RETURN WITH BID

State of _____)
) ss.
County of _____)

AFFIDAVIT

_____ (name of affiant), of _____,

_____, being first duly sworn upon oath, states as follows:

1. That I am the _____ (officer or position) of _____ (bidder) and have personal knowledge of the facts herein stated.
2. That, if selected under this proposal, _____ (bidder) will maintain a business office in the State of Illinois which will be located in _____ County, Illinois.
3. That this business office will serve as the primary place of employment for any persons employed in the construction contemplated by this proposal.
4. That this Affidavit is given as a requirement of state law as provided in Section 30-22(8) of the Illinois Procurement Code.

_____
Signature

_____
Print Name of Affiant

This instrument was acknowledged before me on the _____ day of _____, 20 ___ by _____.

_____
Notary Public

(SEAL)

INSTRUCTIONS

ABOUT IDOT PROPOSALS: All proposals are potential bidding proposals. Each proposal contains all certifications and affidavits, a proposal signature sheet and a proposal bid bond.

PREQUALIFICATION

Any contractor who desires to become pre-qualified to bid on work advertised by IDOT must submit the properly completed pre-qualification forms to the Bureau of Construction no later than 4:30 p.m. prevailing time twenty-one days prior to the letting of interest. This pre-qualification requirement applies to first time contractors, contractors renewing expired ratings, contractors maintaining continuous pre-qualification or contractors requesting revised ratings. To be eligible to bid, existing pre-qualification ratings must be effective through the date of letting.

WHO CAN BID ?

Bids will be accepted from only those companies that request and receive written Authorization to Bid from IDOT's Central Bureau of Construction. This does not apply to Small Business Set-Asides.

REQUESTS FOR AUTHORIZATION TO BID

Contractors wanting to bid on items included in a particular letting must submit the properly completed "Request for Authorization to Bid/or Not For Bid Status" (BDE 124) and the ORIGINAL "Affidavit of Availability" (BC 57) to the proper office no later than 4:30 p.m. prevailing time, three (3) days prior to the letting date. This does not apply to Small Business Set-Asides.

WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?: When a prospective prime bidder submits a "Request for Authorization to Bid/or Not For Bid Status"(BDE 124) he/she must indicate at that time which items are being requested For Bidding purposes. Only those items requested For Bidding will be analyzed. After the request has been analyzed, the bidder will be issued an **Authorization to Bid or Not for Bid Report**, approved by the Central Bureau of Construction and the Chief Procurement Officer that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Authorization to Bid or Not for Bid Report** will indicate the reason for denial.

ABOUT AUTHORIZATION TO BID: Firms that have not received an Authorization to Bid or Not For Bid Report within a reasonable time of complete and correct original document submittal should contact the department as to the status. Firms unsure as to authorization status should call the Prequalification Section of the Bureau of Construction at the number listed at the end of these instructions. These documents must be received three days before the letting date.

ADDENDA AND REVISIONS: It is the bidder's responsibility to determine which, if any, addenda or revisions pertain to any project they may be bidding. Failure to incorporate all relevant addenda or revisions may cause the bid to be declared unacceptable.

Each addendum or revision will be included with the Electronic Plans and Proposals. Addenda and revisions will also be placed on the Addendum/Revision Checklist and each subscription service subscriber will be notified by e-mail of each addendum and revision issued.

The Internet is the Department's primary way of doing business. The subscription server e-mails are an added courtesy the Department provides. It is suggested that bidders check IDOT's website at http://www.dot.il.gov/desenv/delett.html before submitting final bid information.

IDOT IS NOT RESPONSIBLE FOR ANY E-MAIL FAILURES.

Addenda questions may be directed to the Contracts Office at (217)782-7806 or D&Econtracts@dot.il.gov

Technical questions about downloading these files may be directed to Tim Garman at (217)524-1642 or Timothy.Garman@illinois.gov.

BID SUBMITTAL GUIDELINES AND CHECKLIST

In an effort to eliminate confusion and standardize the bid submission process the Contracts Office has created the following guidelines and checklist for submitting bids.

This information has been compiled from questions received from contractors and from inconsistencies noted on submitted bids. If you have additional questions please refer to the contact information listed below.

ABOUT SUBMITTING BIDS: It is recommended that bidders deliver bid proposals in person to ensure they arrive at the proper location prior to the time specified for the receipt of bids. Any proposals received at the place of letting after the time specified will not be read.

STANDARD GUIDELINES FOR SUBMITTING BIDS

- All pages should be single sided.
- Use the Cover Page that is provided in the Bid Proposal (posted on the IDOT Web Site) as the first page of your submitted bid. This page has the Item number in the upper left-hand corner and lines provided for your company name and address in the upper right-hand corner.
- Do not use report covers, presentation folders or special bindings and do not staple multiple times on left side like a book. Use only 1 staple in the upper left hand corner. Make sure all elements of your bid are stapled together including the bid bond or guaranty check (if required).
- Do not include any certificates of eligibility, your authorization to bid, Addendum Letters or affidavit of availability.
- Do not include the Subcontractor Documentation with your bid (pages i – iii and pages a – g). This documentation is required only after you are awarded the contract.
- Use the envelope cover sheet (provided with the proposal) as the cover for the proposal envelope.
- Do not rely on overnight services to deliver your proposal prior to 10 AM on letting day. It will not be read if it is delivered after 10 AM.
- Do not submit your Substance Abuse Prevention Program (SAPP) with your bid. If you are awarded the contract this form is to be submitted to the district engineer at the pre-construction conference.

Use the following checklist to ensure completeness and the correct order in assembling your bid

☐ **Illinois Office Affidavit** (Not applicable to federally funded projects) insert your affidavit after page 4 along with your Cost Adjustments for Steel, Bituminous and Fuel (if applicable).

☐ **Cover page** (the sheet that has the item number on it) **followed by your bid (the Pay Items).** If you are using special software or CBID to generate your schedule of prices, do not include the blank pages of the schedule of prices that came with the proposal package.

☐ **Page 4 (Item 9)** – Check "YES" if you will use a subcontractor(s). Include the subcontractor(s) name, address, general type of work to be performed and the dollar amount (if over $50,000). If you will use subcontractor(s) but are uncertain who or the dollar amount; check "YES" but leave the lines blank.

☐ **Page 10 (Paragraph J)** – Check "YES" or "NO" whether your company has any business in Iran.

☐ **Page 10 (Paragraph K)** – (Not applicable to federally funded projects) List the Union Local Name and number or certified training programs that you have in place. **Your bid will not be read if this is not completed.** Do not include certificates with your bid. Keep the certificates in your office in case they are requested by IDOT.

☐ **Page 11 (Paragraph L)** - A copy of your State Board of Elections certificate of registration is no longer required with your bid.

☐ **Page 11 (Paragraph M)** – Indicate if your company has hired a lobbyist in connection with the job for which you are submitting the bid proposal.

☐ **Page 12 (Paragraph C)** – This is a work sheet to determine if a completed Form A is required. It is not part of the form and you do not need to make copies for each Form A that is filled out.

☐ **Pages 14-17 (Form A)** – One Form A (4 pages) is required for each applicable person in your company. Copies of the Forms can be used and only need to be changed when the financial information changes. The certification signature and date must be original for each letting. Do not staple the forms together.

If you answered "NO" to all of the questions in Paragraph C (page 12), complete the first section (page 14) with your company information and then sign and date the Not Applicable statement on page 17.

☐ **Page 18 (Form B)** - If you check "YES" to having other current or pending contracts it is acceptable to use the phrase, "See Affidavit of Availability on file". **Ownership Certification** (at the bottom of the page) - Check N/A if the Form A you submitted accounts for 100 percent of the company ownership. Check YES if any percentage of ownership falls outside of the parameters that require reporting on the Form A. Checking NO indicates that the Form A you submitted is not correct and you will be required to submit a revised Form A.

☐ **Page 20 (Workforce Projection)** – Be sure to include the Duration of the Project. It is acceptable to use the phrase "Per Contract Specifications".

☐ **Bid Bond –** Submit your bid bond using the current Bid Bond Form provided in the proposal package. The Power of Attorney page should be stapled to the Bid Bond. If you are using an electronic bond, include your bid bond number on the form and attach the Proof of Insurance printed from the Surety 2000 Web Site.

☐ **Disadvantaged Business Utilization Plan and/or Good Faith Effort –** The last item in your bid should be the DBE Utilization Plan (SBE 2026), followed by the DBE Participation Statement (SBE 2025) and supporting paperwork. If you have documentation for a Good Faith Effort, it should follow the SBE Forms.

The Bid Letting is now available in streaming Audio/Video from the IDOT Web Site. A link to the stream will be placed on the main page of the current letting on the day of the Letting. The stream will not begin until 10 AM. The actual reading of the bids does not begin until approximately 10:20 AM.

Following the Letting, the As-Read Tabulation of Bids will be posted by the end of the day. You will find the link on the main page of the current letting.

QUESTIONS: pre-letting up to execution of the contract

Contractor/Subcontractor pre-qualification ---------- 217-782-3413
Small Business, Disadvantaged Business Enterprise (DBE) ---------- 217-785-4611
Contracts, Bids, Letting process or Internet downloads ---------- 217-782-7806
Estimates Unit ---------- 217-785-3483
Aeronautics ---------- 217-785-8515
IDNR (Land Reclamation, Water Resources, Natural Resources) ---------- 217-782-6302

QUESTIONS: following contract execution

Including Subcontractor documentation, payments ---------- 217-782-3413
Railroad Insurance ---------- 217-785-0275

RETURN WITH BID

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Proposal Submitted By
Name
Address
City

Letting September 21, 2012

NOTICE TO PROSPECTIVE BIDDERS
This proposal can be used for bidding purposes by only those companies that request and receive written AUTHORIZATION TO BID from IDOT's Central Bureau of Construction. This does not apply to Small Business Set-Asides.
BIDDERS NEED NOT RETURN THE ENTIRE PROPOSAL

Notice to Bidders, Specifications, Proposal, Contract and Contract Bond

Illinois Department of Transportation

Springfield, Illinois 62764

Contract No. 60P97
Various Counties
Section 2011-073-TS
Various Routes
District 1 Construction Funds

PLEASE MARK THE APPROPRIATE BOX BELOW:

☐ A Bid Bond is included.

☐ A Cashier's Check or a Certified Check is included.

Prepared by

S

Checked by

(Printed by authority of the State of Illinois)

Page intentionally left blank

RETURN WITH BID

Illinois Department of Transportation

PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of _____

_____

Taxpayer Identification Number (Mandatory) _____ a

For the improvement identified and advertised for bids in the Invitation for Bids as:

Contract No. 60P97
Various Counties
Section 2011-073-TS
Various Routes
District 1 Construction Funds

Annual maintenance and operations of traffic signals, highway lighting advanced systems, pump stations, surveillance and other electrical systems located in District 1 in 2013, includes two one year renewals for 2014 and 2015.

2. The undersigned bidder will furnish all labor, material and equipment to complete the above described project in a good and workmanlike manner as provided in the contract documents provided by the Department of Transportation. This proposal will become part of the contract and the terms and conditions contained in the contract documents shall govern performance and payments.

RETURN WITH BID

3. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned further declares that he/she has carefully examined the proposal, plans, specifications, addenda, form of contract and contract bond, and special provisions, and that he/she has inspected in detail the site of the proposed work, and that he/she has familiarized themselves with all of the local conditions affecting the contract and the detailed requirements of construction, and understands that in making this proposal he/she waives all right to plead any misunderstanding regarding the same.

4. **EXECUTION OF CONTRACT AND CONTRACT BOND.** The undersigned further agrees to execute a contract for this work and present the same to the department within fifteen (15) days after the contract has been mailed to him/her. The undersigned further agrees that he/she and his/her surety will execute and present within fifteen (15) days after the contract has been mailed to him/her contract bond satisfactory to and in the form prescribed by the Department of Transportation, in the penal sum of the full amount of the contract, guaranteeing the faithful performance of the work in accordance with the terms of the contract.

5. **PROPOSAL GUARANTY.** Accompanying this proposal is either a bid bond on the department form, executed by a corporate surety company satisfactory to the department, or a proposal guaranty check consisting of a bank cashier's check or a properly certified check for not less than 5 per cent of the amount bid or for the amount specified in the following schedule:

Amount of Bid			Proposal Guaranty	Amount of Bid			Proposal Guaranty
Up to		$5,000	$150	$2,000,000	to	$3,000,000	$100,000
$5,000	to	$10,000	$300	$3,000,000	to	$5,000,000	$150,000
$10,000	to	$50,000	$1,000	$5,000,000	to	$7,500,000	$250,000
$50,000	to	$100,000	$3,000	$7,500,000	to	$10,000,000	$400,000
$100,000	to	$150,000	$5,000	$10,000,000	to	$15,000,000	$500,000
$150,000	to	$250,000	$7,500	$15,000,000	to	$20,000,000	$600,000
$250,000	to	$500,000	$12,500	$20,000,000	to	$25,000,000	$700,000
$500,000	to	$1,000,000	$25,000	$25,000,000	to	$30,000,000	$800,000
$1,000,000	to	$1,500,000	$50,000	$30,000,000	to	$35,000,000	$900,000
$1,500,000	to	$2,000,000	$75,000	over		$35,000,000	$1,000,000

Bank cashier's checks or properly certified checks accompanying proposals shall be made payable to the Treasurer, State of Illinois, when the state is awarding authority; the county treasurer, when a county is the awarding authority; or the city, village, or town treasurer, when a city, village, or town is the awarding authority.

If a combination bid is submitted, the proposal guaranties which accompany the individual proposals making up the combination will be considered as also covering the combination bid.

The amount of the proposal guaranty check is _____ $( ). If this proposal is accepted and the undersigned shall fail to execute a contract bond as required herein, it is hereby agreed that the amount of the proposal guaranty shall become the property of the State of Illinois, and shall be considered as payment of damages due to delay and other causes suffered by the State because of the failure to execute said contract and contract bond; otherwise, the bid bond shall become void or the proposal guaranty check shall be returned to the undersigned.

Attach Cashier's Check or Certified Check Here

In the event that one proposal guaranty check is intended to cover two or more proposals, the amount must be equal to the sum of the proposal guaranties which would be required for each individual proposal. If the guaranty check is placed in another proposal, state below where it may be found.

The proposal guaranty check will be found in the proposal for:

Item _____

Section No. _____

County _____

Mark the proposal cover sheet as to the type of proposal guaranty submitted.

6. **COMBINATION BIDS.** The undersigned further agrees that if awarded the contract for the sections contained in the following combination, he/she will perform the work in accordance with the requirements of each individual proposal comprising the combination bid specified in the schedule below, and that the combination bid shall be prorated against each section in proportion to the bid submitted for the same. If an error is found to exist in the gross sum bid for one or more of the individual sections included in a combination, the combination bid shall be corrected as provided in the specifications.

When a combination bid is submitted, the schedule below must be completed in each proposal comprising the combination.

If alternate bids are submitted for one or more of the sections comprising the combination, a combination bid must be submitted for each alternate.

Schedule of Combination Bids

Combination No.	Sections Included in Combination	Combination Bid Dollars	Cents

7. **SCHEDULE OF PRICES.** The undersigned bidder submits herewith, in accordance with the rules and instructions, a schedule of prices for the items of work for which bids are sought. The unit prices bid are in U.S. dollars and cents, and all extensions and summations have been made. The bidder understands that the quantities appearing in the bid schedule are approximate and are provided for the purpose of obtaining a gross sum for the comparison of bids. If there is an error in the extension of the unit prices, the unit prices shall govern. Payment to the contractor awarded the contract will be made only for actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as provided elsewhere in the contract.

8. **AUTHORITY TO DO BUSINESS IN ILLINOIS.** Section 20-43 of the Illinois Procurement Code (the Code) (30 ILCS 500/20-43) provides that a person (other than an individual acting as a sole proprietor) must be a legal entity authorized to do business in the State of Illinois prior to submitting the bid.

9. **The services of a subcontractor will be used.**

Check box Yes ☐
Check box No ☐

For known subcontractors with subcontracts with an annual value of more than $50,000, the contract shall include their name, address, general type of work to be performed, and the dollar allocation for each subcontractor. (30 ILCS 500/20-120)

_____

_____

10. **EXECUTION OF CONTRACT**: The Department of Transportation will, in accordance with the rules governing Department procurements, execute the contract and shall be the sole entity having the authority to accept performance and make payments under the contract. Execution of the contract by the Chief Procurement Officer (CPO) or the State Purchasing Officer (SPO) is for approval of the procurement process and execution of the contract by the Department. Neither the CPO nor the SPO shall be responsible for administration of the contract or determinations respecting performance or payment there under except as otherwise permitted in the Code.

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 60P97

State Job # - C-91-004-12

Project Number

Route
VARIOUS

County Name - VARIOUS- -
Code - 0 - -
District - 0 - -
Section Number - 2011-073-TS

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X0320990	D1 ELECT MAINT	L SUM	1.000				

CONTRACT NUMBER **60P97**

THIS IS THE TOTAL BID **$** _____

NOTES:

1. **Each PAY ITEM should have a UNIT PRICE and a TOTAL PRICE.**
2. **The UNIT PRICE shall govern if no TOTAL PRICE is shown or if there is a discrepancy between the product of the UNIT PRICE multiplied by the QUANTITY.**
3. **If a UNIT PRICE is omitted, the TOTAL PRICE will be divided by the QUANTITY in order to establish a UNIT PRICE.**
4. **A bid may be declared UNACCEPTABLE if neither a unit price nor a total price is shown.**

RETURN WITH BID

STATE REQUIRED ETHICAL STANDARDS GOVERNING CONTRACT PROCUREMENT: ASSURANCES, CERTIFICATIONS AND DISCLOSURES

I. GENERAL

A. Article 50 of the Code establishes the duty of all State CPOs, SPOs, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

B. In order to comply with the provisions of Article 50 and to carry out the duty established therein, all bidders are to adhere to ethical standards established for the procurement process, and to make such assurances, disclosures and certifications required by law. Except as otherwise required in subsection III, paragraphs J-M, by execution of the Proposal Signature Sheet, the bidder indicates that each of the mandated assurances have been read and understood, that each certification is made and understood, and that each disclosure requirement has been understood and completed.

C. In addition to all other remedies provided by law, failure to comply with any assurance, failure to make any disclosure or the making of a false certification shall be grounds for the CPO to void the contract, and may result in the suspension or debarment of the bidder or subcontractor. If a false certification is made by a subcontractor the contractor's submitted bid and the executed contract may not be declared void unless the contractor refuses to terminate the subcontract upon the State's request after a finding that the subcontractor's certification was false.

II. ASSURANCES

The assurances hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder.

A. Conflicts of Interest

1. The Code provides in pertinent part:

Section 50-13. Conflicts of Interest.

(a) Prohibition. It is unlawful for any person holding an elective office in this State, holding a seat in the General Assembly, or appointed to or employed in any of the offices or agencies of state government and who receives compensation for such employment in excess of 60% of the salary of the Governor of the State of Illinois, or who is an officer or employee of the Capital Development Board or the Illinois Toll Highway Authority, or who is the spouse or minor child of any such person to have or acquire any contract, or any direct pecuniary interest in any contract therein, whether for stationery, printing, paper, or any services, materials, or supplies, that will be wholly or partially satisfied by the payment of funds appropriated by the General Assembly of the State of Illinois or in any contract of the Capital Development Board or the Illinois Toll Highway authority.

(b) Interests. It is unlawful for any firm, partnership, association or corporation, in which any person listed in subsection (a) is entitled to receive (i) more than 7 1/2% of the total distributable income or (ii) an amount in excess of the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(c) Combined interests. It is unlawful for any firm, partnership, association, or corporation, in which any person listed in subsection (a) together with his or her spouse or minor children is entitled to receive (i) more than 15%, in the aggregate, of the total distributable income or (ii) an amount in excess of 2 times the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(d) Securities. Nothing in this Section invalidates the provisions of any bond or other security previously offered or to be offered for sale or sold by or for the State of Illinois.

(e) Prior interests. This Section does not affect the validity of any contract made between the State and an officer or employee of the State or member of the General Assembly, his or her spouse, minor child or any combination of those persons if that contract was in existence before his or her election or employment as an officer, member, or employee. The contract is voidable, however, if it cannot be completed within 365 days after the officer, member, or employee takes office or is employed.

The current salary of the Governor is $177,412.00. Sixty percent of the salary is $106,447.20.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-13, or that an effective exemption has been issued by the Board of Ethics to any individual subject to the Section 50-13 prohibitions pursuant to the provisions of Section 50-20 of the Code and Executive Order Number 3 (1998). Information concerning the exemption process is available from the Department upon request.

B. Negotiations

1. The Code provides in pertinent part:

Section 50-15. Negotiations.

(a) It is unlawful for any person employed in or on a continual contractual relationship with any of the offices or agencies of State government to participate in contract negotiations on behalf of that office or agency with any firm, partnership, association, or corporation with whom that person has a contract for future employment or is negotiating concerning possible future employment.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-15, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

C. Inducements

1. The Code provides:

Section 50-25. Inducement. Any person who offers or pays any money or other valuable thing to any person to induce him or her not to bid for a State contract or as recompense for not having bid on a State contract is guilty of a Class 4 felony. Any person who accepts any money or other valuable thing for not bidding for a State contract or who withholds a bid in consideration of the promise for the payment of money or other valuable thing is guilty of a Class 4 felony.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-25, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

D. Revolving Door Prohibition

1. The Code provides:

Section 50-30. Revolving door prohibition. CPOs, SPOs, procurement compliance monitors, their designees whose principal duties are directly related to State procurement, and executive officers confirmed by the Senate are expressly prohibited for a period of 2 years after terminating an affected position from engaging in any procurement activity relating to the State agency most recently employing them in an affected position for a period of at least 6 months. The prohibition includes, but is not limited to: lobbying the procurement process; specifying; bidding; proposing bid, proposal, or contract documents; on their own behalf or on behalf of any firm, partnership, association, or corporation. This Section applies only to persons who terminate an affected position on or after January 15, 1999.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-30, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

E. Reporting Anticompetitive Practices

1. The Code provides:

Section 50-40. Reporting anticompetitive practices. When, for any reason, any vendor, bidder, contractor, CPO, SPO, designee, elected official, or State employee suspects collusion or other anticompetitive practice among any bidders, offerors, contractors, proposers, or employees of the State, a notice of the relevant facts shall be transmitted to the Attorney General and the CPO.

2. The bidder assures the Department that it has not failed to report any relevant facts concerning the practices addressed in Section 50-40 which may involve the contract for which the bid is submitted.

F. Confidentiality

1. The Code provides:

Section 50-45. Confidentiality. Any CPO, SPO, designee, or executive officer who willfully uses or allows the use of specifications, competitive bid documents, proprietary competitive information, proposals, contracts, or selection information to compromise the fairness or integrity of the procurement, bidding, or contract process shall be subject to immediate dismissal, regardless of the Personnel code, any contract, or any collective bargaining agreement, and may in addition be subject to criminal prosecution.

2. The bidder assures the Department that it has no knowledge of any fact relevant to the practices addressed in Section 50-45 which may involve the contract for which the bid is submitted.

G. Insider Information

1. The Code provides:

Section 50-50. Insider information. It is unlawful for any current or former elected or appointed State official or State employee to knowingly use confidential information available only by virtue of that office or employment for actual or anticipated gain for themselves or another person.

2. The bidder assures the Department that it has no knowledge of any facts relevant to the practices addressed in Section 50-50 which may involve the contract for which the bid is submitted.

III. CERTIFICATIONS

The certifications hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. Section 50-2 of the Code provides that every person that has entered into a multi-year contract and every subcontractor with a multi-year subcontract shall certify, by July 1 of each fiscal year covered by the contract after the initial fiscal year, to the responsible CPO whether it continues to satisfy the requirements of Article 50 pertaining to the eligibility for a contract award. If a contractor or subcontractor is not able to truthfully certify that it continues to meet all requirements, it shall provide with its certification a detailed explanation of the circumstances leading to the change in certification status. A contractor or subcontractor that makes a false statement material to any given certification required under Article 50 is, in addition to any other penalties or consequences prescribed by law, subject to liability under the Whistleblower Reward and Protection Act for submission of a false claim.

A. Bribery

1. The Code provides:

Section 50-5. Bribery.

(a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

(1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

(2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

(b) Businesses. No business shall be barred from contracting with any unit of State or local government, or subcontracting under such a contract, as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

(1) the business has been finally adjudicated not guilty; or

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

(c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

(d) Certification. Every bid submitted to and contract executed by the State, and every subcontract subject to Section 20-120 of the Code shall contain a certification by the contractor or the subcontractor, respectively, that the contractor or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any certifications required by this Section are false. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50.5.

B. Felons

1. The Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any State agency, or enter into a subcontract, from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder or contractor or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any of the certifications required by this Section are false.

C. Debt Delinquency

1. The Code provides:

Section 50-11 and 50-12. Debt Delinquency.
The contractor or bidder or subcontractor, respectively, certifies that it, or any affiliate, is not barred from being awarded a contract or subcontract under the Code. Section 50-11 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The bidder or contractor or subcontractor, respectively, further acknowledges that the CPO may declare the related contract void if this certification is false or if the bidder, contractor, or subcontractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

D. Prohibited Bidders, Contractors and Subcontractors

1. The Code provides:

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.
The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 or if in violation of Subsection (c) for a period of five years from the date of conviction. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder, contractor, or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO shall declare the related contract void if any of the certifications completed pursuant to this Section are false.

E. Section 42 of the Environmental Protection Act

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-12 that the bidder, contractor, or subcontractor, is not barred from being awarded a contract or entering into a subcontract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency, or entering into any subcontract, that is subject to the Code by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The bidder or contractor or subcontractor, respectively, acknowledges that the CPO may declare the contract void if this certification is false.

F. Educational Loan

1. Section 3 of the Educational Loan Default Act provides:

§ 3. No State agency shall contract with an individual for goods or services if that individual is in default, as defined in Section 2 of this Act, on an educational loan. Any contract used by any State agency shall include a statement certifying that the individual is not in default on an educational loan as provided in this Section.

2. The bidder, if an individual as opposed to a corporation, partnership or other form of business organization, certifies that the bidder is not in default on an educational loan as provided in Section 3 of the Act.

G. Bid-Rigging/Bid Rotating

1. Section 33E-11 of the Criminal Code of 1961 provides:

§ 33E-11. (a) Every bid submitted to and public contract executed pursuant to such bid by the State or a unit of local government shall contain a certification by the prime contractor that the prime contractor is not barred from contracting with any unit of State or local government as a result of a violation of either Section 33E-3 or 33E-4 of this Article. The State and units of local government shall provide the appropriate forms for such certification.

(b) A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

A violation of Section 33E-3 would be represented by a conviction of the crime of bid-rigging which, in addition to Class 3 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be barred for 5 years from the date of conviction from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

A violation of Section 33E-4 would be represented by a conviction of the crime of bid-rotating which, in addition to Class 2 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be permanently barred from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

2. The bidder certifies that it is not barred from contracting with the Department by reason of a violation of either Section 33E-3 or Section 33E-4.

H. International Anti-Boycott

1. Section 5 of the International Anti-Boycott Certification Act provides:

§ 5. State contracts. Every contract entered into by the State of Illinois for the manufacture, furnishing, or purchasing of supplies, material, or equipment or for the furnishing of work, labor, or services, in an amount exceeding the threshold for small purchases according to the purchasing laws of this State or $10,000.00, whichever is less, shall contain certification, as a material condition of the contract, by which the contractor agrees that neither the contractor nor any substantially-owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the U.S. Export Administration Act of 1979 or the regulations of the U.S. Department of Commerce promulgated under that Act.

2. The bidder makes the certification set forth in Section 5 of the Act.

I. Drug Free Workplace

1. The Illinois “Drug Free Workplace Act” applies to this contract and it is necessary to comply with the provisions of the “Act” if the contractor is a corporation, partnership, or other entity (including a sole proprietorship) which has 25 or more employees.

2. The bidder certifies that if awarded a contract in excess of $5,000 it will provide a drug free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the contractor’s workplace; specifying the actions that will be taken against employees for violations of such prohibition; and notifying the employee that, as a condition of employment on such contract, the employee shall abide by the terms of the statement, and notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction.

(b) Establishing a drug free awareness program to inform employees about the dangers of drug abuse in the workplace; the contractor’s policy of maintaining a drug free workplace; any available drug counseling, rehabilitation, and employee assistance programs; and the penalties that may be imposed upon employees for drug violations.

(c) Providing a copy of the statement required by subparagraph (1) to each employee engaged in the performance of the contract and to post the statement in a prominent place in the workplace.

(d) Notifying the Department within ten (10) days after receiving notice from an employee or otherwise receiving actual notice of the conviction of an employee for a violation of any criminal drug statute occurring in the workplace.

(e) Imposing or requiring, within 30 days after receiving notice from an employee of a conviction or actual notice of such a conviction, an appropriate personnel action, up to and including termination, or the satisfactory participation in a drug abuse assistance or rehabilitation program approved by a federal, state or local health, law enforcement or other appropriate agency.

(f) Assisting employees in selecting a course of action in the event drug counseling, treatment, and rehabilitation is required and indicating that a trained referral team is in place.

(g) Making a good faith effort to continue to maintain a drug free workplace through implementation of the actions and efforts stated in this certification.

J. Disclosure of Business Operations in Iran

Section 50-36 of the Code, 30ILCS 500/50-36 provides that each bid, offer, or proposal submitted for a State contract shall include a disclosure of whether or not the Company acting as the bidder, offeror, or proposing entity, or any of its corporate parents or subsidiaries, within the 24 months before submission of the bid, offer, or proposal had business operations that involved contracts with or provision of supplies or services to the Government of Iran, companies in which the Government of Iran has any direct or indirect equity share, consortiums or projects commissioned by the Government of Iran, or companies involved in consortiums or projects commissioned by the Government of Iran and either of the following conditions apply:

(1) More than 10% of the Company's revenues produced in or assets located in Iran involve oil-related activities or mineral-extraction activities; less than 75% of the Company's revenues produced in or assets located in Iran involve contracts with or provision of oil-related or mineral-extraction products or services to the Government of Iran or a project or consortium created exclusively by that government; and the Company has failed to take substantial action.

(2) The Company has, on or after August 5, 1996, made an investment of $20 million or more, or any combination of investments of at least $10 million each that in the aggregate equals or exceeds $20 million in any 12-month period, which directly or significantly contributes to the enhancement of Iran's ability to develop petroleum resources of Iran.

The terms “Business operations”, “Company”, “Mineral-extraction activities”, “Oil-related activities”, “Petroleum resources”, and “Substantial action” are all defined in the Code.

Failure to make the disclosure required by the Code shall cause the bid, offer or proposal to be considered not responsive. The disclosure will be considered when evaluating the bid, offer, or proposal or awarding the contract. The name of each Company disclosed as doing business or having done business in Iran will be provided to the State Comptroller.

Check the appropriate statement:

/___/ Company has no business operations in Iran to disclose.

/___/ Company has business operations in Iran as disclosed the attached document.

K. Apprenticeship and Training Certification (Does not apply to federal aid projects)

In accordance with the provisions of Section 30-22 (6) of the Code, the bidder certifies that it is a participant, either as an individual or as part of a group program, in the approved apprenticeship and training programs applicable to each type of work or craft that the bidder will perform with its own forces. The bidder further certifies for work that will be performed by subcontract that each of its subcontractors submitted for approval either (a) is, at the time of such bid, participating in an approved, applicable apprenticeship and training program; or (b) will, prior to commencement of performance of work pursuant to this contract, begin participation in an approved apprenticeship and training program applicable to the work of the subcontract. The Department, at any time before or after award, may require the production of a copy of each applicable Certificate of Registration issued by the United States Department of Labor evidencing such participation by the contractor and any or all of its subcontractors. Applicable apprenticeship and training programs are those that have been approved and registered with the United States Department of Labor. The bidder shall list in the space below, the official name of the program sponsor holding the Certificate of Registration for all of the types of work or crafts in which the bidder is a participant and that will be performed with the bidder’s forces. Types of work or craft work that will be subcontracted shall be included and listed as subcontract work. The list shall also indicate any type of work or craft job category that does not have an applicable apprenticeship or training program. **The bidder is responsible for making a complete report and shall make certain that each type of work or craft job category that will be utilized on the project as reported on the Construction Employee Workforce Projection (Form BC-1256) and returned with the bid is accounted for and listed.**

_____

_____

_____

The requirements of this certification and disclosure are a material part of the contract, and the contractor shall require this certification provision to be included in all approved subcontracts. In order to fulfill this requirement, it shall not be necessary that an applicable program sponsor be currently taking or that it will take applications for apprenticeship, training or employment during the performance of the work of this contract.

L. Political Contributions and Registration with the State Board of Elections

Sections 20-160 and 50-37 of the Code regulate political contributions from business entities and any affiliated entities or affiliated persons bidding on or contracting with the state. Generally under Section 50-37, any business entity, and any affiliated entity or affiliated person of the business entity, whose current year contracts with all state agencies exceed an awarded value of $50,000, are prohibited from making any contributions to any political committees established to promote the candidacy of the officeholder responsible for the awarding of the contracts or any other declared candidate for that office for the duration of the term of office of the incumbent officeholder or a period 2 years after the termination of the contract, whichever is longer. Any business entity and affiliated entities or affiliated persons whose state contracts in the current year do not exceed an awarded value of $50,000, but whose aggregate pending bids and proposals on state contracts exceed $50,000, either alone or in combination with contracts not exceeding $50,000, are prohibited from making any political contributions to any political committee established to promote the candidacy of the officeholder responsible for awarding the pending contract during the period beginning on the date the invitation for bids or request for proposals is issued and ending on the day after the date of award or selection if the entity was not awarded or selected. Section 20-160 requires certification of registration of affected business entities in accordance with procedures found in Section 9-35 of The Election Code.

By submission of a bid, the contractor business entity acknowledges and agrees that it has read and understands Sections 20-160 and 50-37 of the Code, and that it makes the following certification:

The undersigned business entity certifies that it has registered as a business with the State Board of Elections and acknowledges a continuing duty to update the registration in accordance with the above referenced statutes. If the business entity is required to register, the CPO shall verify that it is in compliance on the date the bid or proposal is due. The CPO shall not accept a bid or proposal if the business entity is not in compliance with the registration requirements.

These requirements and compliance with the above referenced statutory sections are a material part of the contract, and any breach thereof shall be cause to void the contract under Section 50-60 of the Code. This provision does not apply to Federal-aid contracts.

M. Lobbyist Disclosure

Section 50-38 of the Code requires that any bidder or offeror on a State contract that hires a person required to register under the Lobbyist Registration Act to assist in obtaining a contract shall:

(i) Disclose all costs, fees, compensation, reimbursements, and other remunerations paid or to be paid to the lobbyist related to the contract,

(ii) Not bill or otherwise cause the State of Illinois to pay for any of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration, and

(iii) Sign a verification certifying that none of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration were billed to the State.

This information, along with all supporting documents, shall be filed with the agency awarding the contract and with the Secretary of State. The CPO shall post this information, together with the contract award notice, in the online Procurement Bulletin.

Pursuant to Subsection (c) of this Section, no person or entity shall retain a person or entity to attempt to influence the outcome of a procurement decision made under the Code for compensation contingent in whole or in part upon the decision or procurement. Any person who violates this subsection is guilty of a business offense and shall be fined not more than $10,000.

Bidder acknowledges that it is required to disclose the hiring of any person required to register pursuant to the Illinois Lobbyist Registration Act (25 ILCS 170) in connection with this contract.

☐ Bidder has not hired any person required to register pursuant to the Illinois Lobbyist Registration Act in connection with this contract.

Or

☐ Bidder has hired the following persons required to register pursuant to the Illinois Lobbyist Registration Act in connection with the contract:

Name and address of person: _____

All costs, fees, compensation, reimbursements and other remuneration paid to said person: _____

_____

_____

_____

IV. DISCLOSURES

A. The disclosures hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. The bidder further certifies that the Department has received the disclosure forms for each bid.

The CPO may void the bid, or contract, respectively, if it is later determined that the bidder or subcontractor rendered a false or erroneous disclosure. A contractor or subcontractor may be suspended or debarred for violations of the Code. Furthermore, the CPO may void the contract and the surety providing the performance bond shall be responsible for completion of the contract.

B. Financial Interests and Conflicts of Interest

1. Section 50-35 of the Code provides that all bids of more than $25,000 shall be accompanied by disclosure of the financial interests of the bidder. This disclosed information for the successful bidder, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act, filed with the Procurement Policy Board, and shall be incorporated as a material term of the contract. Furthermore, pursuant to Section 5-5, the Procurement Policy Board may review a proposal, bid, or contract and issue a recommendation to void a contract or reject a proposal or bid based on any violation of the Code or the existence of a conflict of interest as provided in subsections (b) and (d) of Section 50-35.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the bidding entity or its parent entity, whichever is less, unless the contractor or bidder is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.
The current annual salary of the Governor is $177,412.00

In addition, all disclosures shall indicate any other current or pending contracts, proposals, leases, or other ongoing procurement relationships the bidding entity has with any other unit of state government and shall clearly identify the unit and the contract, proposal, lease, or other relationship.

2. Disclosure Forms. Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. A separate Disclosure Form A must be submitted with the bid for each individual meeting the above requirements. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies and a total ownership certification. **The forms must be included with each bid.**

C. Disclosure Form Instructions

Form A Instructions for Financial Information & Potential Conflicts of Interest

If the bidder is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a bidder is not subject to Federal 10K reporting, the bidder must determine if any individuals are required by law to complete a financial disclosure form. To do this, the bidder should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the NOT APPLICABLE STATEMENT on Form A must be signed and dated by a person that is authorized to execute contracts for the bidding company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES ___ NO ___
2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than 60% of the annual salary of the Governor? YES ___ NO___
3. Does anyone in your organization receive more than 60% of the annual salary of the Governor of the bidding entity's or parent entity's distributive income? YES ___ NO __

   (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.)

4. Does anyone in your organization receive greater than 5% of the bidding entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES ___ NO __

   (Note: Only one set of forms needs to be completed per person per bid even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The bidder must determine each individual in the bidding entity or the bidding entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable**. The person signing can be, but does not have to be, the person for which the form is being completed. The bidder is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the NOT APPLICABLE STATEMENT of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

Form B: Instructions for Identifying Other Contracts & Procurement Related Information

Disclosure Form B must be completed for each bid submitted by the bidding entity. *Note: Checking the NOT APPLICABLE STATEMENT on Form A does not allow the bidder to ignore Form B. Form B must be completed, checked, and dated or the bidder may be considered nonresponsive and the bid will not be accepted.*

The Bidder shall identify, by checking Yes or No on Form B, whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the bidder only needs to complete the check box on the bottom of Form B. If "Yes" is checked, the bidder must do one of the following:

Option I: If the bidder did not submit an Affidavit of Availability to obtain authorization to bid, the bidder must list all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Do not include IDOT contracts. Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included. Bidders who submit Affidavits of Availability are suggested to use Option II.

Option II: If the bidder is required and has submitted an Affidavit of Availability in order to obtain authorization to bid, the bidder may write or type "See Affidavit of Availability" which indicates that the Affidavit of Availability is incorporated by reference and includes all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. For any contracts that are not covered by the Affidavit of Availability, the bidder must identify them on Form B or on an attached sheet(s). These might be such things as leases.

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ILLINOIS DEPARTMENT OF TRANSPORTATION

Form A
Financial Information & Potential Conflicts of Interest Disclosure

Contractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Vendors desiring to enter into a contract with the State of Illinois must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for bids in excess of $25,000, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**

The current annual salary of the Governor is $177,412.00.

DISCLOSURE OF FINANCIAL INFORMATION

1. Disclosure of Financial Information. The individual named below has an interest in the BIDDER (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor. **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

FOR INDIVIDUAL (type or print information)

NAME: _____

ADDRESS _____

_____

Type of ownership/distributable income share:

stock _____ sole proprietorship _____ Partnership _____ other: (explain on separate sheet):

% or $ value of ownership/distributable income share: _____

2. Disclosure of Potential Conflicts of Interest. Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

(a) State employment, currently or in the previous 3 years, including contractual employment of services.
Yes ___ No __

If your answer is yes, please answer each of the following questions.

1. Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___ No __

2. Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, provide the name the State agency for which you are employed and your annual salary. _____
_____

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
   Yes ___No __

4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor? Yes ___No __

(b) State employment of spouse, father, mother, son, or daughter, including contractual employment services in the previous 2 years.
Yes ___No __

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___No __

2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of your spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. _____
   _____

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 71/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes ___No __

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 2 times the salary of the Governor?
   Yes ___No __

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes ___No __

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years. Yes ___No __

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government.
Yes ___No __

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___ No __

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes ___ No __

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes ___ No __

3. Communication Disclosure.

Disclose the name and address of each lobbyist and other agent of the bidder or offeror who is not identified in Section 2 of this form, who is has communicated, is communicating, or may communicate with any State officer or employee concerning the bid or offer. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the process and throughout the term of the contract. If no person is identified, enter "None" on the line below:

Name and address of person(s): _____

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4. Debarment Disclosure. For each of the persons identified under Sections 2 and 3 of this form, disclose whether any of the following has occurred within the previous 10 years: debarment from contracting with any governmental entity; professional licensure discipline; bankruptcies; adverse civil judgments and administrative findings; and criminal felony convictions. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the procurement process and term of the contract. If no person is identified, enter "None" on the line below:

Name of person(s): _____

Nature of disclosure: _____

_____

_____

_____

APPLICABLE STATEMENT

This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page. Under penalty of perjury, I certify the contents of this disclosure to be true and accurate to the best of my knowledge.

Completed by: ☐ _____ _____

Signature of Individual or Authorized Representative — Date

NOT APPLICABLE STATEMENT

Under penalty of perjury, I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.

This Disclosure Form A is submitted on behalf of the CONTRACTOR listed on the previous page.

☐ _____ _____

Signature of Authorized Representative — Date

The bidder has a continuing obligation to supplement these disclosures under Sec. 50-35 of the Code.

RETURN WITH BID

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B
Other Contracts & Financial Related Information Disclosure

Contractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for bids in excess of $25,000, and for all open-ended contracts.

DISCLOSURE OF OTHER CONTRACTS AND PROCUREMENT RELATED INFORMATION

1. Identifying Other Contracts & Procurement Related Information. The BIDDER shall identify whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes ___ No __
If "No" is checked, the bidder only needs to complete the signature box on the bottom of this page.

2. If "Yes" is checked. Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

THE FOLLOWING STATEMENT MUST BE CHECKED

☐ _____ _____
Signature of Authorized Representative Date

OWNERSHIP CERTIFICATION

Please certify that the following statement is true if the individuals for all submitted Form A disclosures do not total 100% of ownership.

Any remaining ownership interest is held by individuals receiving less than $106,447.20 of the bidding entity's or parent entity's distributive income or holding less than a 5% ownership interest.

☐ Yes ☐ No ☐ N/A (Form A disclosure(s) established 100% ownership)

RETURN WITH BID

SPECIAL NOTICE TO CONTRACTORS

The following requirements of the Illinois Department of Human Rights' Rules and Regulations are applicable to bidders on all construction contracts advertised by the Illinois Department of Transportation:

CONSTRUCTION EMPLOYEE UTILIZATION PROJECTION

(a) All bidders on construction contracts shall complete and submit, along with and as part of their bids, a Bidder's Employee Utilization Form (Form BC-1256) setting forth a projection and breakdown of the total workforce intended to be hired and/or allocated to such contract work by the bidder including a projection of minority and female employee utilization in all job classifications on the contract project.

(b) The Department of Transportation shall review the Employee Utilization Form, and workforce projections contained therein, of the contract awardee to determine if such projections reflect an underutilization of minority persons and/or women in any job classification in accordance with the Equal Employment Opportunity Clause and Section 7.2 of the Illinois Department of Human Rights' Rules and Regulations for Public Contracts adopted as amended on September 17, 1980. If it is determined that the contract awardee's projections reflect an underutilization of minority persons and/or women in any job classification, it shall be advised in writing of the manner in which it is underutilizing and such awardee shall be considered to be in breach of the contract unless, prior to commencement of work on the contract project, it submits revised satisfactory projections or an acceptable written affirmative action plan to correct such underutilization including a specific timetable geared to the completion stages of the contract.

(c) The Department of Transportation shall provide to the Department of Human Rights a copy of the contract awardee's Employee Utilization Form, a copy of any required written affirmative action plan, and any written correspondence related thereto. The Department of Human Rights may review and revise any action taken by the Department of Transportation with respect to these requirements.

RETURN WITH BID

Illinois Department of Transportation

Contract No. 60P97
Various Counties
Section 2011-073-TS
Various Routes
District 1 Construction Funds

PART I. IDENTIFICATION

Dept. Human Rights #_____ Duration of Project: _____

Name of Bidder: _____

PART II. WORKFORCE PROJECTION

A. The undersigned bidder has analyzed minority group and female populations, unemployment rates and availability of workers for the location in which this contract work is to be performed, and for the locations from which the bidder recruits employees, and hereby submits the following workforce projection including a projection for minority and female employee utilization in all job categories in the workforce to be allocated to this contract:

TABLE A

TOTAL Workforce Projection for Contract													TABLE B: CURRENT EMPLOYEES TO BE ASSIGNED TO CONTRACT			
			MINORITY EMPLOYEES						TRAINEES							
JOB CATEGORIES	TOTAL EMPLOYEES		BLACK		HISPANIC		*OTHER MINOR.		APPREN-TICES		ON THE JOB TRAINEES		TOTAL EMPLOYEES		MINORITY EMPLOYEES	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
OFFICIALS (MANAGERS)																
SUPERVISORS																
FOREMEN																
CLERICAL																
EQUIPMENT OPERATORS																
MECHANICS																
TRUCK DRIVERS																
IRONWORKERS																
CARPENTERS																
CEMENT MASONS																
ELECTRICIANS																
PIPEFITTERS, PLUMBERS																
PAINTERS																
LABORERS, SEMI-SKILLED																
LABORERS, UNSKILLED																
TOTAL																

TABLE C

TOTAL Training Projection for Contract								
EMPLOYEES IN TRAINING	TOTAL EMPLOYEES		BLACK		HISPANIC		*OTHER MINOR.	
	M	F	M	F	M	F	M	F
APPRENTICES								
ON THE JOB TRAINEES								

FOR DEPARTMENT USE ONLY

* Other minorities are defined as Asians (A) or Native Americans (N).
Please specify race of each employee shown in Other Minorities column.

BC 1256 (Rev. 12/11/07)

Note: See instructions on page 2

PART II. WORKFORCE PROJECTION - continued

B. Included in "Total Employees" under Table A is the total number of **new hires** that would be employed in the event the undersigned bidder is awarded this contract.

The undersigned bidder projects that: (number) _____ new hires would be recruited from the area in which the contract project is located; and/or (number) _____ new hires would be recruited from the area in which the bidder's principal office or base of operation is located.

C. Included in "Total Employees" under Table A is a projection of numbers of persons to be employed directly by the undersigned bidder as well as a projection of numbers of persons to be employed by subcontractors.

The undersigned bidder estimates that (number) _____ persons will be directly employed by the prime contractor and that (number) _____ persons will be employed by subcontractors.

PART III. AFFIRMATIVE ACTION PLAN

A. The undersigned bidder understands and agrees that in the event the foregoing minority and female employee utilization projection included under **PART II** is determined to be an underutilization of minority persons or women in any job category, and in the event that the undersigned bidder is awarded this contract, he/she will, prior to commencement of work, develop and submit a written Affirmative Action Plan including a specific timetable (geared to the completion stages of the contract) whereby deficiencies in minority and/or female employee utilization are corrected. Such Affirmative Action Plan will be subject to approval by the contracting agency and the **Department of Human Rights**.

B. The undersigned bidder understands and agrees that the minority and female employee utilization projection submitted herein, and the goals and timetable included under an Affirmative Action Plan if required, are deemed to be part of the contract specifications.

Company _____ Telephone Number _____

_____

Address _____

NOTICE REGARDING SIGNATURE

The Bidder's signature on the Proposal Signature Sheet will constitute the signing of this form. The following signature block needs to be completed if revisions are required.

Signature: ☐ _____ Title: _____ Date: _____

Instructions: All tables must include subcontractor personnel in addition to prime contractor personnel.

Table A - Include both the number of employees that would be hired to perform the contract work and the total number currently employed (Table B) that will be allocated to contract work, and include all apprentices and on-the-job trainees. The "Total Employees" column should include all employees including all minorities, apprentices and on-the-job trainees to be employed on the contract work.

Table B - Include all employees currently employed that will be allocated to the contract work including any apprentices and on-the-job trainees currently employed.

Table C - Indicate the racial breakdown of the total apprentices and on-the-job trainees shown in Table A.

BC-1256 (Rev. 12/11/07)

RETURN WITH BID
Contract No. 60P97
Various Counties
Section 2011-073-TS
Various Routes
District 1 Construction Funds

PROPOSAL SIGNATURE SHEET

The undersigned bidder hereby makes and submits this bid on the subject Proposal, thereby assuring the Department that all requirements of the Invitation for Bids and rules of the Department have been met, that there is no misunderstanding of the requirements of paragraph 3 of this Proposal, and that the contract will be executed in accordance with the rules of the Department if an award is made on this bid.

Firm Name _____

(IF AN INDIVIDUAL) Signature of Owner _____

Business Address _____

_____

Firm Name _____

By _____

(IF A CO-PARTNERSHIP) Business Address _____

_____

Name and Address of All Members of the Firm:

_____ _____

_____ _____

Corporate Name _____

By _____

Signature of Authorized Representative

_____

Typed or printed name and title of Authorized Representative

(IF A CORPORATION)

Attest _____

Signature

(IF A JOINT VENTURE, USE THIS SECTION FOR THE MANAGING PARTY AND THE SECOND PARTY SHOULD SIGN BELOW) Business Address _____

_____

Corporate Name _____

By _____

Signature of Authorized Representative

_____

Typed or printed name and title of Authorized Representative

(IF A JOINT VENTURE)

Attest _____

Signature

Business Address _____

_____

If more than two parties are in the joint venture, please attach an additional signature sheet.

Illinois Department of Transportation

Return with Bid

Division of Highways
Proposal Bid Bond
(Effective November 1, 1992)

Item No. _____

Letting Date _____

KNOW ALL MEN BY THESE PRESENTS, That We _____

_____

as PRINCIPAL, and _____

_____ as SURETY, are held jointly, severally and firmly bound unto the STATE OF ILLINOIS in the penal sum of 5 percent of the total bid price, or for the amount specified in the bid proposal under "Proposal Guaranty" in effect on the date of the Invitation for Bids, whichever is the lesser sum, well and truly to be paid unto said STATE OF ILLINOIS, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, that whereas, the PRINCIPAL has submitted a bid proposal to the STATE OF ILLINOIS, acting through the Department of Transportation, for the improvement designated by the Transportation Bulletin Item Number and Letting Date indicated above.

NOW, THEREFORE, if the Department shall accept the bid proposal of the PRINCIPAL; and if the PRINCIPAL shall, within the time and as specified in the bidding and contract documents, submit a DBE Utilization Plan that is accepted and approved by the Department; and if, after award by the Department, the PRINCIPAL shall enter into a contract in accordance with the terms of the bidding and contract documents including evidence of the required insurance coverages and providing such bond as specified with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof; or if, in the event of the failure of the PRINCIPAL to make the required DBE submission or to enter into such contract and to give the specified bond, the PRINCIPAL pays to the Department the difference not to exceed the penalty hereof between the amount specified in the bid proposal and such larger amount for which the Department may contract with another party to perform the work covered by said bid proposal, then this obligation shall be null and void, otherwise, it shall remain in full force and effect.

IN THE EVENT the Department determines the PRINCIPAL has failed to comply with any requirement as set forth in the preceding paragraph, then Surety shall pay the penal sum to the Department within fifteen (15) days of written demand therefor. If Surety does not make full payment within such period of time, the Department may bring an action to collect the amount owed. Surety is liable to the Department for all its expenses, including attorney's fees, incurred in any litigation in which it prevails either in whole or in part.

In TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by

their respective officers this _____ day of _____ A.D., _____ .

PRINCIPAL

_____
(Company Name)

By _____
(Signature & Title)

SURETY

_____
(Company Name)

By: _____
(Signature of Attorney-in-Fact)

Notary Certification for Principal and Surety

STATE OF ILLINOIS,
County of _____

I, _____ , a Notary Public in and for said County, do hereby certify that

_____ and _____
(Insert names of individuals signing on behalf of PRINCIPAL & SURETY)

who are each personally known to me to be the same persons whose names are subscribed to the foregoing instrument on behalf of PRINCIPAL and SURETY, appeared before me this day in person and acknowledged respectively, that they signed and delivered said instrument as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this _____ day of _____ A.D. _____

My commission expires _____ _____
Notary Public

In lieu of completing the above section of the Proposal Bid Form, the Principal may file an Electronic Bid Bond. By signing the proposal and marking the check box next to the Signature and Title line below, the Principal is ensuring the identified electronic bid bond has been executed and the Principal and Surety are firmly bound unto the State of Illinois under the conditions of the bid bond as shown above.

_____ _____ ☐ _____
Electronic Bid Bond ID# Company / Bidder Name Signature and Title

Illinois Department of Transportation

DBE Utilization Plan

(1) Policy

It is public policy that disadvantaged businesses as defined in 49 CFR Part 26 and the Special Provision shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal or State funds. Consequently the requirements of 49 CFR Part 26 apply to this contract.

(2) Obligation

The contractor agrees to ensure that disadvantaged businesses as defined in 49 CFR Part 26 and the Special Provision have the maximum opportunity to participate in the performance of contracts or subcontracts financed in whole or in part with Federal or State funds. The contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 and the Special Provision to ensure that said businesses have the maximum opportunity to compete for and perform under this contract. The contractor shall not discriminate on the basis of race, color, national origin or sex in the award and performance of contracts.

(3) Project and Bid Identification

Complete the following information concerning the project and bid:

Route _____ Total Bid _____

Section _____ Contract DBE Goal _____ (Percent) _____ (Dollar Amount)

Project _____

County _____

Letting Date _____

Contract No. _____

Letting Item No. _____

(4) Assurance

I, acting in my capacity as an officer of the undersigned bidder (or bidders if a joint venture), hereby assure the Department that on this project my company : (check one)

☐ Meets or exceeds contract award goals and has provided documented participation as follows:

Disadvantaged Business Participation _____ percent

Attached are the signed participation statements, forms SBE 2025, required by the Special Provision evidencing availability and use of each business participating in this plan and assuring that each business will perform a commercially useful function in the work of the contract.

☐ Failed to meet contract award goals and has included good faith effort documentation to meet the goals and that my company has provided participation as follows:

Disadvantaged Business Participation _____ percent

The contract goals should be accordingly modified or waived. Attached is all information required by the Special Provision in support of this request including good faith effort. Also attached are the signed participation statements, forms SBE 2025, required by the Special Provision evidencing availability and use of each business participating in this plan and assuring that each business will perform a commercially useful function in the work of the contract.

_____
Company

By _____

Title _____

Date _____

The "as read" Low Bidder is required to comply with the Special Provision.

Submit only one utilization plan for each project. The utilization plan shall be submitted in accordance with the special provision.

Bureau of Small Business Enterprises
2300 South Dirksen Parkway
Springfield, Illinois 62764

Local Let Projects
Submit forms to the
Local Agency

The Department of Transportation is requesting disclosure of information that is necessary to accomplish the purpose as outlined under State and Federal law. Disclosure of this information is **REQUIRED**. Failure to provide any information will result in the contract not being awarded. This form has been approved by the State Forms Manager Center.

Illinois Department of Transportation

DBE Participation Statement

Subcontractor Registration _____ Letting _____

Participation Statement Item No. _____

(1) Instructions Contract _____

This form must be completed for each disadvantaged business participating in the Utilization Plan. This form shall be submitted in accordance with the special provision and will be attached to the Utilization Plan form. If additional space is needed complete an additional form for the firm.

(2) Work

Pay Item No.	Description	Quantity	Unit Price	Total
			Total	

(3) Partial Payment Items

For any of the above items which are partial pay items, specifically describe the work and subcontract dollar amount:

(4) Commitment

The undersigned certify that the information included herein is true and correct, and that the DBE firm listed below has agreed to perform a commercially useful function in the work of the contract item(s) listed above and to execute a contract with the prime contractor. The undersigned further understand that no changes to this statement may be made without prior approval from the Department's Bureau of Small Business Enterprises and that complete and accurate information regarding actual work performed on this project and the payment therefore must be provided to the Department.

_____ _____

Signature for Prime Contractor | Signature for DBE Firm

Title _____ Title _____

Date _____ Date _____

Contact _____ Contact _____

Phone _____ Phone _____

Firm Name _____ Firm Name _____

Address _____ Address _____

City/State/Zip _____ City/State/Zip _____

E _____

WC _____

The Department of Transportation is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under the state and federal law. Disclosure of this information is **REQUIRED**. Failure to provide any information will result in the contract not being awarded. This form has been approved by the State Forms Management Center.

PROPOSAL ENVELOPE

Illinois Department of Transportation

PROPOSALS

for construction work advertised for bids by the
Illinois Department of Transportation

Item No.	Item No.	Item No.

Submitted By:

Name:
Address:
Phone No.

Bidders should use an IDOT proposal envelope or affix this form to the front of a 10” x 13” envelope for the submittal of bids. If proposals are mailed, they should be enclosed in a second or outer envelope addressed to:

Engineer of Design and Environment - Room 326
Illinois Department of Transportation
2300 South Dirksen Parkway
Springfield, Illinois 62764

NOTICE

Individual bids, including Bid Bond and/or supplemental information if required, should be securely stapled.

CONTRACTOR OFFICE COPY OF CONTRACT SPECIFICATIONS

NOTICE

None of the following material needs to be returned with the bid package unless the special provisions require documentation and/or other information to be submitted.

Contract No. 60P97
Various Counties
Section 2011-073-TS
Various Routes
District 1 Construction Funds

Illinois Department of Transportation

SUBCONTRACTOR DOCUMENTATION

Public Acts 96-0795, 96-0920, and 97-0895 enacted substantial changes to the provisions of the Code (30 ILCS 500). Among the changes are provisions affecting subcontractors. The Contractor awarded this contract will be required as a material condition of the contract to implement and enforce the contract requirements applicable to subcontractors that entered into a contractual agreement with a total value of $50,000 or more with a person or entity who has a contract subject to the Code and approved in accordance with article 108.01 of the Standard Specifications for Road and Bridge Construction.

If the Contractor seeks approval of subcontractors to perform a portion of the work, and approval is granted by the Department, the Contractor shall provide a copy of the subcontract to the Illinois Department of Transportation's CPO upon request within 15 calendar days after execution of the subcontract.

Financial disclosures required pursuant to Sec. 50-35 of the Code must be submitted for all applicable subcontractors. The subcontract shall contain the certifications required to be made by subcontractors pursuant to Article 50 of the Code. This Notice to Bidders includes a document incorporating all required subcontractor certifications and disclosures for use by the Contractor in compliance with this mandate. The document is entitled State Required Ethical Standards Governing Subcontractors.

RETURN WITH SUBCONTRACT

STATE ETHICAL STANDARDS GOVERNING SUBCONTRACTORS

Article 50 of the Code establishes the duty of all State CPOs, SPOs, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

The certifications hereinafter made by the subcontractor are each a material representation of fact upon which reliance is placed should the Department approve the subcontractor. The CPO may terminate or void the contract approval if it is later determined that the bidder or subcontractor rendered a false or erroneous certification. If a false certification is made by a subcontractor the contractor's submitted bid and the executed contract may not be declared void unless the contractor refuses to terminate the subcontract upon the State's request after a finding that the subcontractor's certification was false.

Section 50-2 of the Code provides that every person that has entered into a multi-year contract and every subcontractor with a multi-year subcontract shall certify, by July 1 of each fiscal year covered by the contract after the initial fiscal year, to the responsible CPO whether it continues to satisfy the requirements of Article 50 pertaining to the eligibility for a contract award. If a contractor or subcontractor is not able to truthfully certify that it continues to meet all requirements, it shall provide with its certification a detailed explanation of the circumstances leading to the change in certification status. A contractor or subcontractor that makes a false statement material to any given certification required under Article 50 is, in addition to any other penalties or consequences prescribed by law, subject to liability under the Whistleblower Reward and Protection Act for submission of a false claim.

A. Bribery

1. The Code provides:

Section 50-5. Bribery.

(a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

(1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

(2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

(b) Businesses. No business shall be barred from contracting with any unit of State or local government, or subcontracting under such a contract, as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

(1) the business has been finally adjudicated not guilty; or

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract to which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

(c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

(d) Certification. Every bid submitted to and contract executed by the State, and every subcontract subject to Section 20-120 of the Code shall contain a certification by the contractor or the subcontractor, respectively, that the contractor or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any certifications required by this Section are false. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50.5.

B. Felons

1. The Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any State agency, or enter into a subcontract, from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder or contractor or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any of the certifications required by this Section are false.

RETURN WITH SUBCONTRACT

C. Debt Delinquency

1. The Code provides:

Section 50-11 and 50-12. Debt Delinquency.
The contractor or bidder or subcontractor, respectively, certifies that it, or any affiliate, is not barred from being awarded a contract or subcontract under the Code. Section 50-11 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The bidder or contractor or subcontractor, respectively, further acknowledges that the CPO may declare the related contract void if this certification is false or if the bidder, contractor, or subcontractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

D. Prohibited Bidders, Contractors and Subcontractors

1. The Code provides:

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.
The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 or if in violation of Subsection (c) for a period of five years from the date of conviction. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder, contractor, or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO shall declare the related contract void if any of the certifications completed pursuant to this Section are false.

E. Section 42 of the Environmental Protection Act

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-12 that the bidder, contractor, or subcontractor, is not barred from being awarded a contract or entering into a subcontract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency, or entering into any subcontract, that is subject to the Code by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The bidder or contractor or subcontractor, respectively, acknowledges that the CPO may declare the contract void if this certification is false.

The undersigned, on behalf of the subcontracting company, has read and understands the above certifications and makes the certifications as required by law.

_____
Name of Subcontracting Company

_____ _____
Authorized Officer Date

RETURN WITH SUBCONTRACT

SUBCONTRACTOR DISCLOSURES

I. DISCLOSURES

A. The disclosures hereinafter made by the subcontractor are each a material representation of fact upon which reliance is placed. The subcontractor further certifies that the Department has received the disclosure forms for each subcontract.

The CPO may void the bid, contract, or subcontract, respectively, if it is later determined that the bidder or subcontractor rendered a false or erroneous disclosure. A contractor or subcontractor may be suspended or debarred for violations of the Code. Furthermore, the CPO may void the contract.

B. Financial Interests and Conflicts of Interest

1. Section 50-35 of the Code provides that all subcontracts with a total value of $50,000 or more from subcontractors identified in Section 20-120 of the Code, shall be accompanied by disclosure of the financial interests of the subcontractor. This disclosed information for the subcontractor, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act, filed with the Procurement Policy Board, and shall be incorporated as a material term of the Prime Contractor's contract. Furthermore, pursuant to this Section, the Procurement Policy Board may recommend to allow or void a contract or subcontract based on a potential conflict of interest.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the subcontracting entity or its parent entity, whichever is less, unless the subcontractor is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a subcontractor is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.
The current annual salary of the Governor is $177,412.00.

In addition, all disclosures shall indicate any other current or pending contracts, subcontracts, proposals, leases, or other ongoing procurement relationships the subcontracting entity has with any other unit of state government and shall clearly identify the unit and the contract, subcontract, proposal, lease, or other relationship.

2. Disclosure Forms. Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. A separate Disclosure Form A must be submitted with the bid for each individual meeting the above requirements. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies and a total ownership certification. **The forms must be included with each bid.**

C. Disclosure Form Instructions

Form A Instructions for Financial Information & Potential Conflicts of Interest

If the subcontractor is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a subcontractor is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a subcontractor is not subject to Federal 10K reporting, the subcontractor must determine if any individuals are required by law to complete a financial disclosure form. To do this, the subcontractor should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the NOT APPLICABLE STATEMENT on the second page of Form A must be signed and dated by a person that is authorized to execute contracts for the subcontracting company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES ___ NO ___
2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than 60% of the annual salary of the Governor? YES ___ NO
3. Does anyone in your organization receive more than 60% of the annual salary of the Governor of the subcontracting entity's or parent entity's distributive income? YES ___ NO __.

   (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.)
4. Does anyone in your organization receive greater than 5% of the subcontracting entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES ___ NO __

   (Note: Only one set of forms needs to be completed per person per subcontract even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The subcontractor must determine each individual in the subcontracting entity or the subcontracting entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable**. The person signing can be, but does not have to be, the person for which the form is being completed. The subcontractor is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the NOT APPLICABLE STATEMENT on page 2 of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

RETURN WITH SUBCONTRACT

Form B: **Instructions for Identifying Other Contracts & Procurement Related Information**

Disclosure Form B must be completed for each subcontract submitted by the subcontracting entity. *Note: Checking the NOT APPLICABLE STATEMENT on Form A does not allow the subcontractor to ignore Form B. Form B must be completed, checked, and dated or the subcontract will not be approved.*

The Subcontractor shall identify, by checking Yes or No on Form B, whether it has any pending contracts, subcontracts, leases, bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the subcontractor only needs to complete the check box on the bottom of Form B. If "Yes" is checked, the subcontractor must list all non-IDOT State of Illinois agency pending contracts, subcontracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts or subcontracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included.

RETURN WITH SUBCONTRACT

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form A
Subcontractor: Financial Information & Potential Conflicts of Interest Disclosure

Subcontractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Subcontractors desiring to enter into a subcontract of a State of Illinois contract must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for subcontracts with a total value of $50,000 or more, from subcontractors identified in Section 20-120 of the Code, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**

The current annual salary of the Governor is $177,412.00.

DISCLOSURE OF FINANCIAL INFORMATION

1. Disclosure of Financial Information. The individual named below has an interest in the SUBCONTRACTOR (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor. **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

FOR INDIVIDUAL (type or print information)

NAME: _____

ADDRESS _____

_____

Type of ownership/distributable income share:

stock _____ sole proprietorship _____ Partnership _____ other: (explain on separate sheet):

% or $ value of ownership/distributable income share: _____

2. Disclosure of Potential Conflicts of Interest. Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

(a) State employment, currently or in the previous 3 years, including contractual employment of services.

Yes ___ No __

If your answer is yes, please answer each of the following questions.

1. Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___ No __

2. Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, provide the name the State agency for which you are employed and your annual salary. _____

_____

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
   Yes ___No __

4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor? Yes ___No __

(b) State employment of spouse, father, mother, son, or daughter, including contractual employment services in the previous 2 years.
   Yes ___No __

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois Toll Highway Authority? Yes ___No __

2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of your spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. _____
   _____

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, as of 7/1/07) are you entitled to receive (i) more then 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes ___No __

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the annual salary of the Governor?
   Yes ___No __

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes ___No __

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years. Yes ___No __

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___No __

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government.
   Yes ___No __

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___ No __

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections.
Yes ___ No __

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections.
Yes ___ No __

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3 Communication Disclosure.

Disclose the name and address of each lobbyist and other agent of the bidder or offeror who is not identified in Section 2 of this form, who is has communicated, is communicating, or may communicate with any State officer or employee concerning the bid or offer. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the process and throughout the term of the contract. If no person is identified, enter "None" on the line below:

Name and address of person(s): _____

_____

_____

_____

RETURN WITH SUBCONTRACT

4. Debarment Disclosure. For each of the persons identified under Sections 2 and 3 of this form, disclose whether any of the following has occurred within the previous 10 years: debarment from contracting with any governmental entity; professional licensure discipline; bankruptcies; adverse civil judgments and administrative findings; and criminal felony convictions. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the procurement process and term of the contract. If no person is identified, enter "None" on the line below:

Name of person(s): _____

Nature of disclosure: _____

_____

_____

_____

APPLICABLE STATEMENT

This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page. Under penalty of perjury, I certify the contents of this disclosure to be true and accurate to the best of my knowledge.

Completed by: ☐ _____ _____

Signature of Individual or Authorized Officer — Date

NOT APPLICABLE STATEMENT

Under penalty of perjury, I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.

This Disclosure Form A is submitted on behalf of the SUBCONTRACTOR listed on the previous page.

☐ _____ _____

Signature of Authorized Officer — Date

RETURN WITH SUBCONTRACT

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B
Subcontractor: Other Contracts & Financial Related Information Disclosure

Subcontractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for subcontracts with a total value of $50,000 or more, from subcontractors identified in Section 20-120 of the Code, and for all open-ended contracts.

DISCLOSURE OF OTHER CONTRACTS, SUBCONTRACTS, AND PROCUREMENT RELATED INFORMATION

1. Identifying Other Contracts & Procurement Related Information. The SUBCONTRACTOR shall identify whether it has any pending contracts, subcontracts, including leases, bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes ___ No __
If "No" is checked, the subcontractor only needs to complete the signature box on the bottom of this page.

2. If "Yes" is checked. Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

THE FOLLOWING STATEMENT MUST BE CHECKED

☐ _____ _____
Signature of Authorized Representative Date

OWNERSHIP CERTIFICATION

Please certify that the following statement is true if the individuals for all submitted Form A disclosures do not total 100% of ownership

Any remaining ownership interest is held by individuals receiving less than $106,447.20 of the bidding entity's or parent entity's distributive income or holding less than a 5% ownership interest.

☐ Yes ☐ No ☐ N/A (Form A disclosure(s) established 100% ownership)

Illinois Department of Transportation

NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Sealed proposals for the improvement described herein will be received by the Department of Transportation at the Harry R. Hanley Building, 2300 South Dirksen Parkway, in Springfield, Illinois until 10:00 o'clock a.m., September 21, 2012. All bids will be gathered, sorted, publicly opened and read in the auditorium at the Department of Transportation's Harry R. Hanley Building shortly after the 10:00 a.m. cut off time.

2. **DESCRIPTION OF WORK**. The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

   Contract No. 60P97
   Various Counties
   Section 2011-073-TS
   Various Routes
   District 1 Construction Funds

Annual maintenance and operations of traffic signals, highway lighting advanced systems, pump stations, surveillance and other electrical systems located in District 1 in 2013, includes two one year renewals for 2014 and 2015.

3. **INSTRUCTIONS TO BIDDERS**. (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.

   (b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.

4. **AWARD CRITERIA AND REJECTION OF BIDS**. This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Ann L. Schneider,
Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2012

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS.

SUPPLEMENTAL SPECIFICATIONS

No Supplemental Specifications this year.

RECURRING SPECIAL PROVISIONS

The following RECURRING SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

STATE OF ILLINOIS

_____

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted , the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of Various Routes, Section 2011-073-TS, in Various Counties, Contract 60P97 and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

CONTRACT# 60P97
VARIOUS COUNTIES
SECTION 2011-073-TS
VARIOUS ROUTES
DISTRICT 1 FORMAL CONTRACT

Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97

Annual maintenance and operations of traffic signals, highway lighting, navigation lighting, pump stations, traffic surveillance, ramp metering, dynamic message signs, and other advanced electrical systems located in District One; including a DMS. Front Access, Full matrix, NTCIP 1203 V2; 24 Blue Tooth Traffic Detectors; 200 sq ft remove and replace asphalt; 14,600 ft galvanized steel conduit; 6,000 ft electrical cable assembly; 78,000 ft electrical cable; 20,000 ft fiber cable; 52 handholes; 20 inspections of standby generators; 10,000ft trench and backfill; 19,000 ft of unit duct; 50 breakaway devices; 5 lighting controllers; 100ft light pole foundation; 50 metal light pole foundations; 50 light pole kits; distribution panels; 4 SCADA, lighting, radio control equipment; 6 light towers; 1500 ft light tower clean and paint; 350 fluorescent luminaires; wash walls at Hubbard's Cave, 16 pump rebuilds; 6 pump SCADA equipment; 256 pump vibration testing and analysis; 300 sq yds wet pit cleaning; 50 hrs wet pit power wash; 3,000 ft detector loop; 6 steel mast arm assemblies and poles; 45 signal heads; 137 LED signal heads; 5 video detection systems; 4 wireless interconnect systems; traffic control and protection. 12 CCTV dome cameras; 3 Chevron signs, 22 swing gates.

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

DISTRICT 1 ELECTRICAL MAINTENANCE CONTRACT

60P97

FOR YEARS 2013-2015

SPECIAL PROVISIONS:

SCHEDULE OF PRICES – PAGES 2 THROUGH 21

SCHEDULE OF PRICES

Routine Pay Items				
Item	**Item Description**	**Locations**	**Units per Location**	**ELU****
A-1	Kennedy REVLAC, RACS, & HS Ramp Gates	313	0.75	234.75
A-2	Traffic Monitoring Cameras	93	0.50	46.50
A-3	Building, Hut, Base Station & Tower Equipment	21	4.00	84.00
A-4	Communication Network	10	2.00	20.00
L-1	Lighting System - On-Expressway	255	3.00	765.00
L-2	Lighting System - Off-Expressway	164	1.50	246.00
L-3	Lighting System - Other Luminaires	61	0.25	15.25
P-1	Pump Stations > or = 4 Pumps	29	6.00	174.00
P-2	Pump Stations < 4 Pumps	19	4.00	76.00
S-1	Surveillance System - Ramp Controls	118	1.00	118.00
S-2	Surveillance System – Cabinets	758	0.25	189.50
S-3	Surveillance System - Expressway DMS	43	2.00	86.00
S-4	Surveillance System - Arterial DMS	15	1.00	15.00
T-1	Traffic Signal System – Signals	2468	1.00	2468.00
T-2	Traffic Signal System - Flashing Beacons	310	0.25	77.50
X-1	Extra Systems	69	0.50	34.50
		Total Equivalent Location Units (ELUs):		**4650.00**

Bid Price per ELU per Month:	$
Contract Fixed Routine Maintenance Monthly Payment (total ELUs multiplied by Bid Price per System ELU):	$

TOTAL ROUTINE MAINTENANCE Yearly Payment (Monthly Payment of Routine Maintenance times 12 months):	$

NON-ROUTINE MAINTENANCE PAY ITEMS:

Item	Item Description	Units	Quantity	Unit Cost	Extension
ACC1	CCTV Dome Camera Assembly, Color, PTZ Control, Furnish Only	Ea	12	$	$
ACC2	CCTV Video Encoder Furnish Only	Ea	12	$	$
ACC3	CCTV Cables (Power, Control, Coax)	Ft	1200	$	$
ACC4	CCTV Video Encoder Weatherproof Furnish Only	Ea	10	$	$
ACM1	CCTV Color Monitor, Quad, 4”, Furnish Only	Ea	5	$	$
ACM2	CCTV Color Monitor, 8.4", Furnish Only	Ea	5	$	$
ACM3	CCTV Color Monitor, Dual, 8.4", Furnish Only	Ea	5	$	$
ACM4	CCTV Color Monitor, 15", Furnish Only	Ea	6	$	$
ACP1	CCTV Camera Pole, Furnish Only	Ea	12	$	$
ALD1	LED Chevron Sign, Furnish Only	Ea	3	$	$
ALD2	LED Auxiliary Sign, Furnish Only	Ea	3	$	$
ALD3	LED Lane Usage Sign, Furnish Only	Ea	3	$	$
ALD4	LED Gore Sign, Furnish Only	Ea	3	$	$

ARR1	Restraining Barrier Tape Cartridge, Refurbish	Ea	2	$	$
ARR2	Restraining Barrier Dragnet Assembly, Furnish Only	Ea	2	$	$
ASC1	Swing Gate Controller, Furnish Only	Ea	1	$	$
ASD1	Swing Gate Drivetrain Assembly, Furnish Only	Ea	1	$	$
ASG1	Swing Gate Arm, 2' to 4', Furnish Only	Ea	2	$	$
ASG2	Swing Gate Arm, 5' to 8', Furnish Only	Ea	4	$	$
ASG3	Swing Gate Arm, 9' to 12', Furnish Only	Ea	4	$	$
ASG4	Swing Gate Arm, 13' to 16', Furnish Only	Ea	4	$	$
ASG5	Swing Gate Arm, 17' to 20', Furnish Only	Ea	4	$	$
ASG6	Swing Gate Arm, 21' to 23', Furnish Only	Ea	4	$	$
ASG7	Swing Gate Arm Capstan and Bracket Assembly, Furnish Only	Ea	2	$	$
AXB1	Budgetary Allowance For Replacement PLC Repair	LS	1	$ 70,000.00	$ 70,000.00
AXB2	Budgetary Allowance For Communication Sys. Repair	LS	1	$ 80,000.00	$ 80,000.00
AXB3	Budgetary Allowance For Building & Equip. Repair	LS	1	$ 60,000.00	$ 60,000.00
AXB4	Budgetary Allowance For Ramp Gates	LS	1	$ 70,000.00	$ 70,000.00

GAC1	Aerial Cable, with Messenger Wire, 4-1/C up to No. 2	Ft	1,500	$	$
GAS1	Asphalt, Remove and Replace	SF	200	$	$
GC01	Conduit, Galvanized Steel, Attached to Struct. 3/4 to 1 1/4"	Ft	5,000	$	$
GC02	Conduit, Galvanized Steel, Attached to Struct. 1 1/2" to 2 1/2"	Ft	2,000	$	$
GC03	Conduit, Galvanized Steel, Attached to Struct. 3" to 5"	Ft	300	$	$
GC04	Conduit, Galv. Steel, Attached to Struct. PVC Coated, 3/4 to 1 1/4"	Ft	2,000	$	$
GC05	Conduit, Galv. Steel, Attached to Struct. PVC Coated, 1 1/2" to 2 1/2"	Ft	1,000	$	$
GC06	Conduit, Galv. Steel, Attached to Struct. PVC Coated, 3" to 5"	Ft	300	$	$
GC07	Conduit, Galvanized Steel, Encased in Concrete, 3/4" to 2 1/2"	Ft	500	$	$
GC08	Conduit, Galvanized Steel, Encased in Concrete, 3" to 5"	Ft	500	$	$
GC09	Conduit, Galvanized Steel, in Ground, 3/4 to 2 1/2"	Ft	2,000	$	$
GC10	Conduit, Galvanized Steel, In Ground, 3" to 5"	Ft	1,000	$	$
GC11	Conduit, Non-Metallic, Coilable, in Ground, 1 1/4"	Ft	2,000	$	$
GC12	Conduit, Non-Metallic, Coilable, in Ground, 2"	Ft	1,000	$	$

GC13	Conduit, PVC, for Buildings, 1", Schedule 40	Ft	300	$	$
GC14	Conduit, Removal	Ft	5,000	$	$
GCC1	Controller, Calcium Chloride Pump	Ea	5	$	$
GCX1	Coaxial Cable	Ft	500	$	$
GE01	Electric Cable Assembly, XLP, 3/C No. 2, 1/C No. 6 Green	Ft	3,000	$	$
GE02	Electric Cable Assembly, XLP, 3/C No. 4, 1/C No. 6 Green	Ft	3,000	$	$
GE03	Electric Cable, XLP, 1/C up to No. 6	Ft	16,500	$	$
GE04	Electric Cable, XLP, 1/C from No. 4 to No. 1	Ft	25,000	$	$
GE05	Electric Cable, XLP, 1/C from No. 1/0 to No. 2/0	Ft	3,000	$	$
GE06	Electric Cable, XLP, 1/C from No. 3/0 to No. 4/0	Ft	2,500	$	$
GE07	Electric Cable, XLP, 1/C from 250 MCM to 500 MCM	Ft	2000	$	$
GE08	Electric Cable, Pull or Remove	Ft	30,000	$	$
GE09	Electric Cable, THWN, 1/C from No.14 to No.10	Ft	30,000	$	$
GF01	Fiber Optic Trunk/Distribution/Lateral Cable up to 96 SM	Ft	5,000	$	$
GF02	Fiber Optic Lateral Installation SM	Ft	20,000	$	$

GF03	Fiber Optic Cable, Hybrid 12 MM & 24 SM	Ft	5,000	$	$
GF04	Fiber Optic Termination Panel 12F or 24 F	Ea	5	$	$
GF05	Fiber Optic Patch Panel, 96 SM	Ea	5	$	$
GF06	Fiber Optic Splice Enclosure	Ea	10	$	$
GF07	Fiber Optic Innerduct, up to 1 1/2"	Ft	20,000	$	$
GF08	Fiber Optic Cable, Install Only	Ft	5,000	$	$
GFC1	Foundation, Concrete, Type 1	Ft	20	$	$
GFR1	Foundation Removal	Ea	35	$	$
GGR1	Ground Rod	Ea	40	$	$
GH01	Handhole	Ea	30	$	$
GH02	Handhole, Fiber Optic	Ea	10	$	$
GH03	Handhole, Heavy-Duty	Ea	4	$	$
GH04	Handhole, Heavy-Duty, Double	Ea	4	$	$
GH05	Handhole, Heavy-Duty, Special	Ea	4	$	$
GH06	Handhole, Remove	Ea	20	$	$
GH07	Handhole, Re-build	Ea	5	$	$

GH08	Handhole, Re-build Existing to Heavy-Duty Type	Ea	5	$	$
GIG1	Inspection, Standby Generator	Ea	20	$	$
GIT1	Inspection, Thermo Graphic	Ea	2	$	$
GJ01	Junction Box, and all Appurtenances, Remove	Ea	10	$	$
GJ02	Junction Box, Stainless Steel, up to 6" Depth	Ea	45	$	$
GJ03	Junction Box, Stainless Steel, 8" Depth	Ea	15	$	$
GPC1	Pump, Calcium Chloride	Ea	5	$	$
GPV1	Pavement Sealcoating	SY	1,000	$	$
GRB1	Radio Tower Beacon, Relamp	Ea	10	$	$
GRT1	Radio Tower, Inspection and Report	Ea	6	$	$
GSD1	Sidewalk, Remove and Replace	SF	300	$	$
GSO1	Sodding	SF	500	$	$
GTC1	Traffic Control	Ea	25	$	$
GTR1	Trench & Backfill with Warning Tape	Ft	10,000	$	$
GU01	Uniduct, XLP, 3/c No. 6 & 1/c No. 8 Green, 1"	Ft	3,000	$	$
GU02	Uniduct, XLP, 3/c No. 4 & 1/c No. 6 Green, 1 1/4"	Ft	15,000	$	$

GU03	Uniduct, XLP, 3/c No. 2 & 1/c No. 6 Green, 1 1/2"	Ft	1,000	$	$
GU04	Uniduct, Install Only	Ft	1,000	$	$
GV01*	Vendor Budgetary Allowance, EMCMS	LS	1	$ 75,000.00	$ 75,000.00
GV02*	Vendor Budgetary Allowance, Operational Support	LS	1	$ 75,000.00	$ 75,000.00
GWR1	Welding Receptacle and Plug, 3 Pole, 30 Amp, Furnish and Install	Ea	5	$	$
GWR2	Welding Receptacle and Plug, 3 Pole, 60 Amp, Furnish and Install	Ea	2	$	$
LA01	Arm or Twin Arm with Luminaire, Install Only	Ea	50	$	$
LB01	Breakaway Device, T-Base	Ea	50	$	$
LBB1	Breaker, Branch, 20A to 70A	Ea	30	$	$
LBB2	Breaker, Main, 60A to 100A	Ea	5	$	$
LBB3	Breaker, Main,125A to 175A	Ea	5	$	$
LBT1	Buck Boost Transformer	Ea	5	$	$
LC01	Controller, Duplex Console, with Radio	Ea	4	$	$
LC02	Controller, Duplex Console, Without Radio	Ea	1	$	$
LC03	Controller, Lighting, Install only	Ea	8	$	$
LC04	Controller, Lighting, Remove & Salvage	Ea	8	$	$

LC05	Controller, Single Door Console, without Radio	Ea	4	$	$
LC06	Controller, Combination Lighting	Ea	2	$	$
LCL1	Clock, Digital Astronomical	Ea	10	$	$
LCN1	Contactor, 125A to 225A	Ea	2	$	$
LCN2	Contactor, 30A to 100A	Ea	5	$	$
LD01	Decal Set, Lighting Unit, Pole	Ea	20	$	$
LD02	Decal Set, Lighting Unit, Tower	Ea	20	$	$
LD03	Decal Set, Lighting Unit, Tunnel or Underpass with Bracket	Ea	20	$	$
LD04	Decal Set, Lighting Unit, Tower with Camera	Ea	20	$	$
LDS1	Disconnect Switch	Ea	5	$	$
LDS2	ON/OFF Switch	Ea	100	$	$
LDS3	Motion Sensor	Ea	75	$	$
LE01	Electrical Outlet, GFCI Type	Ea	30	$	$
LE02	Convenience Receptacle, 20 Amp	Ea	20	$	$
LF01	Foundation, Light Pole	L. Ft.	100	$	$
LF02	Foundation, Light Pole, Metal	Ea	50	$	$

LF03	Foundation, Light Tower, up to 54" Diameter	L. Ft.	100	$	$
LF04	Foundation, Lighting Controller	Ea	5	$	$
LF05	Foundation, Modification for Concrete or Metal	Ea	5	$	$
LGF1	Ground Field	Ea	10	$	$
LP01	Light Pole, Kit	Ea	50	$	$
LP02	Light Pole Unit, Install only	Ea	100	$	$
LP03	Light Pole Unit, Removal & Salvage	Ea	50	$	$
LP04	Wood Pole Unit, Install only	Ea	8	$	$
LP05	Wood Pole Unit, Removal & Salvage	Ea	50	$	$
LPN1	Panel, Distribution	Ea	10	$	$
LT01	Light Tower, 110' or less	Ea	3	$	$
LT02	Light Tower, 111' or more	Ea	3	$	$
LT03	Light Tower, in Place, Clean and Paint	Ft	1,500	$	$
LT04	Light Tower, Remove and Re-Erect	Ea	3	$	$
LT05	Light Tower, Install only	Ea	3	$	$

LT06	Light Tower, Lowering Device for Retrofit	Ea	6	$	$
LT07	Cable, Combination CCTV & Lighting, Install	Ea	5	$	$
LU01	Luminaire, Fluorescent, Eight (8) Ft.	Ea	100	$	$
LU02	Luminaire, Fluorescent, Four (4) Ft.	Ea	100	$	$
LU03	Luminaire, Fluorescent, High Bay	Ea	100	$	$
LU04	Luminaire, Fluorescent, for Wet Locations	Ea	50	$	$
LU05	Luminaire, HPS, for Building Roof	Ea	4	$	$
LU06	Luminaire, HPS, for Building Wall	Ea	16	$	$
LU07	Luminaire, Keeper	Ea	25	$	$
LU08	Luminaire, Navigation LED	Ea	5	$	$
LU09	Luminaire, Removal & Salvage	Ea	105	$	$
LU10	Luminaire Shield, Pole	Ea	50	$	$
LU11	Luminaire Shield, Tower	Ea	40	$	$
LU12	Luminaire, Tower, Install only	Ea	45	$	$

LU13	Luminaire, Two Lamps Fluorescent, Install only	Ea	150	$	$
LU14	Luminaire, Underpass, Ceiling or Tunnel, Install only	Ea	50	$	$
LU15	Emergency or Exit Light Fixture	Ea	50	$	$
LU16	Luminaire, Metal Halide	Ea	20	$	$
LW01	Wash Hubbard's Cave Tiled Tunnel Walls	Ea	2	$	$
PA01	Alarm, Intrusion Override Key Switch	Ea	50	$	$
PC02	Coating, Concrete Surface	SF	5,000	$	$
PC03	Coating, Steel Surface	SF	1,000	$	$
PD01	Detection System, Fire	Ea	6	$	$
PG01	Gas Sensor, Remove and Replace	Ea	15	$	$
PI01	Inspection, Automatic Bus Transfer System	Ea	4	$	$
PI02	Inspection, Auto Transfer Switch	Ea	24	$	$
PI03	Inspection, Gas Detector System	Ea	47	$	$
PI04	Inspection, Switchgear System	Ea	1	$	$
PI05	Inspection, Motor Starter, Soft Start Type	Ea	5	$	$
PI06	Inspection, SCADA Radio Equipment	LS	2	$	$

PI07	Inspection, SCADA Radio	Ea	40	$	$
PI08	Inspection, Backflow Preventer	Ea	8	$	$
PM01	Pump Motor Balancing	Ea	6	$	$
PRB1	Pump Rebuild, Type 1	Ea	1	$	$
PRB2	Pump Rebuild, Type 2	Ea	4	$	$
PRB3	Pump Rebuild, Type 3	Ea	1	$	$
PRB4	Pump Rebuild, Type 4	Ea	8	$	$
PRB5	Pump Rebuild, Type 5	Ea	1	$	$
PRB6	Pump Rebuild, Type 6	Ea	1	$	$
PS01	Pump, SCADA Equipment, Type A, Furnish and Install	Ea	2	$	$
PS02	Pump, SCADA equipment, Type B, Furnish and Install	Ea	2	$	$
PS03	Pump, Vibration Testing and Analysis	Ea	256	$	$
PV01*	Vendor Budgetary Allowance for Pump Repair Services	LS	1	$ 150,000.00	$ 150,000.00
PV02*	Vendor Budgetary Allowance for Pump Bowl Replacement	LS	1	$ 150,000.00	$ 150,000.00
PV03*	Vendor Budgetary Allowance for Pump Replacement	LS	1	$ 150,000.00	$ 150,000.00
PW01	Wet Pit, Cleaning	SY	300	$	$

PW02	Wet Pit, Power Wash	Hr	50	$	$
RMA1	Routine Maintenance Allowance for Increase in Locations per ELU	LS	1	$ 400,000.00	$ 400,000.00
SB01	8" LED Beacon, Flashing, Low Mount, 1 Face	Ea	7	$	$
SC03	Cabinet, Type 3, for Surveillance	Ea	3	$	$
SD01	Detector Loop Sensor Unit, 4 Channel Digital	Ea	6	$	$
SD02	Detector Loop Sensor Unit, 2 Channel Digital	Ea	10	$	$
SD03	Detector Loop, Round, Square or Rectangular	Ft	3,000	$	$
SD04	Blue Tooth Traffic Detector	Ea	24	$	$
SDM1	DMS, Front Access, Full Matrix, Color, NTCIP 1203 V2	Ea	1	$	$
SDM2	DMS Batteries Telespot	Ea	10	$	$
SDM3	DMS Battery, Skyline Sign	Ea	14	$	$
SE01	Electric Service Upgrade and Grounding	Ea	1	$	$
SE02	Electrical Cable in Conduit, 4/c No. 18, Shielded Loop Detector	Ft	5,000	$	$
SEC1	Ethernet Media Converter	Ea	1	$	$
SES1	Ethernet Managed Switch	Ea	1	$	$

SF01	Concrete Foundation Rebuild/Modify, Type D	Ea	2	$	$
SI01	Inspection, Automatic Suppression System	Ea	2	$	$
SS01	Signal Head, 1 Face	Ea	7	$	$
SS03	Signaling Load Relay, Mechanical	Ea	120	$	$
SSP1	Surge Protector	Ea	20	$	$
ST01	TELCO Suppression	Ea	20	$	$
ST02	Telecommunication Cable, Inline Connectors & Termination	Ea	45	$	$
ST03	Telecommunication Cable, No. 19/ 3 Pair	Ft	1,500	$	$
ST04	Telecommunication Cable, No. 19/ 25 Pair	Ft	1,500	$	$
ST05	Telecommunication Cable, install only	Ft	1,500	$	$
STN1	Tone Power Supply	Ea	10	$	$
STN3	Tone Receiver, FSK	Ea	50	$	$
STN4	Tone Transmitter, FSK	Ea	25	$	$
SU01	UPS System, Inspection	Ea	1	$	$
SU02	UPS System, Storage Battery, Remove & Replace	Ea	1	$	$

SV01*	Vendor Budgetary Allowance for Repair Services	LS	1	$ 40,000.00	$ 40,000.00
SV02*	Vendor Budgetary Allowance for ATMS Maintenance/Support	LS	1	$ 75,000.00	$ 75,000.00
TC01	Full-Actuated Controller in Type IV Cabinet	Ea	5	$	$
TC02	Full-Actuated Controller in Type V Cabinet	Ea	3	$	$
TC03	Full-Actuated Controller in Type IV or Type V Cabinet W/RR Equipment	Ea	3	$	$
TC04	Full-Actuated Controller	Ea	5	$	$
TC05	Install Existing Traffic Signal Controller	Ea	20	$	$
TC06	Install Existing Traffic Signal Controller and Cabinet	Ea	10	$	$
TC07	Controller Cabinet, Type IV or Type V	Ea	2	$	$
TC08	Controller and Cabinet Modification	Ea	25	$	$
TC09	Fiber Optic Communications Control Equipment	Ea	4	$	$
TC10	Traffic Signal Master Controller	Ea	2	$	$
TC11	Install Telephone Line and Modem	Ea	2	$	$
TC12	Install Updated PROM Set at Existing Local or Master Controller	Ea	50	$	$

TC13	NEMA Conflict Monitor/MMU with Event Logging	Ea	2	$	$
TC14	UPS System	Ea	10	$	$
TCS1	Portable Changeable Message Sign	Ea	10	$	$
TD01	Drill Existing Handhole	Ea	20	$	$
TE01	Electric Cable No. 14 2/C	Ft	1,000	$	$
TE02	Electric Cable No. 14 3/C	Ft	1,000	$	$
TE03	Electric Cable No. 14 5/C	Ft	1,000	$	$
TE04	Electric Cable No. 14 7/C	Ft	1,000	$	$
TE05	Electric Cable No. 14 2/C, Twisted Shielded	Ft	3,000	$	$
TE06	Electric Cable No. 18 3 Pair, Twisted Shielded	Ft	200	$	$
TEC1	Electric Cable in Conduit, Tracer No. 14 1/C	Ft	5,000	$	$
TEC2	Electric Cable No. 14 3/C Railroad	Ft	500	$	$
TF01	Concrete Foundation, Type A	Ft	36	$	$
TF02	Concrete Foundation, Type D	Ft	24	$	$
TF03	Concrete Foundation, Type C	Ft	24	$	$
TF04	Concrete Foundation, Type E, 30 inch Diameter	Ft	60	$	$

TF05	Concrete Foundation, Type E, 36 inch Diameter	Ft	60	$	$
TF06	Concrete Foundatino, Type E, 42 inch Diameter	Ft	60	$	$
TF07	Concrete Foundation, Rebuild/Modify,Type D	Ea	15	$	$
TFB1	Flashing Beacon, Post Mounted, 1 Face	Ea	6	$	$
TFB2	Flashing Beacon, Span Wire Mounted	Ea	2	$	$
TFB3	Flashing Beacon, Solar, Post Mounted, 1 Face	Ea	10	$	$
TGS1	Traffic Signal Additional Grounding & Electric Service Upgrade	Ea	5	$	$
TL01	Inductive Loop Detector	Ea	100	$	$
TL02	Detector Loop	Ft	3,500	$	$
TLS1	LED Illuminated Sign	Ea	4	$	$
TMA1	Steel Mast Arm Assembly and Pole, 16' to 28'	Ea	1	$	$
TMA2	Steel Mast Arm Assembly and Pole, 30' to 44'	Ea	1	$	$
TMA3	Steel Mast Arm Assembly and Pole, 46' to 55'	Ea	2	$	$
TMA4	Steel Mast Arm Assembly and Pole, 56 ft to 65 ft	Ea	1	$	$
TMA5	Steel Mast Arm Assembly and Pole, 66 ft to 75 ft	Ea	1	$	$

TMA6	Relocate or Install Existing Mast Arm Assembly and Pole	Ea	2	$	$
TPP1	Pedestrian Pushbutton Post, Galvanized Steel,	Ea	5	$	$
TPP2	Pedestrian Pushbutton, Latching and Non-Latching	Ea	30	$	$
TR01	Rotate Signal Phasing at an Existing Traffic Signal Intersection	Ea	5	$	$
TR02	Re-assign System Detectors	Ea	5	$	$
TS01	Manhole Cover and Frame Grounding, Furnish and Install	Ea	10	$	$
TSB1	Traffic Signal Backplate, Reflective	Ea	50	$	$
TSD1	LED Signal Display	Ea	10	$	$
TSH1	Signal Head, 1 Face, 3 Section	Ea	25	$	$
TSH2	Signal Head, 1 Face, 4 Section	Ea	5	$	$
TSH3	Signal Head, 1 Face, 5 Section	Ea	15	$	$
TSL1	LED Signal Head, 1 Face, 3 Section	Ea	50	$	$
TSL2	LED Signal Head, 1 Face, 4 Section	Ea	12	$	$
TSL3	LED Signal Head, 1 Face, 5 Section	Ea	50	$	$
TSL4	LED Signal Head, Optically Programmed, 1F, 3 Section	Ea	10	$	$

TSL5	LED Signal Head, Optically Programmed, 1F, 5 Section	Ea	10	$	$
TSL6	LED Signal Head, Remotely Steerable Optics, 1 Face, 3 Section	Ea	2	$	$
TSL7	LED Signal Head, Remotely Steerable Optics, 1 Face, 5 Section	Ea	3	$	$
TSL8	LED Pedestrian Signal Head, 1 Face	Ea	16	$	$
TSL9	LED Pedestrian Signal Head, Countdown, 1 Face	Ea	16	$	$
TSR1	Remove Signal Section or Head	Ea	10	$	$
TSR2	Relocate or Install Existing Signal Head	Ea	15	$	$
TT01	Span Wire Traffic Signal Installation with Electric SERVICE and UPS	Ea	3	$	$
TTM1	Thermoplastic Pavement Marking Line, 24"	Ea	500	$	$
TTP1	Traffic Signal Post, 10' to 18'	Ea	24	$	$
TTP2	Remove Traffic Signal Post	Ea	10	$	$
TTP3	Remove Mast Arm Assembly and Pole	Ea	2	$	$
TTP4	Relocate or Install Existing Signal Post	Ea	3	$	$
TVD1	Video Detection System, Complete Intersection	Ea	5	$	$

TVD2	Video Detection System, Single Intersection Approach	Ea	5	$	$
TWD1	Wireless Detection System, Complete Intersection	Ea	2	$	$
TWD2	Wireless Detection System, Single Approach	Ea	4	$	$
TWI1	Wireless Interconnect System	Ea	2	$	$
				Sub-Total Non-Routine:	$
				Routine Maintenance/Yr (RM/Yr)=	$
				Total Contract Bid Price (Routine + Non-Routine)=	$

* Non-Biddable Items

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ACC1	CCTV Dome Camera Assembly, Color, PTZ Control, Furnish Only
ACC2	CCTV Video Encoder, Furnish Only
ACC3	CCTV Cables (Power, Control, Coax)
ACC4	CCTV Video Encoder Weatherproof
ACM1	CCTV Color Monitor, Quad, 4”, Furnish Only
ACM2	CCTV Color Monitor, 8.4”, Furnish Only
ACM3	CCTV Color Monitor, Dual, 8.4”, Furnish Only
ACM4	CCTV Color Monitor, 15.1”, Furnish Only
ACP1	CCTV Camera Pole, Furnish Only
ALD1	LED Chevron Sign, Furnish Only
ALD2	LED Auxiliary Sign, Furnish Only
ALD3	LED Lane Usage Sign, Furnish Only
ALD4	LED Gore Sign, Furnish Only
ARR1	REVLAC Restraining Barrier Tape Cartridge, Refurbish
ARR2	REVLAC Restraining Barrier Dragnet Assembly, Furnish Only
ASC1	Swing Gate Controller, Furnish Only
ASD1	Swing Gate Drivetrain Assembly, Furnish Only
ASG1-6	Swing Gate Arm, Furnish Only
ASG7	Swing Gate Arm Capstan and Bracket Assembly, Furnish Only
AXB1	Budgetary Allowance for Replacement PLC Repair
AXB2	Budgetary Allowance for Communication System Repair
AXB3	Budgetary Allowance for Other Building and Equipment Repairs
AXB4	Budgetary Allowance for Ramp Gates
GAC1	Aerial Cable with Messenger Wire
GAS1	Asphalt, Remove and Replace
GC01–GC06	Conduit, Galvanized Steel, Attached to Structure
GC07–GC08	Conduit, Galvanized Steel, Encased In Concrete
GC09–GC10	Conduit, Galvanized Steel, in Ground
GC11–GC12	Conduit, Non-Metallic, Coilable, in Ground
GC13	Conduit, PVC, for Buildings, 1”, Schedule 40
GC14	Conduit, Removal
GCC1	Controller, Calcium Chloride Pump

GCX1	Coaxial Cable
GE01–GE02	Electric Cable Assembly
GE03–GE07	Electrical Cable in Conduit, EPR
GE08	Electric Cable, Pull Or Remove
GE09	Electrical Cable, THWN
GF01	Fiber Optic Trunk/Distribution/Lateral Cable Single Mode Up To 96 SM
GF02	Fiber Optic Lateral Installation SM
GF03	Fiber Optic Cable, Hybrid 12 MM And 12 SM
GF04	Fiber Optic Termination Panel, 12F or 24F
GF05	Fiber Optic Patch Panel 96 SM
GF06	Fiber Optic Splice Closure
GF07	Fiber Optic Innerduct, up to 1 ½”
GF08	Fiber Optic Cable, Install Only
GFC1	Foundation, Concrete, Type 1
GFR1	Foundation Removal
GGR1	Ground Rod
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GIG1	Inspection, Standby Generator
GIT1	Inspection, Thermo Graphic
GJ01	Junction Box and All Appurtenances, Remove
GJ02–GJ03	Junction Box, Stainless Steel
GPC1	Pump, Calcium Chloride
GPV1	Pavement Sealcoating
GRB1	Radio Tower Beacon, Relamp
GRT1	Radio Tower, Inspection and Report
GSD1	Sidewalk, Remove and Replace
GSO1	Sodding
GTC1	Traffic Control
GTR1	Trench and Backfill with Warning Tape
GU01–GU03	Uniduct
GU04	Uniduct, Install Only
GV01	Vendor Budgetary Allowance, EMCMS
GV02	Vendor Budgetary Allowance, Operational Support
GWR1–GWR2	Welding Receptacle and Plug
LA01	Arm or Twin Arm with Luminaire, Install Only
LB01	Breakaway Device, T-Base
LBB1	Breaker, Branch 20A to 70A
LBB2–LBB3	Breaker, Main
LBT1	Buck-Boost Transformer
LC01	Controller, Duplex Console, with Radio
LC02	Controller, Duplex Console, without Radio
LC03	Controller, Lighting, Install Only
LC04	Controller, Lighting, Remove and Salvage

LC05	Controller, Single Door, Console, without Radio
LC06	Controller, Combination Lighting
LCL1	Clock, Digital Astronomical
LCN1–LCN2	Contactor
LD01–LD04	Decal Set, Lighting Unit
LDS1	Disconnect Switch
LDS2	On/Off Switch
LDS3	Motion Sensor
LE01	Electrical Outlet, GFCI Type
LE02	Convenience Receptacle, 20 Amp
LF01	Foundation, Light Pole
LF02	Foundation, Light Pole, Metal
LF03	Foundation, Light Tower, Up To 54 Inch Diameter
LF04	Foundation, Lighting Controller
LF05	Foundation, Modification for Concrete or Metal
LGF1	Ground Field
LP01	Light Pole, Kit
LP02	Light Pole Unit, Install Only
LP03	Light Pole Unit, Removal and Salvage
LP04	Wood Pole Unit, Install Only
LP05	Wood Pole Unit, Removal and Salvage
LPN1	Panel, Distribution
LT01–LT02	Light Tower
LT03	Light Tower, in Place, Clean and Paint
LT04	Light Tower, Remove And Re-Erect
LT05	Light Tower, Install Only
LT06	Light Tower, Lowering Device for Retrofit
LT07	Cable, Combination CCTV & Lighting, Install
LU01	Luminaire, Eight (8) FT. Fluorescent
LU02	Luminaire, Four (4) FT. Fluorescent
LU03	Luminaire, Fluorescent, High Bay
LU04	Luminaire, Fluorescent, for Wet Locations
LU05	Luminaire, HPS, for Building Roof
LU06	Luminaire, HPS, for Building Wall
LU07	Luminaire, Keeper
LU08	Luminaire, Navigation LED
LU09	Luminaire, Removal and Salvage
LU10	Luminaire Shield, Pole
LU11	Luminaire Shield, Tower
LU12	Luminaire, Tower, Install Only
LU13	Luminaire, Two Lamps, Fluorescent, Install Only
LU14	Luminaire, Wall, Ceiling, Underpass or Tunnel, Install Only
LU15	Emergency/Exit Light Fixture
LU16	Luminaire, Metal Halide
LW01	Wash Hubbard’s Cave Tunnel Walls
PA01	Alarm, Intrusion Override Key Switch
PC02	Coating, Concrete Surface

PC03	Coating, Steel Surface
PD01	Detection System, Fire
PG01	Gas Sensor, Remove and Replace
PI01	Inspection, Automatic Bus Transfer System
PI02	Inspection, Auto Transfer Switch
PI03	Inspection, Gas Detector System
PI04	Inspection, Switchgear System
PI05	Inspection, Motor Starter, Soft Start Type
PI06	Inspection, SCADA Radio Equipment
PI07	Inspection, SCADA Radio
PI08	Inspection, Backflow Preventer
PM01	Pump Motor Balancing
PRB1-PRB6	Pump Rebuild,496
PS01-PS02	PUMP, SCADA Equipment, Furnish and Install
PS03	Pump, Vibration Testing and Analysis
PV01–PV03	Vendor Budgetary Allowance
PW01	Wet Pit, Cleaning
PW02	Wet Pit, Power Wash
SB01	8” LED Beacon, Flashing, Low Mount, 1 Face
SC03	Cabinet, Type 3 for Surveillance
SD01	Detector Loop Sensor Unit, Four Channel Digital
SD02	Detector Loop Sensor Unit, Two Channel Digital
SD03	Detector Loop Round, Square, or Rectangular
SD04	Blue Tooth Traffic Detector
SDM1	DMS Front Access, Full matrix, Color, NTCIP 1203 V2
SDM2	DMS Batteries (Telespot)
SDM3	DMS Batteries (Skyline)
SE01	Electric Service Upgrade and Grounding
SE02	Electrical Cable in Conduit, 4C/ No. 18 Shielded Loop Detector
SEC1	Ethernet Media Converter
SES1	Ethernet Managed Switch
SF01	Concrete Foundation, Rebuild/Modify, Type D
SI01	Inspection, Automatic Suppression System
SS01	Signal Head, 1 Face
SS03	Signaling Load Relay, Mechanical
SSP1	Surge Protector
ST01	TELCO Suppression
ST02	Telecommunication Cable Inline Connectors and Termination
ST03	Telecommunication Cable - No. 19/3 Pair
ST04	Telecommunication Cable- No. 19/25 Pair
ST05	Telecommunication Cable, Install Only
STN1	Tone Power Supply
STN3	Tone Receiver, F.S.K., Furnish Only
STN4	Tone Transmitter, F.S.K.
SU01	UPS System, Inspection
SU02	U.P.S. System, Storage Battery, Remove and Replace
SV01	Vendor Budgetary Allowance for Repair Services

SV02	Vendor Budgetary Allowance for ATMS Maintenance/Support
TC01–TC02	Full Actuated Controller in Cabinet
TC03	Full Actuated Controller in Type IV or Type V Cabinet with RR Equipment
TC04	Full Actuated Controller
TC05–TC06	Install Existing Traffic Signal Controller or Controller and Cabinet
TC07	Controller Cabinet, Type IV or Type V
TC08	Controller and Cabinet Modification
TC09	Fiber Optic Communications Control Equipment
TC10	Traffic Signal Master Controller
TC11	Install Telephone Line and Modem
TC12	Install Updated Prom Set at Existing Local or Master Controller
TC13	NEMA Conflict Monitor/ MMU with Event Logging
TC14	UPS System
TCS1	Portable Changeable Message Sign
TD01	Drill Existing Handhole
TE01–TE06 AND TEC1–TEC2	Electric Cable
TF01–TF06	Concrete Foundations
TF07	Concrete Foundation, Rebuild/Modify, Type D
TFB1	Flashing Beacon, Post Mount, 1 Face
TFB2	Flashing Beacon, Span Wire Mounted
TFB3	Flashing Beacon, Solar, Post Mount, 1 Face
TGS1	TS Additional Grounding and Electric Service Upgrade
TL01	Inductive Detector Loop
TL02	Detector Loop
TLS1	LED Illuminated Sign
TMA1–TMA5	Steel Mast Arm Assembly and Pole
TMA6	Relocate or Install Existing Mast Arm Assembly and Pole
TPP1	Pedestrian Push-Button Post, Galvanized Steel,Type II
TPP2	Pedestrian Push-Button, Latching or Non-Latching
TR01	Rotate Signal Phasing at an Existing Traffic Signal Intersection
TR02	Re-Assign System Detectors
TS01	Manhole Cover and Frame Grounding Furnish and Install
TSB1	Traffic Signal Backplate, Reflective
TSD1	LED Signal Display
TSH1–TSH3	Incandescent Signal Head, 1 Face
TSL1–TSL7	LED Signal Head, 1 Face
TSL8	LED Pedestrian Signal Head, 1 Face
TSL9	LED Pedestrian Signal Head, Countdown, 1 Face
TSR1	Remove Signal Section or Head
TSR2	Relocate or Install Existing Signal Section or Head
TT01	Span Wire Traffic Signal Installation with Electric Service & UPS
TTM1	Thermoplastic Pavement Marking Line 24 Inch
TTP1	Traffic Signal Post, 10 FT to 18 FT
TTP2 - TTP3	Remove Traffic Signal Post and Remove Mast Arm Assembly and Pole
TTP4	Relocate or Install Existing Signal Post
TVD1	Video Detection System, Complete Intersection
TVD2	Video Detection System, Single Intersection Approach

TWD1	Wireless Detection System, Complete Intersection
TWD2	Wireless Detection System, Single Approach
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CONSTRUCTION AIR QUALITY-IDLING RESTRICTIONS
DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
ERRATA FOR THE 2012 STANDARD SPECIFICATIONS
FLAGGER AT SIDE ROADS AND ENTRANCES
PAYMENTS TO SUBCONTRACTORS
PAYROLLS AND PAYROLL RECORDS
SUBCONTRACTOR MOBILIZATION PAYMENTS
TRACKING THE USE OF PESTICIDES
TRAFFIC CONTROL DEFICIENCY DEDUCTION
UTILITY COORDINATION AND CONFLICTS
WEEKLY DBE TRUCKING REPORTS

PROJECT LABOR AGREEMENT

DISTRICT 1 ELECTRICAL MAINTENANCE CONTRACT 60P97

ARTICLE 1.0 – BIDDERS INFORMATION AND SPECIAL PRE-QUALIFICATION SUBMITTALS

1.1 Description of Work

This Contract is for the maintenance of Traffic Signal System, Advanced Systems, Lighting, Navigation, and Sign Illumination System, Pump Station System, Surveillance and Dynamic Message System, and Extra Systems including bridge monitoring, highway advisory radio, ice beacons, maintenance yard electrical equipment, radio base stations, weigh station systems, rest area lighting/electrical equipment, and other equipment at State owned properties. Each of these major systems consists of many subsystems and components at many locations throughout District 1.

1.2 Schedule of Prices – Submittal (for Attached Bidding Sheets)

1. The undersigned bidder submits herewith, in accordance with the rules and instructions, a schedule of prices for the items of work for which bids are sought.

2. The Contractor, for specified unit prices listed under the Schedule of Prices, shall conform to all requirements as specified herein these articles.

3. Each Pay Item shall have a unit price and a total price.

4. The unit prices bid are in U.S. dollars and cents.

5. The unit price shall govern if no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity.

6. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.

7. A bid will be declared unacceptable if neither unit price nor a total price is shown.

8. The Department is under no obligation to authorize non-routine pay item work. Non-routine work will be authorized based on preventative maintenance assessments, ongoing operational needs and system inspections.

9. The quantities appearing in the bid schedule are approximate and are provided for the purpose of obtaining a gross sum for the comparison of bids.

10. Payment to the Contractor awarded the Contract will be made only for actual quantities of work performed and accepted or materials furnished according to the Contact. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted.

The Contractor's unit prices are expected to be realistic and no additional compensation will be allowed due to a variance in quantities; however, the Engineer retains the right to seek a revised unit price when quantities exceed Department expected usage.

The Engineer also retains the right to use force account procedures or use other procurement means available to the Department where unit prices reflect pricing significantly higher than Department projected norms. The Contractor is cautioned against unbalanced bidding and is directed to Article 102.01 of the Standard Specifications.

1.3 Examination of Plans, Specifications, Special Provisions, and Site of Work

The prospective bidder shall, before submitting his bid, carefully examine the proposal form, plans, specifications, special provisions and form of contract and bond. All locations to be maintained under this Contract may be inspected in order for the prospective bidder to become familiar with all the local conditions affecting the Contract and the detailed requirements of maintenance.

The prospective bidder shall be responsible for any pre-existing maintenance deficiencies that may exist at the time this contract is awarded and his bid shall reflect these deficiencies. If this bid is accepted, he will be responsible for all errors in his proposal resulting from his failure or neglect to comply with these instructions. The Department will, in no case, be responsible for any change in anticipated profits resulting from such failure or neglect.

Numerous figures, charts, forms, or required contractor submittals, as mentioned herein, shall be furnished to all bidders at the Pre-Bid meeting.

1.4 Proposal Guaranty

Each proposal shall be accompanied by either a bid bond on the Department form, executed by a corporate surety company, satisfactory to the Department, or a bank cashier's check or a properly certified check for Three Hundred Thousand Dollars ($300,000) made payable to the Treasurer, State of Illinois. The proposal guaranty checks will be returned as prescribed in Section l03.03 of the Standard Specifications. Bid bonds will not be returned.

1.5 Requirement of Contract Bond

The successful bidder, at the time of execution of the Contract, shall deposit with the Department a surety bond in the amount of four million dollars ($4,000,000). The form of the bond shall be acceptable to the Department.

1.6 Insurance

The Contractor shall comply with the provisions of Section 107 of the Standard Specifications for Road and Bridge Construction, legal relations and responsibility to public. Insurance shall be in compliance with the requirements of Article 107.27 except for liability minimum amounts as modified herein.

The Contractor's insurance shall be written for not less than limits of liability as follows:

A. Employers Liability

(1) Each Accident $12,500,000

B. Commercial General Liability

(1) General Aggregate Limit $12,500,000

(2) Products-Completed Operations

Aggregate Limit $12,500,000

(3) Each Occurrence Limit $12,500,000

C. Commercial Automobile Liability

Bodily Injury & Property Damage
Liability Limit Each Occurrence $ 12,500,000

D. Umbrella Liability

Refer to Art.107.27

The Chicago Transit Authority and the Illinois Department of Transportation shall be named as additional insured's and furnished with certificates of insurance and a full copy the insurance policy.

The customary exclusion that negates coverage when working within 50 feet of a railroad track shall be eliminated from the Liability policy and the certificates submitted shall plainly state that coverage extends to work being done on or over track right-of-way. The Contractor shall carry a railroad protective insurance policy for the purpose of maintaining traffic signal facilities and appurtenances on railroad right-of-way (R.O.W.). The policy shall cover the Contractor's crews performing normal routine maintenance on traffic signal heads and other traffic signal related items attached directly to the railroad's truss or structure containing the railroad's warning devices. (This coverage is required for all existing locations with traffic signal heads attached directly to railroad structures, or with existing railroad interconnects.)

The Contractor shall obtain railroad protective liability insurance coverage, to perform non-routine work relating to the installation of new traffic signal facilities on railroad R.O.W. where the Department has no existing appurtenances, e.g., railroad interconnect, railroad structure mounted traffic devices, etc.

The Contractor shall provide insurance coverage for all State Stock Inventory in the possession of the Contractor or in the State Stock Warehouse, for losses due to fire, theft or vandalism. Estimated value of current stock on hand is approximately $500,000.

The Contractor shall provide full insurance coverage as described in the above items until all routine and authorized non-routine work has been completed in accordance with the terms of this Contract.

The Contractor shall submit original and duplicate copies of all insurance policies when requested by the Engineer. The complete policies, with all riders, etc., shall be submitted.

1.7 Indemnification

The Contractor shall abide to the requirements of 107.26 Indemnification, per the Standard Specifications for Road and Bridge Construction.

1.8 Qualifications to Bid

It is the intent of this Contract that it be performed only by a contractor having the size, special expertise and organizational capabilities necessary to accomplish its wide-ranging scope of work. The prospective bidder should familiarize himself with all aspects of the Contract prior to bidding.

All bidders must be pre-approved, by the IDOT Central Bureau of Operations, prior to bidding upon the District 1 Electrical Maintenance Contract. In addition, a Special Qualification submittal is required of all bidders at the mandatory Pre-Bid Meeting.

1.9 Mandatory Pre-Bid Meeting

A mandatory pre-bid meeting will be conducted to allow bidders the opportunity to submit, for Department review, a typed list of questions, and the Special Qualifications Submittal. The Department will review the bidders' questions, but is under no obligation to address such questions in an addendum. Minutes of the pre-bid meeting will not be issued to attendees. An addendum may be issued prior to the letting to clarify contract language as necessary. Bidders should watch the Illinois Department of Transportation web site for bidding announcements.

The Pre-Bid Meeting will be held at 9:30AM, Thursday, August 30, 2012

Illinois Department of Transportation
201 West Center Court
Schaumburg, IL 60196-1096

The Pre-Bid Meeting attendance is mandatory for all prospective bidders.

1.10 Bidders' Special Qualifications Submittal

By the conclusion of the mandatory Pre-Bid Meeting all prospective bidders shall provide a bidders' Special Qualifications Submittal; information as listed in points 1 through 11 below, as applicable to Contract article specifications herein, which must be presented to:

Mr. Naser Gholeh, P.E., Resident Engineer
Illinois Department of Transportation
Bureau of Traffic, Electrical Maintenance Operations

If the bidder's Special Qualifications submittal, as presented to the Engineer, does not meet Contract 60P97 requirements as listed herein, the bidder will not be qualified to bid on the EMC 2013-2015.

Special Qualifications Submittal Items:

1. Name of the bidding company and its owners and/or officers

2. Resumes of the proposed:
   - Project Manager
   - Administration Manager
   - Advanced Systems Manager
   - Lighting and Extra Systems Manager
   - Pump Station Manager
   - Traffic Signal Manager
   - Advanced Systems Specialist
   - Pump Station Specialist
   - SCADA Specialist
   - SCADA Trainee
   - Surveillance Specialist
   - Traffic Signal Specialist

3. Location and description, including square footage, of:
   - Bidder's Current Headquarters
   - Proposed EMC Office
   - Proposed EMC Dispatch Center
   - Proposed Shop Facilities

4. A description of the plans for service work, or in-house test facilities which the bidder would use, to overhaul and bench test all electromechanical, solid state, microprocessor and analog and digital control equipment. (Section 1, Article 3.6.4)

5. A 24/7 chart of the bidder's proposed staffing for the EMC Dispatch Center, which shows number of personnel working and on-call each day, by the hour (Section 1, Article 3.10.4)

6. A report which provides the number of vehicles in use in the bidder's current operations, and the number of any additional vehicles to be purchased or leased to meet the requirements of the EMC 2013-2015. (Section 1, Article 3.15)

7. A report which summarizes the number and types of maintenance/construction equipment currently owned or leased by the bidder. (Section 1, Article 3.16)

8. A report which details the bidder's in-house familiarity and capability in installing and maintaining CCTV systems. (Section 1, Article 6.0)

9. A report which describes the bidder's in-house familiarity with Allen-Bradley PLC equipment and troubleshooting of ladder logic used in the REVLAC and RACS systems. (Section 1, Article 6.0)

10. A report which describes the bidder's in-house work on fiber optic systems. (Section 1, Article 6.0)

11. A statement signed by the bidder that:

- He/she has read the EMC 2013-2015 and accepts the methods of payment for work as described herein

- The Special Qualification information submitted is accurate and truthful

Bidders will be furnished with a receipt which states that the Special Bidder Qualifications submittal was received within the required time deadline. The submitted information will be analyzed and, if requested by the Engineer, the prospective bidder shall facilitate an inspection of its facilities and/or equipment. The Engineer shall determine the aggregate suitability and acceptability of the qualification information submitted. If it is determined that the prospective bidder is qualified to perform the work then the Department will notify the bidder through the Illinois Department of Transportation website stating they are approved to bid on the Electrical Maintenance Contract 60P97.

1.11 Site Inspections

Bidders are expected to be familiar with the type and extent of systems covered under the Contract. Bidders are invited to Pre-Bid Site Inspections of EMC equipment following the Mandatory Pre-Bid Meeting. The tentative schedule, beginning at 10:30 A.M. is as follows:

- Pump Stations
- Highway and Navigational Lighting
- Surveillance and DMS System
- Traffic Signal System
- Extra Systems

ARTICLE 2.0 – DESCRIPTION OF WORK

Annual electrical maintenance of Traffic Signal System, Lighting System, Advanced Systems, Pump Station System, Surveillance and Other Electrical Systems located within the District.

ARTICLE 3.0 -- GENERAL CONTRACT REQUIREMENTS

3.1 BASIC CONTRACT PROVISIONS

Unless noted herein, all requirements as listed in Article 3.0 General Requirements shall be paid through, are part of, and are included in routine maintenance. The dedicated and assigned personnel as described herein, and the equipment and material to perform all routine and non-routine maintenance are a minimum requirement of this Contract. The Contractor shall provide additional labor, equipment and material based on the need to meet specific Contract requirements. Delays in response, repair completions, routine maintenance and/or preventive work and inspections thereof will not be accepted and will result in liquidated damages and cancellation of this Contract as specified in Article 3.1.4. It is also the Contractor's responsibility to assure Contract compliance with all systems requirements listed herein.

Once the Contract is executed and the pre-construction submittals have been approved, the Contractor shall begin preparations to assume routine and non-routine maintenance responsibilities as specified and shall perform work as required and as directed by the Engineer. Certain preparatory work, such as transfer of state stock inventory, purchase of materials for routine equipment repairs as specified herein, as arranged with the Engineer, can be completed in advance of the start of the Contract. The Contractor must be prepared to service and maintain all electrical systems as specified in this Contract starting January 1, 2013. The Contractor shall coordinate access to perform maintenance and continued operation of IDOT equipment and systems.

The list of locations and description of items provided herein in each System and in Section 3 are for bidding purposes only, actual quantities and material to be maintained is the responsibility of the Contractor on Jan 1st 2013. Lists of all locations to be maintained are located on the EMCMS system. The Contactor will be provided with a hard copy upon request of current locations maintained. The

Contractor shall inspect all locations to assure continued maintenance and operation of all systems specified in this contract. The Contractor shall be given access to all locations for inspection and shall provide a punch list of all items found prior to the day of transfer.

3.1.1 TERM OF CONTRACT

The Contract shall be valid for operations from 12:00 a.m. on January 1, 2013 to 12:00 a.m. (midnight) on December 31, 2013, subject to cancellation provisions specified herein. However the Contract shall remain in force, even following the completion of routine maintenance response requirements, for the purpose of completing Contract Obligations. All routine and non-routine contract work shall be completed.

The Contractor shall comply with authorized work completion dates; however, any authorized non-routine work which has not yet been started, due to circumstances such as delays in issuance of permits by outside agencies, will be cancelled. If the Contract is renewed, the Department shall make the effort, if circumstances allow, to re-authorize in the renewal term, any work items cancelled from the prior contract term.

The Department will withhold the December routine monthly payment at the end of the contract year prior to termination until all routine and non-routine work is completed, even following the completion of routine maintenance response requirements.

3.1.2 RENEWAL

The Department has the sole discretion to renew this contract for one (1) additional term in 2014. This option would extend the Contract for one additional term from 12:00 a.m. January 1, 2014, to 12:00 a.m. (midnight) December 31, 2014, per all revisions or amendments as defined. If renewed, the Contract shall remain in force, even following the completion of routine maintenance response requirements until 12:00 a.m. (midnight) on December 31, 2014.

The Department has the sole discretion to renew this contract for one (1) final additional term in 2015. This option would extend the Contract for one additional term from 12:00 a.m. January 1, 2015, to 12:00 a.m. (midnight) December 31, 2015, per all revisions or amendments as defined.

The Contract shall be terminated and closed if not renewed at the end of each contract year. The Contract shall be terminated and closed December 31, 2015 without extensions or renewal. All routine and non-routine contract work shall be completed by the contract end date. The Contractor shall comply with

authorized work completion dates; however, any authorized non-routine work which has not yet been started, due to circumstances such as delays in issuance of permits by outside agencies, will be cancelled.

The Contractor shall accept the renewal of the Contract if offered by the Department. Upon notification of the contract renewal by IDOT, the Contractor shall complete and submit IDOT's contract renewal form within fifteen (15) days of notification, together with documentation of the contract bond extension and copies of the required insurance policies for the renewal year as well as any other documentation required by the Department.

The original contract term and the renewal term shall be considered independent with respect to completion of work, payment, and withholding of payment as well as all associated work documentation.

No later than one month prior to the start of the renewal year, the Contractor shall provide the Department the following for approval:

- Written Acknowledgement of the renewal acceptance
- Documentation of the contract bond extension
- Copies of required insurance policies covering the renewal year
- Submittal of contract vehicle assignments, vehicle models and current mileage Submittal of new vehicle purchase invoices or leases (necessary to meet yearly mileage limits)
- Requests for Sub-Contractor Approval, form BC260-A for each desired sub-contractor to be utilized in the renewal year
- A new Disadvantaged Business Utilization Plan for the renewal year on Department forms SBE 2026, and DBE Participation Commitment Statement on Department forms SBE 2025 (which must be approved by the Department prior to the start of the renewal year work)
- Submittals for any new equipment or materials not submitted and approved in the prior contract term, but anticipated for use in the renewal year

3.1.3 COMPLETION OF ANNUAL WORK

The Department shall authorize all work by the end of the Contract term and the Contractor is expected to complete said work by the agreed due date. If the renewal provision is exercised by the State, the renewal shall not relieve the Contractor from the requirements to complete work from the prior year in a timely fashion. The existence of a backlog from a prior year shall not be a justification for delay of work in

the renewal year. Incomplete routine or non-routine work without an approved delayed completion date may cause the application of liquidated damages or retainage of the routine maintenance payment.

The Engineer may apply a withholding of up to 75% of the December, 2013 routine maintenance payment (or last month if this Contract is renewed) until all authorized routine and non-routine maintenance work is complete, but may progressively release portions of the retainage as the incomplete work is reduced. Key items for completion of work under a calendar year (or term) include:

- All routine work complete, approved, with all documentation
- All workforce analysis reports submitted and accepted
- All DBE/EEO submittals complete and accepted/approved

3.1.4 CANCELLATION OF WORK

Only the Department may cancel the contract. The Contractor shall be given 30 days advance notice of cancellation of this Contract. In the event of cancellation, the Contractor shall be entitled to receive payment for services and work performed and materials or equipment furnished under the terms of the Contract prior to the effective date of cancellation, but shall not be entitled to receive any damages on account of such cancellation or any further payment whatsoever. There shall be no payment for incomplete work.

The Department may take possession of the incomplete work and all materials, associated special tools and appliances for any reason which the Engineer deems to be in the public interest, and this decision shall be final. Upon the receipt of a notice of cancellation, the Contractor shall provide the Engineer with a list of all State Stock inventory in his possession as of that date.

3.2 SUBCONTRACTING OF WORK

3.2.1 GENERAL REQUIREMENTS

The Contractor shall obtain approval from the Engineer for employment of all subcontractors performing work on this Contract, prior to the commencement of work. Except as modified herein, subcontracting of the contract work shall be in conformance with the requirements of the Standard Specifications and Supplements and Recurring Special Provisions.

The Contractor shall submit to the Engineer, prior to the start of work, and at the Pre-Construction Meeting:

- A request for Approval of Subcontractor, form BC260A for each subcontractor to be employed for work under this Contract

- A certification stating that the required Federal and State provisions will be inserted in the final contract with the subcontractor. Inclusion of the required contract provisions will be monitored by the Bureau of Small Business Enterprises, as part of its compliance review.

- A written subcontract agreement for each proposed subcontractor which sets forth the scope of services to be subcontracted, the lump sum or unit price for such services and the signatures of the subcontracting parties

- A copy of the Disadvantaged Business Utilization Plan on Department forms SBE 2026, and DBE Participation Commitment Statement on Department forms SBE 2025, all required EEO submittals.

The Contractor shall submit to the Engineer with the monthly routine work submittal book:

- A Monthly DBE report shall be submitted, an Excel spreadsheet listing invoiced service work (or material purchases) by sub-contractor by month. The information shall be provided, but is not limited to, invoice number, date invoice received, date invoice paid, invoice amount, system, routine or non-routine work, dates of routine work (starting and ending) or non-routine authorization number and applicable non-routine pay items used. The Contractor shall provide copies of DBE invoices. The Contractor shall label all items on each invoice by type of EMC work; a ticket number or maintenance program for routine work, or the authorization number for pay item or agreed price work. Invoices $5,000 and above shall have location of the work performed and/or equipment installation location. All material purchased shall have catalog cuts for IDOT approval and records. An Excel spreadsheet with proper format will be provided for Contractors use at the pre-construction meeting

- A copy of any new requests for Approval of Subcontractor, form BC260A

3.2.2 SUBCONTRACTING LIMITATIONS

In addition to the limitations imposed by the Standard Specifications, there shall not be wholesale subcontracting of the herein defined electrical systems. The Contractor shall perform not less than 51% of the maintenance of each electrical system with his own forces. Except for subcontracting of one or two

patrol routes, as may be approved by the Engineer, in the fulfillment of DBE or minority participation requirements, work that depends on a dispersed workforce and timely response activities shall not be subcontracted. Moreover, there shall be no geographically–based subcontracting of the work, e.g., by north Cook or by south Cook, etc. Furthermore, the Contractor's daily management and supervision for each system, all administrative functions and dispatching, shall be done with his own forces.

Work, which is subcontracted, shall not include work which is in turn subcontracted to an additional party. Subcontracted work shall be limited to work performed by the subcontractors' own forces.

3.2.3 SUBCONTRACTOR BILLING

For non-routine agreed price work (not pay items) performed by an approved subcontractor as named on the authorization for work and on the contractor invoice, in accordance with Article 109.04 (b)(7) of the Standard Specifications for Road and Bridge Construction, when work is performed by an approved subcontractor, the Contractor shall be allowed administrative costs of an amount equal to five (5) percent of the total approved costs on a individual work authorization, with the minimum being $100.

Specialty service work as authorized and originated by the Department shall be considered as work by the Contractor, and not subcontracted work for purposes of billing.

3.3 CONTRACT START-UP

3.3.1 BASIC REQUIREMENTS

It is the obligation of the Contractor to make every effort to provide a smooth transition from the prior contract to this contract. This may involve adjustments in ongoing operations to adjust to revised contract provisions or it may involve a startup of operations and the assumption of maintenance responsibility if there is a change in Contractor. In either case, full professional cooperation by the Contractor is expected by the Department to assure that the District's electrical systems remain continuously monitored and maintained.

The Contractor shall assure the Department that at 12:01 a.m. on January 1, 2013 the maintenance transfer is complete and transparent to the public, that the District's electrical systems remain continuously monitored and maintained. It shall be recognized that the transfer and transition from one contract to the next will not be instantaneous with regard to all aspects of all systems.

3.3.2 ELECTRICAL SYSTEMS SURVEY

Following the award of the Contract the Contractor may submit to the Engineer a schedule for inspections of all electrical systems to determine any outstanding maintenance issues. The inspections shall be completed by December 1, 2012. The Contractor shall submit all outstanding items to the Engineer within 72 hours of the inspection.

3.3.3 STATE STOCK TRANSFER

During the last half of December, 2012 the Contractor shall prepare facility storage areas as specified herein for delivery of miscellaneous state stock not stored in the state stock warehouse. The Engineer shall provide the Contractor a list of the state stock prior to delivery.

3.3.4 CONTRACTOR OWNED SPARE PARTS PROCUREMENT

After execution of the Contract, the Contractor shall procure the spare parts as necessary for system equipment as listed in Article 4.0 such that at the time routine maintenance activities begin, adequate spare parts, as approved by the Engineer, are on hand.

3.3.5 LOCKS AND KEYS

At the Pre-Construction Meeting the Engineer shall provide the Contractor a list of equipment; doors, cabinets, hatches, gates, and other items within the electrical systems, which will need to have locks replaced or modified by January 31, 2013. Refer to System Articles, herein, for quantities required. The padlock shall meet the specifications of the weather resistant padlock as specified by the Engineer, equal or better than Master Lock 6125KA. The key number shall be approved by the Engineer prior to the purchase/install. If the equipment is currently locked with a Master Lock 6125KA model the Contractor may replace the cylinder and new key (for Master Lock 6125KA) instead of replacing the entire lock.

Selected locations of the Eisenhower (I-290) Expressway have a special anti-theft locking device on handhole covers and junction boxes at power centers to prevent cable theft. It is the Contractor's responsibility to monitor the special coded, keyed nut drivers required for these junction boxes. If a coded key is lost, it shall be the Contractor's responsibility to furnish and replace a new coded fastener nut at all locations with these anti-theft locking devices, and replace the coded, keyed nut drivers, all at the Contractor's expense.

Homeland security ramp gate locks will not be replaced and the Department will furnish ramp gate keys to the Contractor. The Contractor will keep a key assignment list by name and it shall be emailed to the Engineer whenever updated. Keys shall be turned over at the end of the contract.

3.4 END OF CONTRACT TRANSITION

It is the obligation of the Contractor to cooperate fully to facilitate the transition period work from this contract to any subsequent contract, providing prompt communications, timely completion of authorized work, and other transfers as noted herein.

3.4.1 STATE STOCK INVENTORY RETURN

The Contractor shall provide the Engineer on December 1, 2013 (or December 1 of renewal year if this contract is renewed) a list of all state stock inventory and its applicable location that is in his possession on that day. All state stock inventory and/or other equipment or materials owned by IDOT in the possession of the Contractor shall be moved to state owned locations or locations as designated by the Engineer, by a date to be specified by the Engineer by December 15th. The Contractor shall use his own spare parts for contract work for the remaining days of the term of the Contract. The Contractor shall replace missing stock in kind due to loss, theft, burglary, or damage caused by his workforce.

3.4.2 LOCK AND KEY TURNOVER

At the end of the Contract term(s) the Contractor shall make arrangements to submit to the Engineer all keys to IDOT System equipment, including alarm keys and keys to traffic signal cabinets, railroad cabinets, lighting cabinets, high mast towers, pump station gates, doors and hatches, base station fences and doors, navigational lighting equipment (including I-55 & Harlem Avenue bridge) and IDOT ramp keys, on a date as specified by the Engineer. All existing, replacement and/or new locks added to the electrical systems during the Contract become the property of the Department.

The special coded, keyed nut drivers required for the I-290 junction boxes must be returned to the Engineer. If a coded key is lost, it shall be the Contractor's responsibility to furnish and replace a new coded fastener nut at all locations with these anti-theft locking devices, and replace the coded, keyed nut drivers, all at the Contractor's expense.

3.4.3 EMCMS TERMINATION

The EMCMS will be terminated at the end of contract year, The Contractor shall make preparation to print all uncompleted tickets and authorizations from all contract years specified herein for work completion.

3.5 CONTRACTOR PERFORMANCE

3.5.1 PRIORITY OF WORK

For the Contractor's forces employed on this Contract, the work on this Contract shall take precedence over work performed for others, including other government agencies, except as expressly permitted by the Engineer or specified herein. This requirement applies to work activities on a daily basis. The Engineer reserves the authority to re-direct the Contractor's work priorities in response to emergency situations, potential hazards, contract coordination and incomplete or deficient work and the Contractor will be allowed no additional compensation for priorities so redirected.

3.5.2 SUSPENSION OF WORK

If in the option of the Engineer any work performed on this Contract may seriously jeopardize the welfare of the general motoring public, the Engineer has the authority to order the immediate suspension of the work task. Depending on the offense, the Engineer may withhold all or a portion of the monthly routine maintenance payment due to the Contractor, and/or assess liquidated damages.

3.5.3 UNSATISFACTORY SERVICE

Failure to perform all functions in the manner specified herein or in the Standard Specifications, and within any time limit specified, or should the Contractor refuse or fail to perform the work or any separable part thereof promptly and in the manner specified in this Contract with such diligence as will insure its satisfactory completion, the Engineer will advise the Contractor via e-mail or written transmittal regarding the nature of unsatisfactory service. The Contractor shall take necessary action to correct the items listed and shall respond back to the Engineer within five (5) working days from the time of receipt of the notification, explaining the reasons for the improper service and the expected date of the resolution of the listed problems.

If after two (2) written warnings that a work item (routine or non-routine) is not in Contract compliance or work has not been completed per the agreed time frame, the Engineer will withhold all or a portion of the monthly routine maintenance payment due to the Contractor until the work meets Contract specifications and is completed and approved by the Engineer.

After 30 working days from initial notification of Unsatisfactory Work the Contractor cannot meet or perform routine or non-routine work per contract specifications, it will be the Engineer's option to authorize a new (3rd Party) vendor or contractor to complete or perform the work. The Engineer shall deduct from the Contractor monthly routine maintenance payment as liquidated damages a 3rd Party contractor/vendor quote to perform the work. Where unit prices of pay items are below actual cost of 3rd party work the authorization will be de-authorized and the remainder will be deducted from monthly routine maintenance payment.

3.5.4 WITHHOLDING AND RELEASE OF FUNDS

The Engineer may withhold up to 100% of the total monthly routine maintenance payment for all systems for non-compliance of the Contract; the incomplete or otherwise unsatisfactory performance on any system, including but not limited to failure to respond to reported incidents in a timely manner, perform maintenance in compliance of contract requirements, complete work per the agreed time frame, or document dispatch or response work activities in the time and/or manner as specified in articles herein.

After the previously uncompleted or deficient work has been subsequently completed to the satisfaction of the Engineer, the Contractor shall advise the Engineer in writing, requesting the release of funds previously withheld. The Engineer shall approve the release of funds previously withheld from the Contractor through an authorization letter.

3.5.5 LIQUIDATED DAMAGES

The Engineer may assess liquidated damages, to be deducted from the Contractor monthly routine maintenance payment, for any items not in compliance of the Contract, unless the Contractor can demonstrate to the satisfaction of the Engineer, that his/her efforts were deterred by the Department, or by other contractors employed by the Department or by unforeseeable causes beyond his control and without the fault or negligence of the Contractor.

It shall be the decision of the Engineer whether the liquidated damages per day or one time charge will be assessed as follows:

Liquidated Damage Assessment

PER DAY	PER INCIDENT	PER CONTRACT SPECIFICATIONS:
NA	$ 1,000.00	FAILURE TO RESPOND, PER TICKET OR PER ENGINEER DIRECTION
$ 200.00	$ 500.00	FAILURE TO RESPOND PER TIME SPECIFICATIONS (refer to System Articles herein)
$ 200.00	$ 500.00	FAILURE TO PROVIDE TIMELY ROUTINE REPAIRS AND/OR MEET NON-ROUTINE WORK DUE DATES

$ 200.00	$ 1,000.00	FAILURE TO PROVIDE DOCUMENTATION (AUTHORIZATIONS, TICKET INFORMATION, REPORTS, SUBMITTALS FOR ROUTINE OR NON-ROUTINE WORK)
$ 200.00	$ 500.00	FAILURE TO SUPPLY REPLACEMENT PARTS
$ 200.00	$ 500.00	FAILURE TO PROVIDE PROPER SERVICE
$ 200.00	$ 500.00	FAILURE TO FOLLOW SPECIFIED PROCEDURES
$ 200.00	$ 500.00	FAILURE TO PROVIDE PROPER STAFFING
$ 200.00	$ 500.00	IMPROPER USE OF MATERIALS OR METHODS
$ 500.00	$ 1,000.00	FAILURE TO REPLACE STATE STOCK
$ 500.00	$ 3,000.00	FAILURE TO RETURN STATE STOCK AT END OF CONTRACT

3.6 CONTRACTOR FACILITY REQUIREMENTS

3.6.1 GENERAL REQUIREMENTS

At the time of bidding the Contractor shall have an established business presence in the District to assure the timeliness of the assumption of the contract work on the first day of the Contract.

The Contractor shall have and maintain in District 1 adequate facilities at all times for the timely completion of work under this contract. These facilities shall include an EMC Office and 24-hour Dispatch Center and other permanent facilities, which may be strategically located, geographically, to support the Contractor's work force. The size and type of facility may vary depending on the location, type, and quantity of electrical equipment to be serviced within that area.

All Contractor's facilities shall be complete and ready for operation no later than December 17, 2012, ready for a demonstration inspection by the Engineer, except that dial-up phone numbers which are transferred from the outgoing contractor need not be established by the Contractor until a mutually acceptable date is arranged with the Engineer.

3.6.2 EMC OFFICE

The Contractor shall establish, for the duration of this Contract, a contractor's office in-District, (in the six county area covered by this Contract) for management of all contractor work under this Contract. This EMC office may be a satellite office remote from the Contractor's headquarters or it may be a singular and clearly-defined section within the Contractor's in-District headquarters. In order to facilitate communication and shared interest in contract matters, the contract management and

technical/administrative functions as defined herein and represented in the Contractor's organization chart shall not be dispersed throughout various areas of the Contractor's operations but shall be established here as an identifiable group with dedicated physical space. One desk shall be dedicated for use by IDOT personnel when they are in the office and this space shall have a chair, working telephone, EMCMS terminal, laser printer capable of printing from IDOT personnel laptops and from the EMCMS terminal, and file cabinet with padlock, approved by the Engineer.

3.6.3 EMC DISPATCH CENTER

Unless another location is approved by the Engineer, the Contractor's in-District headquarters or in-District EMC office shall include the 24/7 hour operations of the EMC Dispatch Center, which may be used for other Contractor dispatch functions, but shall be adequately equipped and staffed to service the EMC on a first-priority basis. (The dispatching function cannot be sub-contracted, and voice-mail or answering services will not be accepted.) The dispatch center shall be in full operation and fully staffed as specified herein at the start of contract Jan 1st 2013.

The EMC Dispatch Center shall contain a minimum of four (4) desks and chairs for dispatch personnel, shall be equipped by the Contractor with adequate lighting, voice and data communications lines and equipment necessary to perform contract monitoring functions, system alarms, and the like, including, but not limited to equipment for the emergency call-out database, the EMCMS, the lighting system SCADA, the dial-up pump station alarm system (AEGIS), and the pump station SCADA telemetry system, and the CLMS for traffic signal alarms for all brands of signal systems in use throughout the contract.

The space shall be suitably equipped to protect system electronic equipment. The designated space shall have a HVAC system, air cleaner, emergency lighting, fire detection and smoke detection system. An on-line (true) UPS system is required to provide clean power and back-up electrical power for all dispatch electronic equipment for a minimum of eight (8) hours.

A back-up communications system shall also be in place for emergency back-up communications provisions for a minimum of eight (8) hours. Proper rack(s) for all computer equipment shall be furnished, which shall be a minimum of eighteen (18) inches above floor level. The space shall be kept at a temperature optimum for proper performance of the required electronic equipment, and free of dust and/or other contaminants.

3.6.4 EQUIPMENT SERVICE SHOP

Unless another location is approved by the Engineer, the headquarters shall incorporate facilities for the testing and repair of traffic signal controllers, lighting controllers, luminaires, pump controls, DMS equipment, surveillance equipment, and similar equipment maintained under this contract. These facilities shall be adequately equipped with instruments, test rigs and the tools necessary for the work.

The traffic signal portion of the facility shall be able to handle a minimum of, but not limited to, 600 controller and auxiliary failures a year, which includes electrical-mechanical, solid-state analog, solid state digital, and microprocessor equipment.

Typical testing facilities should include a minimum of five (5) work stations consisting of printers and computers of sufficient operating capacity, to troubleshoot system equipment (masters, local, telemetry modules and modems) and monitor, on a daily basis, the closed loop traffic control system.

3.6.5 STORAGE FACILITIES

State Stock Warehouse

To facilitate security, inventory control, physical separation of state owned materials from Contractor materials, and to reduce costs of material transfers when there is a change of Contractor, most state stock inventory is currently housed at a commercial bonded warehouse at Combined Warehouse Co., 5000 South Central, Chicago, Illinois, 60638 (hereafter referred to as the state stock warehouse).

The state stock warehouse shall be centrally located to the District's major concentration of systems, and located within the boundaries of Devon Avenue on the north, 63rd Street on the south, Cicero Avenue on the east, and I-355 on the west.

The Contractor shall obtain a minimum of 8,000 square feet of rental storage space at the state stock warehouse. The storage arrangements must also include 7 day, 24 hour security, an hourly rate for necessary on-site equipment and labor to access any stored item, all warehouse material handling fees, and a mechanism for formal check-in and checkout of materials. The inventory management shall include computerized record keeping of all inventory and all transactions, including regular monthly reports and occasional reports, on demand by the Engineer. All costs for the state stock warehouse shall be included in routine maintenance.

If the Engineer requests additional state stock warehouse storage space, the Contractor shall be reimbursed through non-routine maintenance at the same rate per sq. ft. as the approved state stock warehouse costs.

Any change in the designation of the state stock warehouse, or facility requirements, shall require approval of the Engineer. The Contractor shall have the option of retaining storage at the existing state stock warehouse or providing an alternate commercial bonded warehouse which is suitable for storage of materials of the type used for the District's electrical maintenance, and meets the space and facility requirements of the current state stock warehouse. All costs associated with any transfer of state stock inventory from the existing state stock warehouse to an approved alternate warehouse shall be borne by the Contractor, and no additional compensation will be allowed.

Contractor Storage Facilities

The Contractor shall have and furnish sufficient and adequate types of material storage areas, stock room space and shelving to house materials and equipment for use on this Contract. Equipment and parts to be used on system equipment including controllers and traffic signal heads and anything which comes boxed or which could deteriorate or be damaged by exposure to the weather shall be stored indoors. The Contractor shall obtain Engineer approval for all state stock to be stored other than in the State Stock Warehouse.

All state stock inventory shall be clearly identified and physically separated from the storage of Contractor-owned materials and equipment. State stock shall be kept screened or fenced, with locked access.

Insurance and Inspections

The Contractor shall provide insurance coverage for all state stock inventory in the possession of the Contractor or in the state stock warehouse, for losses due to fire, theft or vandalism. Estimated value of current stock on hand is approximately $500,000.

The Contractor shall comply with the instructions given by the Engineer relating to the care, storage, and marking of state stock inventory for identification purposes. The Engineer shall be allowed access to inspect state stock inventory at the Contractor's designated sites or the official state stock warehouse at any time.

3.7 CONTRACT ADMINISTRATION AND CORRESPONDENCE

3.7.1 DAILY CONTRACT ADMINISTRATION

The EMC will be administered by the IDOT District 1 Bureau of Traffic Operations. The Resident Engineer, Mr. Naser Gholeh, will be responsible for the control of the work. The Contractor Project Manager shall

communicate with the IDOT Resident Engineer on all formal contract matters. Contractor Supervisors and Administrative personnel shall normally communicate with the IDOT System Engineers and Technicians.

The Contractor shall address all matters of Contract interpretation or dispute at the lowest possible level. Issues which are not addressed to the Contractor's satisfaction at the Engineer/Technician level may be raised first to the IDOT Resident Engineer level and if not resolved may be raised to the level of Bureau Chief of Traffic Operations, Mr. Steve Travia.

It is of utmost importance that the Contract Project Manager conveys to the IDOT Resident Engineer any concerns regarding work authorizations received from the Department. Whether it is routine or non-routine maintenance work, if the Contractor has questions about the location of the work, the work completion dates, quantities of estimated materials, etc., these concerns must be voiced immediately upon the receipt of the project, so the work may start as soon as possible.

3.7.2 FORMAL CORRESPONDENCE

All formal correspondence to IDOT regarding contractual matters shall only be submitted by the Principal or Project Manager and shall be addressed as follows:

Mr. John Fortmann, P.E.

Acting Deputy Director of Highways,

Regional One Engineer

Illinois Department of Transportation, District 1

Attn: Mr. Stephen M. Travia, P.E.

Bureau Chief of Traffic Operations

201 W. Center Court

Schaumburg, Illinois 60196-1096

cc: Mr. Naser M. Gholeh, P.E. Resident Engineer

3.7.3 INFORMAL CORRESPONDENCE

Informal correspondence related to day-to-day maintenance matters shall be made by means of email where possible, or fax, and may be made directly to the parties involved. The Contractor Project Manager, all System Managers, EMC Working Foremen, EMC Specialists, EMC Administrative Manager and assistant, EMC Dispatch Supervisor, and other personnel as requested by the Engineer shall have an email address and access to scan email documents to the Department. The email service used by the Contractor shall not be a service that attaches advertising to email. The Contractor shall also have and maintain plain paper facsimile (fax) equipment at the headquarters, EMC Office, and EMC Dispatch Center, for the purpose of rapid dissemination of written information not in email form.

The Project Manager shall communicate with the Resident Engineer on all contract matters. System Managers and administrative personnel shall normally communicate with the IDOT System Engineers and Technicians.

3.7.4 WORK STATUS MEETINGS

Work status meetings may be requested by the Engineer or the Contractor. These meetings shall normally be held once per month, but may be held weekly if necessary. The Contractor Project Manager, Systems Managers, Specialists, Working Foremen, or other personnel, as requested by the Engineer, shall attend work status meetings, when requested by the Engineer.

3.7.5 MONTHLY PAY MEETING

Beginning with February 13, 2013, pay meetings shall be scheduled monthly by the Engineer, on the second Wednesday of the month at IDOT District 1 Traffic System Center in Oak Park. The Project Manager and other Contractor personnel, as requested by the Engineer, shall meet with Department personnel to present the Routine Maintenance invoice for payment. The Contractor shall provide a brief overview of routine and non-routine work status, as well as a written report on the DBE goal progress. Work planned for the future months and ticket response/repairs may also be discussed. The Contractor shall be provided with a ticket summary for the past month.

3.8 CONTRACT PERSONNEL

3.8.1 GENERAL RESPONSIBILITIES

The Contractor shall at all times provide a force of qualified personnel, approved by the Engineer, sufficient in number to simultaneously perform the routine maintenance work, non-routine work and any specialized work operations required and described herein, and/or emergency operations at all times of the day and night. The Contractor shall meet all response and repair requirements including work schedules.

All personnel working on IDOT systems and equipment shall have the proper training associated with their working environment, and shall use safety practices in accordance with OSHA rules and regulations such as those associated with confined space, fall protection, and lock-out-tag-out.

Except as otherwise restricted, the Contractor may utilize the workforce employed on this contract to serve the maintenance needs of other parties, however, this Contract requires that the Department of Transportation's work shall take precedence over other work. The Engineer may grant the Contractor authorization to postpone IDOT work to address emergency situations of others, but the shortage of workforce shall otherwise be insufficient grounds for the Contractor's failure to perform routine or other non-routine work within the prescribed time constraints.

The Engineer retains the right to reject the Contractor's structure for management of the contract if the specific requirements defined herein are not addressed or if the proposed structure or staffing is such that the effective execution of contract performance is compromised. If work performance is not acceptable to the Engineer, the Contractor shall have thirty days, after written notification is received, to comply with a personnel position change, as approved by the Engineer, or liquidated damages shall be assessed.

The Contractor shall remain responsible for any and all union agreements applicable to his workforce on the Contract. Union jurisdictions and other union contract requirements shall not become grounds for failure to perform the contract work.

The Contractor shall provide individual photo card identification for all personnel working on the Electrical Maintenance Contract and shall submit copies of each at the Pre-Construction Meeting.

The Contractor shall maintain a current EMC personnel list (including sub-contracting personnel) on a spreadsheet, alphabetical by last name, with union designation, EMC job title, applicable call numbers and/or cell numbers, email address, and office desk numbers if applicable. The personnel list shall be initially furnished to the Engineer at the Pre-Construction meeting. A list shall be provided immediately at the time there is a change in personnel for anyone working on IDOT equipment in the field.

The Contractor shall submit the personnel list each month in the routine work submittal book. Changes in personnel from the prior month shall be highlighted. Any new personnel from the prior month shall have a resume submitted with a copy of the Contractor's identification card with photo.

3.8.2 CERTIFIED PAYROLL REPORTING SUBMITTALS

The Contractor shall submit certified payroll reports for all employees including subcontractor's personnel. The time records of labor worked on IDOT Electrical Maintenance Contract shall be submitted to the Illinois Department of Transportation, EEO/Labor Compliance, District 1, Schaumburg and a copy to the IDOT Engineer. The following weekly reports shall be submitted:

- Certified Weekly Payroll Reports, SBE 348
- A Weekly Workforce Report , SBE 956

When union apprentices are working on this Contract, local union certification or federal approval must be submitted prior to submitting certified payroll reports.

The Contractor shall also submit to the Engineer, in the monthly routine work submittal book, a Systems Work report, a spreadsheet listing work performed monthly by:

- Name of employee performing work, in alphabetical order by employee last name
- Weekly hours worked by the employee, by categories of EMC work, non-EMC work, and total hours
- For EMC work list hours worked per system and by category (routine and non-routine)
- For Subcontractor work a separate spreadsheet, identifying same as above

The Department will provide the spreadsheet form at the pre-construction meeting.

3.8.3 GENERAL WORKFORCE RESPONSIBILITIES

The Contractor's workforce shall possess the skills and knowledge necessary to perform all work consistent with the best practices of the trade. The workforce shall include personnel having certain special expertise, including, but not limited to the following:

- Materials Management
- General Electrical Power
- Building Wiring (Indoor Electrician)
- Motor Controls and Control Systems
- Various Types of Pump Rebuild
- Various Types of Mechanical Work
- Low Voltage Power Distribution Systems
- Roadway Electrical (Outdoor Lineman)
- Telemetry/Telecommunications
- Traffic Signal Closed Loop Monitoring System
- Fiber Optic Cable Installation and Repairs
- Hardware/Software Troubleshooting
- Dynamic Message Sign Technology
- Programmable Logic Controller Installation and Maintenance
- Lighting SCADA Trouble-shooting
- Pump Station SCADA Trouble-shooting
- Office Administration

3.8.4 ORGANIZATIONAL DOCUMENTATION

Certain operational capabilities, functions and relationships are prescribed in this Contract. The Contractor shall produce an organization chart to document the chain of command and demonstrate compliance with the requirements defined by the contract, including reporting relationships of field personnel. The submittal shall provide the name of individuals assigned to all positions as required herein, both dedicated and assigned (non-dedicated). This document shall be submitted with the pre-bid

qualifications, re-submitted at the Pre-Construction Meeting with any proposed revisions, and submitted to the Engineer at any time there is a change in personnel or the chain of command.

The Engineer may also reject the assignment of specific personnel to certain functions if the Contractor fails to demonstrate the qualifications matching personnel to defined responsibilities.

3.8.5 PRINCIPAL (OWNER) OR PROJECT MANAGER RESPONSIBILITIES

Experience has shown that personal involvement of a Principal, an officer of the company with signature authority, is inevitable in all major or overall contract matters under the Contract. The Principal may, however, establish a Project Manager to be responsible for performance of the contract, and have the authority to fully represent the Principal in all matters on this Contract. The requirements for attendance at monthly pay meetings, signing of documents and meeting with Department representatives, and other overall-contract duties, may also be delegated to the Project Manager.

Any Project Manager so established shall have supervisory authority over all System Managers. The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

Reporting to Principal or Project Manager:

- Advanced Systems Manager
- Lighting and Extra Systems Manager – Dedicated position
- Pump Station System Manager
- Surveillance/DMS System Manager – Dedicated position
- Traffic Signal System Manager – Dedicated position
- Dispatch Supervisor
- Administrative Manager – Dedicated position

If at any time, the Engineer determines that a Project Manager has insufficient authority and flexibility to effectively manage the work under the contract, the Engineer retains the right to demand the Principal be in charge of the contract, with appropriate attendance at meetings, etc.

To assure 24-hour continuity of a person in responsible charge of the Contract, the Contractor shall establish a prioritized list of staff who are to act, with full authority to speak definitively for the Principal,

relative to this contract, in the event of illness, vacation, or other similar lack of availability of the Principal and, if established, the Project Manager. The Engineer shall be notified as far in advance as possible whenever a substitute Principal officer, Project Manager or System Manager is necessary. System Managers may act in a temporary substitute capacity for the Principal or Project Manager, while retaining their day-to-day responsibilities, however, the Engineer must be notified of the substitution.

3.8.6 SYSTEM MANAGER RESPONSIBILITIES

System Managers shall report directly to the Principal or Project Manager as applicable. If specified herein to be dedicated fully to work under this Contract, System Managers may only be released from Contract obligations through written approval by the Engineer or his appointed representative. Responsibilities of the System Managers shall include:

- Authority to commit workforce and other resources at all times and/or as directed by the Engineer on a 24 hour basis, seven days a week
- Preparation of the daily agenda
- Daily review of ticket summary
- Daily review and timely distribution of all maintenance repair and modification work documentation including daily agenda, ticket follow-up data, and miscellaneous reports
- Overseeing of maintenance transfers and new installation inspections
- Lane closure requests and implementation of approved traffic control plans
- Coordination of emergency operations for the applicable system(s)
- On a rotating basis, be on call 24 hours per day as an Emergency Response Coordinator, prioritizing the emergency response for all electrical Systems. In this capacity the System Manager shall coordinate with the EMC Dispatch Center Supervisor and also have the authority

to call out additional personnel for dispatching or patrol duties. (Refer to Article 4.0 Call-Out Policy).

- Supervision of all routine and non-routine work in the assigned system

3.9 DEDICATED PERSONNEL POSITIONS

3.9.1 RESPONSIBILITIES OF DEDICATED PERSONNEL

In order for the Contract to function effectively specific personnel functions are required to provide quality maintenance service to the public. Furthermore, the size of the Contract dictates that certain personnel be dedicated to this maintenance Contract in full-time capacities as specified herein. No dedicated personnel, shall hold more than one EMC job responsibility as described herein or as shown on the Contractor's organization chart, unless as approved in writing by the Engineer. The dedicated personnel in this Contract are paid through routine maintenance, and no additional compensation will be made for their work performed on non-routine work. The contractor shall submit the names of all dedicated personnel at the pre-construction meeting with their assigned duties. The individual assigned as dedicated shall not be re-assigned without approval of the Engineer.

The forty (40) dedicated personnel as noted herein shall perform work as assigned for this Contract. Dedicated personnel are required to perform Contract work, routine and non-routine as specified herein and as directed by the Engineer at no additional cost to the Department, and can be utilized for emergency and special situations as noted herein.

Dedicated Positions in the EMC: (alphabetical order)

Advanced Systems Field Technician

EMC Administrative Manager

Lighting and Extra Systems Manager

Lighting Night-Rider Patrolman

Pump Station Specialist (Working Foreman)

Pump Station Crew (4)

Repair Crew (22)

SCADA Specialist

SCADA Trainee

Surveillance Specialist (Working Foreman)

Surveillance/DMS Patrolmen (4)

Surveillance Trainee

Traffic Signal Manager

3.9.2 ADVANCED SYSTEMS FIELD TECHNICIAN

The Contractor shall appoint a dedicated Advanced Systems Field Technician who shall have a minimum of five (5) years work experience in electrical construction and maintenance, ability to operate a bucket truck to access cameras, trouble-shoot CCTV, ability to operate a variety of test equipment for installing, servicing and testing electronic equipment, knowledge and ability to calibrate equipment to meet manufacturer and/or IDOT specifications, perform shop and field tests, and have advanced computer skills to troubleshoot network devices. This individual must meet the approval of the Engineer.

3.9.3 EMC ADMINISTRATIVE MANAGER

The Contractor shall appoint an EMC Administrative Manager, dedicated to this Contract, who shall work in the EMC Office and oversee all administrative functions of the Contract. This individual shall supervise the daily activities of the EMC Administrative Assistant.

The EMC Administrative Manager shall assure:

- System Managers have required EMCMS access
- System Managers work and submittals are in compliance with Contract requirements
- All agreed price work quotes are timely and follow Contract requirements
- All vendor warranty agreements are available
- All insurance policies are valid
- All EMCMS entries and submittals are correct and follow Contract requirements
- Traffic Signal Patrolmen submit proper photos for MCHD statements
- Timely payment to Specialty Work vendors
- Wireless communication device functions/inventory

The EMC Administrative Manager shall be responsible for the development and submittal of:

- Daily Agenda
- Monthly Routine Maintenance Work Documentation Book
- Monthly Routine Maintenance Work Invoice
- Quarterly DBE Goal Status Progress Report
- All EEO Contract Requirements
- All Sub-Contractor Agreements
- MCHD Statements and Monthly Summary Invoice
- MCHD Repair Photos
- MCHD Requested Information for Insurance Companies
- State Stock Monthly Report
- 3rd Party Damage Invoices and submittals
- Various documentation submittals as requested

The individual in this position shall have daily contact with Department Engineers and Technicians.

Required qualifications include:

- BA or BS Degree
- Minimum of three (3) years of business experience with a contractor or in a related field
- Minimum of five (5) years experience with Windows 98 or better and spreadsheet software
- Good verbal and written communication skills

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.9.4 LIGHTING AND EXTRA SYSTEMS MANAGER

The Contractor shall appoint an individual to the position of Lighting and Extra Systems Manager who shall be dedicated to this Contract and who shall have full daily responsibility for all maintenance and modification work of the Lighting System and Extra Systems, under this contract.

This individual shall be responsive to the needs of the Lighting and Extra Systems and may be requested to attend weekly work progress meetings at the electrical field office. Various IDOT system representatives shall have free access to this Manager to address specific system repair issues. In the event of conflicts in work priorities the Principal/Project Manager shall coordinate service acceptable to the Engineer.

This individual shall have the ability to manage a staff of twenty or more, shall communicate effectively, and have knowledge of electrical codes and work related safety practices (OSHA).

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

Required Qualifications:

- Minimum of ten (10) years electrical and mechanical maintenance experience as an electrical tradesperson with local electrical contractor companies working on the construction and maintenance of various types of highway lighting and/or other electrical systems
- Experience in the operation of IDOT electrical control circuits
- Ability to interpret contract drawings and wiring diagrams
- Familiarity with diesel engine power generators and related transfer switches for back-up power
- Familiarity with fiber optic signs and CCTV
- Familiarity with fiber optic trunk lines
- Familiarity with cable underground work
- A valid electrician's card
- Valid driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

The individuals appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.9.5 LIGHTING NIGHT-RIDER PATROLMAN

One (1) individual shall be dedicated to the EMC in the position of the all systems Night-Rider Patrolman, who conducts an outage survey for the advanced systems, highway lighting locations, sign illumination locations, navigational lighting locations, and extra system installations three (3) weeks per month, and works on the required database of lighting system lamp outages and luminaire repairs as well as other assigned duties for other times.

Required Qualifications:

- Minimum of two (2) years experience with Windows XP or 2000 and Excel software
- Minimum of two (2) years experience with the EMCMS
- Knowledge of IDOT highway lighting and sign structure identification system
- Ability to perform work at night
- Valid driver's license

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.9.6 PUMP STATION SPECIALIST (WORKING FOREMAN)

The Contractor shall appoint an individual as the Pump Station Specialist who shall be a Working Foreman, and shall be dedicated to this Contract. This individual shall supervise the PS Service Crew in their daily work activities at pump stations, shall conduct patrol inspections, and perform assigned routine or non-routine work. The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

The Pump Station Specialist shall be on-call for mechanical malfunctions or during emergencies at pump stations resulting from rainstorms, power outages, hazardous materials conditions, etc., which may cause travel hazards to the motoring public.

This individual shall be fully responsible for compliance with all NEC requirements.

Required Qualifications:

- Minimum of eight (8) years hands-on experience working with 240V and 480V 3 phase motors, relay logic control systems, vertical/submersible pumps and their appurtenant equipment
- Trained and skilled, capable of troubleshooting and repairing pumps and other mechanical equipment located at each pump station
- Familiarity with relay logic controls
- Valid electrician's card
- Valid commercial driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

3.9.7 PUMP STATION SERVICE CREW

The Contractor shall employ a Pump Station Service Crew, individuals sufficient in number, a minimum of four (4), dedicated to this Contract, to perform routine and non-routine work, including equipment malfunction trouble-shooting, follow-up repairs, testing, pump rebuilding and replacement work, and an inspection of each pump station once per month

The Pump Station Service Crew shall be on-call during emergencies at pump stations resulting from rainstorms, power outages, hazardous materials conditions, etc., which may cause travel hazards to the motoring public.

These individuals shall be fully responsible for compliance with all NEC requirements.

The individuals appointed to this position shall be approved by the Engineer prior to the start of the Contract. The names and work assignments of the dedicated repair crew shall appear on the Daily Agenda Repair and PS Crew Assignment sheet.

Required Qualifications:

- Minimum of five (5) years hands-on experience working with 240/480V 3 phase motors
- Familiarity with HVAC

- Knowledge of pump maintenance procedures
- Familiarity with pump break-down and re-builds
- Familiarity with the installation of submersible/column pumps
- Valid electrician's card
- Valid commercial driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

3.9.8 REPAIR CREW AND SUPPLEMENTAL ELECTRICIANS

The Contractor shall employ a minimum contract repair crew workforce of twenty-two (22) individuals whose work shall be dedicated to the repair work on this Contract. Foremen may be applied toward required crew personnel.

When assigned to work on a specific System, the Repair Crew personnel shall be made responsible to the Contractor's manager of the respective System for the work.

From the twenty-two (22) dedicated repair crew, the Contractor shall train, staff, and provide proper equipment for:

- Three (3) loop crews to operate simultaneously, although they need not be exclusively assigned to loop repair work
- Two (2) light tower crews to operate simultaneously, although they need not be exclusively assigned to tower work

Other work examples include damage repair; motorist caused damage repair, modifications to system installations, troubleshooting special maintenance problems, cable repairs, temporary signal installations, loop repairs, lighting outages, and other authorized routine or non-routine work.

Unless otherwise permitted by the Engineer, the Contractor shall have 100% of the required level of repair crew personnel engaged in contract work on a daily basis by January 1, 2013, and through the remainder of the contract year.

Required Qualifications:

Ten (10) of the required twenty (22) individuals shall have:

- Valid electrician's card and a minimum of four (4) years electrical and mechanical maintenance experience as an electrical trades person with local electrical contractor companies

One (1) individual shall have:

- Minimum of two (2) years of work experience in splicing, termination and testing of fiber optic cable

- Successfully completed a four-day (minimum) training in the "installation of fiber optic products" conducted by a major manufacturer of fiber optic products or a generic fiber training session as approved by the Engineer

One (1) individual shall be:

- Skilled to perform electrical work within buildings, with valid union license

All individuals shall have:

- Electrician's license with minimum five years experience
- Skills in all typical highway system general work, construction and/or repair of traffic signals, surveillance equipment, lighting or sign equipment, etc.
- Ability to interpret contract drawings and wiring diagrams
- Ability to read current and voltage readings and use meggers, multimeters, and other test equipment

- Valid driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

The individual(s) appointed to this position shall be approved by the Engineer prior to the start of the contract and the names and work assignments of the twenty-two (22) dedicated provided.

Ten (10) individuals assigned to the repair crew shall be a journeyman with an electrician's license.

Supplemental Electricians

In addition the Contractor shall provide 500 hours total per year of labor for qualified Electricians to perform electrical work within District 1 on any system at any location as approved by the Engineer. A spreadsheet accounting for the use of these hours, the name(s) of individuals performing the work, date of work, Service Request Authorization number and description of work shall be furnished in the monthly routine work submittal book. Hours of work shall only be counted for actual work performed. All equipment and transportation shall be incidental and covered under routine maintenance. The hours shall be in addition to routine maintenance work and pay items specified herein. Unused hours shall carry over to the renewal year.

3.9.9 SCADA SPECIALIST AND TRAINEE

The Contractor shall assign individuals to the positions of SCADA Specialist and SCADA Trainee, who shall be dedicated to contract work, and shall perform pump station patrol inspections, troubleshoot pump station and lighting SCADA systems, Advanced System, and occasionally troubleshoot malfunctions on the Dynamic Message System.

The SCADA Specialist and Trainee shall be on-call for emergency response situations or call-out for emergencies at pump stations resulting from rainstorms, power outages, hazardous materials conditions, etc., which may cause travel hazards to the motoring public.

These individuals shall be fully responsible for compliance with all NEC requirements.

The individuals appointed to this position shall be approved by the Engineer prior to the start of the Contract.

Required Qualifications:

- Electrical Engineering degree or equivalent technical school certification
- Five (5) years experience with basic electronics and electronic components, such as relays & switches, etc.
- Three (3) years working experience on Windows 95/98/2000 and NT and familiarity with Windows XP operating system setup
- Two (2) years experience with CCTV systems and fiber optic transceivers
- Working knowledge of ladder logic GUI programming
- 1 Individual - Certified to trouble-shoot Allen Bradley programmable logic controllers, PLC 5, and RS Logics 5000 controllers
- 1 Individual - Trained on RSView 32 Project Development, Control Logix 5000 and Liq. V Programming
- Familiarity with wiring of control systems
- Familiarity with ladder logic programming or traffic signal programming
- Familiarity with telephone data line troubleshooting via implementation of break-out box
- Familiarity with dynamic data exchange communications
- Familiarity with open database architecture
- Valid electrician's card
- Valid driver's license and ability to respond in the field

3.9.10 SURVEILLANCE/DMS SPECIALIST (WORKING FOREMAN)

The Contractor shall appoint a journeyman electrician to the position of Surveillance/DMS Specialist (Working Foreman) to be dedicated to the Surveillance/DMS Systems and have daily responsibility to oversee the work of the Surveillance/DMS Patrolmen. With Engineer approval, this individual may also serve as the Surveillance/DMS Manager.

This individual normally performs patrol duties on the Surveillance/DMS Systems, investigates 3rd party damage issues, oversees maintenance transfers or new installation inspections, coordinates requests for lane closure approvals, and attends field site meetings to discuss equipment modifications.

Required Qualifications:

- Minimum of ten (10) years electrical maintenance experience in telemetry, traffic signals, electrical controls, instrumentation, communications networks or other similar large-scale wide area distributed systems and with experience in Surveillance/DMS system maintenance and in electrical construction
- Significant experience with large scale FSK tone telemetry systems
- Significant experience with various types of telecommunication systems
- Experience in planning and coordinating diverse and numerous work tasks
- An IMSA level II certificate and Work Zone Safety certificate
- Familiarity with single mode fiberoptic cable installations
- Familiarity with IDOT Traffic Control Standards
- Familiarity with CCTV system troubleshooting and repair
- Ability to troubleshoot and repair fiberoptic cable
- Familiarity with fiber optic and LED DMS and CCTV
- Familiarity with OSHA Safety Standards
- Communication and documentation skills
- Valid electrician's card
- Valid driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

During emergencies resulting from rainstorms, power outages, hazardous materials conditions, etc., which may cause travel hazards to the motoring public, the Surveillance System Manager shall be

responsible for the Contractor's emergency response call-out for the Surveillance Systems. This individual shall meet the approval of the Engineer.

3.9.11 SURVEILLANCE/DMS PATROLMEN

The Contractor shall appoint a minimum of four (4) Surveillance/DMS Patrolmen, dedicated to the Surveillance/DMS System. Their basic work assignments shall be the patrol duties, preventive maintenance, outage surveys at dynamic message sign locations and response services for the Surveillance/DMS Systems. It is not expected that call-out duties on other systems shall be required except in emergency situations, however, these Patrolmen shall be cross-trained for the Traffic Signal System.

The individuals appointed to this position shall be approved by the Engineer prior to the start of the contract.

Required Qualifications:

- Minimum (5) years construction experience with electronic equipment and communication repair
- Minimum (5) years Surveillance System maintenance experience
- Minimum (3) years traffic signal maintenance experience
- Minimum (3) years DMS MOSYS maintenance experience
- Fiber flip disk and LED DMS maintenance experience
- Ability to troubleshoot low voltage equipment malfunctions
- Familiarity with single mode fiberoptic cable installations
- An IMSA level II certificate
- Familiarity with IDOT Traffic Control standards
- Familiarity with OSHA safety requirements
- A valid electrician's card
- Valid driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

3.9.12 SURVEILLANCE/DMS CREW TRAINEE

The Contractor shall assign an individual to the position of Surveillance/DMS Crew Trainee, dedicated to the Surveillance/DMS system, who shall perform preventative maintenance, patrol duties, and provide backup assistance during emergencies for the Surveillance/DMS Systems Patrolmen.

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract. The Contractor shall confirm to the Engineer, by June 1, 2013, that the trainee has enrolled in the local union's electronics school.

Required Qualifications

- 1 year Construction experience in either Traffic Signals or Surveillance installations
- Union helper or groundsman level status
- Attain IMSA level 1 certification by April 1, 2013
- Valid driver's license and the ability to respond in the field
- Available for 24/7 emergency call-out

3.9.13 TRAFFIC SIGNAL SYSTEM MANAGER

The Contractor shall appoint an individual to the position of Traffic Signal System Manager who shall be dedicated to this Contract and have full daily responsibility for all maintenance and modification work of the Traffic System installations under this Contract.

The Traffic Signal System Manager shall retain supervisory authority over all EMC work performed by all Patrolmen assigned to the Traffic Signal System, including maintenance response work outside the work of this Contract, but he shall not be responsible for traffic signal construction work being performed by the Contractor under other contracts. The Traffic Signal Systems/Railroad Specialist, the Traffic Signal System/Railroad Assistant, and all Equipment Shop personnel shall report to the Traffic Signal System Manager.

During emergencies resulting from rainstorms, power outages, hazardous materials conditions, etc., which may cause travel hazards to the motoring public, the Traffic Signal System Manager shall be responsible for the Contractor's emergency response call-out for the Traffic Signal System.

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

Required Qualifications

- Degree from an Electrical Technical Institute or Electrical Engineering College
- Have or be in the position of obtaining an IMSA level III certificate by July 1, 2013
- Ability to manage a technical staff of fifty (50) or more and communicate effectively
- Minimum of ten (10) years experience in construction, maintenance, and operation of all traffic signals and traffic signals systems currently being used in District 1
- Hands-on ability to solve trouble calls for any traffic signal cabinet or communications failure
- Knowledge of the operation of software for the Econolite, Eagle, and Peek, Traconex, and Transyt Traffic Signal Closed Loop Systems, controller and equipment operations manuals, and equipment safety and Work Zone Traffic Control and Protection measures
- Valid electrician's card
- Valid driver's license and ability to respond in the field

3.10 ASSIGNED CONTRACT PERSONNEL POSITIONS

3.10.1 RESPONSIBILITIES OF ASSIGNED CONTRACT PERSONNEL

Assigned Contract Personnel hold required positions in the EMC, are listed on the EMC organization chart, and normally work daily on the EMC, but since they may have additional assignments other than the EMC they are not required to be dedicated to Contract work.

Assigned Positions in the EMC:

Advanced Systems Manager (may be filled by the Advanced Systems Specialist)

Dispatch Center Supervisor

Dispatch Center Personnel

EMC Administrative Assistant

Equipment Shop Personnel

Patrolmen

Pump Station Manager

Surveillance/DMS Manager (may be filled by Dedicated Surveillance/DMS Specialist)

Traffic Signal/Railroad Specialist

Traffic Signal Systems Assistant

3.10.2 ADVANCED SYSTEMS SPECIALIST/MANAGER

The Contractor shall appoint a journeyman electrician to the position of the Advanced Systems Specialist (Working Foreman) who shall have full daily responsibility for all maintenance and modification work of the Advanced Systems under this Contract. With Engineer approval, this individual may also serve as the Advanced Systems Manager.

This individual shall have a minimum of five (5) years of management experience in electrical construction and maintenance; have an acceptable knowledge of the operations of the Advanced System, and a minimum of five (5) years supervisory experience. The Advanced Systems Manager shall have the full authority to speak definitively for the Principal, with signature authority relative to this Contract. This individual must meet the approval of the Engineer.

The Advanced Systems Specialist/Manager shall review all Tickets daily and correct, if necessary, to assure correct repair terminology, status of repair work, etc., prior to the Contract Administrator sending the Ticket Summary Report to Department personnel. This individual shall be responsible for the scheduling of all Advanced Systems work.

3.10.3 DISPATCH CENTER SUPERVISOR

The Contractor shall provide an assigned EMC Dispatch Supervisor in the EMC Dispatch Center, on duty during the hours of 7 a.m. to 3 p.m., Monday through Friday. A substitute, on-call EMC Dispatch Supervisor shall be available for consultation by the EMC dispatch staff or IDOT Departmental staff during the remaining hours of the week.

It is the responsibility of the EMC Dispatch Center Supervisor to supervise the EMC dispatch staff and monitor their EMCMS data entry, in order to meet the one (1) hour entry requirement, and to assure

dissemination on a daily basis the ticket summary reports and maintenance transfer reports to all Departments and Contractor System Managers, and to provide monthly updated patrol reports for the routine maintenance work submittal book.

Required Qualifications:

- Minimum of four (4) years experience in electrical construction work administration or dispatch
- Minimum of two (2) years experience with Windows XP/2000 or the EMCMS
- Good verbal and written communication skills

The individual(s) appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.10.4 DISPATCH CENTER PERSONNEL

The Contractor is responsible to provide trained, responsive dispatchers, 24/7.

Minimum Required Staffing:

Monday through Friday, 7 A.M. to 3 P.M. -- 2 dispatchers and 1 supervisor

Monday through Friday 3 P.M. to 11 P.M. -- 2 dispatchers and an on-call supervisor

Monday through Friday 11 P.M. to 7 A.M. -- 1 dispatcher and an on-call supervisor

Saturday & Sunday, 24/7 – 1 dispatcher and an on-call supervisor

During Storm Alerts (as received from IDOT ComCenter):

2 dispatchers and an on-call supervisor, (from start time of storm until clearing notification is received from IDOT ComCenter)

Historically the EMC Dispatch Center creates approximately 10,000 work tickets per year on the EMCMS. Other dispatcher duties include documentation of cable locate requests, 3rd party damage reports, maintenance transfers, water on pavement reports, maintenance of EMCMS database, and call-out duties for incidents reported to the Dispatch Center for locations as maintained by the state, county, and municipalities.

Although past dispatching experience is not a requirement, it is essential that the individuals on staff be willing to learn, both dispatching and computer skills for the EMCMS, and are able to speak clearly and distinctly. Due to the importance of the dispatcher duties to the success of the EMC operations, if the dispatcher work performance is not acceptable to the Engineer, routine maintenance payment may be withheld, or liquidated damages assessed.

3.10.5 EMC ADMINISTRATIVE ASSISTANT

The administrative functions on the EMC require either a full-time EMC Administrative Assistant or the duties may be shared between a part-time Administrative Assistant and an EMC Dispatcher.

Suggested work includes:

- EMCMS Logging of non-routine work authorizations
- EMCMS Logging of non-routine work completion dates
- EMCMS Entry of motorist caused damage repair logs as received from crews
- EMCMS Entry of motorist caused damage statements (invoices)
- EMCMS Entry of work quotes
- EMCMS Entry of state stock inventory
- EMCMS Non-Routine work invoicing
- 3rd party damage repair invoicing
- Coordination of Contractor Advisory Reports
- Coordination of the monthly Routine Maintenance Work Documentation Book
- Routine maintenance monthly invoicing
- Coordination of weekly certified payroll submittals
- Subcontractor approval documentation submittals
- DBE documentation submittals
- EEO documentation including workforce analysis submittals

Qualifications include a minimum five (5) year's administrative experience, preferably with a contractor or in a related field, a minimum of five (5) years' experience with Windows 98 or better software, spreadsheet software, and good verbal and written communication skills.

The individual(s) appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.10.6 EQUIPMENT SERVICE SHOP PERSONNEL

The Contractor shall provide sufficient Equipment Service Shop personnel to meet all equipment repair time requirements as stated herein. Work shall include, but is not limited to, the service and overhaul of Surveillance and DMS system equipment, and traffic signal equipment. Types of work includes repair of controllers and programming, bench tests all types of electromechanical, CMOS, solid state, microprocessor, analog and digital control equipment, and surveillance system tone equipment including DMS control equipment. The Contractor shall be aware of requirements stated herein as to the use of new versus repaired equipment (refer to specific system articles).

Required Qualifications:

- Associate Degree from a 2-year technical college
- Minimum five (5) years of related equipment troubleshooting, bench experience, and problem solving diagnostic experience

The individual(s) appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.10.7 PATROLMEN

Patrolmen shall perform response services, on a daily basis, for all of the various systems under this Contract, but the basic work assignment for the Patrolmen shall be the regular patrol of traffic signals, and emergency call-out response for the Traffic Signal System. Those patrolmen assigned to the Traffic Signal System shall also be cross-trained in the Surveillance/DMS Systems.

Although not dedicated to EMC Contract work, the Contractor shall assign twenty-six (26) individuals to be TS Patrolmen. The Contractor is required to have these Patrolmen on duty to meet one (1) hour in-district response requirements as stated in Article 4.0 and patrol requirements as stated in Article 10.0.

A sufficient number of the Patrolmen shall be scheduled for night, weekend and holiday patrol duties to meet the one (1) hour in-district response requirements.

The TS patrolmen shall maintain the integrity of all timing, parameter programming information, traffic responsive and time of day signal systems, and shall be trained to troubleshoot equipment malfunctions including all closed loop signal system malfunctions.

If the routine work performance, including response time, is not acceptable to the Engineer, the number of assigned Patrolmen shall be increased to twenty-eight (28). The Contractor shall have thirty days to comply with this change, after written notification is received.

Required Qualifications:

TS Patrolmen

- Experienced journeymen-level technician
- An IMSA level II certificate
- Minimum of eight (8) years experience with NEMA traffic signal closed loop systems operating in the traffic responsive mode.
- Valid electrician's card
- Valid driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

The individuals appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.10.8 PUMP STATION SYSTEM MANAGER

The Contractor shall appoint an individual to the position of Pump Station System Manager who shall be assigned to have full daily responsibility for all maintenance and modification work of the Pump Station

System. The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

The Pump Station System Manager position need not be dedicated to this Contract, but he is expected to devote a significant portion of his time to pump station activities on a daily basis. The other work activities of the Pump Station System Manager must be significantly related to the technology and type of work employed in the Pump Station System, and shall allow daily supervision of work activities of the Pump Station Specialist (working foreman), and Pump Station Service Crew, SCADA Specialist, and SCADA Trainee. He/she shall be stationed at the facility from where the Pump Station Service Crew is dispatched daily.

It is the responsibility of the Pump Station Manager to recommend modifications or upgrades to optimize the existing PS System, to troubleshoot all facets of pump station equipment, and to be fully responsible for compliance with all NEC requirements.

During emergencies at pump stations resulting from rainstorms, power outages, hazardous materials conditions, etc., which may cause travel hazards to the motoring public, the Pump Station System Manager shall be responsible for the Contractor's emergency response call-out for the Pump Station Specialist, Pump Station Specialist Trainee, and Pump Station Service Crew, and when assigned by the Project Manager, shall direct other Contract personnel in emergency response duties for the Pump Station System. Refer also to responsibilities for hazardous materials operations in Article 3.13.3.

Required Qualifications

- Technical Institute certificate/diploma
- Extensive construction experience in mechanical/electrical of pump station or commercial work
- Facility and building work
- Basic fundamental skills, knowledge and understanding of power distribution
- Eight (8) years of electrical and mechanical maintenance experience, working on all types of storm water pumping station equipment
- Knowledge of implementation and preventive maintenance of vertical and submersible pumps

- Familiarity in the maintenance and operation of switch-gear and circuit protection equipment
- Familiarity with motor control panel/alarm wiring
- Familiarity with low voltage motor-control centers for 3-phase (240/480) systems
- Familiarity with engine power generators and related transfer switch equipment
- A valid electrician's card
- Valid driver's license and ability to respond in the field
- Available for 24/7 emergency call-out

3.10.9 TRAFFIC SIGNAL SYSTEMS/RAILROAD SPECIALIST

The Contractor shall appoint a highly skilled and trained Engineer or Technician to provide technical expertise to all patrolmen and signal technicians responsible for the traffic signal systems, and to manage the trouble-shooting of all types of system equipment at various field sites. Responsibilities shall also include the overall maintenance of the Closed Loop Traffic Signal Monitoring System Equipment, alarm monitoring and follow up of all CLMS daily activities.

Required Qualifications:

- Degree from an Electrical Technical Institute or Electrical Engineering College
- An IMSA level III certificate
- Ability to communicate effectively
- Demonstrable knowledge and minimum of eight (8) years experience in operations of all traffic signals and traffic signals systems currently being used in District 1
- Hands-on ability to solve trouble calls for any traffic signal cabinet or communications failure
- Knowledge of the operation of software for the Econolite, Eagle, Peek, Traconex, and Transyt Traffic Signal Closed Loop Systems, controller and equipment operations manuals, and equipment safety and Work Zone Traffic Control and Protection measures
- One (1) O.T.D.R., Siecor Model 340 or equal with necessary modules capable of testing both single-mode and multi-mode fiber cable
- Lap-Top fully functioning capable of operating all applications software required for the Traffic Signal systems with Carry Bag, and power cords.
- Valid electrician's card

- Valid driver's license and ability to respond in the field

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.10.10 TRAFFIC SIGNAL SYSTEMS ASSISTANT

The Contractor shall appoint a qualified Traffic Signal Systems Assistant who shall work daily with the Traffic Signal System/Railroad Specialist to provide technical expertise to all patrolmen and signal technicians. Responsibilities include alarm monitoring and CLMS daily work activities.

Required Qualifications:

- Degree from an Electrical Technical Institute or Electrical Engineering College
- Ability to communicate effectively
- Demonstrable knowledge and minimum of four (4) years experience in traffic signal maintenance or demonstrate skills in computers or electronics
- Valid electrician's card
- Valid driver's license and ability to respond in the field

The individual appointed to this position shall be approved by the Engineer prior to the start of the contract.

3.11 LEFT OPEN FOR FUTURE USE

3.12 PERSONNEL TRAINING PROGRAMS

3.12.1 GENERAL REQUIREMENTS

Proper training of contract personnel shall assure acceptable maintenance by the Contractor while attaining the highest level of safety for contract personnel and the motoring public. The training programs listed herein shall be completed by June 1, 2013, unless otherwise approved by the Engineer. Although these personnel training programs shall be included under routine maintenance, depending upon the dedicated personnel workday, the Contractor may be required to conduct these training sessions on employee overtime. Training may be required more than once per year if situations and/or personnel changes occur. The training shall be performed each year.

The training programs shall be taught by qualified instructors, and where certification of the trainer is applicable, the trainer shall be certified. The training shall be performed within the first quarter of the year. A scheduled date and time shall be provided at the pre-construction meeting. The instructor and instructional materials shall be approved by the Engineer prior to the training sessions. The Contractor shall submit updates in the monthly routine work documentation book with any training schedule changes and following each training session shall submit an employee attendance list. The Contractor shall provide for the attendance of IDOT inspectors, maximum of twelve, at each training session. The Engineer may arrange for use of the District 1 auditorium classroom for large training session(s) if sufficient advanced notice is given.

3.12.2 OSHA AND OTHER SAFETY TRAINING

The Contractor shall establish training for all personnel in applicable OSHA requirements and other safety-related topics, to include but not be limited to; lock-out/tag-out, confined space, safety, hazmat training, respirator training (as applicable), use of safety harnesses for work on signs and other structures and basic first aid.

3.12.3 NATIONAL ELECTRICAL CODE/GROUNDING/LIGHTNING PROTECTION

The Contractor shall establish a training program(s) not less than one (1) day in duration per contract year to address proper and safe grounding, and/or National Electrical Code, and/or lightning protection of electrical systems. The program shall be taught by a professional trainer regularly engaged on this topic, and the training shall specifically address applications to typical IDOT systems such as electrical installation and maintenance, traffic signals, highway lighting and pump stations. This training shall be provided for all appropriate technical personnel, including all personnel engaged in electrical wiring work

3.12.4 EQUIPMENT/SYSTEM TRAINING

The Contractor shall provide in-house or local training sessions for those individuals who would be maintaining specific equipment on this Contract, for equipment requiring detailed maintenance or troubleshooting and/or situations requiring special attention, or for specific procedures which are unique to this Contract. Requirements include:

Traffic Signal System

The Contractor shall provide training within the first quarter of the year. A scheduled date and time shall be provided at the pre-construction meeting. The training shall be on traffic signal controller operations, from the controller manufacturers, for all Patrolmen, the TS Specialist and Trainee, Surveillance/DMS Patrolmen, and twelve IDOT personnel, for each of the types of controllers in use by the Traffic Signal System in District 1, or as approved by the Engineer, including but not limited to:

- NEMA TS-1 cabinets
- NEMA TS-2 cabinets
- Econolite System controllers
- Eagle System controllers
- Peek System controllers
- Video Detection – Iteris, Autoscope, FLIR
- Conflict Monitors – EDI
- MMU – EDI, Reno, Econolite
- BIU – Eagle, Econolite
- Traffic Signal troubleshooting
- Traffic Signal System timings
- Fiber Optic troubleshooting and testing
- Radio interconnect troubleshooting
- System and intersection controller software uploading and downloading
- Detector amplifiers
- Grounding troubleshooting
- UPS systems
- Wireless Magnetic and Radar Vehicle Detection

Lighting System

Personnel working on the Lighting System shall have basic training on the following items:

Cabinet Control:

- Clock programming

- Control wiring
- SCADA MOSCAD alarm response
- Lock out – tag out
- Lighting SCADA training

The Contractor shall schedule formal advanced training from an approved trainer on the Lighting SCADA radio (ACE3600) system for the SCADA Specialist, SCADA trainee, applicable patrolmen and training shall be performed within the first quarter of the year. A scheduled date and time shall be provided at the pre-construction meeting.

Pump Station System

The SCADA Specialist, SCADA Trainee, Surveillance/DMS Patrolmen, PS Specialist, PS Service Crew, Repair Crew or any Contractor personnel, conducting any routine and/or non-routine work on the Pump Station System shall have introductory training on the following items:

- Ladder logic
- Mechanical training
- Emergency response training for water-on-pavement
- Emergency response training for hazardous material situation
- Lock out – tag out
- PS SCADA maintenance and troubleshooting

Cisco Training

The Contractor shall schedule advanced training on the SCADA system for applicable employees and the PS IDOT Engineer. The Contractor shall provide a schedule at the pre-construction meeting. Training shall include how to make changes or updates to show old and new equipment on the existing system, and removing or adding a pump station from the system, communication and pump station network. The Contractor shall develop and submit a manual to explain the SCADA system change procedures for the equipment at the pump stations, the ComCenter, and Contractor locations, by April 1 of every contract year.

The Contractor shall provide the Department on-site training for up to five days on Cisco devices deployed in the IDOT District One Sonet Network. Each training session shall be for up to 12 Students and incorporate an elab environment as well as hands on training specific to the switches, routers, and nodes in the IDOT Sonet network. The training provider shall be an authorized training partner with our current Cisco Smartnet provider and be a Cisco learning Specialized Partner. All the training instructors shall be Cisco certified in the area of expertise they are providing training. The Contractor shall submit for approval to the Engineer a list of instructors with their certifications and experience for approval. Contractor shall also provide an outline for each course being provided to IDOT for approval 30 days before training begins. All training shall be provided at the Traffic Systems Center or as directed by the Engineer.

- 2013 – **Cisco Routers and switches including brief review of network fundamentals.** OSI model, TCP/IP network addressing and routing IP subnetting , Cisco IOS, VPN solutions, Configuration of Cisco Catalyst Switches and Cisco Routers, managing device configurations files, route tables, routing methods, Spanning Tree Protocol (STP), Concepts of VLANs and trunking, Routing between VLANs, Implementing VLSM, Configure, verify, and troubleshoot OSPF and EIGRP, Network discovery and management using Cisco Discovery Protocol (CDP), Link Layer Discovery Protocol (LLDP), Telnet, secure shell (SSH), and Trivial FTP (TFTP)
- 2014 – **Cisco 15454 ONS.** Learn Sonet optical hierarchy, shelf layout and components, ONS system setup and login, CTC operations (Cisco Works Server), DWDM fundamentals, configure and build circuits, create circuits at the DS1 and DS 3 level, provision the shelf for optical protection, provision Ethernet ports and create circuits between Ethernet components, troubleshooting, performance monitoring, alarm verification, and fault isolation
- 2105- **TBD**. Courses shall be comparable to courses covered in 2013 and 2014.

EMCMS

Prior to EMCMS training the Contractor shall conduct a field tour for all dispatch personnel to learn the names of the various systems' electrical equipment to aid in Ticket entry and visit the IDOT ComCenter. An IDOT Engineer/Inspector shall also accompany the group.

The Dispatch Center Supervisor, substitute supervisors, all Dispatch Center personnel, System Managers, Administrative Manager and Administrative personnel shall be trained on Contract EMCMS entry and documentation requirements and SCADA requirements.

Prior to January 1, 2013 the Contractor shall conduct a minimum one-day training seminar on EMCMS entry and documentation and other Contract requirements.

Each Dispatcher and System Manager shall be competent to complete the following:

- Ticket entry on EMCMS
- Location Locate query (or data entry)
- Maintenance transfer documentation
- Cable locate entry of EMCMS
- Traffic signal patrol logging
- Water on pavement reporting
- Acknowledge/Response for PS SCADA
- Acknowledge/Response for Lighting SCADA
- Acknowledge/Response to AEGIS alarms
- Location cable locate

Administrative Manager and Administrative personnel shall be competent to complete the following:

- Authorization Letter Receipt/Completion
- Quote Work Entry
- Invoicing of Work
- State Stock Reporting
- MCHD Repair Work Entry
- MCHD Invoicing

3.13 SAFETY PROGRAMS AND REQUIREMENTS

3.13.1 GENERAL REQUIREMENTS

The Contractor shall establish a formal safety program to assure overall safety of EMC personnel, operations and the electrical systems maintained as they affect the safety of the motoring public and the public at large. The Contractor shall furnish an overall description of this program at the Pre-Construction Meeting, and furnish the name of the Safety Coordinator or Manager.

As part of the safety program, the Contractor shall initiate a procedure that states: "When a circuit is de-energized, the Contractor shall meter the downstream circuits with an instrument to assure that they are de-energized and safe for working conditions." The Contractor shall be fully responsible for compliance with all OSHA requirements. Particular attention is directed to the lock-out/tag-out requirements to assure that systems undergoing maintenance work cannot be inadvertently energized, causing harm to maintenance person.

The Contractor shall assure that all personnel be trained in, and have knowledge of, approved equipment grounding methods for all work under this contract. The Contractor shall be fully responsible for compliance with all NEC requirements. The Contractor shall be responsible for the maintenance of all existing system and equipment grounding under routine maintenance.

Should locations be identified for which system or equipment grounding is missing or otherwise not in compliance with NEC requirements, the Contractor is obligated to report such locations to the Engineer.

The Contractor shall keep all systems free of hazards to the work force and the public, all in conformance with Article 107 of the Standard Specifications. Special care shall be taken to assure that electrical systems are not left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc., which contain wiring, either energized or non-energized, shall be closed or shall have their covers in place and shall be locked when configured for locking, except when work is being done at the location at the moment. If the worksite is left, enclosures shall be closed and no potentially hazardous electrical situation shall be left unattended.

3.13.2 CONFINED SPACE ENTRY AND TRAINING

The Contractor shall submit at the Pre-Construction Meeting, a copy of the Contractor's confined space entry and training policy which shall be in full compliance with all OSHA requirements for the duration of this Contract. Employees shall be required to:

- Follow all general safety rules and regulations
- Abide by confined space regulations
- Wear proper safety equipment at all times
- Report unsafe conditions to supervisory personnel and IDOT Engineer
- Report any injuries sustained within a confined space

The Contractor shall train and provide safety equipment to all field personnel that are involved with work within a space, as defined as confined space within the training policy. A listing of personnel who are trained or who will be trained for entry into confined spaces shall be included in the Pre-Construction Meeting submittal.

3.13.3 HAZARDOUS MATERIALS OPERATIONS

All activity with contaminated waste shall conform to the Department's Standard Specifications for Road and Bridge Construction Article 669. The Contractor shall employ for emergency hazmat response the services of, or have a full-service Subcontractor designated as the EMC hazardous waste contractor, familiar with and capable of complying with all federal, state, or local regulatory requirements/regulations pertaining to RCRA hazardous and special non-RCRA waste management, and shall be responsible for ensuring the implementation of these requirements. The hazardous waste contractor shall have a 24-hour emergency call number and shall be capable of responding to a pump station within one (1) hour of notification. No additional compensation will be allowed for these services.

The Pump Station Manager shall direct the hazardous waste contractor and other Contractor personnel as necessary to remove and properly dispose of oil, gasoline or other pollutants from the pump station wet pit, or other area as directed. Removal shall be by means other than pumping pollutants into the normal station discharge sewer or receiving open water channel. (The Contractor may store suitable absorbent battens in a drum at each pump station which discharges to a waterway.)

The Contractor shall provide a list of proposed full service contractors, for Engineer approval, at the Pre-Construction Meeting.

The EMC hazardous waste contractor shall:

- Coordinate with all pertinent regulatory agencies to secure all necessary permits and approvals and shall be responsible for coordinating all permits with the IEPA

- Submit to the Engineer, for approval, a copy of all federal, state, or local required licensing documents to perform this work

- Select a hazardous/special waste landfill/disposal facility, verifying that selected landfill/disposal facility is in compliance with applicable standards for hazardous and special waste and whether the disposal facility is presently, has previously been, or has never been, on the U.S. EPA's National Priorities List or the RCRA List of Violating Facilities

- Obtain written approval of the selected landfill/disposal facility from the Engineer, who, reserves the right to review and to accept or reject the selection

- Perform all tests required and make all necessary arrangements for waste disposal approval with the selected landfill/disposal facility

  Be responsible for transporting and disposing all material classified as a "non-special waste", "special waste" or hazardous waste" from the job site to the approved landfill/disposal facility, assuring that the transporter and vehicles comply with all federal, state, and local regulations governing the transportation of non-special, special or hazardous wastes.

- Shall prepare a technical report within 30 days of the conclusion of the project, describing the activities conducted during the life of the project and submit two (2) copies to the Engineer

If the state police or municipal agency has declared a hazardous material spill which affects system equipment and the IDOT Claims Department collects repair costs through the Motorist Caused Damage Repair fund, the Department shall make separate payment to the Contractor of the repair costs collected, minus any payments of non-routine pay items or state stock material used, following submittal of

complete documentation of material purchases and labor repair costs. The Department reserves the right to use Pay Item prices, where applicable, for materials and equipment. The IDOT Claims Department has the final determination as to the amount of the repair cost recovery.

3.14 TRAFFIC CONTROL AND SAFETY

When a project is located in close proximity to a railroad grade crossing, regardless of whether it is interconnected to the crossing, the Contractor should be aware of the construction-related conditions that may cause traffic to back up onto the railroad tracks. When such queuing is likely, the Contractor should consider additional maintenance of Traffic measures or other procedures to satisfy the requirements of the current edition of the MUTCD for the work zone conditions and railroad-highway grade crossing.

3.14.1 TRAFFIC CONTROL PLAN

The Contractor shall provide bound copies of their Traffic Control Plan for the Electrical Maintenance Contract operations, for all patrol vehicles, work crew vehicles, and supervisory vehicles.

The Contractor shall provide a copy of their Traffic Control Plan to the IDOT Expressway/Traffic Operations Engineer for review prior to or at the Pre-Construction Meeting. The Contractor shall submit the name of the subcontractor for traffic control installation and maintenance, if one shall be requested for use on this Contract, at the Pre-Construction Meeting.

3.14.2 KEEPING THE EXPRESSWAY OPEN TO TRAFFIC

The Contractor shall provide the necessary traffic control devices to warn the public and to delineate the work zone as required in these Special Provisions, the Standard Specifications for Road and Bridge Construction, latest version, Supplemental Specifications, the “Illinois Manual on Uniform Traffic Control Devices for Streets and Highways”, “Highway Standards”, the District One Traffic Control and Protection, latest version. The Contractor's personnel shall be limited to these barricaded work zones and shall not cross the expressway.

The governing factor in the execution and staging of work is to provide the motoring public with the safest possible travel conditions on the expressway through the work zone. The Contractor shall arrange his operations to keep the closing of lanes and/or ramps to a minimum.

The Contractor shall request and gain approval from the Illinois Department of Transportation's Expressway Traffic Operations Engineer (847-705-4151) twenty-four (24) hours in advance of all daily lane, partial ramp and shoulder closures and seventy-two (72) hours in advance of all permanent and weekend closures on all Freeways and/or Expressways in District One. Shoulder closures will not be

permitted on weekdays (Monday through Friday) from 5:00 a.m. to 9:00 a.m. and from 3:00 p.m. to 7:00 p.m. Lane closures hours, if needed, will be determined by the expressway Traffic Operations Engineer, and will be made a part of the Traffic Control Plan.

The approval for emergency closures or emergency moving operations during the normal workday shall be requested from the Expressway Traffic Operations Engineer (847-705-4151). After office hours request for approval shall be made to the ComCenter, (847-705-4612) as soon as the need is determined, prior to the Contractor's arrival on the expressway.

All daily lane closures shall be removed during adverse weather conditions such as rain, snow, and/or fog and as determined by the Engineer.

Additional lane closure hour restrictions may have to be imposed to facilitate the flow of traffic to and from major sporting events and/or other events.

Private vehicles shall not be parked in the work zone. Contractor's equipment and/or vehicles shall not be parked on the shoulders or in the median during non-working hours. The parking of equipment and/or vehicles on State right-of-way will only be permitted at the locations approved by the Engineer.

The Contractor shall perform work specified herein within the Allowable Expressway Lane Closures Hours. The Expressway Lane Closures Allowable Hours Schedule will be provided at the pre-bid meeting.

3.14.3 TRAFFIC CONTROL DEFICIENCIES

Upon notification from the Engineer or Department Expressway/Traffic Operations personnel, the Contractor shall dispatch qualified personnel immediately to make needed corrections of deficiencies that constitute an immediate safety hazard and/or the blocking of traffic lanes or ramps. If the Contractor fails to correct the deficiency within the specified time, a daily monetary deduction will be imposed, in accordance with Article 105.03 (b) of the Standard Specifications. This time period will begin with the time of notification to the Contractor and end with the Resident Engineer's acceptance of the corrections.

3.15 VEHICLES

3.15.1 GENERAL REQUIREMENTS

The Contractor shall provide at all times sufficient vehicles and construction equipment to perform the routine and non-routine work and specialized operations required and described herein. The Contractor

is expected to be familiar with the extent of systems to be maintained under this contract and the equipment necessary to provide the specified work response. Failure to have adequate equipment to perform the work shall not be sufficient grounds for the delay of routine or other authorized work. The equipment shall be owned or under long-term lease to the Contractor, and available at all times for the Contractor's use.

The Contractor's vehicles, including but not limited to the minimum special equipment listed herein, shall be in good working condition and physical appearance (no rust) to be suitable for providing timely response for systems' maintenance and to represent a quality product to the motoring public. All vehicles and equipment used by the Contractor shall conform to all applicable laws and the Department safety and traffic control requirements. The Contractor is strongly urged to have six (6) attenuators in his fleet for the safety of repair crews.

Prior to the start of the contract period, the Contractor shall have all vehicles and equipment staged and available for inspection by the Engineer. The Engineer shall provide not less than five (5) calendar days advance notice to the Contractor of the desired inspection date.

All Contractor vehicles and equipment shall be clearly identified by a decal with the Contractor's name, location, and telephone number. The decal shall be readily visible on the exterior sides and rear of each vehicle. Removable magnetic signs or similar non-permanent identification is not permitted at any time. Sub-Contractor vehicles shall be held to similar requirements.

3.15.2 VEHICLES FOR TRAFFIC SIGNAL PATROLMEN

At the beginning of the Contract, January 1, 2013 the Traffic Signal Patrolmen assigned vehicles shall have no more than 60,000 certified odometer miles. The Contractor shall perform a truck safety inspection twice per year and shall perform scheduled preventive maintenance as specified by the manufacturer to assure the reliability of the trucks. The Contractor shall record and maintain a log for all vehicles used under this contract.

If this Contract is renewed all Traffic Signal Patrolmen assigned vehicles shall have no more than 110,000 certified odometer miles as of January 1, 2014 and January 1, 2015. The Contractor shall present scheduled maintenance reports and/or receipts upon request from the Engineer.

Truck Specifications: (minimum standards)

- 80% of fleet shall have Extended Cab
- Utility Body with Locking Storage
- Air Conditioning
- Two internal power source jacks (for cellular and PC use)
- Strobe warning lights
- Spot light
- Directional Light Bar (all new purchases to be equal to or better than Federal Signal Corp Model SAE-W-91 with Control Unit equal to or better than Federal Corp. Model SMC5 B)
- 10 ft. ladder

Vehicle Equipment (per vehicle)

One (1)	Digital camera or camera phone
	For all Patrolmen
One (1)	Lap-Top PC that shall include: Carrying case, power cords to run in vehicle, and capable of operating all applications/software as required for the Traffic Signal systems
One (1)	EDI Malfunction Management Unit (MMU 16E or better)
One (1)	EDI Conflict Monitor
Three (3)	TS2 Bus Interface Unit
One (1)	Cell-Phone Interface for PC (Systems Trucks)
One (1)	3-Point Ground Tester
One (1)	Amp-Volt Meter
One (1)	Loop Analyzer Model ILA-550
One (1)	Conduit-Cable Locator
One (1)	Light Source for Fiber Cable

One (1)	Audible tester for Fiber Cable (System trucks)
One (1)	Emergency Pre-emption Emitter
One (1)	Fish Tape – 100 ft.
One (1)	Measuring Wheel
One (1)	ASC/2 Controller
One (1)	ASC/3 Controller
One (1)	EPAC TS2 M40 Series Controller
One (1)	EPAC TS1 M40 Series Controller
One (1)	Eagle M50 Series Controller
One (1)	Load Switch
One (1)	Electric Drill – ½ chuck
One (1)	Shovel
Eight (8)	Stop Signs
Eight (8)	Traffic Cones
Two (2)	Lane Closure Signing

Equipment as Necessary:

Mapping Grade Handheld GPS (when mapping equipment as described herein)

Loop Amplifiers (shelf & rack)

Loop Splicing Equipment

Cabinet Keys & Locks

Relays, Fuses, Circuit Breakers

Work Lights

Signal Heads

Pedestrian Heads

Pedestrian Pushbuttons

Service Door Covers

Visors

Backplates

Bulbs

Cabinet Logos

Bolt Cutters

Graffiti Removal Solvent

Extension Cord, 100 ft.

Set of Tools

Handhole Cover

Cable, Uniduct

Cabinet Fan, Filter

Cabinet Thermostat

Cabinet Silicone

Caulk

Duct Seal

3.15.3 VEHICLES FOR SURVEILLANCE SYSTEM PATROLMEN, MANAGER, & TRAINEE

The vehicle mileage requirements shall be as specified in 3.15.2.

Truck Specifications (minimum requirements)

- Minimum 3/4 Ton with Extended Cab
- Utility Body with Locking Storage
- Air Conditioning

- Two internal power source jacks (for cellular and PC use)
- Strobe warning lights
- Spot light
- Directional Light Bar (all new purchases to be equal to or better than Federal Signal Corp Model SAE-W-91 with Control Unit equal to or better than Federal Corp. Model SMC5 B)
- 10 ft. ladder
- Three (3) trucks shall be equipped with aerial tower capable of 12.2M (40 ft.) working height to reach Dynamic Message Signs or Advanced Systems Equipment.

Vehicle Equipment (per vehicle)

One (1)	AC generators capable of 40 amp output to power DMS sign
One (1)	Digital Camera
Eight (8)	Stop Signs
Eight (8)	Traffic Cones
Two (2)	Lane Closure Signing
One (1)	Loop Analyzer Model ILA-550
One (1)	Lineman's test set, Harris Dracon TS-21x89
One (1)	Digital multimeter, true RMS multimeter, with case
One (1)	Tektronix TX3 or latest version
One (1)	Wide band scope with case equal to or exceeding Halcyon 704A-200 or W & G VF-1
One (1)	Digital AC clamp on meter with case equal to or Exceeding Fluke Model 30 or latest
One (1)	Breakout box with case equal to or exceeding Black Box Model SAM232-6S
One (1)	Hand held digital Oscilloscope equal to or exceeding

Tektronix (THS710A) with spare battery and case or

Latest version

One (1) Wide band TIMS/Signaling test set equal to or exceeding

Halcyon 704A-400

One (1) Pipe and cable locator equal to or exceeding Nilsson Pipe

and Cable Locator Model #715 with Nilsson 12 volt

One (1) Rechargeable battery Model # 110A or latest version

One (1) Clamp on ground resistance meter equal to or exceeding

AEMC Model #3700 or latest version

One (1) Major megger

One (1) Lap-Top PC, equal to or exceed Panasonic Tough Book 30 with the following options minimum, Intel Core 2 Processor with vPro technology SL9300, 6MB L2 Cache Processor Speed, 1.6GHz, 800MHz FSB, MIL-STD-810G compliant, moisture and dust proof design, with wide area wireless and GPS capable, 13.3" 1024 x768 (XGA) daylight readable LCD display, 2048MB DDR SDRAM minimum, 160GB removable Hard Drive, Combo drive (DVD-ROM/CD-RW), 4 GB USB 2.0 Flash Drive, External USB Video interface adaptor with s-video in, composite in, and antenna in, backlit keyboard, GPS receiver, Internal Wireless Card, Licensed copy of Windows Vista, Licensed copy of Microsoft Office 2010 installed, Licensed copy of Norton 360 version 4.0 installed, Internal Mouse, PCMCIA Modem Network card (built in), Carry Bag, and power cords to run in vehicle, and capable of operating all applications/software as required for the Surveillance System including PC to cellular interface loaded with latest Skyline DMS Maintenance software, TSC DMS portable sign control software (PSCP) by Telespot, latest remote radar sensor software by EIS and Wavetronix, Latest 3M Canoga microloop software, Virtual keyboard program LTC 5138 by Philips (Bosch) and IDOT Springfield speed and count station software, Internal Modem and Modem configuration software, Required Interfaces: Serial: D-sub 9 pin, USB: 4 pin, 10/100/1000 Ethernet RJ45, Lithium Ion Battery, AC Adapter, Battery Charging time: minimum 5 hours off, 8.5 hours on, 2nd battery pack. Each computer shall be equipped with the following cable/adaptor combination 50' DB 9 male to female serial extension cable, 6' DB9 male to female serial cable, DB 9 null modem adaptor male to female, DB 9 mini male to male gender changer, DB 9 mini female to female gender changer, 15' DB 9 female to DB 25 male modem cable.

3.15.4 VEHICLES FOR SYSTEM MANAGERS, TS, SCADA AND ADVANCED SYSTEMS SPECIALISTS

The Contractor shall provide the System Managers, the Traffic Signal Specialist, the SCADA and Advanced Systems Specialist with a ¾ Ton Extended Cab Truck or SUV type vehicle, either of which shall have no more than 75,000 certified odometer miles as of the beginning of the Contract, January 1, 2013, or no more than 125,000 certified odometer miles as of January 1, 2014 and January 1, 2015. The vehicles shall be equipped with strobe lights, air conditioning, two internal power source jack for cellular and PC use, and a directional light bar which meets the specifications for TS Patrol trucks (if street work is performed) and one (1) digital camera.

Equipment for System Managers and TS Specialist Vehicle:

- One (1) Lap-Top fully functioning capable of operating all applications software required for the Traffic Signal systems with Carry Bag, and power cords.
- One (1) Digital Camera

Equipment for TS Specialist Vehicle:

- One (1) Portable PROM Programmer Dataman 54 or equivalent
- One (1) O.T.D.R., Siecor Model 340 or equal with necessary modules capable of testing both single-mode and multi-mode fiber cable
- One (1) CD Writer which transcribes 3 ½ disk onto blank CD
- One (1) Digital Camera

Equipment for SCADA Specialist Vehicle:

- One (1) Lap-Top PC, Core 2 Duo Processor or better, minimum 2.66GHz, LCD Display, 2GB DDR, 250GB Hard Drive CD Burner, Internal Wireless Card, Licensed copy of current Windows OS and Microsoft Access, Internal Mouse, PCMCIA Modem Network card (built in), Carry Bag, Modem configuration software (Telix/ Reflections), MOSCAD Toolbox firmware, MOSCAD System Tools Suite (STS) firmware, Tesco Workbench Firmware, Intrac MRTU Firmware, and power cords to run in vehicle
- One (1) Digital Camera

3.15.5 VEHICLES FOR TS SYSTEM/RAILROAD ASSISTANT AND SCADA SPECIALIST TRAINEE

The Contractor shall provide the TS System/Railroad Assistant and SCADA Specialist Trainee, a truck or SUV type vehicle, either of which shall have vehicle mileage requirements as specified in 3.15.2. The vehicles shall be equipped with strobe lights, air conditioning, two internal power source jack for cellular and PC use, and a directional light bar which meets the specifications for TS Patrol trucks (if street work is performed).

Equipment for TS System/Railroad Assistant Vehicle:

One (1) Lap-Top fully functioning capable of operating all applications software required for the Traffic Signal systems with Carry Bag, and power cords.

Equipment for SCADA Specialist Trainee Vehicle:

One (1) Air Pressure Calibrator Meri-Cal EE33 with kit or equivalent

3.15.6 PS SPECIALIST, PS CREW AND LIGHTING SYSTEM NIGHT-PATROLMAN

The Contractor shall provide the Pump Station Specialist an extended cab truck, and the Pump Station Crew personnel and Lighting Night-Survey Patrolman a regular cab or extended cab truck. All trucks shall have vehicle mileage requirements as specified in 3.15.2. The vehicles shall be equipped with strobe lights, air conditioning, two internal power source jack for cellular and PC use, and a directional light bar which meets the specifications for TS Patrol trucks (if street work is performed).

All vehicles shall be equipped with one (1) digital camera or camera phone. The Lighting Night-Survey Patrolman vehicle shall also be equipped with a spot light.

Equipment for PS Specialist Vehicle:

One (1) Lap-Top PC, Core 2 Duo Processor or better, minimum 2.66GHz, LCD Display, 2GB DDR, 250GB Hard Drive CD Burner, Internal Wireless Card, Licensed copy of current Windows OS and Microsoft Access, Internal Mouse, PCMCIA Modem Network card (built in), Carry Bag, Modem configuration software, Tesco Workbench Firmware, and power cords to run in vehicle One (1) Phase Rotation Indicator

One (1) RPM Strobe

One (1) Megger

One (1) Multimeter

One (1) Digital camera

3.15.7 VEHICLE FOR ADVANCED SYSTEMS FIELD TECHNICIAN

The vehicle mileage requirements shall be as specified in 3.15.2.

Truck Specifications (minimum requirements)

- Minimum 3/4 Ton with Extended Cab
- Utility Body with Locking Storage
- Air Conditioning
- Two internal power source jacks (for cellular and PC use)
- Strobe warning lights
- Spot light
- Directional Light Bar (all new purchases to be equal to or better than Federal Signal Corp Model SAE-W-91 with Control Unit equal to or better than Federal Corp. Model SMC5 B)
- 10 ft. ladder
- Aerial tower capable of 12.2M (40 ft.) working height to reach Advanced Systems Equipment

Vehicle Equipment (per vehicle)

One (1) AC generators capable of 40 amp output to power DMS sign

One (1) Digital Camera

Eight (8) Traffic Cones

One (1) Digital AC clamp on meter with case equal to or

Exceeding Fluke Model 30 or latest

One (1) Lap-Top PC, Intel Core 2 Duo Processor L7500, 4MB L2 Cache Processor Speed or better, 1.6GHz, 800MHz FSB, MIL-STD-810F compliant, moisture and dust proof design, with wide area wireless and GPS capable, 13.3" 1024 x768 (XGA) transmissive, daylight readable TFT active matrix color LCD display, 1024MB DDR SDRAM minimum, 80GB removable Hard Drive, Combo drive (DVD-ROM/CD-RW), 8 GB USB 2.0 Flash Drive, External USB Video interface adaptor with s-video in, composite in, and antenna in, backlit keyboard, GPS receiver, Internal Wireless Card, Licensed copy of Windows XP Professional, Internal Mouse, PCMCIA Modem Network card (built in), Carry Bag, and power cords to run in vehicle, capable of operating all applications/software as required for the Advanced System equipment, virtual keyboard program LTC 5138 by Philips (Bosch), RS Log; CS 5000 software, Allen Bradley PLC-5 software, RS View Software, and Harris MegaStar software.

Required Interfaces: infrared: 4mbps IrDa, Serial: D-sub 9 pin, Parallel: D-sub 25 pin, USB: 4 pin, 10/100/1000 Ethernet RJ45, Lithium Ion Battery, AC Adapter, Battery Charging time: minimum 5 hours off, 8.5 hours on, 2nd battery pack. Each computer shall be equipped with the following cable/adaptor combination 50' DB 9 male to female serial extension cable, 6' DB9 male to female serial cable, DB 9 null modem adaptor male to female, DB 9 mini male to male gender changer, DB 9 mini female to female gender changer, 15' DB 9 female to DB 25 male modem cable.

3.16 EQUIPMENT FOR MAINTENANCE OPERATIONS

The following is a list of equipment used by contractors on prior EMC contracts, which can be used as a guide for equipment as necessary on this Contract.

Arrowboard

Augur, Airhammer

Boat, (for accessing navigational light outages)

Cable Plow

Compactor, Tamper

Compactor, Air

Crane (Under 20 Ton)

Crane (20 Ton)

Drill, Boring 125 HP

Drill, Boring 50 HP

Drill, Boring 37.5 HP

Generator 6.5 HP (small)

Generator 13 HP (large)

Joint Sealer, Loop

Pavement Breaker

Pump, Water (gas) 2”

Pump, Water (gas) 3”

Pump, Water (diesel) 6”

Saw, Concrete

Tractor, Backhoe

Tractor, Skid Loader

Trailer, Cable Rack

Trailer, Flat Bed

Trencher 40 HP Wheelmounted

Trencher 57 HP

Truck, Aerial Bucket 30’

Truck, Aerial Bucket 55’

Truck, Aerial Bucket 70’

Truck, W/Augur

Truck, Cable

Truck, W/Crash Attenuator

Truck, Dump

Truck, Fiber Optic Splice

Truck, Loop w/Saw

Truck, Pick-Up

Truck, Semi

Truck, Stakebody Flatbed

Truck, PS Equipment, with 10,000 lb winch, generator 4500 watt continuous at 120 volts, combination welder, and ability to operate a hydraulic pump

3.17 CONSTRUCTION TEST EQUIPMENT

The Contractor shall own and maintain test equipment, available for specialized maintenance testing at all times by Contractor's work crews, and given two (2) hour notice, for the Engineer's use in inspecting the Contractor's work. All equipment shall be owned or under long-term lease to the Contractor.

The Contractor is expected to maintain all test equipment, in accordance with the manufacturer's specifications at all times, including certified calibration by a responsible test lab. The equipment shall have the test lab's most recent calibration ticket attached.

The minimum quantities and types of required test equipment, as listed below, shall be ready for inspection by the Engineer by January 1, 2013.

At the Pre-Construction Meeting, the Contractor shall submit to the Engineer for approval an itemized list of all test equipment, a manufacturer's product data sheet for each item, and copies of each instrument certification calibration.

One (1) Lineman's Test Set

Equal to Harris Dracon Model 7522A

One (1) Time Domain Reflectometer with case

Equal to Tektronix Model 1502B (metric version)

with battery pack and chart recorder

Two (2) Signal Field Strength Meter with case

Equal to POTOMAC INSTRUMENTS, Model FIM-21

One (1) RUSTRAK RANGER II POWER LOGGERS

Model RR2-123 or equal, with Communications Module

for Recording, Monitoring, and Reporting. Multimeters with

Current Probe, and Thermal Probe.

Twenty-eight(28) AMPROBE & DIGITAL MULTIMETERS

Equal to FLUKE latest model

One (1) HOTSPOT LOCATOR

Equal to Probe Eye 6EMITST2LC Locator with battery & case

One (1) LINEMANS TEST SET

Equal to Harris Dracon Model TS-21x89

Three (3) BREAKOUT BOX WITH CASE

Equal to Black Box Model SAM232-6s

Two (2) HANDHELD DIGITAL OSCILLOSCOPE

Equal to Tektronix (THS710A) with spare battery, case and charger

Two (2) PIPE AND CABLE LOCATOR

Equal to Nilsson Pipe and Cable Locator, Model 715 with

Nilsson 12 Volt Rechargeable Battery, Model 110A or latest

One (1) DIGITAL TACHOMETER (Latest Model)

One (1) SURVEY RODS-LEVEL

Round Fiberglass, 25' – 5 Section, D electric Certified

Eleven (11) 4 CHANNEL GAS DETECTOR

Two (2) TRIAXIAL GAUSS METER, equal to Bell Technologies,

Model 4080 or better

One (1) Coaxial Cable Tester, equal to TWA Communication Model #62-204

One (1) Infrared thermometer, equal to Fluke 60 series or equivalent

Two (2) DIGITAL LOW RESISTANCE OHMMETERS, which meet the following requirements:

Ranges:	2, 20, 200, 2000, and 20000 Ohms
Resolution:	0.5×10^{-3} x range
Accuracy:	± (0.2% + 2)
Power Source:	Line Voltage/Battery
Accessories:	Ground Test Kit
Make:	AEMC Digital Ground Resistance Tester or approved equal

Two (2) DIGITAL MULTIMETERS, which meet the following requirements:

Voltage AC:	Maximum Voltage: 1,000 V
Basic Accuracy:	± (1.0% + 4)
Resolution:	0.1mV X Range multiplier
Voltage DC:	Maximum Voltage: 1,000 V
Resolution:	0.1 mV X Range Multiplier
Basic Accuracy:	± (1.5% + 3)
Resistance:	600 Ohms – 50 M Ohms
Power Source:	Rechargeable Battery
Make:	Fluke 80 Series DMM or approved equal

Two (2) FALL-OFF-POTENTIAL GROUND RESISTANCE TESTER, which meets the following requirements:

Ranges:	2Ω to 20kΩ
Resolutions:	0.5×10^{-3} x range
Accuracy:	± (2% + 1) from 10% to 100% of range

Four (4) INSULATION RESISTANCE TEST EQUIPMENT, which meets the following requirements:

Mega Ohm Range:	Resistance:	0 to 2,000 M Ohms
	Voltage:	250, 500, 1000 V dc + 30 % Max.
	Accuracy:	+/- 1.25 % of full scale deflection on 2.8" arc length
Lo-Ω resistance	Resistance:	0 to 5,000 Ohms@ 3 V +/- 0.2 V
	Voltage:	0 to 600 Volts

	Accuracy:	+/- 3 % of reading	
	Power Source:	Hand Crank/Line/Battery	
	Make:	Megger or approved equal	

Two (2) AMPROBES, which meet the following requirements:

Current AC		
Range:	1 A - 600 A, AC	1 A - 1,000 A, DC
Lowest:	0.5 A	0.5 A
Accuracy:	2 % + 0.5 A	2 % + 0.5 A
Useable Frequency:	DC – 10 KHz	
Output Levels:	1 mV/A	
Power Source:	Rechargeable Battery	
Make:	Fluke 80-i1010 or approved equal	

Three (3) CLAMP-ON GROUND RESISTANCE METER, which meet the following requirements:

Range	0.1Ω to 1.00Ω	1.0Ω to 50Ω	50Ω to 100Ω	100Ω to 200Ω	200Ω to 400Ω	400Ω to 600Ω	600Ω to 1200Ω
Resolution	0.01Ω	0.1Ω	0.5Ω	1Ω	5Ω	10Ω	50Ω
Accuracy	±(2%+2)	±(1.5%+1)	±(2%+1)	±(3%+1)	±(6%+2)	±(10%+1)	±(25%+1)

Current Measurement Ranges	Auto-Ranging 1mA to 30.00 Arms
Range	300 mA, 3A, 30A
Resolution	1 mA, 0.001 A, 0.01 A
Accuracy	± (2.5% + 2)
Power Source:	Battery

Make: AEMC 3700 Clamp-On Ground Resistance Meter or approved latest equal model

One (1) Set Fiber Optic Light Source and Detector for testing both SM and MM fiber optic cables,

Noyes Model SMLP 5-5 or equal

ARTICLE 4.0 – ROUTINE MAINTENANCE WORK AND PAYMENT

4.1 CONTROL OF WORK

Except as notified in writing by the Engineer, the Contractor is automatically authorized and required to perform routine maintenance work, which includes response, scheduled work and preventative maintenance actions on all state maintained electrical systems in a manner prescribed in this Contract. All labor, personnel vehicles, and construction equipment necessary for the routine maintenance work described herein is included in the routine maintenance bid items.

On January 1st, 2013 a list of all maintained locations shall be provided to the Contractor via EMCMS. The Contractors EMCMS workstations are expected to be up and operational Jan 1, 2013 at 12:01 AM. A hard copy of ON maintenance locations can be provided after award at any time prior to the maintenance transfer.

Unless certain work is specifically described herein to be non-routine work, all work required by the Contract shall be incidental to the requirements of routine maintenance. Specific items of routine maintenance work are described under the description of work for each respective system. General requirements of routine maintenance are included in, but not limited to, this article.

The Engineer appointed for this Contract will be responsible for the control of the work in conformance with Section 105 of the Standard Specifications for Road and Bridge Construction, and contract Special Provisions.

The Contractor shall continuously watch for system elements that are malfunctioning or in need of replacement. Malfunctioning equipment shall be repaired or replaced as part of routine maintenance. The Contractor shall, however, submit a Contractor Advisory, per Article 4.17.1, for items which are a safety risk or prone to imminent failure, and receive non-routine payment for the material portion of the repair.

The Contractor shall document to the Engineer that the various items of equipment at all locations perform properly, that maintenance operations for the respective installations and systems prescribed by this contract are not to be interrupted, that maintenance completion dates as specified or agreed are

met, and that repair work as performed on system equipment meets all applicable codes and IDOT requirements.

The Contractor is responsible to perform maintenance under this Contract which prevents operational problems, minimizes trouble calls, safeguards electrical safety, promotes operational safety and which prolongs the operations life of installed systems. Some of these maintenance activities will be initiated by the Engineer, some will be jointly developed between the Contractor and the Engineer, and some are expected to be routine maintenance obligations of the Contractor. The Contractor shall perform and install equipment in accordance with the best practice of the trade and equipment installed shall be in accordance with manufacturer's recommendations.

The Engineer may make frequent investigations of Contractor work and periodic inspections of the respective systems and installations to determine if all maintenance operations are being performed satisfactorily and in the manner specified in the Contract. The Contractor shall provide safe access to any part of the systems for IDOT inspectors.

Equipment for operational needs installed during the contract year at a maintained location shall become part of the maintained location and covered under routine maintenance.

4.2 PRIORITY OF WORK

The following top priorities of work, in the order listed, shall take precedence over work for others and other work on this contract, unless permitted, on a case-by-case basis, by the Engineer. The response times to these situations shall be as defined elsewhere herein.

It is not necessary for the Contractor to obtain approval to utilize dedicated personnel, as specified herein, to respond to these top priorities.

- Railroad/Vehicle Conflict
- Railroad Interconnect Problem/Outage
- Traffic Control Conflict
- Traffic Obstruction
- Electrical Hazard

- Power Outage
- Water on Pavement
- Hazardous Materials on Highway
- Power Center Outage
- Other incidents as specifically alerted by the Engineer

4.3 CONTRACTOR EMERGENCY RESPONSE

When equipment failures do occur due to unforeseen events, motorist caused damage, or from any cause whatsoever, time is of the essence for Contractor personnel to arrive at the scene, shut-down or safely isolate any potentially hazardous electrical condition, clear the pavement of any equipment debris resulting from the damage and take corrective measures to assure the safety of the motoring public, and coordinate the efforts to restore normal traffic operations. The Contractor shall abide by the requirements of Article 4.9.1

The Contractor's response shall include not only reporting to the location of an incident or trouble, but also timely immediate action as prescribed for the various systems herein, or as required by the situation to mitigate immediate hazards and effect necessary temporary and/or permanent repairs and restoration of electrical systems.

It is an objective of this Contract to have the Contractor responds to trouble calls as quickly as possible after obtaining an acceptable amount of information. The Contractor shall dispatch patrol personnel for response after being provided with a main route and a cross street by the ComCenter or other police/municipal agency.

Normal response time shall be one (1) hour, with temporary service restoration in four (4) hours, and permanent equipment repairs in seven (7) days. The systems articles herein discuss specific response time requirements. (Also refer to ticket documentation requirements herein.)

Certain equipment is critical to the EMC and requires immediate response and immediate corrective action, including failures of fiber optic equipment, servers, distribution equipment, or intrusion alarms, all non-scheduled power outages, and other equipment items as specified in systems articles herein.

All damaged equipment, determined by the Contractor not to be re-usable, shall be removed from the state highway right-of-way within twenty-four (24) hours from the time of the notification of the incident, exclusive of Saturdays, Sundays, and Holidays, and taken to the Contractor's shop area.

After inspection by the Engineer, ownership shall be conveyed to the Contractor of the non-re-usable equipment via a state scrap transfer log. (Review disposal of scrap herein.) Any damaged concrete poles, broken concrete or other such refuse and debris generated from the motorist caused damage shall be disposed of by the Contractor.

All expressway, shoulder, or lane closures required for clearing and installing temporary or permanent repairs shall be in conformance with existing Departmental standards governing lane closures.

4.4 CONTRACTOR CALL-OUT POLICY

The Contractor is required to have a Call Out policy that formalizes the 24/7 response necessary to provide continuous maintenance for systems covered under this Contract. The Contractor shall, in addition to the EMC Dispatch Center Supervisor, appoint a System Manager or Specialist to be on-call (on a rotating basis) after the normal workday hours and on weekends, to serve as an Emergency Response Coordinator, to prioritize the emergency response for all electrical systems. In this capacity the Emergency Response Coordinator shall coordinate work with the EMC Dispatch Center Supervisor.

The Emergency Response Coordinator shall have the authority to call out additional personnel for dispatching or patrol duties. During storms or other emergency situations, the EMC Dispatch Center Supervisor and all EMC dispatchers shall be responsible to the Emergency Response Coordinator (or the Project Manager, if in attendance at the EMC Dispatch Center).

Under storm conditions, emergency situations or other special circumstances requiring the setting of priorities from among system needs requiring immediate corrective action, which go beyond the Contractor's immediate ability to respond, the assigned on-call System Manager (Emergency Coordinator) shall set response priorities in such a manner as to minimize hazard and inconvenience to the public and otherwise optimize the effectiveness of the contractor's forces, but only, after first initiating the callout of additional forces in sufficient number to address the situation. The Contractor shall communicate and coordinate with the Engineer in such situations.

The Engineer reserves the authority to re-direct the Contractor's work priorities in response to emergency situations, potential hazards, contract coordination and incomplete or deficient work and the Contractor will be allowed no additional compensation for priorities so redirected.

4.5 SPECIAL RESPONSE SITUATIONS

State of Illinois Disaster Declarations

The Governor may declare a State Disaster due to natural disaster or catastrophic failure. The Contractor shall provide the equipment and personal to promptly respond to equipment trouble calls due to severe storms causing extensive damage from flooding of roadways, massive snow accumulation, or extensive tornado damage, any of which is detrimental to the safety and traffic flow of the motoring public. The Contractor shall adhere to the rules and guidelines set forth by IEMA and FEMA for reimbursement. The Contractor shall provide accurate documentation of work performed through Tickets and clear pictures of damaged equipment caused by the disaster. The documentation shall include all information required under the guidelines.

The Federal Highway Administration (FHWA) through their Emergency Transportation Operations aid the State DOT's when a non-recurring event either interrupts or overwhelms transportation operations. This funding allows the State to collect for repairs and allows the Department to pay the Contractor for emergency repair work, which is normally routine work covered through the EMC. The Contractor shall be able to collect labor, equipment, and repair material costs for eligible repair work during the declared disaster time period (usually no more than 48 hours) if proper documentation is provided to the Department.

The intent of the federal program is to provide aid for repairs to damaged equipment caused by a natural disaster or catastrophic failure, not repairs to equipment damaged as a result of preexisting and non-disaster related, i.e., inherent deficient conditions. In addition, the funding shall not relieve the Contractor of its maintenance responsibility simply because a storm of unusual character and extent causes serious damage.

The EMC Damage Repair Submittal form and FHWA summary submittal; the DDIR (Detailed Damage Inspection Report) must be completed within ten (10) working days of the end date of the declaration and submitted to the Engineer for approval before re-imbursement is made to the Contractor. Both forms shall be provided to the Contractor at the pre-construction meeting.

Contractor Procedures for Potential Disaster Situations

The Contractor shall follow procedures as established herein Article 4.3 Contractor Emergency Response and Article 4.4 Contractor Call-Out Policy. However, when weather situations dictate that there is the potential for a disaster situation, the Contractor's appointed Emergency Coordinator shall be in constant contact with the Engineer as to the state of operations. The Engineer shall be provided a disaster plan with additional staffing for electrical system work and dispatch services.

Eligible Items of Repair Work for Additional Compensation

1. All repair work must be categorized as 1) emergency repairs and 2) permanent repairs and be a minimum of $ 5,000.00 per site:

Emergency Repairs are those repairs during and immediately following a disaster to restore essential traffic, to minimize the extent of damage, or to protect the remaining facilities. (Examples would be repair of damaged equipment from disaster weather events, not motorist caused damage, nor the removal of snow or ice on operating equipment.)

Permanent Repairs are those repairs undertaken (after emergency repairs are complete) to restore the highway to its pre-disaster condition (but completed within the declared disaster timeframe).

2. Repair or replacement of traffic control devices including traffic signal system, directional and informational signs, and railroad-highway crossing warning devices, if the damage and associated repair or replacement costs can be shown to exceed heavy maintenance*.

   "Heavy Maintenance" is defined by the FHWA as work to repair damage normally expected from seasonal and occasionally to unusual natural conditions or occurrences. It includes work at a site required as a direct result of a disaster that can reasonably be accommodated by a State or local road authority's maintenance, emergency, or contingency programs.

3. Work must be in the right-of-way limits of a Federal or State highway, unless local roads are included in the declaration by the Governor.

4. Only restoration work in kind is allowed, no new construction, correction of deficiencies, or improvements are acceptable.

5. Materials of an expendable nature are allowed, however, a supplier's invoice must be supplied and no tax or mark-up is allowed. A Contractor employee having knowledge that the supplies or materials have actually been incorporated into the repairs shall sign the supplier's invoice.

6. Labor and Equipment rates are acceptable as allowed herein the EMC.

7. Debris removal

8. Work necessary to minimize the extent of damage and/or to protect facilities from damage

Ineligible Items of Repair Work

1. Heavy Maintenance (see point 2 above)

2. Damage Estimate under $ 5,000 per site

   Generally, a site is an individual location where damage has occurred. However, a site could include several adjoining locations where similar damage, related to the same cause, has occurred. As an example flooding water that runs along or crosses under a highway has caused damage at several locations within a reasonable distance of each other, so it would be acceptable to package these together as a single site. Another

exception would be damage to traffic signs which has occurred at several locations on an area wide basis. Here it would be acceptable to group these locations on an area wide basis by route or jurisdiction, with the accumulated amount considered a site. But grouping damages to form a site based solely on subdivision, i.e., county or city boundaries will not be accepted.

3. Snow or Ice Removal

   Snow and/or ice removal is viewed as a relatively short term event not causing physical damage to a highway.

4. High wind damage, except in cases of declared storm disasters such as tornados.

4.5.1 UNAUTHORIZED ACCESS OR TAMPERING OF IDOT PROPERTY

If the Contractor sees an unauthorized individual at a site he shall radio the EMC Dispatch Center to call for police assistance, before confronting an individual.

4.5.2 VANDALISM

If the Contractor arrives on the scene of major vandalism to IDOT property, the Engineer shall be notified to determine if a police report is necessary. Photos of major damage shall be taken by the Contractor and forwarded to the Engineer within 24 hours. Following incidents of tampering, vandalism, or theft, the Contractor shall notify the local police agency so they may more frequently monitor the area.

4.5.3 INTRUSION AT FACILITIES AND/OR THEFT OF IDOT PROPERTY

If an entry alarm is received, the EMC Dispatch Center shall dispatch a Patrolman to the scene. If a break-in is confirmed, the Patrolman shall notify the IDOT ComCenter who shall dispatch Police to the area, and notify the IDOT Engineer(s) assigned to that facility. The Patrolman shall wait for the IDOT representative to arrive on the scene and make thorough inspection of the facility to ascertain if anything is missing or damaged, before the Patrolman files an official police theft report.

The Patrolman shall take photos of the damage and radio all information to the EMC Dispatch Center so as a Ticket may be created. The EMC Dispatch Center shall obtain a copy of the official police report, copies patrolman's photos and police report shall be submitted to the Engineer as soon as possible.

When, in judgment of the Engineer, damage or loss of system equipment is the result of extensive, specific theft activity affecting continuity of service, the Engineer may authorize non-routine maintenance payment of all or a portion of the permanent repair work, using contract pay items wherever applicable. The potential for the permanent work authorization, however, shall in no way relieve the Contractor from the responsibility to promptly respond and perform repairs.

4.6 LOCATING CABLE OR OTHER COMPONENTS OF IDOT SYSTEMS

To prevent damage and facilitate work by others, the Contractor shall promptly respond to Department or 3rd party calls requesting a locate of state owned electrical systems, cables or components at all locations and/or facilities. The Contractor shall enter the information as required in the EMCMS for all cable locates requests. The Contractor shall enter all required data in the proper fields in EMCMS form and shall have all fields completed accurately and timely. The table below provides historical data of cable locate requests that have been performed.

2012 as of June 13	1900
2011	3673
2010	3148
2009	2123
2008	1964
2007	1831

The Contractor is required to perform a locate of state owned underground cables or any other components, one time for each system location, per project or contract, as requested by the general contractor of the construction project, before or after the transfer of maintenance responsibilities. Each request may involve multiple locations where separated electrical systems are involved. Markings shall be given with a horizontal tolerance of one foot to either side.

4.7 PROVIDING SYSTEM SERVICES

Upon request of the Engineer, the Contractor is required to provide trained personnel for the following miscellaneous routine maintenance work:

- Provide system access to utility workers or inspectors approved by the Department
- Provide system access for other contractors and consultants who have approved contracts to work on IDOT equipment
- Conduct an immediate System or component inspection upon notice of the Engineer
- Provide labor, transportation, and equipment, to assist IDOT inspectors in their inspection of any portion of a System(s)

- Provide additional special patrols, inspections, and tests to confirm proper system equipment operation
- Collect information to analyze the nature of repetitious or intermittent system malfunctions
- Travel to a designated location/installation to determine ownership, take photos of the requested area, and email photos and information back to the Department (response required within four (4) hours of request, unless directed otherwise).
- Travel to any system designated location/installation and take GPS coordinates reading per specifications as listed in Article 4.17.7
- Travel to the site of a hazmat spill to oversee proper pump station operations (response required within one hour of request)
- Provide Patrolman for monitoring (stand-by time) of hazardous or emergency situations

4.8 GENERAL MAINTENANCE WORK

All maintenance activities, equipment repairs and/or replacements and all associated work as found necessary for the proper maintenance of the systems as described herein shall be considered as part of routine maintenance, except as otherwise noted.

All equipment shall be maintained in accordance with manufacturer specifications and recommendations. Routine maintenance equipment service schedules and work shall be executed in accordance with equipment operations and maintenance (O & M) manuals unless otherwise stated herein.

Permanent repairs shall be started promptly following emergency temporary repairs, and shall be continued insofar as possible without interruption, until completion. If a permanent repair delay is due to "parts on order", the Contractor shall furnish the corresponding material requisition and purchase order for those parts or components of the system required to complete the repair.

The Department retains ownership of all damaged equipment until a state scrap transfer log is signed by the IDOT Inspector. (Refer to state scrap provisions as stated herein.)

All graffiti, including advertising decals, found on system equipment and or structures and buildings shall be removed within one (1) working day. Painting over the graffiti is not allowed.

Following repair work, the associated area restoration shall be equal to or better than the original area condition. For example, if the soil/sod has been disturbed during the course of his work, the Contractor shall re-grade the surface work area with black dirt, placing seed or sod.

At the request of the Engineer, the Contractor shall perform maintenance on equipment not maintained by him at contract unit prices, or if approved by the Engineer, at an agreed price.

At the Engineer's request the Contractor shall inspect, investigate and provide preliminary sketch and layout with measurements, dimensions and connections of equipment, components and material for work to be performed under routine and/or non-routine maintenance. The sketch shall be provided within five days of the Engineers request.

4.9 REPAIR OF DAMAGED OR MALFUNCTIONING SYSTEM EQUIPMENT

4.9.1 GENERAL REQUIREMENTS

The Contractor is required, under routine maintenance, to clear site for safety, provide immediate corrective action, provide immediate temporary repairs, provide timely permanent repairs, and replace where necessary new parts or equipment for all state maintained system equipment found damaged or malfunctioning for any reason, regardless of the type of damage or who caused the damage, unless otherwise directed by the Engineer. Examples of damage include vehicular caused damage, third party damage, vandalism, natural causes, or incidental damage on or affecting system equipment as caused by the failure or the fault of utility company equipment.

Permanent repairs are also paid through routine maintenance, unless specified elsewhere herein, and shall be completed within seven (7) calendar days, or as specified in system articles herein. All responses and work on system equipment must be documented on an EMCMS ticket.

Damaged equipment parts and materials shall be replaced with new equipment, previously approved by the Engineer, in equal quantities, which shall be identical to the original elements except as otherwise specified herein, or permitted by the Engineer. When an item cannot be replaced in kind, the Contractor shall provide components equal or better than the failed devices or equipment for repairs or replacement work. The Engineer shall approve all replacement material which is different from the original installation.

Materials, repair methods and/or equipment replacements shall be suitable for the intended use per specifications and Standards as listed in Article 12.0 and contract requirements herein. In some cases failed equipment under warranty will need to be shipped back to the manufacturer.

The Contractor shall provide components equal or better than the failed devices or equipment for repairs or replacement work, When parts must be ordered from a vendor the Contractor, within 48 hours of order placement, shall provide the Engineer via scanned email the purchase order and vendor information showing the expected arrival date. The Contractor shall submit all orders in the monthly routine work submittal book for materials on order that effect equipment operation and the safety of the motoring public. Failure to provide the information as requested will result in liquidated damages.

All expressway, shoulder, or lane closures required for the response and repair of damaged System equipment is routine maintenance work and shall be in conformance with existing Departmental standards governing lane closures. (Review Article 3.0 for Traffic Control information.)

Whenever the Contractor replaces, installs, or modifies equipment or material under this Contract through routine or non-routine maintenance work, the record drawing(s) shall be modified to reflect the changes and shall be submitted monthly in the routine work submittal book. (Refer to Article 4.17.5 Plan Records Management).

Following the completion of the preventive maintenance work all forms shall be e-mailed to the Engineer via pdf format of in an excel spreadsheet. Follow-up work shall be noted with the applicable Ticket number.

4.9.2 REPAIRS TO EQUIPMENT DAMAGED BY DEPARTMENT PERSONNEL

The Contractor shall abide by requirements of Article 4.9.1, however, when damage to system equipment has been caused by Department personnel in the performance of their assigned duties, the Contractor shall receive payment for temporary and permanent repair work necessary through non-routine maintenance where unit price items are applicable.

Upon finding damage to state property caused by IDOT personnel, the Contractor shall take a date stamped, digital photo of the damage and email to the Engineer or designated IDOT inspector.

Within twenty-four hours of the found damage, the Contractor shall contact the Engineer to establish a mutually agreed date for a field inspection to ascertain the materials and/or parts necessary for the repair. Repairs shall be completed within seven (7) days, or as specified in system articles herein.

The Department reserves the right to furnish any or all of the materials or parts for any non-routine work, so no charge for items so furnished shall be made by the Contractor. Materials or parts furnished by the Department may be from the Department's state stock inventory or from other sources available to the Department.

4.9.3 DAMAGE CAUSED BY CONSTRUCTION (3RD PARTY DAMAGE)

The Contractor shall abide by the requirements of Article 4.9.1 specified herein for repairs to system equipment at locations maintained under routine maintenance, which has been damaged by IDOT construction or other 3rd party. The Contractor is allowed to invoice the offending third party for clearing the site for safety, provide immediate corrective action and temporary repairs to system equipment. Examples of third parties include but not limited to contractors working under contract with IDOT, contractors working on a construction project under permit issued by the District's Traffic Permits Section or the District's Design Utility Section, or municipal and county agency workers and their contractors.

The Contractor shall assign the duties of 3rd Party repair cost collection to one individual (normally the Administrative Manager) and this individual shall be the sole point of contact for all 3rd Party billing documentation.

Temporary repairs to make the equipment operational and safe for motoring public shall be immediately completed as specified in system articles herein.

The Contractor shall notify IDOT Engineers, Construction R.E., and Permit Engineer if applicable and 3rd Party contractor of the extent of damage and temporary repairs immediately via e-mail followed by a phone call. It is the Contractors responsibility to locate the offending party and provide contact information, Contract number, Permit number, pictures of the damage and an up to date cost of work performed.

To coordinate permanent repairs see point d. below.

3rd Party Damage Repair Documentation

a. Upon finding 3rd party damage to state property (not caused by departmental personnel), the first Contractor patrolman responding to the scene shall take a date stamped, digital photo of the damage and email to the Engineer or designated IDOT inspector along with a description of the property damage.

b. The Contractor shall create an EMCMS GB (general billing) ticket, noting the name of the contractor at the scene, address, contract, or permit number and contact name and phone numbers.

c. The Contractor's Administrative Manager (or assigned personnel) shall immediately initiate communications, by email or written correspondence, with the offending 3rd party/contractor (and copies to the IDOT Engineer, Construction Resident Engineer or Permit Engineer), send copies of photos and describe the extent of the damage to state property and temporary repairs which must be completed by the Contractor's forces.

d. Within 5 working days from the date of the 3rd party damage the Contractor shall provide the offending 3rd party/contractor an invoice with copies sent to the Engineer, IDOT Construction Resident Engineer or Permit Engineer, on Company letterhead, for costs of clearing the site for safety, performing and completing immediate corrective action and temporary repairs to system equipment and shall also provide and include with the invoice a cost estimate of the required permanent repair work. The offending 3rd party/contractor shall be notified that he/she may retain the Contractor or another IDOT approved contractor for the permanent repair work. The letter and invoice shall be sent and received by next business day certified mail.

e. The Contractor shall notify the Engineer, and the IDOT Construction Resident Engineer or Permit Engineer via email when the offending 3rd party/contractor has made a decision and designated a contractor for the permanent repair work.

f. If after 15 days from the Contractor's mailing the invoice of the temporary repairs the offending 3rd party/contractor is not taking responsibility for the damage and/or is not replying to Contractor's correspondence, the Engineer, and the IDOT Construction Resident Engineer or Permit Engineer shall immediately be notified via e-mail of the situation.

EMC Contractor performs permanent repair work

1. The Contractor shall follow Electrical Maintenance Contract requirements specified herein and notify the IDOT Engineer/Inspector when the permanent work will be performed. and shall submit catalog cuts for all material to be approved.

2. When the permanent work has been completed by the Contractor and is ready for inspection the Contractor shall submit, in the monthly routine work submittal book, a file on each incident of 3rd Party damage which includes all correspondence including copies of the ticket, initial notification, daily general billing logs, all estimates, temporary repair work invoice and original permanent repair work invoice. The 3rd party invoice number shall be the same as the ticket number. The invoice shall be accompanied by a brief description of the cause of the damage and the repairs made, identifying the location by route, county and city or village.

3. After the work has been tested and inspected, and the Engineer has signed an approval on the original permanent repair work invoice, the Contractor may submit it to the 3rd party/contractor for payment. If the work is inspected but not approved, the unsigned invoice shall be returned with a corrective work list. Contractor shall not submit an invoice to a 3rd party/contractor for permanent repairs to IDOT property without an IDOT approval signature.

Another 3rd Party Contractor performs permanent repair work

In cases where the offending party/contractor has obtained an IDOT approved contractor (other than the EMC) for the repair work and the Contractor is notified that permanent repair work is ready to commence and/or completed and ready for approval, the Engineer and IDOT Construction Engineer or Permit Engineer shall be notified by email. It is the Contractor's responsibility to assure that third party contractor adheres by the Electrical Maintenance Contract requirements specified herein. The Contractor shall inspect the equipment and its operation prior to final acceptance with IDOT Engineer.

Unpaid Work by 3rd Party

When the offending 3rd party/contractor does not admit to the damage or pay for the repair, and the Contractor is unable to collect for repair work. The Contractor shall provide correspondence and documentation as specified in this article to receive payment for temporary and permanent repair work necessary through non-routine maintenance pay items where unit price items are applicable.

3rd Party Damage Repair Summary Report

The Contractor shall submit monthly, in the routine work submittal book, an Excel spreadsheet which provides all details regarding 3rd Party work and billing. The form will be provided at the Pre-construction meeting. The fields include; date of damage, offending party name, notification date, date of temporary repairs, cost of temporary repairs, date of mail to offending party, estimated permanent repair costs, date of reply received, name of contractor for permanent repairs, permanent repair date, final permanent repair costs, date of IDOT work approval, date of mailing of permanent repair cost invoice, and date of payment to the Contractor for status of repair work.

4.9.4 WORK REQUEST MADE BY 3RD PARTY

The Contractor shall create an EMCMS WR (work request) ticket for third parties requesting legally permitted work within the IDOT right of way which is not related to the repair of system equipment damage, but for which the Contractor will receive direct payment from a third party. An example of a work request would be the relocation of a light pole for a developer. The Contractor shall obtain Engineer approval prior to the start of work. The Contractor shall follow same procedures as points c., d., and e. in Article 4.9.3.

4.9.5 DAMAGE CAUSED BY MOTORISTS

The Contractor shall abide by routine maintenance damage repair requirements of Article 4.9.1 herein for temporary and permanent repairs.

Most materials, equipment and labor for repairs are furnished by the Contractor and paid through routine maintenance bid items. The Contractor is not allowed to collect repair costs from licensed motorists or insurance companies.

Advanced Systems

The Contractor is allowed to use materials furnished by the Department as listed in Article 6.0 for Advanced Systems motorist caused damage equipment repairs.

The Contractor shall create a Ticket, and the IDOT ComCenter shall be immediately notified when the Contractor finds motorist caused damage to expressway ramp gate sand barrels. The ComCenter will in turn notify the IDOT District 1 Bureau of Maintenance personnel who will replace the barrels and sand. The Contractor shall keep the Tickets open until the replacement work is completed.

Lighting System

When any part of a light pole unit (pole, arm, luminaire, etc.) is damaged by a motorist, the Contractor is allowed to use state stock materials, if available, for the repair. At the end of each month the Department shall be credited for the materials used, in the routine maintenance monthly payment. The Contractor is responsible for an accurate state stock accounting. Refer also to State Stock documentation requirements and Routine Maintenance Payment herein.

MCHD Ticket Documentation

Upon notification of motorist caused damage to state property, the Contractor creates a Ticket on the EMCMS and immediately dispatches a Patrolman. In some cases the property damage is FOP, (found on Patrol). An EMCMS Ticket is created for both situations and the EMCMS Ticket type shall be "MC" for Motorist Caused Damage.

The EMC Dispatcher shall ask the initial caller for all information applicable for the Ticket. Especially important is the recording of the name of the citizen, Patrolman call #, or agency calling in the report, their telephone number, the police accident report number, the location reported and the pole, quad, or unit number damaged. If the accident report number is not available at the time of the initial notification, the Dispatcher should follow-up later, obtain the accident report number, and enter into the EMCMS. If the damage is due to a "hit and run" incident, the Dispatcher shall enter HR in the Police Report # field.

Photo Documentation of Motorist Caused Damage

Upon arrival at the location of the motorist caused property damage the dispatched Patrolman or other Contractor personnel shall take a minimum of 3 digital photos of the overall damage; one for the damage with the street area showing, and two of the damaged equipment. Clear, concise photos are required regardless of the hour of day or night, so the camera or camera phone used by the Contractor personnel shall be of good quality; a minimum of 5 megapixel, have excellent flash capability, and have email capability to send jpg photos of approximately 15KB to 30KB each to the Engineer. In addition, the Patrolman shall use a spotlight of 1,000,000 foot candle power during the night hours to illuminate the area for the photos. The Patrolman should check the photos for their clarity before leaving the site of the damage. Photos which do not show the damaged equipment due to an unlighted area shall be considered Unsatisfactory Service. The Engineer will approve the format, specific size, and conveyance of the photos when the Contractor's camera phone is selected.

The Contractor shall assign one person to have the responsibility to coordinate the photo receipt from the Patrolmen or other Contractor personnel to the Contractor files. This individual shall be responsible to

compile all MC Ticket photos and email jpg photos with proper subject designation of Ticket number and call #, on a daily or weekly basis to the Engineer. The digital photos shall be retained by the Contractor for a minimum of one year since the process for matching police accident reports to the Tickets can be a lengthy process. When requested by the Engineer, the Contractor may need to re-email photos from past months Tickets due to insurance company requests or other claims. An Unsatisfactory Service will be issued if a photo is not available for a motorist caused damage Ticket, when requested by the Engineer.

GPS Documentation

The Contractor's repair crew shall use the criteria from Article 4.17.7 for a required GPS reading at the site of each item of motorist caused damage, i.e., light pole, light tower, traffic signal, flasher, DMS sign, REVLAC gate, etc:

MCHD Repair Documentation

The Contractor may develop his own documentation for field use for the accounting of materials, equipment, and labor for each item repaired, but this information and the GPS designation as obtained at the time of the repair shall be entered into the EMCMS MCHD Logs within 48 hours of the completion of the repair work. (The EMCMS MCHD Log is used by the Contractor to provide motorist caused damage statements for Department claims processing.) Each Motorist Caused Damage Ticket shall have an EMCMS MCHD Log entered. The EMCMS MCHD Log requires the following information:

Traffic Signal or Surveillance Damage

- GPS Reading
- TS Standard Only
- TS Mast Arm & Standard
- TS Cabinet – Full Replacement
- TS Cabinet with Battery Backup – Full Replacement
- TS Cabinet – Shell Only
- TS Flasher or Surveillance Ramp Signal – Full Replacement
- TS Base or Pedestrian Walk Box
- TS Mast Arm Only
- TS Head Only
- TS L.E.D. Head Only
- Response Only, No Material Charges

Lighting System Damage

- GPS Reading
- Underpass Fixture – Full Replacement
- Pole Only
- Lighting Cabinet – Full Replacement
- Lighting Cabinet – Shell Only
- Light Pole – Full Replacement
- Mast Arm Only
- Luminaire Only
- T-Base Only
- Response Only, No Material Charges

All Systems – Clearing Site

- Straight Time – Labor - Journeyman
- Overtime – Labor - Journeyman
- Patrol Truck Quantity and Hours
- Aerial Truck 26 Ft. to 55 Ft. Quantity and Hours
- Aerial Truck Up to 70 Ft. Quantity and Hours
- Attenuator Quantity and Hours

All Systems – Re-Set Equipment

- Straight Time – Labor - Journeyman
- Straight Time – Labor – Helper
- Patrol Truck Quantity and Hours
- Aerial Truck 26 Ft. to 55 Ft. Quantity and Hours
- Aerial Truck Up to 70 Ft. Quantity and Hours
- Attenuator Quantity and Hours

MCHD Claims Processing

Within one week of notification from the Engineer of the MCHD claims for the month, the Contractor shall print individual claim statements on the EMCMS from the Contractor entered EMCMS MCHD Log and Ticket information. The statements shall be printed on Contractor letterhead paper and shall fit EMCMS print parameters. Each statement number shall be the same as the ticket number. One (1) original MCHD statement and three (3) copies will be required. All statements shall be signed by the Contractor to verify repair work completion per Contract specifications.

The Engineer shall notify the Contractor of any special repair situations which will require the Contractor to produce statements other than on the EMCMS. Once or twice a year the Contractor also will need to

furnish windowed envelopes, as approved by the Engineer, (approximately 1200 per year) to fit the EMCMS generated statements, and approximately ten (10) Brother TC-20 labeling tapes for MCHD files and mailings to insurance companies.

As agreed by the Contractor and the Department, motorists who damage state property shall be charged the Contractor's purchase price of the repair materials, plus any mark-up as allowed per Contract Specifications, labor repair time multiplied by the determined labor rate (union labor rate as applicable) and Blue Book Equipment Rental Rate for equipment used, as of January 1 of each year.

Occasionally the Contractor may also be required to furnish to the Department information and/or letters for insurance company claim requests, such as additional information regarding labor or repair costs, cat cuts of repair items, material purchase orders, etc. This information shall be provided within one week of the Engineer request.

MCHD Accounting Procedure

The Contractor is paid for repair work for motorist caused damage through routine maintenance bid items. However, as an accounting procedure the Contractor shall provide the Engineer a monthly MCHD Summary Statement which shall list all the MCHD claims for the month, by Ticket number and claim number, (a summary of the claims statements as requested by the Engineer). The total dollar amount of the MCHD Summary Statement shall be deducted from the District 1 EMC monthly routine work maintenance payment to the Contractor. The MCHD Summary Statement shall be signed by the Contractor to verify repair work completion per Contract specifications, and once received by the Engineer, shall be forwarded to IDOT Springfield and the Contractor shall be paid that amount from the State of Illinois Motorist Caused Highway Damage Fund.

Special Payment for Damage Repairs

Motorist caused damage repair work is paid through routine maintenance and the Contractor is not allowed to collect repair costs from motorists or insurance companies. In special situations where repair and/or replacement costs exceed $ 25,000.00, wherever, such incidents of wide-spread damage, and/or costly damage, including hazmat situations, the Department may make a special payment to the Contractor if:

A. The Contractor provides the Engineer documentation that an item of state property has been damaged and the repair and/or replacement costs exceed $ 25,000.00 by submitting:

- Material purchase documentation (provide vendor invoice)

- Labor repair costs per day, per job classification (General Billing Logs)
- Equipment charges per EMC allowances (Article 5.1)
- List of State Stock provided for Contractor use
- Minimum of five (5) photos of the damaged equipment
- Contractor notarized Invoice with detailed line item costs

and

B. The IDOT Claims Department obtains MCHD repair cost reimbursement.

<u>To arrive at the special payment amount to the Contractor:</u>

1. Start with the total dollar amount of the repair and/or replacement costs collected by the IDOT Claims Department (which may not equal the total dollar amount of the Contractor's repair invoice)

2. Subtract (from point 1):

    - $ 25,000.00 (base)

    - Total dollar amount of any allowed non-routine authorized work, (for damage to light towers refer to Article 7.0 or damage to the fiber optic network refer to Article 6.0) as stated herein and paid by the Department

    - Total dollar amount of any credit for state stock usage

3. Dollar amount remaining shall be paid to the Contractor

4.10 PATROL INSPECTIONS

4.10.1 PATROL OF SYSTEMS

Routine work requirements of this Contract require patrol inspections of systems. Refer to system articles herein for specific system requirements and patrolmen duties. The Contractor shall strictly adhere to the approved routes and schedules. The patrolling of a new location accepted for maintenance shall be instituted immediately.

The Contractor shall submit proposed system patrol routes, for Engineer approval, at the Pre-Construction Meeting. Proposed system patrol routes shall be submitted on an Excel spreadsheet with columns for Patrolman's number, Patrolman's name, EMCMS designated location number, Main Street name, Cross Street name, Cabinet or Unit number if applicable, Week, Day, Stop number, and maintenance status (ON, OFF, or Partial). The submittal shall show any Patrol stops which the Contractor performs for any other agency or municipality, if on the same day as an IDOT patrol.

Once approved by the Engineer, all patrol routes shall be entered in the EMCMS by January 10, 2013. The Contractor is responsible for accurate EMCMS patrol reporting. The Engineer shall be notified of any changes in patrol routes or patrolman assignments at the monthly System meetings, and a listing of any changes shall be submitted monthly in the routine work submittal book.

During the Contract year Patrolmen may be requested to provide additional information regarding the equipment at their patrol route stops. Examples of work would be collection of GPS data, count of combo lighting, determination of equipment manufacturer or model, etc.

The Patrolmen responding to emergency calls shall be stationed so that their travel time to arrive at any designated point of trouble shall not exceed one hour during normal weather, 24/7. Response times for specific situations are located in system articles herein.

4.10.2 NIGHT OUTAGE PATROL SURVEY

The Contractor shall patrol all highway lighting, sign illumination, and navigational lighting system locations, traffic signal locations with combination traffic signals and overhead lighting, and various Advanced and Extra System locations, to assure safe, operational conditions of equipment and materials, and to assure that all installations are performing at the level of service for which they are designed. The patrol survey shall include installations for which maintenance responsibility has been temporarily transferred to a construction contractor or other third party.

In addition the Contractor shall conduct a special monthly inspection of the obstruction light mounted on top of light pole "HH26" on I/B I 290 @ Western Ave., Location L1335, Cabinet "H". The power for the obstruction light is fed from a Surveillance Cabinet "G10".

Patrols shall be arranged to inspect an approximate equal number of locations, during the first three full weeks of the month, (four or five nights per week). The proposed patrol outage survey shall be presented to the Engineer, for his approval, at the Pre-Construction meeting. The Contractor shall not deviate from the schedule, unless approved in advance by the Engineer. At the request of the Engineer the Contractor shall provide the transportation for a joint inspection of the lighting system during the night time patrol. The joint inspection shall be performed a minimum twice per year as directed by the Engineer.

The patrolman shall be provided a hand free voice activated tape recorder to record each outage found, by noting the unit number (or cabinet designation and the pole or sign's proximity to a cross-street or road). Each night the patrolman shall record his name, call number, route week, day and date and odometer reading at the beginning and end of the patrol outage survey. The patrolman shall also radio the EMC Dispatch Center to create a ticket when multiple outages or tower outages, other malfunctions or damage are noted.

The Contractor shall email the Engineer an Excel spreadsheet report of the previous night's outage survey by 10 a.m., every workday morning, following a night time patrol. The listing shall include location numbers and names, unit numbers of outages, and ticket numbers of any special problems found. The report shall be divided in separate categories, by county, for:

1) Highway lighting outages
2) Sign lighting outages
3) Navigation lighting outages
4) Advanced System outages (beacon lights on radio towers and base stations)
5) Extra System outages (weigh stations, weigh stations open/close signs, and rest areas)
6) Off-maintenance location outages

24 Hour Outage Repairs

Outage repairs for the tower beacon lights on towers, base stations, state police facilities, or the obstruction light on light pole HH26 on I/B I 290 @ Western Ave., Location L1335, Cabinet "H", shall be conducted within twenty-four (24) hours of notification or discovery. It is expected that a sub-contractor will be employed to do this relamping. This work as specified herein is paid though non-routine maintenance pay item GRB1, which shall be payment in full for all required materials, labor and

equipment. The Contractor shall track on a spreadsheet the relamping date of each tower, and each beacon light on a light tower. The spreadsheet shall be submitted in the monthly routine work submittal book.

7 Day Outage Repairs

The Contractor has one week, seven (7) calendar days to repair normal outages found on the nightly outage survey. The Contractor shall repair all outages found, both those found on the patrol and those found when the cabinet is energized. In some cases this may substantially increase the number of outage repairs on a particular date. For those outages that require special lane closures, special parts, etc., the Contractor shall create a ticket and obtain Engineer's approval of the repair delay.

Documentation

The Department shall furnish the Contractor the form for the daily, weekly and final outage repair reports at the Pre-Construction Meeting. The number of patrol survey outages found and repaired by category, as well as repair crew outages found and repaired, equipment repairs made by work crew (ballast change, lamp, etc.) and ticket numbers for locations where repair work was not completed, all sorted by category, county and location, shall be reported on the weekly and final outage repair reports. Each weekly repair report shall be emailed to the Engineer within 7 days of the completion of the weekly night survey and the final report shall be received by the end of the first week of the following month. A hard copy of the weekly and final reports signed and dated by the appropriate system manager, documenting that the repair of each outage was completed in accordance with contract specifications, shall be submitted in the monthly routine work submittal book.

The night outage patrolman shall keep a historic database of outages by Pole/Tower and/or unit number and provide a separate list of repetitive outages for the repair crew prior to their workday. The repair crew shall provide the night outage patrolman with all items found and repaired or replaced by pole or unit number which shall be entered into the database. The database spreadsheet shall be submitted to the IDOT Engineer on a CD in the monthly routine work submittal book

4.10.3 RED-LIGHT RUNNING CAMERA, EVP, TSP, BRT, QUEUE JUMPING SURVEY

The Contractor shall keep current the EMCMS and an Excel spreadsheet list of locations with red-light running cameras, emergency vehicle preemption (EVP), Transit Signal Priority (TSP), Bus Rapid Transit (BRT) and traffic monitoring cameras. While performing patrol duties, for the duration of the Contract, the Contractor Patrolman shall make note of any red-light running camera locations, emergency vehicle preemption (EVP), Transit Signal Priority (TSP), Bus Rapid Transit (BRT) and traffic monitoring camera locations, the agency responsible for their installation, and report the installations or removals once per

month on a cumulative yearly spreadsheet using Excel, to be submitted in the monthly routine work submittal book on a CD.

4.11 COORDINATION WITH ELECTRICAL UTILITY COMPANIES, CONTRACTORS AND OTHERS

The Contractor shall keep incoming power service in proper condition at all times. The Engineer shall be promptly notified by email for cases such as the planned disruption of service power to System equipment.

The Contractor shall monitor the condition of electric service wiring and equipment, telephone service wiring and equipment, natural gas service lines and accessories and water service piping and appurtenances for all systems and facilities maintained under this contract. The Contractor shall maintain contacts with the respective utilities or providers for these services and shall coordinate with the utility and the Department to assure that services are installed in a timely manner, in compliance with requirements established for the service.

The Contractor shall fully coordinate access as required for utility company or contractor inspection, modification work as applicable, repair work as necessary and other matters as necessary to assure continuity of services and proper revisions when needed.

The Engineer may require the Contractor to inspect related non-system equipment, such as Com Ed power lines, that may interfere with the functioning and/or maintenance of systems as covered in the contract.

The Contractor shall assist the Engineer with the inspection of work completed by others such as the construction and/or replacement of intermittent median walls by a construction contractor (the non-EMC) and the necessary inspection of the required electrical ducts by the Contractor.

4.12 ROUTINE MAINTENANCE TRANSFER OF MAINTENANCE RESPONSIBILITY

General Responsibilities

The Contractor shall cooperate with the Engineer and construction contractors with respect to transfers of maintenance on system elements and inspection of completed construction work for Department acceptance. The Contractor shall assist the Engineer and/or IDOT Inspectors to make equipment inspections of installations to be added or removed from routine maintenance to ascertain that the equipment and/or workmanship is in proper working order and verifies equipment inventory quantities. The Engineer may request the Contractor provide new locks for system equipment at the maintenance transfer meeting.

There will be transfer inspection site meetings in the field. The Contractor shall attend these official joint transfer site meetings and shall fill out and sign any required maintenance transfer forms or equipment inventory forms. The Contractor shall provide the Engineer, a minimum of 24-hours in advance of the maintenance transfer meeting, the names of the Contract personnel who shall be attending the meeting.

When construction activity is complete the Contractor has the responsibility to document any new items of equipment (including new locks and key numbers) or the removal/installation of equipment, by system, on an Excel spreadsheet which is submitted to the Engineer monthly in the routine work submittal book.

Transfer of Location Maintenance Responsibility to EMC

The Contractor shall inspect construction work, permit work or other State of Illinois facilities for acceptance by the Department. The Contractor shall advise the Engineer with respect to the completeness, workmanship, safety and maintainability of the installation, and the Engineer will make the final determination regarding acceptance. The Contractor shall take maintenance responsibility for system work accepted by the Engineer. The Contractor shall take GPS recording of cabinets, light poles, towers, JB, splices, MH, and cameras locations and submit on an Excel spreadsheet as specified in Article 4.17.7 for GPS documentation. This work shall be applicable to all systems and its components.

Transfer of Location Maintenance Responsibility from EMC

The Contractor shall conduct a site meeting inspection with the IDOT Engineer and third party contractor. A corrective work list shall be prepared by the Contractor. The Contractor shall be required to correct any outstanding deficiencies though routine maintenance as approved by the Engineer. The Contractor shall perform a physical inspection while video recording all equipment in detail, to document its condition. The video recording shall show the existing condition of light poles, towers, foundations, luminaire operation, cabinets and electrical components, wiring and conduits wherever applicable, including but not

limited to junction boxes, mounting brackets, lowering devices etc. and shall test all equipment and its operation. The tests shall include Megger testing, continuity testing, voltage, current draw of each circuit, ground resistance, neutral current etc. A record of the corrective work list and repairs and test results shall be submitted with the video recording on CD or DVD to IDOT Engineer on the day of the transfer.

This work shall be applicable to all systems and its components.

EMCMS Maintenance Transfer Entry

Immediately upon acceptance of routine maintenance responsibilities or transfer of maintenance responsibilities to another entity, the Contractor representative shall notify the EMC Dispatch Center with the following information in order that they may complete a Maintenance Transfer Log and enter into the EMCMS all applicable data:

- Date and time of maintenance transfer
- Names of all individuals in attendance and their companies or agencies
- County and City
- Name of Installer (if new equipment is coming on maintenance)
- Name of Owner (provide address and telephone number if new to database)
- Name of Maintainer (provide address and telephone number if new to database)
- Name of Contractor who will be responsible for electrical maintenance (provide address and telephone number if new to database)
- EMC Maintenance: YES, NO, or PARTIAL
- Type Maintenance (refer to EMCMS codes)
- Patrolman Information (assignment, week, day, stop)
- Location number
- Main Route and Cross Street
- Cabinet (if applicable)
- RR interconnect (yes or no)
- Traffic Signal System Equipment (yes or no)
- L.E.D. (yes or no)
- Battery Backup/UPS (yes or no)
- Red Lighting Running Camera (yes or no)
- Emergency Vehicle Pre-emption (yes or no)
- Transit Signal Priority or Bus Rapid Transit (yes or no)
- Traffic Management Equipment (i.e., Lake County PASSAGE) (yes or no)
- Maintenance Transfer and Pay Item Changes (Add On, Take Off, or Remove)

- List of Partial Equipment to be maintained (or not maintained) for Notes Page
- Other remarks as appropriate

The EMC Dispatch Center staff shall send the completed Maintenance Transfer Log to the Engineer, System Managers, and assigned IDOT Inspectors via email or fax within two hours following the completion of the maintenance transfer. (Note the Department is responsible to enter new or delete electrical system locations, change the maintenance status, or change the assigned routine pay item in the EMCMS.)

If errors are found in any maintenance transfer log or EMCMS data entry, it is the responsibility of the Contractor to immediately notify the Engineer by email with specific details. Correct data in the EMCMS Locate Location screen is the responsibility of the Contractor (review Article 6.0 EMCMS herein).

The Contractor's Administrative Manager or assigned individual shall review the Maintenance Transfer Logs and provide the Department the Maintenance Transfer Summary Report in the monthly Routine Work Submittal Book. The Maintenance Transfer Summary Report is used to reconcile the locations maintained by the Contractor for the monthly routine maintenance payment. The report form will be provided to the Contractor at the pre-construction meeting.

4.13 ROUTINE MAINTENANCE PAYMENT

Each defined electrical system location has been assigned a monthly Routine Maintenance Pay Item listed in Section 3. Each routine Pay Item has been assigned an ELU "equivalent location unit" in the Schedule of Prices. The Contractor shall enter the ELU bid price in the Schedule of Prices and shall be paid a fixed monthly routine maintenance payment based on total ELU's provided in the Schedule of Prices. Each monthly pay period shall be a calendar month. Pay quantities for routine maintenance are arranged by individual system, but the bid ELU price applies to all systems

Additional Monthly Routine Maintenance Payment

In addition to the fixed monthly routine maintenance payment the Contractor has the opportunity for additional routine maintenance payment. Contractor personnel and/or the Contractor Administrative Manager shall work with Department personnel on the first few days of each month to reconcile the past months maintained location totals and their pay item totals as existing on the last day of the month.

The location pay items which were removed from Contractor maintenance on or before the last day of the month shall be deducted. The location pay items which were added to the Contractor maintenance on or before the last day of the month shall be added. The pay items shall be totaled by system and multiplied by the appropriate ELU. All System's Pay Item ELUs shall be totaled to arrive at a reconciled monthly total ELU. The monthly total ELU will be compared to the total ELUs in the schedule of prices. The Contractor shall only be paid for ELUs that exceed the total number of ELU's provided in the Schedule of Prices.

The Contractor shall review Section 3 List of Locations and their routine maintenance Pay items. Many locations have been consolidated; the Contractor shall base his/her bid on information provided herein. The Contractor shall be paid the bid ELU price for a lighting system location where only a portion of a cabinet less than 40% was transferred off routine maintenance.

When the Engineer has determined that all monthly routine work submittals are complete, a monthly routine maintenance letter, which authorizes payment of the prior month's routine maintenance work, (the fixed amount and any additional amount as reconciled) and which itemizes any credits, including credit for state stock used during the past month, debits, withholding, liquidated damages, or deductions for motorist caused damage statement processing (also review Article 4.9.5 Damage Caused by Motorists), shall be presented to the Contractor. The Contractor shall create the monthly routine maintenance invoice from the monthly routine maintenance authorization, and bring to the monthly pay meeting.

When routine maintenance work completion is severely delayed or deficient or the routine maintenance work submittal book has not been received on time, the Engineer, at his option, may delay the pay meeting, thus delaying the routine maintenance payment to the Contractor.

RMA1 Budgetary Routine Maintenance Allowance

Description. This item is to establish a budget account to allocate funds for the payment of routine maintenance per ELU on locations pay item to be covered under this contract and maintained as specified herein. Payment shall be as specified in Article 4.13 the Additional Monthly Routine Maintenance Payment. This budgetary allowance is established because the total locations and its Pay Item ELU increase historically and require additional funds to cover the cost of maintenance.

The total estimated amount of the annual expenses for services performed which will be paid under this contract, is $400,000 as indicated for Pay Item RMA1. For bidding purposes this amount shall be used.

4.14 STATE STOCK

4.14.1 GENERAL REQUIREMENTS

The Contractor is responsible, under routine maintenance, for the storage and inventory reporting of the Department's stock of parts, materials, and equipment which is to be used exclusively for the Department's installations and systems. The Contractor shall appoint a state stock manager, who shall be responsible for the Contractor submittal of state stocks reports and shall be the Department contact for state stock transactions. This individual shall be named at the Pre-Construction Meeting. Refer also to Article 3.0 Storage Facilities.

The Contractor shall use state stock only when directed and approved by the Engineer. The Department is not obligated to furnish specific parts or equipment in state stock inventory for Contractor use. The Contractor may not use any state stock inventory for any work outside the scope of this contract.

4.14.2 DISBURSEMENT OF STATE STOCK

Upon receiving an approved state stock disbursement/receiving log from the Engineer, the Contractor is responsible for timely, safe transportation and handling to deliver designated state stock inventory from the state stock warehouse, Contractor shops or sites, or other approved state work sites within District 1, to approved Contractor or state work sites within District 1. The Contractor also shall provide all labor and equipment as necessary to relocate any IDOT equipment (stock) to new facilities as directed by the Engineer.

The Contractor shall fax the Engineer a state stock disbursement/receiving log requesting the use of state stock. The state stock disbursement/receiving log must state whether the equipment to be removed is for a routine or non-routine work project. The Contractor may not use any state stock until written approval is received from the Engineer.

4.14.3 RECEIPT OF STATE STOCK

Upon receiving an approved state stock disbursement/receiving log from the Engineer, the Contractor is responsible for timely, safe transportation and handling to pick up materials, parts, and equipment which is to be designated as state stock inventory from Contract routine work sites and locations within District 1 and deliver to the state stock warehouse, Contractor shops or sites, or state work sites within District 1.

The Contractor shall fax the Engineer a state stock disbursement/receiving log requesting delivery of items into state stock. The state stock disbursement/receiving log must state who will be delivering the items and state the project from which the items will be arriving. If the Contractor is replacing state stock items previously used for routine maintenance work, the log must clearly note the original disbursement date of the item. The Contractor may not place any items into state stock until written approval is received from the Engineer.

In order to assure that only materials in good working order and/or condition shall be placed in the state stock warehouse, the Contractor shall provide trained personnel (at minimum a helper/groundsman) to inspect the materials, separate salvage materials, and/or box/wrap/categorize the various in-coming materials at the state stock warehouse. (It is the Contractor's option to assign additional personnel including foremen, however this additional labor will not be paid by the Department.) The helper/groundsman shall be paid through routine maintenance.

If the Engineer directs the Contractor to receive materials into the state stock warehouse from construction contracts, the Contractor will be paid through routine maintenance for a total of one-hundred twenty (120) cumulative hours per year for groundsmen/helper labor and paid through non-routine maintenance for any hours exceeding one-hundred twenty (120) per year.

With Engineer approval the Contractor is allowed to take receipt of materials at the Contractors facilities, but the materials must be moved, at Contractor expense, to the state stock warehouse within five working days of the receipt of materials.

4.14.4 DISPOSAL OF SCRAP

The Engineer shall have the sole determination as to whether material (equipment) is re-usable as system equipment. Except as otherwise indicated herein, all removed items remain property of the state. The Contractor may not dispose (scrap) any materials without receiving prior approval from the Engineer in writing.

The Contractor shall fax the Engineer a state scrap transfer log requesting Engineer approval of items to be scrapped. The state scrap transfer log must state the item name/model/type, condition, and location where item was located. If after inspection the materials are determined to be scrap, the Engineer shall sign the state scrap transfer log, and convey ownership of the scrap materials to the Contractor. Upon receiving the transfer of ownership, the Contractor shall be responsible, at his expense, for the proper, legal disposal of all scrap items; materials, parts, equipment, etc. The estimated salvage value of scrap

materials shall be reflected in the bid unit prices for routine maintenance items. The Contractor shall submit a copy of all state scrap logs in the monthly routine work submittal book.

All lamps removed as part of re-lamping operation, outage repairs or other authorized work shall become property of the Contractor and shall be disposed of in full compliance with Environmental Protection Agency (EPA) regulations. The EPA Rule 40 CFR, part 273, finalized in May 1995 established a guideline for the recycling of lamps and the mercury from scrapped lamps. Fluorescent, high-intensity, low pressure sodium, and other lamps bearing mercury may be classified as a potential hazardous waste.

The Contractor shall recycle removed lamps to the maximum extent possible and shall submit to the Engineer, for approval, the name and background of a qualified lamp recycling specialty service which shall be used for lamp recycling under this Contract. Over the course of the Contract, the Contractor shall provide documentation of all lamp recycling activity to the satisfaction of the Engineer. The Contractor shall provide the names of qualified facilities certified to dispose of used lamps at the pre-construction meeting.

4.14.5 STATE STOCK DOCUMENTATION

The Contractor shall conduct an audit of the state stock inventory as of January 2, 2013. After approval signature of the principal of the company and the Engineer, the Contractor shall have full responsibility for all state stock inventories for the duration of the contract, including the EMCMS entry and reporting of use, disbursements or receipts.

The Contractor shall maintain an Excel spreadsheet, a perpetual inventory of parts and equipment used in the maintenance of the systems, as well as an EMCMS state stock inventory for highway lighting. Both reports shall include information as to the equipment/materials model/name, size, type, manufacturer, location (including all materials at the warehouse facility, shop facilities, etc.) and state of repair of all parts and equipment, as well as a record of where the prior months' stock was utilized, by staging area, category or routine or non-routine work, and ticket number or contract number if applicable.

Both monthly state stock inventory reports shall be sent to the Engineer by the 5th day of the month, prior to the pay meeting. The reports shall be signed by the person directly accountable for the accuracy of same and an officer of the firm with a statement attesting to the accuracy of the report and proper use of the inventory. The Contractor is required to retain all inventory records for a period of 5-years following the completion of the Contract.

In addition, the Contractor shall reconcile the monthly inventory as issued by the leased warehouse to the EMCMS state stock report and shall notify the Engineer of any discrepancies. Both reports and all logs shall be submitted monthly to the Engineer.

4.15 CONTRACTOR SPARE PARTS INVENTORY RESPONSIBILITIES

The Contractor shall be responsible, under routine maintenance for providing spare equipment for emergency and routine service and for overhauling equipment, to meet the response and maintenance requirements as stated herein. The material and/or equipment furnished by the Contractor shall be new, as approved by the Engineer, in equal quantities, which shall be identical to the original elements except as otherwise specified herein, or permitted by the Engineer.

The Contractor and the Engineer shall meet by December 1, 2012 to agree on the minimum quantity of equipment which the Contractor shall have in his possession at the start of this Contract. The Contractor shall submit his current inventory of spare parts for each system to the Engineer as of January 1, 2013, and submit a current monthly report of Contractor Spare Parts Inventory in each monthly routine work submittal book.

Per the Engineer's directive and/or following an inventory-related failure to meet the routine maintenance performance requirements of the contract, the Engineer may direct the Contractor to maintain a minimum quantity of specific items on hand. The additional cost of maintaining the required parts inventory shall be borne solely by the Contractor.

A shortage of any parts or equipment causing delays in the implementation of replacements or repairs shall be sufficient cause to assess liquidated damages. The Contractor shall submit anticipated schedule(s) for ordered replacement items when required for this Contract. The Engineer may inspect the Contractor spare parts inventory at any time as deemed necessary. (Review Article 3.0 for Contractor storage facility requirements.)

4.15.1 Lighting System – Suggested Starting Quantities

Luminaires

Qty	Item
10	HPS, 230 Volt, 200 W
10	HPS, 230 Volt, 310 W

25	HPS, 230 Volt, 400 W
10	HPS, MT, 200 W
10	HPS, MT, 310 W
10	HPS, MT, 400 W
5	HPS, 480 Volt, 200 W
5	HPS, 480 Volt, 310 W
10	HPS, 480 Volt, 400 W
10	LPS, 230 Volt, 55 W
2	HPS, 208 Volt, 400 W
3	HPS, 240 Volt, 1000 W

Cabinets

Qty	**Item**
2	240 Volt, 150 Amp, Asco contactor
2	240 Volt, 200 Amp, Asco contactor
2	277 Volt, 200 Amp, Asco contactor
2	110/120 Volt, 60 Amp, Asco contactor
2	240 Volt, Tork Astronomical Clock

Wire

Qty	**Item**
3000 Ft.	#4 Quadraplex

Poles and Arms

Qty	**Item**

10	11.5” BC, 32 Ft., Alum Lt Pole 8 x 4.5”, .250 Wall
5	15.0” BC, 39 Ft., Alum Lt Pole 10 x 6”, .250 Wall
20	15.0” BC, 45 Ft., Alum Lt Pole 10 x 6”, .250 Wall
2	15.0” BC, 45 Ft., Alum Lt Pole,10 x 6”, .250 Wall, Special HandHole Location
2	15.0” BC, 55 Ft., Alum Lt Pole,10 x 6”, .250 Wall
5	15.0” BC, 26 Ft., Davit Pole
5	15.0” BC, 31 Ft., Davit Pole
5	15.0” BC, 39 Ft., Davit Pole, 38’ – 7”
5	8 Ft., Truss Arm 4”, 34” Rise
5	10 Ft., Truss Arm 4”, 34” Rise
20	12 Ft., Truss Arm 4”, 34” Rise
20	15 Ft., Truss Arm 4”, 34” Rise
5	6 Ft., Single Lt Arm
10	8 Ft., Truss Arm 6”, 34” Rise
2	8 Ft., Truss Arm 6”, 48” Rise
15	12 Ft., Truss Arm 6”, 34” Rise
2	12 Ft., Truss Arm 6”, 48” Rise
20	15 Ft., Truss Arm 6”, 34” Rise
15	15 Ft., Truss Arm 6”, 48” Rise
5	15 Ft., Truss Arm 6”, 72” Rise
5	8 Ft., Davit Arms, Twin
5	8 Ft., Davit Arm

Pole Parts

Qty	**Item**

5	T-Base, 13-15” Top, 15-17” Bottom
5	T-Base, 11.5” Top, 15” Bottom
5	T-Base, 11.5” Top, 11.5” Bottom
5	T-Base, 15” Top, 15” Bottom
25	Breakaway Coupling Sets
25	11.5” Fiberglass Shroud
5	15.0” Fiberglass Shroud
25	11.5” Aluminum Skirt
25	15.0” Aluminum Skirt
200	Small Pole Leaves
150	Large Pole Leaves

4.15.2 PUMP STATION SYSTEM – SUGGESTED STARTING QUANTITIES

Qty	Item
6	AEGIS EPROM Chips

De-watering Pumps

3	4” Pump to de-water the PS, 480/240 volts
1	3” Pump to de-water the PS, 480/240 volts

The Contractor shall have pump(s) capable of a pumping variable head, including piping, fittings, wiring, motor switch gear, and controls to provide a complete operational pump system.

Qty	Item

3	Compressors (Gas)
3	Solenoids
1	12V Power Supply
2	Batteries
1	Battery Charger
6	120v Relays
6	12v Relays
2	Level Transducers
3	Voltage-to-Current converter (0-250mv)
3	Voltage-to-Voltage converter (0-160v)
1	Voltage-to-Voltage converter
4	SCADA panel interconnect terminal blocks, one of each type
2	MDS radios 9710B
1	Antennas (Parabolic)
2	Radio batteries
2	Radio power supplies
1	MDS diagnostics board

4.15.3 TRAFFIC SIGNAL SYSTEM - SUGGESTED STARTING QUANTITIES

Qty	Item
5	TS-I 8 phase – 12 channel cabinets and controllers
2	TS-II 8 phase -- 12 channel cabinet and controller
10	TSI and TSII controllers
2	Eagle Master Controllers

2	Econolite Master Controllers
10	Mast arms and foundation bolts of various sizes
3	Electrical service enclosures
10	Conflict monitors
40	Detector Amplifiers – rack and shelf
5	MMU's
10	BIU's
50	Traffic signal posts of various sizes
30	Signal heads of various sizes
3	Each; LED signal modules, green, red, yellow, green arrow, yellow arrow, red arrow
20	Mast arms signal head mounts
50	Mast arms port mounts
2	Controllers with Railroad Security Software (one each Eagle and Econolite)

4.16 MATERIAL AND EQUIPMENT

4.16.1 USE OF APPROVED MATERIALS

The Contractor shall clearly understand that no equipment or material shall be installed prior to approval by the Engineer and that any equipment or material installed without the approval of the Engineer is subject to removal from the right-of-way solely at the Contractor's expense. If the Contractor changes the supplier of any approved materials for the contract, a new submittal for that item must be made for review and approval by the Engineer. The Contractor shall provide free access to the Bureau of Materials personnel for inspection to insure that the approved materials are used.

The Contractor (including all supervising personnel) is expected to familiarize themselves with all requirements with respect to proper materials, methods and procedures and failure to do so will not be justifiable grounds for lack of compliance with the contract requirements.

4.16.2 SUBMITTALS FOR APPROVAL

Within 60 days after contract execution, the Contractor shall submit to the Engineer for approval, complete, approvable manufacturer's product data (for standard products and components) and detailed shop drawings (for fabricated equipment) of materials and project equipment (products) proposed for use

on this Contract for both routine and non-routine maintenance. The Engineer may grant permission to delay certain submittals until the applicable work is authorized, but the 60-day requirement shall apply to all commonly used and general items.

Due to the highly specialized nature of the Advanced Systems equipment, certain items must be manufactured by the original equipment manufacturer, unless written approval is given by the Engineer. The Engineer may waive the requirements for shop drawings for certain original-manufactured fabricated equipment as long as original shop drawings on file remain valid for the equipment. It is the Contractor's responsibility to coordinate accordingly.

Submittals need not include all project equipment and materials in one submittal; however, the submittals for the equipment and materials for each individual pay item shall be complete in every respect. The Contractor may request, in writing, permission to make a partial submittal. The Engineer will evaluate the circumstances of the request and may agree to review such a partial submittal.

Prior to submittal, the Contractor shall review the submittal material and shall affix his stamp of approval, with comments as applicable, signed by a responsible representative, to each appropriate submittal item. In the case of subcontractors' submittals, both the subcontractor and the general Contractor shall review and stamp approval of the submittal.

The receipt of submittal information from the Contractor will be construed as the Contractor's assurance that he has reviewed the submittal information and attests to the submittal's accuracy and conformance to the requirements of the contract documents. Unless otherwise indicated, manufacturer's guarantees shall be included with the submittal information.

4.16.3 FORMS

The Department shall furnish the multi-part IDOT submittal record and transmittal form that is required with each submittal. The Contractor and any subcontractor as applicable shall sign the submittal form. Submittal forms shall contain items for only one (1) electrical system. Forms which contain multiple systems, or submittals made without the official form, and/or incomplete forms, will be returned to the Contractor without review.

4.16.4 CERTIFICATION REQUIREMENTS

Where certifications are specified, the information submitted for approval shall incorporate certification information. When a certification is available prior to equipment manufacture, the certification shall be included with the submittal information. When a certification is available only after equipment

manufacture, the submittal shall include a statement of intent to furnish the certification after equipment approval and manufacture. Certifications involving inspections and/or tests of equipment shall be complete with all test data, dates and times.

4.16.5 SAMPLES

The Engineer may request from the Contractor a sample of a specific item of a submittal for review and evaluation. The sample shall remain property of the Contractor and shall be returned after the review and evaluation with comments as applicable.

4.16.6 NEW MATERIALS INSPECTION REQUIREMENTS

The Contractor shall comply with the applicable requirements of Section 106 and 1000 of the Standard Specifications for Road and Bridge Construction. No uninspected equipment/material is to be delivered to the job site. When underground materials are furnished, the Contractor shall notify the State of Illinois, Department of Transportation, Bureau of Materials personnel to provide proper inspection for the approval of the materials, prior to delivery to the job site.

4.17 DOCUMENTATION SUBMITTALS

4.17.1 CONTRACTOR ADVISORY

The Contractor shall identify system elements which have become prone to recurring or imminent failure, and/or pose a significant liability or a safety risk, and recommend replacement or repair by submitting an advisory inspection report in the monthly routine work submittal book.

The Engineer shall review and respond to the Contractor in regards to the advisory inspection, and reserves the right to determine a course of action to rectify any identified condition. When the Engineer concurs with the Contractor's basic recommendations, a non-routine authorization will be issued for the material portion of the repair and this will reduce the Contractor's routine maintenance obligation to the labor necessary to replace the deteriorated system element. Should the Engineer determine, however, that a deteriorated condition is due to neglectful maintenance on the part of this Contractor, all remedial work shall be performed as routine maintenance.

Repair of damage from weather-related failures of electric utility systems, broken aerial electrical lines, or damage from deteriorated electric utility systems which have been observed and reported by the Contractor to the utility and the Engineer prior to the occurrence of damage, may also be eligible for payment subject to approval of the Engineer. Engineer approval of the work will be based on adequate contractor repair response, proper advisory inspection report documentation, and the substantiated link to weather-related failure or previously reported deteriorated utility systems as noted above.

In the absence of an advisory inspection report received and acknowledged by the Engineer, if system elements fail or are observed by the Engineer to be causing recurring failures or imminent safety hazards, then the Contractor is obligated for the full cost of replacement or repair under routine maintenance. Such obligation is not limited only to individual components but may extend to the multiples of components at a location(s).

4.17.2 DAILY WORK AGENDA

The scheduling of daily work shall be a responsibility of the Contractor, but governed by established schedules and/or authorized work completion dates. The Contractor is required to email the Engineer, each IDOT System Engineer/Inspector, and the IDOT ComCenter, a daily agenda which shall account for all scheduled work to be performed on system equipment. The daily agenda shall be received by 8:30 a.m. on the specified workday or by 2:30 p.m. on Fridays when weekend work is scheduled by the Contractor.

The Department will provide the Contractor the format for the daily agenda at the Pre-Construction Meeting. The daily agenda shall list all personnel, dedicated or assigned, their name, cell phone number, description of work assignments both routine and non-routine for all systems, the location number, and ticket number or authorization number if applicable.

If the Contractor's work/testing, as specified herein, requires the presence of a IDOT Engineer/Inspector, the Contractor shall give a minimum 24 hour notice to the appropriate IDOT Engineer/Inspector when that work is to be scheduled on the daily agenda. If the Contractor proceeds with the work without this pre-notification, the Contractor shall, by the decision of the Engineer, be required to either re-perform the work/test or shall be assessed liquidated damages.

When a special project and/or system modification warrants, the Engineer may direct the Contractor to create a separate special project agenda. The same issuance requirements apply for the special project agenda as for the daily agenda.

4.17.3 DISPATCH AND CALL-OUT SCHEDULE

On Thursday of each week, the Contractor shall provide the Engineer and each IDOT System Engineer/Inspector an email or fax of the next week's EMC Dispatch Center personnel work schedule, Patrolmen night work schedule, Patrolmen weekend on-call schedule for each system, and the scheduled Emergency Response Coordinator for the week. Names, telephone numbers, call numbers, hours to be worked, or hours on-call shall be noted on this schedule.

4.17.4 EMC TICKETS

The use of Tickets for the documentation of Contractor response and work on system equipment is integral to the EMC. Trained EMC Dispatch Center personnel shall create all Tickets on the EMCMS. A separate database or numbering system will not be allowed. The Contract number and year will automatically be generated and Ticket numbers will be sequentially assigned from the EMCMS database. One Ticket number will be used for all work activities related to the original work assignment.

The average number of Tickets created by the Contractor on the EMCMS in the past five years is over 10,000 (review Ticket charts in the Appendix herein). The EMC Dispatch Center personnel shall be familiar with electrical and/or EMC terminology in order to provide acceptable service to the Department. Staffing shall be sufficient (review Article 3.10.4) so that Patrolmen are dispatched immediately and can respond to the specified location within the one (1) hour requirement herein (Article 4.3 Contractor Response). It is acceptable for the Dispatch Center personnel to use hand-written sheets when accepting information from callers, however, the EMCMS entry shall be completed within one (1) hour upon the following:

- Contractor personnel is dispatched to a state maintained location
- Contractor personnel finds malfunctions or damage to system equipment
- IDOT personnel or any 3rd Party report a malfunction or damage at a state maintained or non-maintained location
- Any equipment, state maintained or not state maintained is found not to be properly grounded

Tickets are created for each electrical system:

A Advanced Systems
L Lighting System
P Pump Station System
S Surveillance System
T Traffic Signal System
X Extra Systems (Maintenance Yards, Weigh Stations, Rest Areas, other State Facilities)

It is the responsibility of the Dispatch Center Manager and the Contractor's System Managers to review the Ticket coding on a daily basis to assure correct information is entered. IDOT inspectors also monitor the ticket coding and ticket information input and shall require the Contractor to make corrections and/or void duplicate Tickets. The Department also reserves the right to correct IDOT ComCenter incident report numbers or police accident number entries in cases of motorist caused damage.

Tickets shall be coded by the item which has the problem or malfunction reported as follows:

AV Automatic Vehicle Locator (A System Ticket Type only)
BA Barrier (A System Ticket Type only)
CC Camera/Closed Circuit TV
CT Cable
DA Damage to Equipment (Not Motorist Caused)
EQ Equipment - Operational Problems, Not Damage (Item will need to be specified)
FO Fiber Optic
GB 3rd Party Damage – Contractor General Billing
ID IDOT "Hold" (Used on Authority of IDOT Personnel)
LP Loop
MC Motorist Caused Damage

OM Off Maintenance – Location Not Currently Maintained by the Contractor*
OT Multiple Outages (additional information needed - L.E.D. Yes or No - and color of lamp)
RR Routine Work - Requested by IDOT personnel
SO Single Outage (additional information needed - L.E.D. Yes or No - and color of lamp)
SR Service Request – Meeting to be held or Patrolman requested to obtain information
SW Swing Gate (Used for A System only)
UT Utility (Responsible)
VO Void – Duplicate Tickets or Non State Owned Locations*
WR Work Request – Work Requested by 3rd Party (not IDOT) to be completed by the Contractor and Billed

At the time the Ticket is created in the EMCMS the following information shall be entered:

- System
- Ticket Type
- Date Received
- Time Received
- Received By (Contractor Dispatcher Initials)
- Informant (Police Dept/IDOT/Contractor/ Patrolman/etc.)
- Police/Agency (If Informant was PD, enter City or County name, for all other situations enter Name)
- Informant Telephone Number
- State (ComCenter) Incident #
- Police Accident # (Request from caller)
- F.O.P. (If Found on Patrol enter Yes)
- Patrolman's Call # (If F.O.P.)
- Location reported (as much information as received)
- Cabinet or Power Center # (to be verified upon Patrolman's arrival)
- Pole, Quad, or Unit # (to be varified upon Patrolman's arrival)
- Alarm (if Yes, state Type)
- AEGIS (if Yes, list #)
- SCADA (if Yes, list #)
- Other Information
- Directions (if necessary)
- Time Patrolman was Dispatched
- Patrolman # who was Dispatched
- EMCMS Location # (after look-up confirmation) (to be verified upon Patrolman arrival at the location)

Within one (1) hour of creating the EMCMS Ticket (or sooner, upon notification by responding Contractor Patrolmen) the following information shall be entered in the EMCMS Ticket:

- Time Arrived and Date
- Time Departed (cleared) and Date
- Pole/Quad/Unit # (verified)
- Photo taken (Yes or No)
- Item Found
- Action Taken
- Follow Up Needed (Yes or No)
- Action: T (temporary) or P (permanent)
- If Permanent, enter Perm Date and Time
- Describe Work

- Controlling Item (if applicable)
- W.O.P. (Water on Pavement) (Yes or No)
- W.O.P. Faxed to Field Office (Yes or No)
- W.O.P. Fax Date and Time
- Notification Information (name, date, time) for Off-Maintenance Locations or Non-State Owned Locations (refer below to Incidents at Non-State Maintained Locations)

If the Ticket requires Crew Follow-Up the following information is entered:

- Arrival Date
- Time Arrived
- Time Departed
- Call # of Foreman
- Initial Follow-Up (description of work)
- Action Taken
- Action: T (temporary) or P (permanent)
- If Permanent, enter Perm Date and Time
- Follow Up Needed (Yes or No)
- Follow Up Action Needed
- Controlling Item

When IDOT ComCenter Incident/EMCMS Ticket is Cleared enter the following:

- State Incident #
- Contractor Dispatcher Initials (who cleared with State)
- Clear Date
- Clear Time
- Name of IDOT ComCenter Dispatcher notified

Communication with the IDOT ComCenter

The EMC Dispatch personnel shall be provided with EMCMS call-out location numbers when the ComCenter workload allows, but it is the responsibility of the EMC Dispatch personnel to have a thorough knowledge of the location look-up feature of the EMCMS. The Contractor shall dispatch patrol personnel for response after being provided with a main route and a cross street by the ComCenter, Department, or other police/ municipal agency.

During certain emergency situations it may be necessary that the EMC Dispatch personnel provide periodical updates on estimated time of arrival when requested by the ComCenter. If the ComCenter provided the notification of the incident, when the ticket is cleared the Contractor is required to notify the ComCenter.

Request to ComCenter for Emergency Lane Closure

After office hours request for approval of emergency lane closures shall be made to the ComCenter, (847-705-4612) as soon as the need is determined, prior to the Contractor's arrival on the expressway.

Incidents at Non-State Maintained Locations

When a third party, Department personnel, or the Contractor's work force notify the EMC Dispatch Center of a problem with an IDOT system location which has been temporarily taken off of routine maintenance due to construction or modification, the Contractor shall create a ticket, but shall notify the proper maintainer and/or contractor.

When a third party, or Department personnel, notify the EMC Dispatch Center of a problem with a location which is maintained by a municipality or is owned by a private party, the Contractor shall notify the proper maintainer and/or contractor.

Transmitting Ticket Summary Information

The Contractor shall transmit the EMCMS ticket summary to the Bureau of Traffic Operations and Maintenance Sections by 8:30 A.M., Monday through Friday. This report shall account for all tickets created from 7 a.m. the prior day to 7 a.m. the current day. The Monday ticket summary shall account for the time period from Friday 7 a.m. through Monday at 7 a.m.

Ticket Documentation for Declared Disasters

Although the dispatching and immediate response of Contractor personnel is the priority of any Declared Disaster (or potential Declared Disaster), properly documented Ticket information is necessary for the Damage Repair Submittal form and Detailed Damage Inspection Report, requirements for possible additional payment to the Contractor when there is a Declared Disaster. Refer to Article 4.5 Special Response Situations herein.

4.17.5 PLAN RECORDS MANAGEMENT

The IDOT plan records system provides for retrieval of system documentation, and provides a digitized central storage of the data records. The Engineer shall specify the format to be used at the Pre-Construction meeting. When the Department authorizes work and requests plan records to be updated, the Contractor shall red line the applicable plan sheets and then scan into a file by EMCMS location number. The Contractor shall also scan catalog cuts for equipment to be installed, this shall include cat cuts to reflect routine or non-routine work performed, or 3rd party work requested and approved, and then scan into separate files, by EMCMS location number. The scanned document files shall be submitted to the Engineer monthly on a CD, in the routine work submittal book. Receipt of the revised plans is required for non-routine work approval. (Review Article 5.0).

Upon taking maintenance of a location under the EMC the Contractor shall scan plans, documents, catalog cuts and video records given to him on the day of transfer and shall setup and/or update the plan and record management files by the EMCMS location number.

The monthly CD submittal shall be accompanied by an Excel spreadsheet; a cumulative yearly report of transfers on-maintenance; noting system, location number, description of modification work, date work was completed, equipment model/name and model number, and the date the modified plan scans,

catalog cuts (via CD), and video were submitted to the Department. The format of the report shall be provided to the Contractor at the pre-construction meeting.

File Conversion Project

In order to best provide readily available information to the Contractor and Department inspectors, the Contractor shall provide 150 hours of scanning service that includes labor, equipment and material to properly scan IDOT Electrical maintenance documents, catalog cuts and various size plans. This work shall also include organizing and filing in an acceptable format. This work located at IDOT TSC office and Schaumburg HQ and will be performed under IDOT supervision. This work shall include the scanned material to be filed electronically by System and Location numbers, a complete set of plans and relevant information into separate files, each labeled with the EMCMS system location number. A CD Copy of the plans will be provided to the contractor for his records, also to update and modify as specified herein.

Fiber Cable Management System

A cable management system is used to document and manage horizontal and backbone cables, hardware, assets, pathways, locations, contacts, and detail equipment connections, test results, attaches drawings, photos and documents, creates a contact directory, and cable label. The Contractor shall provide 150 hours of labor for data entry into fiber optic cable management system and shall be paid for under routine maintenance. Unused hours shall carry over to a new contract year if contract is renewed.

4.17.6 MONTHLY ROUTINE WORK BOOK SUBMITTAL

On the third business day of each month the Contractor shall submit to the Engineer a three ring binder, which contains the required documentation of the various items of work as required herein, for the prior month, with the System Routine Work Approval forms (available at the pre-construction meeting). These submittals include, but are not limited to:

Routine Work Summary Reports by System (Summary of each System's submittals)

Personnel Training Report – refer to Article 3.12.1

Record Drawings – refer to Article 4.9.1

3rd Party Damage Repair Invoices – refer to Article 4.9.3

MCHD Work Crew Log Summary – refer to Article 4.9.5

Patrol Schedule Change Summary Report – refer to Article 4.10.1

Night Outage Patrol Survey & Outage History Report – refer to Article 4.10.2

Red-Light Running Camera Report – refer to Article 4.10.3

Equipment Inventory Summary Report – refer to Article 4.12

Maintenance Transfer Summary Report – refer to Article 4.12

State Stock Scrap Logs – refer to Article 4.14.4

Contractor Spare Parts Inventory Report – refer to Article 4.15

Contractor Advisory – refer to Article 4.17.1

Plan Records Management – refer to Article 4.17.5

Vendor Payment Report – refer to Article 5.16

Monthly Non-Routine Work Status – refer to Article 5.18

EMCMS Time Summary Report – refer to Article 6.8.11

Grounding and Service Upgrade Progress Report – refer to System Articles herein

System Preventive Maintenance Work Documentation – refer to System Articles herein

4.17.7 GPS DOCUMENTATION

Datum to be used shall be North American 1983.

Data shall be provided electronically and in print form. The electronic format shall be compatible with MS Excel. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. Each coordinate shall have the following information:

1. Description of item
2. Designation or approximate station if the item is not designated
3. Latitude, Longitude (decimal degrees)

Examples:

Description	**Designation**	**Latitude**	**Longitude**
PTZ Camera	PTZ42 or County designation	41.580493	-87.793378
Handhole	HH at STA 234+35	41.765532	-87.543571
Flasher	FS100-TS2341	41.700034	-87.693509
Electric Service	Elec Srv-TS2341	41.602248	-87.794053
Railroad Bungalow	RRB-TS2341		
Traffic Signal Controller	TS 2341	41.651848	-87.762053

Prior to the collection of data, the Contractor shall provide a sample data collection of at least six data points of known locations to be reviewed and verified by the Engineer to be accurate within 15 feet. Upon verification, data collection can begin. Data collection can be made as construction progresses, or can be collected after all items are installed. If the data is unacceptable the contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified.

A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have minimum 2-5 meter accuracy after post processing. The device may also utilize Differential GPS to obtain the specified accuracy.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years.

The manufacturer and model of the GPS device shall be identified as well as any software used on the device and in post processing.

The Contractor shall maintain the existing IDOT database and provide data entry for all new locations that shall include but not limited to GPS locations for Lighting, traffic signals, surveillance and advanced system fiber and equipment located under this contract or provided by IDOT Engineer.

ARTICLE 5.0 – NON-ROUTINE MAINTENANCE WORK AND PAYMENT

5.1 CONTROL OF WORK

Non-routine work under this Contract is specifically authorized work, not covered under the requirements of routine maintenance, for materials and work on the systems that tends to be irregular, event driven, or otherwise based on the selective direction of the Engineer in response to system needs. Non-routine work shall include unit-priced (PAY ITEM) work, agreed price work, force-account work, and non-routine specialty service work.

An EMCMS authorization letter shall be received by the Contractor prior to the start of all non-routine work. Any non-routine maintenance work undertaken by the Contractor prior to receiving an approved authorization is done at the Contractor's own risk. The Department is under no obligation to pay for unauthorized work or work which is not in compliance with this Contract.

The Department is under no obligation to authorize any non-routine work. The Department shall authorize unit price work wherever possible, as meets the system needs, or unit price work in addition to agreed price or force account work for the same project/location, if in the best interest of the Department.

Quote work or force account work shall be performed using first shift labor rates for straight time unless Engineer approval is given to use first shift overtime or double-time rates.

When dedicated repair crew personnel (as specified in Article 3.0 herein) are utilized for non-routine agreed-price or force account work, their labor is paid through routine maintenance, and shall be shown on the Contractors Daily Agenda and General billing Logs.

Payment to the Contractor will be made only for actual quantities of work performed and accepted, materials furnished as specified, and new record drawings submitted as requested.

At the Engineer’s request the Contractor shall inspect, investigate and provide preliminary sketch and layout with measurements, dimensions and connections of equipment, components and material for work to be performed under routine and/or non-routine maintenance. The sketch shall be provided within five days of the Engineers request.

The Department reserves the right to furnish any or all of the materials or parts for non-routine work, in which case no charge for items so furnished, shall be made by the Contractor. Materials or parts furnished by the Department may be from the state stock inventory or from other vendor sources available to the Department.

At the request of the Engineer, the Contractor shall be required to perform routine and/or non-routine work by dedicated personnel at locations not maintained by the Contractor and/or not listed herein at contract unit prices. This work may be at locations under construction, off maintenance, at State of Illinois facilities, or on equipment in District 1.

Equipment Rates Submittals

By January 10, 2013 and prior to the start of any non-routine agreed price or force account work, the Contractor shall provide the Engineer a list of all vehicles and construction equipment to be utilized on the Contract noting purchase year, model number, size, operating volume, etc., and the applicable matching pages from the Equipment Watch Rental Rate Blue Book. The equipment operating rates will be averaged for each equipment year of purchase, per model/function, (backhoe, scissors-lift, state of operation, etc.); to arrive at an hourly operating price which will be entered into the EMCMS for non-routine agreed price and force account work for the first half of 2013. There shall be no changes in prices until July 1st, when the Contractor shall re-submit the applicable equipment pages from the most recent Equipment Watch Rental Rate Blue Book and yearly revised labor rates and both will be updated in the EMCMS for use in the second half of 2013. A separate standby time hourly rate for equipment will not be paid. If this contract is renewed the same January 10th and July 1st dates will apply for Equipment Watch Rental Rate Blue Book and labor rate submittals.

Completion of Work

The Contractor has ninety (90) days to complete non-routine work, unless other terms are agreed with the Engineer. If work is not completed in the agreed timeframe the Contractor may be subject to the terms of Unsatisfactory Work per Article 3.5.3 and/or liquidated damages per Article 3.5.5.

Requirements for Final Payment of Non-Routine Work

The Contractor shall obtain and modify the applicable plan sheets to reflect routine or non-routine work performed, or 3rd party work requested and approved. The Contractor shall also provide vendor invoices and time records of labor, material and equipment used on the job for documentation of the work. The Contractor shall provide a scan copy for each authorization with proper backup paper work into separate files, by IDOT EMCMS location number along with the applicable catalog cuts as specified in Plan Records Management Article 4.17.5.

5.2 UNIT PRICE AUTHORIZATIONS

Unit-priced (PAY ITEM), non-routine work shall consist of work which has been authorized based upon the unit prices (PAY ITEMS herein) bid on this contract for the various non-routine work items.

The Engineer shall issue a Non-Routine authorization letter on the EMCMS for unit price work, prior to the start of work. In some cases quantities may be estimated and will be based upon the initial scope of work. Refer to Article 5.1 for Contractor requirements for determining scope of work. The quantities may be revised following the Engineer's inspection of the work.

5.3 AGREED-PRICE AUTHORIZATIONS

Agreed-price, non-routine work shall consist of work for which bid unit prices are not applicable.

Upon receiving a quote work request from the Engineer, the Contractor shall provide a fixed quote for the work and scan and e-mail to the Engineer within five (5) working days from the initial request. Quote cost breakdown shall be provided with vendors catalog cuts and any additional paperwork to explain details or provide justification of the labor or material costs. In some cases, at the request of the Engineer, the Contractor shall provide three (3) quotes from different vendors.

Upon Engineer's quote approval, the Contractor shall create a quote for the work in the EMCMS, using applicable contract labor and equipment rates and necessary materials. When the agreed price work requires materials to be furnished and installed, the Contractor quote may include a fifteen percent mark-up per Article 109.04(b)(3) of the Standard Specifications.

One quote shall be necessary for each non-routine authorization letter. Once the quoted work price is agreed by the Engineer and authorized in the EMCMS the Contractor cannot make revisions. The quote submitted to the Department should take into account the expected completion date of the work.

Once the work starts the Contractor shall immediately notify the Engineer of any unforeseen problems discovered. Upon completion of the work the Contractor shall furnish the Engineer documentation as specified in Requirements for Final Payment of Non-Routine Work in Article 5.1.

The labor price for EMC agreed-price or force account work is determined in June of each year from the approved union labor rates for force account work in District 1.

Agreed-Price Work by a Sub-Contractor

For non-routine agreed price work (not pay items) performed by an approved subcontractor as named on the authorization for work and on the contractor invoice, in accordance with Article 109.04 (b)(7) of the Standard Specifications for Road and Bridge Construction, when work is performed by an approved subcontractor, the Contractor shall be allowed administrative costs of an amount equal to five (5) percent of the total approved costs on a individual work authorization, with the minimum being $100. An additional material mark-up of fifteen percent per Article 109.04(b) (3) of the Standard Specifications is not allowed.

Agreed-Price Work by a Specialty Vendor or requested by the Department

When specialty service work (work by vendors not approved as subcontractors) is approved and authorized by the Department through agreed price work the Contractor shall be paid administrative costs of an amount equal to five (5) percent of the first $10,000, with a minimum of $ 100.00, and the Department shall allow an additional one (1) percent of any amount over $10,000 of the total approved costs, for an individual work authorization. This work includes Department furnishing materials for State Stock.

If the Contractor is furnishing an invoice for materials not supplied by the vendor for specialty service work, the quote may include an appropriate mark-up per Article 109.04(b)(3) of the Standard Specifications. In no case shall specialty service work, in its entirety be considered “materials” when a quote for specialty service work is submitted to the Department, or shall Article 109.05 of the Standard Specifications be applicable.

5.4 FORCE ACCOUNT AUTHORIZATIONS

Force Account Work shall consist of work for which an agreed price cannot be established between the Engineer and the Contractor. The Engineer may direct the Contractor to perform any non-routine work as force account work which shall be measured and paid as described in Article 109.04(b) of the Standard Specifications.

A daily time/work accounting, with the name of each individual, shall be kept on the daily general billing log, which shall be signed by the Contractor’s field supervisor and submitted to the Engineer at the completion of each work day for the authorized work. A summary of all daily general billing logs, as well

as full documentation of materials furnished with accompanying purchase invoices from the vendor, shall be submitted to the Engineer within seven (7) working days following the completion of work. The General Billing Log form shall be provided to the Contractor at the pre-construction meeting.

A general foreman's time will not be billable on force account work unless there are more than five (5) additional crew workers employed at any one time, place and job and then only with the prior approval of the Engineer. A mark-up of fifteen (15) percent is allowed for material costs, which shall include any shipping and handling fees.

A general foreman's time or any overtime and/or prime time billing for any personnel will not be billable on authorized force account work unless prior, written approval is received from the Engineer.

Equipment costs are applicable for Force Account Work as specified herein Article 5.1.

5.5 EXPENSES INCURRED BY THE DEPARTMENT

In accordance with Article 109.05 of the Standard Specifications for Road and Bridge construction, upon written request of the Engineer, the Contractor shall pay the bills for specialty service work and/or expenses incurred by the Department. The Contractor shall be paid administrative costs of an amount equal to five (5) percent of the first $10,000, with a minimum of $ 100.00, and the Department shall allow an additional one (1) percent of any amount over $10,000 of the total approved costs, for an individual work authorization.

5.6 ACCEPTANCE OF NON-ROUTINE WORK ASSIGNMENTS

It is the Contractor's responsibility to review daily, on the EMCMS, the list of authorizations which have been transmitted to the Contractor, and subsequently view and print the non-routine work authorization letters. The Contractor shall communicate with the Engineer regarding any questions about the work assignment and the due date of the work completion. The Contractor may contact the Engineer to request a later work completion date than the normal ninety (90) days, or the Engineer may request an earlier date from the Contractor. If the Contractor fails to seek a change in completion date, the work completion time will remain as initiated by the Engineer.

Unless an email from the Contractor Project Manager is received by the Engineer within five (5) working days from the authorization transmittal date, which states the points of disagreement to the transmitted work assignment or due date, the authorization shall be accepted by the Contractor and logged as received. Any non-routine authorization letters which have been transmitted, but not entered as received by the Contractor in the EMCMS within five (5) working days shall be subject to the assessment of liquidated damages.

5.7 This Article Left Open for Future Use

5.8 NON-ROUTINE WORK COMPLETION REQUIREMENTS

When the work is complete the Contractor shall enter the work completion date in the EMCMS authorization letter, print an EMCMS copy of the authorization letter, note any pay item quantity changes on the letter, stamp "COMPLETED WORK" on the letter, attach any modified record drawings, catalog cuts, time records for labor and equipment scan and email to the Engineer for approval.

Final record documentation for cumulative non-routine work shall be submitted per Article 4.17.5 Plan Records Management.

5.9 AUTHORIZED WORK INSPECTION APPROVAL

The Contractor shall notify the Engineer via e-mail, one day, (24 hours), prior to the Contractor's - work completion of the authorized work in order that a joint EMC/IDOT inspection of the work shall be held.

When all required documentation of work has been received, the Engineer shall review the submittal and may request the Contractor to assist at a final field inspection. Once the Engineer has approved the work the final non-routine work authorization shall be transmitted via the EMCMS to the Contractor so an invoice may be prepared. The Department is under no obligation to approve any non-routine work without receiving scanned documentation.

The Engineer may waive the physical field inspection of any work if he believes the completion to be reasonably demonstrated by performance of the system, electronic monitoring, or other means. In such cases, the Engineer reserves the right to follow-up and/or selective spot inspections, and if evidence of prior incomplete or incorrect work is found, the Contractor shall remain responsible for corrective action and open to liquidated damages and/or payment withholding as provided elsewhere herein.

5.10 EMCMS AUTHORIZATION CORRECTIVE WORK LIST

The Engineer shall issue a corrective work list (CWL) on the EMCMS for any deficiencies found during IDOT inspections of the Contractor's work, The Contractor should view the EMCMS corrective work list summary report on a regular basis in order to promptly address any work deficiencies. When the Contractor has completed the work deficiencies the Contractor shall notify the Engineer that the work is ready for re-inspection.

5.11 EMCMS FINAL AUTHORIZATION LETTER

The Contractor shall review daily, on the EMCMS, the list of authorizations which have had the final transmittal to the Contractor, and subsequently view and print the final non-routine work authorization letter. The final authorization letter shall be signed by the System Foreman completing the work, and shall accompany the Contractor's invoice.

5.12 EMCMS NON-ROUTINE WORK INVOICE

The Contractor shall prepare an EMCMS invoice for each Final Authorization letter. Each EMCMS invoice shall carry the same number as the authorization letter and shall be signed by a Principal of the Company, attesting that the work, as invoiced, has been completed and inspected in accordance with the provisions of the Contract and all applicable specifications. The invoice shall also show a notarized certification by an officer of the Company. The Contractor's invoice shall conform to the EMCMS form requirements. The Engineer, prior to the start of the contract, shall review and approve the style and format of the Contractor's invoice.

All work billed for payment shall be complete, no billing for partially-completed work will be allowed. An original signed invoice with two copies and an original signed final authorization letter with two copies shall be submitted to the Department no later than 30 days following work completion approval by the Engineer. Normal processing time for non-routine work payment to the Contractor is 8 to 12 weeks.

5.13 PAYMENT TO SPECIALTY VENDORS

Refer to Article 5.5 for a definition of non-routine work authorization for Expenses Incurred by the Department. Within seven (7) days following the EMCMS entry of the date the work was scheduled for payment, the Contractor shall pay the specialty vendor invoice, and scan via e-mail a confirmation of the payment with check number to the Engineer.

5.14 MONTHLY NON-ROUTINE WORK STATUS

The Contractor shall submit a schedule/chart in the monthly routine work submittal book which includes the status of all open tickets and open non-routine work authorizations. For all outstanding work and authorizations which have materials on order the Contractor shall submit the Vendor name, purchase order, date it was issued and expected delivery date(s).

ARTICLE 6.0 – ADVANCED SYSTEMS

6.1 DESCRIPTION OF WORK

Advanced Systems are technology dependent items of equipment their controls and communications. The Contractor shall provide labor, equipment and materials as specified herein to maintain the operation and performance of all equipment and its interconnecting cables specified in this article with all associated devices, hardware and software.

A-1 a: Kennedy Expressway Reversible Lane Access Control (REVLAC)

b: Roosevelt Ramp Access Control System (RACS)

c: Homeland Security Expressway Ramp Gates

A-2: Traffic Monitoring Cameras

A-3 Building, Hut, Base Station, and Tower Equipment

A-4 Communication Network

The list of locations and description of items provided herein is for contractors information only, actual quantities and material to be maintained is the responsibility of the Contractor. The Contactor shall inspect all locations to assure continued maintenance and operation of all systems specified in this contract prior to maintenance transfer January 1, 2013.

6.2 ROUTINE MAINTENANCE

Unless noted herein, all requirements as listed herein Article 6.0 shall be paid through, are part of, and incidental to routine maintenance.

A list of locations and there applicable pay items is found in Section 3 and general contract requirements are discussed in other articles herein.

New locations will be added to the Advanced Systems throughout the duration of the Contract including a CCTV distribution systems, cameras, nodal buildings and associated equipment, IP multicast CCTV and network expansion, and associated equipment. After transfer of maintenance and acceptance by the

Department there is a minimum of six (6) months of warranty coverage from the construction contractor for defects in materials or workmanship.

6.3 REVLAC – REVERSIBLE LANE ACCESS CONTROL SYSTEM

The REVLAC System operates to control access at the six entry ramps to the Kennedy Expressway Reversible Lanes and extends from approximately the Ohio Street interchange on the south to the Edens/Kennedy junction on the north, (a distance of approximately 7.5 miles). The REVLAC System includes, but is not limited to; swing gates and their transmissions, barriers and barriers signs, changeable message signs, chevron signs, gore signs, auxiliary signs, roadside control panels, weather station warning signals, cattrons, supervisory controls, operations cameras, and all interconnecting cable, Ethernet, telephone data, and fiber and microwave radio systems for communications.

Swing Gates

The REVLAC system incorporates one hundred seventeen (117) swing gates manufactured by B & B Electromatic of Norwood, Louisiana. These swing gates direct the traffic away from closed ramps. Swing gates can be operated remotely with cattron units, locally, and with a manual hand crank.

Restraining Barriers

The system incorporates six (6) restraining barriers manufactured by the Entwistle Company of Hudson, Massachusetts. Each reversible entrance ramp has a barrier to prevent the entrance of vehicles when in the lowered (closed) position. Each barrier can be operated remotely, locally or by means of a built-in 12V DC motor which can be powered from a 12V DC truck battery.

Signs and Chevrons

There are a combination of forty-seven (47) auxiliary fiber optic and LED signs manufactured by the National Sign and Signal Co. of Battle Creek Michigan throughout the REVLAC System. They are operated remotely.

Roadside Panels

The sixteen (16) roadside panels are the local operation control devices which take control away from the PLC and transfer to local manual switches.

Changeable Message Signs (Drum Signs)

There are fifteen (15) changeable message (drum signs) as manufactured by Lake Technologies. Each changeable message sign can be operated remotely, locally, and with a manual hand crank.

Operations Cameras

There are forty-one (41) operations cameras which provide an overview of the REVLAC operations to the dispatch operators at the IDOT Headquarters.

6.4 RACS - ROOSEVELT RAMP ACCESS CONTROL SYSTEM

The RACS System operates to control access at the single entry ramp from eastbound Roosevelt Road to eastbound I-290, with the ramp entry just east of York Road. The RACS System includes, but is not limited to swing gates and their transmissions, dynamic message signs, chevron signs, auxiliary signs, a traffic detector on the IL 38 ramp, roadside control panels, supervisory controls, alarm system, operations cameras, and all interconnecting cable, Ethernet, fiber and microwave radio systems for communications. Refer to pay item A-3a for RACS building maintenance.

Swing Gates

The RACS System incorporates ten (10) swing gates manufactured by B & B Electromatic of Norwood, Louisiana. These swing gates direct the traffic away from closed ramps. Each swing gate can be operated remotely, locally, and with a manual hand crank.

Dynamic Message Signs (LED)

There are three (3) dynamic message signs, as manufactured by Voltron. Each sign can be operated remotely, or locally.

Signs and Chevrons

There are a combination of eight (8) LED signs manufactured by the National Sign and Signal Co. of Battle Creek Michigan throughout the RACS System. They are operated remotely.

Roadside Panels

There is one (1) roadside panel mounted to the Hillside Ramp Bldg/Hut, a local operation control device which takes control away from the PLC and transfers to local manual switches.

Operations Cameras

There are eight (8) operations cameras which provide an overview of the RACS operations to the dispatch operators at the IDOT Headquarters.

6.5 EXPRESSWAY RAMP GATE SYSTEM

Forty-two (42) ramp gates units have been installed for access control to the area expressways. The ramp gates, the gate arm assembly, the actuator operating mechanism, and bollards are structured so as to stop vehicles from entering expressways through entrance ramps, in case the current inbound expressway traffic would need to be changed to outbound.

6.6 TRAFFIC MONITORING CAMERAS

The CCTV System consists of cameras with pan-tilt-zoom, (PTZ) on expressways, at construction areas, at State Police Accident Investigation Sites, and at various areas for general surveillance, as located throughout District 1. Also Included is the maintenance of the camera brackets, specifically designated camera poles, camera fiber optic transceivers, cabling, conduit, mounting devices, electrical equipment and appurtenances at the camera locations.

A list of current Traffic Monitoring Camera locations and their pay items is found in Section 3, however refer to Article 7.0 Lighting System for a list of cameras located on light towers (maintained as per Article 6.0 herein) where routine maintenance is paid through the Lighting System location (L-1 or L-2 Pay Item).

6.7 BUILDINGS, HUTS, BASE STATIONS, AND TOWER EQUIPMENT

There are twenty-two (21) locations where the Contractor shall maintain equipment, within buildings, huts, and at base stations, monopoles, and towers, all of which contain various types of electrical power apparatus, control systems, alarm systems, fiber panels, fiber connections, networks, radio systems, including microwave radio cables and microwave radio towers/monopoles, transformers, lighting systems, power wiring, HVAC systems, generators, transfer switches, electrical service feeder cable, distribution panels, smoke detectors, doors, locks, and all associated equipment and appurtenances owned by the State of Illinois and under the jurisdiction of the Department. The equipment specified in the locations listed below gives a good overview of the items to be maintained, however, there may be other electrical items which require maintenance. The Contractor is urged to visit the sites to view all the electrical equipment to be maintained.

Tower and monopole maintenance refers to the brackets and supports for traffic monitoring cameras and the coax for camera and camera lowering devices, dehydrators and dehydrator pressure lines, wave guides, antennas and antenna mounts.

6.7.1 REVLAC BUILDINGS A, C, D, and E

Electrical Maintenance

Buildings A, D and E have dual electrical services. Building C is fed from building D. Each of these three buildings route power through a UPS and have battery backup with associated chargers and inverters for critical controls and monitoring.

The following are representative equipment list which are located at BLDG A, C, D and E:

- Vicon Pilot select Video Switcher
- IFS Video chassis w/ 6 video receivers and one power supply
- Cisco 3750 X series switch W/ one 3ckx-nm-ig module
- AXIS 291 Chassis w/ one 6 channel Q7406 encoder
- GarrettCom CSG14UH Gb converter switch w/ one Gbic installed

- Pelco video distribution amplifiers
- Harris MegaStar 155 microwave radio W/ 4 OC3 tributary interfaces installed
- CISCO ONS 15454 node
- Cisco 3560 switch
- iMpath stand along video encoder 2 channel
- DIGI-one AIP serial to Ethernet converters
- Sola power supply
- IFS media converters Serial to fiber d9230
- Netgear Gigabit switch GS105
- Eltek 48 volt power system ocd-3fm-200a w/ 4-48 volt rectifiers installed
- 12 V batteries
- meridian encoder stand alone SR500 and SR1000
- sigma electronics video distribution amplifier bsg-26n
- fiber options video chassis w/ 12- 700r cards installed
- AD video loss detector chassis
- IMC media converter Stand alone
- 30- Johnson controls Dynasty batteries Lead acid
- Lamarche Battery Charger and UPS inverter
- 14 – Allen Bradley PLC chassis
- Andrew Dehydrator
- Berko Heaters, Carrier HVAC unit
- Cattron Radio
- Fiber optic patch panels
- 4 Snow and Ice detector boxes model 100-1
- 1 Russel electric UPS bypass switch
- Hirschmann Fiber to copper MICE modules one for REVLAC one for PS SCADA
- Marchall Monitors model V-R84DP-2C
- VDT computer w/ Flat panel monitor
- Cisco 8 port Switch

Operational Control Panel

Each of the buildings has an Operational Control Panel (OCP). The OCP's house the PLCS Allen Bradley servers 5/60 and manual controls for the swing gates, signs and barriers. These OPC's in the control buildings differ from the IDOT ComCenter Supervisory Control Panels (SCP) only in that the individual gate, sign, and barrier status indication is not available. Instead, a device group indication is provided. The control functionality is otherwise identical, as each of the control buildings can operate the entire system through the normal or abnormal events panels of its OPC. Remote panels may be used for system testing

or may be used in the event of a power outage or disruption at the IDOT ComCenter in order that the reversible lane control is not affected.

Other items to be maintained:

- Shelter/Hut Equipment & connections
- Communication equipment
- Hirschmann Fiber Optic Transceivers
- Physical Building
- Outdoor/Indoor and Service Entrance Equipment
- Various types of electrical power apparatus, control systems, alarm systems, radio systems, including microwave radio cables and microwave radio towers/poles, transformers, lighting systems, power wiring, circuit breakers/power supply systems, heating and ventilation systems, doors, locks, and all associated equipment and appurtenances
- CCTV Monitoring and Equipment (refer to IDOT Headquarters, Article 6.7.11)
- SONET System (refer to IDOT Headquarters, Article 6.7.11)
- All interconnecting cable, Ethernet, and fiber and microwave radio systems and communications

Monopole maintenance is required of the Contractor at REVLAC Building E. Tower and monopole maintenance refers to the brackets and supports for traffic monitoring cameras and the coax for camera and camera lowering devices, dehydrators and dehydrator pressure lines, wave guides, antennas and antenna mounts.

6.7.2 STATE LINE HUT -- I 80 94 @ INDIANA STATE LINE/LANSING

Items to be maintained:

- 16 iMPath VSG Encoder cards
- 2 iMPath Chassis and Fan Trays
- 1 24 Port Video Patch Panels
- 4 Axis 241Q Video Servers
- 1 Axis Chassis
- 1 Eltek Flatpak 1500 Rectifier System
- 1 Eltek Battery String
- 2 Cisco 4506 GigE Switches
- 1 Cisco 15454 ONS
- Tower/Shelter/Hut/Tower equipment, connections, conduit, wire and associated devices

6.7.3 I 290 HUT – OB I 290 @ I 90 94 / HALSTED

Items to be maintained:

- Shelter/hut, equipment, connections, conduit, wire and all associated devices
- 1 – Bard HVAC unit
- 4 – 4 ft florescent lights 3 bulbs 3each.
- 1 – IMUX 2000 Intellegent Multiplexer
- 1- fire extinguisher
- 1 – heat detector
- 1 Cisco Catalyst 3750 switch w/ 3 Gbics installed and one Ethernet.
- 4- fiber optic patch panels
- 1 open 7 ½ foot rack
- 1 traffic cabinet painted blue
- 1 Qmark wall heater

6.7.4 I 80 HUT – I 80 @ IL 394

Items to be maintained:

- Shelter/hut, equipment, connections, conduit, wire and all associated devices
- 3- Fiber panels
- 2 fire extinguishers
- Eaton Powerware UPS
- GE Zenith Controls Power transfer Switch
- Power command Alarm status indicator.
- APC rack
- Smoke and Fire detectors
- 4- 4 foot 2 tube florescent lights
- APEX surge arrestor
- exit sign with 2 emergency lights
- Bard MC3000 environment control unit

- Eaton powerware parallel cabinet
- First aid kit w/ eye wash.
- Highway Advisory Radio (HAR)

6.7.5 I 57 HUT – I 57 @ Parnell Ave

Items to be maintained:

- Shelter/hut, equipment and connections
- CCTV and Associated Equipment
- 1 - Cummins Power Generator, 1- GE Zenith Power Transfer Switch
- 1- Transtector power surge suppressor
- Highway Advisory Radio (HAR)
- IMUX Intelligent multiplexor
- 1- Meridian Chassis, 2- Meridian rs 232 control cards, 3 – meridian technologies video decoders
- 5 – Corning Fiber optic patch panels
- 2 - Cisco 4506 Catalyst Switches
- 2- iMpath Chassis, 16 – iMpath Endoders, 2- iMpath Fan Shelves
- 1 – IFS Chassis, 9 – IFS Video Receiver/ Data transmitter cards, 1 IFS power Supply
- 4 - 4 monitor Tote Vision Monitors
- 1 Leitch Video Distribution Amplifier Chassis, 16 - Leitch Amplifier Cards
- 1 Axis 16 Card Chassis W/ 4 - 4 channel 2400 blade cards
- 1 Axis 3 card Chassis w/ 2 - 6 channel cards Q7408
- 1- GarrettCom CGS14UH BGb converter switch, 2- GarrettCom Gbics installed
- 1 IFS Optical Ethernet transceiver
- 1- RuggedCom Switch
- 1- Middle Atlantic Products Power center 20 AMP

- 1 - 24 port BNC bulk Head chassis
- 1- Bard HVAC unit
- Smoke and Heat detectors
- 4 - 4 foot 2 bulb fluorescent light fixtures, 1 - 20 outlet power strip,1 Hubbell power strip

6.7.6 I 57 HUTS – I 57 @ I 80

Items to be maintained in both huts:

- Shelter/huts, equipment and connections, conduit, wire and all associated devices
- Generator, its transfer switch, alarm panel and appurtenances

  Refer to Article 8.0 to review scheduled maintenance

- CCTV and Associated Equipment

  Refer to IDOT Headquarters, Article 6.7.11

- 9- Marshall monitor banks Model V-R44P
- 2 - Middle Atlantic Power Products 15 amp power center
- 1- 13 in. Pelco monitor, 1 pelco push button video switch
- 1 - Optelicom Series 9989 CWDM, 2- Optelicom 9002 Universal card chassis
- 2- APC rack enclosures
- 4 Leitch 6800+ Video distribution Amplifiers 10 amplifiers cards installed in each.
- 4- Meridian Chassis, 36- Meridian Decoders, meridian Sr-1000 expansion unit and decoder
- 1- Bosch Allegiant Data Unit
- 1- Polyphaser surge suppressor
- 2 - Corning fiber optic patch panels
- 4- iMpath chassis, 4- iMpath Fan shelves, 40- iMpath Encoders cards

- 1- Cisco Node 15454 chassis, 2- Cisco 4506 switches
- Axis Chassis 3 card slots 2 used 6 channel encoders installed.
- Axis Chassis 12 card slots 10 used 4 channel encoders installed.
- 1- GarrettCom Gbic switch CSG14UH
- Heat and Smoke detectors
- 1- Bard HVAC unit
- 1- Transtector surge suppressor
- 1- ACME transformer
- 1- Eltec Flat Pack 48V power system
- 4 - 12 V Batteries
- 3- 20 outlet power strips

Equipment in second Hut

- Exit sign w/ Emergency lights
- 2- Bard HVAC units
- Bard MC3000 Lead/Lag Controller
- fire extinguishers
- Transtector APEX series Surge Arrestors
- 1 – GE Zenith Controls Transfer switch
- 2- Eaton Powerware UPS
- 1 Eaton Powerware Parallel Cabinet
- 1 APC rack enclosure
- 20 outlet power strip
- 1 - Cummings QuietSite generator, 1 – Power command Generator Status panel.
- 1 First aid Kit w/ eye wash
- Cork board, File cabinet 2 drawer, 4 foot Fluorescent lights

6.7.7 HILLSIDE RAMP HUT – IL 38 @ 12100 W Roosevelt Rd

Items to be maintained include:

- Shelter/hut, equipment and connections

- 1 PLC Workstation
- 1 NetCams Workstation
- Equipment connections
- 8 Operations cameras
- Communication equipment
- Various types of electrical power apparatus, control systems, alarm systems, radio systems, including microwave radio cables and microwave radio towers/poles, transformers, lighting systems, power wiring, circuit breakers/power supply systems, heating and ventilation systems, doors, locks, and all associated equipment and appurtenances
- Physical Building
- Radar traffic detection equipment, Traffic Detector on IL 38 ramp
- Generator, its transfer switch, alarm panel and appurtenances

  Refer to Article 8.0 to review scheduled maintenance

- CCTV and associated equipment, CCTV Monitoring

  Refer to IDOT Headquarters, Article 6.7.11

- All interconnecting cable, Ethernet, and fiber and microwave radio systems and communications

6.7.8 HILLSIDE TOWER/HUTS (3) – (Radio and Media Huts) I 294 @ I 88 (5250 W Harrison)

Items to be maintained include:

- Tower, shelter/huts, equipment and connections, conduit and wire and all associated devices
- Indoor/Outdoor Lighting and Control Equipment

- SONET System 2- Cisco ONS 15454 Chassis (refer to IDOT HQ, Article 6.7.11)

- CCTV and associated equipment (refer to IDOT Headquarters, Article 6.7.11)
- Hirschman Fiber Repeaters
- 3 cameras mounted on the tower for picture transmission to a central control and switching system at the IDOT Headquarters ComCenter
- 1 Cisco Gigabit network switch for GCM Network

  Model number WS-C3750G-12S-E, CAT0936Z321

- HVAC units
- Generator, its transfer switches, alarm panels and appurtenances

  Refer to Article 8.0 to review scheduled maintenance

- 5 APC rack Enclosures

- 4- iMpath Chassis w/ 2 decoders and 34 encoders and three fan shelves
- 2- Cisco 4506 switches
- 1- Tote Vision monitor bank Model LCD-400X4
- 12- Marshall monitor banks Model V-R44P
- 1- Pelco tube monitor 12 in, 1- Pelco video push button switcher
- 7- Leitch VDA chassis model 6800+, 1- Harris VDA Chassis Model 6800+
- 1- Vicon Nova video switcher
- 1- Meridian Technologies Chassis w/ 8-8 channel video mux cards
- 1- Optelicom Chassis w/4 – 8 channel video muxes, 1- Optelicom CWDM card
- 1- Harris dehydrator
- 1- Harris MegaStar 155 microwave radio W/ 4 OC-3 Tributary interface cards
- 4 –Marvair HVAC units, 2 –Marvair HVAC controllers
- 1- Power Conversion Products 48 V power system w/ 6- 48 v Rectifiers
- 1- IFS Video chassis w/ 3 Video transmitter and 1 Video receiver and data transmitter and 1 video receiver card
- 1- IFS Video Chassis w/ 7 video receiver and data transmitter cards
- 1- IP mobilenet radio
- 1- IMC media converter Chassis w/ 6 media converters installed
- 1- Garrettcom Gbic converter switch Model number CSG14UH w/1 Gbic installed
- 4-Marathon 12 volt Batteries M12V90
- Symmetricom Stratum GPS Clock
- 4 fire extinguisher one first aid Kit
- Chloride power protection UPS system, power command transfer switch Cummins
- Bosch Allegiant video matrix and Data Unit
- Allen Bradley contrologix 5000 for the RACS system With Long Haul Hirchmann

- 11 fluorescent light fixtures
- AXIS Chassis three card with one card installed Q7406 video encoder 6 ch
- Astron power supply
- 1- ITL alarm monitoring Cabinet
- 1 Eltek Flatpak 1500 Rectifier System,1 Eltek Battery String
- Gates and Locks

6.7.9 PLATO TOWER/BASE STATION – IL 47 @ McDonald Rd

Items to be maintained include:

- Tower, Shelter/hut, equipment, connections, conduit, wire and all associated devices
- Electrical service feeder cable, Distribution panels
- Doors, roofs, fencing, gates, locks
- Flashing beacons
- PS SCADA system repeater radio
- AEGIS alarm System
- Antenna and Antenna line
- Back-up battery
- Diagnostic board
- Indoor/Outdoor Lighting, GFIC Outlets and Control Equipment
- All other equipment and appurtenances
- Generator, its transfer switch, alarm panel and appurtenances

Refer to Article 8.0 to review scheduled maintenance

6.7.10 SCHAUMBURG TOWER/HUT – I 90 @ Roselle Rd

Items to be maintained include:

- Tower, shelter/hut, equipment, connections, conduit, wire and all associated devices
- SONET System (refer to IDOT Headquarters, Article 6.7.11)
- 3 CCTV and Associated Equipment (refer to IDOT Headquarters, Article 6.7.11)
- Hirschman Fiber Repeaters
- REVLAC communications equipment
- Indoor/Outdoor lighting and Control Equipment

- 2- Marvair HVAC units, 1- Marvair Controller
- 2- Harris MegaStar 155 Microwave radios 6 Ghz
- 1- Fiber optic patch Panel
- 1- Power Conversion Products 48 V power system, 6- Power Conversion Products 48 Volt rectifiers
- 4 – 12 V batteries MSB marathon M12V70
- 1- Federal Pacific Transformer Company transformer cat. # s2t37f
- 1- First aid Kit, 2- Fire Extinguishers, 1- Power strip 6 outlet
- Doors, roofs, Fencing, Gates, Locks, conduit, wire
- 1- Eaton Powerware UPS model PW91202000
- 1- Meridian Chassis, 1- Meridian 4 ch Video w/ control card, 2- meridian 4 ch Video cards w/ no control
- 1- IMC media converter stand alone unit.
- 1- Sierra Wireless modem Airlink Raven X
- 1- iMpath video decoder i1000
- 1 B/W COHU monitor
- 1- Tripplite power strip 20 outlets
- 1- Motorola Base Station
- 1- Andrew Dehydrator, 1- 4 gauge manifold
- 1- ITL inc. International Tower Lighting, LLC Alarm control box
- 1- Honeywell tower light controller
- Fencing, gates, locks

6.7.11 IDOT DISTRICT 1 HEADQUARTERS - 201 W. Center Ct. –Schaumburg

Items to be maintained include:

- Radio Monopole, equipment and connections
- Cabinets, power strips
- Hirschmann Fiber Repeaters
- 2 RACS Workstations, RACS Event Logger, RACS Data logger computer system
- SONET Maintenance Workstation
- NetCams Workstation, NetCams Server
- 3 REVLAC Work Stations, REVLAC Event Logger, REVLAC Alarm Monitor
- SWARMS Workstation
- Cisco Catalyst 2900 XL switch, Cisco Catalyst 2960 S Series Switch, Cisco 3826 switch, Cisco 3750 Switch, two Cisco 4506 switches
- 9-Impath chassis with 7 fan shelves, 60-iMpath Decoders and 20-Encoders
- 1 AVL Server, 4 AVL Workstations
- 2 Dell Laptops for PLC Programming 2- Dell 23 in Monitors, 2- Panasonic 7in monitors
- 1 HP Laptop for PLC Programming
- 1 HP or Compaq CPU and Monitor for MCHD Claims
- 6 Dispatch Consoles with auto-rise function
- 2 Dispatch Supervisory Consoles with auto-rise function
- 3 Supervisory Control Panels (for REVLAC)
- Overhead Lighting for Dispatch and Supervisory Consoles
- 3- 42 in. Phillips LCD monitors, 12- 42 in. LG LCD monitors, 6- 46 in. NEC LCD monitors and appurtenances
- Generator and its transfer switches, alarm panels and appurtenances
- UPS, its Transfer Switch, and Station Battery
- 12 VDC Station Battery and charger, RF Transmitter
- Outdoor Lighting and its control equipment
- Underground Cable, Conduits and GFIC outlets for EMC maintained equipment
- Alarm Enunciator panel
- 2-REVLAC alarm summary computers, 1 – RACS alarm summary computer
- 4-Marshall monitors VR82DP2C, 12-Marshall monitors V-R44P, 2- 8.4 in. Marshall monitors VR84DP2C
- LifeSize conference room Video conferencing system
- 8-TOTE Vision LCD-400X4
- 8- LINAK Desk w/ controllers
- 4-Fiber optic Patch Panels
- APC racks, 3- open racks
- AAXION media converter, 6-Verint nextiva decoders
- EMCMS SUN Microsystems SunFire V480, SUN Microsystems StorEdge L7 tape backup unit, 7-EMCMS work station computers
- two Cisco micro switches 10/100 1700
- Compacq Prolient ML370 EMCMS INFO server and app server
- NetCam work station

- Cisco ONS 15454
- 12 Video Distribution Amplifiers LEITCH
- two AXIS chassis with 20 (240Q blades 4 channel)
- Allegiant Video Matrix with Three Bosch controllers
- VICON video switch
- Optelecom Chassis with 4 eight channel video mux, Optelecom 9989 CWDM
- power conversion product 48V power system with three 48 volt rectifiers with 4 12 12 volt Marathon batteries M12V40F
- 4 Linksys 24 port switches EF4124
- 1- IMC media converter chassis w/ 3 media converters installed

HVAC for ComCenter, Equipment Room, and one Emergency Elevator

Trane Air Conditioning model SWUA-2006-MAV, Type 671-0530-40A, and Serial no. L85B26255, compressor motor, fan motor and wall thermostat.

Lighting SCADA Central System

One server and one client computers, monitors, OS, GUI software, SCADA Application tool box (software), FIU cabinet, SCADA CPU's, lighting monitor (night-lite),dedicated lines and dial-up modems, Comtegras, radio power supplies and back-up batteries, rocket port, printers, radio concentrators, photo-cell, night light, portable UPS and all other equipment and appurtenances

Pump Station SCADA Central System

AB RSview (Development) server computer (hardware & software), dedicated lines and dial-up modems, computer monitor, printer, radio base station equipment, rocketport, muti-serial digi-8 board and cables, 3Com 16 port switch, Windows Operating systems, Hirschmann fiber repeaters, and all other equipment and appurtenances.

Dynamic Message Remote System

(refer to Surveillance System for Maintenance Requirements)

One (1) remote status terminal, monitor, video controller including firmware (software), one (1) remote terminal with 486 CPU, modems, utilities services (including all taps, terminations, conduits, and cabling interconnect), and all other equipment and appurtenances

SONET System

The SONET system network is the video and data communication links between the IDOT District 1 Headquarters ComCenter, Traffic Systems Center and other facilities and RACS and REVLAC equipment. The SONET system network is comprised of the digital microwave radio system 6 GHz between Schaumburg Headquarters and the Nordic tower, 11 GHz between the Nordic repeater tower and the Hillside tower, and 6 GHz between the Schaumburg tower, ISP Des Plaines repeater tower and REVLAC Building E at 4755 Wilson Avenue in Chicago.

ATMS Workstations (refer to Surveillance System for Maintenance Requirements)

- 3 360 Chameleon Workstations
- 3 18" LCD Monitors and Ethernet cabling

EMCMS (Electrical Maintenance Contract Management System)

- 1 Database server with Sun Solaris OS
- 1 Application server with Windows 2000 OS
- 1 Infrastructure server with Windows 2000 OS
- 1 Veritas 4.5 Net backup drive unit
- 1 Cisco Router, (4) Cisco Switch
- 1 56 K Modem
- 30 Compaq Desk Pro work stations
- 3 HP JetDirect 500x print server
- 2 HP Laser Jet Printer
- 2 Epson LQ-2090 Dot Matrix Printer
- 16 KVM Switches

GCM Gateway Network

The GCM Gateway Network is the equipment/server which posts a website with travel information for the Gary, Indiana; Chicago, Illinois; and Milwaukee, Wisconsin corridor area. Many travel screens are available including real-time maps of congestion and construction data. Equipment to maintain for the Cisco gigabit network includes a D1 switch model WS-C3750G-24TS-E, CAT1032ZJ19, and D1 router model CISCO3825, FCZ121174A4.

CCTV and Associated Equipment

The Contractor shall maintain the CCTV and associated equipment including cameras, interconnecting fiber and cable, control and switching equipment, monitors, interfaces to communications network equipment including; video transceivers, codecs, video transmission and distribution equipment, switching equipment, video servers, video work stations, wireless links, fiber optic patch panels, fiber jumpers, connections, etc.

The contractor shall backup all internal CCTV titling on an excel spreadsheet, the spreadsheet shall be submitted to the Engineer by September 2nd on CD.

Gig-E Network

The Gig-E network is an Ethernet path which runs on the SONET system.

ComCenter REVLAC Control System

The REVLAC Control System is a network of five sets of Allen Bradley PLC-5/60 and PLC-5/80 Programmable Logic Controllers (PLC). Each Remote Control Building and the ComCenter utilizes a redundant processor in their PLC system. Each system coordinates the communications and control of that specific location. Normally all five units work as an interconnected system (network) through the communications links; however, each system may operate as a stand-alone unit for its ramp or operate the entire system in the event of a loss of communication to/from Schaumburg.

Monopole maintenance is required of the Contractor at the IDOT Headquarters in Schaumburg. Tower and monopole maintenance refers to the brackets and supports for traffic monitoring cameras and the coax for camera and camera lowering devices, dehydrators and dehydrator pressure lines, wave guides, antennas and antenna mounts.

6.7.12 FOSTER TOWER, HUT, AND BASE STATION - I-94 @ Foster Ave

Items to be maintained include:

- Tower, shelter/hut, equipment, connections, doors, roofs, fencing, gates, locks, conduit, wire and all associated devices.
- Indoor/Outdoor Lighting and Control Equipment
- Generator, its transfer switches, alarm panels and appurtenances

Refer to Article 8.0, to review scheduled maintenance

- Transfer switch
- Electrical service feeder cable, Distribution panels
- Emergency Lighting Fixtures with battery back-up
- HVAC units
- Smoke Detector systems
- Flashing beacons
- PS SCADA system repeater radio
- AEGIS alarm System
- Antenna and Antenna line
- Back-up battery
- Diagnostic board
- All other equipment and appurtenances

6.7.13 NORDIC TOWER/HUT – I-355 @ Nordic Rd

Items to be maintained include:

- Tower, Shelter/hut, equipment, connections, conduit, wire and all associated devices
- SONET System (refer to IDOT Headquarters, Article 6.7.11)
- 3 CCTV and Associated Equipment (refer to IDOT Headquarters, Article 6.7.11)
- REVLAC communications equipment
- Indoor/Outdoor lighting and Control Equipment
- 1- Liebert Nfinity UPS system
- 2- Marvair Airxcel inc. HVAC units, 1- Marvair controller
- 1- Honeywell tower light controller
- 1- GE Zenith Controls automatic transfer switch model MX150
- 1- Pelco master power supply
- 2- Harris Megastar 155 Microwave radios 6Ghz and 11Ghz frequencies

  1- Cummins Generator model DGDA-5635725 its transfer switch, alarm panel and appurtenances. Refer to Article 8.0 to review scheduled maintenance

- 1- PowerCommand enunciator

- 3- Corning fiber optic patch panels
- 4- Meridian Chassis, 17- Meridian Video decoders
- 1- Hubbell Power strip
- 1- Bosch Allegiant video system, 1- Bosch Allegiant Data Unit
- 1- Optelicom 9002 Card Chassis,1- Optelicom CWDM
- 3- Optelicom 8 channel video Mux cards
- 1- sierravideosystems Video distribution amplifier Chassis
- 1 – Rack mounted Power Strip
- 5- Marshall Monitors model number V-R44P
- 1- Eltek Flatpack Power system, 1- Eltek Smartpack w/ 6 - 48V rectifiers
- 4- PowerSafe 12V batteries
- 1- Harris Dehydrator, 1- Pressure Manifold 4 gauge clusters
- 1- ITL, LLC International Tower Lighting Control alarm reporting device
- 1- IMUX 2000 intelligent Multiplexer
- 1- Omnitron Systems Technology inc. FlexPoint T1/E1 Copper to fiber inverter
- 1- US robotics Modem
- 2- Fire Extinguishers, 1- First aid kit
- 1- Cutler Hammer Dry type Distribution Transformer
- UPS and Station Battery
- Gates and Locks
- Chain Link Fence

6.7.14 TRAFFIC SYSTEMS CENTER - Oak Park – 445 Harrison St.

Items to be maintained include:

- 1 -DigiMerge 16 Channel DVR
- Altronix 28 VAC power supply

- IMC Media Converter/8 Chassis / 3 media converters installed
- Aaxion Media Converter Ethernet to fiber
- Cable Electronics Composite A/V distribution amplifier model AV400
- 4 - Corning 96 fiber patch panels
- Cisco 2950 catalyst switch, Cisco 4506 Switches, Cisco 15454 ONS node
- Eltek 48V power system w/ 2- 48v rectifiers
- Powersafe 12v batteries model 12V125F
- 6- Tote Vision 4 bank monitors model LCD400x4
- 9- Leitch Video distribution Amplifiers
- iMpath Chassis W/ 12 Decoders installed 2 channel
- Optelicom Chassis w/ 12 video/data muxes and 2 CWDM installed
- Bosch Allegiant video matrix switch, Bosch joystick controller
- APC rack enclosures
- 20 outlet power strips, 8 outlet power strips
- Meridian Chassis w/ various data and video cards installed
- 1 Christie Video Computer
- APC 1000AH UPS
- 2 (360 Workstations)
- 3-46" NEC Display
- 1 Pioneer display
- LifeSize conference room Video conferencing system

- Christy FRC 5000 Video Wall Controller
- 6 NEC 46" LCD Monitors Mounted and configured as video wall
- UPS, its Transfer Switch, and Station Battery
- SmartNet
- Equipment and connections
- Gig-E Equipment
- 8 CCTV and Associated Security Equipment
- Indoor and Outdoor Lighting and its control equipment
- Underground Cable, Conduits and GFIC outlets for EMC maintained equipment
- Generator and its transfer switches, alarm panels and appurtenances

Refer to Article 8.0 to review scheduled maintenance

Lighting SCADA Equipment

- Windows NT client computer
- Monitor
- Multi Tech DED line modem
- Portable UPS

- GUI Software
- Engineering Processors
- Software as applicable
- UPS and all other appurtenances

EMCMS System Equipment

- 1 Compaq Development Work Station with Windows 2000 Professional OS

  With Oracle Application Server, Oracle Development Suite, and Microsoft Office

- 10 Compaq Desk Pro or equivalent work station
- HP Jet Direct 500x Print Server
- EPSON LQ-2090 or equivalent Dot Matrix printers
- Cisco 1700 or equivalent Router
- Cisco 1548 or equivalent Switch
- 56 K Modem
- 24 port interface patch panel
- 8 KVM Switches
- 1 HP Jet Direct Print Server

Pump Station SCADA Equipment

- Dell 2000 client computer
- Monitor
- 2 Engineering processors
- Windows Operating systems
- Software as applicable
- UPS all other equipment and appurtenances

- AEGIS, 1 Silent Knight Digital alarm receiver Model 9000 and 1 Printer

GCM Gateway Network/SmartNet

Equipment to maintain for the Cisco gigabit network includes a TSC switch model WS-C3750G-24TS-E, #CAT1032ZJ4S, D1 router model CISCO3825, #FCZ122670VP, Cisco Paetec router model 7204VXR, #74229976, one switch at TSC Cisco 3550, WS-C3550-48-SMI, SN:CAT0833Y2VC and one switch at Bld "E" Cisco 3560, WS-C3560-24TS-S, SN: FDO1241Z3GE.

Monopole maintenance is required of the Contractor at the Traffic Systems Center. Tower and monopole maintenance refers to the brackets and supports for traffic monitoring cameras and the coax for camera and camera lowering devices, dehydrators and dehydrator pressure lines, wave guides, antennas and antenna mounts.

6.7.15 NORMAL HUT @ 26th and NORMAL

Items to be maintained include:

- Shelter/hut, equipment, connections, conduit, wire and all associated devices
- 3 RuggedComm switches RGS2100
- Bard Climate control Solutions MC 3000, 2- Bard HVAC units
- Cummins Quiet Power II Generator, ATS GE Zenith Controls Transfer switch
- 2-Transtector APEX series Surge arrestors
- telco systems 2 card racks
- omnitron systems t1-e1 data converter copper to fiber
- CISCO 4506 switches, CISCO 15454 SONET Chassis
- Eltek 48 V power system
- 3 iMpath Video Encoders Racks
- 8-LCD400x4 video monitors
- 3-AXIS chassis
- IFS Decoders chassis
- 2-Leitch video distribution amplifier chassis
- Harris video distribution amplifier chassis
- 2 – Meridian chassis racks Decoders, 1- Meridian fan shelf
- Bosch camera control box
- 3-impath fan shelf units
- 1-Garrettcom Gb converter switch, 2- Garrettcom Gbics
- Allen Bradley Building automation control
- 9- corning fiber optic patch panels
- Eaton UPS powerware, 1- ups bypasswitch
- Heat and smoke detectors
- Notifier SFP2402
- 4-4 ft 2 bulb florescent fixtures,1 first aid kit w/ eye wash

6.7.16 I 94 HUT – I 90 94 @ STATE ST / 66th ST

Items to be maintained include:

- Shelter/hut, equipment, connections, conduit, wire and all associated devices
- 1 SCADA Cabinet
- Allen Bradley ControLogix 5555 building automation system
- AB 10 Slot Chassis, Ethernet Card, Prosoft Modbus Card, 4 AB Digital Input Cards
- 2 AB Digital Output Cards, US Robotics Modem
- 1 Entry Key Switch
- Shelter/Hut and all associated equipment
- Notifier SFP-2402
- 1 – Exit sign W/ emergency lights
- GE Zenith controls Automatic transfer Switch Entelli switch 250
- Lighting, wiring and conduits
- Transtector APEX series Surge Suppressor
- Highway Advisory radio (HAR)
- 20 outlet power strip
- Eaton Powerware UPS, UPS bypass switch
- Bard HVAC system
- Bard controller MC3000
- Heat and smoke detectors
- 1 generator Disconnect
- 1 Utility Disconnect
- 5 Corning fiber optic patch panels
- file cabinet 2 drawer
- Cummins Power Generator Quiet site II DSFAE - 7278489

6.7.17 I 55 HUT @ WEIGH STATION (expected to come on state maintenance March, 2013)

Items to be maintained include:

- Cummins Generator/ with power command transfer switch w/ Annunicator
- Cisco 4506 switches
- IFS Video card Chassis w/ 4 video mux cards
- Leibert UPS power system
- fiber optic patch panels
- Bard HVAC units w/ 1 Bard MC3000 controller
- Transector Chassis W/ CWDM and Video mux cards
- 1-ACData Surge suppressor
- Stand alone Transector media converter

6.8 ROUTINE MAINTENANCE OF THE COMMUNICATIONS NETWORK

The IDOT Communications Network is the physical infrastructure between locations and equipment throughout District 1. The Contractor shall maintain the equipment, physical fiber optic and copper cabling, terminations, connections, interconnect, patch panels, fusion splices, splice boxes, raceways, enclosures, cabinets (examples include I 80 WB @ LaGrange and I 80 WB @ I 355), handholes, tracer cables, cable distribution equipment & accessories, video, and data for continued operation of all systems.

Each IDOT Expressway or Highway shall be counted as one location for payment, as specified in Section 3. All other communication infrastructure equipment shall be incidental to these pay items.

6.8.1 FIBER OPTIC NETWORK

The fiber optic network consists of fiber optic nodes, located along the expressway system and at other locations in District 1 for the transmission of video, data, and control signals around District 1 and to provide interconnection points to other governmental agencies, through nodal buildings and nodal cabinets. The Contractor shall maintain, under routine maintenance, fiber optic cables at each node, patch panels, fusion splices, cabinets, nodal buildings, raceway systems, and splice enclosures of the fiber optic interconnect cables located at all remote facilities and the IDOT Headquarters. Drawings showing the various nodes and the fiber optic interconnects will be made available to the prospective bidders and to the Contractor upon request. Also included for maintenance is the fiber cabinet and connections at I-290 west of Wolf Rd at PS 20.

Network Performance Management

Contractor shall furnish and install Network Performance Management server and software on the IDOT District One VDS network. The Network Performance Management software, NPM, and server shall be installed at the Electrical Maintenance Field Office. Contractor shall connect and configure the server to the VDS node at the Traffic Systems Center. The NPM software shall have the following properties minimum;

Automated Network Device Discovery

- Schedule network scans, automatically discover new devices on your network, and begin monitoring them immediately
- Ensure that your network devices are imported into the NPM monitoring database, regardless of vendor

Multi-Vendor Device Support

- Monitor performance statistics from any SNMP enabled device regardless of vendor.
- Software shall provide Out-of-the-box support for Impath, Rugged com, Optelecom, Cisco, NEMA controllers, Moxa, and many other vendors and operating systems
- Monitor disk space utilization for Windows®, Sun®, Novell®, and other devices that support the host resource MIB
- Have the ability to monitor availability and performance for any router, switch, firewall, VPN concentrator, wireless access point, and any other device which supports standard protocols

Create Custom Network Mapping

- Contractor shall create custom network maps for each switch, router, and Vlan detected at each nodal building location on the network. Each map shall allow the Engineer the ability to drill down to the last field device deployed along the interstate.
- Automatically discover and display connections between devices and display on network maps.
- The software shall provide the ability to create custom nested network maps remotely from your desktop quickly and easily, with drag and drop simplicity.
- View the network logically by geographic location and drill into more fine views

Network Availability and Performance Monitoring

- Software shall monitor network performance indicators, such as disk space, CPU load, memory utilization, bandwidth utilization, packet loss, latency, errors, discards, and quality of service for any SNMP-enabled devices
- Conduct detailed performance monitoring and analysis of all network elements
- User shall be able to place your pointer over a network object to see additional details about the object, including status, IP address, MAC address, machine type, interface, percent loss, etc…
- User shall be able to customize and view graphs, tables, maps, and custom lists which detail vital statistics. The Contractor shall create graphs, tables, maps, and custom lists as directed by the Engineer.

Centralized Message Center

- Software shall allow for viewing system log data, traps, events, and alerts in a consolidated view.
- Software shall receive, process, forward, and send system log and SNMP trap messages.
- Contractor shall set up alerts based on system log and SNMP trap messages. Alerts shall be set up to alert the Engineer and staff via e-mail, network map, and mobile device.

Intelligent Network Alerting

- Contractor shall setup and define device dependencies to ensure you don't receive unnecessary alerts and prevent floods of useless messages.
- Contractor shall configure network alerts for correlated events and sustained conditions.
- Escalate network alerts automatically through a variety of alert delivery methods.

Dynamic Service Groups

- Software shall be able to organize devices, interfaces, servers, and volumes into groups and roll up service-level status.
- Software shall allow for grouping of objects by categories, such as location or device type, so you can quickly determine the impact of network issues.
- Software shall pair redundant links to quickly determine if one is up or both are down.

Customizable Performance and Availability Reports

- Contractor shall be able to create performance and availability reports using out-of-the box and community-generated templates.
- Software shall be flexible and robust to allow for customize built-in network reports with a few mouse clicks.
- Shall be able to automate report notifications for the Engineer and staff to provide the relevant data.

Types of categories NPM software can report on include but not limited to;

- Availability
- Current Interface Status
- Current Node Status
- Current Volume Status
- Daily Node Availability
- Events
- Historical Cisco® Buffer Miss Reports
- Historical CPU and Memory Reports
- Historical Response Time Reports
- Historical Traffic Reports
- Historical VMware® Reports
- Historical Volume Usage Reports
- Inventory
- Wireless Reports

Integrated Wireless Polling

- Software shall monitor thick or autonomous access points that support the standard 802.11 MIB including Aruba®, Cisco®, and Meru Networks® wireless controllers and devices
- Software shall monitor thin access points and their corresponding client details including client names, signal strengths, IP addresses, MAC addresses, and an Rx/Tx summary
- Software shall provide access to over 15 out-of-the-box wireless reports, including wireless availability, average and peak number of clients, and rogue access points over varying time frames

Custom MIB Poller

- Software shall create, import, or export a custom MIB poller to monitor any SNMP-enabled device
- Software shall collect detailed information stored in device MIB table
- Software shall monitor virtually any statistic available on networked devices
- NPM shall include MIB support that includes a MIB database that covers the vast majority of common network devices.

VSAN Monitoring and Reporting

- Software shall monitor real-time and historical VSAN health statistics including packets per second, response time, and packet loss
- Software shall provide fibre channel monitoring details for connectivity units, sensor details and WWN's for Cisco MDS, Brocade®, and McData® devices
- Software shall have the ability to create alerts and reports to share VSAN health.

Cisco® Unified Computing System (UCS) Support

- Monitor virtual interface cards, fabric interconnects, chassis and blade servers, and rack-mount servers.

Software shall allow for viewing from any of the most popular mobile web browsers including android, blackberry or apple.

Contractor shall furnish and install a windows server with the following minimum requirements;

Dual or Quad Core Processor 3GHz or better
8 GB RAM
2 x 146GB 15k Hard Drives (RAID 1/Mirrored Settings)
1GBE NIC
Windows 2008 Server R2

Contractor shall provide the Department training for up to three days and include up to 10 participants. Training shall be done at the Traffic Systems Center. Training shall include setup, customization, and optimization of the NPM software. Training shall be provided by an authorized partner of the NPM software provider.

Contractor shall supply a licensed software package capable of pulling in and monitoring more than 2000 switch ports. Bundling of free ware software packages will not be acceptable.

Contractor shall supply the Department with software operational support (maintenance) for the NPM software for each contract year. Software maintenance shall include free access to any software updates, upgrades, and 24x7 support from the vendor. The NPM software shall be equal to or exceed SolarWinds Orion Network Performance Management Software.

Network Maintenance and Documentation

The Contractor shall maintain all Network Hardware, Telecommunication equipment and documentation under this Contract including but not limited to SONET's, Switches, Routers, Hubs, GigE, GBIC's, Chassis, Power supplies, Enclosures and all associated hardware. The contractor shall backup equipment software and configuration and maintain all licenses at all locations, this work shall be completed by September 1st, 2013. The Contractor shall update all record drawings to reflect existing network operations. A copy of existing networks will be provided upon request. The Contractor shall assure continued operation of the network systems including whenever equipment is to be added to keep existing networks running smoothly. The Contractor shall troubleshoot and resolve problems, Network equipment requires software upgrades and in the event of failure, replacement. Traffic operation needs require Network modifications, the Contractor shall assure equipment to be added to the networks does not potentially impact the system. The Contractor shall advise and provide recommendations in a timely manner to the Engineer of potential conflicts with IP addresses and equipment connections to avoid disruption in service and assure continued operations.

The Contractor shall maintain and document all new equipment information as described below and any changes of terminations/ports of fiber and Ethernet connection at all locations. Existing network diagrams for nodes, huts, cabinets or other locations will be provided, all locations specified herein this Contract shall be updated between January 1, 2013 and December 31, 2013. The Contractor shall provide 50% updated record drawings in June with the remainder by end of December. The Engineer will provide an Excel spreadsheet with fiber assignments and IP addresses for the contractor to maintain and update. The Contractor shall furnish a progress report each month in the monthly routine work submittal book.

- **Network Identification**

  Servers|Workstations|Routers|Switches|Hubs|Transceivers,etc.

  IP Addresses

  NetBIOS/Hostnames

  MAC Addresses

  Description

  Installed Software System Inventory

  Make/Model/Serial Numbers

- **Network Topology**

  Diagrams| Network Maps

  Physical and Logical Diagrams

  Layer 3 Networking Diagrams

All diagrams shall be on a CAD format.

6.8.2 REVLAC COMMUNICATIONS

The REVLAC communications scheme is triple redundant to provide prompt and continuous communications in the event of a communications device failure. The three modes of communications are: fiber, microwave radio and telephone lines.

The primary communications is conducted on the fiber system. Primary communications are provided through fiber extensions to the fiber backbone and another fiber backbone involving Illinois Tollway fiber.

The secondary communications system is the microwave radio network. The microwave radio system interconnects directly and indirectly all control nodes of the REVLAC system. The primary function of the microwave radio system is to provide reliable high-speed data transmission between all locations. The bandwidth of the microwave radio allows transmission of video from any site to any site by means of an elaborate switching network.

The third means of communications is a dial-up modem system via the telephone lines. In the event of a fiber link failure, the microwave radio system will pick up the communications traffic and the telephone modem connections will be set up as a backup communication mode.

The REVLAC building locations A, C, D, and E communicate with the IDOT ComCenter. The communications includes video (one way) and data (bi-directional) which is provided by a digital microwave radio link, repeated at the Illinois State Police Headquarters in Des Plaines to control building

E. All microwave radio paths are dual channel allowing redundant data paths, selected automatically, and can provide two real time video signals simultaneously from any site to any site.

The systems consist of 23 GHz analog links between the control buildings, 6 GHz digital links from building E to the IDOT Headquarters Schaumburg tower, dish antennas, coaxial cables, waveguides, power supplies, modulators, RF Heads, State owned radio towers, a network monitoring system, and a vast array of microwave radio technology to provide the desired service.

6.8.3 REVLAC CONTROL SYSTEM

The REVLAC Control System is a network of five sets of Allen Bradley PLC-5/60 and PLC-5/80 Programmable Logic Controllers (PLC). Each Remote Control Building and ComCenter utilizes a redundant processor in their PLC system. Each system coordinates the communications and control of that specific location. Normally all five units work as an interconnected system (network) through the communications links; however, each system may operate as a stand-alone unit for its ramp or operate the entire system in the event of a loss of communication to/from Schaumburg.

6.8.4 REVLAC TELEPHONE SYSTEM

Each nodal site has four 9600-baud smart modems interconnected between the sites. Each modem is dedicated and programmed for speed dial to another node. In the event of microwave radio failure, the modems interconnect and remain connected for the duration of path loss.

6.8.5 RACS CONTROL SYSTEM

The RACS Control System is a network of Allen Bradley Control Logix 5000 series Programmable Logic Controllers (PLC). Each Building (Hut and Ramp) utilize a separate redundant CPU in its PLC system and the user interface software in the workstations in the IDOT ComCenter facilitate the remote control of the system. Each system coordinates the communications and control of that specific location. Normally all units work as an interconnected system (network) through the communications link; however, each system may operate as a stand-alone unit for its ramp or operate the entire system in the event of a loss of communication to/from the IDOT Headquarters in Schaumburg.

6.8.6 SONET SYSTEM

The SONET system network is a basic communications infrastructure which incorporates Microwave Radio, Fiber Optic, Ethernet and SONET equipment to accept, transmit, and receive broadband digital data in a SONET ring that connects the Hillside RACS building site (5300 W. Harrison St., Hillside) to the District 1 Headquarters Schaumburg ComCenter. The connection is accomplished via microwave radio through an intermediate hop at the Nordic site and via a fiber optic link through fiber of the Illinois State Toll Highway Authority System.

6.8.7 CONTRACTOR WIRED COMMUNICATIONS

The Contractor shall have the following wired telephone and data communications lines installed and fully operable by January 1, 2013:

- One (1) high speed T-1 data line between IDOT and the Dispatch Center for the Lighting and Pump Station SCADA and EMCMS connections
- One (1) dedicated “hot-line” (PLNC) between the Dispatch Center and the ComCenter
- A minimum of eight (8) incoming voice lines to the Dispatch Center available to police agencies, etc. (The Contractor shall not utilize an automated voice-answering or voice mail option for the Dispatch Center.)
- Minimum of one (1) high speed data line from the nearest EMCMS node to the EMC Contract Office for the EMCMS terminals.
- One (1) telephone lines (DID or POTS) at the Dispatch Center for dial-up access to the Pump Station’s AEGIS equipment
- One (1) telephone line (DID or POTS) at the Dispatch Center for dial-up access to the Lighting SCADA

- Three (3) telephone lines (DID or POTS) at the Dispatch Center for dial-up access to the Pump Station SCADA

- One (1) telephone line (DID or POTS) at the Dispatch Center for dial-up access from the PS SCADA field processor to the PS SCADA

- Seven (7) telephone lines, (2 lines to monitor Econolite signals, 2 lines to monitor Eagle signals and 3 lines for polling the traffic signals) as applicable for Traffic Signal System, refer to Article 10.0

- Minimum one (1) ISDN line for video monitoring of the traffic signal intersections

- One (1) high speed data line between the qualified vendor facility and TSC for maintenance and support of ATMS

- Other telephone lines as necessary for Contractor communications, and Plan Record System, or other Systems as needed

The Contractor shall provide to the Engineer for approval, a proposed schedule stating when each phone line is to be installed. After installation the Contractor shall submit to the Engineer the list of the type of telephone lines, their outlet locations, applicable telephone numbers, and a contact person and telephone number for reporting problems. The Contractor is responsible under routine maintenance for installation charges, monthly billing, number change charges, and any other related telephone charges.

6.8.8 CONTRACTOR WIRELESS COMMUNICATIONS

The Contractor shall have in place, a district-wide digital wireless field communications system with a central base established at the Contractor's EMC Dispatch Center or other location as approved by the Engineer to assure a consistent and reliable transmit and receive coverage throughout the entire 4400 square mile geographic area of District 1.

To facilitate Contractor communications, timely transmission of data, inspection of work by Department personnel, and transmittal of photos of damage to state property, individual units

shall be assigned as described herein. All Contractor patrolmen, dedicated personnel positions, field supervisory or management personnel, subcontractor supervisory personnel, and forty (40) Department EMC supervisory field inspection personnel and communications center personnel shall be provided units. Each communication unit and its accessory equipment shall be new, and shall be tested and approved by the Engineer prior to purchase or lease by the Contractor. Each unit shall have direct talk, unlimited voice, unlimited text, a minimum 2.0 megapixel camera, and email service for photo transmission and labeling capability. (Refer to Article 4.9.5 for further information regarding photo documentation of motorist caused damage and Engineer approved method of photo transmission.)

Cigarette lighter charger/adapters, AC recharging units in the form of cords, largest Lithium-Ion battery available, separate carry case or protector (unless flip-top model), belt carry attachment, and thirty (30) hands-free receivers equal or better than Motorola H790, meeting all requirements of state laws and designed for the approved model, shall be provided for Department units. As these units are used for field work, it may be necessary for the Contractor to replace up to five inspector units or receivers, and furnish additional new parts, holsters, chargers, adapters or batteries to all units, as necessary, during each contract year. Any necessary cables, CD with PC compatible software for the programming of numbers, name change software, and other programmable functions, and device necessary for the copying of SIMS cards, shall also be furnished to the Engineer.

Following the award of the Contract the Contractor shall provide catalog cuts of the proposed unit(s). The Engineer shall agree with the Contractor on two proposed sample units for a one week trial. When a unit is found acceptable the Engineer shall notify the Contractor so the delivery of the new units will meet a delivery date. If a sample unit is found acceptable the Engineer shall notify the Contractor so the delivery of the new units will meet the specified dates.

The list of proposed call numbers shall be furnished to the Engineer for approval and assignment by December 1, 2012. The units shall be purchased or leased, and units delivered, ready for programming, with applicable software and cables, by December 21, 2012.

The Contractor is responsible under routine maintenance for all communication units, the monthly billing, email service provider, access and photo transmission fees, and other provider assistance as necessary for MCHD repair photo transmissions, data transfers and proper operation of the communication units.

6.8.9 EMAIL COMMUNICATIONS

The Contract Project Manager, all System Managers, Working Foreman as specified herein, Specialists, Administration Manager and assistant, Dispatch Supervisor, and other personnel as requested by the Engineer shall have an email address and access to scan email to the Department. The email service used by the Contractor shall not be a service that attaches advertising to email. By the start of the Contract the Contractor shall provide to the Engineer a list of all Contractor personnel with email addresses.

6.8.10 FACSIMILE COMMUNICATIONS

The Contractor shall have and maintain plain paper facsimile (fax) equipment at the headquarters, EMC Office, and EMC Dispatch Center, for the purpose of rapid dissemination of written information not in email form.

6.8.11 ELECTRICAL MAINTENANCE CONTRACT MANAGEMENT SYSTEM (EMCMS)

General Requirements

Successful performance of the Electrical Maintenance Contract is highly dependent upon an emergency call-out database, electrical systems inventories, and a timely, accurate flow of information regarding contract work and billing. The Electrical Maintenance Contract Management System (EMCMS), which facilitates the emergency call-out database and these functions, consists of hardware, software, and an information database to support these Contract needs. The Contractor shall maintain the existing established Department EMCMS, which shall continue into this Contract to assure operational continuity. No disruption of the instantaneously-available emergency call-out location master information to the District 1 ComCenter will be permitted.

The Contractor is required to have the complete EMCMS, including full data access through screens/reports, communication links, and all required equipment as specified elsewhere herein, in place at the EMC Office and EMC Dispatch Center for approval by the Engineer by December 27, 2012. The EMCMS entry documentation shall begin as of midnight January 1, 2013. The Contractor is allowed until January 10, 2013 to complete entry of all patrol schedules for all systems.

All items necessary to assure a functional operating system, including materials such as paper, ribbons, etc., and labor for installation/removal of equipment shall be the responsibility of the Contactor. In addition the Contractor shall provide proper office space and access to system equipment at the approved Contractor facilities.

The Contractor Administrative Manager shall respond to Department maintenance requests within one hour, providing the estimated time of repair, programming correction, or service restoration.

All costs for the EMCMS system operation, vendor maintenance agreements, programming hours, and equipment warranties, except for the existing IDOT telephone lines and power provided by the Department, shall be borne by the Contractor and included in the routine maintenance bid prices. Refer to Article 6.18 herein.

Equipment Requirements

The Contractor is responsible for establishing EMCMS communications between the Contractor's facilities and the central computer at District 1 Headquarters and for providing terminals and other peripherals for Contractor access to the system.

EMCMS Disaster Recovery:

The Contractor shall provide a plan for disaster recovery a standby EMCMS servers and Sun OS/Oracle Database. The plan shall include system installation and configuration access to the IDOT EMCMS within 4 hours for a complete system recovery. All hardware, software and development will be paid under non-routine agreed price work .A testing procedure shall be part of the plan and shall be implemented tested and verified for operation. The recovery system shall be stored at TSC.

For Contractor's EMC Office:

- Minimum of two (2) shared EMCMS laser printers, capable of printing 11" x 17" size paper and one (1) workstation for each Electrical System Manager, the Administration Manager and the Administrative Assistant

- Minimum of one (1) shared EMCMS laser printer, one (1) workstation for the EMC Field Office Desk for IDOT personnel use

For Contractor's EMC Dispatch Center:

- Minimum of one (1) shared EMCMS laser printer, capable of printing 11" x 17" size paper, and three (3) workstations

6.9 CONTRACTOR IMMEDIATE RESPONSE AND REPAIR

6.9.1 GENERAL REQUIREMENTS

The Contractor is required to use as many personnel as necessary or have approved sub-contractor on-call personnel to respond to trouble calls within one (1) hour of notification and service restoration within four (4) hours or less, unless Engineer approval of a delay is granted. Permanent repairs shall be completed within twenty-four (24) hours. Tickets are required for all maintenance items.

6.9.2 REVLAC and RACS

When equipment failures occur on REVLAC or RACS equipment or other exposed electrical cables/equipment due to unforeseen events, winter weather, motorist caused damage, or from any cause whatsoever and which affect the traveling public, Contractor personnel are required to immediately

respond to the scene, shut-down or safely isolate any potentially hazardous electrical condition, clear the pavement of any equipment debris resulting from the damage, take corrective measures to assure the safety of the motoring public, and coordinate the efforts to restore normal traffic operations. The REVLAC and RACS systems are to be kept operational 24/7 in automatic mode or in manual mode when repairs are required.

The Contractor is required to use as many personnel as necessary to respond to trouble calls within one (1) hour of notification and provide permanent repair to REVLAC or RACS system operations within two (2) hours or less, unless Engineer approval of a delay is granted. In some cases this may require personnel, equipment and materials to assist in the operation of the system such as manually cranking signs into position, manually cranking swing gates, manning a control building if bypassing the PLC control, manning a control building to monitor transition events, manually covering prescribed malfunctioning signs, placing barrels or barricades for failed closure devices, staging Contractor owned vehicles in place of the barrier net and all such similar work as needed to produce essentially normal functionality of the REVLAC or RACS systems to the Department and the motoring public.

When Contractor personnel arrive at the site (or depart the site) where there is REVLAC or RACS equipment, the IDOT ComCenter must be directly notified by the Contractor's dispatch center personnel. This notification includes planned work or emergency work which may or may not require an emergency lane closure.

6.9.3 OTHER ADVANCED SYSTEMS EQUIPMENT

Failures of expressway ramp gates, REVLAC fiber, intrusion alarms, power outages, servers, SONET or CCTV distribution equipment, REVLAC operations cameras, HVAC equipment at the IDOT ComCenter, and ATMS workstations, require immediate response and repair/corrective action by the Contractor.

6.9.4 COMCENTER HVAC

Proper function of the ComCenter HVAC is necessary for the numerous items of equipment in the dispatch and equipment rooms. Upon notification from the ComCenter of HVAC problems, the Contractor is responsible through routine maintenance for immediate response and repair, and if necessary providing on a 24/7 basis, qualified repair company HVAC investigations, labor, and repairs/replacements of equipment, not exceeding five-hundred ($500) dollars per call-out. Equipment and repairs in excess of the $500 will be paid through non-routine maintenance.

6.9.5 FIBER OPTIC CABLE REPAIRS

Immediate corrective action response and repairs are required for the fiber optic network. For transmission troubles found in the "live fiber" (fiber in use) during normal operations, the Contractor shall test the affected fiber, as necessary, to determine the source of the problem. In such cases, the Engineer may direct spot checking or complete checking of all fibers in the affected run, if the problem is suspected to be systemic to the run. Before testing of any live fibers, the patrolman shall coordinate with the users of the fiber run. After the completion of testing, but before leaving, the patrolman shall verify with the users that all video and telemetry data transmission is still working. The patrolmen shall not leave the nodal building until all user groups have checked the accuracy of data being received and video picture quality.

During any of the testing, if any fibers are found to have significantly degraded from original or most recent OTDR readings, the patrolman shall initiate a ticket to prompt further troubleshooting of the fiber. The Contractor shall check all optical connectors, all patch cords, fusion splices, and splice enclosures within that fiber run to determine where the degradation has occurred. The Contractor shall make necessary repairs to restore the system to its original operating parameters. Damaged, deteriorated or leaking splice enclosures shall be replaced with equal or better.

If a problem is found to be with an individual live fiber in the fiber run, the Contractor shall re-assign the user on the defective fiber to another fiber in the run upon approval by the Engineer. The Contractor shall test the defective fiber to identify the location of the problem. If it is found to be in accessible location, the Contractor shall repair/re-splice the fiber to restore to its original condition.

If connector appears to be damaged, the Contractor shall repair or replace optical connector in the following manner:

1. If it is a patch panel which has bulkheads with pre-connector zed pigtails and its optical connector is damaged, the entire pigtail shall be replaced with a new patch cord substituted for the pigtail and fusion-spliced to the trunk cable.
2. If the patch cord optical connector is damaged, the Contractor has the option of replacing the patch cord or replacing the damaged optical connector with a new Camille or equivalent ST connector for single-mode fiber.
3. If it is a patch panel, where the trunk cable was field-terminated with Camille or equivalent connector, the Contractor shall replace in kind.

If the bulkhead is damaged, the Contractor shall replace the bulkhead in kind.

If the optical performance has diminished due to degrading of an existing splice, the Contractor shall replace the bad fusion splice in kind. If the fiber optic trunk cable is damaged due to a broken wall, the Contractor shall clear, determine the problem and perform temporary repairs, to restore the system affected within twenty-four hours, under routine maintenance. The Contractor shall replace the damaged section of cable from splice box to splice box (in handholes), as directed by the Engineer, under routine maintenance. The Contractor shall submit catalog cuts of all replacement material for approval by the Engineer.

6.9.6 GCM GATEWAY NETWORK

The Contractor is required to maintain the GCM Gateway Network connections to the extended fiber network (IDOT fiber and connection to Tollway fiber) that support its IDOT distribution extensions to out-of-state connections, including the associated Gig-E equipment. Immediate corrective response and repairs are required. Equipment includes Cisco Gigabit network: WS-C3750G-12E, CAT1030NG5M.

The Contractor may receive emails from the GCM Gateway Network support team using NAGIOS, notifying them of camera outages requiring immediate field response. If directed by IDOT ComCenter personnel, the Contractor personnel may be dispatched to the Traffic Systems Center to reset the Gateway system server, or post a prepared outage message to the website. Other problems may require the Contractor Advanced Systems Specialist or Field Technician to coordinate with the Engineer and visit an Illinois Tollway property to service GCM equipment.

6.9.7 BUILDING, HUT AND BASE STATION EQUIPMENT REPAIRS

Immediate corrective action response and repairs are required for reports of problems with low voltage wiring, conduit, outlets, and switches, and other electrical equipment within or at the buildings, huts, and base stations, including generators.

Hillside Maintenance Yard and Rodenburg Maintenance Yard Base Stations

The Hillside Maintenance Yard and Rodenburg Maintenance Yard maintenance is paid through routine maintenance pay item X-1 which have base station equipment to be maintained under this Article,

including tower beacons, transfer switches, electrical service feeder cable, distribution panels, gas detector systems, doors, buildings, roofs, fencing, gates, windows, locks, flashing beacons, PS SCADA system repeater radio, AEGIS alarm systems, antenna, antenna line, back-up battery, diagnostic board, lighting, and various other equipment and appurtenances. The generator maintenance is specified in Article 8.0.

6.9.8 TOWER OR BASE STATION (TOWER) STRUCTURAL REPAIRS

If problems or deficiencies are found on towers or base stations (including the Hillside Base Station at the Hillside Maintenance Yard and Rodenburg Base Station at the Rodenburg Maintenance Yard as listed in Article 7.0) the Engineer shall be immediately notified. Structural problems or deficiencies are not the responsibility of the Contractor.

6.9.9 SPECIAL RESPONSE AREAS

The Contractor shall respond to emergency service requests and perform inspections per Engineers request of Department owned equipment residing in non-EMC maintained areas of the University of Illinois Circle Campus building/roof in Chicago, EMC dispatch, the Illinois State Police District Chicago offices in DesPlaines, the Illinois Thompson Center in Chicago, the Illinois Tollway Authority Headquarters in Downers Grove, and other Tollway Authority Plazas throughout District 1. The Contractor shall provide the labor, equipment and material to perform repairs, and shall be paid through non-routine maintenance for material in excess of $500 per call-out.

When notified by the ComCenter or by a police agency that an incident has occurred at the location, a patrolman shall immediately be dispatched to the location by the EMC Dispatch Center. Incidents may include, but are not limited to:

- All motorist caused damage
- Malfunctions which suspend normal operations
- Fiber cable repair, fiber connections/terminations and patch panels
- Intrusion alarms
- Power outages
- Live exposed voltage cables

- Changeable message signs
- Failures of network (telephone, & radio)
- Events which pose a threat to safe, timely operations

The dispatched personnel shall arrive at the relevant system location within sixty minutes of notification of the incident, to assess and troubleshoot the system and/or to make the system operational. The defective equipment shall be permanently repaired as soon as possible, within 24 hours, unless approval is given by the Engineer. The Engineer shall be notified of any response by Contractor personnel.

University of Illinois – Circle Campus - 1140 S. Paulina St.,Chicago

Items to be maintained include:

- 3 Bosch Cameras with PTZ and mounts
- Proxim Radio and Antenna
- Equipment Cabinet NEMA 4X
- Linksys Switch – 8 port
- Equipment and connections
- Power Supplies
- GCM Gateway Network

Ilinois State Police District Chicago Office - DesPlaines

A tower and associated transmission equipment including a 6 GHz active repeater is located at the Illinois State Police District Chicago office in Des Plaines. It is a microwave radio repeater facility for the transmission of signals between the REVLAC Control Building E and District 1 Headquarters, Schaumburg.

Items to be maintained include:

- SONET System (refer to IDOT Headquarters, Article 6.7.11)
- Microwave radio equipment, Department owned
- Backup Battery

Illinois Thompson Center (JRTC)

The Contractor shall maintain the fiber optic patch panels.

Illinois Tollway Authority Central Administration and Plazas

Items to be maintained include:

- CCTV and Associated Equipment (refer to IDOT Headquarters, Article 6.7.11)
- All Gig-E equipment
- IDOT patch panel and fiber cables

Cisco Gigabit Network Equipment/Smartnet:

- Central Admin: WS-C3750G-24TS-E, CAT0937ZOVN
- Plaza 19: WS-3750G-12S-E, CAT0936Z32Z
- Plaza 21: WS-C3750G-24TS-E, CAT1032ZJ46
- Plaza 23: WS-C3750G-12S-E, CAT1031RGPC

EMC Dispatch Center - (IDOT Equipment to be Maintained)

Items to be maintained include:

- Traffic System Conflict Monitor Alarm System
- AEGIS Alarm Equipment, IDOT or EMC owned
- EMCMS equipment required for communications between Contractor's facilities and central computer at IDOT District 1 Headquarters

Lighting SCADA System

One (1) server and monitor, all software including OS, GUI software, FIU cabinet, SCADA CPU's dedicated line and dial-up modems, radio power supplies and back-up batteries, rocket port, printers, radio concentrators, four VHF/UHF radio, portable UPS, batteries, and all other equipment and appurtenances.

PS SCADA System

AB RSview server computer (hardware & software) dedicated lines and dial-up modems, computer monitor, printer, radio base station equipment, rocketport multi-serial board and cables, batteries and all other equipment and appurtenances.

6.10 CONTRACTOR NORMAL CORRECTIVE RESPONSE AND REPAIR

6.10.1 GENERAL REQUIREMENTS

Unless specifically notified by the Engineer to immediately respond/repair, other equipment as listed in Article 6.0, such as CCTV, AVL, expressway ramp gates, equipment in buildings and huts, missing labels, etc., and not listed in Article 6.9, shall be handled through normal corrective action. The Contractor shall investigate items found or reported within twenty-four (24) hours and correct the defective operation or equipment with temporary repairs within forty-eight (48) hours of the investigation, followed by permanent repairs within seven (7) days, unless approval is given by the Engineer for a repair delay. Tickets are required for all maintenance items.

6.10.2 EXPRESSWAY RAMP GATES

The Contractor shall provide normal corrective response and repair for expressway ramp gates, including motorist caused damage. Sand crash barrels if damaged by motorists shall be replaced by Department personnel.

6.10.3 AVL (AUTOMATIC VEHICLE LOCATOR)

The Contractor shall respond to trouble calls regarding the AVL equipment from the IDOT ComCenter and Department personnel. This may require travel to the vehicle in question for the equipment repair, or travel to the ComCenter for supervisory control repairs. The Contractor shall contact the IDOT ETP Manager to obtain the time which the vehicle would be available for repair. Materials for AVL repairs shall be available in State Stock.

Modem installation work shall include all work necessary to install, wire, integrate, set-up all communications to the AVL server, and configure the complete system so as to provide a completely operational AVL unit in the vehicle.

6.11 REQUESTED ROUTINE WORK

Art.	Estimated Number of

No.	Equipment to be Inspected	Locations	Frequency/Month	Submittal
6.11.2	ComCenter DVD Inspection	1	Monthly	RWSB
6.11.8	Network Maintenance And Documentation	All	Monthly	RWSB
6.12	Building and Hut Inspection	15	Monthly	RWSB
6.13	REVLAC Transition Patrol	All	Monthly	NA
6.14.2	Site Maintenance – Spring, Summer, Fall	15	Monthly	RWSB
6.14.3	Site Maintenance – Winter	15	Monthly	RWSB
6.15.1	General Maintenance	All	Monthly	RWSB
6.15.2	Battery and UPS Inspection	1	Monthly	NA
6.15.3	REVLAC/RACS Bld. Floor Maintenance	8	Monthly	RWSB
6.15.4	Fire Extinguisher Maintenance	15	Yearly	RWSB
6.16.1	Tower Site Inspection PM	7	Yearly	RWSB
6.16.2	Swing Gate PM	127	April and October	NA
6.16.3	Drum Sign PM	10	April and October	NA
6.16.4	LED and Fiber Optic Sign PM	7	April and October	NA
6.16.5	Cattron PM	All	April and October	RWSB
6.16.6	Ramp Gate PM	41	April and October	RWSB
6.16.7	Barrier PM	6	April and October	NA
6.16.8	Control Building PM	4	April	NA
6.16.9	Microwave Radio PM	8	TBD	RWSB
6.16.10	CCTV Camera PM	143	April	RWSB
6.16.11	AVL Equipment PM	All	TBD	RWSB
6.16.12	Fiber Testing and Inspection	All	Spring	RWSB
6.16.13	Lighting SCADA Battery Replacement	All	Before June	RWSB

6.16.14	Battery and UPS Testing	All	May or before	RWSB
6.16.15	Fiber Access and Spice Box Inspection	All	See Schedule	RWSB

6.11.1 START AND COMPLETION OF WORK

When requested by the Engineer, the Contractor shall conduct routine work as specified. This work shall begin no more than forty-eight (48) hours following the initial request and shall be completed by a time as agreed by the Engineer and the Contractor.

6.11.2 COMCENTER DVD INSPECTION

The Contractor shall inspect the ComCenter DVD process video for REVLAC once per week, to confirm the transitions are recording properly. This inspection shall be scheduled on the same day of the week, for the duration of the Contract. If a deficiency is found a ticket shall be created. The repair shall be completed or equipment replaced, under routine maintenance, within 24 hours.

6.11.3 CCTV

In addition to the preventative maintenance program, cameras mounted 25 ft or lower, or cameras on lowering devices shall be cleaned upon request of the Engineer or the Department's ComCenter, when the images are not clear. The Contractor shall keep a ticket count, and will not be required to exceed twenty (20) cleanings per month.

6.11.4 FIBER LOGGING AND LABELING

When the Contractor is notified of any deficiencies/abnormalities with fiber logging and/or labeling they shall be brought to the attention of the Engineer and a corresponding ticket shall be generated. The Contractor shall be responsible for record keeping of all equipment and labeling at each node. A log book shall be maintained at each node with a list of all users of the fiber optic cable at each node and the information shall be updated after each new assignment made by the Engineer. The Contractor shall insure that all fiber strands and connectors are properly tagged and labeled at each end, and shall tag that they conform to the Department's labeling scheme. The Contractor shall perform the data entry of all changes to the existing fiber optic cable system in accordance with the D1 Standard Cable Designation Scheme which is available for review upon request.

The fiber labeling, power wiring, Ethernet, RS232 cables, blue tube cables, and coax, as designated by the Engineer, require permanent labeling from a Brady labeling machine or equivalent. A Brother P-Touch type of labeler is not acceptable.

6.11.5 LABELING OF EQUIPMENT

When missing decals are discovered or new equipment installed the Contractor shall furnish and install new decals for cameras, camera poles, chevrons, gates, aux signs, REVLAC/RACS equipment, and cabinets. Decals shall be similar to those for lighting units as specified in Article 1069.06 of the Standard Specifications.

6.11.6 CCTV VIDEO IMAGE LABELING

The Contractor shall be notified by the Engineer or the ComCenter when the CCTV video images need internal titles. Cameras shall be labeled internally through the camera or the video matrix switch for correct location name viewing.

6.11.7 REVLAC AND RACS GATES AND BARRIER STRIPING

The Contractor shall remove the existing retro-reflective sheeting, as specified by the Engineer, and install new striping, strictly following the manufacturer's instructions. The Contractor shall provide special attention to surface preparation and mounting of sheeting for proper bonding and adhesion. A maximum of 500 sq. ft. of striping material will be removed and replaced. The new striping material is furnished through State Stock and/or non-routine agreed prices.

6.12 MONTHLY BUILDING AND HUT INSPECTION

Once per month, the same week for the duration of the Contract, the REVLAC/RACS Field Technician shall inspect all REVLAC and RACS buildings and huts, and Hillside, Foster, and Rodenburg Base Station buildings to insure proper operating condition of all equipment and to check for graffiti. The Engineer may add additional locations to be patrolled if unsatisfactory service reports have been made, or a new building or hut is accepted for Contract maintenance.

Specific items to be checked include, but are not limited to:

- Allen Bradley PLC processors and all input and output cards; check for alarms
- Building rodent infiltration; seal any openings found
- Building site maintenance; empty trash cans
- Check for graffiti, if found create ticket for scheduled cleaning
- Building HVAC operations and temperature control
- Camera focus and image
- Electrical Service
- Check operation of generator
- Check generator diesel fuel level. If fuel level is less than one half of full level, a ticket shall be created to schedule the refill of the tank
- Check generator air filter, change if necessary
- Indicator lamps; replace as required
- Modem communications
- Phone lines
- Little Giant Ladders

6.13 TRANSITION PATROL

Once per month, on approximately the same day per month, for each month of the Contract, for the daytime reversible change (approximately 11:30 a.m.) and for the night-time reversible change (approximately 11:30 p.m.) a Contractor representative shall follow an IDOT ETP (Emergency Traffic Patrol) foreman through a complete gate operation at each REVLAC location in both inbound and outbound directions, to check equipment for proper operations.

6.14 SITE MAINTENANCE - OUTDOOR

6.14.1 GENERAL REQUIREMENTS

The Contractor shall provide general site exterior maintenance at Advanced Systems locations, to provide safe access to buildings and huts and to maintain the site in an aesthetically acceptable condition to the public. The Contractor shall keep all locations free and clear from any debris and litter at all times.

The Contractor shall submit a spreadsheet, noting the location, type of patrol or maintenance, and date work was completed, in the monthly routine work submittal book. In addition all scheduled work shall be noted on the Daily Agenda.

6.14.2 SPRING/SUMMER/FALL MAINTENANCE

Weed or grass cutting to height of three (3) inches or less, tree trimming, tree branch or brush removal and debris disposal work shall be performed for a minimum radius of 50 feet around all buildings and huts as applicable, (Buildings A, C, D, and E, Hillside, Foster, Nordic, and Schaumburg Tower buildings, Hillside RACS Ramp Building, Hillside Media hut, and any future huts as accepted for maintenance by the Department, during the Contract), twice per month in the months, April through October, and as needed for the remaining months.

6.14.3 WINTER MAINTENANCE

General snowfall maintenance shall begin within 48 hours following a 1 inch snowfall or more. The Contractor shall provide reasonable access to Buildings A, C, D, E, and the Hillside Huts, Media Hut, Foster, Nordic and Schaumburg Tower Buildings, and the Hillside RACS Ramp Building, by shoveling and plowing as necessary, and salting, all sidewalks, paths, driveways and parking areas, for the months of November through March.

6.15 SITE MAINTENANCE - INTERIOR

6.15.1 MONTHLY GENERAL EQUIPMENT MAINTENANCE

The Contractor shall provide monthly general interior site maintenance for Advanced System equipment in building locations, hut locations, the ComCenter (equipment room and all terminals and keyboards in the dispatch area), the TSC equipment area, Field Office, and the ISP/CMS facility (IDOT/ISP equipment) in Des Plaines, through routine maintenance, to keep the equipment free of dust build up, to reduce heat buildup, and prolong the life of the systems. Following manufacturers' recommendations, soft cloths shall be used to remove dust build up and compressed air shall be used to clean all keyboards. In addition, four cans of compressed air and one box of cleaning swabs equal or better than Kensington Surface Guardian Swabs shall be delivered per month to the Field Office for Advanced Systems equipment maintenance.

Verbal approval is needed from the ComCenter Supervisor prior to scheduling the maintenance work. The work can be performed in conjunction with other patrols and inspections (and may be performed at night where feasible), but should be scheduled for the same week of the month for the duration of the Contract. The Contractor Daily Agenda shall note the time of the expected maintenance of each location.

6.15.2 MONTHLY BATTERY AND UPS INSPECTION

The Contractor shall inspect the batteries of the UPS Systems, and RF transmitter once per month at Schaumburg HQ. Water levels shall be checked, add if necessary. Connections shall be cleaned and tightened if necessary. The date of the inspection shall be listed on the daily agenda. Tickets shall be created for any problems found, and listed in the monthly routine work submittal book.

6.15.3 REVLAC & RACS BUILDING FLOOR MAINTENANCE

Upon the request of the Engineer, or when the sealed floors of the REVLAC and/or RACS buildings become dirty due to winter and/or other weather conditions the Contractor shall bring water and cleaning supplies to mop the floors. This cleaning shall be conducted a minimum of once per month.

6.15.4 YEARLY FIRE EXTINGUISHER MAINTENANCE

The Contractor shall furnish and install fire extinguishers, equal or better than Badger Fire Protection extra carbon dioxide self-expelling model B20V for any new facilities placed on maintenance during the term of this Contract.

The Contractor shall have all fire extinguishers checked for proper service and re-filled as necessary, through a fire inspection service as approved by the Engineer, a minimum of once per year, in April. It will be necessary for the Contractor to travel with the fire inspection service personnel to unlock facilities. The Engineer shall be provided an email schedule of the yearly testing, prior to the start of the work. A completed work list by date, service, and location shall be submitted in the following monthly routine work submittal book.

6.16 PREVENTIVE MAINTENANCE PROGRAMS

The Contractor is required to perform certain preventive maintenance (PM) work within certain regular intervals or within certain time limits. The following descriptions provide a basic guide for PM work, but shall not be construed as all inclusive. Preventive maintenance required by the manufacturers shall be performed in addition to these inspections. All PM work shall be in compliance with manufacturers' specifications. PM forms will be available at the Pre-Bid Meeting.

Schedules for start and completion of PM program work are important for the effectiveness of the overall system reliability. Every month, the Contractor shall submit the PM program for the following month in the monthly routine work submittal book. All PM work shall be completed within 30 days after starting,

unless extensions are approved by the Engineer. All PM program work shall be scheduled on the Daily Agenda which shall list the specific type of inspection being performed (example: Roof PM).

Following the completion of the preventive maintenance work all forms shall be e-mailed to the Engineer via pdf format. Follow-up work shall be noted with the applicable Ticket number.

The Contractor shall submit in the monthly routine work submittal book a schedule/chart in a spreadsheet that shows all maintenance locations, preventive maintenance programs, status and date of completion for each program, including the status of all uncompleted tickets and authorizations. The Contractor shall identify items, by ticket number or authorization number, which require follow-up.

6.16.1 YEARLY RADIO TOWER SITE INSPECTION AND PM

The Contractor shall inspect the radio towers for any visual defects on the tower structure, lighting, monitoring system (where applicable), antenna, co-axial lines and wave guides, grounding system, site appearance and general condition, fencing and gates (standards per FCC title 47 Sec. 17.47) and locks. Tickets shall be created for any problems found. The date of the inspection, in June, shall be listed on the daily agenda. The Contractor shall submit the inspection reports using Log A1 in the monthly routine work submittal book. Also note these requirements are applicable to the base stations at the Hillside and Rodenburg Maintenance Yard locations per Article 7.0.

6.16.2 BI-YEARLY SWING GATE PM (FOR REVLAC AND RACS)

Swing gate PM shall be performed twice a year, in April and October. Lubrication shall be performed once per year as a minimum. however, this work shall be performed in presence of an IDOT inspector.

- Open control cabinet and clean out debris or corrosion
- Check for fluid leaks in the cabinets and correct, if any
- Check oil level in the drive train and top off as required by the manufacturer’s requirements
- Hand clean control cabinets with biodegradable detergent and water
- Replace gate tip if more than 20% of the tip is damaged, or when directed by the Engineer
- Check proximity limit switch alignment and bracket conditions

- Check electrical connectors and wiring condition
- Check drive and control components
- Lubricate components with lubricants as listed in maintenance manual page 6-1
- Lube flange bearings only if seal failure is noticed
- Lube chain and sprocket with high grade aerosol chain lube
- Repair or replace speed reducer if it leaks oil
- Check that panel doors are closed and padlocked
- Operate the gate automatically to check for shear pin damage
- Operate the gate using the hand crank to check for operation

The swing gates should extend and retract smoothly, without excess vibration or noise, stop quickly at extended or retracted positions, and, when in remote operation, provide prescribed status indicator and warning light indications.

All swing gates shall be washed. Washing shall be performed with a pressure washer and process and cleaning solutions recommended by the reflective sheeting manufacturer. Washing shall not take place when the temperatures are expected to drop below freezing. Residual cleaning solution shall not be left on the pavement after the cleaning operation. Any cleaning solution shall be removed before traffic is allowed to travel on the pavement.

During the second inspection only, in October, all heaters shall be checked for proper operation.

6.16.3 BI-YEARLY ROTATING DRUM SIGNS PM

All rotating drum signs shall be cleaned twice a year, in April and October; however, this work shall be performed in presence of an IDOT inspector.

- Open control cabinet and clean out debris

- Check for fluid leaks in the cabinet and correct, if any
- Check oil level in the drive train and top off as required by manufacturer's specifications
- Lubricate all bearing surfaces as needed, at least once per year
- Lubricate grease fittings and oil reservoir on motors
- Oil chains
- Observe coupling operation, tighten all bolts and set screws
- Clean sign housing
- Hand clean control cabinets with biodegradable detergent and water

6.16.4 BI-YEARLY REVLAC AND RACS LED AND FIBEROPTIC SIGN PM

All REVLAC and RACS auxiliary signs, dynamic message signs, Chevron signs, and fiber optic signs shall be inspected twice a year, in April and October however, this work shall be performed in presence of an IDOT inspector.

- Open access covers and clean out any accumulation of bird and insect nests, dirt and dust, or corrosion
- Clean and inspect interior and exterior sign housing
- Check and adjust voltage to LED power supply
- Clean all associated control cabinets with biodegradable detergent and water
- Clean LED signs with a cloth and biodegradable detergent and water
- Relamp fiber optic sign with halogen lamps and clean housing, once per year, at the time of April inspection
- Inspect lamp housings for corrosion and damage and replace, if necessary

6.16.5 BI-YEARLY REVLAC CATTRON PM

The Contractor shall conduct a PM program twice per year, in April and October, for all Cattron remote controllers and their chargers at the Emergency Traffic Patrol (ETP) building. Since the units are needed

daily by ETP for REVLAC operations, the PM shall be performed on a maximum of six units at any one time and with maximum turn-around time of one business day, returning the units the same evening. The units shall be tested for battery voltage; transmitting and receiving ability; power; modulation; and RX sensibility. The batteries shall be replaced, as needed.

If any unit is found to be defective, the unit shall be replaced with a spare unit until the repairs are completed. Tickets shall be issued for all defective units and reported in the monthly routine work submittal book.

6.16.6 BI-YEARLY RAMP GATE PM

All gates installed on the entrance ramps to expressways shall be operated and tested bi-yearly, in April and October, in presence of an IDOT inspector. In addition all gates shall be hand cleaned with biodegradable detergent and water. No form is required; however, a summary of the ramp gate tickets created shall be included in the April monthly routine work submittal book.

6.16.7 BI-YEARLY RESTRAINING BARRIER PM

Barrier PM shall be conducted twice per year, in April and October. however, this work shall be performed in presence of an IDOT inspector.

- Inspect all control cabinets, equipment access covers and hinged opening for proper closure (bolted or padlocked)
- Open control cabinets and clean out debris or corrosion
- Hand clean control cabinets and reflective strips with biodegradable detergent and water
- Check for fluid leaks in the cabinet and correct, if any
- Lubricate pillow block and idler sprocket bearings with multipurpose lithium grease, NLGI No. 2, or equivalent.
- Check oil level in the drive reducer and fill with SAE No. 20 motor oil, if necessary.
- Lubricate drive chains semiannually using an aerosol chain lubricant spray (WD-40 or similar compounds are not acceptable).
- Clean tower via gas powered pressure washer

- Check net condition and positioning and check for damage or vandalism
- Check wire condition and terminations
- Open tower cover doors and hinged openings, clean, check drive chain and sprocket alignment and wear, counterweight cable attachment and general condition and check for oil leaks
- Check tower cover weather seal for wear or damage
- Check limit switches and actuators; adjustments, clearances, and secure mounting
- Check barrier net cables conditions, for tautness/tension and proper height
- Check stabilizer foot pads (replace worn or missing pads)
- Check inside of tower and cross ramp structure for accumulation of debris, dirt, dust, corrosion, animal nests, and excess grease
- Lubricate per maintenance manual section 4-5

The restraining barrier should run smoothly, without excess vibration or noise, stop quickly at its raised or lowered positions, and, when in remote operation, ensure prescribed status and warning light indications are working.

6.16.8 YEARLY CONTROL BUILDINGS, COMMUNICATION BUILDINGS, AND SYSTEMS PM

A preventive maintenance program shall be conducted once per year, in April, for all REVLAC and RACS buildings, all huts, base station buildings, IDOT Headquarters Advanced System equipment, and ISP/CMS facility (Des Plaines) Advanced System equipment. However, this work shall be performed in presence of an IDOT inspector.

Check refrigeration:

- Replace air filter
- Inspect and clean indoor coil, drain pan, and condensation drain line
- Inspect and clean blower motor and wheel
- Check electrical connections for tightness
- Check controls for proper orientation

- Inspect refrigerant tubing connections

Fans:

- Inspect and tighten bolts and set screws
- Inspect belt wear and alignment
- Clean exterior surfaces
- Replace filters
- Inspect and lubricate bearings if needed
- Check for proper control/line voltage and operation on supply/exhaust fan starters

Switchboards:

- Manually open and close breakers
- Check for torque values in secondary section of bus splices and connections
- Check for proper ammeter/voltmeter values

Panel boards:

- Inspect for moisture damage
- Replace any deteriorated insulation material
- Clean any accumulation of dust or dirt
- Inspect all connections for heat or other damage of loose connections
- Operate mechanical components
- Clean and dress copper electrical contacts
- Operate circuit breakers
- Replace burned out indicating lights

Transformers:

- Clean excessive dirt on windings & insulators

Automatic Transfer Switches:

- Inspect wiring and connections for tracking, overheating, and deterioration
- Tighten control circuit wiring terminals
- Check for free movement and contact continuity in manual switches
- Adjust time delay settings as necessary
- Clean or replace main, arcing, and auxiliary contacts
- Tighten lug connections and mounting insulation bolts
- Perform transfer operation
- Calibrate phase and voltage sensitive relays
- Clean and remove accumulated dust and dirt
- Check for proper operation or door closure, locking bars, and mechanism

Batteries:

- Check and record AC and DC voltages of each cell
- Tighten nuts/bolts
- Clean surfaces
- Check AC/DC power converter charger (if applicable)

Ethernet Network:

- Check Cisco mux
- Check fiber media converters and switches
- Clean and remove accumulated dust and dirt

- Clean filter
- Check Hirschman Fiber/Ethernet transceivers

6 GHz Microwave Radio System:

- Clean outside and front panel of case
- Tighten cable connections
- Measure and record operating parameters
- Measure and record transmitter RF frequency
- Measure and record receiver IF frequency
- Measure and record receiver AGC voltage
- Check dehydrator

Modems Serial Fiber System:

- Remove dust from internal components with soft brush and low pressure air/vac

Antennas Microwave Radio:

- Check tightness of hardware on mount, shroud, radome, and feed
- Inspect antenna and repair when necessary

Remote Control (Cattron) System: (not applicable for ISP/CMS facility)

- Check fuse resistance and replace when necessary
- Check fuse holders for corrosion and clean when necessary
- Check primary power source for proper readings
- Check control transmitter, receiver/decoder, relay output rack for loose bolts/screws/clamps
- Check fuses, holders, resistors, and transformers for over heating

- Visually check antenna, mounting devices, cables and connectors
- Conform receiver and transmitter in the system are aligned on the same frequency

Gate Arm Heating System for REVLAC:

- Check for proper settings, operation, and LED indication

CCTV: (not applicable for ISP/CMS facility)

Patrolmen shall inspect all equipment for cleanliness and proper operation, and check various levels and settings.

Check for alarms on the following equipment:

- iMpath
- Optelicom
- Meridian
- Bosch

Controller for Tower Lights:

- Check and clean

PLC Servers:

- Check operations

DMS Signs: (RACS ramp buildings and Hillside Hub)

- Check media converter
- Check fiber transceiver

Enclosures:

- Blow dirt out of programmable controllers, I/O modules & power supplies with compressed air
- Blow dirt out of T-60 with compressed air
- Brush dust & construction debris off of the I/O racks, wire troughs, & horizontal surfaces
- Brush dust and construction debris off of the T-60 and other horizontal surfaces
- Vacuum dust and construction debris out of cabinets
- Wipe dirt off of edges of doors and door frames
- Check ground bus connections and bonding wires and lugs for tightness and integrity
- Check screws on AB 1771-I/O swing-arms for tightness
- Check screws on terminal boards for tightness
- Test Random Access Memory (RAM) function
- Verify alarms are updating properly
- Verify hard drive is functioning normally
- Verify screen brightness is within normal parameters
- Verify PLC-5 program backup is current and password protected
- Clean and inspect air filter
- Check bonding wires and lugs for tightness and integrity
- Check communication cable integrity
- Check alarm LED indicator lamp on AB I/O chassis

Roof Inspection and Repair for all Buildings and Structures (in April of each year)

- The Contractor shall thoroughly clean the roof surface of dirt, debris, and contaminates.

- The Contractor shall conduct a full roof and flashing inspection on all buildings and structures, by accessing with ladder, and physically walking the roof, checking for leaks or deterioration. Any problems found shall be noted on a Ticket for repair.

- Repair items as found:

  Small Holes and Cracks: Clean surface, apply mastic (roof cement) 1/8" to ¼" thick into the hole or crack using a roofer's trowel or gloved hand, working the mastic into the opening and 2 to 4 inches beyond.

  Large Holes and Cracks: For damaged areas larger than ¼" repair, clean surface, use self-adhering SBS Modified Asphalt Membrane by peeling off the backing and pressing it onto the area to remove any entrapped air. A coating of mastic (roof cement) shall be applied over all repaired areas.

  Loose or Dry Laps, Fishmouths, Buckles, Wrinkles, Ridges: Cut defective material back to an adhered area. Repair area as needed with mastic and/or membrane and mastic as stated above.

  Loose Mechanical Attachment, Termination Bar: Remove loose fasteners. Re-secure base flashings (or new flashing material) through tin discs of a larger diameter or fastened to an adjacent location (new hole).

General Items:

- Replace or repair corroded conduit, junction boxes and connectors
- Replace or repair damaged weather stripping and/or minor leaks
- Replace batteries in the surge arresters, building clocks, and other equipment, per manufacturers' specifications
- PLC batteries to be replaced in April of each year
- Wet mop floors with water and biodegradable cleaner, in Buildings A, C, D and E
- Check heaters for correct operations, note problems on tickets
- Check door operations, note problems on tickets

6.16.9 YEARLY MICROWAVE RADIO PM

The Contractor shall perform a microwave radio preventive maintenance inspection at REVLAC buildings E, ISP/CMS facility, and Hillside, Nordic Schaumburg buildings once per year, on a date as approved by the Engineer. The Contractor shall address any outstanding alarms and perform repairs as needed. The PM shall include the measurement and check, as applicable, of the following parameters by factory authorized and trained personnel:

- TX Crystal Frequency
- RX Crystal Frequency
- TX Output Power
- Input Voltage
- RX Level
- Receiver Frequency

No form is required; however, a summary of the tickets created shall be included in the monthly routine work submittal book.

6.16.10 YEARLY CCTV CAMERA PM

All CCTV cameras shall be inspected once per year, in April. No form is required; however, a summary of the tickets created shall be included in the monthly April routine work submittal book.

- Clean camera lens and domes.
- Clean camera number labels, replace if damaged or missing
- Verify camera operation and correct for picture and control functions
- Provide Excel spreadsheet with all camera labels and locations

6.16.11 YEARLY AVL EQUIPMENT PM

Preventive maintenance on AVL equipment in each vehicle and covered under this contract is required once per calendar year, as mutually scheduled by the Contractor and the Engineer. Preventive maintenance shall include: reading RF power out, reading SWR and impendence of both receive and

transmit antennas, check for and repair any breaks/shorts and other damage of all cables, check condition of all fuses and fuse holders, check and clean all connections (at antennas, at radio modem, at power connection, at GPS receiver, etc.), check data connectivity with respect to the system, check reception of GPS antenna and receiver, and clean any user interface appurtenances.

The Contractor shall submit an annual report, following the inspection, to summarize any changes or modification work performed, on-going problems, and to verify spare equipment inventory. This information and a list of tickets created shall be included in the monthly routine work submittal book.

6.16.12 YEARLY FIBER TESTING AND INSPECTION

The Contractor shall annually test 10% of all, randomly chosen, “dark” fibers (fibers not in use), end-to-end, with a laser light source, a power meter and an OTDR at both 1310 and 1500 nm wavelengths. The annual testing shall be performed in spring of each year, unless approved otherwise by the Engineer. The results of the traces shall be submitted to the Engineer in the monthly routine work submittal book. The test procedure shall comply with ANSI/TIA/EIA-569-A, Annex H, “Optical Fiber Performance Testing” and with ANSI/TIA/EIA-526-7, “Method 1: Optical Power Loss Measurements of Installed Single Mode Fiber Cable Plant.” The Contractor shall also check for loose connectors and repair if necessary.

6.16.13 YEARLY LIGHTING SCADA BATTERY REPLACEMENT

The Contractor shall replace the lithium battery in each CPU of the FIUs and the back-up battery pack in each FIU of the lighting SCADA system, for equipment located in the IDOT ComCenter, in April 2013. The Contractor shall submit catalog cuts of the replacement battery packs for Engineer approval, prior to installation. Refer to Lighting SCADA requirements in Article 7.5.

6.16.14 YEARLY BATTERY AND UPS TESTING

The Contractor shall employ a factory authorized service company to perform an inspection and preventive maintenance at the ComCenter on the UPS, its transfer switch, and its battery and the battery charger of the UPS Systems and RF transmitter. The comprehensive inspection shall be conducted before June of each year and shall include:

Perform initial and final voltage and current checks at each stage

System in bypass and de-energized:

- Check all components

System in bypass and energized:

- Check all alarms, measure and adjust critical setting

System energized and in normal:

- Perform short-term (2 minute) discharge to evaluate battery condition

The Contractor shall obtain a detailed service report from the service engineer. In addition to the readings the report shall note any deficiencies found and/or service recommendations. The Contractor shall submit the original service report in the monthly routine work submittal book. (Any necessary repairs shall be performed through a non-routine work authorization.) Tickets shall be created for any problems found. The date of the inspection(s) shall be listed on the daily agenda.

6.16.15 YEARLY FIBER ACCESS AND SPLICE BOX INSPECTION

The Contractor shall provide the labor, equipment and material to field identify, inspect handholes, access points and provide a GPS location of all access points and splice locations. The Contractor shall inspect splice boxes for leakage and seal degradation. Contractor shall enter tickets and repair all damaged splice boxes, fiber trays and fiber cable including any damage to junction box and or handhole under routine maintenance. The Contractor shall document on an Excel spreadsheet by locations all fiber splices, by number, by color, which direction and entry and exit destination, and show dark fibers and unspliced fibers by color, number, and cable.

The Contractor shall perform this work in year 2013 for Cook county only, starting on I-290/IL 53 which shall be completed by the end of April, followed by the Kennedy which shall be completed by the end of June, followed by I-55 which shall be completed by the end of August and lastly I-57 which shall be completed by the end of October.

For year 2014, if this Contract is renewed, this work shall be performed for DuPage and Will counties, starting on I-80 which shall be completed by the end of April, followed by I-55 which shall be completed by the end of June, followed by I-290/IL 53 DuPage which shall be completed by the end of August.

For year 2015, the contractor shall inspect and test all splice boxes for water leakage by performing float test.

A summary of the tickets created shall be included in the applicable monthly routine work submittal book. Traffic control shall be provided as required during this work. The Contractor shall submit inspection schedule by January 15th to perform the inspection.

The Contractor shall maintain the existing IDOT database and provide data entry for GPS location of all access points, splice locations and devices. Refer to article 4.17.7 for GPS documentation.

6.17 SOFTWARE MAINTENANCE SUPPORT

For the duration of this Contract, and if renewed until December 31, 2015, the Contractor shall secure a commitment for software maintenance support specialty services with the original software developer, Engineered Software Products of Lawrenceville, GA (or an approved alternate) for the Advanced Systems for emergency trouble shooting expertise and for the modification of the existing system as may be necessary.

The principal for Engineered Software Products is Mr. D. Grib Murphy, 770-682-8259. A letter of intent to provide these services is required from Engineered Software Products (or an approved alternate) to be presented to the Engineer at the Pre-Construction Meeting.

The following chart indicates software which shall be maintained and licenses renewed under this Contract. If this Contract is renewed the maintenance support agreements and licenses shall be extended until December 31, 2015, as incidental to routine maintenance.

Rockwell Part Number	Serial Number	Software Description	Version	Expiration Date	IDOT Use
9357DNETL3D	1235020855	RSNetworx for DeviceNet	4.01.00	31-Mar-13	RACS
9357DNETL3D	1235020856	RSNetworx for DeviceNet	4.01.00	31-Mar-13	RACS
9357DNETL3D	1235020866	RSNetworx for DeviceNet	4.01.00	31-Mar-13	RACS
9357DNETL3D	1235020854	RSNetworx for DeviceNet	4.01.00	31-Mar-13	RACS
9357CNETL3D	1163019247	RSNetworx for ControlNet	4.01.00	31-Mar-13	RACS
9357CNETL3D	1163019248	RSNetworx for ControlNet	4.01.00	31-Mar-13	RACS
9357CNETL3D	1163019258	RSNetworx for ControlNet	4.01.00	31-Mar-13	RACS
9357CNETL3D	1163019246	RSNetworx for ControlNet	4.01.00	31-Mar-13	RACS
9324RLD300ENED	1203023898	ControlLogix & RSLOGIX 5000	11.11.00	31-Mar-13	RACS
9324RLD300ENED	1203023899	ControlLogix & RSLOGIX 5000	11.11.00	31-Mar-13	RACS
9324RLD300ENED	1203023897	ControlLogix & RSLOGIX 5000	11.11.00	31-Mar-13	RACS
9324RLD300ENED	1203023909	ControlLogix & RSLOGIX 5000	11.11.00	31-Mar-13	RACS
9324RLD300ENED	1203023859	ControlLogix & RSLOGIX 5000	11.11.00	31-Mar-13	RACS
9701VWSCWAENE	2524000143	RSView SE Client	2.10.00	31-Mar-13	RACS
9701VWSCWAENE	2524000142	RSView SE Client	2.10.00	31-Mar-13	RACS
9701VWSCWAENE	2524000106	RSView SE Client	2.10.00	31-Mar-13	RACS
9701VWSCWAENE	2524000107	RSView SE Client	2.10.00	31-Mar-13	RACS
9701VWSCWAENE	2524000108	RSView SE Client	2.10.00	31-Mar-13	RACS
9701VWSS100AENE	2527000100	RSView SE Server 100 Display	2.10.00	31-Mar-13	RACS
9701VWSS100AENE	2527000101	RSView SE Server 100 Display	2.10.00	31-Mar-13	RACS
9701VWSTENE	2529000103	RSView Studio for RSView Enterprise	2.10.00	31-Mar-13	RACS
9355WABGWENS	1006010204	RSLinx Gateway Software	2.40.01	31-Mar-13	RACS
9324RL5300ENE	1112063372	RSLogix 5	5.20.10	31-Mar-13	REVLAC

9324RL5300ENE	1112063372	RSLogix 5 upgrade Ver. 6.0	6	31-Mar-13	RACS
9357CNETL3	1163019246	RSNetWorx Update	4.11.00	31-Mar-13	RACS
9357CNETL3	1163019247	RSNetWorx Update	4.11.00	31-Mar-13	RACS
9357CNETL3	1163019248	RSNetWorx Update	4.11.00	31-Mar-13	RACS
9357CNETL3	1163019258	RSNetWorx Update	4.11.00	31-Mar-13	RACS
9701VWSCWAENE	2524000142	RSView SE Client 3.00.01	3.00.01	31-Mar-13	RACS
9701VWSCWAENE	2524000143	RSView SE Client	3.00.01	31-Mar-13	RACS
9701VWSS100AENE	2527000100	RSView SE Server 100 display	3.00.01	31-Mar-13	RACS
9701VWSS100AENE	2527000101	RSView SE Server 100 display	3.00.01	31-Mar-13	RACS
9701VWSTENE	2529000103	RSV Studio for RSV Enterprise	3.00.01	31-Mar-13	RACS
930125E3353	1476004195	RSView32 Runtime 5k			REVLAC(S)
9355WABENE	1008079409	RSLinx Professional	2.41.00-ENE		REVLAC(S)
930125E3353	1476004196	RSView32 Runtime 5k			REVLAC(C)
9355WABENE	1008079415	RSLinx Professional	2.41.00-ENE		REVLAC(C)
930125E3353	1476003669	RSView32 Runtime 5k			REVLAC(A)
9355WABENE	1008084954	RSLinx Professional	2.41.00-ENE		REVLAC(A)
930125E3353	1476004198	RSView32 Runtime 5k			REVLAC(D)
9355WABENE	1008079417	RSLinx Professional	2.41.00-ENE		REVLAC(D)
930125E3353	1476004197	RSView32 Runtime 5k			REVLAC(E)
9355WABENE	1008079416	RSLinx Professional	2.41.00-ENE		REVLAC(E)

Key: S =Dist 1 ComCenter/Schaumburg, A=REVLAC Bldg A, C=REVLAC Bldg C, D=REVLAC Bldg D, E=REVLAC Bldg E

6.18 WARRANTY AND MAINTENANCE AGREEMENTS

The Contractor shall obtain a warranty and maintenance agreements for the following equipment and software for the duration of this Contract. If this Contract is renewed the warranty and maintenance

agreements shall be extended until December 31, 2015, incidental to routine maintenance. A complete list of Cisco equipment will be provided at the pre-bid meeting.

REVLAC and RACS systems

Name: AB Rockwell Software support and updates

Contact: Revere Electric or Englewood Electric Supply

Obtain: Annual support agreements for Rockwell software listed in Article 6.17

Expires: 3/31/13

Nordic Tower, REVLAC Buildings A, C, D, and E, Hillside Hub

Obtain: Uninterruptible Power Supplies (UPS) Maintenance Agreements

with next business day field response

SmartNet coverage for all CISCO Equipment,

Name: SBC or CISCO Authorized Service Vendor

Contact: Jeff Patterson, 217-527-2037 (or other CISCO authorized service vendor)

Obtain: Software Extended Support Maintenance Agreement for 24/7 coverage and 4 hour equipment replacement delivery

Expires: 3/31/13

District 1 Microwave Radio Hillside, Nordic, D1 HQ, REVLAC Bldg E, ISP/CMS DesPlaines

Name: Aviat U.S. Inc.

Research Triangle Park

637 Davis Drive

Morrisville, NC 27650

Contact: John Kingsley, 630-762-3730, John.Kingsley@Aviatnet.com

Obtain: One year extended warranty

Expires: 3/31/13

District 1 AVL Equipment; base stations, controller, modems, and radios

Name: IP Mobile Net

Contact: David Birarda, 604-937-5984, or other IP Mobile Net Authorized Vendor

Obtain: Extended software and hardware support maintenance agreement

Expires: 12/31/12

District 1 AVL Equipment; radio removals, re-installations and new installations

Name: Chicago Communications

Obtain: Support maintenance agreement for duration of contract

Contractor may have agreement for per unit billing

District 1 Storm Warning and Records Management System (SWARMS)

Name: Time Business Systems

Contact: John Naatz, 630-827-1800, or other Time Business Systems Authorized Vendor

Obtain: Maintenance agreement with 24/7 software support and field response during business hours

Expires: 3/31/13

The Contractor shall provide copies of the above list and any other signed maintenance agreements specified in this contract, with contact name and telephone number, all agreements term limits and details of equipment and response coverage, and monthly or yearly cost to the Contractor, by the first Pay Meeting of each year (if this contract is renewed). Letters of intent shall be submitted to the Engineer at the Pre-Construction Meeting and prior to the EMC renewal.

EMCMS Vendor Maintenance

Only a Department approved maintainer may perform any changes on the EMCMS. To assure security and integrity of the system, the Contractor shall use the current maintainer of the EMCMS, Xsys Inc., 653 Steele Drive, Valparaiso, IN. 46385 for the duration of the Contract. Bidders will need to contact Xsys, Inc. (telephone 219-477-4816) to obtain a sample contract and cost estimates.

The Vendor shall provide maintenance and operational support for all hardware (IDOT and Contractor owned or leased), for the server/operating system for the database servers and its OS, including communications hardware between the servers and all remote workstations, all software, the back-up drive unit, and information as carried in the database. Normal service restoration shall be within twelve (12) hours, except as otherwise permitted by the Engineer.

Maintenance requirements shall include daily on-line monitoring of system and equipment status, and daily data back-ups by qualified personnel, with preventive maintenance or component replacement as required to forestall preventable system failures. A dedicated telephone line shall be allowed into the server at the Schaumburg IDOT Headquarters for use by the Contractor furnished programmer/service technician, as approved by the Engineer.

Operational vendor support shall include two hundred and fifty hours of programming support per year for adjustments to system programs to address system malfunctions and occasional modifications or additions to the tables, screens, and reports employed in the system. An accounting of the time utilized shall be submitted in the monthly routine work submittal book. User documentation, as existing, and as developed during the course of this Contract shall be provided to the Contractor and the Department. Unused programming hours shall be carried over if the Contract is renewed or credit shall be used for work on other systems.

Equipment and Software Warranties

The Contractor shall obtain and continue the EMCMS equipment and software warranties for the duration of the Contract starting January 1, 2013 and ending December 31, 2013. If this Contract is renewed the warranties shall be extended to cover each renewal year. Items for coverage include software, the server/operating system for the database servers and its OS, communications hardware between the servers and all remote workstations, and the back-up drive unit. The Contractor shall provide copies of all

warranty agreements to the Engineer at the January, 2013 (and again in January of each renewal year) pay meeting.

EMCMS Screens and Reports

The following EMCMS screens and reports are to be maintained by the Contractor.

Contractor Data Entry Only:

Patrol_Schedule

Cable_Locate

Quote_Letter

Invoice_Letter

TS_MCHD_Log_Invoice

Ltg_MCHD_Log_Invoice

Auth_Ready_Log

Shared Data Entry:

Location_Locate

Authorization_Letter

Dispatch_Ticket

ComEd_Info

MCHD_Log

SS_Control Cabinets

SS_Control_Cabinet_Parts

SS_Arms

SS_Poles

SS_Pole_Parts

SS_Tower_Parts

SS_Luminaires

SS_Luminaire_Parts

SS_Cables

SS_Misc_Parts

Shared Viewing/Printing of Screens and Reports:

AL_Auth_Letter

AllSystem_Allchron

AP_Auth_Letter

As_of_Off_RM_Status

As_of_On_RM_Status

Auth_All_CWL

Auth_Completed

Auth_Ltr_Status

Auth_Ltr_Status_All

Auth_Not_IDOT_Apprvd

Auth_Work_Outstanding

Claims_Lookup

CWL_Summary

Location_RM_Status

New_Patrol

New_Patrol_County

Non-State

Owner_Maint

Patrol_Loc_Exceptions

Quote_Summary

SS_Activity

SS_EMC_Transactions

SS_Other_Transactions

SS_Summary

SS_Summary_Qtys

SS_Transactions

Ticket_Overview

Ticket_Summary

Uncompleted_Tickets

Unused_Quote

User_Change_PWD

Vendor_Summary

VL_Auth_Letter

Screens and Reports Used for Contract Management

<u>Used Solely by IDOT, maintained by the Contractor:</u>

Allsystem_MCChron

Category

Category_Ary

Change_PW

Claims_Lookup

COD_Maint

Contract_Num

Contract_Users

Count_Incomplete_Tickets

Count_Ticket_Types

County_Ary

Default_Contract_Num

EMC_Budget_Report

EMCMS_Fiscal_Year

EMCMS_Names

Financial_Statement

IDOT_Users

LDRet_Monthly_Maint

Maint

Maint_Master

MCHD_Claims_Collections

MCHD_Log_Costs

MCHD_Log_Summary

MCHD_Monthly_Maint

MCHD_Monthly_Summary

Monthly_Maint

Multi_Role_Users

Non_State

Oracle_USR_Mgt

Owner

Owner_Maint

Pay_Item

Pay_Item_Per_Auth_Ltr

Pay_Item_Usage_Summary

Pay_Items

Police

Police_Request

Remove_Location

Suprv_Review

System_Maint

Ticket_Analysis

Ticket_History

Ticket_Overview

Work_Code

Work_Type_Report

If system upgrades of hardware or software are necessary to assure continuity of service and vendor maintenance support, the Contractor shall propose necessary upgrades to the Engineer for approval. The costs for the necessary upgrades and installation, if approved by the Engineer, will be paid through non-routine maintenance under agreed price, from budget allowance Pay Item GV01 ($75,000). Upon approval by the Engineer, the Contractor shall furnish and install upgrades, and care shall be exercised to assure the preservation of system data.

6.19 CONTRACTOR FURNISHED MATERIALS, EQUIPMENT, AND LABOR

The Contractor shall furnish the minimum material and equipment listed below. The equipment and labor necessary for transportation, removal, installation, or re-installation of the items listed below is furnished by the Contractor and paid through routine maintenance bid items. (Also the Contractor is

responsible, through routine maintenance, for the equipment and labor necessary for transportation, removal, installation, or re-installation of all Non-Routine Furnish Only Pay Items listed herein).

The Contractor shall provide an inventory of the material used in the monthly routine work submittal book.

Usage quantities from a prior contract year are shown in parenthesis, however, this information is provided to bidders for information purposes only, and is not provided as an estimate of expected future Contract usage.

- Barrier reflective tape (8) minimum required 4
- Building lighting and lamps, inside and outside (10)
- Camera Surge Protection (10) minimum required 5
- Cattron batteries (10) minimum required 4
- Circuit breakers less than 40A (1)
- Contactors less than 40A (3)
- Cleaning materials and solution, power washing equipment
- Decals, (50) for gate numbering, cameras, poles, aux signs, and chevrons minimum required 24
- Fuses and switches (60)
- Gate tips (50) minimum required 24
- Indicator lights and lamps
- Photo cells (5) minimum required 3
- Phone modems (5)
- Relays (20)
- Shear pins and bushings (100) minimum required 25

- Snow removal supplies, salt
- Wire terminations
- Proximity Switch
- Timing delay relays

The Contractor is also responsible, under routine maintenance, for the first $2000 in costs, regardless of the total overall cost, necessary to replace each item of equipment in the Advanced System found to be defective, malfunctioning, or non-operational, or for software, or materials which do not meet manufacturers' specifications.

6.20 DEPARTMENT FURNISHED MATERIALS AND EQUIPMENT

The materials and equipment as listed below shall be made available to the Contractor by the Department for routine and non-routine maintenance work, however, the labor and equipment necessary for transportation, removal, installation or re-installation, plus shipping, mailing, and handling charges are paid through routine maintenance bid items.

- AVL units
- Barrier crash detector
- Barrier dragnet assembly
- Barrier tape cartridges
- Cameras, Camera Assemblies, Camera Pole
- Changeable Message Sign Contactors
- Equipment from State Stock
- Gig-E switches
- LED Chevron, Auxiliary, Lane Usage, Gore and Barrier Signs
- Monitors

- Motors for Changeable Message Signs
- Ramp Gates
- SM/MM Fiber Transceivers
- Swing Gate Arms
- Swing Gate Capstan and bracket assembly
- Swing Gate Controller
- Swing Gate Drive train Assembly
- Swing Gate Transmissions with Motors
- Turret Head Position Switches
- Video Communications Chassis Rack
- Video Decoders and Encoders

Equipment as listed above and other additional equipment in State Stock shall be removed, installed, and/or re-installed, shipped, mailed or handled by the Contractor through labor paid as incidental to routine maintenance bid items. State stock will be replenished as needed and approved by the Engineer.

ARTICLE 7.0 -- LIGHTING, NAVIGATION AND SIGN ILLUMINATION SYSTEM

7.1 SYSTEM DESCRIPTION AND MAINTENANCE RESPONSIBILITIES

The lighting, navigation and sign illumination system (Lighting System) consists of highway lighting, underpass/ tunnel lighting, navigational lighting, and sign illumination; potentially 550 independently controlled installations on the expressways, primary highways, and navigation channels in District 1. These installations include various types of lighting fixtures and lamps, lenses, reflectors, shields, poles, mast arms, high mast towers with associated equipment and cameras with associated power and communication equipment and devices including all associated hardware and software, mounting devices, supporting unistrut (U-channels), step-down or buck-boost transformers, ballasts, T-bases, decals, mile markers, cables, cable brackets, foundations, conduit, control devices, radios, , lighting cabinets, fenced enclosures, access gates including locks, above ground cable splice boxes, exposed conduit, uniduct, facility outdoor lighting equipment, fixtures mounted on fixed bridges, piers and abutment walls, lighting SCADA equipment, and other lighting appurtenances owned by the State of Illinois and under jurisdiction of the Department. CCTV shall be maintained in accordance with Article 6.

A list of current lighting locations and there pay items is found in Section 3.

All items as listed in the system description herein shall be maintained under routine maintenance, unless stated otherwise herein. Also refer to Article 4.0 for other maintenance responsibilities and Article 2.0 for the bidding quantities.

Advanced System Cameras on Light Towers, paid through Lighting System Tower # (Locations) as follows:

Sys	Loc. #	Main Route	Cross St	Co	Tower #	System Type	Qty
A	BF0B	I 94 Ford	Michigan Ave	CO	MMN2	A2BF	1
A	BF0D	I 94 Ford	King Dr	CO	MCD3	A2BF	2
A	BF11	I 94 Ford	170th St	CO	E1IJ3	A2BF	3
A	BF11A	I 94 Ford	WB I 80 to NB I 94	CO	CGH1	A2BF	4
A	BF11B	I 94 Ford	I 94 West of IL 394	CO	CIJ3	A2BF	5
A	BF11C	I 94 Ford	South of I 80	CO	D1CD4	A2BF	6

A	DR0A	I 90 94 Ryan	Polk St	CO	DCD1	A2DR	7
A	DR2A	I 90 94 Ryan	Canal 26th St	CO	Y4	A2DR	8
A	DR3C	I 90 94 Ryan	35th St	CO	WAB2	A2DR	9
A	DR4C	I 90 94 Ryan	45th St	CO	VMN2	A2DR	10
A	DR5B	I 90 94 Ryan	51st St	CO	UIJ3	A2DR	11
A	DR6B	I 90 94 Ryan	59th St	CO	TGH2	A2DR	12
A	DR7A	I 90 94 Ryan	64th St	CO	SAB1	A2DR	13
A	DR7C	I 90 94 Ryan	67th St	CO	RIGH2	A2DR	14
A	DR8A	I 90 94 Ryan	72nd St	CO	RKL3	A2DR	15
A	DR9A	I 90 94 Ryan	81st St	CO	POP3	A2DR	16
A	DR9C	I 90 94 Ryan	86th St	CO	PEF5	A2DR	17
A	DR10A	I 90 94 Ryan	90th St	CO	OKL3	A2DR	18
A	DR11	I 90 94 Ryan	96th St	CO	OAB2	A2DR	19
A	FS0A	I 57	Wentworth	CO	AGH2	A2FS	20
A	KI0A	I 80 94 Kingery	State Line	CO	AGH9	A2KI	21
A	IK14D	I 290 IKE	Wolf Rd	CO	YKL1	A2IK	22
A	IK14E	I 290 IKE	Butterfield Rd	CO	ZAB3	A2IK	23
A	IK15	I 290 IKE	St Charles Rd	CO	WAB11	A2IK	24
A	IK17	I 290 IKE	North Ave on Tower	CO	XEF1	A2IK	25
A	IK18	I 290 IKE	York Rd	CO	YCD1	A2IK	26
A	IK19	I 290 IKE	Grand Ave on Tower	CO	AGH1	A2IK	27
A	IK28A	I 290 IKE	Schaumburg Rd	CO	MAB1	A2IK	28
A	IK29	I 290 IKE	I 290 Exit Ramp at Higgins	CO	OAB2	A2IK	29
A	IK29B	I 290 IKE	Woodfield Dr	CO	OCD3	A2IK	30
A	IK29D	I 290 IKE	Golf Rd	CO	PMN1	A2IK	31

A	IK30	I 290 IKE	I 90 SW Quad	CO	PUV2	A2IK	32
A	IK30A	I 290 IKE	I 90 NW Quad	CO	RAB4	A2IK	33
A	IK30B	I 290 IKE	IL 62 Algonquin Rd	CO	RAB1	A2IK	34
A	KE13	I 90 94 JFK	Cumberland Ave	CO	D1AB5	A2KE	35
A	KE13A	I 90 94 JFK	West of Cumberland Ave	CO	D1AB1	A2KE	36
A	KE14	I 90 94 JFK	W of East River Rd	CO	D1GH3	A2KE	37
A	KI0A	I 80 94 Kingery	West of State Line	CO	AGH9	A2KI	38
A	KI0B	I 80 94 Kingery	William St	CO	AGH2	A2KI	39
A	KI1	I 80 94 Kingery	Fritz Dr Railroad Ave	CO	BGH7	A2KI	40
A	KI1A	I 80 94 Kingery	Torrence Ave	CO	BGH1	A2KI	41
A	KI2	I 80 94 Kingery	Paxton Ave	CO	DCD4	A2KI	42
A	KE15	I 90 94 JFK	E of Mannheim Rd	CO	PC-C	A2KE	43
A	LP1	US 41	West Park	LA	LPAB2	A2	44

Advanced Systems Cameras Coming on State Maintenance

to be paid through Lighting System:

Sys	Loc. #	Main Route	Cross St	Co	Expected Date	System Type	Qty
A	IE 26C	I 80 (NEF2)	WB I 80 .5 West of US 30	WI	Jun-13	A2ST	1
A	IE26D	I 80 (NCD3)	EB I 80 West of US 30	WI	Jun-13	A2ST	2
A	IE26E	I 80 Int (NIJ2)	WB I 80 Exit to US 30	WI	Jun-13	A2ST	3
A	IE26F	I 80 Int (NQR1)	Ramp to EB I 80 from US 30	WI	Jun-13	A2ST	4
A	IE26G	I 80 (NKL2)	WB I 80 East of US 30	WI	Jun-13	A2ST	5
A	ST47A	I 55 Stev	Bridge Security/DesPl	WI	Oct-12	A2ST	6
A	ST47B	I 55 Stev	Bridge Security/DesPl	WI	Oct-12	A2ST	7

A	ST48	I 55 Stev	South of DesPlaines Riv	WI	Oct-12	A2ST	8
A	ST49	I 55 Stev (TCD1)	North of Arsenal Rd	WI	Mar-13	A2ST	9
A	ST50	I 55 Stev (AEF1)	South of Arsenal Rd	WI	Mar-13	A2ST	10

7.2 LIGHTING SYSTEM ROUTINE MAINTENANCE PAY ITEMS

The routine maintenance pay items for the lighting system are as follows:

L-1, Lighting System – On-Expressway: Lighting system locations on Interstate Highways and their extensions leading in to State and/or US Routes

L-2, Lighting System – Off-Expressway: Lighting systems at off-expressway locations, where the number of luminaires at the location are greater than 12

L-3, Lighting System – Other Lighting: Lighting system locations on State maintained routes, where the number of luminaires at the location are less than or equal to 12

7.3 RESPONSE AND REPAIR TIME REQUIREMENTS

Article 4.0 discusses general response requirements of routine maintenance. The following chart lists routine maintenance maximum response time, service restoration, and permanent repair times specifically allowed for the Lighting, Navigation and Sign Illumination System.

Incident or Problem	**Service Response Time**	**Service Restoration Time**	**Permanent Repair Time**
Control cabinet out	1 hour	4 hours	7 Calendar days
Hanging mast arm, head or open luminaire	1 hour to clear	N/A	7 Calendar days

Radio problem	1 hour	4 hours	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – breaker	1 hour	4 hours	7 Calendar days
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	N/A
Outage of 75% of lights on one tower	1 hour	4 hours	7 Calendar days
Outage of light nearest RR crossing approach, islands, or gores	1 hour	4 hours	N/A
Multiple Outages (found on night patrol survey or reported to EMC)	1 hour	4 hours	7 Calendar days
Navigation light outage, single	N/A	1 day	7 calendar days
Single Outage on Pole, Tower, In Underpass or on sign	N/A	N/A	14 calendar days

- **Service Response Time** -- amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location

- **Service Restoration Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage, the undamaged portions of the system are operational.)

- **Permanent Repair Time** – amount of time from initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement

7.4 ROUTINE MAINTENANCE EQUIPMENT RESPONSIBILITIES

7.4.1 DECAL

Cabinet, light pole, underpass, sign, camera or light tower identification decals or accident reference (mile marker) decals reported to or observed by the Contractor to be worn-out, missing, damaged, covered up or placed so they are illegible to police and emergency personnel shall be documented. IDOT will provide a list of the location and equipment to be re-decaled after the joint night time lighting patrol inspection as approved by the Engineer.

Three thousand (3,000) decals (4X4 inches) and Three Hundred (300) decals (6X6 inches) shall be furnished and installed by the Contractor per year through routine maintenance, from mid-May through mid-October. The contractor shall remove existing decal and clean and prepare the surface as per manufacture's recommendations prior to installing new decals. This work shall be applicable to all systems as designated by the Engineer.

Light poles damaged and replaced due to motorist caused damage shall have new decals, including accident reference numbers, replaced by the Contractor at the time of the repair, when weather allows.

The Contractor shall keep a spreadsheet of the number of decals replaced per month per EMCMS Lighting System location and cabinet number and submit in the routine maintenance work submittal book.

7.4.2 CONTROLLER

The lighting controller has several components that require special training to understand the operation and its maintenance. The Contractor must follow a procedure that implements those items covered with special training classes to enable the patrolman to troubleshoot systematically and identify the faulty component whenever there is a problem with the controller. After responding to a trouble call, the patrolman must record the problem found and action taken for service restoration on the cabinet log sheet in addition to ticket. When there is more than one service call due to the same component failure within a month, the Contractor shall replace that component with a new one instead of making temporary repairs.

SCADA Alarms

Receipt of three (3) alarms during one (1) month period, indicating the existence of a recurring problem, shall be investigated and promptly repaired to eliminate the reported alarms. The Contactor shall report his corrective action via email or "The Contractors Advisory Inspection Log Sheet" as per Article 4.0.

Cabinet Components

Receipt of three (3) or more independent lighting tickets where the problem is caused by the same component(s) during any two (2) month period indicating the existence of a recurring problem will be considered unsatisfactory service.

Clock setting

Repeated controller malfunctions due to an incorrect time of the day setting on the controllers' time clock which results in not energizing lighting at sunset and not de-energizing the lighting installation at sunrise shall be considered unsatisfactory service.

Cabinet

The Contractor shall repair lighting cabinet doors, hinges, meter box, etc., to keep the cabinet functioning effectively.

Log Sheets

All inspections shall be logged and recorded with the action taken. The Contractor shall maintain service log sheets in each lighting cabinet. New log sheets shall be placed in the cabinet (in protective plastic) in January 2013. The removed (completed) log sheets shall be submitted to the Engineer in the January 2013 the monthly routine maintenance work documentation book.

Foundation

Minor repairs to concrete foundations shall be completed within seven (7) calendar days from the date of discovery and issuance of a ticket, or within twenty one (21) days if the rebuilding or complete replacement of a concrete foundation is required.

Pad and Bumper Post

If the cabinet pad and/or bumper post are found to be missing, damaged or have shifted due to the ground condition, then Contractor shall repair or replace to the original condition.

Warning Sign

If the cabinet "voltage warning" decal/sign (as approved by the Engineer) is found to be missing or damaged, the Contractor shall immediately apply a replacement.

Radio

When the Contractor removes a lighting cabinet radio for repair, it must immediately be replaced with a spare radio from the Contractor's spare parts inventory. The Contractor is required to have two (2) working, SCADA radios available in his spare parts inventory at all times. The Contractor shall repair the defective radio within seven (7) calendar days, or shall replace with a new radio similar in kind or current version. The ticket shall document this exchange/repair.

Utility Service Voltage

The Contractor shall dispatch a patrolman to check if there has been a notification of low voltage and/or utility problems within one (1) hour of notification. If the service voltage is not restored before sunset, then the Contractor shall provide a generator to power the lights.

Vegetation

The Contractor shall clear all vegetation within the 10-ft. areas surrounding the controller.

State of Illinois Decal

Each controller shall have a decal stating "State of Illinois"; if missing, torn, or illegible it shall be replaced.

7.4.3 LIGHT POLE UNIT

Pole

Standard (non-davit) round-tapered, conventional, combination, or davit light poles decorative or painted of different manufacture than the originally installed pole may be used, but shall otherwise be in conformance with approved submittal requirements. Standard or davit light pole mast arms shall be replaced with the same color, length, rise, diameter, and shape as the original installation. All resets of light poles from knockdowns shall use a short transformer base (T-base). The Contractor shall not use a breakaway coupling. The replacement pole shall meet UL standard.

Ground Lug

If the existing ground tap/lug is damaged or not functional, then the pole should be drilled and the ground wire lugged on and not wrapped.

Light Pole Foundation

It is the Contractor's responsibility to be knowledgeable of safety requirements for light pole foundation construction and current approved height limitations for base extensions above the adjacent grade. See lighting Figures L-5a (concrete) and L-6 (metal) for foundation details distributed at the Pre-bid Meeting.

Minor repairs to concrete foundations shall be completed within seven (7) calendar days from the date of discovery and issuance of a ticket, or within twenty-one (21) days if the rebuilding or complete replacement of a concrete foundation is required.

Uniduct Exposure

Uniduct must be visible inside the pole. Below the foundation grade or flush is not acceptable. Where uniduct is below grade or flush, a split 12" uniduct extension shall be installed in place (excluding existing direct buried cable).

Mast Arm

The Contractor shall use the same mast arm of the type, color, length, direction and rise, replaced after a knockdown by a motorist, or fall down due to high wind or age. The davit arm shall be horizontal to the X-axis and 90 degrees to the shaft plus/minus a tolerance allowed by the manufacturer.

Anti-Theft Locking Devices

Selected locations of the Eisenhower (I-290) Expressway have a special anti-theft locking device on handhole covers and junction boxes at power centers to prevent cable theft. It is the Contractor's responsibility to monitor the special coded, keyed nut drivers required for these junction boxes. If a coded key is lost, it shall be the Contractor's responsibility to furnish and replace a new coded fastener nut at all locations with these anti-theft locking devices, and replace the coded, keyed nut drivers, all at the Contractor's expense.

7.4.4 LIGHT TOWER

Light Towers Requiring Special Maintenance

The Contractor shall provide labor and equipment to perform routine maintenance (outages and safety inspections) on light towers located on I-290 (Eisenhower Expressway) near Wolf Road, I 90/94 Ryan Expressway at Maxwell St, I 80/90 Kingery Expressway and I 394. A lane closure is required, as are attenuators and a bucket truck due to the barrier wall adjacent to the foundation.

Light Tower Removal for Safety

If a motorist causes structural damage to a light tower and/or the Contractor or Department inspectors determine that a tower is unsafe for the motoring public the Engineer shall immediately be notified and the light tower shall immediately be removed.

The Contractor shall be paid for work as follows:

Through Non-Routine Maintenance Unit Prices for:

1. Light Tower (Remove and Re-Erect)
2. New Foundation (if required, removal and replacement)
3. Temporary Lighting (installation and removal)
4. Furnish Replacement Light Tower, if not available in State Stock

Through Non-Routine Maintenance Agreed Prices for:

1. Handling of contaminated soil (if found)
2. Clearing Site for Safety.

The Department reserves the right to use State Stock for all material replacements as necessary; MCHD shall be as specified herein Article 4.9.5.

The Contractor shall install temporary lighting to restore lighting service and shall provide the Engineer catalog material cuts for the tower replacement for approval within ten (10) days of the light tower removal. After receiving the Engineers approval of the catalog cuts, and a non-routine

authorization for tower work, the Contractor shall order the material and complete the reinstallation of the light tower within a three (3) month period.

Block Retaining Wall and Pad

If a light tower block retaining wall and adjacent concrete pad are found to be damaged, they shall be promptly repaired.

Ground Well

The ground well shall be inspected including the cad weld and repaired as necessary.

Site Maintenance

The Contractor shall clear all vegetation within the 10 ft area surrounding a light tower.

External Portable Drive

The Contractor shall maintain, in proper working order, all external portable drive units in State Stock, which are used to lower the towers which are without an internal drive.

7.4.5 LUMINAIRES

Replacement

Certain requirements apply when lighting units are replaced or repaired in place under routine maintenance.

Luminaire ballasts shall match the system voltage and be of the same type and characteristic as the original design and installation being replaced, unless otherwise authorized by the Engineer.

Ballasts in luminaires, employed on other than the District's standard voltage of 240 volts single phase, may be of a multi-tap type, as approved by the Engineer.

Luminaires installed as replacements at an installation location, installed within six (6) years of the current year, shall be of the same manufacturer, and have the same photometric performance specification as the originally installed luminaire, except as otherwise indicated or authorized by the Engineer

Luminaires replacing drop-lens (reflector-type) may be replaced with flat-glass cut-off type units of a distribution type and photometric performance approved by the Engineer. The Contractor shall submit proposed variant replacements to the Engineer for approval.

Lamp

When a replacement luminaire is installed, it shall be equipped with a new lamp. The Contractor shall also provide a new lamp (through routine maintenance) if a non-routine authorization letter requires a replacement luminaire from State Stock. The HPS lamp shall be rated for a minimum of 40,000 hours; Sylvania LUMALUX PLUS ECO non-cycling or better, as approved by the Engineer.

Outages

Refer to Article 4.10.2 to review outage repair requirements and documentation. The Contractor shall provide the labor, equipment and material to meet the response requirements for all outages and repairs and this work shall be included as part of routine maintenance. The Contractor shall wash all the luminaires on the tower, pole, underpass, navigation, tube lighting or sign lighting during an outage repair.

Fuse and Fuse Kit

Standard fuse holders shall be used on non-frangible (non-breakaway) light pole installations and quick-disconnect fuse holders shall be used on frangible (breakaway) light pole installations. Wires shall be carefully stripped only as far as needed for connection to the device. Over-stripping shall be avoided. An oxide inhibiting lubricant shall be applied to the wire for minimum connection resistance before the terminals are crimped-on. Crimping shall be performed in accordance with the fuse holder manufacturer's recommendations. The exposed metal connecting portion of the assembly shall be taped with two half-lapped wraps of electrical tape and then covered by the specified insulating boot. The fuse holder shall be installed such that the fuse side is connected to the pole wire (load side) and the receptacle side of the holder is connected to the line side."

Shields (Light Towers or Light Pole Luminaires)

The luminaire shield, if found to be torn or ineffective, or missing, shall be replaced with the same kind or better.

Luminaire Keeper

The luminaire keeper, if found to be torn or ineffective, or missing, or at the time of a knockdown repair, shall be repaired or replaced with the same kind or better.

7.4.6 CABLE

Repair or Replacement

The Contractor shall repair or replace all cable and associated equipment grounding cable or integral cable-in-duct combination, which becomes damaged, displaced, defective or missing from any cause whatsoever. If an aerial cable is used for temporary response, it shall be installed so that its lowest point is at least twenty-five (25) feet above ground level. When cable deficiencies become suspected or known, the Contractor shall take immediate corrective action to make temporary repairs. Permanent repairs shall follow as soon as possible and shall be completed within 21 calendar days. Only for notifications of cable failure after December 1, when frozen ground conditions restrict permanent repair work, will the temporary repairs be acceptable for a longer period of time. When temporary cable is installed, all splices shall be as good as splices for permanent repairs and proper grounding shall be observed. In all cases where temporary repairs were made during the winter months, permanent repairs shall be completed by May 30.

The Contractor shall document on tickets all cases where temporary aerial cable was installed or found, failure to respond such instances shall be grounds for assessment of liquidated damages. Temporary ground laid cable or attachment to the metal structures is not allowed. Except as otherwise authorized by the Engineer, cable used to repair or replace faulty cable runs under routine maintenance shall be new, and shall be copper conductor EPR-insulated cable. The new cable run shall include a separate green ground wire sized in accordance with codes, even if it did not exist before the malfunction.

Cable in Duct or Conduit

Where damaged cable is in duct or conduit, the faulty wiring shall be removed and replaced with the approved new cable and the duct or conduit shall be repaired. The rigid galvanized conduit shall be used under roadways and driveways to push the uniduct unless otherwise approved by the Engineer.

Cable Run/Grounding Conductor

The new cable run shall include a green equipment ground conductor sized in accordance with the electrical codes. All cable used shall be new copper conductor, EPR-insulated as specified. If the uniduct cannot accommodate the green insulated ground wire, then the bare ground wire continuity shall be tested/measured. All pertinent information shall be documented and communicated to the Engineer by email. If the existing installation is without an equipment ground wire, the Contractor shall also note this information in email to the Engineer.

Ground Well/Rod

The ground well/rod for lighting cabinet, HMLT (high mast lighting tower) and pole shall be inspected for exothermic weld and continuity, if defective shall be repaired or replaced.

Cable Repair (Direct Buried)

The Contractor shall remove and replace any section of faulty direct buried cable plus a minimum of three (3) feet on each side including all of the undamaged adjacent cables. If the fault is six (6) feet or less from a pole, splicing handhole, or a control cabinet, the six (6) foot section shall be removed and replaced. The Engineer shall approve the cable to be used and the type of splices. Existing underground wires may be spliced. If no equipment ground wire exists, the Contractor shall notify the Engineer by email prior to replacing the complete span. At the Engineers direction the Contractor shall install a green ground conductor that shall be paid under non-routine work. Estimated costs shall be submitted by e-mail to the Engineer prior to the start of work.

7.4.7 SIGN

When a sign structure is being repaired or replaced, the Contractor shall disconnect and/or reconnect the sign structure as requested by Department personnel. Prior to a maintenance transfer, the Contractor shall inspect the sign installation with the Engineer and/or IDOT inspector. The Contractor shall replace disconnect switch if it is rusted and/or inoperable to isolate sign lighting fixtures. The sign lighting fixtures and associated conduit, wiring, and disconnect shall be removed if a new reflective sign board for night visibility is installed by the Department, this work shall be paid under unit prices as applicable.

7.5 LIGHTING SCADA SYSTEM

The lighting SCADA system enables the remote control of the lighting at the cabinets equipped with radios along the expressway system on certain arterial highways within District 1. The lighting at such locations is automatically turned on after sun set and turned off before sunrise by the photocell control at the D-1 ComCenter.

Manual remote control features are also available at the IDOT ComCenter, the Traffic Operations Field Office, and the EMC Dispatch Center. The Contractor shall assume responsibility for all manually-initiated commands of the system, such as that required for day time inspection of selected lighting system installations. (In no case, shall the Contractor substitute this partial control of the system for the required lock-out/tag-out procedures necessary for safe work practices.) The Contractor shall note, however, that unless there are specific arrangements with the Engineer to the contrary, all normal automatic features shall remain operational at all times.

The Department retains the right to suspend or terminate the Contractor's privilege to use the system for misuse of the system or any other reason. Only trained/qualified Contractor personnel shall be allowed to operate the lighting SCADA system. Also refer to Article 6.0 Advanced Systems.

7.6 MONTHLY DAYTIME TUNNEL LIGHTING INSPECTIONS

The Lighting System Manager or other personnel, as approved by the Engineer, shall under routine maintenance, schedule an inspection during the first half of the month, to review the operational condition of daytime tunnel lighting equipment to assure that systems are performing at the level of service for which they are designed. The equipment required for both day and night circuit operation shall be inspected.

The Contractor shall record all lighting outages and other deficiencies, on the tunnel outage log L-8, and date of repairs when complete. Outage repairs for all tunnels are to be completed within seven (7) calendar days of the monthly daytime inspection. The tunnel outage logs are to be emailed to the Engineer, when repairs are complete and the summary report submitted in the monthly routine work submittal book. In addition, the lighting system manager shall notify the Engineer or appointed IDOT Inspector, when repair work is complete, so a joint inspection may be conducted, on a mutually agreed date, during the last work week of the month.

Locations for tunnel inspections:

Loc. # L0115 Stewart's Cave Tunnel

Loc. # L0137 I-55 Tunnel @ Pulaski Road

Loc. # L0873 Erie Street Tunnel

Loc. # L0883 Hubbard's Cave Tunnel

Loc. # L1315 I 290 @ Lower Wacker Exit Ramp

Loc. #L 1320 I 290 @ Lower Wacker Entrance Ramp

Loc. # L1325 I-290 @ Canal St. (under Post Office)

Loc. # L1713 US 34 (Ogden Ave) @ 26th St.,

7.6.1 <u>Hubbard's Cave Relamp</u>:

Hubbard's cave shall be relamped with Sylvania ET 18-67312 non-cycling or better lamp rated for minimum of 40,000 hrs, as approved by the Engineer under Routine Maintenance from mid-April to mid-May, 2013.

7.7 PREVENTIVE MAINTENANCE PROGRAMS

The Contractor shall list inspections and repairs performed in the daily agenda for the below listed routine maintenance programs. All submittals shall be made in the monthly routine work submittal book an shall be accompanied by an Excel spreadsheet summary report, cumulative for the contract year, which lists all lighting and/or extra system locations and shows the date of the submittal (by book month) for each location. The Excel spreadsheet list of locations for this summary report will be provided at the start of maintenance work January 1, 2013.

Art. No.	Form #	Program	No. of Locations	Frequency	Submittal
7.6	L-8	Tunnel Lighting Inspection	All	Monthly	Email/RWSB
7.6.1	L-1	Hubbard's Cave Relamp	L0883	Mid-Apr to Mid-May 2013	RWSB
7.7.1	L-2	Clock/Radio/Cabinet Inspection	All	Approx. 50/month	RWSB
7.7.2	L-2	SCADA Back-up Battery Replacement	All	Year 2013 & 2015	RWSB
7.7.3	L-3	Control Cabinet Full Inspection	1/2 All Loc.	Approx. 20/month	RWSB
7.7.4	L-4	Poles & Underpasses Inspection	25%of Poles 50% UP/Yr	Per Schedule	RWSB
7.7.5	L-5	Light Tower Safety Inspection	605	Approx. 605/yr	RWSB
7.7.7		Photo Cell Calibration	All	Yearly/June 21st	RWSB
7.7.8		Navigation Lighting Inspection (Relamp in 2013)	All	Yearly	Email
7.7.9		Lighting Controller Replacement	6	Yearly	RWSB

7.7.1 YEARLY CLOCK, RADIO, AND CABINET INSPECTION

The Contractor shall conduct a yearly clock, radio and cabinet inspection at every lighting system location, once per year. An inspection schedule shall be followed, as presented by the Engineer. Approximately fifty (50) cabinets are to be inspected monthly. This schedule will be available at the Pre-Construction meeting.

The Contractor shall replace the back-up battery for clocks (chargeable or regular), record the battery model and number installed on inspection log L-2. The Contractor is also required to put a sticker on the clock indicating the date for new battery, record the location number, name and battery model and serial number installed information to a spreadsheet, and submit monthly in the routine maintenance work submittal book.

The Contractor shall clean the cabinet, install decals or replace if necessary, and check the following (refer to log L-2):

- Time clock, including escapement (reserve power) and back up battery
- Check radio code by turning On/Off
- Background timer
- Springs (reset as required)
- Lighting contactors and surge suppressor
- Tighten all the contacts with proper torque
- Radio harness, connectors, cables
- Clean inside with vacuum cleaner
- Antenna
- Outages

Repairs must be completed in the same month as the inspection. L-2 logs with repair work notations and ticket numbers shall be submitted to the Engineer in the monthly routine work submittal book. Tickets shall be created for any problems found.

Contractor shall schedule these inspections with the IDOT Maintenance Technician present. The Contractor shall operate the lights and conduct a full inspection of the above. Any Items found damaged, malfunctions, or outages shall be entered into an EMCMS ticket to schedule repair work.

The log form for this survey will be available at the Pre-Construction meeting. Logs shall be submitted in the monthly routine work submittal book.

7.7.2 FIRST YEAR SCADA BACKUP BATTERY REPLACEMENT FOR RADIO

The Contractor shall replace the SCADA backup battery for the radio at all lighting locations in year 2013 and in year 2015 during the clock, radio and exterior cabinet inspection programs. The location number, name, and the battery model installed shall be recorded on inspection log L-2.

7.7.3 YEARLY CONTROL CABINET FULL INSPECTION

(One Half of all Lighting Locations per Year)

The Contractor shall conduct control cabinet inventory inspections on one half of all lighting locations once per year. Information to be collected on log L-3 includes, but is not limited to, CE meter number, CE supply voltage, transformer size, location and transformer number, conduit and cable types, and clock manufacturer and model number.

The Contractor shall carry a digital camera to record the control cabinet pictures, one to show inside of the cabinet and other to view outside of cabinet, for each location. All the pictures shall be transferred into a file on disc to submit with monthly submittal book.

Objectionable current flow from one ground connection to another, which occurs from multiple grounds on the same system equipment or highly unbalanced loads shall be identified and logged. Also the ground resistance and the continuity test for all the circuits shall be measured and documented on the log L-3 as part of the inspection. Before making test measurements, the Contractor shall verify that all luminaires are operating.

As part of this inspection the following SCADA system items shall also be completed:

1. All SCADA inputs/outputs shall be checked for proper operation. This shall be verified by visual inspection of the SCADA CPU.

2. SCADA radio system communications shall be checked to and from the cabinet.

3. Confirm the calibration of analog input values. (This is done by measuring the current and voltage inputs and having the EMC Dispatch Center interrogate the power center.) The interrogated values shall be equivalent to measured values. If the voltage is different by +/- 3 volts or if the amperage is different by +/- 2 amps, a Ticket shall be generated.

The Contractor shall follow an inspection schedule as presented by the Engineer. Approximately twenty (20) cabinets are to be inspected monthly. This schedule will be available at the Pre-Construction meeting. Repairs must be completed in the same month as the inspection. L-3 logs with repair work notations and ticket numbers shall be submitted to the Engineer in the monthly routine work submittal book.

7.7.4 YEARLY LIGHT POLE AND UNDERPASS SAFETY INSPECTION

(25 % of the light poles and 50% of the underpass lighting per Year)

The Contractor shall conduct a safety inspection of 25% of the light poles and 50% of the underpass fixtures once per year. The purpose of this inspection is to insure that all lighting unit components are maintained in a safe and effective operating condition as originally designed or as subsequently modified by the Department. A minimum of ten (10) lighting system locations and twenty (20) underpass locations per month must be inspected beginning February, and continuing in subsequent months, with the remainder of the locations due in November of each calendar year.

Repairs must be completed in the same month as the inspection. L-4 logs for Poles and L-6 for Underpass with repair work notations and ticket numbers shall be submitted to the Engineer along with spreadsheet listing all the locations inspected for Poles and Underpass in the monthly routine work documentation book.

Required repair work includes replacement of damaged poles, T-base, mast arms, luminaires, shields, luminaire keeper, leaning poles, hardware, underpass fixtures, junction boxes, wiring, conduit, conduit hangers, or missing appurtenances such as decals, decal mounting brackets, mile markers, shrouds, skirts, leaves, and handhole doors. Decals shall be replaced if not legible. All equipment and materials required for repairs and replacements shall be furnished as part of routine maintenance.

The Contractor shall provide GPS readings of the location of each pole and each underpass fixture per specifications as provided in Article 4.17.7

The Contractor shall identify:

- existing light pole bases which are too high and do not conform with the current approved height limitations for base extensions above the adjacent grade
- loose and/or worn nuts and washers by lifting the shroud or removing the skirt
- any other abnormality (cracks, loose nuts and joints) due to the wind load condition
- leaning (more than 10 degrees) poles
- Davit poles with open mast arm (not parallel to ground)
- pole that is susceptible to hit by motorist due to road condition
- mast arms fastened with riv-nuts
- lighting locations with temporary aerial cable
- underpass fixtures damaged and/or missing components
- Underpass Lighting Conduit, JB, light fixtures and Decals deteriorated or torn

The Contractor shall conduct any safety inspection of light poles or underpass fixtures when recommended by the manufacturer, upon request by the Engineer, which is in addition to the regular inspection as specified herein.

7.7.5 YEARLY LIGHT TOWER SAFETY INSPECTION

The Contractor shall conduct a safety inspection of (605) of the lighting system high mast towers per year in 2013 and 2014, The department shall provide a list of tower locations at the pre-bid meeting.

In 2015 the contractor shall inspect a third of all lighting system towers, the Department shall provide a list of tower locations.

The purpose of this inspection is to insure that all tower components are maintained in a safe and effective operating condition as originally designed or as subsequently modified by the Department. The inspections shall be completed by the end of November of each year. Lighting equipment inventory and tower locations are provided herein.

The Contractor shall provide GPS readings of the location of each light tower per specifications as provided in Article 4.17.7.

The Contractor shall examine for deterioration:

- Paint
- Metal parts (for corrosion and/or rust)
- Foundation
- Mounting bolts
- Shaft
- Handhole doors
- Lowering device including motor and cables
- Ring assembly electrical cable (faulty splices)
- Fuse kits
- Decals and decal mounting brackets
- ESCO stainless steel swage sockets for cracks
- Outages

Contractor shall schedule these inspections with an IDOT Maintenance Technician present. The Contractor shall operate the lights and conduct a full inspection of the above. Any Items found damaged, malfunctions, or outages shall be entered into an EMCMS ticket to schedule repair work.

The Contractor shall identify the number of towers, and lamps per tower at each location.

The Contractor shall inspect rust on outside of the shaft and at all slip joints during the tower inspection program. The location and magnitude of the rust spots shall be described in detail on the inspection report. At the time of the tower inspection program any rust spots, found within 20 feet from ground, shall be cleaned and touched up, cracks as found located in the first ten (10) feet shall be clearly identified and documented with pictures and measurements and sent to the Engineer. All bolts shall be tightened as necessary; this work shall be done and paid for under routine maintenance.

If the Engineer determines the need to paint the tower or any part thereof, the Contractor shall be paid through Non-Routine maintenance pay items.

The Contractor shall also provide access and traffic control as necessary under routine maintenance.

All the deficiencies found during this inspection shall be listed on the inspection form and repairs must be completed within 30 days of the inspection. L-5 logs with repair work notations shall be submitted to the Engineer in the monthly routine work submittal book.

The Contractor shall train or hire a qualified person with certification in inspection and Maintenance of Ancillary Highway Structures to perform the inspection.

CCTV

The Contractor shall list separately all the towers with CCTV during the Tower Inspection Program. If there are any damages to the camera and/or cable, the Contractor shall create an EMCMS ticket for repair.

7.7.6 This Article Left Open for Future Use

7.7.7 YEARLY PHOTO-CELL CALIBRATION

Each year, on the day of the summer solstice, normally June 21st, the Contractor shall test and adjust the Hubbard's Cave and Stewart's Cave tunnel consoles per manufacturer's operation manual. The Engineer shall attend this inspection and provide the luminance level specifications for Stewart's Cave (L0115) Tunnel and Hubbard's Cave (L0883). Also on this day, the Contractor shall check and clean the IDOT HQ

photo cell and adjust to 5 +/- 0.5 ft. cd., or as specified by the Engineer for proper lighting SCADA control operations.

7.7.8 YEARLY NAVIGATION LIGHTING INSPECTION

L.E.D. lamps shall be tested with an optical meter each year to determine the need for replacement. Readings from the optical meter shall be compared to manufacturer's minimum requirements and those lamps not meeting minimum performance values shall be replaced. Replacement of L.E.D. lamps when determined to be necessary shall be paid as routine work or covered by manufacturer warranty. The Contractor shall record all deficient items and their replacement and submit the information after completion to the Lighting Maintenance Engineer by email. The information shall include manufacturer, model, and serial number of each L.E.D. module needing replacement. Repair of L.E.D. single outages and damaged equipment will be routine maintenance. Under routine maintenance the Contractor shall relamp all LED lamps for navigation lighting in 2013, this program shall be completed by June 30, 2013.

7.7.9 YEARLY LIGHTING CONTROLLER REPLACEMENT

As part of Routine Maintenance of the Lighting System, the Electrical Maintenance Contractor shall upgrade service including the service conductors and conduit, remove and replace lighting controller, modify foundation as required, and replace bumper post if missing or damaged at six (6) lighting locations yearly. The Contractor shall complete the work within the calendar year.

The six (6) locations to be modified in the first year of contract are:

Location	Expressway	Cross Street	Cabinet
L0853	I 90 94 JFK	@ Kimble Ave	PC: L
L0855	I 90 94 JFK	@ California Ave	PC: M
L0857	I 90 94 JFK	@ Leavitt St	PC: N
L0863	I 90 94 JFK	@ Blackhawk St	PC: P
L0865	I 90 94 JFK	@ Augusta Blvd	PC: R
L0867	I 90 94 JFK	@ Grand Ave	PC: S

If the Contract is renewed for a second year, the six (6) locations to be modified are:

Location	Expressway	Cross Street	Cabinet

L0886	I 90 94 JFK	@ W. Washington Blvd	PC: U
L0888	I 90 94 JFK	@ E. Washington Blvd	PC: V
L0850	I 90 94 JFK	@ Kedvale Ave	PC: K
L1035	I 94 Ford	@ Dolton Ave	PC: H
L1060	I 94 Ford	@ 115th St	PC: Y
L1203	I 94 Edens	@ Knox Ave	PC: A

If the Contract is renewed for a third year, the six (6) locations to be modified are:

Location	Expressway	Cross Street	Cabinet
L1255	I 94 Edens	@ Winnetka Rd	PC: M
L1265	I 94 Edens	@ Tower Rd	PC: O
L1280	I 94 Edens	@ Lake Cook Rd	PC: S
L1325	I 290 IKE	@ Canal St	PC: F
L1630	US20	@IL 59	PC: M
L1706	US 12/20/45	@ Chicago Sanitary and Ship canal	PC: BK

A copy of the record drawing for the lighting cabinet indicating the location of cabinet, service conduit size, and number of cables with size from ComEd pole or pad mount transformer shall be provided at the pre-bid meeting.

If one of the above list control cabinets is replaced for any cause whatsoever, then it is the Engineer's option to designate an alternate location to keep the same number of locations per contract year.

The Contractor is responsible for scheduling the work and for coordinating with the Engineer whenever Engineer presence is required. The Contractor shall also advise the Engineer when each location is complete and shall provide a written documentation via e-mail or fax to that effect. The Engineer reserves the right to require a final inspection of the changeover at any or all of the locations documented

as complete. A corrective work list shall be prepared for deficiencies found during inspection. If progress of the work is inadequate, or if errors in complete work are repeatedly found, the Engineer may initiate withholding of Routine Maintenance payment. The Contractor shall provide a progress report in the monthly routine work submittal book.

The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost to the contract. All materials and work shall be in conformance with the requirements of applicable contract specifications and Article 250 of the National Electrical Code.

The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for any and all modifications. The Contractor shall provide temporary backup power or service to maintain continued operation of the cabinet during transition.

The work shall include:

- New conduit and cable from the service disconnect to the controller if the existing cable doesn't meg. (Refer to 7.8.2)
- Restoration of ground with seed or sod
- New grounding of the service unless the existing grounding is adequate as witnessed by the Engineer
- Removing of the old cabinet and transferring into State Stock
- Replacing with new SCADA type cabinet with the same radio code
- Coordinating the RTU terminal and FIU configuration GUI modification
- Testing and documentation

Foundation

The foundation, if modified or replaced, shall be paid using non-routine pay items.

Replace Electric Service Conductors

The work shall include the removal of the existing service conductors if they do not meg, and shall include the furnishing and installing of new service conductors, based on the manner of the existing service. (Article 7.8.2)

Provide New System Ground of Electric Service

The work shall include the installation of a new system ground, using one or more grounding electrodes, or other means approved by the Engineer. The system ground shall have a resistance to earth not to exceed 10 ohms. The Contractor shall conduct a system ground resistance test, using the fall-off potential method, and it shall be witnessed and approved by the Engineer. Ground resistance readings shall be submitted on progress reports. Should more than one electrode be required, additional electrodes shall be connected to the grid, and the grid re-tested. All ground electrode connections shall be exothermically welded. Ground rods and grounding electrode conductors shall be as specified and detailed.

Lighting Cabinet

The Contractor shall furnish and install a roadway lighting controller, duplex console type with radio control and associated wiring for control of highway lighting controller, as specified herein.

Materials

Materials shall be according to Article 1068 of the Standard Specification for Road and Bridge Construction, current version, except as follows: First three paragraphs of Article 1068.01 (c) (2) to be eliminated.

Surface Preparation: The cabinet, doors and all other parts to be painted shall be submerged in each tank of a 3-step iron phosphate conversion technique. After phosphatizing the parts shall be passed through an oven and baked to eliminate any moisture.

Finish coat: Shall be polyester powder point applied electrostatically to a minimum thickness of 2 mils and baked at 375 degrees for 20 minutes.

Revise the first sentence of Article 1068.01 (e) (4) of the Standard Specifications to read:

"Contactors shall be electrically operated, mechanically held as specified, with the number of poles required for the service and with operating coil voltage as indicated."

Add the following to Article 825 of the Standard Specifications:

Radio Control Equipment – Receiver-Decoder

The radio control module consists of a radio receiver, digital decoder, and an output interface which allows centralized remote radio control of the lighting controller turn-on and turn-off functions. The radio control module must be capable of operation consistent with the existing radio control system, a Motorola SCADA Central Station.

The existing control system currently operates over 250 discrete lighting controllers via a securely coded proprietary data scheme. For this reason, the control module must consist of a Motorola ACE 3600 Modular Remote Unit, model F 7563, (small housing), with no less than the following options:

Motorola Designation	**Description**
F 7563 (VHF), F 7564 (UHF)	ACE 3600 CPU **
V 245	Mixed I/O
V 261	240 VAC Power Supply w/charger
Z 857AA	Surge Protection

** Includes (1) three slot frame, (1) ACE 3600 CPU plus firmware, (1) mixed I/O Module, (1) VHF or UHF* CDM 750 Radio with FSK Radio Interface, port 3 (1) AC Power Supply with Charger, (1) 6.5 Ah battery, installed in a 15" X 15" X 8.26" NEMA 4X/IP 56 painted metal enclosure with instruction manual.

* As directed by the Engineer

The manufacturer's designation by no means relieves the Contractor of providing a fully functional radio system as described herein.

The Radio Control Module shall be programmed for the following operational parameters:

- Transceiver Frequency: To be specified by the Engineer
- Receive Frequency: To be specified by the Engineer
- Communications Failure Preset: Normally Open
- Individual Station address: To be specified by the Engineer

Antenna

The antenna shall be thick mount up to ½" mounting surface mounted by screw adapter (no magnet mounts). The low profile antenna mount shall be equivalent to Antenex – MABT8XNSI antenna Mount Low Profile. Accompanying antenna shall be equivalent to Antenex – B132 (Broad Band – VHF/UHF ¼ wave 150-928 MHz. Accompanying cable shall be equivalent to Antenex-RG8X and conductor equivalent to Antenex – CN8X from Radio to Antenna and shall be of appropriate length and not longer than 8 ft.

Installation of I/O Module

All motherboard cards shall be configured and installed as per manufacturer's specifications and IDOT specification Lighting SCADA 397. Modules include but are not limited to; CPU, Mixed I/O. All digital inputs terminated on the Mixed I/O card shall be dry. Termination points for all digital input points will be reflected on power center wiring diagram or additional wiring schematic provided by the engineer. All digital outputs received from the Mixed I/O card shall be rated at 24 VAC 2A. All digital outputs shall be connected to interposing relays prior to being integrated into the power center wiring logic. The digital outputs shall maintain a momentary closure for approximately 2 seconds.

All wiring termination points shall be tagged using the nomenclature given on the wiring diagram. The alarms acknowledge button shall be implemented with a placard stating "Alarm Acknowledge". Site configuration, map implementation, screens tagging and other related software configurations shall be specified elsewhere herein.

The antenna shall be centered on the top of the control cabinet. The antenna cable shall be dressed and trimmed for minimal length, allowing sufficient slack of removal of the radio connection for replacement or testing without disruption to the installation. The antenna connector shall be properly soldered to the cable assembly. Great care shall be exercised in the assembly of the antenna connector, excessive heat will destroy the inner insulation, and insufficient heat will produce a cold solder connection on the outer shield.

Intra-module wiring shall be 18 AWG stranded wire, color coded (American) consistent with battery polarity, and signal. The wire connection from terminal block (TB2) to the interpose relays shall be 14 AWG stranded. All wires connected to the radio modules shall be dressed and tinned prior to insertion, (crimp on connectors shall not be allowed for use in the radio system). Cost of all wire is inclusive within the scope of this work.

A terminal strip separate from the integral radio module and power supply shall be provided to interface power and signal conductors to the lighting controller. Terminals and wiring shall be labeled in accordance with the drawings, and dressed to allow service. The radio module shall be provided with constant 240 VAC power. The control power breaker shall provide power for the SCADA system. This is to allow the system to be energized at all times.

The SCADA system shall be tested in conjunction with the controller inspection, prior to field installation. The turn-on and turn-off function shall be tested ten (10) consecutive times utilizing actual signals originating from District 1 Headquarters. Any failures must be cleared before the controller is delivered to the job site.

Null covers shall be provided for the slots not used. All analog inputs shall be 4-20 mA. All I-O wiring including analog and digital shall be wired as per the enclosed table.

SCADA System Control Relay Assembly

The Contractor shall mount and wire four (4) relays in a box as shown in the wiring diagram. Two relays shall be 240 volts sealed type and two relays shall be 24 volts sealed type, unless otherwise indicated, shall have contacts rated at not less than 20 amperes at 240 volts. The power relay for activating the lighting contactors shall have contacts rated to handle the contactor inrush. The relays shall be wired to a marked terminal strip.

Testing

As part of final acceptance testing, all individual I/O points and internal status alarms shall be tested for proper operation and transmission. The transmission shall be confirmed at IDOT District 1 HQ and the Contractors dispatch facility. This full SCADA system start-up shall be completed with the Engineer present.

The SCADA radio system shall have the following items tested: VSWR, cable impedance, RSSI to the power center and confirmation that data sent from power center is received by the IDOT lighting system computers.

Analog Inputs and Transducers

The panel shall include one voltage transducer for monitoring the line voltage and one current transducer for monitoring the neutral current. Their outputs shall be 4-20 mA DC each and shall be wired to channels 1 and 2 of the Mixed I/O module as shown. The voltage transducer shall be Scientific Columbus Model # VT110 – PAN7 – A4-2 for 480/240 volt single phase systems. The current transducers shall be Mel Kirchler Technologies Model # AT2-420-24L-FT, with power supply, PS-240-24P-1A. Both analog inputs shall be wired using shielded cable. Both transducers shall also be calibrated so that the SCADA system reads the correct value.

Testing of the Assembled Cabinet

Prior to shipment of the completed control cabinet, the control cabinet shall be tested for load, short circuits and complete operation of the cabinet as specified herein and as shown on the plans. The test shall be made at the manufacturer's shop, by the manufacturer and shall be witnessed by the Engineer. The Contractor shall arrange the test date with the Engineer and so allow not less than seven (7) days advance notice. The cabinet shall not be delivered to the job site until inspected, tested and approved for delivery by the Engineer.

Construction Requirements

General

The lighting controller shall be delivered to the storage facility located within District 1. Wood blocking or other supports and appurtenant items required for proper storage shall be included in this item.

Staging

Manufacturer recommendation is for all Central Configuration programming be completed prior to the initial check out/PM of the SCADA unit in the field. This is to assure/confirm 2 way radio communications from the field RTU the Central. Lighting controller information submitted for approval shall include any recommendations of the Manufacturer for storage as provided under this contract.

The packaging of the lighting controller shall incorporate the provisions recommended by the Manufacturer to accommodate storage.

TERM	MOSCAD DESTINATION	WIRE #	DESCRIPTION OF INPUT
32	Analog Input 1 (+)	TB2 B11	CABINET NEUTRAL CURRENT
33	Analog Input 1 (-)	TB2 B1	CABINET NEUTRAL CURRENT
34	Analog Input 2 (+)	TB2 A2	CABINET SERVICE VOLTAGE
35	Analog Input 2 (-)	TB2 B2	CABINET SERVICE VOLTAGE
40	P. Ground	TB2 A3	GROUND
1	Digital Input 1	TB2 B3	ALARM ACKNOWLEDGE
2	Digital Input 2	TB2 A4	DOOR OPEN
3	Digital input 3	TB2 A5	MAIN(S) BREAKER OPEN
4	Digital input 4	TB2 A7	CONTACTOR 1 OPEN
5	Digital Input 5	TB2 A8	CONTACTOR 2 OPEN
6	Digital input 6	TB2 A9	CABINET IN NON-AUTO
7	Digital input 7	TB2 A10	BACK-UP CLOCK OFF CALL
8	Digital Input 8	TB2 A11	BACK-UP CLOCK ON CALL
18	DI Common	*	COMMON
20	K1 NO	TB2 A12	LIGHTS ON CALL
21	K1 Com	TB2 B17	K1 COMMON

23	K2 NO	TB2 A13	LIGHTS OFF CALL
24	K2 Com	TB2 B17	K2 COMMON
17	24 V+	TB2 B13	24+ VDC

All analog inputs will be 4-20 mA only. Digital output relays will be electrically energized and momentarily held.

Mixed I/O module model number V 245

Lighting SCADA RTU Terminal Configuration

Description

This work shall consist of having the SCADA system manufacturer design, implement and test a new RTU on the Lighting SCADA System on all system terminals.

Materials

All software work shall be completed by the manufacturer or approved factory licensed sales and service company for the SCADA equipment. All licensing shall be provided by the entity completing the work. Licenses are to be held by IDOT.

Work

SCADA RTU Configuration and Programming:

1. Setup of CPU and accompanying modules
2. Setup of RTU site number, octal address, group call and All Call
3. Configure application alarm parameters (download config./application)
4. Development and implementation of control and alarm application from IDOT submitted telemetry requirements

Note: IDOT shall supply checklist listing I/O, telemetry, all call, group call and individual call data.

SCADA Service/Client Wonderware Programming:

1. Add RTU to Wonderware
2. Configure Wonderware to poll SCADA CPU for data on that specific RTU
3. Setup servers and clients for alarm notification and database I/O, for that specific RTU
4. Configure RTU polling
5. Activate RTU on FIU polling

SCADA FIU CPU Programming:

1. If RTU exists as an Intrac site, it will have to be setup as a MOSCAD site (MOSCAD CPU).
2. If RTU is a new site, it will have to be configured as a MOSCAD site (MOSCAD CPU).

Submittals

The Motorola VAR shall submit ladder programming, quiescent telemetry and SCADA configuration files for approval by the IDOT Engineer. Submittal shall be reviewed by the Engineer and returned noting changes and/or comments.

Testing and Documentation

As part of final acceptance testing, all individual I/O points and internal status (COS) alarms shall be tested for proper operation and transmission. The transmission shall be confirmed at IDOT Dist. HQ and the contractors dispatch facility. This full SCADA system start-up shall be completed with the Engineer present.

The control cabinet shall be tested for complete operation and the electrical load on each circuit shall be measured and documented on the Log form L-3. The ground resistance test shall be performed by the Contractor using the fall-of-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the

farthest point of each circuit extension from the controller cabinet. Results shall be recorded by the Contractor and witnessed by the Engineer.

Acceptance Transition

After the appropriate testing has been completed and approved by the Engineer, the new SCADA equipment shall be monitored for up to 2 weeks for proper operation. If any problems are to arise, all configuration changes shall be completed at no extra cost.

7.8 NON-ROUTINE MAINTENANCE

7.8.1 YEARLY UNDERGROUND CABLE REPLACEMENT

The Engineer shall issue a non-routine authorization letter using applicable pay items to add the green ground conductor in the existing unit duct provided the ungrounded conductors meg to meet the engineering specifications or shall remove and replace the cables to add the green ground conductor if the unit duct is sized as per NEC code. If the existing raceway is not sized adequately to add the green ground conductor as per NEC code then the existing unit duct shall be abandoned and replaced with the new unit duct with four conductors to carry the load.

The Contractor shall complete two (2) lighting locations within the calendar year.

- The two (2) locations to be modified in the first year (2013) of contract are: L1703 – US 12/20/45 La Grange Rd., @ IL 171 Archer Ave., PC:BA and L1055 – I 94 Bishop Ford Exp., @ 111th St., PC:K.
- The two (2) locations to be modified in the second year (2014) of contract are: L0415 – I 57 @ 112th Pl., PC:D and L0440 – I 57 @ Spaulding Ave., 138th, PC:I
- The two (2) locations to be modified in the third year (2015) of contract are: L0420 – I 57 @ 120th St.,, PC:E and L0425 – I 57 @ 127th St., PC:F

A copy of the record drawing for the lighting cabinet indicating the location of cabinet, conduit size, and number of cables with size shall be provided at the pre-bid meeting.

Testing and Documentation

As part of final acceptance testing, the control cabinet shall be tested for complete operation and the electrical load on each circuit shall be measured and documented on the Log form L-3. The continuity test on each circuit and the ground resistance test shall be performed by the Contractor using the fall-off-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the farthest point of each circuit extension from the controller cabinet. Results shall be witnessed by the Engineer and recorded by the Contractor on Log form L-3.

7.8.2 YEARLY LIGHTING CONTROLLER REPLACEMENT

Service Conductor and Conduit

The Contractor shall be paid using applicable non-routine pay items to replace the service cable and conduit if necessary plus other pay items as applicable provided the service conductors prior to replacing the lighting cabinet in the presence of Engineer don't meg as per the Engineering specifications.

7.9 LOGS AND FORMS

A sample of logs and forms as required for this Contract will be available at the Pre-Bid Meeting.

ARTICLE 8.0 – PUMP STATION SYSTEM

8.1 PUMP STATION SYSTEM DESCRIPTION

There are 48 State-owned pumping stations in District 1, used for pumping water collected from expressways and viaducts into sewers and area waterways. It is essential that these pump stations shall be available and ready to operate at their designed capacity at all times to keep the traffic moving and to ensure motorist safety. The type of equipment used varies from station to station. The equipment at the stations include several types of: electric motor driven pumps; multiple sources of utility power (up to 4160V service); emergency generators; electrical switchgear; motor control centers; transformers; transfer switches; control systems; electrical and flow instrumentation; alarm systems; gas detection systems; lighting systems; power wiring; SCADA RTUs; central, satellite and remote engineering processors of the PS SCADA system; SCADA repeater; radio transceivers, including antenna cables, antennas and antenna towers/poles; fuel and fuel tanks; purged air water level indicating systems; compressed air systems; lubrication systems; automatic trash racks and bar screens; water systems; heating and ventilation systems; steel fencing and gates, wrought iron fencing and gates, windows, doors, locks, highway advisory radio in certain stations, and all associated equipment, including building and structures and appurtenances owned by the State of Illinois and under the jurisdiction of the Department. CCTV & Lighting below shall be maintained in accordance with article 6 and 7.

Advanced Systems Cameras; Maintenance Paid through Pump Station Locations:

Sys	Loc. #	Main Route	Cross St	Co	Equipment
A	PS23	I 90 94 JFK	Roscoe	CO	Camera on Wood Pole (PS 23)
A	DR0	I 90 94 RYAN	I 290 Jct.	CO	TM Camera (PS 5)
A	KE0	I 90 94 JFK	I 290 NE Quad	CO	TM Camera (PS 5)
A	KE0A	I 90 94 JFK	S. of Jackson Blvd.	CO	TM Camera (PS 5)

Lighting Equipment, Under Construction, Coming on State Maintenance, approximately

3 to 4 locations per year, from 2013 through 2015, and paid through Pump Station Locations

Sys	Loc. #	Main Route	Cross St	Co	Cab	Lighting
L	1798	IL 64 North Ave	25th St	CO	YW	at PS12
L	1898	Wood St / Ashland	139th St	CO	CU	at PS14
L	1994	IL 83 Kingery Hwy	IL 64 North Ave	DU	UI	at PS44
L	1995	IL 59	North Aurora Ave	DU	UO	at PS47
L	1996	IL 56 Butterfield Rd	IL 59	DU	UQ	at PS 48
L	2292	IL 60 Town Line	US 41 Skokie Hwy	LA	VI	at PS39
L	2293	US 45 Lake St	IL 60 Town Line Rd	LA	VJ	at PS40
L	2294	US 41 Skokie Hwy	IL 176 Rockland Rd	LA	VO	at PS41
L	2295	US 41 Skokie Hwy	IL 132 Grand Ave	LA	VQ	at PS43
L	2296	IL 22 Half Day Rd	US 41 Skokie Hwy	LA	VU	at PS50
L	2493	IL 59 Division St	IL 126 Main St	WI	HQ	at PS52

8.2 GENERAL MAINTENANCE RESPONSIBILITIES

All items listed in the System Description herein shall be maintained under routine maintenance. The Contractor shall maintain the building structure, grounds, utilities, and equipment such that it can be effectively used for its intended purpose. Equipment found during any inspection (routine and non-routine) which needs repair or replacement is covered under routine maintenance, unless otherwise stated herein. Unless specifically noted, all work required herein this Article shall be paid through routine maintenance. Also refer to response and maintenance requirements as listed in Article 4.0.

Pump Station 27 is a new station with medium voltage (4160V) equipment and is expected to come on state maintenance in late 2012. The Contractor shall use specialized services from vendors to inspect, test, and configure various equipment such as solid state motor controls, vacuum circuit breakers and contactors, soft state starters, PLC automatic MTM or MM per manufacturers' recommendations. Specialist service vendors shall be paid in accordance to Article 5.3 Agreed-Price Work by Specialty Vendors. All maintenance and operations, including labor and equipment to assist specialty vendors in the performance of their work at Pump Station 27 shall be covered through routine maintenance.

The Contractor shall provide the man power for installation, removal and operation of de-watering pumps and safety equipment to assure safe access to the wet pit for IDOT operations to clean wet pits. This work shall be included and paid under routine maintenance.

At the beginning of the Contract, the Contractor shall, under routine maintenance:

- Organize log books in each pump station as described herein,
- Replace approximately 200 locks at pump stations (refer to Article 3.3.5)

8.3 SITE MAINTENANCE

The Contractor shall provide general site maintenance at pump stations, including grass cutting, weed control, debris disposal, snow plowing and removal operations as required to provide safe access to facilities, and to maintain the sites in an aesthetically acceptable condition to the public.

Grass cutting, weed control, and debris disposal work shall be performed in the station areas, in the IDOT R.O.W., to a radius of fifty (50) feet surrounding the building, and within five (5) feet of the access driveway on each side. In addition tree trimming shall be performed within three (5) feet of all pump station structures. This maintenance shall be performed a minimum of once per month in the months, April through September.

Snow removal operations shall be conducted as necessary to provide safe and reasonable access to each facility. All pump stations, that require access for patrol, construction or other scheduled EMC work, shall be attended to immediately following a snowfall of more than three (3) inches. The Contractor shall notify the Engineer of his snow removal plan after each significant snowfall.

The Contractor shall submit a spreadsheet, noting the station and date above-mentioned work was completed, in the monthly routine work submittal book.

For snowfalls of less than 3 inches:

The Contractor shall provide reasonable access to each pump station via sidewalk, staircase, walkway, driveway, and parking areas by shoveling and salting within 48 hours.

For snowfall of more than 3 inches:

The Contractor shall provide snow plowing and salting of each station sidewalk, staircases, walkway, driveway, and parking areas, to commence within 24 hours, and shall be complete within 72 hours in the following order of priority:

Group #1: PS # 4, 7, 17, 28, 32, 37, 38, 40, 42 and 44.

Group #2: PS # 2, 3, 5, 9, 15, 20, 24-26, 30, 34, 46-48, 50 and 51.

Group #3: PS # 10 - 14, 16, 18, 19, 21-23, 27, 29, 33, 35, 36, 39, 41 and 43

8.4 RESPONSE MAINTENANCE FOR PS SYSTEM

8.4.1 CONTRACTOR PS CALL-OUT RESPONSE

Pump Stations shall remain in continuous operation during normal and emergency maintenance activities. It is imperative that the Contractor immediately address alarms, reports of water on pavement, reports of clogged inlets, hazmat spills, or other serious malfunctions or damage by dispatching trained personnel to check the pump station.

Although the availability/location of trained personnel dictates the call-out, during normal workday hours, the order of call-out response shall be:

1. SCADA Specialist
2. PS Specialist
3. PS Crew
4. Other Contractor Personnel Trained in PS Operations

The Contractor shall develop an appropriate emergency PS Call-Out plan to provide trained personnel on-call after normal workday hours for pump station emergencies. This PS Call-Out shall be sent to the Engineer on a weekly basis, with the EMC Dispatch Center Emergency Call-Out Plan. (Refer to Article 4.0).

OSHA safety regulations must be followed at all pump stations. Any Contractor personnel entering a pump station shall be properly trained and equipped for confined space entry.

The Pump Station Manager shall be notified of any reports of possible hazardous materials in the pump station wet pits, and he shall be responsible to immediately contract the services of an approved full service materials waste contractor to remove the hazardous material and dispose of properly off of state property. (Refer to Article 3.0)

The contractor's responsibility is to provide the immediate hazmat response by an approved company and insure compliance in accordance with Article 3.0. The Department is responsible for payment to the approved hazmat company for their services only.

8.4.2 STATION PROCEDURES AND RESPONSE DOCUMENTATION

EMC personnel shall not manually operate the pumps with insufficient wet pit water elevation, for general maintenance operations, including pump inspection, wet pit cleaning, and all other wet pit work. Contractor shall use his own pump equipment to de-water the wet pit.

Two log books are maintained in each pumping station to document entry/inspection. The Contractor shall maintain the log books so that one book contains the current year information and the second log book contains information recorded in the previous years. In January of each year, the Contractor shall transfer the sheets from the current year log book to the previous year log book and place blank sheets in the current year log book . The Contractor shall furnish a new log book for newly rehabbed pump stations. The log book shall not be altered or removed from the station.

There are specific procedures, which are required of <u>all</u> personnel when entering or leaving any pump station. It is necessary to:

- Notify the EMC Dispatch Center of arrival (10-7)
- Complete log book chart I, with the date, time, persons name and reason for entry
- Upon completion of inspection, record the observations in the required charts in the log book.

- Notify the EMC Dispatch Center to issue a Ticket for any deficiencies, observed during the inspection. (Refer to Article 4.0 for Ticket requirements and procedures.) Record the ticket number and the deficiency in the logbook.

- Acknowledge any alarms before departure

- Check all pumps that are not tagged "Out of Service" and set in the auto position (H-O-A switch) immediately before departing the pump station

- Secure all station doors and hatches

- Turn alarm switch to ON position

- Notify the EMC Dispatch Center of departure (10-8)

8.4.3 PS ALARM RESPONSE

Upon receipt of an AEGIS and/or SCADA Pump Station alarm, the EMC Dispatch Center shall:

1. Create a ticket.

2. For all alarms, except entry alarms, dispatch a patrolman to the station, to check the alarm. Arrival shall be within one hour of the receipt of the alarm. For entry alarms (Zone 1), notify the IDOT ComCenter and the respective police department for the station, for a police escort for the patrolman. He shall not enter the premises without having the pump station investigated by the police. (Refer to Article 4.0 for information on procedures for incidents of intrusion, vandalism or theft).

Upon arrival at the station, the patrolman shall:

1. Notify the EMC Dispatch Center of the arrival information, including a notation of all alarms flashing on the annunciator and SCADA panel.

2. Record all information on the incident in the log book

3. Perform all necessary repairs required to restore the pump station to its normal operating condition, if possible. (If follow-up repairs are needed in an emergency situation, notify the PS Manager immediately.)

4. Notify the EMC Dispatch Center, as to status of problem, whether it was cleared or if follow-up work by the SCADA Specialist or PS Crew is necessary, before departing the pump station. (All response information shall be recorded on the ticket)

5. In the event of a power failure alarm (Zone 3), monitor the power outage status at regular intervals and notify the Pump Station System Manager and the IDOT ComCenter if a high

water level is imminent. (Temporary Pumping Requirements as stated herein shall be applied.)

8.4.4 STATION PRE-STORM CONDITION CHECK

Upon receiving a storm warning, code Red or Black, from the IDOT ComCenter or IDOT Engineer, the Contractor shall dispatch sufficient trained personnel to initiate these actions within one hour:

1. Check the operating status of each pump station
2. Check the condition of the trash on bar screen(s), clean if necessary
3. Check the status of the low point inlet and catch basins for the pump station, if found clogged notify IDOT Com Center immediately.
4. Submit a checklist (spreadsheet), indicating the time each pump station was checked, to the PS Engineer when completed.

8.4.5 WATER ON PAVEMENT SITUATIONS

The responding patrolman shall be equipped with the necessary measuring devices to trouble shoot and mark the water level with a reference point.

Upon observing Water on the Pavement (WOP) or extremely high water levels at the station, the Patrolman shall immediately notify the EMC Dispatch Center, who shall in turn notify the IDOT ComCenter.

Immediately after entering the station, the dispatched patrolman shall report the following information:

1. Pumps Running -- Yes or No.
2. Water Depth in Wet Well
3. Depth of Water on Pavement
4. Street Inlet Clogged -- Yes or No

The patrolman shall obtain a ticket number from the EMC Dispatch Center and complete the station log book, Chart W. All ticket information and WOP report information shall be relayed to the EMC Dispatch Center within one (1) hour of receipt of information from the field. All WOP report tickets shall be

marked for follow-up until the pump station system is back to normal operation and there is no water on the pavement. During storm events the Engineer shall be immediately notified by telephone/text of all WOP incidents. In addition to the Ticket summary report, all WOP reports shall be faxed to the Engineer by 8 a.m. the next day.

When there is water on the pavement the Contractor shall retrieve the archived data from the pump station PLC and email to IDOT Engineer within 24 hours.

During high water level or WOP conditions, the patrolman shall remain at the station unless approved otherwise by the PS System Manager.

8.4.6 STATION POST STORM CONDITION CHECK

After each major rainstorm, the pump station crew shall:

- Clean the trash rack bin, bar screen, and the area between the automatic trash rack/bar screen and the inlet sewer to the bare concrete floor.

- Check WOP float and probe sensor for proper operation, and remove debris, and

  Check the inlet/catch basins. If clogged, notify IDOT ComCenter.

- In the event of high water levels the Contractor shall inspect, clean and dry all equipment submerged under water once the water level recedes to normal elevations.

- The Contractor shall check all equipment for proper operation.

8.4.7 TEMPORARY PUMPING REQUIREMENTS

The Contractor shall provide and install temporary portable standby pumps to maintain adequate total station outflow capacity as described in Table P-1.

The Contractor shall submit a detailed temporary pumping operating plan, to the Engineer for approval, at the Pre-Construction meeting, for all maintenance activities which will directly affect normal inflow and outflow pumping operations. The Temporary Operating Plan submittal shall include a list of suppliers that, on an immediate on-call basis, can provide the Contractor with temporary pumps, or generators, to maintain the outflow capacity.

A back-up generator(s) shall be immediately mobilized to each pump station when the Contractor is notified of a high water level or alarm, or water on the pavement due to a power failure. Upon approval of the Engineer, the Contractor may utilize the two 200KW generators which are normally kept in state stock. These generators may not be considered in the Contractor's temporary pumping operations plan.

8.5 SERVICE COMPANIES

8.5.1 SUBMITTALS OF SERVICE COMPANY NAMES

The Contractor shall submit the following, for Engineer approval, at the Pre-Construction meeting:

- Names, addresses qualifications of at least six potential vertical/submersible services repair companies within the tri-state area of Illinois/Indiana/Wisconsin.
- Name(s) of lab facilities that are certified and equipped to test oil and other lubricant fluids.

8.5.2 SERVICE COMPANY WORK

When the Contractor is unable to complete repairs to pump station equipment, the Contractor shall provide an IDOT approved Service Company to supplement his forces in order to meet contract requirements.

The Contractor shall provide all labor, equipment, and general services necessary to schedule and assist a specialty service company in conducting various comprehensive testing and inspections, including routine and non-routine work.

The Contractor shall coordinate the work with the service companies and provide qualified personnel to:

- Allow free and clear access to and from the pump station and all equipment
- Open and close all enclosures to provide access to the electrical equipment being inspected, replaced and/or repaired.
- Notify the power utility company to schedule all power outages required for the project.
- Perform all switching, de-energizing and re-energizing of electrical equipment
- Perform lock out tag out procedures
- Provide safe working conditions in accordance with OSHA requirements
- Assist in data collection when requested by the Engineer

8.6 SCHEDULED DAILY MAINTENANCE

8.6.1 DAILY SCADA MAINTENANCE

The Contractor shall be responsible for proper operation and maintenance of all SCADA System equipment described herein.

On a daily basis, the SCADA Specialist shall review the daily operations of the SCADA System. The SCADA System, including the Master, Slave and RTU equipment shall have its periodic maintenance activities/programs completed by the SCADA Specialist. This work would include, but is not limited to system back-ups, central algorithms, Windows OS debugging, Tescode and/or RSView Programming, Liquitronic 5 Firmware, modem configuration, database and archive array configuration and collating.

- Keep back-ups of all system software/firmware. Any changes to the system shall be submitted to the Engineer for approval, before execution. System changes shall be documented on tickets for documentation.

- Troubleshoot any problems related to network configuration of the system, troubleshoot any Windows OS and/or RSView processing errors, modem configuration, and telecommunication line testing (including network high-speed lines, dedicated leaded lines and dial-up lines).

- Upload and download RTU software configuration and application files, archive array configuration data and review the status of the SCADA system and alarms. The SCADA Specialist shall complete all Tescode programming setpoint changes and remote configuration. A total RTU programming disk shall be stored and updated by the SCADA Specialist in each PS SCADA panel and stored in an appropriate sealed case.

- Shall perform updates to OS and GUI software when released by the manufacturer.

- Shall perform software revisions, program and screen modifications required to integrate additional PLC's or devices in the pump station system into the existing central (Schaumburg) and satellite (Contractor Dispatch Center) processors. Processor functionality and integrity shall be maintained with each added device. Any device furnished, installed, and terminated to pump

station PLC or removed from monitoring, including but not limited to the gas detectors and fire alarm systems during the contract year shall be configured and interfaced with the station PLC and HMI unit screens. This work shall be included under routine maintenance of the pump stations system. IDOT engineer shall be notified prior to any changes and modifications to the SCADA system.

The Contractor shall add any pump station that will become under maintenance during contract year to the SCADA system in order to make a complete operational system and shall develop new screens at all processors. The screens shall be identical to existing pump station screens, such as the pump station information screen, control screen, main pump station screen and status screen with all devices in the pump station properly monitored.

The Contractor shall maintain all SCADA Hardware and software this will include but not limited to RSVIEW 32, ControlLogix5000, RSLinx, Winbench, Liq V as required and all communication media to connect to remote pump stations. Contractor shall also maintain all remote SCADA hardware and software at the pump stations this will include but not limited to ControlLogix PLC, HMI unit, Liq. V PLC. The contractor shall provide a yearly technical support as required for all pump station SCADA system software.

8.6.2 DAILY AEGIS MAINTENANCE

The Contractor shall be responsible for proper operation and maintenance of all AEGIS System equipment. The Contractor shall maintain:

- One AEGIS Silent Knight 9500 pump station alarm receiver,
- One AEGIS Silent Knight 9000 backup unit receiver,
- One AEGIS receiver in the Contractor's EMC Dispatch Center, and
- All existing alarm transmitter units at each pump station including any new units added during the contract year and all associated equipment.

The Engineer shall provide the EMC Dispatch Center with an AEGIS Alarm Zone code list.

The Contractor shall assure that all AEGIS units are functioning for call out to the receivers and shall supply and program prom chips as required for each alarm transmitter unit. A 20-second time delay shall be programmed to prevent nuisance alarms due to contact bouncing.

The AEGIS system shall be configured to execute a 24-hour communication check. This daily check shall be monitored and documented by dispatchers at the EMC Dispatch Center; tickets shall be created for any problems. The weekly report of the communication checks shall be submitted to the Engineer.

The Contractor shall maintain one alarm center in Bureau of Traffic' Electrical Field Office for windows monitoring software for single user module, 250 account version, and provide a "one year office hours" support. The Contractor shall maintain the software and configure to make a complete operational system at all times.

8.6.3 DOCUMENTATION OF DAILY SCHEDULED MAINTENANCE

All preventive maintenance reports and inspections shall be emailed to the IDOT Engineer and Contractor Pump Station System Manager directly from the pump station, when follow-up work is required. All maintenance reports shall be submitted on a CD in the monthly book.

The Contractor shall conduct field survey to provide and maintain a Fiber Drawing of all pump station termination, connection and splice points for the SCADA system, which shall also show fiber color, number and assignment.

8.7 MONTHLY PS QUICK CHECK – ALL STATIONS

The Contractor shall perform a monthly PS quick check at all pump stations. The patrolman shall notify the EMC Dispatch Center to create a Ticket for all deficiencies or malfunctions found.

During the inspection, check the following:

1. Are inlets clear of debris?

   (If clogged on expressway stations, radio Com Center; for off expressway stations, create a ticket).

2. Is grass cutting required?

3. Is fence secure?

4. Is building roof free of leaks?
5. Are doors, windows, walls, and hatches secure and free of graffiti?
6. Dry pit condition OK?
7. Alarm panel OK? (No alarms holding)
8. Lighting fixtures outages?
9. MCC panel indicator lamps OK?
10. Water level meters at proper levels?
11. Ground detection indication lamps OK?
12. Is trash bin free of debris?
13. Does the bar screen need cleaning and free from debris build-up?
14. Is wet pit free of hazardous materials?
15. Pump On/Off operation OK? (Simulate a call)
16. Abnormal noise from pumps?
17. Is piping free of leaks?
18. Is pump free of abnormal noise or vibration?
19. Is oil level consumption OK?
20. Is grease operation OK?
21. Are grease and oil lines free of leaks?
22. Is thermostat set properly and heater operating properly?
23. Are dampers and exhaust system OK?
24. Verify gas detector calibration
25. Fire extinguisher OK?
26. Does floor need mopping ?

8.8 MONTHLY PREVENTIVE MAINTENANCE PROGRAM

The Contractor shall perform the following inspections and allow thirty (30) days between the inspections. A schedule/chart shall be submitted via CD that show the pump station, preventive maintenance

programs (routine and non-routine) and date of completion for each program. Each preventive maintenance program shall have a monthly summery of item(s) require follow-up and associated ticket number. The schedule/chart(s) shall also include the status of all open tickets that require follow-up and shall be submitted at the end of each month. A copy of all routine and non-routine maintenance reports shall be submitted to IDOT Engineer via CD.

The Contractor shall update and maintain all P.S. tables to be true and accurate. The Contractor shall submit updates of a minimum of 6 pump stations per month starting in February and all must be completed by the end of October.

Pump Station Preventive Maintenance Program Schedule

8.8.1	Pump Inspection	Chart A	Monthly	All
8.8.2	Pump Maintenance	Chart F	Monthly	15
8.8.3	Automatic Trash Rack Maintenance		Monthly	9
8.8.4	Bar Screen Maintenance		Monthly	20
8.8.5	Compressed Air Tank Inspection	Chart S	Monthly	9
8.8.6	Flow Meter Inspection	Chart A	Monthly	23
8.8.7	Engine and Generator Maintenance	Chart K, M/P-10	Monthly	14
8.8.8	Transfer Switch Operation Maintenance	Chart C	Monthly	42
8.8.9	Air Induction Inspection	Chart U	Monthly	23
8.8.10	AEGIS Inspection	Chart E	Monthly	All
8.8.11	State Stock Inventory Summary		Monthly	All
8.9.1	Dry Pit/Wet Pit Submersible Pump Insp.		June & Dec.	39
8.9.2	Automatic Trash Rack Maintenance		June & Dec.	9
8.9.3	Vertical Pump Motor Maintenance		June & Dec.	12

8.9.4	Actuators, Valves & Sluice Gate Oper.Insp.	Chart B	Min. 8 per Mo.	All
8.9.5	Side Volute Discharge Pump Maintenance		June & Dec.	4
8.10.1	Air Induction Heater & Space Heater Insp.		November	27
8.10.2	AEGIS Alarm System Inspection	Chart E	January	All
8.10.3	SCADA Inspection	P-100	Min. 15 Jan-Mar	All
8.10.3	Wet Pit Inspection	P-9	Min. 6 Apr-Oct	All
8.10.5	Pump Control System Inspection	P-6	Min. 15 Jan-Mar	All
8.10.6	Pump Station Inspection and Maintenance	P-4	Min. 4 Jan-Nov	All
8.10.7	Infrared Roof Inspections		July to Aug	All
8.10.8	Pump Capacity, Motor Current, Voltage, Moisture, Megger Test	Chart Z & P-5	Min. 8 Jan-May	All
8.10.9	Impeller Adjustment	P-5	Min. 5 Jan-Feb	11
8.10.10	Submersible Pump Inspection	P-8	Min. 5 Jul-Oct	39
8.10.11	Oil Analysis		Min. 8 Jul-Nov	All
8.10.12	Main Circuit Breaker Testing Inspection	P-7	May 2013	3
8.10.13	Flow Meter Inspection		Min. 5 Jul-Oct	23
8.10.14	Fire System Inspection		Min. 3 Jul-Oct	30
8.10.15	Motor Control Center Inspection		Min. 4 Jan-Nov	All
8.10.16	Tube Type Pump Maintenance		September 2013 and 2015	3
8.10.17	Yeoman Pump Maintenance		June 2013 & 2015	5
8.10.18	Generator Maintenance	P-10	October	15

8.10.19	Equipment Identification		August	3

8.8.1 MONTHLY PUMP OPERATION INSPECTION – ALL STATIONS

The Contractor shall perform the following and record on Chart A:

- Operate each pump and check alternator or selector switch for proper sequence in accordance with recommended manufacturer's procedures. Caution: Do not draw down the wet well level past the designated stop elevation under any circumstances.
- Set the selector switch on the pump with the least number of hours as the lead pump.
- Operate each unit noting the current draw and compare with the motor plate and note any deviation, and/or any abnormal operating sounds
- Record number of starts
- Take flow meter reading and record on log chart
- Record number of starts and hours run of each pump

The Contractor shall submit a copy of the chart A on a CD using spreadsheet software, as approved by the Engineer, once every three months, in the monthly routine work submittal book.

8.8.2 MONTHLY PUMP MAINTENANCE

PS # 2, 3, 4, 14, 25, 29, 32, 33, 35, 50

The Contractor shall inspect the oil lube system and greaser for proper lubrication; and inspect both oil and grease lines for leakage or clogging. In addition, the Contractor shall inspect the automatic greaser and manual cap for proper operation, and maintain the proper oil/grease level. All information shall be entered on log chart F. The Contractor shall also grease all fittings such as flap valves, check valves, gate valves, flow meters, and pumps.

At PS # 14, 32, 47, and 50 with the side volute discharge pumps, the Contractor shall lubricate the pump bearings with oil/grease when required, (minimum twice per year), inspect packing glands for leakage, lubricate motor, and clean the motor. In addition, the air release valves/pipes shall be inspected (replace when required) and cleaned.

8.8.3 MONTHLY AUTOMATIC TRASH RACK MAINTENANCE

PS # 4, 5, 21, 22, 23, 26, 28, 35, 46

At pump stations with automatic trash racks, the Contractor shall:

- Inspect and insure the fingers on the trash rake assemble is fully engaged through the entire length of the barscreen. The Contractor shall make the necessary adjustment for proper operation of the trash rack.
- Grease the rake assembly and head shaft bearings with EP#2 waterproof grease, grease drum bores on rope drum,
- Grease teeth on bull gear and pinion,
- Lubricate chains where applicable, and grease slide block channels
- Check limit switches.

The Contractor shall use Bison #88 molybdenum grease or may substitute environmentally safe grease upon approval by the Engineer.

8.8.4 MONTHLY BAR SCREEN MAINTENANCE

PS # 2, 3, 4, 5, 7, 9, 10, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 39, 40, 46, 47, 50, 51 and 52

At pump stations with bar screens, the Contractor shall inspect the bar screen, rake and manually clean the bar screen and remove all debris and silt in the area between the sewer and the trash rack/bar screen. The trash rack itself shall be kept free of debris.

8.8.5 MONTHLY AIR COMPRESSOR INSPECTION

PS # 4, 24, 25, 27, 29, 33, 40, 50, 51

The Contractor shall check the compressor and air tank for proper operating pressure in the pump stations, and drain water from tanks. (The tanks are used for reserve air supply for the bubbler control systems.)

Record the inspection results and the date tank was inspected on chart S in the log book.

8.8.6 MONTHLY FLOW METER INSPECTION

PS # 4, 9, 10, 17, 21, 23, 24, 25, 28, 29, 30, 33, 34, 35, 39, 42, 46, 50, 51

The Contractor shall check the flow meters in each station for proper operation and record their readings on chart A in the log book. A grease fitting is furnished in the head plate and requires greasing once a month, to replace grease that has worked out in the operations. The Contractor is advised not to over-grease the meter, and to lubricate with Lubriplate grease, available from Sparling, Inc.

8.8.7 MONTHLY GENERATOR INSPECTION

PS # 9, 11, 15, 18, 19, 24, 28, 34, 36, 39, 41, 42, 47, Two in State Stock,

Base Stations, Six Moveable Bridges, IDOT Schaumburg Headquarters and Traffic Systems Center, Rodenburg Maintenance Yard, Hillside Maintenance Yard and all Advanced System Communication Huts and Tower locations.

Engine driven pumps and back-up generators in state stock shall be inspected. The Contractor shall:

- Check control panel and transfer switch operation
- Check engine oil and coolant levels
- Check that block heater is working
- Check battery charging system
- Check for holes or leaks and loose connections in the air cleaner
- Check fuel level and fuel transfer pump operation
- Check for exhaust system leaks or restrictions
- Drain the condensation trap
- Check all meters, gauges, and indicator lamps
- Check generator fuel and note level.
- Check for fluid/fuel leaks.
- Check oil reservoir and battery acid level and maintain proper operating levels.
- Check the air filter monthly and change at specified intervals
- Exercise generator at full load for one (1) hour
- Check and note any rusting on the generator and its enclosure
- Prepare, prime, and paint rusting metal (to match existing paint)

The Generator check list, log P-10, shall be completed and submitted to the Engineer in the routine maintenance monthly submittal book. Tickets shall be created for any problems found.

Diesel fuel shall be filled to the proper level at all times, for the generator operation. If fuel level is less than ¾ (75%) of full level, then a ticket shall be created to schedule the refill of the tank.

8.8.8 MONTHLY TRANSFER SWITCH OPERATION INSPECTION

PS # 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 42, 44, 46, 47, 50, 51 and 52

The Contractor shall exercise the transfer switch, on a monthly basis, to inspect for proper transfer and time delay to secondary power source and time delay from secondary to primary and shall be recorded in the chart. This work shall apply for pump stations shall be noted in chart C of the logbook.

8.8.9 MONTHLY AIR INDUCTION INSPECTION

PS# 4, 7, 8, 9, 10, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34, 35, 40, 50, 51 and 52

The Contractor shall change the air induction filter, clean the bird screens, and clean heating element insulators to maintain proper ventilation within the pump station. The date shall be noted on chart U in the log book. The Contractor shall supply and store the proper filters at each pump station.

8.8.10 MONTHLY AEGIS MONTHLY INSPECTION – ALL STATIONS

The Contractor shall check the AEGIS alarm system for each pump station which are not being monitored by the central SCADA system. This inspection will consist of transmitting of all the possible alarm codes for that specific station. Note that each station has an individual listing for zone 2 alarms. When checking the alarm system, each item that is incorporated into a zone 2 alarm shall be checked. The low and high level alarms shall be checked by a continuity test or by jumpering the relay. The Contractor shall not use the pumps to drawn down to a low level. All results shall be entered in chart E in the log book for each station.

8.8.11 MONTHLY STATE STOCK INVENTORY MAINTENANCE

The Contractor shall check the State stock as follows:

- Rotate motor/pump shaft, few revolutions by hand
- Fill oil reservoir to the proper level
- Check bearings for proper lubrication
- Clean motor windings with air, to remove any dust accumulation
- After cleaning, provide protective covering for motors to prevent dirt, moisture and other contaminates

A spreadsheet noting pump station name, inventory items, and work performed on inventory items in the prior month shall be submitted in the monthly routine work submittal book. All items removed or relocated from State Stock shall have the proper forms filled and completed. the forms shall be submitted in the monthly routine submittal book.

8.9 SEMI-YEARLY PREVENTIVE MAINTENANCE PROGRAMS

To be completed by June and December of each year. A copy of all reports shall be submitted to IDOT Engineer via email.

8.9.1 SEMI-YEARLY DRY PIT/WET PIT SUBMERSIBLE PUMP MAINTENANCE

PS # 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 51, 52

The Contractor shall visually inspect pump impeller for clogging, shall inspect oil reservoir for contaminants, shall check and clean air release pipes/valves, and shall flush the cooling system from debris. The wet pit submersible pumps shall be washed down with a pressure hose.

8.9.2 SEMI-YEARLY AUTOMATIC TRASH RACK MAINTENANCE

PS # 4, 5, 21, 22, 23, 26, 28, 35, 46

The Contractor shall grease guides with Bison #88 molybdenum disulfide, and grease, lubricate, and perform an oil change on the worm reducer and coupling. The band brake assembly shall also be inspected and tightened evenly as required.

8.9.3 SEMI-YEARLY VERTICAL PUMP MOTOR MAINTENANCE

PS # 2, 3, 4, 7, 14, 24, 25, 26, 27, 29, 33, 35

The Contractor shall check motor heaters and clean the motor inside and out, wiping off dirt, dust, oil and water from external surfaces of the motor. Any dust or debris from the ventilating air inlets shall be removed. The motors shall be cleaned internally by blowing with clean, dry compressed air.

8.9.4 SEMI-YEARLY ACTUATORS, VALVES & SLUICE GATE OPERATION – ALL STATIONS

Minimum of eight (8) stations are due per month from January through June and July through November and the inspections for each station shall be spaced six months apart throughout the term of the contract.

The Contractor shall operate the flap valves, check valves, gate valves and sluice gates at all the pump stations. All the valves and gates shall be lubricated with environmentally safe grease.

The Contractor shall check the actuators' lubrication consistency and level. If required, it shall be filled or replaced. All electrical connections shall be inspected and tightened. The Contractor shall also check for mechanical damage.

All results shall be entered into chart B in the log book for each station. Create tickets for any deficiencies found and enter the ticket numbers on chart B. When repairs are complete, chart B shall be submitted in the monthly routine work submittal book.

8.9.5 SEMI-YEARLY SIDE VOLUTE DISCHARGE PUMP MAINTENANCE

PS # 14, 32, and 50

The Contractor shall lubricate the pump bearings with oil/grease, inspect packing glands for leakage, lubricate motor, and clean the motor on the side volute discharge pumps. In addition, the air release valves/pipes shall be inspected (replace when required) and cleaned.

8.10 YEARLY PREVENTIVE MAINTENANCE PROGRAMS

8.10.1 YEARLY AIR INDUCTION HEATER AND SPACE HEATER INSPECTION

PS# 4, 5, 7, 8, 9, 10, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34, 35, 40, 41, 43, 44, 50, 51, 52

Before each heating season, the Contractor shall check the air induction heating elements and space heating elements, replace defective heating elements, if any, check and lubricate, if necessary, fan motors and damper mechanisms, check thermostat and settings and clean the finned heating element and fan inlets.

8.10.2 YEARLY AEGIS ALARM SYSTEM INSPECTION - ALL STATIONS

Inspections shall be completed during January of each year

During January of each year, the Contractor shall test the AEGIS alarm system by transmitting all the possible alarm codes for each station. Note that each station has an individual listing for zone 2 alarms. Each item that is incorporated into a zone 2 alarm shall be checked. The low level alarm shall be checked by continuity test or by jumpering the relay. All results shall be entered in the log book for each station, in

chart E. A copy of each log P-1 shall be included in January routine maintenance work documentation book for each year.

8.10.3 YEARLY SCADA INSPECTION AND DOCUMENTATION – ALL STATIONS

A minimum of fifteen (15) stations are due monthly in January, February, and March, with the program to be completed during April of each year. Each station shall be inspected in the same month in the second year of the Contract, if renewed.

The SCADA specialist shall physically inspect all of the equipment and wiring, and record on log P-100 the digital inputs/outputs, and analog inputs for the SCADA system. Create tickets for any deficiencies found on this inspection and enter the numbers on the inspection report, log P-100. When repairs are complete, the log P-100 reports shall be included in the monthly routine work submittal book.

The Contractor shall inspect the primary, and where applicable, the secondary water level monitoring systems in each station. The Engineer shall be present for each inspection. This work shall consist of physically measuring the water level in the wet pit and comparing that value with the primary and secondary reactive air system of the SCADA unit, the bubbler system implemented into the MCC, and the TLC water level monitoring system. The Contractor shall use the Meri-Cal air pressure calibration device with an associated hand pump, fittings, and valves required to calibrate the primary, secondary reactive air system and other bubbler systems. The Contractor shall use the calibration device any time calibration of the above equipment is required during the contract year.

This inspection shall also include the inspection of the trash rack and creek levels reactive air systems. Create tickets for any deviations over 1/2 foot and enter the numbers on the report log P-100. All work required on the SCADA system shall be coordinated with the Engineer and completed by the SCADA Specialist.

After the inspection the Contractor shall download system control information (pull in a new image) and download the archive of the main pump starts and stops. The CD shall be included with the monthly routine work submittal book.

8.10.4 YEARLY WET PIT INSPECTION – ALL STATIONS

Minimum of six (6) stations due per month from April through October with the program to be completed during November of each year. Each station shall be inspected in the same month in the second year of the Contract, if renewed.

The Contractor shall complete the wet pit inspection of all pump stations. The Contractor shall use his own portable pump to draw down the wet pit to a low level and maintain the existing inflow water in the wet pit. The Contractor shall:

- Inspect all grease lines to ascertain if any are broken, clogged, or not secured
- Inspect the integrity of all equipment attached to the structure such as the air bell, air line and the floats
- Inspect the floats for operational efficiency, and clear them of any debris
- Inspect the probes for operational efficiency, and clear them of any debris
- Take a photograph (7.0 Mega Pixel digital camera & flash) of any bowl assemblies that show any wear on the impeller and/or if the suction is clogged with debris. The photos shall be appropriately labeled and placed in a sheet album with the station report, log P-9
- Inspect the silt accumulation and document levels
- Visually inspect the inlet sewer from inside of the pump station
- Maintain existing wet pit lighting, clean lens and reflectors.

Each report, including photo album, shall be included with the monthly routine work submittal book. Create tickets for any deviations found and enter the numbers on the report log P-9.

8.10.5 YEARLY PUMP CONTROL SYSTEM INSPECTION – ALL STATIONS

Minimum of fifteen (15) stations due per month from January through March with the program to be completed during April of each year. Each station shall be inspected in the same month in the second year of the Contract, if renewed.

The Contractor shall inspect all pump control systems within all pump stations. The Engineer shall be present for each inspection. This is work shall include inspection of a bubbler, electrode, and float systems, whichever secondary control system is utilized. The inspection shall consist of all starts, stops and alarm control elevations. Any control elevations which are different than the required elevations shall be noted and corrected, and shall record silt level in the wet pit in report.

Create tickets for any deficiencies found on this inspection including excessive silt build up and enter the numbers on the inspection report, log P-6. Each report shall be included with the monthly routine work submittal book.

8.10.6 YEARLY PUMP STATION INSPECTION AND MAINTENANCE – ALL STATIONS

Minimum of four (4) stations due per month, January through November, with program to be completed during December of each year.

The Contractor shall conduct an annual comprehensive inspection of the electrical and mechanical equipment at each pump station using log P-4 and shall:

- dispose of any debris found on the grounds
- remove or paint over graffiti with comparable paint
- for stations with flat roofs drain any large recessed areas of standing water.
- remove any debris build up in gutters, drains or down spouts
- replace any glass blocks or broken windows
- patch or repair cracks found in concrete
- clean all cabinets, walls, motors and equipment by wiping with a damp cloth
- wash floors with a mop or a suitable floor cleaner
- lubricate exposed trolley drive pinion and wheel teeth
- repair all failed caulk around windows, lintels, doors, and ventilation components
- seal all gaps or openings between structures and concrete or blacktop with material in accordance to manufacturer specifications
- Check and note any rusting on the generator and its enclosure
- Prepare, prime, and paint rusting metal (to match existing paint)

Create tickets for any deficiencies found on this inspection and enter the numbers on the inspection report, log P-4. A re-inspection will be scheduled by the Engineer following completion of any necessary repair work. When repairs are complete the P-4 reports shall be included in the monthly routine work submittal book. The stations shall be inspected in the same month in the second year of the Contract, if renewed.

8.10.7 YEARLY PUMP STATION ROOF INSPECTION AND MAINTENANCE – ALL STATIONS

Once per year, in July to August, the Contractor shall conduct annual roof inspections and maintenance. The Contractor shall provide an Infrared Camera by FLIR Systems Model ThermaCAM E4 or equivalent for the roof inspections and other preventive maintenance equipment inspections herein or as requested by the Engineer.

During daytime hours the Contractor shall thoroughly clean the roof surface of dirt, debris, and contaminates. After sunset the roof shall be inspected for proper drainage and physical condition with the ThermaCAM E4. The Contractor shall note on the inspection log any hole or cracks, loose or dry laps, loose fasteners, buckles, wrinkles, ridges, etc.

Tickets shall be created for any deficiencies found on this inspection and numbers entered on the inspection report, log P-4R. A re-inspection will be scheduled with the Engineer following completion of any necessary repair work. When repairs are complete the P-4R reports shall be included in the monthly routine work submittal book.

The Contractor shall perform roof repairs as described below under routine maintenance:

Small Holes and Cracks:

Clean surface, apply mastic (roof cement) 1/8" to ¼" thick into the hole or crack using a roofer's trowel or gloved hand, working the mastic into the opening and 2 to 4 inches beyond.

Large Holes and Cracks:

For damaged areas larger than ¼" repair, clean surface, use self-adhering SBS Modified Asphalt Membrane by peeling off the backing and pressing it onto the area to remove any entrapped air. A coating of mastic (roof cement) shall be applied over all repaired areas.

Loose or Dry Laps, Fishmouths, Buckles, Wrinkles, Ridges:

Cut defective material back to an adhered area. Repair area as needed with mastic and/or membrane and mastic as stated above.

Loose Mechanical Attachment, Termination Bar:

Remove loose fasteners. Re-secure base flashings (or new flashing material) through tin discs of a larger diameter or fastened to an adjacent location (new hole).

8.10.8 YEARLY PUMP CAPACITY, MOTOR CURRENT, VOLTAGE, MOISTURE, MEGGER TEST – ALL STATIONS

Minimum of eight (8) stations due per month, January through May, with program to be completed by June of each year.

The Contractor shall conduct a pump capacity, motor running current, voltage measurement, megger, and Yeoman submersible pump moisture tests. The Contractor shall also utilize the services of the specialty services subcontractor for this test. The Contractor shall be responsible for providing or storing water for testing, not to exceed high level elevations.

The Contractor shall provide all necessary equipment, tools, material and labor to set up the pumping stations for capacity testing using either the recirculation method, wet pit draw down method or the discharge chamber method with discharge sewer and recirculation gates closed, as applicable for the station.

Prior to testing, record all necessary name plate information for pump and motor. Pump testing will require the presence of at least two personnel equipped with radio communications and measuring tape and block.

A draw down test shall be done in all the pump stations. Record flow meter reading and measure accumulated pumped water in the discharge chamber where sluice gates are present to store water in the discharge chamber. The pumps shall be tested for at least for 1 minute duration. Record all readings, including full load current, RPM on vertical pumps, flow reading and water level change. The testing shall be performed with the Pump Station technician present.

The following data shall be recorded and submitted to the Engineer on log P-5:

- Water depth

- TDH
- Capacity
- Vibration
- Current
- Voltage
- Insulation resistance to ground
- Pressure

In addition, the Contractor shall megger all motor windings and feeder cables. Any reading below 1 Mohm will require the Contractor to determine the source or cause of the low reading and make prompt repairs as required. A copy of the log P-5 shall be kept in the log book. Create tickets for any deficiencies found on this inspection and enter the numbers on the inspection report, log P-5. A copy of the results of the capacity and megger test on log P-5 and on a CD shall be submitted to the Engineer with the monthly routine work submittal book. The stations shall be reinspected in the same month in the second year of the Contract, if renewed.

The Contractor shall retrieve all archived data from the pump station PLC upon completion of the pump capacity test and shall submit the archived data on a CD to the IDOT Engineer.

Pumps testing below 80% shall be immediately re-tested and confirmed for low capacity. The Contractor shall submit a list of all low capacity pumps found with the test results at the end of the month.

8.10.9 YEARLY IMPELLER ADJUSTMENT OF VERTICAL AXIAL FLOW PUMPS

PS # 2, 3, 4, 25, 29, 33, 35

Minimum of five (5) stations due per month, during January and February. This adjustment shall be done only when pumps do not perform according to their design.

The vertical axial flow pumps shall be checked for proper impeller settings in accordance with manufacturer's specifications. This work shall include dropping the suction bell to inspect the wear ring and impeller for wear. The Contractor shall record “as found” measurements, record the adjustment setting on log P-5 and include it in the monthly routine work submittal book.

8.10.10 YEARLY SUBMERSIBLE PUMP INSPECTION

PS # 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 51, 52

Minimum of five (5) stations due per month from July through October with the program to be completed during November of each year

The Contractor shall remove, inspect and service all submersible pumps, each contract year. Service work shall include an oil change, checking and recording the clearance between impeller and wear ring, and an inspection of cooling jacket passageways to assure no blockage would cause low water flow and high temperature. This work shall be done in accordance to manufacturers' specifications and instructions. Create tickets for any deficiencies found on this inspection and enter the numbers on the inspection report, log P-8.

8.10.11 YEARLY OIL ANALYSIS - ALL STATIONS

Minimum of twelve (12) stations due per month, from July through October.

The Contractor shall obtain suitable test containers from an approved lab facility. Collect oil samples from the motor upper and lower bearing compartments, dry pit/wet pit submersible pumps and all generators. The oil shall be drawn from the equipment reservoir. The oil should drain for a few seconds before collecting the sample. A minimum of two (2) ounces of oil shall be used for analysis. Do not use the same container for different equipment or for different compartments of the same equipment.

Samples shall be taken after running the motor, pump or engine or within fifteen minutes after the equipment is turned off. This work shall be done along with the capacity and vibration test.

The Contractor shall provide the laboratory with the brand and type of oil, type of equipment from which the sample was taken, number of days since the last oil change, and any suspected abnormalities in the equipment. Each sample of oil shall be identified with the equipment and compartment from which the sample was taken. The Contractor shall ship the oil samples to the lab facility within one month of collection.

The lab facility shall conduct a wear particle analysis to determine:

- Wear metals
- Contaminants
- Additives elements
- Viscosity
- Solid percent volume
- Water percent volume
- Fuel where required
- Particle counting and direct reading ferrography

Create tickets for any deficiencies found from the lab testing and submit the lab reports to the Engineer on a CD with operating software that can utilize existing data for trending. A condition summery report shall be submitted on paper. Based upon the lab report, the Engineer may request additional analytical ferrography testing. The oil shall be changed if the lab results indicate that the oil is contaminated. All charges for lab work, shipping, and changing of oil etc., shall be covered under routine maintenance. A summary of the report shall be submitted via email at the end of the program.

8.10.12 YEARLY MAIN CIRCUIT BREAKER TESTING INSPECTION

PS # 17, 23 and 39 to be inspected during May of 2013, and PS # 29, 32 and 50 to be inspected during May of 2014, and PS# 10, 22 and 30 to be inspected in 2015

The Contractor shall obtain an approved engineering services company for testing the main circuit breakers, branch circuit breakers and motor starters in three (3) pump stations each year. The IDOT Engineer shall be notified at least twenty-four hours in advance to witness the tests. The Contractor shall coordinate with the electrical utility to turn power off and on where required. The Contractor shall furnish the test set and operator along with all necessary fittings, cables and connectors to connect the test set to the circuit breakers. Prior to testing, a general clean up of the buses and cabinets are required.

Testing shall consist of visual and electrical tests as shown on log P-7. Overcurrent relays and dash pots shall be inspected where present, and are to be set as directed by the Engineer. The inspection and testing shall also include the trip unit, contact resistance and insulation tests. Create tickets for any deficiencies found on this inspection, and enter the numbers on the inspection report, log P-7. The reports shall be submitted via email at the end of the program.

8.10.13 YEARLY FLOW METER INSPECTION

PS # 4, 5, 7, 9, 10, 17, 21, 22, 23, 24, 25, 28, 29, 30, 33, 34, 35, 39, 46, 50

Minimum of five (5) stations due per month from July through October with the remainder of the program to be completed during November of each year

The Contractor shall remove the meter heads out of the line and check the mechanism, note the condition of the pipe and straighten the vanes. The meter head shall be examined, cleaned, and parts replaced per manufacturer recommendations. Create tickets for any deficiencies found on this inspection.

The transmitter and receiver shall be tested and calibrated by a factory certified/approved representative.

8.10.14 YEARLY FIRE ALARM SYSTEMS INSPECTION

PS # 2, 3, 5, 7, 9, 10, 11, 12, 13, 15, 16, 18, 19, 21, 22, 23, 24 ,25, 26, 27, 28, 30, 31, 39, 41, 42, 43, 44, 46, 50, and 52

Minimum of nine (9) stations due per month from July through October with the remainder of the program to be completed during November of each year.

The Contractor shall furnish a factory trained service representative and shall use factory authorized testing equipment for all testing procedures, to complete a comprehensive fire alarm system inspection and maintenance in accordance with NFPA 72 Chapter 7 and as recommended by the manufacturer.

All fire extinguishers in the fifty- (50) pump stations have been hydrostatically tested in 2002.

Upon completion of the inspections, a written report shall be submitted to the Engineer. This report shall identify all devices that were tested as well as any corrective measures that are recommended. Create tickets for any deficiencies found on this inspection and enter the numbers on the inspection report.

8.10.15 YEARLY MOTOR CONTROL CENTER INSPECTION – ALL STATIONS

Minimum of four (4) stations due per month, January through November, with program to be completed during December of each year

The Contractor shall perform the following inspection:

A. Clean enclosure and control equipment by blowing out with low air pressure or vacuuming

B. Check and clean contacts, relays and timers and visually inspect for damage or out of adjustment parts. Remove all dust off of electrical devices and equipment.

C. Check motor control center indicating lamps and all switches and push buttons

D. Circuit breaker maintenance:

- Check connections
- Exercise breaker
- Check trip setting

E. Motor Starter Contact Maintenance:

- Check contacts and burnish or replace, if necessary
- Check coil and clean
- Inspect arc chute for cracks or burns
- Check contact pressure and measure contact resistance on all 3 phases

F. Oil Dash Pots:

- Check oil levels
- Inspect settings

G. Inspect wiring/conductors for overheating and discoloration

H. Check sizing of motor overload heaters

I. Check tightness of wire terminations and connections

J. Check for proper labeling, provide and install missing labels

K. Check wire tags/labels, provide and install missing tags or labels

L. Check fans for proper operation and clean filters

M. Check fuse disconnects for proper operations, keep fuse clips clean and tight

N. Check fuses for proper size, and overheating

O. Test equipment ground system of the station.

Create tickets for any deficiencies found on this inspection and enter the numbers on the inspection report.

8.10.16 TUBE TYPE PUMP MAINTENANCE – YEAR 2013 AND 2015 ONLY

PS #5, 22, 23, 26 and 27

The maintenance program shall be completed by September, 2013 and again by September, 2015.

The Contractor personnel and/or service company shall:

- Remove the pumps, inspect and replace, if necessary, the upper mechanical seals. The condition of the mechanical seal is satisfactory if no fluid leakage (contaminant) or only light seepage out of the inner hole in the casing.

- Dismantle the pump partially, if fluid has leaked, which is evidence that the bearing has also been affected. Check the mechanical seals and replace if necessary.

- Replace the roller bearing grease, if water has penetrated into the bearing.

- Drain all the leakage fluid and the liquid seal, and refill with a sealing fluid as recommended by the manufacturer.

8.10.17 YEOMAN PUMP MAINTENANCE - YEAR 2014 ONLY

PS # 5, 7, 21, 27, 29, 30, 42, 48

In June 2014, at stations with Yeoman Pumps, the Contractor shall:

- Drain, flush and refill the seal chamber with new oil.

- Inspect oil for water intrusion in the motor seal chamber.
- Inspect the cable for any signs of abrasion or damage.
- Inspect the impeller and casing wear ring.
- Notify the Engineer in advance of this scheduled work.
- Create tickets for any problems found during the inspection.

8.10.18 YEARLY GENERATOR MAINTENANCE

PS # 9, 11, 15, 18, 19, 24, 28, 34, 36, 39, 41, 42, 47, Two in State Stock,

Base Stations, Six Moveable Bridges, IDOT Schaumburg Headquarters and Traffic Systems Center, Rodenburg Maintenance Yard, Hillside Maintenance Yard and all Advanced System Communication Huts and Tower locations

The Contractor shall perform inspection and maintenance required for the standby generators in October of each year as follows:

- Change oil and oil filters
- Drain, flush, and replace coolant
- Replace cooling system hoses in 2014
- Replace thermostats in 2014
- Replace fan belts in 2014
- Check and adjust valves as necessary
- Conduct operational inspection to insure proper valve rotation
- Check fan hub
- Check pulley
- Check water pump
- Change the day tank breather
- Clean or replace the crankcase breather
- Change fuel filter

-
- Drain sediment from the fuel tank
- Clean accumulation of grease, oil and dirt on set
- Lubricate generator bearing
-
- Check vibration isolators for proper adjustment and conditions
- Check circuit breaker and transfer switch, and test equipment by simulating a power outage
- Check turbo pressure, adjust if necessary to manufacturer specifications
- Provide fuel system service to perform fuel polishing only in 2013.
- Record inspection on log P-10 in the log book and submit a copy of the report with the monthly routine work submittal book
- Tickets shall be created for any problems found
- Check and note any rusting on the generator and its enclosure
- Prepare, prime, and paint rusting metal (to match existing paint)

8.11 PUMP STATION NON-ROUTINE MAINTENANCE:

The Contractor shall be advised that several routinely maintained items such as, but not limited to, the gas detector inspection, automatic transfer system service, adjustment of existing controls, removal and replacement of gas sensors, intrusion override key switch, motor balancing, SCADA equipment, motor inspection, pump re-building type 1-6, SCADA radio equipment inspection, pump station SCADA radio inspection, switchgear system inspection, pump repair and pump replacement, vibration testing and analysis, cleaning of wet pit, and wet pit power wash. Review Section 2 Special Provisions and Programs.

8.12 LOGS AND FORMS

A sample of logs and forms as required for this Contract will be available at the Pre-Bid Meeting.

8.13 TABLES

The Contractor shall update and maintain all tables to be true and accurate. The Contractor shall submit updates of a minimum of 6 pump station per month starting in February and all must be completed by the end of October.

PS	PUMP STATION LOCATION			RR CROSSING	OUTLET	STATION	CAP	PS
NO	MUNICIPALITY	MAIN ROUTE	NEAREST CROSS STREET	AT PUMP STATION	WATERWAY	GPM	CFS	NO
1		Reserved for future						1
2	NORTHFIELD	I 94 EDENS EXPY	WINNETKA RD	NONE	SKOKIE RIVER	54000	120	2
3	CHICAGO	I 94 EDENS EXPY	CALDWELL/PETERSON	NONE	N. BR CHICAGO RV	70000	156	3
4	FOREST PK	I 290 EISENHOWER EXPY	E. OF 1ST AVE	NONE	DES PLAINES RV	90000	201	4
5	CHICAGO	I 290 EISENHOWER EXPY	DES PLAINES AVE	NONE	CHICAGO RV	38000	85	5
6		Reserved for Future						6
7	CHICAGO	I 290 EISENHOWER EXPY	WELLS ST PLAZA	NONE	CHICAGO RV	6000	13	7
8	DES PLAINES	US 14 NORTHWEST HWY	1/2 MILE E. OF IL RT 45	WIS. CENTRAL	WELLER CREEK	3000	7	8
9	STONE PK	US 45 MANNHEIM RD	LAKE ST	NONE	ADDISON CREEK	24000	53	9
10	NILES	US 14 DEMPSTER ST	MILWAUKEE AVE	NONE	SEWER	1200	3	10
11	OAK FOREST	IL 50 CICERO AVE	158TH STREET	NIRC	MIDLOTHIAN CREEK	5400	12	11
12	MELROSE PK	IL 64 NORTH AVE	W. OF 25TH AVE	BRC	27"SS SILVER CREEK	11000	25	12
13	SKOKIE	US 41 SKOKIE BLVD	SO. OF OAKTON AVE	SKOKIE SWIFT	OAKTON SEWER	11000	25	13
14	RIVERDALE	WOOD / ASHLAND	139TH STREET	IHB & BRC	LITTLE CALUMET RV	11000	25	14
15	CHICAGO	79TH ST	KEDZIE AVE	NS	SEWER ON KEDZIE	5500	12	15
16	ROSEMONT	IL 72 HIGGINS RD	E. OF MANNHEIM RD	Wisconsin Central	WILLOW CREEK	5400	12	16
17	DES PLAINES	IL 58 GOLF RD	E. OF DES PLAINES RV RD	Union Pacific	DES PLAINES RV	3000	7	17
18	SO. HOLLAND	US 6 159TH ST	SOUTH PARK	U.P.	LITTLE CALUMET RV	5800	13	18
19	OAK FOREST	US 6 159TH ST	IL 50 (CICERO AVE)	NIRC	MIDLOTHIAN CREEK	7000	16	19
20	HILLSIDE	I 290 EISENHOWER EXPY	W. OF WOLF RD	NONE	SEWER	7900	13	20
21	CHICAGO	I 94 DAN RYAN EXPY	72ND ST	NONE	SEWER	32000	71	21
22	CHICAGO	I 90 / 94 KENNEDY EXPY	FULTON AVE	C & NW, SOO & CR	SEWER	60000	134	22
23	CHICAGO	I 90 / 94 KENNEDY EXPY	ROSCOE ST	NONE	SEWER	72000	160	23
24	ROSEMONT	I 190 KENNEDY EXPY	E. OF MANNHEIM RD	WIS. CENTRAL	DES PLS RV & WLRS CK	111000	247	24
25	BRIDGEVIEW	US 12 / 20 95TH ST	IL 43 (HARLEM AVE)	BRC	STONE CREEK	37200	83	25
26	CHICAGO	I 90 / 94 DAN RYAN EXPY	ROOSEVELT RD	NONE	SB CHICAGO RIVER	70000	156	26
27	CHICAGO	I 94 CALUMET EXPY	110TH ST	NONE	LAKE CALUMET	240000	535	27
28	CICERO	IL 50 CICERO AVE	US 34 (OGDEN AVE)	BURLINGTON N	SEWER	31800	71	28
29	CHICAGO	I 90 / 94 DAN RYAN EXPY	WALLACE ST	NONE	SO. BR CHICAGO RV	108000	241	29

30	CHICAGO	I 55 STEVENSON EXPY	HOMAN AVE	ATSP	SAN. SHIP CANAL	40000	89	30
31	OAKLAWN	111TH ST.	CENTRAL	B&O RR		7400	16.5	31
32	MELROSE PK	IL 64 NORTH AVE	1ST AVE	SOO LINE	DES PLAINES RV	9600	21	32
33	PROSPECT HTS	PALATINE RD	MILWAUKEE AVE	NONE	DES PLAINES RV	64000	143	33
34	ELMHURST	I 290 EISENHOWER EXPY	EMROY AVE	NONE	SEWER TO DOYLE RES.	11000	25	34
35	BLUE ISLAND	I 57	127TH ST	NONE	CAL SAG CHANNEL	112500	251	35
36	TINLEY PK	IL 43 HARLEM AVE	176TH STREET	NIRC	DITCH	22500	50	36
37	LAKE BLUFF	US 41 SKOKIE HWY	IL 176 (ROCKLAND RD)	NONE	SKOKIE RV	6000	13	37
38	LAKE FOREST	US 41 SKOKIE HWY	DEERPATH AVE	NONE	SKOKIE RV	5000	11	38
39	LAKE FOREST	IL 60	W. OF IL 41	SOO LINE	36” SS N.BR.CHI.RV.	6000	13	39
40	MUNDELEIN	US 45 LAKE AVE	N. OF IL 60	EJ & E	SEWER	2400	5	40
41	KNOLLWOOD	US 41 SKOKIE HWY	N. OF IL 176	EJ & E	SKOKIE RV	6000	13	41
42	HAMPSHIRE	IL 47	IL 72	SOO LINE	SEWER TO DITCH	3000	7	42
43	GURNEE	US 41 SKOKIE HWY	N. OF IL 132	SOO LINE	DES PLAINES RV	6000	13	43
44	ELMHURST	IL 83 KINGERY HWY	SO. OF NORTH AVE	ICG & C & NW	SALT CREEK	5000	11	44
45		Reserved for Future						45
46	HIGHLAND PK	US 41 SKOKIE HWY	CLAVEY RD	NONE	E. SKOKIE DR NG. DITCH	7600	17	46
47	NAPERVILLE	IL 59	NORTH AURORA AVE	BURLINGTON N	SEWER TO DITCH	4000	9	47
48	WARRENVILLE	IL 56 BUTTERFIELD RD	W. OF IL 59	E J & E	FERRY CREEK	5800	13	48
49		Reserved for Future						49
50	HIGHLAND PK	IL 22 HALF DAY RD	US 41	UNION PACIFIC	E. SKOKIE DRNG. DITCH	4800	11	50
51	ALSIP	127TH ST	E. OF CRAWFORD	CSX	STONY CREEK	6800	15	51
52	PLAINFIELD	IL59	IL 126	E.J. & E. RR				52

Table P-2a: Pump Station Construction History & Reference Notes

PS NO	INSTALL/MO DATE	NOTE REF. NO.	STATION TYPE	SECONDARY SERVICE	PUMP CONTROL			ALARM TYPES		CAP METER	PS NO
					PRIMARY	SEC(1)	TERTIARY	AEGIS	SCADA		
1											1
2	1951/72/95	3,5,8,9,23	WET PIT	2ES FAT	CL 5000	FLOATS		AEGIS	SCADA		2
3	1951/72/95	3,5,8,9,23	WET PIT	2ES FAT	CL 5000	FLOATS		AEGIS	SCADA		3
4	1951/71	2,3,7,8,10,22	WET PIT	2ES SBAT	LIQ. V	BUBBLER	PROBES	AEGIS	SCADA	YES	4
5	1965/2005	2,7,8,10,22	WET PIT	2ES SBAT	CL 5000	FLOAT	PROBES	AEGIS	SCADA	YES	5
6											6
7	1955/2012	8,9	WET PIT	2ES FAT	LIQ. V	FLOAT		AEGIS	SCADA	YES	7
8	1928/87/88	22,25,13	WET PIT	-	LIQ. V	FLOAT		AEGIS	SCADA		8
9	1977	1,3,7,11,23,24	DRY PIT	GEN(D)	CL5000	FLOAT		AEGIS	SCADA	YES	9
10	1990	3,5,9,23	DRY PIT	2ES FAT	LIQ. V	FLOAT		AEGIS	SCADA	YES	10
11	1934	5,11,24,25	DRY PIT	GEN (D)	LIQ. V	FLOAT		AEGIS	SCADA		11
12	1934/72	9,20	DRY PIT	2ES FAT	CL 5000	FLOAT		AEGIS	SCADA		12
13	1934	5,9,24,25	DRY PIT	2ES FAT	LIQ. V	FLOAT		AEGIS	SCADA		13
14	1934/72	20,22,25	DRY PIT	-	LIQ. V	FLOAT		AEGIS	SCADA		14
15	1940	11(P),24	DRY PIT	-	LIQ. V	FLOAT		AEGIS	SCADA		15
16	1934	5,9,20	DRY PIT	2ES FAT(P)	CL 5000	FLOAT		AEGIS	SCADA		16
17	1931/91	3,5,9,23,24	WET PIT	2ES FAT	LIQ. IV	FLOAT		AEGIS	SCADA	YES	17
18	1942	24,25	DRY PIT	GEN (D)	LIQ. V	FLOAT		AEGIS	SCADA		18
19	1948	11(P),24,25	DRY PIT	GEN (D)	LIQ. V	FLOAT		AEGIS	SCADA		19
20	1958/86	5,8,9,24	WET PIT	2ES FAT	CL 5000	FLOAT		AEGIS	SCADA		20
21	1960	7,8,9,15,22,25	WET PIT	2ES FAT	LIQ. V	FLOAT		AEGIS	SCADA		21
22	1970/96	2,3,5,8,12,23	WET PIT	2ES SBFAT	CL 5000	FLOAT		AEGIS	SCADA		22
23	1970/96	2,3,5,8,12,23	WET PIT	2ES SBFAT	CL 5000	FLOAT		AEGIS	SCADA	YES	23

24	1960/70/2013	3,7,8,19,22	WET PIT	2ES FAT	LIQ V	BBL/ELCT	PROBES	AEGIS	SCADA	YES	24
25	1962	3,7,9	WET PIT	2ES FAT	LIQ. V	BUBBLER	PROBES	AEGIS	SCADA	YES	25
26	1962/72/2012	2,3,7,8,19,22	WET PIT	2ES SBFAT	LIQ. V	FLOATS		AEGIS	SCADA	YES	26
27	1961/2012	3,7,8,9,19,22	WET PIT	2ES FAT	LIQ. V	BUBBLER	PROBES	AEGIS	SCADA	YES	27
28	1961	2,3,5,11,16,23	WET PIT	GEN(D)	LIQ. V	FLOATS		AEGIS	SCADA	YES	28
29	1962	7,8,10	WET PIT	2ES SBAT	CL 5000	BUBBLER	PROBES	AEGIS	SCADA	YES	29
30	1963	3,5,8,9,16,22	WET PIT	2ES FAT	LIQ. V	FLOATS		AEGIS	SCADA		30
31	1999	3,5,16,28	WET PIT	2ES FAT	CL 5000	FLOATS		AEGIS	SCADA	YES	31
32	1963	9	DRY PIT	2ES FAT	CL 5000	FLOATS		AEGIS	SCADA		32
33	1975	3,9,33	WET PIT	2ES FAT	LIQ. V	BUBBLER	PROBES	AEGIS	SCADA	YES	33
34	1961/90	3,5,8,11,23,24	DRY PIT	GEN(D)	CL 5000	FLOAT		AEGIS	SCADA	YES	34
35	1967	2,3,8,9,12	WET PIT	2ES FAT	CL 5000	FLOATS		AEGIS	SCADA	YES	35
36	1972	1,18,23	DRY PIT	GEN(D)	LIQ. V	FLOATS		AEGIS	SCADA		36
37	1937	9,22,24,25	DRY PIT	2ES FAT	LIQ. V	FLOAT		AEGIS	SCADA		37
38	1937	24	DRY PIT	-	LIQ. V	FLOAT		AEGIS	SCADA		38
39	1990	3,5,11,23,24	WET PIT	GEN(D)	CL 5000	FLOAT		AEGIS	SCADA	YES	39
40	1985	3,9,23	WET PIT	2ES FAT	LIQ. V	FLOAT	PROBES	AEGIS	SCADA	YES	40
41	1937	22,24,25	DRY PIT	GEN(D)	CL 5000	FLOAT		AEGIS	SCADA		41
42	1935/86/87/95	5,11,12,23	WET PIT	GEN(D)	CL 5000	FLOAT		AEGIS	SCADA	YES	42
43	1936	3,5,9,15,23	DRY PIT	-	LIQ. V	FLOAT		AEGIS	SCADA		43
44	1938/00	5,16,23,24	DRY PIT	2ES FAT	LIQ. V	FLOATS		AEGIS	SCADA	YES	44
45											45
46	1993	2,3,5,9,23	WET PIT	2ES FAT	CL 5000	FLOAT		AEGIS	SCADA	YES	46
47	1955/86/2013P	5,11	WET PIT	GEN(D)	LIQ. V	FLOAT		AEGIS	SCADA		47
48	1942/2012	24,25	DRY PIT	-	LIQ. V	FLOAT		AEGIS	SCADA		48
49				-							49
50	1985	3,9,23	DRY PIT	2ES FAT	CL 5000	BUBBLER	FLOAT	AEGIS	SCADA	YES	50
51	1984	3,9,23	DRY PIT	2ES FAT	LIQ. V	BUBBLER	FLOAT	AEGIS	SCADA	YES	51
52	2002	16,9	WET PIT	2ES FAT	LIQ V	FLOAT		AEGIS	SCADA		52

Pumping Station Construction History & Reference Notes

1

2 PUMPING STATION # 4(2), 5, 21, 22, 23, 26, 28, & 35(2)AND 46 HAVE AUTOMATIC TRASH RACKS

3 PUMPING STATIONS # 2, 3, 4, 5, 9, 10, 17, 21, 22, 23, 24, 25, 26, 27,28, 30, 31, 33, 34, 35, 39, 40, 41, 43, 44, 46, 50 & 51 HAVE WATER RECIRCULATING SYSTEMS

4 ALL PUMPING STATIONS HAVE AEGIS ALARM TRANSMITTERS

5 INSTALLATION OF NEW PUMPS, ELECTRICAL CONTROLS AND BLDG RENOVATION# 2,3,7,9,10,11,13,16,17,18,20,22,23,24,26,27,28,30,31,34, 36,47,48

39,42,46

7 PUMP STATIONS HAVING STAND-BY COMPRESSED AIR TANKS FOR BUBBLER CONTROL ARE: 4,24,25,26,27,29,33,35

8 EXPRESSWAY PUMPING STATIONS: TOTAL 18 I-55(30) I-57(35) I-80(1,6) I-290(4,5,7,20,34)

Bishop Ford(27) DAN RYAN(21,26,29) EDENS(2,3) KENNEDY(22,23,24)

9 TWO ELECTRIC SERVICES FULL AUTOMATIC TRANS. (2ES FAT) STATIONS ARE: 2,3,5,7,10,12,13,16,17,20,21,22,23,24,25, 27,30,31,32,33,35,37,40,43,44,46,50,51,52

10 TWO ELECTRIC SERVICE SPLIT BUS AUTOMATIC TRANSFER (2ES SBAT) STATIONS ARE: 4,29

11 STAND-BY GENERATOR, D=DIESEL

PUMP STATION NUMBERS: 9(D), 11(D),15, 18 (D), 19, 28(D), 34(D), 36(D), 39(D), 41(D), 42(D), 47(D) AND TWO (2) MOBILE GENERATORS 31(D), 46(D)

12 MAIN TIE MAIN SCHEME 22,23,26 & 35

13 PS8: Access is limited and requires lane closure for preventive maintenance and other routine maintenance items.

14

15 PUMPING STATIONS PROGRAMMED FOR CONSTRUCTION 14, 38, 8, 25, 4, 33

16 PUMP STATIONS UNDER CONSTRUCTION PS 7, 24, 26, 27,48

17 Pump Station 2 and 3 have two additional low flow pumps each.

18 PUMP STATIONS THAT HAVE INTERCHANGEABLE LOW FLOW PUMPS ARE PS 5 AND PS 21

19 WATER RECIRCULATION IS POSSIBLE, BUT CURRENTLY NOT USABLE AT THE FOLLOWING STATIONS: 24,33

20 PS12, 14 HAVE COMMON DISCHARGE

21

22 THE FOLLOWING PUMPING STATIONS ARE UNDER IMPROVEMENT PROGRAM; 4,8,14, 25, 33, 38

23 PUMP STATIONS THAT HAVE A STANDBY PUMP: 2,3,5,9,10,21,22,23,28,30,31,34,35,36,39,40,41,42,43,44,46,50, 51 & 52

24 PUMP STATIONS HAVE INTERCHANGEABLE PUMPS: 11,15,18,19,20,31,37,38,39,41,44,48 BUT DIFFERENT IMPELLER SIZES/VOLTAGE

25 PUMP STATIONS ON A MULTI-YEAR IMPROVEMENT SCHEDULE BUT NOT PROGRAMMED: ,9,11,12,13,15,16,18,19,20,24,29,32,33,35,36,37

26 PUMP STATIONS WITH INTERCHANGEABLE PUMPS : 9, 13, 17, 31, 34 BUT DIFFERENT IMPELLER SIZE/VOLTAGE

GENERAL ABBREVIATION CODES

P OR (P)..... PROPOSED

PUMP COMPANY ABBREVIATIONS

AB..... ABS PUMP CO.

AC..... ALLIS CHALMERS

AV..... AURORA PUMP CO.

CA..... CASCADE PUMP CO.

CO..... CORNELL MFG. CO.

CP..... CHICAGO PUMP

FL..... FLYGT PUMP CO.

FM..... FAIRBANKS MORSE CO.

JP..... JOHNSTON PUMP CO.

PA..... PATTERSON

PE..... PEERLESS PUMP CO.

CY..... CLOW YEOMANS, GrundFos

SC.....SCAN PUMP CO.

PUMP REBUILD HISTORY CODES

N..... NEW PUMP

R..... REBUILT PUMP

O..... ORIGINAL

RWK..... REWORK

NS..... NEW SPARE BOWL

RS..... REBUILT SPARE

J..... JUNK

PUMP TYPE CODES

VA..... VERTICAL AXIAL

S..... SUBMERSIBLE

SVD..... SIDE VOLUTE DISCHARGE

DPS..... DRY PIT SUBMERSIBLE

* ..... LOW FLOW PUMP

EB…… EBARA PUMP CO.

TABLE P-3 PUMP SPECIFICATIONS

MAIN PUMPS								LOW FLOW PUMPS							
PS	MAIN	STANDBY PUMPS	PUMP	PUMP	DSCHG	MOTOR/ENG	CURRENT (FL)	LOW FLOW		PUMP	PUMP	DSCHG	MOTOR/ENG	CURRENT (FL)	PS
NO	(QTY)	(GPM)	TYPE	SIZE	SIZE	VLT/PHASE/RPM	(AMPS/HP)	(QTY)	(GPM)	TYPE	SIZE	SIZE	VLT/PHASE/RPM	(AMPS/HP)	
1															1
2	4	13200	VA	24	24	460/3/892	181/150	1	9200	VA	18	20	460/3/1188	152/125	2
3	4	17500	VA	30	30	460/3/709	273/200	1	9550	VA	18	20	460/3/1188	120/100	3
4	9	10000	VA	20	24	480/3/1200	227/200	-	-						4
5	4	7000	S	20	16	480/3/1165	117/100	1	3000	S	12	12	480/3/875	79/60	5
6															6
7	3	3000	S	12	12	460/3/	60/35	1	650	S	6	6	480/3	/10	7
8	2	1500	S	8	8	240/3/890	50/20	-	-						8
9	4	8000	DPS	16	18	480/3/700	224/175	1	3500	DPS	12	12	480/3/875	160/60	9
10	3	640	DPS	6	6	460/3/1750	20/14.8	2	290	DPS	4	4	480/3/1750	9/6.4	10
11	2	2700	DPS	12	12	230/3/860	80/30	-	-						11
12	2	5500	DPS	14	14	230/3/875	159/60	-	-						12
13	2	5500	DPS	12	14	230/3/890	160/60	-	-						13
14	2	5500	SVD	14	14	230/3/875	98/20	-	-						14
15	2	2750	SVD,DPS	10	12	230/3/860	54/20, 80/30	-	-						15
16	2	2700	DPS	10	12	480/3/1170	-/25	-	-						16
17	2	4200	S	14	16	460/3/875	60/60	1	375	S	4	4	480/3/		17
18	2	2900	DPS	12	12	230/3/870	80/30	-	-						18
19	2	3500	DPS	10	12	230/3/860	80/30	-	-						19
20	2	3950	S	12	14	480/3/860	41/30	-	-						20
21	4	10700	S	-	-	480/3/175	207/175	1	3000	S	10	12	460/3/880	82.5/60	21

22	5	15000	S	-	30	480/3/1175	230/189	2	2500	S	8	12	480/3/1160	437/54	22
23	6	14400	S	-	32	480/3/875	196/153	2	2500	S	10	12	480/3/1160	74/52	23
24	6	22000	S	24	24	480/3/585	437/310	1	6000	S	12	12	480/3/875	129/100	24
25	6	6000	VA	20	24	480/3/1175	49.5/40	1	1200	S	6	10		-/15	25
26	7	10000	S	36		480/3/1185	240/200	1	3200	S	12	12	480/3/1185	89/70	26
27	8	30000	S	48		4160/3/591	76/468	2	2500	S	8	12	460/3/1160	77/60	27
28	4	8000	DPS		14	460/3/880	90	2	3000	S		12	460/3/1160	/30	28
29	6	18000	VA	36	30	480/3/705	422/350	2	2700	S	8	12	460/3/1160	92/75	29
30	3	13300	S	50	20	460/3/885	170	1	2800	S	8	12	460/3/1165	67/50	30
31	2	3050	S		12	460/3/1180	0/160	2	1300	S		8	460/3/1170	/35	31
32	2	4800	SVD	14	14	440/3/695	55/40	-	-						32
33	6	9000	VA	18	20	480/3/1175	140/125	1	10000	VA			480/3/1180	144/125	33
34	3	5050	DPS	12	16	460/3/1150	81/60	-	2000	DPS	12	12	480/3/1180	34/25	34
35	5	22500	VA	30.5	36	480/3/700	345/300	1	17500	VA	30.5	36	480/3/700	345/300	35
36	4	7507	DPS	14	16	480/3/880	129/100	-	-						36
37	2	3000	DPS	10	12	230/3/860	82/30	-	-						37
38	2	2500	DPS	10	12	230/3/860	67/25, 82/30	-	-						38
39	3	2900	S	12	12	460/3/860	41/30	1	840	S	6	6	460/3/1750	20/14.8	39
40	4	800	S	4	6	480/3/1750	16.1/12	-	-						40
41	3	3400	DPS	12	12	460/3/860	40/30	-	-						41
42	3	2500	S	6	6	460/3/1160	24.9/20	1	500	S	4	4	460/3/1160	11.5/7.5	42
43	3	3000	DPS	12	12	460/3/860	40/30	-	-						43
44	3	2500	DPS	16	12	460/3/860	41/30	1	350	DPS	6	4	460/3/1800	/7.5	44
46	3	3800	S	14	14	460/3/885	39.7/30	2	1100	S	6	8	480/3/1750	-/15	46
47	2	2000	SVD	8	8	460/3/875	37.5/20	-	-						47
48	3	2900	DPS	12	12	4800/3/870	40/30	1	250	DSP			480/3/1160	/7.5	48
50	3	2400	SVD	12	12	480/3/705	50/30	-	-						50
51	3	3400	SVD	12	12	480/3/885	50.5/40	-	-						51
52	3	2200	S	12	10	480/3/860	41/30	1	500	S	4	4	480/3/1750	13/10	52

TABLE P-4: PUMP REBUILD HISTORY

PS	POSITION										PS
NO	1	2	3	4	5	6	7	8	9	10	NO
2	95(O)	95(O)	95(O)	06(R)	06(R)	*02(O)*	*02(O)*				2
3	95(O)	95(O)	95(O)	95(O)	*95(O)*	*02(O)*	*02(O)*				3
4	7/04(P)	10/01(RS)	6/11(RS)	3/11(R)	9/05(RW)	3/94(N)	10/03 RS	3/12 (R)	4/08(R)		4
5	3/06(R)	2/12	3/06(N)	07/11(N)	02/12	1/11					5
6											6
7	2012(O)	2012(O)									7
8	6/06(R)	8/99R									8
9	04(0)	04(0)	04(0)	04(O)	*94(O)*						9
10	93(O)	93(O)	6/11	12/10	*02(R)						10
11	1/94(N)	96(P)									11
12	12/04 (P)	10/03 (O)									12
13	5/01(R)	5/01(R)									13
14	12/07 (R)	8/08 (N)									14
15	12/06(N)	2/11									15
16	01(N)	01(N)									16
17	93(O)	93(O)	3/10(R)								17
18	9/93(N)	7/04 (R)									18
19	3/11	11/93(N)									19
20	4/00(N)	03/12									20
21	6/04 (N)	6/04 (N)	6/04 (N)	6/04 (N)	* 6/04(N)*						21
22	96(O)	96(O)	96(O)	96(O)	96(O)	*96(O)*	02/04(R)				22
23	96(O)	96(O)	96(O)	96(O)	96(O)	96(O)	1/10 (R)	12/10			23
24	2013(O)	2013(O)	2013(O)	2013(O)	2013(O)	2013(O)	2013(O)	2013(O)	2013(O)		24
25	4/04 (RS)	3/27/52	2/95(RS)	5/93(R)	8/91(N)	5/94(R)	*8/01(R)*				25

26	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)				26
27	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)	2012(O)	3/05(R)	9/08(R)	27
28	2/01 (N)	2/01 (N)	2/01 (N)	2/01 (N)	2/01 (N)	*2/01 (N)*	*2/01(N)*				28
29	7/97(N)	5/99(N)	06(R)	5/99(N)	3/11	8/93(N)	03/12	07/09 N			29
30	11/11	11/11	6/11	2/11	3/11						30
31	99(O)	99(O)	99(O)	*7/04 (RW)*	7/04(RW)						31
32	3/08(N)	96(N)									32
33	06(N)	75(O)	2/11	8/86(RS)	6/86(RS)	1/96(N)	3/06(N)				33
34	6/10 (N)	7/04(RW)	7/11	3/10(R)							34
35	02(NS)	67(O)	05/12(N)	3/82(S)	67(O)		5/02(NS)				35
36	04 (O)	04 (O)	04 (O)	04 (O)							36
37	10/99	4/92(R)									37
38	08(N)	5/92(N)									38
39	91(O)	7/04 (RW)	91(O)	91(O)							39
40	3/06(N)	06(N)	3/06(N)	9/09 (R)							40
41	10/04 (N)	10/04 (N)	10/04 (N)								41
42	95(O)	10/09(R)	95(O)	*95(O)*							42
43	9/05 (N)	9/05 (N)	9/05 (N)								43
44	11/02(N)	11/02(N)	11/02 (N)	*02 (N)*							44
46	12/90(O)	9/09(R)	12/90(O)	01/02(R)	*90(O)*						46
47	1/94(R)	2/09(R)									47
48	2012(O)	2012(O)									48
49											49
50	85(O)	85 (O)	85(O)								50
51	07(N)	06(N)	06(N)								51
52	1/08 (RW)	02(O)	02(O)	*02(O)*							52

TABLE P-5 SPARE PUMPS AND PUMP REBUILD PROGRAM

PS		MAIN PUMPS		LOW FLOW PUMPS			OIL-TUBE			PS
NO		NEW	REBUILT	NEW	REBUILT	IMPELLER	ASSEMBLY			NO
1										1
2		1		1	1					2
3			1	1						3
4			1							4
5			1		1					5
6										6
7		1								7
8										8
9		1								9
10		1								10
11						1				11
12										12
13										13
14			1							14
15						1				15
16		1								16
17		1								17
18						1				18
19										19
20										20
21					1					21

22			1			1				22
23			1							23
24			1		1					24
25										25
26		1		1						26
27		1		1						27
28				1						28
29		1	2				2			29
30		1								30
31		1			1					31
32			1		1	1				32
33			1		1	2				33
34										34
35		1								35
36		1								36
37						1				37
38										38
39			1							39
40		1								40
41										41
42			1							42
43						1				43
44				1						44
45										45
46			1							46

47										47
48										48
49										49
50		1								50
51						1				51
52				1						52

TABLE P-7 WET PIT CLEANING AND ROOF MAINTENANCE RECORD

PS NO	WP AREA (SQ FT)	PREVIOUS DATE	LATEST DATE	INSTALL DATE	SUB CONTRACT	REPLACE ROOF	COST	WARRANTY 5 YRS	WARRANTY 10 YRS	DATE INSPECTED	STATUS	PS NO
2	684	July-02	August-11		Boice	(84)			YES	8/1/2011	OK	2
3	684	May-02	August-11		Boice	(84)			YES	8/1/2011	OK	3
4	1144	April-10	August-11		Arrow	(93)	9775		YES	7/20/2011	08(P)	4
5	277	July-01	May-04							8/3/2011	OK	5
7	79		October-03	SLAB	CONST	NEW/2012				ON CONST	OK	7
8	88	UNK		ORIGINAL						7/20/2011	OK	8
9	826	September-01		ORIG(77)	Elgin Roofing	(06)				7/20/2011	OK	9
10	970	April-04	July-09							07-22-09	8/1/2011	10
11	159		September-07		ERC	(08)			YES	7/27/2011	OK	11
12	222	June-09	June-12		ERC	(08)			YES	7/20/2011	OK	12
13	223	June-08	September-11			(87)	2070			8/1/2011	OK	13
14	182		October-03	ORIGINAL						7/21/2011	OK	14
15	143	08b	June-12		Acer	(90)	1395		YES	7/21/2011	OK	15
16	156	UNK	June-11		Acer	(90)	1395		YES	8/1/2011	OK	16
17	88	January-88	08B							7/25/2011	OK	17
18	212	June-08	June-12		Riddiford	(97)	5,197		20yr-yes	7/21/2011	OK	18
19	200	September-07	June-11		Elgin Roofing	(05)				7/27/2011	OK	19
20	265	April-04	April-10		38630	(86)				7/20/2011	OK	20

21	787	November-10	November-11		7 K'S	(89)	8484		YES	8/3/2011	OK	21
22	478	October-01	November-11 Tunnel		Pinnacle	(87)	5190		YES	8/3/2011	OK	22
23	1114		October-01	ORIGINAL						8/3/2011	OK	23
24	639	August-01	March-10		CONST	NEW/2012	23,240		YES	N/A	08(P)	24
25	956	November-99	July-09	ORIGINAL						7/21/2011	OK	25
26	432	June-08	January-10		CONST	NEW/2012	21,560		20yr-yes	N/A	OK	26
27	1984	January-09	September-10		CONST	NEW/2012	10,290		YES	N/A	PA	27
28	1692	April-04	August-11	ORIGINAL						8/3/2011	OK	28
29	1223	July-08	August-09		Riddiford	(97)	30,443		20yr-yes	8/3/2011	OK	29
30	809	January-10	September-11	ORIGINAL	Arrow	(93)				8/3/2011	OK	30
31	738									7/27/2011	OK	31
32	280	September-07	June-12	ORIGINAL						7/20/2011	OK	32
33	1039	08B	January-10		Riddiford	(97)	22,374		20yr-yes	7/25/2011	OK	33
34	163	86A	September-11							7/20/2011	OK	34
35	2002	February-09	November-12		Steward	3-10	8067		YES	7/21/2011	PA	35
36	573	April-04	August-11		Elgin Roofing	(05)				7/27/2011	OK	36
37	253	April-04	08B	ORIGINAL						N/A	10P	37
38	198	October-88	April-04	ORIGINAL						N/A	OK	38
39	436	May-04	January-10							7/25/2011	OK	39
40	1868	October-01	August-11							7/25/2011	OK	40
41	231		March-02		Acer	(90)	1854		YES	7/25/2011		41
42	144	August-00	September-09	SLAB						8/16/2011	OK	42
43	242	March-02	April-10		Acer	(90)	1395		YES	7/25/2011		43
44	204	November-08	May-11	ORIGINAL						7/21/2011	OK	44
45										N/A		45
46	793		November-10							7/25/2011	OK	46
47	88		November-88		CONST	NEW/2012			YES	8/16/2011	OK	47

48	216		August-00		CONST	NEW/2012				8/16/2011	OK	48
49		UNK		SLAB						N/A		49
50	624	UNk								7/25/2011	OK	50
51	327	April-04	January-10		Stewart	4-11	patch			7/27/2011	OK	51
52	443		September-09							8/16/2011	OK	52

ARTICLE 9.0 – SURVEILLANCE AND DYNAMIC MESSAGE SIGN SYSTEM

9.1 SURVEILLANCE SYSTEM

The Surveillance System consists of all devices and appurtenances which make up the Expressway Detector Cabinet and Ramp Meter and Control cabinet locations which are monitored and controlled via the District One Advanced Traffic Management System (ATMS) located at the Traffic Systems Center in Oak Park, IL.

There is a stand-alone ATR (Automatic Traffic Recorder) network which provides vehicle counts and vehicle classifications on various roadway functional classifications around District One. The system is operated by the Office of Planning and Programming (OP & P) and shall be maintained as part of the Surveillance System.

ATMS Maintenance shall be included in the routine maintenance of the surveillance system. The Contractor shall be responsible for the repair/replacement of all in-house (TSC) FSK tone telemetry. Repair/replacement shall be covered and included as part of Routine Maintenance of the Roadside Control Cabinet. The TSC staff shall be responsible for the trouble shooting and in-house wiring associated with FSK tone telemetry located at TSC.

Surveillance cabinet locations which are collocated with CCTV shall include cameras, camera poles, power and communication equipment and devices including all associated hardware and software, shall be considered as part of that Surveillance location for payment. Routine Maintenance for the CCTV equipment shall be as described in Article 6 for Traffic Monitoring cameras.

Contractor shall provide technical assistance at Surveillance/DMS inspections.

Advance Systems Cameras, Maintenance Paid through Surveillance Locations:

Sys	Loc. #	Main Route	Cross St	Co	Expected Date	System Type	Qty
A	FS1	I 57	S of Halsted St	CO	B7	A2FS	1
A	FS1A	I 57	100st St	CO	B4	A2FS	2
A	FS2	I 57	104th St	CO	B6	A2FS	3
A	FS2A	I 57	107th St & Throop St	CO	C7	A2FS	4
A	FS3	I 57	110th St	CO	C8	A2FS	5
A	FS3A	I 57	114th St	CO	D13	A2FS	6
A	FS3B	I 57	S of 116th St	CO	DMS-29	A2FS	7
A	FS4	I 57	121st St	CO	E14	A2FS	8
A	FS5	I 57	S of 125th St	CO	F16	A2FS	9
A	FS5A	I 57	128th St	CO	G18	A2FS	10
A	FS5B	I 57	North of Broadway	CO	G20	A2FS	11
A	FS6	I 57	Charles Dr	CO	H22	A2FS	12
A	FS6A	I 57	S of Thornton Rd	CO	H21	A2FS	13
A	FS7	I 57	141st St	CO	I26	A2FS	14
A	FS7A	I 57	Norris Oakley	CO	I23	A2FS	15
A	FS8	I 57	Sibley Blvd NB Entrance	CO	J28	A2FS	16
A	FS8A	I 57	Sibley Blvd SB Exit ramp	CO	J25	A2FS	17
A	FS8B	I 57	I 294 Tlwy	CO	J32	A2FS	18
A	FS9	I 57	.1 mi North of Kedzie	CO	K27	A2FS	19
A	FS9A	I 57	155th St	CO	K29	A2FS	20
A	FS10	I 57	159th US 6	CO	L33	A2FS	21

A	FS10A	I 57	S of 159th St	CO	L35	A2FS	22
A	FS11	I 57	S of Crawford Pulaski	CO	M37	A2FS	23
A	FS11A	I 57	N of 167th St	CO	N39	A2FS	24
A	FS12	I 57	S of 167th St	CO	N43	A2FS	25
A	FS12A	I 57	S of Cicero Ave	CO	T45	A2FS	26
A	FS12B	I 57	173rd St	CO	T47	A2FS	27
A	FS13	I 57	S of 175th St	CO	T44	A2FS	28
A	FS13A	I 57	N of I 80	CO	T46	A2FS	29
A	FS13B	I 57	S of I 80	CO	U48	A2FS	30
A	FS14	I 57	S of 186th St	CO	DMS-28	A2FS	31
A	IK1	I 290 IKE	Paulina St	CO	G9	A2IK	32
A	IK3	I 290 IKE	Sacramento	CO	I19	A2IK	33
A	IK4	I 290 IKE	Independence	CO	J27	A2IK	34
A	IK10	I 290 IKE	1st Ave	CO	O57	A2IK	35
A	IK11	I 290 IKE	25th Ave	CO	R58	A2IK	36
A	IK12	I 290 IKE	E of US 12 45 Mannheim Rd	CO	S71	A2IK	37
A	IK13	I 290 IKE	W of US 12 45 Mannheim Rd	CO	S66	A2IK	38
A	IK14	I 290 IKE	EB I 88 Tollway Merge	CO	V72	A2IK	39
A	IK21	I 290 IKE	Addison Rd Median	CO	E109	A2IK	40
A	IK25A	I 290 IKE	I 290 SB Thorndale Exit	CO	116	A2IK	41
A	IK25B	I 290 IKE	Devon Ave	CO	121	A2IK	42
A	IK26	I 290 IKE	S of NB Biesterfield Rd	CO	122	A2IK	43
A	IK26A	I 290 IKE	S of Biesterfield Rd	CO	123	A2IK	44
A	IK27	I 290 IKE	N of Biesterfield Rd	CO	M124	A2IK	45
A	IK27A	I 290 IKE	N of Biesterfield Rd	CO	M126	A2IK	46

A	IK28B	I 290 IKE	I 290 Ent Ramp at Higgins	CO	O132	A2IK	47
A	IK29A	I 290 IKE	I 290 NB Ent Ramp Higgins	CO	O127	A2IK	48
A	IK29C	I 290 IKE	I 290 Ent Ramp Woodfield	CO	129	A2IK	49
A	KE9	I 90 94 JFK	Bryn Mawr	CO	H99	A2KE	50
A	NS1	I 355 NB	Lake St	DU	I4	A2NS	51
A	ST4	I 55 STEV	West of California Ave	CO	DMS-5	A2ST	52
A	ST6	I 55 STEV	East of Cicero Ave	CO	13	A2ST	53
A	ST6A	I 55 STEV	Cicero Ave Exit Ramp	CO	15	A2ST	54
A	ST7	I 55 STEV	East of Central Ave	CO	26	A2ST	55
A	ST8	I 55 STEV	West of Central Ave	CO	32	A2ST	56
A	ST9	I 55 STEV	East of Harlem Ave	CO	21	A2ST	57
A	ST10	I 55 STEV	Harlem Ave	CO	23	A2ST	58
A	ST10A	I 55 STEV	1/2 Mi East of 1st Ave	CO	27	A2ST	59
A	ST11	I 55 STEV	East of 1st Ave	CO	38	A2ST	60
A	ST11A	I 55 STEV	West of 1st Ave	CO	40	A2ST	61
A	ST12	I 55 STEV	.75 Mi West of 1St Ave	CO	42	A2ST	62
A	ST12A	I 55 STEV	1.25 Mi West of 1st Ave	CO	44	A2ST	63
A	ST13	I 55 STEV	.5 Mi East of East Ave	CO	DMS-23	A2ST	64
A	ST14	I 55 STEV	.5 East of LaGrange Rd	CO	R43	A2ST	65
A	ST14A	I 55 STEV	LaGrange Rd NW Quad	CO	R47	A2ST	66
A	ST14B	I 55 STEV	LaGrange Rd SW Quad	CO	R54	A2ST	67
A	ST15	I 55 STEV	East of Willow Springs Rd	CO	R49A	A2ST	68

9.1.1 SURVEILLANCE SYSTEM RAMP CONTROLS (SECTION 3, S-1)

The Contractor shall maintain all ramp meter equipment located at a District 1 Expressway ramp metering system Location. A ramp metering location shall consist of all equipment centrally controlled and monitored by the District 1 ATMS FSK telemetry or locally controlled by a 2070 Lite ramp metering controller and monitored by District One ATMS including but not limited to the following;

- Eight inch traffic signal head, a traffic signal post of various lengths and Type A foundation. The traffic control signal head shall consist of one (1) face and two (2) signal sections (incandescent or LED).
- Low mounted 8-inch flashing warning beacon (incandescent or LED) flasher module, and all appurtenances, mounted on a wood pole, traffic signal post and foundation, or mast arm assembly and foundation.
- FSK Ramp metering control cabinet Type III or IV, Type D foundation, load relay, telemetry mounting frame, FSK Transmitters, FSK Receivers, telemetry power supply, and all other appurtenances. (S-1a)
- 334 expressway ramp metering control cabinet mounted on Type I foundation, 2070 Lite controller running Siemens Tempo NTCIP (1207 & 1209) Ramp Metering Software. Ethernet manage switch, PDA, NEMA Flasher, load switches, detector input file, and all other appurtenances located or attached to the ramp meter cabinet Type 334 location. (S-1b)
- Induction loop either embedded in a sawed slot in the roadway pavement or embedded in the concrete pavement (pre-formed loops), magnetic detector, a loop detector sensor unit, vehicle loop detector amplifier or active channel encased in a durable housing, card rack or detector input file.

- Wet pavement sensor, controller, cabling, firmware to interface wet pavement contact closure and NTCIP interface to ATMS at 71st St. and Dan Ryan (S-1c)
- Surveillance handholes, conduit, cable and interconnect (power and communications) between cabinets in ground or attached to structure.
- Grounding Systems complete including ground rods, ground wells, and grounding cable.
- Telephone Services including leased and State owned copper cable system located in Expressway median or within the Expressway ROW
- Electric Service installations with Public Utility, including conduit (in-ground or attached to structure), cable, and pole-mounted or pedestal-mounted service disconnect cabinets, and meter sockets.
- Fiberoptic Interconnects to State owned fiberoptic Trunk and distribution systems along with fiber optic media converters.

9.1.2 SURVEILLANCE SYSTEM CABINET (Section 3, S-2)

Contractor shall maintain all control cabinet equipment located at a District 1 Surveillance Control Cabinet location on or off expressway location. A control cabinet location shall consist of all equipment used to transmit the raw data pulse or monitor and collect volumes, occupancy,

speed, length–based classifications and FHWA classifications collected by the ATMS or ATR systems. Surveillance control cabinets shall include but are not limited to the following;

- FSK control cabinet, pedestal or pad mounted, foundation, telemetry mounting frame, telemetry transmitters and telemetry power supply. (S-2a)
- 334 Cabinet on Type 1 foundation, 2070 Lite controller running Siemens Tempo (1207 & 1209) ramp metering software. PDA, detector input file and all other appurtenances located in or attached to the surveillance cabinet Type 334. (S-2b)
- Induction loop, magnetic detectors, radar vehicle detectors, bluetooth detectors along with their related amplifiers, microprocessors, access points, antennas, pole, foundation, relays, card racks, and detector input files.

- Radar Vehicle Detector, location Type III cab. foundation, RVD pole/foundation, solar panels, solar panel pole (30') and foundation, Ethernet manage switch, and cabling between radar detector/cabinet and solar panel/cabinet. (S-2c)
- Bluetooth detector locations, solar powered 30' pole/helix foundation, with cellular modem/junction box. Contractor will have to provide traffic control to maintain this equipment. Refer to Art. 3.14.1 and 3.14.2 for days and hours lane closures will be allowed. (S-2d)
- Bluetooth and Radar Vehicle detector locations with battery cabinet solar powered 30' pole/helix foundation, with cellular modem/junction box. Contractor will have to provide traffic control to maintain this equipment. Refer to Art. 3.14.1 and 3.14.2 for days and hours lane closures will be allowed. (S-2e)
- Radar vehicle detector location, 30' pole/foundation, control cabinet, power cables, serial communications, and contact closure wiring/interconnect back FSK control cabinet (S-2f)
- Solar powered induction loop location, solar panels, 30' pole/foundation, control cabinet, Ethernet managed switch, and loop.amplifier. (S-2g)
- Red x/Green↓ LED display, mast arm, pole cabinet and wiring interconnect at 2 locations, S3015 and S3020 at Mannheim & I-190 (S-2h)
- ATR site solar powered or AC powered data collection with IRD/Pat Traffic TRS Data, recorder, a micro aid 14.4 or 33.6 modem, 18W solar panel, Solex 5.0 regulator, Concord Gpl 24 T battery, and road sensors. At volume sites, one 6 x 6 loop per lane or at classification sites, two 6 x 8 loops per lane with a Class II Piezo detector per lane. Control Cabinet, foundation, cabling, and service installation shall be included. (S-2i)
- Standalone radar vehicle detector location, radar vehicle detector, solar panels, battery cabinet, cabling, 30 foot aluminum street light pole, and foundation. (S-2j)
- Expressway cross connect surveillance cabinet, including a cabinet shell, foundation, telemetry card racks, mounting frame, the telemetry power supply dual line amps, S-666B8-50 terminal blocks, and A.C. duplex outlets. (S-2k)

- Wet pavement sensor, controller, cabling, firmware to interface wet pavement contact closure and NTCIP interface to ATMS at Addison and JFK. (S-2l)
- Surveillance handholes, conduit, cable and interconnect (power and communications) between cabinets in ground or attached to structure.
- Grounding Systems complete including ground rods, ground wells, and grounding cable.

- Telephone Services including leased and State owned copper cable system located in Expressway median or within the Expressway ROW
- Electric Service installations with Public Utility, including conduit (in-ground or attached to structure), cable, and pole-mounted or pedestal-mounted service disconnect cabinets, and meter sockets.
- Fiberoptic Interconnects to State owned fiberoptic Trunk and distribution systems along with fiber optic media converters.

9.1.3 SPECIFIC EQUIPMENT AT DISTRICT ONE (REMOTE FACILITY):

- 1 - 360 Cameleon Windows Client, Running Windows XP Professional Version 2002
- 2 - ATMS Lenovo E30 Think Stations with Duo Monitors (IDOT ComCenter)
- 1 - Sun Work Station (IDOT ComCenter)
- 1 - Sun Work Station (Expressway Traffic Control Supervisor Office)

9.1.4 TRAFFIC SYSTEMS CENTER, ATMS HARDWARE

Specific equipment at the Traffic Systems Center includes:

- 3 ATMS Lenovo E30 Thinkstation with duo monitors
- 3 Sun Servers (Application, Database, and Communications)
- Dan Ryan server (FEP), Dell Power Edge 2950 Xeon Processor which collects and processes NTCIP 1207 and 1209 Data Elements
- Report Server, Power Edge 600SC, Pentium 4 CPU, Windows 2000 Service Pack 4
- 2 Cisco Catalyst 3750 Ethernet Switches. The 3750 switches are covered by the Cisco SmartNet Agreement as defined in Art. 6
- 2 VMIC (FEP) Front End Processors data acquisition equipment for Ramp Metering Vehicle detector stations and other field input and outputs.

9.1.5 ATMS MAINTENANCE AND SUPPORT

ATMS is used to control ramp metering, provide travel/congestion times, manage incidents/events and manage DMS messaging and amber alerts after completion. The application was developed by Delcan Systems, Schaumburg, IL. The system details will be furnished upon request at the Pre-Bid meeting.

The routine maintenance for ATMS includes preventive maintenance, monthly health check of ATMS system, response and investigation of trouble calls/deficiencies/abnormalities; and replacement of other miscellaneous items less than $300 each in value. The routine maintenance shall also include twenty (20) hours per month, 240 hours per contract year, of approved ATMS vendor work time at the Department's discretion in addition to routine tasks as defined herein.

Routine ATMS Monthly Maintenance Shall Include:

- Responding to correct and address trouble calls and questions from the Department
- Monitor System Resources and behavior
- Check processes, CPU usage, error logs, etc.
- Review of data Acquisition Equipment
- Network integration and management
- Aid and assist the Department in user and database management such as;
  - Adding and deleting users
  - Adding system detectors, DMS, changes to travel time zones, and resetting user passwords
- Reconfiguring existing hardware
- Interface issues with 3rd party software vendors
- Provide monthly report on ATMS system health for each of the 3 main Sun servers (Application, database, and Communications). In report, provide log of error messages and actions taken to remedy those situations. Also provide recommended action to be taken by Department on pending issues, which do not need immediate action, but need to be addressed before causing system interruptions.

Any questions or issues which cannot be supported within a reasonable time frame, 4 hours or less, and > $300.00 value of miscellaneous hardware repair/replacement shall prompt the Contractor to initiate and SPT for the required work.

The Department may initiate the following projects to be covered by the 20 Routine Monthly Maintenance man hours;

1. Update Time of Day Schedules for all 118 ramp meters located in District One base on most current volume and occupancy data for the local mainline traffic detector.

2. Update Local traffic responsive parameters for 118 ramp meters located in District One.

3. Provide project specific custom annual reports and input/output detector data flow on select corridors within District One.

All used and unused hours from the Department's discretionary monthly routine maintenance man hours shall be tracked along with project status and submitted to the Engineer as required for the monthly routine work submittal book.

Software Vendor Qualifications

Minimum requirements for the entity or entities include an existing business presence within District 1, 24/7 on-call service capability, on-line monitoring and intervention capabilities, experience in programming using the existing software, qualified ongoing experience with hardware of the type installed, and qualified ongoing experience with software of the type installed. At the Pre-Construction meeting, the contractor shall submit for approval, to the engineer, a qualified vendor to perform systems support and maintenance of the ATMS. The vendor shall meet the following requirements:

1. Have experience in a data acquisition system, specifically synchronized VMIC front end processors.

2. Have experience in coordination control of three Sun Enterprise 3500 servers networked to process, control, and archive data from the data acquisition system, within and outside IDOT for traffic management control information dissemination and analytical functions; in an environment similar to that of TSC.

3. Have experience in the software environment, similar to that of TSC.

4. Have 5 continuous years of maintenance and support of similar systems in size, and scope, in the Sun Solaris environment.

The vendor shall submit, to the Engineer, resumes of the qualified personnel listed to work on the ATMS. Resumes shall list previous projects and specific duties/responsibilities the individual were responsible for as part of the project. The vendor shall list his previous projects, which involved the Sun Solaris software environment. The list shall include the projects contact person, organization, title, and current phone or e-mail information. The resumes shall be submitted at the Pre-Construction meeting.

The Contractor and his ATMS vendor, when applicable, shall provide on-call support with a two-hour response during off business hours, weekends and holidays. The Contractor shall provide the following on-call support:

1. Traffic Systems Center (TSC) personnel or the Contractor personnel shall initiate a System Problem Ticket , (SPT), for the EMCMS, whenever problems are discovered.

2. The Contractor or the ATMS vendor, if applicable, shall respond within the required response time. When applicable and approved by the Engineer, a telephone response from the vendor's technical staff may suffice to meet the response requirement.

3. If the support and resolution requires less than 4 hours of the ATMS vendor's programmer's time, he shall perform the work in a timely manner and verbally inform TSC of the required work and note the occurrence in the monthly report.

4. If the support and resolution requires more than 4 hours of the ATMS vendor's programmer's time, the Contractor shall follow and document according to the following guidelines:

   a. All actions taken by the vendor shall be documented on a general billing log, identified by the SPT

   b. SPT will include the date, time, workstation, and username at the time of the occurrence, description of the observed details, and screen print when applicable.

   c. The SPTs will be submitted to the vendor, via the Contractor, on Friday, each week, or as needed if deemed an emergency by TSC. The Contractor or vendor shall have until the following Friday to respond to the SPT, except in an emergency, in which case the 1-hour response during normal business hours and 4-hour response during off-peak, weekend, or holiday hours will hold. In cases where extensive research is needed to resolve application problems, the vendor will be allowed 4 man-hours per SPT without additional approval to research/determine the response to the Engineer.

5. The vendor response shall include a detailed description of work required to resolve the SPT or complete the improvement, and number of hours required to complete the task.

6. The Engineer will review and approve/deny/choose to negotiate the description of work and man-hours to complete. Work shall not continue without Engineer's approval.

7. The Contractor shall provide documentation, in the monthly routine work submittal book, of vendor work time, both routine and non-routine work, and a ticket summary for the month. Approved non-routine work shall be paid monthly, through an agreed price authorization, or vendor authorization, from budget allowance Pay Item SV02.

9.2 DMS SYSTEM

The DMS System consists of all devices and appurtenances which make up the DMS sign location. The DMS System is comprised of color LED, amber LED, and fiber flip disk signs located on Expressways and major arterials located within District One. The DMS System is controlled by a 360 Surveillance Cameleon system. This 360 Cameleon system should not be confused with the 360 Cameleon system used to control CCTV images as part of the District's VDS system.

9.2.1 SURVEILLANCE SYSTEM EXPRESSWAY DMS (SECTION 3, S-3)

The Contractor shall maintain all Expressway DMS equipment located at a District One Expressway DMS location. An Expressway DMS location shall consist of all equipment, which is utilized to display traveler information on an electronic display attached to a sign support structure, located on the interstate expressway system, located in District One, shall include but not limited to the following;

- Seven (7) Telespot, 18 inch, 3-line, line matrix, fiber flip disk displays (S-3a)
- Fourteen (14) Skyline, 18 inch, 2070 w/UPS backup, walk-in amber LED displays (S-3b)
- Three (3) Skyline, 2070 w/o UPS backup, walk-in amber LED displays (S-3c)
- Two (2) Skyline, 18 inch, 170 controllers w/UPS backup, walk-in amber LED displays (S-3d)
- Four (4) Skyline, 18 inch, 170 controllers w/o UPS backup, walk-in amber LED displays (S-3e)
- Thirteen (13) Daktronics, 18 inch, full matrix, front access color LED displays. (S-3f)
- Telespot 3901 and 3201 controllers, 170 controllers, 2070 Lite controllers with Skyline NTCIP 1203 V.I firmware, and Daktronics Vanguard 3000 Series controllers and Dakronics NTCIP 1203 V.2 firmware.
- Type IV control cabinets and Type D foundation, fans, heaters, and breaker assembly.
- 334 cabinets, Type 1 foundation, PDA, fans, heaters controllers, and all other appurtenances associated with 334 cabinets.
- Sign enclosures (walk-in and front access), load centers, display drivers, display modules, power supplies, heaters, photocells, fans, temperature sensors, humidity sensors, fans, interior lighting cabling (power and communications) TVSS devices.
- UPS Battery backup, 332 control cabinet, inverter, alarm status feed back, cabling, and all other appurtenances associated with UPS battery backup cabinets.

1. There is traffic control required to maintain the following DMS locations: DMS-08 - NB Ryan @ Chicago River – ramps from I-55 to Dan Ryan need to be partially closed for access to sign enclosure. Refer to Article 3.14.1 and 3.14.2 for days and hours lane closures will be allowed.
2. DMS-30 - SB Ryan @ 8^{3rd} St. – Partial ramp closure from SB 7$^{9th/}$8^{3rd} St. collector distributor for access to sign enclosure. Refer to Article 3.14.1 and 3.14.2 for days and hours lane closures will be allowed.
3. DMS-13 - SEB JFK @ Augusta – Reversible lanes or SEB Division entrance for access to sign enclosure. Refer to Article 3.14.1 and 3.14.2 for days and hours lane closures will be allowed.
4. DMS-31L and 31E – SB Ryan locals and express @ 55th St. right shoulder and/or right lane to access UPS cabinets and access to sign enclosure. Refer to Article 3.14.1 and 3.14.2 for days and hours lane closures will be allowed.

- DMS sign locations which have CCTV cameras to provide sign display status, and/or have co-located CCTV equipment which gets power and communication through the DMS location, shall be considered as part of the DMS location for payment. Routine Maintenance for the CCTV equipment shall be as described in Article 6 for Traffic Monitoring Cameras.
- Complete list of CCTV locations which are part of the DMS Sign location for payment purposes, are listed in Volume 3 for the Advance System.

- Surveillance handholes, conduit, cable and interconnect (power and communications) between cabinets in ground or attached to structure.
- Grounding Systems complete including ground rods, ground wells, and grounding cable.
- Telephone Services including leased and State owned copper cable system located in Expressway median or within the Expressway ROW
- Electric Service installations with Public Utility, including conduit (in-ground or attached to structure), cable, and pole-mounted or pedestal-mounted service disconnect cabinets, and meter sockets.
- Fiberoptic Interconnects to State owned fiberoptic Trunk and distribution systems along with fiber optic media converters.

9.2.2 SURVEILLANCE SYSTEM ARTERIAL DMS (Section 3 S-4)

The Contractor shall maintain all Arterial DMS Equipment located at a District One Arterial DMS location. An Arterial DMS location shall consist of all equipment which is utilized to display traveler information on an electronic display, attached to a sign support structure located on an arterial roadway, located within District One and shall include but not be limited to;

- Five (5) Adaptive Micro Systems (AMS), 8 inch, full matrix, front access amber LED displays. (S-4a)
- Three (3) AMS, 10 inch, full matrix, front access amber LED displays. (S-4b)
- Seven (7) AMS, 12 inch, full matrix, front access amber LED displays. (S-4c)
- Front access sign enclosures with IDI 1300 series controllers, firmware, display drivers, display modules, fans, heaters, power supplies, temperature sensors, humidity sensors, photocells, TVSS devices, interior lighting cabling (power and communications) and all other appurtenances associated with the sign enclosure.
- Type III cabinets, Type D foundation, fans, heaters, door switches, and breaker sub assemblies.
- Surveillance handholes, conduit, cable and interconnect (power and communications) between cabinets in ground or attached to structure.
- Grounding Systems complete including ground rods, ground wells, and grounding cable.
- Telephone Services including leased and State owned copper cable system located in Expressway median or within the Expressway ROW
- Electric Service installations with Public Utility, including conduit (in-ground or attached to structure), cable, and pole-mounted or pedestal-mounted service disconnect cabinets, and meter sockets.
- Fiberoptic Interconnects to State owned fiberoptic Trunk and distribution systems along with fiber optic media converters.
- Wireless broadband communications including antennas, radios, cabling and support structures.

- DMS queue detector system solar panels, 45’ pole, foundation, control cabinet, wireless contact closure radio, and yogi antenna to provide contact closure for traffic

queue to activate a warning message on DMS located at 78th Pl. and Grand Ave. S22050 in Elmwood Park. Queue detection system shall be included in routine maintenance of Grand Ave. DMS.

9.2.3 DMS SYSTEM HARDWARE AND SOFTWARE TO BE MAINTAINED, LOCATED AT THE TRAFFIC SYSTEMS CENTER

- One (1) Telespot 3 line reflective flip disk, line matrix display located in TSC Control Room
- Two (2) 360 Surveillance Cameleon Dell Precision RS400 servers, running Windows XP Professional Version 2002, located in TSC Computer Room.
- Two (2) Windows Clents, Running Windows XP Professional Version 2002 Service Pack 3, Pentium 4 CPU located in TSC Control Room.
- Four (4) Edge port/416 Serial expansion modules located in TSC Computer Room
- Two (2) Telenetics modem racks with power supplies located in TSC Computer Room
- Twenty (20) rack mount Telenetics DSP 9612 modems or equivalent located in TSC Computer Room
- Eight (8) Department DMS lap top computers Panasonic CF31 Tough Books, including Windows 7 operating system, DMS Vendor software, and virus protection software. Contractor shall renew the virus protection software annually
- The Contractor shall renew the current Premium Software Assurance Agreement (PSAA) with 360 Surveillance for the DMS Central Control System servers and clients located at TSC, District One Communications Center, and District 2 Radio Communications Center. The agreement shall be renewed annually as the EMC Contract options are renewed. The PSAA shall provide coverage for the following:

  - Support coverage Monday to Friday 8:00am to 5:00pm (PST) excluding major holidays
  - Unlimited telephone, email and online technical support
  - Logon web access to online knowledge base and FAQ's
  - Free access to all interim and major releases, patches and device drivers within the product category
  - Access to dedicated technical support developers
  - Priority response and resolution of issues
  - Remote configuration and troubleshooting assistance via internet

Current PSAA is set to expire Feb. 23rd, 2013. PSAA shall be included in Routine Maintenance of DMS Sign system.

- The Contractor shall renew the current Skyline NTCIP Central Control Software, Annual Maintenance License, which covers the software used to maintain and operate Skyline DMS Sign within District One. The Skyline NTCIP Central Control Software shall include the following:
  - Telephone Assistance and/or via email, Monday through Friday, 8am to 5 pm MTN time

- Software upgrades, updates, and new releases or versions of software at such time as Skyline makes update available.

The Skyline NTCIP Central Control Software Annual Maintenance License shall be included in the Routine Maintenance of the DMS Sign System. The Contractor shall renew the annual license coverage as the EMC Contract yearly options are renewed.

The current Skyline NTCIP Central Software Annual Maintenance license is due to expire in Feb. 2013.

9.3 SURVEILLANCE PATROLS

9.3.1 SEMI-MONTHLY RAMP METERING CABINET INSPECTION

The Surveillance/DMS patrolmen shall perform a patrol inspection of each Surveillance System Ramp Metering Cabinet location twice per month and provide the following information on Log form S-10:

- Database Location Number
- Expressway Name
- Arrival Time
- Cabinet Number
- Com Ed meter # (if applicable)
- Com Ed Transformer # (if applicable)
- Designate Inbound or Outbound
- Inspect Loop Detectors
- Check 2070 lite controller for proper operation (if applicable)
- Check tones for proper operation (if applicable)
- Verify functioning of bulbs, LED's, signal load relays, and flashing beacon controllers
- Telephone TSC for Location Turn-On
- Verify aim of beacon and signal head.
- Beacon head shall face the top of the ramp, the right hand signal facing the metering input loop (Loop 1), and the left hand signal shall face the top of leading edge of the demand loop (Loop 2).

- Replace burnt-out lamps, LED heads, and damaged lenses.
- Inspect cabinet PDA for proper operation (if applicable)
- Check for missing, damaged or loose signs.
- Check cabinet and signal foundation and tighten where necessary.
- Check lubrication of cabinet doors, hinges, and locks.
- Check tuning and operation of loop detectors and/or detector input files.
- Inspect stop bar striping for deficiencies.
- Log follow-up activity needed and telephone the EMC Dispatch Center for ticket number.

  Before leaving the surveillance installation, the patrolman shall verify the accuracy of the data with TSC. The patrolman shall not leave the location until the Traffic Systems Center's personnel have checked on the accuracy of the data being received at the TSC office.
- Record Departure Time

The EMC Dispatch Center shall be notified to create a ticket noting problems found and/or repairs made.

Log form S-10 shall be delivered to the Surveillance Engineer as part of the monthly Routine Maintenance Workbook on CD or other approved media.

9.3.2 MONTHLY RAMP METERING CLEANING

The Contractor shall wash the ramp control signal head lenses and reflectors, flashing beacons, and signs associated with each ramp metering installation, and clean the inside and outside of the cabinets once per month. The cleaning materials and procedures shall be approved by the Surveillance Engineer prior to starting the work.

Ramp metering cleaning shall be performed during non-peak congestion hours when ramp metering is not in operation controlling traffic. All work shall be noted on the Daily Agenda. The EMC Dispatch Center shall be notified to create a ticket if problems are found.

Contractor shall submit monthly Ramp Meter Cleaning Logs to the Surveillance Engineer as part of the Monthly Routine Maintenance Workbook on CD or other approved media.

9.3.3 QUARTERLY REMOTE DATA COLLECTION, STANDALONE STATION INSPECTIONS

The Surveillance/DMS patrolmen shall perform a quarterly patrol inspection of these standalone data collections sites located within District One. There are 3 sites and all are in the S23000 location series of EMCMS location numbers for reference. The patrolmen shall check the alignment of the detector, measure battery voltages, check battery cabinet and that solar panels are tight to the pole, and if the location reports to another remote site/flasher, ensure proper operation of beacons. The Surveillance/DMS patrolmen shall also collect the bin data volume and occupancy and submit the data to the Engineer. The Department uses this data for future projects, ADTs, and for lane closure restrictions. Data shall be submitted to the Engineer; March, June, Sept., and Dec. on CD or approved media with the Monthly Routine Maintenance Workbook.

9.3.4 YEARLY SURVEILLANCE CABINET INSPECTION AND CLEANING

The Surveillance/DMS patrolmen shall perform an inspection of each surveillance expressway detector cabinet once per calendar year, and record on Log form S-11. Information to be collected or activity required includes:

- Database Location Number
- Expressway Name
- Arrival Time
- Cabinet Number
- Designate Inbound or Outbound
- Inspect Induction Loops
- Inspect electric service disconnect. Note any deficiencies in an advisory report to the TSC Manager.
- Check Tones for proper operation
- Check 2070 lite controllers for proper operation (if applicable)
- Check Cabinet Foundation, tighten where necessary
- Check lubrication of cabinet doors, hinges, and locks
- Clean cabinet inside and out
- Inspect cabinet PDA for proper operation (if applicable)

- Check and record voltage levels for solar powered locations on the load side of the solar regulator, battery side, and solar panel side. Take necessary action to correct any issues found.
- Inspect solar panel attachment to aluminum pole. If any issues, take necessary action to make location safe.
- Check radar, microloop, and bluetooth detector operation (if applicable).
- Check tuning and operation of loop detectors or detector input files
- Log follow-up activity needed and radio the EMC Dispatch Center to create ticket
- Record/edit cabinet inventories
- Before leaving Surveillance location, patrolman shall call TSC and ask that the accuracy of data be checked. The patrolman shall not leave until the Traffic Systems Center personnel have check on the accuracy of the data being received at the Traffic Systems Center.
- Record departure time

The EMC Dispatch Center shall be notified to create a ticket noting problems found and/or repairs made.

Log form S-11 shall be delivered to the Surveillance Engineer as part of the Monthly Routine Maintenance Workbook, on CD or other approved media.

All Surveillance System cabinets are also to be cleaned once per year. The cleaning materials and procedures shall be approved by the Surveillance Engineer prior to starting the work. All work shall be noted on the Daily Agenda.

9.4 DMS PATROL REQUIREMENTS

The Contractor shall perform a weekly visual inspection of each Dynamic Message Sign to ensure that each installation and component are functioning correctly. The Contractor shall perform a monthly night patrol of each DMS to ensure proper sign illumination. The contractor shall perform a monthly CMS enclosure cabinet inspection and wash/enclosure cleaning. Once per calendar year, the Contractor shall perform a DMS sign structure inspection. All patrols and inspections shall be as described herein or as directed by the Engineer. All patrols and inspections shall be reported on the daily agenda and submitted to the Engineer as part of the Monthly Routine Maintenance Workbook.

9.4.1 DMS WEEKLY PATROL REQUIREMENTS

The Surveillance/DMS Patrolmen shall perform a weekly inspection of each Dynamic Message Sign location to assure that each installation and its components are functioning properly. Unless otherwise permitted or requested by the Engineer, except for emergencies, the Contractor is required to schedule the IDOT surveillance patrol routes the first portion of each workday and on the approved route day.

Emergency services required by IDOT or other agencies shall be attended to immediately, however, any incomplete daily patrol shall be completed (by the original patrolman or by an approved substitute) during the normal patrol work week. This may require patrols after the normal work day has ended in order to complete the normal patrol work week.

The Surveillance Engineer shall be notified via e-mail on a daily basis at the end of the patrol work day if the following occurs:

- List of all incomplete patrols for the day
- Specific reason for each individual incomplete patrols
- Plan as to how Contractor will make-up each incomplete patrols

All repairs not completed at the time of the patrol route inspection must be logged and turned over to Contractor's Surveillance System Manager. All Patrol records shall be maintained and submitted to the Engineer on a monthly basis.

9.4.2 DMS NIGHT PATROL

The Surv.DMS Patrolman shall perform a monthly Night Ride Inspection for each DMS sign location to ensure the sign display is properly illuminated. Provide immediate corrective action as required to restore the proper illumination to the DMS. Night Patrol Logs shall be submitted to the Engineer monthly.

9.4.3 MONTHLY DMS CABINET INSPECTION AND CLEANING

The Surveillance/DMS Patrolmen shall inspect, check and service all parts of the DMS cabinet monthly. Information to be collected includes:

- Database location number
- Expressway name
- Arrival/departure time
- Cabinet number
- ComEd meter number
- ComEd transformer number
- Verify photocells operation
- Verify functioning of fans/heaters; replace or repair
- Check cabinet and meter foundation and tighten

- Check filters; replace as needed
- Inspect/test battery back up units (BBU's) where applicable
- Inspect/test PDA's where necessary
- Check operation of DMS Controller for proper operation. Verify proper operation in remote and local modes. Verify proper firmware is loaded and proper sign configurations are loaded. If necessary, load correct firmware and configuration and check with TSC that DMS is properly operating
- Inspect communications and power cables incoming and outgoing.
- Verify with Control Room Operator at TSC, message correctness and lamp or LED intensities on DMS sign. Replace lamps (as a group, not individually) or LED panels as needed.
- Check voltage levels of power supplies and battery and adjust where needed.
- Check blank-out functions, power failure, and communications failures.
- Check levels on transmit and receive pair in cabinet.
- Check meter housing making sure it is seated properly, and weather-tight. If any problems, coordinate with utility company.
- Check ribbon cables in sign enclosure for worn spots or breaks in the cable/insulation. Verify seating of components and connections. The DMS M.O.S.Y.S. sign are subject to vibrations which cause loose connections and ribbon cable which rest on metal surfaces to become worn and become shorted over a period of time. The contractor shall take immediate corrective action to correct these problems when discovered.
- Trim trees and bushes blocking the line of sight of the DMS display to the motorists. All trimmed branches shall be legally disposed of by the Contractor off the Right-of-Way.

All repairs requiring follow-up should be radioed to the EMC Dispatch Center and a Ticket created. Log form D-1 shall be completed and submitted to the Surveillance Engineer as part of the Monthly Routine Maintenance Workbook on CD or other approved media. All work activity shall be reported on the Daily Agenda.

The Contractor shall also clean the DMS cabinets, inside and out, once per month, in off-peak rush periods between 9:30 am and 2:00 PM Monday through Friday. The cleaning materials and procedures shall be

approved by the TSC Manager prior to starting the work. All work activity shall be reported on the Daily Agenda**.**

9.4.4 DMS CCTV MAINTENANCE

Refer to Art. 6, "Traffic Monitoring Cameras for Routine Maintenance Requirements".

9.4.5 MONTHLY DMS SIGN ENCLOSURE CLEANING

The Contractor shall hand wash and clean each DMS sign enclosure, inside and/or outside, on a monthly basis, or less frequently as determined by the Engineer, to ensure proper sign functioning. The Surveillance Engineer shall approve the cleaning agent and cleaning materials prior to the first cleaning, and shall provide the Contractor with a procedure instruction sheet. All work activity shall be reported on the Daily Agenda.

9.4.6 YEARLY SIGN SUPPORT INSPECTION

Each July the Contractor shall visually inspect for general safety the condition of each DMS sign support structure and catwalk, including the sign support brackets/bolts which attach the DMS sign box to the sign structure. All work activity shall be reported on the Daily Agenda. The Contractor shall submit the Yearly Sign Support Inspection to the Surveillance Engineer as part of July's Monthly Routine Maintenance Workbook, on CD or other approved media.

9.5 GENERAL MAINTENANCE RESPONSIBILITIES

Cable Locates

The surveillance/dms patrolmen or specialist shall normally perform all cable locates for the surveillance and dms systems in accordance with art. 4.6.

Keys and Locks

The Contractor shall furnish and install new locks (approx. 350) on Surveillance System and DMS System equipment as directed by the Engineer. As new equipment comes on maintenance, new locks shall be installed at these locations. Locks are typically installed on the DMS signs, service entrances, 334 cabinet and surveillance cabinets which have CCTV equipment installed inside. Refer also to Article 3.3.5.

In-operable induction loop, microloop, or microwave detector procedures

If an inoperable induction loop, micro-loop, or microwave detector is found on patrol (or discovered via dispatched incident), the surveillance/DMS patrolman shall retune the detector or immediately replace the loop detector with a spare detector from the emc spare parts inventory or idot state stock. If it is found that the loop detectors (original and spares) are still inoperable, the contractor shall immediately start an analysis of the induction loop wire and lead-in and report findings to the idot surveillance engineer. All information shall be recorded on a ticket.

Surveillance/DMS Inventory

Contractor shall create an Access database for all Surveillance/DMS field installations and keep current. Current Surveillance database is a Word Perfect document converted into Microsoft Word. Database shall be broken out by freeway and shall incorporate cab. #, EMCMS location #, cabinet type, service address, Service type, phone circuit ID, copper cable pair, fiberoptic cable assignment, GPS coordinates list out equipment, such as signal heads, flashers, controllers, FSK telemetry by type and function and match the field hardware to the in-house equipment for that location. Delcan currently has an Excel spreadsheet which documents in-house equipment by freeway and cabinet location at TSC. The end product shall link these two documents into one database. The Contractor shall maintain current inventory and record and incorporate any missing equipment or locations in the inventory on the Access database, formatted as agreed to by the Engineer.

Analysis of Induction Loop Wire and Lead-in

Before each analysis the patrolmen shall calibrate and date the megger and loop tester and then follow these instructions for the induction loop wire and lead-in;

- Measure a minimum of 100 megohms (above ground under any weather or moisture conditions) when tested with a major megger.
- Have a resistance not greater than five (5) ohms when measured with a loop tester in a continuity test.
- Have an inductance between 50 and 1000 microhenries when tested with the loop tester.

No installation shall be left inoperable because a detector has been removed. The Traffic Systems Center's original detector shall be repaired (or replaced with new) and returned to the original installation within 10 working days.

Both the IDOT original equipment number and the EMC spare part equipment number shall be recorded on the ticket, as well as the other pertinent information concerning the replacement of an inoperable loop detector.

The ticket shall not be cleared until original equipment has been re-installed.

Induction Loop

Following the analysis of the induction loop by the Specialist and/or TSC inspectors, and it is ascertained by Surveillance Engineer that damage was not due to State personnel, the Contractor shall replace the loop under routine maintenance.

Analysis of Microloop Sensors

Before each analysis the patrolman shall calibrate and date the megger, loop tester and volt/ohm meter, then follow these instructions for the micro-loop, micro-loop lead-in and micro-loop homerun cable:

- The micro-loop probe inductance shall be between 50 µH and 80 µH
- The inductance of lead-in cable shall be 16.5 µH per 100 feet
- The inductance of the homerun cable shall be 23 µH per 100 feet
- The total inductance shall be the sum of probe, lead-in and homerun cable calculated ± 20 percent
- The measured DC resistance shall be the sum of the probe, lead-in and homerun cable calculated ± 20 percent
- Probe resistance shall be 1.5 ohms
- Lead-in cable resistance 3.0 ohms per 100 feet
- Homerun cable resistance shall be 2.0 ohms per 100 feet.
- The patrolman can use a properly calibrated functioning matched vehicle detector to measure the change in inductance of the sensor when a standard mid-size vehicle is driven directly over the sensor
- The measured change in inductance for a standard mid-size vehicle shall be in the range from 120 Nh to 1200 Nh.
- If it is found a microloop is inoperable, a repair ticket shall be started and all pertinent information for the replacement shall be logged and used for ordering a replacement sensor.

Analysis of Microwave Vehicle Detector

The microwave vehicle detector shall be remotely interrogated from the detector cabinet with a laptop PC loaded with the latest version of the detector's manufacturer's software available and/or a test cable used locally at the detector.

- The Contractor shall verify if it's the detector or communications cable which has failed.
- Each detector shall have a RS 232 serial port available to use the diagnostic program to talk to the detector.
- If it is found that the detector needs to be replaced, a spare state stock detector shall be used to replace the defective unit until the defective unit can be repaired or replaced.

- If it is found the communication cable is defective, a new cable shall be installed immediately to restore the operations of the detector site.

- A work ticket shall be started and the original equipment shall be repaired and returned to the original locations within 10 working days. Both the original IDOT equipment number and EMC spare part equipment number shall be recorded on the ticket along with all other pertinent information.

- The ticket shall be cleared when the original equipment has been reinstalled.

Analysis of Bluetooth Vehicle Detector

Contractor shall follow the following trouble shooting steps as per manufacturer of each Bluetooth Vehicle Detector that are deployed in the surveillance system to determine whether detector could be reset or another detector deployed to correct issues.

In most cases the Corrective action is to perform a master reset.

Traffic Cast Blue Toad Bluetooth Vehicle Detector:

1. Check LED status – especially the S4, G1, and G2
2. S4 will indicate if the unit is communicating properly to the network
3. G1 and G2 will indicate if the GSM modem is functioning properly
4. Check Battery Voltage
5. Check Charge Controller
6. Confirm charging LED is on.
7. Confirm Low Voltage Disconnect LED is not on.
8. Confirm all cables and connectors are properly connected.
9. After completing steps 1-4, disconnect the main power jumper.
10. Let the capacitors completely drain.
    - This will take about 2 minutes.
    - When all the LEDs are off-the capacitors will have completely drained.
11. Press the master reset button.
12. Observe the LEDs to insure a proper installation.

Traffax Bluetooth Vehicle Detector:

Symptom Issue	Resolution Steps
Power LED does not illuminate This signifies that the sensor is not receiving power	1. Verify that the battery is charged. 2. Check all power connections. 3. Check the fuses on the cable and the charge controller, replacing them if necessary. 4. Verify that none of the power wires are damaged or frayed.
SD LED is red This signifies that the sensor cannot record data to the SD card.	1. Check that there is a MicroSD chip properly inserted in the sensor. 2. Cycle power. If this situation persists, reformat the chip (use FAT 16 and full format, not quick format). 3. If this situation persists, contact Traffax customer support.
GPS LED is red This either signifies that the computer cannot communicate with the GPS module, or that no satellites could be located within 10 minutes of scanning.	1. Move the sensor to an open area with no obstructions such as trees or bridges. 2. Cycle power to the BluFax unit. 3. If GPS LED is green, closure and secure BluFax unit. It is operating properly. IT IS GOOD PRACTICE TO INITIALIZE PORTABLE UNITS IN OPEN AREAS AND THEN MOVE AND SECURE THEM AFTER GPS LOCK IS OBTAINED. 4. If GPS LED is red, data can still be collected, but a local time reference is needed for processing. Carefully record the time when the unit is powered on. If this situation persists, please contact Traffax. 5. At shut-down it is good practice to note the exact time and disconnect the Bluetooth radio right before power off. This sends FFFFFF into the data file.
Bluetooth LED is red	1. Check every USB connection between the computer and the Bluetooth module.

This signifies that the computer cannot communicate with the Bluetooth module.	2. If the error persists, contact Traffax customer support.

If following these steps does not correct the problems, return unit to manufacturer for repair or replacement.

- Count Station/Expressway I/O Validation

  The Contractor shall perform manual traffic counts at 5 percent of the Surveillance count Stations in District One or as directed by the Engineer per contract year. The Contractor shall manually count each lane of the count station for a pre-determined one hour duration. The start and end times shall be coordinated with TSC staff. TSC staff shall synchronize the the Contractor start and end times based on the ATMS clock used to start and end the hourly data collection sequence. These hourly counts will be used to validate the calculated ATMS volumes collected along the corridor.

  TSC staff will analyze the collected data, compare to the calculated ATMS data and issue work tickets where there are discrepancies in the I/O for upstream and down stream detector data.

- Surveillance Conduit and Cable

  Cable which is damaged shall be removed from the job and new cable installed to replace the existing. The damaged cable shall be replaced to the nearest upstream and downstream cabinet or junction box from which it originates or terminates in. No cable splices will be allowed below ground except for induction loop lead in cable. If an induction loop lead-in cable is damaged it shall be replaced back to the loop dive hole or closest handhole to the loop dive and a new lead-in cable shall be spliced there.

- Damage to Unit Duct (Polyethylene Conduit)

  If unit duct is damaged but cable inside is not damaged, then the Contractor shall make the following repairs:

  A. Install a split corrugated slip duct over the damaged section

  B. Install a wrap around heat shrink tube over the damaged section overlapping each end by three inches minimum to make a water-tight installation

If unit duct is damaged and cable is also damaged, then the Contractor shall make the following repairs:

A. Remove cable and damaged section of conduit

B. Replace damaged unit duct with compression couplers (E Loc Coupler) and new unit duct

C. Install heat shrink over entire repaired area, overlapping repair on each end by three inches minimum to make a water-tight repair

Refer to Article 4.0 for other General Maintenance responsibilities.

9.6 RESPONSE AND REPAIR TIME REQUIREMENTS

Article 4.0 discusses general response requirements of routine maintenance. The following chart lists the maximum response, service restoration, and permanent repair time the Contractor will be allowed to perform corrective action on specific surveillance system equipment before liquidated damages are assessed. (For response and repair time documentation requirements (tickets) review Article 4.0).

Incident or Problem	Response Time	Service Restoration Time	Permanent Repair Time
Ramp Metering Malfunction or Damage	1 hour	4 hours *	10 days
Cabinet Motorist Caused Damage	1 hour	48 hours	**
DMS Malfunction or Damage	1 hour	8 hours	10 days
Inoperable Loop Detector Unit	1 hour	4 hours	4 hours
Repair/Replace Induction Loop (Non-Metering Location)	1 hour	48 hours	14 days
Malfunctioning Telemetry (Power Supply, Transmitter, or Receiver)	1 hour	4 hours	4 hours
Repair/Replace 2070 Lite Controller DMS/Ramp Meter/Detector Cabinet	1 hour	4 hours	24 hours
Cable Repairs (Temp Cable	1 hour	24 hours	21 days

Needed)			
Inoperable Microloop	1 hour	4 hours	14 days
Inoperable Microwave Vehicle Detector	1 hour	4 hours	14 days
Conduit Repairs	1 hour	24 hours	21 days
Inoperable bluetooth vehicle detector	1 hour	24 hours	10 days
Repair/replace induction loop lead-in cable	1 hour	24 hours	14 days

*In case of ramp metering cabinet knockdowns, service restoration of all component parts affecting the ramp metering operation shall be completed within four (4) hours or by the next ramp metering control period, whichever is first.

** Dependent upon availability of new control cabinet

9.7 DAILY TICKET REVIEW

The Surveillance/DMS Manager shall review all tickets every work day, edit and/or correct responses, and discuss work activities with the IDOT Surveillance Engineer, prior to the issuance of the Surveillance/DMS Daily Agenda by 8:30 each work day. (Review also Daily Agenda requirements in Article 4.0).

9.8 SURVEILLANCE AND DMS STATE STOCK INVENTORY REQUIREMENTS

The Department maintains a small supply of spare parts to meet the response and maintenance requirements described herein. Some of these parts are specialized or have long lead-times so the Department has procured these parts and makes them available to the Contractor for use in the routine maintenance. The Contractor shall repair or replenish (replace) state stock components which were removed and installed to correct an operational issue. The cost to document, repair, replace, labor, transportation, removal, installation, shipping, mailing, etc., shall be included in routine maintenance of the Surveillance/DMS system. Contractor shall update and maintain an excel spreadsheet documenting the inventory of spare parts, location, manufacture, serial numbers, and quantities on hand, and which parts are in for repair, on a monthly basis to the Engineer. Contractor shall submit the Surveillance/DMS Spare Inventory report as part of the Monthly Routine Maintenance Workbook on CD or other approved media. Included here is a list of Department owned spare parts available for use:

EQUIPMENT	TYPE	AMOUNT
CABINETS	TYPE 4	2
CABINETS	TYPE 3	8
CABINETS	TYPE 2	3
DETECTOR	4CH	48
DETECTOR	2CH	28
DETECTOR	1CH	13
POWER SUPPLY	SURV.	31
TRANSMITTER	SURV.	65
RECEIVERS	SURV.	250
MINI TRANSMITTERS	SURV.	50
POWER SUPPLY	SKYLINE DMS (2070)	8
DISPLAY BOARDS	SKYLINE DMS (2070)	25
CONTROLLER	SKYLINE DMS (2070)	4
CONTROLLER	SKYLINE DMS (170)	5
COMM.BOARD	SKYLINE DMS (2070)	3
POWER SUPPLY	Skyline (170)	4
DUAL TRANS.	SKYLINE	2
GROUND CAB. COMM	SKYLINE	2
COMM SURG BOARD	SKYLINE	2
VOLTAGE MONITOR	SKYLINE	2
170 DISPLAY MODULE	SKYLINE	5

170 DAUTHER BOARD	SKYLINE	2
2070 ENVIRONMENT BR	SKYLINE	4
2070 LINE DRIVER	SKYLINE	7
PCBA sign face driver	SKYLINE	3
Safetran 332 drawer assembly	SKYLINE	1
AC surge	SKYLINE	2
5 volt power supply	SKYLINE	4
470 IB module	safetran	1
2070 IB module	Econolite	1
LED DISPLAY MODULES	DAKTRONICS	14
CONTROLLER	DAKTRONICS	2
POWER SUPPLY/BRACKETS	DAKTRONICS	2
POWER SUPPLY	DAKTRONICS	1
2070 ATC	Econolite	7
MODEMS (shelf mount)	telenetics	4
MODEMS (rack mount)	telenetics	8
MODEMS (shelf mount)	telenetics	3
POWER SUPPLY	ADAPTIVE	6

DIODE MODULE	ADAPTIVE	2
SURGE ARR	ADAPTIVE	2
RELAY	ADAPTIVE	4
SURGE ARR	ADAPTIVE	2
HUMIDITY SENSOR	ADAPTIVE	2
FAN	ADAPTIVE	6
HEATER	ADAPTIVE	2
LIGHHT SENSOR	ADAPTIVE	5
FAN MONITORING ASY	ADAPTIVE	2
FAN MONITORING PCB ASY	ADAPTIVE	4
CONTROLLER	ADAPTIVE	4
LED DISPLAY 10"	ADAPTIVE	12
LED DISPLAY 12" (15deg)	ADAPTIVE	1
LED DISPLAY 8"	ADAPTIVE	10
LED DISPLAY 12" (30deg)	ADAPTIVE	7
3201 CONTROLLER	TELESPOT	8
KEY PAD	TELESPOT	5
RS 232	TELESPOT	10
3202D	TELESPOT	5
POWER SUPPLY	TELESPOT	4
COLUMN BOARD	TELESPOT	25
ROW BOARD	TELESPOT	21
LCPM	TELESPOT	16

LCSM	TELESPOT	2
DISTRUBITION BOARD	TELESPOT	3
GP I/O	TELESPOT	13
202 MODEM	TELESPOT	8
3901 CONTROLLER	TELESPOT	14
LCMM	TELESPOT	12
PHOTO CELL	TELESPOT	2
LCMM COMBO	TELESPOT	6
334 cabinet (I-80)	Brown Traffic	1
ELECTRIC SERVICE DISCONNECTS POLE MOUNT	EXCEL	12

The Department suggests the Contractor have on hand a minimum quantity of equipment at the start of the contract. Refer to Article 4.15 – "Contractor Spare Parts Inventory Responsibilities for Contract Requirements".

Surveillance/DMS Suggested Starting Quantities:

5 Traffic signal bases

10 Traffic Signal Posts of various sizes

20 8" Signal Heads sections

10 8" LED Signal Heads Sections

3 Flasher wood posts (6" x 6"x10')

9.9 YEARLY GROUNDING AND ELECTRIC SERVICE UPGRADE

As part of routine maintenance of the Surveillance System, the Contractor shall perform electric service and grounding modifications to a total of Seven (7) locations 2013, seven (7) locations 2014, eight (8)

locations 2015 Surveillance System and Dynamic Message System cabinets as described herein. Note that the service entrance disconnect is the type used for the Surveillance System, and the distribution extends through one or more surveillance cabinets to complete grounding to all downstream equipment. All grounding upgrade work shall be complete by October 31st each Contract year. The Contractor shall include a progress report in the monthly routine work submittal book.

The Contractor is responsible for scheduling the work and for coordinating with the engineer whenever Engineer-witness functions are required. The Contractor shall also advise the engineer when each location is complete and shall provide a written certification to that effect. The Engineer reserves the right to require a final inspection of the modification at any or all of the locations certified as complete. Should deficiencies be found upon inspection, a corrective work list will be prepared. If progress of the work is inadequate, or if errors in certified complete work are repeatedly found, the Engineer may initiate withholding of routine maintenance payment.

The surveillance installations being modified shall be kept operational at all times except as expressly allowed herein or otherwise permitted by the Engineer. The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost. All cable, conduit, fittings and accessories shall be new. All materials and work shall be in conformance with the requirements of applicable Contract Special Provisions and specifications and article 250 of the National Electrical Code.

The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for reporting any account modifications arising from the work to the Engineer in a timely manner. Although it is anticipated that all service agreements and accounts will remain as-is, if new agreements are required, the Contractor shall facilitate coordination between the Electric Utility and the Engineer, with the Department to sign any appropriate new agreements.

The work will generally include:

- Replacement of the electric service entrance equipment and cables
- New grounding of the service
- New feeder conductors from the service disconnect to the controller cabinet
- Cabinet grounding modifications
- Supplementary ground electrodes at handholes
- Extension of equipment ground wires to all poles, posts, handholes, etc.
- Bonding of equipment ground to all exposed metal parts
- Testing and documentation

Replace Electric Service Entrance

The work shall include the removal of the existing service disconnecting means and the service conductors and shall include the furnishing and installing a new pole-mounted or pedestal-mounted service disconnecting means and new service conductors, based on the manner of the existing service. The new electric service disconnect, cables and the service connection shall be in accordance with details included herein. Unless otherwise indicated, the pole-mounted electric service box provided for these installations shall be as shown in Figure L-3A, in Section 1, Article 7.0, unless specified otherwise by the Engineer.

Provide New System Ground of Electric Service

The work shall include the installation of a new system ground, connected to the ground bar of the service disconnect, using one or more ground rod grounding electrodes, or other means approved by the Engineer. The system ground shall have a resistance to earth not to exceed 10 ohms without connection to the additional electrodes established at poles or other points at the surveillance/DMS location. The system ground resistance shall be verified by a contractor test, using the fall-of potential method and witnessed and approved by the engineer, with a record of the test entered by the Contractor and signed by the Contractor and the Engineer. Should more than one electrode be required to establish a low enough resistance, additional electrodes shall be connected to the grid, with re-testing. All ground electrode connections shall be exothermically welded. Ground rods and grounding electrode conductors shall be as specified and detailed.

The service grounded circuit conductor (which may or may not be a system neutral) shall be bonded to the system ground at the service disconnect and shall be isolated from ground throughout the remainder of the electrical distribution.

Extend New Conductors to Controller

A new ground terminal bar shall be installed at the surveillance cabinet and this bar shall be bonded to the cabinet enclosure. The work shall include the replacement of the existing feeder and the extension of new feeder conductors from the service disconnect to the surveillance cabinet. The cable will be a multi-conductor jacketed cable as specified and it shall include a green-insulated ground wire to bond the service ground bar to the controller cabinet ground bar. The Contractor shall confirm the integrity of the existing feeder conduit run, and shall clean the run before installing the new feeder. If the size of the conduit is demonstrated to be inadequate for the new feeder cable or if it is demonstrated as not re-usable for some other reason and no other alternative is feasible, the contractor shall use a new feeder conduit run, as part

of this routine maintenance work, with all cable work remaining as the Contractor's responsibility at no additional cost.

Cabinet Grounding Modifications

The Contractor shall confirm the presence of a terminal bar, with suitable terminals, for the grounded circuit conductor (white wire) at the controller cabinet and shall assure isolation of this bar from the cabinet enclosure and other grounded parts. If the existing bar is inadequate or is not isolated properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items. Similarly, the contractor shall confirm the presence of a ground bar, with suitable terminals, which is bonded to the cabinet enclosure and grounded metal parts. If the existing ground bar is inadequate or is not bonded properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items.

Extension of Equipment Ground

The contractor shall extend an equipment ground conductor from the ground bar in the controller cabinet to distributed elements of the system, bonding the equipment ground conductor to all handhole frames, metal poles and other enclosures, metal conduit, etc., including any existing supplemental ground rods that may be in place. The Contractor shall assure that good equipment ground continuity and a low-impedance ground return path is established throughout for all exposed metal parts of the installation.

It is not the intent of this work item to require re-cabling of the surveillance load equipment to achieve grounding. In all cases, a green-insulated ground conductor shall be used whenever possible, and only if conduit space will not accommodate an insulated conductor will a bare conductor be allowed. A common conductor may be employed for multiple load circuit cables in a given conduit, but an equipment ground conductor shall be run with or shall encircle each set of circuit conductors extended from the controller cabinet.

Recognizing the intent to leave existing conductors in place and operations, the contractor may choose from among identified and prioritized acceptable alternative to affect the grounding modifications:

If an existing conduit will accommodate the installation of a ground wire, the ground wire shall be installed within the conduit with the circuit conductors. Existing conductors should only be withdrawn from a conduit run to facilitate pulling of the ground wire if absolutely necessary.

If an existing metal conduit will not accommodate the required ground wire, and if the Contractor can identify end-to-end electrical continuity of the conduit, the Contractor may bond to the conduit externally in an approved manner to establish ground continuity, thus using the metal conduit as the equipment ground conductor.

If a given conduit run is demonstrated to be damaged and electrically discontinuous in the presence of the Engineer, and if no other alternative is feasible, the Engineer will authorize a new conduit run, to be paid under separate pay time, with all cable installation to remain part of the grounding modification work at no additional cost to the pay item. When a new conduit is installed, an insulated ground conductor must be installed within, together with the circuit conductors, regardless of the ground continuity of the new conduit, and the new conduit shall be appropriately bonded to the equipment ground.

Bonding

The Contractor shall establish equipment ground bonding to the cover frame of every handhole with an approved connection. The contractor shall establish equipment ground bonding at every metal pole, post or other enclosure or device, also with an approved connection. At poles or post bases, it may be possible to install washers, lugs, and extra nuts where extra anchor bolt protrusion allows it. Otherwise, poles may be drilled and tapped and fitted with appropriate ground lugs. Connections at poles and other enclosures shall be pigtailed from splices whenever more than one ground conductor is connected so that ground continuity is not dependent upon ground lug connection. Splices of ground conductors (in lieu of exothermic weld connectors) will be permitted at poles and other such connection point above grade, with splices to be made using suitable copper crimp sleeves and heat-shrink insulated caps as specified.

Testing and Documentation

As noted above, the system ground resistance to earth shall be tested, in isolation from equipment ground extensions from that point. Testing shall be performed by the contractor using the fall-of-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the farthest point of each circuit extension from the controller cabinet. Results shall be recorded by the contractor and witnessed by the Engineer.

Surveillance/DMS Locations for Yearly Grounding and Electric Service Upgrade

YEAR	LOCATIONS	CABINET #
2013	I 355 @ Lake St.	I-1, I-2, I-4
2013	IL 53 @ Algonquin	142, 135, 133, 146

2013	I-290 @ 25th	R58, R60, R67
2013	I-290 @ 1st Ave.	059, 057, 055, 048
2013	I-290 @ Kostner	J26, J29
2013	I-290 @ Independence	J24, J27
2013	I-290 @ Independence	J25, J22
2014	I-290 @ Homan	I-20, I-23
2014	I-290 @ Racine	G3, G5, G6
2014	Edens @ Niles Center	F19
2014	Edens @ Church	H26
2014	Edens @ Old Orchard	H28, H27
2014	Edens @ Lake St.	L32, L34, L29
2014	Edens @ Skokie Blvd.	M36, M31
2015	Edens @ Winnetka	M33
2015	Edens @ Bob-O-Link	T45
2015	Edens @ Chantilly	T62
2015	Dan Ryan @ 22nd	210, 213
2015	I-290 @ S. of Thorndale	J113
2015	I-290 @ F.A.A.	J112
2015	IL 53 @ Euclid	150, 141
2015	IL 53 @ Euclid	139, 148

9.10 SURVEILLANCE/DMS NON-ROUTINE PLANNED WORK

9.10.1 SEMI-ANNUAL FIRE ALARM INSPECTION TSC BUILDING

The Contractor shall schedule an inspection of the TSC Building fire alarm systems. Each inspection shall be scheduled and completed by June 31st and Dec. 31st of each calendar year. The inspection shall be paid for through pay item SI01. If any malfunctioning detection or other system components are found on the inspection, a non-routine work authorization will be issued.

9.10.2 TSC UPS MAINTENANCE

The Contractor shall provide 24 x 7 maintenance and support for the Traffic Systems Center Uninterruptible Power Supply (UPS) Eaton PowerWare, 9390-100, EC515CBB07 with 80 batteries by a qualified UPS System vendor located within District One. The UPS provides conditioned and uninterruptible AC Power to protect TSC computers, telemetry and LAN as well as the Gateway Servers from surges, spikes, sags and other irregularities which are inherent to commercial utility power.

The Contractor shall provide once per year, an inspection of the UPS module and an inspection on the battery string. The UPS module shall be inspected by March 1st, along with battery inspection.

- The Contractor shall provide 24/7 Dispatch and technical support.
- 24/7 Emergency service.
- Contractor shall be responsible for repair to all components of the UPS System with the exception of the battery units. If any batteries are found to be defective replacement of batteries shall be paid through pay item SU02.

9.10.3 INSTALL AC SUPPRESSION @ 334 CABINET LOCATIONS ON I-55 BETWEEN WEBER RD. AND LORENZO RD.

LOC. #	CAB. #	CROSS STREET
S1490	83	Weber Rd. South
S1495	85	.5 mile S. of Weber
S1500	87	1 mile N. of IL-126
S1505	94	.5 mile N. of IL-126

S1510	89	IL-126 Exit
S1530	93	.5 mile N. of Lockport Rd.
S1545	100	N. of Renwick Rd.
S1565	105	.5 mile S. of US-30
S1580	104	.5 mile S. of Caton Farm
S1585	109	1 mile N. of US-52
S1590	106	.5 mile N. of US-52
S1600	111	.5 mile S. of US-52
S1615	110	.5 mile N. of Rte. 59
S1625	119	IL Rte. 59 South
S1630	121	.5 mile N. of I-80
S1645	127	.5 mile S. of I-80
S1655	131	Canal Rd
S1670	137	Amoco Rd.
S1695	147	N. of Des Plaines River
S1755	171	15 miles West Lorenzo Rd.

Re-splice Surveillance copper communication cable on I-290 from Nordic to PS-20. There are approximately 40 junction boxes located in median barrier wall with access to boxes from both EB and WB I-290. Contractor in many areas will be required to provide traffic control to access these areas. Refer to Article 3.14.1 and 3.14.2 for days and hours lane closures will be allowed. The existing copper cable is a 25 pair #19 cable PE 39.

Surveillance Cabinet upgrades

1. I-57 @ I-80 cabinet U53 Contractor shall replace existing Type III cabinet with new type II on a rebuilt Type D foundation. Reuse existing cables.
2. I-57 @ I-80 Cabinet T49 replace existing cabinet with new Type III and Type D foundation. Reuse existing existing cables.
3. I-55 @ DMS-23 (1st Ave.)

Breakdown and rebuild existing Type D foundation. Reuse existing cables and Type IV control cabinet.

DMS Sign Upgrades

One DMS per year will be upgraded to a new NTCIP 1203 V2 DMS or as directed by the Engineer

1. Edens @ Niles Center
2. Edens @ Tower Rd.
3. Kennedy @ Canfield

9.11 LOGS AND FORMS

A sample of logs and forms as required for this Contract will be available at the Pre-Bid Meeting

ARTICLE 10.0 – TRAFFIC SIGNAL SYSTEM

10.1 TRAFFIC SIGNAL SYSTEM DESCRIPTION

The Traffic Signal System consists of electronically operated traffic control devices owned and maintained by the Department, which includes traffic signal installations and the integrated closed-loop traffic signal monitoring system, and flashing beacon installations.

The Traffic Signal installations (locations) include, but are not limited to, master and local controllers, time base coordinators, coordination units, intersection monitors, modems, controller cabinets, battery backup systems (UPS), phone lines, microwave communication lines, detectors (induction loop type, magnetic type, wireless type, microwave type, video type, pedestrian push-button and infrared type, and light sensing or radio communication emergency vehicle type), incandescent and light emitting diode (LED) signal heads (traffic and pedestrian), aviation red obstruction beacons, internally illuminated, fiber optic signs, LED signs, audible and countdown pedestrian signals, electronically steerable beam LED signals, in-pavement lights, hybrid beacons (pedestrian and emergency vehicle) systems, LED enhanced signing, traffic signal posts, mast arm assembly and poles, electric cable (standard multi conductor, shielded multi conductor, coaxial and fiber optic), conduit, communications lines and conduit between intersections, concrete foundations, handholes, junction boxes, service installations, ground rods, railroad interconnect security systems, tilt/pan/zoom video cameras and control units, red light running enforcement video cameras, microwave interconnect systems, radio interconnect systems, Cisco communication switches, video decoders, combination poles with luminaire mast arms including the luminaire, lighting mast arm, combination pole lighting controls, combination pole cabling and other appurtenances. The Closed Loop Monitoring System (CLMS) includes approximately 325 master controllers interconnected to 2250 intersection controllers. Also included in the CLMS is the interconnect cable, conduit, handhole systems, hardware, software, supplies for the Schaumburg headquarters office, and CLMS field equipment for monitoring. The Lake County Traffic Management Center (TMC) currently includes approximately one hundred (225) and Kane County TMC has less than twenty-five (25) IDOT intersection controllers with additional intersections planned.

The flashing beacon installations include both low and high mounted twelve inch signal sections, a service installation, flasher controller in cabinet, cable and conduit as well as solar flashers and all necessary appurtenances.

All combination poles with luminaire mast arms including the luminaire(s), lighting mast arms(s), combination pole lighting controls and cabling shall be maintained under Article 10, the Traffic Signal System and shall be considered a component of the traffic signal installation or location. The luminaire(s), the lighting mast arm, and cabling for the luminaire on combination mast arm poles shall be maintained in the manner listed in Article 7, Lighting and Sign Illumination System. Standard light poles that have traffic

signals attached will be maintained in Article 7, except in some instances the poles may be under maintenance of other agencies.

Combo Lighting Locations where routine maintenance is paid through the Traffic Signal Location:

Sys	Loc. #	Main Route	Cross St	Co	Cab.	Qty
L	1621	US 41 Skokie	Golf Rd TS1525	CO	XA	1
L	1622	US 41 Skokie	Foster St TS1555	CO	XB	2
L	1643	US 45 IL 21 Milwaukee	IL 68 Dundee TS1715	CO	XG	3
L	1666	IL 50 Cicero Ave	Touhy Ave TS2625	CO	XJ	4
L	1690	Palatine Rd	Schoenbeck TS5620	CO	AU	5
L	1711	US12 45 Mannheim Rd	US 20 Lake TS1010	CO	YC	6
L	1718	IL 43 Harlem Ave	Division St TS2295	CO	YF	7
L	1719	IL 43 Harlem Ave	Augusta Blvd TS2270	CO	YG	8
L	1720	IL 43 Harlem Ave	Chicago Ave TS2290	CO	YH	9
L	1721	IL 43 Harlem Ave	Ontario St TS2385	CO	YI	10
L	1722	IL 43 Harlem Ave	Lake St TS2360	CO	YJ	11
L	1723	IL 43 Harlem Ave	South Blvd TS2380	CO	YK	12
L	1725	IL 43 Harlem Ave	Randolph St TS2390	CO	YM	13
L	1726	IL 43 Harlem Ave	Washington St TS2415	CO	YN	14
L	1727	IL 43 Harlem Ave	Madison St TS2370	CO	YO	15
L	1728	IL 43 Harlem Ave	Roosevelt Rd TS2400	CO	YP	16
L	1729	IL 43 Harlem Ave	16th St TS2110	CO	YR	17
L	1775	IL 38 Roosevelt Rd	Austin Blvd TS2730	CO	BP	18
L	1792	IL 43 Harlem Ave	Foster Ave TS2310	CO	YS	19
L	1796	IL 43 Harlem Ave	Cullom Ave TS14395	CO	YU	20

L	1875	IL 7 SW Hwy	Ridgeland TS11770	CO	CQ	21
L	1902	US 20 Lake St	Bloomingdale TS4600	DU	PT	22
L	1906	US 20 Lake St	Marcus Dr TS12513	DU	UA	23
L	1907	US 20 Lake St	Lombard Rd TS12505	DU	UB	24
L	1908	US 20 Lake St	Itasca Rd TS12500	DU	UC	25
L	1909	US 20 Lake St	Mill Rd TS12510	DU	UD	26
L	1911	US 20 Lake St	JFK Dr TS12515	DU	UE	27
L	1915	IL 38 Roosevelt Rd	Lorraine St TS15230	DU	DG	28
L	1916	IL 38 Roosevelt Rd	President St TS15235	DU	DQ	29
L	1917	IL 38 Roosevelt Rd	Naperville Rd TS15240	DU	DX	30
L	1918	IL 38 Roosevelt Rd	Main Wheatn TS15245	DU	DY	31
L	1919	IL 38 Roosevelt Rd	West St TS15250	DU	DZ	32
L	1921	IL 38 Roosevelt Rd	County Farm TS8225	DU	PQ	33
L	1945	22nd St Cermak Rd	York Rd TS14495	DU	PA	34
L	1955	IL 64 North Ave	Berteau Ave TS6415	DU	PU	35
L	1956	IL 64 North Ave	Emroy Ave TS6430	DU	PV	36
L	1957	IL 64 North Ave	York Rd TS6500	DU	PW	37
L	1958	IL 64 North Ave	Myrtle Ave TS6460	DU	PX	38
L	2047	IL 38 State	14th St TS856	KA	KN	39
L	2067	IL 64 North Ave	Burlington Rd TS878	KA	KW	40
L	2209	IL 43 Waukegan Rd	Deerfield HS TS12950	LA	LT	41
L	2422	US 45 96th Ave	191St St TS7480	WI	WX	42

10.1.1 TRAFFIC SIGNALS (REFER TO SECTION 3, T-1A)

The Contractor shall maintain all traffic control equipment connected at a traffic signal installation location and the District 1 Closed Loop Monitoring System. A traffic signal installation location shall consist of all equipment controlled by or connected to the traffic signal controller and cabinet, including but not limited to the following:

- Traffic signal heads, traffic signal posts, mast arm assemblies, poles and foundations

  (The traffic signal heads shall consist of but not limited to signal sections, back plates, reflective back plates, louvers, visors, aviation red obstruction lights, special signal sections with flashing white strobes, incandescent lamps, programmable and steerable beams and light emitting diodes modules.)

- Pedestrian signal heads, pedestrian push button detectors, infrared detectors, audible pedestrian signals, countdown pedestrian signals and associated signs

- A pre-timed, semi-actuated, or NEMA I or NEMA II actuated controllers and cabinets

  (The controllers may be electrical mechanical or solid state types with volume-density features, railroad and/or fire preemption and time base coordination.)

  (The railroad preemption, fire preemption and time-base coordination may be internal, a module, or external to the controller.)

- The controller cabinet with all associated equipment, system communications equipment, battery backup systems (UPS), switching units, intersection coordinators, time switches and, where applicable, control pedestal and foundation

- Emergency vehicle preemption equipment, intersection monitoring devices, and transit signal priority (TSP) where applicable (The cost of repairing or replacing the emergency vehicle preemption and TSP equipment shall be invoiced, by the Contractor, directly to the local agency, as instructed by the Signal Engineer.)

- Red light running enforcement equipment is generally located within State ROW and utilizes separate facilities than the traffic signal installation except access to field cables within the controller cabinet for signal status is permitted. Red light running enforcement equipment is not the maintenance responsibility of the State or this contract. However, if the red light running system impacts the normal operation or visibility of the traffic signals or is determined to be a safety hazard by the Traffic Signal Engineer, the cost of repairing, replacing, removing or the like shall be invoiced by the Contractor directly to the local agency as instructed by the Traffic Signal Engineer.

- Vehicle detection including Magnetic detector(s), wireless detector(s), video detector(s), cameras, detector loop(s), micro loops, preformed detector loops, microwave detector(s), radar detector(s) FLIR type detection camera system and emergency vehicle detector(s) along with their related amplifiers, microprocessors, access points, relays, video decoders, relays and diodes.

  (The maintenance of vehicle detection systems shall include all necessary modifications to programmable detection zones. Microwave or radio communication for video detection including transmitters, receivers, antennas, reflectors and other miscellaneous communication equipment either on the sending end, receiving end or in between shall be included as part of the Video Detection.).

- Illuminated regulatory and warning signs

  (The illumination shall be accomplished by incandescent lamps, fluorescent lamps, neon tubes, light emitting diodes or fiber optic lights.).

- Illuminated street name signs

  (The illumination is generally accomplished by LEDs. For lighted street name signs not maintained by the State, the cost of repairing or replacing any associated equipment shall be invoiced, by the Contractor, directly to the local agency, as instructed by the Traffic Signal Engineer).

- Traffic signal conduit and interconnect conduit between traffic signals

  (The conduit may be in the ground or attached to structure.).

- Traffic signal handholes and interconnect handholes.

- Traffic signal cable and interconnect cable including copper wire and fiber optic.

- Traffic signal wireless interconnect system.

- Electrical and telephone service installations.

- Pan, tilt and zoom camera installations.

- Traffic adjusted master controllers with solid state features with associated equipment and where applicable, cabinet and foundation (The associated equipment shall consist of modems, telephone jacks, switching units, interface boards for copper and fiber optic type interconnect cables, noise suppressers and all associated components for a coordinated traffic control system.)

- Railroad interconnected traffic signal equipment, conduit, wiring, relays, and security systems

- Signal heads and conduit attached to railroad cantilever or truss type structures.

- Grounding systems complete with ground rods, ground wells, and grounding cable

- Flashing or steady burn LED enhanced warning and regulatory signs may include pedestrian actuation, supplemental lighting, solar panels, batteries, radio control cabinet and other all

necessary appurtenances. (For flashing or steady burn lighted signs not maintained by the State, the cost of repairing or replacing any associated equipment shall be invoiced, by the Contractor, directly to the local agency, as instructed by the Signal Engineer).

- All combination poles with luminaire mast arms including the luminaire(s), lighting mast(s), combination pole lighting controls and cabling.

10.1.2 SPAN WIRE TRAFFIC SIGNAL (REFER TO SECTION 3, T-1B)

The Contractor shall maintain a span wire traffic signal installation, complete.

An installation shall consist of all equipment controlled by one local traffic signal controller including signal heads, two (2) or more per approach and any number of signal sections, wood poles with down guys, span wire cable, span wire accessories, tether wires, electric cables, the service installation, pedestrian signal heads and detectors, vehicle detectors, battery back-up (UPS), controller cabinet, and other system equipment.

10.1.3 FLASHING OVERHEAD MOUNT BEACONS (REFER TO SECTION 3, T-2A)

The Contractor shall maintain a signal head(s), flashing beacon, overhead mounted, flasher controller in a housing and the complete span wire installation. The signal head shall consist of one (1) or more faces with any number of signal sections. The span wire installation shall consist of two (2) or more wood poles with down guys, span wire cable, span wire accessories, electric cable, ground rods, service installation, conduit, and handholes.

10.1.4 FLASHING LOW MOUNT BEACONS (REFER TO SECTION 3, T-2B)

The Contractor shall maintain a signal head(s), flashing beacon low mount, solar powered flasher (where applicable), flasher controller in a housing, ground rods, service installation, a traffic signal post, foundation, conduits and handholes. The signal had may consist of one or more signal sections mounted on the same object.

10.2 GENERAL MAINTENANCE RESPONSIBILITIES

The Contractor shall maintain all items listed in the Traffic Signal System Description under routine maintenance, unless otherwise stated herein. Unless specifically noted, all work required herein this Article shall be paid through routine maintenance. Also refer to general response and maintenance requirements as listed in Article 4.0. In addition the Contractor shall:

- Maintain the IDOT inventory of traffic signal equipment on database software as directed by the Engineer

- Maintain and update the EMCMS data on a weekly basis for all traffic signal items

- Maintain a library of repair and operation manuals for equipment in the IDOT signal inventory

- Purchase and maintain up to date licensed software to operate and maintain all Closed Loop Traffic Signal Systems, Video and Detection Systems, and related central/traffic (CMS, TMS, etc) management systems for Contractor personnel's' and IDOT Signal and System Engineers' laptop and desk computers. This shall include but not limited to the latest versions of Centrax, Tactics, TransSuite, MarcNX, and Aires as directed by the Traffic Signal Engineer.

- Purchase and maintain repair and testing equipment necessary to meet the response or repair time requirements of the Contract. Calibration of test equipments shall be completed in accordance with manufacturer recommendations.

- Provide technical assistance at traffic signal inspections and maintenance transfers

- Provide two week inspections of the traffic signal system through Contractor provided staff of IMSA level II technicians

- Trim vegetation to provide visibility of traffic signals

- Relamp half of all 135 watt and 90 watt signal sections each contract year. Relamp all 54 watt and 150 watt lamps annually. Relamp 80 intersections with LED type signal sections annually.

- Replace UPS batteries at 15 traffic signal locations.

- Record and maintain data base for traffic signal equipment malfunctions and LED module outages by date, location, manufacuturer, type, model and other related information.

- Inspect all mast arm poles yearly and provide report on damage poles

- Inspect conflict monitors and MMU's once every two years

- Inspect all railroad interconnected signals on the State highway System (even those maintained by others)on a yearly basis

  (This inspection shall be coordinated with members of the Illinois Commerce Commission (ICC) and the associated railroad companies.)

- Maintain the District's Closed Loop Traffic Signal System (CLMS) as described in detail within this article. This includes monitoring and maintenance of any signals included in Lake County, Kane County and any other County Traffic Management Center (TMC) within Region One/District One. The Contractor or County, at no cost to the Department, will supply any new software required for the TMC. The signals within the TMC network will be monitored as described in the CLMS later in this Article. The necessary computer components (use of one or more PCs is anticipated) and one or more standard phone lines required to interface with the TMC are included in the CLMS. All CLMS requirements remain in effect for all signals transferred to this system.

10.3 RESPONSE AND REPAIR TIME REQUIREMENTS

The Contractor shall respond to all malfunctions of the traffic signal system in a reasonable time. In addition to the daily routine and non-routine maintenance requirements of the traffic signal system, the Contractor shall provide sufficient manpower to respond to all notification of malfunctions on a 24-hour basis, 7 days a week. The Contractor is required to keep a time and date log of each response from the time of the initial report (ticket issuance) to the time of the final permanent repair. The Contractor is required to notify the Traffic Signal Engineer when any response time is not met.

Article 4.0 discusses general work requirements of routine maintenance for all systems. The following chart lists maximum response, service restoration, and permanent repair times, the Contractor will be allowed to perform corrective action on the Traffic Signal System.

ITEM	RESPONSE TIME	SERVICE RESTORATION TIME	REPAIR TIME	PERMANENT CALENDAR DAYS
FAILURE/DAMAGE (any type) TO:				
CABINET	1 HR.	24 HR.	21 DAYS	
CONTROLLERS AND PERIPHERAL EQUIPMENT	1 HR.	4 HRS.		21 DAYS
SYSTEM DETECTOR LOOP	1 HR.	NA	7 DAYS	
ALL OTHER DETECTORS	1 HR.	NA	21 DAYS	
SIGNAL HEAD/LENSES	1 HR.	4 HRS.	7 DAYS	
AVIATION RED BEACON	1 HR.	4 HRS.	7 DAYS	
MAST ARM ASSEMBLY AND POLE	1 HR.	4 HRS.		* 7 DAYS
TRAFFIC SIGNAL POST	1 HR.	4 HRS.	7 DAYS	

CABLE/CONDUIT	1 HR.	4 HRS.	7 DAYS
INTERCONNECT/ TELEMETRY	1 HR.	4 HRS.	7 DAYS
GRAFFITI, REMOVAL	NA	NA	7 DAYS
MISALIGNMENT OF SIGNAL HEADS	1 HR.	4 HRS.	4 HRS.
CLOSED LOOP MONITORING SYSTEM	1 HR.	24 HRS.	14 DAYS
POST & POLES PLUMB VERTICALLY	NA	NA	21 DAYS
CONTROLLER, POST & POLE, FOUNDATIONS	NA	NA	21 DAYS
COMPLAINTS/CALLS/ CONTROLLER OR SYSTEM ALARMS/TIMING/PHASING/ PROGRAMMING	1 HR.	4 HR.	NA
PATROL TRUCK			

DEFICIENCIES	24 HRS.	24 HRS.	24 HRS.

* Mast arm assembly and pole must be set within 7 days after foundation repairs are completed or after a replacement pole and/or arm assembly become available. In the case of a new pole and/or arm assembly the Contractor must furnish a copy of the signed and dated delivery receipt from the shipping company. Temporary head placement shall meet the requirements of the current MUTCD for driver visibility.

10.4 REPAIR OF SIGNAL LAMP/MODULE OUTAGES

Signal indication and internally illuminated sign lamp outages must be replaced in the following manner:

Immediate corrective action must be provided if only one (1) signal indication remains in operation on an approach. This also includes left turn and right turn arrow indications if only one (1) signal indication remains in operation. If two (2) or more signal indications remain in operation for any given phase (movement) on any approach to an intersection, the replacement of the burned-out lamp/module, damaged socket, or damaged cable shall be accomplished within one (1) working day for red or red arrow indications and two (2) working days for all other indications following discovery and/or notification of the outage. Immediate corrective action must be provided for burned-out pedestrian indications and internally illuminated signs. The replacement of a damaged socket or damaged cable for a pedestrian signal indication or burned-out lamps in an internally illuminated sign such that the illuminated symbol is still identifiable must be accomplished within the next working day following discovery and/or notification. At the time of replacement of a burned out lamp or lamps, the reflector and lens shall be cleaned. All replacement lamps and modules shall meet the requirement of Article 10, Group Relamping of flashing beacon and traffic signal locations.

10.5 SIGNAL DAMAGE EQUIPMENT REPLACEMENT

Damage to flashing beacons or traffic signal heads requires immediate corrective action. Refer to Article 4.0 for EMCMS documentation requirements.

The location of a temporary or permanent traffic signal head installation shall meet the requirements of the current Manual on Uniform Traffic Control Devices (MUTCD) and the following:

- The minimum acceptable signal display is two (2) far side signal faces directed toward the through traffic movements of each approach and two (2) signal faces directed toward any separate turning movement (where provided) on each approach pending permanent repairs,

except where the distance from the stop line to the far side signal exceeds one hundred fifty (150) feet which requires a near right signal face to be in place. Existing conditions may require additional signal displays as directed by the Traffic Signal Engineer.

- Signal faces on mast arm assemblies for through traffic on any one (1) approach shall not be less than eight (8) feet apart measured horizontally between center lines of face with a minimum mounting height of seventeen (17) feet above the crown of pavement surface. See the District's Detail Sheets for additional mounting requirements.

- Damaged signal heads including pedestrian signal shall be replaced in-kind. Incandescent shall replace incandescent; LED's shall replace LED's; new pedestrian count-downs shall replace pedestrian count-down types, etc.

- Locations where pedestrian signal indications are present one (1) pedestrian signal head must face each direction of a pedestrian crosswalk.

- A span wire signal face shall contain the same type, number, and size of lenses as the signal face being replaced except that twelve inch sections shall replace eight inch or nine-inch sections. LED modules should be replaced with LED modules of the same make to minimize performance differences, unless directed otherwise by the Engineer.

10.6 POWER OUTAGES AND FLASHING OPERATION PROCEDURES

When repairs at a signalized intersection require that the controller be disconnected and power is available, the Contractor shall place the intersection on flashing operation. If there is no flasher, the Contractor shall install a temporary flasher in the controller cabinet. The signal shall flash red for all directions unless a different flashing operation has been directed by the Engineer.

At signal installations where power is not available, due to a power failure, or a flasher must be installed, the Contractor shall install at least one stop sign, Illinois Standard Sign R1-1-30x30 on each approach to the intersection as a temporary means of regulating traffic. The stop sign shall be located at the stop bar and mounted at a height of 5-ft above curb or shoulder with a set-back of 12-ft from travel pavement unless otherwise directed by the Engineer. The Contractor when installing temporary stop signs must switch the controller to the flashing operation when responding to a power failure. If the approach flash is yellow, the Contractor is not to place a temporary stop sign unless the flashing operation is changed to red by direction of the Engineer. The Contractor shall furnish and equip all vehicles involved with the

maintenance of traffic signal installations with a sufficient number of stop signs to be erected as specified herein.

10.7 NEW, REVISED OR TRANSFERRED TRAFFIC SIGNAL AND FLASHING BEACON INSPECTIONS

The Contractor shall furnish a trained representative for each traffic signal inspection that requires a new or existing traffic signal installation to be added to the Contract or the transfer of an existing traffic signal installation of this Contract to another agency or contractor. Refer also to transfer requirements in Article 4.0 The Contractor shall:

- Analyze all fiber test results insuring performance conforms with the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications.

- Analyze all induction loop detector loops at the controller cabinet insuring that each detector loop or set of detectors conforms with the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications.

- Analyze the controller program provided by the controller manufacturer to insure that the phase and overlap designation on the traffic signal sequence drawing is provided correctly in the controller program and cabinet wiring drawings.

- Insure that the phase timings in the traffic signal controller are those provided by the Department.

- Assist in placing the traffic signal in operation by observing the signal display and checking of the conflict monitor while all vehicle traffic is stopped, and shall report any operational discrepancies or signal outages to the Signal Engineer immediately.

- Assist the Engineer in walking all approaches of the signal installation inspecting all traffic signal items for conformance with the Departments specifications for the project and aiming of the traffic and signal heads.

- Assist in the testing and adjusting of emergency vehicle preemption equipment. The Contractor shall insure that any time railroad preemption is in operation with emergency vehicle preemption that the railroad preemption has priority over the emergency vehicle preemption equipment.

- Assist in the testing and adjusting of UPS equipment.

- Insure that the locations containing railroad preemption are programmed in accordance with the approved railroad preemption program and that all special lock out devices are operating.

- Be responsible for inspecting each location to determine the completion of construction punch lists as directed by the Signal Engineer. The punch lists shall be prepared and provided by the Engineer and the Contractor shall return written verification of punch list completion or non-completion.

- Upon request, review locations proposed for loop replacement in ongoing pavement resurfacing or grinding construction contracts.

10.8 PATROL INSPECTIONS

10.8.1 GENERAL REQUIREMENTS

Unless otherwise permitted or requested by the Engineer, except for emergencies, the Contractor is required to schedule the IDOT traffic signal patrol routes the first portion of each workday and on the approved route day. Emergency services required by IDOT or other agencies shall be attended to immediately, however, any incomplete daily patrol shall be completed (by others or the original patrolman) during the normal patrol work week. This may require patrols after the normal workday has ended in order to complete the normal patrol workweek.

The Engineer shall be notified on a daily basis via email to all IDOT Area Engineers and Technicians at the end of the Patrol workday of the following:

- List of all incomplete patrols for the day
- Specific reason for each individual incomplete patrols
- Plan as to how Contractor will make-up each incomplete patrols

All repairs not completed at the time of the patrol route inspection must be logged and turned over to Contractor's area supervisor. Repairs not completed at the time of the patrol route inspection are subject to the time limits in Article 10. All Patrol records shall be maintained and submitted to the traffic signal engineer weekly.

The Contractor shall provide a sufficient workforce and equipment to patrol all flashing beacon and traffic signal locations. Each installation shall be patrolled and inspected every two (2) weeks for proper alignment of vehicle and pedestrian signal heads, display outages (all sections of every pedestrian and vehicular signal head), visors, backplates, alignment of posts and mast arm poles, aviation obstruction lights, special traffic signal sections with red lenses and accompanying circular white halo lamps, shielding of optically programmed faces, and general operation of the traffic signal. The Contractor shall repair or replace all worn, missing or damaged components as specified herein.

The EMC Dispatch Center is required to keep a Patrol Route Maintenance Log, which includes the following information. A copy of each log shall be provided to IDOT every month on CDROM. Every Traffic Signal Patrolmen shall notify the EMC Dispatch Center of the following:

- Patrolman Arrival Time and Approved Route Inspection Location
- Patrolman Departure Time and Approved Route Inspection Location
- Time and Reason for Patrolman Departure from Approved Route Inspection Location and Name of Municipality or Agency requesting the emergency service (Example: Accident with damage and traffic signal full outage -- Cook County requesting the Emergency Service)

10.8.2 ROUTINE PATROL DUTIES AND RESPONSIBILITIES

The Contractor's responsibilities shall include inspecting, repairing or replacing the following items:

- Align all signal heads, traffic signal posts, controller or service installation pedestals, mast arm assemblies and poles, and mounting hardware. All poles, foundations, posts and mounting hardware must be straightened to be vertically plumb.

- Check all anchor bolts for mast arm poles, signal posts, controller cabinets, and, in addition, all bolts used to attach the mast arm to the pole.

- Replace missing or damaged bolt covers, mast arm shrouds and handhole access covers. Tighten screws related to signal post base plates, backplates, anchor bolt covers, handhole access covers, service installation covers and controller cabinets. Repair or replace any failed or damaged signal components including signal controllers, cabinets or peripheral equipment, signal heads, back plates or mounting hardware, posts or mast arms, illuminated signs, detectors (vehicle and pedestrian), cable, conduit and other signal appurtenances which are part of a signal installation. Electrical grounds shall be maintained in accordance with the National Electrical Code.

- Signal backplates shall be replaced or re-painted if any unpainted surface is exposed.

- Provide a complete inventory of the signalized intersection including signal equipment located inside and outside of the controller cabinet recorded in the format determined by the Engineer. This work shall be completed by May 1st of each contract year.

- The Contractor shall at all times maintain stock of sufficient materials and equipment to make temporary and permanent repairs within the limits specified in Articles 4 and 10.

- The Contractor shall provide signal operating inspection tasks upon request such as:

    1. Inspect the timing operation of a signal installation at a specific time period and provide a recommendation for improving traffic flow

    2. Program timing parameter changes

    3. Determine the phasing or operation of a signalized installation

4. Check the condition or verify the presence of equipment at a signalized location

5. Provide a copy of timing parameters in use at a signalized location

6. Provide recommendations to improve the safety or the operation of a signalized location

7. Provide a compiled list of all locations meeting a specified criteria

10.8.3 CONTROLLER AND CABINET INSPECTIONS

The Contractor shall provide a sufficient work force and equipment to inspect all controllers and cabinets as provided below:

- Once every four (4) weeks the patrol person shall visually inspect the inside of each controller cabinet. The visual inspection will include checking all timing intervals and time base coordination programs to insure all setting are correct including that the clocks are set to the same hour, minute and second at all locations within the time base coordination system.

- All detector amplifiers shall be visually inspected once every four (4) weeks to insure that the vehicle detectors are receiving vehicle calls and the calls are being placed into the Controller. Loop detector amplifiers with automatic vehicle identification necessary for bus preemption shall be inspected to ensure they are receiving vehicular phase calls and bus preempt calls; and the calls are being placed into the controller. Pedestrian push button detectors shall be tested by pushing each detector and watching for the related walk indication to appear.

- Test system communication for proper operation.

- Update database on appropriate software for closed loop monitoring system on a laptop computer.

- Equipment manuals, box prints and cable logs are to be maintained in each controller cabinet.

- GPS latitude and longitude coordinates of the controller cabinet, electric service location, fiber optic cable handholes and other items as listed herein, shall be recorded or verified annually for use in the District's record retention and maintenance system. Refer to Article 4.17.7 for GPS Documentation.

- Uninterruptible Power Supply (UPS) shall be tested once every four (4) weeks to assure proper operation of the traffic signals upon loss of normal electric utility power. Manual transfer and power loss transfer shall be tested which shall not put the signal in flash. Nominal output voltage and current along with battery string voltage shall be measured and compared to manufacturer's expected values and recorded. Batteries not meeting minimum ratings and capacities shall be replaced under routine maintenance.

- Railroad preemption, emergency vehicle preemption and bus preemption shall be tested during the cabinet inspection. All program settings and each sequence of operation shall be verified to be correct during each inspection.

- Emergency Vehicle Preemption equipment shall be tested during the cabinet inspection. All costs of repairing or replacing damaged or missing emergency vehicle preemption equipment is the responsibility of the local fire district or municipality and should not be reflected in the Contractor's bid price for routine maintenance items (maintaining the light detectors, light detector amplifiers, radio transmitters and receivers, antennas, confirmation lights, cables and/or related components). The Contractor shall notify the agency immediately that their pre-emption equipment is not operating and ask if immediate repairs are requested or if an estimate of repairs is necessary before repair work is provided. A copy of all WR Tickets, correspondence and invoices shall be provided in the monthly routine maintenance work documentation book.

10.9 SITE MAINTENANCE

The Contractor shall trim trees and bushes blocking the line of sight of the traffic signal face to the motorists. Line of sight standards are established in the Manual on Uniform Traffic Control Devices for Streets and Highways. All trimmed branches shall be legally disposed of by the Contractor off the right-of-way. An annual Tree Trimming Schedule shall be prepared by the Contractor and submitted to the Engineer for approval by October 1 of the contract year. The Engineer, at any time during the contract year, may request trimming of trees or bushes in addition to the locations scheduled. This trimming must be completed immediately.

10.10 GROUP RELAMPING OF FLASHING BEACON AND TRAFFIC SIGNAL LOCATIONS

10.10.1 SCHEDULES AND REPORTS

The Contractor shall replace all lamps at state maintained flashing beacon and traffic signal locations as described below. This work shall be completed between April 1 and August 1 of the contract year. All 135 Watt 12" signal lamps and 90 Watt pedestrian signal lamps shall be relamped in the first year and third year of the contract, utilizing a two year bulb as described in the lamp specifications. All remaining incandescent lamps will be relamped annually.

The Contractor shall provide a schedule of all locations to be relamped by each relamping crew. This schedule shall be approved by the engineer. If more than one crew is used, each crew is to work within a different patrol route. Each relamping crew is to be equipped with an EMC Contractors wireless communications unit and the number shall be furnished to the Department Traffic Engineers and Technicians prior to the start of work. The Contractor is to notify the Engineer, in writing, of his planned starting date. On the first day of relamping, through the completion of relamping, the Contractor shall include on the Daily Traffic Signal Agenda the following:

- Call number of each relamping crew leader
- The relamping route number, the week of the patrol route, the day of week in the patrol route and the intersection that the crew is starting from

Upon completion of the relamping, lens washing and reflector washing, the Contractor shall furnish to the Engineer a completion report no later than August 21st of contract year..

The schedule for the second and third year relamp program shall be approved by the Traffic Signal Engineer prior to commencement. Patrolmen will not be used for group relamping until routine patrols are completed. Documentation shall be provided to the Traffic Signal Engineer on a daily basis indicating what routes will be covered in the group relamping, what personnel will be used, and must also submit a statement of completion of routine patrol.

10.10.2 DAILY REPORTS

At the completion of each day's work each relamping crew shall furnish a report indicating all locations which were relamped that day. The report must also indicate lenses that were replaced and lenses that require replacement that the crew did not have a supply of and must be replaced later. This written report must be sent to the Traffic Signal Engineer's office by email before 7:15 AM of the next working

day. The starting location of a relamping crew may be revised at the direction or approval of the Traffic Signal Engineer.

10.10.3 LENS CLEANING AND REPLACEMENT

The Contractor shall as a part of the relamping wash the reflector and inside and outside of each lens. Lenses that are damaged in any manner whatsoever must be replaced. This includes lenses that have discolored areas, holes, and arrow and pedestrian lenses that are peeling and light is visible in areas other than with the prescribed arrow or "Walk or Don't Walk " area.

The Contractor is required to replace damaged lenses for any part of the signal system as needed or as directed by the Engineer, regardless of annual or bi-annual relamp schedule.

10.10.4 SPECIAL TYPES OF LAMPS REQUIRED FOR SPECIAL INDICATIONS

All Aviation Red Obstruction Lights on traffic signal posts or mast arm assemblies and poles shall be relamped at the same time the traffic signal installation is relamped as part of the yearly traffic signal group relamping. The lamps used in the Aviation Red Obstruction Lights shall meet or exceed the requirements for the fixture's lamp set by the manufacturer of the fixture.

Special traffic signals sections with red lenses and accompanying circular white halo strobe lamps shall be relamped.

10.10.5 SPECIFICATION OF LAMPS

All incandescent lamps provided for relamping must have the current calendar year placed in the area containing the lamp's rating. The 150 watt special lamps for optically programmed signals and fluorescent lamps must be dated with indelible ink. The marking shall be on the back of the 150 watt lamp and on the left end of the fluorescent lamp. The lamps provided by the Contractor shall meet the following criteria:

- Twelve inch signal sections: 135 watts, 1650 minimum initial lumens, 16,000 hour lamp life with a two year warranty, 95% Krypton gas filled clear bulb, 3 inch light center (incandescent lamp). H&H Industries 135A21 or approved equal.

- Eight inch traffic or nine inch pedestrian sections: 54 watts, 530 lumens, 8,000 hour, 3 inch light center (incandescent lamp).

- Twelve inch pedestrian signal section: 90 watts, 1000 minimum initial lumens, 16,000 hour lamp life with a two year warranty, 95% Krypton gas filled clear bulb, 2-7/16 inch light center (incandescent lamp). H&H Industries 90A19 or approved equal.

- Twelve inch optically programmable section, 150 watts, 6,000 hours (seal beam)

- Fluorescent and other replacement lamps shall be replaced with a lamp of similar characteristics and wattage's. All fluorescent lamps shall be CAW/HO type.

- Aviation Red Obstruction Light lamps are to meet or exceed the recommendations of the fixture manufacturer.

- Special traffic signal section with red lens and accompanying circular white halo strobe lamps shall meet or exceed the recommendations of the fixture manufacturer.

10.10.6 LAMP DISPOSAL

The Contractor's crew must relamp the entire intersection on the same working day. Old lamps shall be disposed of in accordance with the manufacturer recommendations and Environmental Protection Agency and requirements in Article 4.0 as stated herein.

10.10.7 LED RELAMPING

The Contractor shall replace all LED displays (intersection and pedestrian signals) at 80 state maintained traffic signal locations annually. The locations to be relamped are intended to be designated by the Engineer prior to March 1 of the contract year. The Contractor shall complete the work by October 1 of each contract year.

Each intersection shall have a consistent make and model of LED display installed. Each LED display installed shall be labeled with the month and year of installation. The LED display shall be approved by the Traffic Signal Engineer and meet all current ITE and NEMA standards and the requirements of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications. The replaced LED display shall become the Contractor’s property and shall be recycled without re-use.

10.11 UNINTERRUPTIBLE POWER SUPPLY (UPS) BATTERY REPLACEMENT

The Contractor shall replace all UPS batteries at 15 State maintained traffic signal locations each contract year. The proposed locations for battery replacement are listed herein. This list will be finalized by March 1 of each contract year by the Traffic Signal Engineer with battery replacement work for all locations completed by October 1st of each contract year.

Work shall include, but not limited to, removal of existing batteries from State ROW, furnishing and installing new battery replacements, recycling of existing batteries, cleaning of battery cable connections and cleaning of UPS compartment shelves, vents and filters. New batteries shall meet the requirements listed in the District 1 Traffic Signal Specifications for Uninterruptible Power Supply including run time, sizing, rating and warranty.

Existing batteries shall be recycled meeting all applicable sections of US EPA and IL EPA publications along with the Code of Federal Regulations for transportation.

10.12 ANNUAL CONFLICT MONITOR/TESTING MMU PROGRAM

Conflict monitors and MMU shall be tested once every two years. One-half of the system shall be tested by November 15th of each contract year. The Contractor shall conduct a complete test of all conflict monitors or management malfunction units. The testing method shall be pre-approved by the Engineer and shall test all the features of the monitors or units as required by the Engineer.

Unless prior approval is given by the Engineer, all the above items shall be completed by the Contractor within the same working day at a single traffic signal installation. The Contractor shall provide a schedule for this work to the Traffic Signal Engineer. Any deviation from the approved schedule shall be approved by the Engineer.

The Contractor shall provide a final completion report listing all the signal installations with the date the work was completed and verifying that each item has been completed in an Excel spreadsheet file saved to a CD-Rom and submitted to the Traffic Signal Engineer by December 1st . The Contractor will be required to provide Progress Reports at the Traffic Signal Engineer's request showing the locations which have been completed to that date.

Conflict Monitors/ Malfunction Management Units shall not be replaced at railroad interconnected intersections without prior notification of the Traffic Signal Engineer.

10.13 ANNUAL MAST ARM ASSEMBLY AND POLE INSPECTION

The Contractor shall inspect all mast arm assemblies, mast arm poles and astro brackets (or other types of hardware) supporting traffic signal heads or pedestrian signal heads. (Also review Contractor Advisory Inspections in Article 4.0.)

This inspection shall be completed between April 1 and August 1 of the contract year and may be concurrent with the group relamping in Article 10.11 or done separately. The Contractor shall furnish schedules for this program a minimum of one week in advance of the start of work. The inspection shall be conducted in the same manner as described in Article 10.11, which requires reporting the Daily Work Schedule and follow-up documentation of the work. The inspection shall focus on the structural elements of the mast arm assembly and must include a close-up, arms length investigation of the following elements:

Mast Arm	Mast-to Pole Connection	
Pole	Base Plate	Anchor Bolts

The arm of the assembly shall be visually inspected at all signal head connections for any defects, such as cracks or buckles. The mast arm-to-pole connection shall be inspected for significant loss of section, cracks in welds or base metal, and deterioration of the connection plates. The bolts of the arm-to-pole connection shall be inspected for tightness and condition.

The pole shall be checked for external corrosion, impact damage, perforation by rust through, and any discernible deflection, distortion or cracking. The pole shall be closely checked for corrosion near the base plate, especially if mounted on a grout bed. The welds of the pole-to-base plate connection shall be checked for cracks.

The base plate shall be checked for any severe section loss or deformation.

The anchor bolts of the mast arm shall be inspected to verify that the existing nuts are not loose or missing. The anchor bolts shall also be checked for any corrosion or bending.

Mast Arm Inspection forms are to be scanned and grouped together by intersection. Each traffic signal location shall be one (1) PDF file. The file name is to be labeled in the following format:

TS#_Date of Inspection_MAI.PDF

Date of inspection is to be MMYYYY – no spaces

Example: TS12345_042013_MAI.PDF

Upon discovery of any buckles, significant structural defects (loose nuts, severe corrosion or dents, cracks in welds, plates or structure, etc.), the Contractor will immediately notify the Illinois Department of Transportation at (847)705-4139 and take corrective action as directed by the Signal Engineer to insure the assemblies do not pose an immediate hazard.

The Contractor's crew must inspect the entire intersection on the same working day.

The Contractor shall provide the Engineer a completed form MA-1 or MA-2 (single or double mast arm assemblies), "Annual Mast Arm Inspection Report Form" for each Department maintained traffic signal mast arm assembly and pole inspected by September 1st of the contract year in pdf format on a CDROM.

Digital pictures, noted by TS number, location name, county, town and corner (SE, NW, etc.) of any deficient equipment noted in Article 10.12 shall be included with report forms on a labeled CD-ROM.

10.14 ANNUAL RAILROAD INTERCONNECTED TRAFFIC SIGNAL INSPECTION

The Illinois Commerce Commission will conduct an inspection of all Department traffic signal locations, which are interconnected with railroad crossing flashing signal warning devices with or without railroad gates. Locations not maintained by the Contractor but under the District 1 route jurisdiction system are also included. The inspection shall be completed on an annual basis during the calendar year. In addition to the Contractor an inspection team may consist of personnel from the Department's Bureau of Traffic, the railroad responsible for the railroad crossing warning equipment, and the Illinois Commerce Commission. The signal engineer will schedule the inspection of each railroad interconnected location based on the availability of personnel from each involved agency.

The Contractor shall be responsible for making all necessary measurements as directed by the engineer. He shall determine all signal time intervals and controller settings, which pertain to railroad preemption. The sequences of operation shall be checked and the Contractor shall conduct all necessary tests. Any deficiencies or recommendations shall be reported directly to the engineer.

The Contractor shall maintain and update individual security software and proms for the approximately 150 railroad interconnected signals in District 1. These items shall remain under strict security and be transferred back to the Department at the end of the Contract. The Contractor shall at all times provide and maintain one (1) Eagle/Siemens traffic signal controller and (1) Econolite traffic signal controller, at a location to be approved by the Traffic Signal Engineer, loaded with District 1 approved security software, which can be used to replace damaged equipment in the field. The controller model shall be as directed by the Signal Engineer.

10.15 DETECTOR LOOP MAINTENANCE AND REPLACEMENT

10.15.1 TRAFFIC SIGNAL LOOP RESEALING

The Contractor shall reseal all existing traffic signal detector loop wire which has become exposed or as directed by the Engineer. The Contractor will clean all debris and damaged detector loop sealer from the existing saw cut. Loop detector wire that is exposed will be reinstalled into the existing saw cut and held in place by wedges prior to the resealing of the detector loop.

10.15.2 DETECTOR LOOP REPLACEMENT

The Contractor must replace all detector loops, which become inoperable. The cost of replacing the detector loop shall be part of Traffic Signal Routine Maintenance. Detector loops that are damaged by state forces shall be replaced and paid through a Non-Routine Authorization letter. A detector loop, which is milled out during a pavement resurfacing, will be replaced as part of the Department's resurfacing contract. The Department's Electrical Maintenance Contractor will be notified by the Engineer and dispatch a patrol person to the location to disconnect the loop detector cable from its terminals and place the affected phase or phases on maximum recall. At this time the Engineer will instruct the Contractor representative as to the maximum green time that is to appear for each of the affected phases.

System Detector Loops shall be replaced throughout the entire year. Non-System Loops, at the Contractor's option, between November 30th and March 1st, may be replaced by a loop or with a temporary vehicle detector approved by the Signal Engineer, at no additional cost to the Department. The Department approved vehicle detector shall be installed to provide adequate detection in place of the detector loop to the satisfaction of the engineer and it shall be removed and replaced permanently by a detector loop by March 31st. If the contractor is unable to install cable for the temporary vehicle

detector due to frozen or full conduits, with prior approval from the Engineer, the Contractor may temporarily span the cable overhead as long as proper clearances over the roadway can be maintained. No additional compensation shall be provided for vehicle detector cable or for any special installation requirements.

At locations where the Contractor deems the pavement condition to be unfit to replace an existing inoperable detector loop with a new loop due to pavement deterioration, the Contractor shall, with prior approval from the Traffic Signal Engineer, install a video detection system or other Department approved detection system selected by the Traffic Signal Engineer. The new detection system shall be installed in accordance with the applicable specification under Non-Routine Work. The cost of providing and installing the new detection system complete including all necessary connections, monitors, electronics handhole drilling, trench and backfill, unit duct and restoration shall be included in routine maintenance of the traffic signal installation and no extra payment shall be allowed.

10.16 VIDEO DETECTION

At the beginning of the 2013/2014/2015 EMC it is estimated that District 1 will have approximately sixty (60) intersections with video detection in operation. Video detection will increase each year. The Contractor shall provide license software for each of the System Patrolmen who have video detection in their respective area. The System Patrolmen shall be fully instructed in the operation and maintenance of each video detection system.

At the beginning of the 2013/2014/2015 EMC it is estimated that District 1 will have ninety (90) tilt/ pan/ and zoom video cameras in operation. The Contractor shall provide licensed software for each of the Systems Patrolmen, which have this video in their respective areas. The System Patrolmen shall be fully instructed in the operation and maintenance of these cameras.

10.17 INTEGRATED CLOSED-LOOP TRAFFIC SIGNAL MONITORING SYSTEM (CLMS)

10.17.1 CONTRACTOR RESPONSIBILITIES

The Contractor will, on a daily basis, monitor, review, and maintain the District 1 closed loop monitoring system. Refer to CLMS as described in Article 10.1. The Contractor shall use a local area network (LAN) computer system, with current licensed software for each brand of master controller (used in District 1) to monitor the District 1 closed loop signal system. The LAN system shall communicate with each master through individual telephone lines. The LAN shall also be programmed to compare data bases with the Department's LAN at the District Headquarters in Schaumburg. The Contractor shall provide daily and monthly reports updating the status of the CLMS. The Contractor shall also provide current licensed master software for all system patrolmen laptop computers.

A copy of the Official District 1 Closed-Loop Data Base shall be supplied to the traffic signal engineer at the termination of this contract. The data base shall also be digitally transferred to the next Maintenance Contractor at the termination of this contract.

10.17.2 DEPARTMENT LAN AND SOFTWARE SUPPORT

The Department shall be responsible for maintaining all Department owned Closed Loop Monitoring hardware.

The Contractor shall provide personnel who can demonstrate competence in the proper operation of all closed loop monitoring programs currently in use by District 1. The Contractor shall provide competent personnel for LAN maintenance and repair as defined in the definition of terms under Article 12.0 for specialty service. All costs to maintain daily communication between the Contractor's LAN and the Department's LAN will be included under routine maintenance.

10.17.3 RESPONSIBILITIES

The Contractor shall concurrently monitor all Closed Loop Traffic Control Systems maintained by him under this contract on a 24 hour per day, 7 days per week basis. The Contractor's system monitoring functions shall include, but not be limited to, the reception of telephone calls from Closed Loop System Master Controllers and the storing, displaying, and acting upon any reported events, alarms, equipment failures, operational exceptions and programmed data collection. The Contractor shall have sufficient dedicated telephone lines, his own dedicated Close Loop Monitoring System(s) with appropriate software, and qualified electrical technicians to provide for the simultaneous monitoring of all closed-loop traffic control systems being maintained by him under this contract.

The Contractor shall program all Closed Loop Systems, so that he will receive all system alarms, events, and messages on his Central Closed Loop Monitoring System(s). The Contractor shall respond to all alarms, events, and messages and provide the indicated response or corrective action within the time frame specified in the "Response and Follow-up Time Requirements" listed under Article 10.3. The EMC Dispatch Center shall be equipped with the necessary equipment to receive all alarms, events, and messages as described above. Before the end of the first month of the contract, the Contractor shall submit a list of alarms, events, or messages that each brand of Closed-Loop System is programmed to send to the Contractor's dispatch center for approval by the Traffic Signal Engineer.

The Contractor shall maintain the integrity of the timings and programming information contained in the local controllers and the master controllers. The Contractor shall maintain each Closed Loop Traffic Control System in the mode for which it has been setup and programmed (i.e., Traffic Responsive (TRP), Time-of-Day (TOD), FREE, etc.). The Contractor shall maintain his own data base of all the local and master controller timings, settings and programming information including graphic displays for intersections and systems. This data base shall be kept by him, at his place of business, for his own use in the normal course of system maintenance. The Contractor's data base shall be the Official District 1 Closed Loop Data Base. This data base shall also include Municipal and County maintained Closed Loop Traffic Control Systems that are on IDOT maintained routes. The Contractor shall insure data base

agreement by synchronizing IDOT Schaumburg Headquarters data base with the Official District 1 Closed Loop Data Base.

The Contractor shall provide an Electronic Patrol of each master controller and its local controllers (including municipal and county maintained Closed Loop Traffic Control Systems on IDOT maintained routes) at least once every day, seven (7) days a week. This Electronic Patrol shall be done in addition to any field patrols done as part of Routine Maintenance. The Electronic Patrol shall document that all equipment is working properly and the timings and programming in each system have not changed from their correct values.

In addition, this electronic patrol shall include, but not be limited to, system loop checks (failed, maximum presence, and no activity), local loop checks (phases on recall, locked detectors), loops with system outputs (volume/occupancy checks), failed, Max presence, no activity, master controllers answering, local intersections on line (telemetry checks). Any exceptions found shall be reported to the Traffic Signal Engineer via email by 8:00 AM every work day and corrected within the time frame specified in the "Response and Follow-up Time Requirements" listed under Article 10.3. The format and content required for this email shall be approved by the Traffic Signal Engineer. Any discrepancies shall further be reported in the Closed Loop System Status Report.

All changes to Local or Master Controller programming shall have prior approval of the Engineer. Minor temporary changes to alleviate some sporadic operational anomaly will be acceptable provided it is done by a qualified electrical technician, and reported to the Engineer as soon as practical. It is anticipated that major re-programming will only be brought about through a comprehensive traffic study, optimization of timing effort independent of this maintenance contract. However, the Contractor may be required to effect (program) such timing changes in the closed-loop system masters and/or local controllers. The Contractor shall keep records of all changes to local and master controller data bases with the dates the changes were implemented and who authorized the changes.

The Contractor shall maintain a Closed-Loop System Operational Log accumulating in it the day to day operational information for our Closed Loop Traffic Control Systems. This log shall contain a listing of all program and mode changes that have occurred in each system and any anomalies to normal operation. The Contractor shall monitor this log for any persistent and recurring deviation from normal system operating modes and he shall report them to the Engineer as soon, as is practical. In particular, repeated cycle failures, loss of coordination, excessive pre-emptions or conditions that dictate manually commanded free operation shall be reported. In addition, the Contractor shall verify (at least once a week) that program changes in our traffic responsive Closed Loop Systems are occurring at normal times. This will insure that these systems are not oscillating between programs. This check will be considered part of the operational log. The operational log shall be maintained by the Contractor for the duration of this contract. The last 6 months of this log shall be available for inspection at any time and copies shall be

provided the Engineer upon request. The format, content, and method used to keep the Operational Log shall be approved by the Engineer.

The Contractor shall maintain a Closed-loop System Failure Log for all Closed Loop system alarms, events, anomalies, and reported failures. It shall further contain the date, time of occurrence, the corrective action taken, a notation as to the cause, and a record thereon as to the repair time required to correct the malfunction. The System Failure Log shall be maintained by the Contractor for the duration of this contract. The last 6 months of this log shall be available at any time for inspection by the Engineer and copies shall be provided to the Engineer upon request.

The Contractor shall prepare a Closed-loop System Status Report every two (2) weeks. Copies of the System Status Repo*rt* shall be forwarded to the Signal Engineer and the Signal Systems Engineer on the 1st and 15th of every month. The System Status Report shall describe the status of each closed-loop system being maintained by the Contractor under this contract and a summary of failures and alarms occurring within each system during the two (2) week reporting period. The Closed-loop Operations Log and the Closed Loop Failures Log System Status Report shall in addition highlight any equipment failures that were not attended to, repaired or brought back into operation within the required time frame specified in the Repair Time Table and the reason for failing to meet the specified response/repair time schedule. The report format shall be approved by the Engineer.

The Contractor shall not make any timing or programming changes on any Closed Loop Systems or its components except through qualified electrical technicians.

Where applicable, to insure proper system operation and alarm reporting should the master controller ever go into backup, the Contractor shall maintain a location specific backup program in the backup PROMS of each Master Controller. The backup program in PROM shall duplicate the normal controllers programming as closely as possible. The Contractor shall be responsible for maintaining the backup programming and incorporating appropriate changes whenever normal programming changes are made at a Master or when directed to do so by the Engineer. Should a Master Controller ever need to be removed or replaced, the Contractor shall make the appropriate backup PROM switch with the replacement controller.

One month prior to the contract start date, the Contractor shall supply to the Engineer for approval, his proposal for the Closed Loop Monitoring System to be located at his place of business. The proposal shall include a detailed description of the proposed Closed Loop Monitoring System and a timetable for the installation of the system and components.

The Contractor shall assist consultants who are preparing Signal Coordination and Timing (SCAT) reports for the Department. This assistance shall be limited to a one-time download by the consultant of system timings with a qualified Contractor representative at the system location at the time of the download. Occasional operational questions by the consultants may also need to be answered by the Contractor as well as any required correction of items related to the maintenance of systems. In instances beyond these such as multiple requests for assistance in downloading system timing, programming errors which result in Contractor maintenance intervention, or multiple requests for assistance in programming, the Contractor will be allowed to bill the consultant. An itemized bill, including the date and system number, as well as the reason for the bill shall be submitted to the Traffic Signal Engineer in conjunction with the actual bill being sent to the consultant.

10.18 TRAFFIC SIGNAL INVENTORY

The Contractor shall complete the form "IDOT District 1-Traffic Signal Inventory" for:

- A new traffic signal installation added to the Contractor's maintenance.
- Maintenance of an existing traffic signal installation when it is transferred from another agency to the Department.
- Maintenance of a traffic signal installation, which had been under construction when it is accepted for maintenance by the Department.
- A change in inventory at an existing signal installation.

The Contractor shall provide an updated form with a revised date for all locations being accepted for maintenance even if there is no change in inventory items on the form (the date shall reflect the acceptance of maintenance). The Bureau of Traffic reserves the right to make minor modifications to the form such as adding or deleting items or modifying the format, but without changing the overall scope of the form.

Refer to Article 4.0 for Formal Transfer of Maintenance responsibilities.

The Contractor shall also be responsible for updating and maintaining the Access data base or other data base designated by the Traffic Signal Engineer for traffic signal equipment inventory. The inventory shall be compared to field locations and corrections noted and submitted to the Signal Engineer at least once each year.

- The Contractor shall record or verify the GPS latitude and longitude coordinates of the signal equipment as listed herein for use in the District's record retention system. Refer to Article 4.17.7 for GPS Documentation.

10.19 PAINTING BY OTHERS ON STATE MAINTAINED FACILITIES

Other agencies will be permitted to paint traffic signal equipment, utilizing their own forces, as approved by the Engineer. The Contractor is required to inspect the location, before and after the location is painted, as part of routine maintenance. Maintenance will not be transferred. The Contractor will document dates of painting in the dispatch log. If any damages are observed to IDOT equipment as result of the painting, the Contractor will repair immediately, and recover the expenditures through 3rd party damages. (Refer to Article 4.0 for 3rd party documentation/repair requirements.)

10.20 RAILROAD INSURANCE

The Contractor shall obtain railroad protective liability insurance coverage for performing non-routine work relating to the installation of new traffic signal facilities on railroad R.O.W. where the Department has no existing appurtenances, e.g., railroad interconnect, railroad structure mounted traffic devices, etc.

10.21 NON-ROUTINE MAINTENANCE

Refer to Section 2 to review Special Provisions for non-routine work pay items.

10.21.1 NON-ROUTINE WORK IN THE RAILROAD RIGHT-OF WAY

The Contractor shall be responsible for obtaining any necessary permits as required by the railroad for any non-routine work to be performed on the railroad Right-of-Way. The Contractor shall also be responsible to coordinate all activities between the Department and the railroad.

The Contractor shall be responsible for completing any required forms and shall coordinate all activities between the Department and the railroad. Any fees associated with obtaining the permit shall be paid by the Department in accordance with Article 109.05 of the Standard Specifications for Road and Bridge Construction, as modified and noted in Article 5.0.

10.22 LOCKS AND KEYS

Each traffic signal cabinet shall be furnished with a padlock that meets the specifications of the weather resistant padlock currently specified for District 1 pump stations. The padlock shall meet the specifications of the weather resistant padlock as specified by the Engineer, equal or better than Master Lock 6125KA. The key number shall be approved by the Engineer prior to the purchase/install. If the equipment is currently locked with a Master Lock 6125KA model the Contractor may replace the cylinder and new key (for Master Lock 6125KA) instead of replacing the entire lock. Railroad interconnected traffic signal controller cabinets shall have a similar lock number but different cylinder and key than standard

traffic signal cabinets. It is estimated that there are 150 railroad traffic signal cabinets and 2384 standard traffic signal cabinets and 300 UPS cabinets that require padlocks.

10.23 LOGS AND FORMS

A sample of logs and forms as required for this Contract will be available at the Pre-Bid Meeting.

10.24 EQUIPMENT MALFUNCTION AND REPAIR TRACKING

Malfunction and repair of traffic signal equipment shall be recorded by the Contractor and reported monthly to the Traffic Signal Engineer in a data base on a CDROM. Information shall include date of failure, date of repair or replacement, reason for failure (lightning, water damage, etc.), equipment type, model, manufacturer, location and any other pertinent information as directed by the Traffic Signal Engineer. Equipment replacement information shall include model, manufacturer, and source (new, State stock, other location, etc.). Reports shall include monthly and accumulative totals. LED module failures/outages shall include the information noted above and include age of module, color, and display (ball, arrow, pedestrian hand/man/outline/full/count-down, etc).

10.25 TRAFFIC SIGNAL OUTAGE AND OPERATION REPORT

The Contractor shall maintain a data base that tracks traffic signal outages and operation and generates a report that provides a comprehensive list of these traffic signals locations on a daily and monthly basis. The report shall include, but not limited to:

- Traffic signal locations that are currently dark or are in flashing red mode
- Traffic signal locations that have been dark or in flashing red mode within the last 24 hour period.
- Locations identified by TS number, intersection and route, county and community
- Identify reason for dark or flashing condition with estimated time/date of restoration to normal operation.
- Corrective action taken with date and time normal operation was restored

The report shall be generated from the data base and emailed to the Traffic Signal Engineer, Area Signal Engineers and Communications Center every 8 hours starting at 4am each morning.

In the case of storms or other emergency situations, reports shall be made every 4 hours as or as otherwise directed by the Traffic Signal Engineer. Monthly reports shall be submitted to the Engineer and Traffic Signal Engineer on CDROM.

ARTICLE 11.0 -- EXTRA SYSTEMS

11.1 EXTRA SYSTEMS DESCRIPTION

The Extra Systems consist of various types of electrical equipment, at various District 1 locations, including Base Stations, Moveable Bridge Video Monitoring and Bridge Controls, Highway Advisory Radio, Ice Beacons, Matteson Flood Gates, Rest Area, Maintenance Yards, Sign Shops and Facilities, Material Labs and Weigh Stations. Refer herein for specific electrical items of Contract maintenance. The Contractor shall maintain the equipment at these locations under routine maintenance, unless specified as paid through non-routine maintenance. A list of locations is found in Section 3.

The routine maintenance includes response and investigation of trouble calls, deficiencies and abnormalities, and replacement materials for defective or non-functioning installed items less than $ 500 each in value. The labor and equipment necessary for transportation, removal and re-installation of the materials, plus shipping, mailing, and handling charges are paid through routine maintenance.

Advanced System Equipment, Maintenance Paid through Extra Systems Locations:

Sys	Location	Description	Office	Co.	Equipment
A	BOY1 (XM6155)	IDOT Office	Biesterfield Bridge	CO	Cam on Lt. Pole
A	DRY1 (XM6120)	IDOT Maint Yd	Dan Ryan	CO	Cam. on Bldg.
A	ETP (XM6140)	IDOT ETP	Emer Traffic Patrol	CO	Misc. Equip.
A	NSY1 (XM6190)	IDOT Maint Yd	Northside	CO	Camera on Bldg
A	THILO (XM6150)	IDOT Maint Yd	Hillside	CO	Tower/Ltg/Cam/Equip
A	TROD (XM6135)	IDOT Maint Yd	Rodenburg	CO	Tower/Ltg/Cam/Equip

11.2 GENERAL MAINTENANCE RESPONSIBILITIES

The Contractor shall maintain all equipment per requirements as listed in Article 4.0. For certain technical equipment, as noted herein, the Contractor shall contract with a Specialty Service Company for maintenance. The specialty company names and technician qualifications shall be submitted to the Engineer for approval at the Pre-Construction Meeting.

11.3 RESPONSE AND REPAIR TIME REQUIREMENTS

The Contractor shall dispatch qualified personnel to respond to all trouble calls, malfunctions or damage to Extra Systems electrical and mechanical equipment.

LOCATIONS/EQUIPMENT	RESPONSE TIME	SERVICE RESTORATION	PERMANENT REPAIR
Base Stations	1 Hour	4 Hours	Within 24 hours
Movable Bridges	1 Hour	4 Hours	2 Working days
Highway Advisory Sign	1 Hour	24 Hours	7 Working days
Highway Maintenance Yards*	1 Hour	24 Hours	7 Working days
Highway Rest Areas	1 Hour	24 Hours	7 Working days
Ice Beacons	1 Hour	4 Hours	Within 24 hours
Sign Shops	1 Hour	4 Hours	7 Working days
Weigh Stations	1 Hour	4 Hours	7 Working days

* Includes IDOT Sign Shops and Material Labs.

11.4 HIGHWAY MAINTENANCE YARDS, SIGN SHOPS, MATERIAL LABS & REST AREAS LOCATIONS:

The Contractor shall maintain under routine maintenance in this Contract the following equipment: all indoor and outdoor lighting fixtures and control equipment, light switches, indoor and outdoor GFIC outlets, conduits, wiring, salt dome and cold storage lighting, emergency and exit lighting and/or signs, control boxes, motion sensors, lighting equipment includes outdoor aluminum or wood poles, lighting HM towers, wall packs, roof and ceiling fixtures, main distribution panel, sub-panels, conduit, cables, controllers, junction boxes, fittings, wastewater lift stations pump operation, power, controls, wiring and associated equipment.

The Contractor shall respond to all problem calls and shall troubleshoot to determine the malfunction of the following equipment under routine maintenance: the HVAC systems, air compressors, welders, lift motors/hoist system, motors and pumps for asphalt heating tanks, wastewater lift stations pumps, calcium chloride and brine spray pumps, pressure washer pumps, exhaust fans, material lab ovens, test equipment, and garage door openers and any other electromechanical equipment. Identified

equipment problems found by the Contractor shall be noted on the ticket for proper action to be taken by the Department. The contractor shall advise the Engineer via email or text of the equipment condition.

The Department reserves the right to supply new equipment for the Contractor to replace under routine maintenance hours specified herein.

The Hillside and Rodenburg Maintenance Yards also have base station equipment to be maintained under routine maintenance by the Contractor. Base Stations shall be maintained as specified in Article 6.0 and generators shall be maintained as specified in Article 8.0.

11.4.1 SEMI-YEARLY INSPECTION

The Contractor shall inspect the IDOT Maintenance Yards and Sign Shops twice per year, once in mid-April to mid-May and again mid-September to mid-October. Items for inspection include indoor and outdoor lighting and its control equipment, emergency/exit lights, light switches, GFIC outlets, salt dome storage lighting, and proper electrical operations of lift motors and pumps, asphalt heating tanks, calcium chloride spray pumps its controllers and electrical equipment, pressure washer pumps, and exhaust fans.

During the spring inspection the Contractor shall disconnect the calcium chloride and/or brine pumps, drain fluids, clean and lubricate. During the October inspection the calcium chloride and/or brine pumps shall be re-connected, lubricated and checked for proper electrical and mechanical operation.

The X-1 log sheet shall be completed and submitted to the Engineer in the monthly routine work submittal book. Tickets shall be created for any deficiencies found. The Contractor shall perform maintenance repairs of all deficiencies and shall be completed with seven (7) days.

11.4.2 YEARLY SERVICE ENTRANCE AND FEEDER PANEL INSPECTION

The Contractor shall inspect the service entrance and feeder panels at the Maintenance Yards, Rest Areas and Weigh Stations once per year, during mid-September to mid-October. This work is expected to be completed at the same time as the Semi-Yearly Maintenance Yard Inspections.

The X-1 log sheet shall be completed and submitted to the Engineer in the monthly routine work submittal book. Tickets shall be created for any deficiencies found. The Contractor shall perform maintenance repairs of all deficiencies and shall be completed with seven (7) days.

Inspection procedure is as follows:

A. Clean enclosure and control equipment by blowing out with low air pressure or vacuuming

B. Check and clean contacts, relays and timers and visually inspect for damage or out of adjustment parts. Remove all dust off of electrical devices and equipment.

C. Circuit breaker maintenance:

- Check connections
- Exercise breaker
- Check trip setting

D. Inspect wiring/conductors for overheating and discoloration

E. Check tightness of wire terminations and connections

F. Check for proper labeling, provide and install missing labels

G. Check wire tags/labels, provide and install missing tags or labels

H. Check fuse disconnects for proper operations, keep fuse clips clean and tight

I. Check fuses for proper size

J. Test equipment ground system

11.4.3 YEARLY LIGHTING CLOCK CONTROL INSPECTION

The Contractor shall inspect the lighting control clocks per requirements in Article 7.0. And complete Log Forms L-1 and L-2.

11.5 MAINTENANCE YARD LIGHTING REPLACEMENT

As part of routine maintenance work the Contractor shall furnish, remove and replace lighting fixtures, conduit, junction boxes, and remove and replace wiring conductors at two (2) locations per year. Lighting inside the work areas shall be replaced or installed up to a mounting height of 20 feet.

The fixture mounting accessories, appurtenances, and equipment required are incidental to this work as well as the following new materials:

- Light Switches
- Motion Sensor/Detectors
- Emergency Lights/Exit Light Fixture

The quantities shown below are based on existing record drawings. The Contractor shall meet with the Engineer in March, 2013 to discuss the lighting replacement and the Engineer shall provide the existing record drawing along with a proposed layout of new fixtures. By May 2013 the Contractor shall submit to the Engineer for approval, complete manufacturer's product data and shop drawings. The work is to be completed by August, 2013.

The Contractor is responsible for scheduling the work and for coordinating with the Engineer whenever Engineer-witness functions are required. The Contractor shall also advise the Engineer when each location is complete and shall provide a written certification to that effect. The Engineer reserves the right to a final inspection of the lighting replacement work at any or all of the locations or equipment certified as complete. Any deficiencies found upon inspection, a corrective work list will be prepared and provided to the contractor for repairs and replacement. The Contractor shall provide a progress report in the monthly routine work submittal book.

The two (2) locations to be modified in Year 2013:

XM6165 – South Side Sign Shop

Conduit and Wire:

- Remove two thousand (2,000) ft. of conduit
- Remove eight thousand (8,000) ft. of wire
- Install five thousand (5,000) ft. of up to # 10 THHN wire
- Install twelve hundred (1,200) ft. of 3/4 inch rigid conduit

Light Fixtures:

- Remove fifty eight (58) fixtures
- Install nineteen (19), 8 ft., High Bay Fluorescent High Output with two (2) lamps
- Install five (5), 4 ft., High Bay Hose Down Fluorescent High Output with four (4) lamps for wet location
- Install five (5), 4 ft., High Bay Fluorescent High Output with six (6) lamps
- Install fifteen (15), 4 ft., High Bay Fluorescent High Output with four (4) lamps
- Install four (4), 2 X 4 ft., Lay in Type with four (4) lamps for suspended ceiling

Install twelve (12) Motion Sensors

Install three (3) Emergency "EXIT" Battery Back-Up LED fixtures

Install three (3), 110 Volts GFIC Receptacles

XM6150: Hillside Maintenance Yard

Conduit and Wire:

- Remove two thousand (2,000) ft. of conduit
- Remove eight thousand (8,000) ft. of wire
- Install five thousand (5,000) ft. of up to # 10 THHN wire
- Install twelve hundred (1,200) ft. of 3/4 inch rigid conduit
- Install three hundred (300) ft. of 3/4 inch rigid PVC conduit

Light Fixtures:

- Remove seventy two (72) existing fixtures
- Install five (5), 4 ft., High Bay Fluorescent High Output with six (6) lamps
- Install seventeen (17), 8 ft., High Bay Fluorescent High Output with two (2) lamps
- Install thirty (30), 4 ft., High Bay Fluorescent High Output with four (4) lamps
- Install ten (10), 4 ft., High Bay Hose Down Fluorescent High Output with four (4) lamps for wet location
- Install three (3), 8 ft., High Bay Hose Down Fluorescent High Output with four (2) lamps for wet location
- Install seven (7), 2 X 4 ft., Wrap Around with four (4) lamps for suspended ceiling
- Install six (6), 2 X 2 ft., Lay in Type with four (2) lamps for suspended ceiling

Install ten (10) Motion Sensors

Install four (4) Emergency “EXIT” Battery Back-Up LED fixtures

Install twelve (12), 110 Volts GFIC Receptacles

Install seven (7) ON/OFF switches

Install one (1) Control Switch for Compressor

Remove two (2) switches

Retrofit ten (10) fluorescent fixtures with Electronic Ballast and install T8 lamps

If the Contract is renewed for a second year, the two (2) locations to be modified for 2014:

XM6320: St. Charles Maintenance Yard

Conduit and Wire:

- Remove two thousand (2,000) ft. of conduit
- Remove eight thousand (8,000) ft. of wire
- Install five thousand (5,000) ft. of up to # 10 THHN wire
- Install twelve hundred (1,200) ft. of 3/4 inch rigid conduit
- Install one hundred (100) ft. of 3/4 inch rigid PVC conduit

Light Fixture:

- Remove one hundred seventy five (175) fixtures
- Install eighty nine (89), 8 ft., High Bay Fluorescent High Output with four (4) lamps
- Install six (6), 4 ft., High Bay Fluorescent High Output with six (6) lamps
- Install seven (7), 4 ft., High Bay Fluorescent High Output with two (2) lamps
- Install eight (8), 4 ft., High Bay Hose Down Fluorescent High Output with four (4) lamps for wet location

Install thirteen (13) Motion Sensors

Install eight (8) Emergency "EXIT" Battery Back-Up LED fixtures

Install five (5), 110 Volts GFIC Receptacles

Install seven (7) ON/OFF switches

XM6170 – Kennedy Yard

Conduit and Wire:

- Remove six hundred (600) ft. of conduit
- Remove eight thousand (8,000) ft. of wire
- Install six thousand (6,000) ft. of up to # 10 THHN wire
- Install twelve hundred (1,200) ft. of 3/4 inch rigid conduit
- Install one hundred (100) ft. of 3/4 inch rigid PVC conduit

Light Fixture:

- Remove one hundred sixteen (116) fixtures
- Install seventy one (71), 8 ft., High Bay Fluorescent High Output with two (2) lamps
- Install seven (7), 4 ft., High Bay Hose Down Fluorescent High Output with four (4) lamps for wet location
- Install two (2), 4 ft., High Bay Fluorescent High Output with six (6) lamps

Electrical Panel, SP-4:

- Replace the tub with new breakers with same number of poles and rating
- Remove Lighting Contactor
- Install new front cover

Install fifteen (15) Motion Sensors, and one (1) for Wet Location

Install six (6) Emergency "EXIT" Battery Back-Up fixtures

Install one (1), 110 Volts GFIC Receptacles

Install two (2), 3 - Way ON/OFF switches

If the Contract is renewed for a third year, the two (2) locations to be modified for 2015:

XM6145 – Harvey Yard

Conduit and Wire:

- Remove six hundred (600) ft. of conduit
- Remove eight thousand (8,000) ft. of wire
- Install six thousand (6,000) ft. of up to # 10 THHN wire
- Install twelve hundred (1,200) ft. of 3/4 inch rigid conduit
- Install one hundred (100) ft. of 3/4 inch rigid PVC conduit

Light Fixture:

- Remove eighty two (82) fixtures
- Install forty seven (47), 8 ft., High Bay Fluorescent High Output with two (2) lamps
- Install seven (7), 4 ft., High Bay Hose Down Fluorescent High Output with four (4) lamps for wet location
- Install eleven (11), 4 ft., High Bay Fluorescent High Output with six (6) lamps
- Install four (4), 4 ft., Fluorescent with two (2) lamps

Electrical Panel, SP-2 and SP-3:

- Replace the tub for SP-2 and SP-3 with new breakers with same number of poles and rating
- Install new 100 Amps, 3 – Phase with 4 – wire, 30 circuits panel

Install eight (8) Motion Sensors, and one (1) for Wet Location

Install two (2) Emergency "EXIT" and four (4) Battery Back-Up fixtures

Install fourteen (14), 110 Volts GFIC Receptacles

XM6415 – Gurnee Yard

Conduit and Wire:

- Remove five hundred (500) ft. of conduit
- Remove six thousand (6,000) ft. of wire
- Install ten thousand (10,000) ft. of up to # 10 THHN wire
- Install two thousand (2,000) ft. of 3/4 inch rigid conduit
- Install two hundred (200) ft. of 3/4 inch rigid PVC conduit
- Remove Disconnect and ON/OFF switches

Light Fixture:

- Remove one hundred ten (110) fixtures
- Install three (3), 8 ft., High Bay Fluorescent High Output with two (2) lamps
- Install four (4), 4 ft., High Bay Hose Down Fluorescent High Output with four (4) lamps for wet location
- Install twenty seven (27), 4 ft., High Bay Fluorescent High Output with six (6) lamps

Install three (3) Motion Sensors, and one (1) for Wet Location

Install ten (10) Emergency "EXIT" Battery Back-Up fixtures

Install two (2), 110 Volts GFIC Receptacles

Install six (6), 3 - Way ON/OFF switches

The Contractor shall notify the Engineer upon completion of the work and shall conduct a walk through with the Engineer for inspection and measurement of material installed. Material that is installed shall be counted. It is the Engineers discretion to see that any material left, shall be stored in state stock or installed at a different location.

11.6 HIGHWAY REST AREA LOCATIONS

The equipment under routine maintenance at the rest areas includes exterior and interior lighting (plus lighting inside public washrooms), emergency/exit light and all panels, controls, outlets and well pump.

Monthly Inspection

The lighting night-rider shall inspect the rest areas exterior and interior lighting on the monthly patrol. Refer to patrol procedures as found in Article 4.0.

Yearly Lighting Clock Control Inspection

The Contractor shall inspect the lighting control clocks per requirements in Article 7.0.

Yearly Service Entrance and Feeder Panel Inspection

The Contractor shall inspect the service entrance and feeder panels at the Rest Areas once per year, during mid-September to mid-October. Refer to Article 11.4.2.

11.7 ICE BEACONS

The equipment under routine maintenance at the ice beacon locations includes SCADA radio receiver and electrical control apparatus, cabinet, conduit wiring, flashing amber beacons (signal heads), and all other equipment and appurtenances.

Monthly Inspection

The Contractor shall inspect each Ice Beacon location, once per month, in the last week of the month, to assure proper operation of their intended service. The inspection shall include checking radio equipment for clarity, proper beacon operation, verifying data burst, dusting or cleaning equipment as necessary, and/or opening each controller and radio enclosure and cleaning if necessary. Data shall be recorded on log form X-3, H.A.R. and Ice Beacon Monthly Inspection. The date of the inspection shall be listed on the daily agenda. The Contractor shall submit a copy of the X-3 log form to the Engineer in the monthly routine work submittal book. The Contractor shall create tickets for any problems found.

11.8 WEIGH STATIONS

The Weigh Station equipment under routine maintenance includes electronically operated traffic control devices, traffic control flashers, height detector equipment and truck waiting warning devices, traffic signal heads, traffic signal posts, height detector poles, loop detectors, handholes, vehicle amplifiers, overheight detectors, foundations, cable, conduit, CCTV cameras, fiber optic transreceiver, monitors, inside and outside lighting system including lamp, cable, conduit and panel, lenses, reflectors, shields, poles, mast arms, ballasts, decals, control devices, radios, lighting cabinets, fenced enclosures, access gates, above ground cable splice boxes, exposed conduit, unit duct, breakaway devices, sump pump in wet pit area and appurtenances. Also included is Weigh Station “open/closed” sign equipment which consists of fiber optic message signs, interconnecting cables, controllers, including INTRAC radio, and power sources all located on various expressways. Excluded from routine maintenance are weigh scales and repair of circuit boards, relays, or cabinets associated with the weigh scales.

Monthly Daytime Inspection

The Contractor shall inspect each weigh station installation using the WS patrol inspection log form X-4 and perform the following:

- Replace all burned out lamps and damaged sockets
- Check lighting in scale pit
- Replace damaged, discolored, cracked or peeling signal lenses
- Repair or replace any damaged signal posts, foundations, signal heads, cable, conduit and over height vehicle detector posts from any cause whatsoever
- Check alignment of signal heads
- Check alignment of overheight vehicle detectors
- Check operation and condition of loop detectors
- Align all signal posts
- Identify vehicle detector loops in need of replacement
- Schedule loop resealing as required (create EMCMS Ticket)
- Check proper operation of the CCTV System and monitors filing washer fluid for proper camera operation. The wipers on the cameras at the WS80OB Weigh Station, I-80 outbound, west of 80th Ave, require refilling twice a month.)
- Tickets shall be created for any problems found. The log form XW-1, shall be completed and submitted in the routine maintenance monthly submittal book.

Yearly Lighting Clock Control Inspection

The Contractor shall inspect the lighting control clocks per requirements in Article 7.0.

Yearly Service Entrance and Feeder Panel Inspection

The Contractor shall inspect the service entrance and feeder panels at the Weigh Stations once per year, during mid-September to mid-October. Refer to Article 11.4.2.

Yearly OPEN/CLOSED Sign Relamp

The Contractor shall relamp all OPEN/CLOSED signs during the month of March under routine maintenance and submits form X-5 with the list of signs relamped in the monthly routine work submittal book.

11.9 EMERGENCY TRAFFIC PATROL OFFICE (ETP) - 3501 Harrison St., Chicago

Items to be maintained:

- Cattron units (for the remote control of the swing gates, refer to Article 6.0)
- AVL (Automatic Vehicle Locator) Units (62) (refer to Article 6.0)
- Video Work Station (future install)
- Outdoor/Indoor Lighting system and service entrance equipment

11.10 MOVEABLE BRIDGE MONITORING

The equipment under maintenance includes closed circuit television cameras, monitors, generators and transfer switches, alarm panel and appurtenances, interconnecting coaxial cables, navigation lighting, highway lighting on the bridge, river traffic controls, conduit wiring, circuit breakers, sump pumps, incoming electrical service feeder cable and all appurtenances located on various moveable bridges in the Illinois waterway in or near to Joliet, Illinois. Maintenance also includes the traffic signals and audible alerts for vehicular traffic on the moveable bridge which are powered from and controlled by the moveable bridge equipment.

The Contractor shall respond to all problem calls and shall troubleshoot to determine the malfunction of bridge controls under routine maintenance. Identified equipment problems found by the Contractor above the specified limit shall be noted on the ticket for proper action to be taken by the Department. The Contractor shall advise the Engineer via email or contractor advisory of the equipment condition.

Monthly CCTV Inspection

A certified closed circuit video service technician shall perform a monthly inspection of the Bridge Monitoring CCTV and associated equipment at all locations and list problems found, or no problems found on form XB3. The IDOT Moveable Bridge Office Engineer shall receive the original copy of the technician's monthly inspection, and the Contractor shall submit a copy to the Engineer in the monthly routine submittal book. The lighting night-rider shall inspect the bridge and navigation lighting on the monthly patrol (refer to patrol procedures in Article 4.0.).

11.11 HIGHWAY ADVISORY SIGN LOCATIONS

The equipment under maintenance at the locations includes flasher/load relays and all electrical control apparatus, cabinet(s), conduit wiring, circuit breakers, flashing amber beacons (signal heads), foundations, incoming electrical service feeder cable, solar panels, batteries, and all other equipment and appurtenances.

Monthly Inspection

The Contractor shall inspect each H.A.R. Sign location, once per month, in the last week of the month to assure proper beacon operation. The Contractor shall replace any lights and/or clean equipment as necessary. Data shall be recorded on log form X-3, H.A.R. and Ice Beacon Monthly Inspection. The date of the inspection shall be listed on the daily agenda. The Contractor shall submit a copy of the X-3 log form to the Engineer in the monthly routine work submittal book. The Contractor shall create tickets for any problems found.

Radio Repairs

If the Contractor finds the radio defective, the Contractor shall notify the Engineer via email so it can be referred to the radio maintenance contractor for repair. The Contractor shall provide system access for the radio maintenance contractor.

11.12 MATTESON FLOOD WARNING SYSTEM

The Contractor shall respond to emergency service requests and perform occasional scheduled inspections of Department owned equipment at the Mattson Flood Warning System in Mattson, IL. The Contractor shall provide the labor, equipment and material to perform repairs, the contractor will be paid through non-routine maintenance for material in excess of $500.

Located at Governors Hwy @ 214th St. and Governors Hwy @ 219th St., the flood warning system consists of the following equipment:

- Four (4) Solar Assisted 12 Flashing Beacons with two line message board
- Two (2) High water sensor system
- Two (2) Radio signal based systems
- Two (2) Cellular based systems
- Four (4) 64'W X 3'H Barricade gates
- Two 14' Steel poles with foundation

- Four (4) Mast arm assembly and pole with foundation

When notified by the ComCenter or by a police agency that an incident has occurred at the location, a patrolman shall immediately be dispatched to the location by the EMC Dispatch Center. Incidents may include, but are not limited to:

- All motorist caused damage
- Malfunctions which suspend normal operations
- Intrusion alarms
- Power outages
- Live exposed voltage cables
- Changeable message signs
- Gates laying in roadway
- Failures of network (telephone, & radio)
- Events which pose a threat to safe, timely operations

The dispatched personnel shall arrive at the relevant system location within sixty minutes of notification of the incident, to assess and troubleshoot the system and/or to make the system operational. The defective equipment shall be permanently repaired as soon as possible, within 24 hours, unless approval is given by the Engineer. The Engineer shall be notified of any response by Contractor personnel.

11.13 SCHEDULED WORK CHART

Art. No.	Form #	Equipment to be Inspected	No. of Locations	Frequency/Month	Submittal
11.4.1	X-1	Maintenance Yard Inspections	34	Mid April/May & Mid Sept/Oct	RWSB
11.4.2	X-2	Service Entrance & Feeder Panel	34	Mid Sept/Oct	RWSB

11.4.3	L-2	Lighting Clock Control (Maint. Yds.)	34	Mid Sept/Oct	RWSB
11.6	L-2	Lighting Clock Control (Rest Areas)	2	Mid Sept/Oct	RWSB
11.8	X-4	Weigh Stations	12	Monthly	RWSB
11.8	X-5	Weigh Station Open/Close Sign Relamp	194 Lamps	Yearly/March	RWSB
11.9	P-10	Generator	2	Monthly	RWSB
11.9	P-10	Generator, Comprehensive	2	Yearly/October	RWSB
11.10	XB-3	Moveable Bridge CCTV	6	Monthly	RWSB
11.7/11	X-3	H.A.R. & Ice Beacons	25	Monthly	RWSB

11.14 NON-ROUTINE MAINTENANCE PAY ITEMS

Refer to Section 2 Special Provisions for a list of Non-Routine Pay Items which may be authorized for work on the Extra Systems.

11.15 LOGS AND FORMS

A sample of logs and forms as required for this Contract will be available at the Pre-Bid Meeting.

ARTICLE 12.0 – DEFINITIONS, SPECIFICATIONS & STANDARDS

Definitions of Terms User Herein:

AEGIS District 1 Dial-up Pump Station Alarm System

ANSI American National Standards Institute

ASMC Advanced Systems Maintenance Contract

ASSIGNED PERSONNEL

When used herein shall refer to Contractor personnel whose daily work shall normally be devoted to a particular electrical system as noted herein. Assigned personnel are not solely dedicated to performing EMC 2013/2014/2015 work.

ATMS Advanced Traffic Management System

AVL Automatic Vehicle Locator

CLEAR When used herein describes ticket terminology, the departure of the Contractor personnel from the initial response to the site of a reported incident of damage or trouble on system equipment after verifying that the highway is safe for the motoring public

CLEARING SITE FOR SAFETY

Assure the Electrical, Mechanical and Structural integrity of IDOT property maintained under this contract is safe for workers and the motoring public. Site clearing shall comply with the most current standards (such as NEC and OSHA requirements) as applicable.

CLMS Closed-Loop (Traffic Signal) Monitoring System

CMS Changeable Message Sign

COMCENTER Illinois Department of Transportation, District 1 Communications Center

DAMAGED EQUIPMENT

Any piece of equipment owned or maintained by the Department that is no longer capable of functioning as originally designed, or as since modified, or any piece of equipment that has deteriorated sufficiently in the opinion of the Engineer so that failure is imminent or for which safety could be a concern

DEDICATED PERSONNEL

When used herein shall refer to Contractor personnel whose daily work shall be devoted solely to the EMC 2013/2015

DBE Disadvantaged Business Enterprise

DID Direct Inward Dialing

DISPATCH CENTER

The Contractor's 24/7 dispatching area as required herein, also referred herein as the EMC Dispatch Center

DISTRICT 1 IDOT Department of Transportation area defined as Cook, DuPage, Kane, Lake, McHenry, Will, and a portion of Kendall Counties

DMS Dynamic Message Sign

EFO Illinois Department of Transportation, District 1, Bureau of Traffic, Electrical Maintenance Field Office, 101 W. Center Ct., Schaumburg, IL 60196

ELU Equivalent Location Unit, the result for bidding purposes, of a total of locations per system multiplied by an assigned unit factor

EMC Electrical Maintenance Contract or the Electrical Maintenance Contractor

EMCMS Electrical Maintenance Contract Management System with emergency call-out database

EMERGENCY A condition which is a hazard to the public, or is designated by the Engineer to be a hazard of such severity that life and property are endangered and which requires immediate corrective action

ENGINEER IDOT Resident Engineer on this Contract or authorized representative

EQUIPMENT SERVICE

Refers to the servicing and/or restoration of any equipment to normal operating condition and appearance necessitated by service equipment wear-out, failure, damage or loss

FIU Field Interface Unit, sometimes called an FEP, Front End Processor

FROM ANY CAUSE WHATSOEVER

When used herein shall include any and all causes except those resulting in extensive damage from declared area wide disasters such as fires and floods, acts of the public enemy, or an Act of God. (The declared disaster exclusion will be valid only for the area and time period specified by IEMA and FEMA policies.)

GCM GATEWAY

Gary-Chicago-Milwaukee Corridor Transportation Information Network

GENERAL BILLING INVOICE

Refers to a daily invoice created by the Contractor for time and material work or additional services rendered or work performed for, or on behalf of, a 3rd party, on any part thereof or concerning System installations and equipment owned by IDOT which is included under the scope of maintenance of this contract. Examples would include 3rd party construction related damage repair invoices, work for 3rd party permits involved with construction in the state ROW, 3rd party invoicing for additional cable locate services, etc.

GUI Graphical User Interface

IDOT INSPECTOR

Employees of the Illinois Department of Transportation assigned duties by the Engineer

IMMEDIATE CORRECTIVE ACTION

Refers to all activity necessary to restore the safe operating integrity of a system or system element, without delay

IMSA International Municipal Signal Association

ISP/CMS Illinois State Police Area in a State of Illinois Central Management Service facility

KNOCKDOWN (KD)

Refers to damage which results in the knockdown of a light pole, luminaire, or cabinet, a traffic signal or cabinet, a surveillance signal or cabinet, or camera pole and camera

LIGHT TOWER

Also known as High Mast Lighting Tower

LIGHTING INSTALLATION

One or more lighting units powered from one common electric service

LIGHTING SCADA

The standard specifications for the Illinois Department of Transportation, District 1, Lighting System Supervisory Control and Data Acquisition System

LOCATION For purposes of this Contract, a single defined locally-operational sub-portion of a defined system, usually having a unique electric service or service combination, operated from a unique control cabinet, building, etc., and having a unique system identifier in the Contract.

MANUAL ON TRAFFIC CONTROL DEVICES (M.U.T.C.D.)

State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways”

MOSCAD Motorola Supervisory Control and Data Acquisition

MOSYS Motorist Outreach System, a computer system located at the Traffic Systems Center and ComCenter, which controls Dynamic Message Signs at various expressway locations

MOTORIST CAUSED HIGHWAY DAMAGE (MCHD) REPAIR FUND

A budgeted, re-appropriated item in the state budget from which the Illinois Department of Transportation is given the replacement costs for damaged system equipment caused by motorists, if a police accident report links the motorist to the accident.

NAGIOS Nagios is a software monitoring system that enables organizations to identify and resolve IT infrastructure problems before they affect critical business processes

NEC National Electrical Code

NEMA National Electrical Manufacturers Association

NON-DEDICATED PERSONNEL

When used herein shall refer to Contractor personnel whose daily work priority is the EMC 2013/2015, but whose duties may include other similar type work for the Contractor, but not within the requirements of the EMC.

NON-ROUTINE WORK

Non-routine work shall refer to all maintenance work which is not included under routine work, but which is authorized and paid separately. IDOT is under no obligation to issue authorizations for non-routine work. Methods of payment include use of contract pay items, established agreed prices, or other force mechanisms.

NORMAL WEATHER

Time during which regular dispatch operations continue; no storm alert procedures in effect.

OFF MAINTENANCE

Term used to define a system location which is not being maintained by the state's maintenance contractor

ON MAINTENANCE

Term used to define a system location which is being maintained by the state's maintenance contractor

OSHA Occupational Safety Health Administration

PATROLMAN Defines an electrician, who is assigned regular electrical system patrol and street maintenance response duties by the Contractor. Patrolmen have the responsibility for inspecting and servicing a pre-assigned select group of installations in accordance with a defined regular time schedule. The assigned installations may be from any one (1) or all, of the Electrical Systems included under the overall scope of the Contract.

PAY MEETING

Meeting is held on the second Wednesday of each month, to which the Contractor brings the monthly invoice for the payment of the reconciled quantities of routine maintenance work from the prior month.

PERMANENT REPAIR TIME

Amount of time from initial notification to the Contractor until the time permanent (non-temporary) repairs are made

PLC Programmable Logic Control

POTS Plain old telephone service

PLNC Private line telephone service which provides a direct connection between two points through an automatic ring signal at one end when initiated at the other.

PS Pump or Pumping Station

PS-SCADA The standard specifications for the Illinois Department of Transportation, District 1, for Pumping Station Supervisory Control and Data Acquisition System

QA/QC Quality Assurance/Quality Control

RACS IL 38 (Roosevelt Rd) Ramp Access Control System

RAMP When used in context of the REVLAC system, it refers to an entire reversible lane entrance ramp, including, but not limited to, signs, outside gates, barrier, inside gates, and/or the highway pavement that transitions from one roadway element to another. In this Contract, it may also refer to all access control equipment and systems associated with a particular ramp location.

REGION 1 Area within Cook, DuPage, Kane, Lake, McHenry, Will, and a portion of Kendall Counties (also termed District 1)

RESPONSE TIME

Amount of time from the initial notification to the Contractor until a repair person physically arrives at the location.

REVLAC Reversible Lane Access and Control System for the Kennedy Expressway

ROUTINE MAINTENANCE

Refers to all work required to staff, equip, patrol, inspect and maintain electrical systems, whole and operational, at locations as defined herein, except for work specifically excluded from routine maintenance coverage and paid separately as non-routine maintenance work

RUS Rural Utilities Service, USDA

SALVAGE Material/equipment which has been removed from the installed location, inspected for quality, and re-stored in State Stock for further use if directed by the Engineer

SCADA Supervisory Control and Data Acquisition System

SEOC State Emergency Operations Center

SERVICE RESTORATION TIME

Amount of time from the initial notification to the Contractor until the time the system is safe and operational. (In cases of motorist caused damage, when the undamaged portions of the system are operational.)

SPECIALTY SERVICE

Specialty Service, or Specialty Service Work shall refer to work performed by entities other than the electrical maintenance contractor who may not be pre-qualified subcontractors but whose services are necessary because of specialized equipment, specialized expertise or the maintenance restrictions on a particular piece of electrical system equipment. Examples of specialty service entities include traffic signal control equipment and cabinet repair, motor repair shops, pump re-build shops, communication and/or electronics repair shops, software programmers/developers, manufacturer's authorized repair agents and similar service providers. Such work is not restricted to in-shop work and such services may be field-performed. Such services will not be considered as materials.

STANDARD SPECIFICATIONS

Illinois Department of Transportation's "Standards Specifications for Road and Bridge Construction"

STATE STOCK

When used herein refers to stocks of materials and equipment which are state owned, are to be kept separate from the Contactor's materials and equipment, and shall be used exclusively for the Department's installations and systems.

STORM ALERT

A communication issued by the IDOT ComCenter, as provided by its weather service. Upon receipt of this report, the EMC Dispatch Center storm alert procedure goes into effect.

SYSTEM When used herein refers to any or all the Electrical Systems covered by this Contract including Advanced System, Lighting and Sign Illumination System, Traffic Signal System, Surveillance/DMS Systems, Pump Station System and Extra Systems.

SYSTEM ENGINEER

When used herein refers to IDOT Engineers in charge of maintenance for a particular electrical system for a designated IDOT Bureau.

SYSTEM TYPE

When used herein refers to information provided in Section 3, List of Locations, and defines various sub-sections, types or locations of Pay Items. As an example, the T-1 Pay Item consists of the System Type T-1A, a permanent traffic signal location and System Type T-1B, a span wire traffic signal. An Advanced Systems camera, because it is located on a light tower may be paid through Pay Item L-1, a Lighting System location, but is maintained as per requirements of Article 6.0 Advanced Systems, as System Type A2ST.

THIRD PARTY Any entity other than IDOT or the Contractor

TICKET Maintenance input record of the EMCMS which is used by the Contractor to record various types of malfunctions, failures, damages, knockdowns, vandalism, theft or various other concerns relating to safety matters and/or the reported follow-up response information as necessary to make temporary and/or permanent repairs to restore and/or assure that the system equipment is operating in a normal manner. A ticket consists of various entry screens; dispatch, field response, crew repair follow-up, MCHD repair log, and 3rd party damage information.

TRAFFIC SPECIFICATIONS

The Illinois Department of Transportation's "Standard Specifications for Traffic Control Items", and "Keeping the Expressway Open to Traffic".

TSC The Illinois Department of Transportation, District 1, Bureau of Traffic, Traffic Systems Center, 445 W. Harrison, Oak Park, IL 60304

TSC SPECIFICATIONS

The Illinois Department of Transportation's "Standard Specifications for Traffic Control Items" which includes current design standards for the traffic surveillance system

UPS Uninterruptible Power Supply

V.A.R. Value Added Reseller

WEEK A period of seven (7) consecutive calendar days. Any multiple of this term shall mean a corresponding multiple of number of calendar days.

WORKING DAY

The definition of a working day shall be in accordance with Article 108.04 of the Standard Specifications, with the exception that working days may be charged throughout the entire year.

YARD Any District 1 maintenance yard, sign shop, or other field facility

24/7 Refers to operations required twenty-four hours per day, seven days per week.

All definitions in referenced publications and standards shall apply, except as may be modified herein.

SPECIFICATIONS AND STANDARDS

The latest issue, at the bid date, of the following standards, including subsequent additions or revisions made prior to the bid date, shall apply to all work, materials and equipment furnished and installed under this Contract. In case of conflict with any or parts of the standards listed below the Special Provisions contained herein shall take precedence and shall govern. In case of conflict between referenced standards, the most stringent as determined by the Engineer, shall take precedence and shall govern.

ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS

- Standard Specifications for Road and Bridge Construction, current version

  Note: Article 801.02, Standards of Installation shall apply to all systems under this Contract and is not limited to Lighting.

- Design Manual Section 3-600 published on Highway Lighting
- Flaggers' Handbook
- Highway Standards
- Manual on Uniform Traffic Control Devices
- Accommodating Utilities on Rights-of-Way of IL. State Highway System
- Recurring Special Provisions for Traffic Signals, Road and Bridge
- Special Provisions for Special Non-RCRA Waste and RCRA Hazardous

Waste Working Conditions

- BDE Special Provisions
- Standard Specifications for Traffic Control Items
- Supplemental Construction Specifications and Recurring Specifications, Current Version

IDOT DISTRICT 1 - STANDARDS AND SPECIFICATIONS

- Confined Entry Space Policy
- District 1 Highway Standards
- Freeway Details Freeway Entrance and Exit Ramp Closure Details TC-8
- Traffic Control Details for Freeway Shoulder and Partial Ramp Closures TC-17
- Micro Computer Management Manual
- Permit Specifications Governing Permit Work on State Right-of-Way
- Recurring Traffic Signal Specifications
- Recurring Special Provisions for Roadway Lighting
- Resident Engineers Construction Guide for Electrical Equipment Construction on State Highways
- Standard 2308-4 (Day or Night Moving Operations)
- Standard Specifications for Electrical Maintenance Contract Management System
- Standard Specifications for the Emergency Data Acquisition System
- Standard Specifications Integrated Closed-Loop Traffic Signal Monitoring
- Standard Specification for Pump Station Supv. Control/Data Acquisition System
- Standards for Roadway Lighting by Permit on State Routes
- Standard Traffic Signal Design Details
- Traffic Signal Plan Preparation and Design Guide
- Traffic Surveillance Special Provisions & Traffic Surveillance Typical Drawings

- Keeping the Expressway Open to Traffic

NATIONAL STANDARDS AND SPECIFICATIONS

- An Informational Guide for Roadway Lighting, published by American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Washington, DC 20001

- Insulated Cable Engineers Assn. and Underwriters Laboratories publications when applicable for cable and other materials

- National Electrical Manufacturers Association Standards, American National Standards Institute, where applicable, for signals, lamps, ballasts, and other accessories

- American National Standards Institute, where applicable, for ballasts, and other accessories

- ASTM Standards for materials

- All applicable manuals and policies of FHWA

- American National Standard Practice for Roadway Lighting, published by Illuminating Engineering Society of North America, 120 Wall St., 17th Floor, New York, NY 10005, Phone (212-248-5000)

- National Electrical Code, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, approved by the American National Standards Institute, Publication #ANSI/C2, published by IEEE, 345 E. 47th Street, New York, NY 10017

- Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, an AASHTO Publication

- Institute of Traffic Engineers Technical Report No. 1 (A Standard for Adjustable Face Vehicular Traffic Control Heads)

- Emergency Response Guidebook by U.S. Dept. of Transportation, latest version, for further assistance call National Response Center (NRC) 1-800-424-8802

- Hazardous Materials Regulations, Hazardous Materials Transportation Uniform Safety Act of 1990, Hazardous Materials Regulations and Motor Carrier Safety Regulating by U.S. Department of Transportation

- OSHA, all applicable regulations

- RUS, all applicable regulations

- IMSA Standards & manuals

- Federal Communications Commission

ARTICLE 13.0 HISTORICAL MAINTENANCE DATA FROM PRIOR CONTRACTS

TICKET TOTALS

Year:	Adv	Ltg	PS	Surv	TS	X	All Systems
AV	27	0	0	0	0	0	27
BA	6	0	0	0	0	0	6
CC	168	0	0	0	0	0	168
CT	0	11	0	0	70	1	82
DA	1	5	1	21	10	3	41
EQ	155	332	450	638	3366	218	5159
GB	0	17	0	2	85	2	106
ID	0	2	0	0	0	3	5
LP	0	0	0	43	432	0	475
MC	27	367	1	71	534	6	1006
OM	1	63	5	3	51	1	124
OT	0	21	0	0	7	4	32
RR	0	2	0	0	0	21	23
SO	1	35	2	199	1334	38	1609
SR	1	5	2	0	1	0	9
SW	39	0	0	0	0	0	39
UT	6	174	171	58	839	17	1265
VO	0	4	0	1	7	3	15
WR	0	5	0	0	1	0	6

5 Yr Avg. By Sys:	432	1043	632	1035	6738	316	10197

Ticket Type Codes for All Systems

AV	Automatic Vehicle Locator
BA	Barrier (REVLAC)
CC	CCTV (Camera)
CT	Cable Trouble
DA	Damage
EQ	Equipment Problem
FO	Fiber Optic Problem
GB	General Billing/3rd Party Damage
ID	IDOT Hold on Ticket
LP	Loops Needed
MC	Motorist Caused Damage
OM	Off-Maintenance
OT	Outages – Multiple
RR	Routine Work Request
SO	Single Outage
SR	Service Request
SW	Swing Gate Problem (Not Motorist Caused)
UT	Utility Problem
VO	Void
WR	Work Request by 3rd Party

2011 TICKET TOTALS

	Adv	Ltg	PS	Surv	TS	X	TOTAL
AV	11	0	0	0	0	0	11
BA	6	0	0	0	0	0	6
CC	219	0	0	0	1	0	220
CT	0	3	0	0	57	1	61
DA	0	5	1	16	15	2	39
EQ	191	303	483	599	3755	144	5475
FO	1	0	0	0	0	0	1
GB	0	17	0	1	62	0	80

ID	0	1	0	1	0	0	2
LP	0	0	0	37	308	0	345
MC	28	338	0	65	523	5	959
OM	3	57	12	7	43	4	126
OT	0	26	0	0	1	3	30
RR	1	0	0	0	1	63	65
SO	4	35	2	199	1410	26	1676
SR	3	22	11	0	4	2	42
SW	36	0	0	0	0	0	36
UT	19	267	217	119	1023	15	1660
VO	0	2	1	2	9	0	14
WR	0	1	0	0	1	0	2
Total:	522	1077	727	1046	7213	265	10850

2010 TICKET TOTALS

	Adv	Ltg	PS	Surv	TS	X	TOTAL
AV	25	0	0	0	0	0	25
BA	7	0	0	0	0	0	7
CC	160	0	0	0	0	0	160
CT	0	11	0	0	54	1	66
DA	3	3	0	11	5	4	26
EQ	166	343	500	512	3366	279	5166
FO	1	0	0	0	0	0	1

GB	0	21	1	4	58	1	85
ID	0	0	0	0	0	1	1
LP	0	0	0	83	372	0	455
MC	36	324	0	58	450	5	873
OM	0	39	3	3	38	1	84
OT	0	33	0	0	1	8	42
RR	0	12	0	0	0	8	20
SO	0	34	1	176	1321	26	1558
SR	0	1	0	0	1	0	2
SW	35	0	0	0	0	0	35
UT	4	225	149	111	823	19	1331
VO	2	1	0	2	5	3	13
WR	0	4	0	0	0	0	4
Total:	439	1051	654	960	6494	356	9954

2009 TICKET TOTALS

	Adv	Ltg	PS	Surv	TS	X	TOTAL
AV	41	0	0	0	0	0	41
BA	4	0	0	0	0	0	4
CC	96	0	0	0	0	0	96
CT	0	12	0	0	68	1	81
DA	0	5	0	17	5	1	28
EQ	149	240	382	652	2942	235	4600

FO	0	0	0	0	0	0	0
GB	0	17	0	1	83	2	103
ID	0	5	0	0	0	3	8
LP	0	0	0	56	566	0	622
MC	23	341	1	57	445	7	874
OM	0	74	1	1	49	1	126
OT	0	29	0	1	10	1	41
RR	0	0	0	0	0	3	3
SO	0	36	2	220	1530	30	1818
SR	0	0	0	0	0	0	0
SW	28	0	0	0	0	0	28
UT	3	97	138	19	574	13	844
VO	0	7	0	0	6	2	15
WR	0	2	0	0	2	0	4
Total:	344	865	524	1024	6280	299	9336

ANALYSIS OF EQUIPMENT (EQ) TICKETS -- PROBLEMS REPORTED – YEAR 2011

ADVANCED SYSTEMS TICKET TOTALS FOR EQUIPMENT (EQ) REPORTED PROBLEMS*

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
2	3	6	6	3	4	4	8	3	5	4	2	49	ComCenter Equipment
0	3	4	1	1	2	2	2	8	7	4	2	36	Bldg or Hut Control Equipment
0	1	1	4	1	1	4	4	0	1	1	2	20	Base Station or Tower Equipment
0	0	0	1	2	6	0	4	1	5	2	1	22	Video or Communications
0	2	0	1	2	3	1	0	0	2	0	0	11	Signs or Chevrons
2	5	3	1	6	10	7	3	2	4	7	2	52	Miscellaneous
4	14	14	14	15	26	18	21	14	24	18	9	191	

LIGHTING SYSTEM TICKET TOTALS FOR EQUIPMENT (EQ) REPORTED PROBLEMS*

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
10	12	9	3	7	7	17	9	6	3	7	12	102	Lighting Out (not lamp outages)
2	3	1	7	1	6	2	1	3	1	1	5	33	SCADA Alarm
2	3	2	0	1	2	2	6	4	0	1	1	24	Lights On at Wrong Time
0	1	1	0	0	0	0	0	1	0	0	2	5	Tower Equipment
10	10	15	11	10	23	10	19	7	3	13	8	139	Miscellaneous
24	29	28	21	19	38	31	35	21	7	22	28	303	

PUMP STATION SYSTEM TICKET TOTALS FOR EQUIPMENT (EQ) REPORTED PROBLEMS*

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
8	11	12	14	23	26	55	16	12	13	9	8	207	AEGIS Alarm
9	9	14	5	12	2	16	10	5	4	9	5	100	SCADA Alarm
7	3	5	4	10	4	9	7	7	6	3	3	68	Pump Equipment (fittings,float, propeller,relays, release valve,etc.)
2	0	1	1	3	2	5	5	2	0	1	1	23	Trash Racks
0	1	0	0	0	1	0	0	0	0	5	1	8	Fire Alarm Batteries
2	0	0	0	0	0	0	0	1	1	0	1	5	Heaters
0	0	0	0	2	0	0	0	0	0	1	1	4	Gas Detectors
0	0	1	0	0	0	0	0	0	0	0	2	3	Roof or Louvers
2	4	9	9	16	5	5	6	3	1	2	3	65	Miscellaneous
30	28	42	33	66	40	90	44	30	25	30	25	483	

*Does not include motorist caused damages.

ANALYSIS OF EQUIPMENT (EQ) TICKETS -- PROBLEMS REPORTED -- YEAR 2011

SURVEILLANCE SYSTEMS TICKET TOTALS FOR EQUIPMENT (EQ) REPORTED PROBLEMS*

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
27	9	6	8	20	21	16	38	4	24	12	16	201	Surveillance Telemetry
8	7	25	7	22	14	35	32	9	16	6	13	194	DMS Alarm
17	10	9	7	8	14	19	14	5	16	7	9	135	Cabinet All Out

6	4	2	0	0	8	2	3	1	4	4	3	37	Ramp Metering
5	4	3	2	4	2	7	0	0	2	1	2	32	Miscellaneous
63	34	45	24	54	59	79	87	19	62	30	43	599	

TRAFFIC SIGNAL TICKET TOTALS FOR EQUIPMENT (EQ) REPORTED PROBLEMS*

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
99	168	122	103	136	190	293	141	121	88	98	80	1639	Flashing Red
59	109	50	40	66	72	65	62	76	59	56	34	748	Cycles Not Working/Timing Problem/Arrow Malfunction
9	105	23	23	32	44	74	16	14	19	33	19	411	Twisted Head and/or Twisted and Conflicting
12	39	20	9	22	52	69	24	16	9	15	8	295	All Out
3	15	8	9	23	25	13	21	16	10	13	14	170	Pedestrian Box, Button, or Timing
8	45	16	14	13	17	10	3	4	10	16	10	166	Shroud, Base, Bracket, Covers, Backplate, Door, or Visor
9	37	8	15	11	5	5	3	6	5	10	10	124	Equipment or Cable Not Secure; swaying, hanging, etc.
16	12	7	5	9	10	9	5	7	2	11	6	99	Video or Communications
6	14	13	11	10	11	15	6	2	3	6	6	103	Miscellaneous
221	544	267	229	322	426	553	281	262	205	258	187	3755	

EXTRA SYSTEMS TICKET TOTALS FOR EQUIPMENT (EQ) REPORTED PROBLEMS*

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
13	5	10	10	15	12	5	0	0	0	4	7	81	Lighting -Inside or Outside, lamps, fixtures, outages, etc.
3	2	0	1	1	1	0	0	0	0	1	5	14	Outlet, Switch, or Conduit Problems
2	4	1	1	2	0	0	1	2	0	2	2	17	Power Problems (building or equipment)
1	0	0	0	0	1	1	0	0	0	1	4	8	Time Clocks, Timers, timing problem
1	2	0	1	0	0	1	0	0	2	0	1	8	Navigational Lighting or Moveable Bridge Problem
1	3	0	1	0	0	0	0	0	0	2	0	7	Pump Problem
0	1	2	0	0	0	0	0	0	0	0	1	4	Heater Problem
0	1	0	0	1	2	0	0	0	1	0	0	5	Generator Problem
21	18	13	14	19	16	7	1	2	3	10	20	144	

Total Traffic Signals, Hwy. Lighting & Surveillance MCHD Incidents

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Yr.Total	Mo.Avg
2012	99	80	67	52										
2011	107	155	66	72	69	59	70	55	42	63	64	104	926	77
2010	85	88	58	57	40	72	55	52	59	64	68	136	834	70
2009	128	105	68	56	47	52	54	59	47	76	39	112	843	70

2008	160	152	93	73	85	63	68	72	61	64	68	172	1131	94
2007	126	157	93	85	73	78	69	86	59	67	75	158	1126	94
2006	102	104	84	76	86	81	72	80	86	97	80	93	1041	87
2005	148	82	88	83	69	65	82	82	67	87	121	115	1089	91
7 Yr. Avg:	122	120	79	72	67	67	67	69	60	74	74	127	998	83

Traffic Signal Motorist Caused Damage Incidents

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Yr.Total	Mo.Avg
2012	47	38	40	30										
2011	46	103	40	32	36	35	42	29	24	34	39	63	523	44
2010	41	48	27	31	23	39	31	30	43	36	34	68	451	38
2009	64	53	36	32	27	26	34	23	27	46	19	58	445	37
2008	71	70	46	40	50	40	33	45	34	41	36	83	589	49
2007	64	84	60	45	54	47	33	55	32	45	54	88	661	55
2006	50	65	50	49	58	46	42	49	43	61	52	49	614	51
2005	71	50	53	45	43	34	57	53	39	56	70	63	634	53
7 Yr. Avg:	58	68	46	39	42	38	39	41	40	46	43	67	567	47

Hwy. Lighting Motorist Caused Damage Incidents

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Yr.Total	Mo.Avg
2012	36	37	25	18										
2011	51	40	19	32	28	21	26	21	17	25	22	36	338	28
2010	34	28	29	22	15	30	21	17	13	26	31	58	324	27
2009	46	42	30	19	19	22	19	33	16	27	17	51	341	28
2008	76	68	40	27	29	20	28	19	23	20	28	81	459	38
2007	51	57	24	34	15	26	25	27	22	17	17	59	374	31
2006	44	31	26	22	25	27	23	26	35	34	22	38	353	29
2005	60	27	25	28	22	26	20	18	21	29	44	44	364	30
7 Yr. Avg:	52	42	28	26	22	25	23	23	21	25	26	52	365	30

Surveillance Motorist Caused Damage Incidents

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Yr.Total	Mo.Avg
2012	16	5	2	4										
2011	10	12	7	8	5	3	2	5	1	4	3	5	65	5
2010	10	12	2	4	2	3	3	5	3	2	3	10	59	5
2009	18	10	2	5	1	4	1	3	4	3	3	3	57	5
2008	13	14	7	6	6	3	7	8	4	3	4	8	83	7
2007	11	16	9	6	4	5	11	4	5	5	4	11	91	8
2006	8	8	8	5	3	8	7	5	8	2	6	6	74	6
2005	17	5	10	10	4	5	5	11	7	2	7	8	91	8
7 Yr. Avg:	12	11	6	6	4	4	5	6	5	3	4	7	73	6

The above information is provided from data submitted by past Contractor(s) and is provided for information purposes only.

TRAFFIC SIGNAL -- MOTORIST CAUSED DAMAGE REPAIRS

MATERIALS USED	5 Yr. Avg. Qty	2011 Qty	2010 Qty	2009 Qty	2008 Qty	2007 Qty
TS Mast Arm and Standard FR	19	16	21	17	20	21
TS Standard Only	30	36	19	22	35	39
TS Mast Arm Only	1	4	0	0	0	0
TS Head Only	480	351	346	436	550	718
TS L.E.D. Head Only	138	241	169	81	121	76
TS Cabinet FR	20	16	24	15	23	24
TS Cabinet w/Battery Backup FR	1	1	3	0	1	1
TS Cabinet Shell Only	11	15	8	10	9	11
TS Flasher or Surv. Ramp Signal FR	3	4	0	1	3	5
TS Base or Pedestrian Walk Box	339	340	293	264	375	425

HIGHWAY LIGHTING -- MOTORIST CAUSED DAMAGE REPAIRS

MATERIALS USED	5 Yr. Avg. Qty	2011 Qty	2010 Qty	2009 Qty	2008 Qty	2007 Qty
Light Pole FR	84	70	70	70	106	106
Mast Arm Only	117	117	107	111	145	106
Luminaire Only	257	250	224	252	320	239
T-Base Only	252	245	221	245	313	235

Lighting Cabinet FR	0	0	0	0	0	0
Lighting Cabinet Shell Only	1	0	0	1	2	0
Underpass Fixture	1	0	0	0	1	3

FR= Full Replacement

TRAFFIC SIGNAL SYSTEM

LABOR AND EQUIPMENT TO CLEAR MCHD SITE FOR SAFETY

	5 Yr. Avg.	2011	2010	2009	2008	2007
# of Journeymen	318	317	242	285	370	375
ST Hours	447	491	419	438	277	611
# of Journeymen	331	240	261	198	591	363
OT Hours	582	512	591	438	590	781
# of Patrol Trucks	513	481	448	425	568	644
Hours	1039	943	937	830	1146	1342
# of Aerial Trucks 26 to 55 Ft.	28	39	28	20	23	31
Hours	79	90	108	53	60	84
# of Aerial Trucks Up to 70 Ft.	1	2	1	2	0	1
Hours	6	9	6	7	0	9

TRAFFIC SIGNAL SYSTEM

LABOR AND EQUIPMENT USED FOR MCHD REPAIRS

	5 Yr. Avg.	2011	2010	2009	2008	2007
# of Journeymen	661	670	551	534	729	819
ST Hours	1591	1519	1331	1339	1802	1963
# of Helpers	335	304	303	264	378	427
ST Hours	1017	898	877	813	1217	1282
# of Patrol Trucks	352	187	338	305	437	492
Hours	1085	616	1055	954	1356	1444
# of Aerial Trucks 26 to 55 Ft.	471	463	401	377	522	594
Hours	1456	1402	1243	1184	1647	1803
# of Aerial Trucks Up to 70 Ft.	3	3	1	1	7	3
Hours	14	16	6	5	26	17

HIGHWAY LIGHTING SYSTEM

LABOR AND EQUIPMENT TO CLEAR MCHD SITE FOR SAFETY

	5 Yr. Avg.	2011	2010	2009	2008	2007
# of Journeymen	170	162	174	142	202	172
ST Hours	224	217	215	187	273	228

# of Journeymen	190	169	162	179	228	211
OT Hours	369	332	314	345	441	414
# of Patrol Trucks	335	309	300	310	406	349
Hours	638	537	547	531	704	871
# of Aerial Trucks 26 to 55 Ft.	5	7	4	3	8	3
Hours	12	17	12	8	18	7
# of Aerial Trucks Up to 70 Ft.	4	5	10	0	1	3
Hours	6	10	15	0	1	5

HIGHWAY LIGHTING SYSTEM

LABOR AND EQUIPMENT USED FOR MCHD REPAIRS

	5 Yr. Avg.	2011	2010	2009	2008	2007
# of Journeymen	777	703	686	724	956	816
ST Hours	806	821	730	736	953	790
# of Helpers	277	265	244	243	374	259
ST Hours	569	620	562	483	670	512
# of Patrol Trucks	336	326	304	325	428	295
Hours	764	812	723	729	935	625
# of Aerial Trucks 26 to 55 Ft.	73	13	38	105	108	102

Hours	199	34	103	283	297	281
# of Aerial Trucks Up to 70 Ft.	274	313	265	218	328	246
Hours	597	775	618	444	652	498
# Repairs Needing an Attenuator	101	78	89	104	131	104
Hours	245	188	195	258	308	278

LIGHTING OUTAGE HISTORY ---- TOTAL OUTAGES REPAIRED BY MONTH

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
2012	614	554	615	538									
2011	475	851	597	569	521	734	659	890	556	588	576	650	7666
2010	671	576	542	705	697	630	794	663	529	535	620	670	7632
2009	840	539	667	714	618	490	544	451	573	687	506	519	7148
2008	820	629	490	613	532	506	514	690	691	660	452	448	7045
2007	536	501	599	538	472	460	449	490	690	423	432	562	6152
2006	642	642	498	633	536	571	491	571	541	621	517	531	6794
2005	706	344	663	635	641	599	671	538	491	530	519	766	7103
Avg.	663	580	584	618	574	570	589	613	582	578	517	592	7077

The above information is provided from data submitted by past Contractor(s). Outages for Years 2013 through 2015 may be higher or lower than the above numbers.

Note that approximately 15 to 17% of the total outage numbers as shown above are outages found by the repair crew when they light the cabinet to repair outages as found on the Night Patrol Survey.

MATERIALS USED IN OUTAGES REPAIRS – YEAR 2011

Ballasts	301
Capacitors	208
Fuse Kits	157
Fuses	1981
Glass Doors	21
Lamps	7351
Luminaires	243
Photo Cells	4
Pole Wire (in Ft.)	5790
Power Doors	55
Sockets	115
Starters	366
Tower Grips	4
Tower Motor	1
Tower Plugs	2

Work found necessary by the Repair Crew:

Cable Repairs:	10
Splice Repairs:	43
Head Wire Repairs:	82
Other Misc. Repairs:	81

The above information, from Year 2011, is provided as an example of repairs and materials necessary for the work, but may not be representative of future years.

PAY **2012 ROUTINE MAINTENANCE LOCATION QUANTITIES FOR PAYMENT**

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
A-1	313	313	313	313	313								313
A-2	178	180	180	178	177								179
A-3	22	22	22	24	24								23
L-1	244	244	244	243	246								244

L-2	176	169	169	169	169								170
L-3	83	89	89	89	88								88
P-1	24	24	24	24	24								24
P-2	19	19	19	19	19								19
S-1	114	115	115	115	115								115
S-2	647	646	646	659	658								651
S-3	40	40	40	40	40								40
S-4	15	15	15	15	15								15
T-1	2451	2453	2447	2429	2426								2441
T-2	313	313	308	302	295								306
X-1	67	67	67	67	67								67
TOTAL:	4706	4709	4698	4686	4676								4695

PAY **2011 ROUTINE MAINTENANCE LOCATION QUANTITIES FOR PAYMENT**

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
A-1	na	na	na	313	313	313	313	313	313	313	313	313	313
A-2	na	na	na	129	141	141	141	162	163	163	163	163	152
A-3	na	na	na	21	21	21	22	22	22	22	22	22	22
L-1	248	247	248	244	245	245	246	246	243	244	245	244	245
L-2	176	176	175	177	177	176	177	176	175	175	177	178	176
L-3	85	83	83	82	81	83	83	84	84	84	85	84	83
P-1	27	27	26	25	25	24	23	24	24	24	24	24	25
P-2	20	20	20	20	20	20	20	20	20	20	19	19	20
S-1	99	99	99	99	109	109	111	111	102	116	116	116	107

S-2	591	591	586	586	604	603	606	606	615	643	643	643	610
S-3	40	40	40	40	40	40	40	40	40	40	40	40	40
S-4	14	14	14	14	14	14	14	15	15	15	15	15	14
T-1	2406	2402	2398	2383	2385	2372	2373	2383	2374	2373	2411	2435	2391
T-2	296	296	296	295	306	306	306	310	312	312	313	314	305
X-1	69	69	69	69	69	69	69	69	67	67	67	67	68
TOTAL:	4071	4064	4054	4497	4550	4536	4544	4581	4569	4611	4653	4677	4451

Past Pay Item Quantities of Locations for the Electrical Maintenance Contract are provided to show seasonal patterns over the contract year, generally due to construction activity. Bidders should not make the assumption that historic pay item quantities listed above are representative of the quantities for payment in 2013-2015, as equipment for maintenance has been consolidated in locations, and thus many systems have a fewer number of routine maintenance pay items than in past years.

Data for Parts used during 2011 Maintenance Yard trouble calls

Item #	Part Description	Quantity
1	Lamps	651
2	Battery	1
3	Damaged Conduit	22
4	Damaged Panel	2
5	Ballast	73

6	Box	2
7	Switch	9
8	GFIC	23
9	Light Fixture	12
10	Bad Splice	3
11	Clock	1
12	Breaker	5
13	Calcium Chloride Pump	5
14	Timer	1
15	Exhaust Fan	1
16	Photocell	4
17	Sensor	1
18	Glass	2
19	Beacon Light	4
20	Light Pole	1
21	Mast Arm	1
22	LED Lamps	6
23	Compressor Pressure Switch	1
24	Generator Pressure Switch	1
25	Fuses	5

The above information is provided from data submitted by past Contractors and it is provided for information purposes only.

SECTION 2 -- SPECIAL PROVISIONS - NON-ROUTINE MAINTENANCE PAY ITEMS

Figures mentioned herein will be available upon request at the Pre-Bid Meeting

Advanced Technology Systems – Non-Routine Pay Items

ACC1 CCTV DOME CAMERA ASSEMBLY, COLOR, PTZ CONTROL, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State stock a Color CCTV dome camera assembly complete with an outdoor environmentally rated housing as manufactured by Bosch, Inc. Series EnviroDome with external transformer or approved equal suitable for integration into the existing system. The assembly shall include a high performance color camera with 26X optical zoom or better, and 12X digital zoom. The assembly shall also include the pan, tilt and zoom mechanisms. An alternate camera manufacturer may be used provided that it is directly compatible with the existing CCTV camera system without the use of external PTZ protocol conversion devices and with the approval of the Engineer.

Transportation. The Contractor shall transport and handle the CCTV cameras in complete conformance with the manufacturer's recommendations.

Basis of Payment. This work shall be paid at the contract unit price each for CCTV DOME CAMERA ASSEMBLY, COLOR, PTZ CONTROL, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State Stock as specified herein and as directed by the Engineer.

ACC2 CCTV VIDEO ENCODER, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock or any system location within District 1, a CCTV Video Encoder, power supply and surge suppression for data and/or video.

Materials. Materials shall be in accordance with Article 1069.08 of the Standard Specifications for Road and Bridge Construction, current version and shall be equal to Edco PC642, Edco PCB1BKEY, Pelco 24/28V (WCS1-4), IsoBar 4, and Axis 241S Video Encoder or per written approval by the Engineer.

Method of Measurement. Video Encoder, shall be counted, each, furnished with power supply and surge suppression and all incidental materials necessary for installation.

Basis of Payment. This item shall be paid at the contract unit price, each, for furnishing one, CCTV VIDEO ENCODER, with power supply and surge suppression, of the type as specified, which shall be payment in full for the item specified herein.

ACC3 CCTV CABLES, (POWER, CONTROL, COAX)

Description. This item shall consist of furnishing and installing CCTV Cables, (power, control, and coax) to State Stock or any system location within District 1.

Materials. Materials shall be in accordance with Article 1069.08 of the Standard Specifications for Road and Bridge Construction, current version and shall be equal to Berk-Tek HYPER PLUS 5e OSP Standard Category 5e UTP cables; HWC Tray Cable – Control Cable, 600 Volt UL Type TC, THHN or THWN Insulation, with PVC Jacket and Copper Conductors; ICM Corp, BNC type connector, DB6BNCU, to fit standard, tri-shield, and quad-shield RG6U coaxial cable; and Belden 1694WB coax, flooded RG-6/U type precision low-loss serial digital video coax, of the sizes as specified by the Engineer.

Method of Measurement. CCTV Cables, (power, control, and coax), shall be counted together as a unit per foot, for furnishing and installing the types as specified and approved.

Basis of Payment. This item shall be paid at the contract unit price, per unit, per foot for CCTV CABLES, (POWER, CONTROL, and COAX), which shall be payment in full for the item specified herein.

ACC4 CCTV VIDEO ENCODER WEATHERPROOF

Description. This item shall consist of furnishing and installing, to any system location within District 1, a Weatherproof CCTV Video Encoder, power supply and surge suppression for data and/or video.

Materials. Materials shall be in accordance with Article 1069.08 of the Standard Specifications for Road and Bridge Construction, current version and shall be equal to Edco PC642, Edco PCB1BKEY, Pelco 24/28V (WCS1-4), NKF C-60 E-MC Video Encoder with power supply, IsoBar 4, and necessary installation materials, all per written approval by the Engineer.

Method of Measurement. Weatherproof Video Encoder, shall be counted, each, furnished and installed with power supply and surge suppression and all incidental materials necessary for installation.

Basis of Payment. This item shall be paid at the contract unit price, each, for furnishing and installing a Weatherproof CCTV VIDEO ENCODER, with power supply and surge suppression, which shall be payment in full for the item and work as specified herein.

ACM1 CCTV COLOR MONITOR, QUAD, 4", FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock four, 4" inch, active matrix, color monitors, Marshall Electronics V-R44P or approved equal, with the following characteristics.

Power Source	120 V AC, 60 Hz
Power Consumption	3 W (Approx.)
Input/Output	Video (Input:1 with active loop through)
TV System	NTSC
Resolution	480 x 234 pixels, 112,300 total
Dot Pitch	.171 mm X .264 mm pixel
Viewing Radius	130^0 Horizontal and vertical

Brightness (in cd/m^2)	300
Contrast Ratio	500:1
Actual Display Size (Approx.)	3.23” X 2.43” (4” diagonal)
Overall Size (Approx.)	19.125”W X 3.43”H X 1.9”D
19-type Rack-Mount	Yes, 2U High
Ambient Operating Temperature	-10°C to +50°C (+14°F to +122°F)
Ambient Operating Humidity	Less than 90%
Backlight Life	5 year /50,000 hours
Weight	3.5 lbs.

Basis of Payment. This work shall be paid at the contract unit price each for CCTV COLOR MONITOR, QUAD, 4”, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State stock as specified herein and as directed by the Engineer.

ACM2 CCTV COLOR MONITOR, 8.4”, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock one, 8.4 inch, active matrix, CCTV Color monitor, Marshall Electronics V-R84P-SDI or approved equal, with the following characteristics. Note a REVLAC panel installation shall include custom mounting bracket.

Power Source	120 V AC, 60 Hz
Power Consumption	4 W (Approx.)
Input/Output	1 composite video, S-Video and SDI inputs with active loop through
TV System	NTSC

Resolution	800 x 600 dots with 1.44 million RGB pixels
Dot Pitch	.213 mm square pixel
Viewing Radius	130^0 Horizontal and vertical
Brightness (in cd/m^2)	350
Contrast Ratio	500:1
Actual Display Size (Approx.)	6.7" X 5.03" (8.4" diagonal)
Overall Size (Approx.)	8.74"W X 6.73"H X 2.65D
Stand Alone	Yes
Ambient Operating Temperature	-10°C to +50°C (+14°F to +122°F)
Ambient Operating Humidity	Less than 90%
Backlight Life	5 year /50,000 hours
Weight	3 lbs.

Basis of Payment. This work shall be paid at the contract unit price each for CCTV COLOR MONITOR, 8.4", FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State Stock as specified herein and as directed by the Engineer.

ACM3 CCTV COLOR MONITOR, DUAL, 8.4", FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock one dual screen, 8.4 inch Color TFT monitors, Marshall Electronics V-R82DP-2C or approved equal, with the following characteristics.

Power Source	120 V AC, 60 Hz
Power Consumption	10 W (Approx.)

Input/Output	Video (Input: 2 / Output: 2, loop through) -- composite video
TV System	NTSC
Resolution	800 x 600 dots with 1.44 million RGB pixels
Dot Pitch	.213 mm square pixel
Viewing Radius	130^0 Horizontal and vertical
Brightness (in cd/m^2)	350
Contrast Ratio	500:1
Actual Display Size (Approx.)	17 cm X 12.8 cm (8.4" diagonal)
Overall Size (Approx.)	25 cm (9-13/16") diagonal
19-type Rack-Mount	Yes, 4U Height
Ambient Operating Temperature	-10°C to +50°C (+14°F to +122°F)
Ambient Operating Humidity	Less than 90%
Backlight Life	5 year /50,000 hours
Dimensions (W x H x D)	486 x 175 x 38 mm (19-1/8" x 6-7/8" x 1-1/8")
Weight	2.4 kg (5.5 lbs.)

Basis of Payment. This work shall be paid at the contract unit price each for CCTV COLOR MONITOR, DUAL, 8.4", FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State Stock as specified herein and as directed by the Engineer.

ACM4 CCTV COLOR MONITOR, 15.1", FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock a 15.1", LCD, Color CCTV monitor, Marshall Electronics V-R151DP-AFSD or approved equal, with the following characteristics.

Power Source	120 V AC, 60 Hz TO 12 V DC
Power Consumption	12 V DC 3.0 Amps
Input/Output	Comp. Video, S-Video, BNC, DVI
TV System	NTSC
Resolution	1024 H X RGB X 768 V
Dot Pitch	0.099 X 0.297 mm
Brightness	500 cd
Display	15" diagonal (11.95" X 8.98")
Overall Size (Approx.)	15.25" X 10.5" X 1.77"

Basis of Payment. This work shall be paid at the contract unit price each for CCTV COLOR MONITOR, 15", FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State Stock as specified herein and as directed by the Engineer.

ACP1 CCTV CAMERA POLE, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock, a CCTV camera pole, under 55 feet mounting height, complete with CCTV camera mounting brackets as manufactured by Union Metal Inc., or as approved by the Engineer, identical to the existing CCTV camera poles in use.

Basis of Payment. This work shall be paid at the contract unit price each for CCTV CAMERA POLE, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State Stock as specified herein and as directed by the Engineer.

ALD1 LED CHEVRON SIGN, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State stock a LED chevron sign as manufactured by National Sign & Signal Company, reference National Sign Drawing No. B5450-592LED or as approved by the Engineer, compatible to the existing fiber optic chevron signs in use complete with heaters. The signs shall have built in thermostats as have the existing fiber optic chevrons.

Basis of Payment. This work shall be paid at the contract unit price each for LED CHEVRON SIGN, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State stock as specified herein and as directed by the Engineer.

ALD2 LED AUXILIARY SIGN, FURNISH ONLY

Description.

This item shall consist of furnishing and delivering to State stock a LED auxiliary sign as manufactured by National Sign & Signal Company compatible to the existing fiber optic auxiliary signs in use complete with heaters. The auxiliary sign shall be of the following type as directed by the Engineer:

Type of Sign	**National Sign Drawing No**
"GATES CLOSING"	B5447-589LED
"STAY IN YOUR LANE"	B5448-590LED
Red "X"	B5449LED-2

The LED auxiliary sign shall include thermostats to control the heaters.

Basis of Payment. This work shall be paid at the contract unit price each for LED AUXILIARY SIGN, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State stock as specified herein and as directed by the Engineer.

ALD3 LED LANE USAGE SIGN, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State stock a LED Lane Usage sign compatible to the existing lane usage signs in use complete.

Basis of Payment. This work shall be paid at the contract unit price each for LED LANE USAGE SIGN, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State stock as specified herein and as directed by the Engineer.

ALD4 LED GORE SIGN, FURNISH ONLY

Description. This work shall consist of furnishing and delivering to storage a LED gore sign as described herein. The LED shall be fully operationally equivalent to the existing fiber optic gore sign.

Vendors. The LED system (sign, controller, related appurtenances) shall be manufactured by or approved equal:

Daktronics, Inc.	800-843-5843
Skyline Products:	800-759-9046
National Sign & Signal	269-963-2865

Paint. Paint for the sign front and mask shall be a fluoropolymer-based coating system containing KYNAR 500 resin or equivalent.

Displays. The display shall be provided, utilizing 26mm diameter pixels, each consisting of identical clusters of LED's as per the requirements stated herein.

The signs shall have sufficient borders on all four sides for display clarity and background contrast, and shall be legible from a distance of 300 feet, within a minimum 17 degree cone of vision on each side of the centerline perpendicular to the width of the sign.

The minimum sign luminance shall be 4300 cd/sq m over the range of 8.5 degrees right and left of the vertical geometric center of the sign and 8.5 degrees below the horizontal geometric center of the sign.

All LED's shall conform to the following minimum requirements:

LED's shall be un-tinted, non-diffused, high-output, solid state lamps utilizing aluminum indium gallium phosphide (AlInGaP) LED technology. These lamps shall be as produced by Hewlett-Packard or approved equal and shall be fully interchangeable.

The MTBF at an ambient temperature of +85 degrees Celsius shall be a minimum of 500,000 hours. LED's shall have an operating temperature range of -13 to +185 degrees Fahrenheit (-25 to +85 Celsius).

LED's shall be of the size T-1 3/4 (5 mm).

Normalized intensity of an LED at an angle of 10 degrees off the center axis shall be no less than 50% of the normalized intensity at an off-axis angle of 0 degrees.

Pixels. LED's shall be mounted in 26mm diameter pixels, each one consisting of 4 LED's.

Pixels shall be mounted on a printed circuit board, and shall be arranged into a seven (7) pixel high by five (5) pixel wide matrix. Characters formed by the VMS displays shall have a minimum of seven (7) pixels in height. The number of pixels making up the character width shall vary by character and shall be in accordance with the characters described herein. The pixel pitch, or center-to-center spacing, shall produce a character 18. in height (+/- 0.5%).

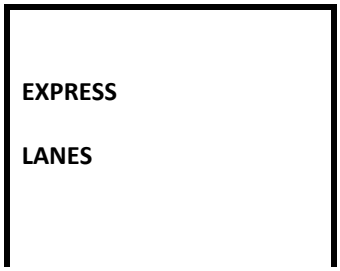
The LED printed circuit board shall be double-sided and shall be plated on both sides with a minimum of .002 inches of copper. The cathode pads shall be located on both the front and back sides of the board. Each cathode lead trace pad shall be a minimum of 0.40 square inches in size.

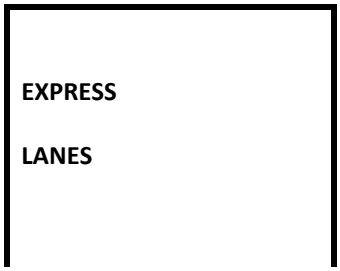
The LED printed circuit boards shall be coated on their front and back sides with a moisture-resistant acrylic conformal coating. The coating shall have a minimum cured thickness of 0.003 inches, except around the front of each LED pixel, where the coating shall be a minimum of 0.006 inches thick. Each pixel shall be protected from normal handling damage by a circular polycarbonate plastic ring that clips onto the printed circuit board and surrounds the LED's. The ring shall be 0.5 to 0.6 inches in height and have a minimum wall thickness of 0.050 inches.

Each pixel printed circuit board shall attach mechanically to an aluminum module panel using standoffs and wing-nut fasteners. Each printed circuit board shall be removable from its module using simple hand tools or no hand tools. The front of the module panel shall be painted flat black.

Pixels shall have automatically variable brightness capabilities. Sign shall only operate at full brightness on cloudless days with full sunshine.

Pixels shall operate with no more that 20 mA of current at full intensity.





Ramp Closed

Ramp Open

Dimensions	
Sign Height	47”
Sign Width	40”
Height of **X**	30”
Character Height	6”
All dimensions are approximate	

LED Colors	
Express Lanes	Amber
Closed	Red
X	Red
Open	Green
Arrow	Green

Exterior Housing. Sign housings shall be constructed of aluminum, alloy 3003-H14, and shall not be less than 1/8 inch thick. Seams shall be continuously welded except for the sign face. Framing structural shapes shall be constructed of aluminum, alloy 6061-T6. Non-corrosive materials shall be used where possible and corrosion protection shall be provided between dissimilar metals. Sign cases shall be cleaned and deoxidized after welding.

The enclosure shall be thoroughly cleaned and then neutralized for priming. The housing shall then be treated with a phosphate coating solution and sealed as per Military Specification MIL-C-5541. The surface shall be prepared for priming per the primer manufacturer's recommended pretreatment procedure. A zincchromate primer shall be applied, 34 mills thick, followed by a top coat of epoxy-mastic based flat matte black paint. The primer and paint shall be compatible products from the same manufacturer.

Sign face shall be designed and developed in a manner that reduces or eliminates reflections from headlights or sunlight. Signs shall have ICYNAR 500 or equivalent polycarbonate sign face coverings. Coverings shall be weather tight, ultraviolet protected, and non-diffusing, with a thickness of 1/4 inch. Polycarbonate sign face shall be covered with a 0.040 inch minimum thickness aluminum mask. Aluminum mask shall provide openings directly in front of each pixel. Pixel openings shall be of sufficient size so as to not interfere with LED light output. Sign face shall be designed to minimize bowing.

Sign housing, windows, framing and mounting members shall be designed to withstand a wind velocity of 90 mph with a gust factor of 30 percent in accordance with AASHTO's “Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" and certified by a registered Professional Structural Engineer.

Signs shall be constructed to present a clean, neat appearance; the equipment located therein shall be protected from moisture, dust, dirt and corrosion. Sign enclosures shall contain small weep holes for draining moisture accumulating in the signs from condensation. Weep holes shall be designed so as to protect against insect entrance.

Lifting eyes or other equivalent components shall be provided for moving and mounting signs. The sign housing shall be designed such that the sign can be shipped and temporarily stored without damage or undue stresses prior to installation. The sign shall be provided with a temporary storage support frame that will permit the storage of the sign in an above-ground vertical position without damage to the sign housing.

Power Supplies. Power supplies shall operate from 208 VAC power. The LED displays shall be operated at low internal DC voltage not exceeding 24 VDC. Power supplies shall be solid-state electronic switching regulated output. Two supplies shall be provided for each 1/3 of the display. Power supplies shall be wired in redundant parallel configuration for each section and shall provide equal amounts of current to each section. Power supplies shall be rated such that if one supply fails, the other can operate the entire LED section under full load conditions. Power supplies shall operate from -2 to +140 degrees F (-30 to +60 C).

Power supplies shall be short-circuit protected by DC power off and shall reset automatically after 5 seconds of AC power off. Power supplies shall also be short-circuit protected by a minimum overload allowance of 105% and have an efficiency rating of at least 75%. Power supply shall be UL listed.

Sign controller shall be capable of sensing the failure of each individual power supply. When one of the power supplies in a group has failed, the status of each supply shall be clearly displayed on the control computer screen.

Terminal Blocks and Connectors. Screw type terminal blocks and crimp-on spade terminals shall be used for all wire connections except plug connections. Telephone type knife connectors are not acceptable.

Lightning Protection. Surrestor SPA-300 or approved equal shall be provided on all external power lines.

Testing. The Contractor shall deliver a sample of the character module to be used in the proposed sign. The module shall be capable of being turned fully on and fully off with all LEDs operating at full design brightness. A sample of the sign face material to be used, attached at the design distance from the character module, shall be included. If any deviations from these Special Provisions are discovered, the sample will be returned to the Contractor for modification, and resubmitted for testing.

Sign Performance Testing. The signs being installed under this project shall be tested for operational completeness. Testing shall be performed in the presence of the Engineer and/or his/her designated representative and shall consist of a pre-test check-out and a systems Sixty-day (60) Performance Test.

The Contractor shall state, in writing, that the sign is complete and ready for local testing. Within five (5) days upon receiving his notification the Authority shall begin the Pre-test Check-out.

Pre-test Check-out:

The Engineer and/or his/her representative shall thoroughly exercise the system, All hardware, and performance functions, including the maintenance and trouble shooting, shall be individually checked for compliance with the specifications.

Any portion of the project which does not meet these specifications shall be corrected by the Contractor and rechecked by the Engineer. The Contractor shall demonstrate that the field equipment can meet the local performance requirements.

Sign Sixty-day (60) Performance Test:

Following successful completion of the Pre-test Check-out, and the correction, repair and/or replacement of identified deficiencies, the Contractor shall demonstrate that the system satisfies the specified operational requirements as an integrated unit by operating the system continuously for ten consecutive days without malfunction or failure.

The Contractor shall notify the Authority, in writing, that the Sign Sixty-day (60) Performance Test will begin on a date and time mutually acceptable to all parties.

During the Sign Sixty-day (60) Performance Test, the Engineer shall exercise the system and document the performance of all specified features and any other events which could be expected to occur in an operational Traffic Management System. During the system exercise, the Sign Sixty-day Performance test may be suspended or terminated by the Engineer or the Contractor. Suspension is defined as halting the test progress, the Contractor taking necessary corrective action, and the test being resumed from the point of suspension. Termination is defined as halting the test. In the event of termination, the Contractor shall take necessary corrective action, and the test shall be restarted from the beginning. Any corrective action shall be by mutual agreement between the Contractor and the Engineer.

The Sign Sixty-day (60) Performance Test may be suspended for the following reasons, including but not limited to:

Failure or interference due to conditions beyond the control of the Contractor, such as vandalism, traffic accidents, power failures and similar occurrences.

Failure of any support or diagnostic equipment necessary to successfully test the system.

The Sign Sixty-day (60) Performance Test may be terminated for the following reasons, including but not limited to:

Failure of any hardware or performance item to meet these Special Provisions.

Failure of any pixel.

Failure of more than 1% of the total number of LEDs in the sign at the end of the test.

Failure of any pixel to turn off or turn on.

The appearance of any problem which, in the opinion of the State, has a significant effect upon the reliability, safety or operation of the system.

Certification. The Contractor shall furnish supplier documentation and certification for all individual components in the finished product, showing that the component manufacturer has established an MTBF rate and what the rate is. Payment will not be made for any sign installed without component certification.

The Contractor shall furnish the following submittal for approval before the delivery of any sign:

LED manufacturer's data sheet, stating the make and model of LED to be used, the luminance of the LED at a stated current, the maximum/minimum operating temperatures and other pertinent information.

Pixel Design - Include a detail drawing of the physical layout of the pixel, including the pixel size, number of LEDs, board detail, operating voltage and current, method of weather protection, orientation of the individual LEDs and the calculated luminance at the following points:

10° right and left of the vertical geometric center.

90° perpendicular to the pixel.

10° below the horizontal geometric center of the sign.

The module design, including mounting details.

The cabinet design and installation details of equipment in the cabinet.

Basis of Payment. This work shall be paid at the contract unit price each for LED GORE SIGN, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State stock as specified herein and as directed by the Engineer.

ARR1 REVLAC RESTRAINING BARRIER TAPE CARTRIDGE, REFURBISH

Description. This item is for furnishing and delivering to State Stock an Energy Absorbing Tape Cartridge completely refurbished, with tape assembly for use with the Vehicle Restraining Mechanisms for the Kennedy Expressway REVLAC System.

Materials. The energy absorbing tape cartridge assembly shall be refurbished Part No. EJ31256, Tape assembly and EJ41223, energy absorber, as manufactured by the Entwistle Company.

The energy absorbing device shall be model number MBF 4K-200-A as manufactured by The Entwistle Company. The following additional requirements shall be incorporated into the design of the barrier restraining mechanism:

The leading end of the energy absorbing device shall attach to one end of the restraining net with a removable connection.

The mounting of the energy absorbing device shall not degrade its FHWA-Approved operating characteristics.

The mounting of the energy absorbing device shall facilitate its replacement as a complete unit and also shall facilitate replacement only of the energy absorbing tape contained within its cartridge. In either case, replacement shall be from the ramp side of the unit

Basis of Payment. This work shall be paid at the contract unit price each for REVLAC RESTRAINING BARRIER TAPE CARTRIDGE, REFURBISH**,** which price shall be payment in full for the work as described herein.

ARR2 REVLAC RESTRAINING BARRIER DRAGNET ASSEMBLY, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State stock a complete restraining barrier dragnet assembly as manufactured by The Entwistle Company, compatible with the existing dragnet and barrier. The dragnet assembly shall be of the following type as directed by the Engineer:

RAMP	**Entwistle Part No.**
OB Mainline	EJ41224-10
OB Ontario	EJ41224-20
IB Edens	EJ41224-20
IB JFK West Leg	EJ41224-30
OB Slip Ramp	EJ41225-10
IB Slip Ramp	EJ41225-20

The restraining net shall be the barrier Vendor's standard Highway Safety Net. The net shall consist of a minimum of two horizontal runs of stranded wire rope interlaced through a section of galvanized chain link fence or shall consist of a minimum of two horizontal runs of wire rope and wire rope vertical members spaced at approximately six inch centers. The restraining net shall be provided with removable connectors and with vertical stays and tensioning devices to maintain proper net tension and deployment. The Barrier Vendor shall submit complete details of the restraining net construction including sized, materials, and rated capacities of all components used.

The restraining net shall be compatible with the energy absorbing devices, be FHWA-Approved, and be approved by the Engineer.

The net shall have a reflective material of eight inch wide, alternating red and white, diagonal stripes adhered to a semi-rigid, conformable, panel fastened to the net. The panel shall be capable of repeated impact without splintering, fracturing, or permanently deforming. The panel shall not alter the performance characteristics of the vehicle restraining mechanism.

Reflective Material for Restraining Net. Reflective sheeting shall be used on both sides of the restraining barrier net as shown on the Contract Drawings. All sheeting requirements shall meet or exceed the standards as defined in AASHTO M 268-84, Retro reflective Sheeting for Traffic Control.

The sheeting shall be a minimum of Type III High Intensity with pre-coated pressure sensitive adhesive (Class 1), diagonal alternating red and sliver white stripes as shown on the Contract Drawings, angling down at 45° from the left to the right. The sheeting shall be oriented to take advantage of the directional reflectivity of the material as defined by the supplier of the reflective sheeting.

The preferred material for this application shall be "Scotchlite" Reflective Sheeting Diamond Grade Series 3970G, as manufactured by 3M, or approved equal. The retro reflective sheeting shall be installed strictly according to the manufacturer's instructions. Special attention to surface preparation and mounting of sheeting for proper bonding and adhesion shall be rigidly followed.

Basis of Payment. This work shall be paid at the contract unit price each for REVLAC RESTRAINING BARRIER DRAGNET ASSEMBLY, FURNISH ONLY, of the location specified, which price shall be payment in full for furnishing and delivering the materials to State stock as specified herein and as directed by the Engineer.

ASC1 SWING GATE CONTROLLER, FURNISH ONLY

Description. This item is for furnishing and delivering to State Stock, a complete Swing Gate controller, for the Kennedy Expressway Traffic Redirection and Access Control System as specified herein.

Materials. The swing gate controller shall be Model Number HZ64B as manufactured by B&B Electromatic, Norwood, Louisiana and shall be a clockwise or counter-clockwise unit as designated by the Engineer without a gate arm or gate arm tip.

Support Frame. The frames shall be rigid structural weldments designed to withstand all operating loads imposed upon them by the swing gates and shall transfer the loads into the barrier walls via the anchor bolts.

The support frame for the swing gate assembly shall be fabricated from ASTM A36 structural steel shapes and plates using standard structural shapes to the maximum extent possible. All steel used in frame fabrication, including the component mounting plates, shall be at least 0.375 inches thick.

The configuration of all frames shall provide a rigid frame support for mounting additional items as described elsewhere herein.

The frames shall be drilled to match the anchor bolt patterns shown on the Contract Drawings with slotted anchor bolt holes, one inch diameter by two inches long, to allow for field positioning. The anchor bolt pattern shall match the anchor bolts installed under a previous contract.

Ease all exposed edges to a radius of 1/32 inch or more. Corners, seams, and joints shall be welded continuously and shall comply with requirements specified for welding. Welding flux shall be removed immediately and all exposed welds and surfaces shall be cleaned and ground to remove all scale, burrs, and sharp edges. Joints that may be exposed to the weather shall be fabricated to prevent the accumulation of water, dirt, and ice.

The frames shall be complete with all mounting requirements for installation of the gate actuators, controls, housing, and operational warning signs. Mounting plates shall be accurately drilled to match the components mounted. Torch-cut holes are not acceptable. The frames shall be hot dip galvanized after fabrication in compliance with Hot Dip Galvanizing.

The frame shall incorporate removable fitting attachments (lugs) for use during initial installation and for subsequent maintenance of the swing gate assembly. The lifting lugs shall be located on the top of the swing gate housing, as generally shown on the Contract Drawings, and shall be either stainless steel or galvanized to protect

the lifting attachments from the elements. The threads of the lifting lugs shall penetrate the housing and engage threaded members welded to the support frame.

The lifting lugs shall be removed after installation and stored inside the swing gate housing in a rigid, non-metallic, re-sealable container, mounted to the inside of the swing gate housing.

Stainless steel bolts with watertight gasketed washers shall be provided with each unit to seal the lifting lug housing penetrations and to achieve an uncluttered appearance upon removal of the lifting lugs.

A stainless steel bottom plate, not less than 12 gauge thickness, shall fit against the bottom of the support frame to cover the opening in the top of the barrier wall at the location of the swing gate insert. Within the confines of the support frame the bottom plate shall cover the entire top area of the swing gate insert, not already covered by the swing gate cover plate (see drawings CP-01 and CP-02), and extend to the capstan end of the frame. Vertical lugs, welded to the upper side of the bottom plate, shall be used to secure the plate against the bottom of the support frame angles by bolting through the lugs and the vertical legs of the angles on three sides of the frame. The bottom of the support frame will vary between 0.875 and 1.75 Inches above the top of the swing gate insert frame (see Mounting Detail on SG series drawings). Provide an adjustable 12 gauge stainless steel skirt, extending the full width of the housing, to close the gap between the bottom plate and the top of swing gate insert. This skirt shall be located along the one edge of the bottom plate which has no support frame angle to fit against. The bottom plate and skirt shall be designed to exclude vermin, to prevent the accumulation of ice, snow, and water within the housing, and to provide safety and security. The bottom plate shall fit as closely as possible around the gate arm capstan. The Swing Gate Vendor shall submit design details for review.

Housing. The housing for the swing gate unit shall be fabricated to accurately fit over the support frame and bolt to the frame to form a weatherproof enclosure to prevent the accumulation of dust, dirt, water, ice, snow and prevent the entrance of vermin. The housing shall be removable and incorporate a positive locating design to facilitate positioning of the housing on the frame. Access doors shall be provided on three sides of the housing to provide maintenance access to each component within the enclosure.

Housings shall be fabricated from Type 302, or approved equal, stainless steel sheets of not less than 12 gauge thickness. Welding flux shall be removed immediately and all exposed welds and surfaces shall be cleaned to remove all scale, burrs, and sharp edges. All exterior welds and surfaces shall be ground smooth and blended to remove all roughness. Each housing shall have two large gasketed doors on the roadway side of the housing and one access door at each end of the housing to provide access for routine maintenance and for servicing of the swing gate assembly. The doors shall be fabricated from the same material as the housing, with a stamped raised

frame/flange for rigidity, and be neoprene gasketed. Housing openings and doors shall be reinforced to eliminate deflection.

Doors shall be hung using bronze slip off hinges with stainless steel hinge pins and incorporate a three point door latch with provision for padlocking, and hold-open linkage. The two access doors on the roadway side of the unit shall be provided with heavy duty brass padlocks; all padlocks shall be keyed alike and each swing gate unit shall be provided with two keys. The two access doors at each end of the unit shall be opened from the inside of the unit. With access doors closed, no portion of the housing, including its latches and locks, may extend beyond the face of the barrier wall. In their open position, access doors may extend past the face of the barrier wall.

Each housing shall have a port opening fitted with a hinged, cast stainless steel cover held normally closed by gravity. The port opening shall be aligned with the extended output shaft of the transmission to permit Inserting the shaft of a hand crank through the opening and onto the end of the extended output shaft. Brackets shall be provided, within the housing, upon which to store the crank when not in use. The Swing Gate Vendor shall submit a sample cast cover for review by the Engineer.

The roof of housing shall be pitched to prevent build-up or ponding of water.

Each housing shall completely enclose the support frame and anchors bolts. The two end doors shall provide access to the anchor bolts for installation and maintenance of the unit:

The local controls for the swing gate mechanism shall be coordinated with the remote building Programmable Logic Control (PLC) system for the Reversible Lanes Traffic Redirection and Access Control System. Each swing gate shall be complete with local controls consisting of, but not limited to, the following:

a) Main Motor Circuit Protector with Auxiliary Contacts

b) Control Power Transformer

c) Motor Overloads with Auxiliary Contacts

d) Reversing Starter - minimum NEMA she 1

e) Terminal Blocks for both AC and DC Voltages

f) 125 Volt DC Coil, Remote Control Relays

g) Limit Switches - Cam Actuated

h) Limit Switches

i) Proximity Switch - two piece magnet actuated

j) Remote Control/Local Manual Control Maintained Correct Selector Switch

k) "Manual Open/Remote Control/Manual Close" Spring Return Selector Switch

l) "ON/OFF" Maintained Contact Rotary Pilot Switch

m) Circuit Breaker for the operation of the gate arm slot heater.

n) Circuit Breaker for the 120 VAC controller power

o) LED's for DC control indication.

All electrical components furnished shall be NEMA rated, U.L listed, readily available products of a national, USA manufacturer. Similar components shall be of the same manufacturer.

The entire local control system is to be serviceable from the roadway side of the unit. The local controls shall be enclosed within the swing gate housing and contained within a separate, self-supporting, single lever latch type NEMA 4X, enclosure. The enclosure shall not attach to the swing gate housing, but shall be attached to the swing gate housing support frame. All selector switches shall be mounted on the hinged door of the NEMA 4X enclosure which mounts inside of the swing gate housing. Switches shall be NEMA 4/13 type and installed with suitable gasketing to retain the NEMA 4 rating.

The local controls shall permit valid automatic operations to resume after manual positioning of the gate arm or switching from manual to automatic operation without requiring on-site resetting of the gate arm.

All wiring shall be through the use of pressure type terminal blocks and all control wires shall terminate in these blocks. Each terminal shall be clearly labeled (number or alpha-numeric), and ail wires shall be color coded based on their connected voltage. The wire numbers for the interconnection points to the remote control system shall be the same as shown on the Contract Drawings. The wiring diagram shall identify all colors and wire numbers. Wire all auxiliary contacts to the terminal block to permit transmission of the selector switch settings to the remote control system.

Where number of wires are trained through a box or wired to a hinged cover, they shall be grouped by circuit where applicable, bundled using appropriate cable ties, and supported to prevent pressure or strain on the cable insulation. Wire all selector switches, limit switches, auxiliary contacts, etc., including spare devices, to the terminal block.

Control Device Requirements.

Motor Circuit Protector (CB-1):

The local controls at each swing gate shall include a three-pole motor circuit protector (MCP) for the incoming three-phase 480 volts.

Located inside of swing gate housing shall be a three-pole incoming MCP power circuit breaker with a normally open (N.O.) auxiliary contact to close on a "TRIP" or "OPEN" position. Contacts shall be rated not less than 0.5 amperes at 125 VDC.

Motor circuit protectors shall be manually operated and have a magnetic trip level adjustment. Trip ratings shown on the Contract Drawings are approximate and the trip rating provided shall be as recommended by the device manufacturer for the characteristics of the motor.

Motor circuit protectors shall be rated for an available fault current of 65,000 RMS symmetrical amperes.

Control Power Transformer (TR1):

Control power transformers shall be not less than 500 VA continuous duty and rated at 480V - 60 Hz primary to 120V single phase secondary. The control power transformer shall have a circuit breaker secondary and shall be sized adequately for the starter and all connected control devices. Control transformers shall be NEMA type AA, dry, with a temperature rise not to exceed 55 degrees C above a 40 degrees C ambient temperature at continuous

rated load. Data submitted for approval shall include starter coil load data and total VA rating of control transformer.

Reversing Starter (MS-1):

Provide a reversing starter that is mechanically and electrically interlocked and rated for 480 Volts, 3 phase power, in a minimum NEMA size 1 configuration.

Starters shall be sized for the motor to be connected, but shall not be smaller than NEMA size 1. Starter size shall be carefully coordinated based on the motor characteristics of the motor to be connected and the manufacturer's starting ratings.

All starters shall be equipped with pull-apart terminal blocks for control and power wiring.

Starters shall be electrically operated, electrically held, with arc-extinguishing characteristics and renewable silver-to-silver contacts. Each starter shall have an overload relay as specified.

As a minimum each starter shall be equipped with two SPDT auxiliary contacts, with the N.C. contacts wired in as coil clearing contacts, in addition to the forward and reverse seal-in contacts. Provide two additional DPDT auxiliary contacts, one in each direction, as spares.

Provide an automatic reset non-compensated thermal overload relay with 480 V, 5 amp continuous duty contact rating. Provide additional auxiliary electrically isolated contacts rated at 120 V, 5 amp continuous duty, one normally dosed in motor control circuit and one normally open for monitoring by the Programmable Logic Controller. Relay shall be a NEMA B600 with three type B heater elements sized as required for the motor HP rating.

Motor control circuit shall operate at 120 volts derived from control transformer TR1, as specified.

Terminal Blocks (TB):

Terminal blocks shall be heavy duty corrosion resistant type rated at 600 volts AC & DC. AC and DC voltages shall be connected to color coded terminal blocks, separated and electrically isolated from each other. AC terminal housing shall be gray, and DC terminals shall be blue. Terminal block housing shall be manufactured from nylon capable of long term exposure of -40 degrees F to 180 degrees F, and all terminals shall be capable of terminating #22 through #6 AWG stranded or solid wire.

The current carrying metal body characteristics shall be as follows:

a. Modular design and construction.

b. Manufactured from a minimum of 85% copper alloy with locking screws manufactured from stress relieved brass.

c. 100% nickel plated.

d. Have self locking screws so that when wire is clamped into terminal, self loosening is not possible.

e. Have wire guides on base body.

f. Achieve "gas tight" termination, as wire is clamped into "serrated" metal body.

g. Have center bridgeability

h. Have no less than 3 milli-ohms of contact resistance.

The terminal blocks shall be as manufactured by Phoenix Contact or approved equal.

125 Volt DC Coil, Remote Control Relays (CR-1, CR-2, CR-3):

Provide electrically held, heavy duty relays rated at 300 V with a minimum of two normally open (N.O.) and two nominally closed (N.C.) independent electrically isolated contacts. The relay shall be hermetically sealed, with convertible, high reliability contact rates not less than 5 ampere resistive. Contact ratings shall be NEMA A300 AC, and NEMA P300 DC as per Contract Drawings.

Control Relay (CR-1), Located in the gate control enclosure. Interlace DC relay to allow remote ramp opening of the gate (PLC control or manual control from the Remote Control Building).

Control Relay (CR-2), Located in the gate control enclosure. Interface DC relay to allow remote ramp closing of the gate (PLC control or manual control from the Remote Control Building).

Control Relay (CR-3), Located in the gate control enclosure. Interface DC relay to allow remote PLC control of chevron sign. Shall be installed in each swing gate unit and connected in only selected swing gates.

Relays shall be as manufactured by Allen Bradley catalog #700-N or as approved by the Engineer.

Limit Switches - Cam Actuated (LS-5, LS-6, & spare LS-7, LS-8):

The gate cam actuated limit switch shall be a unit assembly containing a minimum of 4 individual switches each having one SPDT set of contacts. Contacts shall be totally enclosed and shall have a U.L rating of not less than 15 amperes at 220 volts AC. Each individual switch shall be controlled by an independent cam, which shall be adjustable with a single set screw. The limit switch body, cams and shaft shall be of corrosion resistant non-ferrous materials.

The multiple cam positron sensor assembly shall be operated from the drive transmission. Two of the switches normally closed (N.C.) (LS-5 & LS-6) shall function as motor overtravel limit switches. The other two switches shall be spares. Switches which are of different voltage type shall be isolated through the use of a spacer inserted between the switches.

Each switch shall be operated by an independent cam. The cams shall be position adjustable through 360 degrees of rotation. The signals from these position sensors shall de-energize the starting coils to the motor.

Cam Limit Switches shall be installed as shown on the Contract Drawings and as herein specified:

a) Limit Switch LS-5, with one normally closed (N.C.) contact located on the retract cam position opens and disconnects power to the retract starting coil when the drive travels past the retract position (indicates a broken chain on the cam).

b) Limit Switch LS-6, with one N.C. contact located on the extend cam position opens and disconnects power to the extend starting coil when the drive travels past the extend position (indicates a broken chain on the cam).

Standard Enclosed Limit Switches (LS-1A-1B, LS-2A-2B, LS-3, LS4, LS-9):

Standard Enclosed Limit Switches shall be NEMA 4 as required for outdoor installation (-40 to + 180 degrees F). Limit switches shall be heavy duty, Industrial type, oil and water tight, with a minimum 10 amp, 125 volt DC rating, and rated for one million operations. No electronic switches shall be used.

Standard Enclosed Limit Switches shall be installed as shown on the Contract Drawings and as herein specified:

a) Standard limit Switch LS-1, with one normally open (N.O.) (LS-1A) and one normally closed (N.C.) (LS-1B) independent electrically isolated contacts, located on gate arm inner rotating shaft. LS-1A contact is held closed when the gate is NOT in the retract position. When the gate arm moves to the retracted position (ramp open), the held closed N.O. LS-1A contact opens and disconnects power to the retract starting coil. And the held open N.C. LS-1 B contact closes signaling the Programmable Logic Controller that the Crank Arm is in the retracted (ramp open) position.

b) Standard Limit Switch LS-2, with one N.O.(LS-2A) and one N.C.(LS-2B) independent electrically isolated contacts, located on gate arm Inner rotating shaft. LS-2A contact is held closed when the gate is NOT in the extent position. When the gate arm moves to the extended position (ramp closed), the held closed N.O. LS-2A contact opens and disconnects power to the extend starting coil. And the held open N.C. LS-2B contact closes signaling the PLC that the Crank Arm is in the extended (ramp closed) position.

c) Standard limit switch LS-3, with one N.C. contact, located on the gate arm outer rotating it shaft. LS-3 Is held open when the gate arm is NOT in the retracted position. When the gate arm moves to the retracted

position, the held open LS-3 contact closes and signals the PLC that the gate arm is in the retracted position (Input to PLC constant from + 10 degrees of fully retracted).

d) Standard Limit Switch LS-4, with one N.C. contact, located on the gate arm outer rotating shaft. LS-4 is held open when the gate arm is NOT in the extended position. When the gate arm moves to the extended position, the held open LS contact closes and signals the PLC that the gate arm is in the extended position (Input to PLC constant from -10 degrees of fully extended).

e) Standard Limit Switch LS-9, with two N.C. independent electrically isolated contacts (LS-9A & LS-9B), located at the hand crank opening. When the hand crank is inserted, LS-9A opens and disables the motor control circuit and LS-9B opens and disconnects signal to the PLC.

Standard Limit Switches shall be as manufactured by Allen Bradley Bulletin 802M or approved equal.

Remote/Local Control Selector Switch (SS-1):

Selector switch shall be NEMA 4/13 heavy duty type, two position maintained contact, rated at 600 volts AC. Provide and wire auxiliary contacts to the terminal block to permit transmission of the selector switch position to the remote control system.

Selector Switch (SS-1), Located on door of swing gate local control enclosure. Two position selector switch intended to be used for maintenance and local gate control. To allow the gate to be switched to local control (LOCAL MANUAL CONTROL), or to remote building control (REMOTE CONTROL).

Remote Control Switch (SS-2):

Remote control switch shall be NEMA 4/13 heavy duty type, three position spring return to center, rated at 600 volts AC. Provide and wire auxiliary contacts to the selector switch (SS-1) to permit transmission of the selector switch position to the remote/local control system.

Selector Switch (SS-2), Located on door of swing gate local control enclosure. Three Position, spring return to center, selector switch that allows (MANUAL OPEN), (MANUAL CLOSE), when SS-1 is in the "LOCAL MANUAL CONTROL" position.

Rotary ON/OFF Pilot Switch (SS-3):

Rotary Pilot switch shall be NEMA 4/13 heavy duty type, two position maintained contact, rated at 600 volts AC. Wire SS-3 auxiliary contacts to Selector switch (SS-1) via the Terminal strip.

Rotary Pilot Switch (SS-3), located on door of swing gate local control enclosure. Two position selector switch to turn DC power ON and OFF.

Circuit Breaker for the gate arm slot heater (CB-2):

A two-pole, 15 ampere, 600 volt circuit breaker shall be provided for the swing gate sandwich heater cable mounted on the barrier wall.

Circuit Breaker for 120 VAC control power (CB-3):

A two-pole, 5 ampere, 240 volt circuit breaker shall be provided on the secondary power feed, for the control power transformer TR1.

LED's. Provide high intensity, long life (10 year average) solid state LED cartridges with built-in resistors/rectifiers rated for 125 VDC. Mount LED's in a grouped configuration into the NEMA 4 cabinet as shown on the Contract Drawings.

Wiring for Power and Control. All wire shall be minimum number 14 AWG stranded copper, type MTW, 600 V insulation.

Sequence of Operations, Automatic.

Automatic Operation - Extent Gate (Close Ramp):

a. Beginning state - swing gate retracted, ramp open.

b. Requirements for automatic operation:

- Selector Switch SS-00 "PLC CONTROL/OFF PLC CONTROL" (located in the Remote Control Building) in "PLC CONTROL" Position
- Selector Switch SS-1 "REMOTE CONTROL/LOCAL MANUAL CONTROL" (located in the local swing gate control cabinet) in "REMOTE CONTROL" Position
- Selector Switch SS-3 "ON/OFF" (located in swing gate control cabinet) in "ON" position
- "Crank Arm Open Limit Switch" LS-1B Closed - PLC Input - Crank Arm in Open Position
- "Gate Retracted Limit Switch LS-3 Closed" - PLC Input - Gate in Retracted Position
- "Shear Pin Detector Proximity Switch" PRX-1 Closed - PLC Input - Shear Pin Detector Intact
- Motor Circuit Protector CB-1 Aux Contact Open, and Motor Overload Relay MOL Aux Contact Open - No fault input to PLC

c. PLC power output to swing gate terminal block #4, energize DC relay CR-3 and flashes Chevron Sign on and off. (PLC programmed logic turns relay on and off).

d. PLC applies power to swing gate terminal block #2, energize DC relay CR-2. CR-2 contact closes and energizes starting coil MS-1R.

e. The motor starts and the gate arm begins moving from the retracted to the extended position.

f. When the gate moves 10 degrees from fully retracted, limit switches LS-3 and LS-1B signal inputs to the PLC that the gate is no longer in the retracted position.

g. Power is continuous to relay CR-2, until limit switches LS-4 and LS-2B signal the PLC that the gate is in the extended position, or a pre-set time limit In the PLC has expired. Relay CR-3 is de-energized after all the gates are In the extended position, turning the chevron signs off.

Automatic Operation - Retract Gate (Open Ramp):

a. Beginning state - swing gate extended, ramp closed.

b. Requirements for automatic operation:

- Selector Switch SS-00 "PLC CONTROL/OFF PLC CONTROL" (located In the Remote Control Building) in "PLC CONTROL" Position
- Selector Switch SS-1 "REMOTE CONTROL/LOCAL MANUAL CONTROL" (located in the local swing gate control cabinet) in "REMOTE CONTROL" Position
- Selector Switch SS-3 "ON/OFF" (located in swing gate control cabinet) in "ON" position
- "Crank Arm Closed Limit Switch" LS-2B Closed - PLC Input - Crank Arm Closed
- "Gate Extended Limit Switch" LS-4 Closed - PLC Input - Gate Extended
- "Shear Pin Detector Proximity Switch" PRX-1 Closed PLC Input - Shear Pin Detector Intact
- Motor circuit Protector CB-1 Aux. Contact Open and Motor Overload Relay MOL Aux. Contact Open. No fault input to PLC

c. PLC applies power to swing gate terminal block #1, energize DC relay CR-1. CR-1 contact closes and energizes starting coil MS-1F.

d. The motor starts and the gate arm begins moving from the extended to the retracted position.

e. When the gate moves 10 degrees from fully extended, limit switches LS-4 and LS-2B signal inputs to PLC that the gate is no longer in the extended Position.

f. Power is continuous to relay CR-1, until limit switches LS-3 and LS-1B signal the PLC that the gate is in the retracted position, or a pre-set time limit in the PLC has expired. Relay CR-1 is then de-energized, turning the motor off.

Manual Operating Requirements (Local Control):

a. Open the housing access door.

b. Set selector switch SS-1 in "LOCAL MANUAL CONTROL" position. (disconnects PLC outputs from the remote control building).

c. Moving and holding the selector switch SS-2 in either the "MANUAL OPEN" or "MANUAL CLOSE" position, moves the gate arm in the extended or retract direction. Releasing the spring return switch stops all movement.

d. To return to remote control, SS-1 must be switched to the "REMOTE CONTROL" position.

e. Close the housing access door.

Manual Operating Requirements (Hand Cranking):

A hand crank shall be furnished with each swing gate to provide a means for manual operation of the gate arm in the event of a power or control failure, maintenance, or emergency operations. The hand crank shall connect to

an extended output shaft from the transmission and shall require approximately 36 complete rotations to crank the gate arm 90 degrees. The crank arm shall not require more than 30 pounds of force per rotation. The following steps shall be required to position the hand crank for use:

a. Open the housing access door.

b. Open the port cover for crank arm.

c. From outside the housing, insert the shaft of the crank through the port and onto the end of the transmission shaft. Automatically disconnects motor control circuit from operating remotely (LS-9 Opens). Mechanically releases brake.

d. Crank the arm to the required position, until extended or retracted LED lights up, or until physical stop is reached.

e. Remove the crank arm. Automatically re-energizes the control circuit (LS-9 Closes), and engages the brake.

f. Replace the crank arm inside the housing, and close the access door.

Corrosion Protection. Aluminum components shall not be treated with corrosion inhibitors.

The Swing Gate Vendor's names and data plates, machined ways, and other machined surfaces, bright metal work, lubrication points, oilers, and sumps shall be protected against entry of coatings, dirt, or cleaning agents during coating application.

Basis of Payment. This work shall be paid at the contract unit price each for SWING GATE CONTROLLER, FURNISH ONLY**,** for either a clockwise (CW) or counter-clockwise (CCW) operating unit, which price shall be payment in full for furnishing and delivering the materials to State Stock as directed by the Engineer.

ASD1 SWING GATE DRIVETRAIN ASSEMBLY, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State Stock a complete swing gate actuator transmission, motor and crank arm, hereinafter referred to as a drivetrain assembly, as manufactured by B&B Electromatic, compatible with the existing swing gates.

Transmission. The gate actuator shall include but not be limited to a worm gear transmission with a double extended output shaft, reduction gears, and input shaft. The drive motor shall direct couple to the input shaft of the transmission. One of the output shafts of the transmission shall be connected to the swing gate crank arm assembly. The second output shaft shall be used for manual cranking of the gate arm.

The gate actuator transmission shall transfer the torque to the gate arm capstan via a linkage of the crank arm assembly which shall consist of two crank arms and an adjustable connecting rod having self-aligning ball ends. The crank arm assembly shall be factory pre-set for the specific gate location and gate arm angle. All linkage components shall be heavy-duty and shall permit field adjustment of the rotation of the gate arm from -5 to 95 degrees of rotation.

The gate actuator transmission shall be a totally enclosed unit designed and built for the required service. Gears shall conform with the requirements of AGMA and shall be oil bath lubricated with lightweight oil as applicable for the design temperatures. The transmission housing shall include, but not be limited to an oil fill plug and an oil drain plug. These items shall be located for easy access, from the ramp side access door during routine inspection and maintenance of the mechanism, without removing the housing or other components.

The connecting rod shall be fabricated from ASTM A311 Class B high strength steel.

The gate actuator shall incorporate sine wave motion to accelerate the gate arm smoothly from zero to maximum velocity at mid-stroke and then decelerate smoothly to zero velocity at full stroke. The drive shall be designed to rotate the gate arm through 90 degrees within 15 seconds and shall be capable of reversing of the direction of rotation from any point.

Actuator Drive Motors. The drive motors shall be flange mounted to their transmission cases. The motors shall be double extended shaft type, suitable for harsh environment use, as specified herein. An electric, solenoid released, motor brake shall be mounted to the other end of the motor.

Motors shall be squirrel cage induction type, 460 volt, 3-phase, 60 Hertz, High Slip, High Torque (NEMA design D), Totally Enclosed Non Ventilated, and shall have Class F insulation. Horsepower rating shall be not less than twice that calculated by the Swing Gate Vendor to meet specified design parameters. Motors shall be capable of operating the driven equipment over the full range of operating load conditions without exceeding the nameplate rating. Motors shall be flange mounted, attached to the transmission with at least four bolts, and shall be of the instant reversing type to permit reversing the movement direction at any point of travel.

The ratings, characteristics, materials, and construction of electric motors shall be in accordance with the latest applicable standards of ANSI, IEEE, and NEMA The manufacturer's certification of the preceding shall be provided as a part of the submittal data.

Submittal data shall include complete manufacturer's specifications and descriptive bulletins for all equipment, size, capacity, description and make of motor. Motor data shall include the following:

a. Manufacturer

b. Nameplate Rated Horsepower

c. Rated Voltage

d. Full Load RPM

e. Full Load Current

f. NEMA Design Letter

g. NEC Code Letter or Inrush Current

h. Insulation Class

I. Service Factor

j. Recommended Starting Restrictions, including Allowable Starts Per Hour

k. Design Load Calculations

The motor shall be equipped with an electric solenoid actuated type brake which shall automatically release when the gate arm starts to move out of position under power and shall automatically set when the gate arm reaches the opened or closed position. The brake shall have the same operating voltage rating as the drive motor. A means shall be provided to mechanically release the brake, in the case of control power failure, to permit use of the hand crank for manual operation. The solenoid brake shall be sized to hold the gate arm in position under the forces produced by the wind loads as described elsewhere herein.

Motor bearings shall be designed to withstand all axial thrust from the driven equipment.

Basis of Payment. This work shall be paid at the contract unit price each, for GATE DRIVETRAIN ASSEMBLY, FURNISH ONLY**,** which price shall be payment in full for furnishing and delivering the materials to State stock as directed by the Engineer.

ASG1-6 SWING GATE ARM, FURNISH ONLY

Description. This item is for furnishing and delivering to State Stock swing gate arms with gate tips of various lengths for the Kennedy Expressway REVLAC System as specified herein.

Materials. The swing gate arm shall consist of an aluminum reflectorized area. The swing gate materials shall be compatible with swing gate controller Model Number HZ64B (Referenced drawing No. 0100DD0037 - latest version) as manufactured by B&B Electromatic, Norwood, Louisiana. The swing gate arms are constructed having the following standard lengths: 2 ft., 4 ft., 5 ft., 6 ft., 7 ft., 8 ft., 9 ft., 10 ft., 11 ft., 12 ft., 13 ft., 14 ft., 15 ft., 16 ft., 17 ft., 18 ft., 19 ft., 20 ft., 21 ft., 22 ft. and 23 ft.

Swing Gate Arms. Gate arms shall consist of an assembly of standardized design, standard length, segmented truss structures, connectors, brackets, and a three foot long flexible gate tip. Gate arm truss assemblies, as shown on the Contract Drawings and as specified, shall include both the gate arm truss segments and the gate tips.

Each gate arm truss segment shall be 12 Inches high and configured as generally shown on the Contract Drawings. The truss segments shall form a welded structural fabrication of 6061-T6 extruded seamless aluminum tubing having a minimum allowable yield strength of 40,000 pounds per square inch (psi). The segments shall be constructed to prevent accumulation of water within the structural tubes. The minimum allowable size of the materials shall be as shown on the Contract Drawings.

The truss segments shall be interchangeable to permit assembling the gate arms to the specified lengths. The segments shall be provided with the reflective sheeting on both sides of the truss and the stripes properly oriented to allow either side to face the traffic.

Each assembled gate arm shall be designed to resist the loads described herein and meet the following additional requirements:

a) The free end of the assembled gate arm shall not sag more than 0.75 inches, below horizontal, under its own weight.

b) The longest gate arm assembly, excluding the flexible gate tip, shall not deflect more than 36 inches, horizontally, in the specified wind loads.

c) The free end of the longest gate arm assembly shall not sag more than two inches, below horizontal, when covered with ice as described elsewhere herein.

d) The maximum allowable design stress of the gate arm shall be calculated as 60 percent of the yield strength of the material (6061-T6 extruded seamless aluminum tubing has a yield strength of 40,000 psi; therefore, the design stress of the arm shall not exceed 24,000 psi).

e) The gate arms shall be free of harmonics and standing wave vibrations. Should any such harmonics and vibrations develop, the Swing Gate Vendor shall make all necessary corrections at his own cost.

A gate arm tress shall be connected to its mounting bracket via an aluminum connector assembly. The connector shall be fabricated from the same material as the gate arm truss segment and shall be bolted to the mounting

bracket with stainless steel bolts, nuts and washers as described below. The attachment bracket may be shimmed, if required, to adjust for deflection caused by the weight of the gate arm assembly. The Swing Gate Vendor shall supply a shim pack, as needed, for each arm assembly. Shimming of a gate arm is limited by the physical constraints of the gate arm recess formed in the barrier wall. Whether shimmed or not, all gate arms shall completely retract into the barrier wall recess. Rubber bumpers shall also be provided with each gate arm to prevent the gate arms from damage when they are retracted. A Teflon gasket shall also be provided for the gate arm to mounting bracket connection.

The use of exterior supports or attachments (such as guy wires) to remove sag from the gate or for any other reason is unacceptable.

Gate arms shall be connected, with an aluminum insert of the same material as the gate arm, as shown on the Contract Drawings. The insert shall be bolted to the truss segments with stainless steel bolts, nuts, and washers as described below.

The gate tip is furnished under this pay item. Flexible gate tips shall be connected to the end truss segment using the connector assembly as shown on the Contract Drawings. The assembly, truss segment, and gate tips shall be bolted together with 0.5 inch diameter stainless steel bolts, nuts, and washers. One washer shall be placed under the bolt head and a lock washer shall be placed under the nut. The nuts and bolts shall be hand tightened until snug and further tightened with a wrench a minimum of 1/2 turn of the nut.

Reflective Materials for Gate Arms. Both sides of each gate arm, including both the truss and the flexible end, shall be covered with retro-reflective sheeting. All sheeting requirements shall meet or exceed the standards as defined In AASHTO M 268-84, Retroreflective Sheeting for Traffic Control.

The sheeting shall be a minimum of Type III High Intensity with pre-coated, pressure sensitive, adhesive (Class 1), diagonal alternating red and silver white stripes as shown on the Contract Drawings, angling down at 45° from left to right. The sheeting shall be oriented to take advantage of the directional reflectivity of the material as defined by the supplier of the reflective sheeting.

The material for this application shall be "Scotchlite" Reflective Sheeting Diamond Grade Series 3970G as manufactured by 3M, or approved equal. The sheeting shall be pre-striped of appropriate size and width to match the application surface. The retro-reflective sheeting shall be installed strictly according to the manufacturer's

instructions. Provide special attention to surface preparation and mounting of sheeting for proper bonding and adhesion.

Basis of Payment. This work shall be paid at the contract unit price each for complete SWING GATE ARM and tip, for the length specified:

SWING GATE ARM, (2 FT.) TO (4 FT.), FURNISH ONLY	(ASG1)
SWING GATE ARM, (5 FT.) TO (8 FT.), FURNISH ONLY	(ASG2)
SWING GATE ARM, (9 FT.) TO (12 FT.), FURNISH ONLY	(ASG3)
SWING GATE ARM, (13 FT.) TO (16 FT.), FURNISH ONLY	(ASG4)
SWING GATE ARM, (17 FT.) TO (20 FT.), FURNISH ONLY	(ASG5)
SWING GATE ARM, (21 FT.) TO (23 FT.), FURNISH ONLY	(ASG6**)**

which price shall be payment in full for furnishing and delivering the materials to State Stock as directed by the Engineer.

ASG7 SWING GATE ARM CAPSTAN AND BRACKET ASSEMBLY, FURNISH ONLY

Description. This item shall consist of furnishing and delivering to State stock a complete swing gate arm capstan and mounting bracket assembly Model No. HZ-64B as manufactured by B&B Electromatic, reference drawing numbers 0100DD0537 and 0064DD0072 latest revision.

Gate Arm Capstan and Mounting Bracket. The gate arm capstan shall be composed of two rotating shafts and one stationary support stanchion (tube) in a "shaft within a shaft" design.

The inner rotating shaft shall transfer the torque and rotary motion from the gate actuator crank arm to the outer rotating shaft which supports the gate arm. The upper end of the inner shaft shall extend through a flange bearing

which is bolted to a support plate integral with the frame. Above the crank arm connection, the bearing shall be connected to the shaft with a Nyloc type set-screw. Spare set-screws shall be provided in the box provided for spare shear pins. Self Lubricating, all impregnated, radial bronze bushings shall be used to maintain concentric alignment of the inner shaft relative to a stationary support tube. The upper end of the shaft shall extend past the bearing to provide for the gate position sensors.

The torque and rotary motion shall be transmitted between the inner and outer shafts through a shear connection consisting of two adjacent circular plates of identical metallurgical composition located at the bottom of both shafts. The plates shall be linked by shear pins. The shear pin holes in the plates shall match each other in only one position. Alignment holes shall be provided in both plates to assist shear pin replacement. The adjacent faces of the shear plates shall be ground to a smooth finish and coated with Teflon pipe thread compound or similar material, as approved by the Engineer, to minimize friction and corrosion between the plates.

The inner rotating shaft shall be fabricated from ASTM-A193-B7 solid alloy steel, turned, ground, polished, and machined as required, with a nominal outside diameter of not less than two Inches. The upper end shall be connected to the crank arm using a key and two double set-screws placed 90 degrees apart (one cone point and one set point over top the cone point). The assembly to support the return spring and shear pins shall incorporate keys, rings, or other method approved by the Engineer, at the lower end of the inner shaft.

The stationary support tube shall be rigidly attached to the swing gate frame and incorporate a "keeper collar" to support both the support tube and the outer rotating shaft. The keeper collar shall be bolted through the support tube and into the frame of the swing gate. Self lubricating, oil impregnated, radial bronze bushings shall be located on the exterior at both ends of the support tube to maintain concentric alignment of the outer shaft and the support tube. A self lubricating, oil impregnated, bronze thrust bushing shall be located inside the keeper collar where the outer rotating shaft is supported, to maintain a smooth surface upon which the outer shaft shall ride.

The stationary support tube shall be fabricated from ASTM-A519 steel alloy, machined as required, with a nominal outside diameter of not less than 4.5 inches and a wall thickness of not less than 0.5 inches; it shall be rigidly bolted to the frame of the swing gate using ASTM A-325 bats, nuts and washers.

The outer rotating shaft shall be supported from the keeper collar of the support tube and shall extend to the shear plate of the inner rotating shaft. The gate arm mounting bracket shall attach to the exterior of the outer rotating shaft as described below.

The outer rotating shaft shall be fabricated from ASTM-A519 steel alloy seamless tubing, machined as required, with a nominal outside diameter of not less than six inches and a wall thickness of not less than 0.5 inches. A circular steel plate shall be fabricated from ASTM A656 GR80, welded to the lower end of the outer rotating shaft, and have the shear pin mounting holes drilled and reamed. The shear pin holes shall match the holes for the inner shaft in only one position. Another circular steel plate (ASTM A656 GR80) shall be welded to the upper end of the outer shaft to transfer all axial loads into the swing gate frame via the thrust bearing.

The gate arm mounting bracket shall be fabricated from ASTM A36 steel not less than 0.25 inches thick. The bracket shall be fabricated in two halves and shall be hot dip galvanized after complete fabrication. The halves shall be bolted together with a minimum of eight, 0.5 inch diameter, ASTM-A325 bolts, Type 1 or 2. The bracket shall be damped to the outer shaft of the capstan. The frictional force developed in the clamped connection shall be sufficient to hold the gate arm in position and resist all live and dead loads imposed on the gate. A teflon gasket shall be provided and installed at the end of the bracket, where the aluminum gate arm assembly attaches to the bracket, to isolate the dissimilar metals.

An adjustable disc shall be attached to the swing gate inner rotating shaft. Adjustable position sensing limit switches shall be used to stop the drive motor at the gate arm extended and retracted positions (ramp closed and ramp open).

A second adjustable disc shall be attached to the swing gate outer rotating shaft. Adjustable position sensing limit switches shall be furnished and installed to provide a control input for monitoring the gate position to -10 degrees of fully extended and +10 degrees of fully retracted, by the remote control system.

Basis of Payment. This work shall be paid at the contract unit price each for SWING GATE ARM CAPSTAN AND BRACKET ASSEMBLY, FURNISH ONLY**,** for either a clockwise (COO) or counter-clockwise (CCW) operating unit, which price shall be payment in full for furnishing and delivering the materials to State stock as directed by the Engineer.

AXB1 BUDGETARY ALLOWANCE FOR REPLACEMENT PLC REPAIR

Description. This item is to establish a budget account to allocate funds for the payment of repair to the existing Allen-Bradley PLC control system. A budgetary allowance has been established since it is unknown if repair will be needed and/or a specialty contractor service.

This allowance will not be used to repair damage caused by the Contractor's operations. Damage caused by the Contractor's operations shall be repaired at not additional cost to the Contract.

The total estimated amount of the annual expenses for services performed which will be paid under Article 6.0, is $70,000 as indicated for Pay Item AXB1. For bidding purposes this amount shall be used.

AXB2 BUDGETARY ALLOWANCE FOR COMMUNICATION SYSTEM REPAIR

Description. This item is to establish a budget account to allocate funds for the payment of repairs to the existing communication system. A budgetary allowance has been established since it is unknown if repair will be needed and/or a specialty contractor service.

This allowance will not be used to repair damage caused by the Contractor's operations. Damage caused by the Contractor's operations shall be repaired at not additional cost to the Contract.

The total estimated amount of the annual expenses for services performed which will be paid under Article 6.0, is $80,000 as indicated for Pay Item AXB2. For bidding purposes, this amount shall be used.

AXB3 BUDGETARY ALLOWANCE FOR BUILDING AND EQUIPMENT REPAIRS

Description. This item is to establish a budget account to allocate funds for the payment of the specialty services for repairing or replacing UPS, and other equipment at REVLAC and RACS buildings and communication huts.

This allowance will not be used to repair damage caused by the Contractor's operations. Damage caused by the Contractor's operations shall be repaired at no additional cost to the Contract.

The total estimated amount of the annual expenses for services performed which will be paid under Article 6.0, is $60,000 as indicated for Pay Item AXB3. For bidding purposes this amount shall be used.

AXB4 BUDGETARY ALLOWANCE FOR RAMP GATES

Description. This item is to establish a budget account to allocate funds for materials and/or repairs for damage to ramp gates and attenuators since there is little motorist caused damage history.

The total estimated amount of the annual expenses for services performed which will be paid under Article 6.0, is $70,000 as indicated for Pay Item AXB4. For bidding purposes this amount shall be used.

GAC1 AERIAL CABLE WITH MESSENGER WIRE

Description. This item consists of furnishing, installing, testing and connecting aerial electric cable of the size indicated for temporary lighting or service as specified by an Engineer, and as shown on the contract drawings. The cable shall be new, unless otherwise indicated.

Materials. Section 818 and 1066 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. The aerial electric cable will be measured in feet in place and will be taken as the length of the messenger wire. Measurement will be made in a straight line between changes in direction and to the centers of light standards and control cabinets. Sag of the aerial cable or vertical cable will not be measured for payment. When the Engineer requests the used temporary cable be replaced with new, the new cable shall be measured for payment. Used aerial cable will not be measured for payment but shall be included in the cost of the item.

Basis of Payment. This item will be paid at the contract unit price per foot for AERIAL CABLE WITH MESSENGER WIRE, 4-1/C up to NO. 2 of the size and number of conductors indicated which shall be payment in full for the work described herein.

The cost of disconnecting and abandoning in place the existing cables feeding underpass, sign, and ramp lighting and reconnecting to the temporary lighting system shall be included in the contract unit price for this item.

The cost of removing the used cable shall be included in the cost of the new cable. The rewiring to facilitate relocation of the cable due to staging or other construction requirements shall be included in the cost of this item.

GAS1 ASPHALT, REMOVE AND REPLACE

Description. This item shall conform to the applicable requirements of Section 408, 440, and 441 of the Standard Specifications for Road and Bridge construction. The asphalt removal and replacement shall be completed at locations shown on the plans, including necessary labor and materials, as directed by the Engineer. The base for the asphalt driveway, if required shall be prepared as per Article 358.

Basis of Payment. This work will be paid for at the contract unit price per square foot for ASPHALT, REMOVE AND REPLACE, which price includes all labor, material and equipment necessary to remove and dispose of the existing asphalt and to construct the new asphalt as specified herein. Preparation of base will be paid for according to Article 358.07.

GC01–GC06 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE

Description. This item shall consist of furnishing and installing galvanized steel or PVC coated conduit, fittings and accessories attached to structure for roadway or building, as specified herein and as shown on the contract drawings. All conduit splices shall be threaded as directed by the Engineer.

These items shall conform to Sections 1088 and 811 of the Standard Specifications for Road and Bridge Construction, current version, for this pay item, with the following exceptions:

Add the following to Article 811.03(b) of the Standard Specifications: "The personnel installing the PVC coated conduit shall be certified by the conduit manufacturer for installing PVC coated conduit."

Delete the following sentence of the third paragraph of Article 1088.01(a) (3) of the Standard Specifications: "The exterior galvanized surfaces shall be coated with a primer before the PVC coating to ensure a bond between the zinc substrate and the PVC coating."

Conduit Wall Seals. Conduit wall seals shall be incidental to the conduit specified under this item. Conduit wall seals used in new concrete walls shall consist of a polyvinylchloride (PVC) oversize sleeve with sealing assemblies at both sides of the wall. The sealing assemblies shall be cast iron alloy or malleable iron with pressure rings and neoprene sealing grommets, membrane clamp and they shall be tightened by means of hex-head screws. Each wall seal shall accept multiple conduit sizes. The sealing assemblies' castings shall be hot-dip galvanized.

Conduit wall seals used in cored holes in existing concrete shall consist of an assembly of an oversize outside pressure disc with membrane clamp, a neoprene sealing ring and an interior pressure disc, with the discs tightened by means of not less than three stainless steel socket head cup tightening screws with stainless steel washers. Pressure discs shall be PVC-coated steel.

Installation. These items shall conform to Sections 811 of the Standard Specifications for Road and Bridge Construction, current version, for this pay item, with the following exceptions.

Method of Measurement. Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduit shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Basis of Payment. This work will be paid at the contract unit price per foot of CONDUIT, GALVANIZED STEEL or PVC coated, attached to structure for roadway or building, of the type, diameter, and number of raceways wide by the

number of raceways high, which price shall be payment in full for furnishing and installing the galvanized steel conduit and fittings complete.

GC01 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, ¾ TO 1 ¼"

GC02 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, 1 ½ TO 2 ½"

GC03 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, 3 TO 5"

GC04 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, PVC COATED, ¾ TO 1 ¼"

GC05 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, PVC COATED, 1 ½ TO 2 ½"

GC06 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, PVC COATED, 3 TO 5"

GC07–GC08 CONDUIT, GALVANIZED STEEL, ENCASED IN CONCRETE

Description. This item shall consist of furnishing and installing raceways, fittings and accessories encased in concrete as specified herein and as shown on the contract drawings.

Materials. These items shall conform with Section 810 and 1088.01 (a), (b), and (c) of the Standard Specifications for Road and Bridge Construction, Current version, for this pay item, with the following exceptions:

Revise Article 810.04 of the Standard Specifications to read:

> "Installation. All underground conduit shall have a minimum depth of 30-inches (700 mm) below the finished grade."

Add the following to Article 810.04 of the Standard Specifications:

"All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans."

Add the following to Article 810.04 of the Standard Specifications:

"All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum or 300 mm (12") or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped. The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap. The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125") thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring."

Add the following to Article 810.04(c) of the Standard Specifications:

"Coilable non-metallic conduit shall be machine straightened to remove the longitudinal curvature caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 6 mm (0.25")." The longitudinal axis of the straightened conduit shall not deviate by more than 20 mm per meter (0.25" per foot" from a straight line. The HDPE and straightening mechanism manufacturer operating temperatures shall be followed.

Method of Measurement. Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduits shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Basis of Payment. This work shall be paid at the Contract unit price per foot for furnishing and installing:

GC07 CONDUIT, GALVANIZED STEEL, ENCASED IN CONCRETE, ¾ TO 2 ½"

GC08 CONDUIT, GALVANIZED STEEL, ENCASED IN CONCRETE, FROM 3" TO 5"

of the type, diameter, and number of raceways wide by the number of raceways high specified, which shall be payment in full for the work as described herein.

GC09–GC10 CONDUIT, GALVANIZED STEEL, IN GROUND

Description. This item shall consist of furnishing and installing galvanized steel conduit, fittings and accessories in the ground, either pushed, trenched, plowed, or directionally bored with fittings complete as specified herein and as shown on the contract drawings. All conduit splices shall be solid threaded couplings as directed by the Engineer. Trenching, backfilling and restoration are incidental to this pay item in accordance with the District 1 Traffic Signal Specifications.

These items shall conform to Sections T420 and T642 of the Traffic Specifications and District 1 Traffic Signal Specifications, except as herein revised. All conduits shall be placed at a depth of thirty inches, except under railroad tracks the conduit shall be a minimum of five feet.

Add the following to Article 811.03 of the Standard Specifications: "Pavement, driveways, sidewalk, and curbs shall not be removed to install electrical conduits."

Revise Article 810.04 of the Standard Specifications to read:

> "Installation. All underground conduit shall have a minimum depth of 30-inches (700 mm) below the finished grade."

Add the following to Article 810.04 of the Standard Specifications:

> "All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans."

Add the following to Article 810.04 of the Standard Specifications:

"All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum or 300 mm (12") or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped. The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap. The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125") thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring."

Add the following to Article 810.04(c) of the Standard Specifications:

"Coilable non-metallic conduit shall be machine straightened to remove the longitudinal curvature caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 6 mm (0.25")." The longitudinal axis of the straightened conduit shall not deviate by more than 20 mm per meter (0.25" per foot" from a straight line. The HDPE and straightening mechanism manufacturer operating temperatures shall be followed.

Add the following to Article 811.03 of the Standard Specifications: "Pavement, driveways, sidewalk, and curbs shall not be removed to install electrical conduits."

Method of Measurement. Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduits shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Basis of Payment. This work will be paid at the contract unit price per foot for CONDUIT, GALVANIZED STEEL, IN GROUND of the type, diameter, and number of raceways wide by the number of raceways high, which price shall be payment in full for furnishing and installing the galvanized steel conduit either pushed, trenched, plowed or directionally bored with fittings, complete. Trenching, backfilling and restoration, including removal and replacement of sidewalk are incidental in accordance with the District 1 Traffic Signal Specifications.

GC09 CONDUIT, GALVANIZED STEEL, IN GROUND, ¾ TO 2 ½ INCH

GC10 CONDUIT, GALVANIZED STEEL, IN GROUND, 3 TO 5 INCH.

GC11–GC12 CONDUIT, NON-METALLIC, COILABLE, IN GROUND

Description. This item shall consist of furnishing and installing coilable non-metallic, fittings and accessories in the ground, either pushed, trenched, or directionally bored with fittings complete as specified herein and as shown on the contract drawings.

Materials. These items shall conform with Sections T420 and T642 of the Traffic Specifications and District 1 Traffic Signal Specifications, except herein revised. All conduit shall be placed at a depth of thirty inches, except under railroad tracks the conduit shall be a minimum of five feet.

Also, these items shall conform to Sections 1088 and 810 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item, with the following exceptions:

The duct shall be a plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The duct and its manufacture shall conform to the standards of NEMA Publication TC7 and ASTM Designation D3485.

The duct shall be made of high density polyethylene which shall meet the requirements of ASTM Designation D 1248, Type III Class C and the requirements listed in table 2-1 of NEMA TC7. Submittal information shall demonstrate compliance of these requirements.

Duct dimensions shall conform to the standards listed in table 2-2 of NEMA TC7. Submittal information shall demonstrate compliance with these requirements.

As specified in NEMA TC7, the duct shall be clearly and durably marked at least every 10 feet with the material designation (HDPE for High Density Polyethylene), nominal size of the duct and the name and/or trademark of the manufacturer.

Method of Measurement. Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduits shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Coilable nonmetallic conduit installed in excess of the limits described will not be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per foot of CONDUIT, NON-METALLIC, COILABLE, IN GROUND, of the type, diameter, and number of raceways wide by the number of raceways high, which price shall be payment in full for furnishing and installing the conduit in ground, coilable non-metallic either pushed, trenched, or directionally bored with fittings complete. Trench and backfill will be paid for separately except the restoration of ground is incidental to this pay item.

GC11 CONDUIT, NON-METALLIC, COILABLE, IN GROUND, 1 ¼”

GC12 CONDUIT, NON-METALLIC, COILABLE, IN GROUND, 2”

GC13 CONDUIT, PVC, FOR BUILDINGS, 1”, SCHEDULE 40

Description. This item shall consist of furnishing and installing rigid non-metallic conduit, fittings and accessories as specified herein and as shown on the contract drawings exposed or embedded within or upon a building or structure.

Materials. Rigid non-metallic conduit shall be manufactured in accordance with U.L. Standard 651 and NEMA TC2, accessories in accordance with UL 514 and TC-3, General Service Administration (GSA) WC-1094A, NEC Article 352 (Type RNC) and shall be U.L. listed and labeled Schedule 40 PVC.

Elbows and nipples shall conform to the specifications for conduit. The cost of fittings, couplings, elbows, nipples and other such conduit appurtenances shall be included in the bid unit price for conduit.

Conduit Wall Seals. Conduit wall seals shall be incidental to the conduit specified under this item. Conduit wall seals used in cored holes in existing concrete shall consist of an assembly of an oversize outside pressure disc with membrane clamp, a neoprene sealing ring and an interior pressure disc, with the discs tightened by means of not less than three stainless steel socket head cup tightening screws with stainless steel washers. Pressure discs shall be PVC-coated steel.

Installation.

General. Rigid non-metallic conduit shall be installed in conformance with the requirements of NEC Article 352, except where more stringent requirements are specified herein.

The ends of the conduit shall be cut square and thoroughly reamed before installation. All burrs and rough edges shall be removed.

Bends of rigid nonmetallic conduit shall be so made that the conduit will not be damaged and that the internal diameter of the conduit will not be effectively reduced. Field bends shall be made only with bending equipment identified for the purpose, and the radius of the curve of the inner edge of such bends shall not be less than that shown on Table 354.24 of the National Electrical Code.

Conduit joints shall be coupled. Connection to couplings, fittings and boxes shall be with a suitable-type cement inherently resistant to atmospheres containing corrosive agents.

Conduit runs shall have no more than 270 degrees of bends (the equivalent of three 90 degree bends) between pull points. Bends shall be long radius type unless specifically approved by the Engineer. Bends may be either factory-made bends or field bends using suitable bending apparatus.

Whenever possible, conduits shall be installed so as to drain to the nearest opening, box or fitting.

Fasteners used to mount conduit supports, and other associated items attached to the structure shall be suitable for the weight supported and shall be compatible with the structure material, i.e. wood screws shall be used for solid masonry or concrete and clamps shall be used for structural steel. Expansion anchors shall not be less than ¼ inch trade size and shall extend at least 2 inches into the masonry or concrete. Power-set anchors shall not be less than ¼ inch trade size and they shall extend at least 1 ¼ inch into the masonry or concrete.

Mounting. Unless otherwise indicated or specified, surface-mounted conduits shall be held in place by one-hole clamps and clamp backs. Conduits which are mounted to steel beams or columns shall be held in place by suitable beam clamps. Conduit entering the wet well area of the pump station shall be mounted using stainless steel clamps and clamp backs. All other clamps, clamp backs and beam clamps shall be of electro-plated malleable iron.

Unless otherwise indicated, conduits suspended from the structure shall be supported by trapeze or other hangers approved by the Engineer. Trapeze hangers shall be hot-sip galvanized steel channels or angle irons with conduits held in place by heavy-duty stainless steel U-bolts, nuts and lock washers. Trapeze hangers shall be hung using threaded stainless steel rods not less than 3/8 inch diameter and appropriate anchors or by other means approved by the Engineer.

Conduit supports shall be within 3 feet of each cabinet, panel, box, compression bell fitting. The maximum distance between supports shall be 3 feet.

Method of Measurement. Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduits shall be measured for payment.

Basis of Payment. This work shall be paid at the Contract unit price per foot furnished and installed CONDUIT, PVC, FOR BUILDINGS, 1 INCH, SCHEDULE 40, as indicated, which shall be payment in full for the work as described herein.

GC14 CONDUIT, REMOVAL

Description. This work shall consist of disconnecting, removing, dismantling and transferring off the site existing conduit, including connectors and appurtenances as herein specified and as directed by the Engineer. Except as otherwise indicated or directed by the Engineer, the existing conduit shall be deemed not salvageable upon removal and shall then be disposed of off the site.

Construction Requirements. No removal work shall be permitted without approval from the Engineer. Any damage resulting from the removal and/or transportation of the existing conduit and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer. The Engineer shall be the sole judge to determine the extent of damage.

Method of Measurement. Conduit removal shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduit shall be measured for payment.

Basis of Payment. This item shall be paid at the contract unit price per foot for CONDUIT REMOVAL, including connectors and appurtenances, which shall be payment in full for the work as described herein.

GCC1 CONTROLLER, CALCIUM CHLORIDE PUMP

Description. This item shall consist of furnishing and installing an electrical control cabinet with control devices and wiring as shown on the plan prepared by an Engineer for Calcium Chloride pump in a maintenance yard facility as specified herein.

Materials. The completed controller shall be UL approved as an industrial control panel. The cabinet shall be single door design, wall mounted type, NEMA 4X, not less than 14 gauge Type 304 stainless steel. All external hardware shall be stainless steel. The cabinet shall adequately house all required components with ample room for arrangement and termination of wiring. A 60 percent fill capacity shall be the design guideline. The controller shall have all the components as shown on the electrical plan to operate remotely and manually the calcium chloride pump, refer to the Standard Specifications for Road and Bridge Construction, current version, section 1068.(e) for detailed operating criterion.

Method of Measurement. Each calcium chloride pump controller, inspected and approved by the Engineer, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, CALCIUM CHLORIDE PUMP, which shall be payment in full for furnishing and installing the controller, complete, as specified herein.

GCX1 COAXIAL CABLE

Description. This work shall consist of furnishing materials and labor for installation of coaxial cable exposed or within conduit as specified herein and indicated by the Engineer, complete with all connectors, connector sealant, termination at radio and antenna end and testing.

Materials. Cable shall be low loss (1.5 DB/100' AT 100 m Hz) 50 ohm Helix coaxial cable with flame retardant, foam dielectric, solid inner conductor and solid outer corrugated conductor. Coaxial cable shall be Times Microwave Systems Number LMR-1200 or Engineer-approved equivalent.

Interfacing connectors shall be of the same size and type as the cable, furnished and installed as needed and indicated by the Engineer. All connectors shall be furnished with an O-ring to seal out moisture.

All connectors installed outside or exposed to weather shall be furnished with a weatherproofing kit recommended by the manufacturer.

Installation. The cable shall be carefully installed to avoid damage to the cable jacket. Cable splices will not be allowed. The cable shall not be bent to a radius less than the manufacturer's recommended bending radius, either in permanent placement or during installation.

Fasteners used to mount exposed coaxial cable shall be compatible with the mounting structure material i.e. wood screws shall be used for wood, toggle bolts shall be used for hollow masonry, expansion bolts or power-set studs shall be used for solid masonry or concrete and clamps shall be used for structural steel. Wire tie-wraps are unacceptable. Cable shall be terminated, with the appropriate connectors, at the indicated radio and antenna.

Testing. After installation, the cable shall be tested as approved by the Engineer. Cable failing to pass the test shall be replaced with new cable at no additional cost.

Method of Measurement. The cable shall be measured for payment in feet in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment. A total of 2 ft.

slack shall be allowed for the end of a coaxial cable termination. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This work shall be paid at the Contract unit price per foot installed COAXIAL CABLE, ¾ TO 7/8 INCH, exposed or within conduit as specified, which shall be payment in full for the work as described herein.

GE01–GE02 ELECTRIC CABLE ASSEMBLY

Description. This item shall consist of furnishing and installing multi-conductor power cable, suitable for direct burial, in conduit or trench, as specified herein, complete with all testing. The cable shall be an assembly of insulated power conductors, plus an insulated ground wire cabled in accordance with UL 1277 with fillers and binder tape, and with a jacket overall. The cable shall be UL Listed for direct burial use and shall be rated 90 degrees C dry and 75 degrees C wet.

Materials. Materials shall be according to Article 1076.01 and 1066.06 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Installation. Section 870 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item, with the following exceptions:

Add the following to Article 870.03 of the Standard Specifications:

> "Bored and Pulled. A remotely steerable, fluid cutting tunneling system is to be used to install the cable assembly. The tunneling system shall be electronically detectable and shall line the tunnel with a clay lining as it tunnels. The tunneling system shall be approved by the Engineer prior to its use."

Method of Measurement. Electric cable assembly, in conduit or trench, shall be measured, per feet.

Basis of Payment. This item shall be paid at the contract unit price per foot for :

GE01 ELECTRIC CABLE ASSEMBLY, XLP, 3/C NO. 2, 1/C NO. 6 XLP GREEN

GE02 ELECTRIC CABLE ASSEMBLY, XLP, 3/C NO. 4, 1/C NO. 6 XLP GREEN

of the size and number of conductors indicated, which shall be payment in full for furnishing, installing in conduit or trench and testing the cable as specified herein.

GE03–GE07 ELECTRICAL CABLE IN CONDUIT, XLP

Description. This work shall consist of furnishing materials and labor for installation of electric cables in conduit as shown on the contract drawings or as otherwise indicated, complete with all splicing, identification, terminating and testing.

Sections 817 and 1066 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item, with the following exception(s):

Add the following to Article 1066.03(b) of the Standard Specifications:

> Cable sized No. 2 AWG and smaller shall be UL listed Type RHH/RHW and may be Type RHH/RHW/USE. Cable sized larger than No. 2 AWG shall be UL listed Type RHH/RHW/USE."

Method of Measurement. The cable shall be measured for payment in feet, in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment. A total of 6 ft. slack shall be allowed for the end of a run terminating at a panel and 4 ft. will similarly be allowed when terminating at a wall-mounted panel. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This item will be paid at the contract unit price per foot for furnish & installation of:

GE03 ELECTRICAL CABLE, XLP, 1/C UP to No. 6

GE04 ELECTRICAL CABLE, XLP, 1/C No. 4 to No.1

GE05 ELECTRICAL CABLE, XLP, 1/C from No. 1/0 to No. 2/0

GE06 ELECTRICAL CABLE, XLP, 1/C from No. 3/0 to No. 4/0

GE07 ELECTRICAL CABLE, XLP, 1/C from No.250 to 500 MCM

of the size, number and type of conductors indicated, which shall be payment in full for the work as described herein.

GE08 ELECTRIC CABLE, PULL OR REMOVE

Description. This work shall consist of pulling and/or removing an existing electric cable from a conduit.

Method of Measurement. Electric cable in conduit, pull/remove, shall be counted, each, per feet.

Basis of Payment. This work will be paid for at the contract unit price per foot per electrical cable for ELECTRIC CABLE, PULL OR REMOVE, which price shall be payment in full for removing the electric cable complete. If two or more cables in a conduit are to be removed each cable will be measured for payment separately.

GE09 ELECTRICAL CABLE, THWN

Description. This work shall consist of furnishing materials and labor for installation of electric cables in conduit as specified herein and indicated by the Engineer, complete with all splicing, identification, terminating and testing.

Materials. All cables shall be U.L. listed as Type THHN or THWN per Standard 83, rated for 600 volts, 90 degrees C. dry and 75 degrees C. wet. They shall be suitable for installation in wet and dry locations, expose to the weather, and shall be resistant to oils and chemicals. It shall confirm to the Federal

Specification J-C-30B. The U.L. listing mark, cable voltage, insulation type and ratings, as well as the cable size shall all be clearly printed on the cable in a color contrasting with the insulation color. Conductors shall be annealed uncoated copper per UL Standard 83 or 1063 and unless otherwise indicated, shall be Class B or Class C stranded. Conductors used for general building lighting and receptacle circuits may be solid.

Each cable shall be insulated with Polyvinyl Chloride (PVC) and sheathed with nylon complying with requirements of UL Standard 83 for Types THHN or THWN. The minimum thickness at any point, of the PVC insulation, shall be not less than 90 % of the specified average thickness.

Unless otherwise indicated, cable shall be solid full color coded via insulation color. Unless specifically approved by the Engineer, color coding of neutral and ground wires shall be by means of colored insulation, except where bare ground wires are indicated.

Branch circuit from panelboards, for lighting, receptacles and similar loads shall be color coded by mean of colored wire insulation. Colors shall be as selected by the Contractor but a sufficient number of colors shall be used such that wiring in common enclosures is clearly differentiated and color combinations or funs are generally not repeated. Care shall be taken in the phasing of combined-neutral circuit runs. Switched legs shall be differentiated form un-switched legs of a circuit.

Wiring shall be color coded by means of colored wire insulation as follows:

"line":	black
neutral:	white
ground:	green
others:	color coded using a repeating color format as approved by the Engineer. Signal cable conductor insulation shall be color coded.

Quality Control. Submittal information shall include demonstration of compliance with all specified requirements. All cables shall be new, having been manufactured within the 18 months preceding the date of delivery to the site. All cables shall be delivered to the site in full reels. Cable on the reels shall be protected from damage during shipment and handling by wood lagging or other means acceptable to the Engineer. Reels shall be tagged or otherwise identified to show the UL listing.

Installation. Wired and cables shall be carefully installed to avoid damage to insulation and cable jackets as applicable. Wire lubricant shall be used when pulling wires into conduits. The lubricant shall be no-injurious to conduits, conductors, insulations or jackets and the lubricant shall be UL listed. Each run of cable shall have sufficient slack. Where a number of wires are trained through a box, manhole or handhole, they shall be bundled using appropriate cable ties and supported to minimize pressure or strain on cable insulation. Wire and cable shall not be bent to a radius less than the manufacturer's recommended bending radius, either in permanent placement or during installation. Cable pulling apparatus shall have no sharp edges or protrusions which could damage cables or raceways.

Wire splices will not be allowed on an SCADA system signal or control wiring. All splices must be approved by the Engineer. Splices and terminations, as required, shall be incidental to this item and shall be in conformance with Basic Materials and Methods, elsewhere herein.

All wiring shall be tagged with pre-printed, self-sticking, wrap or heat-shrink type wire markers or other markers approved by the Engineer. Hand written wire markers are not acceptable. The tagging shall be applied at each termination and splice. The tagging shall include the full circuit and wire designation. Markers shall be permanent, of

a size recommended by the manufacturer for the respective wire size and shall be applied as recommended by the marker manufacturer. All wiring shall be terminated as indicated by the Engineer.

Testing. After installation, the cable shall be tested as approved by the Engineer. Cable failing to pass the test shall be replaced with new cable at no additional cost.

Method of Measurement. The cable shall be measured for payment in feet in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment.

A total of six (6) feet slack shall be allowed for the end of a run terminating at a panel and four (4) feet will similarly be allowed when terminating at a wall-mounted panel. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This work shall be paid at the Contract unit price per foot installed ELECTRICAL CABLE, THWN, 1/C from No. 14 to No. 10 of the size and type indicated, which shall be payment in full for the work as described herein.

GF01 FIBER OPTIC TRUNK/DISTRIBUTION/LATERAL CABLE SINGLE MODE UP TO 96 SM

Description. This item shall consist of furnishing, installing, and testing a loose tube, single-mode, fiber-optic cable of the type, size, and number of fibers specified, at the locations shown on the plans and shall be in counts of 12, including all splices, splice enclosures, ST or SC connectors, as specified by the Engineer, patch panels and other miscellaneous equipment to make a complete and operating system.

Materials. The single-mode, fiber optic cable shall incorporate a loose, buffer-tube design. The cable shall be qualified to the requirements of RUS 7 CFR1755.900 (PE-90) for a single sheathed, non-armored cable, and shall be new, unused and of current design and manufacture.

The cables shall use dispersion unshifted fibers. The optical and physical characteristics of the un-cabled fibers shall include:

Core Diameter	8.3µm (nominal)
Numerical Aperture	0.14
Zero Dispersion Wavelength	1300-1322 nm
Zero Dispersion Slope	0.092 ps/(nm²*km)(maximum)
Cladding Diameter	125.0 ± 0.7 µm
Core-Clad Concentricity	0.05 µm maximum
Cladding Non-Circularity	1% maximum
Coating Diameter	245 ± 10 µm
Coating-Cladding Concentricity	12 µm maximum
Mode Field Diameter	9.2 µm ± 0.4 µm at 1310 nm
Mode Field Diameter	10.4 µm ± 0.5 µm at 1550 nm
Dispersion	18.0 ps/(nm*km) maximum at 1550 nm

The number of fibers in each cable shall be as specified on the plans.

For cables with more than 12 fibers, the core construction shall consist of individual buffer tubes, each containing 12 fibers. These buffer tubes shall be stranded around a dielectric central strength member using a reverse oscillation process. For cables containing 12 fibers or less, the core shall use a unitube construction with either 6 or 12 fibers in a single tube.

The individual fibers and buffer tubes shall be identifiable by means of a color-coding scheme as specified in TIA/EIA-598.

The maximum attenuation of any cabled fiber shall not exceed 0.4 dB/km at 1310 nm and shall not exceed 0.3 dB/km at 1550 nm.

The cable shall be capable of withstanding a minimum-bending radius of 20 times its' outer diameter during installation and 10 times its' outer diameter during operation without changing the characteristics of the optical fibers.

The cable shall meet all of specified requirements under the following conditions:

Shipping/storage temperature -58º to F to +158º F (-50º C to +70º C)

Installing temperature: -22º F to + º158 Fº (-30º C to +70º C)

Operating temperature -40º F to + º158 Fº (-40º C to +70º C)

Relative humidity from 0% to 95%, non-condensing

Fiber Optic Splice

The Contractor shall splice optical fibers from different cable sheaths and protect them with a splice closure at the locations shown on the Plans. Fiber splicing consists of in-line fusion splices for all fibers described in the cable plan at the particular location.

Materials

Splice Closures

Splice Closures shall be designed for use under the most severe conditions such as moisture, vibration, impact, cable stress and flex temperature extremes as demonstrated by successfully passing the factory test procedures and minimum specifications listed below:

Physical Requirement: The closure shall provide ingress for up to four cables in a butt configuration. The closure shall prevent the intrusion of water without the use of encapsulates.

The closure shall be capable of accommodating splice organizer trays that accept mechanical or fusion splices. The splice closure shall have provisions for storing fiber splices in an orderly manner, mountings for splice organizer assemblies, and space for excess or un-spliced fiber. Splice organizers shall be re-enterable. The splice case shall be UL rated.

Closure re-entry and subsequent reassembly shall not require specialized tools or equipment. Further, these operations shall not require the use of additional parts.

The splice closure shall have provisions for controlling the bend radius of individual fibers to a minimum of 38 mm (1.5 in.).

Factory Testing

Compression Test: The closure shall not deform more than 10% in its largest cross-sectional dimension when subjected to a uniformly distributed load of 1335 N at temperature of -18º and 38ºC (0 and 100º F). The test shall be performed after stabilizing at the required temperature for a minimum of two hours. It shall consist of placing an assembled closure between two flat parallel surfaces with the longest closure dimension parallel to the surfaces. The weight shall be placed on the upper surface for a minimum of 15 minutes. The measurement shall then be taken with weight in place.

Impact Test: The assembled closure shall be capable of withstanding an impact of 28 N-M at temperatures of -18º and 38ºC (0 and 100º F). The test shall be performed after stabilizing the closure at the required temperature for a minimum of 2 hours. The test fixture shall consist of 9 kg (20 lb) cylindrical steel impacting head with a 50 mm (2in) spherical radius at the point where it contacts the closure. It shall be dropped from a height of 305 mm (12 in.) The closure shall not exhibit any cracks or fractures to the housing that would preclude it from passing the water immersion test. There shall be no permanent deformation to the original diameter or characteristic vertical dimension by more than 5%.

Cable Gripping and Sealing Testing: The cable gripping and sealing hardware shall not cause an increase in fiber attenuation in excess of 0.05 dB/fiber at 1550 nm when attached to the cables and the closure assembly. The test shall consist of measurements from six fibers, one from each buffer tube or channel, or randomly selected in the case of a single fiber bundle. The measurements shall be taken from the test fibers before and after assembly to determine the effects of the cable gripping and sealing hardware on the optical transmission of the fibers.

Vibration Test: The splice organizers shall securely hold the fiber splices and store the excess fiber. The fiber splice organizers and splice retaining hardware shall be tested per EIA Standard FOTP-II, Test Condition 1. The individual fibers shall not show an increase in attenuation in excess of 0.1 dB/fiber.

Water Immersion Test: The closure shall be capable of preventing a 3 m (10 ft) water head from intruding into the splice compartment for a period of 7 days. Testing of the splice closure is to be accomplished by the placing of the closure into a pressure vessel and filling the vessel with tap water to cover the closure. Apply continuous pressure to the vessel to maintain a hydrostatic head equivalent 3 meters (10 ft.) on the closure and cable. This process shall be continued for 30 days. Remove the closure and open to check for the presence of water. Any intrusion of water in the compartment containing the splices constitutes a failure.

Certification: It is the responsibility of the Contractor to insure that either the manufacturer or an independent testing laboratory has performed all of the above tests, and the appropriate documentation has been submitted to the Department. Manufacturer certification is required for the model(s) of closure supplied. It is not necessary to subject each supplied closure to the actual tests described herein.

Construction Requirements

The closure shall be installed according to the manufacturer's recommended guidelines. For mainline splices, the cables shall be fusion spliced 45 days prior to start of the fiber optic cabling installation. The Contractor shall submit the proposed locations of the mainline splice points for review by the Department.

The Contractor shall prepare the cables and fibers in accordance with the closure and cable manufacturers' installation practices. A copy of these practices shall be provided to the Engineer 21 days prior to splicing operations.

Using a fusion splicer, the Contractor shall optimize the alignment of the fibers and fuse them together. The Contractor shall recoat the fused fibers and install mechanical protection over them.

Upon completing all splicing operations for a cable span, the Contractor shall measure the mean bi-directional loss at each splice using an Optical Time Domain Reflectometer. This loss shall not exceed 0.1 dB.

The Contractor shall measure the end-to-end attenuation of each fiber, from connector to connector, using an optical power meter and source. This loss shall be measured from both direction and shall not exceed 0.5 dB per installed kilometer of single mode cable. Measurements shall be made at both 1300 and 1550 nm for single mode cable. For multimode cable, power meter measurements shall be made at 850 and 1300 nm. The end-to-end attenuation shall not exceed 3.8 dB/installed kilometers at 850nm or 1.88 dB per installed kilometer at 1300 nm for multimode fibers.

As directed by the Engineer, the Contractor (at no additional cost to the Department) shall replace any cable splice not satisfying the required objectives.

The contractor shall secure the Splice Closure to the side of the splice facility using cable support brackets. All cables shall be properly dressed and secured to rails or racks within the manhole. No cables or enclosures will be permitted to be on the floor of the splice facility. Cables that are spliced inside a building will be secured to the equipment racks or walls as appropriate, and indicated on the Plans.

Optical Patch Cords and Pigtails:

Optical patch cords and pigtails shall comply with the following:

- The optical patch cords furnished under this contract shall consist of a section of single fiber, jacketed cable, equipped with optical connectors at both ends.
- The factory installed connector furnished as part of the optical patch cords and pigtails shall meet or exceed the requirements for approved connectors specified herein.
- The fiber portion of each patch cord and pigtail shall be a single, jacketed fiber with optical properties identical to the optical cable furnished under this contract.
- The twelve fiber single-mode fiber optic cable shall be installed as a pigtail with factory installed ST compatible connectors.

- The patch cords shall comply with Telcordia GR-326-CORE

Connectors:

The optical connectors shall comply with the following:

- All connectors will be factory installed ST compatible connectors. Field installed connectors shall not be allowed.
- Maximum attenuation 0.4dB, typical 0.2dB
- No more than 0.2dB increase in attenuation after 1000 insertions
- Attenuation of all connectors will be checked and recorded at the time of installation with an insertion test minimum 5 times checked with an OTDR
- All fibers shall be connectorized at each end
- All fibers shall terminate at a fiber patch panel
- Unused fibers will be protected with a plastic cap to eliminate dust and moisture
- Termination shall be facilitated by splicing factory OEM pigtails on the end of the bare fiber utilizing the fusion splicing method. Pigtails shall be one meter in length.

Installation

Fiber optic cable may be installed in 4-inch surveillance duct existing in the foundation of the barrier wall along the expressway. Cable connecting the barrier wall with remote houses or control cabinets will be pulled through 4-inch GS conduit along with an additional 1-C No. 10 insulated cable for locating purposes. Cable will be installed in the longest continuous lengths supplied by the manufacturer. A suitable cable feeder guide shall be used between the cable reel and the face of the duct and conduit to protect the cable and guide it into the duct off the reel. It shall be carefully inspected for jacket defects. If defects are noticed, the operation shall be stopped immediately and the Engineer notified. Precautions shall be taken during installation to prevent the cable from being “kinked” or “crushed”. A pulling eye shall be attached to the cable and used to pull the cable through the duct and conduit system. A pulling swivel shall be used to eliminate twisting of the cable.

As the cable is played off the reel into the cable feeder guide, it shall be sufficiently lubricated with a type of lubricant recommended by the cable manufacturer. Dynamometers or breakaway pulling swing shall be used to

ensure that the pulling line tension does not exceed the installation tension value specified by the cable manufacturer. The mechanical stress placed on a cable during installation shall not be such that the cable is twisted or stretched. The pulling of cable shall be hand assisted at each controller cabinet. The cable shall not be crushed, kinked or forced around a sharp corner. If a lubricant is used, it shall be of water-based type and approved by the cable manufacturer. Sufficient slack shall be left at each end of the cable to allow proper cable termination. 40 feet of additional slack cable shall be left in each junction box and 100 feet at each hand hole or as directed by the Engineer. Storage of additional slack cable in junction boxes and hand holes shall be coiled. The slack coils shall be bound at minimum of 3 points around the coil perimeter and supported in their static storage positions. At each junction box and hand hole the cable shall be visibly marked/tagged as "CAUTION-FIBER OPTIC CABLE". Maximum length of cable pulling tensions shall not exceed the cable manufacturer's recommendations.

During cable pulling operations, the Contractor shall ensure that the minimum bending of the cable is maintained during the unreeling and pulling operations. Entry guide chutes shall be used to guide the cable into the hand hole conduit ports. Lubricating compound shall be used to minimize friction. Corner rollers (wheels), if used, shall not have radii less than the minimum installation-bending radius of the cable. A series array of smaller wheels can be used for accomplishing the bend if the cable manufacturers specifically approve the array.

The pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. Fuse links and breaks can be used to ensure that the cable tensile strength is not exceeded. The pulling system shall have an audible alarm that sounds whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer upon request.

The fiber optic cable may be installed in conduits already populated with copper telecommunication cable, 50 pair #19 or 100 pair #19. The telecommunications cable shall be removed and new cable installed with the fiber optic cable. Removal of the existing 50 pair or 100 pair #19 cable shall be included in contract unit price for fiber optic cable type, size, and number of conductors as specified.

Splices will be performed using approved fusion splicing equipment. A stainless steel rod, and shrink sleeve will be used to protect each splice. After each splice is performed, the attenuation will be checked and recorded. Splices will then be put into a splice tray, and all splice trays installed inside of an approved splice enclosure.

Installation of the fiber optic cable will require traffic control, which will involve lane closures with restrictive times that the Contractor will be allowed on the freeway. The majority of work involved for the installation will have to be done during nighttime operations or on weekends.

Traffic control will be paid for separately but the Contractor shall reflect the premium labor costs incurred due to restrictive working hours in this contract unit price. The Contractor will not be allowed additional compensation for premium work time incurred under this item.

Pigtails with ST or SC, as specified by the Engineer, compatible connectors shall be spliced and then be terminated in a fiber patch panel or termination panel.

As-built documentation: After the fiber optic cable plant has been installed, ten (10) complete sets of as-built documentation shall be provided. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices.
- Final copies of all approved test procedures.
- Complete performance data of the cable plant showing the losses at each splice location and each terminal connector.
- Complete parts list including names of vendors.

Testing Requirements: The Contractor shall submit detailed test procedures for approval by the engineer. All fibers shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter and optical source. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

The Contractor shall provide the date, time and location of any tests required by this specification to the engineer at least 5 days before performing the test. Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers for continuity. Events above 0.1 dB and total attenuation of the cable. The test procedure shall be as follows:

A Certified Technician utilizing an Optical Time Domain Reflectometer (OTDR) and Optical Source/Power Meter shall conduct the installation test. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

The method of connectivity between the OTDR and the cable shall be a factory patch cord of a length equal to the "dead zone" of the OTDR. Optionally, the Technician can use a factory "fiber box" of 328 ft (100m) minimum with no splices within the box. The tests shall be conducted at 1310 and 1550 nm for all fibers.

At the completion of the test, the Contractor shall provide two copies of documentation of the test results to the Project Engineer. The test documentation shall be submitted as both a bound copy and a CD Rom and shall include the following:

Cable & Fiber Identification:

Cable ID

Cable Location-beginning and end point

Fiber ID, including tube and fiber color

Operator Name

Date & Time

Setup Parameters

Wavelength

Pulse width (OTDR)

Refractory index (OTDR)

Range (OTDR)

Scale (OTDR)

Setup Option

Test Results:

A.) OTDR Test

Total Fiber Trace

Splice Loss/Gain

Events>0.10 dB

Measured length (Cable Marking)

Total Length

The OTDR test results file format must be Bellcore/Telcordia compliant according to GR-196-CORE issue 2, OTDR Data Standard.

-GR 196, Revision 1.0

-GR196 Revision 1.1

-GR 196, Revision 2.0 (SR-4731)

B.) Optical Source/Power Meter

Total Attenuation

Attenuation (dB/km)

These results shall be provided in tabular form. The following shall be the criteria for the acceptance of the cable:

The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss. However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the fiber including that event point.

The total loss of the cable (dB) less events shall not exceed the manufacturer's production specifications as follows: 0.5 dB/km at both 1310 and 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair that cable run at the Contractor's expense, both labor and materials. Elevated attenuation due to exceeding the pulling tension during installation shall require the replacement of the cable run at the Contractor's expense, including labor and materials.

Label the destination of each run or distribution cable onto the cable in each hand hole, vault or cable termination panel.

Slack Storage of Fiber Optic Cables

As part of these items, slack fiber shall be supplied as necessary to allow splicing the fiber optic cables in a controlled environment, such as a splicing van or tent. After splicing has been completed, the slack fiber shall be stored underground in hand holes or in the raised base adapters of ground mounted traffic controller cabinets.

Where identified on the plans, or as directed by the Engineer, additional lengths of fiber shall be stored, as maintenance coils. The aggregate lengths of the maintenance coils and the slack fiber will be used to repair and maintain the fiber optic cable.

Fiber optic cable shall be tagged inside hand holes with yellow tape containing the text "CAUTION – FIBER OPTIC CABLE." In addition, permanent tags, as approved by the engineer, shall be attached to all cable in a hand hole or other break-out environment. These tags shall be stainless steel, nominally 0.75" by 1.72", and permanently embossed. These tags shall be attached with stainless steel straps, and shall identify the cable number, the number of fibers, and the specific fiber count. Tags and straps shall be Panduit or approved equal.

Method of Measurement. The fiber optic cable of the number of fibers specified will be measured for payment as the number of feet of cable, including lengths stored as splicing slack and maintenance coils, actually furnished installed and tested.

Basis of Payment. Fiber Optic Trunk/Distribution/Lateral Cable Single Mode Up To 96 SM of the number of fibers specified shall be paid for at the contract unit price per foot, which cost shall include the cost of furnishing all labor, material, documentation, tools and equipment to install and test the fiber optic cable.

Fiber optic termination panels, splice closures, connectors, splice vaults and hand holes will be supplied and paid for under other contract items.

GF02 FIBER OPTIC LATERAL INSTALLATION SM

Description. Work under this item shall consist of furnishing and installing a fiber optic termination panel, 12 or 24 SM fiber optic cable, splice closure, pigtails and patch cords, testing, and documentation to connect a surveillance cabinet, lighting cabinet, pump station or other equipment as approved by the Engineer to the trunk or distribution cable.

Materials, Construction Requirements, and Installation:

- Fiber optic cable refer to GF01 requirements
- Fiber optic termination panel refer to GF04 requirements
- Splice Closure, refer to GF01 requirements
- Pigtails, patch cords, testing and documentation, refer to GF01 requirements

Method of Measurement. The fiber optic lateral installation single mode shall be measured for payment at the contract unit price per foot which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. This work will be paid for at the contract unit price per foot for Fiber Optic Lateral Installation SM, which price shall include furnishing and installing the SM fiber optic cable, splice closure, pigtails and patch cords, testing, and documentation to connect a surveillance cabinet or pump station to the trunk or distribution cable, as directed by the Engineer.

GF03 FIBER OPTIC CABLE, HYBRID 12 MM AND 24 SM

Description. This work shall conform with Section 871 of the Standard Specification for Road and Bridge Construction and District Traffic Signal Specifications as directed by the Signal Engineer.

Method of Measurement. The Fiber Optic Cable, Hybrid 12 MM and 24 SM, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. This work will be paid for at the contract unit price per foot for Fiber Optic Hybrid 62.5/125 multimode (MM) 12 fiber and single mode 24 fiber, which price shall include furnishing and installing the fiber optic cable, necessary slack, cable termination and testing, distribution, enclosures, breakout kits, connectors, lashing wire, messenger wire, splices, pigtail assemblies and all other materials, hardware, and labor necessary to complete the installation as directed by the Signal Engineer. The single mode fiber shall comply with the requirements in GF01. In addition to traffic signal use, this item may also be used at pumping stations and other highway systems.

GF04 FIBER OPTIC TERMINATION PANEL, 12F OR 24F

Description. Work under this item shall consist of furnishing and installing a fiber optic termination panel, type and size as specified on the plans and described herein. This equipment will be used to link field equipment using single-mode fiber optic cable.

Materials. The fiber optic termination panel shall comply with the following requirements:

- The fiber optic termination panel shall be rack mountable or wall mounted
- Rack mounted termination panels shall be installed in 19” racks inside of ITS or 334 Type Cabinets or Pump Houses w/19” racks
- The fiber patch panel shall terminate pigtail fibers as called out on the Plans.
- The fiber optic termination panel shall allow termination of a fiber patch cord to interconnect outside plant fibers to fiber optic communication equipment
- Shall be supplied with optical splice tray and holder
- Wall mounted termination panels shall be installed in Pump Station, Type III, Type IV, or Type V control Cabinets
- Wall-mounted termination panels shall be made out of solid steel construction, shall be powder coated, and feature top or bottom cable entry w/dust resistant grommets.

- Rack-mounted units shall be aluminum material per ATSMB 209, powder coated, and modular design.
- The approved type optical connectors on the end of each pigtail shall screw into a sleeve securely mounted to a patch panel within the controller cabinet. The maximum optical loss across the connection shall not exceed 0.25 dB.
- The fibers with the optical connectors on the pigtail cable shall be routed through and secured in the fiber optic termination panel as directed by and to the satisfaction of the Engineer.
- The bulkheads or single-mode adapter types shall be single-mode ST compatible, ceramic, unless a substitute is approved by the Engineer.

Construction Requirements

The Fiber Optic Termination Panel shall be installed in the Traffic Signal, surveillance cabinets or pump stations as specified on the Plans. The panels shall come with cable strain relief hardware and pull out label for administrative documentation. All work shall be neat and in a workmanlike manner. Particular care shall be taken as to not crush or kink the fiber optic cable. If in the opinion of the engineer the cable has been crushed or kinked, the entire cable span shall be removed and replaced at the Contractor's expense.

The approved type of single-mode connectors on the end of each pigtail must screw into a sleeve securely mounted to the termination panel within the fiber termination panel enclosure. The panel must be provided with pre-connectorized and pre-wired port modules.

Method of Measurement. The fiber optic termination panel, 12 F or 24F, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. Fiber Optic Termination Panel, 12F or 24F will be paid for at the Contract unit price each. This price shall be payment for furnishing and installing the Fiber Optic Termination Panel, 12F or 24F along with any necessary fiber optic patch cords and any other materials, hardware, and labor necessary to complete the installation.

GF05 FIBER OPTIC PATCH PANEL 96 SM

Description. This item shall consist of furnishing and installing a 96 port, ST or SC style, rack or wall mounted, patch panel for single mode fiber. The hardware shall include label holders, numbered ports, front and rear cable management rings. Splicing shall be as described in GF01. Materials shall be as described in GF04.

Method of Measurement. The fiber optic patch panel, 96 SM, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. The work will be paid for a the Contract unit price each for Fiber Optic Patch Panel 96 SM, which shall be payment in full for furnishing, delivering, installing, trimming, and organizing fiber optic cable and testing, supplying optical pigtails and patch cords and all other materials and labor necessary to complete the installation.

GF06 FIBER OPTIC SPLICE CLOSURE

Description. Work under this item shall consist of furnishing and installing a Fiber Optic Splice Closure as described in pay item GF01. Splicing shall be as described in pay item GF01.

Method of Measurement. The fiber optic solice enclosure, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. The work will be paid for at the contract unit price for Fiber Optic Splice Closure, which shall be payment in full for furnishing, delivering, installing, trimming, and organizing the fiber optic splice, testing, and all other materials and labor necessary to complete the installation.

GF07 FIBER OPTIC INNERDUCT, UP TO 1 ½"

Description. The Contractor shall provide a continuous Spiral smooth innerduct installed in the 4" surveillance PVC duct system installed within the median barrier wall. The Polyethylene Plastic Duct shall conform to the following industry standards.

ASTM D3035 - Polyethylene plastic duct (SDR-PR) sized by controlled outside diameter.

ASTM D2247 - Standard specification for polyethylene plastic duct schedules 40 & 80 and sized by controlled outside diameter.

ASTM D1248 - Polyethylene plastics extrusions and molding materials.

The Spiral Ribbed Duct shall be orange in color unless otherwise specified elsewhere in the plans or by the Engineer.

Materials. The high density polyethylene used shall be consistent with PE334420 E/C as described in ASTMD 3350 as per Table 1. The resin properties shall meet or exceed the values set forth below for high density Polyethylene (HDPE).

Table 1 - Resin Properties

ATSM TEST	Description	Valves HDPE
D-638	Tensile Strength at yield PSI	3200min
D638	% Ultimate Elongation Value	400 min
D-746	Brittleness Temp.	-75°C max

D-256	Impact per inch of notch	3.4ft lb/in
D-1238	Melt index, g/10 min. Condition E	.4 max
D-1505	Density g/CM^3	.941-.959
D-1693	Environmental Stress Crack Resistance Condition B, F_{20}	48 hrs.

Nominal Duct Size	Nominal Inside Diameter	Minimum Wall Thickness	Nominal Outside Diameter	Min Sup. Bend Radius
25mm (1”)	28mm (1.101”)	2. 5mm (.097”)	33mm (1.315”)	300mm (12”)
38mm (1.5”)	39mm (1.534”)	4.4mm (.173”)	48mm (1.900”)	432mm (17”)

The ribbed duct shall have internally and externally designed longitudinal ribs for reduced pulling frictions and increased lubrication effectiveness.

A pre-lubricated pull tape shall be installed in the innerduct with a minimum tensile strength of 568 Kg or as recommended by manufacturer. The pull tape shall have accurate printed meter markings.

Installation. The Contractor shall install the ribbed duct in the 4” Surveillance PVC duct in the lower portion of the median barrier wall. The Contractor shall insure the ribbed duct is continuous with no breaks from one junction box or cross connect terminal to another and to the surveillance installation. Crushed or deformed ribbed inner duct shall not be used or accepted for use on the job.

Innerduct which passes through junction boxes shall have a termination approximately 2” beyond the terminal end of the 4” PVC duct terminated in the Junction Box.

Innerduct which passes through cabinet foundations shall have an upper termination approximately 2” above the top of the foundation. Ribbed inner duct shall be capped to prevent water and other contaminants from entering

during construction operations. The duct shall be swabbed and blown clean of any debris before installation of cable.

Method of Measurement. The unit duct will be measured for payment in feet in place. Measurements will be made in straight lines between changes in direction and to the centers of equipment and boxes access points. 10 feet will be allowed when terminating cable at a controller. 3' of slack will be allowed at light pole, handholes, pull boxes, junction boxes, and similar locations.

All vertical unit duct will be measured for payment. The vertical distance required for breakaway devices, barrier walls, concrete pedestals, etc., and the depth of any burial will be measured. Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

Basis of Payment. This item will be paid at the contract unit price per lineal feet of FIBER OPTIC INNERDUCT, UP TO 1 ½". The price will be payment in full for furnishing the specified size duct in place and connected at its terminal.

GF08 FIBER OPTIC CABLE, INSTALL ONLY

Description. This item shall consist of retrieving from the owner's storage facility, installing and testing a single mode fiber optic cable of the type, size, and number of fibers specified, at the locations shown in the plans. Splicing, testing, splice closures, documentation and all other miscellaneous equipment to make a complete and operational system shall be as described in GF01, termination and or patch panels, shall be as described in GF04 or GF05, fiber optic splice closure shall be as described in GF06.

Pre-Installation Testing at the Owners' Storage Facility: An optical domain reflectometer (OTDR) shall be used to evaluate the length and quality of cable reels prior to their use on the project. Testing shall be done as described in GF01. Cable which does not meet the requirements set forth in GF01 shall not be installed on the project. It is the Contractor's responsibility to ensure that the fiber is suitable for installation. If cable which does not meet GF01 and is installed, the Contractor shall remove said cable at this/her own expense. Contractor shall make the Engineer aware of the cable which does not meet the Specification. The Engineer will assign an alternate reel or length of cable for installation on the project. The Contractor will be responsible for testing all cable assigned for

install under this pay item. The Contractor shall not be entitled to extra compensation for testing multiple cable reels or cable lengths.

Method of Measurement. The fiber optic cable shall be measured for payment at the contract unit price per foot which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. The installation of fiber optic cable shall be measured in feet of cable actually installed between controllers. This work will be paid for at the contract unit price per foot for fiber optic cable installed only of the type, size, and number of conductors specified, which price shall include retrieving, loading, transporting, installing, and all necessary slack to connect between controllers. Patch panels, inner duct, termination panels, and splice closures shall be paid for separately.

GFC1 FOUNDATION, CONCRETE, TYPE 1

Description. Concrete foundations shall be constructed to support ITS equipment cabinets (Type 1 foundations) at locations as indicated on the Plans. This work shall include installing any necessary hardware (entering conduits, bolts, anchor rods, grounding, etc.) as shown on the Plans. This work shall also include any topsoil, fertilizing, seeding, and mulching of the distributed areas in accordance with Sections 211, 250, and 251 of the Standard Specifications.

Materials. Type 1 concrete foundations shall be according to materials defined in Article 835.02 of Section 836 of the Standard Specifications. All anchor bolts shall be in accordance with Section 1006.09 of the Standard Specifications except that all anchor bolts shall be hot dipped galvanized full length of the anchor bolt including the hooks. Anchor bolts shall provide bolt spacing as shown in the Plans and as required by the cabinet manufacturer.

The Type 1 concrete foundations shall also be fabricated in accordance with Section 1070 of the Standard Specifications. These concrete foundations shall be fabricated from material new and unused in any previous application. The manufacturer shall provide a Certificate of Compliance that the materials are new and meet the specified requirements in accordance with the Standard Specifications and as shown on the Plans.

Construction Requirements. The Engineer will determine the final placement of the Type 1 concrete foundations. Type 1 concrete foundation dimensions shall be in accordance with those dimensions shown in the Plans on the

detail sheet “Concrete Foundation Type 1 (Model 334 Cabinet) Detail”. The foundation shall be located as required in order to avoid existing and relocated utilities. The top of the foundation shall be finished level. Shimming of the appurtenance to be attached will not be permitted.

Prior to pouring the foundation, the Contractor shall check the Plans for the specific number, size, and direction of conduit entrances required at the given location. All conduits in the foundation shall be installed rigidly in place before concrete is deposited in the form. Bushings shall be provided at the ends of the conduit. Anchor rods and ground rod shall be set in place before the concrete is deposited by means of a template constructed to space the anchor rods according to the pattern of the bolt holes in the base of the appurtenance to be attached. The appurtenances shall not be erected on the foundation until the bases have cured for at least (7) days. The Concrete shall cure according to Article 1020.13 of the Standard Specifications.

Method of Measurement. Concrete foundations shall be measured for payment, in feet of the concrete foundation in-place installed in accordance with the total length of concrete foundation required for Type 1 foundations as indicated on the Plans and as directed by the Engineer. Extra foundation depth, beyond the directive of the Engineer, will not be measured for payment.

Basis of Payment. Payment will be paid for at the Contract unit price, per foot of FOUNDATION, CONCRETE, TYPE 1, of the diameter and length indicated. The price shall include payment in full for all necessary excavation, backfilling, disposal of unsuitable material form work, furnishing, installing, and testing all materials (entering conduits, bolts, anchor rods, grounding, etc.) within the limits of the foundation. Any topsoil, fertilizing, seeding, and mulching of the distributed areas as well as all associated labor is to be included in this Contract unit price.

GFR1 FOUNDATION REMOVAL

Description. This item shall consist of removing a metal foundation or concrete foundation to a level at least three feet below the adjacent grade, disposing of the foundation outside the right-of-way, backfilling the excavated areas with approved material and reconstructing the surface to match the adjoining area. If the concrete foundation is located in the sidewalk area, the entire sidewalk square or squares where the concrete foundation is located shall be replaced with new sidewalk.

This item shall conform to Section 444 of the Traffic Specifications and as required by the Engineer.

General. Concrete foundations shall be removed to at least 2 ft. below grade with removed material disposed of off the site. The metal foundations shall be removed completely from the ground. The removal shall extend deeper where required to facilitate roadway construction at no additional cost. Underground conduits and cables shall be separated from the foundation at 2-1/2 ft. below grade and shall be abandoned or re-used as indicated.

The space caused by the removal of the foundations shall be back-filled with trench backfill in accordance with Section 208 of the Standard Specifications.

The removal of an existing concrete foundation shall meet the requirements of Section T444 of the Traffic Specifications.

The removal of a concrete foundation three feet or less in depth below grade shall be removed completely and disposed of outside of the right-of-way. A concrete foundation greater than three feet in depth shall have the first three feet below grade removed and disposed of outside of the right-of-way.

The area where the foundations have been removed shall be backfilled and restored to meet the existing grade and terrain.

Basis of Payment. This item shall be paid at the contract unit price each for FOUNDATION REMOVAL, which shall be payment in full for the removal and disposal of a foundation as specified herein.

GGR1 GROUND ROD

Description. This item shall consist of furnishing, installing and connecting ground rods for the grounding of service neutral conductors and for supplementing the equipment grounding system via connection at poles or other equipment throughout the system. All materials and work shall be in accordance with Article 250 of the NEC.

Articles 806, and 1087.01 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item.

For Traffic Signal Applications, the District 1 Traffic Signal Specifications and the District 1 Standard Traffic Signal Design details shall apply to this item.

Materials. Materials shall be according to the following Articles of Section 1000 - Materials

Item	Articles/Section
(a) Ground Rod	1087.01
(b) Copper Ground Wire	1066.02

Installation. All connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation.

Ground rods shall be driven so that the tops of the rod are 24 inches below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections. Where indicated, ground rods shall be installed through concrete foundations. Where ground conditions, such as rock, preclude the installation of the ground rod, the ground rod may be deleted with the approval of the Engineer.

Where a ground field of electrodes is provided, such as at control cabinets, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings.

Ground rod connection shall be made by exothermic welds. Ground wire for connection to foundation steel or as otherwise indicated shall be stranded uncoated bare copper in accordance the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG. Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate the exothermic weld.

Method of Measurement. Ground rods shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a GROUND ROD, which shall be payment in full for furnishing and installing the materials and work specified herein.

GH01–GH04 HANDHOLE

Description. This item shall consist of furnishing and installing a handhole at the location shown on the plans or as diverted by the Engineer.

Material. Materials shall be according to Section 814 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item. The outside cover shall contain a legend "IDOT TSC", or "IDOT TRAFFIC", or "IDOT LIGHTING" as directed by the engineer.

Installation. The installation of a handhole shall meet the requirements of Section T428 of the Traffic Specifications, except as follows: All concrete handholes are to be cast in place against undisturbed earth. No precast concrete handholes will be accepted. All conduits will enter the handhole at a depth of 30 in. except for the conduits between the curb and first handhole for detector loops when the handhole is less than 5 ft. from the detector loop.

Basis of Payment. This work will be paid for at the contract unit price each for:

GH01 HANDHOLE

GH02 HANDHOLE, FIBER OPTIC

GH03 HANDHOLE, HEAVY-DUTY (SURVEILLANCE, TRAFFIC, LIGHTING)

GH04 HANDHOLE, HEAVY-DUTY, DOUBLE

which price shall be payment in full for all necessary excavating, backfilling, disposal of unsuitable materials, and furnishing all materials within the limits of the handhole.

GH05 HANDHOLE, HEAVY DUTY, SPECIAL

Description. This item shall consist of constructing a heavy-duty handhole, special extra large cast in place, complete with heavy duty frame and cover and in accordance with the following requirements and conforming in all respects to the lines, grades, and dimensions shown on the plans or as directed by the Engineer. All handholes shall be installed in accordance with the Standard Specifications for Road and Bridge Section 814 and TSC Typical TY-1TSC-400#15.

Materials. All materials shall conform to Section 1088.05 and 1088.06 of the Standard Specifications for Road and Bridge. All handholes shall be constructed of Class S1 concrete meeting the requirements of the Standard Specifications for Road and Bridge construction Article 1020.

Construction Details. Handhole of the type specified shall be constructed in accordance with the details shown on the plans and conform to the following requirements:

Concrete. Concrete construction shall be done in accordance with the provisions of Concrete for Structures and incidental Construction contained in the Standard Specifications for Road and Bridge Construction, Section 503

Placing Castings. Castings shall be set accurately to the finished elevation so that no subsequent adjustment will be necessary. Castings shall be set flush with a sidewalk or pavement surface. When installed in an earth shoulder away from the pavement edge, the top surface of the casting shall be 25.4 mm (1 inch) above the finished surface of the ground.

Backfilling. Any backfilling necessary under a pavement, shoulder, and sidewalk or within 60 cm (2 feet) of the pavement edge shall be made with sand or stone screenings.

Forming. Forms will be required for the inside face of the handhole wall, and across all trenches leading into the handholes excavation. The ends of conduits leading into the handhole shall fit into a conduit bell which shall fit

tightly against the inside form and the concrete shall be carefully placed around it so as to prevent leakage. Handhole walls shall be 10 inches.

French Drain. A French drain conforming to the dimensions shown on the plans shall be constructed in the bottom of the handhole excavation.

Steel Hooks. Each handhole shall be provided with four galvanized steel hooks of appropriate size, one on each wall of the handhole.

Frame and Cover. The outside of the cover shall contain a Type "G" handle for lifting and a legend "IDOT" "TSC" cast in. Frame shall be HD F&C 184 Kg (405 lbs.)

Hinges. Type "T" hinges required only on heavy duty special only.

Cleaning. The handhole shall be thoroughly cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

Basis of Payment. This work will be paid at the contract unit price each for a HANDHOLE, HEAVY DUTY, SPECIAL, which price shall be payment in full for all necessary excavating, backfilling, disposal of surplus material and form work, frame and cover, and furnishing all materials within the outside limits of the handhole:

GH06 HANDHOLE, REMOVE

Description. This work shall consist of removing the frame and cover of an existing handhole, breaking off the top section of the handhole wall to a minimum depth of 6 inch below the surrounding grade, or as specified, disposing of the concrete debris outside the right-of-way, backfilling the hole with approved material, reconstructing the surface to match the adjoining area, and disposing of the frame and cover as directed by the Engineer. If the handhole is located in the sidewalk area, the entire sidewalk square or squares where the handhole is located shall be replaced with new sidewalk per applicable contract pay items.

Method of Measurement. Remove handhole shall be counted, each.

Basis of Payment. This work will be paid for at the contract unit price each for HANDHOLE, REMOVE which price shall be payment in full for all labor and materials necessary to complete the work as described herein.

GH07 HANDHOLE, REBUILD

Description. This item shall consist of rebuilding and bringing to grade a handhole at a location shown on the plans or as directed by the Engineer.

General. The work shall consist of removing the handhole frame and cover and the wall of the handhole to a depth of 203.2 mm (8 in.) below the finished grade. Upon completion, four (4) holes, 101.6 mm (4 in.) in depth and, 12.7 mm (1/2 in.) in diameter, shall be drilled into remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, 203.2 mm (8 in.) in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy.

All concrete debris shall be removed from State right-of-way to a location approved by the Engineer.

The area adjacent to each side of the handhole shall be excavated to allow forming. All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt handhole according to applicable portions of Section 814 of the Standard Specification for Road and Bridge Construction. (The existing frame and cover shall be replaced if it was damaged during removal or as determined by the Engineer.)

Method of Measurement. Each handhole, which is rebuilt, shall be counted as a unit of payment.

Basis of Payment. This work will be paid for at the contract unit price each for HANDHOLE, REBUILD, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

GH08 HANDHOLE, REBUILD EXISTING HANDHOLE TO HEAVY-DUTY

Description. This item shall consist of partial removal of an existing concrete traffic single handhole, reconstruction to the specifications of heavy duty handhole including new frame and cover, at location(s) shown in the plans or as directed by the Engineer.

General. The work shall consist of removing the existing handhole frame and cover and the wall of the handhole to a depth of 381 mm (15 in.) below the finished grade. Upon completion, four (4) holes, 101.6 mm (4 in.) in depth and, 12.7 mm (1/2 in.) in diameter, shall be drilled into the top of the remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, 203.2 mm (8 in.) in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy. All concrete debris shall be removed from State right-of-way to a location approved by the Engineer. Any pavement or asphalt surface removal required to install the new concrete shall have straight and neat edges using a method approved by the Engineer. Care shall be taken to protect the existing traffic signal cable. Any cable damage shall be reported immediately and repaired as directed by the Area System Engineer.

All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt heavy duty handhole according to applicable portions of Section 814 of the Standard Specification for Road and Bridge Construction.

Method of Measurement. Each existing handhole, which is partially removed and reconstructed to a heavy-duty handhole, complete, shall be counted as a unit payment.

Basis of Payment. This work will be paid for at the contract unit price each for HANDHOLE, REBUILD EXISTING HANDHOLE TO HEAVY-DUTY TYPE, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

GIG1 INSPECTION, STANDBY GENERATOR

Description. The Contractor shall furnish a factory trained service representative to complete a comprehensive generator inspection, as specified herein, at designated locations.

Locations. This work shall be applicable to all generators and shall not be limited to generators at the Pump Stations, Base Stations, Traffic Systems Center (TSC), Fiber Huts, Moveable Bridges (Extra Systems) and two (2) in state stock.

Work Description. The inspection shall consist of, but not limited to the following items, which are described on form GIG1.

1) Cooling System
2) Fuel System
3) Air Induction and Exhaust System
4) Lube Oil System
5) Starting System
6) Engine Monitors and Safety Controls
7) Generator Accessories
8) Control Panel
9) Gas Engine
10) Megometer Test
11) Load Bank Test
12) Switch Gear Inspection

Method of Measurement. Each inspection that is completed according to form GIG1 and the inspection report submitted and approved by the Engineer shall be counted as unit for payment.

Basis of Payment. This item shall be paid at the contract unit price, each, for INSPECTION, STANDBY GENERATOR, which shall be payment in full for the work described herein.

Generator Inspection Service List

AGREEMENT NO.	CUSTOMER (NAME AND ADDRESS)		ACCOUNT NO.
GENERATOR SET LOCATION		CONTRACT	TELEPHONE NO.
ENGINE MODEL	SERIAL NO.	SERVICE METER	DATE
GENERATOR MODEL	SERIAL NO.	VOLTS	KILOWATTS

SERVICE ITEMS	SATIS-FACTORY	UNSATIS-FACTORY	COMMENTS

COOLING SYSTEM

1. RADIATOR/HEAT EXCHANGER☐ ☐
2. COOLANT ☐ ☐
3. HOSES AND CONNECTORS ☐ ☐
4. FAN DRIVE PULLEY AND FAN ☐ ☐

5. FAN BELTS	☐	☐
6. JACKET WATER HEATER	☐	☐
7. WATER PUMP	☐	☐
8. THERMOSTATS	☐	☐

FUEL SYSTEM

9. FUEL TANK	☐	☐
10. WATER TRAP SEPARATOR	☐	☐
11. FUEL LINES & CONNECTORS☐	☐	
12. GOVERNOR & CONTROLS	☐	☐
13. FUEL FILTERS-PRIM./SEC.	☐	☐
14. FUEL PRESSURE	☐	☐

AIR INDUCTION AND EXHAUST SYSTEM

15.	AIR FILTER	☐	☐	
16.	AIR FILTER SERVICE			
17.	INDICATOR	☐	☐	
18.	AIR INLET SYSTEM	☐	☐	
19.	TURBOCHARGER☐		☐	
20. EXHAUST MANIFOLD			☐	☐
21. EXHAUST SYSTEM			☐	☐
22. VALVES & VALVE ROTATORS		☐	☐	RECOMMEND LOAD BANK ☐ YES ☐ NO

LUBE OIL SYSTEM

23. OIL	☐	☐
24. OIL FILTERS	☐	☐
25. OIL PRESSURE	☐	☐
26. CRANKCASE BREATHER	☐	☐
27. S-O-S	☐	☐

STARTING SYSTEM

28. BATTERIES	☐	☐
29. BATTERIES-SPECIFIC GRAVITY	☐	☐
30. BATTERY CHARGER	☐	☐
31. STARTING MOTOR	☐	☐
32. ALTERNATOR	☐	☐

ENGINE MONITORS AND SAFETY CONTROLS

33. GAUGES	☐	☐
34. SAFETY CONTROLS	☐	☐
35. REMOTE ANNUN./ALARMS	☐	☐

SERVICE ITEMS	SATIS-FACTORY	UNSATIS-FACTORY

GENERATOR

36.	BEARINGS	☐	☐
37.	SLIP RINGS & BRUSHES	☐	☐
38.	SPACE HEATERS	☐	☐
39.	VIBRATION ISOLATORS	☐	☐

CONTROL PANEL

40.	START CONTROLS-MAN./AUTO	☐	☐
41.	VOLTMETER	☐	☐
42.	AMMETER	☐	☐
43.	FREQUENCY METER	☐	☐
44.	CIRCUIT BREAKER	☐	☐
45.	AUTO TRANSFER SWITCH ☐	☐	

GAS ENGINE

46.	GAS LINES & CONNECTORS ☐	☐	
47.	CARBURETOR & LINKAGE ☐	☐	
48.	MAGNETO/DISTRIBUTOR	☐	☐
49.	IGNITION SYSTEM	☐	☐
50.	SPARK PLUGS	☐	☐

MEGOHMETER TEST

51.	MAIN STATOR	☐	☐
52.	MAIN ROTOR	☐	☐
53.	EXCITER STATOR	☐	☐
54.	EXCITER ROTOR	☐	☐

LOAD BLANK TEST

55. REGULATOR MFG. _____

56. EACH OF THE SPECIFIED LOADS SHALL BE TESTED FOR A HALF HOUR.

57. REGULATOR MODEL _____

58. HOUR METER START _____ STOP _____

59. RACK SETTING _____

60. VOLTAGE STABILITY _____

61. PERCENT OF LOAD	0%	25%	50%	75%	100 %					
62. KW METER										
63. VOLTMETER L1 TO L2										
64. VOLTMETER L2 TO L3										
65. VOLTMETER L3 TO L										
66. AMMETER L1										
67. AMMETER L2										

68. AMMETER L3										
69. FREQUENCY METER-HZ										
70. ELAPSED TIME METER-HOURS										
71. ENGINE SPEED-RPM										
72. LUBE OIL PRESSURE-PSI										
73. WATER TEMPERATURE (F)										
74. FUEL OIL PRESSURE-PSI										
75. AMBIENT TEMPERATURE (F)										
76. LUBE OIL TEMPERATURE-IN										
77. LUBE OIL TEMPERATURE-OUT										

COMMENTS/RECOMMENDATIONS:

_____
_____
_____
_____
_____

SERVICE TECHNICIAN DATE CUSTOMER REPRESENTATIVE DATE

Generator Inspection Service List

Switchgear Inspection Check

Automatically start engine and transfer load.

(Record time it takes to start engine.)

Run engine foe ½ hour and take following readings:

1. Amps
2. Volts
3. Oil Pressure
4. Water Temperature
5. Fuel Pressure
6. Frequency
7. Kilowatts
8. R.P.M.

Automatically stop engine and observe for proper shutdown.

1.	Automatic Transfer Switches	Observe, Work, Clean
2.	Contracts	Observe, Work, Clean
3.	Relays	Observe, Work, Clean
4.	Timers	Observe, Work, Clean
5.	Indicators	Observe, Work, Clean

Automatic start and Load Transfer

1. Time delay for start signal _____ seconds
2. Time engine to start and pick-up _____ seconds
3. Total _____ seconds

Automatic Load Retransfer and engine stop signal

1. Time for normal restoration to retransfer _____ minutes
2. Unload running time _____ minutes
3. Total _____ minutes

Comments: _____ _____

_____

_____

Form GIG1: Rev. 6/06

GIT1 INSPECTION, THERMO GRAPHIC

Description. This work shall consist of furnishing equipment, materials and labor for a thermo graphic inspection of electrical systems, including the main service entrance panel, and sub panels at the maintenance yards and other facilities in District 1, as specified by the Engineer. The testing must be performed by a qualified company, with prior

experience in such type of testing, and shall be approved by the Engineer. An inspection report, including thermo graphs of the equipment tested and deficiencies noted, shall be furnished.

Method of Measurement. Each inspection that is completed, and report submitted and approved by the Engineer, shall be counted as unit for payment.

Basis of Payment. This work shall be paid at the Contract unit price each, for INSPECTION, THERMO GRAPHIC, of the facility specified, which shall be payment in full for the work as described herein.

GJ01 JUNCTION BOX AND ALL APPURTENANCES, REMOVE

Description. This work shall consist of completely removing an existing junction box and all appurtenances, being careful not to damage those existing conduits which will be re-used in the system. In case of an existing conduit being damaged, a new conduit will be furnished in place. The repair work will not be paid for separately, but will be incidental to this bid item. The junction box and cover will be disposed of as directed by the Engineer and all debris removed beyond the right-of-way.

Method of Measurement. Each junction box, which is removed including all appurtenances, shall be counted as a unit of payment.

Basis of Payment. This work will be paid for at the contract unit price each for JUNCTION BOX AND ALL APPURTENANCES, REMOVE, which price shall be payment in full for all labor and material necessary to complete the work as described above.

GJ02–GJ03 JUNCTION BOX, STAINLESS STEEL

Description. This item shall consist of furnishing and installing a stainless steel junction or pull box of the size indicated in locations shown on the contract drawings and as directed by the Engineer. It is not intended to use for installation of fixture.

Section 813 and 1088 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item with the following exceptions: Revise the second sentence of the third paragraph of Article 1088.04 of the Standard Specifications to read: "The gasket shall be extruded directly onto the junction box cover."

Basis of Payment. This work shall be paid for at the contract unit price each for**:**

GJ02 JUNCTION BOX, STAINLESS STEEL, UP TO 6 INCH DEPTH

GJ03 JUNCTION BOX, STAINLESS STEEL, 8 INCH DEPTH

of the size indicated, which shall be payment in full for the work as described herein.

GPC1 PUMP, CALCIUM CHLORIDE

Description. This item shall consist of removing, furnishing and installing a stainless steel up to 1 HP, centrifugal pump for calcium chloride spray as specified herein.

Materials. The stainless steel pump (Finish Thompsons Inc., model no. DB6V – M226 or better) shall be seal less with magnetic drive, extremely resistant to corrosion and able to handle acids, caustics, chemicals. The motor shall be rated for continuous duty, totally enclosed fan cooled and generates at least 3450 rpm with a closed impeller. It shall be made out of Polyvinylidene Fluoride (PVDF) material rated to -20˚F. and shall be UL listed and CSA certified.

Installation. The Contractor shall remove the existing pump, if applicable, for calcium chloride spray at the maintenance yard and replace with the stainless steel pump as specified herein. It shall be wired as per NEC requirement. The cable and conduit if corroded shall be replaced during the installation. It shall be paid separately using non-routine pay items.

Method of Measurement. Stainless steel centrifugal pump of HP as indicated, furnish and install complete with wiring, shall be counted, each.

Basis of Payment. This work shall be paid at the contract unit price to furnish and install STAINLESS STEEL CENTRIFUGAL PUMP, up to 1 HP, which price includes all labor, material and equipment necessary to remove, dispose of, and replace the existing pump, as specified herein.

GPV1 PAVEMENT SEALCOATING

Description. The Contractor shall patch where necessary and seal coat the pavement, within the fenced areas, at each building, hut, and structure once per year in April, per the following specifications. The Engineer's decision shall be final as to the determination of which application and products are utilized.

Preparation. Pavement surface oils shall be removed by washing with an applicable detergent and brushing and/or pressure wash cleaning. All dirt, gravel, leaves, etc., must be removed from the pavement and the pavement must be completely dry, prior to crack sealing and seal coating.

Installation. The Contractor (or Specialty Vendor as approved by the Engineer) shall furnish and install two (2) coats of an appropriate sealcoat coal tar emulsion sealer. The product must meet or exceed both the Air Force and Federal R-P 355e GSA-FSS and the American Society for Testing and Material Specification D-3320-74T specifications. All manufacturers' mix specifications are to be followed as the proper amounts of washed silica sand provide added traction and longevity to the seal finish. A sealer latex enhancer shall be added to increase the longevity and color of the finish. The sealer shall be transported in steel hydraulically agitated tanks to ensure the application of a consistent and uniform mixture at the work site. The seal coating shall be applied at a temperature above 50 degrees F. with a spray device or drag broom assembly, but a uniform distribution is required.

The first seal coat shall be allowed to dry not less than four (4) hours but no more than six (6) hours before the second coat of seal coat is applied. The pavement shall be roped or taped off so no traffic uses the pavement for twenty-four (24) hours after the second coat of seal coat is applied.

The Contractor (or Specialty Vendor as approved by the Engineer) shall furnish and install crack sealant where necessary. Only hot (350 F.) pour rubberized commercial parking lot crack sealant, similar or better than "Flex-A-Fill" shall be used.

Basis of Pavement. This item shall be paid at the contract unit price per square yard for PAVEMENT SEALCOATING**,** .12 gallons of seal per square yard for the first coat and .06 gallons per square yard for the second coat of seal coating for ASMC pavement.

GRB1 RADIO TOWER BEACON, RELAMP

Description. This item shall consist of furnishing the parts, labor and equipment to restore flashing beacon light and group relamp the remaining lights at that elevation on a District 1 communication microwave tower, within 24 hours of notification, as specified herein by the Engineer.

General. The District 1 has radio towers located in six counties listed in Section 3 that have flashing beacon lights manufactured by Honeywell or an equivalent, for lighting and other obstructions to aerial navigation as specified by the FAA, FCC. The optical system is designed to provide a definite 360 degrees horizontal beam. The beacon must be used with a beacon flasher or tower lighting control installed inside the control room to achieve the proper flash rate.

The beacon light has either a mechanical flashers, immune to AM tower RF frequencies, or an electronic lighting controls to flash several lights on tower, including a photocell for automatic day/ night operation.

Outage. The outage is reported by the night outage patrolman, regular patrolman or called in by District 1 ComCenter to the contractor's dispatch center. The contractor should dispatch immediately and respond to the call to check for the outage. The patrolman shall inspect beacon light to isolate the problem by checking breaker, flasher circuit and associated controls. The defective component shall be reported within one (1) hour to District 1 ComCenter.

The defective lamp and the remaining lamps at that elevation shall be replaced within 24 hours of notification to restore the beacon lighting of the tower. If it needs a new or different flashing control board, the contractor should order the part by overnight delivery or furnish temporary lighting to restore beacon lighting within 24 hours at no extra cost to this pay item.

Method of Measurement. Microwave tower flashing beacon light restored, and group relamp of remaining lights at that elevation, shall be counted, each.

Basis of Payment. This work shall be paid at the contract unit price each for a RADIO TOWER BEACON, RELAMP, which price shall be payment in full for furnishing parts, labor and equipment to restore a beacon light and relamp the remaining lights at that elevation, as specified herein.

GRT1 RADIO TOWER, INSPECTION AND REPORT

Description. This item shall consist of inspection, testing and reporting on District 1's communication radio tower, as specified by the Engineer, by a factory approved Service Company, as described herein.

Materials. The specialty company shall furnish the necessary labor, equipment and tools to inspect and test radio tower, located in six (6) counties (refer to Section 3 for list of locations), as outlined on the "Tower Condition Report". The specialty contractor shall be equipped with all recommended test equipment and provide the accompanying report data.

Work Description. The tower maintenance and inspection procedures shall be as per ANSI/TIA 222-G. Information on this document can be found at www.tiaonline.com/standards/catalog. The copy can be accessed at: www.nationwide.com/codes/codes/tia/Annexes/e_1.htm

Reporting. The contractor shall submit a report of data for all items stated on the form. The report shall also include any pertinent changes made or required to the radio tower.

Method of Measurement. Each inspection of a radio tower location including submittal of its report and approved by the Engineer shall count as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for a RADIO TOWER, INSPECTION AND REPORT, which price shall be payment in full for submitting the report as specified herein.

GSD1 SIDEWALK, REMOVE AND REPLACE

Description. This work consist of the removal and disposal of existing sidewalk and the construction of new sidewalk at locations shown on the plans, in accordance with Sections 424 and 440 of the Standard Specifications for Road and Bridge Construction and as directed by the Engineer.

Method of Measurement. Sidewalk removal and replacement shall be measured for payment in place and the area computed in square feet.

Basis of Payment. This work will be paid for at the contract unit price per square feet for SIDEWALK, REMOVE AND REPLACE, which price includes all labor, material and equipment necessary to remove and dispose of the existing sidewalk and to construct the new sidewalk as specified herein.

GSO1 SODDING

Description. This item shall conform to applicable requirements of Section 252 of the Standard Specifications for Road and Bridge construction. The Contractor shall prepare the ground surface, furnish, transport and install sod including labor and other materials required, as directed by the Engineer.

This item shall conform to Section T252 of the Standard Specifications.

Locations that are to be sodded will be shown on the plans or as directed by the Signal Engineer.

Basis of Payment. This work will be paid for at the contract unit price per square foot of SODDING, which price includes all labor, material and equipment necessary to furnish and place the sod, including sod watering as specified herein. Removal and disposal of the existing sod shall be incidental to the contract unit price.

GTC1 TRAFFIC CONTROL

Description. This item of work shall include furnishing, installing, maintaining, replacing, relocating and removing all traffic control devices used for the purpose of regulating, warning or directing traffic during maintenance or construction activities throughout this contract.

The Contractor shall contact the District One Bureau of Traffic at least 72 hours in advance of beginning work.

Basis of Payment. This work will be paid for at the contract unit price per each for TRAFFIC CONTROL of the closure type indicated, which price shall be payment in full for all labor to install, maintain, replace, relocate and remove all traffic control devices indicated in the plans, specifications, or authorizations.

Delays to the Contractor caused by complying with these requirements will be considered incidental to the item for traffic control and no additional compensation will be allowed for daytime or nighttime closures (or for traffic lanes or ramp closure) on the expressway.

GTR1 TRENCH AND BACKFILL WITH WARNING TAPE

Description. This item shall consist of constructing and backfilling a trench for the accommodation of cables, duct or conduit as described in Section 819 of the Standard Specifications for Road and Bridge Construction, Current version, with the following exception: Delete the third paragraph of Article 819.03(a) except otherwise specifically directed by the Engineer

Method of Measurement.

(a) Contract Quantities. The requirements for the use of contract quantities shall be according to Article 202.07 (a).

(b) Measured Quantities. This work will be measured in feet along the centerline of the trench. Trench and backfill will not be measured for payment for conduit which is pushed. Where separate circuit

runs are placed in a common trench, only one run will be measured for payment along the centerline of the parallel portion.

Basis of Payment. This work will be paid for at the contract unit price per feet for TRENCH AND BACKFILL WITH WARNING TAPE, of the depth specified. Excavation in rock will be classified and paid for as specified in Section 502.

GU01–GU03 UNIDUCT

Description. This item shall consist of furnishing, installing splicing, connecting, and testing of electric cable in unit duct of sizes specified herein and as shown on the contract drawings. The unit duct shall be an assembly of insulated conductors, which are factory pre-installed in a continuous flexible plastic duct.

The unit duct shall be manufactured and installed in accordance with NEC Article 354.

As stated in NEC Article 354.12, the unit duct shall not be used in exposed locations, and inside buildings except for termination purposes, and in hazardous (classified) locations.

Section 816 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. The unit duct will be measured for payment in feet in place. Measurements will be made in straight lines between changes in direction and to the centers of equipment and boxes access points. 10 feet will be allowed when terminating cable at a controller. Three feet of slack will be allowed at light pole, handholes, pull boxes, junction boxes, and similar locations.

All vertical unit duct will be measured for payment. The vertical distance required for breakaway devices, barrier walls, concrete pedestals, etc., and the depth of any burial will be measured. Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

Basis of Payment. This item will be paid at the contract unit price per linear feet for:

GU01 UNIDUCT, WITH XLP INSULATED CABLES, 3/C NO.6 & 1/C NO.8 GREEN, 1”

GU02 UNIDUCT, WITH XLP INSULATED CABLES, 3/C NO.4 & 1/C NO.6 GREEN, 1 ¼”

GU03 UNIDUCT, WITH XLP INSULATED CABLES, 3/C NO.2 & 1/C NO.6 GREEN, 1 ½”

of the size of duct as indicated, which shall be payment in full for all material and work as specified herein.

GU04 UNIDUCT, INSTALL ONLY

Description. This item shall consist of retrieving from Owner’s storage facility, loading and installing, splicing, connecting, and testing of electric cable in unit duct of sizes specified herein and as shown on the contract drawings. The unit duct shall be an assembly of insulated conductors, which are factory pre-installed in a continuous flexible plastic duct.

As stated in NEC Article 354.12, the unit duct shall not be used in exposed locations, and inside buildings except for termination purposes, and in hazardous (classified) locations.

Section 816 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. The unit duct will be measured for payment in feet in place. Measurements will be made in straight lines between changes in direction and to the centers of equipment and boxes access points. 10 feet will be allowed when terminating cable at a controller. Three feet of slack will be allowed at light pole, handholes, pull boxes, junction boxes, and similar locations.

All vertical unit ducts will be measured for payment. The vertical distance required for breakaway devices, barriers wall, concrete pedestals, etc., and the depth of any burial will be measured. Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

Basis of Payment. This item will be paid at the contract unit price per linear feet for UNIDUCT, INSTALL ONLY, of the size of cut as indicated, which shall be payment in full for installing the item as specified herein.

GV01 VENDOR BUDGETARY ALLOWANCE, EMCMS

Description. This item is to establish a budget account to allocate funds for hardware and software upgrades to obtain continued maintenance support from the software and hardware vendors of the Electrical Maintenance Contract Management System (EMCMS), if necessary, and as approved by the Engineer.

Basis of Payment. The required upgrades are described in Article 4.6.6. The estimated cost, which will be paid under Article 109.05 of the Standard Specifications for Road and Bridge Construction, is $75,000. This amount shall be used for bidding purposes for pay item GV01.

GV02 VENDOR BUDGETARY ALLOWANCE, OPERATIONAL SUPPORT

Description. This item is to establish a budget account to allocate funds for the payment of EMCMS operational support maintenance, repairs, etc., in the EMCMS, as approved by the Engineer.

Basis of Payment. The Engineer will initiate authorizations accordingly. The total estimated amount of the annual expenses for operational support, which will be paid under Article 109.05 of the Standard Specifications for Road and Bridge Construction, is $75,000. This amount shall be used for bidding purposes for pay item GV02.

GWR1–GWR2 WELDING RECEPTACLE AND PLUG

Description. Furnish and install welding receptacles and mating plug, 30 Amp or 60 Amp, 3 Poles, 208 Volts, or 2 poles, 240 Volts, complete with interlocked fusible disconnect switch, at the Maintenance Yards, Sign Shops and other Department facilities in District 1, as directed by the Engineer.

Installation. The installation shall include all hardware, junction box and other appurtenances. Removal of the existing receptacle and plug, if necessary, shall be included in this work. Conduit and wire installation shall be paid through other pay items, where needed.

Method of Measurement. Welding Receptacle and mating plug of the amperage and number of poles specified, furnished and installed shall be counted, each.

Basis of Payment. This work shall be paid for at the contract unit price each for WELDING RECEPTACLE AND PLUG, furnish and install, of the rating and number of poles specified by the Engineer, which price shall be payment in full for furnishing, delivering, storing, installing and connecting the receptacle, complete.

GWR1 Welding Receptacle, 30 Amp, Furnish and Install

GWR2 Welding Receptacle, 60 Amp, Furnish and Install

LIGHTING AND SIGN ILLUMINATION SYSTEM NON-ROUTINE PAY ITEMS

LA01 ARM, OR TWIN ARM WITH LUMINAIRE, INSTALL ONLY

Description. This item shall consist of retrieving from Owner's storage facility, loading, and installing, one or two mast arms or twin arm with luminaires(s) and associated hardware on one light pole, as specified herein, at locations designated by the Engineer. Furnished arm(s) and/or luminaire(s) shall be paid separately.

Installation. Installation shall be in accordance with Article 830 of the Standard Specifications for Road and Bridge Construction, Current version.

The mast arm or arms shall be set at right angles to the centerline of the pavement, unless otherwise shown on the plan.

Each arm shall be mounted as indicated and as required for the permanent installation, or temporary lighting on wood pole installation.

This item shall be coordinated with the applicable luminaire (with pole wire and fusing), foundation and anchor bolts, breakaway device (if applicable) which shall be provided under separate pay items, as applicable.

The installation shall be complete with pole wire, fusing and connection to the applicable lighting feeder circuits, all incidentals to this item.

Arms shall not be installed until luminaires are available for installation, which shall be at the same time the pole is installed. This item shall not be paid unless the coordinated assembly of the pole and luminaire is installed, complete.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Arm, or twin arm, with luminaire(s), on light pole, shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for **ARM, OR TWIN ARM WITH LUMINAIRE, INSTALL ONLY**, which shall be payment in full for installing the item as specified herein.

LB01 BREAKAWAY DEVICE, T-BASE,

Description. This item shall consist of furnishing and installing a breakaway device, transformer base, height specified, for standard, davit, or painted davit light pole, with all associated hardware, as specified herein.

Materials. Materials shall be according to Article 1070.04 of the Standard Specifications for Road and Bridge Construction, Current version, except that certification shall be submitted from the supplier that the device used under the conditions of the particular design meets the 1985 AASHTO breakaway specification.

Breakaway device, transformer base, information submitted for approval shall include any recommendations of the Manufacturer for storage as provided under this contract.

The packaging of the breakaway devices, transformer bases, shall incorporate the provisions recommended by the Manufacturer to accommodate storage.

Revise the second sentence of Article 1070.04(a)(1) of the Standard Specifications to read:

> "Certification shall be submitted from the supplier that the device used under the conditions of the particular design meets the 1985 AASHTO breakaway specification."

The breakaway device, transformer base for a painted davit light pole is normally installed on the Kennedy Expressway at Power Center C & D. The height, top and bottom bolt circle as specified on the plan submitted shall be used as part of this pay item.

Materials for Painted Davit Light Poles Only:

Preparation. Components shall receive a mild etch solvent cleaning.

Primer. Components shall receive two (2) coats of epoxy primer. The primer shall be a polyamide white epoxy primer with a corrosion inhibitor having a solid content, by volume, of not less than 65% (+/3%). Each coat shall be applied in a 3-5 dry MIL thickness.

Finish Coat. Components shall receive one finish coat of aliphatic urethane enamel having a solid content, by volume, of not less than 58% (+/3%). The finish coat shall have a dry MIL thickness of 1.5-2.5 mils. The

color of the finish paint shall match that of the existing State owned davit poles which is Benjamin Moore Iron Clad Bronzetone No. 16360. A sample of the proposed paint color shall be submitted for approval to the Engineer.

General. The cleaning and finish work shall be performed indoors, under conditions of controlled temperature, humidity and dust in full conformance with the paint manufacturer's recommendations, and in the presence of an authorized representative of the paint manufacturer.

The paint manufacturer shall certify, in writing that the preparation and finishing of the breakaway transformer base housings has been done properly and in conformance with the Manufacturer's recommendations, and will furnish this certification, together with its standard warranty in triplicate, when the finishing is complete.

A certification from the paint manufacturer, attesting the intent to witness the finishing operation and to provide the above-referenced certification together with a copy of the paint manufacturer's standard warranty shall be included with the pole submittal information.

Installation. Installation shall be in accordance with Section 838 of the Standard Specification for Road and Bridge Construction, Current version.

Manufacturer's recommendations shall be followed during the installation process.

Add the following to Article 838.03(a) of the Standard Specifications:

"All nuts, bolts, washers, and lock washers required for the installation of the transformer base to the pole shall be included as a part of this item."

Method of Measurement. Breakaway device, transformer base of the height, top and bottom bolt circle diameter specified for standard, davit, or painted davit light pole, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for BREAKAWAY DEVICE, T-BASE, FURNISH AND INSTALL, with all associated hardware, of the bolt circle and height as specified, which shall be payment in full for furnishing the item as specified herein.

LBB1 BREAKER, BRANCH 20A TO 70A

Description. This item shall consist of furnishing and installing a circuit breaker, regular or GFI type, of the amperage and number of poles specified, with all associated hardware, for overload and short circuit protection for conductors and connected apparatus, as specified herein, as shown on the plans, (where applicable), or as directed by the Engineer.

General Requirements. All feeders, branch circuits, and auxiliary and control circuits shall have overcurrent and short circuit protection for conductors and connected apparatus. Unless otherwise indicated, the overcurrent protection shall be by means of circuit breakers.

Material. Unless otherwise indicated, circuit breakers shall be standard UL-listed molded case, thermal-magnetic bolt-on type circuit breakers with trip-free indicating handles.

Unless otherwise indicated, circuit breakers shall have a UL-listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated circuit voltage for which the breaker is applied.

All breakers shall be equipped with auxiliary dry contacts. These contacts may be on the breaker body or off a breaker-attached device. Contacts shall be in a normally open configuration.

Installation. The branch breaker shall be installed into the panel in accordance with the manufacturer's recommendation and in accordance with the National Electrical Code, as indicated on the plan drawing (if applicable) or as directed by the Engineer. All the connections shall be tight to prevent any arcing.

The branch breaker shall be labeled to indicate circuits. The auxiliary contact switch, if used, shall be wired as directed by the Engineer.

Method of Measurement. Breaker, branch, shall be counted, each, as a unit of payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a BREAKER, BRANCH, 20A to 70A, of the amperage and number of poles specified, which shall be payment in full to provide an installation, complete and operating.

LBB2–LBB3 BREAKER, MAIN

Description. This item shall consist of removing (if upgrading), furnishing, and installing a main breaker, amperage and number poles as per plan or specified for overload and short circuit protection for conductors and connected apparatus as specified herein. All feeders, branch circuits, auxiliary, and control circuits shall have overcurrent and short circuit protection for conductors and connected apparatus. Unless otherwise indicated, the overcurrent protection shall be by means of circuit breakers.

Material. Unless otherwise indicated, main breakers shall be standard UL-listed molded case, for reverse feed applications, thermal-magnetic bolt-on type circuit breakers with trip-free indicating handles. Unless otherwise indicated, main breakers shall have a UL-489 interrupting rating of not less than 35,000 rms symmetrical amperes at 480 volts and 65,000 rms symmetrical amperes at 240 Volts. Multi-pole main breakers larger than 100 amps size shall have instantaneous adjustable magnetic trip settings. The main breaker shall be equipped with auxiliary contacts

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition. No removal work shall be permitted without approval from the Engineer. Any damage resulting from the removal and/or transportation of the main breaker shall be repaired, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. Unless otherwise indicated, power wiring shall be of the size specified for the corresponding service conductors and shall be rated RHH/RHW, 600 volts and tagged with the self-sticking cable markers. The labor and material to make the appropriate terminal connections in the cabinet as directed by the Engineer shall be incidental to this pay item.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load. The main lugs shall be secured in line with Underwriters' Laboratories standards to prevent lugs from turning or loosening when incoming cables are installed. The current carrying parts shall be secured in place to prevent flexing and loosening or damage during and after installation. At the branch circuit, breakers and associated wiring shall be labeled to identify the location of equipment and/or loads used. The auxiliary contact switch, if used, shall be wired as directed by the Engineer.

Method of Measurement. Main breaker shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each of MAIN BREAKER**,** of the type and size indicated below, which shall be payment in full for furnishing and installing a main breaker as shown on the plan and as specified herein, with all related hardware necessary to provide a complete installation.

LBB2 BREAKER, MAIN 60A TO 100A

LBB3 BREAKER, MAIN 125A TO 175A

LBT1 BUCK-BOOST TRANSFORMER

Description. This item shall consist of furnishing and installing a single-phase buck-boost transformer of KVA specified complete with all the appurtenances and all required hardware, connecting cables and terminal connections as specified herein and as directed by the Engineer. The unit(s) may be installed on a sign structure or on a bridge structure or in a lighting control cabinet or at a location specified by the Engineer. Units are single-phase but can be installed as a three-phase bank.

General Requirements. The buck-boost transformer is used as an auto-transformer for slight upward (boost) or downward (buck) adjustments in voltage. Buck-boost transformers are encapsulated designs with totally enclosed, non-ventilated enclosures. In an auto-transformer, the primary and secondary are electrically and mechanically connected together. Auto-transformers can be used only where local electrical codes permit and isolation of the two circuits are not required.

Material. The transformers shall be UL listed and/or CSA approved to meet or exceed all applicable NEMA, ANSI, UL, OSHA, and CSA requirements. The enclosure shall be NEMA 3R suitable for indoor/outdoor applications, coated with a UL approved ASA-61 gray finish. The transformer shall be encapsulated with electrical grade epoxy and silica sand to completely seal the core and coil from moisture and contaminants. It shall be tested in accordance with the latest issue of UL 506 and CSA C22.2 No. 47. The conductor material shall be copper, and the insulation shall be rated for class 180 degrees Celsius.

Installation. Unless otherwise indicated, power wiring shall be of the size specified for the corresponding service conductors and shall be rated RHH/RHW, 600 volts and tagged with the self-sticking cable markers. The labor and material to make the appropriate terminal connections in a junction box as directed by the engineer shall be incidental to this pay item.

The manufacturer's recommendations shall be followed in the installation. The wiring connections shall be made in accordance with the National Electric Code. The Contractor should energize the system to assure that all the components are working in accordance with their specifications and carrying rated load. The Contractor shall provide the electrical data as specified and directed by the Engineer.

Method of Measurement. Buck-Boost transformer shall be counted, each, as specified, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a single-phase BUCK-BOOST TRANSFORMER, of the KVA specified, which shall be payment in full for furnishing all labor, materials and equipment to install the transformer(s) and related appurtenances necessary to provide a complete and operational installation.

LC01 CONTROLLER, DUPLEX CONSOLE, WITH RADIO

Description. This item shall consist of furnishing and installing a roadway lighting controller, duplex console type with radio control and associated wiring for control of highway lighting and delivering to storage a lighting controller, as specified herein. All work shall be according to the Article 7 – Lighting, navigation and sign illumination system in Volume 1.

Locations. Work shall be performed at the following locations:

Year 2013:

L0103 I-55 @ Martin Luther King Dr, Cab. A

L0105, I-55 @ Michigan, Cab. B

L0120, I-55 @ Loomis St, Cab. E

L0123, I-55 @ Ashland Ave, Cab. E1

Year 2014:

L0125, I-55 @ Damen Ave, Cab. F

L0130, I-55 @ California Ave, Cab. G

L0133, I-55 @ Kedzie Ave, Cab. G1

L0135, I-55 @ Pulaski Rd, Cab. H

Year 2015:

L0140, I-55 @ IL 50, Cab. I

L0160, I-55 @ 64th St, Cab. K

L0170, I-55 @ IL 43, Cab. Y

L0171, I-55 @ IL 171 @ 55th St, Cab. V

Method of Measurement. Each lighting controller, duplex console type, with radio control, inspected and approved by the Engineer, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, DUPLEX CONSOLE TYPE, WITH RADIO, which shall be payment in full for furnishing and installing the lighting controller, complete, as specified herein.

LC02 CONTROLLER, DUPLEX CONSOLE, WITHOUT RADIO

Description. This item shall consist of furnishing and installing a roadway lighting controller, duplex console type, without radio control, including associated wiring, for the control of highway lighting, as specified herein. All work shall be according to the Article 7 – Lighting, navigation and sign illumination system in Section 1.

Method of Measurement. Lighting controller, duplex console type, without radio, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, DUPLEX CONSOLE, WITHOUT RADIO CONTROL, which shall be payment in full for furnishing and installing the lighting controller, complete, as specified herein.

LC03 CONTROLLER, LIGHTING, INSTALL ONLY

Description. This item shall consist of retrieving from Owner's storage facility, loading, transporting and installing a lighting controller complete with all the appurtenances and all required hardware as specified herein, at locations designated by the Engineer. The lighting controller and foundation shall be paid separately. The Contractor shall transport, handle and store (as applicable) the lighting controller in complete conformance with the manufacturer's recommendations and as directed by the Engineer.

Installation. The lighting controller shall be installed as shown on the contract plans or as directed by the Engineer. The installation work shall be in accordance with Section 825 of the Standard Specifications for Road and Bridge Construction, current version, except the foundation will be paid separately.

Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall energize

the lighting controller to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Lighting controller shall be counted of the type specified, each, installed.

Basis of Payment. This item will be paid at the contract unit price each for CONTROLLER, LIGHTING, INSTALL ONLY, of the type specified, which shall be payment in full for the complete installation as specified herein.

LC04 CONTROLLER, LIGHTING, REMOVE AND SALVAGE

Description. This item shall consist of disconnecting, completely removing, transporting to the Owner's storage facility, unloading as salvage and stacking or boxing if necessary, and all types of existing lighting controller or designated components thereof, as specified herein. Proper documentation of Owner's salvage is required in this pay item.

General. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition.

No removal work shall be permitted without approval from the Engineer. Direct buried underground electric cables need not be removed. Cables which are abandoned shall be cut one foot below ground level. Cables in unit duct shall be removed from the duct, or as designated by the Engineer. Duct shall be abandoned and cut one foot below ground level.

Except as otherwise indicated, the cabinet, control equipment, and all associated hardware and appurtenances shall remain the property of the Owner and shall be delivered to the Owner or the Owner's electrical maintenance facility.

Unless otherwise directed by the Engineer, the concrete foundation shall be removed to at least two feet below grade and disposed of off the job site. The underground conduits and cables shall be separated from the foundation at 2.5 feet below grade and abandoned. The space caused by the removal shall be backfilled with trench backfill in accordance with Section 815 of the Standard Specifications.

Any damage resulting from the removal and/or transportation of the controller, control equipment, and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer. The Engineer shall be the sole judge to determine the extent of damage.

Method of Measurement. Each lighting controller, and all associated control equipment, which is removed, delivered to storage, unloaded, inspected, stacked and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for existing CONTROLLER, LIGHTING, REMOVE AND SALVAGE, which shall be payment in full for the work specified herein.

LC05 CONTROLLER, SINGLE DOOR, CONSOLE, WITHOUT RADIO

Description. This item shall consist of furnishing and installing a roadway lighting controller, single door, console type, without radio control, including associated wiring, for the control of roadway lighting, as specified herein. All work shall be according to the Article 7 – Lighting, Navigation and Sign Illumination System in Volume 1.

Method of Measurement. Lighting controller, single door enclosure, console type, without radio control, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item will be paid at the contract unit price each for CONTROLLER, SINGLE DOOR, CONSOLE, WITHOUT RADIO, which shall be payment in full for furnishing and installing the controller, as specified herein.

LC06 CONTROLLER, COMBINATION LIGHTING

Description. This item shall consist of furnishing and installing a roadway lighting controller, mounted on traffic signal cabinet for combination lighting and associated wiring as specified herein.

Material. The lighting controller shall be as follows:

Enclosure: The completed controller shall be an industrial control panel NEMA 4X with an overall dimension of 20" X 16" X 8", and shall comply with UL 508 standards. The enclosure shall be made out of molded fiberglass polyester with gray finish and enhanced with UV inhibitors to protect against outdoor weathering. The door fasteners shall be stainless with butterfly type twist lock including a provision for padlocking.

Electrical components; Refer to the figure L-21 for cabinet wiring diagram and list of components. Article 1068 (d), and (e) of the Standard Specification for Road and Bridge Construction, current revision shall apply to this pay item.

Installation. The lighting controller installation shall be according to the details, location, and orientation shown on the plan.

Method of Measurement. Each lighting controller, combination type, inspected and approved by the Engineer, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, COMBINATION TYPE, which shall be payment in full for furnishing and installing the lighting controller, complete, as specified herein.

LCL1 CLOCK, DIGITAL ASTRONOMICAL

Description. This item shall consist of removing, furnishing and installing, a solid state digital astronomical time clock with necessary contactors for control of lighting, as specified herein. All boxes required for proper storage shall be included in this item.

Materials. Article 1068.01 (e) (1) of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item. The timing of the unit shall be synchronous with the 60-Hertz power line frequency.

Installation. The Contractor shall transport and handle the digital time switch in complete conformance with the manufacturer's recommendations. Manufacturer's recommendations shall be followed during the installation process.

The contact rating of the time switch shall be sufficient to energize the contactor. If an external relay is needed to energize the contactor, then the relay, wiring, and installation shall be incidental to this pay item.

The digital astronomical time switch shall be installed inside the lighting controller or as indicated on the plan drawing and wired accordingly. It shall be programmed to set time of the day and set other functions to operate the lighting.

Method of Measurement. Digital astronomical clock, furnished, removed and installed shall be counted each for payment.

Basis of Payment. This item shall be paid at the contract unit price each for a CLOCK, DIGITAL ASTRONOMICAL, which shall be payment in full for furnishing and installing as specified herein.

LCN1–LCN2 CONTACTOR

Description. This item shall consist of furnishing and installing a lighting contactor, with number of poles, with or without an auxiliary switch contact, as per plan and wiring for control of lighting as specified herein.

Material. Article 1068.01(e) (4) of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item with the following exception: Revise the first sentence of Article 1068.01(e)(4) of the Standard Specifications to read:

> "Contactors shall be electrically operated, mechanically held as specified, with the number of poles required for the service and with operating coil voltage as indicated."

Ampere rating of contactors shall be not less than that required for the duty shown and shall otherwise be rated as indicated.

Contactor shall come equipped with normally open, dry, auxiliary contacts. A device attached to the CAM of the contactor may provide these contacts. Unless otherwise indicated, the contactor-operating coil shall operate at 240 volts, single phase and contactors furnished under this specification shall be with continuous rating as specified per pole at 480 Volts AC.

Installation. The lighting contactor shall be carefully installed in accordance with the manufacturer's recommendation and in accordance with the design requirements represented on the plans. The wire sizes listed on the manufacturer's catalog shall be utilized and it must meet the National Electrical Code. The proper electrical clearance between the live metal parts and grounded metal shall be maintained. The proper size wire shall be used for control circuit connections designated "L", "O" and "C" supplied with clamp type terminals. The auxiliary contact, if used, shall be wired as directed by the Engineer.

Method of Measurement. Lighting contactor shall be counted, each, as a unit of payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHTING CONTACTOR**,** of the amperage indicated below**,** which shall be payment in full for furnishing and installing the lighting contactor, complete, as specified herein.

LCN1 CONTACTOR, 125A TO 225A

LCN2 CONTACTOR, 30A TO 100A

LD01–LD04 DECAL SET, LIGHTING UNIT

Description. This item shall consist of furnishing and installing, a lighting unit identification decal set for a pole or underpass, a lighting unit identification decal set including bracket for underpass mounting, a lighting unit identification decal set for a light tower with painted surface only, or a light tower which has a camera mounted on the luminaire ring, at installations and at heights as designated by the Engineer. This work shall also include the removal of all existing decals as necessary to complete the installation in a neat and aesthetically pleasing manner.

Materials. Article 1069.06 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Installation. Underpass luminaires, including appurtenances, identification brackets and conduit, and associated anchors, shall not be attached and/or drilled into precast, prestressed concrete beams. However, existing anchors, which have been installed improperly, shall be left in place. (Removal of such would cause more damage to the beam, than leaving the anchors in place).

Articles 830.03, 835.02 and 844.03 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. Lighting unit identification decal set shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing an IDENTIFICATION (ID) DECAL SET, of the size per maximum character mounting as described below, which shall be payment in full for the work as specified herein.

LD01 DECAL SET, LIGHTING UNIT, POLE, 4 INCH, MAX 10 CHARACTERS

LD02 DECAL SET, LIGHTING UNIT, TOWER, 8 INCH, MAX 10 CHARACTERS

LD03 DECAL SET, LIGHTING UNIT, TUNNEL OR UNDERPASS WITH BRACKET, 4 INCH, MAX 10 CHARACTERS

LD04 DECAL SET, LIGHTING UNIT, TOWER WITH CAMERA, 4 INCH, MAX 10 CHARACTERS

LDS1 DISCONNECT SWITCH

Description. This item shall consist of removing, furnishing and installing a disconnect switch, as directed by the Engineer.

Materials. The disconnect switch shall be 600 volt, 2-pole or 3-pole, up to 60-ampere, fusible, with solid neutral in a NEMA 4X stainless steel enclosure, complete with 20 ampere, 600 volt, dual element, time delay 4L, Class R fuses, having a UL listed interrupting rating of not less than 200,000 rms symmetrical amperes at rated voltage and suitable for use as service equipment for building.

Fuse holders shall be standard type fuse holders complete with fuses. All electrical materials shall conform to Article 1065, latest version of Standard Specification for Road and Bridge Construction. Raceways shall be as detailed on the plans. Wire from the base fuse to the disconnect switch and to the sign luminaires shall be as specified for pole wire.

The fuse at the base of the sign structure shall be 30 ampere with a solid neutral assembly.

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition.

No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the controller, control equipment, and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. The Contractor shall provide all equipment, transportation and labor necessary to install the equipment as specified. New wiring, conduit and luminaires will be paid by separate pay items specified elsewhere herein.

Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall energize the disconnect switch to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Removing, furnishing and installing each Disconnect Switch for a sign unit or State owned facilities as specified above, and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for removing, furnishing and installing a DISCONNECT SWITCH, which shall be payment in full for the work specified herein.

LDS2 ON/OFF SWITCH

Description. This item shall consist of furnishing and installing ON/OFF switch, the removal of old switch is incidental, as directed by the Engineer.

Materials. The ON/OFF switch shall be 600 volt, 2-pole, 3-pole, 2- Way or 3- Way, up to 20-ampere, having a UL listed interrupting rating of not less than 20,000 rms symmetrical amperes at rated voltage and suitable for building.

All electrical materials shall conform to Article 1065, latest version of Standard Specification for Road and Bridge Construction.

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition.

No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the controller, control equipment, and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. The Contractor shall provide all equipment, transportation and labor necessary to install the equipment as specified. New wiring, conduit and luminaires will be paid by separate pay items specified elsewhere herein.

Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall energize the ON/OFF switch to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Removing, furnishing and installing each ON/OFF Switch for State owned facilities as specified above, and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for removing, furnishing and installing an ON/OFF SWITCH, which shall be payment in full for the work specified herein.

LDS3 MOTION SENSOR

Description. This item shall consist of furnishing and installing a Motion Sensor with visual indicator and hardware as specified herein. All required hardware is incidental to this pay item, however, the conduit and wiring, shall be paid under a separate pay item.

Materials. The Motion Sensor shall be ceiling mount H-Moss Adaptive Technology with passive infrared to cover up to 1,500 sq. ft. areas, equivalent to or better than Hubbell model ATP1500C. It should be able to study their environment and automatically adjust the time delay and sensitivity to optimize the sensor's performance for specific application.

The motion sensor must be used in conjunction with a control unit. The control units provide a 24 volts dc power supply for one (1) to three (3) sensor. The control unit must be selected for the operating voltage of application from 120 V to 240 V, 60 Hz.

Transportation. The Contractor shall transport, handle and store (as applicable) the Motion Sensor in complete conformance with the manufacturer's recommendations.

Installation. The Motion Sensor shall be ceiling mounted as indicated on the contract drawing or as directed by the Engineer, if applicable, AAR Add-A-Relay. The installation shall be complete with necessary conduit and cable (paid under separate pay item) and connected to the applicable circuit.

The contractor shall mount to a junction box for hard ceiling; attach to cover plate by using machine screws and punching a small hole through the ceiling tile for the sensor wires or using threaded mounting post then running sensor wires through the center of the post.

The Contractor shall use NEMA 4X enclosure cover "ACIPE" for the sensor and install the control unit inside the NEMA 4X box for the wet locations. The box and cover shall be made out of heavy-duty die cast aluminum, 0.094 in. thick for damp or wet locations and shall be in compliance with the NEC Article 406-8(B). The box shall be UL listed and comply with Federal Spec. W-C586C.

Method of Measurement. A Motion Sensor, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a MOTION SENSOR which shall be payment in full for the item specified herein.

LE01 ELECTRICAL OUTLET, GFCI TYPE

Description. This item shall consist of furnishing and installing a ground fault interrupter, (GFCI) with an indicator visual or audible, and all required hardware as specified herein. All required hardware is incidental to this pay item, however, the circuit breaker for the GFI outlet, shall be paid under a separate pay item.

Materials. The box and cover shall be made out of heavy-duty die cast aluminum, 0.094 in. thick for damp or wet locations and shall be in compliance with the NEC Article 406-8(B). The box shall be UL listed and comply with Federal Spec. W-C586C. The ground fault interrupter shall be of specification grade, NEMA 3 configuration and comply with applicable UL, CSA and Federal Standards. The cover shall be UL listed for wet locations and comply with UL Standard 514.

The GFCI shall have a light indicator when it is energized. The GFCI receptacle shall have an end of life provision when it is incapable of passing its internal test function (can no longer provide ground fault protection), it will either render itself incapable of delivering power, or indicate by visual or audible means that the device must be replaced. The GFCI shall be capable of reverse line-load mis-wire so that it will deny power to the receptacle face if it is mis-wired.

Transportation. The Contractor shall transport, handle and store (as applicable) the GFI outlets in complete conformance with the manufacturer's recommendations.

Installation. Each GFCI shall be mounted as indicated on the contract drawing or as directed by the Engineer. The installation shall be complete with necessary cable (paid under separate pay item) and connected to the applicable feeder circuit. The circuit breaker shall be labeled for the appropriate GFI.

Method of Measurement. A ground fault interrupter (GFI), shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing an ELECTRICAL OUTLET, GFCI TYPE which shall be payment in full for the item specified herein.

LE02 CONVENIENCE RECEPTACLE, 20 AMP

Description. Furnish and install convenience receptacles, 20A, Voltage as specified by the Engineer for Maintenance yards, Sign Shops and other Department facilities in District 1, as directed by the Engineer. Installation shall include all hardware, junction box, and other appurtenances. Removal of the existing receptacle, if necessary, shall be included in this work. Conduit and wire installation shall be paid through other pay items, where needed.

Method of Measurement. Electrical convenience receptacle, 20 Amp, shall be counted, each, furnished and installed.

Basis of Payment. This work shall be paid at the contract unit price each for CONVENIENCE RECEPTACLE, 20 Amp, which price shall be payment in full for furnishing, delivering storing, installing and connecting the receptacle complete.

LF01 FOUNDATION, LIGHT POLE

Description. This item shall consist of the construction of a steel reinforced concrete light pole foundation, up to 30" diameter, of the diameter specified, complete with raceways, as specified herein. The foundation depth shall be as indicated in the Foundation Depth Table on the plans (where applicable) or as directed by the Engineer.

The foundation shall include soil testing, excavation, reinforcement, concrete, anchor bolts, nuts, washers and raceways as well as clean-up and restoration of the location when such work is not provided under other paid items.

Sections 836, 1020, 1070 and also Articles 1006.10, 1088.01, of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item with the following:

Anchor bolts for light poles shall be heat-treated. Therefore, an exothermic ground wire connection shall not be made to the anchor bolt. Instead, a mechanical connection of the ground wire shall be made to the anchor bolt. However, the cable connections to the ground rod and the rebar cage shall be exothermic.

Method of Measurement. Light pole foundation of the diameter and depth specified shall be counted, per linear foot, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price for soil testing, furnishing and installing per linear foot for FOUNDATION, LIGHT POLE of the diameter specified, of the depth indicated, which shall be payment in full for the work as specified herein.

LF02 FOUNDATION, LIGHT POLE, METAL

Description. This item shall consist of furnishing and installing a metal foundation of the diameter specified for a light pole, consisting of a helix type screw base, base plate, pilot point and hardware for supporting a light pole as specified herein. Excavation in rock will be paid as specified in Section 502.12 for Excavation for Structures.

Materials. Article 1070.01 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Installation. Installation shall conform to Article 836.03 (b) of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Light pole foundation of the diameter specified shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a FOUNDATION, LIGHT POLE, METAL, of the diameter, specified, which shall include all excavation or drilling except excavation in rock, backfilling, disposal of unsuitable material, form work and furnishing all materials within the limits of the foundation.

LF03 FOUNDATION, LIGHT TOWER, UP TO 54 INCH DIAMETER

Description. This item shall consist of the construction of a steel reinforced concrete light tower foundation, up to 54 inch in diameter, complete with raceways, as specified herein. The foundation depth shall be as indicated in the Foundation Depth table on the plans (where applicable) or as directed by the Engineer.

The foundation shall include soil testing, excavation, reinforcement, concrete, anchor bolts, nuts, washers and raceways as well as clean-up and restoration of the location.

Excavation in rock shall be paid according to Section 502.05 and 502.12 of the Standard Specifications for Road and Bridge construction, current version.

Sections 837 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item with the following.

Method of Measurement. Light tower foundation, up to 54" in diameter, shall be counted, per linear foot depth, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price for furnishing and installing per linear foot for FOUNDATION, LIGHT TOWER, UP TO 54 INCH DIAMETER, of the depth indicated which shall be payment in full for the work as specified herein.

LF04 FOUNDATION, LIGHTING CONTROLLER

Description. This item shall consist of furnishing and installing a concrete foundation for a lighting controller cabinet as specified herein, shown on the plans, or as directed by the Engineer. The material and labor for the ground field shall be paid under a separate pay item.

Materials. Concrete shall be Class SI complying with Section 1020 of the Standard Specifications, current version.

The anchor bolts shall comply with ASTM A576. The entire length of the anchor bolts shall be hot dipped galvanized steel according to ASTM 153. The nuts, lock washers, and flat washers shall be galvanized also.

The foundation shall include a 1 inch diameter galvanized steel raceway for the ground field connection.

Conduit raceways shall be heavy wall rigid polyvinylchloride (PVC) conduit, (Schedule 40) UL listed and in conformance with NEMA TC2 and Federal Specifications WC-1094A. Raceways shall be of the number and size as indicated on the drawing.

The foundation shall include a ground field of (3) 5/8 inch X 10 ft. copper-clad steel ground rods connected via 2/0 bare copper wire. All connections shall be made with exothermic welds. The ground wire shall be stranded, uncoated, bare copper in accordance with the applicable requirements of ASTM Designation B-3 and B-8.

Installation. Installation shall comply with Section 825 of the Standard Specifications for Road and Bridge Construction, current version.

The foundation shall have a depth and size as shown on the contract drawing. The top of the foundation shall extend twelve inches from the surrounding finished grade and the edges shall be beveled. A poured, 4-inch thick concrete pad, 4 feet wide X 4 feet shall be provided in front of the cabinet with an expansion joint. Exact concrete pad dimensions and location shall be confirmed with the Engineer, prior to installation. The ground field shall be a 10 feet triangle as shown on the drawing. Each ground rod shall be within a ground well as detailed on the drawing. No ground well shall be placed in the concrete pad in front of the controller. The cabinet shall be caulked at the base. All the conduit entrances into the cabinet shall be sealed with a pliable waterproof material.

Method of Measurement. Lighting Controller, console type, foundation shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each, for furnishing and installing FOUNDATION, LIGHTING CONTROLLER, which shall be payment in full for the work as specified herein.

LF05 FOUNDATION, MODIFICATION FOR CONCRETE OR METAL

Description. This item shall consist of furnishing the necessary labor, equipment, and materials to modify and adjust an existing light pole foundation, concrete or metal, to an elevation as specified herein and as indicated by the Engineer, and the re-installation of the existing light pole upon the modified light pole foundation.

General. This work shall include removing an existing light pole, opening the unit duct, exposing the cable, and pulling the cable out of the foundation in order to adjust foundation, concrete or metal, to an acceptable elevation. The existing unit duct shall be opened in a manner as to minimize bends and not damage the existing electric feeder cable into the adjusted foundation. This work shall meet the requirements of Section 844 of the Standard Specifications for Road and Bridge Construction, current version.

The existing raceway wiring slots are 180 degrees apart, thus in the process of lowering the existing metal foundation, rotation should be in multiples of 180 degrees to assure existing raceway cables can be reused. The foundation shall be lowered with its axis plumb so that the light pole may be reinstalled without the use of shims, grout or other leveling devices.

The foundation shall be adjusted vertically and the base plate shall be level. Extreme care shall be used to achieve the proper final elevation of the top of the foundation with respect to the existing grade. The base plate shall be level and not more than 1” above the highest point of adjacent existing grade.

This work shall include installing a unit duct sleeve, which is the next larger diameter unit duct with respect to the existing unit duct diameter, together with the installation of unit duct compression coupling in line splice on both ends to create a water tight seal. The cable shall be reinstalled and respliced as specified. The hollow foundation shall be filled with densely packed sand. The breakaway couplings or breakaway device and/or hardware, shall not be used to align and reset the pole.

All work shall be performed in a safe manner, include necessary area restoration and shall meet the requirements of Articles 836.03(d) and 1070.01 of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Foundation, modification of concrete or metal, shall be counted, each, modified.

Basis of Payment. This item will be paid at the contract unit price per each for FOUNDATION, MODIFICATION FOR CONCRETE OR METAL, which shall be payment in full for the work as described herein.

LGF1 GROUND FIELD

Description. This item shall consist of furnishing materials and labor for the installation of a ground field, which shall consist of 3 (three)-ground rod access wells in a 10ft. triangle connected via bare copper wire as specified herein, at towers, cabinets and locations indicated by the Engineer.

Section 806 and Article 1087.01 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Materials. Each of the 3 (three) ground rod access wells shall consist of a 5/8 in. X 10' copper clad ground rod in a 12 in. minimum diameter PVC enclosure with fiberglass flush covers.

Installation. The 3 (three) ground rod access wells shall be installed in a typical 10FT. triangle connected via 2/O bare copper wire by exothermic welds. No ground well shall be placed in the concrete pad in front of the lighting controller.

The removable flush cover shall be attached to the PVC enclosure via stainless steel hexhead screws.

The ground rods shall be buried 12 in. below grade and the access well shall be filled with crushed stone to point 36 in. below grade.

The 2/O bare copper wire leaving the ground rod access well closest to the lighting controller cabinet, shall be exothermically welded and enter the lighting controller cabinet foundation via a 1 in. diameter rigid steel conduit.

Method of Measurement. Ground field shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for GROUND FIELD, which shall be payment in full for furnishing and installing the item as specified herein.

LP01 LIGHT POLE, KIT

Description. This item shall consist of removing existing damaged basic materials, and furnishing and installing new basic materials such as new lamp, fuses, fuse holder, decal, pole wire, pole cap, or photocell if specified, hardware, nut covers, hand hole door and grommets in conjunction with the use of a light pole from State's storage facility, and utilizing one or two mast arms and luminaires. This item shall also include the removal of old decals, accident reference markers and graffiti from used poles prior to installation at new locations.

Materials. Materials shall be in accordance with Section 1065 and 1066 of the Standard Specifications for Road and Bridge Construction, Current version.

Installation. Installation shall be in accordance with Section 830 of the Standard Specifications for Road and Bridge Construction, Current version.

The luminaire shall be cleaned from inside/outside, replace bulb with new one rated for minimum of 40,000 hrs. equal or better than Sylvania ET 18 – 67584 and test before installation.

Method of Measurement. Light pole kit for state stock light pole, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT POLE, KIT which shall be payment in full for removing damaged materials, and furnishing and installing all new materials including the necessary hardware as specified herein.

LP02 LIGHT POLE UNIT, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage facility (if required), loading, transporting and installing an aluminum light pole unit which is a standard, davit, or painted davit light pole with (all sizes) mast arm or twin mast arm, and (all types) luminaire(s), complete with appurtenances, length of 10 to 60 feet and all required hardware including bolt covers as specified herein.

Installation. Installation shall be as described in Section 830, except that the light pole shall be set plumb on the foundation without the use of shims, grout or any other leveling devices under the pole base. The mast arm or arms shall be set at right angles to the centerline of the pavement. (The leveling area of the luminaire shall be set in a plane parallel to the roadway taking into consideration the upgrade or downgrade and the super-elevation of the roadway).

The Contractor shall transport, handle and store (as applicable) the metal light pole in complete conformance with the manufacturer's recommendations.

The luminaire shall be washed and relamped as specified under Light Pole Kit. This item shall include the applicable luminaire (with pole wire and fusing), foundation, anchor bolts, and breakaway device which shall be provided under separate pay item.

Poles shall not be installed until luminaires are available for installation which shall be at the same time the poles are installed. Poles shall not be installed and left standing without a coordinated installation of mast arm and luminaire.

Method of Measurement. Light pole unit, shall be counted, each, installed.

Basis of Payment: This item shall be paid at the contract unit price each for LIGHT POLE UNIT, INSTALL ONLY, of the length and mounting height as indicated by the Engineer, which shall be payment in full for the work as specified herein. This item shall not be paid unless the coordinated assembly, including mast arm, luminaire, and breakaway device if specified, is complete.

LP03 LIGHT POLE UNIT, REMOVAL AND SALVAGE

Description. This item shall consist of the disconnection, removal, dismantling, and transportation to the State's storage facility and unloading as salvage, a light pole unit, which is a standard, davit, or painted davit light pole with (all sizes) arm or twin arm, and (all types) luminaire(s), complete with appurtenances, as specified herein and as directed by the Engineer. Removal of the associated conduit, wire and junction boxes shall be included in this item. This pay item shall also include all storage documentation as required by the Engineer.

General. Light pole removal shall be in accordance with Section 842 of the Standard Specifications for Road and Bridge Construction, current version. Proper documentation of owner salvage is required.

Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged a to type, size and condition.

No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the light pole shall be repaired, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Method of Measurement. Each light pole unit, which is removed, delivered to storage, unloaded, inspected, and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT POLE UNIT, REMOVAL, SALVAGE, which shall be payment in full for the removal and disposition of light pole as specified herein.

LP04 WOOD POLE UNIT, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage, loading, transporting and installing a wood pole with mast arm(s) and luminaire(s) complete with appurtances of the mounting height as specified herein, including all necessary hardware and accessories required. The wood light pole unit shall be paid separately.

Installation. Installation shall be in accordance with Section 830.03 (c) of the Standard Specifications for Road and Bridge Construction, current version.

The Contractor shall be paid separately for CCTV and Traffic Signal installation using the non-routine pay items if the wood pole is used for CCTV on Traffic Signal.

The Contractor shall transport and handle the light pole in complete conformance with the manufacturer's recommendation.

"Mechanical Damage. Poles are not acceptable if they contain indentations attributed to loading or handling slings that are 1/4 inch or more deep over 20% or more of the pole circumference, or more than 1/2 inch deep at any point. Other indentations or abrasions, for example, forklift damage, chain-saw damage, etc., shall not be more than 1/l0 the pole diameter at the point of damage up to a maximum of 1 inch. Such damage is permitted in an oversized section, where the excess of wood shall be taken into consideration in evaluating the effects of the damage. In any case, the circumference for a given class is still required to be not less than the specification minimum."

Method of Measurement. Wood pole unit of the mounting height as specified, complete with necessary hardware shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for WOOD POLE UNIT, INSTALL ONLY, of the mounting height up to 90', shall be payment in full for installing a wood pole unit with necessary appurtenances as specified herein.

LP05 WOOD POLE UNIT, REMOVAL AND SALVAGE

Description. This item shall consist of disconnecting, completely removing, dismantling, transporting to the State's storage, and unloading as salvage, a wood pole with mast arm(s) and luminaires(s) complete with appurtances, as specified herein. Removal of the CCTV and Traffic Signal, associated conduit, wire and junction boxes shall be included in this item. Proper documentation of the owner's salvage is required with this pay item.

General. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition. No removal work shall be permitted without approval from the Engineer. Any damage resulting from the removal and/or transportation of the light pole unit shall be restored, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Method of Measurement. Each wood pole unit, complete with CCTV, Traffic Signal, Arm and Luminaire which is removed, delivered to storage, unloaded, inspected, and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for WOOD POLE UNIT, REMOVAL AND SALVAGE, complete with CCTV, Traffic Signal, Arm and Luminaire, which shall be payment in full for the removal and disposition as specified herein.

LPN1 PANEL, DISTRIBUTION

Description. This item shall consist of removing (if upgrading) furnishing and installing, a lighting and distribution panel of the amperage (up to 400 Amps) and number of poles (up to 42) specified for lighting and/or equipment with branch breakers as specified by the Engineer.

General Requirements. The panel with all of its electrical components and parts shall be assembled in a neat orderly fashion. All of the electrical cables shall be installed in a trim, neat, professional manner. The cables shall be trained in straight horizontal and vertical directions and be parallel, next to, and adjacent to other cables whenever possible. The completed controller shall be UL listed as an industrial control Panel under UL 508 and UL 98, service entrance rated panel.

If the enclosure of the existing service or distribution panel is in good condition, the Contractor may use the existing enclosure and replace only the panel board upon approval by the Engineer.

Materials. The panel board shall be test-verified by, and listed with, Underwriters Laboratories, Inc. and shall meet all NEMA standards for panelboards. Panel board shall be designed for sequence phase connection of branch circuit devices to allow complete flexibility of circuit arrangement (1,2 or 3 poles) to evenly balance the electrical load on each phase. Main lugs shall be mechanical, solderless type, and approved for Cu or Al conductors. The chassis shall be sturdy, rigid and shall assure accurate alignment of interior with panel front. The fronts (trims) and flush-type lock/latch handle assembly shall have an appearance equivalent to an ANSI-61 light gray finish. Wiring gutters shall be furnished in accordance with Underwriters' Laboratories Inc. standards.

Main Breaker (omit if main lug only panel). The main breaker shall be of the same manufacturer as the lighting or distribution panel. The electrical requirement shall be of the voltage, phase and ampacity of the lighting or distribution panel. The lugs of the main breaker shall be sized to handle the required cable size of the incoming cable.

Unless otherwise indicated, main breakers shall be standard UL-listed molded case, thermal-magnetic bolt-on type circuit breakers with trip-free indicating handles. Unless otherwise indicated, main breakers shall have a UL-489 interrupting rating of not less than 35,000 rms symmetrical amperes at 480 volts and 65,000 rms symmetrical amperes at 240 Volts. Multi-pole main breakers larger than 100 amps size shall have instantaneous adjustable magnetic trip settings. The main breaker shall be equipped with auxiliary contacts.

The interrupting capacity shall be capable of removing a fault at the applied voltage without damage to the breaker. The breaker may be a fixed trip or interchangeable trip as specified by the engineer. The breaker shall be specified as “fully rated” unless noted otherwise. The main breaker shall be a thermal magnetic trip breaker unless noted otherwise.

Top feed or bottom feed should be as specified. The “on/off” position shall be clearly visible and designed to operate in a vertical plane “on” up, “off” down. A tripped indicated of the breaker shall be clearly visible. Lugs on the breaker shall be suitable for 75 degrees Celsius wire. The breaker shall be UL listed for use in lighting and distribution panels.

Circuit Breakers. All feeders, branch circuits, and auxiliary and control circuits shall have overcurrent protection. Unless otherwise indicated, the overcurrent protection shall be by means of circuit breakers.

Unless otherwise indicated, circuit breakers shall be standard UL-listed, molded case, thermal-magnetic, bolt-on-type circuit breakers with trip-free indicating handles.

Unless otherwise indicated circuit breakers shall have a UL-listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated circuit voltage for which the breaker is applied.

The number of branch circuit breakers shall be as indicated on the control cabinet detail drawings or lighting system wiring diagram, whichever is greater, plus two (2) spare circuit breakers.

Ground & Neutral Bus Bars. Separate ground and neutral bus bars shall be provided. The ground bus bar shall be copper, mounted on the equipment panel, fitted with 22 connectors of the type as shown on the plans, as a minimum. The neutral bar shall be similar. The heads of connector screws shall be painted white for neutral bar connectors and green for ground bar connectors.

Standards. The panel boards shall meet the following applicable industry standards, except where noted:

1. Underwriters' Laboratories, Inc.
    a. Panelboards: UL67
    b. Cabinets and boxes: UL50
    Note: Only panelboards contain UL listed devices can be UL labeled.
2. National Electrical Code – Article 408 and 409
3. NEMA Standards: PB1
4. Federal Specifications
    a. Panelboards: W-P-115c

b. Molded case breakers W-C-375a,b

c. Fusible Switches: W-S-865c

d. NFPA: 79

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition.

No removal work shall be permitted without the approval of the Engineer.

Any damage resulting from the removal and/or transportation of the lighting distribution panel, of the size as specified, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. Service entrance equipment NEC Article 230 and UL, require that a panel used as service entrance equipment must be located near the point where the supply conductors enter the building.

A disconnectable electrical bond must be provided between the neutral and ground.

A service-entrance-type UL label must be factory installed.

The main lugs shall be secured in line with Underwriters' Laboratories standards to prevent lugs from turning or loosening when incoming cables are installed.

The current carrying parts shall be secured in place to prevent flexing and loosening or damage during and after installation.

At the branch circuit, breakers and associated wiring shall be labeled to identify the location of equipment and/or loads used.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Lighting and distribution panel removed, furnished and installed shall be counted, each,

Basis of Payment. This item shall be paid at the contract unit price each for PANEL, DISTRIBUTION, of the amperage (up to 400 Amps) and number of poles (up to 42) of the amperage and number of poles specified, which shall be payment in full for removing, furnishing and installing the distribution panel, as specified herein.

LT01–LT02 LIGHT TOWER

Description. This item shall consist of furnishing, delivering to State's storage facility and unloading, as specified, and installing a light tower including a lowering device with ring, luminaires and lamps, as specified herein. The tower foundation shall be provided under separate pay items. The specifications for this item shall be fully coordinated with the lowering device, ring, luminaire, and foundation requirements.

Materials. Materials shall be in accordance with Article 1069.08 of the Standard Specifications for Road and Bridge Construction, current version with the following exceptions:

Revise the sixth and eighth paragraphs of Article 1069.08(a) of the Standard Specifications to read:

The handhole shall have a door with a full collar of similar material that extends over the handhole frame to exclude liquids and contaminants when closed against the flange and gasketed handhole opening. The door shall be mounted with a full-height stainless steel piano hinge or not less than two stainless steel hinges or other hinge arrangement acceptable to the Engineer. A bolt through a door and frame eyelet shall not constitute an acceptable hinge. Hinges shall be heavy duty, suitable for the weight of the handhole door. Hinges shall be welded to the handhole frame and shall be welded or attached with stainless steel nuts, bolts, and lock washers (5 minimum) to the handhole door. Rivets will not be allowed to attach any hardware. The door/opening shall be gasketed in a manner, which will prevent the entry of water into the pole, and the door shall have a tight compressive seal employing a tubular gasket with a flexible wire core. The gasket shall have a mechanical gripping action and be mounted on a metal edge inside

the handhole door. The door shall be held closed with 12 gauge captive stainless steel clamps. The clamps shall be held closed with spring loaded captive clamps. The clamps shall have a depth stop feature to insure uniform sealing pressure at all clamp points. A minimum of four (4) clamps shall be used around the non hinged sides of the door assembly. A stainless steel padlock hasp and staple shall be provided for locking the door. Door hardware shall be stainless steel. The door shall be equipped with an integral door stop mechanism."

Revise the last paragraph of 1069.08 (b), (2) Inspection, to read:

"The independent welding inspector shall send the test results directly to the Engineer at the following address:

Illinois Department of Transportation

Division of Highways, District 1

Attn: Electrical Operations

201 West Center Court

Schaumburg, Illinois 60196-1096

The cost for all independent welding inspections shall be included in the unit price for the bid item."

Add the following to Article 1069.08(c) of the Standard Specifications:

"The primer paint shall be white polyamide epoxy, with minimum solids by volume 65%. The primer shall be applied in two coats to a total thickness of 6-8 mils dry film thickness following manufacturer's method of application. The two primer coats shall be of different colors.

The finish paint shall be silicone-alkyd resin type paint poly-silicone enamel, minimum solids by volume 53%. The finish paint shall be applied in one coat to a 2-3 mils dry film thickness following manufacturer's method of application. The finish paint shall be applied to the outside surface only."

Revise the second and third paragraphs of Article 1069.08(p) of the Standard Specifications to read:

"A flexible UL Listed Class II conductor shall be installed between the lightning rod and the grounding lug on the top of the tower shaft. The conductor shall be a rope lay cable consisting of 28 strands of No. 14 AWG cooper wire. The cable shall have a minimum outside diameter of 7/16", a cross sectional area of 58 mm^2, and a net weight of 1668 N per 375 pounds per 1000 ft. The same conductor shall be attached with studs and exothermic welds at tower shaft sections. The grounding conductor terminations shall be UL Listed."

Installation. Installation and shipment shall be in accordance with Article 835.04 of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Light tower shall be counted, each, furnished, and installed complete.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT TOWER, of the length as specified below, which shall be payment in full for furnishing and installing complete as specified herein. The tower foundation shall be paid under separate pay item.

LT01 LIGHT TOWER, 110 FT. OR LESS IN LENGTH

LT02 LIGHT TOWER, 111 FT. OR MORE IN LENGTH

LT03 LIGHT TOWER, IN PLACE, CLEAN AND PAINT

Description. Paint a complete or part of a light tower structure as directed by the Engineer, luminaire ring assembly and hood, including spot abrasive blast cleaning of various rusted surface areas of the structure up to a maximum of 15% of the shaft surface area and all at various installations.

General. Under this item, for a unit price per linear feet as shown in the Schedule of Prices and when directed by the Engineer in writing, the Contractor shall prepare the existing deteriorated surfaces and paint all designated surfaces of the various components of the light towers with coatings specified by the Engineer.

All identification decals shall be retained or removed, as directed by the Engineer. Replacement of decals will be paid separately. Removal of all designated decals shall be incidental to this pay item.

Dependent upon lane closure requirements at each light tower location, traffic control and protection may be paid separately.

The work involves the surface preparation and application of coating materials on existing steel light towers greater than 80 ft. high.

The work includes, but is not limited to, the surface preparation and coating application work for the following: Structural Steel as defined in Section 2.1 of the AISC "Code of Standard Practice for Steel Buildings and Bridges" and Other Steel or Metal Items as defined in Section 2.2 of the AISC "Code of Standard Practice for Steel Buildings and Bridges."

The Contractor shall provide all management, supervisory, administration, clerical, quality control personnel, labor forces and all other services required to carry out his surface preparation work, coating and coating related operations, including the furnishing, handling and removal of spent abrasive material, if required and all testing and reporting as specified herein.

Decal Replacement Work. All decals, which are found to be worn, torn, cracked, partially missing, etc., shall be removed. Decals, which appear to be in good condition and fully readable, may remain in place. The Engineer will make the final decision regarding any question relative to the removal and/or replacement of decals. Decals, which are determined by the Engineer to remain in place, shall be covered (masked) prior to new coatings being applied.

Tower Number and Luminaire Quantity Decals. Following sufficient curing of the finish coat, new tower number and luminaire quantity decals 8 inch x 9 inch shall be affixed to poles at locations where the existing decals were removed during the surface preparation process. The Engineer will determine when the decal may be replaced after the finish coat has had sufficient time to cure. Normally, the waiting period will be about 4 to 6 months. The Contractor will be paid separately for the furnishing and reinstalling new decals.

Accident Reference Marker Decals. Accident Reference Marker decals which have been removed shall be replaced within one (1) month following the placement of the final coat. This work will be paid separately.

Responsibilities. The Contractor shall be responsible for:

The planning and performance of all scaffolding work, ventilation, enclosures, protective covers, and utilization of labor and equipment.

Supplying and maintaining of tools, test equipment, enclosures, scaffoldings, etc.

Purchasing and/or requisitioning of supplies.

Performing tests to assure proper lasting equipment performance and required dry film thickness of coatings.

Relocating and/or removing all temporary equipment, enclosures, scaffolding, etc. at the completion of the work, or as directed by the Engineer throughout the course of the job schedule to permit the work of others.

Providing the testing and inspection, equipment, and services for all surface preparation and material application.

Protecting all existing equipment, piping, ducts, etc. and complete coated areas from damage resulting from blasting work and/or misapplied coating materials.

The quality and appearance of the finished work. He/she shall carefully examine this specification and shall be thoroughly familiar with the physical makeup of the areas to be painted and the established schedule and completion date.

Storage Conditions on Site. Extreme care must be exercised in the handling and storage of all materials to insure that the specified coating systems can be properly applied.

Prior to use on the structure, materials, equipment, scaffolding, etc. furnished by the Contractor may require storage for limited periods as approved by the Engineer. Any outdoor storage of materials shall be protected by the Contractor against any kind of damage. The Contractor shall also provide a safe, secure area for this equipment away from the general public.

Health and Safety. The Contractor shall observe all OSHA, State and local laws, ordinances and regulations pertaining to health and safety. The precautions indicated on the paint containers with regard to fire and safety, as well as the laws of the State of Illinois, shall be observed.

The Contractor shall conform to all the requirements of OSHA 29 CFR 1910.1200 pertaining to the communication of information regarding hazards involved in the work.

The importance of safety to all workers on the project shall be recognized, and accident prevention shall be integral part of the Contractor's operations. The Contractor shall cooperate with the Illinois Department of Transportation safety programs.

Material Safety Data Sheets shall be provided by the manufacturer for each product and shall be conspicuously posted.

The Contractor shall handle all wastes from the operation in accordance with the Resource Conservation and Recovery Act (RCRA) located in 40 CFR Parts 260-266 of the Code of Federal Regulations.

The Contractor shall maintain the premises free from rubbish at all times and upon completion, shall carefully clean up all dirt and rubbish left or resulting from the work, and dispose of it in such place and manner as directed by the Engineer.

General Work Provisions. All coating work shall be done in a careful workmanlike manner using the materials specified herein in strict accordance with this Specification.

Surface preparation and coating application shall be in accordance with the Coating Schedule contained herein. The manufacturer's specifications regarding the mixing, thinning, application, drying and general handling of the various materials shall be followed as being supplementary to this Specification.

Any false work (scaffolding, ladders, etc.) required for surface preparation and/or painting shall be designed by the Contractor for loads not less than those established by the State of Illinois, local building codes and (OSHA) 29 CFR 1910 and 29 CFR 1926.

Prior to initial application of coatings, the Contractor or his agent will inspect representative areas to assure conformance with his requirements. The Contractor will perform additional inspections to assure that all coating application is in accordance with his Specification.

All coatings shall be applied as recommended by the manufacturer. Thinning shall be done only as recommended by the manufacturer for a particular application.

The surfaces to be coated shall be dry. No coating work shall be done in damp weather (rain, fog, mist, dew, etc.) which might cause a slight amount of moisture to collect or condense on the surface. No coating work shall be done when the ambient air temperature is below 50 degrees Fahrenheit or above 100 degrees Fahrenheit. No coating work shall be done if the relative humidity exceed 85% or if the substrate temperature is not at least 5 degrees Fahrenheit above the dew point.

Coatings shall be applied in a workmanlike manner by skilled applicators. All coatings must be evenly spread and smoothly flowed on and shall be free from runs and sags. Care shall be taken to apply a film of uniform thickness that completely covers all surfaces required to be coated and avoids local thin spots.

All coating materials shall be as manufactured by Keeler & Long, Inc., or equivalents approved in writing by the Engineer, and shall be as specified in the Coating Schedule contained herein. Intermixing of materials from different manufacturers will not be permitted.

All coating materials delivered to or received at the job site shall be in original unopened and sealed containers bearing manufacturer's name, type of designation, batch number and shelf life. All coatings shall be mixed in strict

accordance with the manufacturer's written instructions, and thinning will not be permitted unless specified in those instructions.

All containers of coatings shall remain unopened until ready for use. The oldest of each kind of coating shall be used first. Containers, which have been opened, shall be used first.

Any coating material found not be in conformance with the specification shall be removed from the site, and from the structure, if already applied, at the Contractor's expense. If reapplication to a formerly coated surface is required, it shall be treated as if it had never been coated insofar as this Specification is concerned.

All coatings shall be stored in an area that is well-ventilated and free from excessive heat, sparks, flame, or the direct rays of the sun. The ambient temperature of the storage areas shall be maintained within the range specified in the Coating manufacturer's printed instruction, unless otherwise specified.

Coatings, which have livered, gelled, exceeded manufacturer's recommended shelf life, or otherwise deteriorated during storage shall not be used, and shall be removed promptly from the site.

Mixing of coatings shall be done in accordance with manufacturer's printed instructions. Power mixers may be used, but it should be noted that the heat generated could shorten the pot life of the coating.

Catalysts and/or thinners shall be added to the coatings strictly in accordance with the manufacturer's printed instructions. Uniform mixing shall be assured by checking for consolidated pigment remains.

If the coatings became thick in cool weather, they shall preferably be heated in the container by the use of paint heaters and not thinned by the addition of solvents. Deviations from manufacturers recommended storage temperature ranges will not be permitted without manufacturer's approval. The Contractor shall furnish, to the Engineer, all information on materials and supplies utilized by the Contractor.

Surface Preparation. The Contractor shall be wholly responsible for finish of his work, and shall not commence any coating work until the surface to be coated has been properly prepared in accordance with the surface preparation

portion of the Coating Schedule contained herein. Chemical contamination shall be removed by washing with clean water, steam, neutralizing solutions, detergents, or other methods recommended by the Coating manufacturer.

Each designated surface area of each light tower to be painted shall be thoroughly washed clean using a sufficient number of cleaning cloths. The cloths shall be changed frequently to avoid using contaminated cleaning materials.

7. Application of Coating Materials. Coatings may be applied by brushes, roller, or paint mitt. All methods of application shall be in accordance with the best practice as recommended by the manufacturer.

When coatings are applied by brushing or rolling, the surface shall be cross-brushed or cross-rolled to secure uniformity of surface and the specified paint film thickness.

Coating Applicators:

Based upon the method of application selected, the proper applicator may be obtained

from Best Libel, Philadelphia, PA. 19148, or Fond du Lac, WI. 54935

Brushes: 3 inch x 1 1/16 inch x 3-5/8 inch

Model: Beauty # 0-10015-00

Pipe Painter: 7 inch x 7/8 inch

(Roller) complete with cover, # 0-94580-00

Mitts: Lambskin PM-1 #0-94500-00

or

Synthetic PM-4 #0-94520-00

All surfaces shall be primed the same day as they are prepared. Finish coats shall be applied as soon as practicable after cleaning. If the surface becomes contaminated in the interim, it shall be refinished to the original cleanliness requirements.

Adequate ventilation must be assured, at all times, for proper drying.

Film thickness of the coating being applied shall be periodically checked using a wet film thickness gauge. Dry film thickness shall be calculated from wet film thickness and volume solids and as recommended by the coating manufacturer. In addition, each coat shall have been visually inspected for holes and thin spots before the next coat is applied.

Surfaces, which have been coated, shall not be handled, worked on, or otherwise disturbed until the coating is completely set. Sufficient time shall elapse between coats to permit them to dry hard. All layers of coated surfaces shall be unscarred and completely integral at the time of application of all succeeding coats.

Each coat shall follow the preceding coat within the time limits set by the manufacturer.

After the application of the scheduled number of coatings, the total dry film thickness (DFT) shall be within the range of the sum of the thickness of the coats as specified. The Contractor shall apply enough paint to adequately cover and to fulfill the DFT as specified in the Coating Schedule continued herein no matter how many coats are necessary.

All finished coating surfaces shall be uniform texture, free of any runs, drips, sags or other detrimental defects, and acceptable to the Owner.

Misplaced coating materials shall be promptly removed and the surface shall be made thoroughly clean and satisfactory to the Engineer.

Copies of manufacturer's application guides or printed instructions shall be conspicuously posted wherever materials are being prepared for application.

Cloths, cotton and waste material which might constitute a fire hazard, shall be placed in closed metal containers or removed from the working area at the end of each day's work.

The Contractor shall provide portable fire extinguishers of suitable type and sufficient number to permit placing at least one (1) extinguisher in any areas where coating with fume-creating or flammable products is in progress, and where coatings are stored and mixed. No smoking shall be permitted in these areas and the Contractor shall be responsible for policing the work.

All protective covers shall be removed upon completion of paint application.

Applicable Documents. The following codes, specifications and standards shall be considered integral parts of this specification. The latest issue of these codes and standards, and other tests and standards incorporated therein as applicable, in effect during the term of this contract, shall apply, unless otherwise noted.

Steel Structures Painting Council (SSPC) Pittsburgh, Pennsylvania 15213

Steel Structures Painting Manual, Volume 1, Good Painting Practice

Steel Structures Painting Manual, Volume 2, Systems and Specifications

SSPC-Vis.-1 No. 1 Pictorial Surface Preparation Standards for Painting Steel Structures.

Pay item LTP1 continued:

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Washington, DC 20210

Title 29 Code of Federal Regulations, Occupational Safety and Health Act of 1970.

29 CFR 1910, 29 CFR 1926

Code of Federal Regulations, Resource Conservation and Recovery Act (RCRA)

40 CFR Parts 260-266

Coating Application Daily Log. The Contractor shall furnish all necessary test instruments to complete the information required on Log Form L-DA. The completed reporting logs shall be faxed to the Engineer as a record of each days work progress. A separate log shall be completed for each tower worked upon by the Contractor. Refer to Log Form L-DA at the end of this section.

Test Equipment:

The test equipment may be obtained from KTA-TATOR Co., Pittsburgh, PA. 15275

Telephone: 1-800-KTA-GAGE.

1. Surface Temperature Thermometer

   Part # PTC 312F

2. Sling Psychrometer

   Part # 127012

3. Weather Psychometric Tables

   Part # WB235

4. Dry and Wet Film Thickness Gauges

Project Status Summary Log - Form L-TP

In addition to the Coating Application Daily Log, the Contractor shall submit a Daily Project Status Summary Log Form L-TP, showing the status of each light tower to be painted on the overall project. This information shall include the specific stage of operations at each light tower. Refer to Log L-TP at the end of this section.

Scope of Work:

LIGHT TOWER SHAFT

Surface Preparation**.** The tower shall be spot abrasive blasted as required in accordance with SSPC SP-6 Commercial Blast Cleaning and/or Power Tool Cleaned to SSPC SP-3, depending on overall condition. The remaining surface shall then be hand tool cleaned in accordance with SSPC SP-2 to remove all loose corrosion and existing paint. All oil, grease, dirt, salt and other surface contaminants shall be removed in accordance with Steel Structures Painting Council's SSPC SP-1 Solvent Cleaning Specification.

Coating System.

Prime Coat. The primer shall be applied to the entire designated area of each tower and be a two component, polyamide epoxy with the following characteristics:

Solids by Volume	66% ± 3%
Dry Film Thickness	4.0 - 6.0 mils
Color	Light Gray or White
VOC Content	2.6 Pounds/Gallon (or less)
Weight/Gallon	13.6 ± 0.5 (pounds)
Shelf Life	2 Years (minimum)
Flash Point	85 degrees F ± 2 degrees F (Pensky-Martens)

Finish Coat. The finish shall be applied to the entire designated area of each tower and be a single component co-polymerized silicone-alkyd with 20% - 30% silicone content, and shall have the following characteristics:

Solids by Volume - 53% ± 3%

Dry Film Thickness - 1.5 - 2.5 mils

Color	White or Hansford Gray
VOC Content	3.0 Pounds/Gallon (or less)
Weight/Gallon	9.0 ± 0.3 (pounds)
Shelf Life	2 Years (minimum)
Flash Point	105 degrees F ± 2 degrees F (Pensky-Martens)

LUMINAIRE RING ASSEMBLY AND HOOD

Surface Preparation. All oil, grease, dirt, salt and other surface contaminants shall be removed in accordance with Steel Structures Painting Council's SSPC Sp-1 Solvent Cleaning. The surface shall then be Hand Tool Cleaned in accordance with SSPC SP-2 to remove all loose corrosion and existing paint.

Coating System. Same as finish coat listed above.

CLEATS, WELDS AND HAND HOLE DOOR HARDWARE SURFACES

Surface Preparation. Prepare surfaces using the SSPC SP-11 power tool cleaning to bare metal to remove all rust and existing coating.

Coating System.

Prime Coat. The prime coat shall be the same as the shaft prime coat described above.

Finish Coat . The finish coat shall be the same as the shaft finish coat described above.

Method of Measurement. The light tower length for payment of all work described herein shall be measured, in feet, in place, and shall be measured as the distance in feet from the top head frame assembly to shaft's base plate or any part thereof, (Refer to Article 7.7.5) spot blast clean and paint.

Basis of Payment. This item shall be paid at the contract unit price, per foot, of tower length for LIGHT TOWER, IN PLACE, CLEAN AND PAINT (GRAY OR WHITE), which shall be payment in full for all labor, materials and equipment required to complete the work as described herein.

LT04 LIGHT TOWER, REMOVE AND RE-ERECT

Description. This item shall consist of removing an existing light tower for inspection and/or retrofitting, and reinstalling the tower on foundation all during the same work day as designated by the Engineer. This pay item shall also include the removal of towers found unsafe by IDOT inspectors. Clearing Site for Safety (including removal of damaged equipment due to MCHD), Site Restoration, all appurtenant materials and work required for removing and reinstalling shall be included as part of this item. The retrofitting work as specified by the Engineer will be paid separately.

General. The existing light tower shall be disconnected and removed from the existing foundation by way of removing the anchor bolt nuts and lifting the light tower from the foundation.

Any damage sustained to the light tower during removal operations shall be repaired, or replaced in kind, to the satisfaction of the Engineer at Contractor's own expense.

Unless otherwise indicated, the light tower shall be reinstalled immediately after inspection and/or modification work the same day on the foundation. The electric power cables shall be reconnected so that tower becomes operational that evening without interruption.

All components shall be replaced upon re-installation of the tower. The anchor nuts shall be repainted. The nuts shall be tightened in compliance with torque specifications recommended by the manufacturer of the lighting unit.

As applicable, recently calibrated dynamometers shall employed by the Contractor for measuring the applied force during final assembly.

The Contractor shall remove the stainless steel screening at the base of the tower, prior to the removal of the tower, and after re-erecting and plumbing the tower, shall reinstall the screening and tighten all anchor bolt nuts, to the satisfaction of the Engineer. The Contractor shall exercise care in the removal of the screening so it remains in a serviceable condition. Replacement screening shall be included in this pay item.

A penetrating oil shall be applied to all anchor bolt nuts prior to removing. The Contractor shall exercise extreme care in the removal of the anchor bolt nuts so that no damage occurs to the anchor bolt threads. If an anchor bolt nut cannot be easily removed, the Contractor shall consult the Engineer to determine the best method to be used to remove the anchor bolt nut.

Any anchor bolt nuts damaged in the removal process or which the Engineer determines should not be reused, shall be replaced with anchor bolt nuts meeting the requirements of Article 1070.03 of the Special Provisions for Road and Bridge Construction, current version, for Light Towers.

Method of Measurement. Light tower shall be counted, each, remove and re-erect.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT TOWER, REMOVE AND RE-ERECT, which shall be payment in full for performing the work as specified herein.

LT05 LIGHT TOWER, INSTALL ONLY

Description. This item shall consist of erecting a light tower as specified herein and as directed by the Engineer. Luminaire, lamp, lowering device and foundation shall be provided under separate pay items. This item shall be fully coordinated with the luminaire, lowering device, and foundation requirements. The light tower shall be paid separately.

Installation. Installation and shipment shall be in accordance with Article 835.04 of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Light tower shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT TOWER, INSTALL ONLY, which shall be payment in full for installing the item as specified herein.

LT06 LIGHT TOWER, LOWERING DEVICE FOR RETROFIT

Description. This item shall consist of removing, furnishing and installing a light tower lowering device for retrofit with 6, 8, or 12 luminaire ring, as specified herein. The lowering device shall be an equivalent to the existing lowering device. The drive mechanism shall be compatible with other existing towers in the same power center location that have previously been retrofitted.

Materials. Materials shall be in accordance with Article 1069.08 (e) of the Standard Specifications for Road and Bridge Construction, current version, except the motor as described under Article 1069.08 (k) shall be omitted. The Contractor shall make sure that the drive is compatible to the existing external drive used for other locations.

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged a to type, size and condition.

No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the light tower shall be repaired, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Transportation. The Contractor shall transport, handle and store (as applicable) the light tower in complete conformance with the manufacturer's recommendations. The Contractor shall make arrangements to transfer the material from the State's storage facility or directly from the manufacturer's facility to the job site.

Inspection and Acceptance. The Contractor shall examine the light tower in the presence of the Engineer and after acceptance shall be held responsible for preservation of the condition of the light tower, as it was at the time of acceptance, until the Final Acceptance Inspection.

Installation Procedure. The installation shall be in accordance with applicable articles of Section 835 of the Standard Specifications for Road and Bridge Construction, current version, and the following:

The Contractor shall remove existing luminaires, ring, fixtures and complete winch assembly, and install a complete new lowering device without any field welding or structural alterations of the handhole frame or doors. The pole shall be readied for the installation of new fixtures including the required counter weights.

Raising and Resetting the Tower. After the tower is reset, the tower assembly shall be inspected and checked for satisfactory operation through a full cycle. After the operation of the full cycle, make final adjustments. Work shall be completed as required, with no more than one night of down time per tower.

Method of Measurement. Light tower lowering device for retrofit with 6, 8, or 12 luminaire ring removed, furnished and installed shall be counted, each.

Basis of Payment. This item shall be paid at the contract unit price each for removing, furnishing and installing LIGHT TOWER LOWERING DEVICE FOR RETROFIT**,** for 6, 8 or 12 luminaire ring which shall be payment in full for the item as specified herein.

LT07 CABLE, COMBINATION CCTV & LIGHTING, INSTALL

Description. This item shall consist of removing the existing power cable and installing a combination CCTV and power cable in a high mast tower, as specified by the Engineer. In addition, the Contractor shall coordinate with the Department's Advanced Systems Maintenance Contract (ASMC) contractor to install a camera mount, a camera and terminate the CCTV cable on the high mast tower, as designated by the Engineer. All appurtenant materials and work required for removing the old cable, reinstalling the new cable, splitting the cable at both ends and securing the CCTV and power cables, in an approved manner, with heat-shrinkable tubing; terminating the power cable for lighting shall be included as part of this item. The camera installation and its terminations, as specified by the Engineer, will be paid separately under ASMC

Removal. Prior to the removal of power cable, the Contractor shall conduct a thorough inspection with the Engineer, and shall log as to its type, size and condition.

No removal work shall be permitted without the approval of the Engineer. Any damage resulting from the removal of the lighting power cable, as specified, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Materials. The Contractor shall use the combination CCTV and lighting cable from State Stock purchased under a separate non-routine pay item and stored at the warehouse.

Transportation. The Contractor shall transport and handle (as applicable) the combination CCTV and lighting cable in complete conformance with the manufacturer's recommendations.

Installation. The Contractor shall remove the old power cable in the tower by lowering the ring down and replace with a combination CCTV and power cable. The power cable shall be terminated in the junction box on the ring and to the four pin connector at the hand hole of the tower. The CCTV cable shall be fed and terminated through the ring to the tenon arm and to the camera mount by the Contractor. If the power cable and/or CCTV cable are damaged during the installation, the Contractor shall repair or replace the cable, as directed by the Engineer.

Unless otherwise indicated, the removal of lighting power cable and replacement of combination CCTV and lighting cable shall be coordinated with advanced system personnel to install the camera and terminate the CCTV cable to the

camera at the same time. The electric power cables shall be reconnected so that tower becomes operational that evening without interruption in service.

Method of Measurement. Removal of power cable and installing a combination CCTV and lighting cable with terminations complete, as approved by the Engineer, shall be counted, each as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for COMBINATION CCTV AND LIGHTING CABLE, INSTALL, as described above, which price shall be payment in full for all work as described herein and as directed by the Engineer.

LU01 LUMINAIRE, EIGHT (8) FT. FLUORESCENT

Description. This item shall consist of furnishing and installing a fluorescent luminaire up to twenty (20) feet mounting height for maintenance yard, sign shop or other facilities, with two eight (8) feet lamps, of the wattage and operating voltage as specified herein.

Materials. The housing shall be one piece constructed of die-formed cold rolled steel with longitudinal V-grooves in channel for strength. The channel cover shall be secured by latch for easy access to wire way. The luminaire shall be designed and constructed in accordance with the requirements of UL. The mounting accessories, hardware and brackets, shall be made out of steel for environmental conditions.

The finish shall be five stage iron phosphate permanent ensuring superior paint adhesion and corrosion resistance. Reflector and channel finished with a high gloss baked white enamel. Reflector is painted after fabrication.

The ballast shall be multi-voltage, thermally protected, resetting, class P, HPF, non-PCB, UL listed and CSA certified. The fluorescent fixture shall be equivalent to Lithonia Lighting model TEJS or better.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Luminaire information submitted for approval shall include any recommendations of the manufacturer for storage as provided under this contract.

The packaging of the luminaires shall incorporate the provisions recommended by the manufacturer for storage.

Installation. The luminaires shall be installed in accordance with the plans as specified by the Engineer. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, FLUORESCENT EIGHT (8) FT., of the type indicated, wattage and operating voltage indicated or shown on the plan, which shall be payment in full for the item as specified herein.

LU02 LUMINAIRE, FOUR (4) FT. FLUORESCENT

Description. This item shall consist of furnishing and installing a fluorescent luminaire up to twenty (20) feet mounting height for maintenance yard, sign shop or other facilities, with up to four (4), four (4) feet lamps, of the wattage and operating voltage as specified herein.

Materials. The housing shall be one piece constructed of die-formed cold rolled steel with longitudinal V-grooves in channel for strength. The channel cover shall be secured by latch for easy access to wire way. The luminaire shall be designed and constructed in accordance with the requirements of UL. The mounting accessories, hardware and brackets, shall be made out of steel for environmental conditions.

The finish shall be five stage iron phosphate permanent ensuring superior paint adhesion and corrosion resistance. Reflector and channel finished with a high gloss baked white enamel. Reflector is painted after fabrication.

The ballast shall be multi-voltage, thermally protected, resetting, class P, HPF, non-PCB, UL listed and CSA certified. The fluorescent fixture shall be equivalent to Lithonia Lighting model EJS or better.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Luminaire information submitted for approval shall include any recommendations of the manufacturer for storage as provided under this contract.

The packaging of the luminaires shall incorporate the provisions recommended by the manufacturer for storage.

Installation. The luminaires shall be installed in accordance with the plans as specified by the Engineer. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, FLUORESCENT FOUR (4) FT., of the type indicated, wattage and operating voltage indicated or shown on the plan, which shall be payment in full for the item as specified herein.

LU03 LUMINAIRE, FLUORESCENT, HIGH BAY

Description. This item shall consist of furnishing and installing a fluorescent luminaire high bay system for mounting height 15’ – 40’ for maintenance yard, sign shop or other facilities, with up to six (6), four (4) feet lamps, of the wattage and operating voltage as specified herein.

Materials. The housing shall be one piece constructed of die-formed cold rolled steel with longitudinal V-grooves in channel for strength. The channel cover shall be secured by latch for easy access to wire way. The luminaire shall be designed and constructed in accordance with the requirements of UL. The mounting accessories, hardware and brackets, shall be made out of steel for environmental conditions.

The finish shall be five stage iron phosphate permanent ensuring superior paint adhesion and corrosion resistance. Reflector and channel finished with a high gloss baked white enamel. Reflector is painted after fabrication.

The ballast shall be multi-voltage, thermally protected, resetting, class P, HPF, non-PCB, UL listed and CSA certified. The fluorescent fixture shall be equivalent to Lithonia Lighting model IBZ or better.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Luminaire information submitted for approval shall include any recommendations of the manufacturer for storage as provided under this contract.

The packaging of the luminaires shall incorporate the provisions recommended by the manufacturer for storage.

Installation. The luminaires shall be installed in accordance with the plans as specified by the Engineer. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE FLUORESCENT HIGH BAY, of the type indicated, wattage and operating voltage indicated or shown on the plan, which shall be payment in full for the item as specified herein.

LU04 LUMINAIRE, FLUORESCENT, FOR WET LOCATIONS

Description. This item shall consist of furnishing and installing, a fluorescent luminaire with lamp for the weigh station pit area, wash bay at the maintenance yard or buildings, as specified herein, at the wattage and at locations as designated by the Engineer.

Materials. The housing shall be one piece and refractor made out of durable polycarbonate to reduce vandalism. The luminaire shall be equal or better than Lithonia Lighting model series "FHE" and UL listed for wet locations.

The cover-reflector and socket-reflector junctions shall be sealed against the entry of moisture, dirt and insects with a thick, high density Dacron felt gasket, securely attached by mechanical means, such as a retaining clip, or by a wide-temperature permanent adhesive in a manner acceptable to the Engineer.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

The packaging of the luminaires shall incorporate the provisions recommended by the manufacturer to accommodate storage. The submittal shall include these recommendations.

Installation. Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall test the luminaires with the lighting controller energized to assure that all the components are working in accordance with their specifications and carrying rated load.

Wall mounted luminaires shall be either attached to structures, such as a wall, as indicated on the plans or as directed by the Engineer.

All mounting hardware shall be corrosion resistant and shall be stainless steel unless otherwise indicated. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire, fluorescent, shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, FLUORESCENT, FOR WET LOCATIONS, of the type, number of lamps and wattage indicated by the Engineer, which shall be payment in full for the item as specified herein.

LU05 LUMINAIRE, HPS, FOR BUILDING ROOF

Description. This item shall consist of furnishing and installing, a HPS, luminaire, with lamp and photocell, if specified, for flood lighting or roof mount, as specified herein. All boxes, recommended by the manufacturer for proper storage, shall be included in this item.

Materials. The housing shall be heavy duty, made of die cast aluminum. The luminaire shall meet NEMA specifications, high pressure sodium lamp, of specified wattage and voltage. The shield and other mounting accessories, as specified on the contract drawing, shall be included with the luminaire.

When closed, the optical assembly shall be sealed with a gasket against the entry of moisture, dirt and insects. The cover-reflector and socket-reflector joints shall be sealed against the entry of moisture, dirt and insects with a thick, high density Dacron felt gasket, securely attached by mechanical means, such as a retaining lip, or by a wide-temperature permanent adhesive in a manner acceptable to the Engineer. Submittal information shall include data relative to gasket thickness and density and the means of securing it in place. Any alternative gasket material may be approved by the Engineer. There shall be a provision for thermal breathing. A charcoal filter may be used, subject to approval by the Engineer.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Installation. The installation shall be as indicated on the plans, or as directed by the Engineer. All mounting hardware shall be corrosion resistant and shall be stainless steel unless otherwise indicated. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, HPS, FOR BUILDING ROOF, of the wattage and operating voltage specified, which shall be payment in full for the item as specified herein.

LU06 LUMINAIRE, HPS, FOR BUILDING WALL

Description. This item shall consist of furnishing and installing, a wall mounted luminaire, with lamp, as specified herein. All boxes, recommended by the manufacturer for proper storage, shall be included in this item.

Materials. The housing shall be of aluminum construction consisting of a single piece extruded main frame and flat sheet back panel. Heavy-duty cast aluminum doorframe shall be hinged and latched by means of a single screw. The optical system shall be adjustable, with “sharp cutoff”, reflector optical assembly consisting of a hydroformed, specular Alzak main reflector with both parabolic and cylindrical reflecting surfaces, auxiliary reflecting elements, and a support frame. Optical elements may be rotated to permit adjustment of cutoff over a range from 70 degrees through 86 degrees. The refractor shall be vandal resistant, injection molded, polycarbonate lens, UV stabilized, and complete with special UV inhibiting coating. The luminaire shall be UL listed for wet locations. The mounting accessories, hardware and brackets, shall be stainless steel, unless indicated otherwise.

The cover-reflector and socket-reflector junctions shall be sealed against the entry of moisture, dirt and insects with a thick, high density Dacron felt gasket, securely attached by mechanical means, such as a retaining lip, or by

a wide-temperature permanent adhesive in a manner acceptable to the Engineer. It shall be an equivalent or better than the Paracyl luminaire.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Luminaire information submitted for approval shall include any recommendations of the manufacturer for storage as provided under this contract.

The wattage and operating voltage as specified on the plan submitted shall be used as part of this pay item.

Installation. Wall mount luminaires shall be either attached to structures, such as a wall, as indicated or implied by the configuration on the plans, or as directed by the Engineer. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, HIGH PRESSURE SODIUM, FOR BUILDING WALL, of the wattage and operating voltage specified, which shall be payment in full for the item as specified herein.

LU07 LUMINAIRE, KEEPER

Description. This item shall consist of furnishing, delivering and installing a luminaire keeper of the type and construction, as shown in figure L-22, to secure the luminaire to the mast arm or davit arm in case of a failure of the luminaire mounts.

Materials. The cable used for the luminaire keeper shall be 3.18 mm (0.0125”) stainless steel aircraft cable. The cable shall be secured at both ends, as shown on the drawing.

Method of Measurement. Luminaire keeper, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing one, LUMINAIRE KEEPER, of the type and construction as specified, which shall be payment in full for the item specified herein.

LU08 LUMINAIRE, NAVIGATION LED

Description. This item shall consist of furnishing and installing a navigation LED light fixture including LED lamp, of the wattage as specified, conduit connection, wiring and all appurtenances mounted on fixed and moveable bridges, piers, abutment walls and dolphins.

Materials. The existing navigation light fixtures currently installed on the Department structures meet U.S. Coast Guard Bridge Lighting Regulations. Refer to Section 822 of the Standard Specifications for Road and Bridge Construction, current version. Replacement fixtures of equipment required under this contract shall:

- Meet current U.S.C.G. regulations.
- Be mounted in the same location and manner as the original units.
- Match the Fresnel lens color and degree spread (either 180 degrees or 360 degrees) as the existing units.
- Be equipped with a shielding device for protection from flying debris and other spurious objects.

The existing equipment was manufactured by Security Products Division of Federal Signal Corporation and identified as follows:

TYPE	DESCRIPTION

Type 1 Pier light	180 Degree red lens, cast aluminum housing
Type 1-A Pier light	180 Degree red lens, cast aluminum housing
Type 1-P Pivot type Channel or Pier light	180 Degree red lens, cast aluminum housing
Type 2 Pivot type Bridge Light	1 Green and 1 Red 180 Degree lenses, cast aluminum housing
Type 6 Channel Marker	360 Degree green or red lens, cast aluminum housing
Type 6 PSU Pivot type Channel light	360 Degree green or red lens, cast aluminum housing
Type 11 Channel light	2-360 Degree green or red lenses, cast aluminum housing

Installation. The Contractor shall provide all equipment, transportation and labor necessary to furnish and install the equipment as specified. New wiring and conduit will be paid under separate contract pay items. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Furnishing and installing each Navigation LED luminaire, as specified above and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for LUMINAIRE, NAVIGATION LED, which shall be payment in full for furnishing and installing, specified herein and as directed by the Engineer.

LU09 LUMINAIRE, REMOVAL AND SALVAGE

Description. This item shall consist of disconnecting, completely removing and transporting to the State's storage facility, and unloading as salvage, a luminaire mounted on a wall, roof, or ceiling, in a maintenance yard, sign shop, weigh station, rest areas and other IDOT facilities , light pole, light tower, underpass, tunnel sign structure or navigation light fixture as specified herein. This pay item shall also include removal of the associated conduit, wire, disconnect switch and junction boxes. Proper documentation of the State's salvage is required with this pay item.

General. Luminaire removal shall be in accordance with Section 841 of the Standard Specifications for Road and Bridge Construction, current version.

Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition. No removal work shall be permitted until approved by the Engineer.

Unless otherwise indicated, luminaires shall be removed, boxed in containers approved by the Engineer and delivered and unloaded at the storage facility of the State, or as designated by the Engineer.

Any damage resulting from the removal and/or transportation of the luminaire shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Existing anchors for underpass or tunnel lighting fixture which have been attached improperly shall be left in place as removal would cause more damage to the beam than leaving the anchors in place.

Method of Measurement. Each luminaire, which is removed, boxed as approved, delivered to storage, unloaded, inspected, and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for LUMINAIRE, REMOVAL AND SALVAGE, which shall be payment in full for the luminaire location as specified herein.

LU10 LUMINAIRE SHIELD, POLE

Description. This item shall consist of furnishing, delivering and installing a luminaire shield, for highway luminaires on light poles at locations, as directed by the Engineer, to minimize off-highway light infringement.

Materials. The luminaire shields shall be GE Lighting Systems Model ELSHS-M4AC, off-highway side luminaire shield, or approved equal. Highway side shields shall not be used.

Method of Measurement. Luminaire shield, pole, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing one, LUMINAIRE SHIELD, POLE, of the type and construction as specified, which shall be payment in full for the item specified herein.

LU11 LUMINAIRE SHIELD, TOWER

Description. This item shall consist of furnishing, delivering and installing a luminaire shield, for highway luminaires on light towers, at locations, as directed by the Engineer, to minimize off-highway light infringement.

Materials. The luminaire shields shall be 15" high, curved shield, GE Lighting Systems Model ELS-HMAA060, off-highway side luminaire shield, or approved equal. Highway side shields shall not be used.

Method of Measurement. Luminaire shield, tower, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing one, LUMINAIRE SHIELD, TOWER, of the type and construction as specified, which shall be payment in full for the item specified herein.

LU12 LUMINAIRE, TOWER, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage facility, loading, transporting and installing a luminaire on a light tower, complete with new lamp, of the wattage as specified by the Engineer, and all required hardware as specified herein. The luminaire and new lamp shall be paid separately.

Installation. Installation shall be as described in Section 821.05 of the Standard Specifications for Road and Bridge Construction, current version and with the Special Provisions, attached at the end of the luminaire pay items.

Method of Measurement. Luminaires shall be counted each, installed.

Basis of Payment. This item will be paid at the contract unit price each for LUMINAIRE, TOWER, INSTALL ONLY, which shall be payment in full for the complete installation as specified herein.

LU13 LUMINAIRE, TWO LAMPS, FLUORESCENT, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage facility, loading, transporting, installing, connecting, and adjusting ready for operation, as specified herein and as shown on the plans.

Installation. The installation shall conform to Article 821.07 of the Standard Specifications for Road and Bridge Construction, current version. The Contractor shall provide all equipment, transportation and labor necessary to install the equipment as specified. All wiring, terminal blocks, and ballast shall be fully enclosed within the fixture so that none of the above parts are exposed when relamping. The mounting hardware, including the U-channel, fuse, and new lamps as specified are incidental to this pay item.

The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Installing each luminaire, complete in place, with integral ballast and lamps as specified and as shown on the plans, as provided for installing as stated above, and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for LUMINAIRE, FLUORESCENT, TWO LAMPS, INSTALL ONLY, complete in place, which shall be payment in full for the work as described herein.

LU14 LUMINAIRE, WALL, CEILING, UNDERPASS OR TUNNEL, INSTALL ONLY

Description. This item shall consist of retrieving from Owner's storage facility, loading, transporting, and installing a wall, ceiling, underpass or tunnel luminaire, complete with new lamp, of wattage as specified by the Engineer, and all required hardware, as specified herein.

Installation. Installation shall be as described in Section 821.06 of the Standard Specifications for Road and Bridge Construction, current version and with the Special Provisions, attached at the end of the luminaire pay items.

The mounting hardware, junction box, fuse, new lamp as specified and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Unless otherwise indicated, attachment of underpass lighting appurtenances, including the placement of associated anchors, but not limited to underpass luminaires, identification brackets and conduit shall not be attached and/or drilled into precast, prestressed concrete beams. However, existing anchors, which have been installed improperly, shall be left in place, as removal may cause more damage to the beam than leaving it in place.

Method of Measurement. Luminaire shall be counted each, installed.

Basis of Payment. This item will be paid at the contract unit price each for LUMINAIRE, WALL, CEILING, UNDERPASS OR TUNNEL, INSTALL ONLY, which shall be payment in full for the complete installation as specified herein.

LU15 EMERGENCY/EXIT LIGHT FIXTURE

Description. Furnish and install one emergency/exit light fixture at the Maintenance Yards, Sign Shops, and other Department facilities in District 1, as directed by the Engineer. The fixture shall be a 2-lamp, 120 V, with a minimum two hour battery back up, totally enclosed industrial type fixture. Installation shall include all hardware, hangers, junction box, fuse, lamp as specified and other appurtenances. Removal of the existing fixture, if necessary, shall be included in this work. Conduit and wire installation shall be paid through other pay items, where needed.

Method of Measurement. Furnishing and installing, removing old fixture if necessary, as specified above and approved by the Engineer, shall be counted as a unit of payment.

Basis of Payment. This work shall be paid at the contract unit price each for EMERGENCY/EXIT LIGHT FIXTURE, which shall be payment in full for furnishing, delivering storing, installing and connecting the fixture, complete.

LU16 LUMINAIRE, METAL HALIDE

Description. This item shall consist of removing the old fixture and furnishing and installing, a Metal Halide light fixture of the wattage specified, conduit connection wiring, and all appurtenances, mounted on location as specified by the Engineer, in facilities in District 1.

Materials. Materials shall be in accordance with Section 1067 of the Standard Specification for Road and Bridge Construction, current version, and with the Special Provisions, attached at the end of the luminaire pay items.

The wattage and operating voltage as specified on the plan submitted shall be used as part of this pay item.

Installation. The Contractor shall provide all equipment, transportation and labor necessary to furnish and install the Metal Halide light fixture as specified. New wiring and conduit up to 20' shall be included under this contract pay item, and will not be paid separately.

The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Removing an old fixture, furnishing and installing each Metal Halide Light Fixture, as specified above and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for LUMINAIARE, METAL HALIDE, which shall be payment in full for the work, specified herein and as directed by the Engineer.

SPECIAL PROVISIONS FOR LUMINAIRES

These special provisions apply to the preceding luminaire pay items.

Revise the second paragraph, Article 1067.01(c) of the Standard Specifications:

> "The reflector, the refractor or lens, and the entire optical assembly shall not develop any discoloration over the normal life span of the luminaire. An extended warranty over and above the normal warranty, shall be furnished by the manufacturer pertaining to the above said discoloration. The extended warranty shall be furnished in writing guaranteeing replacement, including cost of labor and shipment, free of charge to this contract and to the Owner, of any optical assembly, or any component parts thereof, which, as determined by the Engineer, would develop the aforesaid discoloration. The extended warranty shall accompany submittal information."

Add the following to Article 1067.01(e). of the Standard Specifications:

> "The ballast shall be a high power factor, low-loss, auto regulator type ballast."

Delete Article 1067.01(e)(1) High Pressure Sodium Reactor ballast of the Standard Specifications

Revise Article 1067.01(e)(1) of the Standard Specifications to read:

> "High Pressure Sodium Regulator. That ballast shall be a high power factor, constant wattage auto-regulator, lead type (CWA). The ballast shall be designed to furnish proper electrical characteristics for starting and operating a high pressure sodium vapor lamp of the specified rating

at ambient temperatures of -29 degrees to +40 degrees C. The ballast windings shall be adequately impregnated and treated for protection against the entrance of moisture, insulated with Class H insulation, and able to withstand the NEMA standard dielectric test. The ballast shall include an electronic starting assembly.

The starting assembly shall be comprised of solid state devices capable of withstanding ambient temperatures of 85 degrees C. The starter shall provide timed pulsing with sufficient follow-through current to completely ionize and start all lamps. Minimum amplitude of the pulse shall be 2,500 volts, with a width of one (1) microsecond at 2,250 volts, and shall be applied within 20 electrical degrees of the peak of the open circuit voltage wave with a repetition rate as required by the lamp in accordance with ANSI for the 60 cycle wave. The lamp peak pulse current shall be a minimum of 0.2 amperes. Proper ignition shall be provided over a range of input voltage from 216 to 264 volts. The starter component shall be field replaceable and completely interchangeable with no adjustment necessary for proper operation. The starter component shall have push-on type electrical terminations to provide good electrical and mechanical integrity and ease of replacement. Terminal configuration shall preclude improper insertion of plug-in components. The starter circuit board shall be treated in an approved manner to provide a water and contaminant-resistant coating.

The ballast shall have an overall power factor of at least 0.9 when operated under rated lamp load. The ballast shall withstand a 2,500 volt dielectric test between the core and windings without damage to the insulation. The ballast shall not subject the lamp to a crest factor exceeding 1.8 and shall operate the lamp without affecting adversely the lamp life and performance.

The ballast shall be designed to ANSI Standards and shall be designed and rated for operation on a nominal 240 volt system. The ballast shall provide positive lamp ignition at the input voltage of 216 volts. It shall operate the lamp over a range of input voltages from 216 to 264 volts without damage to the ballast. It shall provide lamp operation within ANSI lamp specifications for rated lamp life at input design voltage range. All measurements shall be taken using a seasoned reference lamp conforming to ANSI test procedures. The reference lamp wattage shall not vary more that +/- 2% from the nominal wattage rating of the reference lamp.

Operating characteristics shall produce output regulation not exceeding the following values:

Nominal Ballast	Maximum Ballast

Wattage	Regulation
750	25%
400	25%
310	26%
250	22%
150	22%

For this measure, regulation shall be defined as the following:

$$Percentage\ Ballast\ Regulation = \frac{W_{LampH} - W_{lampL}}{W_{lampN}} \times 100$$

where: W_{LampH} = lamp watts at +10% line voltage (264v)

W_{LampL} = lamp watts at - 10% line voltage (216v)

W_{lampN} = lamp watts at line voltage (240v)

Ballast losses, based on cold bench tests, shall not exceed the following values:

Nominal Ballast Wattage	Maximum Ballast Losses
750	16.0%
400	16.0%
310	19.0%
250	17.5%

150	26.0%

Ballast losses shall be calculated based on input watts and lamp watts at nominal system voltage as indicated in the following equation:

$$Percentage\ Ballast\ Losses = \frac{W_{line} - W_{lamp}}{W_{lamp}} \times 100$$

where: W_{line} = line watts at 240v

W_{lamp} = lamp watts at 240v

Revise the eighth paragraph of Article 1067.01 of the Standard Specifications to read:

"The testing performed shall include photometric and electrical testing. Photometric testing shall be in accordance with IES recommendations, in addition that the selected luminaire(s) shall be tested as manufactured without any disassembly or modification and, as a minimum shall yield an isofootcandle chart, with maximum candela point and half candela trace indicated, an isocandela diagram, maximum plane and cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, and complete calculations based on specified requirements and test results."

Add the following to Article 1067.02(a)(1) of the Standard Specifications:

"The luminaire shall slip-fit on a two inch pipe arm, and shall have a barrier to limit the amount of insertion. The mounting clamp shall be concealed in the housing and provide a +5 degree vertical leveling adjustment. The slip-fit pipe entry shall be made by means of a flange internal to the cylinder and a round guide tube or other approved means which will provide a seal of the housing and minimum disruption of a smooth outside surface of the luminaire which will be compatible with the mounting arm."

Add the following table(s) to Article 1067.01 of the Standard Specifications:

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE

GIVEN CONDITIONS			
ROADWAY DATA	Pavement Width	m	(ft)
	Number of Lanes		
	I.E.S. Surface Classification	R3	
	Q-Zero Value	.07	
LIGHT POLE DATA	Mounting Height	m	(ft)
	Mast Arm Length	m	(ft)
	Pole Set-Back From Edge of Pavement	m	(ft)
LUMINAIRE DATA	Lamp Type	HPS	
	Lamp Lumens		
	I.E.S. Vertical Distribution	Medium	
	I.E.S. Control Of Distribution	Cutoff	
	I.E.S. Lateral Distribution	Type I	

	Total Light Loss Factor	
LAYOUT DATA	Spacing	m (ft)
	Configuration	Single Sided
	Luminaire Overhang over edge of pavement	m (ft)

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION	Average Horizontal Illumination, E_{AVE}	Lux
	Uniformity Ratio, E_{AVE}/E_{MIN}	
LUMINANCE	Average Luminance, L_{AVE}	Cd/m^2
	Uniformity Ratio, L_{AVE}/L_{MIN}	
	Uniformity Ratio, L_{MAX}/L_{MIN}	
	Max. Veiling Luminance Ratio, L_V/L_{AVE}	

LW01 WASH HUBBARD'S CAVE TUNNEL WALLS

Description. The tiled tunnel walls at highway lighting locations L0883, (Hubbard's cave) shall be steam washed per paint and grout manufacturers' recommended pressure and temperature. Both I/B and O/B sides shall be washed to remove dirt, dust or other foreign material. The Contractor shall inspect locations prior to bidding this item.

Hubbard's cave approximate dimensions

Maximum Height:14'

Length (4 sides): 741', each side

Tile manufacturer: Buchtal

Grout: Epoxy coated latex modified according to ANSI Standard A118.6.

General. Protect all surrounding painted surfaces and foliage to avoid damage from contact with washing solutions. Avoid wind drift onto passersby, vehicles or adjacent properties. Protect and/or divert pedestrian and auto traffic from the work area. Use a soft bristled brush or broom for washing, and rinse with sponge and water. Pressure water rinsing may improve cleaning results, but is not required.

Materials. The detergent, used for the Tile washing, shall be ONERESTORE, made by EaCo CHEM Inc., or equal. The Contractor shall follow all manufacturer instructions for application and use of the product.

The technical data is as follows:

Appearance:	Liquid	Specific Gravity:	1.117
Color:	Yellow to Amber	Solubility in Water:	complete
Odor	Mild	Biodegradable:	100%
Flash Point:	212° F @ 760 mm Hg	Personal Protection:	B*
		B* = Chemical Resistant and goggles	

Test each type of surface before overall application to ensure suitability and desired results. Apply test areas according to the manufacturer's recommendations.

Cleaning. Protect all surrounding painted surfaces and foliage to avoid damage from contact with washing solutions. Avoid wind drift onto passersby, vehicles or adjacent properties. Protect and/or divert pedestrian and auto traffic from the work area. Block any and all drains where present and setup water recovery to recover waste water.

Use pressurized water to rinse the tiles, then spray the chemical detergent and scrub clean, high pressure wash surface until clean. use soft bristled brush or broom for extra washing as applicable, and rinse clean with a pressure water and recover waste water.

The Contractor shall recover waste water and detergent chemical, the recovered waste water shall be picked up after completion by an environmental vacuum truck and shall be disposed of in accordance with IEPA rules and guidelines as specified herein.

The Contractor shall provide the traffic control for lanes and ramps as per the Bureau of Traffic Expressway closure guidelines for Hubbard's cave and protection of workers and motorists. as part of this pay item.

Method of Measurement. Tiled tunnel walls, each installation, washed.

Basis of Payment. This item shall be paid at the contract unit price, each, for WASH HUBBARD'S CAVE TILED TUNNEL WALLS, WASH, as specified which shall be payment in full for all work specified herein.

PUMP STATION SYSTEM – NON ROUTINE PAY ITEMS:

PA01 ALARM, INTRUSION OVERRIDE KEY SWITCH

Description. This item shall consist of furnishing, installing and interfacing an intrusion override key switch to the SCADA panel and existing intrusion alarm system as specified herein and indicated by the Engineer into an existing pumping station.

Materials. The pumping station existing intrusion override key switch shall be replaced with a new High Security Switch that provides a contact closure to the SCADA panel and a contact closure to the existing intrusion alarm system when the intrusion alarm system is armed. Only the "barrel" of the existing override key assembly shall be replaced. The override key switch shall be from MEDECO High Security Locks, five pin, double D mounting, two key pulls. The Contractor shall be responsible for coordinating IDOT authorization for the lock revisions.

All equipment furnished and installed under this item shall be appropriately identified with nameplates as specified under Basic Materials and Methods, elsewhere herein.

Installation. All intrusion override switches shall be mounted as indicated or directed by the Engineer, anchored as required and in conformance with the applicable specifications for Basic Materials and Methods, elsewhere herein.

Method of Measurement. Each intrusion override key switch as furnished, installed and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the Contract unit price each for ALARM, INTRUSION OVERRIDE KEY SWITCH which shall be payment in full for the work as described herein.

PC02 COATING, CONCRETE SURFACE

Description. This item shall consist of furnishing and applying paint coating to exterior and interior concrete surfaces and all attached conduits and fittings as specified herein.

Materials. The concrete and conduit surface will receive one coat of polyamide epoxy primer 2.5 to 6 MILS DFT (Dry Film Thickness) and one coat of urethane enamel 2 to 4 MILS DFT. Unless the moisture content is above 3 LB/SF use a acrylic latex paint 2-4 MILS DFT with an approved primer 1/1/2 – 2/1/2 MILS DFT.

Application. The concrete surfaces shall be prepared to SSPC SP-2 hand tool clean or SSPC SP-3 power tool clean to remove any peeled or failed coatings. A solvent cleaning and scraping necessary to remove dirt, grease and peeling paint shall be used to prepare the floor. A moisture content test shall be performed and results provided to the IDOT Engineer. All conduits, fittings, boxes and switches attached and or within one foot of the concrete surfaces shall be cleaned properly and painted. The contractor may have to apply multiple coats to obtain manufacturer's recommended thickness.

Method of Measurement. A square foot of coating applied to a pump station in accordance with manufacturer's specifications, and clean up of work site, as approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price in square feet, for COATING, CONCRETE SURFACE, which shall be payment in full for the work described herein.

PC03 COATING, STEEL SURFACE

Description. This item shall consist of furnishing, cleaning and applying a primer and final paint coating to steel surfaces as specified herein.

Materials. The coating shall be a tri-polar oil-alkyd primer 2-4 MILS DFT (Dry Film Thickness) and one finish coat of 20%-30% Copolymerized polysilicone enamel 1½ - 2 ½ MILS DFT. Steel located in dry pit or wet pits, where high humidity is present use Aluminum aromatic moisture cured urethane.

Application. The steel shall be prepared to SSPC SP-2 hand tool clean or SSPC SP-3 power tool clean to remove any rust, peeled or failed coatings.

Method of Measurement. A square foot of primer with final coating applied to a surface shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price in square feet, for COATING, STEEL SURFACE, which shall be payment in full for the work described herein.

PD01 DETECTION SYSTEM, FIRE

Description. This work shall consist of furnishing labor, equipment and material to install a wall mounted fire alarm panel, and associated devices as specified herein and indicated by the Engineer.

Materials. Furnish a four zone fire alarm panel, class B/A with three photoelectric smoke detector with thermal, and two 12Volt @ 7 A.H. Gel battery.

Work Description. The contractor shall Install, commission, and perform testing on the fire alarm panel and associated devices. Commissioning shall be done by a qualified Fire Alarm Service Representative. The representative shall identify the location of the smoke and head detectors prior to installation. The output signal shall be connected to the SCADA and Aegis system. All conduit and wire necessary for complete installation in the pump station shall be paid under their respective pay items for conduit and wire. Submit all catalog cuts, shop drawings and pump station layout showing location of all devices for IDOT approval.

All equipment furnished, installed or mounted for this pay item shall conform to the applicable specifications for Basic Materials and Methods, elsewhere herein. The Contractor shall provide all submittals as specified above in this pay item including catalog cuts, design drawings and product data sheets for the Engineers approval prior to installation. Three complete sets of record drawings, catalog cuts and O&M manuals shall be provided upon completion for Engineers approval

Method of Measurement. Each Detection System, Fire, that is inspected, tested, and certified shall be counted as a unit for payment.

Basis of Payment. This work will be paid at the contract unit price, each, for DETECTION SYSTEM, FIRE, which will be payment in full for the work described herein.

PG01 GAS SENSOR, REMOVE AND REPLACE

Description. This item shall consist of the removal, Installation, calibration and function test of a new gas sensor by a factory trained sales and Service Company. The transmitter and controller shall remain in place and functional with only the gas sensor being replaced.

Locations. The list of pump stations with their corresponding gas detector system manufacturer, number of sensors and their respective locations is listed under pay item PGS1.

Materials. The furnished gas sensor shall be equivalent or superior in quality to the existing gas sensor and be rated and approved for its intended use by the national FM and CSA standards. The furnished gas sensor shall have the same sensing element as the existing SCOTT, MSA or Rexnord gas sensors to be replaced.

Work Description. The factory trained sales and Service Company, such as Automatic Suppression Systems Inc., or Engineer approved equivalent shall execute this work in conjunction with Pay Item PG6 Gas Detector System Inspection. The removal and reinstallation of the sensor shall comply with manufacturer specifications.

Method of Measurements. Each gas sensor that is furnished, installed, calibrated, tested and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for GAS SENSOR, REMOVE AND REPLACE, which shall be payment in full for the work described herein.

PI01 INSPECTION, AUTOMATIC BUS TRANSFER SYSTEM

Description. The contractor shall supply a factory trained field service technician to perform preventive maintenance testing and inspection of the automatic bus transfer scheme at PS #22, 23, 26,35. A service sheet shall be filled out listing both the "as found" and "as left" condition of the system. Equipment for the preventive maintenance, testing and inspection, include Main-Tie-Main transfer scheme, with associated circuit breakers, controls and devices.

Scope of Work.

1. Physical inspection will include:

- Overall enclosure inspection for structural integrity
- Verification of proper door swing, hinge operation, latching and door interlocking

2. Insure proper operation of:

- Pilot devices such as selector switches and pushbutton
- Control and timing relays
- Protective devices
- Auxiliary electrical contacts
- Circuit breakers and switches
- Operating mechanisms and interlocks
- Other safety interlocks and mechanisms
- Review of all power cable terminations for tightness. Conductor fraying and clearances

3. Electrical inspection will include:

- Inspection of control wiring terminations
- Pull apart terminal blocks engagement
- Wiring conformance to factory schematics

- Compare instrument transformer ratios to meter scales
- Electrical operation of all components
- Main, tie, and main circuit breaker inspection and
- Testing in accordance with air circuit breaker test report, P-7.

4. Installation conformance to specifications:

- Ensure physical arrangement conforms to factory drawings
- Ensure supplied features and options conform to factory drawings
- Ensure all wiring conforms to factory specifications
- Adherence to State and local codes

5. Record of inspection and test results will be kept. A check-off list will be used; detailing work performed and results obtained. The formal report produced will list equipment as found, technical service/assistance rendered final equipment settings and recommendations. A report copy shall be submitted.

This pay item includes simulating a power failure to see if the Automatic Transfer System main tie main will properly switch over and switch back to normal upon power restoration. The breakers shall be inspected to look for signs of arcing or pitting of the arcing contacts, and for uneven or premature wearing of the main contacts. All timing circuits will be tested and all connections will be checked for tightness.

The Electrical Maintenance Contractor shall be responsible for operation of the overall system and application. It is expected that the Contractor will have qualified personnel available with the necessary knowledge and authority regarding performance of the overall system and application so that the controller may be adjusted for optimum performance.

Method of Measurement. Each Service Automatic Bus Transfer System of each Pump Station as approved by IDOT Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for INSPECTION, AUTOMATIC BUS TRANSFER SYSTEM, which shall be payment in full for the work described herein.

PI02 INSPECTION, AUTO TRANSFER SWITCH

Description. The Contractor shall provide a factory trained service representative and shall use factory authorized testing equipment for all testing procedures to complete a comprehensive transfer switch inspection. The inspection, testing and maintenance shall be as recommended by the Manufacturer.

Scope of Work. The Inspection shall consist of the following work:

1. Verify that all cabled connections are on the proper terminals and torque to the proper specifications
2. Inspect unit for debris and clean
3. Check and adjust all voltage and current sensors as necessary
4. Check phase rotation of both sources
5. Check all auxiliary contacts and accessories are connected properly and adjust to the proper specifications
6. Inspect main contacts
7. Check integrity of electrical hardware of control panel
8. Perform milli-volt drop test
9. Test all light bulbs and replace if necessary
10. Inspect all mechanical interlocks
11. Inspect all electrical interlocks
12. Lubricate necessary moving parts
13. Inspect all limit switches
14. Coordinate with Generator Inspection load test for generator output and timer settings and verify with, specifications
15. Exercise timer operation and control.
16. Test unit and insure proper operation of all components

A report shall be submitted that includes the following:

1. Recorded values of all measurements taken such as voltage, amperage, frequency, milli-volt, etc.
2. Any adjustments made will be noted
3. Recommendations relative to repairs or upgrades
4. Note all options or features
5. Note the following per manufacturer recommendations:

   "How to bypass unit"

   "How to test unit"

   "How to set times"

A record of inspection and test results will be kept. A check off list will be used detailing work performed and results obtained. The formal report produced will list equipment as found and final equipment settings and recommendations. The Contractor shall be responsible for operation of the overall system and application. It is expected that the Contractor will have qualified personnel available with the necessary knowledge and authority regarding performance of the overall system and applications so that the controller may be adjusted for optimum performance.

Method of Measurement. Each, for the Auto Transfer Switch Inspection of each pump station as approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price, each for INSPECTION, AUTO TRANSFER SWITCH, which shall be payment in full for the work described herein.

PI03 INSPECTION, GAS DETECTOR SYSTEM

Description. This item consists of furnishing a manufacturer approved factory-trained sales and Service Company to test and calibrate a gas detector system as specified herein for a pumping station.

Locations. The following is a list of pump stations with their corresponding gas detector system manufacturer, number of sensors and their respective locations.

PS 2	MSA 5100 with 2 sensors
PS 3	MSA 5100 with 2 sensors
PS 4	
PS 5	MSA 5300 with 6 sensors
PS 7	
PS 8	
PS 9	MSA 5100 with 2 sensors
PS 10	MSA 5300 with 2 sensors
PS 11	MSA 5100 with 2 sensors
PS 12	MSA 5100 with 2 sensors
PS 13	
PS 14	
PS 15	MSA 5100 with 2 sensors
PS 16	MSA 5100 with 2 sensors
PS 17	MSA 5300 with 2 sensors
PS 18	MSA 5100 with 2 sensors
PS 19	MSA 5100 with 2 sensors
PS 20	Rexnord System with 2 sensors

PS 27	MSA 5100 with 2 sensors
PS 28	MSA ULT System with 5 sensors
PS 29	
PS 30	MSA ULT System with 5 sensors
PS 31	MSA 5100 with 1 sensor
PS 32	
PS 33	
PS 34	MSA 5100 with 2 sensors
PS 34	
PS 36	
PS 37	
PS 38	
PS 39	Scott Quadraplex with 2 sensors
PS 40	
PS 41	MSA 5100 with 2 sensors
PS 42	
PS 43	MSA 5100 with 2 sensors
PS 44	MSA 5100 with 2 sensors
PS 46	MSA 5100 with 2 sensors

PS 21	Scott Quadraplex with 6 sensors
PS 22	Detronics 2000 with 6 sensors
PS 23	Detronics 2000 with 6 sensors
PS 24	MSA 5100 with 2 sensors
PS 25	MSA 5100 with 2 sensors
PS 26	MSA 5100 with 2 sensors

PS 47	MSA 5100 with 1 sensor
PS 48	
PS 50	
PS 51	MSA 5100 with 2 sensors
PS 52	MSA 5100 with 2 sensors

Work Description. The factory trained sales and Service Company shall furnish all tools and test equipment to complete the work as specified herein. The service company personnel shall be OSHA certified and equipped with proper safety equipment to enter areas where hazardous gases might be present. The Contractor shall provide access to the pumping station for the Service Company and assistance in reaching any difficult locations within the pumping station.

The Service Company shall complete the following procedures.

1) Clean all detectors and hydrophobic filters.

2) Check calibration of all detectors and adjust each, if required

3) Replace sensing element if calibration can no longer be properly performed. This work shall be completed at the time of testing but will be paid under separate contract unit price specified elsewhere herein.

4) Actual alarms of the detectors and sensors to ensure reliability.

5) Check gas detector internal and power supply wiring for grounds and shorts.

6) Check AEGIS and SCADA system for alarm acknowledgment.

7) Check all fans and dampers for start-up and/or shut down.

Report. A written report shall be submitted to the Engineer, which shall contain any pertinent recommendations for the system.

Method of Measurement. Each detector system that is tested, calibrated and has its accompanying report submitted and approved by the Engineer shall count as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for INSPECTION, GAS DETECTOR SYSTEM, which shall be payment in full for the work described herein.

PI04 INSPECTION, SWITCHGEAR SYSTEM

Description. This item shall consist of furnishing of services and equipment to inspect the 600-Volt class switchgear, including the circuit breakers, bus, structure, instrument transformers and other devices, at a pump station. The services shall be provided by a factory trained field service technician.

Scope of Work. Preventative maintenance testing and inspection shall be performed according to the following inspection and test procedures.

Switchgear and Switchboard Assemblies:

1. Visual and Mechanical Inspection
    - Inspect the assemblies for physical damage
    - Inspect bussing compartment. Check tightness of accessible bolted bus joints by torque wrench method. Check insulators for cracks and contamination.
    - Verify all electrical, Key, and mechanical interlock systems for correct operation
    - Make closure attempt on locked open devices. Make opening/withdrawal attempt on locked closed devices
    - Check mechanical operations of circuit breaker in cell and activate auxiliary devices
    - Check ease of operation, proper grounding and interlock
    - Inspect circuit breaker for contamination, physical damage
    - Verify all LED's are working when the system is operating

2. Electrical Tests

   - Insulation resistance of each bus section is measured phase to phase and phase to ground
   - Electrical operation of the circuit breaker is checked in the test and connected position
   - The control power source is checked
   - The circuit breaker control scheme is tested
   - A phasing check is made on double-ended and/or emergency source switchgear at tie points to ensure correct bus phasing.

Circuit Breakers:

1. Visual and Mechanical Inspection

   - Check mechanical operation
   - Cell fit and element alignment are checked
   - Check bolt torque levels are in accordance with manufacturers or U.S. Standards specifications
   - Check arc chutes for foreign matter, cracks and secure Installation
   - Clean primary contact surfaces and lubricate if required

2. Electrical Tests

   - Measure contact resistance
   - Check Insulation resistance at 1000 volts D.C. for one (1) minute from pole to pole and from each pole to ground and across open contacts for each phase.
   - Determine minimum long-time pick-up current and delay time at 300% of pick-up by secondary injection
   - Determine short-time pick-up and time delay by secondary injection
   - Determine instantaneous pick-up current by secondary injection
   - Determine ground fault pick-up current and time delay by secondary injection
   - Trip unit reset characteristics are verified

- Final settings are made in accordance with Engineer's prescribed settings.
- Auxiliary devices, such s under voltage relays, blown main fuses detector, shunt close, shunt trip, spring charging motor and auxiliary contacts are activated to ensure operation as applicable
- All functions of the tip units shall be tested with test kits

Metering and instrumentation:

- Verify meter connections in accordance with

  single line meter and relay diagram
- Inspect for physical damage
- Electrical tests
- Ammeter accuracy is checked using current injection.
- Voltmeter accuracy is checked

SY/MAX 50PLC:

- Visual and mechanical inspection
- Inspect programmable controller Installation for physical damage
- Inspect for proper grounding
- Check for power wiring
- Check all terminal wiring
- Check all I/O wiring
- Check LI/RI wiring
- Verify correct switch settings on all modules
- Electrical tests
- Inspect sequence of operation
- Verify power supply voltages

- Verify operation of selected I/Os
- Verify resistance of LI/RI cable
- Verify input voltages
- Verify resistance of system ground

Record of inspection and test results will be kept. A check-off list will be used, detailing work performed and results obtained. The formal report produced will list equipment as found, technical service/assistance rendered final equipment settings and recommendations. A report copy shall be submitted to IDOT engineer.

Method of Measurement. Lump sum for Switchgear System Inspection approved by IDOT Engineer for the pump station shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contact unit price lump sum for INSPECTION, SWITCHGEAR SYSTEM, which shall be payment in full for the work described herein.

PI05 INSPECTION, MOTOR STARTER, SOFT START TYPE

Description. The contractor shall supply a factory trained field service technician to perform preventive maintenance testing and inspection of the soft start type motor starter at PS #22. A service sheet for each starter shall be filled out listing both the “as found” and “as left” condition of the starters. All starters shall be inspected and tested under this pay item. Equipment included in the preventive maintenance, testing and inspection five (5) Soft start buckets with associated controls including devices associated with the transfer scheme.

Scope of Work.

1. Physical inspection will include:

- Overall enclosure inspection for structural integrity
- Verification of proper door swing, hinge operation, latching and door interlocking

2. Insure proper operation of:

- Pilot devices such as selector switches and pushbuttons
- Soft starters
- Control and timing relays
- Overload and protective devices
- Auxiliary electrical contacts
- Circuit breakers and switches
- Operating mechanisms and interlocks
- Other safety interlocks and mechanisms
- Review of all power cable terminations for tightness. Conductor traying and clearances

3. Electrical inspection will include:

- Inspection of control wiring terminations
- Pull apart terminal blocks engagement
- Wiring conformance to factory schematics
- Compare instrument transformer ratios to meter scales
- Electrical operation of all components

4. Installation conformance to specifications:

- Ensure physical arrangement conforms to factory drawings
- Ensure supplied features and options conform to factory drawings
- Ensure all wiring conforms to factory specifications
- Adherence to State and local codes

5. Record of inspection and test results will be kept. A check-off list will be used, detailing work performed and results obtained. The formal report produced will list equipment as found, technical service/assistance rendered final equipment settings and recommendations. A report copy shall be submitted.

6. Servicing the Motor Soft starters includes final controller adjustments to ensure maximum performance, efficiency and conformance to system limitations. Adjustments include current limit, current trip, minimum and maximum voltage, and controller stability settings as described in the instructions manual. If the adjustable voltage ramp option is provided, initial torque, and ramp times settings are adjusted. Operational features, such as jam/underload, extended start time and smooth stop, are checked and adjusted. The current calibration switch is checked for proper settings.

   The Electrical Maintenance Contractor shall be responsible for operation of the overall system and application. It is expected that the Contractor will have qualified personnel available with the necessary knowledge and authority regarding performance of the overall system and application so that the controller may be adjusted for optimum performance.

Method of Measurement. Each for Servicing a Motor Starter, Soft Start Type, Inspection as approved by IDOT Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price, each for INSPECTION, MOTOR STARTER, SOFT START TYPE, which shall be payment in full for the work described herein.

PI06 INSPECTION, SCADA RADIO EQUIPMENT

Description. This item shall consist of the Contractor providing a manufacturer approved factory sales and service company to inspect the IDOT SCADA radio system as described herein for the Hillside repeater, Central and Satellite radio as described herein.

Equipment. All radios, antennas, antenna line and connectors, surge suppressor, power supplies, batteries and all appurtenances for the site specific radio system for each location.

Materials. The factory sales and Service Company shall provide all necessary tools and manufacturer's test sets to complete this work.

Work Description. The Contractor shall assist the factory sales and Service Company, if required, to complete this inspection.

The factory Service Company's inspection shall include but not be limited to the following items:

Verification of transmit frequency, transmit power, voltage standing wave ratio (VSWR), transmit deviation, receive frequency, receiver sensitivity, receive audio with signal, receive audio without signal, forward/reflected power ratio levels, a printed time domain reflectometer (TDR) line trace and the antenna signal. All values for the above items shall be corrected, if required.

Test for 1/2 hour battery back-up power and replace battery, if required.

Reporting. The Service Company shall submit a report consisting of all data values for items stated above, the methods/means used to test and record the data values and the previous data values recorded during the last inspection (for comparison purposes). The report shall also include any pertinent changes made or required to the system.

Method of Measurement. The total inspection as provided for the Hillside repeater, Central and Satellite radios system including accompanying report and approval of the Engineer shall be counted as a lump sum unit for payment.

Basis of Payment. This work shall be paid at the contract unit price lump sum for INSPECTION, SCADA RADIO EQUIPMENT, which shall be payment in full for the work described herein.

PI07 INSPECTION, SCADA RADIO

Description. This item shall consist of the Contractor furnishing a manufacturer approved factory sales and service company to inspect the SCADA radio system for a designated pump station as described herein.

Equipment. All radios, antennas, antenna line, and connectors, surge suppressers, power supplies, batteries and all appurtenances for the site specific radio system for each location.

Materials. The factory sales and Service Company shall provide all tools and manufacturer's test sets to complete all work specified herein.

Work Description.

The factory sales and Service Company shall complete the following list of items.

1. Inspect and correct radio AFC and CTS operating parameters.
2. Check frequency, soft carrier delay, time-out timer length and status of squelch tail eliminator.
3. Check real forward RF power, VCO lock voltage, transmit power output, received signal strength, supply voltage of radio, regulator voltage and VSWR at antenna connector.
4. Check receiver sensitivity, forward/reflected power ratio levels and correct any deviation.
5. Check status of battery, power supply and diagnostics board and replace, if necessary.

Print a time domain reflectometer (TDR) line trace and submit with report

Reporting. The factory sales and service company shall submit a report consisting of data for all items stated above, the methods/means used to test and record consisting of all data values recorded during the last inspection (for comparison purposes). The report shall also include any pertinent changes made or required to the system.

Method of Measurement. Each inspection of pump station SCADA radio equipment including submittal of its report and approval by the Engineer shall count as a unit for payment.

Basis of Payment. This work shall be paid at the contact unit price each for INSPECTION, PUMP STATION SCADA RADIO, which shall be payment in full for the work, described herein.

PI08 INSPECTION, BACKFLOW PREVENTER

Description. This work shall consist of inspecting, and testing the backflow preventer as specified at Pump Station 10, 17, 23, 31, 39, 44, 46, and 52.

Work Description. Inspection, testing, and certification of the backflow preventer shall be performed in accordance with: State of Illinois, Rules and Regulations; Title 35: Environmental Protection; Subtitle F: Public Water Supplies; Chapter II: Environmental Protection Agency; Part 653: Design, Operation and Maintenance Criteria; Subpart H: Cross-Connections. After the inspection and testing are complete, records of the test shall be submitted to the local community public works department and the Engineer. In addition, the Contractor shall provide the Engineer with documentation of the receipt of the test records by the local community public works department.

Method of Measurement. Each backflow preventer device that is inspected, tested, and certified shall be counted as a unit for payment.

Basis of Payment. This work will be paid at the contract unit price, each, for INSPECTION, BACKFLOW PREVENTER, which will be payment in full for the work described herein.

PM01 PUMP MOTOR BALANCING

Description. This pay item consists of furnishing labor, material and equipment to balance a motor as specified herein and indicated by the Engineer at a designated pumping station.

Materials. Contractor shall provide all instruments for testing the motors and balancing. The instruments and equipment shall be calibrated before testing. Proof of calibration shall be presented at each pumping station prior to testing.

Work Description. This item shall consist of balancing a motor of a specified horsepower. The balancing shall be done in conjunction with the motor inspection tests. The Contractor shall record all test readings as identified in the motor inspection before and after balancing and with coupled and uncoupled drive shaft.

Method of Measurement. Each motor of a specified horsepower that is balanced in accordance with manufacturer's recommendations and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP MOTOR BALANCING which shall be payment in full for the work described herein.

PUMP REBUILD PROGRAM 496

Scope of Work. There are six types of pump rebuilds. After the Engineer and Pump Station Specialist have analyzed the condition of each selected pump and agreed to the type of rebuild and work schedule, the Engineer will issue an authorization for that specific type of rebuild. The Electrical Maintenance Contractor shall provide all the services as required during each calendar year of the Contract. The rebuild program locations are based upon site inspection and operational data including historical data of the pump capacity and vibration analysis. The Contractor is advised that the Engineer may change the proposed list of locations for rebuild as circumstances warrant during the contract year(s). The Electrical Maintenance Contractor shall submit the recommendations for pump repair or replacement any time during each calendar year. All pump removal and reinstallation for repairs and rebuilds shall be documented in the pump station pump rebuild log sheet.

Pump Station Specialist Requirements. The Pump Station Specialist is responsible to oversee the work on each pump, including removal, disassembly, and re-Installation. The Specialist will be required to provide documentation on a detailed inventory which includes test measurements such as micrometer measurement of the shafts, bearings,

total indicator readings, threads per inch, shaft length and size, shaft stick-up, impeller settings, and end play. He is responsible for properly identifying all existing IDOT inventory and any removed or replaced parts. All inventories shall be properly tagged to IDOT specifications. The Specialist shall also perform inspections on repaired or new equipment, record any discrepancies, and provide recommendations on any/all aspects of the pump rebuild program.

Specialty Pump Repair Service Company. A minimum of six potential vertical/submersible service repair companies, within the tri-state area of Illinois/Indiana/Wisconsin shall be submitted during the pre-construction meeting, for review and approval of the Engineer. The Contractor shall be responsible to provide repair quote from approved vendors. Transportation of pump equipment in the tri-state area is included in each of the pay items. Cost of transportation outside this region will be discussed with the Engineer and can be paid as a separate item.

Specialty Pump Removal and Replacement Service Co. The Electrical Maintenance Contractor shall contract with a Specialty Pump Removal and Replacement Service Company, to establish a contractual arrangement for selected on call services for the pump rebuild program as specified in Pay Items Types 1, 2, and 3. The Specialty Pump Service Contractor is necessary to supplement the contractor's forces for certain projects involving the rebuild of certain select pumps where because of the type of rebuild, factory trained personnel having special technical qualifications would be desirable to facilitate certain rebuild projects. The Service Co. also shall provide quality control and quality assurance for work performed on selected vertical axial flow pumps. The Service Co. shall furnish factory trained or certified personnel with a minimum of 15 years experience and expertise in the removal and replacement of vertical mixed flow pumps. This Service Co. shall adhere to the above described Specialty Pump Repair Service Company requirements when providing a quote for repair or replacement and shall follow General pump rebuilding program procedures.

The Electrical Maintenance contractor's personnel shall coordinate with the Service Co.'s personnel on scheduling and performing removal, replacement, energizing, de-energizing and disconnection of any motor electrical splices at the junction boxes.

The following are the procedures by which a pump rebuild is executed. Charges for these items shall be paid through the following pay items:

PRB1 Pump Rebuild Type 1

PRB2 Pump Rebuild Type 2

PRB3 Pump Rebuild Type 3

PRB4 Pump Rebuild Type 4

PRB5 Pump Rebuild Type 5

PRB6 Pump Rebuild Type 6

Pump Rebuild Program Procedures. The pump rebuild program is primarily developed using operational data received by testing and inspecting pumps via various routine maintenance programs and periodic inspections. Each pump rebuild is normally executed when spare part(s) are available in State Stock. Following is a step by step procedure for this program:

General Procedures:

- Pump is selected for the rebuild program.

- The Specialist is scheduled to be present for removal and reinstallation of the pump.

- An inspection report of the removal is completed and submitted to IDOT by the PS Specialist with their recommendations.

Case A: If pump/pump part is to be repaired:

1. The pump or its part shall be sent to the service Repair Company to be inspected.

2. The service co. shall solicit and obtain a quote(s) for pump repair(s).

3. The quote(s) are analyzed by the IDOT Engineer to determine which company shall be authorized to do the repair. The service co. shall be responsible to transport the pump (if necessary) to the selected company's facility for the repair as specified in the following pump rebuild pay items.

4. Following the repair(s) the pump/part(s) shall be inspected and approved by the PS Specialist. Before assembly by the repair facility, the PS Specialist for review and approval shall submit a corresponding inspection report to the Engineer.

5. The Engineer shall review the repair report and final re-assembly, and if found satisfactory shall approve the subsequent return of the repaired materials to the designated Pump Station.

Case B: If State Stock Pump/Pump Part(s) are to be used as a replacement:

1. The state stock pump/pump part(s) shall be disassembled and inspected by the Engineer and the PS Specialist to determine satisfactory condition.

2. If the spare part(s) are determined (or suspected) to need reconditioning they shall be sent to a service company. The same procedure(s) should then be followed as in Case A above.

Case C: If Pump/Pump Part(s) are to be replaced:

1. The PS Specialist shall submit a report to the Engineer indicating the type, make, model and material specification for the pump replacement parts.

2. The PS Specialist and the Engineer shall review the manufacturer's pump/pump part(s) literature and test data.

3. The Engineer shall make arrangements to procure the selected pump/pump part(s) for replacement.

4. Following delivery of the new equipment, the PS Specialist shall inspect it and submit a report to the Engineer for approval.

PRB1 PUMP REBUILD, TYPE 1

Description. This item shall consist of providing transportation within the Tri-State area, removal and re-Installation of a complete mixed flow pump assembly as a single unit not including the motor. The Pump Removal and Replacement Service Co. shall remove and install the pump as specified herein and conform to PR496. The service co. shall procure quotes for the pump repair as directed by the Engineer. The Engineer will evaluate the specialty service quotations and authorize work according to account PV. This type of work would be applicable for Pump Stations 25.

Work Description. As part of removal and re-installation the service co. shall provide all labor, tools, transportation and the use of a crane.

The work shall include but not be limited to the following items:

1) De-coupling and removing the motor drive from the pump assembly.

2) Complete removal of the pump assembly including the discharge column, drive shafting, enclosing tube and bowl as a complete unit.

3) Loading and unloading of the complete unit on a flatbed truck.

4) Transportation of the complete pump assembly to the approved service company shop for repairs and delivery of the pump back to the station upon completion of work.

5) Re-Installation of the complete pump assembly includes the motor.

6) Provide all services for start-up and testing prior to putting the pump back in service.

7) All work shall be accompanied with its respective warranties and guaranties.

8) If test results are unsatisfactory, the Contractor shall be responsible for analyzing all operational problem(s) and resolving it to the Engineer's satisfaction.

The above information is for removal and for information only. Exact procedure necessary for removal and re-Installation of a complete operational pump is the responsibility of the Service co.. This item shall also include the loading and unloading of pump parts and equipment.

Pump capacity, vibration tests, motor current and voltage readings shall be taken upon Installation of pump. The readings and tests shall conform to the pump and motor specifications, or be approved by the Engineer.

Method of Measurement. Each removal and re-Installation of a complete mixed flow pump assembly as a single unit including all connections and transportation as specified herein and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD, TYPE 1, which shall be payment in full for the work described herein.

PRB2 PUMP REBUILD, TYPE 2

Description. This item shall consist of providing transportation within the Tri-State area for, removal and reinstallation of a pump bowl from the complete pump assembly as a single unit not including the motor. The pump removal and replacement service company. Shall remove and install the pump as specified herein and in conformance with PR496. The Service Company shall procure quotes for the pump repair as directed by the Engineer. The Engineer will evaluate the specialty service quotations and authorize work according to account PV. This type of work shall be applicable for Pump Stations 2, 3, 4, 29, 33 and 35.

Materials. This item shall require the furnishing of stainless steel bolts and oil for lubrication.

Work Description. The work within this item shall require the use of a crane and chain falls. The Service Company shall provide all equipment, transportation and labor necessary to work as described herein. The work shall include but not be limited to the following items:

1) Disconnect breaker
2) Uncouple motor coupling
3) Lift motor and set aside

4) Remove dresser coupling

5) Set up chain fall on top of hatch or use a crane if required

6) Lift pump and column assembly to allow space for removal of bowl assembly from bottom of column pipe. (That contains the discharge pipe, bowl and oil tube assembly including the shaft and motor stand.)

7) Brake loose tube tension unit.

8) Disconnect grease line from the assembly

9) Drop bowl assembly

10) Break loose the oil tube and shaft coupling

11) Remove bowl

12) Take out shafting and oil tube assembly

The above information is for removal and for information only. Exact procedure necessary for removal and re-Installation of a complete operational pump is the responsibility of the Service company. This item shall also include the loading and unloading of pump parts and equipment.

Pump capacity, vibration, motor current and voltage readings shall be taken upon Installation of pump. The readings and tests shall conform to the pump and motor specifications or be approved by the Engineer.

Method of Measurement. Each bowl that is removed and reinstalled per pump as described herein and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD, TYPE 2, which shall be payment in full for the work described herein.

PRB3 PUMP REBUILD, TYPE 3

Description. This item shall consist of providing transportation within the Tri-State area for, removal and reinstallation of a complete mixed flow pump assembly in stages and disassembly of the complete unit on pump station grounds. The pump removal and replacement Service Company shall remove and install the pump as specified herein and conform with PR496. The Service Company shall procure quotes for the pump repair as directed by the Engineer. The Engineer will evaluate the specialty service quotations and authorize work according to account PV. This type of work will be applicable for Pump Stations 2, 3, 4, 29, 33 and 35.

Work Description. The service company shall furnish all equipment, labor, transportation and material, including lifting crane to perform the work as specified herein. This work shall include but not be limited to the following items:

Disassembly of the pump into the following parts: motor, oil tube sections, shafting, coupling, bearing, bowl assembly, column pipes in sections, motor stand, and set-up for inspection by a service manufacturer for service and repairs and loading and unloading of equipment that requires inspection and repair.

The above information is for removal and for information only. Exact procedure necessary for removal and reinstallation of a complete operational pump is the responsibility of the Service Co.. This item shall also include the loading and unloading of pump parts and equipment.

Pump capacity, vibration tests, motor current and voltage readings shall be taken upon Installation of pump. The readings and tests shall conform to the pump and motor specification, or be approved by the Engineer.

Method of Measurement. Each pump that is removed and reinstalled per pump station, including all equipment, labor, transportation and approval of the Engineer shall be counted as an unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for PUMP REBUILD, TYPE 3, which shall be payment in full for the work described herein.

PRB4 PUMP REBUILD, TYPE 4

Description. This item shall consist of providing transportation within the Tri-State area for, removal of wetpit/drypit submersible and side volute discharge pumps and their rotating assembly for service, repair and reinstallation. The Contractor shall remove and install the pump as specified herein and conform with PR496. The Contractor shall procure quotes for the pump repair as directed by the Engineer. The Engineer will evaluate the specialty service quotations and authorize and pay for work according to account PV. This type of work will be applicable for Pump Stations 2, 3, 5, 7, 8 - 24, 25, 26 - 32, 34, 36 - 44, 46 - 48, 50 and 51.

Work Description. The service company shall furnish all equipment, transportation and labor necessary to perform the work as specified herein. This work shall include but not be limited to the following items:

1) Setting up for removal, Disconnect electric connections

2) Disconnecting the drive shaft from the rotating assembly

3) Close gate valve and provide a blind flange if necessary to stop water leaks

4) Loosening the bolt of the rotating assembly from the volute

5) Remove rotating assembly out from pump station

6) Loading and unloading of equipment that requires inspection and repair.

This work will consist of removing and installing the open shaft and rotating assembly and setting up inspection for manufacturer's sales and service companies for service and repairs.

The above information is for removal and for information only. Exact procedure necessary for removal and reinstallation of a complete operational pump is the responsibility of the service company. This item shall also include the loading and unloading of pump parts and equipment.

Pump capacity, vibration tests, motor current readings shall be taken upon Installation of pump. The readings and tests shall conform to the pump and motor specifications or be approved by the Engineer.

Method of Measurement. Each side volute discharge pump and its rotating assembly that is removed and reinstalled as described above and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD, TYPE 4, which shall be payment in full for the work described herein.

PRB5 PUMP REBUILD, TYPE 5

Description. This item shall consist of removal of an existing side volute discharge pump and motor assembly and replace with a dry pit submersible pump as furnished elsewhere herein. This item will be applicable for Pump Stations 32.

Materials. The pump removal and replacement Service Company shall replace the gate valve of the removed pump and replace with a gate valve that is specified below.

1) Gate valves shall have a CWP non-shock rating of 150 psi

2) Gate valves shall be metal seated type, round, port design for high flow capacity.

3) Gate valve body shall be constructed of cast iron with an inner stainless steel lining. All wetted parts of the body, chest area and packing chamber shall be constructed of type 316 stainless steel for maximum corrosion resistance.

4) The body shall be a wafer face-to-face design with supporting ribs between the raised face flange to provide additional valve strength. Flange bolt holes shall be drilled for through bolting, except where tapped as required in the chest area, to the ANSI class 125/150 standard.

5) The gate shall be constructed of stainless steel and finish ground on both sides. The gate shall have a beveled, knife-like edge.

6) The valve stem shall be constructed of stainless steel and shall have double-pitch threads. Gate guides and jams shall be provided for proper support and positive seating of the gate against a raised face seat.

7) The gate valve packing shall be plastic coated for corrosion resistance. The packing chamber shall have a smooth-surface liner of uniform chamber width that shall accept extra ring type layers of packing material. Packing gland adjusting bolts shall be easily accessible.

8) The gate valve superstructure shall be fabricated, angular steel. A bronze yoke sleeve shall be provided as part of the superstructure for ease of valve operation.

9) Non-motorized gate valves shall be provided with bevel gear actuators to provide vertical mounting for a chain wheel actuator. The chain wheel actuator shall be as specified elsewhere herein.

10) The gate valve shall be provided with chain wheel actuator for manual operation. The chain wheel shall be provided with rust-resistant chrome-plated operating chain of sufficient length to allow floor operation. The chain wheel shall be positioned 90 degrees relative to the valve/pipe center-line to assure floor operation.

11) The gate valve shall be Dezurick Series L, ITT Fabri, or approved equal.

Installation. All equipment furnished, installed or mounted for this pay item shall conform with the applicable pump station reference specifications detailed elsewhere herein.

The Contractor shall furnish the labor to remove and install all electrical wiring, conduits, relays, fuses, circuit breakers, knife switch disconnects, starters, timers, and any other electrical appurtenances required. The electrical schematic diagram and piping layout shall be submitted for approval by the Engineer.

The pumps shall be installed in compliance with the manufacturer's recommendations.

The pump shall be removable through the pump access hatch. Provide a means to guide the draw-down pump into place when the pump is lowered into the dry pit through the pump hatch. Submit details to the Engineer for approval prior to Installation.

Each installed pump shall be complete with an inlet stand assembly, including anchoring flanges and an integral port suction elbow and clean out port with removable cover, this shall be indicated on submitted drawings.

Each installed pump shall be installed on a steel base support of the pump manufacturer's design and recommendation, designed to straddle the pump inlet port area for access to the pump suction pipe.

The base shall be of adequate strength and rigidity to prevent harmful vibration or deflection of the pump piping from the forces involved in the application. Data submitted for approval shall include calculations supporting an included manufacturer's certification of the adequacy of the base design. The base may be a combination of a steel frame and concrete pad, as required to properly join the pump with the new and/or existing piping as approved by the Engineer.

After assembly and Installation on the foundation, the pumping units shall be leveled, aligned, wedged in place and grouted with a non-shrink grout. Grouting shall not take place until after the initial fitting and alignment.

The manufacturer shall inspect the pump Installation and shall certify that the pumps have been installed properly. Information submitted for approval shall include a letter of intent to provide this certification.

In addition, the services of a qualified representative of the manufacturer shall be provided to supervise the testing of the equipment, make any necessary adjustments, place it in initial trouble-free operation, and instruct the operating personnel in its operation and maintenance.

Testing. After Installation of the pumping units and all accessory equipment, the units shall be subjected to running tests under actual operating conditions. The tests shall be made at the expense of the Contractor and conducted in the presence of the Engineer and the State of Illinois. The following items shall be specifically checked:

- The units are installed according to plans and specifications and the manufacturer's instructions:
- There is no pipe strain on the pump units.
- The units are properly aligned.
- Vibration limits are with Hydraulic Institute Standards.
- There is no over heating of bearings or other parts.
- The full load current is not exceeding the nameplate rating.
- The units are properly grouted and secured.

The tests shall include a timed pump run and a field capacity check. If, in the judgment of the Engineer, pump performance, as measured in the field test, is not substantially true to published characteristics, modification, adjustment or replacement of the equipment shall be made to achieve specified performance results.

Due to the required continuous operation of the station the pumps may be installed and field tested progressively, as approved by the Engineer.

Clean-Up and Safety. The work site shall be maintained in a clean condition, free of hazards, all in conformance with the requirements of Article 107 of Standard Specifications. Special care shall be taken to assure that electrical systems are not left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc., which contain wiring either energized, or non-energized, shall be closed or shall have their covers in place and shall be locked when possible during off-work hours.

Method of Measurement. Each side volute discharge pump and motor assembly that is removed and replaced with a dry pit submersible pump as specified herein and approved by the manufacturer and the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD, TYPE 5, which shall be payment in full for the work described herein.

PRB6 PUMP REBUILD, TYPE 6

Description. This item shall consist of furnishing all material, transportation, labor and equipment for the removal of an existing side volute discharge pump and motor assembly and replace with a dry pit submersible pump as furnished elsewhere herein. This item will be applicable for Pump Station 14. This work includes the replacement of the pump discharge pipe to the first manhole about 16' away from the pump station.

Materials. The pump removal and replacement Service Company shall replace the gate valve of the removed pump and replace with a gate valve that is specified below.

1) Gate valves shall have a CWP non-shock rating of 150 psi

2) Gate valves shall be metal seated type, round, port design for high flow capacity.

3) Gate valve body shall be constructed of cast iron with an inner stainless steel lining. All wetted parts of the body, chest area and packing chamber shall be constructed of type 316 stainless steel for maximum corrosion resistance.

4) The body shall be a wafer face-to-face design with supporting ribs between the raised face flange to provide additional valve strength. Flange bolt holes shall be drilled for through bolting, except where tapped as required in the chest area, to the ANSI class 125/150 standard.

5) The gate shall be constructed of stainless steel and finish ground on both sides. The gate shall have a beveled, knife-like edge.

6) The valve stem shall be constructed of stainless steel and shall have double-pitch threads. Gate guides and jams shall be provided for proper support and positive seating of the gate against a raised face seat.

7) The gate valve packing shall be plastic coated for corrosion resistance. The packing chamber shall have a smooth-surface liner of uniform chamber width that shall accept extra ring type layers of packing material. Packing gland adjusting bolts shall be easily accessible.

8) The gate valve superstructure shall be fabricated, angular steel. A bronze yoke sleeve shall be provided as part of the superstructure for ease of valve operation.

9) Non-motorized gate valves shall be provided with bevel gear actuators to provide vertical mounting for a chain wheel actuator. The chain wheel actuator shall be as specified elsewhere herein.

10) The gate valve shall be provided with chain wheel actuator for manual operation. The chain wheel shall be provided with rust-resistant chrome-plated operating chain of sufficient length to allow floor operation. The chain wheel shall be positioned 90 degrees relative to the valve/pipe center-line to assure floor operation.

11) The gate valve shall be Dezurick Series L, ITT Fabri, or approved equal.

The Contractor shall remove existing check valve at Pump Station 14. The Contractor shall furnish and install a TightFlex check valve or equivalent.

Quantity	**Size**
1	16 inch – TideFlex Series 39 Flanged Check Valve
1	14 inch – gate valve 125# flanged
1	Pump Section Elbow Flanged 20 ¾ inches Face to Face
1	16” 150# Flange X Plain end Ductile Iron Spool, 16’ pipe
1	16” x 12” Concentric pipe Reducer
1	12 inch base elbow

1	16 inch Schedule 40 LR Elbow Flanged
2	16” Schedule 40, 10’ pipe

The above quantities and lengths are approximate and are listed for information only. Exact quantities, dimensions and all other materials that may be necessary to render the new Installation complete for operation is the responsibility of the Service Company.

Installation. All equipment furnished, installed or mounted for this pay item shall conform to the applicable pump station reference specifications detailed elsewhere herein.

The Contractor shall furnish the labor to remove and install all electrical wiring, conduits, relays, fuses, circuit breakers, knife switch disconnects, starters, timers, and any other electrical appurtenances required. The electrical schematic diagram and piping layout shall be submitted for Engineer’s approval.

The pumps shall be installed in compliance with the manufacturer's recommendations.

The pump shall be removable through the pump access hatch. Provide a means to guide the draw-down pump into place when the pump is lowered into the dry pit through the pump hatch. Submit details to the Engineer for approval prior to Installation.

Each installed pump shall be complete with an inlet stand assembly, including anchoring flanges and an integral port suction elbow and clean out port with removable cover, this shall be indicated on submitted drawings.

Each installed pump shall be installed on a steel base support of the pump manufacturer's design and recommendation, designed to straddle the pump inlet port area for access to the pump suction pipe.

The base shall be of adequate strength and rigidity to prevent harmful vibration or deflection of the pump piping from the forces involved in the application. Data submitted for approval shall include calculations supporting an included manufacturer's certification of the adequacy of the base design. The base may be a combination of a steel

frame and concrete pad, as required to properly join the pump with the new and/or existing piping as approved by the Engineer.

After assembly and Installation on the foundation, the pumping units shall be leveled, aligned, wedged in place and grouted with a non-shrink grout. Grouting shall not take place until after the initial fitting and alignment.

The manufacturer shall inspect the pump Installation and shall certify that the pumps have been installed properly. Information submitted for approval shall include a letter of intent to provide this certification.

In addition, the services of a qualified representative of the manufacturer shall be provided to supervise the testing of the equipment, make any necessary adjustments, place it in initial trouble-free operation, and instruct the operating personnel in its operation and maintenance.

This work shall also include removing the discharge pipe and replacing it with an approved 16" discharge pipe at PS 14, coring of the wet pit concrete wall. Also installing a wall pipe leak seals shall be included as a part of the scope of work.

The Contractor shall coordinate Installation of the pump which includes Installation of the pump which includes the check valve, gate valve and appurtenances. Restoration of location to the original status is required before final acceptance.

Testing. After Installation of the pumping units and all accessory equipment, the units shall be subjected to running tests under actual operating conditions. The tests shall be made at the expense of the Contractor and conducted in the presence of the Engineer and the State of Illinois. The following items shall be specifically checked:

- The units are installed according to plans and specifications and the manufacturer's instructions.
- There is no pipe strain on the pump units.
- The units are properly aligned.
- Vibration limits are with Hydraulic Institute Standards.

- There is no over heating of bearings or other parts.
- The full load current is not exceeding the nameplate rating.
- The units are properly grouted and secured.

The tests shall include a timed pump run and a field capacity shock. If, in the judgment of the Engineer, pump performance, as measured in the field test, is not substantially true to published characteristics, modification, adjustment or replacement of the equipment shall be made to achieve specified performance results.

Due to the required continuous operation of the station the pumps may be installed and field tested progressively, as approved by the Engineer.

Clean-Up and Safety. The work site shall be maintained in a clean condition, free of hazards, all in conformance with the requirements of Article 107 of Standard Specifications. Special care shall be taken to assure that electrical systems are not left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc., which contain wiring either energized, or non-energized, shall be closed or shall have their covers in place and shall be locked when possible, during off-work hours.

Method of Measurement. Each side volute discharge pump and motor assembly that is removed and replaced with a dry pit submersible pump as specified herein and approved by the manufacturer and the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD, TYPE 6, which shall be payment in full for the work described herein.

PS01-PS02 PUMP, SCADA PANEL, FURNISH AND INSTALL

Description. The Contractor shall furnish, deliver, and install a new SCADA panel. The existing panel shall be removed and relocated as directed by the Engineer. The pay item shall include start-up and calibration service by the supplier. This work shall be done at pump station 11,13,15,18,19, 28, 33, 36, 37, 38, 40, 44, 51 and 52.

The mounting of the SCADA equipment, the furnishing and installing of transducers and controls at existing pump station, pumping control equipment and all interconnecting wiring between the SCADA equipment and devices. All materials and work not expressly specified but necessary for the proper completion to furnish and install a SCADA panel in a neat, workmanlike manner shall be considered incidental and shall be included under the unit bid prices. All equipment shall be furnished in kind with recently installed SCADA panels as approved by the Engineer, a copy of the shop drawings and approved equipment list can be provided upon request.

All materials and work not expressly specified but necessary for the proper completion in a neat, workmanlike manner shall be considered incidental and shall be included under this pay item.

General. The Contractor shall furnish where indicated and applicable, and as directed by the Engineer, all materials, equipment and labor, to perform work as specified. The District has in place a Supervisory, Control And Data Acquisition (SCADA) system to remotely monitor, alarm and control its un-manned storm water pumping stations. These stations are to be considered critical systems that must remain operational at all times.

The SCADA system central equipment is in place, operational and several stations, as noted elsewhere herein, have been equipped with the required remote terminal units (RTU's) and interfacing transducer sets. The system has become part of the District's standard for storm water pumping stations

For compatibility with the District's existing system equipment, the Pump Station SCADA equipment shall be a RSView/Contrologix system, as programmed and configured for IDOT District One, as manufactured by Rockwell Automation. Information on the system and local service is available from:

Meade Electric Company Inc.

9550 W. 55th Street Suite A

McCook, IL 60525

Phone: (708) 588-2515

Fax: (708) 588-2501

Contact: Scott Myers

Other work, including various appurtenant items for the SCADA system, shall be performed by the Contractor. Including but not limited to the mounting of the SCADA equipment, the furnishing and installing of Software and Hardware and all interconnecting wiring between the SCADA equipment and these devices

SCADA Panel. The Contractor shall furnish a Supervisory, Control And Data Acquisition (SCADA) panel complete with programmable logic controller (PLC), ControlLogix processor model 1756 L55M13, remote transducer interface hardware, enclosure, back-up power UPS, MMI, communication modems and programming as specified herein and indicated by the Engineer

All furnished equipment shall be UL listed and shall be appropriately labeled as such.

Equipment catalog information shall be submitted to the Engineer for approval (as specified elsewhere herein).

All panel wiring diagrams and programming shall be submitted and approved by the Engineer before the equipment is furnished.

Enclosure. The SCADA enclosure shall be a NEMA 12 single door enclosure fabricated from hot dipped galvanized steel, ASA-61 exterior, white interior.

All equipment shall be installed in the SCADA enclosure unless directed otherwise by the Engineer.

The wet well level display, pump manual lock-out button with protective guard, alarm light and manual purge button shall be furnished and mounted on the front face of the enclosure. Also furnish and install ground bus, light switch box and cover, convenience light 24”, convenience outlet ground fault.

The PLC shall be mounted on the back plane of the SCADA panel. A cutout shall be provided on the enclosure door to allow for the Installation of the 17” Touch screen Monitor and door mounted Keyboard and mouse sliding tray

hardware. The monitor is part of the workstation installed inside the cabinet an ms6000 PC work station. The work station shall come pre-programmed with the IDOT generic configuration. The workstation shall come pre-wired for power and integration to the PLC, as per IDOT standard configuration. The enclosure door shall be reinforced to provide rigidity when the Monitor is pressed with no deflection.

All equipment furnished shall be wired, installed and interfaced to the PLC within the enclosure.

Pump Manual Lock-Out Button. The button shall be used for disconnecting all PLC pump controls when pressed in (Lock-out). However, the manual lock-out will not alter the operation of other control systems.

This button shall be a round, red, mushroom push-pull type button, minimum of 30mm in diameter with one pulled position contact (normally open) and two pushed positioned contacts (normally closed).

The button, auxiliary contacts, a protective ring shall be similar to existing IDOT standard or as Engineer Approved.

Alarm Light. The alarm light shall lit by the PLC when an alarm condition is detected.

The alarm light shall be round, red, push-to-test type, and a minimum of 30mm in diameter.

The alarm light shall be installed with nameplate.

Manual Purge Button. The button shall activate the purge sequence on the SCADA system reactive air system (specified elsewhere herein) when pushed.

The button shall be round, black, momentary contact type button, minimum of 30mm in diameter. This button shall be installed with nameplate as Engineer approved.

Panel Power Supply System. The power supply system shall be capable of providing power to all equipment internal to the SCADA panel by furnishing and installing two (2) power supply 12VDC 6 Amp, Eight (8) fuse holders with blown fuse indicators and two (2) fuse holders with blown fuse.

The PLC, alarm light and reactive air system shall be powered by a self charging, automatic battery back-up system that will provide a minimum of twelve (12) hours of reserve power by furnishing and installing a one (1) KVA double conversion backup power.

Pneumatic Air System. This item shall consist of furnishing two (2) reactive air systems capable of monitoring wet well elevations and one (1) inflow air system. Each reactive air system shall consist of a compressor, solenoid, pressure to current conversion circuit.

Furnish and install a compressors and solenoids, which shall have a design life of forty (40) years, Also furnish and install pressure transducer 0-27 PSIG 4-20 mA 12-28 VDC.

All equipment needed and recommended by the manufacturer to ensure system warranty shall be furnished, including miscellaneous mounting apparatuses.

Power Monitoring Conversion Circuit. A power monitoring conversion circuit shall be provided capable of converting power monitoring transformer currents and voltages to a direct current 4-20 mA signal as a PLC analog input by furnishing and installing voltage transducer(s) 0-150 VAC 4-20 mA.

Motor Current Monitoring Conversion Circuit. A motor current monitoring conversion circuit shall be provided capable of converting current monitoring transformer currents and voltages to a direct current 4-20 mA signal as a PLC analog input by furnishing and installing current transducer(s) 0-5 A 4-20 mA.

Surge Protection. The circuit shall contain necessary surge suppression devices to protect critical circuit elements from line surges. All equipment supplied and installed by the contractor shall be properly installed and protected against voltage surges, transients and lightning strikes by furnishing and installing phone line surge arrestor and two (2) surge suppressors.

Programmable Logic Controller (PLC). The PLC shall be Allen-Bradley ControlLogix sized as required or Engineer approved equivalent.

The ControlLogix system shall be implemented in one of the following types of I/O configurations:

Type A:	Chassis: 17 slot, , Power Supply ; Controller 1756L55M13; DI modules: Qty. (6) 16 point DC ; AI modules: Qty. (3) 1756-IF8; DO Modules: Qty. (3) #1756-OW16I, Ethernet and MODBUS communication modules 1756-ENBT and Prosoft # MV156-MCM, blank slot covers, cables and interface modules.
Type B	Chassis 13 slot, Power Supply: Controller 1756L62; DI modules: Qty. (5) 12/24 VDC; AI modules: Qty. (2) 1756-IF8; DO Modules: Qty. (3) contact output, 1756-OW16I, Ethernet and MODBUS communication modules 1756-ENBT and Prosoft # MV156-MCM, blank slot covers, cables and interface modules.

All components shall be labeled with a rigid, two-color laminated, plastic nameplate indicating the enclosed contents. The lettering shall be engraved, at least one-half inch high, and highly contrast with its back-ground. The labels shall be permanently affixed to the cabinetry with stainless steel screws or rivets. All wiring shall be uniquely color coded with its color shown on the associated system documentation. A permanent tag affixed within three (3) inches of every termination shall indicate the function and placement of all connectors. All terminals shall be labeled and identified on the associated system documentation. The interior cabinet door housing the PLC shall have the procedures laminated and posted for replacing any processor equipment and replacing it with a rotating spare; downloading the PLC programs from the other system processors, interrogating the PLC to obtain specific levels of information in registers, and set points. Also provided in the cabinetry shall be holders for the circuit diagrams and system Descriptions. The initial set points for alarms and controls shall be posted. Other abbreviated maintenance and user procedures shall be created, laminated, and posted in appropriate areas, as determined by the Engineer. Samples of all materials and the attachment procedures shall be submitted for approval/revision to the Engineer before Installation.

The front of the SCADA panel shall be implemented with an industrial 17" Touch screen Monitor part of the SCADA work station shall be furnished and installed with the latest Pump Station SCADA RTU GUI application. This work shall include software configuration for communication to the PLC rack. The following software shall be furnished, configured, installed and interfaced with SCADA system: RSVIEW 32 Runtime with 300 tags, Windows 2000 or XP operating system, RSLinx communication driver and Microsoft Access data base. The equipment will be tested for proper performance during acceptance testing. The Contractor shall pay for any corrections required making the system fully operational. The contractor shall develop and install a RSView Screen file which shall be configured for each location based on the pump station equipment I/O.

Software installation and Screens Development

The pump station PLC application file and RSView Screen File shall be programmed and configured by the Contractor, to communicate, monitor, archive, control and alarm all I/O points in the existing pump station. The PLC shall be installed in the pump station and shall communicate over all communication media with remote processors at Schaumburg and the Contractor Dispatch Center. The PLC program shall include all set points related to software (internally and externally) triggered alarms. The Remote processors, Satellite and pump station HMI screens shall be identical such as the pump station information screen, control screen, main pump station screen and status screen are the same that will show all devices in the pump station properly controlled, monitored and archived.

Communication. The PLC data communicator shall be both a dialup telephone network and point multi-point radio system by furnishing and installing 56K external modem , serial modem cable , Ethernet Switch.

Miscellaneous Equipment. The contractor shall furnish and install in addition to the above equipment wire, wire-way, nameplates, fuses, ground bus , convenience outlet, ground fault , terminal blocks , relay sockets , 120VAC, DPDT relays , 12VDC, DPDT relays , circuit breaker 20 Amp 120/240V one (1) pole 10,000 AIC , keyboard, mouse, door-mounted keyboard tray, convenience light 24", 120V-u light switch, box and cover, as required to make a complete and operational system.

Documentation. SCADA System Operations and Maintenance Manual

A SCADA system operations and maintenance manual shall be provided. This manual shall be targeted at the complete documentation of all equipment and software installed for an individual pumping station under these specifications. It shall serve as maintenance, trouble shooting and operations guide for the Electrical Maintenance Contractor who is responsible for maintaining the Department's pumping stations. The manuals shall be constructed in such a way as to meet environmental requirements of the pumping station including metal hinged binders and plastic sheet covers. The manual shall include but not be limited to the following items:

Table of Contents:

SCADA system Description

PLC operation, maintenance and programming Manual

Set point table listing all programmable set point values

PLC input/output designation table

Telemetry, control and alarm message specifications

List of materials supplied

All supplied equipment catalog cuts

Copies of all station labeling

Full size wiring diagrams (as described herein)

Cumulative storage curves and calculations

back-up control operations and elevations

PLC field replacement procedures

Three (3) copies of these manuals shall be furnished.

Diagrams. All circuit, system, wiring, block and interfacing diagrams shall be provided. The complete set of diagrams provided shall completely illustrate all wiring and equipment installed under these specifications including: termination points, equipment labeling, mounting and Installation dimensions and wiring. Seven (7) copies of each of these diagrams shall be provided (Six (6) on full size blue line plan sheets and One (1) on full size Mylar) prior to the beginning of the final acceptance testing. Each diagram shall be stamped record drawing and shall reflect all final wiring and Installations. A minimum of the following diagrams shall be provided:

- PLC I/O wiring diagram
- Pumping station interface diagram
- Telemetry panel diagram
- A complete block diagrams of all telemetry and control equipment installed
- Remote radio and phone line wiring and block diagram
- Pneumatic air system diagram

PLC Programming Documentation

All PLC program documentation shall be furnished to the Engineer on a DC in a Microsoft Word format.

General Description. The PLC shall be used as the primary, secondary or tertiary control system as determined by the Engineer for the pumping station. As a control system in the pumping station, the PLC shall have the capabilities of controlling all pumping station operations including control of pumps, fans, vents, greasers, pneumatic air systems and emergency power supplies independent of all other control systems. The PLC program shall be internally stored within the PLC's non-volatile memory. It shall be a completely independent program, which will not require any communications with any other system processor for operations. The PLC shall include all I/O noted by the Engineer on the SCADA I/O checklist. Inputs and outputs shall be wired to their corresponding high states noted on the checklist. PLC software shall include all setpoints related to software (internally) triggered alarms. This list shall be included as part of the software submittal.

Local Control. The PLC shall operate the pumping station as a completely independent primary, secondary or tertiary control system. It shall operate on dynamic or step control pumping logic as determined by the Engineer. No communications with any of the other system processors shall be needed by the PLC for control and operation of the pumping station. Care shall be taken during SCADA panel Installation and equipment interfacing to ensure that the PLC is totally independent of all other control systems and no common failure point exists prior to the motor start contactor.

Primary Control. If the Engineer determines the PLC as the primary control system", the PLC shall be the governing control system for pumping station control and operations based on its own internally stored program.

Secondary or Tertiary Control. If the Engineer determines the PLC as the secondary or tertiary control system, the PLC shall be the back-up control system for pumping station control and operations. As a back-up" control system the PLC shall monitor primary, or if acting as the tertiary control system, primary and secondary control systems for failure. When failure of all other preceding control systems is detected, the PLC shall assume control of the pumping stations operations based on its own internally stored program. It shall be ensured that there is absolute isolation of the PLC’s control circuits from all other control systems control circuits. Each control system shall operate independently of one another.

Dynamic Pump Control. If the Engineer determines the PLC shall operate on dynamic pump control logic, the PLC shall determine pumping requirements based on a calculated Control Curve and set pointed benchmark control elevations.

Control Curve Calculation. The PLC shall continuously construct and evaluate a wetpit depth verses time curve (Control Curve) as part of the dynamic pump control logic. The slope ratio of the Control Curve shall be based on the vertical axis being wetpit depth in feet and the horizontal axis being time in minutes. A slope ratio of 1:1 means the

water has risen one (1) foot in the last minute. A ratio of 2:1 means the water has risen two (2) feet in the last minute. Control decision points shall occur: at set pointed benchmark elevations; when the slope of the control curve changes direction and maintains that direction for a set pointed time interval; when the slope significantly changes magnitude and stays within that range for a set pointed time interval; and when a set pointed time interval has expired since the last control command. The curve shall be calculated continuously by the PLC with averaging and/or filtering used to compensate for wave action and other discontinuities. The dynamic pump control logic presently being used on State pumping stations shall be incorporated on future dynamic control stations.

Step Pump Control. If the Engineer determines the PLC shall operate on step pump control logic, the PLC shall determine pumping requirements based on set pointed benchmark control elevations. The number of set pointed benchmark control elevations needed will be specified by the Engineer.

While the pumping station PLC acts independently on a real-time basis, all system processors shall be capable of establishing a communications link between it and any system PLC. Once a communications link is established, the system processor will have the capability of remotely controlling and monitoring the PLC it has a communication link established to. Remote control and monitoring of the PLC shall include, but not be excluded to, controlling of pumps, changing of set pointed values, downloading/uploading of PLC programming and monitoring current pumping station operations.

If during remote testing the elevation in the wetpit reaches the all pumps stop elevation, the PLC will turn off the operating pumps.

The PLC shall have remote uploading and downloading capabilities. Any system processor shall have the capability of remotely loading programming to the PLC via telephone, radio or PLC maintenance port.

This shall include provisions so that when a PLC fails, a spare unit can be installed and the individualized PLC programming for that particular pumping station can be downloaded from any system processor via telephone line and radio communications. Remotely uploading all programming from the PLC to any of the system processors in the same manner as the downloading procedure.

Alarms. Any change of PLC digital input, digital output or register status (externally imputed or internally calculated) shall be considered an alarm and/or alarm conditions as herein these specifications. All alarms shall be sent to the central processor by the PLC.

The PLC shall receive pumping station status information from all of the telemetry and control equipment interfaced to it. The processor shall constantly scan the input information and determine (based on its internally stored software logic) if the station has an alarm condition. When an alarm condition is detected the associated processors shall be called and advised using the remote radio or dial-up telephone network (if failure of the remote radio is detected by the PLC). When the alarm condition ceases, an additional notification shall be made by the PLC. The PLC shall be configured in accordance with and as directed by the Engineer. The PLC shall operate the common alarm light (as specified elsewhere herein) based upon alarm conditions detected by its internal programming. All PLC alarms shall be capable of being acknowledged by the alarm acknowledgment button (as specified elsewhere herein).

All alarm conditions generated by the PLC and I/O changes in state shall be received by the central computer via polling. The SCADA system is a poll only system and no I/O changes in state shall trigger any report by exception telemetry. When an alarm condition is corrected, the corresponding message will be sent to the central processor the next time the pump station is polled. All data sent/received by the pump station shall be the same format. All communications shall be routed to the designated processor using radio system and/or dial-up telephone network facilities located at each facility. Radio shall be the telecommunications media of choice. A failure to contact a processor by radio shall imitate a call by dial-up telephone network. When a telecommunications media fails, the PLC shall send an alarm on the other available media indicating the failure. The PLC shall automatically re-send the initial alarm if the associated condition has not been corrected within a set point time interval beginning from the time the alarm condition was detected. In the event of failure to establish a useable telecommunications radio pathway the PLC will retry calling each processor a set pointed number of times after which, if failure still occurs, the PLC shall then call by telephone. It shall be ensured that any change of the PLC's digital input, digital output or register status (externally inputted or internally calculated) is sent to the receiver by the central processor.

Programming in the PLC shall be non-volatile. Volatile memory using lithium battery back-up shall be permitted. Permanently embedded programming shall be held in PROM chips. Operational and control programming subject to revision shall have battery back-up sufficient to sustain memory for a minimum of five (5) years without external power.

As the timing and power parameters inherent in a pumping station conflict with those typical of a microprocessor all necessary buffering, filtering, surge protection and time delays shall be incorporated in the hardware and programming of the PLC.

Central and Engineering Processor Programs. The SCADA system consists of three (3) central processors (IDOT Schaumburg, IDOT electrical maintenance office and EMC) and six (6) engineering processors.

Each processor in the system shall be configured, by the Contractor, to communicate, monitor, archive all I/O points, control and alarm each additional PLC installed in a pumping station over all communication media.

Software revisions or modifications required to integrate additional PLC's into the existing processor shall be provided by the Contractor. Processor functionality and integrity shall be maintained with each added PLC.

All mounting apparatuses necessary to rigidly wall or floor mount the SCADA panel. Conduits, wiring and fittings as required for a complete operational system is included in this pay item.

All equipment furnished and installed under this item shall be appropriately identified with nameplates as specified under Basic Materials and Methods, elsewhere herein.

Removal and Installation. The Engineer shall designate the Pumping Station to facilitate the removal and installation of SCADA panel. No splicing.

The Contractor shall maintain the operation of the pumping station. All operations shall be subject to approval of the Engineer.

The Contractor shall protect adjacent material, equipment and areas during process of removal and replacement of SCADA panel operations from all dirt, dust, debris or damage of any kind.
The SCADA panel shall be rigidly wall or floor mounted with an Engineer-approved mounting means.

Install a SCADA enclosure size 36” W X 90” H.X 20” D Type A
Install a SCADA enclosure size 36” W X 48” H X 20” D Type B

All software shall be configured, installed and interfaced with existing SCADA system at the pumping station and at both central and satellite location to provide a complete and operational system

All equipment furnished, installed or mounted for this pay item shall conform to the NEC and applicable specifications for Basic Materials and Methods, elsewhere herein.

The Contractor shall submit catalog cuts, design drawings and product data for the Engineers approval prior to installation including all software as specified elsewhere herein. Three complete sets of record drawings, catalog cuts and O&M manuals shall be provided upon completion for Engineers approval.

Startup training onsite, a minimum of 8 hours shall be provided with each pump station.

Method of Measurement. Each furnished and installed SCADA panel and removal of existing SCADA panel as specified above and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the Contract unit prices each for

PS01 PUMP, SCADA PANEL, FURNISH AND INSTALL TYPE A
PS02 PUMP, SCADA PANEL, FURNISH AND INSTALL TYPE B

which shall be payment in full for the work as described herein.

PS03 PUMP, VIBRATION TESTING AND ANALYSIS

Description. The Contractor shall provide a Vibration and Analysis Testing Consultant who is a data analyst with a minimum of two years experience in vibration data collection and spectrum analysis, and shall have a Level II certification by a vibration institute or equivalent.

The Consultant shall conduct the testing and start-up on all the pumps and including new and/or rebuild. The Consultant shall provide recommendations for pump motor inspection, balancing, repair or replacement of pumps and motors, maintenance and troubleshooting of all associated equipment. A strobe tachometer should also be used to verify motor speed.

The Contractor shall provide the Consultant with records of the type of pump, head design, manufacturer's performance curve, moisture resistance and megger test results and other pertinent data to the pump operation prior to start up of the above inspections and testing.

The Contractor shall conduct the first vibration test with the capacity test.

The Consultant shall be equipped with required tools, transportation, equipment, instrumentation and supplies to perform the Pump Vibration and Analysis Testing Inspection.

The Vibration and Analysis Testing Consultant shall perform vibration analysis on all pumps, utilizing a Smart Meter Plus, Model 1330F or better which will include a copy of the associated software for IDOT and the electrical maintenance contractor use for the duration of the contract. The Electrical Maintenance Contractor shall calibrate and maintain the IDOT vibration meter including all software and accessories. The first Testing shall be conducted at the same time as the Yearly Pump Station Inspection and Pump Capacity Test. The 2nd Testing shall be due November 30 of each contract year. All results shall be entered into the Log Book for each station, in Chart Z. Each inspection report shall be entered into the EMCMS System. Any deficiencies found on this inspection shall have appropriate EMCMS Tickets issued, and the numbers shall appear on the inspection report, Form P-5. A start-up testing on the Pump repair/replacement work shall be scheduled by the Consultant following completion of any necessary repair/replacement work.

The Consultant shall provide testing, analysis, database development, baseline data acquisition and problem identification and reporting, for all the pumping station equipment.

Full vibration signatures shall be acquired for all mechanical equipment included in the program. the baseline data is to be analyzed to determine baseline condition of all equipment. The analysis will result in a series of reports that:(1) identify specific problems, (2) provide specific corrective actions, and (3) establish a priority (based on the problem severity) for maintenance actions.

Monitoring and analysis of the operating condition of the pumps is an absolute requirement of the predictive maintenance program. Therefore, all pumps will be monitored twice per year, additional tests are required for the pumps that indicate potential problems.

Problem Identification and Reporting:

A report will be prepared each month that defines specific maintenance tasks that are required to correct incipient problems identified by the monthly data acquisition and analysis program. These reports will be submitted within five (5) working days following completion of the data acquisition. The format of the report should be designed to reduce the amount of paper work necessary to properly maintain accurate communication between the Consultant and IDOT. Each report is to provide a prioritized list of specific maintenance or inspection tasks that are required to verify or correct developing problems.

The Consultant shall notify IDOT and the Electrical Maintenance Contractor immediately when any deficiency is noted that could jeopardize equipment operation or personnel safety. Written reports will address all monitoring points, but will place a priority on “exception” reports describing problems that have been identified including a detailed evaluation of pump status and recommended maintenance actions.

a. Tests must be conducted with a flooded suction so not to cause vortexing or cavitation. For data history purpose each test should be conducted with about the same amount of pump submergence as the previous test for that pump. The Electrical Maintenance Contractor shall store or provide water in order to conduct the proper test in accordance with normal operation of the pumps. Two vibration readings shall be taken at the thrust end of the motor (one should be parallel to the discharge pipe and one perpendicular to the discharge pipe), and two readings shall be taken at the coupling end of the motor and should be in the same plane.

Finally an axial reading should be taken. The transducer location shall be marked with different colors which will correspond to x and y-axis.

b. The results of the tests shall be saved on intelli-cards or 3.5 inch floppy showing the velocity in inches per second (ips). In the event that the vibration exceeds 0.3 ips the Engineer may require that the motor be uncoupled from the pump and another test be conducted. Where motor speed is below 1000 RPM, the 0.3 ips velocity "evaluation point" shall be decreased by 10% for each 100 RPM below one-thousand. The worst case reading shall be assumed to be the "true" reading.

c. Readings shall be considered "abnormal" when the vibration exceeds 0.3 ips. The test card data shall be entered into the EMCMS System for each station, no later than 48 hours after the completion of the inspection of each station, with the entire inspection report and test cards to be received by the Engineer by June 30th and November 30th of each contract year. Note the location axis of the transducer, the pump manufacturer, model number and serial number of the associated pumps must be specified for each station. Any deficiencies found on this inspection shall have appropriate Tickets issued, and the numbers shall appear on the inspection report, Form P-5.

Coordination with PS Specialist

The Vibration and Analysis Testing Consultant shall coordinate with the PS Specialist Consultant on all findings and results to develop an overall condition of the equipment.

Method of Measurement. This work shall be measured and paid on the basis of each pump tested in a pump station and analysis of results and reports delivered, as well as all labor costs, travel expenses, miscellaneous expenses, as specified in this pay item for each pumping station inspected.

Basis of Payment. This item shall be paid at the contract unit price each for PUMP, VIBRATION TESTING AND ANALYSIS of a pump that shall be payment in full for the work described herein.

PV01–PV03 VENDOR BUDGETARY ALLOWANCE

Description. This item is to establish a budget account to allocate funds for the payment of various types of repair services including replacement pumps, appurtenances, and miscellaneous system equipment required for the ongoing pump station system maintenance program but which are not accurately or completely identifiable at the time of bidding. When mentioned herein, Article 109.05 is modified whereas the Contractor shall be paid an administrative costs of an amount equal to five (5) percent of the first $10,000, and the Department shall allow an additional one (1) percent of any amount over $10,000 of the total approved costs, on an individual work authorization.

Following is detailed information concerning each major category of work, which requires the allocation of funds for certain expenses:

1. Pump Repair Services

The annual pump rebuilding program involves many repairs for which the costs cannot be estimated or determined until the pumps are removed from operation and disassembled for examination. Most pump repairs cannot be performed by the General contractor's forces, and it is therefore necessary to have various service and/or pump manufacturing companies perform the necessary specialty service work. Specifically, the work consists of the repair of pump bowl assemblies, discharge column repairs, shafting and oil tube assembly overhaul, and other miscellaneous services.

The Engineer will evaluate the specialty service quotations and authorize work accordingly. The total estimated amount of the annual expenses incurred for the services performed by others, which will be paid under Article 109.05 of the Standard Specifications as herein modified in Article 5.0, is $150,000.00 as indicated for Pay Item PV01. For bidding purposes, this amount shall be used.

2. Pump Bowl Replacement

The annual pump rebuilding program involves the necessity to replace certain major parts of the pump assembly called the pump suction bowl. Until the pumps are removed from operation, it is not known whether pumps suction bowl will need to be replaced with a completely new unit. When it becomes

known, after disassembly of the pump that the pump bowl cannot be repaired, the Contractor is directed by the Engineer to obtain quotations for a new replacement unit.

The Engineer will evaluate the specialty service quotations and authorize work accordingly. The total estimated amount of the annual expenses for the purchase of replacement bowl assemblies, which will be paid under Article 109.05 of the Standard Specifications, and as herein modified in Article 5.0, is $150,000.00 as indicated for Pay Item PV02. For bidding purposes, this amount shall be used.

3. Complete Pump Replacement

The annual pump rebuilding program involves the need to replace complete pump assemblies at certain pump stations because of the extent of their deteriorated conditions found at the time of removal. For these cases, the Contractor must obtain quotations for direct replacements from the same manufacturer and also sometimes from other pump manufacturers.

The Engineer will evaluate the quotations and authorize procurement accordingly. The total estimated amount of the annual expenses for the purchase of complete pump assemblies, which will be paid under Article 109.05 of the Standard Specifications and as herein modified in Article 5.0, is $150,000.00 as indicated for Pay Item PV03. For bidding purposes, this amount shall be used.

PW01 WET PIT, CLEANING

Description. This item shall include the removal of all debris from the designated pump station wet pit as described herein.

Work Description. The method by which the debris is removed from the wet pit shall include any traffic control, safety, transportation, and vacuum equipment and shall require the approval of the Engineer.

All removed material shall be disposed of outside the State right-of-way and in accordance with the local EPA rules and regulations.

Areas outside the bar screen(s)/trash rack(s) up to the inlet sewer shall be cleaned at the same time in accordance with Article 8.

Method of Measurement. Each square yard area of wet pit silt material that is cleaned and all refuse disposed of in accordance with the above specifications and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price per square yard for WET PIT, CLEANING, which shall be payment in full for the work described herein.

PW02 WET PIT, POWER WASH

Description. This item shall consist of providing all labor, material, and equipment to power wash and clean IDOT pumping station wet pits, walls, floors, beams, grating, railings, piping, ladders, and stairs. This work will be authorized in conjunction with pumping station wet pit cleaning paid under a separate pay item elsewhere herein.

Equipment. 10,000 PSI water blaster

Method of Measurement. Each power wash hour as approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price for each hour of WET PIT, POWER WASH, which shall be payment in full for the work described herein.

Note for **RMA1 Budgetary Routine Maintenance Allowance**

See Routine Maintenance Article 4.13

SURVEILLANCE AND DYNAMIC MESSAGE SYSTEMS NON-ROUTINE PAY ITEMS:

SB01 8" LED BEACON, FLASHING, LOW MOUNT, 1 FACE

Description. This item shall conform with sections TSC T401#1, T412#1, and T426#1 of the Recurring Special provisions for Traffic Surveillance and Vehicle Traffic Control Signal Heads- Light Emitting Diode (LED) Circular Signal Supplement June27, 2005 and except as revised herein. This item shall consist of installing two (2) low mounted eight inch LED yellow flashing beacons on an existing post as shown on the plans or directed by the TSC Engineer. This item shall include furnishing and installing a two (2) 8" Yellow LED single section heads, flasher controller in the cabinet, required by the TSC Engineer, and all other incidentals necessary to complete the installation. The basis of payment is each for furnishing all equipment and labor necessary to complete the installation. The item shall not include the underground conduits, trench and backfill or the cable between the service installation and the base of the flashing beacon. These items will be paid separately.

Basis of Payment. This work shall be paid at the contract unit price each to 8" LED BEACON, FLASHING, LOW MOUNT, 1 FACE, FURNISH AND INSTALL as described above, which price shall be payment in full for all work as described herein and as directed by the Engineer.

SC03 CABINET, TYPE 3, FOR SURVEILLANCE

Description. This item shall consist of furnishing and installing a new type 3 (lll) cabinet at an existing surveillance installation and shall include wiring and re-installation of equipment from existing cabinet to a new cabinet.

The components of the expressway monitoring cabinet shall consist of where applicable a flasher controller. It shall be solid state. It shall consist of two components: A base, which is mounted on the ramp metering, control cabinet wall, and the flasher which plugs into and is secured to the base by a loading screw. A radio interference filter shall be supplied with the flasher controller. The flashing beacons shall flash alternately at the rate of not less than fifty (50) nor more than sixty (60) flashes per minute. Ramp metering cabinet shall have a signal load relay installed. The signal load relay shall consist of two components, a base, which is mounted on the E.S.P. Type 3 cabinet wall, and a signal load relay which plugs into and is secured to the base by locking screw. The coil of this relay shall be connected to the mark output of the signal change tone receiver. The one set of contacts of the load relay shall be used to change the ramp signal and one set of contacts shall be used to key the mark input to the signal change transmitter. Telemetry mounting frame with frame mounting hardware. All cabinets shall be fitted with a fused thermostatically controlled fan. It shall be mounted at the top of the cabinet for a forced air fan system that has a screened air exhaust opening under roof overhang and no opening in top of cabinetry. The fan shall be capable of operating at 130 cfm.. at .160" of water static pressure

Cabinets shall be supplied in sizes with minimum inside dimensions listed below:

TYPE	HEIGHT		WIDTH	DEPTH	THICKNESS	MATERIAL
ESP 3	49-1/2"	30"	17"	3/16"		Fabricated Aluminum

This cabinet shall be watertight. Doors shall be gasketed to provide a waterproof seal. Bases shall be caulked to obtain a moisture-proof bond, and replacement cabinets will be re-numbered with cabinet replacement numbers to match location.

Materials shall conform to controller cabinets as listed in the Standard Specifications for Road and Bridge items, 1085.47 except that the door shall not have any outside designation nor shall the cabinet door be equipped with a police door or louvers.

Installation shall conform to applicable portions of Section TSC T637#2 of the Traffic Surveillance Specifications.

Cabinets, shall be primed and painted in accordance with Section TSC T712#1 of the Traffic Surveillance Specifications. The final coat and color shall be as directed by the Engineer.

All cabinets shall be serviced by 117 volts AC power and a telecommunication system. Each cabinet shall be equipped with a 10 ampere circuit breaker, ground rod, 115 VAC RF1 filtering surge protector (SHP-6LC Surrestor), 130 volt, 70 joules, 10 amp varistor lighting protection for each leg of the four (4) wire telecommunication system (SRA 64 C Surrestor), 130 volt, 70 joules, 10 amp varistor, lighting protection for each loop (SRA-6LC Surrestor), data line protection for each leg of the four (4) wire telecommunication system (SRA 64C Surrestor).

It will also be equipped with Handy Boxes, with G.F.I. duplex outlet and a pull chain lampholder with an A.C. outlet.

No holes shall be drilled through the cabinet exterior for internal equipment mounting.

Each wire entering a cabinet shall be terminated in a workmanlike manner at a terminal strip or switch. If more than one wire has a common terminal on a terminal strip, the adjacent strip shall be used and an appropriate jumpered connection shall be made.

All cables and wires entering a cabinet shall be dressed, harnessed, tied, laced and clamped to produce a workmanlike wiring installation.

A copper wire, combination grounding bus shall be mounted on the rear wall of the cabinets. All cabinets shall be furnished with a minimum of two (2) shelves per cabinet.

Basis of Payment This work shall be paid at the contract unit price each for CABINET, TYPE 3 (III), FOR SURVEILLANCE, which price shall be payment in full for furnishing and installing and all work as described herein and as directed by the Engineer.

SD01 DETECTOR LOOP SENSOR UNIT, FOUR CHANNEL DIGITAL

Description. This item shall consist of furnishing and installing a four (4) channel digital loop detector sensor unit in an existing cabinet at the location and as directed by the Engineer.

The sensor unit shall operate on a regulated 117 VAC. The sensor unit shall be of solid state design throughout. Each sensor unit shall include two or four complete loop detector channels.

The loop connected to each of the four or two channels shall be sequentially scanned at a rate of not less than 148 times per second. Only one loop shall operate at a time in the system to eliminate cross-talk.

The digital loop sensor shall be automatically and instantaneously self-tuning requiring no burn-in or warm-up time. Then it shall also track environmental changes.

The digital sensor unit shall be self-tracking and fully automatic in its recovery from power failure.

The digital sensor unit shall be of sufficient sensitivity to detect the smallest licensable motor vehicle, including motorbikes. The sensor unit shall detect a Honda CT-170 and hold the detection for a minimum of four minutes.

The sensor unit shall be designed to operate in conjunction with three turns of a loop wire imbedded up to three inches deep in a reinforced concrete roadway.

The loop and lead-ins will measure at least 100 megaohms above ground and have a minimum inductance of 50 microhenries and a maximum of not more than 5 ohms. Digital sensor unit shall be capable of turning to an inductance of 50 microhenries and a maximum of not more than 5 ohms. Digital sensor unit shall be capable of tuning to an inductance range of 0 to 2000 microhenries.

Vehicle detection shall be indicated by a single optically insulated solid state output per channel.

Output circuit shall be an optically coupled output, which uses a coupled photo transistor. It shall be capable of switching 50 milliamperes with less than 0.7 volts drop and shall tolerate 30 volts when off.

Polarity of interface between telemetry and sensor unit must be observed.

Any size or type of motor vehicle from motorcycle to a high bed tractor-trailer moving over the loop shall be detected and each vehicle shall produce only one output for length of time the vehicle is over the loop.

Detection shall be positive for all vehicle speeds 0 to 80 miles per hour.

The sensor unit shall be capable of reliable operations when placed up to 1000 feet away from loops and connected with Canoga 30003 or equal, stranded copper wire.

The loops will vary in size from 5 feet by 6 feet up to 18 feet by 6 feet. Loop system with 100 feet of lead-in shall perform with sensitivity to detect and hold the smallest motorbike.

Detection shall not be affected by weather conditions nor shall a false detection be caused by a sudden rainstorm nearby lighting or erratic change in temperature of the sensor unit shall be from -30 degrees C to +60C. The sensor unit shall be so designed that it will be stable in operation over a very high drift range and over the entire temperature range and environmental changes. The sensor unit shall have built-in lightning protection for each channel.

Each detection channel shall have its own output indicator lamp and switch. The switch shall provide eight sensitivities, .0025% to .33% and 3 modes; off, pulse, and presence. In the pulse mode each new vehicle shall produce and output pulse of 225 millisecond duration. A vehicle remains on a loop for more than two seconds shall be "tuned out" allowing operation of the loop to other vehicle.

In the presence mode output duration shall be equal to the percent of time the vehicle is present on the loop. Vehicle detection and hold times shall not be less than 30 minutes.

Electrical connection from the sensor unit to incoming and outgoing circuits shall be made by one MS type multiple positive connection plug and jack, or equivalent arrangement, to permit rapid replacement with similar existing units without disconnecting or reconnecting individual wires.

All tuning adjustments shall be made with controls provided on the sensor unit without requiring movement of the sensor unit. These controls shall be identified and it shall not be necessary to remove or change wires or contacts nor to use any tools other than a screwdriver in tuning or making sensitivity adjustments.

A properly tuned sensor unit shall detect all high vehicles (truck with chassis 4 feet above pavement) with one contact closure and yet shall not detect vehicles passing in lanes adjacent to loop installation.

All transistors shall be silicon types. The main logic of the unit shall be a single MOS-LS1 chip to simplify the electronics, increase reliability and improve maintainability. All IC chips will be socketed.

The sensor unit shall be contained in a rigid high quality metal enclosure providing complete protection to all components and electrical connections.

During normal detection operation the state of the output indicator shall correspond exactly to the state of the output.

A frequency switch shall be provided to raise or lower the loop oscillator frequency for the elimination of cross-talk between sensor unit, should it ever occur.

The digital sensor unit shall be provided with a circuit breaker.

Special circuitry shall be provided so that the sensor unit shall continue in proper operation even though the induction loop is shorted or leaking to the ground.

Induction loops shall be coupled to a transformer to provide for rejection of induction loop lead-in cable noise and shall allow low inductance operation (0 to 50 microhenries).

A reset shall be provided to reset all channels.

There shall be a write-on pad mounted on sensor to identify traffic lane with channel indication.

Basis of Payment. This item shall be paid at the contract unit price each for DETECTOR LOOP SENSOR UNIT, FOUR CHANNEL DIGITAL, channels specified, furnished and installed, operating and completely in place. Terminal boards, cable harness wiring and miscellaneous will not be paid separately, but shall be considered as incidental to the cost of the item.

SD02 DETECTOR LOOP SENSOR UNIT, TWO CHANNEL DIGITAL

Description. This item shall consist of furnishing and installing a two (2) channel digital loop detector sensor unit in an existing cabinet at the location and as directed by the Engineer.

The sensor unit shall operate on a regulated 117 VAC. The sensor shall be of solid state design throughout. Each sensor unit shall include two or four complete loop detector channels.

The loop connected to each of the four or two channels shall be sequentially scanned at a rate of not less than 148 times per second. Only one loop shall operate at a time in the system to eliminate cross-talk.

The digital loop sensor shall be automatically and instantaneously self-tuning requiring no burn-in or warm-up time. Then it shall also track environmental changes.

The digital loop sensor unit shall be self-tracking and fully automatic in its recovery from power failure.

The digital loop sensor unit shall be of sufficient sensitivity to detect the smallest licensable motor vehicle including motorbikes. The sensor unit shall detect a Honda CT-170 and hold the detection for a minimum of our minutes.

The sensor unit shall be designed to operate in conjunction with three turns of a loop wire imbedded up to three inches deep in a reinforced concrete roadway.

The loop and lead-ins will measure at least 100 megohms above ground and have a minimum inductance of 50 microhenries and a maximum of not more than 5 ohms. Digital sensor unit shall be capable of tuning to an inductance range of 0 to 2000 microhenries.

Vehicle detection shall be indicated by a single optically insulated solid state output per channel.

Output circuit shall be an optically coupled output, which uses a coupled photo transistor. It shall be capable of switching 50 milliamperes with less than 0.7 volts drop and shall tolerate 30 volts when off.

Polarity of interface between telemetry and sensor unit must be observed.

Any size or type of motor vehicle from motorcycle to a high bed tractor trailer moving over loop shall be detected and each vehicle shall produce only one output for length of time the vehicle is over the loop.

Detection shall be positive for all vehicle speeds 0 to 80 mph.

The sensor unit shall be capable of reliable operations when placed up to 1000 feet away from loops and connected with Canoga 30003 or equal, stranded copper wire.

The loops will vary in size from 5 feet by 6 feet up to 18 feet by 6 feet. Loop system with 100 feet of lead-in shall perform with sensitivity to detect and hold the smallest motorbike.

Detection shall not be affected by weather conditions nor shall a false detection be caused by a sudden rainstorm nearby lighting or erratic change in temperature of the sensor unit shall be from -30C to +60C. The sensor unit shall be so designed that it will be stable in operation over a very high drift range and over the entire temperature range and environmental changes. The sensor unit shall have built-in lightning protection for each channel.

Each detection channel shall have its own output indicator lamp and switch. The switch shall provide eight sensitivities, .0025% to .33% and 3 modes; off, pulse, and presence.

In the presence mode output duration shall be equal to the percent of time the vehicle is present on the loop. Vehicle detection and hold times shall not be less than 30 minutes.

Electrical connection from the sensor unit to incoming and outgoing circuits shall be made by one MS type multiple positive connection plug and jack, or equivalent arrangement, to permit rapid replacement with similar existing units without disconnecting or reconnecting individual wires.

All tuning adjustments shall be made with controls provided on the sensor unit without requiring movement of the sensor unit.

These controls shall be identified and it shall not be necessary to remove or change wires or contacts nor to use any tools other than a screwdriver in tuning or making sensitivity adjustments.

A properly tuned sensor unit shall detect all high vehicles (truck with a chassis 4 feet above pavement) with one contact closure and yet shall not detect vehicles passing in lanes adjacent to loop installation.

All transistors shall be silicon types. The main logic of the unit shall be a single MOS-LS1 chip to simplify the electronics, increase reliability and improve maintainability. All IC chips will be socketed.

The sensor unit shall be contained in a rigid high quality metal enclosure providing complete protection to all components and electrical connections.

During normal detecting operation the state of the output indicator shall correspond exactly to the state of the output.

A frequency switch shall be provided to raise or lower the loop oscillator frequency for the elimination of cross-talk between sensor unit, should it ever occur.

The digital sensor unit shall be provided with a circuit breaker.

Special circuitry shall be provided so that the sensor unit shall continue in proper operation even though the induction loop is shorted or leaking to the ground.

Induction loops shall be coupled to a transformer to provide for rejection of induction loop lead-in cable noise and shall allow low inductance operation (0 to 50 microhenries).

A reset shall be provided to reset all channels.

There shall be a write-on pad mounted on sensor to identify traffic lane with channel indication.

Basis of Payment. This item shall be paid at the contract unit price each for TWO (2) CHANNEL DIGITAL LOOP DETECTOR SENSOR UNIT, channels specified, installed, operating and completely in place.

Terminal boards, cable harness wiring and miscellaneous will not be paid separately, but shall be considered as incidental to the cost of the item.

SD03 DETECTOR LOOP ROUND, SQUARE, OR RECTANGULAR

Description. This item shall consist of furnishing, installing and testing an induction loop, of the dimensions shown on the plans or of the dimension from Table 1, at the locations shown. The induction loop shall be installed in accordance with all applicable portions of article 847 of the standard specification for Road and Bridge. All saw cutting, cable installation, joint sealing, lead-ins and testing necessary to complete the installation shall conform with the following requirements.

Materials. The cable used for induction loop shall be No 14-7 strand XHHW XLP-600V. Encased in orange Detect-duct tubing as manufactured by Kris-Tech Wire Company, or comparable. Lead-ins shall be Conoga 30003 or equal cable.

Joint sealer (Dozseal 230) shall have sufficient strength and resiliency to withstand stresses set up by vibrations and differences in expansion and contraction due to temperature changes. Adhesion to clean dry, oil-free Portland Cement concrete shall be at least equal to the tensile strength of the concrete. The joint sealer, with qualities described above, shall be capable of curing in a maximum time of 30 minutes at all temperatures. Curing shall be defined as the capability of withstanding normal traffic loads without degradation.

Installation Details. Slots in the pavement shall be cut with a concrete sawing machine in accordance with the applicable portions of Section 420.10 of the Standard Specifications for Road and Bridge Construction. The slot must be clean, dry, and oil-free. Wire shall be inserted in the pavement slot with a blunt tool which will not damage the insulation and wedges made of loop tubing “Deteca-duct” will be installed at eighteen (18) inch intervals to keep new loops from floating. Loops should not be installed at an outside temperature below 50F (10C) degrees unless directed by Engineer.

Plastic sleeving shall be used to insulate the wire where loop wire crosses cracks and joints in the pavement. The sleeving shall be properly sealed with electrical tape to prevent joint sealer from entering sleeves. Sleeving shall extend a minimum of 8 inches each side of joint.

All mainline loops shall be round, six(6) feet in diameter, and centered in traffic lanes unless designated otherwise by the Engineer.

The Contractor shall core drill a six foot diameter round induction loop. The width of the drill portion shall be .500”, the depth shall be a maximum of 2.75”. A saw cut (home run) .375 in width and the same depth as the drilled portion shall be cut to the core hole. The core hole will be a minimum 2 ½” diameter and drilled to a depth to meet the installed P-duct. At the point where the 6’ diameter loop intercepts the straight cut (home run) the wire leaving the loop will have a minimum of a 1.5” radius entering the straight cut. Interception point of home run slot and round loop shall not be cored.

Induction loops on exit and entrance ramps as well as speed/count stations shall be square or rectangular with edges perpendicular or parallel to traffic flow. Induction loops shall be centered on all ramps and in traffic lanes unless designated otherwise on the plans or by the Engineer. Traffic lanes shall be referred to by number and loop wire shall be color-coded and labeled accordingly.

A chart, which shows the coding for each installation, shall be included in each cabinet. No core holes shall be allowed at corner of any loop. Sawcuts for all induction loops and lead ins shall not be greater than 2.75 inches in depth.

All excess joint sealer shall be removed so that the level of the sealer in the saw cut is at the same level as the adjoining pavement.

All excess joint sealer shall be removed so that the level of the sealer in the saw cut is at the same level as the adjoining pavement.

All induction loops shall contain a minimum three (3) turns of No. 14 wire. Each induction loop shall have its own Canoga 30003 or equal home run or lead-in to the cabinet. Induction loops shall not be connected in series with other loops. This wire shall be free from kinks or any insulation abrasions. The loop lead-in shall be barrels sleeved, crimped, soldered and protected by heat shrinkable tubing to the loop #14 wire. Lead-ins shall be placed in such a manner that they take the most direct route to the cabinet.

Lead-in cable Canoga 30003 or equivalent will only be installed where the lead in length from point of interception to the point of termination exceeds 150 feet (45.75m).

Where lead-in runs are less than 150 feet (45.75m), the loop wire will be utilized as lead-in to the point of termination w/o splices, being twisted 5 turns per foot (304.8mm). The loop wire will be paid as "lead-in" from last point of saw cut in pavement at dive hole to point of termination in cabinet.

Loop lead-ins placed in handholes shall be coiled, taped and hung from hooks on the sides of the handhole to protect against water damage. Any other method of installation will require prior written approval of the Engineer. Each loop lead-in shall be color coded and tagged at the core hole, in each junction box it passes through and at the termination point in the cabinet.

Slots shall be cut so that no bends greater than 50 degrees is used. Diagonal saw cuts (a minimum of twelve (12) inches (304.8mm) in length) shall be used at all corners to conform with this specification. Core hole at corner or cracks shall not be allowed. The Engineer shall be contacted regarding proposed changes in loop locations necessitated by badly deteriorated pavement. The Engineer may relocate such loops.

Copper wire and lead-ins shall not be installed in the curb and gutter section or through the edge of pavement. A hole shall be drilled at least 12" (304.8mm) in from the edge of pavement through which the P-duct, loop wire and lead-in shall be installed. Saw cuts through shoulders to core hole shall not be allowed. loop lead-ins shall not be allowed in saw cuts in shoulders.

Ramp Loop Table (1)

W (FT.)	(m)	S (FT.)	(m)
12	3.7m	8	2.4m
13	4.0m	9	2.8m
14	4.3m	10	3.1m
15	4.6m	11	3.4m

16	4.9m	12	3.7m
17	5.2m	13	4.0m
18	5.5m	14	4.3m
19	5.8m	15	4.6m
20	6.1m	16	4.9m
21	6.4m	17	5.2m
22	6.7m	18	5.5m
23	7.0m	19	5.8m
24	7.3m	20	6.1m
25	7.6m	21	6.4m

*EXAMPLE: Where lane width (W) is 12' (3.66m), loop width(s) shall be 8' (2.44m), Length of loop shall be determined by location.

Should the induction loop and/or core hole for the induction loop and loop lead-in cable be paved over by other construction operations, it shall be the contractor's responsibility for locating and finding the induction loop and/or the core hole for the repair of a bad loop or lead-in or for the installation of a new loop or loop lead-in. The locating of the core hole and the induction loop shall be incidental to the cost of the induction loop lead-in installation.

Traffic Systems Center
Loop Splicing Requirement

Mainline Loops	Metering Loops	Speed Count	
Lane 1 - Blue	Loop 1 - Green - Input Loop	Lane 1 - Blue	Exit-Black
Lane 2 - Brown	Loop 2 - Yellow - Demand Loop	Lane 2 - Brown	Entrance-White
Lane 3 - Orange	Loop 3 - Red - Passage loop	Lane 3 - Orange	
Lane 4 - Violet		Lane 4 – Violet	
Lane 5 - Slate			

Lane 1 being the left lane in direction of traffic flow for mainline and ramps.

When 2 or 3 loops are installed on an exit or entrance ramp the loop color code shall conform to the mainline loop color code and shall be marked as entrance or exit ramp loops.

Only Speed/Count Station loops both square and rectangle shall be color coded and tagged by lane per specific locations as noted on plans, or as directed by the Engineer.

In addition to color codes each loop shall be identified with a written label attached to the loop wire, or lead-in wire. The tags shall be Panduit #MP250W175-C or equivalent. All wires and cables shall be identified in each handhole or cabinet the cable passes through, or terminates in. The labels shall be attached to the cable by use of two cable ties.

An electronic test instrument capable of measuring large values of electrical resistance such as a major megger, shall be used to measure the resistance of the induction loop and its lead-in shall be a minimum of 500 megohms above ground under any conditions of weather or moisture. The loop and the loop lead-in shall have an inductance between 50 microhenries and 1000 microhenries. The continuity test of the loop and loop lead-in shall not have a resistance greater than five (5) ohms. Testing shall be done with the required loop tester.

Loop wire and lead-ins shall not be installed in the curb and gutter section or through the edge of pavement. A hole, 2-1/2" shall be drilled at least 12" in from the edge of pavement through which the P-Duct, loop wire, and lead-in shall be installed.

Method of Measurement. A loop is considered by lineal feet plus lead-in into the dive hole.

Basis of Payment. This work shall be paid at the contract unit price per lineal foot for DETECTOR LOOP ROUND, SQUARE, OR RECTANGULAR of the size, number and type as specified, which shall be payment in full for the work described herein. The contract shall be paid lineal feet for the loop, plus the lineal footage for the home run straight cut to the core hole. The cost of expressway lane closure and miscellaneous cost shall be incidental.

SD04 BLUE TOOTH TRAFFIC DETECTOR

Description. This item shall consist of retrieving from the Owners storage facility, loading, and installing a Blue Tooth Traffic detector on a light pole, sign truss, as specified herein, at locations designated by the Engineer.

Mounting Requirement. The Contractor shall provide the banding and any other miscellaneous mounting hardware required to attach the sensor and solar collector to the light pole, sign truss, or other structure as directed by the Engineer. The Contractor shall replace the harness that connects the Solar panel to the Blue Tooth detector enclosure. The cost to replace the solar panel harness shall be included in the cost of the pay item. The Contractor shall replace the existing AGM Battery with a 36AH, 12 Volt, AGM Battery. The cost to replace the AGM Battery shall be included in the cost of the pay item.

Basis of Payment. This item shall be paid for at the contract unit price each for Blue Tooth Traffic Detector which shall be payment in full for installing the item as described herein.

SDM1 DMS FRONT ACCESS, FULL MATRIX, COLOR, NTCIP 1203 V2

1.0 General Requirements

This specification shall govern the furnishing and installation of DMS Front Access, Full matrix, Color, NTCIP 1203 V2 at an existing DMS field location and associated equipment cabinets as shown in the plans and as detailed in this specification. The display shall be a full matrix configuration of **27 pixels high by 125** pixels wide. The size of the sign shall be as shown in the plans. All display elements and modules shall be solid state. No mechanical or electromechanical elements or shutters shall be used.

DMS Sign Upgrades

One DMS per year will be upgraded to a new NTCIP 1203 V2 DMS or as directed by the Engineer

1. Edens @ Niles Center
2. Edens @ Tower Rd.
3. Kennedy @ Canfield

Equipment to be furnished at each dynamic message sign (DMS) field site shown in the plans shall include, but not be limited to the following:

LED DMS, sign controller, cabling, maintenance diagnostic software, sign enclosure, documentation, warranties, mounting hardware, etc.

The Contractor will be removing an existing DMS and replacing the existing DMS sign with the new Full matrix DMS and installing the new Auxiliary Control equipment in the existing DMS Control cabinet.

The removal of the existing DMS sign and control equipment shall be considered incidental to this item. Certain control boards and display modules will be salvaged and returned to State Stock. The Engineer will determine which boards are salvage and which items are scrap. The DMS sign housing will be considered scrap and not returned to State Stock. There will be no additional compensation for removal and salvaging of control boards or display panels. The cost of removal and salvage of these items shall be considered incidental to the cost of this pay item.

The auxiliary control equipment shall include new distribution breakers, AC suppression, thermostatically controlled fan and heater, convenience outlets and splice blocks as necessary to complete the cabinet upgrade. Refer to 7.1.3 for circuit breaker requirements and 7.3.3 for convenience outlets. Refer to 12.0 Transient Protection for details. Heater shall be 500 watts minimum.

Latest vendor diag. software w/20 licenses to load software on Department/Department's maintenance forces laptops.

The Central Controller resides at the Traffic Systems Center. The DMS Central Software was developed by 360 Surveillance, Inc. The successful sign vendor shall perform an on-site working sample demonstration test to prove their product is compatible with the 360 Cameleon Client/Server Software. The Working Sample demonstration test criteria is outlined in Section 2.0 of this document.

Each DMS assembly shall consist of a LED DMS sign case including contents, mounting brackets, its associated sign controller unit (SCU), and communication unit, cabling between the DMS case and the sign controller unit, , opto-coupled interface from controller to sign, and DMS walkway platforms with permanent safety and mounting brackets and hardware.

Each LED DMS shall be capable of displaying three lines of text. Each line shall consist of a string of 18 alphanumeric characters. Each character shall be composed from a luminous dot matrix system. The matrix system shall consist of 35 dots composed of 5 columns and 7 rows. There shall be an appropriate blank spacing between each 5 by 7 matrix for maximum readability at various distances. A luminous pixel shall consist of a LED pixel array. All display elements and modules shall be solid state. No mechanical of electromechanical elements or shutters shall be used.

All characters, symbols, and digits shall be 18 inch nominal character size and shall be clearly visible and legible at a distance of 900 feet within a 30 degree cone of vision centered around the optical axis of the pixel.

The signs shall be capable of displaying the following:
A static message
A flashing message
Two alternating messages, either flashing or static

The changing from one message to another shall be instantaneous.

The total weight added to the sign structure shall be no greater than 2200 pounds. The dimensions of the sign housing will not exceed 8'0" tall, 30'0" wide, and 1'6" deep and access to the electronics shall be achieved through the front display panels of the DMS. Larger signs may be submitted, but they will require additional review time to evaluate the structural adequacy of the Department's standard sign trusses.

The Contractor shall provide structure mounted service equipment to provide power to each sign. The cost of this shall be considered incidental to the unit price for the DMS.

The Contractor shall gut the existing DMS Control cabinet to mount the new DMS Auxiliary Control Panel. Any additional materials needed to mount the Auxiliary Control Panel shall be considered incidental to this item.

The Contractor shall be responsible to have a Licensed Structural Engineer in the State of Illinois design the new sign attachment to the existing DMS sign truss and stamp the drawings. These drawings shall be submitted to the Engineer for approval before work can commence. These drawings will describe the mounting required to attach the new DMS to the existing Structure. Shop drawings for the structures may be available upon request. The contractor shall supply all mounting hardware necessary to attach the New DMS to the existing structure. The cost of this work shall be included in the contract bid price for the item. No additional compensation will be allowed for any modifications that maybe required to the existing structure.

All field equipment shall remain fully functional over an ambient temperature range of –40˚F to + 149˚F with relative humidity of up to 95%. All field equipment enclosures shall be designed to and shall withstand the effects of sand, dust, and hose-directed water. All connections shall be watertight.

2.0 Working Sample Demonstration (Dynamic Message Sign)

To ensure timely delivery for installation, it is imperative that the DMS manufacturer be regularly engaged in the manufacture of the specified equipment and capable of immediately demonstrating a sample DMS that is in clear compliance with the key portions of the specifications. Delay from the specified timeline, and failure to present the sample in a timely manner may result in termination of the contract, at the discretion of the Engineer.

The DMS manufacturer shall provide a satisfactory, approvable demonstration of a working sample DMS within 14 calendar days after contract execution. The sample shall be a complete mock-up of a working DMS based on the proposed equipment to be furnished under this contract and identified in the submittal material. The sample demonstration may utilize a portable sample at the IDOT Traffic Systems Center, or it may be at the manufacturer's production facility if located within District 1. A demonstration of an identical installed unit for some other contract will be acceptable.

The sample demonstration will be for purposes of review and approval by the engineer. The Engineer will issue review comments based on examination of the unit and its operation at the time of the demonstration, and the Engineer may require a subsequent revised sample demonstration if, in the Engineer's judgment, the comments warrant re-work of the sample unit.
Delay in presenting the specified demonstration or delay in attaining "Approved" or "Approved as Noted" status will result in cancelation of the authorization, the contractors shall pay for all costs and expenses. The Department will not be held liable for any cost whatsoever.

For a demonstration to be held at the IDOT Traffic Systems Center, the manufacturer shall coordinate the exact date, time, demonstration location, and power requirements with the Traffic Systems Center Engineer.

The sample unit shall be in substantial compliance with the contract requirements. The Engineer may elect to waive minor deviations for purposes of the demonstration, or may waive minor deviations completely if alternative provisions are judged superior to specified requirements, but deviations from key specified requirements will not be accepted.

3.0 Materials

All materials furnished, assembled, fabricated or installed under this item shall be new, corrosion resistant and in strict accordance with the details shown in the plans and as detailed in this specification. All details and functionality listed in this specification will be thoroughly inspected and tested by the department. Failure to meet all details and functionality detailed in this specification shall be grounds for rejection of the equipment.

4.0 Terminology

Due to the varying definitions used in Dynamic Message Sign technology, this section defines specific terms as they apply to this specification.

Sign: The sign housing and its contents.

Sign Controller: Located in a ground cabinet or in the sign (as detailed in this specification), the sign controller specifies the message to be displayed. Messages can be selected either remotely from the central controller, locally from a laptop computer or from the front panel of the sign controller.

Central Controller: The MS Windows Server computer system and related software, which operates the system from a remote control site.

Workstation: This computer operates as a remote client to the central controller. A workstation operator cans dial-in to the central controller and gain access to the functions of the central by using the appropriate access codes.

LED: Light Emitting Diode

Pixel: Any of the small discrete elements that, when arranged in a pixel matrix, create a character. A pixel contains a cluster of LEDs.

Pitch: Distance measured from center to center of adjacent pixels within a matrix. This distance is measured both horizontally and vertically.

Poll: The central controller and laptop computer are said to “poll” a sign when they request the sign’s status information. The term is derived from the periodic status polling, which a central can perform, but is loosely used to refer to any status request.

Message: Text; the information shown on the sign.

Display: The message seen by the motorist. A display may include more than one page of text (an alternating display). Any character or set of characters of a display may be flashed (a flashing display).

Neutral State: Sign is blank, or displaying a predefined message that is displayed regularly.

WYSIWYG: What You See IS What You Get. In this specification, this is the functionally of the LED DMS system where the central, workstation or laptop display mimics the actual message that is visibly displayed on the sign on an individual pixel basis.

5.0 DMS Manufacture Requirements

The company that designs and manufactures the LED DMS shall be currently ISO 9001 certified as of the bid date for this project and shall have received its ISO 9001 certification a minimum of three years prior to the bid date for this project. The scope of this company’s ISO 9001certification shall be for the Design, Manufacture, Installation, Maintenance and Sales of Dynamic Message Sign Systems. The facility where this company actually designs and manufactures the LED DMS shall be ISO 9001 certified. This company, this scope and the address of this facility shall all be listed on the ISO 9001 certificate. This ISO 9001 certificate shall be provided with the bid. The name, phone number and address of both the

Authorized ISO 9001 Registrar that certified this company and the Authorized ISO 9001 Accreditation Body that accredited this Registrar shall be provided with the bid. Failure to fully comply with these requirements and to provide all this information will cause this company's equipment and software to be rejected. ISO 9002 and ISO 9003 certifications are not adequate and do not meet this requirement.

Experience Requirements:
The LED DMS System Manufacturer shall submit a State Department of Transportation reference for minimum of three (3) different states that have been successfully operating a highway LED dynamic message sign system, and that completely meets these specifications, manufactured and supplied by this manufacturer, for a period of no less than five (5) years.

The LED DMS Signs and System shall be fabricated by an established DMS manufacturer having the minimum of:
10 years experience, under the current corporate name, in the design and manufacturing of State Highway or Interstate Highway, permanently-mounted, overhead dynamic message signs and central control systems installed in freeway service. This 10 years of experience shall include the complete design and manufacturing of all aspects of the dynamic message signs, including the electronic hardware, software and sign housings.

100 State Highway or Interstate Highway, permanently-mounted, overhead dynamic message signs installed in freeway service, under the current corporate name.

50 State Highway or Interstate Highway, permanently-mounted, overhead LED dynamic message signs that completely meet this specification with three lines of 18-inch characters and Front Access housings installed in freeway service, under the current corporate name.

The manufacturer of the LED DMS Signs and System shall submit documentary evidence and reference data for the above requirements. Reference data shall include the name and address of the organization, and the name and telephone number of an individual from the organization who can be contacted to verify the above requirements. The name of the DMS manufacturer that meets these experience requirements shall have the same corporate name as the DMS manufacturer that meets the ISO 9001 requirements stated elsewhere in this specification. This information shall be provided prior to documentation submittal. Failure to furnish the above references will be sufficient reason for rejection of the supplier's equipment.

The Contractor shall submit the information described in this section to the Engineer within 15 days of award of the contract. The Engineer will review the submitted information and provide comments and approval of the information to the Contractor within 15 calendar days after receipt. Review of the submittal information by the Engineer shall not relieve the Contractor of the contractor's obligation to furnish and install the work in accordance with the contract documents. No time extensions will be granted to the Contractor as a result of the need to resubmit various items to review.

Shop drawings shall be submitted in accordance with Article 105.04 of the Standard Specifications and as specified in these special provisions.

Prior to purchase or fabrication of any equipment or materials for use in this project, the Contractor shall submit, for review by the Engineer, appropriate catalog cuts sheets, and specifications for all standard, off-the-shelf items and shall submit shop drawings and other necessary data for all non-catalog or custom-made items.

The Contractor shall furnish five sets of submittal data directly to the Engineer. Two copies of this information, with appropriate notations, will be returned to the Contractor after the review.

If reprinted literature, such as catalog cut sheets, is used to satisfy the submittal data requirements, there shall be no statements on the literature which conflict with the requirements of the contract documents. Any such statements shall be crossed off and initialed by the Contractor. Explanation of how specifications shall be met pertaining to items changed from the literature shall be documented in writing and included with the submittal information.

All items shall be submitted together.

Each submittal shall contain sufficient information and details to permit full evaluation of each item, and its interrelationships among the various items shall be carefully addressed.

The Contractor shall prepare and submit detailed shop drawings for each sign type indicating types of materials proposed for each component of each sign, parts lists, assembly techniques, layout of all display elements and wiring schematics. The shop drawings shall also illustrate in detail how the Contractor proposes to mount and connect the DMS sign case to the sign support structure (truss). The DMS sign case shall include any support mechanism necessary for the installation of the DMS sign case that is not included in the truss. These drawings shall be submitted to the Engineer for review and approval prior to fabrication of any sign. Parts lists shall include circuit and board designation, part type and class, power rating, component manufacturer and mechanical part manufacturer.

As part of the submittals for the DMS assembly, the Contractor shall submit an engineering drawing illustrating the DMS character set including 26 upper case letters, 10 numerals, a dash, a plus sign (+), and slash. The Contractor shall also submit complete technical information, shop drawings, photographs, graphs, circuit diagrams, instruction manuals, security provisions, and any other necessary documents to fully describe the DMS assembly and associated equipment.

6.0 Product Testing

The DMS manufacturer shall provide documentation indicating that the DMS product has been tested to the following standards. It shall be acceptable for the testing to be performed on scale-sized versions of the actual DMS provided that the test unit is functionally and structurally equivalent to the full size DMS.

Failure to conform to these testing requirements shall be grounds for rejection. Rejected equipment may be offered for test or retest provided all non-compliant items have been corrected and tested or retested by the DMS manufacturer. Any corrections deemed necessary by the Engineer shall be made by the DMS manufacturer, at no additional cost to the Department.

6.1 Third Party Testing

Third party test reports shall be submitted for the following testing:

NEMA Standards Publication TS 4, Hardware Standards for Dynamic Message Signs (DMS), with NTCIP Requirements – Section 2, Environmental Requirements. Test report shall detail results of mechanical vibration and shock, electrical noise and immunity, temperature, and humidity.

Underwriters Laboratories (UL), UL 48 Standard for Electric Signs, UL 50 Enclosures for Electrical Equipment, and UL 1433 Standard for Control Centers for Changing Message Type Electric Signs. The UL report number(s) for all DMS and control equipment manufactured by the DMS manufacturer shall be submitted and the products shall bear the UL mark.

The supplier shall provide a record of each test performed including the results of each test. The report shall include a record of the 3rd party test laboratory and the test lab's representative that witnessed the

tests, including the signature of the lab's representative. The test reports shall be provided to the Engineer for review as part of the technical submittal.

6.2 Self Certification
The DMS manufacturer shall provide self-certification, including a statement of conformance and copies of test reports, indicating that the following tests have been performed and passed.

Third party test reports shall be submitted for testing of the following National Transportation Communication for ITS Protocol (NTCIP) standards:

NTCIP 1201:1996, NTCIP Global Object Definitions (including Amendment 1)
NTCIP 1203:1997,Object Definitions for Dynamic Message Signs (including Amendment1)
NTCIP 2101:2001, Point to Multi-Point Protocol Using RS-232 Subnetwork Profile.
NTCIP 2103 (Draft v1.13), Point-to-Point Protocol Over RS-232 Subnetwork Profile.
NTCIP 2104 V01.11 Ethernet Subnetwork Profile

The NTCIP testing shall have been completed using industry accepted test tools such as the NTCIP Exerciser, Trevilon's NTester, Intelligent Devices' Device Tester, and/or Frontline's FTS for NTCIP. The NTCIP test report(s) shall include testing of sub-network communications functionality, all mandatory objects in all mandatory conformance groups, and a subset of the remaining objects.

7.0 Physical Construction

7.1 Wiring and Power Distribution
7.1.1 Power and Signal Entrances

Two threaded conduit hubs shall be located on the rear or side wall of the DMS housing. One hub shall be for incoming AC power and the other shall be for incoming DMS signal cabling or a communications line.

7.1.2 Panel Board
The DMS shall contain a power panel board and circuit breakers that meet the following minimum requirements:
Service entrance-rated
Minimum of 20 circuit breaker mounting positions
Short circuit ratings of 22,000 amps and 10,000 amps for the main and branch circuits, respectively
UL listed panel board and circuit breakers

7.1.3 Internal Wiring
Wiring for LED display module control, environmental control circuits and other internal DMS components shall be installed in the DMS housing in a neat and professional manner. Wiring shall not impede the removal of display modules, power supplies, environmental control equipment, and other sign components. Wires shall not make contact with or bend around sharp metal edges. All wiring shall conform to the National Electrical Code.

7.2 Earth Grounding
The DMS manufacturer shall provide one earth ground lug that is electrically bonded to the DMS housing. The lug shall be installed near the power entrance location on the DMS housing's rear wall. The DMS installation contractor shall provide the balance of materials and services needed to properly earth ground the DMS. All earth grounding shall conform to the National Electrical Code.

7.3 DMS Enclosure

The LED DMS shall enable the display of text, consisting of a string of alphanumeric and other characters. The size of the sign shall be as shown in the plans, and elsewhere in the specification. Each character shall be formed by a matrix of luminous pixels. The matrix of a standard character shall consist of 35 pixels over 5 columns and 7 rows.

The equipment design and construction shall utilize the latest available techniques with a minimum number of different parts, subassemblies, circuits, cards and modules to maximize standardization and commonality. The equipment shall be designed for ease of maintenance. All component parts shall be readily accessible for inspection and maintenance. Test points shall be provided for checking essential voltages.

The sign shall be designed for a minimum life of 20 years.

The sign shall be designed and constructed so as to present a clean and neat appearance. Poor workmanship shall be cause for rejection of the sign.
All cables shall be securely clamped/tied in the sign housing. No adhesive attachments will be allowed.

The dynamic message sign, including the sign housing and all modules and assemblies, shall be designed and manufactured in the USA.

The complete sign housing shall be designed and manufactured in-house by the LED DMS Sign Manufacturer.

A registered structural engineer in the State of Illinois shall analyze the DMS structure and certify that the DMS will withstand the temporary effects of being lifted by the provided eye bolts, will comply with the applicable requirements of AASHTO Standard Specs for Structural Supports for Highway Signs, Luminaries and Traffic Signals, Fourth Draft, 2001, and will support a front face ice load of 4 lbs. per square foot.

The equipment within the sign housing shall be protected from moisture, dust, dirt and corrosion. The sign shall be constructed of aluminum alloy 5052-H32 or 3003-H14 which shall not be less than 1/8" thick, unless otherwise specified in this document. Framing structural members shall be made of aluminum alloy 6061-T6 or 6063-T5.

All welding shall be by an inert gas process in accordance with the American Welding Society (AWS) Standards, ANSI/AWS D1.2-97. The LED DMS manufacturer's welders and welding procedures shall be certified by an ANSI/AWS Certified Welding Inspector to the 1997 ANSI/AWS D1.2-97 Structural Welding Code for Aluminum. Proof of certification of all the LED DMS manufacturer's welders and applicable welding procedures shall be supplied with the submittals. The name, phone number and address of the ANSI/AWS Certified Welding Inspector that certified the LED DMS manufacturer's welders and procedures shall also be provided with the submittals.

The DMS housing's right, left, and rear walls shall be vertical. The top and bottom sides shall be horizontal.

The sign housing shall be capable of withstanding a wind loading of 120 M.P.H. without permanent deformation or other damages.

All 120/240 VAC wiring located inside the sign housing shall be run in conduit pull-boxes, handy-boxes, power supply boxes, control cabinets, and circuit breaker boxes.

The performance of the sign shall not be impaired due to continuous vibration caused by wind, traffic or other factors. This includes the visibility and legibility of the display.
The presence of power transients or electromagnetic fields, including those created by any components of the system, shall have no deleterious effect on the performance of the system. The system shall not conduct or radiate signals which will adversely affect other electrical or electronic equipment including, but not limited to, other control systems, data processing equipment, audio, radio and industrial equipment.

All DMS structural hardware shall be stainless steel and appropriately sized for the application.

The DMS Manufacturer shall provide a signed and sealed copy of these certifications by the registered Structural Engineer as part of the catalog cut submittal.

7.3.1 Electronic Components
All electronic components, except printed circuit boards, shall be commercially available, easily accessible, replaceable and individually removable using conventional electronics repair methods.

All workmanship shall comply with ANSI/IPC-1-610B Class 2 titled “Acceptability of Electronic Assemblies”, ANSI/IPC-7711 titled “Rework of Electronic Assemblies”, and ANSI/IPC-7721 titled “Rework and Modification of Printed Boards and Electronic Assemblies”.

All electronic components shall comply with Section Electronic Materials and Construction Methods, located in this document.

All Printed Circuit Boards (PCBs) shall be completely conformal coated with a 0.010 inch (10 MIL) minimum thickness silicone resin conformal coat. The LED mother boards shall be completely conformal coated, except at the pixels on the front of the PCB, with a 0.010 inch (10 MIL) minimum thickness silicone resin conformal coat. The material used to coat the PCBs shall meet the military specification: MIL-I-46058C Type SR.

7.3.2 Mechanical Components
All external screws, nuts, and locking washers shall be stainless steel. No self-tapping screws shall be used. All parts shall be made of corrosion resistant materials, such as plastic, stainless steel or aluminum. All materials used in construction shall be resistant to fungus growth and moisture deterioration. An inert dielectric material shall separate dissimilar metals.

7.3.3 Convenience Outlets
The DMS housing shall contain a utility outlet circuit consisting of a minimum of one (1) 15-A NEMA 15-R, 120 VAC duplex outlet, with ground-fault circuit interrupters. This outlet shall be located near the panel board.

If the sign controller and communication equipment is to be mounted in the sign, a second outlet circuit shall be included consisting of a minimum of two (2) 15-A NEMA 15-R, 120 VAC duplex outlets. These outlets shall be located near the controller and communication equipment mounting location.

7.4 Front Face Construction
The DMS front face shall be constructed with multiple vertically hinged rigid door panels, each of which contains a full-height section of the LED display matrix. The door panels shall be fabricated using aluminum sheeting on the exterior and polycarbonate sheeting on the interior of the panel.

The DMS housing shall provide safe and convenient access to all modular assemblies, components, wiring, and subsystems located within the DMS housing. All of those internal components shall be removable and replaceable by a single technician.

7.4.1 Doors

One (1) access door shall be provided for each 10 or 15 pixel wide section of the sign housing. These doors shall be vertically hinged and shall contain a section of the sign's front face. The doors shall swing out from the face to provide access to the cabinet interior. Each door shall extend the full height of the display matrix.

To prevent open doors from blowing in wind, they shall each have a retaining latch mechanism to hold the door open at a 90-degree angle.

Each door shall form the face panel for a section of the sign. The LED modules shall be mounted to the door and be removable from the door when in the open position. Other sign components, such as power supplies, wiring, etc. shall be located inside the sign cabinet and be accessible through the door opening. Each door shall cover an opening that is a minimum of 23-inches (584 mm) wide and the same height as the display pixel matrix.

Each door shall contain a minimum of two (2) screw-type latches to lock them in the closed position. These latches shall be captive to prevent them from falling off. They shall pull the door tight and compress a gasket located around the perimeter of each door. They shall also be capable of providing leverage to easily release the gasket seal when opening the doors. The gasket shall prevent water from entering the cabinet around the doors.

7.4.2 Face Panels

Front face panels shall provide a high-contrast background for the DMS display matrix. The aluminum mask of each door panel shall be painted black and shall contain an opening for each pixel. Openings shall be large enough to not block any portion of the viewing cones of the LEDs.

Each door panel shall have a single polycarbonate sheet attached securely to the inside of the aluminum panel. The polycarbonate sheet shall cover all of the pixel openings. The polycarbonate shall be sealed to prevent water and other elements from entering the DMS. The polycarbonate shall contain UV inhibitors that protect the LED display matrix from the effects of ultraviolet light exposure and prevent premature aging of the polycarbonate itself. Polycarbonate sheets shall have the following characteristics:

Tensile Strength, Ultimate: 10,000 PSI
Tensile Strength, Yield: 9,300 PSI
Tensile Strain at Break: 125%
Tensile Modulus: 330,000 PSI
Flexural Modulus: 330,000 PSI
Impact Strength, Izod (1/8", notched): 17 ft-lbs/inch of notch
Rockwell Hardness: M75, R118
Heat Deflection Temperature Under Load: 264 PSI at 270F and 66 PSI at 288F
Coefficient of Thermal Expansion: 3.9X10-5 in/in/F
Specific Heat: 0.30 BTU/lb/F
Initial Light Transmittance: 85% minimum
Change in Light Transmittance, 3 years exposure in a Southern latitude: 3%
Change in Yellowness Index, 3 years exposure in a Southern latitude:
less than 5%

LED display modules shall mount to the inside of the DMS front face door panels. Common hand tools shall be used for removal and replacement.

DMS front face borders (top, bottom, left side, and right side), which surround the front face panels and LED display matrix, shall be painted black to maximize display contrast and legibility.

In the presence of wind, the DMS front face shall not distort in a manner that adversely affects LED message legibility.

7.4.3 Exterior Finish

DMS front face panels and front face border pieces shall be coated with semi-gloss black Kynar 500 resin or an equivalent brand of oven-fired fluoropolymer coating, which has an expected outdoor service life of 20 years.

All other DMS housing surfaces, including the DMS mounting brackets, shall be natural mill-finish aluminum.

7.4.4 Heating

The lens panel shall be heated to prevent fogging and condensation. An eight watt-per-foot, self-regulating, heat tape shall be provided along the bottom of the message area, between the glazing and the display modules. The sign controller shall control the heat tape. All heat tape terminal blocks shall be covered for safety.

7.5 Humidity Control

A humidity sensor shall be provided and sensed by the sign controller from zero percent to 100 percent relative humidity in one percent or fewer increments. The sensor shall operate and survive from 0 percent to 100 percent relative humidity.

The sensor shall have an accuracy that is better than +/- five percent relative humidity.

The sign controller shall read the internal temperature sensors, external ambient temperature sensor and the humidity sensor. The sign controller shall use these readings in an algorithm that turns on the heat tape and/or the fans at the appropriate times to reduce both frost on the face of the sign and condensation on the display modules and other electronic circuitry.

7.6 Drain Holes

The bottom panel of the housing shall have a minimum of four drain holes, with snap-in, drain filter plug inserts, in each section formed by internal structural members. Water drain filter plug inserts shall be replaceable.

7.7 Ventilation System

The ventilation system shall be a positive-pressure, filtered, forced-air system which cools both the display modules and the sign housing interior. The sign housing shall two exhaust ports. Each exhaust port shall be filtered and protected by an aluminum hood assembly.

The ventilation system shall have four fans. Air shall be drawn into the sign housing through hoods near the bottom of the housing, and then filtered before reaching the fan units. There shall be two aluminum hood assemblies and inlet filters.

The inlet and exhaust filters shall be electrostatic and shall be sized to properly accommodate the air flow and pressure drop requirements of the ventilation system. The inlet filters shall an Initial Atmospheric Dust Spot Efficiency of 64 at 20 cm/s in accordance with ASHRAE 52.1. These filters shall be easily removable from within the sign housing without the use of tools.

Each fan shall be capable of providing a minimum of one sign housing volume change per minute at the pressure drop developed throughout the entire ventilation system with all fans operating. The fans shall have ball or roller bearings, shall be permanently lubricated and shall require no periodic maintenance. The fans are to be positioned in such a manner so as to provide a balanced air flow to the ventilation system in the event of failure of any fan.

Adequate air flow shall be automatically tested once a day and tested on command from the central controller or laptop computer. Inadequate airflow will cause an error message to be sent to the central controller or laptop computer when the sign controller is polled by the central controller or laptop computer.

Adequate air flow shall be tested with a 100% solid state air flow detection device downstream from each fan. The entire message area shall be ventilated by an efficient forced air system. Air shall be ducted directly from the fans to the bottom of the entire message area. The air shall be directed to provide equal distribution of air to the bottom of the cavity between the lens panel and the LED modules. The air shall be exhausted out of the top of the cavity into the sign housing interior. Air flow shall be sufficient to exchange a minimum of one volume of air every eight (8) seconds in the void between each display module and the lens panel.

The air plenums shall be sealed and designed to keep any water that gets through the louvers from getting into the sign housing interior.

All duct work that impedes access to any sign components shall be easily removable, without tools, for servicing of these components.

All ductwork shall be 0.040 minimum aluminum and shall be designed to be extremely efficient with minimal pressure drop throughout the system.

Multiple temperature sensors shall activate the ventilation system. There shall be a minimum of one sensor located near the middle of the sign, at the top of the display area in the exhaust stream from the cavity between the display modules and the lens panel. There shall be an additional temperature sensor located to accurately measure the ambient temperature outside the sign housing. The temperature sensors shall have an accuracy of +/- 1.5 degrees C. and a range from –40 to +70 degrees C.

The temperatures from the sensors shall be continuously measured and monitored by the sign controller. A temperature reading greater than a user selectable critical temperature shall cause the sign to go to blank and the sign controller shall report this error message to the central controller.

The LED modules and electronic equipment shall be protected by a fail-safe, back-up fan control system in the event of an electronic fan control failure or shutdown of the sign controller.

Alternate sign ventilation systems can be submitted to the Engineer for approval. Extra time and additional demonstration testing and documentation of the proposed alternate system may be needed to secure the necessary approval from the Engineer. No extra compensation shall be awarded to the Contractor for the alternate design but if the alternate design is rejected, liquidated damages may apply.

8.0 LED Display Modules

The DMS shall contain LED display modules that include an LED pixel array, LED driver circuitry, and mounting hardware. These modules shall be mounted adjacently in a two-dimensional array to form a continuous LED pixel matrix. Each LED display module shall be constructed as follows:

Each LED display module may consist of one or two circuit boards. If two boards are used, they shall be mounted physically to each other using durable non-corrosive hardware. They shall be electrically connected via one or more header-type connectors. The header connectors shall be keyed such that the boards cannot be connected incorrectly.

All LED modules shall be manufactured using laminated fiberglass printed circuit boards.

Each LED display module shall be mounted to the rear of the display's front face panels using durable non-corrosive hardware. No tools shall be required for module removal and replacement. The modules shall be mounted such that the LEDs emit light through the face panel's pixel holes and such that the face panel does not block any part of the viewing cone of any of the LEDs in any pixels.

LED display module power and signal connections shall be a quick-disconnect locking connector type. Removal of a display module from the DMS, or a pixel board or driver circuit board from its display module, shall not require a soldering operation.

All exposed metal on both sides of each printed circuit board, except connector contacts, shall be protected from water and humidity exposure by a thorough application of conformal coating. Bench level repair of individual components, including discrete LED replacement and conformal coating repair, shall be possible.

Individual addressing of the each LED display module shall be configured via the communication wiring harness and connector. No on-board addressing jumpers or switches shall be allowed.

Removal or failure of any LED module shall not affect the operation of any other LED module or sign component. Removal of one or more LED modules shall not affect the structural integrity of any part of the sign.

It shall not be possible to mount an LED display module upside-down or in an otherwise incorrect position within the DMS display matrix.

All LED display modules, as well as the LED pixel boards and driver circuit boards, shall be identical and interchangeable throughout the DMS.

8.1 LED Pixels

Each LED module shall contain a printed circuit board to which LED pixels are soldered. The LED pixel matrix shall conform to the following specifications:

Each LED module shall contain a minimum of 45 LED pixels configured in a two dimensional array. The pixel array shall be a minimum of nine (9) pixels high by five (5) pixels wide.

The distance from the center of one pixel to the center of all adjacent pixels, both horizontally and vertically, shall be 2.6-inches (66 mm).

Each pixel shall consist of a minimum of one (1) independent string of discrete LEDs for each color. All pixels shall contain an equal quantity of LED strings.

The failure of an LED string or pixel shall not cause the failure of any other LED string or pixel in the DMS.

Each pixel shall contain the quantity of discrete LEDs needed to output white colored light at a minimum luminous intensity of 12,400 candelas per square meter when operated within the forward current limits defined in these specifications.

Each pixel shall also be capable of displaying amber colored light with a minimum luminous intensity of 7,440 candelas per square meter when operated within the forward current limits defined in these specifications.

Each LED pixel shall not consume more than 1.5 watts.

The circular base of the discrete LEDs shall be soldered so that they are flush and parallel to the surface of the printed circuit board. The longitudinal axis of the LEDs shall be perpendicular to the circuit board.

8.2 Discrete LEDs

DMS pixels shall be constructed with discrete LEDs manufactured by Avago Technologies (formerly Agilent Technologies), Toshiba Corporation, Nichia Corporation, OSRAM, or equivalent. Discrete LEDs shall conform to the following specifications:

All LEDs shall have a nominal viewing cone of 30 degrees with a half-power angle of 15 degrees measured from the longitudinal axis of the LED. Viewing cone tolerances shall be as specified in the LED manufacturer's product specifications and shall not exceed +/- 3 degrees.

Red LEDs shall utilize AlInGaP semiconductor technology and shall emit red light that has a peak wavelength of 650 $\pm$ 5 nm.

Green LEDs shall utilize InGaN semiconductor technology and shall emit green light that has a peak wavelength of 525 $\pm$ 5 nm.

Blue LEDs shall utilize InGaN semiconductor technology and shall emit blue light that has a peak wavelength of 470 $\pm$ 5 nm.

The LED lenses shall be fabricated from UV light resistant epoxy.

The LED manufacturer shall perform color sorting of the bins. Each color of LEDs shall be obtained from no more than two (2) consecutive color "bins" as defined by the LED manufacturer.

The LED manufacturer shall perform intensity sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive luminous intensity "bins" as defined by the LED manufacturer.

The various LED color and intensity bins shall be distributed evenly throughout the sign and shall be consistent from pixel to pixel. Random distribution of the LED bins shall not be accepted.

LED package style shall be either through-hole flush-mount or surface-mount. Through-hole LEDs with standoffs will not be accepted.

All LEDs used in all DMS provided for this contract shall be from the same manufacturer and of the same part number, except for the variations in the part number due to the intensity and color bins.

The LEDs shall be rated by the LED manufacturer to have a minimum lifetime of 100,000 hours of continuous operation while maintaining a minimum of 70% of the original brightness.

8.3 Pixel Drive Circuitry

One (1) electronic driver circuit board shall be provided for each LED pixel module and shall individually control all pixels on that module. The driver circuit boards shall conform to the following specifications:

Each LED driver board shall be microprocessor-controlled and shall communicate with the sign controller on a wire or fiber optic communication network using an addressable network protocol. The microprocessor shall process commands from the sign controller to display data, perform diagnostic tests, and report pixel and diagnostic status.

Constant current LED driver ICs shall be used to prevent LED forward current from exceeding the LED manufacturer's recommended forward current whenever a forward voltage is applied. To maximize LED service life, LED drive currents will not be allowed that exceed the manufacturer's recommendations for the 100,000-hour lifetime requirement.

The LED pixels shall be directly driven using pulse width modulation (PWM) of the drive current to control the display intensity. This LED driver circuitry shall vary the current pulse width to achieve the proper display intensity levels for all ambient light conditions. The drive current pulse shall be modulated at a frequency high enough to provide flicker-free operation and a minimum of 200 brightness levels.

The LED driver circuitry shall receive updated display data at a minimum rate of ten (10) frames per second from the sign controller.

Each LED driver circuit shall be powered by 24 VDC from external regulated DC power supplies. Each driver circuit shall receive power from a minimum of two (2) independent power supplies. Indicator LEDs shall be provided to indicate the status of each power source.

Each LED driver circuit shall contain a microprocessor-controlled power regulation circuit that controls the voltage applied to the LED strings. The power circuit shall automatically adjust the voltage supplied to the LEDs to optimize power consumption efficiency as the temperature changes.

The voltage of each power input shall be measured to the nearest tenth of a volt and reported to the sign controller upon request. Each driver circuit shall also contain one status LED for each power source that indicates if the power source is present or not.

The LED driver circuitry shall be able to detect that individual LED strings or pixels are stuck off and shall report the pixel status to the sign controller upon request.

The LED driver board shall contain a seven segment numeric LED display that indicates the functional status of the driver and pixel boards. At a minimum, it shall indicate error states of the LED pixels and communication network. The indicator shall be positioned such that a maintenance technician can easily view the status code for diagnostic purposes. The status codes shall also be reported to the sign controller upon request.

8.4 Characters Displayed

The signs shall be capable of displaying ASCII characters 32 through 126 (including all upper and lower case letters and digits from 0 to 9) at any location in a message line.
The display area shall be 27 pixels high by 125 pixels wide.

The sign shall normally display single stroke (4 x 7) characters with single-column spacing between characters. The operator shall be able to display normal (5 X 7), expanded (6 x 7) or double-stroke (7 x

7) character fonts or change the default spacing between characters. The spacing options shall be one, two or three pixel columns. Font access privileges shall be assigned by the system supervisor.

The full matrix display shall be capable of displaying other sized character, graphics/symbols, and other number of lines depending on the height of the character utilized.

The separation between the last column of one module and the first column of the next shall be equal to the horizontal distance between the columns of a single display module. The separation between the last row of one module and the first row of the next shall be equal to the horizontal distance between the rows of a single display module.

18-inch characters shall be legible under all light conditions at a distance of 900 feet within a 30 degree cone of vision centered around the optical axis of the pixel. The cone perimeter shall be defined by its 50% intensity points.

The sign shall be the proper brightness in all lighting conditions for optimum legibility. It shall be bright enough to have a good target value, but not be the point where the pixels bloom, especially in low ambient light level conditions.

The brightness and color of each pixel shall be uniform over the entire face of the sign within the 30 degree cone of vision from 900 feet to 200 feet in all lighting conditions. Non-uniformity of brightness or color over the face of the sign under these conditions shall be cause for rejection of the sign.

8.5 Display of Graphic Images

The DMS control software shall support the inclusion of graphics in messages. If the NTCIP 1203 v2 standard has not reached a “recommended” or “approved” state by the time of contract award, the vendor shall support graphics using manufacturer-specific objects and MULTI tags.

If a manufacturer-specific means of supporting graphics is used, the vendor shall commit to provide NTCIP 1203 v2 firmware updates at no cost to the customer. These updates will include all current requirements of these specifications and also standard graphics support. The vendor shall install the updates no later than six months after the NTCIP 1203 v2 standard reaches the “approved” state.

9.0 Regulated DC Power Supplies

The LED pixel display modules shall be powered with auto-ranging regulated switching power supplies that convert the incoming AC to DC at a nominal voltage of 24 volts DC. Power supplies shall be wired in a redundant parallel configuration that uses multiple supplies for the DMS display matrix.

Power supplies shall be arranged in redundant pairs within the display such that each pair supplies power to a defined region of the sign. Each pair of power supplies shall contain two (2) physically and electrically independent supplies. Each pair of power supplies shall be parallel, but shall not be wired in a current sharing configuration.

Power supplies within each pair shall be redundant and rated such that if one supply fails, the remaining supply shall be able to operate 100% of the pixels in that display region at 100% brightness when the internal DMS air temperature is +140ºF (60ºC) or less.

Each power supply within each pair shall receive 120VAC power from separate circuits on separate circuit breakers, such that a single tripped breaker will not disconnect power from both supplies. It shall be acceptable for a single circuit breaker to power multiple DC power supplies provided that none of those power supplies are in the same power supply pair.

The power supplies shall be sufficient to maintain the appropriate LED display intensity throughout the entire operating input voltage range.

The output of each power supply shall be connected to multiple circuits that provide power to the LED modules. Each output circuit shall not exceed 15 amperes and shall be fused.

Each group of power supplies shall be monitored by a microprocessor-controlled circuit. This circuit shall monitor the voltage of each power supply and the status of each output circuit's fuse. The power supply voltages and fuse states shall be reported to the sign controller upon request.
The power supplies used to power the LED pixel modules shall be identical and interchangeable throughout the DMS.

Regulated DC power supplies shall conform to the following specifications:
Nominal output voltage of 24 VDC +/- 10%
Nominal maximum output power rating of 1000 watts
Operating input voltage range shall be a minimum of 90 to 260 VAC
Operating temperature range shall be a minimum of –30ºF to +165ºF (-34ºC to +74ºC)
Maximum output power rating shall be maintained over a minimum temperature range of –30ºF to +140ºF (-34ºC to +60ºC)
Power supply efficiency shall be a minimum of 80%
Power factor rating shall be a minimum of 0.95
Power supply input circuit shall be fused
Automatic output shut down and restart if the power supply overheats or one of the following output faults occurs: over-voltage, short circuit, or over-current
Power supplies shall be UL listed
Printed circuit boards shall be protected by an acrylic conformal coating

9.1 Photoelectric Sensor Devices
Three (3) photocells shall be installed on the sign. These devices shall permit automatic light intensity measurement of light conditions at each sign location.

These photocells shall be mounted in a manner to measure front, rear and ambient light conditions.

9.2 Brightness Control
Automatic adjustment of the LED brightness shall occur in small enough increments so that the brightness of the sign changes smoothly, with no perceivable brightness change between adjacent levels. Provision shall be made to prevent perceivable brightening of the sign due to stray headlights shining upon the photo sensors at night.

Pixel brightness shall be controlled by pulse width modulation of the DC current. The pixel current waveform shall have a frequency of 100 +/-5 Hertz at nighttime brightness levels and 2400 $\pm$ 120 Hertz at daytime brightness levels with an adjustable duty cycle of 0.03 to 99.9% in 0.5% or finer increments. Brightness shall be manually settable from the front panel of the controller and remotely from the central computer in 1% increments. Brightness control shall be able to be returned to automatic from the sign controller front panel and the central computer.

9.3 Pixel Status Feedback
Two separate types of pixel status feedback shall be provided to the central controller from the local sign controller. These include a pixel test and a pixel read:

Pixel Test: The pixel test shall be performed from the central controller on command and automatically once a day. During a pixel test, the full operational status of each string of LEDs in each pixel shall be

tested and then transmitted to the central controller or laptop computer. This pixel status test shall distinguish the difference between half out, full out, half stuck-on and fully stuck-on pixels. A list of defective pixels shall be provided, listing pixel status, line number, module number, column number and row number for each defective pixel. The pixel test may briefly disturb the displayed message for less than 0.5 seconds.

Pixel Read: The pixel read shall be performed during both message downloads and during every sign poll from the central controller or laptop computer. The pixel read shall perform a real-time read of the displayed message and shall return the state of each pixel to the central controller as it is currently displayed to the motorist, including any errors. This shall allow the central controller operator to see what is visibly displayed to the motorist on an individual pixel basis. During a pixel read, the state of each pixel (full-on, half-on or off) in the sign shall be read by the sign controller to allow the central controller or laptop computer to show the actual message, including static flashing and alternating messages, that is visibly displayed on the sign in a WYSIWYG format. This pixel reading shall take place while a message is displayed on the sign without disturbing the message in any way. Any flashing, flickering, blinking, dimming, or other disturbance of the message during this pixel read shall be cause for rejection of the sign.

The pixel read shall be an actual real-time read of the current flowing through each string of LEDs at the time of the associated sign poll or message download and shall not be accomplished by simulating errors based on the last pixel test.

10.0 Environmental Operating Parameters

All DMS components shall be capable of operating without any decrease in performance over a temperature range of –40°C (-40°F) to + 70°C (+158°F) with a relative humidity of up to 95% non-condensing, unless otherwise noted in this specification.

11.0. Sign Controller

11.1 General Requirements

Each DMS shall be controlled and monitored by its own sign controller. The sign controller shall be a stand-alone microprocessor-based system, which does not require continuous communication with DMS control software in order to perform most DMS control functions.

The sign controller shall meet the following operational requirements:
Communicate using the NTCIP protocol
Contain memory for storing changeable and permanent messages, schedules, and other necessary files for controller operation
Include a front panel user interface with LCD and keypad for direct operation and diagnostics as described herein
Contain a minimum of three (3) NTCIP-compliant RS232 communication ports
Contain a minimum of one (1) NTCIP-compliant Ethernet port with RJ45 connector
Contain a built-in Hayes-compatible modem with standard RJ11 connector
Contain DMS-specific control firmware (embedded software) that shall monitor all external and internal sensors and communication inputs and control the display modules as directed by external control software and the front panel interface

NTCIP shall be natively supported in the DMS controller. External protocol converter or translator devices shall not be allowed.

11.2 Controller Location

The sign controller and associated communication equipment shall be installed inside the DMS housing.

11.3 Environmental

The sign controller shall meet the following environmental requirements defined in NEMA Standards Publication TS 4, Hardware Standards for Dynamic Message Signs (DMS), with NTCIP Requirements.

11.4 Mechanical and Electrical

The sign controller shall meet the following electrical and mechanical requirements:
Mount in a standard EIA 19-inch (480 mm) equipment rack with a maximum 4U space requirement
Weigh no more than 10 pounds, including its enclosure
Consume no more than 30 watts of power
Powered by an internal regulated DC power supply capable of operating on 120VAC or 240VAC at both 50Hz and 60Hz
All printed circuit boards shall be sealed with an acrylic conformal coating

11.5 Operational Requirements

Front Panel User Interface

The sign controller's front panel shall include a keypad and LCD. These devices shall be used to perform the following functions with the sign controller and DMS:
Monitor the current status of the sign controller, including the status of all sensors and a monochromatic what-you-see-is-what-you-get (WYSIWYG) representation of the message visible on the display face
Perform diagnostics testing of various system components, including pixels, power systems, sensors, and more
Activate messages stored in memory
Configure display parameters, including display size and colors
Configure communications port settings and NTCIP options

The front panel interface shall also include:
Power switch to turn the controller on and off
LED power "on" indicator
"Local/remote" switch that places the controller in local mode such that it can be controlled from the front panel interface, instead of via the primary NTCIP communication channel
LED to indicate state of the "local/remote" mode switch
Reset switch to quickly restart the controller
LED "Active" indicator that blinks when the controller is operating correctly
LED to indicate when any of the NTCIP communication channels are active

11.6 Memory

The sign controller shall have non-volatile electronically changeable memory. This memory shall be formed by flash or battery-backed static RAM integrated circuits that retain the data in memory for a minimum of 30 days following a power loss. This changeable memory shall be used to store messages and schedules. The controller memory shall be capable of storing a minimum of 100 changeable messages in non-volatile RAM.

11.7 Internal Clock

The DMS sign controller shall contain a computer-readable clock that has a battery backup circuit. The battery shall keep the clock operating properly for at least 5 years without external power, and the clock shall automatically adjust for daylight savings time and leap year using hardware, software, or a combination of both. The clock shall be set electronically by the sign controller microprocessor and shall be accurate to within one (1) minute per month.

11.8 Communications

All remote communication ports shall be NTCIP-compatible as defined in the “Requirements for NTCIP Compatibility” section of these specifications.

11.9 Communication Modes

The DMS sign controller shall be able to receive instructions from and provide information to a computer containing DMS control software using the following communication modes:

Remotely via direct or dial-up communications with a remotely located computer. The system communications backbone, as well as all field modems or signal converters, shall provide the DMS sign controller with an RS232 signal.

Locally via direct connection with a laptop computer that is connected directly to the sign controller using an RS232 null modem connection.

11.10 Serial Communication Ports

The DMS sign controller shall contain a minimum of three (3) NTCIP-compatible RS232 communication ports. These ports shall support multiple communication interfaces, including, but not limited to, direct null-modem (for local laptop control), dial-up and leased-line modems, radio systems, cellular modems, and fiber optic modems. The RS232 ports shall all have standard DB9M connectors.

The baud rate, connection type, and NTCIP communication protocol shall be configurable. Each port must support all typical serial baud rates ranging from 1200 to 115,200 baud. All three ports shall be capable of supporting either of the following sub network profiles: NTCIP 2101 (PMPP) or NTCIP 2103 (PPP). They shall also be capable of supporting either NTCIP 2201 (Null) or NTCIP 2202 (Internet) transport profiles. Only one each of the transport and sub network profiles shall be active at any time on each port.

11.11 Ethernet Port

The DMS sign controller shall contain a minimum of one (1) 10/100Base-T Ethernet communication port. This port shall be available for use for communicating from the central control system to the DMS sign controller when an Ethernet network is available. The Ethernet port shall have a standard RJ45 connector.

Communications on the Ethernet port shall be NTCIP-compatible using the NTCIP 2202 Internet transport profile and the NTCIP 2104 Ethernet sub network profile. This shall permit the controller to be operated on any typical Ethernet network using the TCP/IP and UDP/IP protocols.

For purposes of this contract this DMS shall connect via a layer 3 switch at the Dan Ryan/I-55 Interchange to the Traffic Systems Center.

11.12 Dial-Up Modem Communication Port

The DMS sign controller shall include one (1) built-in Hayes-compatible dial-up modem. The modem port shall have a standard RJ11 connector.

This modem shall be configured to support either the NTCIP 2101 (PMPP) or the NTCIP 2103 (PPP) sub network profile. At least one of the following transport profiles shall also be available for configuration: NTCIP 2201 (Null) or NTCIP 2202 (Internet). Only one each of the transport and sub network profiles shall be active at any time on the port.

The modem shall be configurable to support both incoming and outgoing calls as supported by NTCIP. The modem shall support a minimum communication speed range from 1200 baud to 28,800 baud. The modem shall support the following protocols at a minimum: Hayes-compatible “AT” command set, MNP5, MNP10, and V.42bis.

11.13 Controller Addressing

The DMS sign controller shall use whatever addressing scheme is appropriate for the NTCIP network types used for communications. The controller addressing shall be configurable through the front panel user interface.

NTCIP 2101 (PMPP) networks shall be configured with an address in the range 1 to 255 with a default address of 1. NTCIP 2104 (Ethernet) networks shall use a static IP address. Both the IP address and subnet shall be configurable. NTCIP 2103 (PPP) networks shall not require network addressing.

12.0 Transient Protection

The DMS and sign controller signal and power inputs shall be protected from electrical spikes and transients as follows:

12.1 Sign AC Power

The AC power feed for all equipment in the sign cabinet shall be protected at the panel board by a parallel-connection surge suppresser rated for a minimum surge of 40 kA. This device shall conform to the following requirements:

Withstand a peak 80,000-ampere surge current, 40kA L-N, 40kA L-G

Designed, manufactured, & tested consistent with: IEEE C6.41.1-2002, C62.41.2-2002, C2.45-2002, ANSI/IEEE C62.41-1991, C62.45-1992, NEMA LS-1, and NEC 285.6

Less then 0.5 nanosecond response time

Temperature range of -40ºF to +140°F (-40ºC to +70ºC)

Approximate dimensions of 3-inches (76 mm) wide by 8-inches (203 mm) long by 3-inches (76 mm) high

5000 Category (C3 High) impulses with <10% drift, short circuit current rating of 200,000 rms symmetrical amperes (UL Listed)

UL listed to: UL 1449 200kA SCCR, UL 1283 4th Edition, and Canadian safety standards

12.2 Control Equipment AC Power

A series-connected surge suppressor capable of passing 15 amps of current shall protect the sign controller and other control and communication equipment. This device shall conform to the following requirements:

Withstand a peak 50,000 ampere surge current for an 8x20 microsecond wave form

Maximum continuous operating current of 15 amps at 120 VAC, 60 Hz

Series inductance of 200 micro henrys (nominal)

Temperature range of –40ºF to +158°F (-40ºC to +70ºC)

Approximate dimensions of 3-inches wide by 5-inches long by 2-inches high (76 mm by 127 mm by 50 mm)

The device shall be UL-1449 recognized

UL 1449 surge rating of 400 V or less

12.3 Communication Signals

Transient voltage surge suppressors shall protect all communication signals connecting to the control equipment from off-site sources using copper cables.

Transient voltage surge suppressors shall protect all copper communication lines used to pass data between the sign controller and sign.

12.4 Protection

A series/parallel two-stage suppression device shall protect the modem communication port from over-voltage and over-current conditions. This surge protection shall be integrated internally within the controller.

13.0 Local User Auxiliary Interface;
when DMS sign Controller is located inside of DMS sign Enclosure

13.1 Auxiliary Control Panel
The DMS shall include an auxiliary control panel that will provide a secondary user interface panel for DMS control, configuration, and maintenance. The auxiliary control panel shall meet the same electrical, mechanical, and environmental specifications as the DMS controller. It shall be powered independently from a 120 VAC outlet. There also shall be a 120 volt convenience outlet for maintenance personnel lap top computers and a hinged shelf which folds from inside the cabinet and is suitable for the laptop computer to rest on.

13.2 Interface Panel
The auxiliary control panel shall have an LCD panel and keypad identical to those found on the DMS controller. It shall also contain a local/remote switch, a reset switch, status LEDs, and one NTCIP compatible RS232 communication port that meet the same specifications as the DMS controller.

13.3 DMS Control Interface
The auxiliary control panel shall include an identical menu system to the DMS controller with all of its features and functionality.

13.4 Location
The Auxiliary Control Panel shall be installed in the existing DMS control cabinet. Any necessary cutting, fitting, and miscellaneous materials necessary to make the Auxiliary Control Panel functional in the existing DMS Control cabinet shall be considered incidental to this pay item.

13.5 Controller Signal Interface
The auxiliary control panel shall interface to the DMS controller using outdoor-rated Category 5 copper cable. It shall be capable of operating up to 4000 feet from the DMS controller.

14.0 Sign Controller Functions
The sign controller shall be capable of being controlled from the central controller or the laptop computer. The controller software shall be capable of performing the following functions:
Display a message, including:
Static messages
Flashing messages
Alternating messages

Messages shall be capable of displaying text, graphics or a combination of both. The graphics area shall be downloaded from the central controller with each message.

It shall be possible to separately vary the flashing and alternating frequencies.
Flashing messages shall have the following adjustable timing:
Message time on from 0.5 to 5.0 seconds in 0.1 second increments.
Message time off from 0.5 to 5.0 seconds in 0.1 second increments

It shall be possible to flash any character or set of characters in a static message.
Alternating messages shall have the following adjustable timing:
Primary message time on from 0.5 to 5.0 seconds in 0.1 second increments.
Primary message time off from 0 to 5.0 seconds in 0.1 second increments.
Alternative message time on from 0.5 to 5.0 seconds in 0.1 second increments.
Alternate message time off from 0 to 5.0 seconds in 0.1 second increments.

It shall be possible to flash any character or set of characters in an alternating message at the adjustable frequencies listed above for flashing messages. The flashing period shall be a sub-multiple of the alternating on-time it is associated with.
Report errors and failures, including:
Power failure
Power recovery
Pixel string failure
Fan failure
Over a user selectable critical temperature
Power supply failure
Data transmission error
Receipt of invalid data
Communication failure recovery

Message and status monitoring:
The sign controller shall respond to the central controller whenever it receives a request for status (a poll). The return message shall be capable of providing the following information:
Actual message that is visibly displayed on the sign on an individual pixel basis (full-on, half-on or off)
Current sign illumination level
Local Control Panel switch position (central, local or local override mode)
Error and failure reports
Temperature readings
LED power supply voltage levels
Origin of display message transmission (laptop, manual or central)
Heater status
Heat tape status
Address of sign controller
Uninterruptible power supply status
AC Surge protection status
Communication line protection status
Operational status of the following sensors
Each temperature sensor
Each photocell
Each airflow sensor
Humidity sensor
Each power supply sensor
Severe error condition response

In dial-up mode, the sign controller shall initiate a call to the central controller and report any severe error conditions. In multi-drop mode, the sign controller shall report severe error conditions to the central controller during the next polling.

The severe error conditions are:
AC power failure
AC power recovery
Surge protection has been tripped
The sign housing door is open

Each time the sign controller is polled by the DMS Master Controller or laptop computer, the sign controller shall test the operation status of the sensors listed below and return this information to the DMS Master Controller. This operational status test shall determine if each of the following sensors are functioning properly.

Each temperature sensor
Each photocell
Humidity sensor
Each airflow sensor
Each LED power supply

The sign controller shall provide a library with a minimum of 50 permanent messages, consisting of 30 or less characters per line, stored in PROM. The sign controller shall also be able to accept a downloaded library from the central or laptop computer of a minimum of 25 changeable messages stored in non-volatile RAM. These messages may be called for display on the sign from the keypad on the front panel of the DMS Controller.
The sign controller shall also be capable of displaying messages on the sign that are downloaded from the central controller or laptop computer, but are not located in the library stored in non-volatile memory of the sign controller.
The sign shall normally display single stroke (4 X7) characters with single-column spacing between characters. The sign shall also be able to display single stroke (5 X 7), expanded (6 X 7) or double-stroke (7 X 7) nominal character fonts or change the default spacing between characters. The spacing options shall be one, two or three pixel columns. Each font may be edited and downloaded to the sign controller from the central controller or laptop computer at any time without any software or hardware modifications.
The full matrix display shall also be capable of displaying other sized characters, graphics/ symbols, and other number of lines depending on the height of the character utilized. The interline spacing shall be variable.
The sign controller shall monitor the photo cell circuits in the sign and convert the measured light intensity into the desired pixel brightness. The photo circuit readings shall be correlated with a brightness table in the sign controller. The brightness table shall have a minimum of 255 brightness levels. Automatic adjustment of the LED driving waveform duty cycle shall occur in small enough increments so that brightness of the sign changes smoothly, with no perceivable brightness change between adjacent levels. The brightness table in each individual sign controller shall be adjustable from the central controller and can be customized according to the requirements of the installation site. Each sign shall have its own, independent brightness table.
Brightness shall be manually settable from the front panel of the controller and remotely from the central computer in one percent increments from one to 99%.
There shall be a means to adjust how rapidly the sign responds to changes in ambient light as measured by the photocells. This can be used, for example, to prevent the sign from changing its brightness due to a vehicle's headlight momentarily hitting the sign. The adjustment shall be made from the central controller or laptop computer and shall have two different settings, one for daytime control and one for nighttime control, with the day/night ambient light threshold also being an adjustable value. In addition, there shall be a means to specify different weighting factors for each photocell, to specify how prominently each photocell figures in the calculation of nighttime ambient light.
In the event of a power failure, the sign controller shall activate a programmable default message (which shall be a blank message) and shall report the AC power failure to the central controller.
The operational status of each pixel in the sign shall be automatically tested once a day and tested when a pixel test is requested from the central controller or laptop computer. A list of defective pixels shall then be transmitted to the central controller or laptop computer, listing pixel status test shall distinguish the difference between half-out, full-out, half-stuck on and fully stuck-on pixels. This test shall not affect the displayed message for more that 0.5 seconds.
When the sign controller is polled and when messages are downloaded from the central controller or laptop computer, each pixel in the sign shall be read and its current state (full-on, half-on or off), for the currently displayed message, shall be returned to the central controller. This will allow the central controller or laptop computer to show the actual message that is visibly displayed on the sign on an individual pixel basis in a WUYSIWYG format. (This is different from the pixel test listed above.) This pixel status read shall not affect the displayed message in any way. The pixel read shall be an actual

real-time read of the current flowing through each string of LEDs at the time of the associated sign poll or message download and shall not be accomplished by simulating errors based on the last pixel test.
The operational status of the fans shall be automatically tested once a day and tested on command from the central controller or laptop computer. Any failure will cause an error message to be sent to the central controller or laptop when the sign controller is polled by the central controller or laptop computer.
The sign controller shall read the internal temperature sensors, external ambient temperature sensor and the humidity sensor. The sign controller shall use these readings in an algorithm that turns on the heat tape and/or the fans at the appropriate times to reduce both frost on the face of the sign and condensation on the display modules and other electronic circuitry.
Temperature sensors shall be continuously measured and monitored by the sign controller. A temperature greater than a user selectable critical temperature shall cause the sign message to go to blank and the sign controller shall report this error message to the central controller. This user selectable critical temperature shall be capable of being changed by the central controller or laptop computer. The central controller and laptop computers shall have the ability to read all measurements from the sign controller.
All LED module power supply voltages shall be continuously measured by the sign controller. The sign controller shall provide these voltage readings to the central controller or laptop computer when the sign controller is polled by the central controller or laptop computer.
There shall be no perceivable blinking, flickering or ghosting of the pixels at any time, except during a pixel test as described above. The displayed message will not be affected in any way at any time for the pixel status read as described above.
In the event the central controller fails to communicate with the sign controller within a programmable time limit, the sign shall activate a programmable default message (which shall be a blank). This function shall apply only when the sign controller is in central control mode.
Failure of any sign shall not affect the operation of any other sign in the system.
The sign controller shall perform a consistency check of messages downloaded from the central controller or laptop computer to ensure that the message will fit in the display area of the sign. If any part of the message fails this check, the downloaded message shall not be displayed and an error message shall be displayed on the operator's GUI.
The sign controller internal time clock shall ensure that a message is taken down at the correct time, even in the event of a communications loss.
The sign controller shall maintain its internal time clock during power outages less than 255 minutes and display the proper message when power is restored.
The sign controller shall be able to put a self-updating time, temperature and/or date display on the sign.
The sign controller shall allow a moving arrow to be displayed by the central controller or laptop computer. The moving arrow shall be on one line with a standard message on the other lines. The moving arrows shall be from the left or right and shall start from one end or in the middle of the sign and continue to the end of the sign.
The sign controller shall blank the sign in the event of a communication failure or power failure. The controller shall blank the sign if failure lasts greater than 5 minutes. Communication failures are either on the field transmit, field receive, or both.
The sign controller shall have a special function output bit to control an auxiliary blank-out sign. This shall be a closure to ground capable of sinking at least 10 ma. It shall be controlled from the central controller.
The sign controller shall be capable of being remotely reset from the central controller.
The system power shall be protected by two stages of transient voltage suppression devices as required in the AC Power Section of this specification. Tripping of each stage (or both if tripped simultaneously) of the surge protection shall cause the sign controller to call central and report the error condition (for dial-up operation) or report the error condition to central on the next poll (for multi-drop operation). There shall be an option that is either enabled or disabled and is selected and downloaded from the central controller to the sign controller. When this option is enabled, tripping of the second stage of surge protection shall prevent power from reaching any components of the sign until the surge protection has been replaced.

When this option is disabled, the sign will continue to function normally after the second stage of surge protection is tripped.
Communication lines shall be protected by two stages of transient voltage suppression devices as required in the Sign Controller Communication Interface Section of this specification. Tripping of each stage (or both if tripped simultaneously) of the surge protection shall cause the sign controller to call central and report the error condition (for dial-up operation) or report the error condition to central on the next poll (for multi-drop operation). There shall bean option that is either enabled or disabled and is selected and downloaded from the central controller to the sign controller. When this option is enabled, tripping of the second stage of surge protection shall disconnect the communication lines until the surge protection has been replaced. When this option is enabled, tripping of the second stage of surge protection shall disconnect the communication lines until the surge protection has been replaced. When this option is disabled, the sign will continue to function normally after the second stage of surge protection is tripped.

14.1 Modes of Operation
The mode of operation determines which level of control governs the DMS message selection. The three modes of operation are:
Central Mode: The local control panel switch is off and the central controller control and monitors the sign
Local Mode: The local control panel switch is on and the laptop computer is used to locally control the sign. The central controller only monitors the sign (i.e. status poll).
Local Override: The local mode has been overridden by the central to allow the central to control the sign in case the local control panel switch was unintentionally left in local mode.

14.2 AC Power
The sign and its sign controller shall be capable of operating with 120/240 VAC, 50 amp per leg, 60 hertz, single-phase power.
The sign shall have a 50 amp per leg, 120240 VAC, two-pole load center with 16 circuit capability. Each circuit in the sign shall be powered from a separate circuit breaker.
The system shall be protected by two stages of transient voltage suppression devices including MOVS and spark gap arrestor. If enabled by the central controller, tripping of the second stage shall prevent power from reaching any components of the sign until the surge protection has been replaced. Tripping of each stage of the surge protection shall cause the sign controller to call central and report the error condition (for dial-up operation) or report the error condition to central on the next poll (for multi-drop operation).

14.3 Transient Test Requirements
The sign housing electronics and the control cabinet shall be separately capable of withstanding a high-energy transient having the following characteristics repeatedly applied to the AC input terminals:
A ten microfarad oil filled capacitor charged to 1000 VDC $\pm$ 5% shall be discharged into the power input terminals a minimum of three times for each polarity. Immediately following this test the unit under test shall perform all of its defined functions upon the restoration of normal AC power.

15.0 Electronic Materials and Construction Methods

15.1 Printed Circuit Boards
Printed Circuit Boards (PCB) design shall be such that components may be removed and replaced without damage to boards, traces or tracks.
Only FR-4 0.062 inch material shall be used. Inter-component wiring shall be copper clad track having a minimum weight of 2 ounces per square foot with adequate cross section for current to be carried. Jumper wires will not be permitted, except from plated-through holes to component. The maximum number of jumper wires allowed per circuit board is two.

All PCBs shall be finished with a solder mask and a component identifier silk screen.

15.2 Components
All components shall be of such design, fabrication, nomenclature, or other identification so as to be purchased from a wholesale electronics distributor, or from the component manufacturer, except for printed circuit board assemblies:
Circuit design shall be such that all components of the same generic type, regardless of manufacturer, shall function equally in accordance with the specifications.
All discrete components, such as resistors, capacitors, diodes, transistors, and integrated circuits shall be individually replaceable. Components shall be arranged so they are easily accessible for testing and replacement.

15.2.1 Capacitors
The DC and AC voltage ratings as well as the dissipation factor of a capacitor shall exceed the worst case design parameters of the circuitry by 50%
A capacitor which can be damaged by shock or vibration shall be supported mechanically by a clamp or fastener.
Capacitor encasements shall be resistant to cracking, peeling and discoloration.

15.2.2 Resistors
Resistors shall be within 5% of tolerance over the specified temperature range.
Any resistor shall not be operated in excess of 50% of its power rating.

15.2.3 Semiconductor Devices
All transistors, integrated circuits, and diodes shall be a standard type listed by EIA and clearly identifiable.

16.0 Technical Assistance

The DMS manufacturer's technical representative shall provide on-site technical assistance in following areas:
Sign to structure installation
Sign controller cabinet installation
Sign to controller cabling

The initial powering up of the sign(s) shall not be executed without the permission of the DMS manufacturer's technical representative.

17.0 Testing Requirements

The equipment covered by this specification shall be subjected to design approval tests (DAT), factory demonstration tests (FDT), stand-alone tests, systems tests and 72 hour and 90 day test periods to determine conformance with all the specification requirements. The Engineer may accept certification by an independent testing lab in lieu of the design approval tests to verify that the design approval tests have previously been satisfactorily completed. The DMS vendor shall arrange for and conduct the tests in accordance with the testing requirements stated herein. Unless otherwise specified, the DMS vendor is responsible for satisfying all inspection requirements prior to submission for the Engineer's inspection and acceptance. The contract periods will not be extended for time lost or delays caused by testing prior to final Department approval of any items. The Engineer reserves the right to have his representative witness any and all tests. The results of each test shall be compared with the requirements specified herein. Failure to conform to the requirements of any test shall be counted as a defect, and the equipment shall be subject to rejection by the Engineer. Rejected equipment may be offered again for a retest provided that all non-compliances have been corrected and retest by the DMS vendor and evidence thereof submitted to the Engineer.

Final inspection and acceptance of equipment shall be made after installation at the designated location as shown on the plans, unless otherwise specified herein.

17.1 Test Procedures

The DMS vendor shall provide five (5) copies of all design approval, factory demonstration, stand-alone and system test procedures and data forms for the Engineer's approval at least sixty (60) days prior to the day the tests are to begin. The test procedures shall include the sequence in which the tests will be conducted. The test procedures shall have the Engineer's approval prior to submission of equipment for tests.

The DMS vendor shall furnish data forms containing all of the data taken, as well as quantitative results for all tests. The data forms shall be signed by an authorized representative (company official) of the equipment manufacturer. At least one copy of the data forms shall be sent to the Engineer.

The DMS vendor shall be responsible for providing the test fixtures and test instruments for all of the tests.

17.2 Design Approval Tests

Design approval tests shall be conducted by the DMS vendor on one or more samples of equipment of each type, as approved by the Engineer, to determine if the design of the equipment meets the requirements of this Specification. The test shall be conducted in accordance with the approved test procedures as described in section 19.0.

If the design approval tests have not previously been satisfactorily completed by an independent testing lab and accepted by the Engineer, the Engineer shall be notified a minimum of thirty (30) calendar days in advance of the time these tests are to be conducted.

The design approval tests shall cover the following:

17.2.1 Temperature and Condensation

The DMS sign system equipment shall successfully perform all the functionality requirements listed in this specification under the following conditions in the order specified below:

The equipment shall be stabilized at -40°F (-40°C). After stabilization at this temperature, the equipment shall be operated without degradation for two (2) hours.

Moisture shall be caused to condense on the equipment by allowing it to warm up to room temperature in an atmosphere having relative humidity of at least 40% and the equipment shall be satisfactorily operated for two (2) hours while wet.

The equipment shall be stabilized at 149°F (65°C). After stabilization, the equipment shall be satisfactorily operated for two (2) hours without degradation or failure.

17.2.2 Primary Power Variation

The equipment shall meet the specified performance requirements when the nominal input voltage is 115 V $\pm$ 15 V. The equipment shall be operated at the extreme limits for at least 15 minutes during which the operational test of the FDT shall be successfully performed.

17.2.3 Power Service Transients

The equipment shall meet the performance requirements, specified in the parent specification, when subjected to the power service transient specified in 2.1.6 "Transient, Power Service", of the NEMA standard TS1. The equipment shall meet the performance requirements specified in the parent specification.

17.2.4 Relative Humidity

The equipment shall meet its performance requirements when subjected to a temperature of (149°F 65°C)and a relative humidity of 90%. The equipment shall be maintained at the above condition for 48

hours. At the conclusion of the 48 hour soak, the equipment shall meet the requirements of the operational test of the FDT within 30 minutes of beginning the test.

17.2.5 Vibration
The equipment (excluding cabinets) shall show no degradation of mechanical structure, soldered components, or plug-in components and shall operate in accordance with the manufacturer's equipment specifications after being subjected to the vibration tests as described in Section 2.2.5, "Vibration Test", of the NEMA standard TS1.

17.2.6 Consequences of Design Approval Test Failure
If the unit fails the design approval test, the design fault shall be corrected and the entire design approval test shall be repeated. All deliverable units shall be modified without additional costs to the Department, to include design changes required to pass the design approval tests.

18.0 DMS Controller Uninterruptible Power Supply

A UPS shall be provided to allow the sign controller to notify the central controller when an improper power condition at the DMS persists for longer than 30 seconds.
The UPS shall meet the following minimum specifications:
Line Transient Protection: Passes ANSI/EEE C62.41 Category A testing
Safety Compliance: UL listed to UA1778
EMC Compliance: FCC Class B
Efficiency:>95% on line
Capacity VA/Watts @ 0.67P.F. : 425VA/285W
Voltage Nominal: 120 VAC
Voltage Range: 100-142 VAC
Typical run time (minutes): Full load: 3 minutes. Typical load: 5 minutes
Transfer time: 4 ms typical
Battery: Sealed, maintenance-free, valve regulated, UL 924 recognized.
Battery recharge time (to 95% of capacity): 8 hours with output fully loaded
Over current protection (on line): circuit breaker
Input fault current (maximum): 15A
Operating temperature: Range minimum -10°F -140°F (-23°C to 60°C)
Humidity: 5% - 95% RH (non-condensing)

19.0 Factory Demonstration Tests

The DMS vendor shall be responsible for conducting Factory Demonstration Tests on an all units at the DMS Vendor's Manufacturing Facility. These tests shall be performed on each unit supplied. The Engineer shall be notified a minimum of sixty (60) calendar days before the start of tests. The DMS Vendor shall pay for all travel expenses, including airfare, rental car, hotel, meals, etc., for up to three (3) department personnel or designated representatives for the Engineer to witness the Factory Demonstration Tests on the first unit at the vendor's manufacturing facility. All tests shall be conducted in accordance with the approved test procedures of Section 17.0. All equipment shall pass the following individual tests:
Examination Tests:
Each equipment shall be examined carefully to verify that the materials, design, construction, markings and workmanship comply with the requirements of the Specification.
Continuity Tests:
The wiring shall be checked to determine conform with the requirements of the appropriate paragraphs in the Specifications.

19.1 Operational Test

Each equipment shall be operated long enough to permit equipment temperature stabilization, and to check and record an adequate number of performance characteristics to ensure compliance with the requirements of this Specification.

19.2 Consequences of Factory Test Failure

If any unit fails to pass its demonstration test, the unit shall be corrected and another unit substituted in its place and the test successfully repeated.

If a unit has been modified as a result of a demonstration test failure, a report shall be prepared and delivered to the Engineer prior to shipment of the unit. The report shall describe the nature of the failure and the corrective action taken.

If a failure pattern develops, the Engineer may direct that design and construction modifications be made to all units without additional cost to the Department or extension of the contract period.

20.0 Stand-Alone Tests

The DMS vendor shall conduct an approved stand-alone test of the equipment installation at the field site. The test shall, as a minimum, exercise all stand-alone (non-network) functional operations of the field equipment with all of the equipment installed as per the plans, or as directed by the Engineer.

Approved data forms shall be completed and turned over to the Engineer as the basis for review and rejection or acceptance. At least thirty (30) working days' notice shall be given prior to all tests to permit the Engineer or his representative to observe each test.

20.1 Consequences of Stand-Alone Test Failure

If any unit fails to pass its stand-alone test, the unit shall be corrected or another unit substituted in its place and the test successfully repeated.

If a unit has been modified as a result of a stand-alone test failure, a report shall be prepared and delivered to the Engineer prior to the re-testing of the unit. The report shall describe the nature of the failure and the corrective action taken.

If a failure pattern develops, the Engineer may direct that design and construction modifications be made to all units without additional cost to the Department or extension of the contract period.

21.0 System Test

The DMS vendor shall conduct approved DMS system tests on the field equipment with the central equipment. The tests shall, as a minimum, exercise all remote control functions and display the return status codes from the controller.

Approved data forms shall be completed and turned over to the Engineer as the basis for review and for rejection or acceptance.

21.1 Consequence of System Test Failure

If system tests fail because of any components(s) in the subsystem, the particular components(s) shall be corrected or substituted with other components(s) and the tests shall be repeated. If a component has been modified as a result of the system test failure, a report shall be prepared and delivered to the Engineer prior to retest.

22.0 72 Hours and 90 Days Test Failure

After the installation of the DMS system is completed and the successful completion of the System Test, the DMS vendor shall conduct one continuous 72-hour full operating test prior to conducting a 90-day test period. The type of test to be conducted shall be approved by the Engineer, and shall consist primarily of exercising all control, monitor and communications functions of the field equipment by the central equipment.

The 90-day test period shall commence on the first day after the successful completion of the approved 72-hour continuous full operating test period.

During the 90-day test period, downtime, due to mechanical, electrical and/or other malfunctions, shall not exceed five (5) working days. The Engineer may extend the 90-day test period by a number of days equal to the downtime in excess of five (5) working days.
The Engineer will furnish the DMS vendor with a letter of approval stating the first day of the 90-day test period.

23.0 Final System Acceptance

Final system acceptance shall be defined as when all work and materials provided for in this item have been furnished and completely installed, and all parts of the work have been approved and accepted by the Engineer and the Dynamic Message Sign System has been operated continuously and successfully for ninety (90) calendar days with no more than five (5) working days downtime due to mechanical, electrical and/or other malfunctions.

24.0 Warranty

Equipment furnished under this Specification shall be guaranteed to perform according to these specifications and to the manufacturer's published specifications. Equipment shall be warranted for a minimum of **five years** return to factory against defects and/or failure in design, materials and workmanship. Unless otherwise specified in the invitation for bids, warranty coverage shall become effective on the date of final acceptance of the system by the Department. The Contractor shall assign to the Department all manufacturer's normal warranties or guarantees, on all such electronic, electrical and mechanical equipment, materials, technical data, and products furnished for and installed on the project. Defective equipment shall be repaired or replaced, at the manufacturer's option, during the warranty period at no cost to the Department. The Contractor shall provide a written document on DMS Vendor letterhead, signed by the DMS Principle, documenting said warranties or guarantees and shall be submitted to the Engineer before project acceptance.

25.0 Center to Field Communications NTCIP Requirements

This section describes the minimum specifications for the NTCIP communication capabilities of the DMS controller and DMS control software. The contractor shall provide all the software, firmware, and services necessary to operate a dynamic message sign (DMS) system that fully complies with the NTCIP functional requirements specified herein, including incidental items that may have been inadvertently omitted.
References
These specifications reference standards through their NTCIP designated names. The following list provides the current versions of each of these standards.

Each NTCIP device covered by these project specifications shall implement the version of the standard that is specified in the following table. Refer to the NTCIP library at www.ntcip.org for information on the current status of NTCIP standards.

Document Number and Version	Document Title	Document Status
NTCIP 1101:1996 and Amendment 1	Simple Transportation Management Framework (STMF)	Approved Standard with Amendment
NTCIP 1102:2004	Octet Encoding Rules (OER) Base Protocol	Approved Standard
NTCIP 1103 v1.26a	Transportation Management Protocols	Recommended Standard

Document Number and Version	Document Title	Document Status
NTCIP 1201:1996 and Amendment 1	Global Object (GO) Definitions	Approved Standard
NTCIP 1203:1997 and Amendment 1	Object Definitions for Dynamic Message Signs	Approved Standard with Amendment
NTCIP 2001:1996 and Amendment 1	Class B Profile	Approved Standard
NTCIP 2101:2001	Point to Multi Point Protocol (PMPP) Using RS-232 Subnetwork Profile	Approved Standard
NTCIP 2103:2003	Point-to-Point Protocol Over RS-232 Subnetwork Profile	Approved Standard
NTCIP 2104:2003	Ethernet Subnetwork Profile	Approved Standard
NTCIP 2201:2003	Transportation Transport Profile	Approved Standard
NTCIP 2202:2001	Internet (TCP/IP and UDP/IP) Transport Profile	Approved Standard
NTCIP 2301:2001	Simple Transportation Management Framework (STMF) Application Profile	Approved Standard

Table 1: NTCIP Document References

25.1 Subnetwork Profiles

Each serial or modem port on each NTCIP device shall be configurable to support both NTCIP 2101 and NTCIP 2103. Only one of these profiles shall be active at any given time. Serial ports shall support external dial-up modems.

Each Ethernet port on the NTCIP device shall comply with NTCIP 2104.

The NTCIP device(s) may support additional Subnet Profiles at the manufacturer's option. At any one time, only one subnet profile shall be active on a given port of the NTCIP device. All response datagram packets shall use the same transport profile used in the request. The NTCIP device shall be configurable to allow a field technician to activate the desired subnet profile and shall provide a visual indication of the currently selected subnet profile.

25.2 Transport Profiles

Each serial or modem port on each NTCIP device shall be configurable to support both NTCIP 2201 and NTCIP 2202.

Each Ethernet port on the NTCIP device shall comply with NTCIP 2202.

The NTCIP device(s) may support additional transport profiles at the manufacturer's option. Response datagrams shall use the same transport profile used in the request. Each NTCIP device shall support the receipt of datagrams conforming to any of the supported transport profiles at any time.

25.3 Application Profiles

Each NTCIP device shall comply with NTCIP 2301 and shall meet the requirements for Conformance Level 1.
An NTCIP device may support additional application profiles at the manufacturer's option. Responses shall use the same application profile used by the request. Each NTCIP device shall support the receipt of application data packets at any time allowed by the subject standards.

25.4 Object Support
Each NTCIP device shall support all mandatory objects of all mandatory conformance groups as defined in NTCIP 1201 and NTCIP 1203.
Each NTCIP device shall support all mandatory objects in all optional conformance groups required herein. All optional objects listed in these specifications shall be supported.
The NTCIP device(s) shall are required to support the following optional conformance groups.

Conformance Group	Reference
Time Management	NTCIP 1201
Timebase Event Schedule	NTCIP 1201
Report	NTCIP 1201
PMPP	NTCIP 1201
Font Configuration	NTCIP 1203
DMS Configuration	NTCIP 1203
MULTI Configuration	NTCIP 1203
MULTI Error Configuration	NTCIP 1203
Illumination/Brightness Control	NTCIP 1203
Scheduling	NTCIP 1203
Sign Status	NTCIP 1203
Status Error	NTCIP 1203
Pixel Error Status	NTCIP 1203

Table 2: Required Optional Conformance Groups

The following table indicates objects that are considered optional in the NTCIP standards, but are required by this specification. It also indicates modified object value ranges for certain objects. Each NTCIP device shall provide the full, standardized object range support (FSORS) of all objects required by these specifications unless otherwise indicated below.

Object	Reference	Project Requirement
moduleTable	NTCIP 1201 Clause 2.2.3	Shall contain at least one row with moduleType equal to 3 (software).
maxTimeBaseScheduleEntries	NTCIP 1201 Clause 2.4.3.1	Shall be at least 28
maxDayPlans	NTCIP 1201 Clause 2.4.4.1	Shall be at least 20
maxDayPlanEvents	NTCIP 1201 Clause 2.4.4.2	Shall be at least 12
maxEventLogConfig	NTCIP 1201 Clause 2.5.1	Shall be at least 50

eventConfigMode	NTCIP 1201 Clause 2.4.3.1	The NTCIP Component shall Support the following Event Configuration: onChange, greaterThanValue, smallerThanValue
eventConfigLogOID	NTCIP 1201 Clause 2.5.2.7	FSORS
eventConfigAction	NTCIP 1201 Clause 2.5.2.8	FSORS
maxEventLogSize	NTCIP 1201 Clause 2.5.3	Shall be at least 200
maxEventClasses	NTCIP 1201 Clause 2.5.5	Shall be at least 16
eventClassDescription	NTCIP 1201 Clause 2.5.6.4	FSORS
maxGroupAddresses	NTCIP 1201 Clause 2.7.1	Shall be at least 1
communityNamesMax	NTCIP 1201 Clause 2.8.2	Shall be at least 3
numFonts	NTCIP 1203 Clause 2.4.1.1.1.1	Shall be at least 12
maxFontCharacters	NTCIP 1203 Clause 2.4.1.1.3	Shall be at least 255
defaultFlashOn	NTCIP 1203 Clause 2.5.1.1.1.3	The DMS shall support flash “on” times ranging from 0.1 to 9.9 seconds in 0.1 second increments
defaultFlashOff	NTCIP 1203 Clause 2.5.1.1.1.4	The DMS shall support flash “off” times ranging from 0.1 to 9.9 seconds in 0.1 second increments
defaultBackgroundColor	NTCIP 1203 Clause 2.5.1.1.1.1	The DMS shall support the black background color
defaultForegroundColor	NTCIP 1203 Clause 2.5.1.1.2	The DMS shall support the amber foreground color
defaultJustificationLine	NTCIP 1203 Clause 2.5.1.1.1.6	The DMS shall support the following forms of line justification: left, center, and right
defaultJustificationPage	NTCIP 1203 Clause 2.5.1.1.1.7	The DMS shall support the following forms of page justification: top, middle, and bottom
defaultPageOnTime	NTCIP 1203 Clause 2.5.1.1.1.8	The DMS shall support page “on” times ranging from 0.1 to 25.5 seconds in 0.1 second increments
defaultPageOffTime	NTCIP 1203 Clause 2.5.1.1.1.9	The DMS shall support page “off” times ranging from 0.1 to 25.5 seconds in

		0.1 second increments
defaultCharacterSet	NTCIP 1203 Clause 2.5.1.1.1.10	The DMS shall support the eight bit character set
dmsMaxChangeableMsg	NTCIP 1203 Clause 2.6.1.1.1.4	Shall be at least 100.
dmsMessageMultiString	NTCIP 1203 Clause 2.6.1.1.1.8.3	The DMS shall support any valid MULTI string containing any subset of those MULTI tags listed in Table 3 (below)
dmsControlMode	NTCIP 1203 Clause 2.7.1.1.1.1	Shall support at least the following modes: local, central, and centralOverride
dmsSWReset	NTCIP 1203 Clause 2.7.1.1.1.2	FSORS
dmsMessageTimeRemaining	NTCIP 1203 Clause 2.7.1.1.1.4	FSORS
dmsShortPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.8	FSORS
dmsLongPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.19	FSORS
dmsShortPowerLossTime	NTCIP 1203 Clause 2.7.1.1.1.10	FSORS
dmsResetMessage	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsCommunicationsLossMessage	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsTimeCommLoss	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsEndDurationMessage	NTCIP 1203 Clause 2.7.1.1.1.15	FSORS
dmsMemoryMgmt	NTCIP 1203 Clause 2.7.1.1.1.16	The DMS shall support the following Memory management Modes: normal and clearChangeableMessages
dmsMultiOtherErrorDescription	NTCIP 1203 Clause 2.4.1.1.1.20	If the vendor implements any vendor-specific MULTI tags, the DMS shall provide meaningful error messages within this object whenever one of these tags generates an error
dmsIllumControl	NTCIP 1203 Clause 2.8.1.1.1.1	The DMS shall support the following illumination control modes: Photocell, and Manual
dmsIllumNumBrightLevels	NTCIP 1203 Clause 2.8.1.1.1.4	Shall be at least 100
dmsIllumLightOutputStatus	NTCIP 1203 Clause 2.8.1.1.1.9	FSORS

numActionTableEntries	NTCIP 1203 Clause 2.9.1.1.1	Shall be at least 200
watcdogFailureCount	NTCIP 1203 Clause 2.11.1.1.1.5	FSORS
dmsStatDoorOpen	NTCIP 1203 Clause 2.11.1.1.1.6	FSORS
fanFailures	NTCIP 1203 Clause 2.11.2.1.1.8	FSORS
fanTestActivation	NTCIP 1203 Clause 2.11.2.1.1.9	FSORS
tempMinCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.1	FSORS
tempMaxCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.2	FSORS
tempMinSignHousing	NTCIP 1203 Clause 2.11.4.1.1.5	FSORS
tempMaxSignHousing	NTCIP 1203 Clause 2.11.4.1.1.6	FSORS

Table 3: Modified Object Ranges and Required Optional Objects

25.5 Multi Tags

Each NTCIP device shall support the following message formatting MULTI tags. The manufacturer may choose to support additional standard or manufacturer-specific MULTI tags.

MULTI Tag	Description
f1	Field 1-time (12 hr)
f2	Field 1-time (24 hr)
f8	Field 8- day of month
f9	Field 9-month
f10	Field 10-2 digit year
f11	Field 11-4 digit year
fl (and /fl)	Flashing text on a line-by-line basis with flash rates controllable in 0.1-second increments.
Fo	Font
jl2	Justification- line-left
jl3	Justification- line-center
jl4	Justification- line- right
jp2	Justification- page- top
jp3	Justification- page- middle
jp4	Justification- page- bottom
mv	Moving text
nl	New line
np	New page up to 5 instances in a message (i.e. up to 6 pages/frame in a message counting first page)
pt	Page times controllable in 0.1-second

MULTI Tag	Description
	increments

Table 4: Required MULTI Tags

25.6 Documentation

NTCIP documentation shall be provided on a CD-ROM and will contain ASCII versions of the following Management Information Base (MIB) files in Abstract Syntax Notation 1 (ASN.1) format:

The relevant version of each official standard MIB modules referenced by the device functionality.

If the device does not support the full range of any given object within a standard MIB Module, a manufacturer specific version of the official standard MIB Module with the supported range indicated in ASN.1 format in the SYNTAX and/or DESCRIPTION fields of the associated OBJECT TYPE macro. The filename of this file shall be identical to the standard MIB Module except that it will have the extension "man".

A MIB module in ASN.1 format containing any and all manufacturer specific objects supported by the device with accurate and meaningful DESCRIPTION fields and supported ranges indicated in the SYNTAX field of the OBJECT-TYPE macros.

A MIB containing any other objects supported by the device

25.7 Acceptance Testing

The vendor will provide certification of NTCIP-compliance as part of the vendor's pre-build submittal documentation. This certification shall be in the form of a comprehensive test plan and completed test report as performed by either the vendor or a third-party testing agency. The testing shall have been completed using industry accepted test tools such as the NTCIP Exerciser, Trevilon's NTester, Intelligent Devices' Device Tester, and/or Frontline's FTS for NTCIP. Data capture files from the FTS software during the performance of the above testing shall be furnished upon request of the Engineer.

The Engineer can elect to perform additional NTCIP testing if desired. This testing shall be conducted on a production DMS in the vendor's facility during the factory acceptance test. The vendor shall provide a written NTCIP test procedure to the Engineer a minimum of 30 days prior to the NTCIP testing.

25.8 Interpretation Resolution

If the Engineer or DMS manufacturer discovers an ambiguous statement in the standards referenced by this procurement specification, the issue shall be submitted to the NTCIP DMS Working Group for resolution. If the Working Group fails to respond within 90 days, the engineer shall provide an interpretation of the specification for use on the project.

26.0 As-Built Documentation

The Contractor shall provide to the Engineer the following documentation of the complete installed equipment prior to testing. Sufficient documentation shall be provided to reflect "as-built" conditions and to facilitate operation, maintenance, modification and expansion of the system or any of its individual components. Manufacturer supplied documentation which covers the intent of this requirement may be used, subject to the approval of the Engineer.

A. Operator's Manuals: A manual containing a general description and detailed operating and installation instructions shall be provided for each different type or model of equipment. Five copies of the manual shall include the following information:

A general description of the equipment including all information necessary to describe the basic use or function of the system components. This shall include a general block diagram presentation of the equipment. Where auxiliary equipment is required, tabular charts shall be included, list such equipment. These charts shall include the nomenclature physical and electrical characteristics and functions of the

auxiliary equipment, unless such information is contained elsewhere in an associated manual. In the latter case, a reference shall be made to the location of the information pertaining to the auxiliary equipment.
The theory of operation of the system components in a clear, concise manner supported by simplified schematics, logic, data flow diagrams, one-function diagrams, etc. Timing and waveform diagrams and voltage levels shall be shown as required. A logical development shall be used starting with a system block level and proceeding to a circuit analysis. Circuit analysis shall be detailed whenever circuits are not normally found in standard text books. This application of new theoretical concepts shall be fully described. Where the design allows operation in a number of different modes, an operational description of each mode shall be included.
In simple, clear language, the routine of operation, from necessary preparations for placing the equipment into operation, to securing the equipment after operation. This section shall contain appropriate illustrations, with the sequence of operations presented in tabular form wherever feasible.
The manufacturer's recommended procedures and checks necessary for preventive maintenance. This shall be specified for pre-operation, weekly, monthly, quarterly, semi-annual, annual and "as required" checks as necessary to assure reliable equipment operation. Specification, including tolerances, for all electrical, mechanical, and other applicable measurement, adjustments, or both, shall be listed.
Data necessary for isolation and repair of failure or malfunctions, assuming the maintenance technicians to be capable of analytical reasoning using the information provided in the submittal information. Accuracies, limits, and tolerances for all electrical, physical or other applicable measurements shall be described. General instructions shall be included for disassembly, overhaul and reassembly, including shop specifications or performance requirements.
Detailed instructions shall be given only where failure to follow special procedures would result in damage to the equipment, improper operation, danger to operating or maintenance personnel. Consumption of excessive person hours, etc. Such instructions and specifications shall be included only for such maintenance as maybe accomplished by specialized technicians and engineers in a modern electromechanical shop. The instructions shall describe special test set-up, components fabrication, the use of special tools, jibs and test equipment.
A detailed physical description of size, weight, special mounting requirements, electrical connections, and all other pertinent information necessary for proper installation and use of the equipment shall be provided.
The parts list shall contain all information required to describe the characteristics of the individual parts, as required for identification. It shall include a list of all equipment within a group and list all assemblies, sub-assemblies and replacement parts of units. The tabular arrangement shall be an alphanumerical order of the schematic reference symbols and shall give the associated description, manufacturer's name and part number. A table of contents or some other convenient means shall be provided for the purpose of identifying major components, assemblies, etc.
Schematic diagrams shall be complete and accurate as required to supplement the text material and to allow the books to be a self-contained technical information source. Maximum size of these diagrams shall be limited to allow their use in close proximity to the equipment, in the class room, etc., part reference symbols, test voltages, waveforms and other aids to understanding of the circuits function shall be included on the diagrams. Test voltages, waveforms and other aids to understanding of the circuits function may be shown on either the simplified schematics and other drawings (as required in the above sections) on theory of operation or maintenance or on the schematic diagrams required for this section. The overall scope of information shall not be less, however, than that stated for the schematic diagrams.

B. Software Manuals
The DMS vendor shall provide manuals and data for the computer software system and components thereof. These shall include the following:
Computer programmer's manuals and computer user's manuals (5 copies each). Include manuals for any CPU language used by the Contractor for this project. Include instructions for performing a back-up of all software and message libraries.

Two original copies of the computer's operating system manual and compiler and assembly language manuals and an instruction manual for translating source to object code.
Manufacturer's documentation (including schematics) for all plug in circuit cards used in the microcomputer chassis.
Computer program logic in flow chart form (5 copies).
Narrative descriptions of programs and input output formats (5 copies).
Two copies of source programs, for master and sign controller software, shall be provided on CD-ROM. An unrestricted license for software use by the Department shall be provided to the Engineer.
DMS vendor shall provide the communication protocol used between the DMS master controller and the DMS sign controller for use by the Department without any restrictions.

C. Final Documentation
Final documentation shall reflect all field changes and software modifications and shall be provided before installation. Final documentation shall be approved prior to final system acceptance has begun. This document shall include drawings of conduit layouts, cable diagrams, wiring lists, cabinet layouts, wiring diagrams and schematics for all elements of the communications system. This shall also include detailed drawings identifying by cable type, color-coded function, the routing of all conductors (pairs) in the communications system. Upon completion of the installation, the Contractor shall submit these plans, maps, and/or drawings to reflect an as built condition, incorporating all changes made during installation, such as in pair identification and routing.

27.0 Spare Parts Requirements
The Contractor shall provide additional parts to create two (2) additional character matrixes, tow (2) load modules to drive a character module, one (1) LED power supply, one complete sign controller unit and two (2) Lap Top maintenance units equal to the lap top units as defined in Article 3.15.3 with the delivery of each sign. The cost of additional parts/equipment shall be considered incidental to the price for each DMS.

28.0 DMS Training
Operational and maintenance training for the entire system shall be provided to designated personnel during installation, testing and debugging. This training shall be provided through practical demonstrations and other related technical procedures. Training shall be limited to a maximum of 15 people and shall be provided at a time and location approved by the Engineer. The training shall include, but not be limited to, the following:
Hands-on operation of all sign control hardware
Explanation of all system commands, their function and usage.
Insertion of data
Required preventative maintenance
Servicing procedures
System trouble-shooting or problem identification procedures

A minimum of 24 hours of instruction shall be provided for the operational and maintenance procedures for the system. The DMS vendor shall submit an agenda for the training and one complete set of training materials along with the qualification of proposed instructors to the Engineer for approval at least 30 days before the training is to begin. The Engineer will review material and approve or request changes. After approval, the vendor shall provide a minimum of 5 copies of the training material that will become the property of the Department after training period is over.

The DMS vendor shall record the entire training on DVDs and shall provide the recordings to the Engineer for later use. The training shall be conducted at District One Traffic Systems Center building where the control room is located, after the completion of all system integration tests. The schedule of training sessions shall be established by the DMS vendor, with the approval of the Engineer.

29.0 Warranty

The equipment and parts furnished for the DMS and DMS control system shall be new, of the latest model, fabricated under high quality standards.

Equipment and parts furnished for the DMS shall be warranted by the manufacturer to be free of defects in assembly or fabrication and materials for a minimum of five years from the date of acceptance and shall be warranted for quality of work for twelve months from the date of final acceptance. If component manufacturer's warranties are for a longer period, they shall apply. Any parts or equipment found to be defective during the warranty period shall, upon the concurrence of the defect by the manufacturer, be replaced free of charge.

The Engineer shall be furnished with a certification stating that the equipment, parts and material furnished for the DMS and DMS control system complies with all the provisions of this special provision. If there are any items which do not comply with this special provision, then a list of those exceptions shall be detailed on the certification.

All manufacturer's warranties and guarantees for the dynamic message sign system shall be transferred to the Department on the date of final acceptance.

30.0 Method of Measurement

The DMS Front Access, Full matrix, Color, NTCIP 1203 V2 shall be paid for at the contract unit price as each which cost shall include furnishing all labor, materials, documentation, warranties, tools and equipment to remove existing DMS and install, test, and make the location operational with the specified DMS Front Access, Full matrix, Color, NTCIP 1203 V2 in this pay item.

31.0 Basis of Payment

This work shall be paid for at the contract unit price each for DMS Front Access, Full matrix, Color, NTCIP 1203 V2 which price shall include furnishing and installing the DMS sign, documentation, warranties, spare parts, training, and diagnostic software as directed by the engineer.

SDM2 DMS BATTERIES (TELESPOT)

Description. This item shall consist of furnishing and installing a new lead acid battery, 12 volts, 7AH in an existing line matrix Telespot DMS. Included in this item is the removal and proper disposal of the existing 12 volt, 7AH lead acid battery.

It shall be the contractor's responsibility to verify the dimensions of the existing space to ensure the new battery will fit in the existing space.

Basis of Payment. This work shall be paid for at the contract unit price each for DMS Batteries (Telespot) and for which price shall be payment in full for all labor and materials necessary to complete the work as described above.

SDM3 DMS BATTERIES (SKYLINE)

Description. This item shall consist of furnishing and installing Nine (9) 12 volt, 105 AH valve regulated, sealed lead acid AGM batteries in an existing Battery Backup Unit (BBU). Included in this item is the removal and proper disposal of the existing lead acid batteries.

It shall be the contractor's responsibility to verify the dimensions and weight limitation of the existing shelves to ensure the new batteries will fit and not exceed the weight limits of the existing space.

Basis of Payment. This work shall be paid for at the contract unit price each for DMS Batteries (Skyline) and for which price shall be payment in full for all labor and materials necessary to complete the work as described above.

SE01 ELECTRIC SERVICE UPGRADE AND GROUNDING

Description. The Contractor shall perform the electric service and grounding modification as specified to surveillance locations as designated by the Engineer. (This work is for additional locations, over and above the 50 locations to be upgraded under routine maintenance).

Work Description. The contractor is responsible for scheduling the work and for coordinating with the engineer whenever Engineer-witness functions are required. The Contractors shall also advise the engineer when each location is complete and shall provide a written certification to that effect. The Engineer reserves the right to require a final inspection of the modification at any or all of the locations certified as complete. Should deficiencies be found upon inspection, a corrective work list will be prepared.

The surveillance installations being modified shall be kept operational at all times except as expressly allowed herein or otherwise permitted by the Engineer. The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost to the pay item. All cable, conduit, fittings and accessories shall be new. All materials and work shall be in conformance with the requirements of applicable contract specifications and article 250 of the National Electrical Code.

The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for reporting any account modifications arising from the work to the Engineer in a timely manner. Although it is anticipated that all service agreements and accounts will remain as-is, if new agreements are required, the Contractor shall facilitate coordination between the Electric Utility and the Engineer, with the Department to sign any appropriate new agreements.

The work will generally include:
Replacement of the electric service entrance equipment and cables
New grounding of the service
New feeder conductors from the service disconnect to the controller cabinet
Cabinet grounding modifications
Supplementary ground electrodes at handholes
Extension of equipment ground wires to all poles, posts, handholes, etc.
Bonding of equipment ground to all exposed metal parts
Testing and documentation

Replace Electric Service Entrance
The work shall include the removal of the existing service disconnecting means and the service conductors and shall include the furnishing and installing a new pole-mounted or pedestal-mounted service disconnecting means and new service conductors, based on the manner of the existing service. The new electric service disconnect, cables and the service connection shall be in accordance with details included herein. Unless otherwise indicated, the pole-mounted electric service box provided for these installations shall be Type B1 (equipped for 240/120 V. – 2 W service), shown in Figure L-3A, Volume 1, Article 7, page 20, unless specified otherwise by the Engineer to meet special requirements of certain locations.

Provide New System Ground of Electric Service
The work shall include the installation of a new system ground, connected to the ground bar of the service disconnect, using one or more ground rod grounding electrodes, or other means approved by the Engineer. The system ground shall have a resistance to earth not to exceed 10 ohms without connection to the

additional electrodes established at poles or other points at the surveillance/CMS signal location. The system ground resistance shall be verified by a contractor test, using the fall-of potential method and witnessed and approved by the engineer, with a record of the test entered by the Contractor and signed by the Contractor and the Engineer. Should more than one electrode be required to establish a low enough resistance, additional electrodes shall be connected to the grid, with re-testing. All ground electrode connections shall be exothermically welded. Ground rods and grounding electrode conductors shall be as specified and detailed.

The service grounded circuit conductor (which may or may not be a system neutral) shall be bonded to the system ground at the service disconnect and shall be isolated from ground throughout the remainder of the electrical distribution.

Extend New Conductors to Controller

A new ground terminal bar shall be installed at the surveillance cabinet and this bar shall be bonded to the cabinet enclosure. The work shall include the replacement of the existing feeder and the extension of new feeder conductors from the service disconnect to the surveillance cabinet. The cable will be a multi-conductor jacketed cable as specified and it shall include a green-insulated ground wire to bond the service ground bar to the controller cabinet ground bar. The Contractor shall confirm the integrity of the existing feeder conduit run, and shall clean the run before installing the new feeder. If the size of the conduit is demonstrated to be inadequate for the new feeder cable or if it is demonstrated as not re-usable for some other reason and no other alternative is feasible, the contractor shall use a new feeder conduit run, as part of this pay item, with all cable work remaining as the Contractor's responsibility at no additional cost to the pay item.

Cabinet Grounding Modifications

The Contractor shall confirm the presence of a terminal bar, with suitable terminals, for the grounded circuit conductor (white wire) at the controller cabinet and shall assure isolation of this bar from the cabinet enclosure and other grounded parts. If the existing bar is inadequate or is not isolated properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items. Similarly, the Contractor shall confirm the presence of a ground bar, with suitable terminals, which is bonded to the cabinet enclosure and grounded metal parts. If the existing ground bar is inadequate or is not bonded properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items.

Extension of Equipment Ground

The Contractor shall extend an equipment ground conductor from the ground bar in the controller cabinet to distributed elements of the system, bonding the equipment ground conductor to all handhole frames, metal poles and other enclosures, metal conduit, etc., including any existing supplemental ground rods that may be in place. The Contractor shall assure that good equipment ground continuity and a low-impedance ground return path is established throughout for all exposed metal parts of the installation.

It is not the intent of this work item to require re-cabling of the surveillance load equipment to achieve grounding. In all cases, a green-insulated ground conductor shall be used whenever possible, and only if conduit space will not accommodate an insulated conductor will a bare conductor be allowed. A common conductor may be employed for multiple load circuit cables in a given conduit, but an equipment ground conductor shall be run with or shall encircle each set of circuit conductors extended from the controller cabinet.

Recognizing the intent to leave existing conductors in place and operations, the contractor may chose from among identified and prioritized acceptable alternative to affect the grounding modifications:

If an existing conduit will accommodate the installation of a ground wire, the ground wire shall be installed within the conduit with the circuit conductors. Existing conductors should only be withdrawn from a conduit run to facilitate pulling of the ground wire if absolutely necessary.

If an existing metal conduit will not accommodate the required ground wire, and if the Contractor can identify end-to-end electrical continuity of the conduit, the Contractor may bond to the conduit externally in an approved manner to establish ground continuity, thus using the metal conduit as the equipment ground conductor.

If a given conduit run is demonstrated to be damaged and electrically discontinuous in the presence of the Engineer, and if no other alternative is feasible, the Engineer will authorize a new conduit run, to be paid under separate pay item, with all cable installation to remain part of the grounding modification work at no additional cost to the pay item. When a new conduit is installed, an insulated ground conductor must be installed within, together with the circuit conductors, regardless of the ground continuity of the new conduit, and the new conduit shall be appropriately bonded to the equipment ground.

Bonding
The Contractor shall establish equipment ground bonding to the cover frame of every handhole with an approved connection. The contractor shall establish equipment ground bonding at every metal pole, post or other enclosure or device, also with an approved connecting. At poles or post bases, it may be possible to install washers, lugs, and extra nuts where extra anchor bolt protrusion allows it. Otherwise, poles may be drilled and tapped and fitted with appropriate ground lugs. Connections at poles and other enclosures shall be pigtailed from splices whenever more than one ground conductor is connected so that ground continuity is not dependent upon ground lug connection. Splices of ground conductors (in lieu of exothermic weld connectors) will be permitted at poles an other such connection point above grade, with splices to be made using suitable copper crimp sleeves and heat-shrink insulated caps as specified.

Testing and Documentation
As noted above, the system ground resistance to earth shall be tested, in isolation from equipment ground extensions from that point. Testing shall be performed by the Contractor using the fall-of-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the farthest point of each circuit extension from the controller cabinet. Results shall be recorded by the contractor and witnessed by the Engineer.

Method of Measurement. Each additional surveillance grounding and service upgrade performed as specified and inspection report submitted and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the Contract unit price each for ELECTRICAL SERVICE UPGRADE AND GROUNDING, which shall be payment in full for the work described herein.

SE02 ELECTRICAL CABLE IN CONDUIT, 4C/ NO. 18 SHIELDED LOOP DETECTOR

Description. This work shall consist of furnishing materials and labor for installation of shielded loop detector cables in conduit as specified herein and indicated by the Engineer, complete with all identification, terminating and testing.

Materials.

General

Lead-ins shall be Conoga 30003 or equal cable. The jacket of high density polyethylene shall be rated to 600 volts in accordance with UL 83 Section 36.

All cables shall be UL listed.

Unless otherwise indicated all cable shall be rated 600 volts.

The cable shall be rated 90 degrees C. dry and 75 degrees C. wet and shall be suitable for installation in wet and dry locations, exposed to the weather, and shall be resistant to oils and chemicals.

The UL listing mark, cable voltage, insulation type and ratings, as well as the cable size shall all be clearly printed on the cable in a color contrasting with the insulation color.

Conductors:

Conductors shall be #18 awg 7X.0152" un-coated copper.

Conductors shall meet the requirements of ASTM Designation B-8 as applicable.

Unless otherwise indicated, all conductors shall be stranded and twisted 4 turns per foot.

The cable shall be an assembly of pairs of left hand lay twisted insulated conductors, with a core filled with a petroleum base flooding compound, overlapped conductive tape shield and a black high density polyethylene jacket overall. This cable shall meet the requirements of IEEE Standard 383.

Insulation:

The conductors shall be coded as follows: black-red-white-green

Cable insulation shall incorporate polyvinyl chloride (PVC) with a clear nylon covering overall as specified and the insulation shall meet or exceed the requirements of ICEA S-61-402, NEMA Standard Publication No. WC-5, UL Standard 83, as applicable.

Unless otherwise indicated, cable conductors shall be solid full color coded via insulation color.

Quality Control:

Submittal information shall include demonstration of compliance with all specified requirements.

All cables shall be delivered to the site in full reels. Cable on the reels shall be protected from damage during shipment and handling by wood lagging or other means acceptable to the Engineer. Reels shall be tagged or otherwise identified to show the UL listing.

Installation. The loop lead-in shall be a Canoga 30003 or equal cable. The loop lead-in shall be barrel sleeved, crimped, soldered and protected by heat shrinkable tubing to the loop #14 wire. Lead-ins shall be twisted in such a manner so as to prevent mechanical movement between the individual cables. Lead-ins shall be brought into a cabinet or handhole at the time the induction loop is placed in the pavement. Loops located over 1000 feet from cabinet require four (4) turns of No. 14 wire.

Lead-in cable Canoga 30003 or equivalent will be installed where the lead in length from point of interception to the point of termination exceeds 150 feet.

Where lead in runs are less than 150 feet the loop wire will be utilized as lead in to the point of termination w/o splices, being twisted 5 turns per foot. The loop wire will be paid for as "lead in" from last point of sawcut in pavement at dive hole to point of termination.

Loop lead-ins placed in handholes shall be coiled, taped and hung from the side of the handhole to protect against water damage. Any other method of installation will require prior written approval of the Engineer. Each loop lead-in shall be color coded and tagged in each handhole through which it passes. The loop lead-in shall be color coded and tagged at the core hole, in each junction box it passes through and at the termination point in the cabinet.

TRAFFIC SYSTEMS CENTER LOOP SPLICING REQUIREMENT

MAINLINE LOOPS				METERING LOOPS	
Lane 1	Blue	Lane 4	Violet	Loop 1	Green
Lane 2	Brown	Exit	Black	Loop 2	Yellow
Lane 3	Orange	Entrance		White	Loop 3 Red

When 2 or 3 loops are installed on an exit or entrance ramp the loop color code shall conform to the mainline loop color code and shall be marked as entrance or exit ramp loops.

In addition to color codes each loop shall be identified with a written label attached to the loop wire, or lead-in wire. The tags shall be Panduit #MP250W175-C or equivalent. All wires and cables shall be identified in each handhole or cabinet the cable passes through, or terminates in. The labels shall be attached to the cable by use of two cable ties.

Testing. After installation, the cable shall be tested as approved by the Engineer. Cable failing to pass the test shall be replaced with new cable at no additional cost.
Pay Item SE1 Continued:

Method of Measurement. The cable shall be measured for payment in linear foot in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment. A total of six (6) feet of slack shall be allowed for the end of a run terminating at a panel and four (4) feet will similarly be allowed when terminating at a wall-mounted panel. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This work shall be paid at the Contract unit price per linear foot furnish and installed for ELECTRICAL CABLE IN CONDUIT, 4/C NO. 18 SHIELDED LOOP DETECTOR

SEC1 ETHERNET MEDIA CONVERTER

Description. The Contractor shall furnish and install a field hardened Ethernet Media Converter, copper to fiber, at a Surveillance or DMS cabinet as shown on the plans or directed by the Engineer. The Ethernet media converter shall be equal to or exceed Rugged Com Rugged RMC part number RMC-HI-TXFXSM. The contractor shall supply a match pair to connect devices which are 200 feet or more from the nearest Ethernet Managed Switch. The contractor shall supply the Ethernet cat 5e patch cords as necessary to connect the field device to the Ethernet media converter and to the Ethernet managed switch.

Basis of Payment. This work shall be paid for at the contract unit price each for Ethernet Media Converter and for which price shall be payment in full for all the labor and materials required to complete this work as described herein.

SES1 ETHERNET MANAGED SWITCH

Description. The Contractor shall furnish and install a field hardened Ethernet Managed Switch at a DMS or Surveillance cabinet as shown on the plans or as directed by the Engineer.

General Requirements. The Ethernet switch shall be an environmentally hardened Ethernet switch compliant with IEEE 802.3 (1-Mbps) and IEEE 802.3u (100 Mbps) as manufactured by RuggedCom, Series RS900 or approved equal.

Operating Environment. The Ethernet switch shall be capable of operating properly over an ambient temperature range of -40ºC to +85ºC without the use of internal or external cooling fans in accordance with IEC 60068-2-1 and 60068-2-2. The Ethernet switch shall be capable of operating properly in relative humidity conditions of 95% non-condensing at 55ºC in accordance with IEC 60068-2-30. The Ethernet switch shall meet the environmental requirements of traffic control equipment in accordance with NEMA TS 2 (1998), Section 2: Environmental Requirements. Specifically NEMA TS 2 1998 (Section 2.2.8)
Vibration in each of the 3 mutually perpendicular planes.
Vibration frequency sweep of 5 to 30 Hz
Vibration strength = 0.5g
Duration = 3 hours, 1 hour at each plane

The Manufacturer shall provide evidence of independent testing verifying performance. In general, the Ethernet Switch shall comply with the environmental requirements outlined in Table 1. The Ethernet switch shall be capable of operating properly when exposed to radiated electric fields of up to 10 V/m continuously and magnetic fields of up to 40 A/m continuously. In general, the Ethernet switch shall comply with the EMI Immunity requirements given in IEC 61850-3 and IEEE1613. The Ethernet switch shall also pass the minimum EMC immunity requirements of EN61800-3. EN61800-3 A11 is the IEC standard for EMC emissions and immunity requirements for Adjustable Speed Power Drive Systems.

Port Requirements. The Ethernet switch shall have 8 - 10/100Base TX ports, 2 – 100Base X fiber optic ports. All fiber optic link ports shall be capable of Multimode or Single mode. The Ethernet switch shall have the option of both small form pluggable (SFP) optics and fixed (soldered on) optics. Single mode optics shall support distances up to 70km. The Ethernet switch shall support the following requirements and options:

10/100Base TX ports:
RJ45 connectors
Cable type: Category 5, unshielded twisted pair (CAT 5 UTP)
Segment Length: 100m
Auto-negotiation support (10/100Mbps)
Auto MDIX crossover capability
TVS (Transient Voltage Suppression) between Line +/-, Line+/- ground, to protect the circuitry
Full Duplex operation (IEEE 802.3x)

100 Base X Fiber Optic ports:
SFP
St connectors Single mode
Optical Characteristics 1310 nm Single mode, 1550 nm Single mode
Support fiber type 9/125um Single mode fiber

Optical budget single mode fiber: min. 34.5db @ 1310nm
Full duplex operation (IEE802.3x)

Networking Requirements. The Ethernet switch shall support automatic address learning of up to 8192 MAC addresses. The Ethernet switch shall support the following advanced layer 2 functions:
IEEE 802.1Q VLAN, with support for up to 255 VLANs and 4096 VLAN ID's.
IEEE 802.1 p priority queuing
IEEE 802.1w rapid spanning tree
IEEE 802.1Q-2005 MSTP (formerly 802.1s)
IEEE 802.1Q-2005 standard GMRP
IEEE 802.3x flow control
IEEE 802.3ad-Link Aggregation
IGMPv2 with 256 IGMP groups
Port Rate Limiting
Configuration via test file which can be modified through standard text editor
Forwarding/filtering rate shall be 14,880 packets per second (PPS) for 10 Mps, 148,800 for 100Mps, 1,488,000 for 1000 Mps
DHCP Option 82

Network Management Functionality Requirements. The Ethernet switch shall provide the following network management functions**:**
SNMPv2, SNMPv3
RMON
GVRP
Port Mirroring
802.1x port security
SSL – Secure Socket Layer
SSH – Secure Shell
TFTP
Network Time Protocol (SNTP)
Simple Network Time Protocol (SNTP)
Management via web or Telnet
Built in Protocol analyzer which enables traces to be run from within the Ethernet switch operating system. Must be able to forward traces to an IP address or UDP port

Traces for must include but not be limited to the following: STP, MAC, Link, IGMP, GVRP, PPP, Transport, DHCPRA, 802.1X, WEBS, SNMP, IP, TacPlus, Radius, FORW, IPASSIGN, TRANSPORT

Additionally, the Ethernet switch shall demonstrate to provide sub 15 ms failover per Ethernet switch hop in a ring topology.

Programmable Critical Failure Relay. The Ethernet switch shall provide a programmable critical failure out relay that may be configured to activate upon critical error detection such as loss of link or detection of critical system errors. This function shall be user enabled and programmable. The output contacts shall be available in a Form-C configuration with Max Current at 2A@250 VAC, .15A@125VDC, 2 @20VDC.

Power Supply Requirements. The Ethernet switch shall be supplied with provisions for operation at the following power supply inputs, 85 to 264 VAC (50/60Hz). The power supply shall be internal to the Ethernet switch. Power supply shall have two stage isolation accomplished via two transformers which step down from primary AC/DC to VDC. A power cord of not less than 5 feet in length shall be supplied as well. The Ethernet switch shall require no more than 15W of power.

'Hipot' Testing in the field. The Ethernet switch shall allow for dielectric strength ('hipot') tests in the field, in accordance with IEC 60255-5, by trained personnel. It shall be capable of enduring a test voltage of at least 2kVrms on power supply inputs above 60V and 0.5kVrms on power supply inputs below 60V. A removable grounding wire shall be provided to allow disconnecting of any transient suppression circuitry at the power supply input to allow for 'hipot' testing without activating the transient suppression circuitry.
Mounting Requirement. The Ethernet switch shall provide options for DIN Rail mounting or panel mounting via brackets.

Warranty. The Ethernet switch shall be warranted for defects in material and workmanship for five (5) years after shipment. The Warranty shall include software updates and 7 x 24 phone support for the 5 year warranty period.

Environmental Requirements. The Ethernet switch shall comply with the atmospheric, vibration, shock and bump requirements outlined in Table 1. This compliance shall be demonstrated by type withstands tests (i.e. 'type tests') as outlined in Table 1 and summarized in a Type Test Report per the test report requirements of each of the standards given in Table 1.

Table 1: Environmental Tests

Test	Description		Test Level	Severity
IEC 60068-2-1	Cold Temp	Test Ad	-40ºC, 16 hours	N/A
IEC 60068-2-2	Dry Heat	Test Bd	+85ºC, 16 hours	N/A
IEC 60068-2-30	Humidity	Test Db	95% (non condensing), 55 deg. C, 6 cycles	N/A
IEC 60255-21-1	Vibration	Test Fc		Class 1
IEC 60255-21-2	Shock	Test Ea.		Class 1
IEC 60255-21-2	Bump	Test Eb		Class 1

Safety Requirements/Agency Approvals. The Ethernet switch shall comply with the following electrical safety requirements or equivalents: UL 60950 or CSA C22.2 No. 60950 (safety requirements for IT equipment). The Ethernet switch shall also have CE (Europe) qualification. The Ethernet switch shall also comply with FCC Par 15 Class A for EMI emissions.

Method of Measurement. The Ethernet Managed Switch shall be measured each for payment when furnished, installed, configured, warranted, made fully operational, and tested as detailed herein.

Basis of Payment. This work will be paid for at the contract price, each, for **ETHERNET MANAGED SWITCH**, of the type specified, which shall be for the work as specified herein

SF01 CONCRETE FOUNDATION, REBUILD/MODIFY, TYPE D

Description. This item shall consist of the partial removal of an existing Type "D" Foundation at the location on the plans or as directed by the Surveillance Engineer. The existing foundation shall be removed to a depth of at least 0.3048m (twelve inches) below finished grade. The disposal of the concrete debris outside of the right-of-way shall be included in this Item. The existing conduit shall remain in place and shall be carefully protected. The existing conduit shall be extended up into the newly capped foundation. The foundation shall be extended 24" above the finish grade or as directed by the Engineer.

Installation. Upon completion of the above work, holes for steel dowels of the size indicated shall be drilled in the remaining concrete where indicated on the drawings.

The adjacent area shall be excavated and formed with anchor bolts and new conduit stubs to provide a concrete foundation for a Type II, Type IV or existing cabinet's bolt pattern as per the current Highway Standard, "Concrete Foundation Details". The Contractor shall follow the recommendations of the manufacturer, subject to approval of the Engineer.

The Contractor shall provide a 36' x 48" x 5" P.C.C. apron sidewalk on the side of the access door to the controller to facilitate servicing the controller.

Anchor bolts shall be new and shall meet all the requirements of sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for CONCRETE FOUNDATION REBUILD/MODIFY, TYPE D, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings. The removal of the existing controller shall be included in this pay item, as well as the pulling and reinstalling of the existing cable from conduit.

SI01 INSPECTION, AUTOMATIC SUPPRESSION SYSTEM

This item shall consist of scheduling a semi-annual inspection, functional test, and certification of the Automatic Suppression Alarm System located at the Traffic Systems Center.

All work shall be performed by a trained and certified fire alarm technician twice during each contract year in accordance with the manufactures recommendations, local code and national code.
The following procedure minimum shall be conducted during each inspection;

1. clean smoke detectors
2. calibration of smoke detectors
3. actual alarming of detectors and manual pull stations
4. check control panel electrical wiring for grounds and shorts
5. check control panel battery standby and charger
6. check alarm devices such as bells and horns
7. check Halon storage tanks weight and pressure
8. Test interlocking equipment for shut down
9. check other specialized components as needed
10. submit written reports to purchaser with recommendations for corrections, additions, deletions, or other changes to the system.

Basis of Payment. This item shall be paid at the contract unit price each for INSPECTION, AUTOMATIC SUPPRESSION SYSTEM, which price be payment in full for all work described herein and as directed by the Engineer.

SS01 8" LED SIGNAL HEAD, 1 FACE

Description. This items shall conform with Section 880 of the Standard Specifications for Road and Bridge Construction and Vehicle Traffic Control Signal Heads- Light Emitting Diode (LED) Circular Signal Supplement June27, 2005 and except as revised herein. All traffic signal sections shall have eight (8) inch modules unless otherwise stated on the plans or directed by the signal engineer. Existing signal

head(s) at locations where a new signal head, face(s) or section(s) are installed, the removal of an existing signal head, face(s) or section(s) shall be incidental to this item. Mounting hardware will not be paid separately but shall be included in the cost of this item. The basis of payment is each for furnishing and installing the signal section head complete.

Basis of Payment. This work shall be paid at the contract unit price each for 8" LED Signal Head, 1 Face as described above, which price shall be payment in full for all work as described herein and as directed by the Engineer.

SS03 SIGNALING LOAD RELAY, MECHANICAL

Description. This item shall consist of furnishing and installing a signal load relay, mechanical state, in a surveillance cabinet.

This item shall consist of furnishing and installing a Signal Load Relay-Mechanical type mated with Cinch series 2400 socket.

The load relay shall be able to switch 20 amperes for industrial use in multiple configuration and 30 amperes in multi-pole configuration at 120 VAC or 240 VAC, in a dust covered Jones plug. Relay shall be double pole, double throw.

The load relay shall have a mechanical life in excess of 5 million operations and shall be a Midtex type 136 or equal.

Ramp metering cabinet shall have a signal load relay installed. The signal load relay shall consist of two components, a base which is mounted on the E.S.P. Type 3 cabinet wall and a signal load relay which plugs into and is secured to the base by a locking screw. The coil of this relay shall be connected to the mark output of the signal change tone receiver. The one set of contracts of the load relay shall be used to change the ramp signals and one set of contacts shall be used to key the mark input to the signal change transmitter.

Basis of Payment. This work shall be paid at the contract unit price each for SIGNALING LOAD RELAY, MECHANICAL, which price shall be payment in full for all work as described herein and as directed by the Engineer.

SSP1 SURGE PROTECTOR

Description. This item shall consist of furnishing a surge protector overvoltage protection, with LED indicator for the 120 volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of -40C to +85C. The surge protector shall be UL 1449 listed.

Basis of Payment. This item shall be paid at the contract unit price each for SURGE PROTECTOR, which price shall be payment in full for the item as described herein and as approved by the Engineer.

ST01 TELCO SUPPRESSION

Description. This item shall consist of furnishing and installing a 66 block, silicon avalanche diode technology, transient voltage surge suppression on Telco T-1 and E-1 data lines at Communication Cross Connects, Comm Huts, or at Traffic Systems Center.

The transient voltage surge suppression shall employ silicon avalanche diode (SAD) technology which is non degrading, fast clamping, clip on with a single bus to ground to allow multiple modules to be placed in series for a quick installation.

Max operating voltage	17Vpk
Clamping voltage	20Vpk
Max operating frequency	20Mhz
Peak pulse power dissipation	15joules
Response time	<5nsec
Protection mode	Tip to Ring
	Tip to Ground
	Ground to Tip

Basis of Payment. This work shall be paid for at the contract unit price each, for TELCO SUPPRESSION, which shall be payment in full for all work described herein and as directed by the Engineer.

ST02 TELECOMMUNICATION CABLE INLINE CONNECTORS AND TERMINATION

Description. This item shall consist of furnishing and installing U1B inline connectors and U1Y bridging inline connectors in a junction box type "J" in the expressway median barrier wall as directed, in writing, by the Engineer.

Installation. There is an existing 100C-No. 19 telecommunication cable in the expressway median barrier wall. This cable is "spliced" in junction box type "J" at each surveillance installation and every 1500 feet in the barrier wall. In the junction box type "J" the Contractor shall remove the existing S66 telephone type terminal blocks and the Plate bracket. The Contractor shall re-terminate the 100C-No. 19 cable the installation incoming 6C-No. 19 cable with Scotchlok Brand U1B inline, sealed, moisture resistant four wire (1 full pair) connector for solid copper (16-19 AWG) cable. The 100 C-No. 19 cable shall be joined bundle for bundle, cable pair or cable pair in the junction box type "J" with the U1B and U1Y connectors. A special crimping tool shall be required for installing the Scotchlok inline connectors. All cabling shall be tied and placed in the "J" box in a neat workmanlike manner. The Contractor shall clean the interior of the "J" box ensuring it is free of debris, water and any corrosion. The Contractor shall ensure that the shielding of both incoming cables are properly bonded together with 10 AWG wire and stainless steel clamps. Contractor shall be responsible for the cost of any and all expressway lane and/or shoulder closures required to complete the work in the median barrier wall. Miscellaneous hardware shall not be paid separately but considered as incidental to the cost of this item.

Basis of Payment. This work shall be paid at the contract unit price each, TELECOMMUNICATION CABLE INLINE CONNECTORS AND TERMINATION, which payment will be paid in full for all the work described herein.

ST03 TELECOMMUNICATION CABLE - NO. 19/3 PAIR

Description. This item shall consist of furnishing and installing telephone cable intended for direct burial in P-duct or G.S. conduit. The number of conductors shall be twisted into pairs stranded into a cable core and enclosed in two polyethylene jackets, with a copper shield between the inner and outer jackets.

All No. 19 electric cable shall conform with these specifications and the current addition of the Rural Electrification Specification for fully color-coded, polyethylene or crystalline propylene/ethylene copolymer-insulated, double polyethylene copolymer-insulated, double polyethylene-jacketed telephone cables for direct burial PE 54. The No. 19 cables shall be installed in complete spans.

Material and Testing. No. 19 electric cable shall meet the requirement set forth in the REA Specification PE 54.

Conductors. Each conductor shall be a solid round wire of commercially pure annealed copper. Conductors shall meet the requirements of ASTM Designation B-3, latest issue, except that the requirements for dimensions and permissible variations are waived.

Conductor Insulation. Each conductor shall be insulated with colored insulating grade high density polyethylene or crystalline propylene/ethylene copolymer. The manufacturer shall have the option of using either of the above materials.

Identification of Pairs. The polyethylene or propylene copolymer compounds used for conductor insulation shall be colored so as to identify (1) the "tip" and "ring" conductor of each pair, and (2) each pair in the completed cable.

Standards of Color. The colors of insulated conductors supplied in accordance with this specification shall fall within the limits of standards of color as defined by the Munsell Color Notations specified in paragraph 4.031.

Twisting of Pairs. The insulated conductors shall be twisted into pairs.

In order to provide sufficiently high crosstalk losses at voice and carrier frequencies, the pair twists shall be designed to enable the cable to meet the pair-to-pair capacitance unbalance requirements and the crosstalk requirements.

Core Covering. The core shall consist of an inner jacket of polyethylene applied over the completed core, a metal shield, and an outer jacket of polyethylene.

Shield. A gopher-resistant corrugated shield of fully annealed copper shall be applied longitudinally over the inner jacket. The shield shall completely cover the inner jacket and shall be so constructed that the completed cable shall meet the bending requirements given in paragraph 9 of Rural Electrification Specification PE-54. The shield shall provide 100% electrical shielding plus resistance to gopher attack or other severe service conditions.

Mutual Capacitance. The average mutual capacitance of all pairs in any reel shall be in accordance with the following table:

Number of Cable Pairs	Average Mutual Capacitance mf/mile (mf/km)
3	0.083 plus or minus 0.010 (0.052 plus or minus 0.006)
6, 12	0.083 plus or minus 0.007 (0.052 plus or minus 0.004)
18 or more	0.083 plus or minus 0.004 (0.052 plus or minus 0.002)

Mutual capacitance is the effective capacitance between the two wires of a pair.

Capacitance Unbalance: (Pair to Pair): Pair-to-pair capacitance unbalances as measured on the completed cable at a frequency of 1000 plus or minus 100 Hz shall not exceed the following values:

Number of Cable Pairs	Pair-to-Pair Capacitance Unbalance (Max) mmf/kf (mmf/km) Max. Individual
Less than 12	100 (181.1)

Capacitance Unbalance - (Crosstalk Loss): The r.m.s. output-to-output far-end crosstalk loss as measured on the completed cable at a frequency of 150 kHz shall be not less than 73 db per 1,000 feet (67.8 db per kilometer) for cable sizes of 6 pairs and larger. The r.m.s. calculation shall be based on the combined total of all adjacent and alternate pair combinations within the same layer and center to first layer pair combinations.

Capacitance Unbalance - (Pair to Shield): Pair-to-shield direct capacitance unbalances as measured on the completed cable at a frequency of 1000 plus or minus 100 Hz shall not exceed the following values:

Number of Cable Pairs	Pair-to-Shield Capacitance Unbalance (Max) mmf/kf (mmf/km) Max. Individual
Less than 12	250 (820)

Conductor Resistance. The DC. resistance of any conductor as measured on the completed cable shall not exceed the following values when measured at or corrected to 20° C.

AWG	Maximum Resistance ohms/kf (ohms/km)
19	8.7 (28.5)

Basis of Payment. This work will be paid for at the contract price per lineal foot for TELECOMMUNICATION CABLE - NO. 19/3 PAIR of the number of conductors specified, which price or prices shall be payment in full for furnishing all materials, making all electrical connection and installing the cable in place.

ST04 TELECOMMUNICATION CABLE- NO. 19/25 PAIR

Description. It is the intent of this specification that a continuous communication cable be installed on the Expressway and be connected to the Traffic Systems Center. All surveillance installations along the Expressway will be connected to this cable which shall be connected to the Traffic Systems Center building approximately East Avenue and the Eisenhower Expressway. This item shall consist of furnishing and installing a 25 pair No. 19 gauge wire, telephone type cable, with all necessary connection blocks, binding posts, connections and all necessary miscellaneous hardware. The 25 pair No. 19 cable shall conform with these specifications and the current edition of The Rural Electrification Specification (REA) PE-39.

Material & Construction. The #19 telecommunication cable shall meet the requirements set forth in the REA Specification PE-39. Shielding shall be fully annealed solid copper. Shielding between cables shall be bonded together by a #10 AWG copper wire and stainless steel clamps.

Testing. Once the telecommunications cable is installed the Contractor in the presence of the TSC Engineer shall test the cable. The type of test performed shall be an end to end test with Halcyon type equipment transmitting and receiving at each end of the cable. Each pair shall be tested and the results shall be recorded and submitted to the Engineer. If any results don't fall within the requirements set forth in (REA) PE-39, the Contractor shall correct and re-test that cable pair. Traffic Systems will tolerate only one pair out of every 100 pair of cable that doesn't meet or exceed specifications set forth in (REA) PE-39.

Installation Details. The telecommunication cable shall be installed in the median barrier wall where a 4-inch P.V.C. duct shall be provided for its installation. The Contractor shall insure that the telecommunication duct is continuous, free of debris and not connected to the electrical lighting cable duct.

"Junction boxes" or cross connect terminals shall be installed in or at the median barrier wall at every Surveillance installation, as shown on the plans, and every 1500 feet. The cable shall be continuous between runs. No splices will be allowed in the cable. Should it not be possible to run the cable continuous between surveillance installation, the interconnection of the cable will be allowed in the "junction box" with U1B/U1Y connectors or equal. These "splices" shall be held to a minimum and maximum cable lengths shall be used to reduce the number connections.

The cables shall be terminated in a Surveillance installation cabinet as shown on the plan. The cables shall be connected on a type 66 connector block which shall be mounted in the cabinet. The Surveillance installation shall be connected to the appropriate cable pair on the 66 blocks with a 6C-No. 19 cable. Two (2) type 66 connecting blocks shall be required per 50 pair cable installation; four (4) type 66 connecting blocks shall be required per 100 pair cable installation.

The type 66 quick connect terminal blocks shall be furnished with tin lead plated clips manufactured to Western Electric Specification #669A. There shall be eight spring clips, which are electrically and mechanically common to each other, to a row and 25 rows of spring clips. The type 66 connecting block shall be 13-5/16 x 3-3/8 x 1-1/8. The block shall be molded of self extinguishing material and shall have molded in fanning strips on each side which shall be marked every five rows. The top

of the block shall be lettered by rows (A-B-C etc.) and the retaining plate shall be numbered every other row and lettered on the top to correspond to the face of the block. The Contractor shall insure that none of the spring clip rows are shorted together or shorted to the junction box or cabinet. The Contractor shall supply the type 66 block with high impact PVC, transparent snap on protective covers. The Contractor shall spray the spring clips with a protective coating after all wires are terminated. A punch down impact tool will be required to make the connection to the type 66 block. The punch down, impact tool shall be equal to or exceed the Harris Dracon DELUX Automatic Impact Tool D814 for Type 66 blocks only.

When installing the tele-communication cable, the Contractor shall extend his installation and connection of the cable to the next adjacent surveillance installation or "junction box" beyond the limits of his contract section. He shall be responsible for insuring that the cable is continuous and connected from one contract section to the other.

Basis of Payment. This work shall be paid at the contract price per lineal foot for TELECOMMUNICATIONS CABLE - NO. 19/25 PAIR which price shall be payment in full for furnishing all materials, making all electrical connections and installing the cable complete in place.

Connecting blocks, terminal blocks, wiring, mounting brackets, U1B/U1Y connectors, and miscellaneous hardware will not be paid separately, but shall be considered as incidental to the cost of this item.

ST05 TELECOMMUNICATION CABLE, INSTALL ONLY

Description. This item shall consist of retrieving from the State's storage facility, installing and testing telecommunication cable of the type and size specified. There are several sizes of cable at the State's storage facility: 25 pair, 50 pair, and 100 pair No. 19.

Material and Construction. The #19 telecommunication cable shall meet the requirements set forth in the REA Specification PE-39. Shielding shall be fully annealed and solid copper. Shielding between cables shall be bonded together by a #10 AWG copper wire and stainless steel clamps.

Testing. Once the telecommunications cable is installed, the Contractor (in the presence of the TSC Engineer) shall test the cable. The type of test performed shall be an end to end test with Halcyon type of equipment transmitting and receiving at each end of the cable. Each pair shall be tested and the results shall be recorded and submitted to the Engineer. If any results don't fall within the requirement set forth in (REA) PE-39, the Contractor shall correct and re-test that cable pair.

Installation Details. The telecommunication cable shall be installed in the median barrier wall where a 4-inch P.V.C. duct shall be provided for its installation. The Contractor shall insure that the telecommunication duct is continuous, free of debris and not connected to the electrical lighting cable duct.

"Junction boxes" or cross connect terminals shall be installed in or at the median barrier wall at every surveillance installation, as shown on the plans, and every 1500 feet. The cable shall be continuous between runs. No splices will be allowed in the cable. Should it not be possible to run the cable continuous between surveillance installations, the interconnection of the cable will be allowed in the "junction box" with U1B/U1Y connectors or equal. These "splices" shall be held to a minimum and maximum cable lengths shall be used to reduce the number of connections.

The cables shall be terminated in a surveillance installation cabinet as shown on the plan. The cables shall be connected on a type 66 connector block which shall be mounted in the cabinet. The surveillance installation shall be connected to the appropriate cable pair on the 66 blocks with a 6C-No. 19 cable. Two (2) type 66 connecting blocks shall be required per 50 cable installation.

The type 66 quick connect terminal blocks shall be furnished with tin lead plated clips manufactured to Western Electric Specification #669A. There shall be eight spring clips, which are electrically and mechanically common to each other, to a row and 50 rows of spring clips. The type 66 connecting block shall be 13-5/16 x 3-3/8 x 1-1/8. The block shall be molded of self extinguishing material and shall have molded in fanning strips on each side which shall be marked every five rows. The top of the block shall be lettered by rows (A-B-C) etc. and the retaining plate shall be numbered every other row and lettered on the top to correspond to the face of the block. The Contractor shall insure that one of the spring clip rows are shorted together or shorted to the junction box of cabinet. The Contractor shall supply the type 66 block with high impact PVC, transparent snap-on protective covers. The Contractor shall spray the spring clips with a protective coating after all wires are terminated. A punch down impact tool will be required to make the connection to the type 66 block. The punch down, impact tool shall be equal to or exceed the Harris Dracon DELUX Automatic Impact Tool D814 for type 66 blocks only.

When installing the telecommunication cable, the Contractor shall extend his installation and connection of the cable to the next adjacent surveillance installation or 'junction box" beyond the limits of his contract section. He shall be responsible for insuring that the cable is continuous and connected from one contract section to the other.

Basis of Payment. This work shall be paid at the contract price per lineal foot for Telecommunications Cable, Install Only which price shall be payment in full for furnishing all materials, making all electrical connections and installing the cable complete in place.

Connecting blocks, terminal blocks, wiring mounting brackets, U1B/U1Y connectors, and miscellaneous hardware will not be paid separately, but shall be considered as incidental to the cost of this item.

STN1 TONE POWER SUPPLY

Description. Under this item, for a unit price each as shown in the schedule of prices, and when directed by the Engineer in writing, the Contractor shall furnish a power supply (QEI Model P 21 or equivalent) in strict accordance with supplement and specified herein.

The power supply shall operate on input voltage of 117 VAC allowing for 10% variation in line voltage.

The power supply shall provide a regulated 12 VDC output at 1.7 amps.

Each tone equipment mounting frame field located or office located, shall have its own regulated power supply, capable of operating at least ten tone modules in any combination of transmitters and receivers.

The power supply shall have floating type gold plated connection to insure good connection.

The front panel of the power supply shall have an on/off switch and a yellow LED that indicates the status of the output DC voltage.

The power supply shall contain a switch and L.E.D. on the front panel to permit the monitoring of the supply voltage with the existing Traffic Systems Center tone test meter.

The power supply shall be fused.

The power supply shall have a DC voltage control.

Basis of Payment. This work shall be paid at the contract unit price each for furnishing a Power Supply (QEI Model QP21 or equivalent), TONE POWER SUPPLY, which price shall be payment in full for all work as described herein and as directed by the Engineer.

STN3 TONE RECEIVER, F.S.K., FURNISH ONLY

Description. Under this item, for a unit price each as shown in the schedule of prices, and when directed by the Engineer in writing, the Contractor shall furnish a FSK tone receiver (QEI Model TSC445R or equivalent).

The requirements as to the programmable channel frequency range, channel spacing, holding of shifted frequency and operating voltage shall be the same as those for 3 Frequency Transmitter.

Input sensitivity of tone receiver shall be adjustable down to -45 dbm. The dynamic range shall be 25 db.

Adjacent channel attenuation shall be at least 35 db.

Each receiver shall be capable of test operation of at least 30 pulses per second.

Each receiver shall have one single pole, double throw, mark relay output and single pole, double throw space output relay.

Each receiver shall also have carrier detector circuit with one single pole double throw relay output.

All output relays contacts shall be capable of handling a minimum of 30 VA continuously. Any substitution shall be subject to written approval of the Engineer.

Receiver shall have L.E.D. indicators for Mark-Red, Space-Yellow and Carrier Green, visible through the face panel.

The receiver shall have a floating type gold plated connector to insure good connection.

Receiver shall operate in a space hold, 2 state operation.

An attenuation plug shall be provided to set sensitivity level of receiver.

Each receiver shall come with 2 spare relays as above.

Test points through front face plate shall be provided to test for DC voltage levels.

Basis of Payment. Under this item, for a unit price each as shown in the schedule of prices, and when directed by the Engineer in writing, the Contractor shall furnish a FSK TONE RECEIVER (QEI Model TSC445R or equivalent).

STN4 TONE TRANSMITTER, F.S.K., FURNISH ONLY

Description. Under this item, for a unit price each as shown in the schedule of prices, and when directed by the Engineer in writing, the Contractor shall furnish a F.S.K. tone transmitter (Regular)(QEI Model TSC 445T or equivalent) in strict accordance specified herein.

Telemetry equipment shall be furnished and delivered to the Traffic Systems Center office at 445 W. Harrison St., Oak Park, IL. 60304.

Communication line from field located cabinets to the Traffic Systems Center Office will be via 3002 Channel, C1 conditioning, Type 7FDDC telephone pairs leased by the Traffic Systems Center, or telecommunication cable in the barrier wall.

All tone transmitters and tone receivers shall be three frequency frequency-shift; that is equipment which the center frequency is normally on at all times and electrically shifted +30 Hz to a higher frequency (mark) or -30 Hz to a lower frequency (space). Other frequency shifts from +10 to +300 shall be user selectable.

All transmitters, receivers and power supplies shall be of the modular plug in type construction. The circuitry of each unit shall be protected U-shaped metal chassis, cadmium plated with irradiate finish.

All tone equipment shall be physically interchangeable with existing Traffic Systems Center tone equipment, that is furnished tone equipment shall be directly compatible with and replaceable by existing tone equipment with no modification to any hardware.

All transmitters, receivers and power supplies shall be solid state. All transistors shall be silicon, excepting the power transistors in power supplies. All transmitters and receivers IC's shall be plug in.

All transmitters and receivers shall be programmable frequency-shift key units. These FDM units shall have a universal card which is field programmable for any channel frequency or shift. The frequencies available shall be in the range of 120 HZ to 5235 Hz in increments of 5 Hz. The shifts available shall be 10, 25, 30, 35, 42.5, 60, 70, 75, 120, 150, 240, and 300 Hz. A new center frequency or shift shall be field programmed by simply changing setting of the program switch or plug-in jumpers.

All transmitters and receivers shall be capable of being operated at any frequency shall be clearly visible through or on the front of each transmitter and receiver. Such indication will always correspond to the frequency of the elements currently operating in each module. Contractor shall supply 500 complete sets of pre-printed tags for labeling the units indicating the center frequency.

Transmitters and receivers shall work into a communication link with standard impedance of 600 ohms.

Transmitters and receivers shall be individually fused.

Mechanical and Environmental Requirements:

Field Units:
Receivers, transmitters and power supplies shall be capable of operation in field cabinets which provide protection against direct contact with the elements with no special provisions for environmental; control.

All field located tone equipment shall be mounted in the traffic control cabinets as designated elsewhere in these specifications.

All field located tone equipment shall be capable of operation on a temperature range of -30 degrees to +60 degrees Celsius and shall have P.C. boards coated for protection against humidity in the range of o% to 96%.

All field tone equipment shall be capable of being tipped, while in operation, from the vertical to the horizontal position and back again, without having adverse effect on the continuous operation of the transmitter, receiver or power supply.

Basis of Payment. This work shall be paid at the contract unit price each for furnishing a TONE TRANSMITTER, F.S.K., which price shall be payment in full for all work as described herein and as directed by the Engineer.

SU01 UPS SYSTEM, INSPECTION

Description. The Contractor shall furnish a factory sales and service company to complete an annual comprehensive UPS inspection as specified herein at the Traffic Systems Center.

Location. This work shall apply to the monitoring UPS system located at 445 W. Harrison St., Oak Park, IL 60304

Work Description. Eaton Power Ware Model #9390-100 Serial # EC515CBB07 with 80 batteries.

The inspection shall consist of but not be limited to the following items, which are described below:

(A) Initial checks - System energized and carrying a customer's load.

1. Verify initial, as found, voltage and current on the following:
    a) Rectifier input
    b) Rectifier output
    c) Inverter output
    d) Alternate line

(B) System in bypass and de-energized - Customer's load on alternate line.

1. Verify the following:
    a) Bolted, screw and crimp connections for tightness
    b) Relays, seated properly
    c) Wiring, for electrical and physical damage
    d) Capacitors, for bulging and/or leaking
    e) Proper alignment of all sliding P.C. Boards
    f) Plugs, for proper electrical and physical connection
    g) P.C. Boards, for over-temperaturing
    h) Vacuum system (if customer has vacuum available)

(C) System in bypass and energized - Customer's load on alternate line.

1. Verify the following:
    a) All alarms and indicators for proper function and operation
    b) Measure and adjust all critical logic settings
    c) Battery Plant:
        1) measure Volts per cell
        2) visual inspection for leaks or bad cells
        3) spot check for connection torques
        4) Visual inspection of interior and intercell connections

2. Short term (2 Minute) discharge test using the inverter as the load to evaluate battery condition. (Only with customer prior approval)

3. All battery data recorded in site log book.

(D) Final Checks - System energized and carrying customer's load.

1. Verify final voltage and current on the following:
    a) Rectifier input
    b) Rectifier output
    c) Inverter output
    d) Alternate line

(E) Report - The service engineer shall provide a detail service report to the TSC Manager along with any service recommendations for additional service which they believe may be required but not covered under their service agreement.

Method of Measurement. Each inspection that is completed shall be recorded on vendor furnished forms, with all its corresponding deficiencies noted and the inspection report submitted to the Engineer. Any necessary repairs shall be paid on an as needed basis through vendor item.

Basis of Payment. This item shall be paid at the contract unit price each for the UPS SYSTEM, INSPECTION, which shall be payment in full for the work described above.

SU02 U.P.S. SYSTEM, STORAGE BATTERY, REMOVE AND REPLACE

Description. This item shall consist of removal, disposal and replacement of a existing storage battery for U.P.S. system located at TRAFFIC SYSTEMS CENTER, 445 West Harrison St., Oak Park, Illinois.

Materials. All materials shall conform to Power Ware VRLA Battery PWHR 12500W4FR Float voltage 13.5-13.8 volts or equivalent.

Basis of Payment. This work will be paid at the contract unit price each for a U.P.S. SYSTEM, STORAGE BATTERY, REMOVE AND REPLACE, which price shall be payment in full for all necessary removal and disposal of existing storage battery and installing new storage battery.

SV01 VENDOR BUDGETARY ALLOWANCE FOR REPAIR SERVICES

Description. This item is to establish a budget account to allocate funds for the payment of various types of non-routine repair services required for those changeable message signs utilizing Telespot equipment and components.

These services, including associated modifications to the equipment, are required for the continuing maintenance program but which cannot be accurately or completely identified nor specified properly as necessary for preparation of the bidding document for this contract because of Telespot's apparent discontinuance of manufacturing and support. This item requires immediate service to support the operational requirements of freeway-installed changeable message signs but is not for services included under Routine Maintenance.

Basis of Payment. The Engineer will evaluate the quotations and authorize work accordingly. The total estimated amount of annual expenses to be incurred for goods and services performed under this item is $40,000 as indicated under pay item SV1, as a budgetary allowance for repair services.

SV02 VENDOR BUDGETARY ALLOWANCE FOR ATMS MAINTENANCE/SUPPORT

Description. This item is to establish a budget account to allocate funds for ATMS maintenance and support from the approved vendors of the hardware and software to continue maintenance and support of the ATMS at the Traffic Systems Center.

These services, including associated modifications to the equipment, are required for the continuing maintenance program but which can not be accurately or completely identified nor specified properly as necessary for preparation of the bidding document for this contract. This item is for immediate service to support the operational requirements of the traffic management system but is not for services included under Routine Maintenance.

Basis of Payment. The Engineer will evaluate the quotations and authorize work accordingly. The total estimated amount of annual expenses to be incurred for goods and services performed under this item is $75,000 as indicated under pay item SV02, as a budgetary allowance for repair services.

TRAFFIC SIGNAL SYSTEM NON-ROUTINE PAY ITEMS

TC01–TC02 FULL ACTUATED CONTROLLER IN CABINET

Description. This item shall conform with sections 857 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications except as revised herein. All equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. At the time this item is authorized, the Signal Engineer may indicate what brand of equipment is to be supplied for that authorization. Installation of controller and cabinet, including all testing, shall be included in these items. Removal of any existing controller, cabinet, and all other related equipment in the cabinet is considered included in this item. The Contractor shall deliver the removed equipment to the state stock storage location per the requirements within the contract.

Basis of Payment. This work shall be paid at the contract unit price each for FULL ACTUATED CONTROLLER IN CABINET of the type specified as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC01 Full Actuated Controller In Type IV Cabinet

TC02 Full Actuated Controller In Type V Cabinet

TC03 FULL ACTUATED CONTROLLER IN TYPE IV OR TYPE V CABINET WITH RR EQUIPMENT

Description. This item shall conform with sections 857 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications and the provision of Pay Item TC1 in this contract except as revised herein. The controller and cabinet furnished is to be installed at an intersection which is interconnected with a railroad gate controller cabinet. Equipment shall be NEMA TS 2 Type1 unless otherwise approved by the Engineer. At the time this item is authorized, the Signal Engineer may indicate what brand of equipment is to be supplied for that authorization. At all Railroad locations which are not part of a closed loop system (stand alone), the controller and cabinet shall meet the following: The controller cabinet shall contain a 56 kbps auto dial/Auto answer modem. The cabinet shall be provided with an outdoor network interface for the termination of the telephone service. It shall be mounted to the inside of the cabinet suitable to provide access for the termination of the telephone service and shall be equipped with a standard three electrode heavy duty gas tube surge arrestor. Installation of controller and

cabinet, including all testing, shall be included in this item. Removal of any existing controller, cabinet, and all other related equipment in the cabinet is considered included in this item. The Contractor shall deliver the removed equipment to the State stock storage location per the requirements within the contract.

Basis of Payment. This work shall be paid at the contract unit price each for FULL ACTUATED CONTROLLER, IN TYPE IV OR TYPE V CABINET WITH RAILROAD EQUIPMENT as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC04 FULL ACTUATED CONTROLLER

Description. This item shall conform with sections 857 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications. Equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. At the time this item is authorized, the Signal Engineer may indicate what brand of equipment is to be supplied for that authorization. Removal of the existing controller and related items, if required, shall be considered included in this item. The Contractor shall deliver the existing equipment to the State stock storage location per the requirements within the contract.

Installation of the controller and testing shall be included in this item. When installing the new controller into an existing system, the new controller shall contain all necessary telemetry modules, modems, circuit panels and wiring harnesses. All items necessary to enable the controller to communicate/operate within an existing FSK closed loop system or an existing fiber optic closed loop system shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for FULL-ACTUATED CONTROLLER as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC05–TC06 INSTALL EXISTING TRAFFIC SIGNAL CONTROLLER OR CONTROLLER AND CABINET

Description. These items shall conform with sections 857 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications except as revised herein. Included in the above pay items are the replacement and/or addition of controller harnesses, conflict monitor harnesses, and detector harnesses as

required to install the existing controller and/or cabinet at a location directed by the Signal Engineer. The current controller software at time of field installation shall be included in these items. The Contractor shall provide five (5) copies (11" x 17") of the cabinet wiring diagrams and in PDF format on a CDRom for the new cabinet location. Cable logs must be furnished indicating the number of each cable, the field termination point, and all cables must be tagged with an I.D. number corresponding with the cable log. As included in this item, the Contractor shall transport the proposed equipment to the intersection and transport the existing equipment to the Contractor's location for state stock storage.

Basis of Payment. This work shall be paid at the contract unit price each for INSTALL EXISTING TRAFFIC SIGNAL CONTROLLER, OR CONTROLLER AND CABINET as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC05 INSTALL EXISTING TRAFFIC SIGNAL CONTROLLER

TC06 INSTALL EXISTING TRAFFIC SIGNAL CONTROLLER AND CABINET

TC07 CONTROLLER CABINET, TYPE IV OR TYPE V

Description. This work shall consist of furnishing and installing a cabinet and peripheral equipment for an existing traffic signal controller.

Materials. Materials shall be according to the following Articles of Section 1000 – Materials:

Item	Article/Section
Controller Cabinet and Peripheral Equipment	1074.03

General. The cabinet shall be furnished with panel, terminal facilities, conflict monitor, load switches, and flasher relays complete with necessary connections for proper operation. The type of cabinet shall be as specified on the plans.

Basis of Payment. This work shall be paid at the contract unit price each for CONTROLLER CABINET**,** as described above**,** of the type specified as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC08 CONTROLLER AND CABINET MODIFICATION

Description. This item shall conform with Section 857 of the Standard Specifications for Road and Bridge construction. This work shall consist of controller and cabinet revisions to provide an additional phase, phase overlap, or pedestrian movement to an existing traffic signal. This work to include but not limited to installing a load switch cabinet wiring, UPS wiring, and reprogramming the controller per plans or as directed by the engineer.

Basis of Payment. This work shall be paid for at the contact unit price each to provide CONTROLLER AND CABINET MODIFICATION as described above, which price shall be payment in full for all work described herein and as directed by the Signal Engineer.

TC09 FIBER OPTIC COMMUNICATIONS CONTROL EQUIPMENT

Description. This item shall conform with sections 857 and 864 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications except as revised herein. This item may be used in conjunction with the items for "Full Actuated Controller in Cabinet" or it may be used with an existing cabinet. This item shall include the installation of all items necessary to enable the controller and cabinet to communicate as part of a fiber optic closed loop system, as specified. Any modifications or equipment which needs to be removed from an existing cabinet to convert it from FSK/wire to fiber optic shall be included in this item. The Contractor shall deliver any existing equipment to the State stock storage location per the requirements of the contract.

Basis of Payment. This work shall be paid at the contract unit price each for FIBER OPTIC COMMUNICATIONS CONTROL EQUIPMENT of the type specified as described above, which price will be payment in full for all work as described herein and as directed by the Signal Engineer.

TC10 TRAFFIC SIGNAL MASTER CONTROLLER

Description. This item shall conform with section 860 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications except as revised herein. Equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. The master controller may be installed in an existing controller cabinet replacing an existing master controller of the same, or different, manufacturer or at a new location. In all cases the Contractor shall furnish all necessary harnesses, relays, modems, transceivers, and telephone jack to place the proposed traffic signal master controller in operation. Locations where the master controller is installed within an existing system without the local traffic signal controllers being replaced, it shall be of the same manufacturer as the local controllers. The closed loop systems presently in use are manufactured by Siemens/Eagle Signal and Econolite Corporation. At the time this item is authorized, the Signal Engineer will indicate which manufacturer's equipment is to be supplied for that authorization. At the completion of installing the proposed master controller the Contractor shall, if applicable, remove the existing master controller, harnesses, relays, modems, and transceivers that are not used and deliver them to the State stock storage location per the requirements within the contract. A telephone line and modem for proper communication if not pre-existing shall be paid for separately under the item “Telephone Line and Modem”.

Basis of Payment. This work shall be paid at the contract unit price each for TRAFFIC SIGNAL MASTER CONTROLLER as described above, which price shall be payment in full for all work as described herein and directed by the Signal Engineer.

TC11 INSTALL TELEPHONE LINE AND MODEM

Description. This item shall conform with section 857 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic signal Specifications except as revised herein. This work shall consists of providing a phone line from the Illinois Bell System to a traffic signal controller cabinet to provide a working remote monitoring capabilities by the IDOT Traffic Signal Engineer in the Schaumburg office. The phone line shall be capable of providing regular or ISDN communication as required by the Engineer. The contractor shall provide an approved phone company junction box inside the controller cabinet, a 56K band modem as recommended by the equipment supplier, and all wiring necessary to the master controller or controller to provide proper communications. Cable and conduit from the Illinois Bell System to the cabinet phone junction box will be paid for separately.

The contractor shall accomplish this work in the following process utilizing District 1 staff:

As soon as practical or within one week after the work has been authorized, the Contractor shall contact (via phone) the Administrative support Manager in the District 1 Business Services Section at 847-705-4011 to request a phone line installation.

A follow-up fax transmittal to the Administrative Support Manager (847-705-4712) with all required information pertaining to the phone installation is required from the Contractor within one week after the initial request has been made. A copy of this fax transmittal must also be emailed by the Contractor to the Traffic Signal Systems Engineer. The required information to be supplied on the fax shall include (but not limited to): A street address for the new traffic signal service is needed; the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line is 4-6 weeks after the Business Services Section has received the Contractor supplied fax. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor in anticipation of this time frame. On jobs which include roadway widening in which the conduit cannot be installed until this widening is completed, the Contractor will be allowed to delay the phone line installation request to the Business Services Section until a point in time that is 4-6 weeks prior to the anticipated completion of the traffic signal work.

The telephone line shall be installed and activated one month before the system final inspection.

All phone company costs associated with the telephone line installation and activation (not including the contract specified conduit installation between the point of telephone service and the traffic signal controller cabinet) shall be paid by the District One Business Services Section (i.e., this will be an IDOT phone number not a Contractor phone number).

Basis of Payment. This work shall be paid for at the contract unit price each and to install a working INSTALL TELEPHONE LINE AND MODEM as described above, which price shall be payment in full for all work as described herein and directed by the Signal Engineer.

TC12 INSTALL UPDATED PROM SET AT EXISTING LOCAL OR MASTER CONTROLLER

Description. This item shall consist of installing a new PROM or set of PROMS of the latest version of software in an existing traffic signal local or master controller. At locations that contain coordination modules, all PROMS in the controller, telemetry module, and coordination module must be of the same version and revision. New system interface board shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for INSTALL UPDATED PROM SET AT EXISTING LOCAL OR MASTER CONTROLLER, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC13 NEMA CONFLICT MONITOR/ MMU WITH EVENT LOGGING

Description. This item shall conform with sections 857 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications except as revised herein. This item includes all labor and harnesses required to install an EDI Model SSM-12LE or MMU-16 NEMA type conflict/voltage monitor with event logging or an approved equal in an existing traffic signal controller cabinet as directed by the Signal Engineer. Remove all existing conflict monitor/ MMU harnesses not reused and the existing conflict monitor/ MMU from the cabinet and deliver them to the State stock storage location per the requirements of the contract.

Basis of Payment. This work shall be paid at the contract unit price each for NEMA CONFLICT MONITOR/ MMU WITH EVENT LOGGING as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TC14 UPS SYSTEM

Description. This specification sets forth the minimum requirements for a system that provides an uninterruptible power supply (UPS) for signalized intersections. This work shall consist of furnishing and installing a UPS as specified by the District 1 Traffic Signal Specifications.

Basis of Payment. This work shall be paid at the contract unit price each to install UPS SYSTEM as described above, which price shall be payment in full for all work as described herein including replacement of any incandescent EVP confirmation beacon with LED type and as directed by the Signal Engineer.

TCS1 PORTABLE CHANGEABLE MESSAGE SIGN

Description. This specification sets forth the minimum requirements for use of a portable changeable message sign intended to advise motorists of future or current conditions. This device should operate with LEDs, have a programmable message sign capable of displaying varying fonts, and alphanumeric messages. The device must be capable of displaying three lines with a minimum 12" x 18" characters.

The sign must be solar powered with battery back up. The message should be legible from a minimum of 600' and have a total display of at least approximately 70" x 120". Ver-macPCMS-1210, Wanco WTMMB-s-LL(A), or approved equivalent.

Basis of Payment. This work shall be paid for at the contract unit price each for Portable Changeable Message Sign, which shall include payment in full for furnishing, installing and removing, maintaining, and programming one sign for a minimum of fourteen (14) days or as directed by the Engineer.

TD01 DRILL EXISTING HANDHOLE

Description. Refer to Section 879 of the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for DRILL EXISTING HANDHOLE as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TE01–TE06 AND TEC1–TEC2 ELECTRIC CABLE

Description. This item shall conform with section 873 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications, or as directed by the Engineer. When a new cable is being installed to replace an existing cable, the removal of the existing cable shall be included in this item. This item shall be used for cable installed in a raceway, conduit or aerial suspended.

Basis of Payment. This work will be paid at the contract unit price per foot of ELECTRIC CABLE of the type, size, and number of conductors specified, which price shall be payment in full for furnishing the material, making all electrical connections, and installing the cable complete.

The type specified will indicate whether it is shielded and the method of installation. For example: Electric Cable No. 14, 2/C Twisted, Shielded.

TE01 Electric Cable No. 14 2/C

TE02 Electric Cable No. 14 3/C

TE03 Electric Cable No. 14 5/C

TE04 Electric Cable No. 14 7/C

TE05 Electric Cable No. 14 2/C, Twisted Shielded

TE06 Electric Cable No. 18, 3 Pair, Twisted Shielded

TEC1 Electric Cable in Conduit, Tracer No. 14 1/C

TEC2 Electric Cable No. 14, 3/C, Railroad

TF01–TF06 CONCRETE FOUNDATIONS

Description. These items shall conform with Section 878 of the Traffic Specifications and District 1 Traffic Signal Specifications and as directed by the Signal Engineer.

Basis of Payment. This work will be paid at the contract unit price per foot of depth for CONCRETE FOUNDATION of the type specified, which price shall be payment in full for all necessary excavating or drilling, backfilling, disposal of unsuitable material, form work, and furnishing all materials within the limits of the foundation including anchor bolts. If rock excavation is required it will be paid in accordance with Article 109.04 of the Standard Specifications.

TF01 Concrete Foundation, Type A

TF02 Concrete Foundation, Type D

TF03 Concrete Foundation, Type C

TF04 Concrete Foundation, Type E 30 inch Diameter

TF05 Concrete Foundation, Type E 36 inch Diameter

TF06 Concrete Foundation, Type E 42 inch Diameter

TF07 CONCRETE FOUNDATION, REBUILD/MODIFY, TYPE D

Description. This item shall consist of the partial removal of an existing Type "D" Foundation at the location on the plans or as directed by the Signal Engineer. The existing foundation shall be removed to a depth of at least 0.3048m (twelve inches) below finished grade. The disposal of the concrete debris outside of the right-of-way shall be included in this item. The existing conduit shall remain in place and shall be carefully protected. The new conduits from the double handhole shall be installed, if required, as shown on the plans.

Installation. Upon completion of the above work, holes for steel dowels of the size indicated shall be drilled in the remaining concrete where indicated on the drawings.

The adjacent area shall be excavated and formed with anchor bolts and new conduit stubs to provide a concrete foundation for a Type IV cabinet as per the current Highway Standard, "Concrete Foundation Details". The Contractor shall follow the recommendations of the manufacturer, subject to approval of the Engineer.

Provide a 36" x 48" x 5" P.C.C. apron sidewalk on the side of the access door to the controller to facilitate servicing the controller.

Anchor bolts shall be new and shall meet all the requirements of sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for CONCRETE FOUNDATION, REBUILD/MODIFY, TYPE D, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings. The removal of the existing controller shall be included in this pay item, as well as the pulling and reinstalling of the existing cable from conduit.

TFB1 FLASHING BEACON, POST MOUNT, 1 FACE

Description. This item shall conform with sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction. District 1 Traffic Signal Specifications and the current Highway standard, "Details of Spanwire Mounted Signal and Flashing Beacon Installation" except as revised herein. This item shall consist of installing a post mounted 300mm (twelve inch) L.E.D. single section red or yellow flashing beacon on an existing post as shown on the plans or directed by the Signal Engineer. This item shall include furnishing and installing a flasher controller in an aluminum cabinet, or integrated within the head, service installation (post mounted), 300mm (twelve inch) L.E.D. red or yellow signal section with a dimmer if required by the Signal Engineer, and all other includeds necessary to complete the installation.

As directed by the Signal Engineer or if shown on the plans, the Contractor may be instructed to provide LED displays as opposed to standard incandescent signal sections. All lamps and LED modules are considered included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to install FLASHING BEACON, POST MOUNT, 1 FACE as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TFB2 FLASHING BEACON, SPAN WIRE MOUNTED

Description. This item shall conform with the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications and the current Highway standard "Details of Spanwire Mounted Signals and Flashing Beacon Installations" except as revised herein. This item shall include furnishing and installing a flasher controller in an unpainted aluminum cabinet, or integrated within the head, service installation (post mounted), any number of 300 mm (twelve inch) L.E.D. signal faces, red or yellow with a dimmer if required by the Signal Engineer, wood poles, span wire and span wire accessories, electrical conduit, electric cable, trench and backfill and all other includeds necessary to complete the installation.

As directed by the Signal Engineer or if shown on the plans, the Contractor may be instructed to provide LED displays as opposed to standard incandescent signal sections. All lamps and LED modules are considered included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to install FLASHING BEACON, SPAN WIRE MOUNTED as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TFB3 FLASHING BEACON, SOLAR, POST MOUNT, 1 FACE

Description. This item shall conform with sections 800 and 1000 of the Standard Specifications for Road and Bridge construction and District One Traffic Signal Specifications. This item shall consist of furnishing and installing a 300mm (12-inch) single red or yellow flashing module on a new or existing post as shown on the plans or directed by the engineer. This item shall include furnishing and installing a flasher controller that is integrated

within the signal head, with discrete solar panels, LED module, battery, electronics, compact housing and capable of operating 24 hours, 7 days a week.

The flasher unit shall install on standard wood or metal posts. The flash pattern shall be MUTCD compliant and have alternate flash patterns available. The LED module shall be ITE VTCSH-STD Part-2 compliant.

The flasher unit shall operate over a maximum temperature range of -40° F to 176° F.

The battery shall have a life span of a minimum of 5 years and be field replaceable. The battery and electronics may be located inside the solar panel housing or signal head.

The sections of the flasher unit shall be secured with tamper resistant stainless steel hardware and unless otherwise noted, the housing shall be black in color.

Basis of Payment. This work shall be paid for at the contract unit price each for FLASHING BEACON, SOLAR, POST MOUNT, 1 FACE FLASHER UNIT, of the color LED, as described above, which price shall be payment in full for furnishing and installing a post mounted flasher with all mounting hardware.

TGS1 ADDITIONAL GROUNDING AND ELECTRIC SERVICE UPGRADE

Description. The Contractor shall perform additional electric service and grounding upgrades as specified to the traffic signal system locations as designated by the Engineer.

Work Description. The contractor is responsible for scheduling the work and for coordinating with the engineer whenever Engineer-witness functions are required. The contractors shall also advise the engineer when each location is complete and shall provide a written certification to that effect. The Engineer reserves the right to require a final inspection of the modification at any or all of the locations certified as complete. Should deficiencies be found upon inspection, a corrective work list will be prepared.

The traffic signal installations being modified shall be kept operational at all times except as expressly allowed herein or otherwise permitted by the Engineer. The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost to the pay item. All cable, conduit, fittings and accessories shall be new. All materials and work shall be in conformance with the requirements of applicable contract specifications and article 250 of the National Electrical Code.

The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for reporting any account modifications arising from the work to the Engineer in a timely manner. Although it is anticipated that all service agreements and accounts will remain as-is, if new agreements are required, the Contractor shall facilitate coordination between the Electric Utility and the Engineer, with the department to sign any appropriate new agreements. Only momentary outage of a traffic signal location undergoing modification will be allowed, and the contractor shall provide generator power or make temporary service connections as necessary to assure continuity of operations as modifications are made.

The work will generally include:

Replacement of the electric service entrance equipment and cables

New grounding of the service

New feeder conductors from the service disconnect to the controller cabinet

Cabinet grounding modifications

Supplementary ground electrodes at handholes

Extension of equipment ground wires to all poles, posts, handholes, etc.

Bonding of equipment ground to all exposed metal parts

Testing and documentation

Replace Electric Service Entrance

The work shall include the removal of the existing service disconnecting means and the service conductors and shall include the furnishing and installing a new pole-mounted service disconnecting means and new service conductors, based on the manner of the existing service. The new electric service disconnect, cables and the service connection shall be in accordance with details included herein, and Figure L-3A, as shown in Volume 1, Article 7,unless specified otherwise by the Engineer to meet special requirements of certain locations, pedestrian traffic, etc.

Provide New System Ground of Electric Service

The work shall include the installation of a new system ground, connected to the ground bar of the service disconnect, using one or more ground rod grounding electrodes, or other means approved by the Engineer. The system ground shall have a resistance to earth not to exceed 10 ohms without connection to the additional electrodes established at poles or other points at the traffic signal location. The system ground resistance shall be verified by a contractor test, using the fall-of potential method and witnessed and approved by the engineer, with a record of the test entered by the Contractor and signed by the Contractor and the Engineer. Should more than one electrode be required to establish a low enough resistance, additional electrodes shall be connected to the grid, with re-testing. All ground electrode connections shall be exothermically welded. Ground rods and grounding electrode conductors shall be as specified and detailed.

The service grounded circuit conductor (which may or may not be a system neutral) shall be bonded to the system ground at the service disconnect and shall be isolated from ground throughout the remainder of the electrical distribution.

Extend New Conductors to Controller

A new ground terminal bar shall be installed at the traffic signal control cabinet and this bar shall be bonded to the cabinet enclosure. The work shall include the replacement of the existing feeder and the extension of new feeder conductors from the service disconnect to the traffic signal control cabinet. The cable will be a multi-conductor jacketed cable as specified and it shall include a green-insulated ground wire to bond the service ground bar to the controller cabinet ground bar. The contractor shall confirm the integrity of the existing feeder conduit run, and shall clean the run before installing the new feeder. If the size of the conduit is demonstrated to be inadequate for the new feeder cable or if it is demonstrated as not re-usable for some other reason and no other alternative is feasible, the contractor shall use a new feeder conduit run, as part of this pay item, with all cable work remaining as the Contractor's responsibility at no additional cost to the pay item.

Cabinet Grounding Modifications

The contractor shall confirm the presence of a terminal bar, with suitable terminals, for the grounded circuit conductor (white wire) at the controller cabinet and shall assure isolation of this bar from the cabinet enclosure and other grounded parts. If the existing bar is inadequate or is not isolated properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items. Similarly, the contractor shall confirm the presence of a ground bar, with suitable terminals, which is bonded to the cabinet enclosure and grounded metal parts. If the existing ground bar is inadequate or is not bonded properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items, as included in this pay item.

Supplementary Ground Electrodes

A ground rod shall be driven at traffic signal handholes present at each corner of a location (but not within the roadway) except for handholes within 15 feet of the service ground electrode. The ground rods shall be as specified and all connections directly to the ground rods shall be exothermically welded.

Extension of Equipment Ground

The contractor shall extend an equipment ground conductor from the ground bar in the controller cabinet to distributed elements of the system, bonding the equipment ground conductor to all handhole frames, metal poles and other enclosures, metal conduit, etc., including any existing supplemental ground rods that may be in place. The Contractor shall assure that good equipment ground continuity and a low-impedance ground return path is established throughout for all exposed metal parts of the installation.

It is not the intent of this work item to require re-cabling of the traffic signal load equipment to achieve grounding. In all cases, a green-insulated ground conductor shall be used whenever possible, and only if conduit space will not accommodate an insulated conductor will a bare conductor be allowed. A common conductor may be employed for multiple load circuit cables in a given conduit, but an equipment ground conductor shall be run with or shall encircle each set of circuit conductors extended from the controller cabinet.

Recognizing the intent to leave existing coductors in place and operations, the contractor may chose from among identified and prioritized acceptable alternative to affect the grounding modifications:

If an existing conduit will accommodate the installation of a ground wire, the ground wire shall be installed within the conduit with the circuit conductors. Existing conductors should only be withdrawn from a conduit run to facilitate pulling of the ground wire if absolutely necessary.

If an existing metal conduit will not accommodate the required ground wire, and if the contractor can identify end-to-end electrical continuity of the conduit, the contractor may bond to the conduit externally in an approved manner to establish ground continuity, thus using the metal conduit as the equipment ground conductor.

If a given conduit run is demonstrated to be damaged and electrically discontinuous in the presence of the Engineer, and if no other alternative is feasible, the engineer will authorize a new conduit run, to be paid

under separate pay time, with all cable installation to remain part of the grounding modification work at no additional cost to the pay item. When a new conduit is installed, an insulated ground conductor must be installed within, together with the circuit conductors, regardless of the ground continuity of the new conduit, and the new conduit shall be appropriately bonded to the equipment ground.

Bonding

The Contractor shall establish equipment ground bonding to the cover frame of every handhole with an approved connection. The contractor shall establish equipment ground bonding at every metal pole, post or other enclosure or device, also with an approved connecting. At poles or post bases, it may be possible to install washers, lugs, and extra nuts where extra anchor bolt protrusion allows it. Otherwise, poles may be drilled and tapped and fitted with appropriate ground lugs. Connections at poles and other enclosures shall be pigtailed from splices whenever more than on ground conductor is connected so that ground continuity is not dependent upon ground lug connection. Splices of ground conductors (in lieu of exothermic weld connectors) will be permitted at poles an other such connection point above grade, with splices to be made using suitable copper crimp sleeves and heat-shrink insulated caps as specified.

Testing and Documentation

As noted above, the system ground resistance to earth shall be tested, in isolation from equipment ground extensions from that point. Testing shall be performed by the contractor using the fall-of-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the farthest point of each circuit extension from the controller cabinet. Results shall be recorded by the contractor and witnessed by the Engineer.

Special Considerations

Temporary signal installations and other span-wire installations shall be included in the scope of service and grounding modifications. For span-wire installations, the messenger wire shall be employed as an equipment ground conductor and taps shall be made to this wire to extend an equipment ground connection to appropriate exposed metal parts. A service grounding electrode shall be established at the electric service disconnect and a ground rod shall be installed and connected at one pole per quadrant.

Method of Measurement. Each traffic signal grounding modification and electric service upgrade as performed as specified and inspection report submitted and approved by the Engineers shall be counted as unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for TRAFFIC SIGNAL ADDITIONAL GROUNDING AND ELECTRIC SERVICE UPGRADE, which shall be payment in full for the work described herein.

TL01 INDUCTIVE DETECTOR LOOP

Description. This work shall consist of furnishing and installing inductive loop detector

Materials. Materials shall be according to the following Articles/Section 1000 – Materials"

Item	Article/Section
(a) Inductive Loop detector …….	1079.01

Construction Requirements:

Installation:

The inductive loop detector shall be installed inside traffic signal controller cabinet. The detector shall be either card rack type or shelf-mounted type. The detector may be single-channel, two-channel, or four-channel, as directed by the Traffic Signal Engineer.

Basis of Payment. This work will be paid for at the contract unit price each for INDUCTIVE LOOP DETECTOR which price shall include the necessary connections and adjustment for proper operation.

If the detector unit has more than one complete detection channel, each compound detection channel will be considered as a detector for payment.

TL02 DETECTOR LOOP

Description. This item shall conform with sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications and the District 1 Standard Traffic Signal Design Details, except as revised herein.

1. Asphalt Pavement

Detector loop which is to be installed in the proposed asphalt pavement must be placed in the pavement below the surface coarse. The location of each dive hole shall be marked on the face of the curb or handhole with a saw cut.

2. Existing Asphalt Pavement

Detector loop which is to be installed in an existing asphalt pavement shall be located to miss existing pavement cracks, if possible. The saw cut is to be filled with sealant to 3.0mm (one-eighth inch) below the surface of the pavement.

3. Concrete Pavement

Detector loop which is to be installed in concrete pavement must be placed to miss pavement joints and cracks, if possible. The saw cut is to be filled with sealant to one-eighth inch below the surface of pavement.

Loop Preparation

All detector loop saw cuts shall be a minimum of one and one half inches and a maximum of two inches, and the depth shall be equal to the saw cut. Saw cuts across the corners are NOT allowed. The saw cut shall be a minimum of five-sixteenths inches wide and cut in accordance with local and EPA dust control requirements. Detector loop(s) shall not be installed in wet conditions and the saw cuts must be free of debris and residue such as dust and water which is to be achieved by the use of compressed air, wire brushing and heat drying according to sealant manufacturer requirements. The detector wire shall be held in place by the use of form wedges of sufficient diameter and strength to hold the wire one inch below the surface of the pavement. Wedges shall be spaced no more than eighteen inches apart. The wire from the detector loop to the handhole shall have six twists per foot and have a separate unit duct raceway from the edge of pavement to the handhole. The unit duct shall be one foot into the pavement and loop under the curb and gutter. The unit duct shall be placed at a thirty inch depth.

Contractor Loop Identification

The loop detector wire shall be spliced in the handhole and each lead-in wire shall be labeled in the handhole using a Conduit 250W175C waterproof tag or approved equal secured to each wire with nylon ties. Each lead-in cable tag shall indicate the location of the loop, loop rotation (clockwise/counterclockwise), loop lead-in direction (in or out), loop cable number, location in cabinet, and number of turns in the detector loop using waterproof ink as indicated on the District 1 Loop Detail. The Contractor shall mark loop locations on as-built plans and present to the Engineer after final inspection.

Six foot round loop(s) may be substituted for six foot by six foot square loop(s) and shall be paid as 24 feet of detector loop.

Basis of Payment. This work shall be paid at the contract unit price per foot for DETECTOR LOOP as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TLS1 LED ILLUMINATED SIGN

Description. This item shall conform with the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications, except as revised herein. This work shall consist of furnishing and installing an Illuminated Sign, LED type with blank out ability indicating the symbolic legend for “No Right Turn” or “No Left Turn” as required by the Signal Engineer.

Basis of Payment. This work shall be paid at the contract unit price each for LED ILLUMINATED SIGN which price shall be payment in full for furnishing and installing the illuminated sign complete.

TMA1–TMA5 STEEL MAST ARM ASSEMBLY AND POLE

Description. This item shall conform to the requirements of sections 877 of the Standard Specifications for Road and Bridge Construction, the District 1 Traffic Signal Specifications and the current Highway Standard, "Steel Mast Arm Assembly and Pole", except as revised herein.

Prior to the final acceptance of any Steel Mast Arm Assembly and Pole, Contractor must furnish to the Engineer a certified, notarized mill analysis of the material used in the Steel Mast Arm Assembly and Pole.

This item, when applicable, shall include the relocation of existing sign panels currently installed at the location.

If the proposed mast arm assembly is replacing an existing mast arm, the removal of the existing mast arm assembly shall be included in this item. The Contractor shall retain ownership of the existing mast arm assembly.

The mast arm shroud shall be included in this item and shall be galvanized steel or extruded aluminum for protection of the mast arm pole base plate similar to the dimensions detailed in the “District 1 Standard Traffic signal Design Details.” The shroud shall be of sufficient strength to deter pedestrian and vehicular damage. The shroud shall allow it to circulate throughout the mast arm but not allow manifestation of insects or critters. The shroud shall be constructed, installed, and designed not to be hazardous to probing fingers and feet. All mounting hardware shall be stainless steel.

Shroud shall fit any pole size supplied by the manufacturer

Basis of Payment. This work shall be paid at the contract unit price each for furnishing and installing a STEEL MAST ARM ASSEMBLY AND POLE as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TMA1 Steel Mast Arm Assembly and Pole 16 ft to 28 ft

TMA2 Steel Mast Arm Assembly and Pole 30 ft to 44 ft

TMA3 Steel Mast Arm Assembly and Pole 46 ft to 55 ft

TMA4 Steel Mast Arm Assembly and Pole 56 ft to 65 ft

TMA5 Steel Mast Arm Assembly and Pole 66 ft to 75 ft

TMA6 RELOCATE OR INSTALL EXISTING MAST ARM ASSEMBLY AND POLE

Description. This item shall conform with sections 877 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications except as revised herein. The Mast Arm Assembly and Pole shall come from State stock or be relocated from one foundation to another foundation at the same intersection or another intersection as indicated on the plans. All transportation costs to move the mast arm assembly and pole from State stock to an intersection or from intersection to intersection are included in this item. Existing holes in the Mast Arm Assembly and Pole shall be plugged as directed by the Signal Engineer. If the existing mast arm has an existing galvanized metal shroud, it shall be relocated along with the mast arm as included in this item. Otherwise, the Contractor shall be required as part of this item to install at the base of the mast arm, stainless steel screening in accordance with the Standard Specifications; or the Contractor may be required to install a mast arm shroud as described in TMA1-5 in lieu of stainless steel screening as directed by the Signal Engineer. The cost of furnishing and installing a new shroud shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for RELOCATE OR INSTALL EXISTING MAST ARM ASSEMBLY AND POLE, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TPP1 PEDESTRIAN PUSH-BUTTON POST, GALVANIZED STEEL

Description. This work shall consist of furnishing a nominal 3 or 4.5 inch diameter pedestrian push-button post and installing it on a base and concrete foundation as shown on the District One Traffic Signal detail sheets. The post diameter shall be as directed by the Traffic Signal Engineer and shall be coordinated with the base construction.

Materials. Materials shall be according to the following Articles of section 1000 – Materials:

Item	Article/Section

9. Traffic Signal Post and Base 1077

10. Concrete 1020

Construction Requirements.

Installation.

The pedestrian push-button post shall be installed plumb on a square base and concrete foundation according to the details shown on the plans. The contractor shall apply an anti-seize post compound on all nuts and bolts prior to assembly.

The foundation shall be made Class SI concrete.

Basis of Payment. This work will be paid for at the contract unit price each for PEDESTRIAN PUSH-BUTTON POST, GALVANIZED STEEL, , which shall be payment in full for the work described herein.

TPP2 PEDESTRIAN PUSH-BUTTON, LATCHING AND NON-LATCHING

Description. This item shall conform with sections 888 and 1074 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Specifications except as revised herein. The Pedestrian Push-button assembly shall be one piece cast aluminum alloy with momentary LED or latching type LED display, as directed by the Traffic Signal Engineer, such as the Campbell 4EVR 120 or Polara Bulldog type, or an approved equivalent and include pedestrian push button station and sign. See District One Specifications for Pedestrian Station and Sign Requirements.

Basis of Payment. This work shall be paid at the contract unit price each for PEDESTRIAN PUSH-BUTTON, LATCHING AND NON-LATCHING as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TR01 ROTATE SIGNAL PHASING AT AN EXISTING TRAFFIC SIGNAL INTERSECTION

Description. This item shall consist of revising the traffic signal phasing at an existing traffic signal intersection. The proposed sequence of operation shall conform with the current "Standard Phase Designation Diagrams and Phase Sequences" Highway Standard, the District's phase diagrams and notes, the District's chart sequence of operations or as directed by the Signal Engineer. The phase rotation shall consist of the following items to complete the phase rotation:

- Modify all incoming field wiring to provide the new sequence of operations which includes all signal heads, pedestrian heads, internally illuminated signs, emergency vehicle preemption confirmation beacons, vehicle detectors, pedestrian detectors and system detectors.
- Modify the controller programming and phase overlaps to provide the proposed sequence of operations.
- All back panel modifications are required to provide the proposed sequence of operations and system detection.
- The Contractor shall provide five (5) copies (11" x 17") of revised cabinet wiring diagrams and pdf files on CDROM.
- The Contractor shall provide revised cable logs indicating the number of each cable, the field location the cable is terminated at, and all cables must be tagged with an I.D. number that corresponds with the revised cable log.

Basis of Payment. This work shall be paid at the contract unit price each for ROTATE SIGNAL PHASING AT AN EXISTING TRAFFIC SIGNAL INTERSECTION as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TR02 RE-ASSIGN SYSTEM DETECTORS

Description. This work shall consist of reassigning system detectors in an existing Closed Loop System as per the plan or as directed by the Signal Engineer. This may include rewiring system detectors to different inputs into the local controller, installing diodes to provide a second channel of detector output to use an existing local detector as a dual system/local detector, changing system detector assignments, wiring system detectors directly to a master controller or rewiring system detectors to different inputs in the master controller. Any additional amplifiers or dual output amplifiers that are necessary will be paid separately, otherwise all remaining materials and labor required to complete this work shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price for 1 each RE-ASSIGN SYSTEM DETECTORS, which will include all necessary reassigning of system detectors at one signalized intersection.

TS01 MANHOLE COVER AND FRAME GROUNDING FURNISH AND INSTALL

Description. As described in the District One Traffic Signal Specifications.

Basis of Payment. This work shall be paid at the contract unit price each for MANHOLE COVER AND FRAME GROUNDING FURNISH AND INSTALL as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TSB1 TRAFFIC SIGNAL BACKPLATE, REFLECTIVE

Delete 1st sentence of Article 1078.03 of the Standard Specifications and add “All backplates shall be aluminum and louvered”.

Delete second sentence of the fourth paragraph of Article 1078.03 of the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

Reflective sheeting shall be Type ZZ according to Article 1091.03, 2-inches wide and applied in the manufucturer's preferred orientation for the maximum angularity according. The retro reflective sheeting shall be installed under a controlled environment at the manufacturer/supplier facilities before shipment of the contractor. The aluminum backplate shall be prepared and cleaned, following recommendations of the retro reflective sheeting manufacturer.

TSD1 LED SIGNAL DISPLAY

Description. This item shall consist of installing a 12" LED Display into an existing signal section or a new signal section. The LED display shall fit into the signal housing without any modifications to the housing and meet District 1 Traffic Signal Specifications. Removal of the existing lens and reflector shall be included in this item. The existing lens and reflector shall become the Contractor's property and the unit price should reflect the salvage value of these items.

Basis of Payment. This work shall be paid at the contract unit price each for LED SIGNAL DISPLAY, which price shall be payment in full for supplying and installing a display as described herein.

TSH1–TSH3 INCANDESCENT SIGNAL HEAD, 1 FACE

Description. These items shall conform with sections 880 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications, the current Highway Standard "Traffic Signal Mounting Details", and District 1 Standard Traffic Signal Design Details, except as revised herein. All traffic signal sections shall have incandescent optics with 300mm (twelve inch) lenses unless otherwise stated on the plans or as directed by the Signal Engineer. At locations where new signal heads are replacing existing signal heads, the removal of the existing signal heads and existing mounting hardware shall be included in these items and the Contractor shall retain ownership of the existing used signal heads.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay items listed below shall include either bracket mounts or mast arm mounts as required by the plans or directed by the Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Mast arm mounted signal heads shall include louvered traffic signal backplates. The backplate shall be included in these items.

Basis of Payment. This work shall be paid at the contract unit price each for SIGNAL HEAD, 1 FACE of the number sections specified, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer. Removal, salvage, or disposal of existing heads and related mounting hardware and backplates shall be included in these items.

TSH1 Signal Head, 1 Face, 3 Section

TSH2 Signal Head, 1 Face, 4 Section

TSH3 Signal Head, 1 Face, 5 Section

TSL1–TSL7 LED SIGNAL HEAD, 1 FACE

Description. These items shall conform with sections 880 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications, the current Highway Standard "Traffic Signal Mounting Details", Special Provision for Light Emitting Diode (LED) Signal Head, and District 1 Standard Traffic Signal Design Details, except as revised herein. All traffic signal sections shall have 300mm (twelve inch) lenses unless otherwise stated on the plans or as directed by the Signal Engineer. At locations where new signal heads are replacing existing signal heads, the removal of the existing signal heads and mounting hardware shall be include in this item and the Contractor shall retain ownership of the existing used signal heads.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay items listed below shall include either bracket mounts or mast arm mounts as required by the plans or directed by the Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Remotely Steerable Optics:

This item shall provide a visibility zone of red, yellow and green, without requiring louvers or other external blocking devices to achieve the end result. No indication shall result from external illumination nor shall one section illuminate another. The LEDs are steered using one (1) Wi-Fi enabled a PDA which is included in this contract. Manufacturer shall warrant the remotely steerable optic head to be free from defects in material and workmanship for a minimum of seven (7) years from date of turn-on.

Mast arm mounted signal heads shall include louvered traffic signal backplates. The backplate shall be included in the cost of the signal head.

Basis of Payment. This work shall be paid at the contract unit price each for LED SIGNAL HEAD, 1 FACE of the number of sections specified OR LED SIGNAL HEAD, OPTICALLY PROGRAMMED or REMOTELY STEERABLE OPTICS, 1 FACE of the number of sections specified, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer. Removal, salvage, or disposal of existing heads and related mounting hardware and backplates shall be included in these items.

TSL1 LED Signal Head, 1 Face, 3 Section

TSL2 LED Signal Head, 1 Face, 4 Section

TSL3 LED Signal Head, 1 Face, 5 Section

TSL4 LED Signal Head, Optically Programmed, 1 Face, 3 Section

TSL5 LED Signal Head, Optically Programmed, 1 Face, 5 Section

TSL6 LED Signal Head, Remotely Steerable Optics, 1 Face, 3 Section

TSL7 LED Signal Head, Remotely Steerable Optics, 1 Face, 5 Section

TSL8 LED PEDESTRIAN SIGNAL HEAD, 1 FACE

Description. This item shall conform with sections 881 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications, the current Highway Standard "Traffic Signal Mounting Details" and District 1 Standard Signal Design Details, except as revised herein. All led pedestrian signal sections shall have 300mm (twelve inch) lenses unless stated on the plans or as directed by the Signal Engineer. At locations where new pedestrian signal head(s) or faces are replacing an existing pedestrian signal head(s) or faces the removal shall be included in this item and the Contractor shall retain the used existing pedestrian signal head(s) or faces.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay items listed below shall include either pole mounts or post mounts as required by the plans or directed by the Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for LED PEDESTRIAN SIGNAL HEAD, 1 FACE, as described above, which price shall be payment in full for all work as described herein including mounting hardware and as directed by the Signal Engineer.

TSL9 LED PEDESTRIAN SIGNAL HEAD, COUNTDOWN, 1 FACE

Description. This item shall conform with sections 881 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications, the current Highway Standard "Traffic Signal Mounting Details" and District 1 Standard Signal Design Details, except as revised herein. This work shall consist of furnishing and installing a pedestrian countdown signal head, with light emitting diodes (LED) of the type specified in the plan. At locations where new pedestrian signal head(s) or faces are replacing an existing pedestrian signal head(s) or faces, the removal shall be included in this item and the Contractor shall retain the used existing pedestrian signal head(s) or faces. Existing pedestrian push button signing shall be replaced with new count-down type signs (R10-3e, 9-inch x 15-inch) with associated sign station or housing at locations where existing push buttons are not being replaced.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay item listed below shall include either pole mounts or post mounts as required by the plans or directed by the Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Pedestrian Countdown Signal Head, LED, shall be 16 inch (406mm) x 18 inch (457mm) and conform fully to the District 1 Traffic Signal Specifications.

Basis of Payment. This item shall be paid for at the contract unit price each for PEDESTRIAN COUNTDOWN SIGNAL HEAD, LED, 1 FACE, which shall be payment in full for furnishing the equipment described above including LED(s) modules, all mounting hardware, and installing them in satisfactory operating condition.

TSR1 REMOVE SIGNAL SECTION OR HEAD

Description. This item shall conform with sections 880 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications, except as revised herein.

This item shall consist of removing an existing traffic signal head or section at a location shown on the plans or as directed by the Signal Engineer. The removal of an existing traffic signal head or section will be paid only when its removal or relocation is not included in another pay item. The existing signal section(s) or head(s), when removed, shall become the property of the Contractor and the salvage value of the head(s) or section(s) is to be reflected in the unit bid price.

A traffic signal head with multiple faces and/or pedestrian signals mounted on the same item shall be paid at 1 each for the complete or partial removal. All remaining holes in the post or mast arm shall be plugged and any additional hardware necessary for any remaining sections shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to REMOVE SIGNAL SECTION OR HEAD, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TSR2 RELOCATE OR INSTALL EXISTING SIGNAL SECTION OR HEAD

Description. This item shall conform with sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications except as revised herein. This item includes the relocation of traffic signal head(s) and pedestrian signal head(s). The combination of a traffic signal head and a pedestrian signal head mounted on the same traffic signal post, mast arm pole, or street lighting pole shall be considered a single unit and shall be paid as one (1) each relocate signal head. This item shall include removing a traffic signal head from one intersection, transporting it to another intersection and installing it at a new location or installing an existing signal head from State stock. Any modifications or adjustments to the existing signal head or programming of the existing signal head shall be included in this item.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay item listed below shall include either mast arm mounts, pole mounts or post mounts as required by the plans or directed by the Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to RELOCATE OR INSTALL EXISTING SIGNAL HEAD, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TT01 SPAN WIRE TRAFFIC SIGNAL INSTALLATION WITH ELECTRIC SERVICE AND UPS

Description. This item shall conform with sections 890 of the Standard Specifications for Road and Bridge Construction, the District 1 Traffic Signal Specifications and the current Highway Standard, "Temporary Traffic Signal", except as revised herein.

The span wire traffic signal installation when completed shall become the property of the State of Illinois. All equipment and material shall be new.

The controller shall be one of the approved District 1 Closed Loop brands and the display shall be menu driven. The controller and its associated equipment shall be housed in an aluminum traffic signal controller cabinet Type IV or Type V, as designated on the plans or by the Signal Engineer and mounted on an enclosed wood stand with a three feet by four feet by 5 inches thick and a concrete pad in front of the cabinet door. The cabinet shall contain all harnesses, load switches, flasher, conflict monitor, detector harnesses and related components required to provide the sequence of operations on the plans or as directed by the Signal Engineer.

Traffic signal heads furnished for the installation shall be LED type with expanded view and have twelve inch lenses and be painted federal yellow with flat black faces and tunnel visors. Each approach to a signalized intersection must have a minimum or three (3) signal heads spaced a minimum of eight feet apart.

The Electric Service Installation and UPS, as described in the District One Traffic Signal Specification, shall be included in this item.

Pedestrian signal heads and push-button detectors, if required, will be paid separately. All vehicle detection, when required, as part of a span wire signal installation, will be paid separately. When possible, the Department will provide the detector amplifiers for the intersection from state stock. If necessary the Department shall authorize the installation of new amplifiers through a non routine work order.

The bottom of any span wire mounted signal head (or backplate if equipted) shall be no lower than 17-ft and the top of the signal head shall be no higher than 25-ft above the crown of the road, unless otherwise directed by the Signal Engineer.

All equipment furnished and installed shall become the property of the Illinois Department of Transportation.

Basis of Payment. This work shall be paid at the contract unit price each for SPAN WIRE TRAFFIC SIGNAL INSTALLATION, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer. Maintenance of the span wire traffic signal installation will be paid separately after the span wire signal is approved for operation by the Department.

TTM1 THERMOPLASTIC PAVEMENT MARKING LINE 24 INCH

Description. This item shall conform with sections 700 and 1000 of the Standard Specifications for Road and Bridge Construction as directed by the Signal Engineer.

Basis of Payment. This work will be paid at the contract unit price per foot of applied line for THERMOPLASTIC PAVEMENT MARKING LINE 24 inch.

TTP1 TRAFFIC SIGNAL POST, 10 FT TO 18 FT

Description. This item shall conform with sections 875 of the Standard Specifications for Road and Bridge Construction, the District 1 Traffic Signal Specifications and District 1 Traffic Signal Design Details except as revised herein.

When the new post is being installed on an existing foundation to replace an existing post, the removal of the existing post shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for TRAFFIC SIGNAL POST, 10 FT TO 18 FT as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TTP2 - TTP3 REMOVE TRAFFIC SIGNAL POST AND REMOVE MAST ARM ASSEMBLY AND POLE

Description. These items consist of removing an existing traffic signal post or mast arm assembly and pole at a location shown on the plans or as directed by the Signal Engineer. The existing traffic signal post or existing mast arm assembly shall become the Contractor's property and the salvage value of the item shall be reflected in the unit price.

Basis of Payment. This work shall be paid at the contract unit price each for the pay items listed below and as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TTP2 Remove Traffic Signal Post

TTP3 Remove Mast Arm Assembly and Pole

TTP4 RELOCATE OR INSTALL EXISTING SIGNAL POST

Description. This item shall conform with sections 875 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Specifications, except as revised herein. Installation of an existing signal post includes transportation from the Contractor storage facilities or from one intersection to the intersection where the post is to be installed. The existing signal post will be installed on an existing or new concrete foundation. This item shall include new anchor bolts, nuts, and washers, if required, as included in this item. New concrete foundation will be paid separately.

Basis of Payment. This work shall be paid at the contract unit price each for RELOCATE OR INSTALL EXISTING SIGNAL POST, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TVD1-TVD2 VIDEO DETECTION SYSTEM, COMPLETE INTERSECTION OR SINGLE INTERSECTION APPROACH

Description: This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images and provides detector outputs to a traffic controller or similar device. This work shall consist of furnishing and installing an Autoscope Terra, Iteris Vantage cameras or an approved equal video vehicle detection system at one signalized intersection. This item includes vision/camera sensors, processing equipment an all necessary hardware, cable and accessories necessary to complete the installation in accordance with the manufacturer's specifications. The system shall also include a LCD in-cabinet monitor with BNC connector for video input.

The vision/camera sensors shall be installed on an existing traffic signal mast arm pole, luminaire arm or other structure. Pole extensions or other video sensing equipment mounting devises and hardware as directed by the Traffic Signal Engineer shall be included in this item.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

To protect the video detection cameras from electrical surges, the video detection chassis shall be connected to the cabinet ground rod with a #10 1/C green wire.

The supplier of the video detection system shall supervise the installation and testing of the video detection system. A factor certified representative from the supplier shall be on-site during installation.

The video detection system shall be warranted by its supplier for a minimum of two (2) years with ongoing software support by the supplier and no-cost video sensor and supervisor software.

Basis of Payment: This item will be paid for at the contract unit price each for VIDEO DETECTION SYSTEM, COMPLETE INTERSECTION or SINGLE INTERSECTION APPORACH which price shall be payment in full for furnishing all associated equipment required, installing the system at one signalized intersection, and placing the system in operation to the satisfaction of the Engineer.

TVD1 Video Detection System, Complete Intersection

TVD2 Video Detection System, Single Intersection Approach

TWD1 WIRELESS DETECTION SYSTEM, COMPLETE INTERSECTION

Description. This specification sets forth the minimum requirements for a wireless vehicle detection system that uses pavement-mounted magnetic senors to detect the presence and movement of vehicles. This work shall consist of furnishing and installing a Sensys or approved equal wireless vehicle detection system including all necessary hardware, cable and accessories as shown on the plans and required to provide a fully operational system.

The system shall consist of a minimum of thirty (30) flush mounting pavement detector sensors, two (2) access points, two (2) repeaters and associated contact closure cards. The system shall be able to detect either approaching or receding vehicles in multiple traffic lanes. Extension poles for mounting wireless access points and repeaters shall meet the requirements of specification LP02 and be included in this item.

General:

The Detector Sensing System shall deploy a design that supports a minimum of eight sensor units being controlled by a radio repeater and a design that incorporates repeaters and a single receiver that supports a cumulative sum of eighty (80) separate detector sensors concurrently at any traffic signalized intersection. The design shall structure data transmissions in a manner as to be non-interfering with other sensors installed. This design shall include a non-interference technique that allows radio link from the detector sensor to the repeater/receiver and a radio link from each repeater to the receiver base at the traffic controller. Repeater devices shall deploy a battery operation or be provided with a battery with solar recharging installation. Batteries shall be rated for a minimum of two (2) years. Each repeater device or receiver device shall be capable of receiving up to eight (8) embedded detector sensors at a range of up to 150 feet from the repeater to the embedded detector sensor.

Epoxy fill for the roadway based on the pavement surface where the detectors are being installed with appropriate temperature ratings shall be applied.

Detector cards for traffic control detector rack positions shall be furnished. Each detector card shall be a four channel device and be capable of providing detector ground true input to the traffic controller as well as linking the detector data to a remote Ethernet port for remote monitoring, concurrently. Traffic controller detector sensor card units shall be compatible with TS-1 terminal facility terminations, unless otherwise specified on the Plans. The detector cards and Expansion Modules shall provide one detector input to the traffic controller for each detector sensor installed. Modification to the existing detector racks to accommodate the new detector may be necessary.

Repeater sites are required for all embedded sensors installed in excess of 150 feet from a receiver or repeater. An additional repeater for any repeater is required for distances greater than 900 feet from a repeater or receiver and/or does not provide sufficient radio propagation to properly support a radio link – repeater to repeater or repeater to receiver, which could occur with non-line of sight locations.

A factory representative is requires at turn-on to support the radio installations and to implement the radio and device programming.

Detector Sensors:

The flush mounting pavement sensors shall be of the magnetic field (magnetometer) sensing technology capable of detecting and reporting volume count, speed, occupancy and headway, as a minimum. The sensor section of the detector shall be embedded in the roadway pavement and shall utilize a radio transmitter link for the detector to a receiver radio being provided to the traffic controller and/or central monitoring server. The detector sensor embedded in the pavement shall not exceed a four (4) inch diameter and a depth of two (2) inches and shall be

installed in a four (4) inch diameter, two and a half (2.5) inch deep cored hole in the pavement, centered in the travel lane. Detector sensors, embedded at a distance greater than one-hundred and fifty (150) feet from the receiver unit installed at the traffic controller cabinet, shall have a repeater installed to relay the sensor data to the receiver. The embedded detector sensor shall be battery operated with a battery design rated for ten (10) year life in this application.

Each detector sensor unit shall self-calibrate and self-configure their electronics for proper detection application. Each sensor unit shall be provided with flash memory upgrade capability to allow upgraded operation or safety enhancements to be “flashed” into local memory without removing the device for the pavement.

Radio Transceivers:

Radio transceivers shall utilize devices that are compliant with IEEE 802.15.4 standards and are able to operate on any of the allocated 16 channels of the 2.4 to 2.48 GHz spectrum. The factory support shall include the programming of the embedded sensor time slots and shall provide a written copy of the final design to the City Traffic Engineer plus one copy for the traffic controller cabinet. One software set of device programming (GUI), if other than standard WEB Browser via SNMP protocol, shall be provided for each intersection where devices are installed. The factory representative shall certify proper installation of the devices, the radio links, device settings and the traffic controller detector assignments. The factory representative shall provide an on-site computer and shall link to the Access Box for all programming. The GUI software shall provide real time management and monitoring of the Detector Sensing System as well as the Event Processing Software. One copy of the Event Processing Software shall be provided.

Basis of Payment. This work shall be paid at the contract unit price each to WIRELESS DETECTION SYSTEM, COMPLETE INTERSECTION, as described above, which price shall be payment in full for al work as described herein and as directed by the Signal Engineer.

TWD2 WIRELESS DETECTION SYSTEM, SINGLE APPROACH

Description. This item shall conform with the specification for Wireless Detection System (Complete Intersection) except as revised herein.

The system shall consist of a minimum of twelve (12) flush mounting pavement detector sensors, one (1) access point, one (1) repeater and associated contact closure cards for a single intersection approach with multiple lanes.

Basis of Payment. This work shall be paid at the contract unit price each for WIRELESS DETECTION SYSTEM, SINGLE APPROACH, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TWI1 WIRELESS INTERCONNECT SYSTEM

Description. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This item shall include all materials, labor and testing to provide the completely operational closed loop system between two (2) intersections as shown on the plans. The radio interconnect system shall include the following components:

a.Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio

b.Software for Radio Configuration (Configure Frequency and Hopping Patterns)

c.Antennas (Omni Directional or Yagi Directional)

d.Antenna Cables, LMR400, Low Loss. Max. 100-ft from controller cabinet to antenna

e.Brackets, Mounting Hardware, and Accessories Required for Installation

f.RS232 Data Cable for Connection from the radio to the local or master controller

g.All other components required for a fully functional radio interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the radio interconnect system components shall be included in this item.

The radio interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed master controller and telemetry module shall be configured for use with the radio interconnect at a minimum rate of 9600 baud.

The radio interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance to the manufacturers recommendations.

The following radio equipment is currently approved for use in Region One/District One: Encon Model 5100 and Intuicom Communicator II.

Basis of Payment. This work shall be paid at the contract unit price each for WIRELESS INTERCONNECT SYSTEM, as described above, which price shall be payment in full for all work as described herein and as directed by the Signal Engineer.

TRAFFIC SIGNAL SPECIFICATIONS

Effective: May 22, 2002

Revised: September 1, 2012

These Traffic Signal Special Provisions and the "District One Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations. All material furnished shall be new. The locations and the details of all installations shall be as indicated on the Plans or as directed by the Engineer. Traffic signal construction and maintenance work shall be performed by personnel holding IMSA Traffic Signal Technician Level II certification. The work to be done under this contract consists of furnishing and installing all traffic signal work as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

SECTION 720 SIGNING

MAST ARM SIGN PANELS

Add the following to Article 720.02 of the Standard Specifications:

Signs attached to poles or posts (such as mast arm signs) shall have mounting brackets and sign channels which are equal to and completely interchangeable with those used by the District Sign Shops. Signfix Aluminum Channel Framing System is currently recommended, but other brands of mounting hardware are acceptable based upon the Department's approval.

DIVISION 800 ELECTRICAL

SUBMITTALS.

Revise Article 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted in accordance with the District's current Electrical Product Data and Documentation Submittal Guidelines. General requirements include:

1. Material approval requests shall be made at the preconstruction meeting, including major traffic signal items listed in the table in Article 801.05. Material or equipment which is similar or identical shall be the product of the same manufacturer, unless necessary for system continuity. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.

2. Product data and shop drawings shall be assembled by pay item and separated from of other pay item submittals. Only the top sheet of each pay item submittal will be stamped by the Department with the review status, except shop drawings for mast arm pole assemblies and the like will be stamped with the review status on each sheet.

3. Partial or incomplete submittals will be returned without review.

4. Certain non-standard mast arm poles and structures will require additional review from IDOT's Central Office. Examples include ornamental/decorative and non-standard length mast arm pole assemblies. The Contractor shall account for the additional review time in his schedule.

5. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of correspondence,, catalog cuts and mast arm poles and assemblies drawings.

6. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall be complete with all test data, dates, and times.

7. After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or 'Incomplete'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.

8. All submitted items reviewed and marked 'APPROVED AS NOTED', 'DISAPPROVED', or 'INCOMPLETE' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify contract compliance at no additional cost to the contract.

9. Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.

INSPECTION OF ELECTRICAL SYSTEMS.

Add the following to Article 801.10 of the Standard Specifications:

(c) All cabinets including temporary traffic signal cabinets shall be assembled by an approved equipment supplier in District One. The Department reserves the right to request any controller and cabinet to be tested at the equipment supplier facilities prior to field installation, at no extra cost to this contract.

MAINTENANCE AND RESPONSIBILITY.

Revise Article 801.11 of the Standard Specifications to read:

a. Existing traffic signal installations and/or any electrical facilities at all or various locations may be altered or reconstructed totally or partially as part of the work on this Contract. The Contractor is hereby advised that all traffic control equipment, presently installed at these locations, may be the property of the State of Illinois, Department of Transportation, Division of Highways, County, Private Developer, or the Municipality in which they are located. Once the Contractor has begun any work on any portion of the project, all traffic signals within the limits of this contract or those which have the item "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," shall become the full responsibility of the Contractor. Automatic Traffic Enforcement equipment is not owned by the State and the Contractor shall not be responsible for maintaining it during construction. The Contractor shall supply the Engineer, Area Traffic Signal Maintenance and Operations Engineer, IDOT ComCenter and the Department's Electrical Maintenance Contractor with two 24-hour emergency contact names and telephone numbers.

b. When the project has a pay item for "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," the Contractor must notify both the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 and the Department's Electrical Maintenance Contractor, of their intent to begin any physical construction work on the Contract or any portion thereof. This notification must be made a minimum of seven (7) working days prior to the start of construction to allow sufficient time for inspection of the existing traffic signal installation(s) and transfer of maintenance to the Contractor. If work is started prior to an inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection. The Contractor will become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted.

c. Contracts such as pavement grinding or patching which result in the destruction of traffic signal loops do not require maintenance transfer, but require a notification of intent to work and an inspection. A minimum of seven (7) working days prior to the loop removal, the Contractor shall notify the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 and the Department's Electrical Maintenance Contractor, at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection. Damaged Automatic Traffic Enforcement equipment, including cameras, detectors, or other peripheral equipment, shall be replaced by others, per Permit agreement, at no cost to the contract. See additional requirements in these specifications under Inductive Loop Detector.

d. The Contractor is advised that the existing and/or temporary traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shutdown the traffic signal installation will only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.

e. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals. Any inquiry, complaint or request by the Department, the Department's Electrical Maintenance Contractor or the public, shall be investigated and repairs begun within one hour. Failure to provide this service will result in liquidated damages of $500 per day per occurrence. In addition, the Department reserves the right to assign any work not completed within this timeframe to the Electrical Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Electrical Maintenance Contractor within one month after the incident will result in additional liquidated damages of $500 per month per occurrence. Unpaid bills will be deducted from the cost of the Contract. The District's Electrical Maintenance Contractor may inspect any signalizing device on the Department's highway system at any time without notification.

f. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be

provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

DAMAGE TO TRAFFIC SIGNAL SYSTEM.

Add the following to Article 801.12(b) of the Standard Specifications to read:

Any traffic signal control equipment damaged or not operating properly from any cause whatsoever shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed.

Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause whatsoever, shall be the responsibility of the municipality or the Automatic Traffic Enforcement company per Permit agreement.

TRAFFIC SIGNAL INSPECTION (TURN-ON).

Revise Article 801.15(b) of the Standard Specifications to read:

It is the intent to have all electric work completed and equipment field tested by the vendor prior to the Department's "turn-on" field inspection. If in the event the Engineer determines work is not complete and the inspection will require more than two (2) hours to complete, the inspection shall be canceled and the Contractor will be required to reschedule at another date. The maintenance of the traffic signals will not be accepted until all punch list work is corrected and re-inspected.

When the road is open to traffic, except as otherwise provided in Section 850 of the Standard Specifications, the Contractor may request a turn-on and inspection of the completed traffic signal installation at each separate location. This request must be made to the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 a minimum of seven (7) working days prior to the time of the requested inspection. The Department will not grant a field inspection until notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. The Department's facsimile number is (847) 705-4089. The Contractor must invite local fire department personnel to the turn-on when Emergency Vehicle Preemption (EVP) is included in the project. When the contract includes the item RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM, OPTIMIZE TRAFFIC SIGNAL SYSTEM, or TEMPORARY TRAFFIC SIGNAL TIMINGS, the Contractor must notify the SCAT Consultant of the turn-on/detour implementation schedule, as well as stage changes and phase changes during construction.

The Contractor must have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and turn-on of the traffic signal installation. The Contractor shall be responsible to provide a police officer to direct traffic at the time of testing.

The Contractor shall provide a representative from the control equipment vendor’s office to attend the traffic signal inspection for both permanent and temporary traffic signal turn-ons. Upon demonstration that the signals are operating and all work is completed in accordance with the Contract and to the satisfaction of the Engineer, the Engineer will then allow the signals to be placed in continuous operation. The Agency that is responsible for the maintenance of each traffic signal installation will assume the maintenance upon successful completion of this inspection.

The District requires the following from the Contractor at traffic signal turn-ons.

1. One set of signal plans of record with field revisions marked in red ink.
2. Written notification from the Contractor and the equipment vendor of satisfactory field testing.
3. A knowledgeable representative of the controller equipment supplier shall be required at the traffic signal turn-on. The representative shall be knowledgeable of the cabinet design and controller functions.
4. A copy of the approved material letter.
5. One (1) copy of the operation and service manuals of the signal controller and associated control equipment.
6. Five (5) copies 11” x 17" (280 mm X 430 mm) of the cabinet wiring diagrams.

7. The controller manufacturer shall supply a printed form, not to exceed 11" x 17" (280 mm X 430 mm) for recording the traffic signal controller's timings; backup timings; coordination splits, offsets, and cycles; TBC Time of Day, Week and Year Programs; Traffic Responsive Program, Detector Phase Assignment, Type and Detector Switching; and any other functions programmable from the keyboard. The form shall include a location, date, manufacturer's name, controller model and software version. The form shall be approved by the Engineer and a minimum of three (3) copies must be furnished at each turn-on. The manufacturer must provide all programming information used within the controller at the time of turn-on.

8. All manufacturer and contractor warrantees and guarantees required by Article 801.14.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on." If approved, traffic signal acceptance shall be verbal at the "turn on" inspection followed by written correspondence from the Engineer. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until Departmental acceptance is granted.

All equipment and/or parts to keep the traffic signal installation operating shall be furnished by the Contractor. No spare traffic signal equipment is available from the Department.

All punch list work shall be completed within two (2) weeks after the final inspection. The Contractor shall notify the Electrical Maintenance Contractor to inspect all punch list work. Failure to meet these time constraints shall result in liquidated damage charges of $500 per month per incident.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements shall be subject to removal and disposal at the Contractor's expense.

RECORD DRAWINGS

The requirements listed for Electrical Installation shall apply for Traffic Signal Installations in Article 801.16. Revise the 2nd paragraph of Article 801.16 of the Standard Specifications to read:

a. "When the work is complete, and seven days before the request for a final inspection, the full-size set of contract drawings. Stamped "RECORD DRAWINGS", shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor's supervising Engineer or electrician. The record drawings shall be submitted in PDF format on CDROM as well as hardcopy for review and approval.

b. In addition to the record drawings, copies of the final catalog cuts which have been Approved or Approved as Noted shall be submitted in PDF format along with the record drawings. The PDF files shall clearly indicate the pay item either by filename or PDF Table of Contents referencing the respective pay item number for multi-item PDF files. Specific part or model numbers of items which have been selected shall be clearly visible."

c. Additional requirements are listed in the District's Electrical Product Data and Documentation Guidelines.

Add the following to Article 801.16 of the Standard Specifications:

"In addition to the specified record drawings, the Contactor shall record GPS coordinates of the following traffic signal components being installed, modified or being affected in other ways by this contract:

- All Mast Arm Poles and Posts
- Handholes
- Conduit roadway crossings
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV Camera installations
- Fiber Optic Splice Locations

Datum to be used shall be North American 1983.

Data shall be provided electronically and in print form. The electronic format shall be compatible with MS Excel. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. Each coordinate shall have the following information:

1. Description of item
2. Designation or approximate station if the item is undesignated
3. Latitude
4. Longitude

Examples:

Description	**Designation**	**Latitude**	**Longitude**
Mast Arm Pole Assembly (dual, combo, etc)	MP (SW, NW, SE or NE corner)	41.580493	-87.793378
FO mainline splice handhole	HHL-ST31	41.558532	-87.792571
Handhole	HH	41.765532	-87.543571
Electric Service	Elec Srv	41.602248	-87.794053
Conduit crossing	SB IL83 to EB I290 ramp SIDE A	41.584593	-87.793378
PTZ Camera	PTZ	41.584600	-87.793432
Signal Post	Post	41.558532	-87.792571
Controller Cabinet	CC	41.651848	-87.762053

Master Controller Cabinet	MCC	41.580493	-87.793378
Communication Cabinet	ComC	41.558532	-87.789771
Fiber splice connection	Toll Plaza34	41.606928	-87.794053

Prior to the collection of data, the contractor shall provide a sample data collection of at least six data points of known locations to be reviewed and verified by the Engineer to be accurate within 100 feet. Upon verification, data collection can begin. Data collection can be made as construction progresses, or can be collected after all items are installed. If the data is unacceptable the contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified.

Accuracy. Data collected is to be mapping grade. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have a minimum 5 meter accuracy after post processing.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years."

Delete the last sentence of the 3rd paragraph of Article 801.16.

LOCATING UNDERGROUND FACILITIES.

Revise Section 803 to the Standard Specifications to read:

If this Contract requires the services of an Electrical Contractor, the Contractor shall be responsible at his/her own expense for locating existing IDOT electrical facilities prior to performing any work. If this Contract does not require the services of an Electrical Contractor, the Contractor may request one free locate for existing IDOT electrical facilities from the District One Electrical Maintenance Contractor prior to the start of any work. Additional requests may be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities, locally owned equipment, and leased enforcement camera system facilities, the local Counties or Municipalities may need to be contacted: in the City of Chicago contact Digger at (312) 744-7000 and for all other locations contact J.U.L.I.E. at 1-800-892-0123 or 811.

RESTORATION OF WORK AREA.

Add the following article to Section 801 of the Standard Specifications:

801.17 Restoration of work area. Restoration of the traffic signal work area shall be included in the related pay items such as foundation, conduit, handhole, trench and backfill, underground raceways, etc. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be replaced in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded. All brick pavers disturbed in the work area shall be restored to their original configuration as directed by the Engineer. All damaged brick pavers shall be replaced with a comparable material approved by the Engineer. Restoration of the work area shall be included in the contract without any extra compensation allowed to the Contractor.

ELECTRIC SERVICE INSTALLATION.

Revise Section 805 of the Standard Specifications to read:

Description.

This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the details in the "District One Standard Traffic Signal Design Details" and applicable portions of the Specifications.

General.

The electric service installation shall be the electric service disconnecting means and it shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of contract preparation. The Contractor must request in writing for service and/or service modification within 10 days of contract award and must follow-up with the electric utility to assure all necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the contractor and utility company to the Engineer and Area Traffic Signal Maintenance and Operations Engineer. The service agreement and sketch shall be submitted for signature to the IDOT's Traffic Operations Programs Engineer.

Materials.

a. General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.

b. Enclosures.

1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080-inch (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14-inches (350 mm) high, 9-inches (225 mm) wide and 8-inches (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the manufacturer.

2. Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125-inch (3.175 mm) thick, the top 0.250-inch (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075-inch (1.91 mm) thick hinge bolted to the cabinet with stainless steel carriage bolts and nylocks nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40-inches (1000 mm) high, 16-inches (400 mm) wide and 15-inches (375 mm) in depth is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.

c. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120 volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of –40C to +85C. The surge protector shall be UL 1449 Listed.

d. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

e. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.

f. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar, mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.

g. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30 day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company marketing representative for service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.

h. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10 feet (3.0m) in length, and 3/4 inch (20mm) in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the contract.

Installation.

a. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.

b. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.

c. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment.

The service installation shall be paid for at the contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The CONCRETE FOUNDATION, TYPE A, which includes the ground rod, shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4 inch (20mm) grounding conduit, ground rod, and pole mount assembly. Any charges by the utility companies shall be approved by the engineer and paid for as an addition to the contract according to Article 109.05 of the Standard Specifications.

GROUNDING OF TRAFFIC SIGNAL SYSTEMS.

Revise Section 806 of the Standard Specifications to read:

General.

All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. See IDOT District One Traffic Signal detail plan sheets for additional information.

The grounding electrode system shall include a ground rod installed with each traffic signal controller concrete foundation and all mast arm and post concrete foundations. An additional ground rod will be required at locations were measured resistance exceeds 25 ohms. Ground rods are included in the applicable concrete foundation or service installation pay item and will not be paid for separately.

Testing shall be according to Article 801.13 (a) (4) and (5).

a) The grounded conductor (neutral conductor) shall be white color coded. This conductor shall be bonded to the equipment grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.

b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications.

    1) Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.

2) Equipment grounding conductors shall be bonded, using a Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A Listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations.

3) All metallic and non-metallic raceways containing traffic signal circuit runs shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.

4. Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.

c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, listed pressure connectors, listed clamps or other approved listed means.

GROUNDING EXISTING HANDHOLE FRAME AND COVER.

Description.

This work shall consist of all materials and labor required to bond the equipment grounding conductor to the existing handhole frame and handhole cover. All installations shall meet the requirements of the details in the "District One Standard Traffic Signal Design Details," and applicable portions of the Standard Specifications and these specifications.

The equipment grounding conductor shall be bonded to the handhole frame and to the handhole cover. Two (2) ½-inch diameter x 1 ¼-inch long hex-head stainless steel bolts, spaced 1.75-inches apart center-to-center shall be fully welded to the frame and to the cover to accommodate a heavy duty Listed grounding compression terminal (Burndy

type YGHA or approved equal). The grounding compression terminal shall be secured to the bolts with stainless steel split-lock washers and nylon-insert locknuts.

Welding preparation for the stainless steel bolt hex-head to the frame and to the cover shall include thoroughly cleaning the contact and weldment area of all rust, dirt and contaminates. The Contractor shall assure a solid strong weld. The welds shall be smooth and thoroughly cleaned of flux and spatter. The grounding installation shall not affect the proper seating of the cover when closed.

The grounding cable shall be paid for separately.

Method of Measurement.

Units measured for payment will be counted on a per handhole basis, regardless of the type of handhole and its location.

Basis of Payment.

This work shall be paid for at the contract unit price each for GROUNDING EXISTING HANDHOLE FRAME AND COVER which shall be payment in full for grounding the handhole complete.

COILABLE NON-METALLIC CONDUIT.

Description.

This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC) for detector loop raceways.

General.

The CNC installation shall be in accordance with Sections 810 and 811 of the Standard Specifications except for the following:

Add the following to Article 810.03 of the Standard Specifications:

CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes.

Add the following to Article 811.03 of the Standard Specifications:

On temporary traffic signal installations with detector loops, CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways from the saw-cut to 10 feet (3m) up the wood pole, unless otherwise shown on the plans

Basis of Payment.

All installations of CNC for loop detection shall be included in the contract and not paid for separately.

HANDHOLES.

Add the following to Section 814 of the Standard Specifications:

All handholes shall be concrete, poured in place, with inside dimensions of 21-1/2 inches (549mm) minimum. Frames and lid openings shall match this dimension. The cover of the handhole frame shall be labeled “Traffic Signals" with legible raised letters.

For grounding purposes the handhole frame shall have provisions for a 7/16 inch (15.875mm) diameter stainless bolt cast into the frame. The covers shall have a stainless steel threaded stint extended from the eye hook assembly for the purpose of attaching the grounding conductor to the handhole cover.

The minimum wall thickness for heavy duty hand holes shall be 12 inches (300mm).

All conduits shall enter the handhole at a depth of 30 inches (760mm) except for the conduits for detector loops when the handhole is less than 5 feet (1.52 m) from the detector loop. All conduit ends should be sealed with a waterproof sealant to prevent the entrance of contaminants into the handhole.

Steel cable hooks shall be coated with hot-dipped galvanization in accordance with AASHTO Specification M111. Hooks shall be a minimum of 1/2 inch (12.7 mm) diameter with two 90 degree bends and extend into the handhole at least 6 inches (150 mm). Hooks shall be placed a minimum of 12 inches (300 mm) below the lid or lower if additional space is required.

GROUNDING CABLE.

The cable shall meet the requirements of Section 817 of the "Standard Specifications," except for the following:

Add the following to Article 817.02 (b) of the Standard Specifications:

Unless otherwise noted on the Plans, traffic signal grounding conductor shall be one conductor, #6 gauge copper, with a green color coded XLP jacket.

The traffic signal grounding conductor shall be bonded, using a Listed grounding connector (Burndy type KC/K2C, as applicable, or approved equal), to all proposed and existing traffic signal mast arm poles and traffic/pedestrian signal posts, including push button posts. The grounding conductor shall be bonded to all proposed and existing pull boxes, handhole frames and covers and other metallic enclosures throughout the traffic signal wiring system and noted herein and detailed on the plans. The grounding conductor shall be bonded to conduit terminations using rated grounding bushings. Bonding to existing handhole frames and covers shall be paid for separately.

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

Grounding cable shall be measured in place for payment in foot (meter). Payment shall be at the contract unit price for ELECTRIC CABLE IN CONDUIT, GROUNDING, NO. 6, 1C, which price includes all associated labor and material including grounding clamps, splicing, exothermic welds, grounding connectors, conduit grounding bushings, and other hardware.

RAILROAD INTERCONNECT CABLE.

The cable shall meet the requirements of Section 873 of the Standard Specifications, except for the following:

Add to Article 873.02 of the Standard Specifications:

The railroad interconnect cable shall be three conductor stranded #14 copper cable in a clear polyester binder, shielded with #36 AWG tinned copper braid with 85% coverage, and insulated with .016" polyethylene (black, blue, red). The jacket shall be black 0.045 PVC or polyethylene.

Add the following to Article 873.05 of the Standard Specifications:

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for ELECTRIC CABLE IN CONDUIT, RAILROAD, NO. 14 3C, which price shall be payment in full for furnishing, installing, and making all electrical connections in the traffic signal controller cabinet. Connections in the railroad controller cabinet shall be performed by railroad personnel.

FIBER OPTIC TRACER CABLE.

The cable shall meet the requirements of Section 817 of the "Standard Specifications," except for the following:

Add the following to Article 817.03 of the Standard Specifications:

In order to trace the fiber optic cable after installation, the tracer cable shall be installed in the same conduit as the fiber optic cable in locations shown on the plans. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a barrier type terminal strip mounted on the side wall of the controller cabinet. The barrier type terminal strip and tracer cable shall be clearly marked and identified. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable will be allowed to be spliced at handholes only. The tracer cable splice shall use a Western Union Splice soldered with resin core flux and shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. All exposed surfaces of the solder shall be smooth. The splice shall be covered with a black shrink tube meeting UL 224 guidelines, Type V and rated 600v, minimum length 4 inches (100 mm) and with a minimum 1 inch (25 mm) coverage over the XLP insulation, underwater grade.

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C per foot (meter), which price shall include all associated labor and material for installation.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

Revise Articles 850.02 and 850.03 of the Standard Specifications to read:

Procedure.

The energy charges for the operation of the traffic signal installation shall be paid for by others. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof.

The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance.

This item shall include maintenance of all traffic signal equipment at the intersection, including emergency vehicle pre-emption equipment, master controllers, uninterruptible power supply (UPS and batteries), telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment, but shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment, not owned by the State.

Maintenance.

The maintenance shall be according to MAINTENANCE AND RESPONSIBILITY in Division 800 of these specifications and the following:.

The Contractor shall check all controllers every two (2) weeks, which will include visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. This item includes, as routine maintenance, all portions of emergency vehicle pre-emption equipment. The Contractor shall maintain in stock at all times a sufficient amount of materials and equipment to provide effective temporary and permanent repairs.

The Contractor shall provide immediate corrective action when any part or parts of the system fail to function properly. Two far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected or otherwise removed from normal operation, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall be required to place stop signs (R1-1-36) at each approach of the intersection as a temporary means of regulating traffic. When the signals operate in flash, the Contractor shall furnish and equip all their vehicles assigned to the maintenance of traffic signal installations with a sufficient number of stop signs as specified herein. The Contractor shall maintain a sufficient number of spare stop signs in stock at all times to replace stop signs which may be damaged or stolen.

The Contractor shall provide the Engineer with a 24 hour telephone number for the maintenance of the traffic signal installation and for emergency calls by the Engineer.

Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of the Standard Specifications and these special provisions.

The Contractor shall respond to all emergency calls from the Department or others within one hour after notification and provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the contract. The Contractor may institute action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the State's Electrical Maintenance Contractor perform the maintenance work required. The State's Electrical Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the Electrical Maintenance Contractor to make reviews of the Existing Traffic Signal Installation that has been transferred to the Contractor for Maintenance.

TRAFFIC ACTUATED CONTROLLER.

Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant NEMA TS2 Type 1, Econolite ASC/3S-1000 or Eagle/Siemens M50 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment manufacturers will be allowed. The controller shall be the most recent model and software version supplied by the manufacturer at the time of the approval and include the standard data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events.

Add the following to Article 857.03 of the Standard Specifications:

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET as called for on the traffic signal installation plans. If the traffic signal installation is part of a traffic signal system, a telephone line is usually not required, unless a telephone line is called for on the traffic signal plans. The Contractor shall follow the requirements for the telephone service installation as contained in the current District One Traffic Signal Special Provisions under Master Controller.

MASTER CONTROLLER.

Revise Articles 860.02 - Materials and 860.03 - Installation of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment manufacturers will be allowed. Only NEMA TS 2 Type 1 Eagle/Siemens and Econolite closed loop systems shall be supplied. The latest model and software version of master controller shall be supplied.

Functional requirements in addition to those in Section 863 of the Standard Specifications include:

The system commands shall consist of, as a minimum, six (6) cycle lengths, five (5) offsets, three (3) splits, and four (4) special functions. The system commands shall also include commands for free or coordinated operation.

Traffic Responsive operation shall consist of the real time acquisition of system detector data, data validation, and the scaling of acquired volumes and occupancies in a deterministic fashion so as to cause the selection and implementation of the most suitable traffic plan.

Upon request by the Engineer, each master shall be delivered with up to three (3) complete sets of the latest edition of registered remote monitoring software with full manufacture's support. Each set shall consist of software on CD, DVD, or other suitable media approved by the Engineer, and a bound set of manuals containing loading and operating instruction. One copy of the software and support data shall be delivered to the Agency in

charge of system operation, if other than IDOT. One of these two sets will be provided to the Agency Signal Maintenance Contractor for use in monitoring the system.

The approved manufacturer of equipment shall loan the District one master controller and two intersection controllers of the most recent models and the newest software version to be used for instructional purposes in addition to the equipment to be supplied for the Contract.

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the master controller. This shall be accomplished through the following process utilizing District One staff. This telephone line may be coupled with a DSL line and a phone filter to isolate the dial-up line. An E911 address is required.

The cabinet shall be provided with an Outdoor Network Interface for termination of the telephone service. It shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service at a later date.

Full duplex communication between the master and its local controllers is recommended, but at this time not required. The data rate shall be 1200 baud minimum and shall be capable of speeds to 38,400 or above as technology allows. The controller, when installed in an Ethernet topology, may operate non-serial communications.

The cabinet shall be equipped with a 9600 baud, auto dial/auto answer modem. It shall be a US robotics 33.6K baud rate or equal.

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact (via phone) the Administrative Support Manager in the District One Business Services Section at (847) 705-4011 to request a phone line installation.

A follow-up fax transmittal to the Administrative Support Manager (847-705-4712) with all required information pertaining to the phone installation is required from the Contractor as soon as possible or within one week after the initial request has been made. A copy of this fax transmittal must also be faxed by the Contractor to the Traffic Signal Systems Engineer at (847) 705-4089. The required information to be supplied on the fax shall include (but not limited to): A street address for the new traffic signal controller (or nearby address); a nearby existing

telephone number; what type of telephone service is needed; the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line is 4-6 weeks after the Business Services Section has received the Contractor supplied fax. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor in anticipation of this time frame. On jobs which include roadway widening in which the conduit cannot be installed until this widening is completed, the Contractor will be allowed to delay the phone line installation request to the Business Services Section until a point in time that is 4-6 weeks prior to the anticipated completion of the traffic signal work. The contractor shall provide the Administrative Support Manager with an expected installation date considering the 4-6 week processing time.

The telephone line shall be installed and activated one month before the system final inspection.

All costs associated with the telephone line installation and activation (not including the Contract specified conduit installation between the point of telephone service and the traffic signal controller cabinet) shall be paid for by the District One Business Services Section (i.e., this will be an IDOT phone number not a Contractor phone number).

UNINTERRUPTIBLE POWER SUPPLY.

Add the following to Article 862.01 of the Standard Specifications:

The UPS shall have the power capacity to provide normal operation of a signalized intersection that utilizes all LED type signal head optics, for a minimum of six hours.

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTIBLE POWER SUPPLY in Division 1000 of these specifications.

Add the following to Article 862.03 of the Standard Specifications:

The UPS shall additionally include, but not be limited to, a battery cabinet. The UPS shall provide reliable emergency power to the traffic signals in the event of a power failure or interruption.

Revise Article 862.04 of the Standard Specifications to read:

Installation.

When a UPS is installed at an existing traffic signal cabinet, the UPS cabinet shall partially rest on the lip of the existing controller cabinet foundation and be secured to the existing controller cabinet by means of at least four (4) stainless steel bolts. The UPS cabinet shall be completely enclosed with the bottom and back constructed of the same material as the cabinet.

When a UPS is installed at a new signal cabinet and foundation, it shall be mounted as shown on the plans.

At locations where UPS is installed and Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron 67 in. x 50 in. x 5 in. (1702mm x 1270mm x 130mm) shall be provided on the side of the existing Type D Foundation, where the UPS cabinet is located. The concrete apron shall follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the UPS.

Revise Article 862.05 of the Standard Specifications to read:

Basis of Payment.

This work will be paid for at the contract unit price per each for UNINTERRUPTIBLE POWER SUPPLY SPECIAL. Replacement of Emergency Vehicle Priority System confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTIBLE POWER SUPPLY SPECIAL item. The concrete apron and earth excavation required shall be included in the cast of the UNINTERRUPTIBLE POWER SUPPLY SPECIAL item.

FIBER OPTIC CABLE.

Add the following to Article 871.01 of the Standard Specifications:

The Fiber Optic cable shall be installed in conduit or as specified on the plans.

Add the following to Article 872.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be CSC FTWO12KST-W/O 12/MM 24/SM Port Fiber Wall Enclosure or an approved equivalent. The fiber optic cable shall provide six fibers per tube for the amount of fibers called for in the Fiber Optic Cable pay item in the Contract. Fiber Optic cable may be gel filled or have an approved water blocking tape.

Add the following to Article 871.04 of the Standard Specifications:

A minimum of six multimode fibers from each cable shall be terminated with approved mechanical connectors at the distribution enclosure. Fibers not being used shall be labeled “spare." Fibers not attached to the distribution enclosure shall be capped and sealed. A minimum of 13.0 feet (4m) of extra cable length shall be provided for controller cabinets. The controller cabinet extra cable length shall be stored as directed by the Engineer.

Add the following to Article 871.06 of the Standard Specifications:

The distribution enclosure and all connectors will be included in the cost of the fiber optic cable.

MAST ARM ASSEMBLY AND POLE.

Revise Article 877.01 of the Standard Specifications to read:

Description.

This work shall consist of furnishing and installing a steel mast arm assembly and pole and a galvanized steel or extruded aluminum shroud for protection of the base plate.

Revise Article 877.03 of the Standard Specifications:

Mast arm assembly and pole shall be as follows.

(a) Steel Mast Arm Assembly and Pole and Steel Combination Mast Arm Assembly and Pole. The steel mast arm assembly and pole and steel combination mast arm assembly and pole shall consist of a traffic signal mast arm, a luminaire mast arm or davit (for combination pole only), a pole, and a base, together with anchor rods and other appurtenances. The configuration of the mast arm assembly, pole, and base shall be according to the details shown on the plans.

(1) Loading. The mast arm assembly and pole, and combination mast arm assembly and pole shall be designed for the loading shown on the Highway Standards or elsewhere on the plans, whichever is greater. The design shall be according to AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 1994 Edition for 80 mph (130 km/hr) wind velocity. However, the arm-to-pole connection for tapered signal and luminaire arms shall be according to the "ring plate" detail as shown in Figure 11-1(f) of the 2002 Interim, to the AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 2001 4th Edition.

(2) Structural Steel Grade. The mast arm and pole shall be fabricated according to ASTM A 595, Grade A or B, ASTM A 572 Grade 55, or ASTM A 1011 Grade 55 HSLAS Class 2. The base and flange plates shall be of structural steel according to AASHTO M 270 Grade 50 (M 270M Grade 345). Luminaire arms and trussed arms 15 ft (4.5 m) or less shall be fabricated from one steel pipe or tube size according to ASTM A 53 Grade B or ASTM A 500 Grade B or C. All mast arm assemblies, poles, and bases shall be galvanized according to AASHTO M 111.

(3) Fabrication. The design and fabrication of the mast arm assembly, pole, and base shall be according to the requirements of the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals published by AASHTO. The mast arm and pole may be of single length or sectional design. If section design is used, the overlap shall be at least 150 percent of the maximum diameter of the overlapping section and shall be assembled in the factory.

The manufacturer will be allowed to slot the base plate in which other bolt circles may fit, providing that these slots do not offset the integrity of the pole. Circumferential welds of tapered arms and poles to base plates shall be full penetration welds.

(4) Shop Drawing Approval. The Contractor shall submit detailed drawings showing design materials, thickness of sections, weld sizes, and anchor rods to the Engineer for approval prior to fabrication. These drawings shall be at least 11 x 17 in. (275 x 425 mm) in size and of adequate quality for microfilming. All product data and shop drawings shall be submitted in electronic form on CD-ROM

(b) Anchor Rods. The anchor rods shall be ASTM F 1554 Grade 105, coated by the hot-dip galvanizing process according to AASHTO M 232, and shall be threaded a minimum of 7 1/2 in. (185 mm) at one end and have a bend at the other end. The first 12 in. (300 mm) at the threaded end shall be galvanized. Two nuts, one lock washer, and one flat washer shall be furnished with each anchor rod. All nuts and washers shall be galvanized.

(c) The galvanized steel or extruded aluminum shroud shall have dimensions similar to those detailed in the "District One Standard Traffic Signal Design Details." The shroud shall be installed such that it allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet.

Add the following to Article 877.04 of the Standard Specifications:

The shroud shall not be paid for separately but shall be included in the cost of the mast arm assembly and pole.

CONCRETE FOUNDATIONS.

Add the following to Article 878.03 of the Standard Specifications:

All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. (300 mm) from the threaded end.

Concrete Foundations, Type "A" for Traffic Signal Posts shall provide anchor bolts with the bolt pattern specified within the "District One Standard Traffic Signal Design Details." All Type "A" foundations shall be a minimum depth of 48 inches (1220 mm).

Concrete Foundations, Type "C" for Traffic Signal Cabinets with Uninterruptible Power Supply (UPS) cabinet installations shall be a minimum of 72 inches (1830 mm) long and 31 inches (790 mm) wide. All Type "C" foundations shall be a minimum depth of 48 inches (1220 mm). The concrete apron in front of the Type IV or V cabinet shall be 36 in. x 48 in. x 5 in. (915 mm X 1220 mm X 130 mm). The concrete apron in front of the UPS cabinet shall be 36 in. x 67 in. x 5 in. (915 mm X 1700 mm X 130 mm). Anchor bolts shall provide bolt spacing as required by the manufacturer.

Concrete Foundations, Type "D" for Traffic Signal Cabinets shall be a minimum of 48 inches (1220 mm) long and 31 inches (790 mm) wide. All Type "D" foundations shall be a minimum depth of 48 inches (1220 mm). The concrete apron shall be 36 in. x 48 in. x 5 in. (910 mm X 1220 mm X 130 mm). Anchor bolts shall provide bolt spacing as required by the manufacturer.

Concrete Foundations, Type "E" for Mast Arm and Combination Mast Arm Poles shall meet the current requirements listed in the Highway Standards.

Foundations used for Combination Mast Arm Poles shall provide an extra 2-1/2 inch (65 mm) raceway.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD.

Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

Basis of Payment.

The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

LIGHT EMITING DIODE (LED), SIGNAL HEAD, RETROFIT

Description.

This work shall consist of retrofitting an existing polycarbonate traffic signal head with a traffic signal module, pedestrian signal module, and pedestrian countdown signal module, with light emitting diodes (LEDs) as specified in the plans.

Materials.

Materials shall be according to LIGHT EMITTING DIODE (LED) AND OPTICALLY PROGRAMMED LED SIGNAL HEAD, AND LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD in Divisions 880, 881 and 1000 of these specifications.

Add the following to Article 880.04 of the Standard Specifications:

Basis of Payment.

This item shall be paid for at the contract unit price each for SIGNAL HEAD, LED, RETROFIT, or PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, for the type and number of polycarbonate signal heads, faces, and sections specified, which price shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition. The type specified will indicate the number of faces and the method of mounting.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

Add the following to the third paragraph of Article 881.03 of the Standard Specifications:

No mixing of different types of pedestrian traffic signals or displays will be permitted.

Add the following to Article 881.03 of the Standard Specifications:

(a) Pedestrian Countdown Signal Heads.

(1) Pedestrian Countdown Signal Heads shall not be installed at signalized intersections where traffic signals and railroad warning devices are interconnected.

(2) Pedestrian Countdown Signal Heads shall be 16 inch (406mm) x 18 inch (457mm), for single units with the housings glossy black polycarbonate. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on.

(3) Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. "Egg Crate" type sun shields are not permitted. Numerals shall measure 9 inches (229mm) in height and easily identified from a distance of 120 feet (36.6m).

Add the following to Article 881.04 of the Standard Specifications:

Basis of Payment.

The price shall include furnishing the equipment described above, all mounting hardwire and installing them in satisfactory operating condition.

DETECTOR LOOP.

Revise Section 886 of the Standard Specifications to read:

Description.

This work shall consist of furnishing and installing a detector loop in the pavement.

Procedure.

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall have the proposed loop locations marked and contact the Area Traffic Signal Maintenance and Operations Engineer (847) 705-4424 to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the pouring of the Portland cement concrete surface, using the same notification process as above.

Installation.

Loop detectors shall be installed according to the requirements of the "District One Standard Traffic Signal Design Details." Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut (homerun on preformed detector loops) unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a Panduit PLFIM water proof tag, or an approved equal, secured to each wire with nylon ties.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

(a) Type I. All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement, curb and handhole shall be cut with a 1/4 inch (6.3 mm) deep x 4 inches (100 mm) saw cut to mark location of each loop lead-in.

(b) Loop sealant shall be a two-component thixotropic chemically cured polyurethane either Chemque Q-Seal 295, Percol Elastic Cement AC Grade or an approved equal. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface, if installed above the surface the overlap shall be removed immediately.

(c) Detector loop measurements shall include the saw cut and the length of the loop lead-in to the edge of pavement. The lead-in wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. Unit duct, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.

(d) Preformed. This work shall consist of furnishing and installing a rubberized or crosslinked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:

(e) Preformed detector loops shall be installed in new pavement constructed of Portland cement concrete using mounting chairs or tied to re-bar or the preformed detector loops may be placed in the sub-base. Loop lead-

ins shall be extended to a temporary protective enclosure near the proposed handhole location. The protective enclosure shall provide sufficient protection from other construction activities and may be buried for additional protection.

(f) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. Non-metallic coilable duct, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.

(g) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. Homeruns and interconnects shall be pre-wired and shall be an integral part of the loop assembly. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 11/16 inch (17.2 mm) outside diameter (minimum), 3/8 inch (9.5 mm) inside diameter (minimum) Class A oil resistant synthetic cord reinforced hydraulic hose with 250 psi (1,720 kPa) internal pressure rating or a similarly sized XLPE cable jacket. Hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns or interconnects to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to insure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. For XLPE jacketed preformed loops, all splice connections shall be soldered, sealed, and tested before being sealed in a high impact glass impregnated plastic splice enclosure. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application specific. Homerun wire pairs shall be twisted a minimum of four turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to insure complete moisture blockage and further protect the wire. The preformed loops shall be constructed to allow a minimum of 6.5 feet of extra cable in the handhole.

Method of Measurement.

This work will be measured for payment in feet (meters) in place. Type I detector loop will be measured along the sawed slot in the pavement containing the loop and lead-in, rather than the actual length of the wire. Preformed detector loops will be measured along the detector loop and lead-in embedded in the pavement, rather than the actual length of the wire.

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I or PREFORMED DETECTOR LOOP as specified in the plans, which price shall be payment in full for furnishing and installing the detector loop and all related connections for proper operation.

EMERGENCY VEHICLE PRIORITY SYSTEM.

Revise Section 887 of the Standard Specifications to read:

It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle pre-emption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency.

All new installations shall be equipped with Confirmation Beacons as shown on the "District One Standard Traffic Signal Design Details." The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, maximum 6 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

All light operated systems shall include security and transit preemption software and operate at a uniform rate of 14.035 Hz ±0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the EMERGENCY VEHICLE PRIORITY SYSTEM.

Basis of Payment.

The work shall be paid for at the contract unit price each for furnishing and installing LIGHT DETECTOR and LIGHT DETECTOR AMPLIFIER. Furnishing and installing the confirmation beacon shall be included in the cost of the Light Detector. Any required modifications to the traffic signal controller shall be included in the cost of the LIGHT DETECTOR AMPLIFIER. The preemption detector amplifier shall be paid for on a basis of (1) one each per intersection controller and shall provide operation for all movements required in the pre-emption phase sequence.

TEMPORARY TRAFFIC SIGNAL INSTALLATION.

Revise Section 890 of the Standard Specifications to read:

Description.

This work shall consist of furnishing, installing, maintaining, and removing a temporary traffic signal installation as shown on the plans, including but not limited to temporary signal heads, emergency vehicle priority systems, interconnect, vehicle detectors, uninterruptible power supply, and signing. Temporary traffic signal controllers and cabinets interconnected to railroad traffic control devices shall be new. When temporary traffic signals will be operating within a county or local agency Traffic Management System, the equipment must be NTCIP compliant and compatible with the current operating requirements of the Traffic Management System.

General.

Only an approved equipment vendor will be allowed to assemble the temporary traffic signal cabinet. Also, an approved equipment vendor shall assemble and test a temporary railroad traffic signal cabinet. (Refer to the "Inspection of Controller and Cabinet" specification). A representative of the approved control equipment vendor shall be present at the temporary traffic signal turn-on inspection.

Construction Requirements.

(a) Controllers.

1. Only controllers supplied by one of the District approved closed loop equipment manufacturers will be approved for use at temporary signal locations. All controllers used for temporary traffic signals shall be fully actuated NEMA microprocessor based with RS232 data entry ports

compatible with existing monitoring software approved by IDOT District 1, installed in NEMA TS2 cabinets with 8 phase back panels, capable of supplying 255 seconds of cycle length and individual phase length settings up to 99 seconds. On projects with one lane open and two way traffic flow, such as bridge deck repairs, the temporary signal controller shall be capable of providing an adjustable all red clearance setting of up to 30 seconds in length. All controllers used for temporary traffic signals shall meet or exceed the requirements of Section 857 of the Standard Specifications with regards to internal time base coordination and preemption. All railroad interconnected temporary controllers and cabinets shall be new and shall satisfy the requirements of Article 857.02 of the Standard Specifications as modified herein.

2. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved closed loop equipment manufacturers will be approved for use at temporary traffic signal locations. All control equipment for the temporary traffic signal(s) shall be furnished by the Contractor unless otherwise stated in the plans. On projects with multiple temporary traffic signal installations, all controllers shall be the same manufacturer brand and model number with current software installed.

(b) Cabinets. All temporary traffic signal cabinets shall have a closed bottom made of aluminum alloy. The bottom shall be sealed along the entire perimeter of the cabinet base to ensure a water, dust and insect-proof seal. The bottom shall provide a minimum of two (2) 4 inch (100 mm) diameter holes to run the electric cables through. The 4 inch (100 mm) diameter holes shall have a bushing installed to protect the electric cables and shall be sealed after the electric cables are installed.

(c) Grounding. Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 806 of the Standard Specifications and shall meet the requirements of the District 1 Traffic Signal Specifications for “Grounding of Traffic Signal Systems.”

(d) Traffic Signal Heads. All traffic signal sections and pedestrian signal sections shall be 12 inches (300 mm). Traffic signal sections shall be LED with expandable view, unless otherwise approved by the Engineer. Pedestrian signal heads shall be Light Emitting Diode (LED) Pedestrian Countdown Signal Heads except when a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing. When a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing, Light Emitting Diode (LED) Pedestrian Signal Heads shall be furnished. The temporary traffic signal heads shall be placed as indicated on the temporary traffic signal plan or as directed by the Engineer. The Contractor shall furnish enough extra cable length to relocate heads to any position on the span wire or at locations illustrated on the plans for construction staging. The

temporary traffic signal shall remain in operation during all signal head relocations. Each temporary traffic signal head shall have its own cable from the controller cabinet to the signal head.

(e) Interconnect.

1. Temporary traffic signal interconnect shall be provided using fiber optic cable or wireless interconnect technology as specified in the plans. The Contractor may request, in writing, to substitute the fiber optic temporary interconnect indicated in the contract documents with a wireless interconnect. The Contractor must provide assurances that the radio device will operate properly at all times and during all construction staging. If approved for use by the Engineer, the Contractor shall submit marked-up traffic signal plans indicating locations of radios and antennas and installation details. If wireless interconnect is used, and in the opinion of the engineer, it is not viable, or if it fails during testing or operations, the Contractor shall be responsible for installing all necessary poles, fiber optic cable, and other infrastructure for providing temporary fiber optic interconnect at no cost to the contract.

2. The existing system interconnect and phone lines are to be maintained as part of the Temporary Traffic Signal Installation specified for on the plan. The interconnect shall be installed into the temporary controller cabinet as per the notes or details on the plans. All labor and equipment required to install and maintain the existing interconnect as part of the Temporary Traffic Signal Installation shall be included in the item Temporary Traffic Signal Installation. When shown in the plans, temporary traffic signal interconnect equipment shall be furnished and installed. The temporary traffic signal interconnect shall maintain interconnect communications throughout the entire signal system for the duration of the project.

3. Temporary wireless interconnect, complete. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This item shall include all temporary wireless interconnect components, complete, at the adjacent existing traffic signal(s) to provide a completely operational closed loop system. This item shall include all materials, labor and testing to provide the completely operational closed loop system as shown on the plans. The radio interconnect system shall include the following components:

    a. Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio

    b. Software for Radio Configuration (Configure Frequency and Hopping Patterns)

c. Antennas (Omni Directional or Yagi Directional)

d. Antenna Cables, LMR400, Low Loss. Max. 100-ft from controller cabinet to antenna

e. Brackets, Mounting Hardware, and Accessories Required for Installation

f. RS232 Data Cable for Connection from the radio to the local or master controller

g. All other components required for a fully functional radio interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the radio interconnect system components shall be included in this item.

The radio interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed master controller and telemetry module shall be configured for use with the radio interconnect at a minimum rate of 9600 baud.

The radio interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance to the manufacturers recommendations.

The following radio equipment is currently approved for use in Region One/District One: Encom Model 5100 and Intuicom Communicator II.

(f) Emergency Vehicle Pre-Emption. All emergency vehicle preemption equipment (light detectors, light detector amplifiers, confirmation beacons, etc.) as shown on the temporary traffic signal plans shall be provided by the Contractor. It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle preemption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency. All light operated systems shall operate at a uniform rate of 14.035 hz ±0.002, or as otherwise required by the Engineer, and provide compatible operation

with other light systems currently being operated in the District. All labor and material required to install and maintain the Emergency Vehicle Preemption installation shall be included in the item Temporary Traffic Signal Installation.

(g) Vehicle Detection. All temporary traffic signal installations shall have vehicular detection installed as shown on the plans or as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as shown on the plans or as directed by the Engineer. All approaches shall have vehicular detection provided by vehicle detection system as shown on the plans or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system shall be approved by IDOT prior to Contractor furnishing and installing. The Contractor shall install, wire, and adjust the alignment of the microwave vehicle sensor or video vehicle detection system in accordance to the manufacturer's recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the microwave vehicle sensor or video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. A representative of the approved control equipment vendor shall be present and assist the contractor in setting up and maintaining the microwave vehicle sensor or video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item Temporary Traffic Signal Installation.

(h) Uninterruptible Power Supply. All temporary traffic signal installations shall have Uninterruptible Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic signal cabinet and meet the requirements of Uninterruptible Power Supply in Divisions 800 and 1000 of these specifications.

(i) Signs. All existing street name and intersection regulatory signs shall be removed from existing poles and relocated to the temporary signal span wire. If new mast arm assembly and pole(s) and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost. Any intersection regulatory signs that are required for the temporary traffic signal shall be provided as shown on the plans or as directed by the Engineer. Relocation, removing, bagging and installing the regulatory signs for the various construction stages shall be provided as shown on the plans or as directed by the Engineer.

(j) Energy Charges. The electrical utility energy charges for the operation of the temporary traffic signal installation shall be paid for by others if the installation replaces an existing signal. Otherwise charges shall be paid for under 109.05 of the Standard Specifications.

(k) Maintenance. Maintenance shall meet the requirements of the Standard Specifications and MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION in Division 800 of these specifications. Maintenance of temporary signals and of the existing signals shall be included in the cost of the TEMPORARY TRAFFIC SIGNAL INSTALLATION pay item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as he begins any physical work on the Contract or any portion thereof. In addition, a minimum of seven (7) days prior to assuming maintenance of the existing traffic signal installation(s) under this Contract, the Contractor shall request that the Resident Engineer contact the Bureau of Traffic Operations (847) 705-4424 for an inspection of the installation(s).

(l) Temporary Traffic Signals for Bridge Projects. Temporary Traffic Signals for bridge projects shall follow the State Standards, Standard Specifications, District One Traffic Signal Specifications and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification. In addition all electric cable shall be aerially suspended, at a minimum height of 18 feet (5.5m) on temporary wood poles (Class 5 or better) of 45 feet (13.7 m) minimum height. The signal heads shall be span wire mounted or bracket mounted to the wood pole or as directed by the Engineer. The Controller cabinet shall be mounted to the wood pole as shown in the plans, or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system may be used in place of detector loops as approved by the Engineer.

(m) Temporary Portable Traffic Signal for Bridge Projects.

1. Unless otherwise directed by the Engineer, temporary portable traffic signals shall be restricted to use on roadways of less than 8000 ADT that have limited access to electric utility service, shall not be installed on projects where the estimated need exceeds ten (10) weeks, and shall not be in operation during the period of November through March. The Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract if the bridge project or Engineer requires temporary traffic signals to remain in operation into any part of period of November through March. If, in the opinion of the engineer, the reliability and safety of the temporary portable traffic signal is not similar to that of a temporary span wire traffic signal installation, the Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract.

2. The controller and LED signal displays shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification.

3. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.

4. General.

    a. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of 12 days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.

    b. All signal heads located over the travel lane shall be mounted at a minimum height of 17 feet (5m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 feet (2.5m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.

    c. The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.

    d. As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with microwave sensors or other approved methods of vehicle detection and traffic actuation.

    e. All portable traffic signal units shall be interconnected using hardwire communication cable. Radio communication equipment may be used only with the approval of the Engineer. If radio communication is used, a site analysis shall be completed to ensure

that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.

f. The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV and other applicatble portions of the currently adopted version of the Manual on Uniform Traffic Control Devices (MUTCD) and the Illinois MUTCD. The signal system shall be designed to continuously operate over an ambient temperature range between -30 ºF (-34 ºC) and 120 ºF (48 ºC). When not being utilized to inform and direct traffic, portable signals shall be treated as nonoperating equipment according to Article 701.11.

g. Basis of Payment. This work will be paid for according to Article 701.20(c).

Basis of Payment.

This work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION, or TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION, the price of which shall include all costs for the modifications required for traffic staging, changes in signal phasing as required in the Contract plans, microwave vehicle sensors, video vehicle detection system, any maintenance or adjustment to the microwave vehicle sensors/video vehicle detection system, the temporary wireless interconnect system complete, temporary fiber optic interconnect system complete, all material required, the installation and complete removal of the temporary traffic signal. Each intersection will be paid for separately.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT.

Add the following to Article 895.05 of the Standard Specifications:

The traffic signal equipment which is to be removed and is to become the property of the Contractor shall be disposed of outside the right-of-way at the Contractor's expense.

All equipment to be returned to the State shall be delivered by the Contractor to the State's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the State's Electrical Maintenance Contractor to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within 30 days of removing it from the traffic signal installation. The Contractor shall provide 5 copies of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. The Contractor shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned with these requirements, it will be rejected by the State's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until the acceptance of a receipt drawn by the State's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up or delivery of all equipment to be returned to agencies other than the State. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.

TRAFFIC SIGNAL PAINTING.

Description.

This work shall include surface preparation, powder type painted finish application and packaging of new galvanized steel traffic signal mast arm poles and posts assemblies. All work associated with applying the painted finish shall be performed at the manufacturing facility for the pole assembly or post or at a painting facility approved by the Engineer. Traffic signal mast arm shrouds and post bases shall also be painted the same color as the pole assemblies and posts.

Surface Preparation.

All weld flux and other contaminates shall be mechanically removed. The traffic mast arms and post assemblies shall be degreased, cleaned, and air dried to assure all moisture is removed.

Painted Finish.

All galvanized exterior surfaces shall be coated with a urethane or triglycidyl isocyanurate (TGIC) polyester powder to a dry film thickness of 2.0 mils. Prior to application, the surface shall be mechanically etched by brush blasting (Ref. SSPC-SP7) and the zinc coated substrate preheated to 450 ºF for a minimum one (1) hour. The coating shall be electrostatically applied and cured by elevating the zinc-coated substrate temperature to a minimum of 400 ºF.

The finish paint color shall be one of the manufacturer's standard colors and shall be as selected by the local agency responsible for paint costs. The Contractor shall confirm, in writing, the color selection with the local responsible agency and provide a copy of the approval to the Engineer and a copy of the approval shall be included in the material catalog submittal.

Painting of traffic signal heads, pedestrian signal heads and controller cabinets is not included in this pay item.

Any damage to the finish after leaving the manufacturer's facility shall be repaired to the satisfaction of the Engineer using a method recommended by the manufacturer and approved by the Engineer. If while at the manufacturer's facility the finish is damaged, the finish shall be re-applied at no cost to the contract.

Warranty.

The Contractor shall furnish in writing to the Engineer, the paint manufacturer's standard warranty and certification that the paint system has been properly applied.

Packaging.

Prior to shipping, the poles and posts shall be wrapped in ultraviolet-inhibiting plastic foam or rubberized foam.

Basis of Payment.

This work shall be paid for at the contract unit price each for PAINT NEW MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, PAINT NEW COMBINATION MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW COMBINATION MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, or PAINT NEW TRAFFIC SIGNAL POST of the length specified, which shall be payment in full for painting and packaging the traffic signal mast arm poles and posts described above including all shrouds, bases and appurtenances.

ILLUMINATED STREET NAME SIGN

Description.

This work shall consist of furnishing and installing a LED internally illuminated street name sign.

Materials.

Materials shall be in accordance with ILLUMINATED STREET NAME SIGN in Division 1000 of these specifications.

Installation.

The sign can be mounted on most steel mast arm poles. Mounting on aluminum mast arm pole requires supporting structural calculations. Some older or special designed steel mast arm poles may require structural evaluation to assure that construction of the mast arm pole is adequate for the proposed additional loading. Structural calculations and other supporting documentation as determined by the Engineer shall be provided by the contractor for review by the Department.

The sign shall be located on a steel traffic signal mast arm no further than 8-feet from the center of the pole to the center of the sign at a height of between 16 to 18-feet above traveled pavement. Mounting hardware shall be Pelco model SE-5015, or approved equal, utilizing stainless steel components.

Signs shall be installed such that they are not energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptible power supply (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

Basis of Payment.

This work will be paid for at the contract unit price each for ILLUMINATED STREET NAME SIGN, of the length specified which shall be payment in full for furnishing and installing the LED internally illuminated street sign, complete with circuitry and mounting hardware including photo cell, circuit breaker, fusing, relay, connections and cabling as shown on the plans for proper operation and installation.

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM.

Description.

This work shall consist of re-optimizing a closed loop traffic signal system according to the following Levels of work.

LEVEL I applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system. The purpose of this work is to integrate the improvements to the subject intersection into the signal system while minimizing the impacts to the existing system operation. This type of work would be commonly associated with the addition of signal phases, pedestrian phases, or improvements that do not affect the capacity at an intersection.

LEVEL II applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system and detailed analysis of the intersection operation is desired by the engineer, or when a new signalized or existing signalized intersection is being added to an existing system, but optimization of the entire system is not required. The purpose of this work is to optimize the subject intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the traffic responsive program.

For the purposes of re-optimization work, an intersection shall include all traffic movements operated by the subject controller and cabinet.

After the signal improvements are completed, the signal shall be re-optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the

Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank computer disks, copies of computer simulation files for the existing optimized system and a timing database that includes intersection displays will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.

    a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.

    b. Proposed signal timing plan for the new or modified intersection(s) shall be forwarded to IDOT for review prior to implementation.

    c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations.

2. The following deliverables shall be provided for LEVEL I Re-Optimization.

    a. Consultant shall furnish to IDOT a cover letter describing the extent of the re-optimization work performed.

    b. Consultant shall furnish an updated intersection graphic display for the subject intersection to IDOT and to IDOT's Traffic Signal Maintenance Contractor.

(b) LEVEL II Re-Optimization

1. In addition to the requirements described in the LEVEL I Re-Optimization above, the following tasks are associated with LEVEL II Re-Optimization.

    a. Traffic counts shall be taken at the subject intersection after the traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.

    b. As necessary, the intersections shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.

    c. Traffic responsive program operation shall be evaluated to verify proper pattern selection and lack of oscillation and a report of the operation shall be provided to IDOT.

2. The following deliverables shall be provided for LEVEL II Re-Optimization.

    a. Consultant shall furnish to IDOT one (1) copy of a technical memorandum for the optimized system. The technical memorandum shall include the following elements:

        (1) Brief description of the project

        (2) Printed copies of the analysis output from Synchro (or other appropriate, approved optimization software file)

        (3) Printed copies of the traffic counts conducted at the subject intersection

    b. Consultant shall furnish to IDOT two (2) CDs for the optimized system. The CDs shall include the following elements:

        (1) Electronic copy of the technical memorandum in PDF format

        (2) Revised Synchro files (or other appropriate, approved optimization software file) including the new signal and the rest of the signals in the closed loop system

        (3) Traffic counts conducted at the subject intersection

        (4) New or updated intersection graphic display file for the subject intersection

        (5) The CD shall be labeled with the IDOT system number and master location, as well as the submittal date and the consultant logo. The CD case shall include a clearly readable label displaying the same information securely affixed to the side and front.

Basis of Payment.

This work shall be paid for at the contract unit price each for RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL I or RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL II, which price shall be payment in full for performing all work described herein per intersection. Following completion of the timings and submittal of specified deliverables, 100 percent of the bid price will be paid. Each intersection will be paid for separately.

OPTIMIZE TRAFFIC SIGNAL SYSTEM.

Description.

This work shall consist of optimizing a closed loop traffic signal system.

OPTIMIZE TRAFFIC SIGNAL SYSTEM applies when a new or existing closed loop traffic signal system is to be optimized and a formal Signal Coordination and Timing (SCAT) Report is to be prepared. The purpose of this work is to improve system performance by optimizing traffic signal timings, developing a time of day program and a traffic responsive program.

After the signal improvements are completed, the signal system shall be optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank computer disks, copies of computer simulation files for the existing optimized system and a timing database that includes intersection displays will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which

case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) The following tasks are associated with OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Appropriate signal timings and offsets shall be developed for each intersection and appropriate cycle lengths shall be developed for the closed loop signal system.

2. Traffic counts shall be taken at all intersections after the permanent traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday. The turning movement counts shall identify cars, and single-unit and multi-unit heavy vehicles.

3. As necessary, the intersections shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.

4. A traffic responsive program shall be developed, which considers both volume and occupancy. A time-of-day program shall be developed for used as a back-up system.

5. Proposed signal timing plan for the new or modified intersection shall be forwarded to IDOT for review prior to implementation.

6. Consultant shall conduct on-site implementation of the timings and make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

7. Speed and delay studies shall be conducted during each of the count periods along the system corridor in the field before and after implementation of the proposed timing plans for comparative evaluations. These studies should utilize specialized electronic timing and measuring devices.

(b) The following deliverables shall be provided for OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Consultant shall furnish to IDOT one (1) copy of a SCAT Report for the optimized system. The SCAT Report shall include the following elements:

Cover Page in color showing a System Map

Figures

1. System overview map – showing system number, system schematic map with numbered system detectors, oversaturated movements, master location, system phone number, cycle lengths, and date of completion.
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Basis of Payment.

The work shall be paid for at the contract unit each for OPTIMIZE TRAFFIC SIGNAL SYSTEM, which price shall be payment in full for performing all work described herein for the entire traffic signal system. Following the completion of traffic counts, 25 percent of the bid price will be paid. Following the completion of the Synchro analysis, 25 percent of the bid price will be paid. Following the setup and fine tuning of the timings, the speed-delay study, and the TRP programming, 25 percent of the bid price will be paid. The remaining 25 percent will be paid when the system is working to the satisfaction of the engineer and the report and CD have been submitted.

TEMPORARY TRAFFIC SIGNAL TIMINGS

Description.

This work shall consist of developing and maintaining appropriate traffic signal timings for the specified intersection for the duration of the temporary signalized condition, as well as impact to existing traffic signal timings caused by detours or other temporary conditions.

All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in optimizing Closed Loop Traffic signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMINGS.

(a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings. Make fine-turning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

(b) Consultant shall provide monthly observation of traffic signal operations in the field.

(c) Consultant shall provide on-site consultation and adjust timings as necessary for construction stage changes, temporary traffic signal phase changes, and any other conditions affecting timing and phasing, including lane closures, detours, and other construction activities.

(d) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.

Basis of Payment.

The work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL TIMINGS, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on and/or detour implemented, 50 percent of the bid price will be paid. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or detour.

MODIFYING EXISTING CONTROLLER CABINET.

The work shall consist of modifying an existing controller cabinet as follows:

(a) Uninterruptible Power Supply (UPS). The addition of uninterruptible power supply (UPS) to an existing controller cabinet could require the relocation of the existing controller cabinet items to allow for the installation of the uninterruptible power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications.

(b) Light Emitting Diode (LED) Signal Heads, Light Emitting Diode (LED) Optically Programmed Signal Heads and Light Emitting Diode (LED) Pedestrian Signal Heads. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(5)(b)(2) of the Standard Specifications and the recommended load requirements of the light emitting diode (LED) signal heads that are being installed at the existing traffic signal. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

(c) Light Emitting Diode (LED), Signal Head, Retrofit. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(2) of the Standard Specifications and the recommended load requirements of light emitting diode (LED) traffic signal modules, pedestrian signal modules, and pedestrian countdown signal modules as specified in the plans. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

Basis of Payment.

Modifying an existing controller cabinet will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER CABINET. This shall include all material and labor required to complete the work as described above, the removal and disposal of all items removed from the controller cabinet, as directed by the Engineer. The equipment for the Uninterruptible Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptible Power Supply. Modifying an existing controller will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER, per Sections 895.04 and 895.08 of the Standard Specifications.

DIVISION 1000 MATERIALS

PEDESTRIAN PUSH-BUTTON.

Revise Article 1074.02(a) of the Standard Specifications to read:

The pedestrian push-button housing shall be constructed of aluminum alloy according to ASTM B 308 6061-T6 and powder coated yellow, unless otherwise noted on the plans. The housing shall be furnished with suitable mounting hardware.

Revise Article 1074-02(e) of the Standard Specifications to read:

Stations shall be designed to be mounted directly to a post, mast arm pole or wood pole. The station shall be aluminum and shall accept a 3 inch (75mm) round push-button assembly and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9 x 15 inch sign with arrow(s) for a count-down pedestrian signal. The pedestrian station size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9 x 12 inch sign with arrow(s).

Add the following to Article 1074.02(a) of the Standard Specifications:

(f) Location. Pedestrian push-buttons and stations shall be mounted directly to a post, mast arm pole or wood pole as shown on the plans and shall be fully accessible from a paved or concrete surface. See the District's Detail sheets for orientation and mounting details.

CONTROLLER CABINET AND PERIPHERAL EQUIPMENT.

Add the following to Article 1074.03 of the Standard Specifications:

(a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.

(b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.

(b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.

(b) (7) Surge Protection – Plug-in type EDCO SHA-1250 or Atlantic/Pacific approved equal.

(b) (8) BIU – Containment screw required.

(b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.

(b) (10) Switch Guards – All switches shall be guarded.

(b) (11) Heating – One (1) 200 watt, thermostatically-controlled, Hoffman electric heater, or approved equivalent.

(b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a wall switch. Relume Traffic Control Box LED Panels and power supply or approved equivalent.

(b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 24 inches (610mm) wide.

(b) (14) Plan & Wiring Diagrams – 12" x 16" (3.05mm x 4.06mm) moisture sealed container attached to door.

(b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.

(b) (16) Field Wiring Labels – All field wiring shall be labeled.

(b) (17) Field Wiring Termination – Approved channel lugs required.

(b) (18) Power Panel – Provide a nonconductive shield.

(b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.

(b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.

(b) (21) Railroad Pre-Emption Test Switch – Eaton 8830K13 SHA 1250 or equivalent.

RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET.

Controller shall comply with Article 1073.01 as amended in these Traffic Signal Special Provisions.

Controller Cabinet and Peripheral Equipment shall comply with Article 1074.03 as amended in these Traffic Signal Special Provisions.

Add the following to Articles 1073.01 (c) (2) and 1074.03 (a) (5) (e) of the Standard Specifications:

Controllers and cabinets shall be new and NEMA TS2 Type 1 design.

A method of monitoring and/or providing redundancy to the railroad preemptor input to the controller shall be included as a component of the Railroad, Full Actuated Controller and Cabinet installation and be verified by the traffic signal equipment supplier prior to installation.

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. All railroad interconnected (including temporary railroad interconnect) controllers and cabinets shall be new, built, tested and approved by the controller equipment vendor, in the vendor's District One facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

UNINTERRUPTIBLE POWER SUPPLY (UPS).

Revise Article 1074.04(a)(1) of the Standard Specifications to read:

The UPS shall be line interactive and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection's normal traffic signal operating connected load, plus 20 percent (20%). The total connected traffic signal load shall not exceed the published ratings for the UPS. The UPS shall provide a minimum of six (6) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 700 W/1000 VA active output capacity, with 90 percent minimum inverter efficiency).

Revise the first paragraph of Article 1074.04(a)(3) of the Standard Specifications to read:

The UPS shall have a minimum of four (4) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.

Revise Article 1074.04(a)(10) of the Standard Specifications to read:

The UPS shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation.

Revise Article 1074.04(a)(17) of the Standard Specifications to read:

When the intersection is in battery backup mode, the UPS shall bypass all internal cabinet lights, ventilation fans, cabinet heaters, service receptacles, any lighted street name signs, any automated enforcement equipment and any other devices directed by the Engineer.

Revise Article 1074.04(b)(2)b of the Standard Specifications to read:

Batteries, inverter/charger and power transfer relay shall be housed in a separate NEMA Type 3R cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125-inch thick and have a natural mill finish.

Revise Article 1074.04(b)(2)c of the Standard Specifications to read:

No more than three batteries shall be mounted on individual shelves for a cabinet housing six batteries and no more than four batteries per shelf for a cabinet housing eight batteries.

Revise Article 1074.04(b)(2)e of the Standard Specifications to read:

The battery cabinet housing shall have the following nominal outside dimensions: a width of 25 in. (785 mm), a depth of 16 in. (440 mm), and a height of 41 to 48 in. (1.1 to 1.3 m). Clearance between shelves shall be a minimum of 10 in. (250 mm).

UPS

End of paragraph 1074.04(b) (2)e

The door shall be equipped with a two position doorstop, one a 90^{o} and one at 120^{o}.

Revise Article 1074.04(b)(2)g of the Standard Specifications to read:

The door shall open to the entire cabinet, have a neoprene gasket, an Aluminum continuous piano hinge with stainless steel pin, and a three point locking system. The cabinet shall be provided with a main door lock which shall operate with a traffic industry conventional No. 2 key. Provisions for padlocking the door shall be provided.

Add the following to Article 1074.04(b)(2) of the Standard Specifications:

j. The battery cabinet shall have provisions for an external generator connection.

Add the following to Article 1074.04(c) of the Standard Specifications:

(8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.

(9) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate (Hubbell model HBL4716C or approved equal). Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

Battery System.

Revise Article 1074.04(d)(3) of the Standard Specifications to read:

All batteries supplied in the UPS shall be either gel cell or AGM type, deep cycle, completely sealed, prismatic leadcalcium based, silver alloy, valve regulated lead acid (VRLA) requiring no maintenance. All batteries in a UPS installation shall be the same type; mixing of gel cell and AGM types within a UPS installation is not permitted.

Revise Article 1074.04(d)(4) of the Standard Specifications to read:

Batteries shall be certified by the manufacturer to operate over a temperature range of -13 to 160 °F (-25 to + 71 °C) for gel cell batteries and -40 to 140 °F (-40 to + 60 °C) for AGM type batteries.

Add the following to Article 1074.04(d) of the Standard Specifications:

(9) The UPS shall consist of an even number of batteries that are capable of maintaining normal operation of the signalized intersection for a minimum of six hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of four batteries shall be provided.

Add the following to the Article 1074.04 of the Standard Specifications:

(e) Warranty. The warranty for an uninterruptible power supply (UPS) shall cover a minimum of two years from date the equipment is placed in operation; however, the batteries of the UPS shall be warranted for full replacement for a minimum of five years from the date the traffic signal and UPS are placed into service.

ELECTRIC CABLE.

Delete "or stranded, and No. 12 or" from the last sentence of Article 1076.04 (a) of the Standard Specifications.

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

TRAFFIC SIGNAL POST.

Add the following to Article 1077.01 (d) of the Standard Specifications:

All posts and bases shall be steel and hot dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

PEDESTRIAN PUSH-BUTTON POST.

Add the following to Article 1077.02(b) of the Standard Specifications:

All posts and bases shall be steel and hot-dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with Traffic Signal Painting in Division 800 of these specifications.

MAST ARM ASSEMBLY AND POLE.

Add the following to Article 1077.03 (a) of the Standard Specifications:

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer. All poles shall be galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

The shroud shall be of sufficient strength to deter pedestrian and vehicular damage. The shroud shall be constructed and designed to allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet. All mounting hardware shall be stainless steel.

LIGHT EMITTING DIODE (LED) TRAFFIC SIGNAL HEAD.

Add the following to Section 1078 of the Standard Specifications:

General.

All signal and pedestrian heads shall provide 12” (300 mm) displays with glossy yellow or black polycarbonate housings. All head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all signal and/or pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on. Post top mounting collars are required on all posts, and shall be constructed of the same material as the brackets.

Pedestrian signal heads shall be furnished with the international symbolic "Walking Person" and "Upraised Palm" displays. Egg crate sun shields are not permitted.

Signal heads shall be positioned according to the “District One Standard Traffic Signal Design Details."

LED signal heads (All Face and Section Quantities), (All Mounting Types) shall conform fully to the requirements of Articles 1078.01 and 1078.02 of the Standard Specifications amended herein.

1. The LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery. LED signal modules which exhibit luminous intensities less than the minimum values specified in Table 1 of the ITE Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement (June 27, 2005) [VTSCH], or applicable successor ITE specifications, or show signs of entrance of moisture or contaminants within the first 60 months of the date of delivery shall be replaced or repaired. The manufacturer's written warranty for the LED signal modules shall be dated, signed by an Officer of the company and included in the product submittal to the State.

(a) Physical and Mechanical Requirements

1. Modules can be manufactured under this specification for the following faces:

a. 12 inch (300 mm) circular, multi-section

b. 12 inch (300 mm) arrow, multi-section

c. 12 inch (300 mm) pedestrian, 2 sections

2. The maximum weight of a module shall be 4 lbs. (1.8 kg).

3. Each module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.

4. Material used for the lens and signal module construction shall conform to ASTM specifications for the materials.

5. The lens of the module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face. Polymeric lens shall provide a surface coating or chemical surface treatment applied to provide abrasion resistance. The lens of the module shall be integral to the unit, convex with a smooth outer surface and made of plastic. The lens shall have a textured surface to reduce glare.

6. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

7. Each module shall have a symbol of the type of module (i.e. circle, arrow, etc.) in the color of the module. The symbol shall be 1 inch (25.4 mm) in diameter. Additionally, the color shall be written out in 1/2 inch (12.7mm) letters next to the symbol.

(b) Photometric Requirements

1. The minimum initial luminous intensity values for the modules shall conform to the values in Table 1 of the VTCSH (2005) for circular signal indications, and as stated in Table 3 of these specifications for arrow and pedestrian indications at 25 °C.

2. The modules shall meet or exceed the illumination values stated in Articles 1078.01 and 1078.02 the Standard Specifications for circular signal indications, and Table 3 of these specifications for arrow and pedestrian indications, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

3. The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of Section 4.2 of the VTCSH (2005) or applicable successor ITE specifications.

4. The LEDs utilized in the modules shall be AlInGaP technology for red, yellow, Portland orange (pedestrian) and white (pedestrian) indications, and GaN for green indications, and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

(c) Electrical

1. Maximum power consumption for LED modules is per Table 2.

2. Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.

3. The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).

4. When a current of 20 mA AC (or less) is applied to the unit, the voltage read across the two leads shall be 15 VAC or less.

5. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

6. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

(d) Retrofit Traffic Signal Module

1. The following specification requirements apply to the Retrofit module only. All general specifications apply unless specifically superseded in this section.

2. Retrofit modules can be manufactured under this specification for the following faces:

   a. 12 inch (300 mm) circular, multi-section

   b. 12 inch (300 mm) arrow, multi-section

   c. 12 inch (300 mm) pedestrian, 2 sections

3. Each Retrofit module shall be designed to be installed in the doorframe of a standard traffic signal housing. The Retrofit module shall be sealed in the doorframe with a one-piece EPDM (ethylene propylene rubber) gasket.

4. The maximum weight of a Retrofit module shall be 4 lbs. (1.8 kg).

5. Each Retrofit module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.

6. Electrical conductors for modules, including Retrofit modules, shall be 39.4 inches (1m) in length, with quick disconnect terminals attached.

7. The lens of the Retrofit module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

(e) The following specification requirements apply to the 12 inch (300 mm) arrow module only. All general specifications apply unless specifically superseded in this section.

1. The arrow module shall meet specifications stated in Section 9.01 of the Equipment and Material Standards of the Institute of Transportation Engineers (November 1998) [ITE Standards], Chapter 2 (Vehicle Traffic Control Signal Heads) or applicable successor ITE specifications for arrow indications.

2. The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.

(f) The following specification requirement applies to the 12 inch (300 mm) programmed visibility (PV) module only. All general specifications apply unless specifically superseded in this section.

1. The LED module shall be a module designed and constructed to be installed in a programmed visibility (PV) signal housing without modification to the housing.

(g) The following specification requirements apply to the 12 inch (300 mm) Pedestrian module only. All general specifications apply unless specifically superseded in this section.

1. Each pedestrian signal LED module shall provide the ability to actuate the solid upraised hand and the solid walking person on one 12 inch (300mm) section.

2. Two (2) pedestrian sections shall be installed. The top section shall be wired to illuminate only the upraised hand and the bottom section shall be the walking man.

3. "Egg Crate" type sun shields are not permitted. All figures must be a minimum of 9 inches (225mm) in height and easily identified from a distance of 120-feet (36.6m).

LIGHT EMITTING DIODE (LED) PEDESTRIAN COUNTDOWN SIGNAL HEAD.

Add the following to Article 1078.02 of the Standard Specifications:

General.

1. The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to "0" and turn off when the steady Upraised Hand (symbolizing Don't Walk) signal turns on. Module shall not have user accessible switches or controls for modification of cycle.

2. At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.

3. The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.

4. The module shall allow for consecutive cycles without displaying the steady Upraised Hand.

5. The module shall recognize preemption events and temporarily modify the crossing cycle accordingly.

6. If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.

7. If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.

8. The next cycle, following the preemption event, shall use the correct, initially programmed values.

9. If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.

10. The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.

11. The countdown numerals shall be two (2) “7 segment” digits forming the time display utilizing two rows of LEDs.

12. The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, “Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules,” or applicable successor ITE specifications, except as modified herein.

13. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

14. In the event of a power outage, light output from the LED modules shall cease instantaneously.

15. The LEDs utilized in the modules shall be AlInGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and GaN technology for Lunar White (Walking Person) indications.

16. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

Electrical.

1. Maximum power consumption for LED modules is 29 watts.

2. The measured chromaticity shall remain unchanged over the input line voltage range listed of 80 VAC to 135 VAC.

TRAFFIC SIGNAL BACKPLATE.

Delete 1st sentence of Article 1078.03 of the Standard Specifications and add "All backplates shall be aluminum and louvered".

Add the following to the third paragraph of Article 1078.03 of the Standard Specifications. The reflective backplate shall not contain louvers.

Delete second sentence of the fourth paragraph of Article 1078.03 f the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

When retro reflective sheeting is specified, it shall be Type ZZ sheeting according to Article 1091.03 and applied in preferred orientation for the maximum angularity according to the manufacturer's recommendations. The retro reflective sheeting shall be installed under a controlled environment at the manufacturer/supplier before shipment to the contractor. The aluminum backplate shall be prepared and cleaned, following recommendations of the retro reflective sheeting manufacturer.

INDUCTIVE LOOP DETECTOR.

Add the following to Article 1079.01 of the Standard Specifications:

Contracts requiring new cabinets shall provide for rack mounted detector amplifier cards. Detector amplifiers shall provide LCD displays with loop frequency, inductance, and change of inductance readings.

ILLUMINATED SIGN, LIGHT EMITTING DIODE.

Delete last sentence of Article 1084.01(a) and add "Mounting hardwire shall be black polycarbonate or galvanized steel and similar to mounting Signal Head hardware and bracket specified herein and shall provide tool free access to the interior."

Revise the second paragraph of Article 1084.01(a) to read:

The exterior surface of the housing shall be acid-etched and shop painted with one coat of zinc-chromate primer and two coats of exterior enamel. The housing shall be the same color (yellow or black) to match the existing or proposed signal heads. The painting shall be according to Section 851.

Add the following to Article 1084.01 (b) of the Standard Specifications:

The message shall be formed by rows of LEDs. The sign face shall be 24 inches (600 mm) by 24 inches (600 mm).

Add the following to Article 1084.01 of the Standard Specifications:

(e) The light emitting diode (LED) blank out signs shall be manufactured by National Sign & Signal Company, or an approved equal and consist of a weatherproof housing and door, LEDs and transformers.

ILLUMINATED STREET NAME SIGN

The illuminate street name sign shall be as follows.

(a) Description.

The LEDs shall be white in color and utilize InGaN or UV thermally efficient technology. The LED Light Engines shall be designed to fit inside a standard fluorescent illuminated street sign housing in lieu of fluorescent lamps and ballasts or a slim line type housing. The LED internally-illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. The sign assembly shall consist of a four-, six-, or eight-foot aluminum housing. White translucent 3M DG^3 reflective sheeting sign faces with the street name applied in 3M/Scotchlite Series 1177 or current 3M equivalent transparent green shall be installed in hinged doors on the side of the sign for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

(b) Environmental Requirements.

The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50^{o}C (-40 to +122^{o}F) for storage in the ambient temperature range of -40 to +75^{o}C (-40 to +167^{o}F).

(c) General Construction.

1. The LED Light Engine shall be a single, self-contained device, for installation in an existing street sign housing. The power supply must be designed to fit and mounted on the inside wall at one end of the street sign housing. The LED Light Engine shall be mounted within the inner top portion of the housing and no components of the light source shall sit between the sign faces.

2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI, C136.31-2001 standards.

(d) Mechanical Construction.

1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum top with a minimum thickness of .140" x 10 ¾" deep (including the drip edge). The extruded aluminum bottom is .094" thick x 5 7/8" deep. The ends of the housing shall be cast aluminum with a minimum thickness of .250". A six-foot sign shall be 72 5/8" long and 22 5/16" tall and not weigh more than 77 pounds. An eight-foot sign shall be 96 5/8" long and 22 5/16" tall and not weigh more than 92 pounds. All corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal around the entire housing.

2. The door shall be constructed of extruded aluminum. Two corners are continuous TIG welded with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full length, .040" x 1 1/8" open stainless steel hinge. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by three (six total for two-way sign) quarter-turn fasteners to form a watertight seal between the door and the housing.

3. The sign face shall be constructed of .125" white translucent polycarbonate. The letters shall be 8" upper case and 6" lower case. The sign face legend background shall consist of 3M/Scotchlite Series 4090T or current equivalent 3M translucent DG^3 white VIP (Visual Impact Performance) diamond grade sheeting (ATSM Type 9) and 3M/Scotchlite Series 1177 or current 3M equivalent transparent green acrylic EC (electronic cut-able) film applied to the front of the sign face. The legend shall be framed by a white polycarbonate border. A logo symbol and/or name of the community may be included with approval of the Engineer.

4. All surfaces of the sign shall be etched and primed in accordance to industry standards before receiving appropriate color coats of industrial enamel.

5. All fasteners and hardware shall be corrosion resistant stainless steel. No tools are required for routine maintenance.

6. All wiring shall be secured by insulated wire compression nuts.

7. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and provide a weather tight seal.

8. A photoelectric switch shall be mounted in the control cabinet to control lighting functions for day and night display. Each sign shall be individually fused.

9. Brackets and Mounting: LED internally-illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets.

(e) Electrical.

1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.

2. The LED Light Engine shall operate from a 60 +- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +- 10%.

3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage, and at a temperature of +25^{o}C (+77^{o}F), shall not exceed 20%.

4. The LED Light Engine shall cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed the following maximum power values:

4-Foot Sign	60 W
6-Foot Sign	90 W

8-Foot Sign	120 W

The signs shall not be energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power source (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m^2.

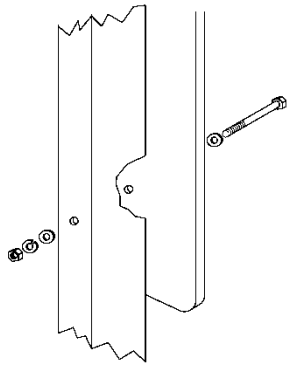
2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.

3. Twelve (12) 1.25 watt LED units shall be mounted on 1-inch x 22-inch metal cone printed circuit boards (MCPCB). The viewing angle shall be 120 degrees. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

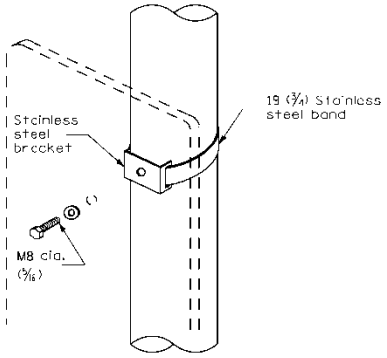
(g) Quality Assurance.

The LED Light Engine shall be manufactured in accordance with a vendor quality assurance (QA) program. The production QA shall include statistically controlled routine tests to ensure minimum performance levels of the LED Light Engine build to meet this specification. QA process and test result documentations shall be kept on file for a minimum period of seven (7) years. The LED Light Engine that does not satisfy the production QA testing performance requirements shall not be labeled, advertised, or sold as conforming to these specifications. Each LED Light Engine shall be identified by a manufacturer's serial number for warranty purposes. LED Light Engines shall be replaced or repaired if they fail to function as intended due to workmanship or material defects within the first sixty (60) months from the date of acceptance. LED Light Engines that exhibit luminous intensities less than the minimum value specified in Photometric Section within the first thirty-six (36) months from the date of acceptance shall be replaced or repaired.

Standard Traffic Signal Design Details

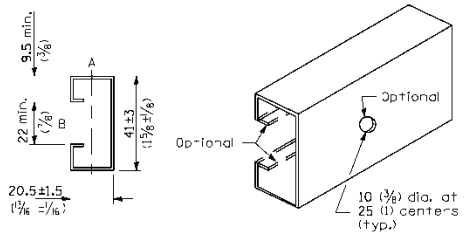


Sign panel 900 (36) wide or less

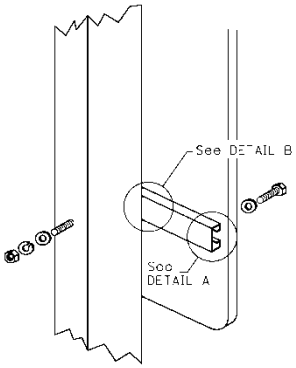


Sign panel 900 (36) wide or less

Section modulus (minimum)	Axis A	Axis B
Steel	819 mm³ (0.050 in.³)	1720 mm³ (0.105 in.³)
Aluminum	2458 mm³ (0.150 in.³)	5162 mm³ (0.315 in.³)

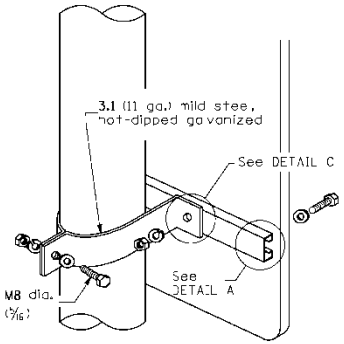


SUPPORTING CHANNEL DETAILS



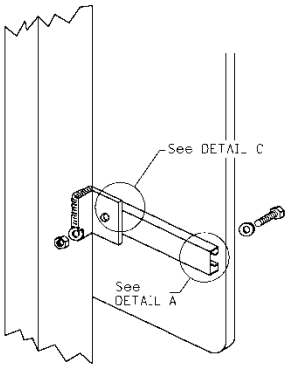
Sign panel over 900 (36) wide

WOOD OR TELESCOPING STEEL POSTS

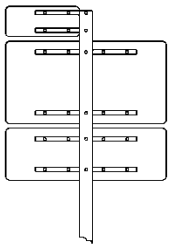


Sign panel over 900 (36) wide

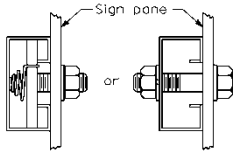
LIGHT OR SIGNAL STANDARDS



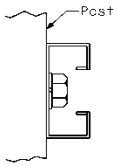
BREAKAWAY STEEL TUBING POSTS
(All sign panel sizes)



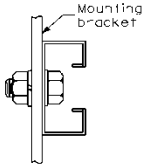
ROUTE MARKER ASSEMBLY



DETAIL A



DETAIL B



DETAIL C

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 1997
ENGINEER OF OPERATIONS

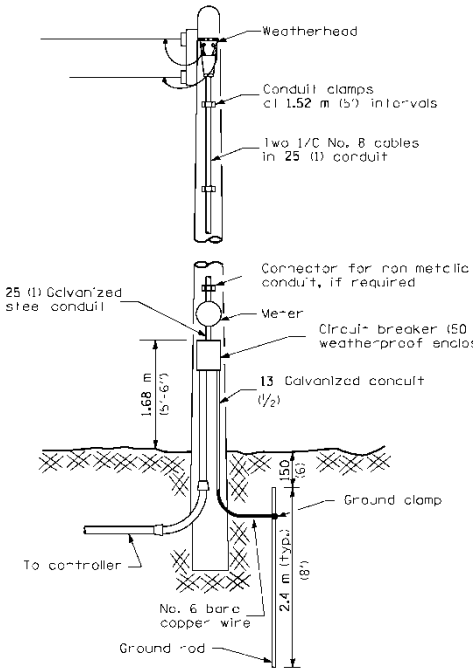
APPROVED January 1, 1997
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-97	Renum. Standard 2319-6.
2-1-95	Moved G. N. to Specs.
	Added metric.

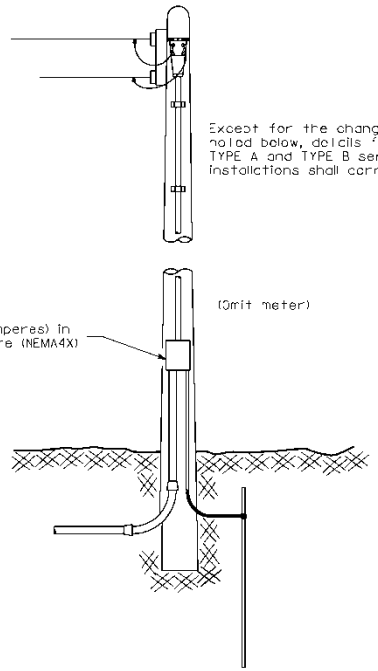
SIGN PANEL MOUNTING DETAILS

STANDARD 720001

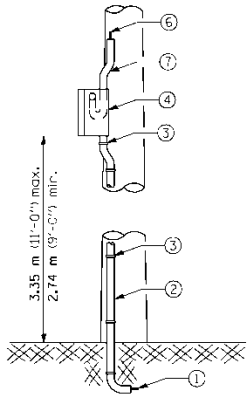
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97



TYPE A



TYPE B



The following equipment is to be furnished and installed for the TYPE C installation.

(1) = Cable in conduit (electric cable, No. 6, 2/C except where otherwise specified)

(2) = Galvanized steel conduit 32 (1 1/4) with bend

(3) = Galvanized conduit clamps

(4) = Aluminum weatherproof box with gasketed cover. Weatherproof box shall be installed facing the adjacent property line. (See diagram for alternate installation.)

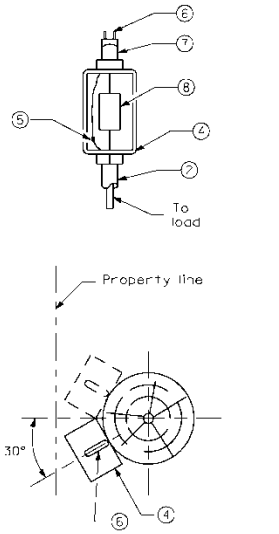
(5) = Ground stud for neutral connection

(6) = Service cables

(7) = Offset weatherproof fitting

(8) = Circuit breaker

TYPE C



ALTERNATE INSTALLATION

(Installation when weatherproof box cannot be installed facing the adjacent property line.)

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2002
ENGINEER OF OPERATIONS

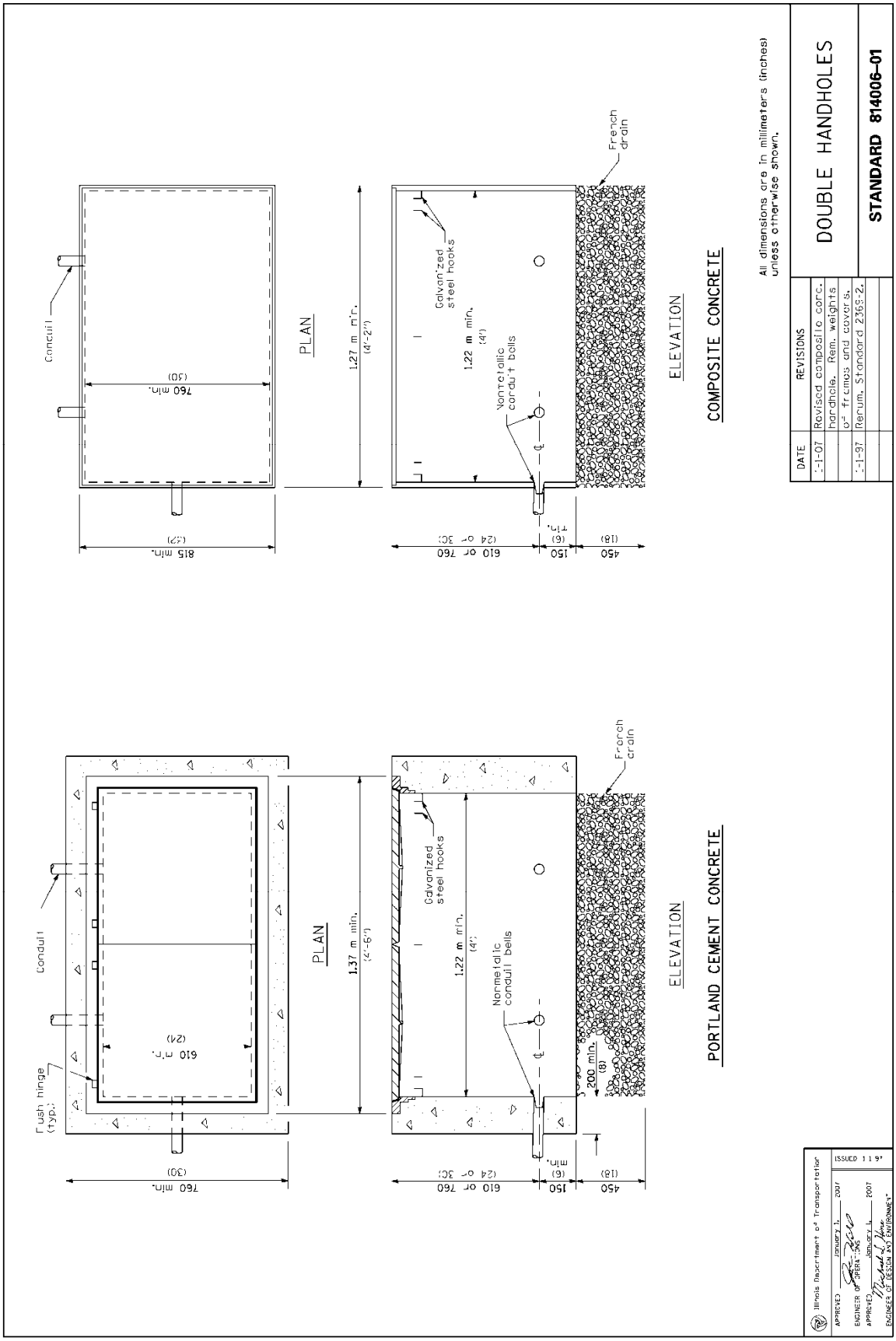
APPROVED January 1, 2002
ENGINEER OF DESIGN AND ENVIRONMENT

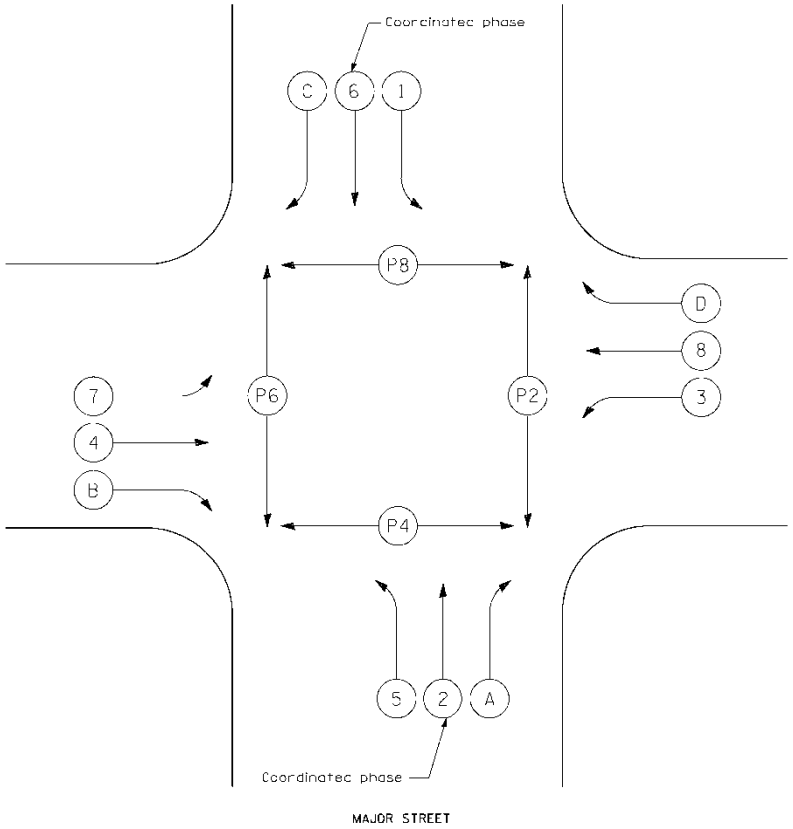
DATE	REVISIONS
1-1-02	Renum. Standard 866001.
1-1-97	Renum. Standard 2373-1.

ELECTRICAL SERVICE INSTALLATION DETAILS

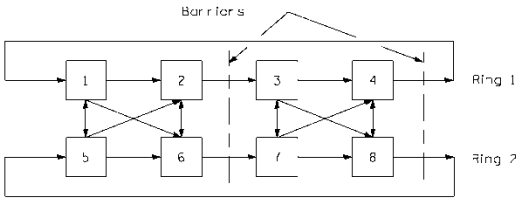
STANDARD 805001

Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97


COMPOSITE CONCRETE
PLAN
ELEVATION
Conduit
760 min.
(30)
815 min.
(32)
1.27 m min.
(4'-2")
Galvanized steel hooks
1.22 m min.
(4')
Nonmetallic conduit bells
French drain
610 or 760
(24 or 30)
150
(6)
450
(18)
PORTLAND CEMENT CONCRETE
Conduit
Push hinge (typ.)
610 mm.
(24)
1.37 m min.
(4'-6")
200 min.
(8)
All dimensions are in millimeters (inches) unless otherwise shown.
DOUBLE HANDHOLES
STANDARD 814006-01
DATE
REVISIONS
1-1-07
Revised composite conc. handhole. Rem. weights of frames and covers.
1-1-97
Renum. Standard 2363-2.
Illinois Department of Transportation
APPROVED
January 1, 2007
ENGINEER OF OPERATIONS
APPROVED
January 1, 2007
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 1 1 97



STANDARD PHASE DESIGNATION DIAGRAM (NEMA)



NEMA EIGHT PHASE DUAL RING ACTUATED CONFIGURATION

LEGEND

(X) , [X]	Vehicular phase no. x
(Px)	Pedestrian phase no. x
(A), (B), (C), (D)	Right turn overlaps where:
(A) = (2) + (3)	
(B) = (4) + (5)	
(C) = (6) + (7)	
(D) = (8) + (1)	
NEMA	National Electrical Manufacturers Association

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 1997
ENGINEER OF OPERATIONS

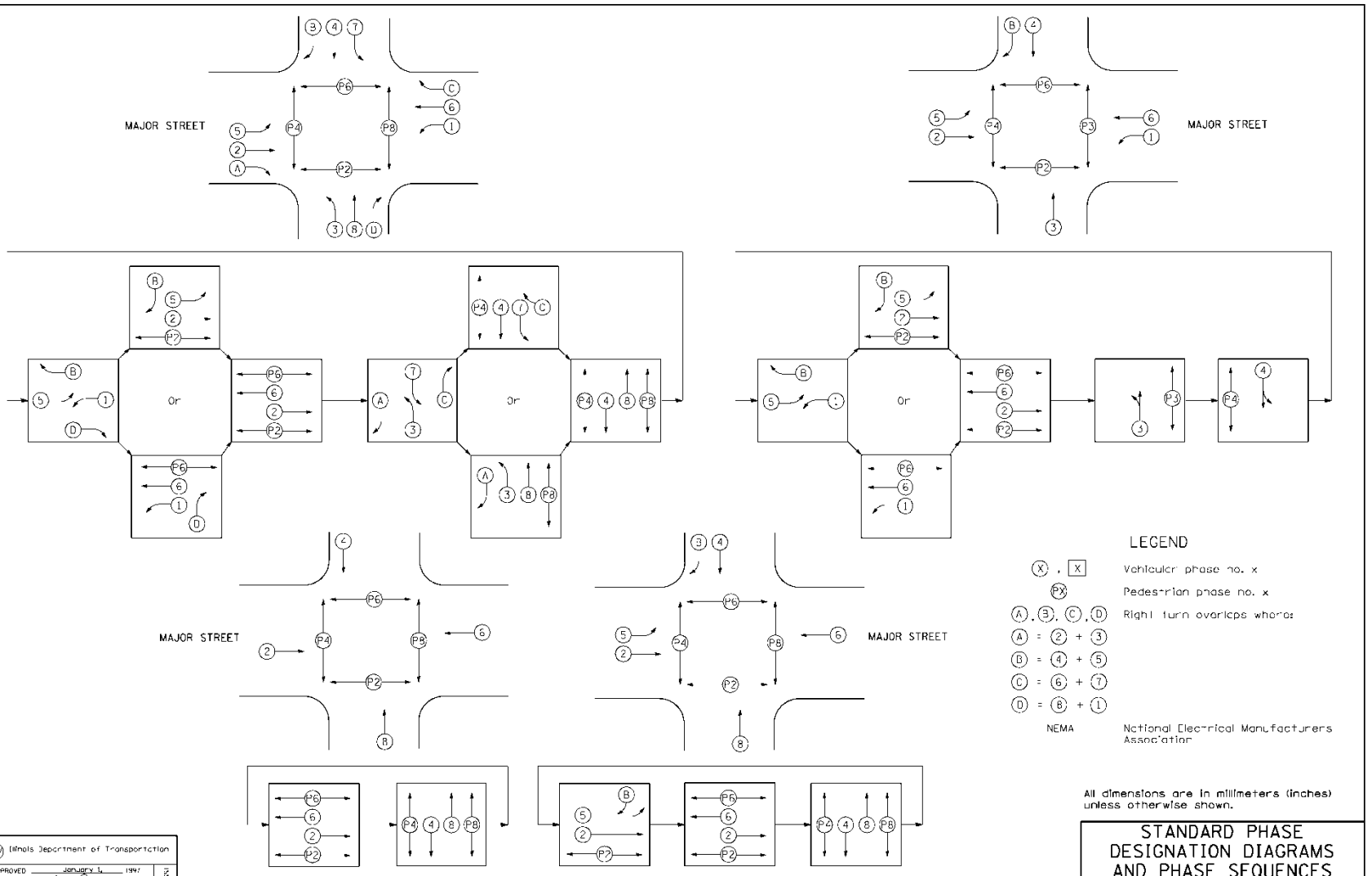
APPROVED January 1, 1997
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-97	Renum. Standard 7393-2.
2-1-95	Totaly revised.

STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES
(Sheet 1 of 2)

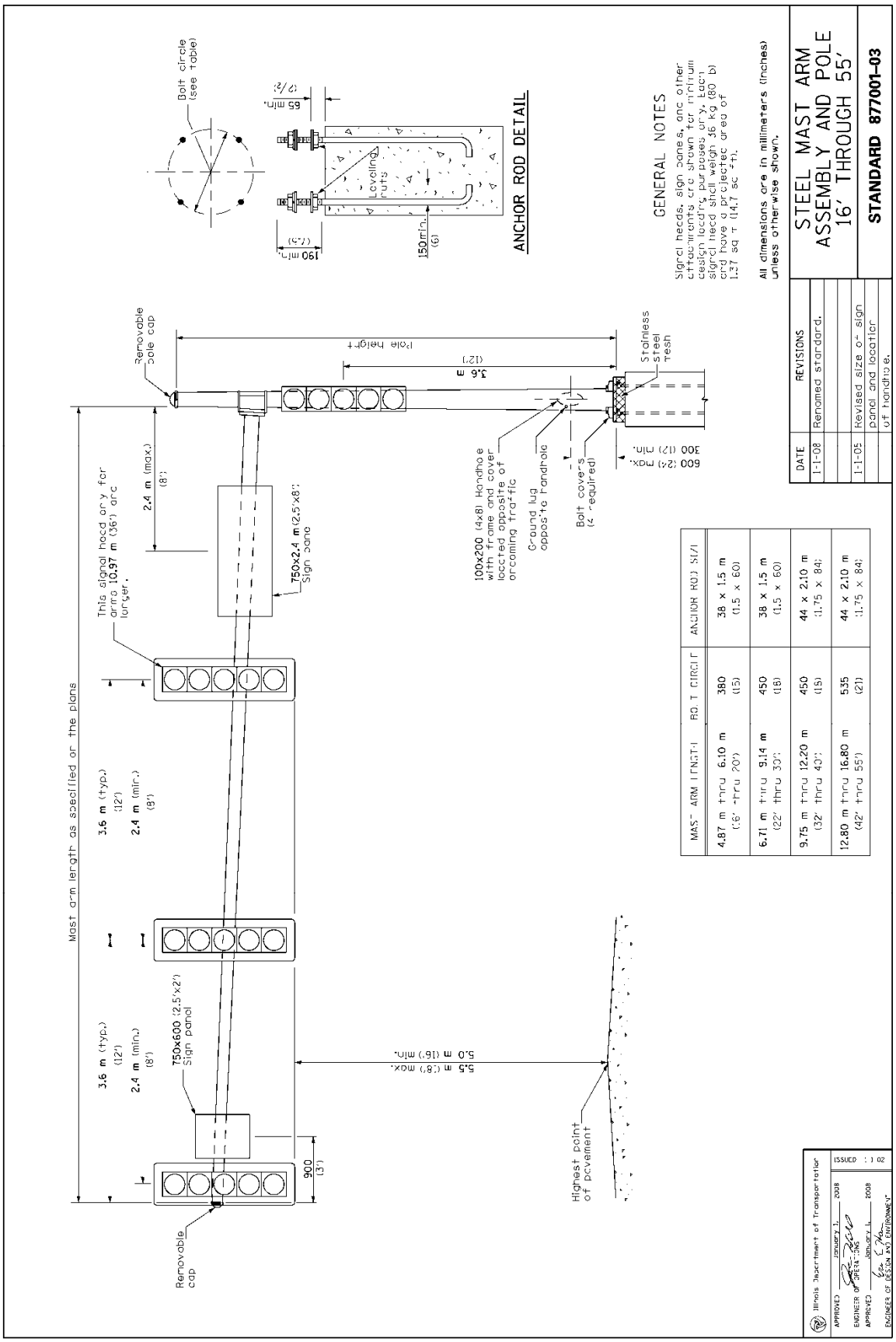
STANDARD 857001

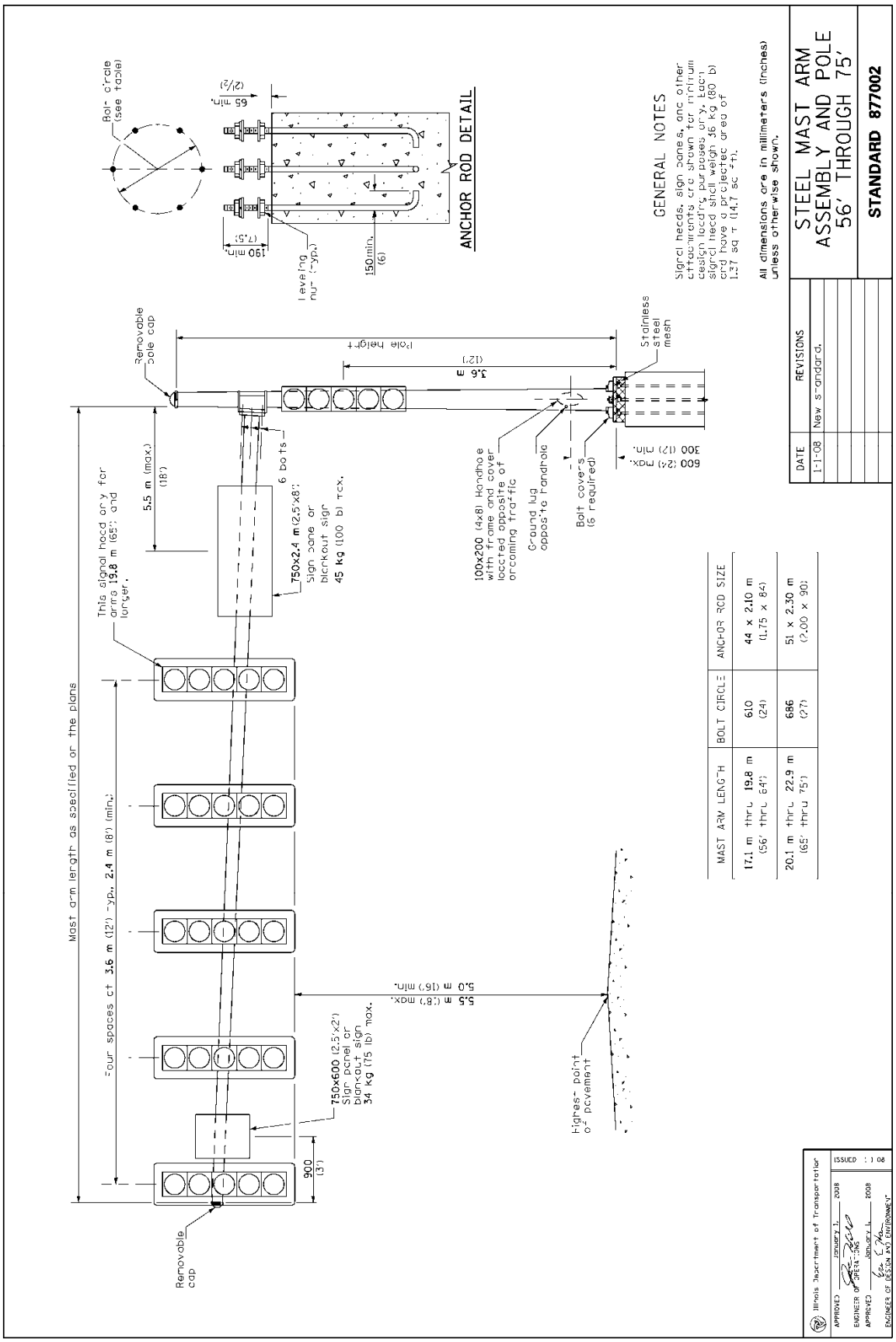
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97

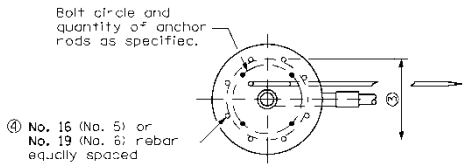


PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES

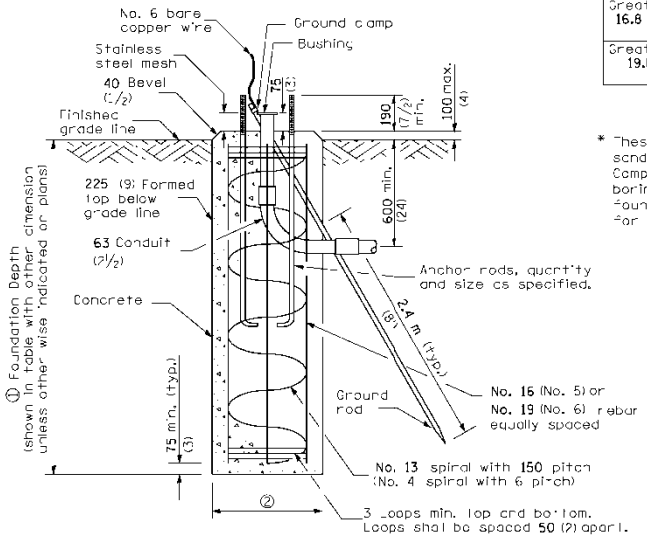
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97


ANCHOR ROD DETAIL
Bolt circle (see table)
65 mm (2 1/2")
Leveling nuts
190 mm (7.5")
150min. (6)
GENERAL NOTES
Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 36 kg (80 lb) and have a projected area of 1.37 sq m (14.7 sq ft).
All dimensions are in millimeters (inches) unless otherwise shown.
STEEL MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'
STANDARD 877001-03
DATE
REVISIONS
1-1-08
Renamed standard.
1-1-05
Revised size of sign panel and location of handhole.
Mast arm length as specified on the plans
Pole height
3.6 m (12')
Removable pole cap
This signal head only for arms 10.97 m (36') or longer.
2.4 m (max.) (8')
750x2.4 m (2.5'x8') Sign panel
100x200 (4x8) Handhole with frame and cover located opposite of oncoming traffic
Ground lug opposite handhole
Bolt covers (4 required)
300 (12) min.
600 (24) max.
Stainless steel mesh
3.6 m (typ.) (12')
2.4 m (min.) (8')
750x600 (2.5'x2') Sign panel
5.5 m (18') max.
5.0 m (16') min.
Highest point of pavement
900 (3')
Removable cap
MAST ARM LENGTH
RD. T CIRCLE
ANCHOR ROD SIZE
4.87 m thru 6.10 m (16' thru 20')
380 (15)
38 x 1.5 m (1.5 x 60)
6.71 m thru 9.14 m (22' thru 30')
450 (18)
38 x 1.5 m (1.5 x 60)
9.75 m thru 12.20 m (32' thru 40')
450 (18)
44 x 2.10 m (1.75 x 84)
12.80 m thru 16.80 m (42' thru 55')
535 (21)
44 x 2.10 m (1.75 x 84)
Illinois Department of Transportation
APPROVED
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED : 1 02


ANCHOR ROD DETAIL
Bolt circle (see table)
65 min. (2½)
190 min. (7.5)
Leveling nut (typ.)
150 min. (6)
GENERAL NOTES
Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 36 kg (80 lb) and have a projected area of 1.37 sq m (14.7 sq ft).
All dimensions are in millimeters (inches) unless otherwise shown.
REVISIONS
DATE
1-1-08
New standard.
STEEL MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'
STANDARD 877002
Removable pole cap
Pole height
3.6 m (12')
Stainless steel mesh
600 (24) Max.
300 (12) Min.
Bolt covers (6 required)
Ground lug opposite handhole
100x200 (4x8) Handhole with frame and cover located opposite of oncoming traffic
6 bolts
5.5 m (max.) (18')
This signal head only for arms 19.8 m (65') and longer.
750x2.4 m (2.5'x8') Sign panel or blankout sign 45 kg (100 lb) max.
Mast arm length as specified on the plans
Four spaces at 3.6 m (12') typ., 2.4 m (8') (min.)
750x600 (2.5'x2') Sign panel or blankout sign 34 kg (75 lb) max.
5.5 m (18') max.
5.0 m (16') min.
Higher point of pavement
900 (3')
Removable cap
MAST ARM LENGTH | BOLT CIRCLE | ANCHOR ROD SIZE
17.1 m thru 19.8 m (56' thru 64') | 610 (24) | 44 x 2.10 m (1.75 x 84)
20.1 m thru 22.9 m (65' thru 75') | 686 (27) | 51 x 2.30 m (2.00 x 90)
Illinois Department of Transportation
APPROVED January 1, 2008
ENGINEER OF SPECIAL UNITS
APPROVED January 1, 2008
ENGINEER OF BUREAU OF ENVIRONMENT
ISSUED : 1 08



TOP VIEW



TYPE E

For standard and combination mast arm assemblies. Mast arm assemblies with dual arms require a special foundation design.

Mast Arm Length	① Foundation Depth*	② Foundation Diameter	③ Spiral Diameter	④ Quantity of Rebars	Size of Rebars
Less than 9.1 m (30')	3.0 m (10'-0")	750 (30)	600 (24)	8	16 (5)
Greater than or equal to 9.1 m (30') and less than 12.2 m (40')	4.1 m (13'-6")	750 (30)	600 (24)	8	16 (5)
	3.4 m (11'-0")	900 (36)	750 (30)	12	16 (5)
Greater than or equal to 12.2 m (40') and less than 15.2 m (50')	4.0 m (13'-0")	900 (36)	750 (30)	12	16 (5)
Greater than or equal to 15.2 m (50') and up to 16.8 m (55')	4.6 m (15'-0")	900 (36)	750 (30)	12	19 (6)
Greater than or equal to 16.8 m (56') and less than 19.8 m (65')	6.4 m (21'-0")	1060 (42)	900 (36)	16	19 (6)
Greater than or equal to 19.8 m (65') and up to 22.9 m (75')	7.6 m (25'-0")	1060 (42)	900 (36)	16	19 (6)

* These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (Q_u) > 100 kPa (1.0 tsf). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

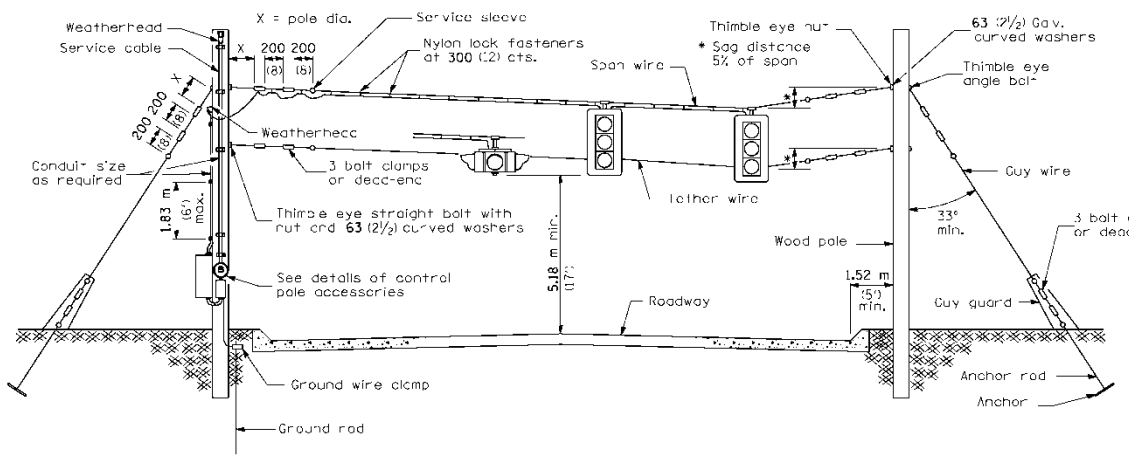
APPROVED	January 1, 2008	ISSUED
ENGINEER OF OPERATIONS		
APPROVED	January 4, 2008	1-1-07
ENGINEER OF DESIGN AND ENVIRONMENT		

CONCRETE FOUNDATION DETAILS

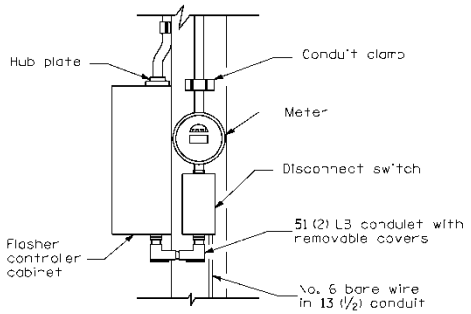
(Sheet 2 of 2)

STANDARD 878001-06

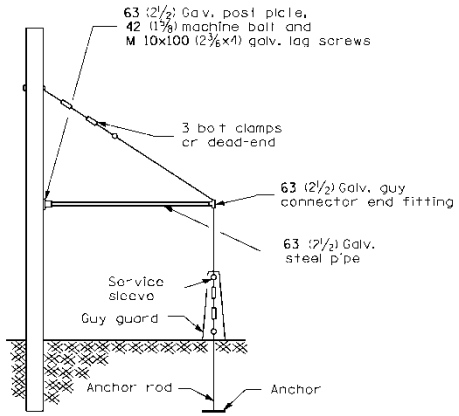
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97



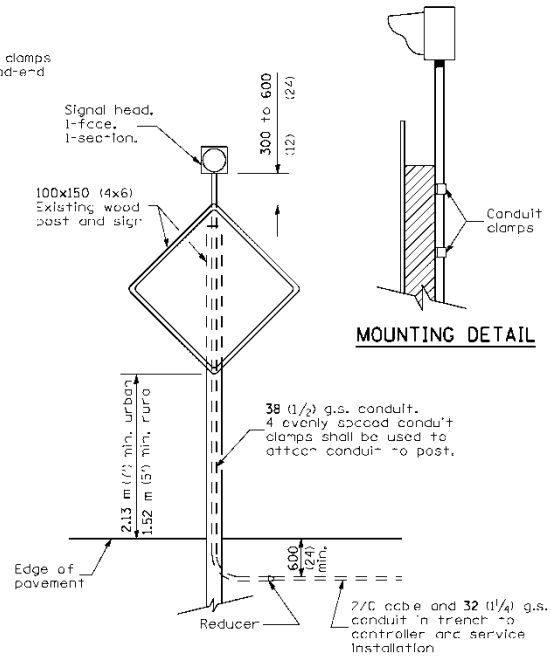
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON



CONTROL POLE DETAIL



SIDEWALK GUY DETAIL



POST MOUNTED FLASHING BEACON

MOUNTING DETAIL

All dimensions are in millimeters (inches) unless otherwise shown.

DATE	REVISIONS
1-1-02	Renum. Standard 840001.
1-1-97	Renum. Standard 2372-1.

SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION

STANDARD 880001

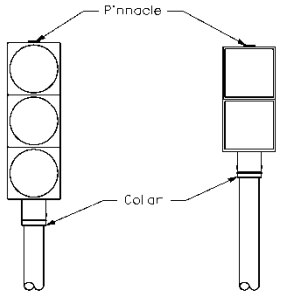
Illinois Department of Transportation

APPROVED January 1, 2002
ENGINEER OF OPERATIONS

APPROVED January 1, 2002
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 20-1-1

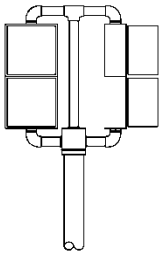
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97



POST MOUNTED
TRAFFIC SIGNAL HEAD

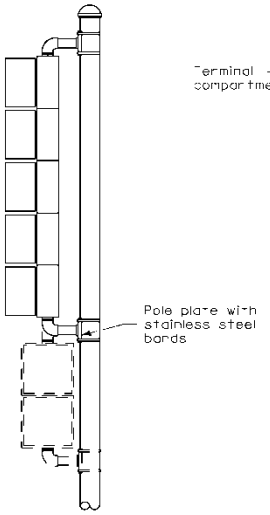
POST MOUNTED
PEDESTRIAN SIGNAL HEAD

ONE WAY



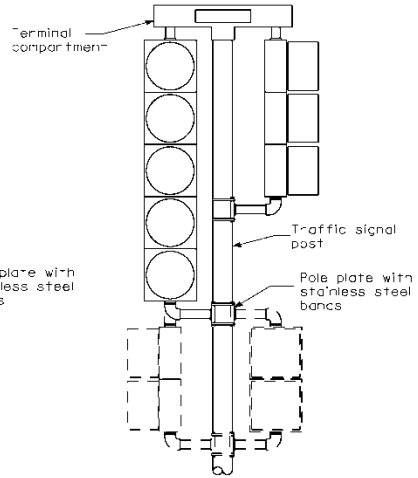
POST MOUNTED
PEDESTRIAN SIGNAL HEAD

TWO WAY

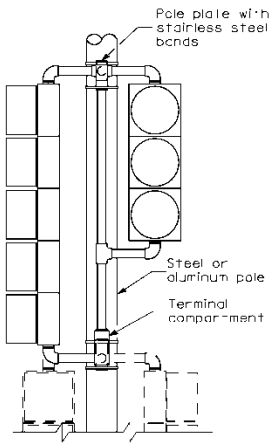


BRACKET MOUNTED
TRAFFIC SIGNAL HEAD

ONE WAY

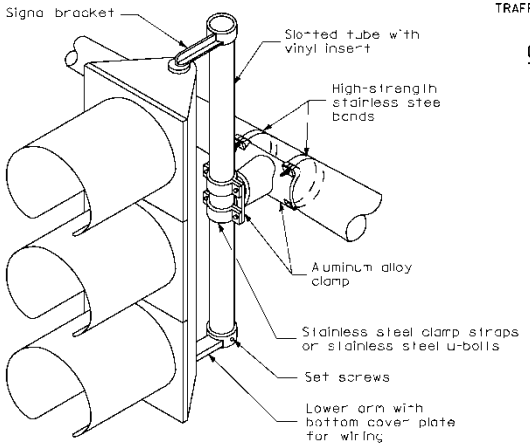


BRACKET MOUNTED
TRAFFIC SIGNAL HEAD



BRACKET MOUNTED
TRAFFIC SIGNAL HEAD

TWO WAY



STEEL MAST ARM MOUNTING

All dimensions are in millimeters (inches)
unless otherwise shown.

DATE	REVISIONS
1-1-02	Renum. Standard 840006.
1-1-98	Renum. Standard 839001.

TRAFFIC SIGNAL MOUNTING DETAILS

STANDARD 880006

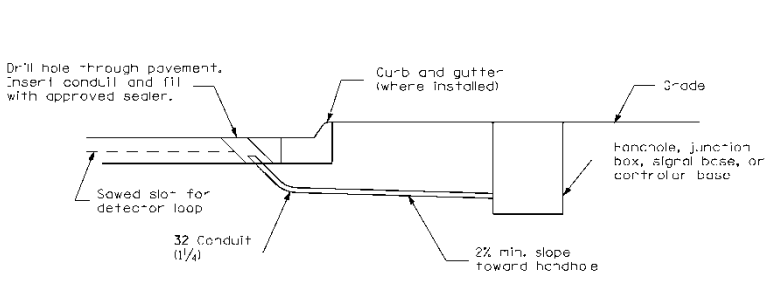
Illinois Department of Transportation

APPROVED January 1, 2002
ENGINEER OF OPERATIONS

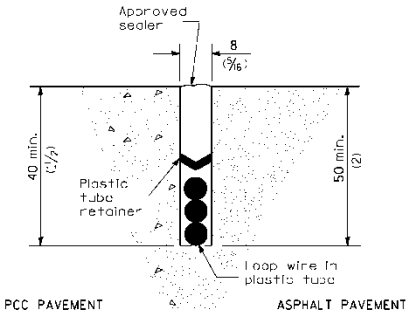
APPROVED January 1, 2002
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

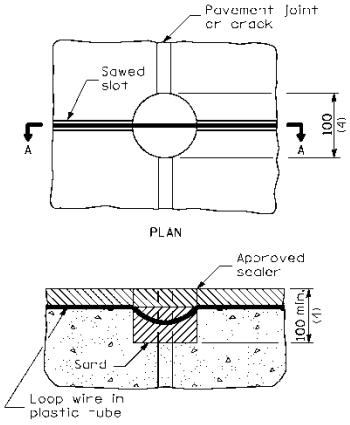
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97



DETECTOR LOOP LEAD-IN

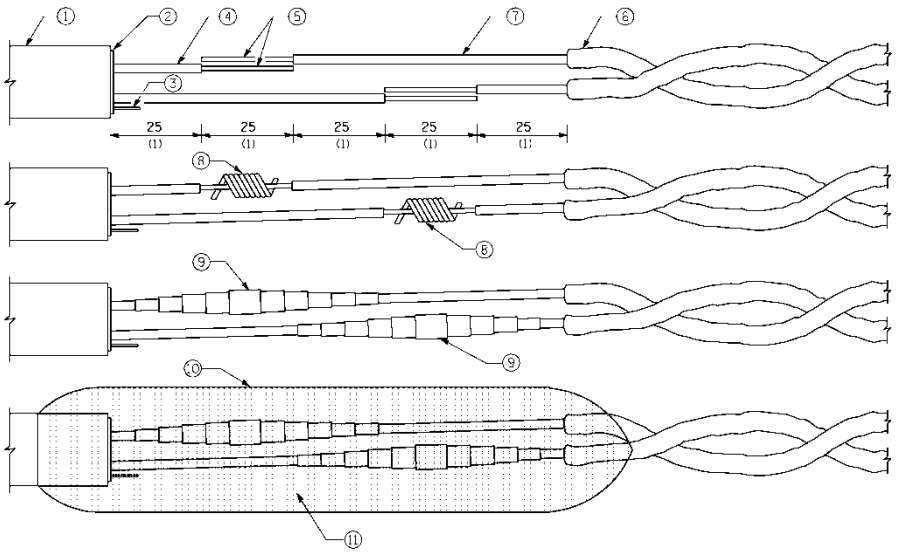


DETECTOR LOOP INSTALLATION



NOTE
Loop wire shall follow saw cut to bottom, forming slack section at joint.

DETECTOR LOOP AT PAVEMENT JOINT OR PAVEMENT CRACK



LOOP WIRE AND LEAD-IN CABLE SPLICE

① = Lead-in cable (single pair or multipair)
② = Lead in cable shield
③ = Lead-in cable shield drain-wire
④ = Lead in cable insulated conductor
⑤ = Bare conductor
⑥ = Loop wire in tube
⑦ = Loop wire insulated conductor
⑧ = Twisted and resin soldered conductor
⑨ = Electrical tape insulated splice
⑩ = Rigid mold
⑪ = Waterproof and dielectric resin

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2002
ENGINEER OF OPERATIONS

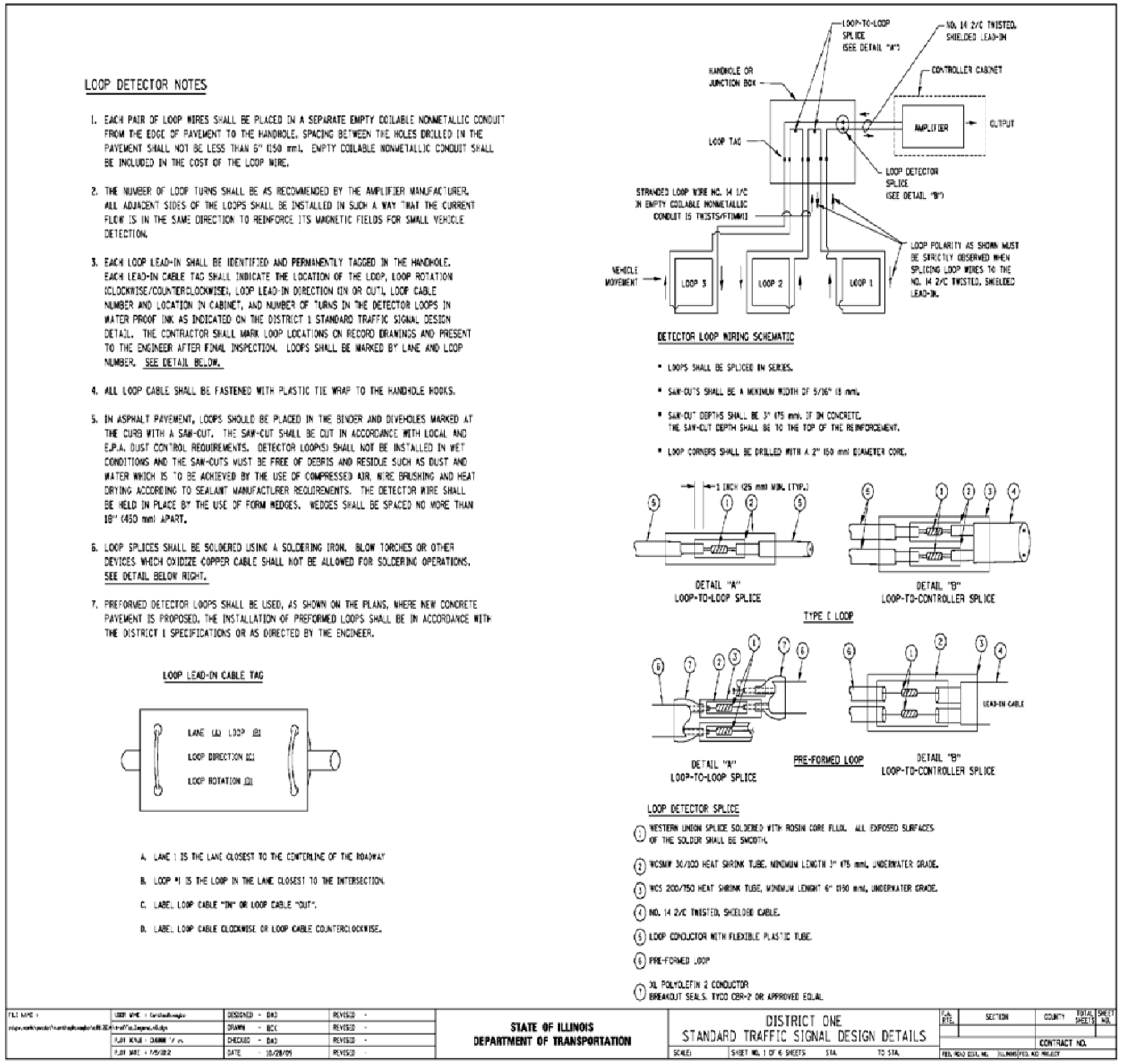
APPROVED January 1, 2002
ENGINEER OF DESIGN AND ENVIRONMENT

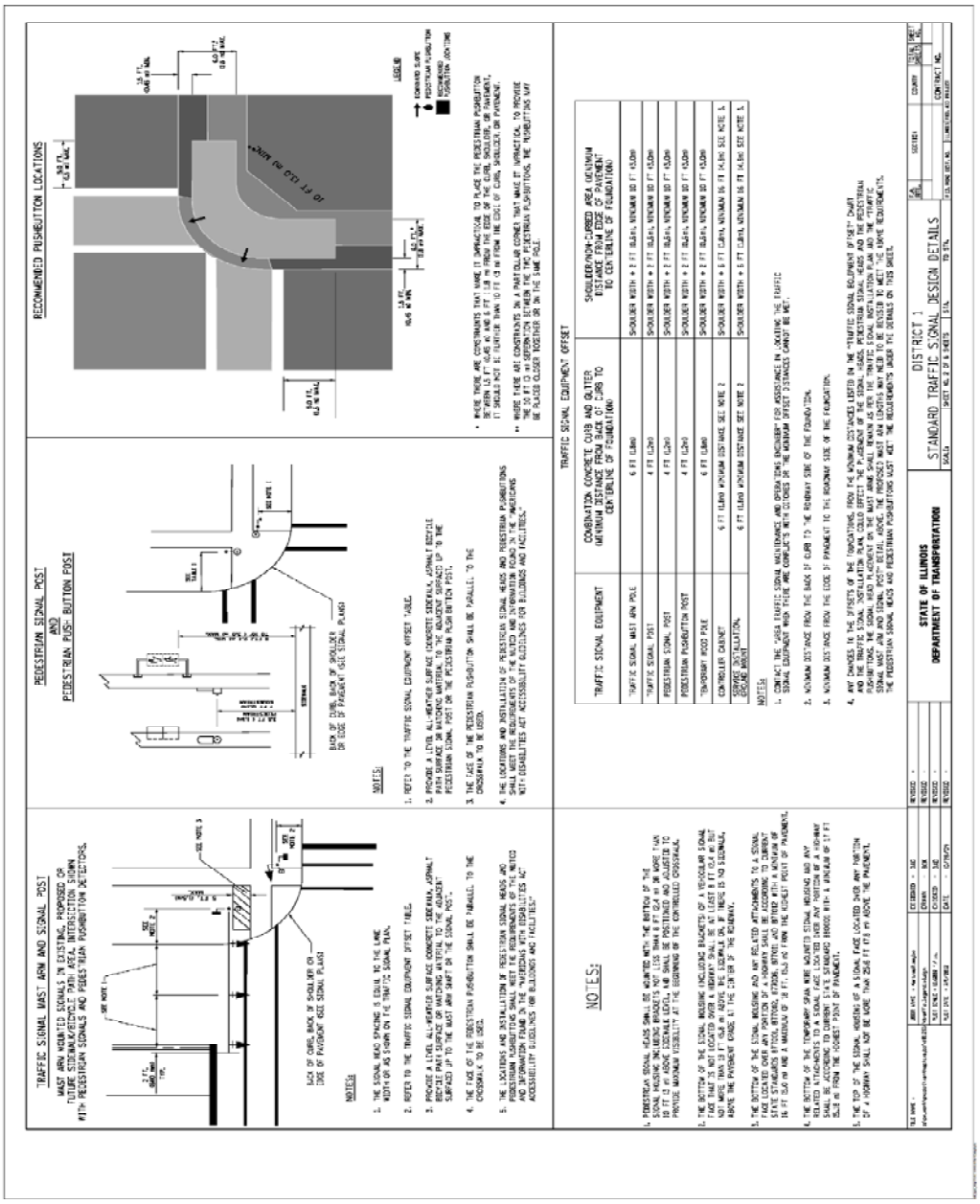
DATE	REVISIONS
1-1-02	Renum. Standard 846001.
1-1-97	Renum. Standard 2370-2.

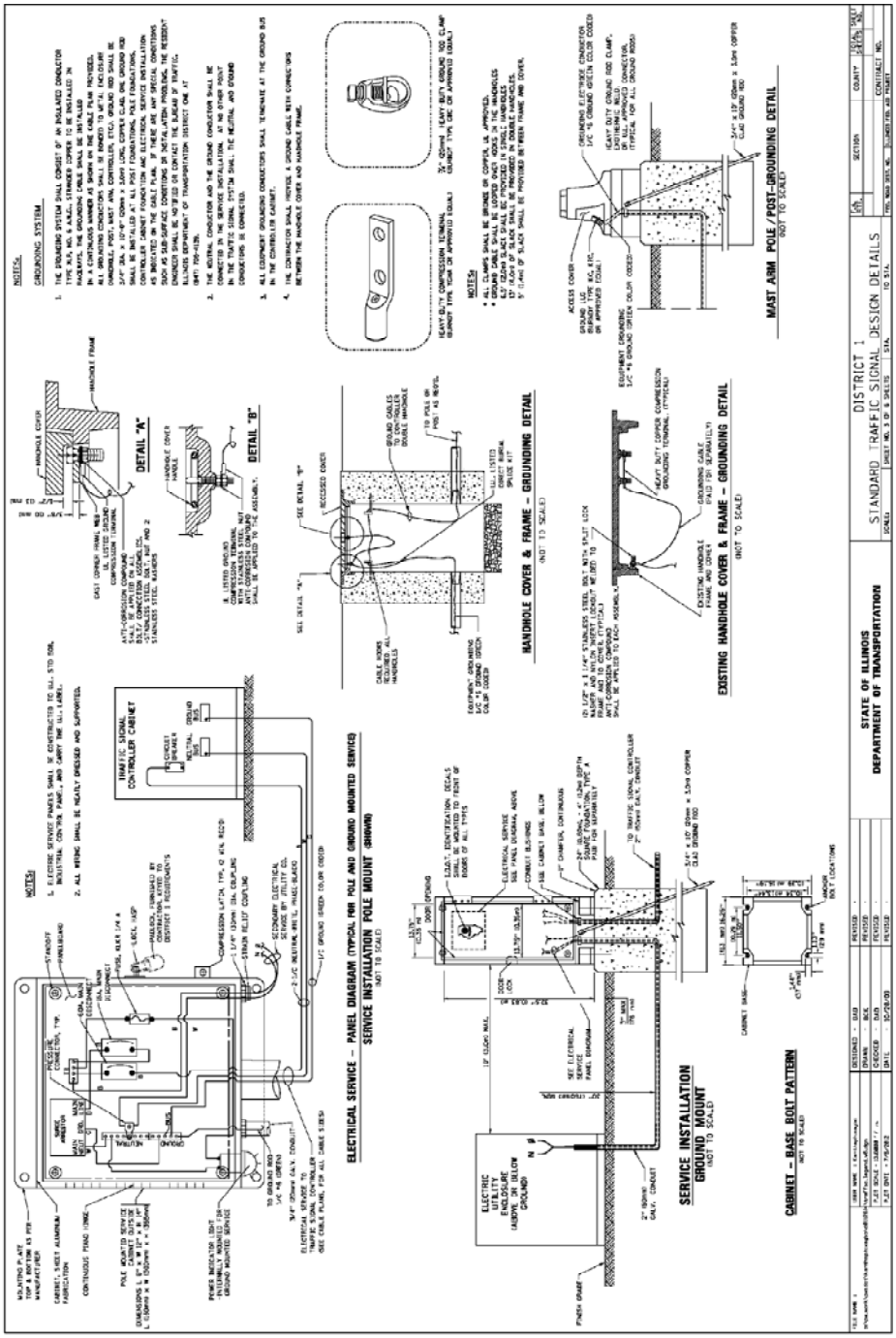
DETECTOR LOOP INSTALLATIONS

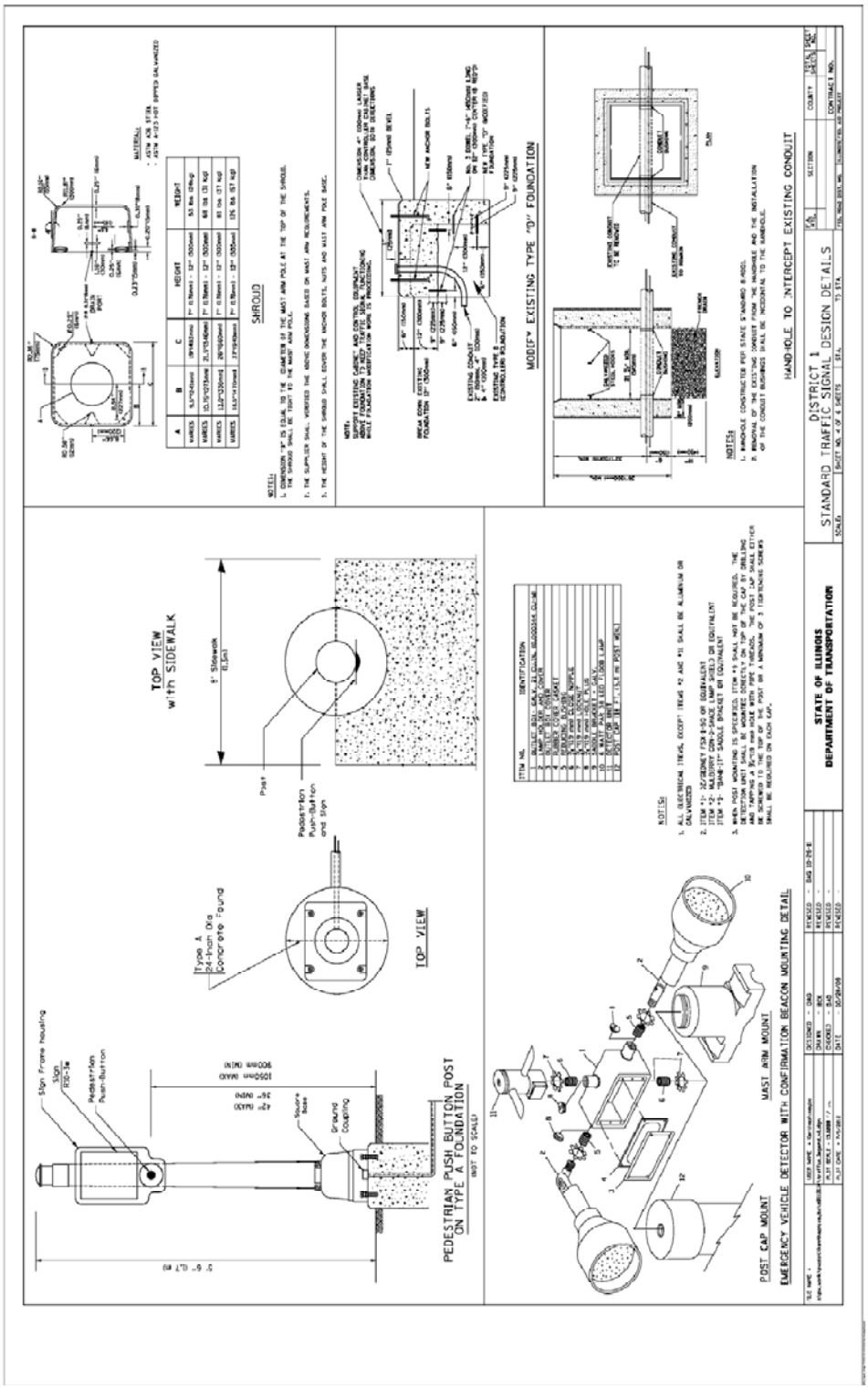
STANDARD 886001

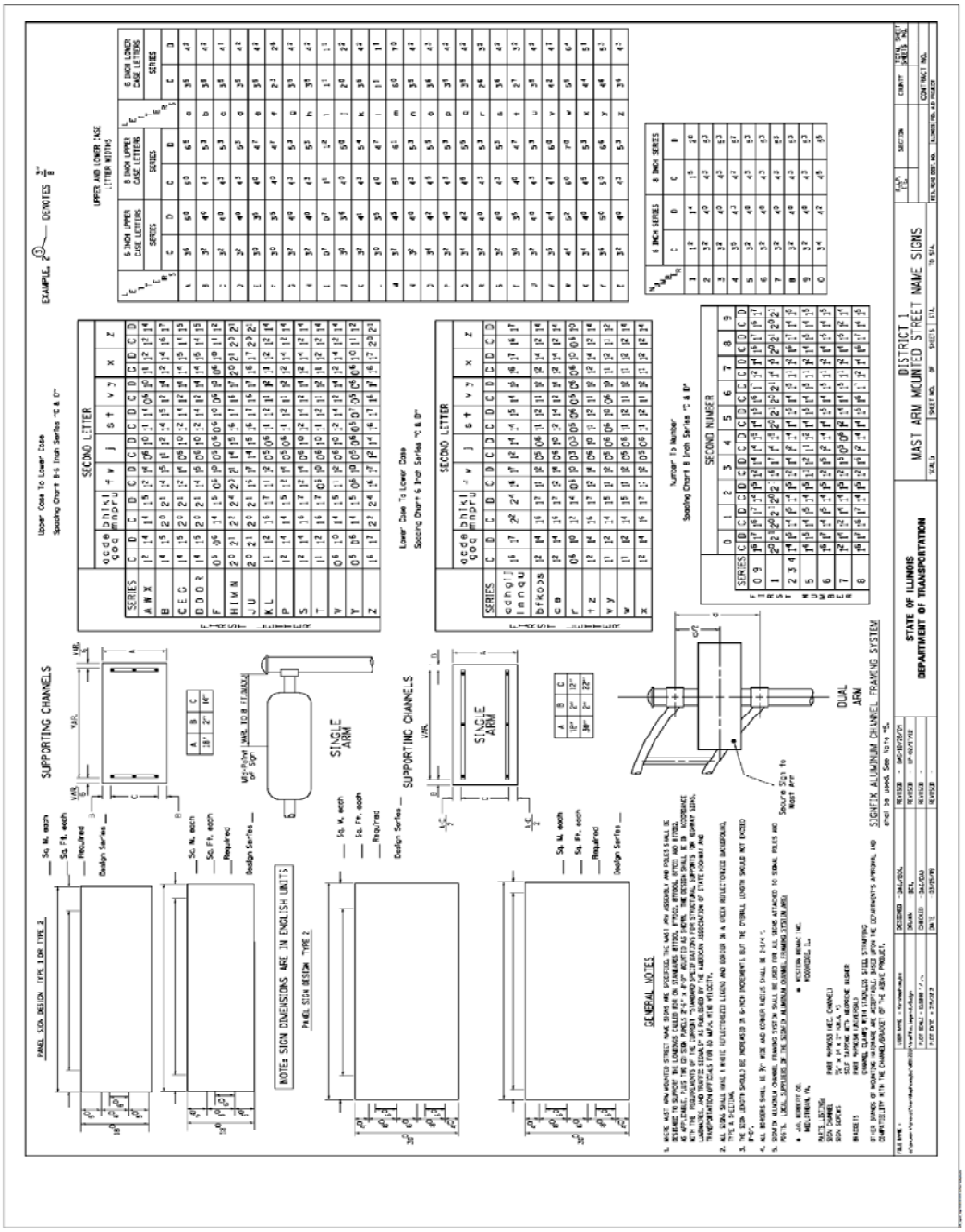
Various Routes
Section 2011-073-TS
Various Counties
Contract 60P97

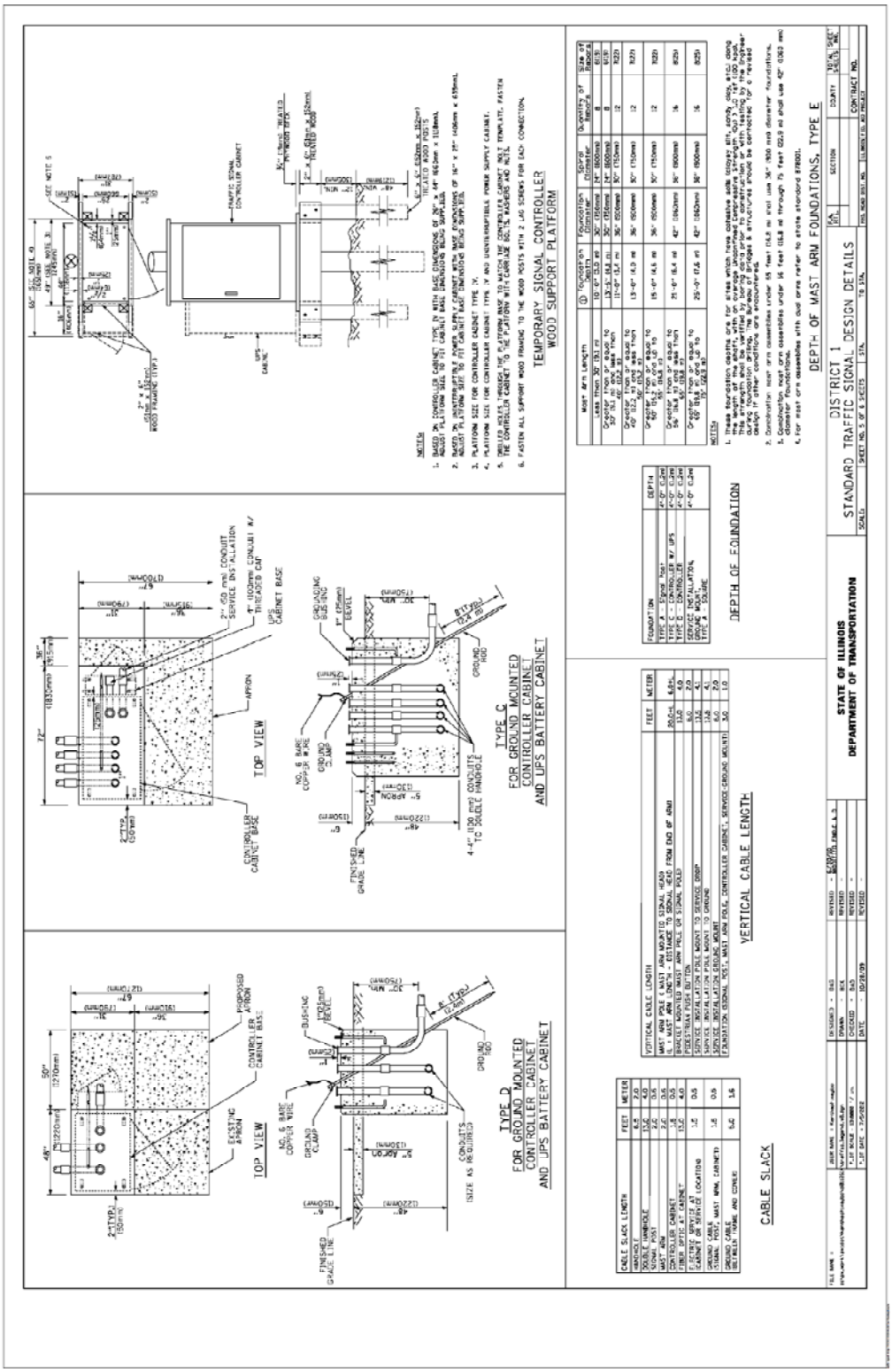

LOOP DETECTOR NOTES
1. EACH PAIR OF LOOP WIRES SHALL BE PLACED IN A SEPARATE EMPTY COILABLE NONMETALLIC CONDUIT FROM THE EDGE OF PAVEMENT TO THE HANDHOLE. SPACING BETWEEN THE HOLES DRILLED IN THE PAVEMENT SHALL NOT BE LESS THAN 6" (150 mm). EMPTY COILABLE NONMETALLIC CONDUIT SHALL BE INCLUDED IN THE COST OF THE LOOP WIRE.
2. THE NUMBER OF LOOP TURNS SHALL BE AS RECOMMENDED BY THE AMPLIFIER MANUFACTURER. ALL ADJACENT SIDES OF THE LOOPS SHALL BE INSTALLED IN SUCH A WAY THAT THE CURRENT FLOW IS IN THE SAME DIRECTION TO REINFORCE ITS MAGNETIC FIELDS FOR SMALL VEHICLE DETECTION.
3. EACH LOOP LEAD-IN SHALL BE IDENTIFIED AND PERMANENTLY TAGGED IN THE HANDHOLE. EACH LEAD-IN CABLE TAG SHALL INDICATE THE LOCATION OF THE LOOP, LOOP ROTATION (CLOCKWISE/COUNTERCLOCKWISE), LOOP LEAD-IN DIRECTION (IN OR OUT), LOOP CABLE NUMBER AND LOCATION IN CABINET, AND NUMBER OF TURNS IN THE DETECTOR LOOPS IN WATER PROOF INK AS INDICATED ON THE DISTRICT 1 STANDARD TRAFFIC SIGNAL DESIGN DETAIL. THE CONTRACTOR SHALL MARK LOOP LOCATIONS ON RECORD DRAWINGS AND PRESENT TO THE ENGINEER AFTER FINAL INSPECTION. LOOPS SHALL BE MARKED BY LANE AND LOOP NUMBER. SEE DETAIL BELOW.
4. ALL LOOP CABLE SHALL BE FASTENED WITH PLASTIC TIE WRAP TO THE HANDHOLE HOOKS.
5. IN ASPHALT PAVEMENT, LOOPS SHOULD BE PLACED IN THE BINDER AND DIVEHOLES MARKED AT THE CURB WITH A SAW-CUT. THE SAW-CUT SHALL BE CUT IN ACCORDANCE WITH LOCAL AND E.P.A. DUST CONTROL REQUIREMENTS. DETECTOR LOOP(S) SHALL NOT BE INSTALLED IN WET CONDITIONS AND THE SAW-CUTS MUST BE FREE OF DEBRIS AND RESIDUE SUCH AS DUST AND WATER WHICH IS TO BE ACHIEVED BY THE USE OF COMPRESSED AIR, WIRE BRUSHING AND HEAT DRYING ACCORDING TO SEALANT MANUFACTURER REQUIREMENTS. THE DETECTOR WIRE SHALL BE HELD IN PLACE BY THE USE OF FORM WEDGES. WEDGES SHALL BE SPACED NO MORE THAN 18" (450 mm) APART.
6. LOOP SPLICES SHALL BE SOLDERED USING A SOLDERING IRON. BLOW TORCHES OR OTHER DEVICES WHICH OXIDIZE COPPER CABLE SHALL NOT BE ALLOWED FOR SOLDERING OPERATIONS. SEE DETAIL BELOW RIGHT.
7. PREFORMED DETECTOR LOOPS SHALL BE USED, AS SHOWN ON THE PLANS, WHERE NEW CONCRETE PAVEMENT IS PROPOSED. THE INSTALLATION OF PREFORMED LOOPS SHALL BE IN ACCORDANCE WITH THE DISTRICT 1 SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.
LOOP LEAD-IN CABLE TAG
LANE (A) LOOP (B)
LOOP DIRECTION (C)
LOOP ROTATION (D)
A. LANE 1 IS THE LANE CLOSEST TO THE CENTERLINE OF THE ROADWAY
B. LOOP #1 IS THE LOOP IN THE LANE CLOSEST TO THE INTERSECTION.
C. LABEL LOOP CABLE "IN" OR LOOP CABLE "OUT".
D. LABEL LOOP CABLE CLOCKWISE OR LOOP CABLE COUNTERCLOCKWISE.
LOOP-TO-LOOP SPLICE (SEE DETAIL "A")
NO. 14 2/C TWISTED, SHIELDED LEAD-IN
HANDHOLE OR JUNCTION BOX
CONTROLLER CABINET
AMPLIFIER
OUTPUT
LOOP TAG
LOOP DETECTOR SPLICE (SEE DETAIL "B")
STRANDED LOOP WIRE NO. 14 1/C IN EMPTY COILABLE NONMETALLIC CONDUIT 15 TWISTS/FT(MIN)
LOOP POLARITY AS SHOWN MUST BE STRICTLY OBSERVED WHEN SPLICING LOOP WIRES TO THE NO. 14 2/C TWISTED, SHIELDED LEAD-IN.
VEHICLE MOVEMENT
LOOP 3
LOOP 2
LOOP 1
DETECTOR LOOP WIRING SCHEMATIC
LOOPS SHALL BE SPLICED IN SERIES.
SAW-CUTS SHALL BE A MINIMUM WIDTH OF 5/16" (8 mm).
SAW-CUT DEPTHS SHALL BE 3" (75 mm). IF IN CONCRETE, THE SAW-CUT DEPTH SHALL BE TO THE TOP OF THE REINFORCEMENT.
LOOP CORNERS SHALL BE DRILLED WITH A 2" (50 mm) DIAMETER CORE.
1 INCH (25 mm) MIN. (TYP.)
DETAIL "A" LOOP-TO-LOOP SPLICE
DETAIL "B" LOOP-TO-CONTROLLER SPLICE
TYPE I LOOP
LEAD-IN CABLE
DETAIL "A" LOOP-TO-LOOP SPLICE
PRE-FORMED LOOP
DETAIL "B" LOOP-TO-CONTROLLER SPLICE
LOOP DETECTOR SPLICE
1 WESTERN UNION SPLICE SOLDERED WITH ROSIN CORE FLUX. ALL EXPOSED SURFACES OF THE SOLDER SHALL BE SMOOTH.
2 WCSMW 30/100 HEAT SHRINK TUBE, MINIMUM LENGTH 3" (75 mm), UNDERWATER GRADE.
3 WCS 200/750 HEAT SHRINK TUBE, MINIMUM LENGHT 6" (150 mm), UNDERWATER GRADE.
4 NO. 14 2/C TWISTED, SHIELDED CABLE.
5 LOOP CONDUCTOR WITH FLEXIBLE PLASTIC TUBE.
6 PRE-FORMED LOOP
7 XL POLYOLEFIN 2 CONDUCTOR BREAKOUT SEALS. TYCO CBR-2 OR APPROVED EQUAL
DESIGNED - BAO
DRAWN - BCK
CHECKED - BAO
DATE - 10/28/09
REVISED -
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DISTRICT ONE
STANDARD TRAFFIC SIGNAL DESIGN DETAILS
SCALE:
SHEET NO. 1 OF 6 SHEETS
STA.
TO STA.
F.A. RTE.
SECTION
COUNTY
TOTAL SHEETS
SHEET NO.
CONTRACT NO.
FED. ROAD DIST. NO.
ILLINOIS
FED. AID PROJECT




STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DISTRICT 1
STANDARD TRAFFIC SIGNAL DESIGN DETAILS
NOTES:
GROUNDING SYSTEM
ELECTRICAL SERVICE – PANEL DIAGRAM (TYPICAL FOR POLE AND GROUND MOUNTED SERVICE)
SERVICE INSTALLATION POLE MOUNT (SHOWN)
NOT TO SCALE
DETAIL "A"
DETAIL "B"
HANDHOLE COVER & FRAME – GROUNDING DETAIL
NOT TO SCALE
EXISTING HANDHOLE COVER & FRAME – GROUNDING DETAIL
NOT TO SCALE
MAST ARM POLE / POST-GROUNDING DETAIL
NOT TO SCALE
SERVICE INSTALLATION
GROUND MOUNT
NOT TO SCALE
CABINET – BASE BOLT PATTERN
NOT TO SCALE


STANDARD TRAFFIC SIGNAL DESIGN DETAILS
DISTRICT 1
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SHROUD
MODIFY EXISTING TYPE "D" FOUNDATION
HANDHOLE TO INTERCEPT EXISTING CONDUIT
TOP VIEW with SIDEWALK
PEDESTRIAN PUSH BUTTON POST ON TYPE A FOUNDATION
TOP VIEW
POST CAP MOUNT
MAST ARM MOUNT
EMERGENCY VEHICLE DETECTOR WITH CONFIRMATION BEACON MOUNTING DETAIL




TEMPORARY SIGNAL CONTROLLER
WOOD SUPPORT PLATFORM
TYPE C
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET
TOP VIEW
TYPE D
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET
TOP VIEW
DEPTH OF FOUNDATION
VERTICAL CABLE LENGTH
CABLE SLACK
DEPTH OF MAST ARM FOUNDATIONS, TYPE E
STANDARD TRAFFIC SIGNAL DESIGN DETAILS
DISTRICT 1
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL LEGEND

ITEM	REMOVAL	EXISTING	PROPOSED
CONTROLLER CABINET	R	E	P
RAILROAD CONTROL CABINET	R	E	P
COMMUNICATIONS CABINET	R	E	P
MASTER CONTROLLER	R	E	P
UNINTERRUPTIBLE POWER SUPPLY	R	E	P
SERVICE INSTALLATION, #1 POLE OR ISO SHIELD MOUNT	R	E	P
TELEPHONE CONNECTION #1 POLE OR ISO SHIELD MOUNT	R	E	P
STEEL MAST ARM ASSEMBLY AND POLE	R	E	P
ALUMINUM MAST ARM ASSEMBLY AND POLE	R	E	P
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE	R	E	P
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH PTZ CAMERA	R	E	P
SIGNAL POST	R	E	P
TEMPORARY MODE POLE (CLASS 5 OR BETTER) 45 FOOT (13.7m) MINIMUM	R	E	P
GUY WIRE	R	E	P
SIGNAL HEAD	R	E	P
SIGNAL HEAD CONSTRUCTION STAGES (NUMBERS INDICATE THE CONSTRUCTION STAGE)	R	E	P
SIGNAL HEAD WITH BACKPLATE	R	E	P
SIGNAL HEAD OPTICALLY PROGRAMMED	R	E	P
FLASHER INSTALLATION (S DENOTES SOLAR POWER)	R	E	P
PEDESTRIAN SIGNAL HEAD	R	E	P
PEDESTRIAN PUSHBUTTON DETECTOR	R	E	P
ACCESSIBLE PEDESTRIAN PUSHBUTTON DETECTOR	R	E	P
ILLUMINATED SIGN "NO LEFT TURN"	R	E	P
ILLUMINATED SIGN "NO RIGHT TURN"	R	E	P
DETECTION LOOP, TYPE I	R	E	P
PREFORMED DETECTION LOOP	R	E	P
MICROWAVE VEHICLE SENSOR	R	E	P
VIDEO DETECTION CAMERA	R	E	P
VIDEO DETECTION ZONE	R	E	P
PAN, TILT, ZOOM CAMERA	R	E	P
WIRELESS DETECTOR SENSOR	R	E	P
WIRELESS ACCESS POINT	R	E	P

ITEM	REMOVAL	EXISTING	PROPOSED
EMERGENCY VEHICLE LIGHT DETECTOR	R	E	P
CONFIRMATION BEACON	R	E	P
HANDHOLE	R	E	P
HEAVY DUTY HANDHOLE	R	E	P
DOUBLE HANDHOLE	R	E	P
JUNCTION BOX	R	E	P
UNDERGROUND CONDUIT, GALVANIZED STEEL 4(X)	R	E	P
TEMPORARY SPAN WIRE, TETHER WIRE, AND CABLE	R	E	P
COMMON TRENCH			CT
CONDUCTIVE KINEMATIC CONDUIT (EMPTY)			CKC
SYSTEM ITEM		S	S
INTERSECTION ITEM		I	IP
REMOVE ITEM	R		
RELOCATE ITEM	RL		
ABANDON ITEM	A		
12" (300mm) TRAFFIC SIGNAL SECTION		E	P
12" (300mm) POST WITH 8" (200mm) YELLOW AND GREEN TRAFFIC SIGNAL FACE		E	P
SIGNAL FACE WITH BACKPLATE, 12" (300mm) LED PROGRAMMED HEAD		E	P
SIGNAL FACE		E	P
12" (300mm) PEDESTRIAN SIGNAL HEAD WALK/DON'T WALK SYMBOL		E	P
12" (300mm) PEDESTRIAN SIGNAL HEAD INTERNATIONAL SYMBOL, OUTLINED		E	P
12" (300mm) PEDESTRIAN SIGNAL HEAD INTERNATIONAL SYMBOL, SOLID		E	P
PEDESTRIAN SIGNAL HEAD, INTERNATIONAL SYMBOL, WITH COUNTDOWN TIMER		E	P
RADIO INTERCONNECT	R	E	P
RADIO REPEATER	R	E	P
DENOTES NUMBER OF CONDUCTORS, ELECTRIC CABLE NO. 14, UNLESS NOTED OTHERWISE. ALL DETECTOR LOOP CABLE TO BE SHIELDED		E	P
GROUND CABLE IN CONDUIT NO. 6 SOLID COPPER (GREEN)		E	P

ITEM	REMOVAL	EXISTING	PROPOSED
ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1/C UNLESS NOTED OTHERWISE	R	E	P
COAXIAL CABLE	R	E	P
VENDOR CABLE FOR CAMERA	R	E	P
COPPER INTERCONNECT CABLE, NO. 19 3 PAIR TWISTED, SHIELDED	R	E	P
FIBER OPTIC CABLE NO. 62.5/125, MM/SM	R	E	P
FIBER OPTIC CABLE NO. 62.5/125, MM/SM SHOP	R	E	P
FIBER OPTIC CABLE NO. 62.5/125, NUMBER OF FIBERS & TYPE TO BE NOTED ON PLANS	R	E	P
GROUND ROD 4" ID CONTROLLER, (W/ HANDHOLE, #9 POST, #8 MAST ARM, OR ISO SERVICE	R	E	P
CONTROLLER CABINET AND FOUNDATION TO BE REMOVED	RCF		
STEEL MAST ARM POLE AND FOUNDATION TO BE REMOVED	RMP		
ALUMINUM MAST ARM POLE AND FOUNDATION TO BE REMOVED	RMP		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE AND FOUNDATION TO BE REMOVED	RMP RF		
SIGNAL POST AND FOUNDATION TO BE REMOVED	RMP		
INTERSECTION & SAMPLING SYSTEM DETECTOR	R	E	P
SAMPLING ISYSTEM DETECTOR	R	E	P
EXISTING INTERSECTION LOOP DETECTOR PROPOSED INTERSECTION AND SAMPLING ISYSTEM DETECTOR	R	E	P
EXISTING PREFORMED INTERSECTION LOOP DETECTOR PROPOSED INTERSECTION AND SAMPLING ISYSTEM DETECTOR	R	E	P
PREFORMED INTERSECTION AND SAMPLING SYSTEM DETECTOR	R	E	P
PREFORMED SAMPLING ISYSTEM DETECTOR	R	E	P

RAILROAD SYMBOLS

	EXISTING	PROPOSED
RAILROAD CONTROL CABINET	R	P
RAILROAD CANTILEVER MAST ARM	R	P
FLASHING SIGNAL	R	P
CROSSING GATE	R	P
CROSSBUCK	R	P

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	DISTRICT 1 STANDARD TRAFFIC SIGNAL DESIGN DETAILS	SECTION	COUNTY	TOTAL SHEET NO.	SHEET NO.
SCALE: NONE SHEET NO. 6 OF 8 SHEETS STA. TO STA.		CONTRACT NO.			

SECTION 3 – LIST OF LOCATIONS

ADVANCED SYSTEM LOCATIONS ON STATE MAINTENANCE AS OF 5-31-12

Sys	Loc. #	Main Route	Cross St	Co	Description	Other Info	System Type	Pay Item	Qty
A	IE S1	I 94	N of Lawrence Ave	CO	Aux Sign		A1AS	A-1	1
A	IE S2	I 94	S of Lawrence Ave	CO	Aux Sign		A1AS	A-1	2
A	IS S1	I 90 94	S of Kedzie Ave	CO	Aux Sign		A1AS	A-1	3
A	IS S2	I 90 94	S of Kedzie Ave	CO	Aux Sign		A1AS	A-1	4
A	IW S1	I 90	W of Cicero Ave	CO	Aux Sign		A1AS	A-1	5
A	IW S2	I 90	Cicero Ave	CO	Aux Sign		A1AS	A-1	6
A	OM S1	I 90 94	S of Grand Ave	CO	Aux Sign		A1AS	A-1	7
A	OM S2	I 90 94	S of Grand Ave	CO	Aux Sign		A1AS	A-1	8
A	OM S3	I 90 94	S of Grand Ave	CO	Aux Sign		A1AS	A-1	9
A	OO S1	I 90 94	E of Milwaukee Ave	CO	Aux Sign		A1AS	A-1	10
A	OO S2	I 90 94	E of Milwaukee Ave	CO	Aux Sign		A1AS	A-1	11
A	OO S3	I 90 94	E of Milwaukee Ave	CO	Aux Sign		A1AS	A-1	12
A	OS S1	I 90 94	N of Logan Blvd	CO	Aux Sign		A1AS	A-1	13
A	OS S2	I 90 94	N of Logan Blvd	CO	Aux Sign		A1AS	A-1	14
A	IEB1	I 94	N of Wilson Ave	CO	Barrier	28 Ft	A1BA	A-1	15
A	ISB1	I 90 94	N of Sacramento	CO	Barrier	36.21 Ft	A1BA	A-1	16

			Ave						
A	IWB1	I 90	N of Montrose Ave	CO	Barrier	28.94 Ft	A1BA	A-1	17
A	OMB1	I 90	N of Grand Ave	CO	Barrier	22.27 Ft	A1BA	A-1	18
A	OOB1	I 90 94	W of Milwaukee Ave	CO	Barrier	28 Ft	A1BA	A-1	19
A	OSB1	I 90 94	S of Diversey Ave	CO	Barrier	38.25 Ft	A1BA	A-1	20
A	IEX1	I 94	S of Wilson Ave	CO	Barrier “X” Sign		A1BS	A-1	21
A	ISX1	I 90 94	S of Kedzie Ave	CO	Barrier “X” Sign		A1BS	A-1	22
A	IWX1	I 90	N of Montrose Ave	CO	Barrier “X” Sign		A1BS	A-1	23
A	OMX1	I 90 94	N of Grand Ave	CO	Barrier “X” Sign		A1BS	A-1	24
A	OOX1	I 90 94	W of Milwaukee Ave	CO	Barrier “X” Sign		A1BS	A-1	25
A	OSX1	I 90 94	S of Diversey Ave	CO	Barrier “X” Sign		A1BS	A-1	26
A	OMCM1	I 90 94	NW of Fulton St	CO	CM Sign		A1CM	A-1	27
A	OMCM2	I 90 94	SE of Green St	CO	CM Sign		A1CM	A-1	28
A	OOCM3	Ontario St	Kennedy Split	CO	CM Sign		A1CM	A-1	29
A	OOCM4	Ontario St	E of Kennedy Split	CO	CM Sign		A1CM	A-1	30
A	OOCM5	Ontario St	Chicago River	CO	CM Sign		A1CM	A-1	31
A	OMCM6	I 90 94	SE of Grand Ave	CO	CM Sign		A1CM	A-1	32
A	OMCM7	I 90 94	NE of Ohio St	CO	CM Sign		A1CM	A-1	33
A	OSCM8	I 90 94	Fullerton Ave	CO	CM Sign		A1CM	A-1	34
A	OSCM9	I 90 94	S of Diveresy Ave	CO	CM Sign		A1CM	A-1	35
A	ISCM10	I 90 94	Sacramento Ave	CO	CM Sign		A1CM	A-1	36
A	ISCM11	I 90 94	Kimball Ave	CO	CM Sign		A1CM	A-1	37
A	IECM12	I 94	S of Lawrence	CO	CM Sign		A1CM	A-1	38

			Ave						
A	IECM13	I 94	Foster Ave	CO	CM Sign		A1CM	A-1	39
A	IWCM14	I 90	S of Lawrence Ave	CO	CM Sign		A1CM	A-1	40
A	IWCM15	I 90	N of Montrose Ave	CO	CM Sign		A1CM	A-1	41
A	IEV1	I 94	S of Lawrence Ave	CO	Chevron Sign		A1CS	A-1	42
A	IEV2	I 94	S of Lawrence Ave	CO	Chevron Sign		A1CS	A-1	43
A	IEV3	I 94	S of Lawrence Ave	CO	Chevron Sign		A1CS	A-1	44
A	ISV1	I 90 94	S of Kedzie Ave	CO	Chevron Sign		A1CS	A-1	45
A	ISV2	I 90 94	S of Kedzie Ave	CO	Chevron Sign		A1CS	A-1	46
A	ISV3	I 90 94	S of Kedzie Ave	CO	Chevron Sign		A1CS	A-1	47
A	IWV1	I 90	N of Montrose Ave	CO	Chevron Sign		A1CS	A-1	48
A	IWV2	I 90	N of Montrose Ave	CO	Chevron Sign		A1CS	A-1	49
A	IWV3	I 90	N of Montrose Ave	CO	Chevron Sign		A1CS	A-1	50
A	IWV4	I 90	N of Montrose Ave	CO	Chevron Sign		A1CS	A-1	51
A	IWV5	I 90	S of Montrose Ave	CO	Chevron Sign		A1CS	A-1	52
A	OMV1	I 90 94	S of Grand Ave	CO	Chevron Sign		A1CS	A-1	53
A	OMV2	I 90 94	S of Grand Ave	CO	Chevron Sign		A1CS	A-1	54
A	OMV3	I 90 94	S of Grand Ave	CO	Chevron Sign		A1CS	A-1	55
A	OMV4	I 90 94	S of Grand Ave	CO	Chevron Sign		A1CS	A-1	56
A	OOV1	I 90 94	Milwaukee Ave	CO	Chevron Sign		A1CS	A-1	57

A	OOV2	I 90 94	Milwaukee Ave	CO	Chevron Sign		A1CS	A-1	58
A	OOV3	I 90 94	W of Milwaukee Ave	CO	Chevron Sign		A1CS	A-1	59
A	OSV1	I 90 94	N of Logan Blvd	CO	Chevron Sign		A1CS	A-1	60
A	OSV2	I 90 94	N of Logan Blvd	CO	Chevron Sign		A1CS	A-1	61
A	OSV3	I 90 94	N of Logan Blvd	CO	Chevron Sign		A1CS	A-1	62
A	IE1	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	63
A	IE2	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	64
A	IE3	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	65
A	IE4	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	66
A	IE5	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	67
A	IE6	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	68
A	IE7	I 94	S of Lawrence Ave	CO	Swing Gate		A1G	A-1	69
A	IE8	I 94	N of Wilson Ave	CO	Swing Gate		A1G	A-1	70
A	IE9	I 94	N of Wilson Ave	CO	Swing Gate		A1G	A-1	71
A	IE10	I 94	N of Wilson Ave	CO	Swing Gate		A1G	A-1	72
A	IE11	I 94	N of Wilson Ave	CO	Swing Gate		A1G	A-1	73
A	IE12	I 94	S of Wilson Ave	CO	Swing Gate		A1G	A-1	74
A	IE13	I 94	S of Wilson Ave	CO	Swing Gate		A1G	A-1	75
A	IE14	I 94	S of Wilson Ave	CO	Swing Gate		A1G	A-1	76
A	IE15	I 94	S of Wilson Ave	CO	Swing Gate		A1G	A-1	77
A	IS1	I 90 94	N of Sacramento	CO	Swing Gate		A1G	A-1	78

			Ave						
A	IS2	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	79
A	IS3	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	80
A	IS4	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	81
A	IS5	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	82
A	IS6	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	83
A	IS7	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	84
A	IS8	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	85
A	IS9	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	86
A	IS10	I 90 94	N of Sacramento Ave	CO	Swing Gate		A1G	A-1	87
A	IS11	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	88
A	IS12	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	89
A	IS13	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	90
A	IS14	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	91
A	IS15	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	92
A	IS16	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	93
A	IS17	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	94
A	IS18	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	95
A	IS19	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	96
A	IS20	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	97

A	IS21	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	98
A	IS22	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	99
A	IS23	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	100
A	IS24	I 90 94	S of Kedzie Ave	CO	Swing Gate		A1G	A-1	101
A	IW1	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	102
A	IW2	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	103
A	IW3	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	104
A	IW4	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	105
A	IW5	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	106
A	IW6	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	107
A	IW7	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	108
A	IW8	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	109
A	IW9	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	110
A	IW10	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	111
A	IW11	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	112
A	IW12	I 90	N of Montrose Ave	CO	Swing Gate		A1G	A-1	113
A	IW13	I 90	Montrose Ave	CO	Swing Gate		A1G	A-1	114
A	IW14	I 90	Montrose Ave	CO	Swing Gate		A1G	A-1	115
A	IW15	I 90	S of Montrose	CO	Swing Gate		A1G	A-1	116

			Ave						
A	IW16	I 90	S of Montrose Ave	CO	Swing Gate		A1G	A-1	117
A	IW17	I 90	S of Montrose Ave	CO	Swing Gate		A1G	A-1	118
A	IW18	I 90	S of Montrose Ave	CO	Swing Gate		A1G	A-1	119
A	IW19	I 90	S of Montrose Ave	CO	Swing Gate		A1G	A-1	120
A	IW20	I 90	S of Montrose Ave	CO	Swing Gate		A1G	A-1	121
A	OM1	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	122
A	OM2	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	123
A	OM3	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	124
A	OM4	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	125
A	OM5	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	126
A	OM6	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	127
A	OM7	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	128
A	OM8	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	129
A	OM9	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	130
A	OM10	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	131
A	OM11	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	132
A	OM12	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	133
A	OM13	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	134
A	OM14	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	135
A	OM15	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	136
A	OM16	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	137
A	OM17	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	138

A	OM18	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	139
A	OM19	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	140
A	OM20	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	141
A	OM21	I 90 94	S of Grand Ave	CO	Swing Gate		A1G	A-1	142
A	OO1	I 90 94	E of Milwaukee Ave	CO	Swing Gate		A1G	A-1	143
A	OO2	I 90 94	Milwaukee Ave	CO	Swing Gate		A1G	A-1	144
A	OO3	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	145
A	OO4	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	146
A	OO5	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	147
A	OO6	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	148
A	OO7	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	149
A	OO8	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	150
A	OO9	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	151
A	OO10	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	152
A	OO11	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	153
A	OO12	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	154
A	OO13	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	155
A	OO14	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	156

A	OO15	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	157
A	OO16	I 90 94	W of Milwaukee Ave	CO	Swing Gate		A1G	A-1	158
A	OS1	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	159
A	OS2	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	160
A	OS3	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	161
A	OS4	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	162
A	OS5	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	163
A	OS6	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	164
A	OS7	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	165
A	OS8	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	166
A	OS9	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	167
A	OS10	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	168
A	OS11	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	169
A	OS12	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	170
A	OS13	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	171
A	OS14	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	172
A	OS15	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	173
A	OS16	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	174
A	OS17	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	175
A	OS18	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	176
A	OS19	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	177
A	OS20	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	178
A	OS21	I 90 94	N of Logan Blvd	CO	Swing Gate		A1G	A-1	179
A	IEG1	I 94	N of Wilson Ave	CO	Gore Sign		A1GS	A-1	180

A	ISG1	I 90 94	S of Kedzie Ave	CO	Gore Sign		A1GS	A-1	181
A	IWG1	I 90	N of Montrose Ave	CO	Gore Sign		A1GS	A-1	182
A	OMG1	I 90 94	S of Ogden Ave	CO	Gore Sign		A1GS	A-1	183
A	OOG1	I 90 94	W of Milwaukee Ave	CO	Gore Sign		A1GS	A-1	184
A	OSG1	I 90 94	N of Logan Blvd	CO	Gore Sign		A1GS	A-1	185
A	IKIBAS	I 290	Ashland Ave IB	CO	Ramp Gate	25 Ft	A1-H	A-1	186
A	IKIBCA	I 290	California Ave IB	CO	Ramp Gate	25 Ft	A1-H	A-1	187
A	IKIBCE	I 290	Central Ave IB	CO	Ramp Gate	30 Ft	A1-H	A-1	188
A	IKIBDA	I 290	Damen Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	189
A	IKIBHO	I 290	Homan Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	190
A	IKIBIN	I 290	Independence Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	191
A	IKIBKO	I 290	Kostner Ave IB	CO	Ramp Gate	27.5 Ft	A1-H	A-1	192
A	IKIBLA	I 290	Laramie Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	193
A	IKIBOA	I 290	Oakley Ave IB	CO	Ramp Gate	25 Ft	A1-H	A-1	194
A	IKIBAD	I 290	Addison	CO	Ramp Gate	25 Ft	A1-H	A-1	195
A	KEIBAR	I 90 94	Armitage Ave IB	CO	Ramp Gate	25 Ft	A1-H	A-1	196
A	KEIBAU	I 90 94	Augusta Blvd IB	CO	Ramp Gate	25 Ft	A1-H	A-1	197
A	KEIBCE	I 90	Central Ave IB	CO	Ramp Gate	25 Ft	A1-H	A-1	198
A	KEIBCN	I 90	Canfield Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	199
A	KEIBCU	I 90	Cumberland Ave IB	CO	Ramp Gate	27.5 Ft	A1-H	A-1	200
A	KEIBDI	I 90 94	Division St IB	CO	Ramp Gate	30 Ft	A1-H	A-1	201
A	KEIBDV	I 90 94	Diversey Ave IB	CO	Ramp Gate	30 Ft	A1-H	A-1	202
A	KEIBFO	I 90	Foster Ave IB	CO	Ramp Gate	30 Ft	A1-H	A-1	203

A	KEIBFU	I 90 94	Fullerton Ave IB	CO	Ramp Gate	30 Ft	A1-H	A-1	204
A	KEIBHAN	I 90	Harlem Ave OB	CO	Ramp Gate	23 Ft	A1-H	A-1	205
A	KEIBHAS	I 90	Harlem Ave OB	CO	Ramp Gate	23 Ft	A1-H	A-1	206
A	KEIBIR	I 90 94	Irving Park Rd IB	CO	Ramp Gate	30 Ft	A1-H	A-1	207
A	KEIBKE	I 90 94	Kedzie Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	208
A	KEIBKI	I 90 94	Kimball Ave B	CO	Ramp Gate	30 Ft	A1-H	A-1	209
A	KEIBMO	I 90 94	Montrose Ave IB	CO	Ramp Gate	30 Ft	A1-H	A-1	210
A	KEIBNA	I 90	Nagle Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	211
A	KEIBNO	I 90 94	North Ave IB	CO	Ramp Gate	25 Ft	A1-H	A-1	212
A	KEIBPU	I 90 94	Pulaski Rd IB	CO	Ramp Gate	27.5 Ft	A1-H	A-1	213
A	KEIBSA	I 90	Sayre Ave IB	CO	Ramp Gate	23 Ft	A1-H	A-1	214
A	KEIBWE	I 90 94	Webster Ave IB	CO	Ramp Gate	27.5 Ft	A1-H	A-1	215
A	KEOBAC	I 90 94	California Ave OB	CO	Ramp Gate	30 Ft	A1-H	A-1	216
A	KEOBAD	I 90 94	Addison St OB	CO	Ramp Gate	27.5 Ft	A1-H	A-1	217
A	KEOBAR	I 90 94	Armitage Ave OB	CO	Ramp Gate	25 Ft	A1-H	A-1	218
A	KEOBCU	I 90	Cumberland Ave OB	CO	Ramp Gate	30 Ft	A1-H	A-1	219
A	KEOBDI	I 90 94	Division St OB	CO	Ramp Gate	30 Ft	A1-H	A-1	220
A	KEOBFO	I 90	Foster Ave OB	CO	Ramp Gate	23 Ft	A1-H	A-1	221
A	KEOBFU	I 90 94	Fullerton Ave OB	CO	Ramp Gate	30 Ft	A1-H	A-1	222
A	KEOBHA	I 90	Harlem Ave OB	CO	Ramp Gate	23 Ft	A1-H	A-1	223
A	KEOBKI	I 90 94	Kimball Ave OB	CO	Ramp Gate	30 Ft	A1-H	A-1	224
A	KEOBNA	I 90	Nagle Ave OB	CO	Ramp Gate	23 Ft	A1-H	A-1	225
A	KEOBNO	I 90 94	North Ave OB	CO	Ramp Gate	27.5 Ft	A1-H	A-1	226
A	KEOBOG	I 90 94	Ogden Ave OB	CO	Ramp Gate	30 Ft	A1-H	A-1	227
A	IECC1	I 94	S of Lawrence	CO	OP Camera		A1OP	A-1	228

			Ave						
A	IECC2	I 94	S of Lawrence Ave	CO	OP Camera		A1OP	A-1	229
A	IECC3	I 94	S of Lawrence Ave	CO	OP Camera		A1OP	A-1	230
A	IECC4	I 94	S of Lawrence Ave	CO	OP Camera		A1OP	A-1	231
A	IECC5	I 94	S of Wilson Ave	CO	OP Camera		A1OP	A-1	232
A	IECC6	I 94	S of Wilson Ave	CO	OP Camera		A1OP	A-1	233
A	ISCC1	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	234
A	ISCC2	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	235
A	ISCC3	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	236
A	ISCC4	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	237
A	ISCC5	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	238
A	ISCC6	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	239
A	ISCC7	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	240
A	ISCC8	I 90 94	N of Sacramento Ave	CO	OP Camera		A1OP	A-1	241
A	IWCC1	I 90 94	Cicero Ave	CO	OP Camera		A1OP	A-1	242
A	IWCC2	I 90	S of Cicero Ave	CO	OP Camera		A1OP	A-1	243
A	IWCC3	I 90	N of Montrose Ave	CO	OP Camera		A1OP	A-1	244
A	IWCC4	I 90	N of Montrose Ave	CO	OP Camera		A1OP	A-1	245

A	IWCC5	I 90	N of Montrose Ave	CO	OP Camera		A1OP	A-1	246
A	IWCC6	I 90	S of Montrose Ave	CO	OP Camera		A1OP	A-1	247
A	IWCC7	I 90	S of Montrose Ave	CO	OP Camera		A1OP	A-1	248
A	OMCC1	I 90 94	N of Grand Ave	CO	OP Camera		A1OP	A-1	249
A	OMCC2	I 90 94	N of Grand Ave	CO	OP Camera		A1OP	A-1	250
A	OMCC3	I 90 94	S of Ogden Ave	CO	OP Camera		A1OP	A-1	251
A	OMCC4	I 90 94	N of Grand Ave	CO	OP Camera		A1OP	A-1	252
A	OMCC5	I 90 94	S of Ogden Ave	CO	OP Camera		A1OP	A-1	253
A	OMCC6	I 90 94	S of Ogden Ave	CO	OP Camera		A1OP	A-1	254
A	OMCC7	I 90 94	S of Ogden Ave	CO	OP Camera		A1OP	A-1	255
A	OOCC1	I 90 94	W of Milwaukee Ave	CO	OP Camera		A1OP	A-1	256
A	OOCC2	I 90 94	W of Milwaukee Ave	CO	OP Camera		A1OP	A-1	257
A	OOCC3	I 90 94	E of Milwaukee Ave	CO	OP Camera		A1OP	A-1	258
A	OOCC4	I 90 94	E of Milwaukee Ave	CO	OP Camera		A1OP	A-1	259
A	OOCC5	I 90 94	E of Milwaukee Ave	CO	OP Camera		A1OP	A-1	260
A	OOCC6	I 90 94	E of Milwaukee Ave	CO	OP Camera		A1OP	A-1	261
A	OSCC1	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	262
A	OSCC2	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	263
A	OSCC3	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	264
A	OSCC4	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	265

A	OSCC5	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	266
A	OSCC6	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	267
A	OSCC7	I 90 94	S of Diversey Ave	CO	OP Camera		A1OP	A-1	268
A	IER1	I 94	Foster Ave	CO	RD Control Panel		A1R	A-1	269
A	IER2	I 94	N of Wilson Ave	CO	RD Control Panel		A1R	A-1	270
A	IER3	I 94	S of Lawrence Ave	CO	RD Control Panel		A1R	A-1	271
A	ISR1	I 90 94	S of Kedzie Ave	CO	RD Control Panel		A1R	A-1	272
A	ISR2	I 90 94	S of Kedzie Ave	CO	RD Control Panel		A1R	A-1	273
A	ISR3	I 90 94	S of Kedzie Ave	CO	RD Control Panel		A1R	A-1	274
A	IWR1	I 90	S of Lawrence Ave	CO	RD Control Panel		A1R	A-1	275
A	IWR2	I 90	N of Montrose Ave	CO	RD Control Panel		A1R	A-1	276
A	IWR3	I 90	N of Montrose Ave	CO	RD Control Panel		A1R	A-1	277
A	OMR1	I 90	N of Grand Ave	CO	RD Control Panel		A1R	A-1	278
A	OOR1	I 90 94	E of Milwaukee Ave	CO	RD Control Panel		A1R	A-1	279
A	OOR2	I 90 94	E of Milwaukee Ave	CO	RD Control Panel		A1R	A-1	280
A	OOR3	I 90 94	E of Milwaukee Ave	CO	RD Control Panel		A1R	A-1	281
A	OOR4	I 90 94	E of Milwaukee Ave	CO	RD Control Panel		A1R	A-1	282
A	OSR1	I 90 94	S of Diversey Ave	CO	RD Control Panel		A1R	A-1	283
A	OSR2	I 90 94	S of Diversey Ave	CO	RD Control Panel		A1R	A-1	284
A	RACS1	IL 38	W of York Rd	DU	OP Camera for	Sign EB-R1	A1RC	A-1	285
A	RACS2	IL 38	E of York Rd	DU	OP Camera for	AS-1	A1RC	A-1	286

A	RACS3	IL 38	E of York Rd	DU	OP Camera for	AS-2	A1RC	A-1	287
A	RACS4	IL 38	E of I 88 Tollway	DU	OP Camera for	G1,G2,G3	A1RC	A-1	288
A	RACS5	IL 38	E of I 88 Tollway	DU	OP Camera for	G4,G5,G6,G7	A1RC	A-1	289
A	RACS6	IL 38	E of I 88 Tollway	DU	OP Camera for	G8,G9,G10	A1RC	A-1	290
A	RACS7	IL 38 Ramp	S of I 294 Tollway	DU	OP Camera for	Ramp	A1RC	A-1	291
A	RACS8	IL 38	Hillside Tower	DU	3 Cameras on	Tower	A1RC	A-1	292
A	RACSR1	IL 38	W of York Rd	DU	RACS DMS		A1RD	A-1	293
A	RACSR3	IL 38	W of I 88 Tollway	DU	RACS DMS		A1RD	A-1	294
A	RACSR4	IL 38	E of I 88 Tollway	DU	RACS DMS		A1RD	A-1	295
A	RACSG1	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	296
A	RACSG2	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	297
A	RACSG3	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	298
A	RACSG4	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	299
A	RACSG5	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	300
A	RACSG6	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	301
A	RACSG7	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	302
A	RACSG8	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	303
A	RACSG9	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	304
A	RACSG10	IL 38	E of I 88 Tollway	DU	RACS Swing Gate		A1RG	A-1	305
A	RACSC1	IL 38	E of I 88 Tollway	DU	RACS Chevron Sign		A1RS	A-1	306
A	RACSC2	IL 38	E of I 88 Tollway	DU	RACS Chevron Sign		A1RS	A-1	307
A	RACSC3	IL 38	E of I 88 Tollway	DU	RACS Chevron Sign		A1RS	A-1	308
A	RACSC4	IL 38	E of I 88 Tollway	DU	RACS Chevron Sign		A1RS	A-1	309
A	RACSC5	IL 38	E of I 88 Tollway	DU	RACS Chevron Sign		A1RS	A-1	310
A	RACSC6	IL 38	E of I 88 Tollway	DU	RACS Chevron Sign		A1RS	A-1	311

A	RACS S1	IL 38	W of I 88 Tollway	DU	RACS Aux Sign AS1		A1RS	A-1	312
A	RACS S2	IL 38	W of I 88 Tollway	DU	RACS Aux Sign AS2		A1RS	A-1	313

A	DR1	I 90 94 Ryan	Archer Ave	CO	TM Camera		A2DR	A-2	1
A	DR1A	I 90 94 Ryan	Archer Ave	CO	TM Camera		A2DR	A-2	2
A	DR2	I 90 94 Ryan	I 55	CO	TM Camera		A2DR	A-2	3
A	DR2B	I 90 94 Ryan	28th Place	CO	TM Camera		A2DR	A-2	4
A	FS0	I 57	S of Wentworth Ave	CO	TM Camera		A2FS	A-2	5
A	FS0B	I 57	N of Parnell Ave	CO	TM Camera		A2FS	A-2	6
A	KE0B	I 90 94 JFK	Hubbard St Cave	CO	TM Camera		A2KE	A-2	7
A	KE0C	I 90 94 JFK	Hubbard St Cave	CO	TM Camera		A2KE	A-2	8
A	KE0D	I 90 94 JFK	Hubbard St Cave	CO	TM Camera		A2KE	A-2	9
A	KE0E	I 90 94 JFK	Hubbard St Cave	CO	TM Camera		A2KE	A-2	10
A	KE0F	I 90 94 JFK	Hubbard St Cave	CO	TM Camera		A2KE	A-2	11
A	KE1	I 90 94 JFK	Grand Ave	CO	TM Camera		A2KE	A-2	12
A	KE3	I 90 94 JFK	Webster Ave	CO	TM Camera		A2KE	A-2	13
A	KE3A	I 90 94 JFK	Webster Ave Damon Ave	CO	TM Camera		A2KE	A-2	14
A	KE3B	I 90 94 JFK	Damon Ave	CO	TM Camera		A2KE	A-2	15
A	KE4	I 90 94 JFK	Fullerton Ave N AIS	CO	TM Camera		A2KE	A-2	16
A	KE4A	I 90 94 JFK	Fullerton Ave	CO	TM Camera		A2KE	A-2	17
A	KE4B	I 90 94 JFK	Fullerton Ave S AIS	CO	TM Camera		A2KE	A-2	18
A	KE4C	I 90 94 JFK	Western Ave	CO	TM Camera		A2KE	A-2	19
A	KE4D	I 90 94 JFK	Logan Blvd Western Ave	CO	TM Camera		A2KE	A-2	20

A	KE4E	I 90 94 JFK	Logan Blvd	CO	TM Camera		A2KE	A-2	21
A	KE5	I 90 94 JFK	Diversey Ave	CO	TM Camera		A2KE	A-2	22
A	KE5A	I 90 94 JFK	California Diversey Ave	CO	TM Camera		A2KE	A-2	23
A	KE5B	I 90 94 JFK	California Ave	CO	TM Camera		A2KE	A-2	24
A	KE5C	I 90 94 JFK	SE of Sacramento Ave	CO	TM Camera		A2KE	A-2	25
A	KE5D	I 90 94 JFK	Sacramento Ave	CO	TM Camera		A2KE	A-2	26
A	KE6	I 90 94 JFK	Kimball Ave	CO	TM Camera		A2KE	A-2	27
A	KE6A	I 90 94 JFK	NW of Kimball Ave	CO	TM Camera		A2KE	A-2	28
A	KE7	I 90 94 JFK	Irving Park Rd	CO	TM Camera		A2KE	A-2	29
A	KE7A	I 90 94 JFK	Keeler Ave Irving Park Rd	CO	TM Camera		A2KE	A-2	30
A	KE7B	I 90 94 JFK	Keeler Ave	CO	TM Camera		A2KE	A-2	31
A	KE7C	I 90 94 JFK	Kostner Ave	CO	TM Camera		A2KE	A-2	32
A	KE7D	I 90 94 JFK	NW of Kostner Ave	CO	TM Camera		A2KE	A-2	33
A	KE15A	I 90 94 JFK	E of Mannheim Rd	CO	TM Camera		A2KE	A-2	34
A	KI2A	I 80 94 Kingery	I 394 NW Quad	CO	TM Camera		A2KI	A-2	35
A	NS2	I 355 Tlwy SB	Army Trail Rd	DU	TM Camera		A2NS	A-2	36
A	ST1	I 55 STEV	West of Canal St	CO	TM Camera		A2ST	A-2	37
A	ST1A	I 55 STEV	I 90 94 Kennedy	CO	TM Camera		A2ST	A-2	38
A	ST1B	I 55 STEV	I 90 94 Dan Ryan	CO	TM Camera		A2ST	A-2	39
A	ST1C	I 55 STEV	East of Halsted St	CO	TM Camera		A2ST	A-2	40
A	ST17	I 55 STEV	County Line Rd	CO	TM Camera		A2ST	A-2	41
A	ST29	I 55 STEV	Windham Pkwy	WI	TM Camera		A2ST	A-2	42

A	ST30	I 55 STEV	Weber Rd	WI	TM Camera		A2ST	A-2	43
A	ST30A	I 55 STEV	Weber Rd NW	WI	TM Camera		A2ST	A-2	44
A	ST31	I 55 STEV	Btwn 113th & Weber Rd	WI	TM Camera		A2ST	A-2	45
A	ST32	I 55 STEV	North of IL 126	WI	TM Camera		A2ST	A-2	46
A	ST32A	I 55 STEV	South of IL 126	WI	TM Camera		A2ST	A-2	47
A	ST34	I 55 STEV	Lockport St	WI	TM Camera		A2ST	A-2	48
A	ST35	I 55 STEV	South of 159th St	WI	TM Camera		A2ST	A-2	49
A	ST35A	I 55 STEV	Dan Ireland	WI	TM Camera		A2ST	A-2	50
A	ST36	I 55 STEV	North of US 30	WI	TM Camera		A2ST	A-2	51
A	ST36A	I 55 STEV	South of IL 30	WI	TM Camera		A2ST	A-2	52
A	ST37	I 55 STEV	Btwn US 30 & Caton Farm	WI	TM Camera		A2ST	A-2	53
A	ST37A	I 55 STEV	South of Caton Farm Rd	WI	TM Camera		A2ST	A-2	54
A	ST38	I 55 STEV	South of Black Rd	WI	TM Camera		A2ST	A-2	55
A	ST39	I 55 STEV	West of California	WI	TM Camera		A2ST	A-2	56
A	ST40	I 55 STEV	North of Jefferson	WI	TM Camera		A2ST	A-2	57
A	ST40A	I 55 STEV	South of Jefferson	WI	TM Camera		A2ST	A-2	58
A	ST42	I 55 STEV	Seil Rd	WI	TM Camera		A2ST	A-2	59
A	ST43	I 55 STEV	I 80 NE Quad	WI	TM Camera		A2ST	A-2	60
A	ST43A	I 55 STEV	I 80 SE Quad	WI	TM Camera		A2ST	A-2	61
A	ST44	I 55 STEV	Near I 55 Maint Yd	WI	TM Camera		A2ST	A-2	62
A	ST45	I 55 STEV	IL 6	WI	TM Camera		A2ST	A-2	63

A	A	I 90 94	950 W Ontario / Bldg A	CO	Bldg/Mono./Cam		A3	A-3	1
A	B	I 90 94	1035 W Grand / Bldg B	CO	Bldg		A3	A-3	2
A	C	I 90 94	2735 George St / Bldg C	CO	Bldg		A3	A-3	3
A	D	I 90 94	3002 N Fransisco / Bldg D	CO	Bldg/Mono./Cam		A3	A-3	4
A	E	I 90 94	4755 Wilson Ave / Bldg E	CO	Bldg/Mono./Cam		A3	A-3	5
A	H290A	I 290	I 90/94 @ Halsted St	CO	Hut		A3	A-3	6
A	H55B	I 55	26th St & Normal Ave	CO	Hut		A3	A-3	7
A	H57A	I 57	Parnell Ave	CO	Hut		A3	A-3	8
A	H57B	I 57	I 80	CO	2 Huts		A3	A-3	9
A	H80	I 80	IL 394	CO	Hut		A3	A-3	10
A	H94	I 90 94 Ryan	State St 66 th St	CO	Hut		A3	A-3	11
A	HRB	IL 38 RACS Ramp	12100 W. Roosevelt Rd	CO	Hut		A3	A-3	12
A	HQ1	I 90	IDOT HQ & ComCenter	CO	Bldg/Monopole/Camera		A3	A-3	13
A	TFOS	I 94	Foster Ave	CO	Tower / Base Sta/Cam		A3	A-3	14
A	THIL	I 294 I 88	5250 W Harrison	CO	Tower / 3 Huts/ 3 Cam		A3	A-3	15
A	TNOR	I 290	I 355 Nordic Rd	DU	Tower / Hut / 3 Cameras		A3	A-3	16
A	TPLA	IL 47	McDonald Rd, Plato	KA	Tower / Base Station		A3	A-3	17
A	TSC	Traffic Maint Oper	445 Harrison St, Oak Park	CO	Bldg/Mono./ 9 Cameras		A3	A-3	18
A	TSCH	I 90	Roselle Rd (IDOT Mat Lab)	CO	Tower/ Hut/ 3 Cameras		A3	A-3	19

A	TSTA	I 80	Ind / Il State Line	CO	Tower / Hut/Cameras		A3	A-3	20

A	F290	I 290	Expressway		Communication Network		A4	A-4	1
A	F355	I 355	Expressway		Communication Network		A4	A-4	2
A	F55	I 55 STEV	Expressway		Communication Network		A4	A-4	3
A	F57	I 57	Expressway		Communication Network		A4	A-4	4
A	F80	I 80	Expressway		Communication Network		A4	A-4	5
A	F90	I 90 JFK	Expressway		Communication Network		A4	A-4	6
A	F94	I 94	Expressway		Communication Network		A4	A-4	7
A	F190	IL 190	Highway		Communication Network		A4	A-4	8
A	F394	IL 394	Highway		Communication Network		A4	A-4	9
A	F53	IL 53 I 355	Highway		Communication Network		A4	A-4	10

ADVANCED SYSTEM SPECIAL RESPONSE LOCATIONS

Sys	Loc. #	Main Route	Cross St	Co	Description		System Type	Pay Item	Qty
A	EMC	Contractor's	Dispatch Center TBD	CO	IDOT Equipment		Alt	Routine	1
A	ISP	State Police	Office in DesPlaines	CO	Communications Equip		Alt	Routine	2
A	THOM	Thompson Center	Downtown Chicago	CO	Communications Equip		Alt	Routine	3
A	TOLL	IL Tollway	Various Plazas	CO	Communications Equip		Alt	Routine	4
A	UIC	I 290 Univ IL Cgo	Equip on Roof	CO	Cameras/Comm Equip		Alt	Routine	5

ADVANCED SYSTEM LOCATIONS COMING ON STATE MAINTENANCE BY End of 2012

							Expected	System	Pay

Sys	Loc. #	Main Route	Cross St	Co	Description	Date	Type	Item	Qty
A	IE17	I 80	West of US 45	CO	TM Camera	Dec-12	A2IE	A-2	1
A	IE18	I 80	104th Ave	CO	TM Camera	Dec-12	A2IE	A-2	2
A	IE19	I 80	Wolf Rd	CO	TM Camera	Dec-12	A2IE	A-2	3
A	IE20	I 80	116th St/Weigh Station	WI	TM Camera	Dec-12	A2IE	A-2	4
A	IE21	I 80	187th St	WI	TM Camera	Dec-12	A2IE	A-2	5
A	IE22	I 80	Parker Rd	WI	TM Camera	Dec-12	A2IE	A-2	6
A	IE23	I 80	East of I 355 Tlwy	WI	TM Camera	Dec-12	A2IE	A-2	7
A	IE23A	I 80	West of I 355 Michael Ln	WI	TM Camera	Dec-12	A2IE	A-2	8
A	IE24	I 80	Francis Rd	WI	TM Camera	Dec-12	A2IE	A-2	9
A	ST16	I 55 Stev	Wolf Rd	CO	TM Camera	Mar-13	A2IK	A-2	10
A	ST16A	I 55 Stev	West of I 294 Tlwy	CO	TM Camera	Mar-13	A2IK	A-2	11
A	ST18	I 55 Stev	West of County Line	DU	TM Camera	Mar-13	A2ST	A-2	12
A	ST18A	I 55 Stev	Madison St	DU	TM Camera	Mar-13	A2ST	A-2	13
A	ST19	I 55 Stev	IL 83	DU	TM Camera	Mar-13	A2ST	A-2	14
A	ST20	I 55 Stev	Portsmouth Dr	DU	TM Camera	Mar-13	A2ST	A-2	15
A	ST20A	I 55 Stev	Cass Ave	DU	TM Camera	Mar-13	A2ST	A-2	16
A	ST22	I 55 Stev	East of Lemon Rd	DU	TM Camera	Mar-13	A2ST	A-2	17
A	ST22A	I 55 Stev	Lemont Rd	DU	TM Camera	Mar-13	A2ST	A-2	18
A	ST23	I 55 Stev	Betw I 355 & Lemont	DU	TM Camera	Mar-13	A2ST	A-2	19
A	ST24	I 55 Stev	I 355	DU	TM Camera	Mar-13	A2ST	A-2	20
A	ST24A	I 55 Stev	Joliet Rd	WI	TM Camera	Mar-13	A2ST	A-2	21
A	ST25	I 55 Stev	Betw IL 53 &	WI	TM Camera	Mar-13	A2ST	A-2	22

			Joliet Rd						
A	ST26	I 55 Stev	IL 53	WI	TM Camera	Mar-13	A2ST	A-2	23
A	ST27	I 55 Stev	East of Schmidt Rd	WI	TM Camera	Mar-13	A2ST	A-2	24
A	ST28	I 55 Stev	Weigh Station	WI	TM Camera	Mar-13	A2ST	A-2	25
A	ST46	I 55 Stev	South of US 6	WI	TM Camera	Mar-13	A2ST	A-2	26
A	ST47	I 55 Stev	North of DesPLaines Riv	WI	TM Camera	Mar-13	A2ST	A-2	27
A	ST50A	I 55 Stev	Blodgett Rd	WI	TM Camera	Mar-13	A2ST	A-2	28
A	ST51	I 55 Stev	Lorenzo Rd	WI	TM Camera	Mar-13	A2ST	A-2	29
A	ST52	I 55 Stev	River Rd	WI	TM Camera	Mar-13	A2ST	A-2	30
A	STWS	I 55 Stev	Weigh Station IB	WI	Hut, Generator	Mar-13	A3	A-3	31

LIGHTING SYSTEM LOCATIONS ON STATE MAINTENANCE AS OF 5-31-12

Sys	Loc. #	Main Route	Cross St	Co	Cab.		System Type	Pay Item	Qty
L	0103	I 55 Stev	Martin Luther King Dr	CO	A		L1-Exp	L-1	1
L	0105	I 55 Stev	Michigan Ave	CO	B		L1-Exp	L-1	2
L	0110	I 55 Stev	Wentworth Ave	CO	C		L1-Exp	L-1	3
L	0115	I 55 Stev	Stewart Ave	CO	D		L1-Exp	L-1	4
L	0120	I 55 Stev	Loomis St	CO	E		L1-Exp	L-1	5
L	0123	I 55 Stev Incl Nav Ltg	Ashland Ave	CO	E1		L-NAV	L-1	6
L	0125	I 55 Stev	Damen Ave	CO	F		L1-Exp	L-1	7
L	0130	I 55 Stev	California Ave	CO	G		L1-Exp	L-1	8
L	0133	I 55 Stev	Kedzie Ave	CO	G1		L1-Exp	L-1	9

L	0135	I 55 Stev	Pulaski Rd	CO	H		L1-Exp	L-1	10
L	0137	I 55 Stev	Pulaski Rd Tunnel	CO	H1		L1-Exp	L-1	11
L	0140	I 55 Stev	IL 50 Cicero Ave	CO	I		L1-Exp	L-1	12
L	0150	I 55 Stev	N Central Ave	CO	X		L1-Exp	L-1	13
L	0160	I 55 Stev	64th St 6400 W	CO	K		L1-Exp	L-1	14
L	0165	I 55 Stev	IL 43 Harlem Ave	CO	L		L1-Exp	L-1	15
L	0170	I 55 Stev	IL 43 Harlem Ave	CO	Y		L1-Exp	L-1	16
L	0171	I 55 Stev	IL171 & 55th St	CO	V		L1-Exp	L-1	17
L	0173	I 55 Stev Incl Nav Ltg	IL 171 1st Ave	CO	M		L-NAV	L-1	18
L	0175	I 55 Stev Incl Nav Ltg	IL 171 1st Ave	CO	N		L-NAV	L-1	19
L	0177	I 55 Stev	IL 171 & 47th St	CO	Z		L1-Exp	L-1	20
L	0180	I 55 Stev	85th Ave 8500W	CO	O		L1-Exp	L-1	21
L	0184	I 55 Stev	91st Ave 9100W	CO	P		L1-Exp	L-1	22
L	0187	I 55 Stev	US 12 20 45 LaGrange Rd	CO	R		L1-Exp	L-1	23
L	0188	I 55 Stev	US12 20 45 SB Ramp	CO	R1		L1-Exp	L-1	24
L	0190	I 55 Stev	Wolf Rd	CO	S		L1-Exp	L-1	25
L	0193	I 55 Stev	W of I 294 Tollway	CO	S1		L1-Exp	L-1	26
L	0195	I 55 Stev	County Line Rd	CO	T		L1-Exp	L-1	27
L	0203	I 55 Stev	Madison St	DU	A		L1-Exp	L-1	28
L	0205	I 55 Stev	S IL 83 Kingery Hwy	DU	B		L1-Exp	L-1	29
L	0210	I 55 Stev	N IL 83 Kingery	DU	C		L1-Exp	L-1	30

			Hwy						
L	0215	I 55 Stev	Cass Ave	DU	D		L1-Exp	L-1	31
L	0220	I 55 Stev	Kearney Rd	DU	E		L1-Exp	L-1	32
L	0225	I 55 Stev	Lemont Rd	DU	F		L1-Exp	L-1	33
L	0230	I 55 Stev	Woodward Ave	DU	G		L1-Exp	L-1	34
L	0305	I 55 Stev	Joliet Rd	WI	H		L1-Exp	L-1	35
L	0307	I 55 Stev	International Drive	WI	H1		L1-Exp	L-1	36
L	0310	I 55 Stev	IL 53	WI	I		L1-Exp	L-1	37
L	0313	I 55 Stev	W of IL 53	WI	I1		L1-Exp	L-1	38
L	0321	I 55 Stev	E of Naperville Rd	WI	K2		L1-Exp	L-1	39
L	0322	I 55 Stev	E of Weber Rd	WI	K1		L1-Exp	L-1	40
L	0323	I 55 Stev	Weber Rd	WI	K		L1-Exp	L-1	41
L	0325	I 55 Stev	IL 126	WI	L		L1-Exp	L-1	42
L	0330	I 55 Stev	US 30 Lincoln Hwy	WI	M		L1-Exp	L-1	43
L	0335	I 55 Stev	US 52 Jefferson St	WI	N		L1-Exp	L-1	44
L	0340	I 55 Stev	IL 59 Brookforest Ave	WI	O		L1-Exp	L-1	45
L	0345	I 55 Stev	I 80	WI	P		L1-Exp	L-1	46
L	0350	I 55 Stev	US 6	WI	R		L1-Exp	L-1	47
L	0355	I 55 Stev	Bluff Rd	WI	S		L1-Exp	L-1	48
L	0365	I 55 Stev	Wilmington Rd	WI	U		L1-Exp	L-1	49
L	0370	I 55 Stev	Lorenzo Rd	WI	V		L1-Exp	L-1	50
L	0375	I 55 Stev	IL 129	WI	X		L1-Exp	L-1	51
L	0380	I 55 Stev	IL 113	WI	Y		L1-Exp	L-1	52

L	0385	I 55 Stev	Reed Rd	WI	Z		L1-Exp	L-1	53
L	0403	I 57	99th St	CO	A		L1-Exp	L-1	54
L	0405	I 57	Racine Ave	CO	B		L1-Exp	L-1	55
L	0410	I 57	107th Pl	CO	C		L1-Exp	L-1	56
L	0415	I 57	112th St	CO	D		L1-Exp	L-1	57
L	0420	I 57	120th St	CO	E		L1-Exp	L-1	58
L	0425	I 57	127th St	CO	F		L1-Exp	L-1	59
L	0430	I 57	Vermont St	CO	G		L1-Exp	L-1	60
L	0435	I 57	IHB RR	CO	H		L1-Exp	L-1	61
L	0440	I 57	Spaulding Ave	CO	I		L1-Exp	L-1	62
L	0445	I 57	147th St	CO	J		L1-Exp	L-1	63
L	0450	I 57	Kedzie Ave	CO	K		L1-Exp	L-1	64
L	0455	I 57	US 6 159th St	CO	L		L1-Exp	L-1	65
L	0460	I 57	159th St & Crawford Ave	CO	P		L1-Exp	L-1	66
L	0465	I 57	163rd St Barry Ln	CO	M		L1-Exp	L-1	67
L	0470	I 57	W 167th St	CO	N		L1-Exp	L-1	68
L	0475	I 57	E 167th St	CO	O		L1-Exp	L-1	69
L	0480	I 57	175th St	CO	T		L1-Exp	L-1	70
L	0485	I 57	I 80	CO	U		L1-Exp	L-1	71
L	0489	I 57	Flossmoor Rd	CO	V		L1-Exp	L-1	72
L	0492	I 57	Vollmer Rd	CO	W		L1-Exp	L-1	73
L	0495	I 57	US 30 Lincoln Hwy	CO	X		L1-Exp	L-1	74
L	0497	I 57	Sauk Trail Rd	CO	Y		L1-Exp	L-1	75
L	0499	I 57	Steger Rd	CO	Z		L1-Exp	L-1	76

L	0510	I 57	Stuenkel	WI	A		L1-Exp	L-1	77
L	0515	I 57	Dralle	WI	B		L1-Exp	L-1	78
L	0525	I 57	Manhatten Rd Monee Rd	WI	M		L1-Exp	L-1	79
L	0535	I 57	Bruns	WI	D		L1-Exp	L-1	80
L	0540	I 57	Pauling	WI	E		L1-Exp	L-1	81
L	0560	I 57	Wilmington Rd Peotone Rd	WI	Y		L1-Exp	L-1	82
L	0603	I 80 94	Burnham Ave	CO	A		L1-Exp	L-1	83
L	0605	I 80 94	Torrence Ave	CO	B		L1-Exp	L-1	84
L	0610	I 80	169th St	CO	E		L1-Exp	L-1	85
L	0615	I 80	Crawford Ave	CO	F		L1-Exp	L-1	86
L	0618	I 80	175th St	CO	F1		L1-Exp	L-1	87
L	0620	I 80	Central Ave	CO	G		L1-Exp	L-1	88
L	0625	I 80	Ridgeland Ave	CO	H		L1-Exp	L-1	89
L	0703	I 80	IL 43 Harlem Ave	WI	I		L1-Exp	L-1	90
L	0707	I 80	W of 80th Ave	WI	B		L1-Exp	L-1	91
L	0713	I 80	W of 88th Ave	WI	D		L1-Exp	L-1	92
L	0715	I 80	US 45 96th Ave	WI	F		L1-Exp	L-1	93
L	0717	I 80	E of 104th Ave	WI	G		L1-Exp	L-1	94
L	0724	I 80	I 355	WI	K		L1-Exp	L-1	95
L	0728	I 80	US 30 Lincoln Hwy	WI	N		L1-Exp	L-1	96
L	0730	I 80	Briggs St	WI	P		L1-Exp	L-1	97
L	0735	I 80	N Richard St	WI	R		L1-Exp	L-1	98
L	0740	I 80	S Richard St	WI	S		L1-Exp	L-1	99
L	0750	I 80	IL 53 Chicago St	WI	U		L1-Exp	L-1	100

L	0755	I 80	Water St	WI	V		L1-Exp	L-1	101
L	0760	I 80	E Center St	WI	W		L1-Exp	L-1	102
L	0765	I 80	W Center St	WI	X		L1-Exp	L-1	103
L	0770	I 80	Larkin Ave	WI	Y		L1-Exp	L-1	104
L	0775	I 80	Houbolt Rd	WI	Z		L1-Exp	L-1	105
L	0803	US 12 45	Devon Ave	CO	A		L1-Exp	L-1	106
L	0805	US 12 45	Lawrence Ave	CO	B		L1-Exp	L-1	107
L	0810	I 190	CN RR Soo RR	CO	C		L1-Exp	L-1	108
L	0815	I 190	Des Plaines River Rd	CO	D		L1-Exp	L-1	109
L	0820	I 90 JFK	East River Rd	CO	D1		L1-Exp	L-1	110
L	0825	I 90 JFK	Cumberland Ave	CO	E		L1-Exp	L-1	111
L	0830	I 90 JFK	Oriole Ave	CO	F		L1-Exp	L-1	112
L	0835	I 90 JFK	Sayer Ave	CO	G		L1-Exp	L-1	113
L	0840	I 90 JFK	Moody Ave	CO	H		L1-Exp	L-1	114
L	0845	I 90 JFK	Edmunds St	CO	I		L1-Exp	L-1	115
L	0847	I 90 JFK	Lawrence Ave	CO	J		L1-Exp	L-1	116
L	0850	I 90 94 JFK	Kedvale Ave	CO	K		L1-Exp	L-1	117
L	0853	I 90 94 JFK	Kimball Ave	CO	L		L1-Exp	L-1	118
L	0855	I 90 94 JFK	California Ave	CO	M		L1-Exp	L-1	119
L	0857	I 90 94 JFK	Leavitt St	CO	N		L1-Exp	L-1	120
L	0860	I 90 94 JFK	Cortland St	CO	O		L1-Exp	L-1	121
L	0863	I 90 94 JFK	Blackhawk St	CO	P		L1-Exp	L-1	122
L	0865	I 90 94 JFK	Augusta Blvd	CO	R		L1-Exp	L-1	123
L	0867	I 90 94 JFK	Grand Ave	CO	S		L1-Exp	L-1	124
L	0870	I 90 94 JFK	Ontario St Ohio	CO	S1		L1-Exp	L-1	125

			St						
L	0873	I 90 94 JFK	Erie St	CO	S2		L1-Exp	L-1	126
L	0875	I 90 94 JFK	Hubbard St	CO	W		L1-Exp	L-1	127
L	0883	I 90 94 JFK	Hubbard St Cave	CO	T		L1-Exp	L-1	128
L	0886	I 90 94 JFK	W Washington Blvd	CO	U		L1-Exp	L-1	129
L	0888	I 90 94 JFK	E Washington Blvd	CO	V		L1-Exp	L-1	130
L	0890	I 90 94 JFK	Van Buren St	CO	Z		L1-Exp	L-1	131
L	0903	I 94 Ryan	99th St	CO	N		L1-Exp	L-1	132
L	0905	I 94 Ryan	91st St	CO	O		L1-Exp	L-1	133
L	0910	I 94 Ryan	81st St	CO	P		L1-Exp	L-1	134
L	0915	I 94 Ryan	73rd St	CO	R		L1-Exp	L-1	135
L	0917	I 90 94 Ryan	67th St	CO	R1		L1-Exp	L-1	136
L	0920	I 90 94 Ryan	63rd St	CO	S		L1-Exp	L-1	137
L	0925	I 90 94 Ryan	57th St	CO	T		L1-Exp	L-1	138
L	0927	I 90 94 Ryan	55th St	CO	T1		L1-Exp	L-1	139
L	0930	I 90 94 Ryan	48th St	CO	U		L1-Exp	L-1	140
L	0935	I 90 94 Ryan	Root St	CO	V		L1-Exp	L-1	141
L	0940	I 90 94 Ryan	35th St	CO	W		L1-Exp	L-1	142
L	0945	I 90 94 Ryan	27th St	CO	X		L1-Exp	L-1	143
L	0950	I 90 94 Ryan	Normal Ave	CO	Y		L1-Exp	L-1	144
L	0955	I 90 94 Ryan	Wallace St	CO	Z		L1-Exp	L-1	145
L	0960	I 90 94 Ryan	21st Pl Incl Nav Ltg	CO	A		L-NAV	L-1	146
L	0965	I 90 94 Ryan	17th St	CO	B		L1-Exp	L-1	147
L	0970	I 90 94 Ryan	Maxwell St	CO	C		L1-Exp	L-1	148

L	0975	I 90 94 Ryan	Polk St	CO	D		L1-Exp	L-1	149
L	1003	IL 394	Sauk Trail Rd	CO	A		L1-Exp	L-1	150
L	1004	IL 394	US 30 Lincoln Hwy	CO	N		L1-Exp	L-1	151
L	1005	IL 394	Glenwood Dyer Rd	CO	B		L1-Exp	L-1	152
L	1008	IL 394	Thornton Lansing Rd	CO	D1		L1-Exp	L-1	153
L	1010	I 94 Ryan	N of I 80	CO	C		L1-Exp	L-1	154
L	1015	I 94 Ryan	S of I 80	CO	D		L1-Exp	L-1	155
L	1017	I 94 Ryan	170th St	CO	E1		L1-Exp	L-1	156
L	1020	I 94 Ryan	165th St	CO	E		L1-Exp	L-1	157
L	1025	I 94 Ryan	159th St	CO	F		L1-Exp	L-1	158
L	1030	I 94 Ryan	Michigan City Rd	CO	G		L1-Exp	L-1	159
L	1032	I 94 Ryan	147th St	CO	G1		L1-Exp	L-1	160
L	1035	I 94 Ryan	Dolton Ave	CO	H		L1-Exp	L-1	161
L	1040	I 94 Ryan	137th St	CO	X		L1-Exp	L-1	162
L	1046	I 94 Ryan	E 130th St	CO	V		L1-Exp	L-1	163
L	1047	I 94 Ryan	W 130th St	CO	W		L1-Exp	L-1	164
L	1050	I 94 Ryan	119th St	CO	J		L1-Exp	L-1	165
L	1060	I 94 Ryan	115th St	CO	Y		L1-Exp	L-1	166
L	1065	I 94 Ryan	103rd St	CO	L		L1-Exp	L-1	167
L	1070	I 94 Ryan	100th St	CO	M		L1-Exp	L-1	168
L	1075	I 94 Ryan	Stoney Island Feeder 105th	CO	P		L1-Exp	L-1	169
L	1080	I 94 Ryan	Stoney Island Feeder 103rd	CO	R		L1-Exp	L-1	170
L	1085	I 94 Ryan	Stoney Island	CO	S		L1-Exp	L-1	171

			Feeder & 98th						
L	1090	I 94 Ryan	Stoney Island Feeder & 99th	CO	T		L1-Exp	L-1	172
L	1103	I 94 Edens US 41	Clavey Rd	LA	T		L1-Exp	L-1	173
L	1203	I 94 Edens	Knox Ave	CO	A		L1-Exp	L-1	174
L	1205	I 94 Edens	Foster Ave	CO	B		L1-Exp	L-1	175
L	1210	I 94 Edens	US 14 Caldwell Peterson	CO	C		L1-Exp	L-1	176
L	1215	I 94 Edens	Pratt Ave	CO	D		L1-Exp	L-1	177
L	1220	I 94 Edens	Touhy Ave	CO	E		L1-Exp	L-1	178
L	1225	I 94 Edens	Niles Center Rd	CO	F		L1-Exp	L-1	179
L	1230	I 94 Edens	Oakton Rd	CO	G		L1-Exp	L-1	180
L	1235	I 94 Edens	IL 58 Dempster St	CO	H		L1-Exp	L-1	181
L	1240	I 94 Edens	Golf Rd	CO	J		L1-Exp	L-1	182
L	1245	I 94 Edens	Glenview Rd	CO	K		L1-Exp	L-1	183
L	1250	I 94 Edens	Lake Ave	CO	L		L1-Exp	L-1	184
L	1255	I 94 Edens	Winnetka Rd	CO	M		L1-Exp	L-1	185
L	1260	I 94 Edens	Willow Rd	CO	N		L1-Exp	L-1	186
L	1265	I 94 Edens	Tower Rd	CO	O		L1-Exp	L-1	187
L	1270	I 94 Edens	S of IL 68 Dundee Rd	CO	P		L1-Exp	L-1	188
L	1275	I 94 Edens	IL 68 Dundee Rd	CO	R		L1-Exp	L-1	189
L	1280	I 94 Edens	Lake Cook Rd	CO	S		L1-Exp	L-1	190
L	1325	I 290 IKE	Canal St	CO	F		L1-Exp	L-1	191
L	1330	I 290 IKE	Racine Ave	CO	G		L1-Exp	L-1	192
L	1335	I 290 IKE	Leavitt St	CO	H		L1-Exp	L-1	193

L	1340	I 290 IKE	Kedzie Ave	CO	I		L1-Exp	L-1	194
L	1345	I 290 IKE	Pulaski Ave Crawford Ave	CO	J		L1-Exp	L-1	195
L	1350	I 290 IKE	IL 50 Cicero Ave	CO	K		L1-Exp	L-1	196
L	1355	I 290 IKE	Central Ave	CO	L		L1-Exp	L-1	197
L	1360	I 290 IKE	Oak Park Ave	CO	M		L1-Exp	L-1	198
L	1362	I 290 IKE	IL 43 Harlem Ave	CO	M1		L1-Exp	L-1	199
L	1365	I 290 IKE	Des Plaines Ave	CO	N		L1-Exp	L-1	200
L	1370	I 290 IKE	IL 171 1st Ave	CO	O		L1-Exp	L-1	201
L	1375	I 290 IKE	17th Ave	CO	P		L1-Exp	L-1	202
L	1380	I 290 IKE	25th Ave	CO	R		L1-Exp	L-1	203
L	1385	I 290 IKE	Westchester Blvd	CO	S		L1-Exp	L-1	204
L	1386	I 290 IKE	US 12 20 45 Mannheim Rd	CO	W		L1-Exp	L-1	205
L	1387	I 290 IKE	Wolf Rd Exit Ramp	CO	X		L1-Exp	L-1	206
L	1388	I 290 IKE	Orchard Ave	CO	Y		L1-Exp	L-1	207
L	1390	I 290 IKE	Laverne Ave Wolf Rd	CO	T		L1-Exp	L-1	208
L	1391	I 290 IKE	W of I 88 Split	CO	Z		L1-Exp	L-1	209
L	1393	I 290 IKE	Roosevelt Rd Exit Ramp	CO	U		L1-Exp	L-1	210
L	1397	I 290 IKE	Arthur Ave	CO	V		L1-Exp	L-1	211
L	1405	I 290	St Charles Rd	DU	W		L1-Exp	L-1	212
L	1410	I 290	IL 64 North Ave	DU	X		L1-Exp	L-1	213
L	1420	I 290	Grand Ave	DU	A		L1-Exp	L-1	214
L	1425	I 290	Villa Ave	DU	B		L1-Exp	L-1	215
L	1430	I 290	N IL 83 Elmhurst	DU	C		L1-Exp	L-1	216

			Rd						
L	1435	I 290	S IL 83 Elmhurst Rd	DU	D		L1-Exp	L-1	217
L	1440	I 290	Addison Rd	DU	E		L1-Exp	L-1	218
L	1445	I 290	Mill Rd	DU	F		L1-Exp	L-1	219
L	1450	I 290	Itasca Rd	DU	G		L1-Exp	L-1	220
L	1455	I 290	I 290 IKE I 355 & Central Ave	DU	H		L1-Exp	L-1	221
L	1460	I 290	IL19 Irving Park Rd	DU	J		L1-Exp	L-1	222
L	1465	I 290	Thorndale Ave	DU	K		L1-Exp	L-1	223
L	1468	I 290	Devon Ave	DU	L		L1-Exp	L-1	224
L	1470	I 290 I-355	Army Trail Rd	DU	T		L1-Exp	L-1	225
L	1504	I 290 IL 53	Biesterfield Rd	CO	S		L1-Exp	L-1	226
L	1505	I 290 IL 53	Schaumburg Rd	CO	M		L1-Exp	L-1	227
L	1510	I 290 IL 53	S of IL 72 Higgins Rd	CO	N		L1-Exp	L-1	228
L	1515	I 290 IL 53	IL 72 Higgins Rd	CO	O		L1-Exp	L-1	229
L	1520	I 290 IL 53	IL 58 Golf Rd	CO	P		L1-Exp	L-1	230
L	1525	I 290 IL 53	IL 62 Algonquin Rd	CO	R		L1-Exp	L-1	231
L	1535	I 290 IL 53	Euclid St	CO	U		L1-Exp	L-1	232
L	1540	I 290 IL 53	US 14 Northwest Highway	CO	V		L1-Exp	L-1	233
L	1545	I 290 IL 53	Palatine Rd	CO	W		L1-Exp	L-1	234
L	1550	I 290 IL 53	US 12 Rand Rd	CO	X		L1-Exp	L-1	235
L	1580	I 290 IL 53	IL 68 Dundee Rd	CO	Y		L1-Exp	L-1	236
L	1590	I 290 IL 53	Lake Cook Rd	CO	Z		L1-Exp	L-1	237

L	2515	Elgin O'Hare	W of Plum Grove Rd	CO	J		L1-Exp	L-1	238
L	2520	Elgin O'Hare	Roselle Rd	CO	K		L1-Exp	L-1	239
L	2525	Elgin O'Hare	Mitchell Blvd	CO	L		L1-Exp	L-1	240
L	2530	Elgin O'Hare	Rodenburg Rd	CO	M		L1-Exp	L-1	241
L	2535	Elgin O'Hare	Springinsguth Rd	CO	N		L1-Exp	L-1	242
L	2605	Elgin O'Hare	IL 53 Rohlwing Rd	DU	H		L1-Exp	L-1	243
L	2610	Elgin O'Hare	Meacham Rd Medinah Rd	DU	I		L1-Exp	L-1	244
L	2615	Elgin O'Hare	Wetland's Metra RR Bridge	DU	O		L1-Exp	L-1	245
L	2620	Elgin O'Hare	US 20 Lake St	DU	P		L1-Exp	L-1	246

L	1603	US 12 Rand Rd	US 12 45 Lee St	CO	AD		L2-Off Exp	L-2	1
L	1604	US 12 Rand Rd	IL 68 Dundee Rd	CO	XC		L2-Off Exp	L-2	2
L	1605	US 12 Rand Rd	Euclid St	CO	AR		L2-Off Exp	L-2	3
L	1607	US 12 Rand Rd	Lake Cook Rd	CO	XI		L2-Off Exp	L-2	4
L	1610	US 14 NW Hwy	Baldwin Rd	CO	AA		L2-Off Exp	L-2	5
L	1615	US 14 Dempster St	IL 21 Milwaukee Ave	CO	AM		L2-Off Exp	L-2	6
L	1617	US 14 Dempster St	IL 43 Waukegan Rd	CO	XH		L2-Off Exp	L-2	7
L	1626	US 14 Dempster St	I 294 Tollway	CO	XL		L2-Off Exp	L-2	8
L	1627	Busse Hwy	I 294 Tollway	CO	XM		L2-Off Exp	L-2	9

L	1628	Oakton St	I 294 Tollway	CO	XN		L2-Off Exp	L-2	10
L	1629	Touhy Ave	I 294 Tollway	CO	XR		L2-Off Exp	L-2	11
L	1630	US 20 Lake St	IL 59 Sutton Rd	CO	AC		L2-Off Exp	L-2	12
L	1635	US 20 Lake St	Shales Pkwy Bluff City Rd	CO	AY		L2-Off Exp	L-2	13
L	1637	IL 43 Waukegan Rd	I 94 Tollway	CO	RB		L2-Off Exp	L-2	14
L	1640	US 45 DesPlaines Riv	IL 21 Milwaukee Ave	CO	AX		L2-Off Exp	L-2	15
L	1641	US 45 Des Plaines Riv	IL 58 Golf Rd	CO	AO		L2-Off Exp	L-2	16
L	1645	US 45 IL 21 Milwaukee	Hintz Rd	CO	AV		L2-Off Exp	L-2	17
L	1647	US 45 IL 21Milwaukee	Lake Cook Rd	CO	AK		L2-Off Exp	L-2	18
L	1650	IL 59 Sutton Rd	IL 58 Golf Rd	CO	AH		L2-Off Exp	L-2	19
L	1653	IL 58 Golf Rd	Roselle Rd	CO	RG		L2-Off Exp	L-2	20
L	1656	IL 58 Golf Rd	Highland Blvd	CO	RH		L2-Off Exp	L-2	21
L	1657	IL 58 Golf Rd	IL 72 Higgins Rd	CO	RE		L2-Off Exp	L-2	22
L	1658	IL 58 Golf Rd	Gannon Dr	CO	RI		L2-Off Exp	L-2	23
L	1659	IL 58 Golf Rd	Southbridge Ln	CO	RJ		L2-Off Exp	L-2	24
L	1662	IL 59 Sutton Rd	IL 72 Higgins Rd	CO	AW		L2-Off Exp	L-2	25
L	1663	IL 59 Sutton Rd	Shoe Factory Rd	CO	AZ		L2-Off	L-2	26

							Exp		
L	1664	IL 62 Algonquin Rd	Arlington Heights Rd	CO	AF		L2-Off Exp	L-2	27
L	1668	IL 72 Higgins Rd	Barrington Rd	CO	XK		L2-Off Exp	L-2	28
L	1673	IL 72 Higgins Rd	Spring Mill Dr	CO	RD		L2-Off Exp	L-2	29
L	1674	IL 72 Higgins Rd	Churchill Rd	CO	RF		L2-Off Exp	L-2	30
L	1675	US 14 NW Hwy	IL 68 Dundee Rd	CO	AG		L2-Off Exp	L-2	31
L	1677	IL 72 Higgins Rd	Roselle Rd	CO	RC		L2-Off Exp	L-2	32
L	1678	IL 72 Higgins Rd	Morningside Dr	CO	XF		L2-Off Exp	L-2	33
L	1680	IL 72 Higgins Rd	Touhy Ave	CO	AL		L2-Off Exp	L-2	34
L	1683	IL 83 Elmhurst Rd	Palatine Rd	CO	AS		L2-Off Exp	L-2	35
L	1685	Busse Highway	Oakton St	CO	AB		L2-Off Exp	L-2	36
L	1691	Willow Rd	I 294 Tollway	CO	XD		L2-Off Exp	L-2	37
L	1695	IL 72 Higgins Rd	I 90 Tollway	CO	AN		L2-Off Exp	L-2	38
L	1698	Wolf Rd	I 90 Tollway	CO	AQ		L2-Off Exp	L-2	39
L	1703	US12 20 45 LaGrange	IL 171 NE Ramp	CO	BA		L2-Off Exp	L-2	40
L	1705	US12 20 45 LaGrange	IL 171 SW Ramp	CO	BL		L2-Off Exp	L-2	41
L	1706	US12 20 45 LaGrange	Chicago Sanitary & Ship Canal	CO	BK		L2-Off Exp	L-2	42

L	1707	IL 38 Roosevelt Rd	Boeger St	CO	YA		L2-Off Exp	L-2	43
L	1708	IL 38 Roosevelt Rd	US 12 20 45 Mannheim Rd	CO	YB		L2-Off Exp	L-2	44
L	1710	US12 45 Mannheim	IL 19 Irving Park Rd	CO	BD		L2-Off Exp	L-2	45
L	1713	US 34 Ogden Ave	26th St	CO	BZ		L2-Off Exp	L-2	46
L	1714	US 34 Ogden Ave	IL 50 Cicero Ave	CO	BY		L2-Off Exp	L-2	47
L	1716	US 34 Ogden Ave	Wolf Rd	CO	BW		L2-Off Exp	L-2	48
L	1730	IL 43 Harlem Ave	66th St	CO	BX		L2-Off Exp	L-2	49
L	1732	IL 64 North Ave	IL 171 1st Ave	CO	BG		L2-Off Exp	L-2	50
L	1735	22nd St Cermak Rd	IL 171 1st Ave	CO	BC		L2-Off Exp	L-2	51
L	1760	Damen Ave	Webster Ave	CO	YV		L2-Off Exp	L-2	52
L	1762	Western Ave	Logan Blvd	CO	YX		L2-Off Exp	L-2	53
L	1763	Sacramento Ave	Wellington Ave	CO	YY		L2-Off Exp	L-2	54
L	1764	Kostner Ave	Berteau Ave	CO	YZ		L2-Off Exp	L-2	55
L	1802	US 12 20 45 96th Ave	87th St	CO	CV		L2-Off Exp	L-2	56
L	1803	US 12 20 45 96th Ave	US 12 20 95th St	CO	CW		L2-Off Exp	L-2	57
L	1804	US 45 LaGrange Rd	107th St	CO	CX		L2-Off Exp	L-2	58
L	1805	US 45	111th St	CO	CY		L2-Off	L-2	59

		LaGrange Rd					Exp		
L	1810	US 12 20 95th St	IL 43 Harlem Ave	CO	CB		L2-Off Exp	L-2	60
L	1823	US 30 Lincoln Hwy	Torrence Ave	CO	CS		L2-Off Exp	L-2	61
L	1825	US 45 LaGrange Rd	IL 83 Cal Sag Rd	CO	CE		L2-Off Exp	L-2	62
L	1827	IL 50 Cicero Ave	127th St	CO	CH		L2-Off Exp	L-2	63
L	1835	IL 1 Halsted Ave	Ridge Rd	CO	CA		L2-Off Exp	L-2	64
L	1837	IL 43 Harlem Ave	143rd St	CO	CN		L2-Off Exp	L-2	65
L	1845	IL 83 Kingery Hwy	N IL 171 Archer Ave	CO	CC		L2-Off Exp	L-2	66
L	1850	IL 83 Kingery Hwy	S IL 171 Archer Ave	CO	CD		L2-Off Exp	L-2	67
L	1860	111th St	Austin Ave	CO	CF		L2-Off Exp	L-2	68
L	1870	111th St	Laramie Ave	CO	CG		L2-Off Exp	L-2	69
L	1885	US 6 159th St	Leavitt St	CO	CT		L2-Off Exp	L-2	70
L	1886	US 6 159th St	CN RR Lincoln Ave	CO	CJ		L2-Off Exp	L-2	71
L	1887	US 6 159th St	Park Ave	CO	CL		L2-Off Exp	L-2	72
L	1888	US 6 159th St	Center Ave	CO	CM		L2-Off Exp	L-2	73
L	1905	US 34 Ogden Ave	IL 59	DU	DB		L2-Off Exp	L-2	74
L	1910	US 34 Ogden Ave	IL 83 Kingery Highway	DU	DA		L2-Off Exp	L-2	75

L	1912	IL 38 Roosevelt Rd	York Rd	DU	DH		L2-Off Exp	L-2	76
L	1913	IL 38 Roosevelt Rd	IL 83 NB Ramp	DU	DU		L2-Off Exp	L-2	77
L	1914	IL 83 Kingery Hwy	IL 56 EB Ramp	DU	DV		L2-Off Exp	L-2	78
L	1925	IL 53	IL 56 Butterfield Rd	DU	DM		L2-Off Exp	L-2	79
L	1940	IL 56 Butterfield Rd	Highland Ave	DU	DJ		L2-Off Exp	L-2	80
L	1959	IL 64 North Ave	IL 83 Kingery Highway	DU	DN		L2-Off Exp	L-2	81
L	1960	IL 64 North Ave	Main St in Lombard	DU	DE		L2-Off Exp	L-2	82
L	1962	IL 64 North Ave	Kramer Ave	DU	PY		L2-Off Exp	L-2	83
L	1963	IL 64 North Ave	Ardmore ave	DU	PZ		L2-Off Exp	L-2	84
L	1964	IL 64 North Ave	Swift Rd	DU	PH		L2-Off Exp	L-2	85
L	1965	IL 64 North Ave	Main St Glen Ellyn Rd	DU	PI		L2-Off Exp	L-2	86
L	1966	IL 64 North Ave	Evergreen Ave	DU	PJ		L2-Off Exp	L-2	87
L	1967	IL 64 North Ave	Linda Ave	DU	PK		L2-Off Exp	L-2	88
L	1968	IL 64 North Ave	Schmale Rd	DU	PL		L2-Off Exp	L-2	89
L	1969	IL 64 North Ave	Gary Ave	DU	PM		L2-Off Exp	L-2	90
L	1970	IL 64 North Ave	Kuhn Rd	DU	PN		L2-Off Exp	L-2	91
L	1971	IL 64 North	Morton Rd	DU	PO		L2-Off	L-2	92

		Ave					Exp		
L	1972	IL 64 North Ave	St. Charles Rd	DU	PP		L2-Off Exp	L-2	93
L	1973	IL 64 North Ave	Prince Crossing Rd	DU	PR		L2-Off Exp	L-2	94
L	1974	IL 64 North Ave	Woodcrest Dr	DU	PS		L2-Off Exp	L-2	95
L	1975	IL 83 Kingery Hwy	55th St	DU	DL		L2-Off Exp	L-2	96
L	1980	IL 83 Kingery Hwy	Bluff Rd	DU	DI		L2-Off Exp	L-2	97
L	2003	US 20 Lake St	IL 47 IL 72	KA	KS		L2-Off Exp	L-2	98
L	2010	US 20 Lake St	Randall Rd	KA	KX		L2-Off Exp	L-2	99
L	2015	IL 47	US 30 & IL 56	KA	KG		L2-Off Exp	L-2	100
L	2045	IL 38 Roosevelt Rd	IL 47	KA	KO		L2-Off Exp	L-2	101
L	2050	IL 47	Big Timber Rd	KA	KE		L2-Off Exp	L-2	102
L	2060	IL 47	Galena	KA	KV		L2-Off Exp	L-2	103
L	2065	IL 56 Butterfield Rd	Kirk Rd	KA	KR		L2-Off Exp	L-2	104
L	2103	US 30 Briarcliff Rd	US 34 Owesgo Rd	KE	EA		L2-Off Exp	L-2	105
L	2203	US 12 IL 59	IL 134 Long Lake Rd	LA	LX		L2-Off Exp	L-2	106
L	2205	IL 22 Half Day Rd	I 94	LA	LS		L2-Off Exp	L-2	107
L	2207	Deerfield Rd	Northland Ave	LA	LA		L2-Off Exp	L-2	108

L	2211	US 41 Skokie Highway	Deerfield Rd	LA	LE		L2-Off Exp	L-2	109
L	2215	US 41 Skokie Highway	IL 60 Town Line Rd	LA	LR		L2-Off Exp	L-2	110
L	2217	US 41 Skokie Highway	IL 120 Belvidere Rd	LA	LB		L2-Off Exp	L-2	111
L	2220	US 41 Skokie Highway	IL 132 Grand Ave	LA	LG		L2-Off Exp	L-2	112
L	2221	US 41 Skokie Highway	IL 173 Rosecrans Rd	LA	LU		L2-Off Exp	L-2	113
L	2227	US 41 I 94	Russell Rd	LA	LL		L2-Off Exp	L-2	114
L	2230	US 41 Skokie Highway	Washington St	LA	LD		L2-Off Exp	L-2	115
L	2235	IL 120 Belvidere Rd	Cohasset Ct	LA	VA		L2-Off Exp	L-2	116
L	2236	IL 120 Belvidere Rd	Greenleaf St	LA	VB		L2-Off Exp	L-2	117
L	2237	IL 120 Belvidere Rd	IL 43 Waukegan Rd	LA	VC		L2-Off Exp	L-2	118
L	2239	IL 120 Belvidere Rd	Lakehurst Rd	LA	VD		L2-Off Exp	L-2	119
L	2243	US 41 Skokie Highway	West Park Ave	LA	LP		L2-Off Exp	L-2	120
L	2245	IL 21 Milwaukee Ave	IL 120 Belevidere Rd	LA	LF		L2-Off Exp	L-2	121
L	2247	IL 21 Milwaukee Ave	I 94 Tollway	LA	LC		L2-Off Exp	L-2	122
L	2255	IL 43 Waukegan Rd	IL 137 Buckley Rd	LA	LN		L2-Off Exp	L-2	123
L	2256	IL 59	Grass Lake Rd	LA	LK		L2-Off Exp	L-2	124
L	2267	IL 60 Town	Riverwoods Rd	LA	VE		L2-Off	L-2	125

		Line Rd					Exp		
L	2268	IL 60 Town Line Rd	Saunders Rd	LA	VF		L2-Off Exp	L-2	126
L	2270	IL 131 Green Bay Rd	IL 137 Buckley Rd	LA	LY		L2-Off Exp	L-2	127
L	2274	IL 137 Buckley Rd	I 94 Tollway	LA	LJ		L2-Off Exp	L-2	128
L	2276	IL 137 Sheridan Rd	MLK Jr Dr	LA	LQ		L2-Off Exp	L-2	129
L	2280	Amstutz Highway	Grand Ave	LA	B		L2-Off Exp	L-2	130
L	2285	Amstutz Highway	Greenwood Ave	LA	A		L2-Off Exp	L-2	131
L	2305	US 14 Northwest Hwy	IL 31	MC	MA		L2-Off Exp	L-2	132
L	2310	US 14 Northwest Hwy	IL 47	MC	MC		L2-Off Exp	L-2	133
L	2315	US 14 Northwest Hwy	IL 176 Terra Cotta Ave	MC	MZ		L2-Off Exp	L-2	134
L	2402	US 6 Southwest Hwy	I 355	WI	WZ		L2-Off Exp	L-2	135
L	2404	US 30 Plainfield Rd	Larkin Ave	WI	WA		L2-Off Exp	L-2	136
L	2415	US 30 Cass St	Stevens St	WI	WD		L2-Off Exp	L-2	137
L	2417	US 30	Wolf Rd	WI	HC		L2-Off Exp	L-2	138
L	2420	US 45	US 52	WI	WW		L2-Off Exp	L-2	139
L	2428	IL 7 159th St	I 355	WI	WY		L2-Off Exp	L-2	140
L	2430	IL 7 Renwick Rd	IL 53 Broadway St	WI	WB		L2-Off Exp	L-2	141

L	2435	IL 50 Cicero Ave	Governors Highway	WI	WG		L2-Off Exp	L-2	142
L	2445	IL 53 Independence Ave	Joliet Rd	WI	WP		L2-Off Exp	L-2	143
L	2448	IL 171 Archer Ave	I 355	WI	WQ		L2-Off Exp	L-2	144
L	2452	IL 113 Main St	IL 53 Front & IL129 Washington	WI	HB		L2-Off Exp	L-2	145
L	2455	IL 394	Bemes Rd	WI	WK		L2-Off Exp	L-2	146
L	2460	IL 394	Faithorn Rd Burville Rd	WI	WL		L2-Off Exp	L-2	147
L	2465	IL 394	Cottage Grove Ave	WI	WM		L2-Off Exp	L-2	148
L	2470	IL 394	Elms Court Rd	WI	WT		L2-Off Exp	L-2	149
L	2478	IL 394	IL 1	WI	WV		L2-Off Exp	L-2	150
L	2480	IL 394	Goodnow Rd	WI	WU		L2-Off Exp	L-2	151
L	2490	IL 394	Steger Rd	WI	WS		L2-Off Exp	L-2	152

L	1625	US 14 NW Hwy	CN RR Soo RR	CO	AE		L3-Sm	L-3	1
L	1655	IL 58 Golf Rd	Wolf Rd CN RR	CO	AJ		L3-Sm	L-3	2
L	1660	IL 59 Sutton Rd	IL 68 Dundee Rd	CO	AI		L3-Sm	L-3	3
L	1670	IL 62 Algonquin Rd	Palatine Rd	CO	AP		L3-Sm	L-3	4
L	1687	Palatine Rd	Wheeling Rd	CO	AT		L3-Sm	L-3	5
L	1709	US12 20 45 Mannheim	22nd St Cermak Rd	CO	BF		L3-Sm	L-3	6

L	1712	US12 45 Mannheim Rd	Proviso RR Bridge	CO	YD		L3-Sm	L-3	7
L	1717	IL 38 Roosevelt Rd	I 294 Tollway	CO	BB		L3-Sm	L-3	8
L	1765	Lake Shore Dr	I 55 Ramp Sign only	CO	C1E		L-S	L-3	9
L	1766	Lake Shore Dr	39th St Cant Sign only	CO	BQ		L-S	L-3	10
L	1767	Lake Shore Dr	35th St Cant Sign only	CO	YE		L-S	L-3	11
L	1768	Lake Shore Dr	27th St Cant Sign only	CO	YQ		L-S	L-3	12
L	1794	IL 43 Harlem Ave	Lawrence Ave	CO	YT		L3-Sm	L-3	13
L	1820	US 30 Lincoln Highway	Governors Hwy Crawford Ave	CO	CR		L3-Sm	L-3	14
L	1903	US 20 Lake St	Walnut St	DU	DW		L3-Sm	L-3	15
L	1920	IL 38 Roosevelt Rd	Gary's Mill Rd	DU	PF		L3-Sm	L-3	16
L	1922	IL 53	I 88 Tollway	DU	DS		L3-Sm	L-3	17
L	1930	IL 53	BNSF RR Bridge	DU	DR		L3-Sm	L-3	18
L	1950	IL 59	Aurora Rd	DU	DC		L3-Sm	L-3	19
L	1951	IL 59	Gary's Mill Rd	DU	PG		L3-Sm	L-3	20
L	1985	IL 83 Kingery Hwy	St. Charles Rd	DU	DT		L3-Sm	L-3	21
L	2012	US 30 Briarcliff Rd	IL 31 W Lake St	KA	KF		L3-Sm	L-3	22
L	2020	IL 31 State St	W Big Timber Rd	KA	KH		L3-Sm	L-3	23
L	2025	IL 31 State St	E Big Timber Rd	KA	KJ		L3-Sm	L-3	24
L	2030	IL 31 2nd St State St	Indian Mounds Rd	KA	KM		L3-Sm	L-3	25

L	2035	IL 31 State St	Judson Collage Entrance	KA	KL		L3-Sm	L-3	26
L	2040	IL 31 State St	River Rd	KA	KK		L3-Sm	L-3	27
L	2105	US 30	IL 47	KE	EB		L3-Sm	L-3	28
L	2224	US 41 Skokie Highway	Kelly Rd	LA	LV		L3-Sm	L-3	29
L	2260	IL 120 Belevidere Rd	Mill Rd Wildwood Rd	LA	LH		L3-Sm	L-3	30
L	2265	IL 120 Belevidere Rd	O'Plaine Rd	LA	LO		L3-Sm	L-3	31
L	2275	IL 137 Sheridan Rd	Wadsworth Rd	LA	LW		L3-Sm	L-3	32
L	2290	IL 22 Lake Zurich Rd	Ela Rd	LA	LZ		L3-Sm	L-3	33
L	2330	IL 47	S IL 176 Terra Cotta Ave	MC	MS		L3-Sm	L-3	34
L	2335	IL 47	N IL 176 Terra Cotta Ave	MC	MN		L3-Sm	L-3	35
L	2410	US 30 Cass St	Pilcher Park Entrance	WI	WC		L3-Sm	L-3	36
L	2425	IL 1 Halsted St	Union	WI	WF		L3-Sm	L-3	37
L	2440	IL 53 Broadway St	EJE RR	WI	WH		L3-Sm	L-3	38
L	2450	IL 171 Archer Ave	EJE RR	WI	WJ		L3-Sm	L-3	39
L	2485	IL 394	Richton Rd	WI	WR		L3-Sm	L-3	40
L	3110	I 94 Bishop Ford	R.Mi. 324.6	CO			NAV	L-3	41
L	3115	IL 1 Halsted St	R.Mi.320.1	CO			NAV	L-3	42
L	3210	Ashland Ave & I 57	Ri.Mi.318.9-319	CO			NAV	L-3	43

L	3217	Western Ave	R.Mi. 318.0	CO			NAV	L-3	44
L	3220	Kedzie Ave	Ri.Mi. 316.9	CO			NAV	L-3	45
L	3235	127th St	Ri.Mi. 314.2	CO			NAV	L-3	46
L	3240	IL 43 Harlem Ave	Ri.Mi. 311.5	CO			NAV	L-3	47
L	3245	IL 7 Southwest Highway	Ri.Mi. 310.7	CO			NAV	L-3	48
L	3250	US 45 96th Ave	Ri.Mi. 308.4	CO			NAV	L-3	49
L	3255	IL 83 Kingery Highway	Ri.Mi. 304.1	CO			NAV	L-3	50
L	3410	IL 43 Harlem Ave	Ri.Mi.313.9-314	CO			NAV	L-3	51
L	3435	US 12 20 45 LaGrange Rd	Ri.Mi. 309.4	CO			NAV	L-3	52
L	3440	Willow Springs Rd	Ri.Mi. 307.9	CO			NAV	L-3	53
L	3445	IL 83 Kingery Highway	Ri.Mi. 304.1	CO			NAV	L-3	54
L	3450	Lemont Rd State St	Ri.Mi. 300.5	CO			NAV	L-3	55
L	3535	I 80 Access by Boat	Ri.Mi. 287.0	WI			NAV	L-3	56
L	3545	I 55	Ri.Mi. 277.9	WI			NAV	L-3	57
L	3555	IL 7 9th St Lockport	Ri.Mi. 292.7	WI			NAV	L-3	58

LIGHTING SYSTEM LOCATIONS UNDER CONSTRUCTION

Expected to come on State Maintenance by End of Year 2012 with the Rest in 2013 through 2015

Sys	Loc. #	Main Route	Cross St	Co	Cab.		System Type	Pay Item	Qty

L	0145	I 55 Stev	S Central Ave	CO	W		L1-Exp	L-1	1
L	0155	I 55 Stev	Central Ave	CO	J		L1-Exp	L-1	2
L	0360	I 55 Stev	Arsenal Rd	WI	T		L1-Exp	L-1	3
L	0363	I 55	NB Arsenal Frontage	WI	A		L1-Exp	L-1	4
L	1055	I 94 Ryan	111th St	CO	K		L1-Exp	L-1	5
L	1303	I 290 IKE	Lower Wacker	CO	A		L1-Exp	L-1	6
L	1315	I 290 IKE	Lower Wacker	CO	D		L1-Exp	L-1	7
L	1320	I 290 IKE	Lower Wacker	CO	E		L1-Exp	L-1	8
L	1320	I 290 IKE	Lower Wacker Ent	CO	E		L1-Exp	L-1	9
L	1415	I 290	York Rd	DU	Y		L1-Exp	L-1	10
L	1458	I 290 I 355	US 20 Lake St	DU	I		L1-Exp	L-1	11
L	1614	Gross Point Rd	Church St	CO	XW		L2-Off Exp	L-2	12
L	1618	Dempster St	Crawford Ave	CO	XS		L2-Off Exp	L-2	13
L	1619	Dempster St	East Praire St	CO	XP		L2-Off Exp	L-2	14
L	1620	Dempster St	St. Louis Ave	CO	XO		L2-Off Exp	L-2	15
L	1623	US 41 Skokie Blvd	Old Orchard Rd	CO	XQ		L2-Off Exp	L-2	16
L	1624	US 41 Skokie Blvd	Gross Point Rd	CO	XU		L2-Off Exp	L-2	17
L	1669	IL 72 Higgins Rd	Prairie Stone Pkwy	CO	XT		L2-Off Exp	L-2	18
L	1807	US 45 LaGrange Rd	142nd St	CO	CI		L2-Off Exp	L-2	19
L	1808	US 45	143rd St	CO	CO		L2-Off	L-2	20

		LaGrange Rd					Exp		
L	1830	IL 1 Halsted Ave	I 80 I 294 Tollway	CO	CK		L2-Off Exp	L-2	21
L	1877	IL 83 147th St	Sacramento Ave	CO	ZA		L2-Off Exp	L-2	22
L	1935	IL 56 Butterfield Rd	IL 59	DU	DD		L2-Off Exp	L-2	23
L	1942	IL 56 Butterfield Rd	22nd St Cermak Rd	DU	DP		L2-Off Exp	L-2	24
L	1947	IL 19 Irving Park Rd	York Rd	DU	UP		L2-Off Exp	L-2	25
L	1961	IL 64 North Ave	IL 53 Rohlwing Rd	DU	DF		L2-Off Exp	L-2	26
L	1983	IL 83 Kingery Hwy	22nd St Cermak Rd	DU	DO		L2-Off Exp	L-2	27
L	1990	IL 64 North Ave	Woodland Ave	DU	PC		L2-Off Exp	L-2	28
L	1991	IL 64 North Ave	Powis Rd	DU	PD		L2-Off Exp	L-2	29
L	1992	IL 64 North Ave	Kautz Rd Smith Rd	DU	PE		L2-Off Exp	L-2	30
L	2005	US 20 Lake St	Mc Lean Blvd	KA	KI		L2-Off Exp	L-2	31
L	2048	IL 47	I 90 Tlwy	KA	KA		L2-Off Exp	L-2	32
L	2070	IL 72 Higgins Rd	Randall Rd	KA	KT		L2-Off Exp	L-2	33
L	2075	IL 56 Butterfield Rd	Galena Rd	KA	KZ		L2-Off Exp	L-2	34
L	2222	IL 173 Rosecrans Rd	I 94 Tlwy	LA	VG		L2-Off Exp	L-2	35
L	2226	US 41	N Country Rd	LA	LI		L2-Off Exp	L-2	36

L	2250	IL 21 Milwaukee Ave	IL 137 Buckley Rd	LA	LM		L2-Off Exp	L-2	37
L	2307	IL 31	IL 62	MC	MB		L2-Off Exp	L-2	38
L	2313	IL 31	Greenwood Ct	MC	MD		L2-Off Exp	L-2	39
L	2416	US 30	Ridgemore Rd	WI	HE		L2-Off Exp	L-2	40
L	2442	IL 53 Chicago St	US 52 Doris Ave	WI	HD		L2-Off Exp	L-2	41
L	2475	IL 394	Exchange St	WI	WO		L2-Off Exp	L-2	42
L	1815	US 30 Lincoln Highway	IL 43 Harlem Ave	CO	CR		L3-Sm	L-3	43
L	2055	IL 47	Plank Rd	KA	KP		L3-Sm	L-3	44
L	3230	IL 50 Cicero Ave	Ri.Mi. 314.9	CO			NAV	L-3	45
L	3405	Central Ave	Ri.Mi. 316.2	CO			NAV	L-3	46

LIGHTING SYSTEM SPECIAL RESPONSE LOCATIONS

Sys	Loc. #	Main Route	Cross St	Co	Cab.		System Type	Pay Item	Qty
L	1998	IL 64 North Ave	Sign Only @ Harvard Ave	DU	D5E		RM-Alt	Routine	1
L	2098	US 30	Sign Only West of IL 47	KA	K1E		RM-Alt	Routine	2

PUMP STATION LOCATIONS ON STATE MAINTENANCE AS OF 5-31-12

Sys	Loc. #	Main Route	Cross St	Co	Description	System Type	Pay Item	Qty
PS	02	I 94	Winnetka Rd	CO	18 N West Frontage,Northfield	PS-L	P-1	1

PS	03	I 94	Caldwell Peterson	CO	5700 N Cicero Ave, Chicago	PS-L	P-1	2
PS	04	I 290	E of 1st Ave	CO	8107 W I 290, Forest Park	PS-L	P-1	3
PS	05	I 290	Des Plaines Ave	CO	701 W Van Buren, Chicago	PS-L	P-1	4
PS	09	US 45 Mannheim	US 20 Lake St	CO	1549 Mannheim Rd, Stone Park	PS-L	P-1	5
PS	10	US 14 Dempster	IL 21 Milwaukee Ave	CO	8104 W Dempster St, Niles	PS-L	P-1	6
PS	21	I 94	72nd St	CO	3 E 72nd St, Chicago	PS-L	P-1	7
PS	22	I 90 94	Fulton Ave	CO	240 N Union Ave, Chicago	PS-L	P-1	8
PS	23	I 90 94	Roscoe St	CO	3415 N Central Park,Chicago	PS-L	P-1	9

PS	25	US 12 20 95th St	IL 43 Harlem Ave	CO	7201 W 95th St, Bridgeview	PS-L	P-1	1
PS	28	IL 50 Cicero Ave	US 34 Ogden Ave	CO	2618 S Cicero Ave, Cicero	PS-L	P-1	2
PS	29	I 90 94	Wallace St	CO	2422 S Archer Ave, Chicago	PS-L	P-1	3
PS	30	I 55	Homan Ave	CO	3510 S Kedzie Ave, Chicago	PS-L	P-1	4
PS	31	111th St	Central Ave	CO	5300 W 111th St, Oak Lawn	PS-L	P-1	5
PS	33	Palatine Rd	IL 21 Milwaukee Ave	CO	699 Milwaukee Ave, Prospect Hts	PS-L	P-1	6
PS	34	I 290	Emroy Ave	DU	395 N Emroy Ave, Elmhurst	PS-L	P-1	7
PS	35	I 57	127th St	CO	12950 S Paulina St, Blue Island	PS-L	P-1	8
PS	36	IL 43 Harlem Ave	176th St	CO	17701 S Harlem , Tinley Park	PS-L	P-1	9
PS	39	IL 60 Kennedy Rd	W of US 41 Skokie	LA	1391 Kennedy Rd, Lake Forest	PS-L	P-1	10
PS	40	US 45 Lake Ave	N of IL 60 Towne Line	LA	1499 S Lake Ave, Mundelein	PS-L	P-1	11

PS	42	IL 47	IL 72	KA	15N300 IL 47, Hampshire	PS-L	P-1	12
PS	44	IL 83 Kingery Hwy	S of IL 64 North Ave	DU	100 S IL 83, Villa Park	PS-L	P-1	13
PS	46	US 41 Skokie Hwy	Clavey Rd	LA	1448 Clavey Rd, Highland Park	PS-L	P-1	14
PS	52	IL 59	IL 126	WI	14706 S IL 59, Plainfield	PS-L	P-1	15

PS	08	US 14 NW Hwy	1 2 Mi E of US 12 45	CO	865 NW Hwy, Des Plaines	PS-S	P-2	1
PS	11	IL 50 Cicero Ave	158th St	CO	15801 S Cicero Ave, Oak Forest	PS-S	P-2	2
PS	12	IL 64 North Ave	W of 25th Ave	CO	2600W North Ave, Melrose Park	PS-S	P-2	3
PS	13	US 41 Skokie Blvd	S of Oakton St	CO	7846 N Skokie Blvd, Skokie	PS-S	P-2	4
PS	14	Ashland Ave	139th St	CO	13901 S Ashland Ave, Dixmoor	PS-S	P-2	5
PS	15	79th St	Kedzie Ave	CO	3200W 79th St, Chicago	PS-S	P-2	6
PS	16	IL 72 Higgins Rd	E of US 12 45	CO	10225 W Higgins Rd, Rosemont	PS-S	P-2	7
PS	17	IL 58 Golf Rd	US 45 River Rd	CO	1855 W Golf Rd, Des Plaines	PS-S	P-2	8
PS	18	US 6 159th St	Park Ave	CO	200E 162nd St, South Holland	PS-S	P-2	9
PS	19	US 6 159th St	IL 50 Cicero Ave	CO	4900 W 159th St, Oak Forest	PS-S	P-2	10
PS	20	I 290	W of Wolf Rd	CO	5005 W I 290, Hillside	PS-S	P-2	11
PS	32	IL 64 North Ave	1st Ave	CO	8501 W North Ave, Melrose Park	PS-S	P-2	12
PS	37	US 41 Skokie Hwy	IL 176 Rockland Rd	LA	437 Skokie Highway, Lake Bluff	PS-S	P-2	13
PS	38	US 41 Skokie Hwy	Deerpath Ave	LA	301 N Skokie Highway, Lake Forest	PS-S	P-2	14

PS	41	US 41 Skokie Hwy	N of IL 176 Rockland	LA	29315 N Skokie Highway, Knollwood	PS-S	P-2	15
PS	43	US 41 Skokie Hwy	N of IL 132 Grand Ave	LA	1331 N Skokie Highway, Gurnee	PS-S	P-2	16
PS	47	IL 59	North Aurora Ave	DU	315 N IL 59	PS-S	P-2	17
PS	50	IL 22 Half Day Rd	US 41 Skokie Hwy	LA	1232 Half Day Rd, Highland Park	PS-S	P-2	18
PS	51	127th St	E of Crawford Ave	CO	3559 W 127th St, Alsip	PS-S	P-2	19

PUMP STATION SYSTEM LOCATIONS UNDER CONSTRUCTION

Expected to come on State Maintenance in late 2012 or early 2013.

Sys	Loc. #	Main Route	Cross St	Co	Description	System Type	Pay Item	Qty
PS	07	I 290	Wells St	CO	530 S Franklin St, Chicago	PS-L	P-1	1
PS	24	I 190 JFK	E. of Mannheim	CO	9998 West Bryn Mawr, Rosement	PS-L	P-1	2
PS	26	I 90 94	Roosevelt Rd	CO	1125 S Union Ave, Chicago	PS-L	P-1	3
PS	27	I 94	110th St	CO	10925 S Doty Rd, Chicago	PS-L	P-1	4
PS	48	IL 56 Butterfield Rd	W of IL 59	DU	30W400 Butterfield Rd,Warrenville	PS-S	P-2	5

SURVEILLANCE LOCATIONS ON STATE MAINTENANCE AS OF 5-31-12

Sys	Loc. #	Main Route	Cross St	Co	Cab#		System Type	Pay Item	Qty
S	3075	I 90 JFK OB NB Exit	IL 171 Cumberland Ave	CO	E113		S-1a	S-1	1
S	3080	I 90 JFK OB SB Ent	IL 171 Cumberland Ave	CO	E115		S-1a	S-1	2

S	3085	I 90 JFK IB Ent	IL 171 Cumberland Ave	CO	E120		S-1a	S-1	3
S	3095	I 90 JFK IB Ent	Canfield Ave	CO	F118		S-1a	S-1	4
S	3105	I 90 JFK	IL 43 Harlem Ave	CO	F109		S-1a	S-1	5
S	3110	I 90 JFK	IL 43 Harlem Ave	CO	F114		S-1a	S-1	6
S	3125	I 90 JFK	IL 43 Harlem Ave	CO	G112		S-1a	S-1	7
S	3135	I 90 JFK	Sayre Ave	CO	G110		S-1a	S-1	8
S	3140	I 90 JFK	Nagle Ave	CO	H101		S-1a	S-1	9
S	3155	I 90 JFK	Bryn Mawr Ave	CO	H106		S-1a	S-1	10
S	3165	I 90 JFK	Foster Ave	CO	H97		S-1a	S-1	11
S	3175	I 90 JFK	Foster Ave	CO	I102		S-1a	S-1	12
S	3185	I 90 JFK	Central Ave Ent	CO	I100		S-1a	S-1	13
S	3210	I 90 JFK	Lawrence Ave	CO	J91		S-1a	S-1	14
S	3215	I 90 JFK	Lawrence Ave	CO	J94A		S-1a	S-1	15
S	3240	I 90 94 JFK	Montrose Ave	CO	J92		S-1a	S-1	16
S	3245	I 90 94 JFK	Keeler Ave	CO	K77		S-1a	S-1	17
S	3270	I 90 94 JFK	Pulaski Rd	CO	K84		S-1a	S-1	18
S	3275	I 90 94 JFK	IL 19 Irving Park Rd	CO	K86		S-1a	S-1	19
S	3310	I 90 94 JFK	Avondale Ave	CO	L76		S-1a	S-1	20
S	3320	I 90 94 JFK	Kimball Ave	CO	L65		S-1a	S-1	21
S	3325	I 90 94 JFK	Kimball Ave	CO	L72		S-1a	S-1	22
S	3340	I 90 94 JFK	Kedzie Ave	CO	L70		S-1a	S-1	23
S	3350	I 90 94 JFK	California Ave	CO	M57		S-1a	S-1	24
S	3365	I 90 94 JFK	Sacramento Blvd	CO	M66		S-1a	S-1	25

S	3385	I 90 94 JFK	Diversey Ave	CO	M62		S-1a	S-1	26
S	3390	I 90 94 JFK	Fullerton Ave	CO	N51		S-1a	S-1	27
S	3405	I 90 94 JFK	Fullerton Ave	CO	N58		S-1a	S-1	28
S	3415	I 90 94 JFK	Webster Ave	CO	N56		S-1a	S-1	29
S	3420	I 90 94 JFK	Armitage Ave	CO	O45		S-1a	S-1	30
S	3435	I 90 94 JFK	Armitage Ave	CO	O52		S-1a	S-1	31
S	3445	I 90 94 JFK	IL 64 North Ave	CO	P41A		S-1a	S-1	32
S	3450	I 90 94 JFK	IL 64 North Ave	CO	P48		S-1a	S-1	33
S	3460	I 90 94 JFK	Division St	CO	R39		S-1a	S-1	34
S	3465	I 90 94 JFK	Division St	CO	R44		S-1a	S-1	35
S	3480	I 90 94 JFK	Augusta Blvd	CO	R42		S-1a	S-1	36
S	3485	I 90 94 JFK	Ogden Ave	CO	R35		S-1a	S-1	37
S	3525	I 90 94 JFK	Lake St Ent	CO	Y28		S-1a	S-1	38
S	3565	I 90 94 JFK	Washington Blvd	CO	Y23		S-1a	S-1	39
S	3595	I 90 94 JFK	Monroe St	CO	Y15		S-1a	S-1	40
S	4010	I 94 Edens	Wilson Ave	CO	2		S-1a	S-1	41
S	4015	I 94 Edens	Wilson Ave	CO	3		S-1a	S-1	42
S	4020	I 94 Edens	Elston Ave	CO	B4		S-1a	S-1	43
S	4025	I 94 Edens	Foster Ave	CO	B5		S-1a	S-1	44
S	4040	I 94 Edens	Peterson Ave	CO	C8		S-1a	S-1	45
S	4045	I 94 Edens	Peterson Ave	CO	C9		S-1a	S-1	46
S	4050	I 94 Edens	Peterson Ave	CO	C10		S-1a	S-1	47
S	4065	I 94 Edens	Touhy Ave	CO	E12		S-1a	S-1	48
S	4070	I 94 Edens	Touhy Ave	CO	E15		S-1a	S-1	49
S	4075	I 94 Edens	Touhy Ave	CO	E16		S-1a	S-1	50

S	4080	I 94 Edens	Touhy Ave	CO	E17		S-1a	S-1	51
S	4100	I 94 Edens	Dempster St	CO	H21		S-1a	S-1	52
S	4105	I 94 Edens	Dempster St	CO	H22		S-1a	S-1	53
S	4110	I 94 Edens	Dempster St	CO	H23		S-1a	S-1	54
S	4115	I 94 Edens	Dempster St	CO	H24		S-1a	S-1	55
S	5015	I 94 Ryan NB	95th St Ent	CO	68		S-1b	S-1	56
S	5035	I 94 Ryan SB	87th St Ent	CO	65		S-1b	S-1	57
S	5040	I 94 Ryan NB	87th St Ent	CO	64		S-1b	S-1	58
S	5055	I 94 Ryan NB	83rd St Ent	CO	62		S-1b	S-1	59
S	5070	I 94 Ryan NB	79th St Ent	CO	58		S-1b	S-1	60
S	5075	I 94 Ryan SB	79th St Ent	CO	59		S-1b	S-1	61
S	5085	I 94 Ryan SB	76th St Ent	CO	57		S-1b	S-1	62
S	5105	I 94 Ryan NB	75th St Ent	CO	56		S-1b	S-1	63
S	5115	I 94 Ryan NB	71st St Ent	CO	52		S-1c	S-1	64
S	5120	I 94 Ryan SB	71st St Ent	CO	53		S-1b	S-1	65
S	5125	I 94 Ryan SB	67th St Ent	CO	49		S-1b	S-1	66
S	5145	I 94 Ryan NB	63rd St Ent	CO	46		S-1b	S-1	67
S	5160	I 90 94 Ryan SB	59th St Ent	CO	45		S-1b	S-1	68
S	5195	I 90 94 Ryan SB	55th St Ent	CO	41		S-1b	S-1	69
S	5210	I 90 94 Ryan	55th St Ent	CO	42		S-1b	S-1	70
S	5225	I 90 94 Ryan SB	47th St Ent	CO	37		S-1b	S-1	71
S	5235	I 90 94 Ryan	47th St Ent	CO	38		S-1b	S-1	72
S	5250	I 90 94 Ryan	43rd St Ent	CO	35A		S-1b	S-1	73
S	5255	I 90 94 Ryan	43rd St Ent	CO	36		S-1b	S-1	74
S	5290	I 90 94 Ryan SB	39th St Ent	CO	31		S-1b	S-1	75

S	5385	I 90 94 Ryan	Roosevelt Rd	CO	C5		S-1a	S-1	76
S	5390	I 90 94 Ryan	Roosevelt Rd	CO	C6		S-1a	S-1	77
S	5405	I 90 94 Ryan	Taylor St	CO	D4		S-1a	S-1	78
S	8040	I 290 IKE	Ashland Ave	CO	G8		S-1a	S-1	79
S	8060	I 290 IKE	Damen Ave & Paulina St	CO	H11A		S-1a	S-1	80
S	8085	I 290 IKE	Western Ave	CO	H15		S-1a	S-1	81
S	8095	I 290 IKE	California Ave	CO	H16		S-1a	S-1	82
S	8105	I 290 IKE	Sacramento Blvd	CO	I19		S-1a	S-1	83
S	8110	I 290 IKE	Homan Ave	CO	I20		S-1a	S-1	84
S	8120	I 290 IKE	Independence Blvd	CO	J22		S-1a	S-1	85
S	8135	I 290 IKE	Independence Blvd	CO	J27		S-1a	S-1	86
S	8140	I 290 IKE	Kostner Ave	CO	J26		S-1a	S-1	87
S	8160	I 290 IKE	IL 50 Cicero Ave	CO	K33		S-1a	S-1	88
S	8165	I 290 IKE	Laramie Ave	CO	K30		S-1a	S-1	89
S	8175	I 290 IKE	Central Ave	CO	L32		S-1a	S-1	90
S	8195	I 290 IKE	Central Ave	CO	L39		S-1a	S-1	91
S	8210	I 290 IKE	Austin Blvd	CO	M43		S-1a	S-1	92
S	8230	I 290 IKE	IL 43 Harlem Ave	CO	M40		S-1a	S-1	93
S	8240	I 290 IKE	IL 43 Harlem Ave	CO	M49		S-1a	S-1	94
S	8255	I 290 IKE	Des Plaines Ave	CO	N53		S-1a	S-1	95
S	8265	I 290 IKE	IL 171 1st Ave	CO	O48		S-1a	S-1	96
S	8280	I 290 IKE	IL 171 1st Ave	CO	O59		S-1a	S-1	97
S	8285	I 290 IKE	9th Ave	CO	P52		S-1a	S-1	98

S	8295	I 290 IKE	17th Ave	CO	P54		S-1a	S-1	99
S	8310	I 290 IKE	17th Ave	CO	P65		S-1a	S-1	100
S	8315	I 290 IKE	25th Ave	CO	R58		S-1a	S-1	101
S	8320	I 290 IKE	25th Ave	CO	R60		S-1a	S-1	102
S	8340	I 290 IKE	Addison Creek	CO	R69		S-1a	S-1	103
S	8345	I 290 IKE	Mannheim Rd SE	CO	S64		S-1a	S-1	104
S	8350	I 290 IKE	Mannheim Rd SW	CO	S66		S-1a	S-1	105
S	8370	I 290 IKE	Mannheim Rd nw	CO	S75		S-1a	S-1	106
S	8375	I 290 IKE	Hillside Ave Car Max Ent	CO	T70		S-1a	S-1	107
S	9030	I 290	St. Charles Rd	DU	W80		S-1a	S-1	108
S	9035	I 290	St. Charles Rd	DU	W82		S-1a	S-1	109
S	9040	I 290	St. Charles Rd	DU	W83		S-1a	S-1	110
S	9045	I 290	St. Charles Rd	DU	W85		S-1a	S-1	111
S	9055	I 290	IL 64 North Ave	DU	X86		S-1a	S-1	112
S	9075	I 290	IL 64 North Ave	DU	X90		S-1a	S-1	113
S	9130	I 290 WB	IL 83 Kingery Hwy	DU	A101		S-1a	S-1	114
S	9140	I 290	IL 83 Kingery Hwy	DU	A103		S-1a	S-1	115

S	1000	I 55 Stev	Martin Luther King Dr	CO	B0		S-2a	S-2	1
S	1005	I 55 Stev	Martin Luther King Dr	CO	B1		S-2a	S-2	2
S	1010	I 55 Stev	State St	CO	B3		S-2a	S-2	3
S	1015	I 55 Stev	26th St & Wentworth Ave	CO	C2		S-2a	S-2	4

S	1020	I 55 Stev	26th St & Wentworth Ave	CO	C5		S-2a	S-2	5
S	1025	I 55 Stev	W of Wentworth Ave	CO	C4		S-2a	S-2	6
S	1030	I 55 Stev	W of Wentworth Ave	CO	C7		S-2a	S-2	7
S	1035	I 55 Stev	I 90 94 Ryan Interchange	CO	Y15		S-2a	S-2	8
S	1040	I 55 Stev	I 90 94 Ryan Interchange	CO	Y16		S-2a	S-2	9
S	1045	I 55 Stev	I 90 94 Ryan Interchange	CO	Y17		S-2a	S-2	10
S	1047	I 55 Stev	I 90 94 Cross Connect	CO	MCD18		S-2k	S-2	11
S	1050	I 55 Stev	I 90 94 Ryan I 55 Interchange	CO	Y18		S-2a	S-2	12
S	1055	I 55 Stev	Archer Ave & Mary St	CO	6		S-2a	S-2	13
S	1060	I 55 Stev	Lock St	CO	8		S-2a	S-2	14
S	1065	I 55 Stev	Wood St	CO	10		S-2a	S-2	15
S	1075	I 55 Stev	Hoyne Ave	CO	12		S-2a	S-2	16
S	1080	I 55 Stev	Penn RR	CO	14		S-2a	S-2	17
S	1100	I 55 Stev	Kedzie & California Ave	CO	16		S-2a	S-2	18
S	1105	I 55 Stev	Kedzie & California Ave	CO	18		S-2a	S-2	19
S	1110	I 55 Stev	Kedzie & California Ave	CO	20		S-2a	S-2	20
S	1115	I 55 Stev	East of Pulaski Rd ATSF RR	CO	9		S-2a	S-2	21
S	1120	I 55 Stev	Pulaski Rd	CO	H11		S-2a	S-2	22

S	1125	I 55 Stev	Pulaski Rd	CO	22		S-2a	S-2	23
S	1130	I 55 Stev	IL 50 Cicero Ave	CO	13		S-2a	S-2	24
S	1135	I 55 Stev	IL 50 Cicero Ave	CO	TDC1		S-2a	S-2	25
S	1140	I 55 Stev	IL 50 Cicero Ave OB Exit	CO	15		S-2a	S-2	26
S	1150	I 55 Stev	IL 50 Cicero Ave IB RS	CO	26		S-2a	S-2	27
S	1160	I 55 Stev	IL 50 Cicero Ave	CO	24		S-2a	S-2	28
S	1165	I 55 Stev	Central Ave	CO	17		S-2a	S-2	29
S	1170	I 55 Stev	Central Ave	CO	28		S-2a	S-2	30
S	1175	I 55 Stev	Central Ave IL 43 Harlem Ave	CO	30		S-2a	S-2	31
S	1180	I 55 Stev	60th IB RS	CO	32		S-2a	S-2	32
S	1185	I 55 Stev	Central Ave IL 43 Harlem Ave	CO	19		S-2a	S-2	33
S	1190	I 55 Stev	Central Ave IL 43 Harlem Ave	CO	21		S-2a	S-2	34
S	1195	I 55 Stev	IL 43 Harlem Ave	CO	23		S-2a	S-2	35
S	1205	I 55 Stev	IL 43 Harlem Ave	CO	34		S-2a	S-2	36
S	1210	I 55 Stev	IL 43 Harlem Ave	CO	25		S-2a	S-2	37
S	1215	I 55 Stev	IL 43 Harlem Ave	CO	36		S-2a	S-2	38
S	1220	I 55 Stev	75th West	CO	27		S-2a	S-2	39
S	1225	I 55 Stev	Lawndale Ave	CO	29		S-2a	S-2	40
S	1235	I 55 Stev	Lawndale Ave IB	CO	38		S-2a	S-2	41
S	1240	I 55 Stev	Lawndale Ave	CO	31		S-2a	S-2	42

S	1245	I 55 Stev	Lawndale Ave	CO	40		S-2a	S-2	43
S	1250	I 55 Stev	B&O RR 83rd W	CO	42		S-2a	S-2	44
S	1255	I 55 Stev	86th W	CO	44		S-2a	S-2	45
S	1260	I 55 Stev	88th W	CO	46		S-2a	S-2	46
S	1265	I 55 Stev	91st W	CO	P50		S-2a	S-2	47
S	1270	I 55 Stev	97th W	CO	R43		S-2a	S-2	48
S	1275	I 55 Stev	US 12 20 45 LaGrange Rd	CO	R45		S-2a	S-2	49
S	1280	I 55 Stev	US 12 20 45 LaGrange Rd	CO	R47		S-2a	S-2	50
S	1285	I 55 Stev	US 12 20 45 LaGrange Rd	CO	R52		S-2a	S-2	51
S	1290	I 55 Stev	US 12 20 45 LaGrange Rd SW	CO	R54		S-2a	S-2	52
S	1295	I 55 Stev	E of Willow Springs Rd	CO	R49		S-2a	S-2	53
S	1300	I 55 Stev	OB E of Willow Springs Rd	CO	R49A		S-2a	S-2	54
S	1305	I 55 Stev	I 294	CO	S51		S-2a	S-2	55
S	1310	I 55 Stev	109th St	CO	S56		S-2a	S-2	56
S	1315	I 55 Stev	I 294 Tollway	CO	S53		S-2a	S-2	57
S	1320	I 55 Stev	Joliet Rd	CO	S55		S-2a	S-2	58
S	1325	I 55 Stev	County Line Rd East	CO	57		S-2a	S-2	59
S	1330	I 55 Stev	W of County Line Rd	DU	59		S-2a	S-2	60
S	1335	I 55 Stev	1 Mi W of County Line	DU	61		S-2a	S-2	61
S	1340	I 55 Stev	Madison St	DU	63		S-2a	S-2	62

S	1345	I 55 Stev	E of IL 83	DU	58		S-2a	S-2	63
S	1350	I 55 Stev	W of IL 83	DU	60		S-2a	S-2	64
S	1355	I 55 Stev	Clarendon Hills Rd	DU	65		S-2a	S-2	65
S	1360	I 55 Stev	1 2 Mi W of Clarendon Hills Rd	DU	62		S-2a	S-2	66
S	1365	I 55 Stev	E of Cass Ave	DU	64		S-2a	S-2	67
S	1370	I 55 Stev	W of Cass Ave	DU	66		S-2a	S-2	68
S	1375	I 55 Stev	1 Mi W of Cass Ave	DU	68		S-2a	S-2	69
S	1380	I 55 Stev	1/2 Mi E of Lemont Rd	DU	67		S-2a	S-2	70
S	1385	I 55 Stev	E of Lemont Rd	DU	70		S-2a	S-2	71
S	1390	I 55 Stev	W of Lemont Rd	DU	72		S-2a	S-2	72
S	1395	I 55 Stev	1 2 Mi W of Lemont Rd	DU	74		S-2a	S-2	73
S	1400	I 55 Stev	Woodward Ave	DU	76		S-2a	S-2	74
S	1401	I 55 Stev	I 355 Tollway	WI	RVD9		S-2f	S-2	75
S	1402	I 55 Stev	I 355 Tollway	WI	RVD6		S-2f	S-2	76
S	1403	I 55 Stev	I 355 Tollway	WI	RVD5		S-2f	S-2	77
S	1404	I 55 Stev	I 355 Tollway	WI	RVD7		S-2f	S-2	78
S	1405	I 55 Stev	I 355 Tollway	WI	RVD8		S-2f	S-2	79
S	1406	I 55 Stev	I 355 Tollway	WI	RVD4		S-2f	S-2	80
S	1407	I 55 Stev	I 355 Tollway	WI	RVD2		S-2f	S-2	81
S	1408	I 55 Stev	I 355 Tollway	WI	RVD3		S-2f	S-2	82
S	1425	I 55 Stev	Joliet Rd	WI	69		S-2a	S-2	83
S	1427	I 55 Stev	I 355 Tollway Ent	WI	RVD1		S-2f	S-2	84

S	1430	I 55 Stev	1/2 Mi W of Joliet Rd	WI	71		S-2a	S-2	85
S	1435	I 55 Stev	W of Upton Rd	WI	82		S-2a	S-2	86
S	1440	I 55 Stev	2 3 Mi E of IL 53	WI	73		S-2a	S-2	87
S	1445	I 55 Stev	E of IL 53	WI	84		S-2a	S-2	88
S	1450	I 55 Stev	W of IL 53	WI	86		S-2a	S-2	89
S	1455	I 55 Stev	E of Schmidt Rd	WI	88		S-2a	S-2	90
S	1460	I 55 Stev	W of Schmidt Rd	WI	75		S-2a	S-2	91
S	1465	I 55 Stev	1 2 Mi E of Naperville Rd	WI	90		S-2a	S-2	92
S	1470	I 55 Stev	W of Naperville Rd	WI	92		S-2a	S-2	93
S	2015	I 57	IL 1 Halsted St	CO	B7		S-2a/f	S-2	94
S	2020	I 57	100th St	CO	B4		S-2a/f	S-2	95
S	2025	I 57	104th St	CO	B6		S-2a/f	S-2	96
S	2030	I 57	107th St	CO	C9		S-2a/f	S-2	97
S	2035	I 57	111th St	CO	C8		S-2a	S-2	98
S	2040	I 57	111th St	CO	C11		S-2a	S-2	99
S	2050	I 57	111th St	CO	D13		S-2a/f	S-2	100
S	2055	I 57	119th St	CO	D12		S-2a/f	S-2	101
S	2060	I 57	119th St	CO	E14		S-2a/f	S-2	102
S	2065	I 57	119th St	CO	D12A		S-2a/f	S-2	103
S	2075	I 57	127th St	CO	F16		S-2a/f	S-2	104
S	2080	I 57	127th St	CO	F19		S-2a	S-2	105
S	2085	I 57	127th St	CO	G18		S-2a/f	S-2	106
S	2095	I 57	Cal Sag Channel	CO	G20		S-2a	S-2	107
S	2100	I 57 IB	B&O RR	CO	H22		S-2a/f	S-2	108

S	2105	I 57 IB	IHB RR	CO	H24		S-2a/f	S-2	109
S	2110	I 57 IB	1/2 Mi S of IHB RR	CO	I26		S-2a/f	S-2	110
S	2115	I 57 OB	1/2 Mi N of IL 83	CO	I23		S-2a	S-2	111
S	2120	I 57 OB	IL 83 147th St Sibley Blvd	CO	J25		S-2a	S-2	112
S	2125	I 57 IB	IL 83 147th St Sibley Blvd	CO	J28		S-2a	S-2	113
S	2165	I 57	US 6 159th St	CO	L35		S-2a/f	S-2	114
S	2170	I 57	US 6 159th St	CO	L36		S-2a	S-2	115
S	2175	I 57	163rd St	CO	M37		S-2a/f	S-2	116
S	2180	I 57	167th St	CO	N39		S-2a	S-2	117
S	2190	I 57	167th St	CO	N43		S-2a/f	S-2	118
S	2195	I 57	167th St	CO	O38		S-2a	S-2	119
S	2205	I 57	167th St	CO	O42		S-2a	S-2	120
S	2210	I 57	W of Cicero Ave	CO	T45		S-2a/f	S-2	121
S	2215	I 57	1/2 Mi W of Cicero Ave	CO	T47		S-2a/f	S-2	122
S	2220	I 57	I 80 Interchange	CO	T44		S-2a	S-2	123
S	2225	I 57	I 80 Interchange	CO	T46		S-2a	S-2	124
S	2230	I 57	I 80 Interchange	CO	T49		S-2a	S-2	125
S	2235	I 57	I 80 Interchange	CO	U48		S-2a	S-2	126
S	2240	I 57	I 80 Interchange	CO	U51		S-2a	S-2	127
S	2245	I 57	I 80 Interchange	CO	U53		S-2a	S-2	128
S	3000	I 190	O'Hare Airport Parking Lot C	CO	C131		S-2a	S-2	129
S	3005	I 190	US 12 45 Mannheim Rd	CO	C127		S-2a	S-2	130

S	3007	I 190	US 12 45 Mannheim Rd	CO	C127A		S-2a	S-2	131
S	3010	I 190	US 12 45 Mannheim Rd	CO	C129		S-2a	S-2	132
S	3015	I 190	US 12 45 Mannheim Rd	CO	C134		S-2h	S-2	133
S	3020	I 190	US 12 45 Mannheim Rd	CO	C136		S-2h	S-2	134
S	3025	I 190	I 294 Toll Plaza	CO	C123		S-2a	S-2	135
S	3030	I 190	I 294 Toll Plaza	CO	C125		S-2a	S-2	136
S	3035	I 190	I 294 Toll Plaza	CO	C130		S-2a	S-2	137
S	3040	I 190	I 294 Toll Plaza	CO	C132		S-2a	S-2	138
S	3045	I 190	Des Plaines River Rd	CO	D119		S-2a	S-2	139
S	3050	I 190	Des Plaines River Rd	CO	D121		S-2a	S-2	140
S	3055	I 190	Des Plaines River Rd	CO	D126		S-2a	S-2	141
S	3060	I 190	Des Plaines River Rd	CO	D128		S-2a	S-2	142
S	3065	I 90 JFK	East River Rd	CO	D124		S-2a	S-2	143
S	3067	I 90 JFK	East River Rd	CO	MCD6		S-2k	S-2	144
S	3070	I 90 JFK	Cumberland Ave	CO	D122		S-2a	S-2	145
S	3090	I 90 JFK	Canfield Ave	CO	F111		S-2a	S-2	146
S	3100	I 90 JFK	IL 43 Harlem Ave	CO	F107		S-2a	S-2	147
S	3115	I 90 JFK	IL 43 Harlem Ave	CO	F116		S-2a	S-2	148
S	3120	I 90 JFK	IL 43 Harlem Ave	CO	G105		S-2a	S-2	149

S	3130	I 90 JFK	Sayre Ave	CO	G103		S-2a	S-2	150
S	3145	I 90 JFK	Nagle Ave	CO	H108		S-2a	S-2	151
S	3150	I 90 JFK	Bryn Mawr Ave	CO	H99		S-2a	S-2	152
S	3160	I 90 JFK	Meade Ave	CO	H104		S-2a	S-2	153
S	3170	I 90 JFK	Foster Ave	CO	I95		S-2a	S-2	154
S	3180	I 90 JFK	Central Ave	CO	I93		S-2a	S-2	155
S	3190	I 90 JFK	Central Ave	CO	I100A		S-2a	S-2	156
S	3195	I 90 JFK	Milwaukee Ave	CO	I98		S-2a	S-2	157
S	3200	I 90 JFK	Lawrence Ave	CO	J87		S-2a	S-2	158
S	3205	I 90 JFK	Lawrence Ave	CO	J89		S-2a	S-2	159
S	3220	I 90 JFK	Lawrence Ave	CO	J96		S-2a	S-2	160
S	3225	I 90 JFK	IL 50 Cicero Ave	CO	98		S-2a	S-2	161
S	3230	I 90 JFK	IL 50 Cicero Ave	CO	94		S-2a	S-2	162
S	3232	I 90 94 JFK	Montrose Ave	CO	MCD12		S-2k	S-2	163
S	3235	I 90 94 JFK	Montrose Ave	CO	81		S-2a	S-2	164
S	3238	I 90 94 JFK	Montrose Ave	CO	92A		S-2a	S-2	165
S	3250	I 90 94 JFK	Kostner Ave	CO	79		S-2a	S-2	166
S	3253	I 90 94 JFK	Keeler Ave	CO	77A		S-2a	S-2	167
S	3255	I 90 94 JFK	Keeler Ave	CO	90		S-2a	S-2	168
S	3260	I 90 94 JFK	Pulaski Rd	CO	73		S-2a	S-2	169
S	3290	I 90 94 JFK	Addison Rd	CO	L67		S-2a	S-2	170
S	3295	I 90 94 JFK	Addison Rd	CO	L69		S-2a	S-2	171
S	3300	I 90 94 JFK	Addison Rd	CO	L78		S-2l	S-2	172
S	3315	I 90 94 JFK	Kimball Ave	CO	L63		S-2a	S-2	173
S	3330	I 90 94 JFK	Kimball Ave	CO	L74		S-2a	S-2	174

S	3335	I 90 94 JFK	Belmont Ave	CO	L61		S-2a	S-2	175
S	3345	I 90 94 JFK	Sacramento Blvd	CO	M55		S-2a	S-2	176
S	3375	I 90 94 JFK	California Ave	CO	M64		S-2a	S-2	177
S	3380	I 90 94 JFK	Diversey Ave	CO	M53		S-2a	S-2	178
S	3395	I 90 94 JFK	Fullerton Ave	CO	N60		S-2a	S-2	179
S	3400	I 90 94 JFK	Fullerton Ave	CO	N49		S-2a	S-2	180
S	3410	I 90 94 JFK	Webster Ave	CO	N47		S-2a	S-2	181
S	3425	I 90 94 JFK	Armitage Ave	CO	O45		S-2a	S-2	182
S	3430	I 90 94 JFK	Armitage Ave	CO	O43		S-2a	S-2	183
S	3440	I 90 94 JFK	North Ave	CO	P41		S-2a	S-2	184
S	3455	I 90 94 JFK	North Ave	CO	O50		S-2a	S-2	185
S	3462	I 90 94 JFK	Division St	CO	R39A		S-2a	S-2	186
S	3470	I 90 94 JFK	Division St	CO	R46		S-2a	S-2	187
S	3475	I 90 94 JFK	Augusta Blvd	CO	R37		S-2a	S-2	188
S	3490	I 90 94 JFK	Chicago Ave	CO	R40		S-2a	S-2	189
S	3495	I 90 94 JFK	Ohio St	CO	S31		S-2a	S-2	190
S	3500	I 90 94 JFK	Ohio St	CO	S33		S-2a	S-2	191
S	3505	I 90 94 JFK	Ohio St	CO	S38		S-2a	S-2	192
S	3510	I 90 94 JFK	Ohio St Feeder	CO	S32		S-2a	S-2	193
S	3515	I 90 94 JFK	Ohio St Feeder	CO	S34		S-2a	S-2	194
S	3520	I 90 94 JFK	Green St	CO	S36		S-2a	S-2	195
S	3530	I 90 94 JFK	Lake St	CO	Y30		S-2a	S-2	196
S	3540	I 90 94 JFK	Randolph St	CO	Y26		S-2a	S-2	197
S	3545	I 90 94 JFK	Randolph St	CO	Y27		S-2a	S-2	198
S	3558	I 90 94 JFK	Washington Blvd	CO	Y22S		S-2a	S-2	199

S	3560	I 90 94 JFK	Washington Blvd	CO	Y22		S-2a	S-2	200
S	3580	I 90 94 JFK	Madison Ave	CO	Y18		S-2a	S-2	201
S	3585	I 90 94 JFK	Madison Ave	CO	Y19		S-2a	S-2	202
S	3610	I 90 94 JFK	Monroe St	CO	Z12		S-2a	S-2	203
S	3615	I 90 94 JFK	Monroe St	CO	Z14		S-2a	S-2	204
S	3620	I 90 94 JFK	Adams St	CO	Z8		S-2a	S-2	205
S	3630	I 90 94 JFK	Adams St	CO	Z11		S-2a	S-2	206
S	3640	I 90 94 JFK	I 290 Circle Interchange	CO	Z1		S-2a	S-2	207
S	3645	I 90 94 JFK	I 290 Circle Interchange	CO	Z2		S-2a	S-2	208
S	3650	I 90 94 JFK	I 290 Circle Interchange	CO	Z3		S-2a	S-2	209
S	3655	I 90 94 JFK	I 290 Circle Interchange	CO	Z4		S-2a	S-2	210
S	3660	I 90 94 JFK	I 290 Circle Interchange	CO	Z5		S-2a	S-2	211
S	3665	I 90 94 JFK IB Van Buren	I 290 Circle Interchange	CO	Z6		S-2a	S-2	212
S	3670	I 90 94 JFK OB Van Buren	I 290 Circle Interchange	CO	Z7		S-2a	S-2	213
S	3675	I 90 94 JFK	I 290 Circle Interchange	CO	MCD5		S-2k	S-2	214
S	4000	I 94 Edens	Wilson Ave	CO	A2A		S-2a	S-2	215
S	4005	I 94 Edens	Wilson Ave	CO	A1		S-2a	S-2	216
S	4016	I 94 Edens	Wilson Ave	CO	MCD10		S-2k	S-2	217
S	4018	I 94 Edens	Wilson Ave	CO	MCD11		S-2k	S-2	218
S	4030	I 94 Edens	IL 50 Cicero Ave	CO	B6		S-2a	S-2	219
S	4035	I 94 Edens	Peterson Ave	CO	C7		S-2a	S-2	220

S	4055	I 94 Edens	Devon Ave	CO	D11		S-2a	S-2	221
S	4060	I 94 Edens	Pratt Ave	CO	D13		S-2a	S-2	222
S	4085	I 94 Edens	Niles Center Rd	CO	E19		S-2a	S-2	223
S	4090	I 94 Edens	Oakton St	CO	G18		S-2a	S-2	224
S	4095	I 94 Edens	Lincoln Ave	CO	G20		S-2a	S-2	225
S	4120	I 94 Edens	Church St	CO	H26		S-2a	S-2	226
S	4125	I 94 Edens	Golf Rd	CO	J25		S-2a	S-2	227
S	4130	I 94 Edens	Old Orchard	CO	K27		S-2a	S-2	228
S	4135	I 94 Edens	Old Orchard	CO	K28		S-2a	S-2	229
S	4140	I 94 Edens	Glenview Ave	CO	K30		S-2a	S-2	230
S	4145	I 94 Edens	Lake Ave	CO	L29		S-2a	S-2	231
S	4150	I 94 Edens	Lake Ave	CO	L32		S-2a	S-2	232
S	4155	I 94 Edens	Lake Ave	CO	L34		S-2a	S-2	233
S	4160	I 94 Edens	US 41 Skokie Blvd	CO	M31		S-2a	S-2	234
S	4165	I 94 Edens	US 41 Skokie Blvd	CO	M36		S-2a	S-2	235
S	4170	I 94 Edens	Winnetka Rd	CO	M33		S-2a	S-2	236
S	4175	I 94 Edens	Willow Rd	CO	N35		S-2a	S-2	237
S	4180	I 94 Edens	Willow Rd	CO	N37		S-2a	S-2	238
S	4185	I 94 Edens	Willow Rd	CO	N38		S-2a	S-2	239
S	4190	I 94 Edens	Willow Rd	CO	N40		S-2a	S-2	240
S	4195	I 94 Edens	1 2 Mi S of Tower Rd	CO	O42		S-2a	S-2	241
S	4200	I 94 Edens	Tower Rd	CO	O39		S-2a	S-2	242
S	4205	I 94 Edens	Tower Rd	CO	O44		S-2a	S-2	243
S	4210	I 94 Edens	1 2 Mi N of Tower	CO	P46		S-2a	S-2	244

			Rd						
S	4215	I 94 Edens	1 2 Mi S of IL 68 Dundee	CO	P48		S-2a	S-2	245
S	4220	I 94 Edens	IL 68 Dundee Rd	CO	R41		S-2a	S-2	246
S	4225	I 94 Edens	IL 68 Dundee Rd	CO	R50		S-2a	S-2	247
S	4230	I 94 Edens	IL 68 Dundee Rd	CO	R52		S-2a	S-2	248
S	4235	I 94 Edens	I 294 Tollway	CO	R54		S-2a	S-2	249
S	4240	I 94 Edens	Lake Cook Rd	CO	S56		S-2a	S-2	250
S	4245	US 41 Skokie Hwy	Lake Cook Rd	LA	S58		S-2a	S-2	251
S	4250	US 41 Skokie Hwy	1/2 Mi N of Lake Cook Rd	LA	T60		S-2a	S-2	252
S	4255	US 41 Skokie Hwy	Bob O Link Golf Club	LA	T45		S-2a	S-2	253
S	4260	US 41 Skokie Hwy	Chantilly Blvd	LA	T62		S-2a	S-2	254
S	4265	US 41 Skokie Hwy	Clavey Rd	LA	T43		S-2a	S-2	255
S	5010	I 94 Ryan	97th St	CO	69		S-2b	S-2	256
S	5020	I 94 Ryan SB	95th St Exit	CO	O67		S-2b	S-2	257
S	5045	I 94 Ryan	87th St Ent	CO	63		S-2b	S-2	258
S	5060	I 94 Ryan	83rd St Exit	CO	61		S-2b	S-2	259
S	5065	I 94 Ryan	79th St Exit	CO	60		S-2b	S-2	260
S	5080	I 94 Ryan	79th St Exit	CO	58A		S-2b	S-2	261
S	5090	I 94 Ryan	76th St CD Ent	CO	57A		S-2b	S-2	262
S	5095	I 94 Ryan	75th St Exit	CO	55		S-2b	S-2	263
S	5100	I 94 Ryan	75th St Exit	CO	54		S-2b	S-2	264
S	5110	I 94 Ryan	75th St Exit	CO	51		S-2b	S-2	265

S	5122	I 94 Ryan NB	67th St Exit	CO	50		S-2b	S-2	266
S	5135	I 94 Ryan SB	65th St Skyway Exit	CO	47		S-2b	S-2	267
S	5140	I 94 Ryan NB	65th St Skyway Ent	CO	48		S-2b	S-2	268
S	5150	I 90 94 Ryan SB	63rd St Exit	CO	45A		S-2b	S-2	269
S	5155	I 90 94 Ryan NB	59th St Exit	CO	46A		S-2b	S-2	270
S	5165	I 90 94 Ryan SB	59th St	CO	43		S-2b	S-2	271
S	5170	I 90 94 Ryan NB	59th St	CO	44		S-2b	S-2	272
S	5220	I 90 94 Ryan SB	53rd St	CO	39		S-2b	S-2	273
S	5230	I 90 94 Ryan	47th St Exit	CO	40		S-2b	S-2	274
S	5240	I 90 94 Ryan	47th St Exit	CO	35		S-2b	S-2	275
S	5245	I 90 94 Ryan	43rd St Exit	CO	38A		S-2b	S-2	276
S	5260	I 90 94 Ryan	43rd St Exit	CO	33		S-2b	S-2	277
S	5265	I 90 94 Ryan	39th St Exit	CO	34		S-2b	S-2	278
S	5295	I 90 94 Ryan NB	39th St Exit	CO	32		S-2b	S-2	279
S	5300	I 90 94 Ryan SB	35th St	CO	29		S-2b	S-2	280
S	5305	I 90 94 Ryan NB	35th St	CO	30		S-2b	S-2	281
S	5310	I 90 94 Ryan SB	35th St	CO	27		S-2b	S-2	282
S	5315	I 90 94 Ryan SB	33rd St	CO	25		S-2b	S-2	283
S	5320	I 90 94 Ryan NB	33rd St	CO	28		S-2b	S-2	284
S	5325	I 90 94 Ryan SB	31st St	CO	23		S-2b	S-2	285
S	5330	I 90 94 Ryan NB	31st St	CO	26		S-2b	S-2	286
S	5335	I 90 94 Ryan	29th St	CO	X20		S-2a	S-2	287
S	5340	I 90 94 Ryan	29th St	CO	X21		S-2a	S-2	288
S	5345	I 90 94 Ryan	29th St	CO	X22		S-2a	S-2	289

S	5350	I 90 94 Ryan	29th St	CO	X24		S-2a	S-2	290
S	5355	I 90 94 Ryan	26th St & Princeton Ave	CO	X19		S-2a	S-2	291
S	5360	I 90 94 Ryan	Ford Ave	CO	Z12		S-2a	S-2	292
S	5365	I 90 94 Ryan	Ford Ave	CO	Z14		S-2a	S-2	293
S	5370	I 90 94 Ryan	22nd St & Emerald Ave	CO	Z10		S-2a	S-2	294
S	5375	I 90 94 Ryan	22nd St & Emerald Ave	CO	Z13		S-2a	S-2	295
S	5380	I 90 94 Ryan	16th St & Union Ave	CO	A11		S-2a	S-2	296
S	5393	I 90 94 Ryan	Taylor St	CO	C6T		S-2a	S-2	297
S	5395	I 90 94 Ryan	Roosevelt Rd	CO	C8		S-2a	S-2	298
S	5400	I 90 94 Ryan	Taylor St	CO	C3		S-2a	S-2	299
S	5410	I 90 94 Ryan	Polk St	CO	D1		S-2a	S-2	300
S	6000	I 94 Ford EB	East of I 94 I 80 Interchange	CO	7		S-2a	S-2	301
S	6005	I 94 Ford WB	East of I 94 I 80 Interchange	CO	6		S-2a	S-2	302
S	6010	I 94 Ford EB	Torrence Slip to I 80 WB	CO	8		S-2a	S-2	303
S	6015	I 94 Ford WB	East of I 94 I 80 Interchange	CO	12		S-2a	S-2	304
S	6040	I 94 Ford WB	163rd St	CO	E38		S-2b	S-2	305
S	6045	I 94 Ford	US 6 159th St	CO	F32		S-2a	S-2	306
S	6050	I 94 Ford	US 6 159th St	CO	F34		S-2a	S-2	307
S	6055	I 94 Ford	US 6 159th St	CO	F36		S-2a	S-2	308
S	6060	I 94 Ford	US 6 159th St	CO	F47		S-2a	S-2	309
S	6065	I 94 Ford	US 6 159th St	CO	F49		S-2a	S-2	310

S	6070	I 94 Ford	Penn Central RR	CO	F45		S-2a	S-2	311
S	6075	I 94 Ford	Pulaski Rd	CO	F43		S-2a	S-2	312
S	6080	I 94 Ford	IL 83 147th St Sibley Blvd	CO	G28		S-2a	S-2	313
S	6085	I 94 Ford	IL 83 147th St Sibley Blvd	CO	G30		S-2a	S-2	314
S	6090	I 94 Ford	IL 83 147th St Sibley Blvd	CO	G37		S-2a	S-2	315
S	6095	I 94 Ford	IL 83 147th St Sibley Blvd	CO	G39		S-2a	S-2	316
S	6100	I 94 Ford	IL 83 147th St Sibley Blvd	CO	G41		S-2a	S-2	317
S	6105	I 94 Ford	Dolton St	CO	H24		S-2a	S-2	318
S	6110	I 94 Ford	Dolton St	CO	H26		S-2a	S-2	319
S	6120	I 94 Ford	Dolton St	CO	H35		S-2a	S-2	320
S	6125	I 94 Ford	N of B & O RR	CO	H31		S-2a	S-2	321
S	6130	I 94 Ford	138th St	CO	X22		S-2a	S-2	322
S	6135	I 94 Ford	138th St	CO	X29		S-2a	S-2	323
S	6140	I 94 Ford	133rd St	CO	X20		S-2a	S-2	324
S	6145	I 94 Ford	130th St	CO	I16		S-2a	S-2	325
S	6150	I 94 Ford	130th St	CO	I18		S-2a	S-2	326
S	6155	I 94 Ford	130th St	CO	I25		S-2a	S-2	327
S	6160	I 94 Ford	130th St	CO	I27		S-2a	S-2	328
S	6165	I 94 Ford	128th St	CO	J23		S-2a	S-2	329
S	6170	I 94 Ford	124th St	CO	J21		S-2a	S-2	330
S	6175	I 94 Ford	125th St	CO	J19		S-2a	S-2	331
S	6180	I 94 Ford	115th St	CO	H12		S-2a	S-2	332
S	6185	I 94 Ford	115th St	CO	H14		S-2a	S-2	333

S	6190	I 94 Ford	115th St	CO	H15		S-2a	S-2	334
S	6195	I 94 Ford	115th St	CO	J17		S-2a	S-2	335
S	6200	I 94 Ford	111th St	CO	K8		S-2a	S-2	336
S	6205	I 94 Ford	111th St	CO	K10		S-2a	S-2	337
S	6210	I 94 Ford	111th St	CO	K11		S-2a	S-2	338
S	6215	I 94 Ford	111th St	CO	K13		S-2a	S-2	339
S	6220	I 94 Ford	107th St	CO	L7		S-2a	S-2	340
S	6225	I 94 Ford	107th St	CO	L9		S-2a	S-2	341
S	6230	I 94 Ford	103rd St	CO	L6		S-2a	S-2	342
S	6235	I 94 Ford	Ellis Ave	CO	L4		S-2a	S-2	343
S	6240	I 94 Ford	Ellis Ave	CO	L5		S-2a	S-2	344
S	6245	I 94 Ford	Rhodes St	CO	M3		S-2a	S-2	345
S	6250	I 94 Ford	Michigan Ave	CO	M1		S-2b	S-2	346
S	7000	I 80 WB	Indiana State Line	CO	2		S-2b	S-2	347
S	7005	I 80 EB	West of Wentworth	CO	1		S-2b	S-2	348
S	7015	I 80 EB	West of Railroad Ave	CO	5		S-2b	S-2	349
S	7025	I 80 EB	I 80 I 94 IL 394	CO	9		S-2b	S-2	350
S	7030	I 80 WB	I 80 I 94 IL 394	CO	10		S-2b	S-2	351
S	8010	I 290 IKE	Morgan St	CO	G1		S-2a	S-2	352
S	8015	I 290 IKE	Racine Ave	CO	G3		S-2a	S-2	353
S	8020	I 290 IKE	Racine Ave	CO	G4		S-2a	S-2	354
S	8025	I 290 IKE	Racine Ave	CO	G5		S-2a	S-2	355
S	8030	I 290 IKE	Racine Ave	CO	G6		S-2a	S-2	356
S	8035	I 290 IKE	Ashland Ave	CO	G7		S-2a	S-2	357

S	8045	I 290 IKE	Damen Ave & Paulina	CO	G9		S-2a	S-2	358
S	8050	I 290 IKE	Damen Ave & Paulina	CO	G10		S-2a	S-2	359
S	8055	I 290 IKE	Damen Ave & Paulina	CO	H11		S-2a	S-2	360
S	8065	I 290 IKE	Damen Ave & Paulina	CO	H12		S-2a	S-2	361
S	8070	I 290 IKE	Damen Ave & Paulina	CO	H12A		S-2a	S-2	362
S	8075	I 290 IKE	Oakley Ave	CO	H13		S-2a	S-2	363
S	8080	I 290 IKE	Oakley Ave	CO	H14		S-2a	S-2	364
S	8090	I 290 IKE	Western Ave	CO	H17		S-2a	S-2	365
S	8100	I 290 IKE	Sacremento Blvd	CO	I18		S-2a	S-2	366
S	8115	I 290 IKE	Homan Ave	CO	I23		S-2a	S-2	367
S	8125	I 290 IKE	Independence Blvd	CO	J24		S-2a	S-2	368
S	8130	I 290 IKE	Independence Blvd	CO	J25		S-2a	S-2	369
S	8145	I 290 IKE	Kostner Ave	CO	J29		S-2a	S-2	370
S	8150	I 290 IKE	IL 50 Cicero Ave	CO	K28		S-2a	S-2	371
S	8155	I 290 IKE	IL 50 Cicero Ave	CO	K31		S-2a	S-2	372
S	8170	I 290 IKE	Laramie Ave	CO	K35		S-2a	S-2	373
S	8180	I 290 IKE	Central Ave	CO	L34		S-2a	S-2	374
S	8185	I 290 IKE	Central Ave	CO	L34S		S-2a	S-2	375
S	8190	I 290 IKE	Central Ave	CO	L37		S-2a	S-2	376
S	8200	I 290 IKE	Austin Blvd	CO	L36		S-2a	S-2	377
S	8205	I 290 IKE	Austin Blvd	CO	M41		S-2a	S-2	378
S	8215	I 290 IKE	East Ave	CO	M38		S-2a	S-2	379

S	8220	I 290 IKE	East Ave	CO	M45		S-2a	S-2	380
S	8225	I 290 IKE	East Ave	CO	MCD1		S-2k	S-2	381
S	8235	I 290 IKE	IL 43 Harlem Ave	CO	M47		S-2a	S-2	382
S	8245	I 290 IKE	Des Plaines Ave	CO	N42		S-2a	S-2	383
S	8250	I 290 IKE	Des Plaines Ave	CO	N51		S-2a	S-2	384
S	8260	I 290 IKE	Des Plaines River	CO	O44		S-2a	S-2	385
S	8270	I 290 IKE	IL 171 1st Ave	CO	O55		S-2a	S-2	386
S	8275	I 290 IKE	IL 171 1st Ave	CO	O57		S-2a	S-2	387
S	8290	I 290 IKE	9th Ave	CO	P61		S-2a	S-2	388
S	8300	I 290 IKE	17th Ave	CO	P56		S-2a	S-2	389
S	8305	I 290 IKE	17th Ave	CO	P63		S-2a	S-2	390
S	8325	I 290 IKE	25th Ave	CO	R67		S-2a	S-2	391
S	8335	I 290 IKE	Addison Creek	CO	R62		S-2a	S-2	392
S	8360	I 290 IKE	Mannheim Rd	CO	S71		S-2a	S-2	393
S	8380	I 290 IKE	Hillside Ave Wolf Rd Exit	CO	T77		S-2a	S-2	394
S	9000	I 290 IKE	Wolf Rd	CO	V72		S-2a	S-2	395
S	9005	I 290 IKE	Wolf Rd	CO	MCD3		S-2k	S-2	396
S	9010	I 290	Butterfield Rd	CO	V74		S-2a	S-2	397
S	9015	I 290	I 294 Tollway	CO	V76		S-2a	S-2	398
S	9020	I 290	I 294 Tollway	CO	V81		S-2a	S-2	399
S	9025	I 290	Maple Ave	CO	W78		S-2a	S-2	400
S	9050	I 290	Cn RR C & NW RR	DU	X84		S-2a	S-2	401
S	9060	I 290	IL 64 North Ave	DU	X87		S-2a	S-2	402
S	9065	I 290	IL 64 North Ave	DU	X88		S-2a	S-2	403

S	9070	I 290	IL 64 North Ave	DU	X89		S-2a	S-2	404
S	9080	I 290	IL 64 North Ave	DU	X91		S-2a	S-2	405
S	9085	I 290	Emroy Ave	DU	X92		S-2a	S-2	406
S	9090	I 290	York Rd & Lake St	DU	Y93		S-2a	S-2	407
S	9095	I 290	York Rd & Lake St	DU	Y94		S-2a	S-2	408
S	9100	I 290 WB	York Rd & Lake St	DU	Y95		S-2a	S-2	409
S	9110	I 290 WB	York Rd & Lake St	DU	Y97		S-2a	S-2	410
S	9115	I 290 WB	Church Rd	DU	Y99		S-2a	S-2	411
S	9120	I 290 EB	Grand Ave	DU	Y98		S-2a	S-2	412
S	9125	I 290 EB	IL 83 Kingery Hwy	DU	A100		S-2a	S-2	413
S	9135	I 290	IL 83 Kingery Hwy	DU	A102		S-2a	S-2	414
S	9145	I 290	Wooddale Rd	DU	B105		S-2a	S-2	415
S	9150	I 290	W of Wooddale Rd	DU	E107		S-2a	S-2	416
S	9155	I 290	Addison Rd	DU	E109		S-2a	S-2	417
S	9160	I 290	W of Addison Rd	DU	E104		S-2a	S-2	418
S	9165	I 290	Mill Rd	DU	F111		S-2a	S-2	419
S	9170	I 290 IL 53	Itasca Rd	DU	G106		S-2a	S-2	420
S	9175	I 290 IL 53	Nordic Rd	DU	G110		S-2a	S-2	421
S	9180	I 290 IL 53	Nordic Rd	DU	J112		S-2a	S-2	422
S	9190	I 290 IL 53	N of IL 19 Irving Park Rd	DU	J114		S-2a	S-2	423
S	9195	I 290 IL 53	1/2 Mi S of Thorndale Ave	DU	J113		S-2a	S-2	424
S	9200	I 290 IL 53 IB	S of Thorndale Ave	DU	J116		S-2a	S-2	425

S	9205	I 290 IL 53 OB	S of Thorndale Ave	DU	J117		S-2a	S-2	426
S	9210	I 290 IL 53 IB	Thorndale Ave NE	DU	L119		S-2a	S-2	427
S	9215	I 290 IL 53 IB	Thorndale Ave NW	DU	K118		S-2a	S-2	428
S	9225	I 290 IL 53 OB	Devon Ave	DU	L121		S-2a	S-2	429
S	9230	I 290 IL 53 OB	N of Devon Ave	CO	L123		S-2a	S-2	430
S	9235	I 290 IL 53 IB	Biesterfield Rd	CO	L122		S-2a	S-2	431
S	9240	I 290 IL 53 OB Ent	Biesterfield Rd	CO	L123A		S-2a	S-2	432
S	9245	I 290 IL 53 IB	N of Biesterfield Rd	CO	M124		S-2a	S-2	433
S	9250	I 290 IL 53 IB	WGn Radio Station Tower	CO	M126		S-2a	S-2	434
S	9255	I 290 IL 53 IB	1 1/2 Mi S of IL 72 Higgins Rd	CO	M128		S-2a	S-2	435
S	9260	I 290 IL 53 IB	1 Mi S of IL 72 Higgins Rd	CO	N130		S-2a	S-2	436
S	9270	I 290 IL 53 OB	IL 72 Higgins Rd	CO	O127		S-2a	S-2	437
S	9275	I 290 IL 53 IB	IL 72 Higgins Rd	CO	O132		S-2a	S-2	438
S	9285	I 290 IL 53 OB	Woodfield Dr	CO	P129		S-2a	S-2	439
S	9295	I 290 IL 53	I 90 Tollway	CO	P131		S-2a	S-2	440
S	9300	I 290 IL 53	I 90 Tollway	CO	P138		S-2a	S-2	441
S	10000	IL 53	I 90 Tollway IB	CO	133		S-2a	S-2	442
S	10003	IL 53	I 90 Tollway OB	CO	140		S-2a	S-2	443
S	10005	IL 53	IL 62 Algonquin Rd	CO	135		S-2a	S-2	444
S	10010	IL 53	IL 62 Algonquin Rd	CO	142		S-2a	S-2	445

S	10015	IL 53	1/2 Mi n of Algonquin Rd	CO	144		S-2a	S-2	446
S	10020	IL 53	Kirchoff Rd	CO	146		S-2a	S-2	447
S	10025	IL 53	Kirchoff Rd	CO	137		S-2a	S-2	448
S	10030	IL 53	Industrial Ave	CO	143		S-2a	S-2	449
S	10035	IL 53	Euclid St	CO	139		S-2a	S-2	450
S	10040	IL 53	Euclid St	CO	148		S-2a	S-2	451
S	10045	IL 53	Euclid St	CO	150		S-2a	S-2	452
S	10047	IL 53	Euclid St	CO	141		S-2a	S-2	453
S	10050	IL 53	US 14 Northwest Hwy	CO	145		S-2a	S-2	454
S	10055	IL 53	US 14 Northwest Hwy	CO	152		S-2a	S-2	455
S	10060	IL 53	Palatine Rd	CO	147		S-2a	S-2	456
S	10065	IL 53	Palatine Rd	CO	149		S-2a	S-2	457
S	10070	IL 53	Palatine Rd	CO	154		S-2a	S-2	458
S	10075	IL 53	Palatine Rd	CO	156		S-2a	S-2	459
S	10080	IL 53	Anderson Dr	CO	151		S-2a	S-2	460
S	10085	IL 53	US 12 Rand Rd	CO	153		S-2a	S-2	461
S	10090	IL 53	US 12 Rand Rd	CO	158		S-2a	S-2	462
S	10095	IL 53	IL 68 Dundee Rd	CO	155		S-2a	S-2	463
S	10100	IL 53	IL 68 Dundee Rd	CO	157		S-2a	S-2	464
S	10105	IL 53	IL 68 Dundee Rd	CO	160		S-2a	S-2	465
S	10110	IL 53	IL 68 Dundee Rd	CO	162		S-2a	S-2	466
S	10115	IL 53	1/2 Mi S of Lake Cook Rd	CO	159		S-2a	S-2	467
S	11000	I 355	Schick Rd	DU	G108		S-2a	S-2	468

S	11005	I 355	US 20 Lake St	DU	I1		S-2a	S-2	469
S	11010	I 355	US 20 Lake St	DU	I2		S-2a	S-2	470
S	11015	I 355	US 20 Lake St	DU	I4		S-2a	S-2	471
S	11020	I 355	Kings Point Dr	DU	I6		S-2a	S-2	472
S	12000	Lake Shore Dr	S of Marquette Rd	CO	1		S-2a	S-2	473
S	12005	Lake Shore Dr	S of Marquette Rd	CO	2		S-2a	S-2	474
S	12010	Lake Shore Dr	Hayes Dr	CO	3		S-2a	S-2	475
S	12015	Lake Shore Dr	S of 59th St	CO	4		S-2a	S-2	476
S	12020	Lake Shore Dr	S of 55th St	CO	5		S-2a	S-2	477
S	12025	Lake Shore Dr	S of 53rd St	CO	6		S-2a	S-2	478
S	12030	Lake Shore Dr	S of 48th St	CO	7		S-2a	S-2	479
S	12035	Lake Shore Dr	S of 47th St	CO	8		S-2a	S-2	480
S	12040	Lake Shore Dr	S of 47th St	CO	9		S-2a	S-2	481
S	12045	Lake Shore Dr	S of 43rd St	CO	10		S-2a	S-2	482
S	12050	Lake Shore Dr	S of Oakwood Blvd	CO	11		S-2a	S-2	483
S	12055	Lake Shore Dr	S of Oakwood Blvd	CO	12		S-2a	S-2	484
S	12060	Lake Shore Dr	n of Oakwood Blvd	CO	13		S-2a	S-2	485
S	12065	Lake Shore Dr	S of 35th St	CO	14		S-2a	S-2	486
S	12070	Lake Shore Dr	S of 31st St	CO	15		S-2a	S-2	487
S	12075	Lake Shore Dr	N of 31st St	CO	16		S-2a	S-2	488
S	12080	Lake Shore Dr	S of 31st St	CO	17		S-2a	S-2	489
S	12085	Lake Shore Dr	N of 31st St	CO	18		S-2a	S-2	490
S	12090	Lake Shore Dr	25th St	CO	19		S-2a	S-2	491

S	12095	Lake Shore Dr	23rd St	CO	20		S-2a	S-2	492
S	12100	Lake Shore Dr	N of 23rd St	CO	21		S-2a	S-2	493
S	12105	Lake Shore Dr	N of 23rd St	CO	MCD7		S-2k	S-2	494
S	12106	Lake Shore Dr	18th St	CO	22		S-2a	S-2	495
S	12107	Lake Shore Dr OB	18th St	CO	21A		S-2a	S-2	496
S	12110	Lake Shore Dr	S of McFetridge Dr	CO	23		S-2a	S-2	497
S	12115	Lake Shore Dr	S of Balbo Ave	CO	24		S-2a	S-2	498
S	12120	Lake Shore Dr	Jackson Blvd	CO	25		S-2a	S-2	499
S	13025	Lake Shore Dr	Randolph St	CO	26		S-2a	S-2	500
S	13030	Lake Shore Dr	Randolph St	CO	27		S-2a	S-2	501
S	13035	Lake Shore Dr	Randolph St	CO	28		S-2a	S-2	502
S	13040	Lake Shore Dr	Randolph St	CO	29		S-2a	S-2	503
S	13045	Lake Shore Dr	Wacker Dr	CO	30		S-2a	S-2	504
S	13050	Lake Shore Dr	Illinois St	CO	31		S-2a	S-2	505
S	13055	Lake Shore Dr	Grand Ave	CO	32		S-2a	S-2	506
S	13060	Lake Shore Dr	Wacker Dr	CO	33		S-2a	S-2	507
S	13065	Lake Shore Dr	Erie St	CO	34		S-2a	S-2	508
S	13070	Lake Shore Dr	S of Chicago Ave	CO	35		S-2a	S-2	509
S	13075	Lake Shore Dr	Chicago Ave	CO	36		S-2a	S-2	510
S	13080	Lake Shore Dr	Chicago Ave	CO	37		S-2a	S-2	511
S	13085	Lake Shore Dr	Chestnut St	CO	38		S-2a	S-2	512
S	13090	Lake Shore Dr	Chestnut St	CO	39		S-2a	S-2	513
S	13095	Lake Shore Dr	Michigan Ave	CO	40		S-2a	S-2	514
S	13100	Lake Shore Dr	Michigan Ave	CO	41		S-2a	S-2	515

S	13105	Lake Shore Dr	Michigan Ave	CO	42		S-2a	S-2	516
S	13110	Lake Shore Dr	Division St	CO	43		S-2a	S-2	517
S	13115	Lake Shore Dr	Division St	CO	44		S-2a	S-2	518
S	13120	Lake Shore Dr	Division St	CO	45		S-2a	S-2	519
S	13125	Lake Shore Dr	North Ave	CO	46		S-2a	S-2	520
S	13130	Lake Shore Dr	North Ave	CO	47		S-2a	S-2	521
S	13135	Lake Shore Dr	North Ave	CO	48		S-2a	S-2	522
S	13140	Lake Shore Dr	North Ave	CO	49		S-2a	S-2	523
S	13145	Lake Shore Dr	North Ave	CO	50		S-2a	S-2	524
S	13150	Lake Shore Dr	Armitage Ave	CO	51		S-2a	S-2	525
S	13155	Lake Shore Dr	Fullerton Parkway	CO	52		S-2a	S-2	526
S	13160	Lake Shore Dr	Fullerton Parkway	CO	53		S-2a	S-2	527
S	13165	Lake Shore Dr	Fullerton Parkway	CO	54		S-2a	S-2	528
S	13170	Lake Shore Dr	Diversey Ave	CO	55		S-2a	S-2	529
S	13175	Lake Shore Dr	Diversey Ave	CO	56		S-2a	S-2	530
S	13180	Lake Shore Dr	Belmont Ave	CO	57		S-2a	S-2	531
S	13185	Lake Shore Dr	Belmont Ave	CO	58		S-2a	S-2	532
S	13190	Lake Shore Dr	Belmont Ave	CO	59		S-2a	S-2	533
S	13195	Lake Shore Dr	Belmont Ave	CO	60		S-2a	S-2	534
S	13200	Lake Shore Dr	Belmont Ave	CO	61		S-2a	S-2	535
S	13205	Lake Shore Dr	Addison St	CO	62		S-2a	S-2	536
S	13210	Lake Shore Dr	Addison St	CO	63		S-2a	S-2	537
S	13215	Lake Shore Dr	IL 19 Irving Park Rd	CO	64		S-2a	S-2	538

S	13220	Lake Shore Dr	IL 19 Irving Park Rd	CO	65		S-2a	S-2	539
S	13225	Lake Shore Dr	IL 19 Irving Park Rd	CO	66		S-2a	S-2	540
S	13230	Lake Shore Dr	IL 19 Irving Park Rd	CO	67		S-2a	S-2	541
S	13235	Lake Shore Dr	Montrose Ave	CO	68		S-2a	S-2	542
S	13240	Lake Shore Dr	Montrose Ave	CO	69		S-2a	S-2	543
S	13245	Lake Shore Dr	Wilson Ave	CO	70		S-2a	S-2	544
S	13250	Lake Shore Dr	Wilson Ave	CO	71		S-2a	S-2	545
S	13255	Lake Shore Dr	Wilson Ave	CO	72		S-2a	S-2	546
S	13260	Lake Shore Dr	Lawrence Ave	CO	73		S-2a	S-2	547
S	13265	Lake Shore Dr	Lawrence Ave	CO	74		S-2a	S-2	548
S	13270	Lake Shore Dr	Lawrence Ave	CO	75		S-2a	S-2	549
S	13275	Lake Shore Dr	Foster Ave	CO	76		S-2a	S-2	550
S	13280	Lake Shore Dr	Foster Ave	CO	77		S-2a	S-2	551
S	13285	Lake Shore Dr	Foster Ave	CO	78		S-2a	S-2	552
S	13290	Lake Shore Dr	Bryn Mawr Ave	CO	79		S-2a	S-2	553
S	13295	Lake Shore Dr	Bryn Mawr Ave	CO	80		S-2a	S-2	554
S	13297	Lake Shore Dr	Bryn Mawr Ave	CO	81		S-2a	S-2	555
S	14000	Elgin O'Hare	IL 53 Rohlwing Rd	DU	1		S-2a	S-2	556
S	14005	Elgin O'Hare	1 2 Mi W of IL 53 Rohlwing Rd	DU	2		S-2a	S-2	557
S	14010	Elgin O'Hare	E of Meacham Rd	DU	3		S-2a	S-2	558
S	14015	Elgin O'Hare	Meacham Rd	CO	5		S-2a	S-2	559
S	14020	Elgin O'Hare	Plum Grove Rd	CO	7		S-2a	S-2	560
S	14025	Elgin O'Hare	1 2 Mi E of	CO	4		S-2a	S-2	561

			Roselle Rd						
S	14030	Elgin O'Hare	E of Roselle Rd	CO	6		S-2a	S-2	562
S	14035	Elgin O'Hare	W of Roselle Rd	CO	9		S-2a	S-2	563
S	14040	Elgin O'Hare	E of Mitchell Blvd	CO	11		S-2a	S-2	564
S	14045	Elgin O'Hare	E of Wright Blvd	CO	13		S-2a	S-2	565
S	14050	Elgin O'Hare	E of Wright Blvd	CO	8		S-2a	S-2	566
S	14055	Elgin O'Hare	W of Wright Blvd	CO	15		S-2a	S-2	567
S	14060	Elgin O'Hare	IL 19 Irving Park Rd	CO	10		S-2a	S-2	568
S	14065	Elgin O'Hare	IL 19 Irving Park Rd	CO	17		S-2a	S-2	569
S	14070	Elgin O'Hare	Gary Ave	CO	19		S-2a	S-2	570
S	14075	Elgin O'Hare	Springinsguth Rd	CO	21		S-2a	S-2	571
S	14080	Elgin O'Hare	W of Springinsguth Rd	CO	12		S-2a	S-2	572
S	14085	Elgin O'Hare	Metra RR Bridge	DU	14		S-2a	S-2	573
S	14090	Elgin O'Hare	US 20 Lake St	DU	16		S-2a	S-2	574
S	15000	I 80	I 294 Tollway	CO	2		S-2a	S-2	575
S	15005	I 80	Kedzie Ave	CO	4E		S-2a	S-2	576
S	15010	I 80	1 2 Mi W of Kedzie Ave	CO	1		S-2a	S-2	577
S	15015	I 80	Crawford Ave	CO	6E		S-2a	S-2	578
S	15020	I 80	1 2 Mi E of IL 50 Cicero Ave	CO	8E		S-2a	S-2	579
S	15025	I 80	IL 50 Cicero Ave	CO	10		S-2a	S-2	580
S	15030	I 80	E of I 57	CO	3		S-2a	S-2	581
S	15035	I 80	W of I 57	CO	5		S-2a	S-2	582
S	15040	I 80	CEntral Ave	CO	7		S-2a	S-2	583

S	15045	I 80	183rd St	CO	12		S-2a	S-2	584
S	15050	I 80	Ridgeland Ave	CO	14		S-2a	S-2	585
S	15055	I 80	Oak Park Ave	CO	9		S-2a	S-2	586
S	15060	I 80	E of IL 43 Harlem Ave	CO	16		S-2a	S-2	587
S	15065	I 80	W of IL 43 Harlem Ave	WI	18		S-2a	S-2	588
S	15067	I 80	IL 43 Harlem Ave	CO	MCD13		S-2k	S-2	589
S	15070	I 80	76th St	WI	11		S-2a	S-2	590
S	15075	I 80	80th Ave	WI	20		S-2a	S-2	591
S	15080	I 80	187th St	WI	13		S-2a	S-2	592
S	15085	I 80	E of Metra RR Bridge	WI	15		S-2a	S-2	593
S	15090	I 80	W of Metra RR Bridge	WI	17		S-2a	S-2	594
S	15095	I 80	E of US 45 LaGrange Rd	WI	22		S-2a	S-2	595
S	15100	I 80	W of US 45 LaGrange Rd	WI	24		S-2a	S-2	596
S	16000	IL 394 SB	I 80 94 SW Quad IL 39	CO	11		S-2b	S-2	597
S	16005	IL 394 nB	I 80 94 SE Quad IL 39	CO	14		S-2b	S-2	598
S	16010	IL 394 nB	S of Thorton Lansing Rd	CO	16		S-2b	S-2	599
S	20000	US 12 IL 59	IL134 Long Lake Big Hollow Rd	LA	1040		S-2i	S-2	600
S	20005	IL 59 Sutton Rd	US 20 Lake St	CO	1050		S-2i	S-2	601
S	20010	I 90 JFK 94	51st St	CO	1121		S-2i	S-2	602

S	20015	I 90 JFK 94	51st St	CO	1123		S-2i	S-2	603
S	20020	US 6 159th St	Pulaski Rd Crawford Ave	CO	1170		S-2i	S-2	604
S	20025	IL 53	75th St	DU	1310		S-2i	S-2	605
S	20030	IL 64 North Ave	IL 59 Sutton Rd	DU	1320		S-2i	S-2	606
S	20035	IL 31 Lincoln Way	IL 56 State St	KA	1420		S-2i	S-2	607
S	20040	US 45	IL 176	LA	1500		S-2i	S-2	608
S	20045	IL 22 Half Day Rd	IL 83	LA	1520		S-2i	S-2	609
S	20050	IL 31	US 14 nwest Hwy	MC	1610		S-2i	S-2	610
S	20055	US 45 LaGrange Rd	US 30 Lincoln Hwy	WI	1730		S-2i	S-2	611
S	20060	IL 38 Roosevelt Rd	W of Finley Rd	DU	1330		S-2i	S-2	612
S	20065	IL 131 Green Bay Rd	S of 20th St	LA	1530		S-2i	S-2	613
S	20070	IL 43 Harlem Ave	Techny Rd	CO	1280		S-2i	S-2	614
S	20075	IL 68 Dundee Rd	Portwine Rd	CO	1290		S-2i	S-2	615
S	20080	Peplow Rd	N of Ramm Rd	KA	1430		S-2i	S-2	616
S	20085	IL 58 Golf Rd	Birch Ave	CO	1260		S-2i	S-2	617
S	20090	IL 50 Cicero Ave	S of 99th St	CO	1200		S-2i	S-2	618
S	20095	IL 83 Kingery Hwy	N of 55th St	DU	1340		S-2i	S-2	619
S	20100	IL 59	S of Hillcrest Dr	LA	1540		S-2i	S-2	620
S	20105	Independence	n of Taylor St	WI	1740		S-2i	S-2	621

		Blvd							
S	20110	IL 7 SW Highway	131st St	CO	1190		S-2i	S-2	622
S	20115	US 14 Northwest Hwy	W of Chatham Pl	CO	1270		S-2i	S-2	623
S	20120	Devon Ave	E of Arlington Heights Rd	CO	1230		S-2i	S-2	624
S	20125	Wooddale Ave	S of Mark St	DU	1350		S-2i	S-2	625
S	20130	Galligan Rd	S of Freeman Rd	KA	1440		S-2i	S-2	626
S	20135	Wilson Ave	N of Marshall Blvd	LA	1550		S-2i	S-2	627
S	20140	IL 176 Park Ave	E of Blue Spruce Ln	LA	1560		S-2i	S-2	628
S	20145	IL 126 Plainfield Rd	N of 143rd St	WI	1750		S-2i	S-2	629
S	20150	US 14	SE of Deep Cut Rd	MC	1620		S-2i	S-2	630
S	20155	Campton Hills Rd	E of Lynn Dr	KA	1450		S-2i	S-2	631
S	20160	Kedzie Ave	S of Touhy Ave	CO	1250		S-2i	S-2	632
S	20165	IL 72 Higgins	E of I 294 Tollway	CO	1240		S-2i	S-2	633
S	20170	Lake St	W of West St	LA	1570		S-2i	S-2	634
S	20175	7th St	W of Peppermill Rd	WI	1760		S-2i	S-2	635
S	20180	Manhattan Rd	1 Mi N of Elwood	WI	1770		S-2i	S-2	636
S	20185	I 57	E of Kennedy Rd	WI	1780		S-2i	S-2	637
S	20190	Peotone Beecher Rd	W of Kedzie Ave	WI	1790		S-2i	S-2	638
S	20195	I 80	N of Shepley Rd Holt Rd	WI	1850		S-2i	S-2	639
S	20196	I 80	Cherry Hill Rd	WI	1840		S-2i	S-2	640

S	20200	I 55 Stev	S of IL 113	WI	1860		S-2i	S-2	641
S	20205	IL 83 147th St Sibley Blvd	W of Minerva Ave	CO	1180		S-2i	S-2	642
S	20210	Cossitt Ave	E of Sunset Ave	CO	1210		S-2i	S-2	643
S	20215	US 12 45 Mannheim Rd	Roadway Shipping Terminal Ent.	CO	1220		S-2i	S-2	644
S	20220	IL 59	S of 75th St	DU	1995		S-2i	S-2	645
S	22000	I 90 JFK	Nagle Ave	CO	1110		S-2i	S-2	646
S	22015	I 290	IL 83 Kingery Hwy	DU	1140		S-2i	S-2	647
S	22020	I 55 Stev	Cass Ave	DU	1176		S-2i	S-2	648
S	22025	I 80	3 4 Mi W of Kedzie Ave	CO	1177		S-2i	S-2	649
S	22040	US 52 Joliet Rd	US 45 LaGrange Rd	WI	5182		S-2i	S-2	650
S	23100	I 55 Stev	IL 129	WI			S-2j	S-2	651
S	23200	I 57	N of US 30	WI			S-2j	S-2	652
S	23300	I 57	Peotone Wilmington Exit	WI			S-2j	S-2	653

S	1007	I 55 Stev OB	Martin Luther King Dr	CO	DMS-7		S-3f	S-3	1
S	1112	I 55 Stev Median	W of Kedzie Ave	CO	DMS-5		S-3f	S-3	2
S	1262	I 55 Stev IB	W of 1st Ave	CO	DMS-23		S-3a	S-3	3
S	1332	I 55 Stev IB	W of County Line Rd	DU	DMS-24		S-3a	S-3	4
S	1570	I 55 Stev nE	Caton Farm	WI	DMS-34		S-3c	S-3	5
S	1605	I 55 Stev nE	US 6	WI	DMS-33		S-3c	S-3	6

S	2052	I 57 IB	119th St	CO	DMS-29		S-3e	S-3	7
S	2265	I 57 IB	S of I 80 183rd St	CO	DMS-28		S-3e	S-3	8
S	3096	I 90 JFK IB	Canfield Ave	CO	DMS-19		S-3a	S-3	9
S	3176	I 90 JFK IB	Foster Ave	CO	DMS-18		S-3f	S-3	10
S	3281	I 90 94 JFK IB	Pulaski Rd	CO	DMS-17		S-3f	S-3	11
S	3331	I 90 94 JFK Reversible IB	Kimball Ave	CO	DMS-16		S-3a	S-3	12
S	3416	I 90 94 JFK Reversible IB	Webster Ave	CO	DMS-14		S-3a	S-3	13
S	3417	I 90 94 JFK OB	Damen Ave	CO	DMS-15		S-3f	S-3	14
S	3482	I 90 94 JFK IB	Augusta Blvd	CO	DMS-13		S-3f	S-3	15
S	4086	I 94 Edens IB	Niles Center Rd	CO	DMS-21		S-3a	S-3	16
S	4206	I 94 Edens IB	Tower Rd	CO	DMS-22		S-3a	S-3	17
S	5052	I 94 Ryan SB	83rd St	CO	DMS-30		S-3b	S-3	18
S	5053	I 94 Ryan NB	83rd St	CO	DMS-02		S-3b	S-3	19
S	5186	I 90 94 Ryan NB	57th St Locals	CO	DMS-3L		S-3b	S-3	20
S	5188	I 90 94 Ryan NB	57th St	CO	DMS-3E		S-3b	S-3	21
S	5196	I 90 94 Ryan SB	55th St Locals	CO	DMA31L		S-3b	S-3	22
S	5197	I 90 94 Ryan SB	55th St	CO	DMS-31E		S-3b	S-3	23
S	5292	I 90 94 Ryan SB	39th St Locals	CO	DMS-32L		S-3b	S-3	24
S	5293	I 90 94 Ryan SB	39th St	CO	DMS-32E		S-3b	S-3	25
S	5296	I 90 94 Ryan NB	37th St Locals	CO	DMS-4L		S-3b	S-3	26
S	5298	I 90 94 Ryan NB	37th St	CO	DMS-4E		S-3b	S-3	27
S	5377	I 90 94 Ryan	S Branch of Chicago River	CO	DMS-8		S-3b	S-3	28
S	5406	I 90 94 Ryan	Taylor St	CO	DMS-9		S-3f	S-3	29

S	5407	I 90 94 Ryan Median	Taylor St	CO	DMS-10		S-3f	S-3	30
S	6103	I 94 Ford IB	145th St	CO	DMS-26		S-3b	S-3	31
S	6104	I 94 Ford OB	145th St	CO	DMS-25		S-3d	S-3	32
S	6177	I 94 Ford SB	119th St	CO	DMS-20		S-3b	S-3	33
S	6178	I 94 Ford NB	124th St	CO	DMS-06		S-3b	S-3	34
S	7001	I 80 WB	State Line	CO	DMS-1		S-3c	S-3	35
S	8002	I 290 IKE IB	E of Old Post Office	CO	DMS-12		S-3f	S-3	36
S	8072	I 290 IKE IB	Damen Ave	CO	DMS-11		S-3f	S-3	37
S	9252	I 290 IB	N of Biesterfield Rd	DU	DMS-35		S-3e	S-3	38
S	10029	IL 53 I 290 Exit	Industrial Ave	CO	DMS-36		S-3e	S-3	39
S	16015	IL 394 NB	186th St	CO	DMS-27		S-3d	S-3	40

S	1282	US 12 20 45 LaGrange nB	87th St	CO	DMS-104		S-4c	S-4	1
S	1283	US 12 20 45 LaGrange SB	N of I 55	CO	DMS-105		S-4c	S-4	2
S	4072	Touhy Ave WB OB	E of I 94	CO	DMS-106		S-4a	S-4	3
S	4073	Touhy Ave EB IB	W of I 94	CO	DMS-107		S-4b	S-4	4
S	9132	IL 83 Kingery NB	I 290	DU	DMS-102		S-4c	S-4	5
S	9133	IL 83 Kingery SB	I 290	DU	DMS-103		S-4c	S-4	6
S	22050	Grand Ave EB IB	77th Ave	CO	DMS-101		S-4a	S-4	7
S	22100	US 41 Skokie Hwy OB	S of West Park Ave	LA	DMS-111		S-4c	S-4	8

S	22150	Stoney Island Ave SB OB	98th Pl	CO	DMS-108		S-4c	S-4	9
S	22200	US 6 159th St EB IB	W of Crawford Ave	CO	DMS-109		S-4c	S-4	10
S	22250	US 6 159th St WB OB	W of Dixie Hwy	CO	DMS-110		S-4a	S-4	11
S	22300	US 41 Skokie Hwy OB	S of IL 22 Half Day Rd	LA	DMS-112		S-4b	S-4	12
S	22350	US 45 Mannheim Rd nB	S of I 290	CO	DMS-113		S-4a	S-4	13
S	22400	US 45 Mannheim Rd SB	N of I 290	CO	DMS-114		S-4a	S-4	14
S	22450	US 45 Mannheim Rd SB	N of I 190	CO	DMS-115		S-4b	S-4	15

SURVEILLANCE SYSTEM LOCATIONS UNDER CONSTRUCTION

COMING ON STATE MAINTENANCE End of 2012

Sys	Loc. #	Main Route	Cross St	Co	Cab#	Expected Date	System Type	Pay Item	Qty
S	2005	I 57	IL 1 Halsted St	CO	A2	Oct-12	S-1b	S-1	1
S	6255	I 94 Ford	99th Pl Wabash Ent	CO	M2	Oct-12	S-1b	S-1	2
S	8005	I 290 IKE	Canal St	CO	F0	Oct-12	S-1a	S-1	3
S	1475	I 55 Stev	.5 Mile N of Weber Rd	WI	77	Sep-12	S-2b	S-2	4
S	1480	I 55 Stev	Weber Rd Exit	WI	79	Sep-12	S-2g	S-2	5
S	1485	I 55 Stev	Weber Rd North	WI	81	Sep-12	S-2b	S-2	6
S	1490	I 55 Stev	Weber Rd South	WI	83	Sep-12	S-2b	S-2	7

S	1495	I 55 Stev	.5 Mile South of Weber Rd	WI	85	Sep-12	S-2b	S-2	8
S	1500	I 55 Stev	1 Mile North of IL 126	WI	87	Sep-12	S-2b	S-2	9
S	1505	I 55 Stev	.5 Mile North of IL 126	WI	94	Sep-12	S-2b	S-2	10
S	1510	I 55 Stev	IL 126 Exit	WI	89	Sep-12	S-2b	S-2	11
S	1515	I 55 Stev	IL 126	WI	91	Sep-12	S-2g	S-2	12
S	1520	I 55 Stev	.25 Mile South of IL 126	WI	96	Sep-12	S-2g	S-2	13
S	1525	I 55 Stev	.75 Mile South of IL 126	WI	98	Sep-12	S-2b	S-2	14
S	1530	I 55 Stev	.5 Mile N of Lockport Rd	WI	93	Sep-12	S-2b	S-2	15
S	1535	I 55 Stev	North of Lockport Rd	WI	95	Sep-12	S-2b	S-2	16
S	1540	I 55 Stev	South of Lockport Rd	WI	97	Sep-12	S-2b	S-2	17
S	1545	I 55 Stev	North of Renwick Rd	WI	100	Sep-12	S-2b	S-2	18
S	1550	I 55 Stev	.5 Mile North of US 30	WI	100A	Sep-12	S-2b	S-2	19
S	1555	I 55 Stev	US 30 North	WI	101	Sep-12	S-2b	S-2	20
S	1560	I 55 Stev	US 30 South	WI	103	Sep-12	S-2b	S-2	21
S	1565	I 55 Stev	.5 Mile South of US 30	WI	105	Sep-12	S-2b	S-2	22
S	1570	I 55 Stev	.5 Mile North Caton Farm Rd	WI	107	Sep-12	S-2b	S-2	23
S	1575	I 55 Stev	Caton Farm Rd	WI	102	Sep-12	S-2b	S-2	24
S	1580	I 55 Stev	.5 Mile South of Caton Farm	WI	104	Sep-12	S-2b	S-2	25

S	1585	I 55 Stev	1 Mile North of US 52	WI	109	Sep-12	S-2b	S-2	26
S	1590	I 55 Stev	.5 Mile North of US 52	WI	106	Sep-12	S-2b	S-2	27
S	1595	I 55 Stev	Black Rd	WI	108	Sep-12	S-2b	S-2	28
S	1600	I 55 Stev	.5 Mile North of US 52	WI	111	Sep-12	S-2b	S-2	29
S	1605	I 55 Stev	US 52 North	WI	113	Sep-12	S-2b	S-2	30
S	1610	I 55 Stev	US 52 South	WI	115	Sep-12	S-2b	S-2	31
S	1615	I 55 Stev	.5 Mile North of IL 59	WI	110	Sep-12	S-2b	S-2	32
S	1620	I 55 Stev	IL 59 North	WI	117	Sep-12	S-2b	S-2	33
S	1625	I 55 Stev	IL 59 South	WI	119	Sep-12	S-2b	S-2	34
S	1630	I 55 Stev	.5 Mile North of I 80	WI	121	Sep-12	S-2b	S-2	35
S	1635	I 55 Stev	I 80 North	WI	123	Sep-12	S-2b	S-2	36
S	1640	I 55 Stev	I 80 South	WI	125	Sep-12	S-2b	S-2	37
S	1645	I 55 Stev	.5 Mile South of I 80	WI	127	Sep-12	S-2b	S-2	38
S	1650	I 55 Stev	1 Mile South of I 80	WI	129	Sep-12	S-2b	S-2	39
S	1655	I 55 Stev	Canal Rd	WI	131	Sep-12	S-2b	S-2	40
S	1660	I 55 Stev	US 6 North	WI	133	Sep-12	S-2b	S-2	41
S	1665	I 55 Stev	US 6 South	WI	135	Sep-12	S-2b	S-2	42
S	1670	I 55 Stev	Amoco Rd	WI	137	Sep-12	S-2b	S-2	43
S	1675	I 55 Stev	1 Mile North of Bluff Rd	WI	139	Sep-12	S-2b	S-2	44
S	1680	I 55 Stev	.5 Mile North of Bluff Rd	WI	141	Sep-12	S-2b	S-2	45

S	1685	I 55 Stev	Bluff Rd North	WI	143	Sep-12	S-2b	S-2	46
S	1690	I 55 Stev	Bluff Rd South	WI	145	Sep-12	S-2b	S-2	47
S	1695	I 55 Stev	North of Desplaines River	WI	147	Oct-12	S-2b	S-2	48
S	1700	I 55 Stev	Arsenal Rd South of DesPl River	WI	149	Oct-12	S-2b	S-2	49
S	1705	I 55 Stev	.5 Mile North of Arsenal Rd Interch	WI	151	Oct-12	S-2b	S-2	50
S	1710	I 55 Stev	Arsenal Rd Interchange North	WI	153	Oct-12	S-2b	S-2	51
S	1715	I 55 Stev	Arsenal Rd Interchange South	WI	155	Oct-12	S-2b	S-2	52
S	1720	I 55 Stev	.5 Mile South of Arsenal Rd	WI	112A	Oct-12	S-2b	S-2	53
S	1725	I 55 Stev	.5 Mile West of Blodgett Rd	WI	159	June-12	S-2g	S-2	54
S	1730	I 55 Stev	1 Mile East of River Rd	WI	161	June-12	S-2g	S-2	55
S	1735	I 55 Stev	.5 Mile East of River Rd	WI	163	June-12	S-2g	S-2	56
S	1740	I 55 Stev	River Rd	WI	165	June-12	S-2b	S-2	57
S	1745	I 55 Stev	Lorenzo Rd East	WI	167	June-12	S-2b	S-2	58
S	1750	I 55 Stev	Lorenzo Rd West	WI	169	June-12	S-2b	S-2	59
S	1755	I 55 Stev	.5 Mile West of Lorenzo Rd	WI	171	June-12	S-2b	S-2	60
S	2000	I 57	C&W RR	CO	A3	Oct-12	S-2a/f	S-2	61
S	2010	I 57	IL 1 Halsted St	CO	A5	Oct-12	S-2a/f	S-2	62
S	2135	I 57	I 294 Tollway	CO	J32	Mar-13	S-2a	S-2	63

S	2140	I 57	North of Kedzie Ave	CO	K27	Mar-13	S-2a	S-2	64
S	2145	I 57	155th St	CO	K29	Mar-13	S-2a	S-2	65
S	2155	I 57	US 6 159th St	CO	L33	Mar-13	S-2a	S-2	66
S	2160	I 57	US 6 159th St	CO	L34	Mar-13	S-2a	S-2	67
S	6035	I 94 Ford	171st St	CO	C40	Oct-12	S-2b	S-2	68
S	7010	I 80 EB	West of Burnham	CO	3	Oct-12	S-2b	S-2	69
S	7020	I 80 WB	Torrence	CO	4	Oct-12	S-2b	S-2	70
S	8000	I 290 IKE	Franklin St	CO	B2	Oct-12	S-2a	S-2	71
S	9105	I 290 IKE EB	York Rd & Lake St	DU	Y96	Dec-12	S-2a	S-2	72
S	15105	I 80	.5 Mile West of LaGrange Rd	WI	25	Oct-12	S-2c	S-2	73
S	15107	I 80	East of LaGrange Rd	CO	DMS-39	Jun-12	S-3f	S-3	74
S	15010	I 80	1 Mile West of LaGrange Rd	WI	27	Oct-12	S-2c	S-2	75
S	15115	I 80	.5 Mile East of Wolf Rd	WI	29	Oct-12	S-2c	S-2	76
S	15120	I 80	Wolf Rd West	WI	31	Oct-12	S-2c	S-2	77
S	15121	I 80	West of Wolf Rd	CO	DMS-40	Jun-12	S-3f	S-3	78
S	15125	I 80	.5 Mile West of Wolf Rd	WI	33	Oct-12	S-2c	S-2	79
S	15130	I 80	.5 Mile East of Maple	WI	35	Oct-12	S-2c	S-2	80
S	15135	I 80	Maple Rd	WI	37	Oct-12	S-2c	S-2	81
S	15140	I 80	Norfolk Southern RR	WI	39	Oct-12	S-2c	S-2	82
S	15145	I 80	Parker Rd East	WI	41	Oct-12	S-2c	S-2	83
S	15150	I 80	.5 Mile West of	WI	43	Oct-12	S-2c	S-2	84

			Parker Rd						
S	15155	I 80	I 355 East	WI	45	Oct-12	S-2c	S-2	85
S	15160	I 80	I 355	WI	47	Oct-12	S-2c	S-2	86
S	15165	I 80	I 355 West (Cedar Rd)	WI	49	Oct-12	S-2c	S-2	87
S	15170	I 80	.5 Mile West of I 355	WI	51	Oct-12	S-2c	S-2	88
S	15175	I 80	.5 Mile East of Francis Rd	WI	53	Oct-12	S-2c	S-2	89
S	15180	I 80	Francis Rd	WI	55	Oct-12	S-2c	S-2	90
S	15185	I 80	.25 Mile East of US 30	WI	57	Dec-12	S-2d	S-2	91
S	15195	I 80	.25 Mile East of Gouger Rd	WI	59	Dec-12	S-2e	S-2	92
S	15205	I 80	1 Mile East of Briggs	WI	61	Dec-12	S-2d	S-2	93
S	15210	I 80	West of Cherry Hill Rd	CO	DMS-41	Jun-12	S-3f	S-3	94
S	15215	I 80	East of Briggs	WI	63	Dec-12	S-2d	S-2	95
S	15225	I 80	.75 Mile East of Richards St	WI	65	Dec-12	S-2e	S-2	96
S	15235	I 80	Richards St West	WI	67	Dec-12	S-2d	S-2	97
S	15245	I 80	WB at Meadow Center St Exit	WI	69	Dec-12	S-2d	S-2	98
S	15255	I 80	.5 Mile East of Larkin	WI	71	Dec-12	S-2e	S-2	99
S	15265	I 80	.5 Mile West of Larkin	WI	73	Dec-12	S-2d	S-2	100
S	15275	I 80	.5 Mile East of Houbolt	WI	75	Dec-12	S-2e	S-2	101
S	15285	I 80	EB Houbolt Exit	WI	77	Dec-12	S-2d	S-2	102

S	15295	I 80	I 55 East	WI	79	Dec-12	S-2d	S-2	103
S	15305	I 80	River Rd	WI	81	Dec-12	S-2e	S-2	104
S	15315	I 80	1 Mile West of I 55	WI	83	Dec-12	S-2d	S-2	105
S	15325	I 80	.25 East of Shepley Rd	WI	85	Dec-12	S-2d	S-2	106
S	15335	I 80	Grundy County Line	WI	87	Dec-12	S-2e	S-2	107
S	16020	IL 394 NB	186th St	CO	18	Oct-12	S-2f	S-2	108

TRAFFIC SIGNAL LOCATIONS ON STATE MAINTENANCE AS OF 5-31-12

Sys	Loc. #	Main Route	Cross Street	Co.	Type of Equipment		System Type	Pay Item	Qty
TS	5	IL 43 Harlem Ave	I 55 N Ramp	CO	Permanent Signals		T-1A	T-1	1
TS	15	IL 43 Harlem Ave	I 55 S Ramp	CO	Permanent Signals		T-1A	T-1	2
TS	22	Kedzie Ave	131st St	CO	Permanent Signals		T-1A	T-1	3
TS	25	127th St I 57 E Ramps	Marshfield Ave	CO	Permanent Signals		T-1A	T-1	4
TS	30	IL 83 Sibley Blvd	I 57 West Ramp	CO	Permanent Signals		T-1A	T-1	5
TS	31	IL 83 Sibley Blvd	I 57 East Ramp	CO	Permanent Signals		T-1A	T-1	6
TS	35	127th St I 57 W Ramps	Paulina St	CO	Permanent Signals		T-1A	T-1	7
TS	45	Dixie Hwy	I 80 Tollway	CO	Permanent Signals		T-1A	T-1	8
TS	48	171st St	Dixie Hwy	CO	Permanent Signals		T-1A	T-1	9
TS	50	I 80	Kedzie Ave N Ramp	CO	Permanent Signals		T-1A	T-1	10

TS	60	IL 43 Waukegan Rd	I 94 Edens Tlwy Spur North	CO	Permanent Signals		T-1A	T-1	11
TS	61	IL 43 Waukegan Rd	I 94 Edens Tlwy Spur South	CO	Permanent Signals		T-1A	T-1	12
TS	65	I 94 Estes Ave	IL 50 Cicero Ave	CO	Permanent Signals		T-1A	T-1	13
TS	75	I 290 S Frontage Rd Harrison	US 12/20/45 Mannheim Rd	CO	Permanent Signals		T-1A	T-1	14
TS	77	I 290 EB Exit Ramp F	US 12/20/45 Mannheim Rd	CO	Permanent Signals		T-1A	T-1	15
TS	80	I 290 WB Exit Ramps B & G	US 12/20/45 Mannheim Rd	CO	Permanent Signals		T-1A	T-1	16
TS	85	I 290	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	17
TS	90	I 290 IL 53 E Frontage Rd	IL 58 Golf Rd	CO	Permanent Signals		T-1A	T-1	18
TS	91	I 290 IL 53 W Frontage Rd	IL 58 Golf Rd	CO	Permanent Signals		T-1A	T-1	19
TS	95	I 290 IL 53 W Frontage Rd	IL 72 Higgins Rd	CO	Permanent Signals		T-1A	T-1	20
TS	96	I 290 IL 53 E Frontage Rd	IL 72 Higgins Rd	CO	Permanent Signals		T-1A	T-1	21
TS	100	IL 171 1st Ave	I 290 IKE Harrison Bataan	CO	Permanent Signals		T-1A	T-1	22
TS	105	I 290 Harrison St	17th Ave	CO	Permanent Signals		T-1A	T-1	23
TS	110	I 290	Austin Blvd	CO	Permanent Signals		T-1A	T-1	24
TS	115	I 290 Harrison St	Des Plaines Ave	CO	Permanent Signals		T-1A	T-1	25
TS	125	IL 50 Cicero Ave	128th St	CO	Permanent Signals		T-1A	T-1	26
TS	130	22nd St	I 294 Tollway E	CO	Permanent Signals		T-1A	T-1	27

		Cermak Rd	Ramps						
TS	135	22nd St Cermak Rd	I 294 Tollway W Ramps	CO	Permanent Signals		T-1A	T-1	28
TS	140	Willow Rd	I 294 Tollway E Ramps	CO	Permanent Signals		T-1A	T-1	29
TS	145	Willow Rd	I 294 Tollway W Ramps	CO	Permanent Signals		T-1A	T-1	30
TS	150	US 6 159th St	US 45 LaGrange Rd	CO	Permanent Signals		T-1A	T-1	31
TS	155	US 6 159th St	IL 1 Halsted St	CO	Permanent Signals		T-1A	T-1	32
TS	156	179th St	Wolf Rd	CO	Permanent Signals		T-1A	T-1	33
TS	158	IL 7 Wolf Rd	151st St	CO	Permanent Signals		T-1A	T-1	34
TS	159	IL 7 Wolf Rd	153rd St	CO	Permanent Signals		T-1A	T-1	35
TS	160	US 6 159th St	IL 7 Wolf Rd North Junction	CO	Permanent Signals		T-1A	T-1	36
TS	161	US 6 Wolf Rd	US 6 173rd St South Junction	CO	Permanent Signals		T-1A	T-1	37
TS	162	US 6 Wolf Rd	Brookhill Dr	CO	Permanent Signals		T-1A	T-1	38
TS	163	IL 7 159th St	Will Cook Rd	CO	Permanent Signals		T-1A	T-1	39
TS	165	US 6 159th St	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	40
TS	170	US 6 159th St	IL 50 Cicero Ave	CO	Permanent Signals		T-1A	T-1	41
TS	175	US 6 159th St	IL 83 Torrence Ave	CO	Permanent Signals		T-1A	T-1	42
TS	180	US 6 159th St	76th Ave	CO	Permanent Signals		T-1A	T-1	43
TS	185	US 6 159th St	80th Ave	CO	Permanent Signals		T-1A	T-1	44
TS	190	US 6 159th St	94th St	CO	Permanent Signals		T-1A	T-1	45
TS	195	US 6 IL 83 Torrence Ave	170th St	CO	Permanent Signals		T-1A	T-1	46

TS	200	US 6 159th St	162nd @ Carse St	CO	Permanent Signals		T-1A	T-1	47
TS	205	US 6 159th St	Central Ave	CO	Permanent Signals		T-1A	T-1	48
TS	210	US 6 159th St	Cottage Grove Ave	CO	Permanent Signals		T-1A	T-1	49
TS	215	US 6 159th St	Crawford Ave / Pukaski Rd	CO	Permanent Signals		T-1A	T-1	50
TS	220	US 6 159th St	Dixie Hwy	CO	Permanent Signals		T-1A	T-1	51
TS	225	US 6 159th St	Ellis Ave	CO	Permanent Signals		T-1A	T-1	52
TS	230	US 6 159th St	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	53
TS	235	US 6 159th St	71st Ct	CO	Permanent Signals		T-1A	T-1	54
TS	240	US 6 159th St	84th Ave	CO	Permanent Signals		T-1A	T-1	55
TS	245	US 6 159th St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	56
TS	255	US 6 159th St	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	57
TS	265	US 6 159th St	Park Ave / River Oaks Golf Ent	CO	Permanent Signals		T-1A	T-1	58
TS	270	US 6 159th St	Paxton Ave	CO	Permanent Signals		T-1A	T-1	59
TS	275	US 6 159th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	60
TS	280	US 6 159th St	Ring Rd	CO	Permanent Signals		T-1A	T-1	61
TS	285	US 6 159th St	School St	CO	Permanent Signals		T-1A	T-1	62
TS	290	US 6 159th St	South Park Ave / Chicago Rd	CO	Permanent Signals		T-1A	T-1	63
TS	293	US 6 159th St	162nd @ Wausau	CO	Permanent Signals		T-1A	T-1	64
TS	295	US 6 159th St	State St / Indiana Ave	CO	Permanent Signals		T-1A	T-1	65
TS	300	US 6 159th St	Thornton Blue Island Rd	CO	Permanent Signals		T-1A	T-1	66
TS	305	US 6 159th St	Van Dam Rd	CO	Permanent Signals		T-1A	T-1	67
TS	310	US 6 159th St	Vincennes Ave / Vandrunen Rd	CO	Permanent Signals		T-1A	T-1	68

TS	315	US 6 159th St	Wood St	CO	Permanent Signals		T-1A	T-1	69
TS	320	US 6 159th St	Woodlawn Ave	CO	Permanent Signals		T-1A	T-1	70
TS	325	US 6 159th St	Laramie Ave	CO	Permanent Signals		T-1A	T-1	71
TS	326	IL 21 Milwaukee Ave	US 14 Dempster St	CO	Permanent Signals		T-1A	T-1	72
TS	330	US 6 159th St	88th Ave	CO	Permanent Signals		T-1A	T-1	73
TS	345	US 6 IL 83 Torrence	River Oaks South Ent	CO	Permanent Signals		T-1A	T-1	74
TS	350	US 6 IL 83 Torrence	River Oaks Center Ent	CO	Permanent Signals		T-1A	T-1	75
TS	355	US 6 IL 83 Torrence	River Oaks North Ent	CO	Permanent Signals		T-1A	T-1	76
TS	365	US 12 Rand Rd	US 12/45 Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	77
TS	370	US 12 Rand Rd	US 12 Elk Blvd	CO	Permanent Signals		T-1A	T-1	78
TS	375	US 12 Rand Rd	IL 58 Golf Rd	CO	Permanent Signals		T-1A	T-1	79
TS	380	US 12 Rand Rd	IL 83 Elmhurst Rd & Foundry Rd	CO	Permanent Signals		T-1A	T-1	80
TS	385	US 12 Rand Rd	Baldwin Rd Williams Dr	CO	Permanent Signals		T-1A	T-1	81
TS	390	US 12 Rand Rd	Camp McDonald Rd	CO	Permanent Signals		T-1A	T-1	82
TS	392	US 12 Rand Rd	Schoenbeck Rd	CO	Permanent Signals		T-1A	T-1	83
TS	395	US 12 Rand Rd	Euclid St	CO	Permanent Signals		T-1A	T-1	84
TS	400	US 12 Rand Rd	Hintz Rd	CO	Permanent Signals		T-1A	T-1	85
TS	405	US 12 Rand Rd	Kennicott Dr	CO	Permanent Signals		T-1A	T-1	86
TS	410	US 12 Rand Rd	Lake Cook Road	CO	Permanent Signals		T-1A	T-1	87
TS	415	US 12 Rand Rd	Clarence Ave / Dryden Ave	CO	Permanent Signals		T-1A	T-1	88

TS	419	US 12 Rand Rd	Olive St	CO	Permanent Signals		T-1A	T-1	89
TS	420	US 12 Rand Rd	Thomas Ave / Willow Rd	CO	Permanent Signals		T-1A	T-1	90
TS	421	US 12 Rand Rd	Beverly Ln	CO	Permanent Signals		T-1A	T-1	91
TS	425	US 12 Rand Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	92
TS	427	US 12 20 95th St	I 294 Ramp B	CO	Permanent Signals		T-1A	T-1	93
TS	430	US 12 20 95th St	US 12/20/45 La Grange Rd	CO	Permanent Signals		T-1A	T-1	94
TS	435	US 12 20 95th St	IL 50 Cicero Ave	CO	Permanent Signals		T-1A	T-1	95
TS	440	US 12 20 95th St	52nd Ave	CO	Permanent Signals		T-1A	T-1	96
TS	445	US 12 20 95th St	54th Ave	CO	Permanent Signals		T-1A	T-1	97
TS	450	US 12 20 95th St	78th Ave	CO	Permanent Signals		T-1A	T-1	98
TS	460	US 12 20 95th St	Campbell Ave	CO	Permanent Signals		T-1A	T-1	99
TS	465	US 12 20 95th St	Central Ave	CO	Permanent Signals		T-1A	T-1	100
TS	470	US 12 20 95th St	Chicago Ridge Mall Drive	CO	Permanent Signals		T-1A	T-1	101
TS	475	US 12 20 95th St	Cook Ave	CO	Permanent Signals		T-1A	T-1	102
TS	480	US 12 20 95th St	Crawford Ave / Pukaski Rd	CO	Permanent Signals		T-1A	T-1	103
TS	481	US 12 20 95th St	Keeler Ave	CO	Permanent Signals		T-1A	T-1	104
TS	485	US 12 20 95th St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	105
TS	490	US 12 20 95th	Kostner Ave	CO	Permanent Signals		T-1A	T-1	106

		St							
TS	495	US 12 20 95th St	K Mart Ent	CO	Permanent Signals		T-1A	T-1	107
TS	500	US 12 20 95th St	Millard Ave	CO	Permanent Signals		T-1A	T-1	108
TS	502	US 20 Lake St	Naperville Rd	CO	Permanent Signals		T-1A	T-1	109
TS	503	US 20 Lake St	Rose Ln / Lambert	CO	Permanent Signals		T-1A	T-1	110
TS	505	US 12 20 95th St	Chicago Ridge Mall Drive	CO	Permanent Signals		T-1A	T-1	111
TS	510	US 12 20 95th St	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	112
TS	515	US 12 20 95th St	Melvina Ave	CO	Permanent Signals		T-1A	T-1	113
TS	520	US 12 20 95th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	114
TS	525	US 12 20 95th St	Roberts Rd	CO	Permanent Signals		T-1A	T-1	115
TS	530	US 12 20 95th St	IL 7 Southwest Hwy	CO	Permanent Signals		T-1A	T-1	116
TS	535	US 12 20 95th St	Western Ave	CO	Permanent Signals		T-1A	T-1	117
TS	540	US 12 20 95th St	Homan Ave	CO	Permanent Signals		T-1A	T-1	118
TS	741	IL 19 Irving Park Rd	Shales Parkway	CO	Permanent Signals		T-1A	T-1	119
TS	742	IL 19 Irving Park Rd	Poplar Creek Dr	CO	Permanent Signals		T-1A	T-1	120
TS	743	IL 19 Irving Park Rd	Rohrsen Rd	CO	Permanent Signals		T-1A	T-1	121
TS	744	IL 19 Irving Park Rd	Schaumburg Rd	CO	Permanent Signals		T-1A	T-1	122

TS	1007	123rd St McCarthy Rd	Will Cook Rd	CO	Permanent Signals		T-1A	T-1	123
TS	1009	123rd St McCarthy Rd	Bell Rd	CO	Permanent Signals		T-1A	T-1	124
TS	1010	US 12 20 45 Mannheim Rd	US 20 Lake St	CO	Permanent Signals		T-1A	T-1	125
TS	1011	123rd St McCarthy Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	126
TS	1015	US 12 20 45 Mannheim Rd	IL 38 Roosevelt Rd	CO	Permanent Signals		T-1A	T-1	127
TS	1020	US 12 20 45 Mannheim Rd	Washington Blvd	CO	Permanent Signals		T-1A	T-1	128
TS	1022	IL 59 Sutton Rd	US 20 Lake St N Ramps	CO	Permanent Signals		T-1A	T-1	129
TS	1023	IL 59 Sutton Rd	US 20 Lake St S Ramps	CO	Permanent Signals		T-1A	T-1	130
TS	1025	US 12 20 45 LaGrange Rd	31st St	CO	Permanent Signals		T-1A	T-1	131
TS	1030	US 12 20 45 LaGrange Rd	47th St	CO	Permanent Signals		T-1A	T-1	132
TS	1035	US 12 20 45 LaGrange Rd	55th St	CO	Permanent Signals		T-1A	T-1	133
TS	1040	US 12 20 45 LaGrange Rd	67th St	CO	Permanent Signals		T-1A	T-1	134
TS	1043	US 12 20 45 LaGrange Rd	63rd St	CO	Permanent Signals		T-1A	T-1	135
TS	1045	US 12 20 45 LaGrange Rd	87th St	CO	Permanent Signals		T-1A	T-1	136
TS	1050	US 12 20 45 LaGrange Rd	22nd St / Cermak Rd	CO	Permanent Signals		T-1A	T-1	137
TS	1055	US 12 20 45 LaGrange Rd	Countryside Plaza Ent	CO	Permanent Signals		T-1A	T-1	138
TS	1060	US 12 20 45	Joliet Rd	CO	Permanent Signals		T-1A	T-1	139

		LaGrange Rd							
TS	1065	US 12 20 45 LaGrange Rd	Plainfield Rd	CO	Permanent Signals		T-1A	T-1	140
TS	1070	US 12 20 45 Mannheim Rd	Randolph St	CO	Permanent Signals		T-1A	T-1	141
TS	1075	US 12 20 45 Mannheim Rd	St Charles Rd	CO	Permanent Signals		T-1A	T-1	142
TS	1080	US 12 20 45 Mannheim Rd	Madison St	CO	Permanent Signals		T-1A	T-1	143
TS	1085	US 12 45 Lee St	US 45 Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	144
TS	1090	US 12 45 Elk Blvd	US 45 Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	145
TS	1095	US 12 45 Mannheim Rd	IL 19 Irving Park Rd	CO	Permanent Signals		T-1A	T-1	146
TS	1100	US 12 45 Mannheim Rd	IL 72 Higgins Rd	CO	Permanent Signals		T-1A	T-1	147
TS	1102	IL 72 Higgins Rd	Willow Creek Health Club Ent	CO	Permanent Signals		T-1A	T-1	148
TS	1105	US 12 45 Mannheim Rd	Armitage St	CO	Permanent Signals		T-1A	T-1	149
TS	1110	US 12 45 Mannheim Rd	Fullerton Ave	CO	Permanent Signals		T-1A	T-1	150
TS	1114	US 12 45 Mannheim Rd	Wrightwood	CO	Permanent Signals		T-1A	T-1	151
TS	1115	US 12 45 Mannheim Rd	Melrose Crossing	Cool	Permanent Signals		T-1A	T-1	152
TS	1120	US 12 45 Mannheim Rd	Melrose Crossing	CO	Permanent Signals		T-1A	T-1	153
TS	1125	US 12 45 Mannheim Rd	Lawrence Ave	CO	Permanent Signals		T-1A	T-1	154
TS	1130	US 12 45 Lee St	Oakton St	CO	Permanent Signals		T-1A	T-1	155

TS	1135	US 12 45 Mannheim Rd	Touhy Ave	CO	Permanent Signals		T-1A	T-1	156
TS	1137	US 12 45 Mannheim Rd	Lunt Ave	CO	Permanent Signals		T-1A	T-1	157
TS	1140	US 12 45 Mannheim Rd	United Parkway	CO	Permanent Signals		T-1A	T-1	158
TS	1145	US 12 45 Mannheim Rd	Montrose Ave / O'Hare Access Rd	CO	Permanent Signals		T-1A	T-1	159
TS	1150	US 12 IL 53 Rand Rd	IL 53 Hicks Rd	CO	Permanent Signals		T-1A	T-1	160
TS	1155	US 12 IL 53 Rand Rd	IL 53 IL 68 Dundee Rd	CO	Permanent Signals		T-1A	T-1	161
TS	1157	IL 68 Dundee Rd	Lynda Dr Access Dr	CO	Permanent Signals		T-1A	T-1	162
TS	1160	US 14 IL 58 Rand Rd	Old Hicks Rd Coach	CO	Permanent Signals		T-1A	T-1	163
TS	1170	US 14 Northwest Hwy	US 14 Baldwin Rd	CO	Permanent Signals		T-1A	T-1	164
TS	1172	US 14 Northwest Hwy	Sterling Ave	CO	Permanent Signals		T-1A	T-1	165
TS	1175	US 14 Caldwell Ave	US 14/IL 43 Waukegan Rd	CO	Permanent Signals		T-1A	T-1	166
TS	1180	US 14 Northwest Hwy	IL 53 E Ramp	CO	Permanent Signals		T-1A	T-1	167
TS	1185	US 14 Northwest Hwy	IL 53 W Ramp	CO	Permanent Signals		T-1A	T-1	168
TS	1190	US 14 Northwest Hwy	Benton St	CO	Permanent Signals		T-1A	T-1	169
TS	1200	US 14 Dempster St	Cumberland Ave	CO	Permanent Signals		T-1A	T-1	170
TS	1205	US 14 Dempster St	Dee Rd	CO	Permanent Signals		T-1A	T-1	171
TS	1210	US 14	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	172

		Dempster St							
TS	1213	US 14 Dempster St	Western Ave	CO	Permanent Signals		T-1A	T-1	173
TS	1215	US 14 Caldwell Ave	Gross Point Rd	CO	Permanent Signals		T-1A	T-1	174
TS	1220	US 14 Dempster St	Harlem Ave	CO	Permanent Signals		T-1A	T-1	175
TS	1225	US 14 Northwest Hwy	Hicks Rd S Jct / Linden Ave	CO	Permanent Signals		T-1A	T-1	176
TS	1230	US 14 Caldwell Ave	Howard St	CO	Permanent Signals		T-1A	T-1	177
TS	1235	US 14 Northwest Hwy	Hicks Pl / Lincoln St	CO	Permanent Signals		T-1A	T-1	178
TS	1240	US 14 Dempster St	Luther Ln	CO	Permanent Signals		T-1A	T-1	179
TS	1245	US 14 Northwest Hwy	Lake Cook Rd	CO	Permanent Signals		T-1A	T-1	180
TS	1250	US 14 Northwest Hwy	US Post Office Ent	CO	Permanent Signals		T-1A	T-1	181
TS	1260	US 14 Caldwell Ave	Oakton St	CO	Permanent Signals		T-1A	T-1	182
TS	1265	US 14 Dempster St	Ozark St	CO	Permanent Signals		T-1A	T-1	183
TS	1270	US 14 Northwest Hwy	Palatine Rd	CO	Permanent Signals		T-1A	T-1	184
TS	1275	US 14 Dempster St	Potter Rd	CO	Permanent Signals		T-1A	T-1	185
TS	1285	US 14 Miner St	Rand Rd	CO	Permanent Signals		T-1A	T-1	186
TS	1290	US 14 Northwest Hwy	Rohlwing Rd	CO	Permanent Signals		T-1A	T-1	187
TS	1295	US 14 Dempster St	Shermer Rd	CO	Permanent Signals		T-1A	T-1	188

TS	1300	US 14 Northwest Hwy	Smith Rd	CO	Permanent Signals		T-1A	T-1	189
TS	1305	US 14 Caldwell Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	190
TS	1310	US 14 Northwest Hwy	Wilke Rd	CO	Permanent Signals		T-1A	T-1	191
TS	1315	US 14 Northwest Hwy	Plum Grove Rd	CO	Permanent Signals		T-1A	T-1	192
TS	1320	US 20 Lake St	Bluff City Rd	CO	Permanent Signals		T-1A	T-1	193
TS	1325	US 20 Lake St	Oak Ave	CO	Permanent Signals		T-1A	T-1	194
TS	1330	US 20 Lake St	Park Ave	CO	Permanent Signals		T-1A	T-1	195
TS	1335	US 20 Lake St	44th Ave	CO	Permanent Signals		T-1A	T-1	196
TS	1338	US 20 Lake St	I 294 Tollway Ramp	CO	Permanent Signals		T-1A	T-1	197
TS	1340	US 30 Lincoln Hwy	US 30/IL 83 Glenwood Dyer Rd	CO	Permanent Signals		T-1A	T-1	198
TS	1345	IL 1 Chicago	US 30 Lincoln Hwy	CO	Permanent Signals		T-1A	T-1	199
TS	1355	US 30 Lincoln Hwy	IL 50 Cicero Ave	CO	Permanent Signals		T-1A	T-1	200
TS	1357	IL 50 Cicero Ave	207th	CO	Permanent Signals		T-1A	T-1	201
TS	1358	IL 50 Cicero Ave	Morning Glory Village Commons	CO	Permanent Signals		T-1A	T-1	202
TS	1360	US 30 Lincoln Hwy	Cottage Grove Ave	CO	Permanent Signals		T-1A	T-1	203
TS	1365	US 30 Lincoln Hwy	Division St	CO	Permanent Signals		T-1A	T-1	204
TS	1370	US 30 Lincoln Hwy	Ford Motor Plant Ent	CO	Permanent Signals		T-1A	T-1	205
TS	1375	US 30 Lincoln	Governors Hwy	CO	Permanent Signals		T-1A	T-1	206

		Hwy	Crawford Ave						
TS	1376	Governors Hwy	212th Pl	CO	Permanent Signals		T-1A	T-1	207
TS	1380	US 30 Lincoln Hwy	Halsted St	CO	Permanent Signals		T-1A	T-1	208
TS	1385	US 30 Lincoln Hwy	Main St	CO	Permanent Signals		T-1A	T-1	209
TS	1390	US 30 Lincoln Hwy	Olympian Way	CO	Permanent Signals		T-1A	T-1	210
TS	1400	US 30 Lincoln Hwy	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	211
TS	1405	US 30 IL 83 Lincoln Hwy	Sauk Trail Rd	CO	Permanent Signals		T-1A	T-1	212
TS	1410	US 30 Lincoln Hwy	State St	CO	Permanent Signals		T-1A	T-1	213
TS	1414	US 30 Lincoln Hwy	Center St	CO	Permanent Signals		T-1A	T-1	214
TS	1415	US 30 Lincoln Hwy	Torrence Ave	CO	Permanent Signals		T-1A	T-1	215
TS	1420	US 30 Lincoln Hwy	Western Ave	CO	Permanent Signals		T-1A	T-1	216
TS	1425	US 30 Lincoln Hwy	Woodlawn Ave	CO	Permanent Signals		T-1A	T-1	217
TS	1430	US 30 Lincoln Hwy	Lindenwood Dr / Lincoln Mall Ent	CO	Permanent Signals		T-1A	T-1	218
TS	1435	US 30 Lincoln Hwy	Ashland Ave	CO	Permanent Signals		T-1A	T-1	219
TS	1437	US 30 Lincoln Hwy	Access Rd / Transportation Dr	CO	Permanent Signals		T-1A	T-1	220
TS	1445	US 30 Lincoln Hwy	Hilltop Ave	CO	Permanent Signals		T-1A	T-1	221
TS	1450	US 30 Lincoln Hwy	Kostner Ave	CO	Permanent Signals		T-1A	T-1	222

TS	1455	US 34 Ogden Ave	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	223
TS	1460	US 34 Ogden Ave	39th St / Miller Rd	CO	Permanent Signals		T-1A	T-1	224
TS	1465	US 34 Ogden Ave	Gilbert Ave / Nazareth Academy	CO	Permanent Signals		T-1A	T-1	225
TS	1470	US 34 Ogden Ave	Joliet Rd	CO	Permanent Signals		T-1A	T-1	226
TS	1480	US 34 Ogden Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	227
TS	1485	US 41 Lincoln Ave	US 41/IL 50 Cicero Ave	CO	Permanent Signals		T-1A	T-1	228
TS	1490	IL 58 Dempster St	US 41 Skokie Blvd	CO	Permanent Signals		T-1A	T-1	229
TS	1495	US 41 Skokie Blvd	Church St	CO	Permanent Signals		T-1A	T-1	230
TS	1500	US 41 Lincoln Ave	Crawford Ave	CO	Permanent Signals		T-1A	T-1	231
TS	1505	US 41 Lincoln Ave	Devon Ave	CO	Permanent Signals		T-1A	T-1	232
TS	1510	US 41 Skokie Blvd	East Lake Ave	CO	Permanent Signals		T-1A	T-1	233
TS	1515	US 41 Skokie Blvd	Edens Plaza SC Ent	CO	Permanent Signals		T-1A	T-1	234
TS	1520	US 41 Skokie Blvd	Emerson St	CO	Permanent Signals		T-1A	T-1	235
TS	1525	US 41 Skokie Blvd	Golf Rd	CO	Permanent Signals		T-1A	T-1	236
TS	1530	US 41 Skokie Blvd	Gross Point Rd	CO	Permanent Signals		T-1A	T-1	237
TS	1535	US 41 Skokie Blvd	Hibbard Rd	CO	Permanent Signals		T-1A	T-1	238

TS	1540	US 41 Skokie Blvd	Howard St	CO	Permanent Signals		T-1A	T-1	239
TS	1545	US 41 Lincoln Ave	Kostner Ave	CO	Permanent Signals		T-1A	T-1	240
TS	1555	US 41 Skokie Blvd	Foster St	CO	Permanent Signals		T-1A	T-1	241
TS	1560	US 41 Skokie Blvd	Main St	CO	Permanent Signals		T-1A	T-1	242
TS	1565	US 41 Skokie Blvd	New Glenview Rd	CO	Permanent Signals		T-1A	T-1	243
TS	1570	US 41 Skokie Blvd	Niles Center Rd	CO	Permanent Signals		T-1A	T-1	244
TS	1574	Niles Center Rd	Fargo Ave	CO	Permanent Signals		T-1A	T-1	245
TS	1575	US 41 Skokie Blvd	Oakton St	CO	Permanent Signals		T-1A	T-1	246
TS	1577	US 41 Skokie Blvd	Searle Pkwy	CO	Permanent Signals		T-1A	T-1	247
TS	1580	US 41 Skokie Blvd	Old Glenview Rd	CO	Permanent Signals		T-1A	T-1	248
TS	1610	US 41 Lincoln Ave	Pratt Ave	CO	Permanent Signals		T-1A	T-1	249
TS	1613	Crawford Ave	Pratt Ave	CO	Permanent Signals		T-1A	T-1	250
TS	1615	US 41 Lincoln Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	251
TS	1617	IL 72 Touhy Ave	Kilbourn Ave	CO	Permanent Signals		T-1A	T-1	252
TS	1620	US 41 Skokie Blvd	Wilmette Ave	CO	Permanent Signals		T-1A	T-1	253
TS	1625	US 45 Des Plaines River Rd	IL 58 Golf Rd	CO	Permanent Signals		T-1A	T-1	254
TS	1626	US 45 Des Plaines River	Nazareth Way / Holy Family Hosp	CO	Permanent Signals		T-1A	T-1	255

		Rd							
TS	1630	US 45 LaGrange Rd	107th St	CO	Permanent Signals		T-1A	T-1	256
TS	1631	111th St	84th Ave	CO	Permanent Signals		T-1A	T-1	257
TS	1632	111th St	Kean Ave	CO	Permanent Signals		T-1A	T-1	258
TS	1633	104th Ave	107th St	CO	Permanent Signals		T-1A	T-1	259
TS	1635	US 45 LaGrange Rd	111th St	CO	Permanent Signals		T-1A	T-1	260
TS	1640	US 45 LaGrange Rd	131st St	CO	Permanent Signals		T-1A	T-1	261
TS	1645	US 45 LaGrange Rd	135th St	CO	Permanent Signals		T-1A	T-1	262
TS	1650	US 45 LaGrange Rd	143rd St	CO	Permanent Signals		T-1A	T-1	263
TS	1655	US 45 LaGrange Rd	147th St	CO	Permanent Signals		T-1A	T-1	264
TS	1660	US 45 LaGrange Rd	149th St	CO	Permanent Signals		T-1A	T-1	265
TS	1665	US 45 LaGrange Rd	151st St	CO	Permanent Signals		T-1A	T-1	266
TS	1670	US 45 LaGrange Rd	153rd St	CO	Permanent Signals		T-1A	T-1	267
TS	1675	US 45 Des Plaines River Rd	Central Rd	CO	Permanent Signals		T-1A	T-1	268
TS	1676	Central Rd	East River Rd	CO	Permanent Signals		T-1A	T-1	269
TS	1677	Central Rd	Oakton Community College	CO	Permanent Signals		T-1A	T-1	270
TS	1680	US 45 Des Plaines River Rd	Euclid Ave / West Lake Ave	CO	Permanent Signals		T-1A	T-1	271

TS	1685	US 45 Des Plaines River Rd	Kensington Rd / Foundry Rd	CO	Permanent Signals		T-1A	T-1	272
TS	1690	US 45 LaGrange Rd	McCarthy Rd 123rd St	CO	Permanent Signals		T-1A	T-1	273
TS	1695	US 45 DesPlaines River Rd	Old Willow Rd	CO	Permanent Signals		T-1A	T-1	274
TS	1700	US 45 LaGrange Rd	167th St	CO	Permanent Signals		T-1A	T-1	275
TS	1701	US 45 LaGrange Rd	163rd St	CO	Permanent Signals		T-1A	T-1	276
TS	1705	US 45 LaGrange Rd	Lakeview Plaza Dr	CO	Permanent Signals		T-1A	T-1	277
TS	1710	US 45 LaGrange Rd	Carl Sandburg High School Ent	CO	Permanent Signals		T-1A	T-1	278
TS	1712	US 45 Des Plaines River Rd	Camp McDonald Rd	CO	Permanent Signals		T-1A	T-1	279
TS	1715	US 45 IL 21 Milwaukee Ave	IL 68 Dundee Rd	CO	Permanent Signals		T-1A	T-1	280
TS	1720	US 45 IL 21 Milwaukee Ave	Hintz Rd	CO	Permanent Signals		T-1A	T-1	281
TS	1724	US 45 IL 21 Milwaukee Ave	Lake Cook Rd S Ramps	CO	Permanent Signals		T-1A	T-1	282
TS	1726	US 45 IL 21 Milwaukee Ave	Lake Cook Rd N Ramps	CO	Permanent Signals		T-1A	T-1	283
TS	1730	US 45 IL 21 Milwaukee Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	284
TS	1735	US 45 IL 21 Milwaukee Ave	Apple Dr	CO	Permanent Signals		T-1A	T-1	285
TS	1740	US 45 IL 21 Milwaukee Ave	Palatine Rd North Ramp	CO	Permanent Signals		T-1A	T-1	286
TS	1745	US 45 IL 21	Palatine Rd South	CO	Permanent Signals		T-1A	T-1	287

		Milwaukee Ave	Ramp						
TS	1750	US 45 LaGrange Rd	144th Pl	CO	Permanent Signals		T-1A	T-1	288
TS	1755	IL 1 Halsted St	IL 1 Halsted St Cutoff / Parkside	CO	Permanent Signals		T-1A	T-1	289
TS	1760	IL 1 Halsted St	IL 1 Vincennes Rd	CO	Permanent Signals		T-1A	T-1	290
TS	1765	IL 83 Sibley Blvd 147th St	IL 1 Halsted St	CO	Permanent Signals		T-1A	T-1	291
TS	1770	IL 1 Chicago Rd	15th St	CO	Permanent Signals		T-1A	T-1	292
TS	1775	IL 1 Chicago Rd	16th St	CO	Permanent Signals		T-1A	T-1	293
TS	1780	IL 1 Chicago Rd	26th St	CO	Permanent Signals		T-1A	T-1	294
TS	1785	IL 1 Halsted St	123rd St	CO	Permanent Signals		T-1A	T-1	295
TS	1790	IL 1 Halsted St	127th St	CO	Permanent Signals		T-1A	T-1	296
TS	1795	IL 1 Halsted St	138th St	CO	Permanent Signals		T-1A	T-1	297
TS	1800	IL 1 Halsted St	149th St	CO	Permanent Signals		T-1A	T-1	298
TS	1805	IL 1 Halsted St	152nd St	CO	Permanent Signals		T-1A	T-1	299
TS	1810	IL 1 Halsted St	157th St	CO	Permanent Signals		T-1A	T-1	300
TS	1815	IL 1 Halsted St	163rd St	CO	Permanent Signals		T-1A	T-1	301
TS	1820	IL 1 Halsted St	167th St	CO	Permanent Signals		T-1A	T-1	302
TS	1825	IL 1 Halsted St	171st St	CO	Permanent Signals		T-1A	T-1	303
TS	1830	IL 1 Halsted St	183rd St	CO	Permanent Signals		T-1A	T-1	304
TS	1835	IL 1 Halsted St	Holbrook Rd	CO	Permanent Signals		T-1A	T-1	305
TS	1840	IL 1 Halsted St	187th St	CO	Permanent Signals		T-1A	T-1	306
TS	1845	IL 1 Halsted St Cut Off	IL 1 Chicago Rd / Riegel Rd	CO	Permanent Signals		T-1A	T-1	307
TS	1850	IL 1 Halsted St	Joe Orr Rd	CO	Permanent Signals		T-1A	T-1	308

TS	1855	IL 1 Halsted St	Ridge Rd	CO	Permanent Signals		T-1A	T-1	309
TS	1860	IL 1 Chicago Rd	Sauk Trail Rd	CO	Permanent Signals		T-1A	T-1	310
TS	1865	IL 1 Chicago Rd	Steger Rd	CO	Permanent Signals		T-1A	T-1	311
TS	1870	IL 1 Halsted St	Vollmer Rd	CO	Permanent Signals		T-1A	T-1	312
TS	1875	IL 1 Halsted St	Maple Gate 3	CO	Permanent Signals		T-1A	T-1	313
TS	1880	IL 1 Halsted St	175th St	CO	Permanent Signals		T-1A	T-1	314
TS	1885	IL 1 Chicago Vincennes	Dixie Hwy	CO	Permanent Signals		T-1A	T-1	315
TS	1890	IL 7 Southwest Hwy	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	316
TS	1895	IL 7 Southwest Hwy	IL 83 Cal Sag Rd / 80th Ave	CO	Permanent Signals		T-1A	T-1	317
TS	1899	80th Ave	123rd St / McCarthy Rd	CO	Permanent Signals		T-1A	T-1	318
TS	1900	IL 7 Southwest Hwy	111th St	CO	Permanent Signals		T-1A	T-1	319
TS	1903	IL 7 Southwest Hwy	117th St	CO	Permanent Signals		T-1A	T-1	320
TS	1904	IL 7 Southwest Hwy	114th St / Metra Train Station	CO	Permanent Signals		T-1A	T-1	321
TS	1905	IL 7 Southwest Hwy	131st St	CO	Permanent Signals		T-1A	T-1	322
TS	1910	IL 7 Southwest Hwy	135th St	CO	Permanent Signals		T-1A	T-1	323
TS	1911	131st St	76th Ave	CO	Permanent Signals		T-1A	T-1	324
TS	1913	131st St	86th Ave	CO	Permanent Signals		T-1A	T-1	325
TS	1915	IL 7 Southwest Hwy	143rd St	CO	Permanent Signals		T-1A	T-1	326
TS	1920	IL 7 143rd St	West Ave / 100th	CO	Permanent Signals		T-1A	T-1	327

			Ave						
TS	1925	IL 43 Harlem Ave	IL 19 Irving Park Rd	CO	Permanent Signals		T-1A	T-1	328
TS	1930	IL 59 Sutton Rd	IL 19 Irving Park Rd	CO	Permanent Signals		T-1A	T-1	329
TS	1932	IL 19 Irving Park Rd	Madison Dr	CO	Permanent Signals		T-1A	T-1	330
TS	1937	IL 59 Sutton Rd	Gulf Keys Rd	CO	Permanent Signals		T-1A	T-1	331
TS	1940	IL 171 Cumberland Ave	IL 19 Irving Park Rd	CO	Permanent Signals		T-1A	T-1	332
TS	1945	IL 19 Irving Park Rd	DesPlaines River	CO	Permanent Signals		T-1A	T-1	333
TS	1948	Des Plaines River Rd	Ivanhoe Ave	CO	Permanent Signals		T-1A	T-1	334
TS	1950	IL 19 Irving Park Rd	Forest Preserve Dr	CO	Permanent Signals		T-1A	T-1	335
TS	1953	IL 19 Irving Park Rd	Judd Ave	CO	Permanent Signals		T-1A	T-1	336
TS	1955	IL 19 Irving Park Rd	Oriole Ave	CO	Permanent Signals		T-1A	T-1	337
TS	1957	IL 19 Irving Park Rd	Seymour Ave	CO	Permanent Signals		T-1A	T-1	338
TS	1960	IL 19 Irving Park Rd	Ruby St 25th	CO	Permanent Signals		T-1A	T-1	339
TS	1965	IL 19 Irving Park Rd	Springinsguth Rd	CO	Permanent Signals		T-1A	T-1	340
TS	1966	Elgin O'Hare E Frontage Rd	Springinsguth Rd	CO	Permanent Signals		T-1A	T-1	341
TS	1967	Elgin O'Hare W Frontage Rd	Springinsguth Rd	CO	Permanent Signals		T-1A	T-1	342
TS	1970	IL 19 Irving	Wesley Terrace	CO	Permanent Signals		T-1A	T-1	343

		Park Rd							
TS	1975	IL 19 Irving Park Rd	Wise Rd	CO	Permanent Signals		T-1A	T-1	344
TS	1976	IL 19 Irving Park Rd	Mercury Dr	CO	Permanent Signals		T-1A	T-1	345
TS	1980	IL 19 Irving Park Rd	Sunnydale Blvd	CO	Permanent Signals		T-1A	T-1	346
TS	1985	IL 19 Irving Park Rd	East Ave	CO	Permanent Signals		T-1A	T-1	347
TS	1990	IL 21 Milwaukee Ave	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	348
TS	1995	IL 21 Milwaukee Ave	IL 58 Golf Rd	CO	Permanent Signals		T-1A	T-1	349
TS	2000	IL 21 Milwaukee Ave	Ballard Rd	CO	Permanent Signals		T-1A	T-1	350
TS	2005	IL 21 Milwaukee Ave	Central Rd	CO	Permanent Signals		T-1A	T-1	351
TS	2010	IL 21 Milwaukee Ave	Dearlove Rd / Glenview Rd	CO	Permanent Signals		T-1A	T-1	352
TS	2015	IL 21 Milwaukee Ave	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	353
TS	2020	IL 21 Milwaukee Ave	Howard St	CO	Permanent Signals		T-1A	T-1	354
TS	2025	IL 21 Milwaukee Ave	Main St	CO	Permanent Signals		T-1A	T-1	355
TS	2030	IL 21 Milwaukee Ave	Maryland St	CO	Permanent Signals		T-1A	T-1	356
TS	2045	IL 21 Milwaukee Ave	Sanders Rd	CO	Permanent Signals		T-1A	T-1	357
TS	2050	IL 21 Milwaukee Ave	Euclid Ave / West Lake Ave	CO	Permanent Signals		T-1A	T-1	358
TS	2055	IL 21 Milwaukee Ave	Zenith Dr / Castilian Ct	CO	Permanent Signals		T-1A	T-1	359

TS	2060	IL 21 Milwaukee Ave	Golf Mill Center Dr Ent	CO	Permanent Signals		T-1A	T-1	360
TS	2065	IL 21 Milwaukee Ave	Golf Mill North Dr Ent	CO	Permanent Signals		T-1A	T-1	361
TS	2070	IL 38 Roosevelt Rd	Harrison St / Hamilton Ave	CO	Permanent Signals		T-1A	T-1	362
TS	2075	IL 38 Roosevelt Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	363
TS	2077	IL 38 Roosevelt Rd	Fencl Ln	CO	Permanent Signals		T-1A	T-1	364
TS	2080	IL 43 Harlem Ave	IL 43 Oakton St	CO	Permanent Signals		T-1A	T-1	365
TS	2085	IL 43 Waukegan Rd	IL 43 Oakton St	CO	Permanent Signals		T-1A	T-1	366
TS	2087	Oakton St	Niles Civic Center Plaza Ent	CO	Permanent Signals		T-1A	T-1	367
TS	2090	IL 58 Golf Rd	IL 43/IL 58 Waukegan Rd	CO	Permanent Signals		T-1A	T-1	368
TS	2095	IL 43 Harlem Ave	IL 64 North Ave	CO	Permanent Signals		T-1A	T-1	369
TS	2100	IL 43 Waukegan Rd	IL 68 Dundee Rd	CO	Permanent Signals		T-1A	T-1	370
TS	2105	IL 43 Harlem Ave	IL 83 / 119th St / College Dr	CO	Permanent Signals		T-1A	T-1	371
TS	2110	IL 43 Harlem Ave	16th St	CO	Permanent Signals		T-1A	T-1	372
TS	2115	IL 43 Harlem Ave	23rd St	CO	Permanent Signals		T-1A	T-1	373
TS	2120	IL 43 Harlem Ave	25th St	CO	Permanent Signals		T-1A	T-1	374
TS	2125	IL 43 Harlem Ave	26th St	CO	Permanent Signals		T-1A	T-1	375
TS	2130	IL 43 Harlem	39th St / Pershing	CO	Permanent Signals		T-1A	T-1	376

		Ave	Rd						
TS	2135	IL 43 Harlem Ave	47th St	CO	Permanent Signals		T-1A	T-1	377
TS	2140	IL 43 Harlem Ave	57th St	CO	Permanent Signals		T-1A	T-1	378
TS	2145	IL 43 Harlem Ave	60th St	CO	Permanent Signals		T-1A	T-1	379
TS	2150	IL 43 Harlem Ave	63rd St	CO	Permanent Signals		T-1A	T-1	380
TS	2155	IL 43 Harlem Ave	63rd St Cutoff	CO	Permanent Signals		T-1A	T-1	381
TS	2160	IL 43 Harlem Ave	65th St	CO	Permanent Signals		T-1A	T-1	382
TS	2165	IL 42 Harlem Ave	71st St	CO	Permanent Signals		T-1A	T-1	383
TS	2170	IL 43 Harlem Ave	75th Pl	CO	Permanent Signals		T-1A	T-1	384
TS	2175	IL 43 Harlem Ave	79th Pl	CO	Permanent Signals		T-1A	T-1	385
TS	2180	IL 43 Harlem Ave	83rd St	CO	Permanent Signals		T-1A	T-1	386
TS	2185	IL 43 Harlem Ave	87th St	CO	Permanent Signals		T-1A	T-1	387
TS	2190	IL 43 Harlem Ave	88th St / Southfield SC Dr Ent	CO	Permanent Signals		T-1A	T-1	388
TS	2195	IL 43 Harlem Ave	90th St / Cambridge St	CO	Permanent Signals		T-1A	T-1	389
TS	2200	IL 43 Harlem Ave	99th St	CO	Permanent Signals		T-1A	T-1	390
TS	2205	IL 43 Harlem Ave	103rd St	CO	Permanent Signals		T-1A	T-1	391
TS	2210	IL 43 Harlem	111th St	CO	Permanent Signals		T-1A	T-1	392

		Ave							
TS	2215	IL 43 Harlem Ave	115th St	CO	Permanent Signals		T-1A	T-1	393
TS	2220	IL 43 Harlem Ave	123rd St	CO	Permanent Signals		T-1A	T-1	394
TS	2226	IL 43 Harlem Ave	127th St	CO	Permanent Signals		T-1A	T-1	395
TS	2230	IL 43 Harlem Ave	131st St	CO	Permanent Signals		T-1A	T-1	396
TS	2235	IL 43 Harlem Ave	135th St	CO	Permanent Signals		T-1A	T-1	397
TS	2240	IL 43 Harlem Ave	151st St	CO	Permanent Signals		T-1A	T-1	398
TS	2245	IL 43 Harlem Ave	175th St	CO	Permanent Signals		T-1A	T-1	399
TS	2250	IL 43 Harlem Ave	157th St	CO	Permanent Signals		T-1A	T-1	400
TS	2255	IL 43 Harlem Ave	183rd St	CO	Permanent Signals		T-1A	T-1	401
TS	2256	183rd St	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	402
TS	2260	IL 43 Harlem Ave	Archer Ave / 55th St	CO	Permanent Signals		T-1A	T-1	403
TS	2265	IL 43 Harlem Ave	Armitage Ave	CO	Permanent Signals		T-1A	T-1	404
TS	2270	IL 43 Harlem Ave	Augusta Blvd	CO	Permanent Signals		T-1A	T-1	405
TS	2275	IL 43 Harlem Ave	Bloomingdale Rd	CO	Permanent Signals		T-1A	T-1	406
TS	2280	IL 43 Harlem Ave	22nd St / Cermak Rd	CO	Permanent Signals		T-1A	T-1	407
TS	2285	IL 43 Waukegan Rd	Chestnut St	CO	Permanent Signals		T-1A	T-1	408

TS	2290	IL 43 Harlem Ave	Chicago Ave	CO	Permanent Signals		T-1A	T-1	409
TS	2295	IL 43 Harlem Ave	Division St	CO	Permanent Signals		T-1A	T-1	410
TS	2305	IL 43 Harlem Ave	Forest Preserve Dr	CO	Permanent Signals		T-1A	T-1	411
TS	2310	IL 43 Harlem Ave	Foster Pl	CO	Permanent Signals		T-1A	T-1	412
TS	2315	IL 43 Harlem Ave	Garfield Ave / Harrison St	CO	Permanent Signals		T-1A	T-1	413
TS	2325	IL 43 Harlem Ave	Lawrence Ave	CO	Permanent Signals		T-1A	T-1	414
TS	2330	IL 43 Harlem Ave	Howard St	CO	Permanent Signals		T-1A	T-1	415
TS	2335	IL 43 Harlem Ave	92nd Pl / Stanford Dr	CO	Permanent Signals		T-1A	T-1	416
TS	2340	IL 43 Harlem Ave	84th St	CO	Permanent Signals		T-1A	T-1	417
TS	2345	IL 43 Harlem Ave	77th St	CO	Permanent Signals		T-1A	T-1	418
TS	2350	IL 43 Harlem Ave	Jackson Blvd	CO	Permanent Signals		T-1A	T-1	419
TS	2355	IL 43 Harlem Ave	41st St / Joliet Rd	CO	Permanent Signals		T-1A	T-1	420
TS	2360	IL 43 Harlem Ave	Lake St	CO	Permanent Signals		T-1A	T-1	421
TS	2362	US 20 Lake St	Bonnie Brae Pl	CO	Permanent Signals		T-1A	T-1	422
TS	2370	IL 43 Harlem Ave	Madison St	CO	Permanent Signals		T-1A	T-1	423
TS	2375	IL 43 Harlem Ave	Montrose Ave / Agatite Ave	CO	Permanent Signals		T-1A	T-1	424
TS	2377	IL 43 Harlem Ave	Montrose Ave / Persacola Ave	CO	Permanent Signals		T-1A	T-1	425

TS	2380	IL 43 Harlem Ave	North Blvd & South Blvd	CO	Permanent Signals		T-1A	T-1	426
TS	2385	IL 43 Harlem Ave	Ontario Ave	CO	Permanent Signals		T-1A	T-1	427
TS	2390	IL 43 Harlem Ave	Randolph St	CO	Permanent Signals		T-1A	T-1	428
TS	2395	IL 43 Harlem Ave	Riverside Dr / Longcommon Rd	CO	Permanent Signals		T-1A	T-1	429
TS	2400	IL 38 Roosevelt Rd	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	430
TS	2401	IL 38 Roosevelt Rd	Lathrop Ave	CO	Permanent Signals		T-1A	T-1	431
TS	2406	IL 43 Waukegan Rd	Founders Rd	CO	Permanent Signals		T-1A	T-1	432
TS	2410	IL 43 Harlem Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	433
TS	2411	IL 43 Harlem Ave	Pioneer Park / Joswiak Park	CO	Permanent Signals		T-1A	T-1	434
TS	2415	IL 43 Harlem Ave	Washington Blvd	CO	Permanent Signals		T-1A	T-1	435
TS	2420	IL 43 Harlem Ave	Wheeler Dr	CO	Permanent Signals		T-1A	T-1	436
TS	2425	IL 43 Harlem Ave	Willow Rd	CO	Permanent Signals		T-1A	T-1	437
TS	2430	IL 43 Harlem Ave	Wilson Ave	CO	Permanent Signals		T-1A	T-1	438
TS	2435	IL 43 Waukegan Rd	Winnetka Rd	CO	Permanent Signals		T-1A	T-1	439
TS	2445	IL 50 Cicero Ave	31st St	CO	Permanent Signals		T-1A	T-1	440
TS	2450	IL 50 Cicero Ave	39th St Pershing Rd	CO	Permanent Signals		T-1A	T-1	441
TS	2451	IL 50 Cicero	Burbank Station	CO	Permanent Signals		T-1A	T-1	442

		Ave	Ent						
TS	2455	IL 50 Cicero Ave	65th St	CO	Permanent Signals		T-1A	T-1	443
TS	2456	IL 50 Cicero Ave	66th St	CO	Permanent Signals		T-1A	T-1	444
TS	2460	IL 50 Cicero Ave	67th St / Marquette Ave	CO	Permanent Signals		T-1A	T-1	445
TS	2470	IL 50 Cicero Ave	79th St	CO	Permanent Signals		T-1A	T-1	446
TS	2475	IL 50 Cicero Ave	83rd St	CO	Permanent Signals		T-1A	T-1	447
TS	2480	IL 50 Cicero Ave	87th St	CO	Permanent Signals		T-1A	T-1	448
TS	2485	IL 50 Cicero Ave	94th St	CO	Permanent Signals		T-1A	T-1	449
TS	2490	IL 50 Cicero Ave	99th St	CO	Permanent Signals		T-1A	T-1	450
TS	2495	IL 50 Cicero Ave	103rd St	CO	Permanent Signals		T-1A	T-1	451
TS	2500	IL 50 Cicero Ave	107th St	CO	Permanent Signals		T-1A	T-1	452
TS	2505	IL 50 Cicero Ave	110th St	CO	Permanent Signals		T-1A	T-1	453
TS	2510	IL 50 Cicero Ave	111th St	CO	Permanent Signals		T-1A	T-1	454
TS	2512	111th St	Laramie Ave / Jordan Dr	CO	Permanent Signals		T-1A	T-1	455
TS	2515	IL 50 Cicero Ave	113th St / State Bank of Alsip Ent	CO	Permanent Signals		T-1A	T-1	456
TS	2520	IL 50 Cicero Ave	115th St	CO	Permanent Signals		T-1A	T-1	457
TS	2525	IL 50 Cicero Ave	80th St	CO	Permanent Signals		T-1A	T-1	458

TS	2530	IL 50 Cicero Ave	91st St	CO	Permanent Signals		T-1A	T-1	459
TS	2535	IL 50 Cicero Ave	76th Pl / Ford City South Ent	CO	Permanent Signals		T-1A	T-1	460
TS	2540	IL 50 Cicero Ave	88th Ave	CO	Permanent Signals		T-1A	T-1	461
TS	2545	IL 50 Cicero Ave	75th Pl / Ford City North Ent	CO	Permanent Signals		T-1A	T-1	462
TS	2550	IL 50 Cicero Ave	72nd St	CO	Permanent Signals		T-1A	T-1	463
TS	2555	IL 50 Cicero Ave	122nd St	CO	Permanent Signals		T-1A	T-1	464
TS	2560	IL 50 Cicero Ave	123rd St	CO	Permanent Signals		T-1A	T-1	465
TS	2565	IL 50 Cicero Ave	127th St	CO	Permanent Signals		T-1A	T-1	466
TS	2566	127th St	I 294 E Ramps	CO	Permanent Signals		T-1A	T-1	467
TS	2567	127th St	I 294 W Ramps	CO	Permanent Signals		T-1A	T-1	468
TS	2570	IL 50 Cicero Ave	151st St	CO	Permanent Signals		T-1A	T-1	469
TS	2575	IL 50 Cicero Ave	155th St	CO	Permanent Signals		T-1A	T-1	470
TS	2580	IL 50 Cicero Ave	167th St	CO	Permanent Signals		T-1A	T-1	471
TS	2585	IL 50 Cicero Ave	183rd St	CO	Permanent Signals		T-1A	T-1	472
TS	2590	IL 50 Cicero Ave	Devon Ave	CO	Permanent Signals		T-1A	T-1	473
TS	2595	IL 50 Cicero Ave	Fieldcrest Dr / 166th St	CO	Permanent Signals		T-1A	T-1	474
TS	2600	IL 50 Cicero Ave	Flossmoor Rd	CO	Permanent Signals		T-1A	T-1	475

TS	2605	IL 50 Cicero Ave	Pratt Ave	CO	Permanent Signals		T-1A	T-1	476
TS	2620	IL 50 Cicero Ave	Southwest Hwy	CO	Permanent Signals		T-1A	T-1	477
TS	2625	IL 50 Cicero Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	478
TS	2630	IL 50 Cicero Ave	Matteson Town Center Mall Ent	CO	Permanent Signals		T-1A	T-1	479
TS	2635	IL 50 Cicero Ave	Vollmer Rd	CO	Permanent Signals		T-1A	T-1	480
TS	2640	US 45 LaGrange Rd	131st St	CO	Permanent Signals		T-1A	T-1	481
TS	2645	IL 50 IL 83 Cicero Ave	IL 83 Cal Sag Rd	CO	Permanent Signals		T-1A	T-1	482
TS	2649	IL 50 IL 83 Cicero Ave	Rivercrest East Ent	CO	Permanent Signals		T-1A	T-1	483
TS	2650	IL 50 IL 83 Cicero Ave	135th St	CO	Permanent Signals		T-1A	T-1	484
TS	2655	IL 50 IL 83 Cicero Ave	Midlothian Turnpike	CO	Permanent Signals		T-1A	T-1	485
TS	2660	IL 53 IL 68 Dundee Rd	IL 53 West Frontage	CO	Permanent Signals		T-1A	T-1	486
TS	2665	IL 53 East Ramps	IL 62 Algonquin Rd	CO	Permanent Signals		T-1A	T-1	487
TS	2670	IL 53 West Ramps	IL 62 Algonquin Rd	CO	Permanent Signals		T-1A	T-1	488
TS	2677	IL 53 Hicks Rd	Lake Cook Rd	CO	Permanent Signals		T-1A	T-1	489
TS	2685	IL 53 IL 68 Dundee Rd	Baldwin Rd	CO	Permanent Signals		T-1A	T-1	490
TS	2693	IL 56 Butterfield Rd	Darmstadt Rd	CO	Permanent Signals		T-1A	T-1	491
TS	2700	IL 59 Sutton Rd	IL 58 Golf Rd	CO	Permanent Signals		T-1A	T-1	492

TS	2705	IL 58 Golf Rd	IL 62 Algonquin Rd	CO	Permanent Signals		T-1A	T-1	493
TS	2707	IL 62 Algonquin Rd	Lowes Ent	CO	Permanent Signals		T-1A	T-1	494
TS	2708	IL 62 Algonquin Rd	Market Place	CO	Permanent Signals		T-1A	T-1	495
TS	2715	IL 58 Golf Rd	IL 83 Elmhurst Rd	CO	Permanent Signals		T-1A	T-1	496
TS	2720	IL 58 Golf Rd	Arlington Heights Rd	CO	Permanent Signals		T-1A	T-1	497
TS	2725	IL 58 Golf Rd	Barrington Rd	CO	Permanent Signals		T-1A	T-1	498
TS	2735	IL 58 Dempster St	Bronx Ave	CO	Permanent Signals		T-1A	T-1	499
TS	2740	IL 58 Golf Rd	Busse Rd	CO	Permanent Signals		T-1A	T-1	500
TS	2745	IL 58 Dempster St	CTA RR Terminal Ent	CO	Permanent Signals		T-1A	T-1	501
TS	2750	IL 58 Golf Rd	Dee Rd	CO	Permanent Signals		T-1A	T-1	502
TS	2755	IL 58 Golf Rd	East River Rd	CO	Permanent Signals		T-1A	T-1	503
TS	2760	IL 58 Golf Rd	Gannon Dr	CO	Permanent Signals		T-1A	T-1	504
TS	2765	IL 58 Golf Rd	Goebbert Rd	CO	Permanent Signals		T-1A	T-1	505
TS	2767	IL 58 Golf Rd	International Plaza Rd	CO	Permanent Signals		T-1A	T-1	506
TS	2770	IL 58 Golf Rd	Gould Dr	CO	Permanent Signals		T-1A	T-1	507
TS	2775	IL 58 Golf Rd	Greenwood Ave	CO	Permanent Signals		T-1A	T-1	508
TS	2780	IL 58 Golf Rd	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	509
TS	2785	IL 58 Golf Rd	6th Ave	CO	Permanent Signals		T-1A	T-1	510
TS	2790	IL 58 Golf Rd	Highland Blvd	CO	Permanent Signals		T-1A	T-1	511
TS	2795	IL 58 Golf Rd	Jones Rd / Salem Dr	CO	Permanent Signals		T-1A	T-1	512

TS	2800	IL 58 Golf Rd	Kraft Food Ent	CO	Permanent Signals		T-1A	T-1	513
TS	2805	IL 58 Dempster St	Lockwood Ave	CO	Permanent Signals		T-1A	T-1	514
TS	2810	IL 58 Golf Rd	Meacham Rd	CO	Permanent Signals		T-1A	T-1	515
TS	2815	IL 58 Golf Rd	Wilke Rd	CO	Permanent Signals		T-1A	T-1	516
TS	2820	IL 58 Golf Rd	Niles Center Rd	CO	Permanent Signals		T-1A	T-1	517
TS	2825	IL 58 Golf Rd	Oakton Community College	CO	Permanent Signals		T-1A	T-1	518
TS	2830	IL 58 Golf Rd	Plum Grove Rd	CO	Permanent Signals		T-1A	T-1	519
TS	2835	IL 58 Golf Rd	Potter Rd	CO	Permanent Signals		T-1A	T-1	520
TS	2840	IL 58 Golf Rd	Roselle Rd	CO	Permanent Signals		T-1A	T-1	521
TS	2845	IL 58 Golf Rd	Shermer Rd	CO	Permanent Signals		T-1A	T-1	522
TS	2850	IL 58 Golf Rd	Washington St	CO	Permanent Signals		T-1A	T-1	523
TS	2855	IL 58 Golf Rd	Western Ave	CO	Permanent Signals		T-1A	T-1	524
TS	2860	IL 58 Golf Rd	3 Com Dr / Apollo Dr	CO	Permanent Signals		T-1A	T-1	525
TS	2865	IL 58 Golf Rd	Wolf Rd / Segers Rd	CO	Permanent Signals		T-1A	T-1	526
TS	2870	IL 58 Golf Rd	Moon Lake Rd / Walnut Ln	CO	Permanent Signals		T-1A	T-1	527
TS	2875	IL 58 Golf Rd	Meier Rd	CO	Permanent Signals		T-1A	T-1	528
TS	2880	IL 58 Golf Rd	Valley Lake	CO	Permanent Signals		T-1A	T-1	529
TS	2885	IL 58 Golf Rd	Four Flags Shopping Center Ent	CO	Permanent Signals		T-1A	T-1	530
TS	2890	IL 62 IL 68 Algonquin Rd	IL59/IL 68 Dundee Rd	CO	Permanent Signals		T-1A	T-1	531
TS	2892	IL 59 Sutton Rd	Bartlett Rd	CO	Permanent Signals		T-1A	T-1	532

TS	2895	IL 59 Sutton Rd	IL 72 Higgins Rd	CO	Permanent Signals		T-1A	T-1	533
TS	2897	IL 59 Sutton Rd	Penny Rd	CO	Permanent Signals		T-1A	T-1	534
TS	2899	IL 59	Arboretum Blvd	CO	Permanent Signals		T-1A	T-1	535
TS	2900	IL 59 Hough Rd Hawthorne Rd	Barrington Rd	CO	Permanent Signals		T-1A	T-1	536
TS	2905	IL 59 Hough Rd Hawthorne Rd	Hillside Ave	CO	Permanent Signals		T-1A	T-1	537
TS	2910	IL 59 Sutton Rd	Schaumburg Rd	CO	Permanent Signals		T-1A	T-1	538
TS	2915	IL 59 IL 68 Sutton Rd	IL 62/IL 68 Algonquin Rd	CO	Permanent Signals		T-1A	T-1	539
TS	2920	IL 62 IL 68 Algonquin Rd	IL 68 Dundee Rd / Brinker Rd	CO	Permanent Signals		T-1A	T-1	540
TS	2922	IL 62 Algonquin Rd	Palatine Rd	CO	Permanent Signals		T-1A	T-1	541
TS	2925	IL 62 Algonquin Rd	IL 83 Elmhurst Rd	CO	Permanent Signals		T-1A	T-1	542
TS	2930	IL 62 Algonquin Rd	Arbor Dr	CO	Permanent Signals		T-1A	T-1	543
TS	2935	IL 62 Algonquin Rd	Arlington Heights Rd	CO	Permanent Signals		T-1A	T-1	544
TS	2936	IL 62 Algonquin Rd	95 West Radisson Marriot Hotel Ent	CO	Permanent Signals		T-1A	T-1	545
TS	2938	Arlington Heights Rd	I 90 Tollway N Ramps	CO	Permanent Signals		T-1A	T-1	546
TS	2939	Arlington Heights Rd	I 90 Tollway S Ramps	CO	Permanent Signals		T-1A	T-1	547
TS	2940	IL 62 Algonquin Rd	Barrington Rd	CO	Permanent Signals		T-1A	T-1	548

TS	2950	IL 62 Algonquin Rd	Dempster St	CO	Permanent Signals		T-1A	T-1	549
TS	2955	IL 62 Algonquin Rd	Ela Rd	CO	Permanent Signals		T-1A	T-1	550
TS	2957	IL 62 Algonquin Rd	Winston Dr	CO	Permanent Signals		T-1A	T-1	551
TS	2960	IL 62 Algonquin Rd	Freeman Rd / Huntington Blvd	CO	Permanent Signals		T-1A	T-1	552
TS	2965	IL 62 Algonquin Rd	Goebbert Rd	CO	Permanent Signals		T-1A	T-1	553
TS	2966	IL 62 Algonquin Rd	Tonne Rd	CO	Permanent Signals		T-1A	T-1	554
TS	2967	IL 62 Algonquin Rd	Meijer Ent	CO	Permanent Signals		T-1A	T-1	555
TS	2970	IL 62 Algonquin Rd	Harper College Ent	CO	Permanent Signals		T-1A	T-1	556
TS	2975	IL 62 Algonquin Rd	Linneman Rd	CO	Permanent Signals		T-1A	T-1	557
TS	2980	IL 62 Algonquin Rd	Magnolia Dr / Commerce Rd	CO	Permanent Signals		T-1A	T-1	558
TS	2985	IL 62 Algonquin Rd	New Wilke Rd	CO	Permanent Signals		T-1A	T-1	559
TS	2990	IL 62 Algonquin Rd	Roselle Rd	CO	Permanent Signals		T-1A	T-1	560
TS	2995	IL 64 North Ave	IL 171 1st Ave	CO	Permanent Signals		T-1A	T-1	561
TS	3000	IL 64 North Ave	5th Ave	CO	Permanent Signals		T-1A	T-1	562
TS	3005	IL 64 North Ave	7th Ave	CO	Permanent Signals		T-1A	T-1	563
TS	3010	IL 64 North Ave	9th Ave	CO	Permanent Signals		T-1A	T-1	564
TS	3015	IL 64 North	19th Ave /	CO	Permanent Signals		T-1A	T-1	565

		Ave	Broadway Ave						
TS	3020	IL 64 North Ave	25th Ave	CO	Permanent Signals		T-1A	T-1	566
TS	3025	IL 64 North Ave	76th Ave / Lathrop Ave	CO	Permanent Signals		T-1A	T-1	567
TS	3030	IL 64 North Ave	Austin Blvd	CO	Permanent Signals		T-1A	T-1	568
TS	3035	IL 64 North Ave	Cornell Ave / 35th St	CO	Permanent Signals		T-1A	T-1	569
TS	3040	IL 64 North Ave	George St	CO	Permanent Signals		T-1A	T-1	570
TS	3045	IL 64 North Ave	Hawthorne Ave	CO	Permanent Signals		T-1A	T-1	571
TS	3050	IL 64 North Ave	Indian Boundary Rd / Ruby Rd	CO	Permanent Signals		T-1A	T-1	572
TS	3055	IL 64 North Ave	Narragansett Ave / Edmer Ave	CO	Permanent Signals		T-1A	T-1	573
TS	3060	IL 64 North Ave	Natoma Ave / Columbian Ave	CO	Permanent Signals		T-1A	T-1	574
TS	3065	IL 64 North Ave	Northwest Ave	CO	Permanent Signals		T-1A	T-1	575
TS	3067	US 20 Lake St	Railroad Ave	CO	Permanent Signals		T-1A	T-1	576
TS	3070	IL 64 North Ave	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	577
TS	3075	IL 64 North Ave	Railroad Ave	CO	Permanent Signals		T-1A	T-1	578
TS	3080	IL 64 North Ave	Ridgeland Ave / Mobile Ave	CO	Permanent Signals		T-1A	T-1	579
TS	3083	IL 64 North Ave	Roy St	CO	Permanent Signals		T-1A	T-1	580
TS	3085	IL 64 North Ave	Thatcher Ave	CO	Permanent Signals		T-1A	T-1	581

TS	3090	IL 64 North Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	582
TS	3095	IL 68 Dundee Rd	IL 83 Elmhurst Rd	CO	Permanent Signals		T-1A	T-1	583
TS	3100	IL 68 Dundee Rd	Arlington Heights Rd	CO	Permanent Signals		T-1A	T-1	584
TS	3105	IL 68 Dundee Rd	Barrington Rd	CO	Permanent Signals		T-1A	T-1	585
TS	3110	IL 68 Dundee Rd	Buffalo Grove Rd	CO	Permanent Signals		T-1A	T-1	586
TS	3112	IL 68 Dundee Rd	Buffalo Grove High School Ent	CO	Permanent Signals		T-1A	T-1	587
TS	3115	IL 68 Dundee Rd	Charlemagne Dr / Torrey Pines Parkway	CO	Permanent Signals		T-1A	T-1	588
TS	3120	IL 68 Dundee Rd	Hicks Rd	CO	Permanent Signals		T-1A	T-1	589
TS	3122	IL 68 Dundee Rd	Denise Dr / Deergrove SC Ent	CO	Permanent Signals		T-1A	T-1	590
TS	3125	IL 68 Dundee Rd	Huehl Rd	CO	Permanent Signals		T-1A	T-1	591
TS	3130	IL 68 Dundee Rd	Kennicott Ave	CO	Permanent Signals		T-1A	T-1	592
TS	3135	IL 68 Dundee Rd	Landwehr Rd	CO	Permanent Signals		T-1A	T-1	593
TS	3137	IL 68 Dundee Rd	Anthony Tr	CO	Permanent Signals		T-1A	T-1	594
TS	3140	IL 68 Dundee Rd	Midway Rd	CO	Permanent Signals		T-1A	T-1	595
TS	3145	IL 68 Dundee Rd	Old McHenry Rd / Wheeling Rd	CO	Permanent Signals		T-1A	T-1	596
TS	3150	IL 68 Dundee Rd	Ridge Ave	CO	Permanent Signals		T-1A	T-1	597

TS	3155	IL 68 Dundee Rd	Golfview Terrace	CO	Permanent Signals		T-1A	T-1	598
TS	3160	IL 68 Dundee Rd	Pfingsten Rd	CO	Permanent Signals		T-1A	T-1	599
TS	3165	IL 68 Dundee Rd	Quentin Rd	CO	Permanent Signals		T-1A	T-1	600
TS	3168	IL 68 Dundee Rd	Sterling Ave	CO	Permanent Signals		T-1A	T-1	601
TS	3170	IL 68 Dundee Rd	Sanders Rd	CO	Permanent Signals		T-1A	T-1	602
TS	3175	IL 68 Dundee Rd	Schoenbeck Rd	CO	Permanent Signals		T-1A	T-1	603
TS	3185	IL 68 Dundee Rd	Skokie Rd	CO	Permanent Signals		T-1A	T-1	604
TS	3190	IL 68 Dundee Rd	Smith Rd	CO	Permanent Signals		T-1A	T-1	605
TS	3195	IL 68 Dundee Rd	Western Ave	CO	Permanent Signals		T-1A	T-1	606
TS	3200	IL 68 Dundee Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	607
TS	3205	IL 68 Dundee Rd	Wilke Rd / E Frontage Rd	CO	Permanent Signals		T-1A	T-1	608
TS	3210	IL 68 Dundee Rd	Weidner Rd / Crofton Ln	CO	Permanent Signals		T-1A	T-1	609
TS	3213	IL 68 Dundee Rd	Buffalo Grove Fire House	CO	Permanent Signals		T-1A	T-1	610
TS	3215	IL 72 Higgins Rd	Landmeier Rd	CO	Permanent Signals		T-1A	T-1	611
TS	3220	IL 72 Higgins Rd	Mall Dr	CO	Permanent Signals		T-1A	T-1	612
TS	3225	IL 72 Higgins Rd	Martingale Rd	CO	Permanent Signals		T-1A	T-1	613
TS	3230	IL 72 Higgins	Meacham Rd	CO	Permanent Signals		T-1A	T-1	614

		Rd							
TS	3235	IL 72 Higgins Rd	Mt Prospect Rd	CO	Permanent Signals		T-1A	T-1	615
TS	3240	IL 72 Higgins Rd	Oakton St W Junction	CO	Permanent Signals		T-1A	T-1	616
TS	3245	IL 72 Higgins Rd	Plum Grove Rd	CO	Permanent Signals		T-1A	T-1	617
TS	3255	IL 72 Higgins Rd	Salem Dr	CO	Permanent Signals		T-1A	T-1	618
TS	3260	IL 72 Touhy Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	619
TS	3265	IL 72 Higgins Rd	O'Hare Plaza Ent # 2	CO	Permanent Signals		T-1A	T-1	620
TS	3270	IL 72 Higgins Rd	IL 72 Touhy Ave	CO	Permanent Signals		T-1A	T-1	621
TS	3275	IL 72 Higgins Rd	Oakton St E Junction	CO	Permanent Signals		T-1A	T-1	622
TS	3280	IL 83 Busse Rd	Oakton St	CO	Permanent Signals		T-1A	T-1	623
TS	3285	IL 72 Higgins Rd	Arlington Heights Rd	CO	Permanent Signals		T-1A	T-1	624
TS	3290	IL 72 Higgins Rd	Barrington Rd	CO	Permanent Signals		T-1A	T-1	625
TS	3300	IL 72 Higgins Rd	Canfield Rd	CO	Permanent Signals		T-1A	T-1	626
TS	3305	IL 72 Higgins Rd	IL 171 Cumberland Ave	CO	Permanent Signals		T-1A	T-1	627
TS	3310	IL 72 Higgins Rd	Dee Rd / East River Rd	CO	Permanent Signals		T-1A	T-1	628
TS	3315	IL 72 Higgins Rd	Elmhurst Rd	CO	Permanent Signals		T-1A	T-1	629
TS	3318	Elmhurst Rd	Landmeier Rd	CO	Permanent Signals		T-1A	T-1	630
TS	3325	IL 72 Higgins	Gannon Dr	CO	Permanent Signals		T-1A	T-1	631

		Rd							
TS	3330	IL 72 Higgins Rd	Governors Ln / Moon Lake Blvd	CO	Permanent Signals		T-1A	T-1	632
TS	3335	IL 72 Higgins Rd	King Rd / Stanley St	CO	Permanent Signals		T-1A	T-1	633
TS	3340	IL 72 Higgins Rd	Beverly Rd	CO	Permanent Signals		T-1A	T-1	634
TS	3350	IL 83 Elmhurst Rd	IL 83 Oakton St	CO	Permanent Signals		T-1A	T-1	635
TS	3355	IL 83 Elmhurst Rd	IL 83 Old McHenry Rd	CO	Permanent Signals		T-1A	T-1	636
TS	3360	IL 83 Cal Sag Rd	104th Ave	CO	Permanent Signals		T-1A	T-1	637
TS	3365	IL 83 IL 171 N Junction	107th St	CO	Permanent Signals		T-1A	T-1	638
TS	3370	IL 83 IL 171 S Junction	111th St	CO	Permanent Signals		T-1A	T-1	639
TS	3375	IL 83 Cal Sag Rd	127th St	CO	Permanent Signals		T-1A	T-1	640
TS	3380	IL 83 Torrence Ave	186th St	CO	Permanent Signals		T-1A	T-1	641
TS	3385	IL 83 Sibley 147th St	Broadway Vincinnes	CO	Permanent Signals		T-1A	T-1	642
TS	3390	IL 83 Elmhurst Rd	Camp McDonald Rd	CO	Permanent Signals		T-1A	T-1	643
TS	3395	IL 83 Sibley 147th St	Chicago Rd	CO	Permanent Signals		T-1A	T-1	644
TS	3400	IL 83 147th St SibleyBlvd	Crawford Ave	CO	Permanent Signals		T-1A	T-1	645
TS	3405	IL 83 Elmhurst Rd	Dempster St / Thacker St	CO	Permanent Signals		T-1A	T-1	646
TS	3410	IL 83 Busse Rd	Devon Ave	CO	Permanent Signals		T-1A	T-1	647
TS	3415	IL 83 Sibley	Dixie Hwy	CO	Permanent Signals		T-1A	T-1	648

		147th St							
TS	3420	IL 83 Elmhurst Rd	Euclid St	CO	Permanent Signals		T-1A	T-1	649
TS	3425	IL 83 Busse Rd	Greenleaf Ave	CO	Permanent Signals		T-1A	T-1	650
TS	3430	IL 83 Elmhurst Rd	Hintz Rd	CO	Permanent Signals		T-1A	T-1	651
TS	3435	IL 83 Sibley 147th St	Homan Ave	CO	Permanent Signals		T-1A	T-1	652
TS	3440	IL 83 147th St SibleyBlvd	Indiana Ave	CO	Permanent Signals		T-1A	T-1	653
TS	3445	IL 83 147th St SibleyBlvd	Keeler Ave	CO	Permanent Signals		T-1A	T-1	654
TS	3450	IL 83 Sibley 147th St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	655
TS	3455	IL 83 147th St SibleyBlvd	Kilbourn Ave	CO	Permanent Signals		T-1A	T-1	656
TS	3460	IL 83 Busse Rd	Landmeier Rd	CO	Permanent Signals		T-1A	T-1	657
TS	3465	IL 83 Sibley 147th St	LaSalle Markham	CO	Permanent Signals		T-1A	T-1	658
TS	3470	IL 83 147th St SibleyBlvd	Loomis St	CO	Permanent Signals		T-1A	T-1	659
TS	3475	IL 83 147th St SibleyBlvd	Michigan City Rd / Lincoln Ave	CO	Permanent Signals		T-1A	T-1	660
TS	3480	IL 83 Torrence Ave	Michigan City Rd	CO	Permanent Signals		T-1A	T-1	661
TS	3485	IL 83 Elmhurst Rd	Palatine Rd	CO	Permanent Signals		T-1A	T-1	662
TS	3490	IL 83 Busse Rd	Pratt Rd	CO	Permanent Signals		T-1A	T-1	663
TS	3495	IL 83 Torrence Ave	Ridge Rd / 179th St	CO	Permanent Signals		T-1A	T-1	664
TS	3500	IL 83 Elmhurst Rd	Randhurst Shopping Center	CO	Permanent Signals		T-1A	T-1	665

			Ent						
TS	3505	IL 83 Cal Sag Rd	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	666
TS	3510	IL 83 147th St SibleyBlvd	Robey Ave	CO	Permanent Signals		T-1A	T-1	667
TS	3515	IL 83 Torrence Ave	Thornton Lansing Rd	CO	Permanent Signals		T-1A	T-1	668
TS	3520	IL 83 147th St SibleyBlvd	Wood St	CO	Permanent Signals		T-1A	T-1	669
TS	3530	IL 83 Cal Sag Rd College Dr	119th St	CO	Permanent Signals		T-1A	T-1	670
TS	3532	IL 83 Cal Sag Rd College Dr	76th Ave	CO	Permanent Signals		T-1A	T-1	671
TS	3535	IL 83 Elmhurst Rd	Huntington Commons Dr	CO	Permanent Signals		T-1A	T-1	672
TS	3540	IL 83 Elmhurst Rd	Willow Rd	CO	Permanent Signals		T-1A	T-1	673
TS	3545	IL 171 Archer Ave	63rd St	CO	Permanent Signals		T-1A	T-1	674
TS	3550	IL 171 1st Ave E Ramps	Joliet Rd	CO	Permanent Signals		T-1A	T-1	675
TS	3555	IL 171 Archer Ave	55th St	CO	Permanent Signals		T-1A	T-1	676
TS	3557	IL 171 Archer Ave	59th St	CO	Permanent Signals		T-1A	T-1	677
TS	3560	IL 171 Archer Ave	Roberts Rd	CO	Permanent Signals		T-1A	T-1	678
TS	3565	IL 171 Archer Ave	State St	CO	Permanent Signals		T-1A	T-1	679
TS	3567	IL 171 Archer Ave	Access Dr / Target Ent	CO	Permanent Signals		T-1A	T-1	680
TS	3570	IL 171 Archer Ave	Willow Springs Rd	CO	Permanent Signals		T-1A	T-1	681

TS	3572	IL 171 Archer Ave	Nolton Ave	CO	Permanent Signals		T-1A	T-1	682
TS	3573	Willow Springs Rd	German Church Rd	CO	Permanent Signals		T-1A	T-1	683
TS	3575	IL 171 1st Ave E Ramps	47th St	CO	Permanent Signals		T-1A	T-1	684
TS	3580	IL 394	Steger Rd	CO	Permanent Signals		T-1A	T-1	685
TS	3585	IL 171 1st Ave	26th St	CO	Permanent Signals		T-1A	T-1	686
TS	3590	IL 171 1st Ave	31st St	CO	Permanent Signals		T-1A	T-1	687
TS	3595	IL 171 1st Ave	31st St / Cutoff Golf View Rd	CO	Permanent Signals		T-1A	T-1	688
TS	3600	IL 171 1st Ave	22nd St / Cermak Rd	CO	Permanent Signals		T-1A	T-1	689
TS	3605	IL 171 1st Ave	22nd St / Cermak Rd Cutoff	CO	Permanent Signals		T-1A	T-1	690
TS	3610	IL 171 1st Ave	Chicago Ave	CO	Permanent Signals		T-1A	T-1	691
TS	3615	IL 171 1st Ave	Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	692
TS	3620	IL 171 1st Ave	Forest Ave / Ridgewood Ave	CO	Permanent Signals		T-1A	T-1	693
TS	3625	IL 171 1st Ave	Fullerton Ave	CO	Permanent Signals		T-1A	T-1	694
TS	3630	IL 171 1st Ave	Lake St	CO	Permanent Signals		T-1A	T-1	695
TS	3635	IL 171 1st Ave	13th St / Madden Medical Center Ent	CO	Permanent Signals		T-1A	T-1	696
TS	3640	IL 171 1st Ave	Madison St	CO	Permanent Signals		T-1A	T-1	697
TS	3645	IL 171 1st Ave	Maybrook Square Ent	CO	Permanent Signals		T-1A	T-1	698
TS	3650	IL 171 1st Ave	Roosevelt Rd	CO	Permanent Signals		T-1A	T-1	699
TS	3656	IL 171 1st Ave	Warren Ave	CO	Permanent Signals		T-1A	T-1	700

TS	3660	IL 171 1st Ave	Thatcher Rd Cutoff	CO	Permanent Signals		T-1A	T-1	701
TS	3665	IL 171 1st Ave	Van Buren St / Comm Edison Ent	CO	Permanent Signals		T-1A	T-1	702
TS	3670	IL 171 1st Ave	Washington Blvd	CO	Permanent Signals		T-1A	T-1	703
TS	3675	IL 171 1st Ave	G St / Loyola Hospital Ent	CO	Permanent Signals		T-1A	T-1	704
TS	3680	5th Ave	Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	705
TS	3685	5th Ave	Triton College N Ent	CO	Permanent Signals		T-1A	T-1	706
TS	3690	5th Ave	Triton College S Ent	CO	Permanent Signals		T-1A	T-1	707
TS	3691	31st St	Prairie Ave	CO	Permanent Signals		T-1A	T-1	708
TS	3693	30th St	Maple Ave	CO	Permanent Signals		T-1A	T-1	709
TS	3695	17th Ave Maple Ave	31st St / Logan Blvd	CO	Permanent Signals		T-1A	T-1	710
TS	3700	22nd St Cermak Rd	17th Ave	CO	Permanent Signals		T-1A	T-1	711
TS	3701	22nd St Cermak Rd	12th Ave	CO	Permanent Signals		T-1A	T-1	712
TS	3705	Roosevelt Rd	17th Ave	CO	Permanent Signals		T-1A	T-1	713
TS	3715	25th Ave	Lake St	CO	Permanent Signals		T-1A	T-1	714
TS	3720	25th Ave	Lexington Dr	CO	Permanent Signals		T-1A	T-1	715
TS	3725	Roosevelt Rd	25th Ave	CO	Permanent Signals		T-1A	T-1	716
TS	3740	26th St	East End Ave	CO	Permanent Signals		T-1A	T-1	717
TS	3745	26th St	Highland Blvd	CO	Permanent Signals		T-1A	T-1	718
TS	3750	26th St	North Riverside Plaza Ent	CO	Permanent Signals		T-1A	T-1	719
TS	3755	26th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	720

TS	3760	31st St	Des Plaines Ave	CO	Permanent Signals		T-1A	T-1	721
TS	3765	31st St	Golfview Ln / 1st Ave Cutoff	CO	Permanent Signals		T-1A	T-1	722
TS	3770	31st St	Kemman Ave / Grand Blvd	CO	Permanent Signals		T-1A	T-1	723
TS	3775	31st St	Wolf Rd	CO	Permanent Signals		T-1A	T-1	724
TS	3780	39th St Pershing Rd	Central Ave	CO	Permanent Signals		T-1A	T-1	725
TS	3785	39th St Pershing Rd	Laramie Ave	CO	Permanent Signals		T-1A	T-1	726
TS	3790	39th St Pershing Rd	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	727
TS	3795	39th St Pershing Rd	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	728
TS	3800	39th St Pershing Rd	Austin Blvd	CO	Permanent Signals		T-1A	T-1	729
TS	3810	47th St	Joliet Rd	CO	Permanent Signals		T-1A	T-1	730
TS	3815	47th St	Lawndale Ave	CO	Permanent Signals		T-1A	T-1	731
TS	3820	47th St	Plainfield Rd	CO	Permanent Signals		T-1A	T-1	732
TS	3825	47th St	Wolf Rd	CO	Permanent Signals		T-1A	T-1	733
TS	3830	55th St	Brainard Ave	CO	Permanent Signals		T-1A	T-1	734
TS	3835	IL 171 Archer Ave	Center Ave / Lawndale Ave	CO	Permanent Signals		T-1A	T-1	735
TS	3840	55th St	County Line Rd	CO	Permanent Signals		T-1A	T-1	736
TS	3845	55th St	East Ave	CO	Permanent Signals		T-1A	T-1	737
TS	3850	55th St	Joliet Rd	CO	Permanent Signals		T-1A	T-1	738
TS	3855	55th St	Plainfield Rd	CO	Permanent Signals		T-1A	T-1	739
TS	3860	55th St	Willow Springs Rd	CO	Permanent Signals		T-1A	T-1	740
TS	3865	55th St	Wolf Rd	CO	Permanent Signals		T-1A	T-1	741

TS	3870	55th St	Laurel Ave	CO	Permanent Signals		T-1A	T-1	742
TS	3875	79th St	Austin Blvd	CO	Permanent Signals		T-1A	T-1	743
TS	3880	79th St	Central Ave	CO	Permanent Signals		T-1A	T-1	744
TS	3885	79th St	Narragansett Ave	CO	Permanent Signals		T-1A	T-1	745
TS	3890	79th St	Roberts Rd	CO	Permanent Signals		T-1A	T-1	746
TS	3893	79th St	Willow Springs Rd	CO	Permanent Signals		T-1A	T-1	747
TS	3895	79th St	Sayre Ave	CO	Permanent Signals		T-1A	T-1	748
TS	3900	79th St	State Rd	CO	Permanent Signals		T-1A	T-1	749
TS	3910	87th St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	750
TS	3915	87th St	Kostner Ave	CO	Permanent Signals		T-1A	T-1	751
TS	3920	Crawford Ave Pulaski Rd	Southwest Hwy / Columbus	CO	Permanent Signals		T-1A	T-1	752
TS	3925	103rd St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	753
TS	3930	103rd St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	754
TS	3935	103rd St Virginia Ave	Southwest Hwy	CO	Permanent Signals		T-1A	T-1	755
TS	3936	123rd St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	756
TS	3942	111th St	Possum Dr College Pkwy	CO	Permanent Signals		T-1A	T-1	757
TS	3945	111th St	Central Ave	CO	Permanent Signals		T-1A	T-1	758
TS	3950	111th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	759
TS	3955	111th St	Roberts Rd	CO	Permanent Signals		T-1A	T-1	760
TS	3960	115th St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	761
TS	3965	115th St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	762
TS	3970	119th St	Vincennes Ave	CO	Permanent Signals		T-1A	T-1	763

TS	3975	127th St	76th Ave	CO	Permanent Signals		T-1A	T-1	764
TS	3980	127th St	Ashland Ave	CO	Permanent Signals		T-1A	T-1	765
TS	3985	127th St	Central Ave	CO	Permanent Signals		T-1A	T-1	766
TS	3990	127th St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	767
TS	3995	127th St	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	768
TS	4000	127th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	769
TS	4005	127th St	Throop St	CO	Permanent Signals		T-1A	T-1	770
TS	4010	127th St	Wood St	CO	Permanent Signals		T-1A	T-1	771
TS	4015	127th St	Bishop St	CO	Permanent Signals		T-1A	T-1	772
TS	4030	135th St	Long Ave	CO	Permanent Signals		T-1A	T-1	773
TS	4035	135th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	774
TS	4045	138th St	Ashland Ave / Wood St	CO	Permanent Signals		T-1A	T-1	775
TS	4050	142nd St Main St	Chicago Ave	CO	Permanent Signals		T-1A	T-1	776
TS	4055	142nd St Main St	Indiana Ave	CO	Permanent Signals		T-1A	T-1	777
TS	4060	142nd St Main St	Lincoln Ave	CO	Permanent Signals		T-1A	T-1	778
TS	4075	147th St	Central Ave	CO	Permanent Signals		T-1A	T-1	779
TS	4076	147th St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	780
TS	4080	154th St	Chicago Ave / South Park Ave	CO	Permanent Signals		T-1A	T-1	781
TS	4085	167th St	Wood St	CO	Permanent Signals		T-1A	T-1	782
TS	4090	Governors Hwy 175th St	Dixie Hwy	CO	Permanent Signals		T-1A	T-1	783
TS	4092	Governors Hwy	Metra RR Station Ent	CO	Permanent Signals		T-1A	T-1	784

TS	4095	183rd St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	785
TS	4108	183rd St	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	786
TS	4110	183rd St	Riegal Rd	CO	Permanent Signals		T-1A	T-1	787
TS	4115	IL 171 Cumberland Ave	Addison St	CO	Permanent Signals		T-1A	T-1	788
TS	4120	Algonquin Rd	Mt Prospect Rd	CO	Permanent Signals		T-1A	T-1	789
TS	4125	Algonquin Rd	Oakton St	CO	Permanent Signals		T-1A	T-1	790
TS	4130	Algonquin Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	791
TS	4135	Ashland Ave	Broadway Ave at North Water St	CO	Permanent Signals		T-1A	T-1	792
TS	4140	Ashland Ave	Vermont Ave	CO	Permanent Signals		T-1A	T-1	793
TS	4145	Ballard Rd	Dee Rd	CO	Permanent Signals		T-1A	T-1	794
TS	4146	Ballard Rd	Nesset Dr	CO	Permanent Signals		T-1A	T-1	795
TS	4150	Ballard Rd	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	796
TS	4155	Ballard Rd	Potter	CO	Permanent Signals		T-1A	T-1	797
TS	4160	Ballard Rd	US12 Rand Rd	CO	Permanent Signals		T-1A	T-1	798
TS	4165	Barrington Rd	Bourbon Parkway	CO	Permanent Signals		T-1A	T-1	799
TS	4170	Barrington Rd	Bode Rd	CO	Permanent Signals		T-1A	T-1	800
TS	4175	Barrington Rd	Hassel Rd	CO	Permanent Signals		T-1A	T-1	801
TS	4176	Barrington Rd	Central Rd	CO	Permanent Signals		T-1A	T-1	802
TS	4180	Barrington Rd	Schaumburg Rd	CO	Permanent Signals		T-1A	T-1	803
TS	4185	Barrington Rd	Mundhank Rd	CO	Permanent Signals		T-1A	T-1	804
TS	4188	Barrington Rd	Locust Dr / Lakewood Blvd	CO	Permanent Signals		T-1A	T-1	805
TS	4190	Belmont Ave	80th Ave / Pacific Ave	CO	Permanent Signals		T-1A	T-1	806

TS	4200	IL 171 Cumberland Ave	Belmont Ave	CO	Permanent Signals		T-1A	T-1	807
TS	4203	IL 171 Cumberland Ave	Thatcher Woods SC Ent	CO	Permanent Signals		T-1A	T-1	808
TS	4204	Belmont Ave	Plainfield Ave	CO	Permanent Signals		T-1A	T-1	809
TS	4205	Belmont Ave	Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	810
TS	4210	Belmont Ave	Forest Preserve Dr	CO	Permanent Signals		T-1A	T-1	811
TS	4215	Belmont Ave	77th Ave / Overhill Ave	CO	Permanent Signals		T-1A	T-1	812
TS	4220	Belmont Ave	Burnham Ave	CO	Permanent Signals		T-1A	T-1	813
TS	4225	Broadway Ave	Joe Orr Rd / Riegel Rd	CO	Permanent Signals		T-1A	T-1	814
TS	4230	Burnham Ave	170th St	CO	Permanent Signals		T-1A	T-1	815
TS	4235	Burnham Ave	Ridge Rd	CO	Permanent Signals		T-1A	T-1	816
TS	4240	Burnham Ave	Schrum Pl	CO	Permanent Signals		T-1A	T-1	817
TS	4245	Busse Hwy	Potter Rd	CO	Permanent Signals		T-1A	T-1	818
TS	4250	Busse Rd	Dempster St	CO	Permanent Signals		T-1A	T-1	819
TS	4255	Canfield Ave	Devon Ave	CO	Permanent Signals		T-1A	T-1	820
TS	4260	Canfield Ave	Talcott Ave	CO	Permanent Signals		T-1A	T-1	821
TS	4270	111th St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	822
TS	4280	IL 43 Harlem Ave	143rd St	CO	Permanent Signals		T-1A	T-1	823
TS	4285	IL 43 Harlem Ave	Foster Shopping Center Ent	CO	Permanent Signals		T-1A	T-1	824
TS	4375	Joe Orr Rd	Ashland Ave	CO	Permanent Signals		T-1A	T-1	825

TS	4410	Burnham Ave	152nd St	CO	Permanent Signals		T-1A	T-1	826
TS	4415	Burnham Ave	156th St	CO	Permanent Signals		T-1A	T-1	827
TS	4425	Burnham Ave	Michigan City Rd	CO	Permanent Signals		T-1A	T-1	828
TS	4430	Burnham Ave	154th St / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	829
TS	4435	Sibley Blvd 147th St	Burnham Ave	CO	Permanent Signals		T-1A	T-1	830
TS	4660	IL 59 Sutton Rd	West Bartlett Rd	CO	Permanent Signals		T-1A	T-1	831
TS	4670	IL 59	Stearns Rd	CO	Permanent Signals		T-1A	T-1	832
TS	4695	US 14 Northwest Hwy	Eastern Ave	CO	Permanent Signals		T-1A	T-1	833
TS	4715	IL 43 Harlem Ave	48th St / Amoco Oil Ent	CO	Permanent Signals		T-1A	T-1	834
TS	4725	IL 50 Cicero Ave	37th St Citco Oil Ent	CO	Permanent Signals		T-1A	T-1	835
TS	4735	Central Ave	51st St	CO	Permanent Signals		T-1A	T-1	836
TS	4740	Central Rd	Dee Rd	CO	Permanent Signals		T-1A	T-1	837
TS	4742	Central Rd	Dearlove Rd / Glenview Rd	CO	Permanent Signals		T-1A	T-1	838
TS	4745	Central Rd	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	839
TS	4755	Central Ave Carpenter Rd	Pratt Ave	CO	Permanent Signals		T-1A	T-1	840
TS	4760	Central Ave	Roosevelt Rd	CO	Permanent Signals		T-1A	T-1	841
TS	4765	Central Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	842
TS	4775	22nd St Cermak Rd	57th St	CO	Permanent Signals		T-1A	T-1	843
TS	4780	22nd St Cermak Rd	58th St	CO	Permanent Signals		T-1A	T-1	844
TS	4785	22nd St	Austin Blvd	CO	Permanent Signals		T-1A	T-1	845

		Cermak Rd							
TS	4790	22nd St Cermak Rd	Central Ave	CO	Permanent Signals		T-1A	T-1	846
TS	4795	22nd St Cermak Rd	Cermak Plaza North Ent	CO	Permanent Signals		T-1A	T-1	847
TS	4800	22nd St Cermak Rd	Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	848
TS	4805	22nd St Cermak Rd	East Rd	CO	Permanent Signals		T-1A	T-1	849
TS	4810	22nd St Cermak Rd	Home Ave	CO	Permanent Signals		T-1A	T-1	850
TS	4815	22nd St Cermak Rd	Lombard Ave	CO	Permanent Signals		T-1A	T-1	851
TS	4820	22nd St Cermak Rd	North Riverside Plaza W Ent	CO	Permanent Signals		T-1A	T-1	852
TS	4825	22nd St Cermak Rd	North Riverside Plaza E Ent	CO	Permanent Signals		T-1A	T-1	853
TS	4830	22nd St Cermak Rd	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	854
TS	4835	22nd St Cermak Rd	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	855
TS	4840	22nd St Cermak Rd	Riverside Dr / Wesley Ave	CO	Permanent Signals		T-1A	T-1	856
TS	4845	22nd St Cermak Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	857
TS	4850	22nd St Cermak Rd	Westbrook Corporate Center Ent	CO	Permanent Signals		T-1A	T-1	858
TS	4851	22nd St Cermak Rd	Enterprise Dr	CO	Permanent Signals		T-1A	T-1	859
TS	4855	Chicago Rd South Park Ave	Indianwood Dr	CO	Permanent Signals		T-1A	T-1	860
TS	4861	Chicago Hts	Holbrook Rd	CO	Permanent Signals		T-1A	T-1	861

TS	4870	Church St	Niles Center Rd	CO	Permanent Signals		T-1A	T-1	862
TS	4885	Crawford Ave Pulaski Rd	99th St	CO	Permanent Signals		T-1A	T-1	863
TS	4890	Crawford Ave Pulaski Rd	119th St	CO	Permanent Signals		T-1A	T-1	864
TS	4892	Crawford Ave Pulaski Rd	120th St / Jewel Ent / Aldi Ent	CO	Permanent Signals		T-1A	T-1	865
TS	4900	Crawford Ave Pulaski Rd	167th St	CO	Permanent Signals		T-1A	T-1	866
TS	4905	Crawford Ave Pulaski Rd	175th St	CO	Permanent Signals		T-1A	T-1	867
TS	4907	Crawford Ave Pulaski Rd	178th St / Cambridge Dr	CO	Permanent Signals		T-1A	T-1	868
TS	4910	Crawford Ave Pulaski Rd	Devon Ave	CO	Permanent Signals		T-1A	T-1	869
TS	4915	Crawford Ave Pulaski Rd	Golf Rd	CO	Permanent Signals		T-1A	T-1	870
TS	4920	Crawford Ave Pulaski Rd	Harrison St / Old Orchard Rd	CO	Permanent Signals		T-1A	T-1	871
TS	4930	Crawford Ave Pulaski Rd	Vollmer Rd	CO	Permanent Signals		T-1A	T-1	872
TS	4935	Crawford Ave Pulaski Rd	Flossmoor Rd	CO	Permanent Signals		T-1A	T-1	873
TS	4940	87th St	California Ave	CO	Permanent Signals		T-1A	T-1	874
TS	4945	Crawford Ave Pulaski Rd	Governors Hwy	CO	Permanent Signals		T-1A	T-1	875
TS	4950	Crawford Ave Hunter Rd	Wilmette Ave / Glenview Rd	CO	Permanent Signals		T-1A	T-1	876
TS	4955	Devon Ave	IL 171 Cumberland Ave	CO	Permanent Signals		T-1A	T-1	877
TS	4960	IL 171 Cumberland Ave	Forest Preserve Dr	CO	Permanent Signals		T-1A	T-1	878

TS	4965	IL 171 Cumberland Ave	Lawrence Ave	CO	Permanent Signals		T-1A	T-1	879
TS	4970	IL 171 Cumberland Ave	Montrose Ave / East River Rd	CO	Permanent Signals		T-1A	T-1	880
TS	4975	Des Plaines River Rd	Algonquin Rd	CO	Permanent Signals		T-1A	T-1	881
TS	4985	Des Plaines River Rd	Grand Ave	CO	Permanent Signals		T-1A	T-1	882
TS	4990	Des Plaines River Rd	Lawrence Ave	CO	Permanent Signals		T-1A	T-1	883
TS	4995	Oakton St	Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	884
TS	5000	Roosevelt Rd	Des Plaines Ave	CO	Permanent Signals		T-1A	T-1	885
TS	5005	Des Plaines River Rd	Touhy Ave	CO	Permanent Signals		T-1A	T-1	886
TS	5010	Des Plaines River Rd	Fullerton Ave	CO	Permanent Signals		T-1A	T-1	887
TS	5040	Devon Ave	Dee Rd	CO	Permanent Signals		T-1A	T-1	888
TS	5047	US 41 Lincoln Ave	Fire Station Exit	CO	Permanent Signals		T-1A	T-1	889
TS	5050	Dixie Hwy Roby St	167th St / 170th St	CO	Permanent Signals		T-1A	T-1	890
TS	5055	Dixie Hwy	Holbrook Rd	CO	Permanent Signals		T-1A	T-1	891
TS	5060	Dixie Hwy	Joe Orr Rd	CO	Permanent Signals		T-1A	T-1	892
TS	5065	Joliet Rd	East Ave	CO	Permanent Signals		T-1A	T-1	893
TS	5066	Joliet Rd	Quarry Mall Ent	CO	Permanent Signals		T-1A	T-1	894
TS	5067	Joliet Rd	Circuit City Ent / Quarry Mall Ent	CO	Permanent Signals		T-1A	T-1	895
TS	5070	Plainfield Rd	East Ave	CO	Permanent Signals		T-1A	T-1	896

TS	5075	East End Ave	Sauk Trail Rd	CO	Permanent Signals		T-1A	T-1	897
TS	5080	Elmhurst Rd York Rd	Devon Ave	CO	Permanent Signals		T-1A	T-1	898
TS	5090	Euclid Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	899
TS	5095	Forest Preserve Dr	Montrose Ave	CO	Permanent Signals		T-1A	T-1	900
TS	5100	Forest Preserve Dr	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	901
TS	5105	Flossmoor Rd	Western Ave	CO	Permanent Signals		T-1A	T-1	902
TS	5110	Franklin Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	903
TS	5115	Fullerton Ave	Thatcher Rd	CO	Permanent Signals		T-1A	T-1	904
TS	5120	Kensington Rd Foundry Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	905
TS	5125	Glenwood Dyer Rd	Cottage Grove Rd	CO	Permanent Signals		T-1A	T-1	906
TS	5130	Glenwood Dyer Rd	Main St / Glenwood Lansing Rd	CO	Permanent Signals		T-1A	T-1	907
TS	5135	Glenview Rd	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	908
TS	5140	Golf Rd	Central Park Ave	CO	Permanent Signals		T-1A	T-1	909
TS	5145	Golf Rd	East Prairie	CO	Permanent Signals		T-1A	T-1	910
TS	5150	Golf Rd	Gross Point Rd	CO	Permanent Signals		T-1A	T-1	911
TS	5152	Gross Point Rd	Kenton Ave	CO	Permanent Signals		T-1A	T-1	912
TS	5157	Golf Rd	Woods Dr	CO	Permanent Signals		T-1A	T-1	913
TS	5160	Golf Rd	Lavergne Ave	CO	Permanent Signals		T-1A	T-1	914
TS	5165	Golf Rd	Lawler Ave	CO	Permanent Signals		T-1A	T-1	915
TS	5170	Golf Rd	McCormick Blvd	CO	Permanent Signals		T-1A	T-1	916
TS	5175	Golf Rd	Glenview Country Club Ent	CO	Permanent Signals		T-1A	T-1	917

TS	5180	Governors Hwy	Flossmoor Rd	CO	Permanent Signals		T-1A	T-1	918
TS	5185	Governors Hwy	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	919
TS	5200	Governors Hwy	Vollmer Rd	CO	Permanent Signals		T-1A	T-1	920
TS	5205	Grand Ave	Oak St / Struckman Ave	CO	Permanent Signals		T-1A	T-1	921
TS	5210	Grand Ave	Mt Prospect Rd / County Line Rd	CO	Permanent Signals		T-1A	T-1	922
TS	5211	Grand Ave	Northwest Ave	CO	Permanent Signals		T-1A	T-1	923
TS	5215	IL 171 Thatcher Rd	Grand Ave	CO	Permanent Signals		T-1A	T-1	924
TS	5220	Grand Ave	Wolf Rd	CO	Permanent Signals		T-1A	T-1	925
TS	5235	Greenwood Rd	Lake Ave	CO	Permanent Signals		T-1A	T-1	926
TS	5240	Gross Point Rd	Church St	CO	Permanent Signals		T-1A	T-1	927
TS	5245	Gross Point Rd	Harrison St / Old Orchard Rd	CO	Permanent Signals		T-1A	T-1	928
TS	5250	Gross Point Rd	Laramie Ave / Carol Ave	CO	Permanent Signals		T-1A	T-1	929
TS	5255	Gross Point Rd	Oakton St / Central Ave	CO	Permanent Signals		T-1A	T-1	930
TS	5260	Touhy Ave	Gross Point Rd	CO	Permanent Signals		T-1A	T-1	931
TS	5270	Gunnison St	Nagle Ave	CO	Permanent Signals		T-1A	T-1	932
TS	5275	Gunnison St	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	933
TS	5285	Harts Rd Gross Pt Rd	Milwaukee Ave	CO	Permanent Signals		T-1A	T-1	934
TS	5295	Hicks Rd	Cunningham Dr	CO	Permanent Signals		T-1A	T-1	935
TS	5300	Hicks Rd	Euclid Ave	CO	Permanent Signals		T-1A	T-1	936
TS	5305	Hicks Rd	Illinois Ave / Industrial Ave	CO	Permanent Signals		T-1A	T-1	937
TS	5315	Hicks Rd	Carpenter Dr	CO	Permanent Signals		T-1A	T-1	938

TS	5320	Hibbard Rd	Lake Ave	CO	Permanent Signals		T-1A	T-1	939
TS	5325	US 41 Lincoln Ave	Howard St	CO	Permanent Signals		T-1A	T-1	940
TS	5330	Howard St	Gross Point Rd / Menards Ent	CO	Permanent Signals		T-1A	T-1	941
TS	5335	Howard St	Lehigh Ave	CO	Permanent Signals		T-1A	T-1	942
TS	5345	Indiana Ave	137th St	CO	Permanent Signals		T-1A	T-1	943
TS	5350	Indiana Ave	138th St	CO	Permanent Signals		T-1A	T-1	944
TS	5355	Joliet Rd	Brainard Ave	CO	Permanent Signals		T-1A	T-1	945
TS	5360	Joliet Rd	Lawndale Ave	CO	Permanent Signals		T-1A	T-1	946
TS	5365	Joliet Rd	Willow Springs Rd	CO	Permanent Signals		T-1A	T-1	947
TS	5370	Joliet Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	948
TS	5375	Joliet Rd	Universal Oil Products Ent	CO	Permanent Signals		T-1A	T-1	949
TS	5380	Kedzie Ave	119th St / Oakhill Cemetery Ent	CO	Permanent Signals		T-1A	T-1	950
TS	5385	Kedzie Ave	123rd St	CO	Permanent Signals		T-1A	T-1	951
TS	5390	Kensington Rd Foundry Rd	Wheeling Rd	CO	Permanent Signals		T-1A	T-1	952
TS	5395	Kirchoff Rd	Wilke Rd	CO	Permanent Signals		T-1A	T-1	953
TS	5425	Lake Cook Rd	Quentin Rd	CO	Permanent Signals		T-1A	T-1	954
TS	5430	Lake Cook Rd	Sheridan Rd	CO	Permanent Signals		T-1A	T-1	955
TS	5435	Lawrence Ave	East River Rd / Dee Rd	CO	Permanent Signals		T-1A	T-1	956
TS	5440	Lawrence Ave	Forster Rd	CO	Permanent Signals		T-1A	T-1	957
TS	5445	Lee St	Touhy Ave	CO	Permanent Signals		T-1A	T-1	958
TS	5448	Oakton St	River Dr	CO	Permanent Signals		T-1A	T-1	959
TS	5450	Lehigh Ave	Oakton St	CO	Permanent Signals		T-1A	T-1	960

TS	5455	Lehigh Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	961
TS	5460	Madison St	Jackson Blvd	CO	Permanent Signals		T-1A	T-1	962
TS	5477	McCormick Blvd	Northeast Parkway	CO	Permanent Signals		T-1A	T-1	963
TS	5490	Milwaukee Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	964
TS	5495	IL 21 Milwaukee	IL 43 Waukegan Rd	CO	Permanent Signals		T-1A	T-1	965
TS	5500	Montrose Ave	Narragansett Ave	CO	Permanent Signals		T-1A	T-1	966
TS	5505	Northwest Hwy	Oakton St	CO	Permanent Signals		T-1A	T-1	967
TS	5510	Northwest Hwy	Potter Rd	CO	Permanent Signals		T-1A	T-1	968
TS	5515	Oak Park Ave	31st St	CO	Permanent Signals		T-1A	T-1	969
TS	5520	US 34 Ogden Ave	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	970
TS	5525	Roosevelt Rd	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	971
TS	5535	Oakton St	Florence Dr	CO	Permanent Signals		T-1A	T-1	972
TS	5540	Oakton St	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	973
TS	5545	Oakton St	Mt Prospect Rd	CO	Permanent Signals		T-1A	T-1	974
TS	5550	Oakton St	Wolf Rd	CO	Permanent Signals		T-1A	T-1	975
TS	5555	US 34 Ogden Ave	31st St	CO	Permanent Signals		T-1A	T-1	976
TS	5556	US 34 Ogden Ave	25th Pl / 26th St	CO	Permanent Signals		T-1A	T-1	977
TS	5557	IL 50 Cicero Ave	Connector Ogden	CO	Permanent Signals		T-1A	T-1	978
TS	5558	US 34 Ogden Ave	Connector Ramp	CO	Permanent Signals		T-1A	T-1	979
TS	5565	US 34 Ogden Ave	Austin Blvd	CO	Permanent Signals		T-1A	T-1	980
TS	5570	US 34 Ogden	Clarence Ave	CO	Permanent Signals		T-1A	T-1	981

		Ave							
TS	5575	US 34 Ogden Ave	Clinton St	CO	Permanent Signals		T-1A	T-1	982
TS	5580	US 34 Ogden Ave	East Ave	CO	Permanent Signals		T-1A	T-1	983
TS	5590	US 34 Ogden Ave	Home Ave	CO	Permanent Signals		T-1A	T-1	984
TS	5595	US 34 Ogden Ave	Ridgeland Ave / 34th St	CO	Permanent Signals		T-1A	T-1	985
TS	5600	Old Plum Grove Rd	Meacham Rd	CO	Permanent Signals		T-1A	T-1	986
TS	5605	Palatine Rd	Kennicott Dr	CO	Permanent Signals		T-1A	T-1	987
TS	5620	Palatine Rd	Schoenbeck Rd	CO	Permanent Signals		T-1A	T-1	988
TS	5625	Palatine Rd	Wheeling Rd	CO	Permanent Signals		T-1A	T-1	989
TS	5630	Palatine Rd	Windsor Dr	CO	Permanent Signals		T-1A	T-1	990
TS	5645	Palatine Rd	Ela Rd	CO	Permanent Signals		T-1A	T-1	991
TS	5650	171st St	Park Ave	CO	Permanent Signals		T-1A	T-1	992
TS	5655	Willow Rd	Pfingsten Rd	CO	Permanent Signals		T-1A	T-1	993
TS	5675	Ridgeland Ave	96th St	CO	Permanent Signals		T-1A	T-1	994
TS	5680	Ridgeland Ave	98th St	CO	Permanent Signals		T-1A	T-1	995
TS	5690	Ridgeland Ave	Ridgeland Commons Shopping	CO	Permanent Signals		T-1A	T-1	996
TS	5695	Ridge Rd	Ashland Ave / Riegel Ave	CO	Permanent Signals		T-1A	T-1	997
TS	5710	Riegel Ave	Holbrook Rd	CO	Permanent Signals		T-1A	T-1	998
TS	5715	IL 53 Rohlwing Rd	Devon Ave	CO	Permanent Signals		T-1A	T-1	999
TS	5720	Roosevelt Rd	5th Ave	CO	Permanent Signals		T-1A	T-1	1000

TS	5725	Roosevelt Rd	9th Ave	CO	Permanent Signals		T-1A	T-1	1001
TS	5730	Roosevelt Rd	Austin Ave	CO	Permanent Signals		T-1A	T-1	1002
TS	5735	Roosevelt Rd	East Ave	CO	Permanent Signals		T-1A	T-1	1003
TS	5745	Roosevelt Rd	Mayfield Ave	CO	Permanent Signals		T-1A	T-1	1004
TS	5750	Roosevelt Rd	Ridgeland Ave	CO	Permanent Signals		T-1A	T-1	1005
TS	5755	Sauk Trail Rd	State St	CO	Permanent Signals		T-1A	T-1	1006
TS	5760	Sauk Trail Rd	Torrence Ave	CO	Permanent Signals		T-1A	T-1	1007
TS	5770	Willow Rd	Shermer Rd	CO	Permanent Signals		T-1A	T-1	1008
TS	5780	State Rd	Central Ave / 80th St	CO	Permanent Signals		T-1A	T-1	1009
TS	5785	State St	Illinois St	CO	Permanent Signals		T-1A	T-1	1010
TS	5790	State St	Steger Rd	CO	Permanent Signals		T-1A	T-1	1011
TS	5795	St Charles Rd	Taft Ave	CO	Permanent Signals		T-1A	T-1	1012
TS	5800	St Charles Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	1013
TS	5810	Talcott Ave	Dee Rd	CO	Permanent Signals		T-1A	T-1	1014
TS	5815	Talcott Ave	Touhy Ave	CO	Permanent Signals		T-1A	T-1	1015
TS	5820	IL 83 Torrence Ave	Dolton Rd / State St / 146th St	CO	Permanent Signals		T-1A	T-1	1016
TS	5825	Touhy Ave	Crawford Ave	CO	Permanent Signals		T-1A	T-1	1017
TS	5830	Touhy Ave	Dee Rd	CO	Permanent Signals		T-1A	T-1	1018
TS	5835	Touhy Ave	Kostner Ave	CO	Permanent Signals		T-1A	T-1	1019
TS	5840	Touhy Ave	Mobile Ave	CO	Permanent Signals		T-1A	T-1	1020
TS	5841	Touhy Ave	Meade Ave	CO	Permanent Signals		T-1A	T-1	1021
TS	5843	Touhy Ave	Melvina Ave	CO	Permanent Signals		T-1A	T-1	1022
TS	5845	Touhy Ave	Riverside Dr	CO	Permanent Signals		T-1A	T-1	1023
TS	5850	Washington Blvd	Lathrop Ave	CO	Permanent Signals		T-1A	T-1	1024

		Randolph St							
TS	5855	Western Ave	91st St	CO	Permanent Signals		T-1A	T-1	1025
TS	5860	Western Ave	98th St	CO	Permanent Signals		T-1A	T-1	1026
TS	5865	Western Ave	99th St	CO	Permanent Signals		T-1A	T-1	1027
TS	5870	Western Ave	119th St	CO	Permanent Signals		T-1A	T-1	1028
TS	5875	123rd St	Western Ave	CO	Permanent Signals		T-1A	T-1	1029
TS	5880	139th St	Western Ave	CO	Permanent Signals		T-1A	T-1	1030
TS	5885	Western Ave	Monee Rd	CO	Permanent Signals		T-1A	T-1	1031
TS	5890	Western Ave	Steger Rd	CO	Permanent Signals		T-1A	T-1	1032
TS	5895	Western Ave	Vollmer Rd	CO	Permanent Signals		T-1A	T-1	1033
TS	5900	Western Ave	Illinois St / 16th St	CO	Permanent Signals		T-1A	T-1	1034
TS	5915	Willow Rd	Greenwood Ave	CO	Permanent Signals		T-1A	T-1	1035
TS	5920	Willow Rd	Landwehr Rd	CO	Permanent Signals		T-1A	T-1	1036
TS	5925	Willow Rd	Sanders Rd	CO	Permanent Signals		T-1A	T-1	1037
TS	5927	Willow Rd	Astellas Way	CO	Permanent Signals		T-1A	T-1	1038
TS	5930	Willow Rd	Old Willow Rd	CO	Permanent Signals		T-1A	T-1	1039
TS	5931	Willow Rd	Ravina Way	CO	Permanent Signals		T-1A	T-1	1040
TS	5932	Willow Rd	Patriot Blvd	CO	Permanent Signals		T-1A	T-1	1041
TS	5933	Willow Rd	Westleigh Dr Founders Dr	CO	Permanent Signals		T-1A	T-1	1042
TS	5935	Willow Springs Rd	Plainfield Rd	CO	Permanent Signals		T-1A	T-1	1043
TS	5940	Wireton Rd	Francisco Ave	CO	Permanent Signals		T-1A	T-1	1044
TS	5944	Wolf Rd	Edward Rd	CO	Permanent Signals		T-1A	T-1	1045
TS	5945	Wolf Rd	Camp McDonald Rd	CO	Permanent Signals		T-1A	T-1	1046

TS	5950	Wolf Rd	Willow Rd / Old Willow Rd	CO	Permanent Signals		T-1A	T-1	1047
TS	5955	Wolf Rd	Howard St	CO	Permanent Signals		T-1A	T-1	1048
TS	5965	Wood St	171st St	CO	Permanent Signals		T-1A	T-1	1049
TS	6077	US 20 Lake St	North Ave / East Bartlett Rd	CO	Permanent Signals		T-1A	T-1	1050
TS	6612	US 45 LaGrange Rd	IL 83 Cal Sag Rd W Ramps	CO	Permanent Signals		T-1A	T-1	1051
TS	6613	US 45 LaGrange Rd	IL 83 Cal Sag Rd E Ramps	CO	Permanent Signals		T-1A	T-1	1052
TS	7185	Lake Cook Rd	Hart Rd	CO	Permanent Signals		T-1A	T-1	1053
TS	7417	US 45 La Grange Rd	183rd St	CO	Permanent Signals		T-1A	T-1	1054
TS	7635	IL 19 Irving Park Rd	Rodenburg Rd	CO	Permanent Signals		T-1A	T-1	1055
TS	7637	IL 19 Irving Park Rd	Wright Blvd	CO	Permanent Signals		T-1A	T-1	1056
TS	7645	IL 43 Harlem Ave	Grand Ave / Fullerton Ave	CO	Permanent Signals		T-1A	T-1	1057
TS	7655	IL 62 Algonquin Rd	Lexington Dr	CO	Permanent Signals		T-1A	T-1	1058
TS	7860	Barrington Rd	Tower Dr	CO	Permanent Signals		T-1A	T-1	1059
TS	7885	IL 62 Algonquin Rd	Quentin Rd	CO	Permanent Signals		T-1A	T-1	1060
TS	7947	IL 43 Harlem Ave	34th St / Windsor Ave	CO	Permanent Signals		T-1A	T-1	1061
TS	7950	IL 43 Harlem Ave	32nd St	CO	Permanent Signals		T-1A	T-1	1062
TS	8780	IL 58 Golf Rd	Woodfield Mall Center Ent	CO	Permanent Signals		T-1A	T-1	1063
TS	8785	IL 58 Golf Rd	Woodfield Mall W Ent	CO	Permanent Signals		T-1A	T-1	1064

TS	8790	IL 58 Golf Rd	Woodfield Mall E Ent / Hyatt Ent	CO	Permanent Signals		T-1A	T-1	1065
TS	8800	IL 64 North Ave	Winston Plaza Ent	CO	Permanent Signals		T-1A	T-1	1066
TS	8905	Golf Rd	Lamon Ave East Old Orchard	CO	Permanent Signals		T-1A	T-1	1067
TS	8910	IL 43 Harlem Ave	167th St	CO	Permanent Signals		T-1A	T-1	1068
TS	8920	IL 43 Harlem Ave	171st St	CO	Permanent Signals		T-1A	T-1	1069
TS	8935	IL 43 Harlem Ave	163rd St / Brementown Rd	CO	Permanent Signals		T-1A	T-1	1070
TS	8940	IL 19 Irving Park Rd	Park Blvd	CO	Permanent Signals		T-1A	T-1	1071
TS	9085	IL 72 Higgins Rd	Devon Ave	CO	Permanent Signals		T-1A	T-1	1072
TS	9090	IL 72 Higgins Rd	Scott St	CO	Permanent Signals		T-1A	T-1	1073
TS	9155	IL 83 147th St	Cleveland	CO	Permanent Signals		T-1A	T-1	1074
TS	9160	IL 83 147th St	Harrison St	CO	Permanent Signals		T-1A	T-1	1075
TS	9165	IL 83	Sacramento	CO	Permanent Signals		T-1A	T-1	1076
TS	9185	Talcott Ave	Cumberland Ave	CO	Permanent Signals		T-1A	T-1	1077
TS	9190	Cumberland in Park Ridge	Touhy Ave in Park Ridge	CO	Permanent Signals		T-1A	T-1	1078
TS	9205	Talcott Ave	Greenwood Rd	CO	Permanent Signals		T-1A	T-1	1079
TS	9215	Northwest Hwy	Meacham Ave	CO	Permanent Signals		T-1A	T-1	1080
TS	9220	Northwest Hwy	Washington St	CO	Permanent Signals		T-1A	T-1	1081
TS	9222	Touhy Ave	Summit	CO	Permanent Signals		T-1A	T-1	1082
TS	9240	Busse Hwy	Meacham Touhy in Park Ridge	CO	Permanent Signals		T-1A	T-1	1083

TS	9245	Devon Ave	Talcott Ave / Cortland Ave	CO	Permanent Signals		T-1A	T-1	1084
TS	9247	US 14 Northwest Hwy	Summit	CO	Permanent Signals		T-1A	T-1	1085
TS	9250	US 14 Northwest Hwy	Prospect Ave in Park Ridge	CO	Permanent Signals		T-1A	T-1	1086
TS	9255	Touhy Ave	Washington St	CO	Permanent Signals		T-1A	T-1	1087
TS	9295	Western Ave	26th St	CO	Permanent Signals		T-1A	T-1	1088
TS	9297	Western Ave	Norwood Square SC Ent	CO	Permanent Signals		T-1A	T-1	1089
TS	9300	Western Ave	Beacon Blvd	CO	Permanent Signals		T-1A	T-1	1090
TS	9335	Crawford Ave Pulaski Rd	107th St	CO	Permanent Signals		T-1A	T-1	1091
TS	9360	22nd St Cermak Rd	Mid City Bank Ent / N Riverside Plaza	CO	Permanent Signals		T-1A	T-1	1092
TS	9625	IL 83 Elmhurst Rd	Lonnquist Blvd	CO	Permanent Signals		T-1A	T-1	1093
TS	9630	IL 83 Elmhurst Rd	US 14 Northwest Hwy	CO	Permanent Signals		T-1A	T-1	1094
TS	9640	US 14 Northwest Hwy	Emerson St	CO	Permanent Signals		T-1A	T-1	1095
TS	9653	Central Rd	Busse Rd	CO	Permanent Signals		T-1A	T-1	1096
TS	9654	3 Com Ent	Central Rd	CO	Permanent Signals		T-1A	T-1	1097
TS	9660	IL 83 Elmhurst Rd	Central Rd	CO	Permanent Signals		T-1A	T-1	1098
TS	9665	IL 83 Elmhurst Rd	Council Tr	CO	Permanent Signals		T-1A	T-1	1099
TS	9670	IL 83 Elmhurst Rd	Lincoln St	CO	Permanent Signals		T-1A	T-1	1100
TS	9690	US 14 Northwest Hwy	Central Rd	CO	Permanent Signals		T-1A	T-1	1101

TS	9726	147th St	Oakpark Justamere	CO	Permanent Signals		T-1A	T-1	1102
TS	9727	143rd St	Justamere Rd	CO	Permanent Signals		T-1A	T-1	1103
TS	9950	US 6 159th St	Oak Forest Hospital Ent	CO	Permanent Signals		T-1A	T-1	1104
TS	10125	IL 43 Harlem Ave	Harlem Irving Plaza	CO	Permanent Signals		T-1A	T-1	1105
TS	10595	IL 43 Waukegan Rd	Kraft Food Ent / Three Lakes Dr	CO	Permanent Signals		T-1A	T-1	1106
TS	10635	US 6 159th St	Central Park Ave	CO	Permanent Signals		T-1A	T-1	1107
TS	10640	US 6 159th St	Richmond Ave	CO	Permanent Signals		T-1A	T-1	1108
TS	10900	IL 43 Waukegan Rd	Carillon Square Ent	CO	Permanent Signals		T-1A	T-1	1109
TS	10915	IL 64 North Ave	Jewel Foods Plant Ent	CO	Permanent Signals		T-1A	T-1	1110
TS	10970	US 12 45 Mannheim Rd	Belmont	CO	Permanent Signals		T-1A	T-1	1111
TS	11015	US 12 45 Mannheim Rd	Grand Ave	CO	Permanent Signals		T-1A	T-1	1112
TS	11030	US 12 45 Mannheim Rd	Seymour Ave	CO	Permanent Signals		T-1A	T-1	1113
TS	11035	US 12 45 Mannheim Rd	Waveland Ave	CO	Permanent Signals		T-1A	T-1	1114
TS	11040	Des Plaines River Rd	King Ave	CO	Permanent Signals		T-1A	T-1	1115
TS	11080	55th St	Electro Motive Dr	CO	Permanent Signals		T-1A	T-1	1116
TS	11086	55th St	Sergo Dr	CO	Permanent Signals		T-1A	T-1	1117
TS	11130	IL 59 Sutton Rd	Shoe Factory Rd	CO	Permanent Signals		T-1A	T-1	1118
TS	11133	IL 72 Higgins Rd	Shoe Factory Rd	CO	Permanent Signals		T-1A	T-1	1119

TS	11161	Touhy Ave	Northpoint Plaza Ent / Circuit City	CO	Permanent Signals		T-1A	T-1	1120
TS	11170	IL 58 Golf Rd	Michael Manor	CO	Permanent Signals		T-1A	T-1	1121
TS	11175	US 12 45 Mannheim Rd	Devon Ave / Zemke Blvd	CO	Permanent Signals		T-1A	T-1	1122
TS	11185	Devon Ave	Kenton Ave / Lemont Ave	CO	Permanent Signals		T-1A	T-1	1123
TS	11190	US 30 Lincoln Hwy	Matteson Shopping Center Ent	CO	Permanent Signals		T-1A	T-1	1124
TS	11210	IL 58 Golf Rd	Milwaukee Plaza Ent / Toys R Us Ent	CO	Permanent Signals		T-1A	T-1	1125
TS	11245	US 12 45 Lee St	US 12/45 Mannheim Rd	CO	Permanent Signals		T-1A	T-1	1126
TS	11250	Touhy Ave	Central Ave	CO	Permanent Signals		T-1A	T-1	1127
TS	11280	IL 59 Hough Rd	Main St / Lake Cook Rd	CO	Permanent Signals		T-1A	T-1	1128
TS	11282	Main St Lake Cook Rd	Applebee's Ent	CO	Permanent Signals		T-1A	T-1	1129
TS	11285	Barrington Rd	Palatine Rd	CO	Permanent Signals		T-1A	T-1	1130
TS	11290	US 12 Rand	IL 53 West Ramp	CO	Permanent Signals		T-1A	T-1	1131
TS	11295	US 12 Rand Rd	IL 53 E Ramps	CO	Permanent Signals		T-1A	T-1	1132
TS	11305	Pfingsten Rd	West Lake Ave	CO	Permanent Signals		T-1A	T-1	1133
TS	11310	IL 72 Higgins Rd Oakton St	IL 83 Busse Rd	CO	Permanent Signals		T-1A	T-1	1134
TS	11320	Arlington Heights Rd	Northwest Point Blvd S Junction	CO	Permanent Signals		T-1A	T-1	1135
TS	11325	IL 43 Harlem Ave	161st St	CO	Permanent Signals		T-1A	T-1	1136
TS	11330	US 6 159th St	Park Center Plaza Ent	CO	Permanent Signals		T-1A	T-1	1137

TS	11345	US 30 Lincoln Hwy	Mid Continent Dr	CO	Permanent Signals		T-1A	T-1	1138
TS	11350	US 6 IL 83 Torrence Ave	Landings Shopping Center Ent	CO	Permanent Signals		T-1A	T-1	1139
TS	11355	Margaret St Thornton Lansing Rd	Williams St / Vincennes Rd	CO	Permanent Signals		T-1A	T-1	1140
TS	11356	Margaret St Thornton Lansing	Schwab St	CO	Permanent Signals		T-1A	T-1	1141
TS	11360	Williams St Vincennes Rd	Eleanor St	CO	Permanent Signals		T-1A	T-1	1142
TS	11460	IL 83 147th St Sibley Blvd	Woodlawn Ave	CO	Permanent Signals		T-1A	T-1	1143
TS	11465	IL 83 Sibley 147th St	Greenwood Ave	CO	Permanent Signals		T-1A	T-1	1144
TS	11470	IL 83 147th St Sibley Blvd	Engle Pl	CO	Permanent Signals		T-1A	T-1	1145
TS	11475	IL 83 147th St Sibley Blvd	Cottage Grove Ave	CO	Permanent Signals		T-1A	T-1	1146
TS	11635	IL 171 Archer Ave	65th St	CO	Permanent Signals		T-1A	T-1	1147
TS	11640	US 12 20 95th St	Kean Ave	CO	Permanent Signals		T-1A	T-1	1148
TS	11645	IL 50 Cicero Ave	23rd Delray Farms	CO	Permanent Signals		T-1A	T-1	1149
TS	11690	IL 68 Dundee Rd	Northgate Parkway	CO	Permanent Signals		T-1A	T-1	1150
TS	11695	US 14	Elm St	CO	Permanent Signals		T-1A	T-1	1151
TS	11710	US 6 159th St	Arroyo Dr	CO	Permanent Signals		T-1A	T-1	1152
TS	11715	Western Ave	Sauk Trail Rd	CO	Permanent Signals		T-1A	T-1	1153
TS	11716	Western Ave	South St / Main	CO	Permanent Signals		T-1A	T-1	1154

			St						
TS	11720	IL 50 Cicero Ave	175th St	CO	Permanent Signals		T-1A	T-1	1155
TS	11725	Dixie Hwy	Flossmoor Rd / Cambridge Ave	CO	Permanent Signals		T-1A	T-1	1156
TS	11730	Hicks Rd	Northrop Grummen Corp Ent	CO	Permanent Signals		T-1A	T-1	1157
TS	11735	Hicks Rd	Hellen Rd	CO	Permanent Signals		T-1A	T-1	1158
TS	11745	IL 394	Sauk Trail Rd	CO	Permanent Signals		T-1A	T-1	1159
TS	11750	US 6 159th St	Park Ave Harvey	CO	Permanent Signals		T-1A	T-1	1160
TS	11755	Ashland Ave Wood St	Thornton Blue Island Rd	CO	Permanent Signals		T-1A	T-1	1161
TS	11760	US 12 20 95th St	76th Ave	CO	Permanent Signals		T-1A	T-1	1162
TS	11770	Ridgeland Ave	IL 7 Southwest Hwy	CO	Permanent Signals		T-1A	T-1	1163
TS	11785	US 12 20 95th St	California Ave	CO	Permanent Signals		T-1A	T-1	1164
TS	11790	US 12 20 95th St	Utica Ave	CO	Permanent Signals		T-1A	T-1	1165
TS	11800	22nd St Cermak Rd	1st Ave Cutoff	CO	Permanent Signals		T-1A	T-1	1166
TS	11805	IL 171 1st Ave Frontage Rd	47th St W Ramps	CO	Permanent Signals		T-1A	T-1	1167
TS	11810	IL 171 1st Ave Frontage Rd	47th St E Ramps	CO	Permanent Signals		T-1A	T-1	1168
TS	11853	94th Ave	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	1169
TS	11860	IL 68 Dundee Rd	Ela Rd	CO	Permanent Signals		T-1A	T-1	1170
TS	11861	IL 68 Dundee East Ramp	US 14 Northwest Hwy	CO	Permanent Signals		T-1A	T-1	1171

TS	11862	IL 68 Dundee West Ramp	US 14 Northwest Hwy	CO	Permanent Signals		T-1A	T-1	1172
TS	11865	Main St Vincennes Rd	Glenwood Rd	CO	Permanent Signals		T-1A	T-1	1173
TS	11870	IL 72 Higgins Rd	Lee Ramp/Trammel	CO	Permanent Signals		T-1A	T-1	1174
TS	11965	IL 64 North Ave	Polk Plaza Shopping Center Ent	CO	Permanent Signals		T-1A	T-1	1175
TS	12000	US 6 IL 83 Torrence Ave	Bernice Rd / 173rd St	CO	Permanent Signals		T-1A	T-1	1176
TS	12005	Hicks Rd	Old Hicks Rd	CO	Permanent Signals		T-1A	T-1	1177
TS	12010	IL 58 Dempster St	Gross Point Rd	CO	Permanent Signals		T-1A	T-1	1178
TS	12015	IL 56 Butterfield Rd	Taft Ave	CO	Permanent Signals		T-1A	T-1	1179
TS	12025	Lawrence Ave	25th Ave / Ruby St	CO	Permanent Signals		T-1A	T-1	1180
TS	12035	Crawford Ave Pulaski Rd	93rd St	CO	Permanent Signals		T-1A	T-1	1181
TS	12075	IL 72 Higgins Rd	Huntington Blvd	CO	Permanent Signals		T-1A	T-1	1182
TS	12090	Touhy Ave	Barclay Pl / Hyatt Dr	CO	Permanent Signals		T-1A	T-1	1183
TS	12100	State St	Taft	CO	Permanent Signals		T-1A	T-1	1184
TS	12101	State St	168th Ave	CO	Permanent Signals		T-1A	T-1	1185
TS	12102	State St	Armory Dr	CO	Permanent Signals		T-1A	T-1	1186
TS	12105	142nd St	Cottage Grove Rd	CO	Permanent Signals		T-1A	T-1	1187
TS	12115	IL 1 Halsted St	Park Place Plaza Ent	CO	Permanent Signals		T-1A	T-1	1188
TS	12125	IL 83 Busse Rd	Howard St	CO	Permanent Signals		T-1A	T-1	1189

TS	12135	111th St	Kostner Ave	CO	Permanent Signals		T-1A	T-1	1190
TS	12155	IL 53 IL 68 Dundee Rd	IL 53 West Ramp	CO	Permanent Signals		T-1A	T-1	1191
TS	12160	IL 53 IL 68 Dundee Rd	IL 53 East Ramp	CO	Permanent Signals		T-1A	T-1	1192
TS	12165	27th Ave	US 20 Lake St	CO	Permanent Signals		T-1A	T-1	1193
TS	12175	US 12 Rand Rd	Winslowe Dr Park Pl	CO	Permanent Signals		T-1A	T-1	1194
TS	12220	IL 171 Archer Ave	66th Pl	CO	Permanent Signals		T-1A	T-1	1195
TS	12400	IL 50 Cicero Ave	Southwick Dr	CO	Permanent Signals		T-1A	T-1	1196
TS	12403	IL 50 Cicero Ave	Wal Mart Ent	CO	Permanent Signals		T-1A	T-1	1197
TS	12404	IL 50 Cicero Ave	North Gateway Dr	CO	Permanent Signals		T-1A	T-1	1198
TS	12530	IL 43 Harlem Ave	100th Pl	CO	Permanent Signals		T-1A	T-1	1199
TS	12535	Arlington Heights Rd	White Oak St	CO	Permanent Signals		T-1A	T-1	1200
TS	12540	Arlington Heights Rd	Central Rd	CO	Permanent Signals		T-1A	T-1	1201
TS	12550	Arlington Heights Rd	Sigwalt St	CO	Permanent Signals		T-1A	T-1	1202
TS	12555	Arlington Heights Rd	US 14 Northwest Hwy	CO	Permanent Signals		T-1A	T-1	1203
TS	12560	Arlington Heights Rd	Miner St	CO	Permanent Signals		T-1A	T-1	1204
TS	12565	Arlington Heights Rd	Euclid St	CO	Permanent Signals		T-1A	T-1	1205
TS	12585	Arlington Heights Rd	Lillian Ave	CO	Permanent Signals		T-1A	T-1	1206

TS	12590	Arlington Heights Rd	Palatine Rd	CO	Permanent Signals		T-1A	T-1	1207
TS	12595	Arlington Heights Rd	US 12 Rand Rd	CO	Permanent Signals		T-1A	T-1	1208
TS	12600	Arlington Heights Rd	North Point SC Ent	CO	Permanent Signals		T-1A	T-1	1209
TS	12615	Central Rd	Kirchoff Rd	CO	Permanent Signals		T-1A	T-1	1210
TS	12620	Central Rd	Arthur Ave / McKinley Ave	CO	Permanent Signals		T-1A	T-1	1211
TS	12625	US 12 Rand Rd	Cub Foods Ent	CO	Permanent Signals		T-1A	T-1	1212
TS	12630	US 12 Rand Rd	Palatine Rd	CO	Permanent Signals		T-1A	T-1	1213
TS	12635	US 12 Rand Rd	Northpoint Center Ent	CO	Permanent Signals		T-1A	T-1	1214
TS	12640	US 12 Rand Rd	Arlington Plaza Ent	CO	Permanent Signals		T-1A	T-1	1215
TS	12660	Euclid St	US 14 Northwest Hwy	CO	Permanent Signals		T-1A	T-1	1216
TS	12665	US 14 Northwest Hwy	Arthur Ave / McKinley Ave / Davis St	CO	Permanent Signals		T-1A	T-1	1217
TS	12675	US 14 Northwest Hwy	Evergreen Ave	CO	Permanent Signals		T-1A	T-1	1218
TS	12680	US 14 Northwest Hwy	Dunton Ave	CO	Permanent Signals		T-1A	T-1	1219
TS	12685	US 14 Northwest Hwy	Vail Ave	CO	Permanent Signals		T-1A	T-1	1220
TS	12690	US 14 Northwest Hwy	Walnut Ave / Ridge Ave	CO	Permanent Signals		T-1A	T-1	1221
TS	12700	US 12 Rand Rd	Annex of Arlington SC Ent	CO	Permanent Signals		T-1A	T-1	1222
TS	12770	IL 50 Cicero Ave	Cermak Rd 22nd St	CO	Permanent Signals		T-1A	T-1	1223

TS	12775	Cermak Rd 22nd St	49th Ave	CO	Permanent Signals		T-1A	T-1	1224
TS	12780	Cermak Rd 22nd St	50th Ave	CO	Permanent Signals		T-1A	T-1	1225
TS	12785	Cermak Rd 22nd St	Laramie Ave	CO	Permanent Signals		T-1A	T-1	1226
TS	12790	Cermak Rd	54th Ave	CO	Permanent Signals		T-1A	T-1	1227
TS	12795	IL 50 Cicero Ave	16th St	CO	Permanent Signals		T-1A	T-1	1228
TS	12825	IL 50 Cicero Ave	19th St	CO	Permanent Signals		T-1A	T-1	1229
TS	12830	IL 50 Cicero Ave	29th St	CO	Permanent Signals		T-1A	T-1	1230
TS	12985	Touhy Ave	Maple St	CO	Permanent Signals		T-1A	T-1	1231
TS	12995	Oakton St	Webster Ln	CO	Permanent Signals		T-1A	T-1	1232
TS	13000	US 12 45 Lee St	Algonquin Rd	CO	Permanent Signals		T-1A	T-1	1233
TS	13005	IL 62 Algonquin Rd	Seymour Ave	CO	Permanent Signals		T-1A	T-1	1234
TS	13020	IL 58 Golf Rd	Mt Prospect Rd	CO	Permanent Signals		T-1A	T-1	1235
TS	13025	US 12 45 Lee St	Prairie Ave	CO	Permanent Signals		T-1A	T-1	1236
TS	13026	US 12 45 Lee St	Thacker St	CO	Permanent Signals		T-1A	T-1	1237
TS	13027	US 12 45 Graceland Ave	Thacker St	CO	Permanent Signals		T-1A	T-1	1238
TS	13035	US 12 45 Lee St	US 14 Miner St / Ellenwood St	CO	Permanent Signals		T-1A	T-1	1239
TS	13040	US 14 Northwest Hwy Miner St	Pearson St	CO	Permanent Signals		T-1A	T-1	1240
TS	13050	US 12 45	Prairie Ave	CO	Permanent Signals		T-1A	T-1	1241

		Graceland Ave							
TS	13055	US 12 45 Graceland Jefferson	US 14 Miner	CO	Permanent Signals		T-1A	T-1	1242
TS	13065	US 12 45 Mannheim Rd	Prospect Ave	CO	Permanent Signals		T-1A	T-1	1243
TS	13072	Des Plaines River Rd	Pearson	CO	Permanent Signals		T-1A	T-1	1244
TS	13075	US 14 Miner St	Des Plaines River Rd	CO	Permanent Signals		T-1A	T-1	1245
TS	13080	US 14 Northwest Hwy	State St / Cornell Ave	CO	Permanent Signals		T-1A	T-1	1246
TS	13085	US 12 Rand Rd	3rd Ave	CO	Permanent Signals		T-1A	T-1	1247
TS	13140	IL 72 Higgins Rd	Lively Blvd	CO	Permanent Signals		T-1A	T-1	1248
TS	13145	IL 53 Rohlwing Rd	Nerge Rd	CO	Permanent Signals		T-1A	T-1	1249
TS	13150	IL 53 Rohlwing Rd	Biesterfield Rd	CO	Permanent Signals		T-1A	T-1	1250
TS	13285	IL 58 Summit	Hiawatha Dr	CO	Permanent Signals		T-1A	T-1	1251
TS	13286	IL 58 Summit	Waverly Dr	CO	Permanent Signals		T-1A	T-1	1252
TS	13440	IL 19 Irving Park Rd	Willard St	CO	Permanent Signals		T-1A	T-1	1253
TS	13470	Wolf Rd	Thacker St / Dempster St	CO	Permanent Signals		T-1A	T-1	1254
TS	13685	Des Plaines Ave	Jackson Blvd	CO	Permanent Signals		T-1A	T-1	1255
TS	13687	CTA	Des Plaines Ave	CO	Permanent Signals		T-1A	T-1	1256
TS	13700	Roosevelt Rd	Circle Ave	CO	Permanent Signals		T-1A	T-1	1257
TS	13755	IL 19 Irving Park Rd	Kingsbury	CO	Permanent Signals		T-1A	T-1	1258
TS	13756	IL 19 Irving	Westview Center	CO	Permanent Signals		T-1A	T-1	1259

		Park Rd							
TS	13760	US 20 Lake St	Metra Commuter Lot	CO	Permanent Signals		T-1A	T-1	1260
TS	13762	US 20 Lake St	Center Ave	CO	Permanent Signals		T-1A	T-1	1261
TS	13765	US 20 Lake St	Barrington Rd	CO	Permanent Signals		T-1A	T-1	1262
TS	13855	US 34 Ogden Ave	Brainard Ave	CO	Permanent Signals		T-1A	T-1	1263
TS	13860	US 34 Ogden Ave	Waiola Ave	CO	Permanent Signals		T-1A	T-1	1264
TS	13865	US 34 Ogden Ave	Kensington Ave	CO	Permanent Signals		T-1A	T-1	1265
TS	13870	US 34 Ogden Ave	Eberle Ave / East Ave	CO	Permanent Signals		T-1A	T-1	1266
TS	13871	US 34 Ogden Ave	DuBois Blvd	CO	Permanent Signals		T-1A	T-1	1267
TS	13872	US 34 Ogden Ave	Maple Ave	CO	Permanent Signals		T-1A	T-1	1268
TS	13873	US 34 Ogden Ave	Prairie Ave	CO	Permanent Signals		T-1A	T-1	1269
TS	13880	US 12 20 45 La Grange Rd	Harris Ave	CO	Permanent Signals		T-1A	T-1	1270
TS	13885	US 12 20 45 La Grange Rd	Cossitt Ave	CO	Permanent Signals		T-1A	T-1	1271
TS	13890	47th St	Gilbert Ave / Willow Springs Rd	CO	Permanent Signals		T-1A	T-1	1272
TS	13895	47th St	Edgewood Ave	CO	Permanent Signals		T-1A	T-1	1273
TS	13900	Brainard Ave	47th St	CO	Permanent Signals		T-1A	T-1	1274
TS	13905	US 12 20 45 La Grange Rd	Burlington Ave / Hillgrove Ave	CO	Permanent Signals		T-1A	T-1	1275
TS	13910	US 12 20 45 La Grange Rd	US 34 Ogden Ave	CO	Permanent Signals		T-1A	T-1	1276

TS	13915	US 12 20 45 La Grange Rd	Harding Ave	CO	Permanent Signals		T-1A	T-1	1277
TS	13920	US 12 20 45 La Grange Rd	Homestead Rd / Pine Ave	CO	Permanent Signals		T-1A	T-1	1278
TS	13923	31st St	Brainard Ave	CO	Permanent Signals		T-1A	T-1	1279
TS	13925	31st St	Forest Rd	CO	Permanent Signals		T-1A	T-1	1280
TS	13930	31st St	Raymond Ave	CO	Permanent Signals		T-1A	T-1	1281
TS	13940	IL 83 Torrence Ave	178th St	CO	Permanent Signals		T-1A	T-1	1282
TS	13942	I 80 94	Torrence	CO	Permanent Signals		T-1A	T-1	1283
TS	14155	IL 171 1st Ave	US 34 Ogden Ave	CO	Permanent Signals		T-1A	T-1	1284
TS	14157	US 34 Ogden Ave	Lawndale Ave	CO	Permanent Signals		T-1A	T-1	1285
TS	14160	IL 171 1st Ave	Plainfield Rd	CO	Permanent Signals		T-1A	T-1	1286
TS	14165	IL 171 1st Ave	44th St	CO	Permanent Signals		T-1A	T-1	1287
TS	14170	US 34 Ogden Ave	Plainfield Rd	CO	Permanent Signals		T-1A	T-1	1288
TS	14175	US 34 Ogden Ave	Custer Ave	CO	Permanent Signals		T-1A	T-1	1289
TS	14205	5th Ave	Chicago Ave	CO	Permanent Signals		T-1A	T-1	1290
TS	14215	17th Ave	Madison St	CO	Permanent Signals		T-1A	T-1	1291
TS	14245	9th Ave	Chicago Ave	CO	Permanent Signals		T-1A	T-1	1292
TS	14265	IL 64 North Ave	15th Ave	CO	Permanent Signals		T-1A	T-1	1293
TS	14270	Golf Rd	Narragansett Ave / Overlook Dr	CO	Permanent Signals		T-1A	T-1	1294
TS	14275	IL 43 IL 58 Waukegan Rd	Emerson St	CO	Permanent Signals		T-1A	T-1	1295
TS	14280	IL 43 IL 58	Beckwith Rd	CO	Permanent Signals		T-1A	T-1	1296

		Waukegan Rd							
TS	14285	IL 58 Dempster St	Prairie View Park Ent	CO	Permanent Signals		T-1A	T-1	1297
TS	14325	Oakton St	Austin Ave	CO	Permanent Signals		T-1A	T-1	1298
TS	14330	Oakton St	Menard Ave	CO	Permanent Signals		T-1A	T-1	1299
TS	14375	IL 171 Cumberland Ave	Foster Ave	CO	Permanent Signals		T-1A	T-1	1300
TS	14395	IL 43 Harlem Ave	Cullom Ave	CO	Permanent Signals		T-1A	T-1	1301
TS	14400	IL 43 Waukegan Rd	Walters Ave	CO	Permanent Signals		T-1A	T-1	1302
TS	14402	IL 43 Waukegan Rd	Voltz Rd	CO	Permanent Signals		T-1A	T-1	1303
TS	14430	IL 43 Waukegan Rd	Shermer Rd	CO	Permanent Signals		T-1A	T-1	1304
TS	14480	IL 43 Waukegan Rd	Christian Heritage School Ent	CO	Permanent Signals		T-1A	T-1	1305
TS	14715	Palatine Rd	Smith St	CO	Permanent Signals		T-1A	T-1	1306
TS	14720	Palatine Rd	Brockway St	CO	Permanent Signals		T-1A	T-1	1307
TS	14725	Palatine Rd	Plum Grove Rd	CO	Permanent Signals		T-1A	T-1	1308
TS	14741	IL 62 Algonquin Rd	Carriage Way / Essex Way	CO	Permanent Signals		T-1A	T-1	1309
TS	14744	IL 62 Algonquin Rd	Weber Rd / Old Wilke Rd	CO	Permanent Signals		T-1A	T-1	1310
TS	14750	IL 62 Algonquin Rd	Hammond Dr	CO	Permanent Signals		T-1A	T-1	1311
TS	14755	IL 62 Algonquin Rd	Motorola E Dr / Village Tree Ent	CO	Permanent Signals		T-1A	T-1	1312
TS	14760	IL 62 Algonquin Rd	Motorola W Dr / Plum Grove Rd	CO	Permanent Signals		T-1A	T-1	1313

TS	14765	IL 62 Algonquin Rd	Thoreau Dr / Thorntree Ln	CO	Permanent Signals		T-1A	T-1	1314
TS	14780	IL 62 Algonquin Rd	Meacham Rd	CO	Permanent Signals		T-1A	T-1	1315
TS	14820	Howard St	Niles Center Rd	CO	Permanent Signals		T-1A	T-1	1316
TS	14835	Touhy Ave	Niles Center Rd / Carpenter Rd	CO	Permanent Signals		T-1A	T-1	1317
TS	14840	Touhy Ave	Laramie Ave	CO	Permanent Signals		T-1A	T-1	1318
TS	14845	Touhy Ave	Leclaire Ave	CO	Permanent Signals		T-1A	T-1	1319
TS	14855	US 12 45 Mannheim Rd	Hirsch Ave / Soffel Ave	CO	Permanent Signals		T-1A	T-1	1320
TS	15105	US 12 45 Mannheim Rd	Dorchester Ave / Balmoral Ave	CO	Permanent Signals		T-1A	T-1	1321
TS	15110	IL 38 Roosevelt Rd	Westchester Blvd	CO	Permanent Signals		T-1A	T-1	1322
TS	15115	22nd St Cermak Rd	Mayfair Ave	CO	Permanent Signals		T-1A	T-1	1323
TS	15120	US 12 45 Mannheim Rd	Canterbury St	CO	Permanent Signals		T-1A	T-1	1324
TS	20341	Touhy Ave	Lawndale Ave	CO	Permanent Signals		T-1A	T-1	1325
TS	20345	Touhy Ave	Lincolnwood Town Center Ent	CO	Permanent Signals		T-1A	T-1	1326
TS	20355	Niles Center Rd Carpenter Rd	Village Crossing Ent D	CO	Permanent Signals		T-1A	T-1	1327
TS	20365	US 6 159th St	91st Ave / Park Hill Dr	CO	Permanent Signals		T-1A	T-1	1328
TS	20366	IL 50 IL 83 Cicero Ave	137th St	CO	Permanent Signals		T-1A	T-1	1329
TS	20380	US 14 Northwest Hwy	Ela Rd	CO	Permanent Signals		T-1A	T-1	1330
TS	20385	Ballard Rd	Bender Rd / East River Rd	CO	Permanent Signals		T-1A	T-1	1331

TS	20395	McCormick Blvd	Lincolnwood Town Center Ent	CO	Permanent Signals		T-1A	T-1	1332
TS	20400	Barrington Rd	St Alexius Hospital / Hoffman Medical	CO	Permanent Signals		T-1A	T-1	1333
TS	20402	IL 58 Golf Rd	Hoffman Estates SC Ent	CO	Permanent Signals		T-1A	T-1	1334
TS	20405	US 45 IL 21 Milwaukee Ave	US 45 DesPlaines	CO	Permanent Signals		T-1A	T-1	1335
TS	20435	IL 50 Cicero Ave	24th Pl Hawthorne Works	CO	Permanent Signals		T-1A	T-1	1336
TS	20480	Palatine Rd	Roselle Rd	CO	Permanent Signals		T-1A	T-1	1337
TS	20490	US 6 159th St	108th Ave	CO	Permanent Signals		T-1A	T-1	1338
TS	20491	US 6 159th St	Ravinia Way	CO	Permanent Signals		T-1A	T-1	1339
TS	20495	IL 50 Cicero Ave	120th St	CO	Permanent Signals		T-1A	T-1	1340
TS	20525	IL 171 Archer Ave	Bulldog Dr / 57th St	CO	Permanent Signals		T-1A	T-1	1341
TS	20555	IL 43 Waukegan Rd	Niles Civic Center Plaza Ent	CO	Permanent Signals		T-1A	T-1	1342
TS	20560	US 6 Wolf Rd	167th St	CO	Permanent Signals		T-1A	T-1	1343
TS	20575	US 20 Lake St	Walnut Ave	CO	Permanent Signals		T-1A	T-1	1344
TS	20590	US 14 Northwest Hwy	First Bank Ent	CO	Permanent Signals		T-1A	T-1	1345
TS	20605	I 290 IL 53	Biesterfield Rd W Ramps	CO	Permanent Signals		T-1A	T-1	1346
TS	20610	I 290 IL 53	Biesterfield Rd E Ramps	CO	Permanent Signals		T-1A	T-1	1347
TS	20615	Brainard Ave	Hegewisch Metra Parking Lot Ent	CO	Permanent Signals		T-1A	T-1	1348
TS	20935	Touhy Ave	Village Crossing	CO	Permanent Signals		T-1A	T-1	1349

			SC Ent C						
TS	20945	US 45 LaGrange Rd 96th Ave	179th St	CO	Permanent Signals		T-1A	T-1	1350
TS	20955	US 6 IL 83 Torrence Ave	166th St / Fieldcrest Dr	CO	Permanent Signals		T-1A	T-1	1351
TS	20965	127th St	Kostner Ave	CO	Permanent Signals		T-1A	T-1	1352
TS	21015	IL 50 Cicero Ave	105th St	CO	Permanent Signals		T-1A	T-1	1353
TS	21090	Glenwood Dyer Rd	Stoney Island Ave	CO	Permanent Signals		T-1A	T-1	1354
TS	21100	IL 83 Old McHenry Rd	Lexington Dr	CO	Permanent Signals		T-1A	T-1	1355
TS	21125	IL 58 Golf Rd	Golf Glen Shopping Center Ent	CO	Permanent Signals		T-1A	T-1	1356
TS	21130	Barrington Rd	Old Church Rd	CO	Permanent Signals		T-1A	T-1	1357
TS	21145	Elmhurst Rd	Greenleaf Ave	CO	Permanent Signals		T-1A	T-1	1358
TS	21150	Elmhurst Rd	Pratt Ave	CO	Permanent Signals		T-1A	T-1	1359
TS	21175	31st St	Mayfair Ave	CO	Permanent Signals		T-1A	T-1	1360
TS	21185	IL 83 Torrence Ave	Glenwood Lansing Rd	CO	Permanent Signals		T-1A	T-1	1361
TS	21200	IL 68 Dundee Rd	Huntington Ln / Lake Blvd	CO	Permanent Signals		T-1A	T-1	1362
TS	21210	Lake Cook Rd	Ela Rd	CO	Permanent Signals		T-1A	T-1	1363
TS	21220	111th St	Austin Blvd	CO	Permanent Signals		T-1A	T-1	1364
TS	21225	Meacham Rd	American Ln	CO	Permanent Signals		T-1A	T-1	1365
TS	21230	Meacham Rd	Remington Ln	CO	Permanent Signals		T-1A	T-1	1366
TS	21235	IL 58 Golf Rd	Basswood Rd / Basswood St	CO	Permanent Signals		T-1A	T-1	1367

TS	21237	IL 58 Golf Rd	Wilkening Rd	CO	Permanent Signals		T-1A	T-1	1368
TS	21275	Willow Rd	Kraft Food Ent / Three Lakes Dr	CO	Permanent Signals		T-1A	T-1	1369
TS	21280	Barrington Rd	Buttitta Dr / Laurie Ln	CO	Permanent Signals		T-1A	T-1	1370
TS	21285	Barrington Rd	Ramblewood Dr	CO	Permanent Signals		T-1A	T-1	1371
TS	21290	IL 58 Golf Rd	National Parkway	CO	Permanent Signals		T-1A	T-1	1372
TS	21320	IL 72 Higgins Rd	Spring Mill Rd	CO	Permanent Signals		T-1A	T-1	1373
TS	21322	IL 72 Higgins Rd	Grand Canyon Parkway	CO	Permanent Signals		T-1A	T-1	1374
TS	21325	IL 43 Harlem Ave	Oak Park Ave	CO	Permanent Signals		T-1A	T-1	1375
TS	21340	IL 83 Torrence Ave	176th St	CO	Permanent Signals		T-1A	T-1	1376
TS	21355	IL 62 Algonquin Rd	Briarwood Dr	CO	Permanent Signals		T-1A	T-1	1377
TS	21370	IL 58 Golf Rd	Knollwood Dr	CO	Permanent Signals		T-1A	T-1	1378
TS	21375	IL 58 Golf Rd	Harmon Blvd	CO	Permanent Signals		T-1A	T-1	1379
TS	21450	IL 19 Irving Park Rd	Olde Salem Dr	CO	Permanent Signals		T-1A	T-1	1380
TS	21473	IL 171 Archer Ave	131St St	CO	Permanent Signals		T-1A	T-1	1381
TS	21475	IL 171 Archer Ave	Bell Rd	CO	Permanent Signals		T-1A	T-1	1382
TS	21510	IL 59 Sutton Rd	I 90 Tollway S Ramps	CO	Permanent Signals		T-1A	T-1	1383
TS	21515	IL 43 Harlem Ave	Vollmer Rd	CO	Permanent Signals		T-1A	T-1	1384
TS	21520	IL 7 143rd St	IL 7 Wolf Rd	CO	Permanent Signals		T-1A	T-1	1385
TS	21522	IL 7 143rd St	108th St	CO	Permanent Signals		T-1A	T-1	1386

TS	21535	IL 59 Sutton Rd	I 90 Tollway N Ramps / Columbine Blvd	CO	Permanent Signals		T-1A	T-1	1387
TS	21537	IL 59	Popular Creek Ent	CO	Permanent Signals		T-1A	T-1	1388
TS	21550	IL 68 Dundee Rd	Barrington Middle School Ent	CO	Permanent Signals		T-1A	T-1	1389
TS	21555	IL 72 Higgins Rd	Sears E Ent / Trillium Blvd	CO	Permanent Signals		T-1A	T-1	1390
TS	21557	IL 72 Higgins Rd	Sears W Ent	CO	Permanent Signals		T-1A	T-1	1391
TS	21560	IL 72 Higgins Rd	Old Sutton Rd	CO	Permanent Signals		T-1A	T-1	1392
TS	21595	IL 62 Algonquin Rd	Newport Dr	CO	Permanent Signals		T-1A	T-1	1393
TS	21600	Pfingsten Rd	Glenlake Dr / Glenbrook Hosp. Ent	CO	Permanent Signals		T-1A	T-1	1394
TS	21605	US 30 Lincoln Hwy	Ellis St	CO	Permanent Signals		T-1A	T-1	1395
TS	21610	Meacham Rd	Motorola N Dr / Drummer Dr	CO	Permanent Signals		T-1A	T-1	1396
TS	21620	Meacham Rd	Motorola S Dr / Thoreau Dr	CO	Permanent Signals		T-1A	T-1	1397
TS	21650	IL 50 Cicero Ave	71st St / Wal Mart Ent	CO	Permanent Signals		T-1A	T-1	1398
TS	21709	IL 19 Irving Park Rd	Elgin O'Hare E Frontage Rd	CO	Permanent Signals		T-1A	T-1	1399
TS	21710	IL 19 Irving Park Rd	Elgin O'Hare W Frontage Rd	CO	Permanent Signals		T-1A	T-1	1400
TS	21711	Elgin O'Hare W Frontage Rd	Rodenburg Rd	CO	Permanent Signals		T-1A	T-1	1401
TS	21712	Elgin O'Hare E Frontage Rd	Rodenburg Rd	CO	Permanent Signals		T-1A	T-1	1402

TS	21720	Elgin O'Hare E Frontage Rd	Wright Blvd	CO	Permanent Signals		T-1A	T-1	1403
TS	21721	Elgin O'Hare W Frontage Rd	Wright Blvd	CO	Permanent Signals		T-1A	T-1	1404
TS	21730	Elgin O'Hare W Frontage Rd	Meacham Rd	CO	Permanent Signals		T-1A	T-1	1405
TS	21731	Elgin O'Hare W Frontage Rd	Meacham Rd / Medinah Rd	CO	Permanent Signals		T-1A	T-1	1406
TS	21770	Meacham Rd	Tower Rd / McConnor Parkway	CO	Permanent Signals		T-1A	T-1	1407
TS	21775	Montrose Ave	Neenah Ave	CO	Permanent Signals		T-1A	T-1	1408
TS	21795	Western Ave	Joe Orr Rd / Country Club Dr	CO	Permanent Signals		T-1A	T-1	1409
TS	21805	Palatine Rd	Chambers Dr / Jewel Osco Ent	CO	Permanent Signals		T-1A	T-1	1410
TS	21845	Main St Lake Cook Rd	Dundee Ave	CO	Permanent Signals		T-1A	T-1	1411
TS	21850	IL 64 North Ave	Wal Mart Ent	CO	Permanent Signals		T-1A	T-1	1412
TS	21855	IL 43 Waukegan Rd	Overlook Dr / Kraft Food Ent	CO	Permanent Signals		T-1A	T-1	1413
TS	21890	Biesterfield Rd	Beisner Rd	CO	Permanent Signals		T-1A	T-1	1414
TS	21920	US 6 159th St	Jewel Ent / Orland Town Center Ent	CO	Permanent Signals		T-1A	T-1	1415
TS	21955	IL 72 Higgins Rd	National Parkway	CO	Permanent Signals		T-1A	T-1	1416
TS	22035	75th St	Willow Springs Rd	CO	Permanent Signals		T-1A	T-1	1417
TS	22060	US 45 La Grange Rd	171st St	CO	Permanent Signals		T-1A	T-1	1418
TS	22065	22nd St Cermak Rd	14th St	CO	Permanent Signals		T-1A	T-1	1419

TS	22095	104th Ave	123rd St / McCarthy Rd	CO	Permanent Signals		T-1A	T-1	1420
TS	22120	17th Ave	19th St	CO	Permanent Signals		T-1A	T-1	1421
TS	22121	17th Ave	23rd St	CO	Permanent Signals		T-1A	T-1	1422
TS	22150	Devon Ave	Greenwood Ave	CO	Permanent Signals		T-1A	T-1	1423
TS	22165	25th Ave	Armitage	CO	Permanent Signals		T-1A	T-1	1424
TS	22195	127th St	State St	CO	Permanent Signals		T-1A	T-1	1425
TS	22215	US 12 20 45 La Grange Rd	58th St	CO	Permanent Signals		T-1A	T-1	1426
TS	22225	IL 58 Golf Rd	Rohrsen Rd	CO	Permanent Signals		T-1A	T-1	1427
TS	22230	IL 62 Algonquin Rd	Willowmere Willow Creek Church	CO	Permanent Signals		T-1A	T-1	1428
TS	22235	Arlington Heights Rd	Bennett Rd	CO	Permanent Signals		T-1A	T-1	1429
TS	22263	IL 43 Harlem Ave	191st St	CO	Permanent Signals		T-1A	T-1	1430
TS	545	IL 83 Kingery Hwy	3rd Ave	DU	Permanent Signals		T-1A	T-1	1431
TS	550	IL 83 Kingery Hwy	22nd St Cermak Rd	DU	Permanent Signals		T-1A	T-1	1432
TS	565	IL 83 Kingery Hwy	63rd St	DU	Permanent Signals		T-1A	T-1	1433
TS	570	IL 83 Kingery Hwy	75th St	DU	Permanent Signals		T-1A	T-1	1434
TS	580	IL 83 Kingery Hwy	Bluff Rd	DU	Permanent Signals		T-1A	T-1	1435
TS	585	IL 83 Kingery Hwy	Central Ave	DU	Permanent Signals		T-1A	T-1	1436
TS	587	IL 83 Kingery Hwy	91st St	DU	Permanent Signals		T-1A	T-1	1437

TS	590	IL 83 Kingery Hwy	Foster Ave	DU	Permanent Signals		T-1A	T-1	1438
TS	595	IL 83 Kingery Hwy	Grove Ave Sherwood	DU	Permanent Signals		T-1A	T-1	1439
TS	600	IL 83 Kingery Hwy	Hillside Dr	DU	Permanent Signals		T-1A	T-1	1440
TS	605	IL 83 Kingery Hwy	Elmhurst Shop Ctr Ent	DU	Permanent Signals		T-1A	T-1	1441
TS	610	IL 83 Kingery Hwy	Mark St	DU	Permanent Signals		T-1A	T-1	1442
TS	615	IL 83 Kingery Hwy	Midway Dr	DU	Permanent Signals		T-1A	T-1	1443
TS	620	IL 83 Kingery Hwy	Hodges Rd Oakbrook	DU	Permanent Signals		T-1A	T-1	1444
TS	625	IL 83 Kingery Hwy	16th St	DU	Permanent Signals		T-1A	T-1	1445
TS	630	IL 83 Kingery Hwy	Elmhurst Quarry Ent	DU	Permanent Signals		T-1A	T-1	1446
TS	635	IL 83 Kingery Hwy	Plainfield Rd	DU	Permanent Signals		T-1A	T-1	1447
TS	637	IL 83 Kingery Hwy	72nd St	DU	Permanent Signals		T-1A	T-1	1448
TS	640	IL 83 Kingery Hwy	Riverside Dr	DU	Permanent Signals		T-1A	T-1	1449
TS	645	IL 83 Kingery Hwy	St. Charles Rd	DU	Permanent Signals		T-1A	T-1	1450
TS	650	IL 83 Kingery Hwy	Thorndale Ave	DU	Permanent Signals		T-1A	T-1	1451
TS	4595	US 20 Lake St	Fairfield Way	DU	Permanent Signals		T-1A	T-1	1452
TS	4600	US 20 Lake St	Bloomingdale Rd	DU	Permanent Signals		T-1A	T-1	1453
TS	4605	US 20 Lake St	Circle Dr	DU	Permanent Signals		T-1A	T-1	1454
TS	4610	US 20 Lake St	Springbrook Shop	DU	Permanent Signals		T-1A	T-1	1455

			Ctr						
TS	5975	I 55 N Frontage Rd	Cass Ave	DU	Permanent Signals		T-1A	T-1	1456
TS	5990	I 290	York Rd N Ramp	DU	Permanent Signals		T-1A	T-1	1457
TS	6000	I 290 E Ramp	Thorndale Ave	DU	Permanent Signals		T-1A	T-1	1458
TS	6005	I 290 W Ramp	Thorndale Ave	DU	Permanent Signals		T-1A	T-1	1459
TS	6015	US 20 Lake St	IL 83 W Ramps	DU	Permanent Signals		T-1A	T-1	1460
TS	6020	US 20 Lake St	Addison Rd	DU	Permanent Signals		T-1A	T-1	1461
TS	6025	US 20 Lake St	Church Rd	DU	Permanent Signals		T-1A	T-1	1462
TS	6030	US 20 Lake St	Gary Ave	DU	Permanent Signals		T-1A	T-1	1463
TS	6035	US 20 Lake St	Glen Ellyn Rd	DU	Permanent Signals		T-1A	T-1	1464
TS	6037	US 20 Lake St	Euclid Ave Lake View	DU	Permanent Signals		T-1A	T-1	1465
TS	6040	US 20 Lake St	IL 83 E Rp Grand Ave	DU	Permanent Signals		T-1A	T-1	1466
TS	6043	US 20 Lake St	Greenbriar Dr	DU	Permanent Signals		T-1A	T-1	1467
TS	6045	US 20 Lake St	Medinah Rd	DU	Permanent Signals		T-1A	T-1	1468
TS	6046	US 34 Ogden Ave	Commons Dr	DU	Permanent Signals		T-1A	T-1	1469
TS	6047	US 34 Ogden Ave	75th St	DU	Permanent Signals		T-1A	T-1	1470
TS	6048	US 34 Ogden Ave	Long Grove Rd	DU	Permanent Signals		T-1A	T-1	1471
TS	6049	US 34 Ogden Ave	Eola Rd	DU	Permanent Signals		T-1A	T-1	1472
TS	6050	US 34 Ogden Ave	Montgomery Rd	DU	Permanent Signals		T-1A	T-1	1473
TS	6051	US 34 Ogden Ave	Frontenac Rd	DU	Permanent Signals		T-1A	T-1	1474

TS	6065	US 20 Lake St	Springfield Dr	DU	Permanent Signals		T-1A	T-1	1475
TS	6070	US 20 Lake St	Villa Ave Wooddale Rd	DU	Permanent Signals		T-1A	T-1	1476
TS	6075	US 20 Lake St	Walnut St	DU	Permanent Signals		T-1A	T-1	1477
TS	6080	US 20 Lake St	West Ave	DU	Permanent Signals		T-1A	T-1	1478
TS	6085	US 20 Lake St	Rosedale Ave	DU	Permanent Signals		T-1A	T-1	1479
TS	6089	IL 59	McCoy Dr Commons	DU	Permanent Signals		T-1A	T-1	1480
TS	6090	IL 59	US 34 Oswego Rd	DU	Permanent Signals		T-1A	T-1	1481
TS	6092	IL 59	87th St White Eagle Dr	DU	Permanent Signals		T-1A	T-1	1482
TS	6095	US 34 Ogden Ave	Cass Ave	DU	Permanent Signals		T-1A	T-1	1483
TS	6100	US 34 Ogden Ave	Pasquinelli Middaugh	DU	Permanent Signals		T-1A	T-1	1484
TS	6110	US 34 Ogden Ave	IL 83 W Ramps	DU	Permanent Signals		T-1A	T-1	1485
TS	6115	US 34 Ogden Ave	IL 83 E Ramps	DU	Permanent Signals		T-1A	T-1	1486
TS	6116	US 34 Ogden Ave	Oak St Salt Creek Ln	DU	Permanent Signals		T-1A	T-1	1487
TS	6118	US 34 Ogden Ave	York Rd	DU	Permanent Signals		T-1A	T-1	1488
TS	6120	US 34 Ogden Ave	Cross St	DU	Permanent Signals		T-1A	T-1	1489
TS	6125	US 34 Ogden Ave	Belmont Rd Finley Rd	DU	Permanent Signals		T-1A	T-1	1490
TS	6130	US 34 Ogden Ave	Madison St	DU	Permanent Signals		T-1A	T-1	1491
TS	6135	US 34 Ogden Ave	Oakwood Rd	DU	Permanent Signals		T-1A	T-1	1492

TS	6140	IL 19 Irving Park Rd	Marshall Rd	DU	Permanent Signals		T-1A	T-1	1493
TS	6145	IL 19 Irving Park Rd	Medinah Rd	DU	Permanent Signals		T-1A	T-1	1494
TS	6160	IL 19 Irving Park Rd	Spruce Ave	DU	Permanent Signals		T-1A	T-1	1495
TS	6164	IL 19 Irving Park Rd	Bloomingdale Rd	DU	Permanent Signals		T-1A	T-1	1496
TS	6165	IL 19 Irving Park Rd	Walnut St	DU	Permanent Signals		T-1A	T-1	1497
TS	6170	IL 19 Irving Park Rd	Prospect Ave	DU	Permanent Signals		T-1A	T-1	1498
TS	6175	IL 38 Roosevelt Rd	Fabyan Parkway	DU	Permanent Signals		T-1A	T-1	1499
TS	6180	IL 38 Roosevelt Rd	Joliet Rd	DU	Permanent Signals		T-1A	T-1	1500
TS	6185	IL 38 Roosevelt Rd	Kress Rd	DU	Permanent Signals		T-1A	T-1	1501
TS	6190	IL 38 Roosevelt Rd	Meyers Rd	DU	Permanent Signals		T-1A	T-1	1502
TS	6195	IL 38 Roosevelt Rd	Summit Ave	DU	Permanent Signals		T-1A	T-1	1503
TS	6200	IL 38 Roosevelt Rd	Winfield Rd	DU	Permanent Signals		T-1A	T-1	1504
TS	6205	IL 59 N Ramp Dayton Ave	IL 38 Roosevelt Rd	DU	Permanent Signals		T-1A	T-1	1505
TS	6206	IL 59	IL 38 Roosevelt Rd S	DU	Permanent Signals		T-1A	T-1	1506
TS	6210	IL 38 Roosevelt Rd	Courtyard Shop Ctr	DU	Permanent Signals		T-1A	T-1	1507
TS	6220	IL 53	75th St	DU	Permanent Signals		T-1A	T-1	1508
TS	6225	IL 53	Hobson Rd	DU	Permanent Signals		T-1A	T-1	1509

TS	6230	IL 53	Park Blvd	DU	Permanent Signals		T-1A	T-1	1510
TS	6240	IL 53	Summerhill Dr	DU	Permanent Signals		T-1A	T-1	1511
TS	6245	IL 53	83rd St	DU	Permanent Signals		T-1A	T-1	1512
TS	6250	IL 53	59th St Four Lakes Ave	DU	Permanent Signals		T-1A	T-1	1513
TS	6255	IL 53	Woodridge Dr 7 Bridges	DU	Permanent Signals		T-1A	T-1	1514
TS	6256	IL 53	High Tr 7 Bridges Dr	DU	Permanent Signals		T-1A	T-1	1515
TS	6265	IL 56 Butterfield Rd	22nd St	DU	Permanent Signals		T-1A	T-1	1516
TS	6275	IL 56 Butterfield Rd	Finley Rd	DU	Permanent Signals		T-1A	T-1	1517
TS	6290	IL 56 Butterfield Rd	Lambert Rd	DU	Permanent Signals		T-1A	T-1	1518
TS	6293	IL 56 Butterfield Rd	Fountain Square Rd	DU	Permanent Signals		T-1A	T-1	1519
TS	6295	IL 56 Butterfield Rd	Meyers Rd	DU	Permanent Signals		T-1A	T-1	1520
TS	6300	IL 56 Butterfield Rd	Midwest Rd Summit	DU	Permanent Signals		T-1A	T-1	1521
TS	6305	IL 56 Butterfield Rd	Park Blvd	DU	Permanent Signals		T-1A	T-1	1522
TS	6310	IL 56 Butterfield Rd	Fairfield Ave	DU	Permanent Signals		T-1A	T-1	1523
TS	6325	IL 56 Butterfield Rd	Eola Rd	DU	Permanent Signals		T-1A	T-1	1524
TS	6340	IL 56 Butterfield Rd	Glenbard South HS	DU	Permanent Signals		T-1A	T-1	1525
TS	6345	IL 56 Butterfield Rd	Trans Am Plaza Dr	DU	Permanent Signals		T-1A	T-1	1526
TS	6350	IL 56	Woodcreek	DU	Permanent Signals		T-1A	T-1	1527

		Butterfield Rd	Lloyd Ave						
TS	6352	IL 56 Butterfield Rd	Home Depot Esplanade	DU	Permanent Signals		T-1A	T-1	1528
TS	6360	IL 59	75th St	DU	Permanent Signals		T-1A	T-1	1529
TS	6362	IL 59	Beebe Dr Costco Ent	DU	Permanent Signals		T-1A	T-1	1530
TS	6365	IL 59 Sutton Rd	Army Trail Rd	DU	Permanent Signals		T-1A	T-1	1531
TS	6370	IL 59 Joliet Rd	Batavia Rd	DU	Permanent Signals		T-1A	T-1	1532
TS	6377	IL 59 Ingalton Rd	Struckman Blvd	DU	Permanent Signals		T-1A	T-1	1533
TS	6378	IL 59 Ingalton Rd	Apple Valley Home Depot	DU	Permanent Signals		T-1A	T-1	1534
TS	6379	IL 59	Woodland Hills Pkwy	DU	Permanent Signals		T-1A	T-1	1535
TS	6380	IL 59	North Aurora Rd	DU	Permanent Signals		T-1A	T-1	1536
TS	6390	IL 59 Neltner Blvd	Forest Ave	DU	Permanent Signals		T-1A	T-1	1537
TS	6395	IL 59 Joliet Rd	Continental Dr Meadow	DU	Permanent Signals		T-1A	T-1	1538
TS	6400	IL 64 North Ave	IL 83 Kingery Hwy	DU	Permanent Signals		T-1A	T-1	1539
TS	6405	IL 64 North Ave	Addison Rd	DU	Permanent Signals		T-1A	T-1	1540
TS	6410	IL 64 North Ave	Ardmore Ave	DU	Permanent Signals		T-1A	T-1	1541
TS	6415	IL 64 North Ave	Berteau Ave	DU	Permanent Signals		T-1A	T-1	1542
TS	6420	IL 64 North Ave	Bloomingdale Rd	DU	Permanent Signals		T-1A	T-1	1543
TS	6425	IL 64 North Ave	County Farm Rd	DU	Permanent Signals		T-1A	T-1	1544

TS	6430	IL 64 North Ave	Emroy Ave Melrose	DU	Permanent Signals		T-1A	T-1	1545
TS	6435	IL 64 North Ave	Gary Ave	DU	Permanent Signals		T-1A	T-1	1546
TS	6440	IL 64 North Ave	Grace St	DU	Permanent Signals		T-1A	T-1	1547
TS	6445	IL 64 North Ave	Kuhn Rd	DU	Permanent Signals		T-1A	T-1	1548
TS	6446	IL 64 North Ave	Bennett Windsor	DU	Permanent Signals		T-1A	T-1	1549
TS	6450	IL 64 North Ave	Main St {Glen Ellyn}	DU	Permanent Signals		T-1A	T-1	1550
TS	6455	IL 64 North Ave	Main St {Lombard}	DU	Permanent Signals		T-1A	T-1	1551
TS	5456	IL 64 North Ave	Lombard Rd	DU	Permanent Signals		T-1A	T-1	1552
TS	6460	IL 64 North Ave	Myrtle Ave	DU	Permanent Signals		T-1A	T-1	1553
TS	6465	IL 64 North Ave	Schmale Rd	DU	Permanent Signals		T-1A	T-1	1554
TS	6470	IL 64 North Ave	Michigan Ave North Park	DU	Permanent Signals		T-1A	T-1	1555
TS	6475	IL 64 North Ave	Swift Rd	DU	Permanent Signals		T-1A	T-1	1556
TS	6480	IL 64 North Ave	Villa Ave	DU	Permanent Signals		T-1A	T-1	1557
TS	6490	IL 64 North Ave	West Ave	DU	Permanent Signals		T-1A	T-1	1558
TS	6495	IL 64 North Ave	Westwood Ave	DU	Permanent Signals		T-1A	T-1	1559
TS	6500	IL 64 North Ave	York Rd	DU	Permanent Signals		T-1A	T-1	1560
TS	6505	IL 64 North	Elmhurst Plaza	DU	Permanent Signals		T-1A	T-1	1561

		Ave	Ent						
TS	7695	US 20 Lake St	Bearflag Dr Ontarioville	DU	Permanent Signals		T-1A	T-1	1562
TS	7800	IL 56 Butterfield Rd	Macarthur Dr	DU	Permanent Signals		T-1A	T-1	1563
TS	7830	IL 53 Lincoln Ave	Maple Ave	DU	Permanent Signals		T-1A	T-1	1564
TS	7835	IL 56 Butterfield Rd	IL 53	DU	Permanent Signals		T-1A	T-1	1565
TS	7855	US 34 Ogden Ave	Main St {Lisle}	DU	Permanent Signals		T-1A	T-1	1566
TS	7870	US 20 Lake St	Bartels Rd Arlington	DU	Permanent Signals		T-1A	T-1	1567
TS	7875	US 20 Lake St	Bryn Mawr Ave	DU	Permanent Signals		T-1A	T-1	1568
TS	8225	IL 38 Roosevelt Rd	County Farm Rd	DU	Permanent Signals		T-1A	T-1	1569
TS	8370	US 34 Ogden Ave	Fairview Ave	DU	Permanent Signals		T-1A	T-1	1570
TS	8375	22nd St Cermak Rd	Midwest Rd Summit	DU	Permanent Signals		T-1A	T-1	1571
TS	8377	22nd St Cermak Rd	Shops Oak Brook Ent	DU	Permanent Signals		T-1A	T-1	1572
TS	8830	US 34 Ogden Ave	Washington St	DU	Permanent Signals		T-1A	T-1	1573
TS	8850	IL 59 Neltner Blvd	James St	DU	Permanent Signals		T-1A	T-1	1574
TS	8853	IL 59 Neltner Blvd	Hawthorn Ln	DU	Permanent Signals		T-1A	T-1	1575
TS	8855	IL 59 Neltner Blvd	Washington St	DU	Permanent Signals		T-1A	T-1	1576
TS	8860	IL 59 Neltner Blvd	Main St West Chicago	DU	Permanent Signals		T-1A	T-1	1577

TS	8970	IL 59 Neltner Blvd	22nd St	DU	Permanent Signals		T-1A	T-1	1578
TS	9022	IL 38 Roosevelt Rd	Kautz Rd	DU	Permanent Signals		T-1A	T-1	1579
TS	9035	IL 19 Irving Park Rd	Roselle Rd	DU	Permanent Signals		T-1A	T-1	1580
TS	9037	IL 19 Irving Park Rd	Lawerence Ave	DU	Permanent Signals		T-1A	T-1	1581
TS	9040	IL 19 Irving Park Rd	Park St	DU	Permanent Signals		T-1A	T-1	1582
TS	9100	IL 19 Irving Park Rd	Maple Ave	DU	Permanent Signals		T-1A	T-1	1583
TS	9450	IL 59	Diehl Rd	DU	Permanent Signals		T-1A	T-1	1584
TS	9455	IL 59	Bruce Ln Brookdale Rd	DU	Permanent Signals		T-1A	T-1	1585
TS	9470	IL 59	I 88 S Ramp	DU	Permanent Signals		T-1A	T-1	1586
TS	9475	IL 59	I 88 N Ramp	DU	Permanent Signals		T-1A	T-1	1587
TS	10910	US 34 Ogden Ave	Warwick Shop Ctr Ent	DU	Permanent Signals		T-1A	T-1	1588
TS	11085	IL 59	Ferry Rd	DU	Permanent Signals		T-1A	T-1	1589
TS	11180	IL 38 Roosevelt Rd	Fairfield Ave	DU	Permanent Signals		T-1A	T-1	1590
TS	11390	IL 64 North Ave	Venture Shop Ctr	DU	Permanent Signals		T-1A	T-1	1591
TS	11410	IL 56 Butterfield Rd	Downers Dr	DU	Permanent Signals		T-1A	T-1	1592
TS	11415	IL 38 Roosevelt Rd	Lombard Shop Ctr	DU	Permanent Signals		T-1A	T-1	1593
TS	11420	US 34 Ogden Ave	Saratoga St	DU	Permanent Signals		T-1A	T-1	1594
TS	11425	US 34 Ogden Ave	Main St Downers Grove	DU	Permanent Signals		T-1A	T-1	1595

TS	11655	IL 53 Lincoln Ave	Main St {Lisle}	DU	Permanent Signals		T-1A	T-1	1596
TS	11660	IL 53 Lincoln Ave	Short St	DU	Permanent Signals		T-1A	T-1	1597
TS	11662	IL 53 Lincoln Ave	I 88 North Ramp	DU	Permanent Signals		T-1A	T-1	1598
TS	11665	IL 53 Lincoln Ave	Warrenville Rd	DU	Permanent Signals		T-1A	T-1	1599
TS	11670	IL 53 Lincoln Ave	Burlington Ave	DU	Permanent Signals		T-1A	T-1	1600
TS	11675	US 34 Ogden Ave	Blackhawk Dr	DU	Permanent Signals		T-1A	T-1	1601
TS	11680	US 34 Ogden Ave	US 34 Ogden Ave N Rp	DU	Permanent Signals		T-1A	T-1	1602
TS	11685	US 34 Ogden Ave	US 34 Ogden Ave S Rp	DU	Permanent Signals		T-1A	T-1	1603
TS	11825	US 34 Ogden Ave	Swartz Ave	DU	Permanent Signals		T-1A	T-1	1604
TS	11830	US 34 Ogden Ave	Yackley Rd	DU	Permanent Signals		T-1A	T-1	1605
TS	11835	US 34 Ogden Ave	Indiana Ave Western	DU	Permanent Signals		T-1A	T-1	1606
TS	11840	US 34 Ogden Ave	Old Tavern Rd	DU	Permanent Signals		T-1A	T-1	1607
TS	11970	IL 59	83rd St Montgomery	DU	Permanent Signals		T-1A	T-1	1608
TS	12020	IL 59 Neltner Blvd	Joliet St	DU	Permanent Signals		T-1A	T-1	1609
TS	12021	IL 59	Mack Rd	DU	Permanent Signals		T-1A	T-1	1610
TS	12045	IL 19 Irving Park Rd	York Rd	DU	Permanent Signals		T-1A	T-1	1611
TS	12065	IL 19 Irving Park Rd	Church Rd	DU	Permanent Signals		T-1A	T-1	1612

TS	12140	IL 59	Liberty St Jefferson Ave	DU	Permanent Signals		T-1A	T-1	1613
TS	12215	IL 83	67th St	DU	Permanent Signals		T-1A	T-1	1614
TS	12250	IL 64 North Ave	I 355 Tollway E Ramp	DU	Permanent Signals		T-1A	T-1	1615
TS	12255	IL 64 North Ave	I 355 Tollway W Ramp	DU	Permanent Signals		T-1A	T-1	1616
TS	12310	IL 59	Audrey Rd Aurora Market	DU	Permanent Signals		T-1A	T-1	1617
TS	12320	IL 38 Roosevelt Rd	Finley Rd	DU	Permanent Signals		T-1A	T-1	1618
TS	12325	IL 38 Roosevelt Rd	Main St Lombard	DU	Permanent Signals		T-1A	T-1	1619
TS	12360	US 34 Oswego Rd	Trade St Aurora Market	DU	Permanent Signals		T-1A	T-1	1620
TS	12375	IL 64 North Ave	Prince Crossing Rd	DU	Permanent Signals		T-1A	T-1	1621
TS	12376	IL 64 North Ave	Fair Oaks Rd	DU	Permanent Signals		T-1A	T-1	1622
TS	12420	US 34 Ogden Ave	I 355 Tollway E Ramp	DU	Permanent Signals		T-1A	T-1	1623
TS	12421	US 34 Ogden Ave	I 355 Tollway W Ramp	DU	Permanent Signals		T-1A	T-1	1624
TS	12424	IL 38 Roosevelt Rd	Baker Hill Dr	DU	Permanent Signals		T-1A	T-1	1625
TS	12425	IL 38 Roosevelt Rd	I 355 Tollway E Ramp	DU	Permanent Signals		T-1A	T-1	1626
TS	12426	IL 38 Roosevelt Rd	I 355 Tollway W Ramp	DU	Permanent Signals		T-1A	T-1	1627
TS	12500	US 20 Lake St	Itasca Rd	DU	Permanent Signals		T-1A	T-1	1628
TS	12505	US 20 Lake St	Lombard Ave	DU	Permanent Signals		T-1A	T-1	1629
TS	12510	US 20 Lake St	Mill Rd	DU	Permanent Signals		T-1A	T-1	1630

TS	12515	US 20 Lake St	Kennedy Dr	DU	Permanent Signals		T-1A	T-1	1631
TS	12520	IL 53 Rohlwing Rd	Fullerton Ave	DU	Permanent Signals		T-1A	T-1	1632
TS	13770	US 20 Lake St	Greenbrook Blvd	DU	Permanent Signals		T-1A	T-1	1633
TS	14065	IL 38 Roosevelt Rd	Highland Ave	DU	Permanent Signals		T-1A	T-1	1634
TS	14491	22nd St Cermak Rd	Oak Brook Ctr E Ent	DU	Permanent Signals		T-1A	T-1	1635
TS	14492	22nd St Cermak Rd	Oak Brook Ctr W Ent	DU	Permanent Signals		T-1A	T-1	1636
TS	14493	22nd St Cermak Rd	Spring Rd	DU	Permanent Signals		T-1A	T-1	1637
TS	14494	22nd St Cermak Rd	McDonald Dr	DU	Permanent Signals		T-1A	T-1	1638
TS	14495	York Rd	22nd St Cermak Rd	DU	Permanent Signals		T-1A	T-1	1639
TS	14496	22nd St	Jorie Blvd Enterprise	DU	Permanent Signals		T-1A	T-1	1640
TS	14497	22nd St Cermak Rd	Windsor Dr	DU	Permanent Signals		T-1A	T-1	1641
TS	15090	IL 19 Irving Park Rd	Addison Rd	DU	Permanent Signals		T-1A	T-1	1642
TS	15100	IL 19 Irving Park Rd	Wooddale Rd	DU	Permanent Signals		T-1A	T-1	1643
TS	15175	IL 56 Butterfield Rd	Bradford Dr Briar Brook	DU	Permanent Signals		T-1A	T-1	1644
TS	15178	IL 56 Butterfield Rd	Leask Ln	DU	Permanent Signals		T-1A	T-1	1645
TS	15230	IL 38 Roosevelt Rd	Lorraine Rd	DU	Permanent Signals		T-1A	T-1	1646
TS	15235	IL 38 Roosevelt Rd	President St	DU	Permanent Signals		T-1A	T-1	1647

TS	15240	IL 38 Roosevelt Rd	Naperville Rd	DU	Permanent Signals		T-1A	T-1	1648
TS	15245	IL 38 Roosevelt Rd	Main St Wheaton	DU	Permanent Signals		T-1A	T-1	1649
TS	15250	IL 38 Roosevelt Rd	West St Warrenville Rd	DU	Permanent Signals		T-1A	T-1	1650
TS	15255	IL 38 Roosevelt Rd	Carleton Ave	DU	Permanent Signals		T-1A	T-1	1651
TS	15260	IL 38 Roosevelt Rd	Adare Dr Saddle Rd	DU	Permanent Signals		T-1A	T-1	1652
TS	15261	IL 38 Roosevelt Rd	Marian Joy Ent	DU	Permanent Signals		T-1A	T-1	1653
TS	15315	IL 64 North Ave	Westmore Ave	DU	Permanent Signals		T-1A	T-1	1654
TS	20330	IL 53 Bryant Ave	DuPage Bl Baker Hill	DU	Permanent Signals		T-1A	T-1	1655
TS	20335	IL 53 Bryant Ave	Pershing Ave	DU	Permanent Signals		T-1A	T-1	1656
TS	20360	IL 59	Meridian Pk Glacier Pk	DU	Permanent Signals		T-1A	T-1	1657
TS	20620	IL 59	New York Aurora Ave	DU	Permanent Signals		T-1A	T-1	1658
TS	20625	IL 56 Butterfield Rd	I 355 Tollway E Ramp	DU	Permanent Signals		T-1A	T-1	1659
TS	20630	IL 56 Butterfield Rd	I 355 Tollway W Ramp	DU	Permanent Signals		T-1A	T-1	1660
TS	20631	IL 38 Roosevelt Rd	Nicoll Way	DU	Permanent Signals		T-1A	T-1	1661
TS	20632	IL 38 Roosevelt Rd	Park Blvd	DU	Permanent Signals		T-1A	T-1	1662
TS	20634	IL 38 Roosevelt Rd	Lambert Rd	DU	Permanent Signals		T-1A	T-1	1663
TS	20635	IL 59	Fox Valley Mall N	DU	Permanent Signals		T-1A	T-1	1664

			Ent						
TS	20910	US 34 Ogden Ave	Fox River Commons	DU	Permanent Signals		T-1A	T-1	1665
TS	21030	22nd St Cermak Rd	Macarthur Costco Ent	DU	Permanent Signals		T-1A	T-1	1666
TS	21035	22nd St Cermak Rd	Parkview Dr	DU	Permanent Signals		T-1A	T-1	1667
TS	21139	IL 59	Vantage Meijer Ent	DU	Permanent Signals		T-1A	T-1	1668
TS	21250	IL 38 Roosevelt Rd	Blanchard St	DU	Permanent Signals		T-1A	T-1	1669
TS	21255	IL 38 Roosevelt Rd	Main St Glen Ellyn Rd	DU	Permanent Signals		T-1A	T-1	1670
TS	21395	IL 64 North Ave	President St Fireside	DU	Permanent Signals		T-1A	T-1	1671
TS	21505	IL 53 Bryant Ave	Sheehan Ave	DU	Permanent Signals		T-1A	T-1	1672
TS	21700	US 34 Ogden Ave	Chelsea Ave Lisle PO	DU	Permanent Signals		T-1A	T-1	1673
TS	21830	US 34 Ogden Ave	Downers Pl Shop Ent	DU	Permanent Signals		T-1A	T-1	1674
TS	21870	IL 56 Butterfield Rd	Technology Waste Man	DU	Permanent Signals		T-1A	T-1	1675
TS	21910	US 20 Lake St	Elgin OHare	DU	Permanent Signals		T-1A	T-1	1676
TS	21930	Aurora Ave	Westridge Naper West	DU	Permanent Signals		T-1A	T-1	1677
TS	22025	US 20 Lake St	Rodenburg Rd	DU	Permanent Signals		T-1A	T-1	1678
TS	22110	IL 59	Ingalton Ave Arbor Ave	DU	Permanent Signals		T-1A	T-1	1679
TS	22115	IL 59 Ingalton Ave	Diversey St Andrew Golf	DU	Permanent Signals		T-1A	T-1	1680
TS	22125	IL 59 Sutton Rd	Schick Rd	DU	Permanent Signals		T-1A	T-1	1681

TS	22135	IL 53 Rohlwing Rd	Sidney Ave	DU	Permanent Signals		T-1A	T-1	1682
TS	196	IL 38	IL 47	KA	Permanent Signals		T-1A	T-1	1683
TS	665	IL 25 Dundee Ave	I 90 Tlwy	KA	Permanent Signals		T-1A	T-1	1684
TS	670	IL 25 Liberty St	Villa St Bus US 20	KA	Permanent Signals		T-1A	T-1	1685
TS	675	US 20 Lake St	IL 31 LaFox St	KA	Permanent Signals		T-1A	T-1	1686
TS	677	US 20 Lake St	Nesler Rd	KA	Permanent Signals		T-1A	T-1	1687
TS	693	US 20 Lake St	Plank Rd Coombs Rd	KA	Permanent Signals		T-1A	T-1	1688
TS	700	US 30 Baseline Rd	US 30 IL 47	KA	Permanent Signals		T-1A	T-1	1689
TS	703	IL 47	Keslinger Rd	KA	Permanent Signals		T-1A	T-1	1690
TS	705	IL 31	US 30 Briarcliff N Rp	KA	Permanent Signals		T-1A	T-1	1691
TS	710	IL 31	US 30 Briarcliff S Rp	KA	Permanent Signals		T-1A	T-1	1692
TS	725	US 30 Baseline Rd IL 47	Jericho Rd	KA	Permanent Signals		T-1A	T-1	1693
TS	727	US 30 Baseline Rd	Griffin Dr	KA	Permanent Signals		T-1A	T-1	1694
TS	728	US 30 Baseline Rd	Gordon	KA	Permanent Signals		T-1A	T-1	1695
TS	730	US 30 Baseline Rd	Orchard Rd	KA	Permanent Signals		T-1A	T-1	1696
TS	735	IL 31	I 88 Tlwy IL 56	KA	Permanent Signals		T-1A	T-1	1697
TS	737	IL 31	Oak	KA	Permanent Signals		T-1A	T-1	1698
TS	740	IL 19 Irving Park Rd	IL 25 Liberty St	KA	Permanent Signals		T-1A	T-1	1699
TS	745	IL 58 Golf Rd	IL 25 Liberty St	KA	Permanent Signals		T-1A	T-1	1700

		Summit St							
TS	750	IL 25 River St	IL 25 Wilson St	KA	Permanent Signals		T-1A	T-1	1701
TS	755	IL 38 State St	IL 25 Bennet St	KA	Permanent Signals		T-1A	T-1	1702
TS	760	IL 62 Algonquin Rd	IL 25 JFK Mem Dr	KA	Permanent Signals		T-1A	T-1	1703
TS	765	IL 25 Dundee Ave	IL 68 Barrington Rd	KA	Permanent Signals		T-1A	T-1	1704
TS	770	IL 25 Dundee Ave	IL 72 Higgins Rd	KA	Permanent Signals		T-1A	T-1	1705
TS	775	IL 25 Dundee Ave	Brandt Dr	KA	Permanent Signals		T-1A	T-1	1706
TS	785	IL 25 Wilson St	IL 25 Washington Ave	KA	Permanent Signals		T-1A	T-1	1707
TS	795	IL 31 Batavia Ave 1st St	3rd St	KA	Permanent Signals		T-1A	T-1	1708
TS	805	IL 38 State St	IL 31 1st St	KA	Permanent Signals		T-1A	T-1	1709
TS	810	IL 31 State St	Tollgate Rd Airport Rd	KA	Permanent Signals		T-1A	T-1	1710
TS	820	IL 31 State St	Davis Rd River Rd	KA	Permanent Signals		T-1A	T-1	1711
TS	830	IL 31 LaFox St	Middle St	KA	Permanent Signals		T-1A	T-1	1712
TS	835	IL 31 West Lake St	Webster St Aucutt Rd	KA	Permanent Signals		T-1A	T-1	1713
TS	845	IL 38 State St	East Side Dr	KA	Permanent Signals		T-1A	T-1	1714
TS	856	IL 38 State St	Bricher Rd 14th St	KA	Permanent Signals		T-1A	T-1	1715
TS	857	IL 38 Lincoln Hwy	Peck Rd	KA	Permanent Signals		T-1A	T-1	1716
TS	859	IL 38	La Fox Rd	KA	Permanent Signals		T-1A	T-1	1717
TS	860	US 30 IL 47	Cross St	KA	Permanent Signals		T-1A	T-1	1718

TS	861	US 30	Municipal Dr	KA	Permanent Signals		T-1A	T-1	1719
TS	862	US 30	Dugan Rd	KA	Permanent Signals		T-1A	T-1	1720
TS	865	IL 47	Galena Blvd	KA	Permanent Signals		T-1A	T-1	1721
TS	868	IL 47	Bliss Rd Wheeler Rd	KA	Permanent Signals		T-1A	T-1	1722
TS	869	IL 47	Waubonsee	KA	Permanent Signals		T-1A	T-1	1723
TS	877	IL 64 Main St	Peck Rd	KA	Permanent Signals		T-1A	T-1	1724
TS	880	IL 68 Penny Rd	IL 72 Higgins Rd	KA	Permanent Signals		T-1A	T-1	1725
TS	883	IL 68 Dundee Rd	Golfview Ln	KA	Permanent Signals		T-1A	T-1	1726
TS	885	IL 72 Main St	River St	KA	Permanent Signals		T-1A	T-1	1727
TS	890	IL 72 Main St	Van Buren St	KA	Permanent Signals		T-1A	T-1	1728
TS	895	IL 72 Main St	1st St	KA	Permanent Signals		T-1A	T-1	1729
TS	900	IL 72 Main St In W Dundee	2nd St	KA	Permanent Signals		T-1A	T-1	1730
TS	905	IL 72 Higgins Rd	Rock Road Dr	KA	Permanent Signals		T-1A	T-1	1731
TS	920	Wilson St	Island Ave Shimway Ave	KA	Permanent Signals		T-1A	T-1	1732
TS	1000	IL 31	IL 72	KA	Permanent Signals		T-1A	T-1	1733
TS	4305	IL 25 JFK Mem Dr	Golfview Ln	KA	Permanent Signals		T-1A	T-1	1734
TS	4310	IL 25 JFK Mem Dr	Kings Rd	KA	Permanent Signals		T-1A	T-1	1735
TS	4315	IL 25 JFK Mem Dr	Besinger Dr	KA	Permanent Signals		T-1A	T-1	1736
TS	4320	IL 25 JFK Mem Dr	Helm Rd	KA	Permanent Signals		T-1A	T-1	1737
TS	4325	IL 25 JFK Mem Dr	Robin Rd	KA	Permanent Signals		T-1A	T-1	1738

TS	4390	IL 25 JFK Mem Dr	Lake Marian Rd Hazard Rd	KA	Permanent Signals		T-1A	T-1	1739
TS	6052	US 34 Ogden Ave	Rush Copley Hospital Ent	KA	Permanent Signals		T-1A	T-1	1740
TS	6053	US 34 Ogden Ave	Ridge Ave Waterford Dr	KA	Permanent Signals		T-1A	T-1	1741
TS	7324	IL 47	Huntley Crossing Dr	KA	Permanent Signals		T-1A	T-1	1742
TS	7328	IL 47	Regency	KA	Permanent Signals		T-1A	T-1	1743
TS	7331	IL 47	Freeman Rd	KA	Permanent Signals		T-1A	T-1	1744
TS	7332	IL 47	Del Webb Blvd	KA	Permanent Signals		T-1A	T-1	1745
TS	7339	IL 47	Big Timber Rd	KA	Permanent Signals		T-1A	T-1	1746
TS	8975	IL 31 2nd St	Illinois St	KA	Permanent Signals		T-1A	T-1	1747
TS	8990	IL 64 Main St	IL 25 5th Ave	KA	Permanent Signals		T-1A	T-1	1748
TS	8995	IL 25 5th Ave	Illinois Ave	KA	Permanent Signals		T-1A	T-1	1749
TS	9010	IL 64 Main St	IL 31 2nd St	KA	Permanent Signals		T-1A	T-1	1750
TS	9015	IL 64 Main St	3rd St	KA	Permanent Signals		T-1A	T-1	1751
TS	9016	IL 64 Main St	7th St	KA	Permanent Signals		T-1A	T-1	1752
TS	9017	IL 64 Main St	15th St	KA	Permanent Signals		T-1A	T-1	1753
TS	9047	IL 38 State St	Meijer Ent	KA	Permanent Signals		T-1A	T-1	1754
TS	9065	IL 64 Main St	1st Ave	KA	Permanent Signals		T-1A	T-1	1755
TS	9070	IL 64 Main St	1st St	KA	Permanent Signals		T-1A	T-1	1756
TS	9700	IL 31 West Lake St	Knell St	KA	Permanent Signals		T-1A	T-1	1757
TS	10945	IL 38 Roosevelt Rd	Glengarry Dr	KA	Permanent Signals		T-1A	T-1	1758
TS	10950	IL 38 State St	3rd St	KA	Permanent Signals		T-1A	T-1	1759
TS	10952	IL 38 State St	7th St	KA	Permanent Signals		T-1A	T-1	1760

TS	10955	IL 38 State St	Anderson Blvd	KA	Permanent Signals		T-1A	T-1	1761
TS	11481	IL 31	Lovedale	KA	Permanent Signals		T-1A	T-1	1762
TS	11482	IL 31	Airport	KA	Permanent Signals		T-1A	T-1	1763
TS	11483	IL 31	IL 56 State St	KA	Permanent Signals		T-1A	T-1	1764
TS	11484	IL 56 Butterfield Rd	Hart Rd Mitchell Rd	KA	Permanent Signals		T-1A	T-1	1765
TS	11485	IL 56 Butterfield Rd	Kirk Rd Farnsworth Ave	KA	Permanent Signals		T-1A	T-1	1766
TS	11486	IL 56 Butterfield Rd	Church Rd	KA	Permanent Signals		T-1A	T-1	1767
TS	11975	IL 56 Butterfield Rd	IL 25 RiverRd	KA	Permanent Signals		T-1A	T-1	1768
TS	12091	IL 25 Dunham	IL 25 Stearns	KA	Permanent Signals		T-1A	T-1	1769
TS	12092	IL 25 Stearns	Gilbert St	KA	Permanent Signals		T-1A	T-1	1770
TS	12093	IL 25 Stearns	Stearns Rd	KA	Permanent Signals		T-1A	T-1	1771
TS	12094	IL 31	McClean Rd	KA	Permanent Signals		T-1A	T-1	1772
TS	13404	IL 72 Higgins Rd	Tyrrell	KA	Permanent Signals		T-1A	T-1	1773
TS	14865	IL 72 Higgins Rd	Locust Dr	KA	Permanent Signals		T-1A	T-1	1774
TS	14867	IL 72 Higgins Rd	Tartans Dr	KA	Permanent Signals		T-1A	T-1	1775
TS	14875	IL 72 Main St In W. Dundee	5th St	KA	Permanent Signals		T-1A	T-1	1776
TS	14880	IL 31 Western Ave	Spring Hill Mall Ent Spruce Dr	KA	Permanent Signals		T-1A	T-1	1777
TS	14885	IL 31 Western Ave	Aldi Ent	KA	Permanent Signals		T-1A	T-1	1778
TS	14890	IL 31 Western Ave	Main St Huntley Rd	KA	Permanent Signals		T-1A	T-1	1779
TS	14895	Huntley Rd	Elm Ave Mall	KA	Permanent Signals		T-1A	T-1	1780

			Ent "F"						
TS	14900	IL 31 8th St	Willow Ln Strom Dr	KA	Permanent Signals		T-1A	T-1	1781
TS	20390	IL 38 State St	St Charles Mall Ent	KA	Permanent Signals		T-1A	T-1	1782
TS	20396	IL 31 Western Ave	Kane Ave	KA	Permanent Signals		T-1A	T-1	1783
TS	21630	IL 31	Boncosky Rd	KA	Permanent Signals		T-1A	T-1	1784
TS	21768	IL 72 Higgins Rd	Sleepy Hollow Carrington Dr	KA	Permanent Signals		T-1A	T-1	1785
TS	21935	IL 31 2nd St	Prairie St	KA	Permanent Signals		T-1A	T-1	1786
TS	21972	US 20	I 90 Tlwy	KA	Permanent Signals		T-1A	T-1	1787
TS	21996	IL 25	Country Club Rd	KA	Permanent Signals		T-1A	T-1	1788
TS	22305	IL 72 Higgins Rd	Village Quarter Rd	KA	Permanent Signals		T-1A	T-1	1789
TS	695	US 34 Ogden Ave	US 30 Oswego Rd Fall	KE	Permanent Signals		T-1A	T-1	1790
TS	696	US 34 Ogden Ave	Hill US 30 Lincoln Hwy	KE	Permanent Signals		T-1A	T-1	1791
TS	698	US 34 Ogden Ave	Hafenrichter Farnsworth	KE	Permanent Signals		T-1A	T-1	1792
TS	715	US 30	Briarcliff Rd	KE	Permanent Signals		T-1A	T-1	1793
TS	720	US 30 Oswego Rd	Douglas Rd	KE	Permanent Signals		T-1A	T-1	1794
TS	722	US 30	Fifth St	KE	Permanent Signals		T-1A	T-1	1795
TS	731	US 30	Goodwin	KE	Permanent Signals		T-1A	T-1	1796
TS	732	Hill	Goodwin	KE	Permanent Signals		T-1A	T-1	1797
TS	733	US 34 Ogden Ave	Commercial Menards	KE	Permanent Signals		T-1A	T-1	1798
TS	837	IL 31 West	Caterpillar Rd	KE	Permanent Signals		T-1A	T-1	1799

		Lake St							
TS	21390	US 30 Lincoln Hwy	Wolfs Crossing Rd	KE	Permanent Signals		T-1A	T-1	1800
TS	557	IL 134 Long Lake	Wilson Rd	LA	Permanent Signals		T-1A	T-1	1801
TS	558	US 12 IL 59	Hartigan Rd Home Depot Ent	LA	Permanent Signals		T-1A	T-1	1802
TS	559	US 12 IL 59	IL 134 Big Hollow Rd	LA	Permanent Signals		T-1A	T-1	1803
TS	717	IL 59 Grand Ave	Monaville Rd	LA	Permanent Signals		T-1A	T-1	1804
TS	925	IL 176 Rockland Rd	I 94 Tollway W Ramps	LA	Permanent Signals		T-1A	T-1	1805
TS	930	IL 176 Rockland Rd	I 94 Tollway E Ramps	LA	Permanent Signals		T-1A	T-1	1806
TS	936	IL 137 Buckley Rd	I 94 Tollway E Ramps	LA	Permanent Signals		T-1A	T-1	1807
TS	940	US 12 Rand Rd	IL 22 Main St	LA	Permanent Signals		T-1A	T-1	1808
TS	941	IL 22 Main St	Village Square Ent	LA	Permanent Signals		T-1A	T-1	1809
TS	950	US 12 Rand Rd	Old Rand Rd N Jct	LA	Permanent Signals		T-1A	T-1	1810
TS	955	US 12 Rand Rd	Quentin Rd	LA	Permanent Signals		T-1A	T-1	1811
TS	960	US 12 Rand Rd	W Lake Shore Knollwood	LA	Permanent Signals		T-1A	T-1	1812
TS	965	US 12 Rand Rd	Long Grove Rd	LA	Permanent Signals		T-1A	T-1	1813
TS	966	IL 53 Hicks Rd	Long Grove Rd	LA	Permanent Signals		T-1A	T-1	1814
TS	967	US 12 Rand Rd	Old Rand Rd S Jct	LA	Permanent Signals		T-1A	T-1	1815
TS	969	US 12 Rand Rd	Deer Park	LA	Permanent Signals		T-1A	T-1	1816
TS	975	US 12 Rand Rd	Cuba Rd	LA	Permanent Signals		T-1A	T-1	1817
TS	2367	IL 43	Oakmont Ave	LA	Permanent Signals		T-1A	T-1	1818

		Waukegan Rd							
TS	4685	US 14 NW Hwy	Berry Rd	LA	Permanent Signals		T-1A	T-1	1819
TS	4690	US 14 NW Hwy	Western Chicago Aerial Industries Ent	LA	Permanent Signals		T-1A	T-1	1820
TS	4700	US 14 NW Hwy	Hart Rd	LA	Permanent Signals		T-1A	T-1	1821
TS	4705	IL 83 Main Antioch	Lake St	LA	Permanent Signals		T-1A	T-1	1822
TS	4710	IL 83 Main Antioch	North Ave	LA	Permanent Signals		T-1A	T-1	1823
TS	4712	IL 83 Main Antioch	Orchard St	LA	Permanent Signals		T-1A	T-1	1824
TS	6510	US 12 IL 59	IL 120 Belvidere Rd	LA	Permanent Signals		T-1A	T-1	1825
TS	6511	US 12 IL 59	Old Belvidere Rd	LA	Permanent Signals		T-1A	T-1	1826
TS	6515	US 12 IL 59 E Ramps	IL 176 Liberty St	LA	Permanent Signals		T-1A	T-1	1827
TS	6516	US 12 IL 59 W Ramps	IL 176 Liberty St	LA	Permanent Signals		T-1A	T-1	1828
TS	6517	IL 176 Liberty St	Waconda Crossing SC Ent	LA	Permanent Signals		T-1A	T-1	1829
TS	6520	US 12 IL 59	Bonner Rd	LA	Permanent Signals		T-1A	T-1	1830
TS	6525	US 14 NW Hwy	IL 59 Hough Rd	LA	Permanent Signals		T-1A	T-1	1831
TS	6530	US 14 NW Hwy	Kelsey Rd	LA	Permanent Signals		T-1A	T-1	1832
TS	6531	IL 22 Lake Zurich Highwood Rd	Kelsey Rd	LA	Permanent Signals		T-1A	T-1	1833
TS	6532	US 14	Pepper Rd	LA	Permanent Signals		T-1A	T-1	1834
TS	6543	IL 22 Half Day Rd	US 41 Skokie Hwy NB Exit Ramp	LA	Permanent Signals		T-1A	T-1	1835

TS	6550	US 41 Skokie Hwy	IL 132 Grand Ave	LA	Permanent Signals		T-1A	T-1	1836
TS	6551	IL 132 Grand Ave	First St	LA	Permanent Signals		T-1A	T-1	1837
TS	6555	US 41 Skokie Hwy	IL 137 Buckley Rd	LA	Permanent Signals		T-1A	T-1	1838
TS	6565	US 41 Skokie Hwy	Dr. Martin Luther King Dr 22nd St	LA	Permanent Signals		T-1A	T-1	1839
TS	6570	US 41 Skokie Hwy	Delaney Rd	LA	Permanent Signals		T-1A	T-1	1840
TS	6575	US 41 Skokie Hwy	Old Elm Rd	LA	Permanent Signals		T-1A	T-1	1841
TS	6585	US 41 Skokie Hwy	Westleigh Rd	LA	Permanent Signals		T-1A	T-1	1842
TS	6590	US 41 Skokie Hwy	West Park Ave	LA	Permanent Signals		T-1A	T-1	1843
TS	6594	US 45 IL 21 Milwaukee	Olde Half Day Rd	LA	Permanent Signals		T-1A	T-1	1844
TS	6595	US 45 IL 21 Milwaukee Ave	US 45 Olde Half Day Rd	LA	Permanent Signals		T-1A	T-1	1845
TS	6598	US 45	Port Clinton	LA	Permanent Signals		T-1A	T-1	1846
TS	6600	US 45 IL 21 Milwaukee Ave	IL 22	LA	Permanent Signals		T-1A	T-1	1847
TS	6605	US 45	IL 60 Town Line Rd	LA	Permanent Signals		T-1A	T-1	1848
TS	6610	US 45	IL 83 Mundelein Rd	LA	Permanent Signals		T-1A	T-1	1849
TS	6615	US 45	IL 132 Grand Ave	LA	Permanent Signals		T-1A	T-1	1850
TS	6617	US 45	Sand Lake Rd	LA	Permanent Signals		T-1A	T-1	1851
TS	6618	US 45	Dada Dr Grant Ave	LA	Permanent Signals		T-1A	T-1	1852
TS	6620	US 45	IL 173	LA	Permanent Signals		T-1A	T-1	1853

TS	6625	US 45 Lake St	IL 176 Park Ave Maple Ave	LA	Permanent Signals		T-1A	T-1	1854
TS	6630	US 45 IL 21 Milwaukee Ave	Aptakisic Rd	LA	Permanent Signals		T-1A	T-1	1855
TS	6635	US 45	Brae Loch Rd	LA	Permanent Signals		T-1A	T-1	1856
TS	6640	US 45	Butterfield Rd	LA	Permanent Signals		T-1A	T-1	1857
TS	6641	US 45	Oakwood Rd	LA	Permanent Signals		T-1A	T-1	1858
TS	6645	US 45	Center St Deerpath Rd	LA	Permanent Signals		T-1A	T-1	1859
TS	6650	US 45 IL 21 Milwaukee Ave	Deerfield Rd	LA	Permanent Signals		T-1A	T-1	1860
TS	6655	US 45	Deerpath Dr	LA	Permanent Signals		T-1A	T-1	1861
TS	6657	US 45	Commuter Lot Ranney Ave	LA	Permanent Signals		T-1A	T-1	1862
TS	6658	US 45	Buffalo Grove Rd Fairway Dr	LA	Permanent Signals		T-1A	T-1	1863
TS	6660	US 45 IL 21 Milwaukee Ave	Inverrary Ln	LA	Permanent Signals		T-1A	T-1	1864
TS	6665	US 45 IL 21 Milwaukee Ave	Knightsbridge Parkway Jamestown Ln	LA	Permanent Signals		T-1A	T-1	1865
TS	6675	US 45	Peterson	LA	Permanent Signals		T-1A	T-1	1866
TS	6680	US 45 IL 21 Milwaukee Ave	Busch Parkway	LA	Permanent Signals		T-1A	T-1	1867
TS	6685	US 45	Washington St	LA	Permanent Signals		T-1A	T-1	1868
TS	6695	US 45 IL 21 Milwaukee Ave	Marriott Ln	LA	Permanent Signals		T-1A	T-1	1869
TS	6698	US 45 IL 21 Milwaukee Ave	Audubon Way	LA	Permanent Signals		T-1A	T-1	1870
TS	6700	IL 21 Milwaukee Ave	IL 60 Town Line Rd	LA	Permanent Signals		T-1A	T-1	1871

TS	6705	IL 21 Milwaukee Ave	IL 132 Grand Ave	LA	Permanent Signals		T-1A	T-1	1872
TS	6715	IL 21 Milwaukee Ave	IL 176 Park Ave	LA	Permanent Signals		T-1A	T-1	1873
TS	6718	IL 21 Milwaukee Ave	Hollister Dr N Junction	LA	Permanent Signals		T-1A	T-1	1874
TS	6720	IL 21 Milwaukee Ave	Hawthorn Center Dr Ent # 6	LA	Permanent Signals		T-1A	T-1	1875
TS	6725	IL 21 Milwaukee Ave	Hawthorn Center Dr Ent # 7	LA	Permanent Signals		T-1A	T-1	1876
TS	6730	IL 21 Milwaukee Ave	Washington	LA	Permanent Signals		T-1A	T-1	1877
TS	6732	IL 21 Milwaukee Ave	Six Flags Riverside Dr	LA	Permanent Signals		T-1A	T-1	1878
TS	6740	IL 22 Lake Zurich Highwood Rd	IL 59 Hough Rd Lake Shore Blvd	LA	Permanent Signals		T-1A	T-1	1879
TS	6745	IL 22 Half Day Rd	IL 83 Mundelein Rd	LA	Permanent Signals		T-1A	T-1	1880
TS	6750	IL 22 Main St	Church St Midlothian Rd	LA	Permanent Signals		T-1A	T-1	1881
TS	6751	IL 22 Main St	Buesching Rd	LA	Permanent Signals		T-1A	T-1	1882
TS	6753	Midothian Rd	Oakwood Rd Lakewood Ln	LA	Permanent Signals		T-1A	T-1	1883
TS	6755	Main St Lake Zurich	Old Rand Rd	LA	Permanent Signals		T-1A	T-1	1884
TS	6757	IL 22 Half Day Rd	Old Rand Rd	LA	Permanent Signals		T-1A	T-1	1885
TS	6758	IL 22 Half Day Rd	East Main Lake Zurich	LA	Permanent Signals		T-1A	T-1	1886
TS	6759	IL 22 Half Day Rd	West Main Lake Zurich	LA	Permanent Signals		T-1A	T-1	1887
TS	6760	IL 22 Half Day	Olde Half Day Rd	LA	Permanent Signals		T-1A	T-1	1888

		Rd							
TS	6765	IL 22 Half Day Rd	Quentin Rd	LA	Permanent Signals		T-1A	T-1	1889
TS	6767	IL 22 Half Day Rd	Kemper Insurance Ent	LA	Permanent Signals		T-1A	T-1	1890
TS	6770	IL 22 Half Day Rd	Riverwoods Rd	LA	Permanent Signals		T-1A	T-1	1891
TS	6775	IL 22 Half Day Rd	Ela Rd	LA	Permanent Signals		T-1A	T-1	1892
TS	6780	IL 22 Half Day Rd	Barclay	LA	Permanent Signals		T-1A	T-1	1893
TS	6785	IL 22 Half Day Rd	Old Mill Grove Rd Oakwood Rd	LA	Permanent Signals		T-1A	T-1	1894
TS	6795	IL 43 Waukegan Rd	IL 60 Town Line Rd	LA	Permanent Signals		T-1A	T-1	1895
TS	6800	IL 137 Buckley	IL 43 Waukegan Rd	LA	Permanent Signals		T-1A	T-1	1896
TS	6805	IL 43 Waukegan Rd	IL 176 Park Ave	LA	Permanent Signals		T-1A	T-1	1897
TS	6806	IL 43 Waukegan Rd	Westmoreland Rd Middle Fork Dr	LA	Permanent Signals		T-1A	T-1	1898
TS	6810	IL 43 Waukegan Rd	Dr. Martin Luther King Dr 22nd St	LA	Permanent Signals		T-1A	T-1	1899
TS	6815	IL 43 Waukegan Rd	Abbott Labs Gate # 1	LA	Permanent Signals		T-1A	T-1	1900
TS	6820	IL 43 Waukegan Rd	Abbott Labs Gate # 2	LA	Permanent Signals		T-1A	T-1	1901
TS	6830	IL 43 Waukegan Rd	Foster Ave	LA	Permanent Signals		T-1A	T-1	1902
TS	6835	IL 83 Mundelein Rd	IL 53 Breese Rd	LA	Permanent Signals		T-1A	T-1	1903
TS	6837	IL 83	Robert Parker	LA	Permanent Signals		T-1A	T-1	1904

		Mundelein Rd	Coffin Rd						
TS	6838	IL 53	Menards Ent	LA	Permanent Signals		T-1A	T-1	1905
TS	6839	IL 53 Breese Rd	Old McHenry Rd	LA	Permanent Signals		T-1A	T-1	1906
TS	6840	IL 59	IL 132 Grand Ave	LA	Permanent Signals		T-1A	T-1	1907
TS	6845	IL 59	IL 173	LA	Permanent Signals		T-1A	T-1	1908
TS	6847	IL 173	Walmart	LA	Permanent Signals		T-1A	T-1	1909
TS	6850	IL 59 Grand Ave	Grand Ave Washington Ave	LA	Permanent Signals		T-1A	T-1	1910
TS	6855	IL 59	Grass Lake Rd	LA	Permanent Signals		T-1A	T-1	1911
TS	6857	IL 59	Beach Grove Rd	LA	Permanent Signals		T-1A	T-1	1912
TS	6860	IL 59 Lake Shore Blvd	Miller Rd	LA	Permanent Signals		T-1A	T-1	1913
TS	6865	IL 60 Town Line Rd	Butterfield Rd	LA	Permanent Signals		T-1A	T-1	1914
TS	6870	IL 60 Town Line Rd	Deerpath Dr	LA	Permanent Signals		T-1A	T-1	1915
TS	6875	IL 60 Town Line Rd	Lakeview Parkway	LA	Permanent Signals		T-1A	T-1	1916
TS	6880	IL 60 Town Line Rd	Hawthorn Center Dr # 3	LA	Permanent Signals		T-1A	T-1	1917
TS	6885	IL 60 Town Line Rd	Hawthorn Center Dr # 4	LA	Permanent Signals		T-1A	T-1	1918
TS	6890	IL 60 Town Line Rd	Hawthorn Center Dr # 5	LA	Permanent Signals		T-1A	T-1	1919
TS	6895	IL 60 Town Line Rd	St Marys Rd	LA	Permanent Signals		T-1A	T-1	1920
TS	6900	IL 60 Town Line Rd	Aspen Dr	LA	Permanent Signals		T-1A	T-1	1921
TS	6905	IL 60 Town Line Rd	Oak Creek Plaza Ent	LA	Permanent Signals		T-1A	T-1	1922

TS	6908	IL 60	Cedar Lake Rd Bacon Rd	LA	Permanent Signals		T-1A	T-1	1923
TS	6909	IL 60	Peterson Rd	LA	Permanent Signals		T-1A	T-1	1924
TS	6910	IL 60 IL 83	Schank Ave	LA	Permanent Signals		T-1A	T-1	1925
TS	6911	IL 60 IL 83	Connector Rd Target Ent	LA	Permanent Signals		T-1A	T-1	1926
TS	6912	IL 60	Fairfield Rd	LA	Permanent Signals		T-1A	T-1	1927
TS	6915	IL 60 IL 83	IL 176 Ivanhoe Rd	LA	Permanent Signals		T-1A	T-1	1928
TS	6917	IL 176 Ivanhoe Rd	Hawley Rd W Junction	LA	Permanent Signals		T-1A	T-1	1929
TS	6920	IL 60 IL 83	Diamond Lake Rd	LA	Permanent Signals		T-1A	T-1	1930
TS	6930	IL 60 IL 83	Hawley Rd	LA	Permanent Signals		T-1A	T-1	1931
TS	6935	IL 60 IL 83	Willow Springs Rd	LA	Permanent Signals		T-1A	T-1	1932
TS	6940	IL 83 Ivanhoe Rd	IL 120 Belvidere Rd	LA	Permanent Signals		T-1A	T-1	1933
TS	6945	IL 83	IL 132 Grand Ave	LA	Permanent Signals		T-1A	T-1	1934
TS	6948	IL 83 Milwaukee Ave	Monaville Rd	LA	Permanent Signals		T-1A	T-1	1935
TS	6949	IL 83	Engle Dr Walmart Ent	LA	Permanent Signals		T-1A	T-1	1936
TS	6950	IL 83	IL 173	LA	Permanent Signals		T-1A	T-1	1937
TS	6955	IL 83	Aptakisic Rd	LA	Permanent Signals		T-1A	T-1	1938
TS	6957	IL 83	Hilltop Rd	LA	Permanent Signals		T-1A	T-1	1939
TS	6960	IL 83 Mundelein Rd	Arlington Heights Rd	LA	Permanent Signals		T-1A	T-1	1940
TS	6965	IL 83 Mundelein Rd	Deerfield Parkway	LA	Permanent Signals		T-1A	T-1	1941
TS	6970	IL 83	Grass Lake	LA	Permanent Signals		T-1A	T-1	1942

TS	6975	IL 83	Buffalo Grove Rd	LA	Permanent Signals		T-1A	T-1	1943
TS	6982	IL 83 Ivanhoe Rd	Peterson Rd	LA	Permanent Signals		T-1A	T-1	1944
TS	6985	IL 83 Mundelein Rd	Buffalo Grove SC Ent Highpoint	LA	Permanent Signals		T-1A	T-1	1945
TS	6990	IL 83	Gilmer Rd Oakwood Rd	LA	Permanent Signals		T-1A	T-1	1946
TS	6992	IL 83	Westmoreland Dr	LA	Permanent Signals		T-1A	T-1	1947
TS	6995	IL 120 Belvidere Rd	IL 134 Main St	LA	Permanent Signals		T-1A	T-1	1948
TS	7000	IL 120 Belvidere Rd	Hainsville Rd	LA	Permanent Signals		T-1A	T-1	1949
TS	7005	IL 120 Belvidere Rd	Knight Ave	LA	Permanent Signals		T-1A	T-1	1950
TS	7010	IL 120 Belvidere Rd	Oplaine Rd	LA	Permanent Signals		T-1A	T-1	1951
TS	7015	IL 137 Buckley Rd	IL 131 Green Bay Rd	LA	Permanent Signals		T-1A	T-1	1952
TS	7018	IL 131 Green Bay Rd	CAvin Rd	LA	Permanent Signals		T-1A	T-1	1953
TS	7030	IL 131 Green Bay Rd	Wadsworth Rd	LA	Permanent Signals		T-1A	T-1	1954
TS	7035	IL 131 Green Bay Rd	Washington St	LA	Permanent Signals		T-1A	T-1	1955
TS	7040	IL 131 Green Bay Rd	Yorkhouse Rd	LA	Permanent Signals		T-1A	T-1	1956
TS	7045	IL 131 Green Bay Rd	10th St	LA	Permanent Signals		T-1A	T-1	1957
TS	7048	IL 173 Rosecrans Rd	Hunt Club Rd	LA	Permanent Signals		T-1A	T-1	1958
TS	7055	IL 132 Grand Ave	Great America Ent Lawson Blvd	LA	Permanent Signals		T-1A	T-1	1959

TS	7060	IL 132 Grand Ave	Hunt Club Rd	LA	Permanent Signals		T-1A	T-1	1960
TS	7062	IL 132 Grand Ave	Brookside Dr	LA	Permanent Signals		T-1A	T-1	1961
TS	7065	IL 132 Grand Ave	Oplaine Rd	LA	Permanent Signals		T-1A	T-1	1962
TS	7070	IL 132 Grand Ave	Sand Lake Rd	LA	Permanent Signals		T-1A	T-1	1963
TS	7075	IL 132 Grand Ave	Granada Blvd Lindenhurst Dr	LA	Permanent Signals		T-1A	T-1	1964
TS	7080	IL 132 Grand Ave	Deep Lake Rd	LA	Permanent Signals		T-1A	T-1	1965
TS	7081	IL 132 Grand Ave	Munn Rd	LA	Permanent Signals		T-1A	T-1	1966
TS	7085	IL 132 Grand Ave	Dilleys Rd	LA	Permanent Signals		T-1A	T-1	1967
TS	7090	IL 134 Long Lake Rd	Fairfield Rd	LA	Permanent Signals		T-1A	T-1	1968
TS	7094	IL 137 Buckley Rd	Butterfield Square	LA	Permanent Signals		T-1A	T-1	1969
TS	7095	IL 137 Buckley Rd	Butterfield Rd	LA	Permanent Signals		T-1A	T-1	1970
TS	7100	IL 137 Buckley Rd	Meridian Dr	LA	Permanent Signals		T-1A	T-1	1971
TS	7115	IL 137 Buckley Rd	Great Lakes Dr	LA	Permanent Signals		T-1A	T-1	1972
TS	7120	IL 137 Buckley Rd	Mississippi St	LA	Permanent Signals		T-1A	T-1	1973
TS	7125	IL 137 Buckley Rd	Abbott Labs Gate # 3	LA	Permanent Signals		T-1A	T-1	1974
TS	7129	IL 173	Savage Deercrest	LA	Permanent Signals		T-1A	T-1	1975
TS	7130	IL 173	Deep Lake Rd	LA	Permanent Signals		T-1A	T-1	1976

TS	7137	IL 176 Slocum Lake Rd	Westridge Dr	LA	Permanent Signals		T-1A	T-1	1977
TS	7139	IL 176 Slocum Lake Rd	Beech St Eastway Dr	LA	Permanent Signals		T-1A	T-1	1978
TS	7140	IL 176 Wauconda Rd	Fairfield Rd	LA	Permanent Signals		T-1A	T-1	1979
TS	7142	IL 176 Ivanhoe Rd	Gilmer Rd	LA	Permanent Signals		T-1A	T-1	1980
TS	7145	IL 176 Park Ave	Midlothian Rd	LA	Permanent Signals		T-1A	T-1	1981
TS	7150	IL 176 Wauconda Rd	Old Rand Rd Main St	LA	Permanent Signals		T-1A	T-1	1982
TS	7152	IL 176 Liberty St	Lakrdale Row	LA	Permanent Signals		T-1A	T-1	1983
TS	7160	IL 137 Buckley Rd	Lewis Ave	LA	Permanent Signals		T-1A	T-1	1984
TS	7170	IL 137 Buckley Rd	Illinois St	LA	Permanent Signals		T-1A	T-1	1985
TS	7175	IL 137 Buckley Rd	Ray St	LA	Permanent Signals		T-1A	T-1	1986
TS	7190	IL 137 Sheridan Rd	Beach Rd	LA	Permanent Signals		T-1A	T-1	1987
TS	7200	IL 137 Sheridan Rd	Yorkhouse Rd	LA	Permanent Signals		T-1A	T-1	1988
TS	7820	IL 131 Green Bay Rd	IL 120 Belvidere Rd	LA	Permanent Signals		T-1A	T-1	1989
TS	9375	IL 131 Green Bay Rd	14th St Pulaski	LA	Permanent Signals		T-1A	T-1	1990
TS	9380	IL 131 Green Bay Rd	22nd St MLK	LA	Permanent Signals		T-1A	T-1	1991
TS	9390	IL 131 Green Bay Rd	Saratoga	LA	Permanent Signals		T-1A	T-1	1992
TS	9885	IL 83 Old McHenry Rd	Pauline Ave Town Place	LA	Permanent Signals		T-1A	T-1	1993

			Parkway						
TS	10661	Sheridan Rd	Old Elm Rd	LA	Permanent Signals		T-1A	T-1	1994
TS	10665	IL 43 Waukegan Rd	Deerpath Rd	LA	Permanent Signals		T-1A	T-1	1995
TS	10670	IL 43 Waukegan Rd	Everett Rd Old Elm Rd	LA	Permanent Signals		T-1A	T-1	1996
TS	10675	IL 43 Waukegan Rd	Westleigh Rd	LA	Permanent Signals		T-1A	T-1	1997
TS	10676	IL 43 Waukegan Rd	Gloucester Crossing	LA	Permanent Signals		T-1A	T-1	1998
TS	10822	Lake Cook Rd	Green Bay Rd	LA	Permanent Signals		T-1A	T-1	1999
TS	11595	Sheridan Rd	IL 137 Buckley Rd	LA	Permanent Signals		T-1A	T-1	2000
TS	11596	Sheridan Rd	24th St	LA	Permanent Signals		T-1A	T-1	2001
TS	11597	Sheridan Rd	Farragut Ave	LA	Permanent Signals		T-1A	T-1	2002
TS	11598	Sheridan Rd	D St	LA	Permanent Signals		T-1A	T-1	2003
TS	11605	IL 22 Half Day Rd	Elm Rd Oxford Dr	LA	Permanent Signals		T-1A	T-1	2004
TS	11615	IL 21 Milwaukee Ave	Hawthorn Center Dr	LA	Permanent Signals		T-1A	T-1	2005
TS	11700	IL 60 Town Line Rd	Bradley Rd Riverwoods Rd	LA	Permanent Signals		T-1A	T-1	2006
TS	11701	IL 60 Town Line Rd	Grainger Woods W Ent	LA	Permanent Signals		T-1A	T-1	2007
TS	11705	IL 60 Town Line Rd	I 94 Tollway E Ramps	LA	Permanent Signals		T-1A	T-1	2008
TS	11706	IL 60 Town Line Rd	I 94 Tollway W Ramps	LA	Permanent Signals		T-1A	T-1	2009
TS	11707	IL 60 Town Line Rd	Conway Farms	LA	Permanent Signals		T-1A	T-1	2010
TS	11708	IL 60 Town Line Rd	Lake Forest Academy	LA	Permanent Signals		T-1A	T-1	2011

TS	11875	US 41 Skokie Hwy	Clavey Rd Old Skokie Rd	LA	Permanent Signals		T-1A	T-1	2012
TS	11876	Skokie Valley Rd	Clavey Rd	LA	Permanent Signals		T-1A	T-1	2013
TS	11877	US 41 Skokie Hwy	Skokie Valley Rd	LA	Permanent Signals		T-1A	T-1	2014
TS	11930	IL 120 Belvidere Rd	Hunt Club Rd	LA	Permanent Signals		T-1A	T-1	2015
TS	11940	IL 59 Grand Ave	Wilson Rd Ridge Ave	LA	Permanent Signals		T-1A	T-1	2016
TS	11945	US 12	State Park Rd East St	LA	Permanent Signals		T-1A	T-1	2017
TS	12120	IL 21 Milwaukee Ave	Rockland Rd	LA	Permanent Signals		T-1A	T-1	2018
TS	12280	US 41 Skokie Hwy	IL 176 Rockland Rd W Ramp Shagbark	LA	Permanent Signals		T-1A	T-1	2019
TS	12285	US 12 Rand Rd	Whitney Rd Northlake Commons Ent	LA	Permanent Signals		T-1A	T-1	2020
TS	12297	US 12 Rand Rd	June Terrace	LA	Permanent Signals		T-1A	T-1	2021
TS	12305	US 45	IL 120 Belvidere Rd	LA	Permanent Signals		T-1A	T-1	2022
TS	12315	IL 83 Baron Blvd	Washington St	LA	Permanent Signals		T-1A	T-1	2023
TS	12317	IL 83 Baron Blvd	Brighton Ln	LA	Permanent Signals		T-1A	T-1	2024
TS	12330	US 45	Winchester Rd	LA	Permanent Signals		T-1A	T-1	2025
TS	12380	IL 22 Half Day Rd	I 94 Tollway E Ramps	LA	Permanent Signals		T-1A	T-1	2026
TS	12385	IL 22 Half Day Rd	I 94 Tollway W Ramps	LA	Permanent Signals		T-1A	T-1	2027
TS	12915	IL 43	McDonalds Ent	LA	Permanent Signals		T-1A	T-1	2028

		Waukegan Rd	Cadwells Cr						
TS	12920	IL 43 Waukegan Rd	Kates Rd	LA	Permanent Signals		T-1A	T-1	2029
TS	12925	IL 43 Waukegan Rd	Longfellow Ave Osterman Ave	LA	Permanent Signals		T-1A	T-1	2030
TS	12930	IL 43 Waukegan Rd	Deerfield Commons Ent	LA	Permanent Signals		T-1A	T-1	2031
TS	12935	IL 43 Waukegan Rd	Deerfield Rd	LA	Permanent Signals		T-1A	T-1	2032
TS	12937	IL 43 Waukegan Rd	Deerfield Fire Station	LA	Permanent Signals		T-1A	T-1	2033
TS	12940	IL 43 Waukegan Rd	Hazel Ave Elder Ln	LA	Permanent Signals		T-1A	T-1	2034
TS	12945	IL 43 Waukegan Rd	Greenwood Ave	LA	Permanent Signals		T-1A	T-1	2035
TS	12950	IL 43 Waukegan Rd	Deerfield High School Ent	LA	Permanent Signals		T-1A	T-1	2036
TS	12952	IL 43 Waukegan Rd	North Ave	LA	Permanent Signals		T-1A	T-1	2037
TS	13739	IL 83 Baron Blvd	Library Ln	LA	Permanent Signals		T-1A	T-1	2038
TS	13740	IL 83 Baron Blvd	Center St	LA	Permanent Signals		T-1A	T-1	2039
TS	13741	IL 83 Baron Blvd	Frederick Rd	LA	Permanent Signals		T-1A	T-1	2040
TS	13742	IL 120 Belvidere Rd	Lake St Lake Ave	LA	Permanent Signals		T-1A	T-1	2041
TS	13746	IL 120 Belvidere Rd	Alleghent Rd	LA	Permanent Signals		T-1A	T-1	2042
TS	13985	IL 21 Milwaukee Ave	Winchester Rd	LA	Permanent Signals		T-1A	T-1	2043
TS	13990	IL 21 Milwaukee Ave	Cook Ave	LA	Permanent Signals		T-1A	T-1	2044

TS	13995	IL 21 Milwaukee Ave	Church St	LA	Permanent Signals		T-1A	T-1	2045
TS	14005	IL 21 Milwaukee Ave	Valley Park Dr	LA	Permanent Signals		T-1A	T-1	2046
TS	14007	IL 21 Milwaukee Ave	Condell Dr	LA	Permanent Signals		T-1A	T-1	2047
TS	14013	IL 21 Milwaukee Ave	Artaius Parkway S Junction	LA	Permanent Signals		T-1A	T-1	2048
TS	14015	IL 21 Milwaukee Ave	Red Top Greentree Pkwy	LA	Permanent Signals		T-1A	T-1	2049
TS	14017	IL 21 Milwaukee Ave	Golf Rd	LA	Permanent Signals		T-1A	T-1	2050
TS	14018	IL 21 Milwaukee Ave	Greggs Pkwy North Artaius	LA	Permanent Signals		T-1A	T-1	2051
TS	14020	IL 176 Park Ave	Butterfield Rd	LA	Permanent Signals		T-1A	T-1	2052
TS	14025	IL 176 Park Ave	Garfield Ave	LA	Permanent Signals		T-1A	T-1	2053
TS	14030	IL 176 Park Ave	Dawes St	LA	Permanent Signals		T-1A	T-1	2054
TS	14035	IL 176 Park Ave	4th Ave Wedgemere Ave	LA	Permanent Signals		T-1A	T-1	2055
TS	14340	US 45 Lake St	Diamond Lake Rd Forest Dr	LA	Permanent Signals		T-1A	T-1	2056
TS	14345	US 45 Lake St	Division St	LA	Permanent Signals		T-1A	T-1	2057
TS	14350	US 45 Lake St	Hawley St	LA	Permanent Signals		T-1A	T-1	2058
TS	14370	US 45 Lake St	Allanson Rd	LA	Permanent Signals		T-1A	T-1	2059
TS	14372	US 45 Lake St	Courtland St	LA	Permanent Signals		T-1A	T-1	2060
TS	14904	IL 43 Waukegan Rd	Casimer Pulaski Dr McGraw Rd	LA	Permanent Signals		T-1A	T-1	2061
TS	14905	IL 43 Waukegan Rd	Lakehurst Rd	LA	Permanent Signals		T-1A	T-1	2062
TS	14910	IL 43 Waukegan Rd	Greenleaf St Fountain Square	LA	Permanent Signals		T-1A	T-1	2063

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TS	14915	IL 43 Waukegan Rd	North Point Blvd	LA	Permanent Signals		T-1A	T-1	2064
TS	14917	IL 43 Waukegan Rd	Lakeside Dr Baxter Ent	LA	Permanent Signals		T-1A	T-1	2065
TS	14925	Greenleaf St	IL 120 Belvidere Rd N Ramps	LA	Permanent Signals		T-1A	T-1	2066
TS	14930	Greenleaf St	IL 120 Belvidere Rd S Ramps	LA	Permanent Signals		T-1A	T-1	2067
TS	14940	IL 120 Belvidere Rd	Lewis Ave	LA	Permanent Signals		T-1A	T-1	2068
TS	14945	IL 120 Belvidere Rd	Glen Rock	LA	Permanent Signals		T-1A	T-1	2069
TS	14950	IL 120 Belvidere Rd	Jackson	LA	Permanent Signals		T-1A	T-1	2070
TS	14955	IL 120 Belvidere Rd	McCalister	LA	Permanent Signals		T-1A	T-1	2071
TS	14960	IL 120 Belvidere Rd	County St	LA	Permanent Signals		T-1A	T-1	2072
TS	14970	IL 120 Belvidere Rd	Keller	LA	Permanent Signals		T-1A	T-1	2073
TS	14972	IL 120 Belvidere Rd	Pioneer Ct Lake Plaza	LA	Permanent Signals		T-1A	T-1	2074
TS	14974	IL 120 Belvidere Rd	Belvidere Mall East Ent	LA	Permanent Signals		T-1A	T-1	2075
TS	15020	IL 131 Green Bay Rd	IL 132 Grand Ave	LA	Permanent Signals		T-1A	T-1	2076
TS	15022	IL 131 Green Bay Rd	Brookside Ave	LA	Permanent Signals		T-1A	T-1	2077
TS	15025	IL 131 Green Bay Rd	Sunset Ave Bonnie Brook Rd	LA	Permanent Signals		T-1A	T-1	2078
TS	20350	IL 22 Half Day Rd	Lakeside Dr	LA	Permanent Signals		T-1A	T-1	2079

TS	20375	IL 176 Rockland Rd	Bradley Rd	LA	Permanent Signals		T-1A	T-1	2080
TS	20425	IL 22 Half Day Rd	Buffalo Grove Rd	LA	Permanent Signals		T-1A	T-1	2081
TS	20426	IL 22 Half Day Rd	Buffalo Grove Fire Station Ent	LA	Permanent Signals		T-1A	T-1	2082
TS	20485	IL 131 Green Bay Rd	Crescent Ave	LA	Permanent Signals		T-1A	T-1	2083
TS	20530	IL 60 Town Line Rd	Saunders Rd Field Dr	LA	Permanent Signals		T-1A	T-1	2084
TS	20535	US 12 Rand Rd	Pheasant Ridge Rd	LA	Permanent Signals		T-1A	T-1	2085
TS	20595	US 12 Rand Rd	Old McHenry Rd	LA	Permanent Signals		T-1A	T-1	2086
TS	20995	US 45 IL 21 Milwaukee Ave	Riverwalk Dr Columbus Parkway	LA	Permanent Signals		T-1A	T-1	2087
TS	21000	IL 132 Grand Ave	Gurnee Mills SW Access	LA	Permanent Signals		T-1A	T-1	2088
TS	21010	IL 137 Amstutz Expy	IL 137 Buckley Rd	LA	Permanent Signals		T-1A	T-1	2089
TS	21070	US 45	Evergreen Dr	LA	Permanent Signals		T-1A	T-1	2090
TS	21110	IL 132 Grand Ave	Gurnee Mills SE Acess	LA	Permanent Signals		T-1A	T-1	2091
TS	21115	IL 132 Grand Ave	Gurnee Mills West Ent Sams Club Ent	LA	Permanent Signals		T-1A	T-1	2092
TS	21117	IL 132 Grand Ave	Almond Rd Hutchins Rd	LA	Permanent Signals		T-1A	T-1	2093
TS	21118	IL 132 Grand Ave	Rollings Rd Oakwood Dr	LA	Permanent Signals		T-1A	T-1	2094
TS	21119	IL 132 Grand Ave	Stonebrook Dr	LA	Permanent Signals		T-1A	T-1	2095
TS	21181	IL 22 Half Day	Main St Prairie	LA	Permanent Signals		T-1A	T-1	2096

		Rd	Rd W Junction						
TS	21190	IL 59 Barrington Rd Lake Shore	Kelsey Rd	LA	Permanent Signals		T-1A	T-1	2097
TS	21195	IL 132 Grand Ave	Belle Plaine Ave	LA	Permanent Signals		T-1A	T-1	2098
TS	21215	IL 22 Half Day Rd	Arboretum Way	LA	Permanent Signals		T-1A	T-1	2099
TS	21260	US 45 Lake St	Motorola Parkway	LA	Permanent Signals		T-1A	T-1	2100
TS	21295	US 12 Rand Rd	Miller Rd	LA	Permanent Signals		T-1A	T-1	2101
TS	21350	IL 59 Hough Rd	Cuba Rd	LA	Permanent Signals		T-1A	T-1	2102
TS	21405	US 45 IL 21 Milwaukee Ave	Tower Parkway	LA	Permanent Signals		T-1A	T-1	2103
TS	21409	IL 21 Milwaukee Ave	American Hotel Dr	LA	Permanent Signals		T-1A	T-1	2104
TS	21410	IL 21 Milwaukee Ave	Corporate Woods Parkway	LA	Permanent Signals		T-1A	T-1	2105
TS	21411	IL 21 Milwaukee Ave	Woodlands Parkway	LA	Permanent Signals		T-1A	T-1	2106
TS	21412	IL 21 Milwaukee Ave	Jamestown Rd Port Clinton	LA	Permanent Signals		T-1A	T-1	2107
TS	21420	US 45 Lake St	Dunbar Rd	LA	Permanent Signals		T-1A	T-1	2108
TS	21490	IL 21 Milwaukee Ave	Lake St	LA	Permanent Signals		T-1A	T-1	2109
TS	21525	IL 22 Lake Zurich Rd	Old McHenry Rd	LA	Permanent Signals		T-1A	T-1	2110
TS	21543	IL 21 Milwaukee Ave	IL 120 Belvidere Rd N Ramps	LA	Permanent Signals		T-1A	T-1	2111
TS	21544	IL 21 Milwaukee Ave	IL 120 Belvidere Rd S Ramps	LA	Permanent Signals		T-1A	T-1	2112
TS	21545	IL 21	Gages Lake Rd	LA	Permanent Signals		T-1A	T-1	2113

		Milwaukee Ave							
TS	21547	IL 21 Milwaukee Ave	I 94 Tollway exit ramp	LA	Permanent Signals		T-1A	T-1	2114
TS	21625	IL 134 Main St	Hart Rd	LA	Permanent Signals		T-1A	T-1	2115
TS	21655	US 45	Gages Lake Rd	LA	Permanent Signals		T-1A	T-1	2116
TS	21660	US 45 E Ramp	IL 137 Buckley Rd	LA	Permanent Signals		T-1A	T-1	2117
TS	21662	IL 137 Buckley Rd	Harris Rd Casey Rd	LA	Permanent Signals		T-1A	T-1	2118
TS	21663	US 45	Casey Rd	LA	Permanent Signals		T-1A	T-1	2119
TS	21695	IL 43 Waukegan Rd	Baxter Ent Norman Rd S Junction	LA	Permanent Signals		T-1A	T-1	2120
TS	21715	IL 43 Waukegan Rd	Abbott Labs Gate # 4	LA	Permanent Signals		T-1A	T-1	2121
TS	21717	IL 43 Waukegan Rd	Atkinson Rd	LA	Permanent Signals		T-1A	T-1	2122
TS	21755	US 45	Grass Lake Rd	LA	Permanent Signals		T-1A	T-1	2123
TS	21756	US 45	Millburn Rd	LA	Permanent Signals		T-1A	T-1	2124
TS	21785	US 12 Rand Rd	Plum Grove Rd	LA	Permanent Signals		T-1A	T-1	2125
TS	21885	US 45	Arbor Vista Ln	LN	Permanent Signals		T-1A	T-1	2126
TS	21940	IL 120 Belvidere Rd	Gilmer Rd	LA	Permanent Signals		T-1A	T-1	2127
TS	21965	IL 22 Half Day Rd	Palazzo Dr Stevenson HS Ent	LA	Permanent Signals		T-1A	T-1	2128
TS	21969	IL 120 Belvidere Rd	Mill Rd	LA	Permanent Signals		T-1A	T-1	2129
TS	21975	US 45 Lake St	Townline Square SC Ent Jewel Ent	LA	Permanent Signals		T-1A	T-1	2130
TS	21990	IL 83 Baron Blvd	Lake Ave	LA	Permanent Signals		T-1A	T-1	2131

TS	21991	IL 83 Milwaukee Ave	Home Depot Ent Millstone Circle	LA	Permanent Signals		T-1A	T-1	2132
TS	21992	IL 83 Milwaukee Ave	Hook Dr Old Rollins Rd	LA	Permanent Signals		T-1A	T-1	2133
TS	21993	IL 83 Baron Blvd	Shorewood Rd	LA	Permanent Signals		T-1A	T-1	2134
TS	22010	IL 120 Belvidere Rd	IL 60	LA	Permanent Signals		T-1A	T-1	2135
TS	22015	IL 60	Fish Lake Rd	LA	Permanent Signals		T-1A	T-1	2136
TS	22040	IL 59 Barrinton Rd	Roberts Rd	LA	Permanent Signals		T-1A	T-1	2137
TS	22041	IL 59 Barrinton Rd	Indian Trail Rd Essex Pl	LA	Permanent Signals		T-1A	T-1	2138
TS	22050	IL 21 Milwaukee Ave	Market Place Ent Continental Dr	LA	Permanent Signals		T-1A	T-1	2139
TS	22102	IL 120 Belvedere Rd	Darrell Rd	LA	Permanent Signals		T-1A	T-1	2140
TS	22130	IL 59	Devlin Rd	LA	Permanent Signals		T-1A	T-1	2141
TS	22205	Gilmer Rd	Midlothian Rd	LA	Permanent Signals		T-1A	T-1	2142
TS	22250	IL 120 Belvidere Rd	Fairfield Rd	LA	Permanent Signals		T-1A	T-1	2143
TS	22255	IL 120 Belvidere Rd	Wilson Rd	LA	Permanent Signals		T-1A	T-1	2144
TS	1236	US 14 NW Hwy	Algonquin Rd	MC	Permanent Signals		T-1A	T-1	2145
TS	1237	US 14 NW Hwy	Lincoln Ave	MC	Permanent Signals		T-1A	T-1	2146
TS	1238	US 14 NW Hwy	Foxmoor Rd	MC	Permanent Signals		T-1A	T-1	2147
TS	2996	US 14 NW Hwy	Motorola Ent	MC	Permanent Signals		T-1A	T-1	2148
TS	5812	US 14 NW Hwy	Wal Mart Ent	MC	Permanent Signals		T-1A	T-1	2149
TS	7210	US 12	IL 31 Tyron Grove Rd	MC	Permanent Signals		T-1A	T-1	2150

TS	7215	US 12	IL 173	MC	Permanent Signals		T-1A	T-1	2151
TS	7220	US 12	Fox Lake Rd	MC	Permanent Signals		T-1A	T-1	2152
TS	7223	US 12	Wilmot Rd	MC	Permanent Signals		T-1A	T-1	2153
TS	7225	US 12	Winn Johnsburg Spring	MC	Permanent Signals		T-1A	T-1	2154
TS	7230	US 14 NW Hwy	IL 22	MC	Permanent Signals		T-1A	T-1	2155
TS	7235	US 14 NW Hwy	IL 47 Eastwood Dr	MC	Permanent Signals		T-1A	T-1	2156
TS	7236	US 14 NW Hwy	Lake Ave	MC	Permanent Signals		T-1A	T-1	2157
TS	7237	US 14 NW Hwy	West Lake Shore Dr	MC	Permanent Signals		T-1A	T-1	2158
TS	7238	US 14 NW Hwy	Dean St	MC	Permanent Signals		T-1A	T-1	2159
TS	7240	US 14 Divisin St	IL 173 WB Brink St	MC	Permanent Signals		T-1A	T-1	2160
TS	7245	US 14 NW Hwy	West Main St Cary	MC	Permanent Signals		T-1A	T-1	2161
TS	7246	US 14 NW Hwy	East Main St Cary	MC	Permanent Signals		T-1A	T-1	2162
TS	7248	US 14 NW Hwy	Cary Square Shop Ctr	MC	Permanent Signals		T-1A	T-1	2163
TS	7260	US 14 NW Hwy	Three Oaks Rd	MC	Permanent Signals		T-1A	T-1	2164
TS	7270	US 14 Division St	IL 173 EB Diggins St	MC	Permanent Signals		T-1A	T-1	2165
TS	7275	US 14 NW Hwy	First St	MC	Permanent Signals		T-1A	T-1	2166
TS	7280	IL 31 Main St	IL 62 Algonquin Rd	MC	Permanent Signals		T-1A	T-1	2167
TS	7285	IL 120 Elm St W Junction	IL 31 Front St	MC	Permanent Signals		T-1A	T-1	2168
TS	7288	IL 31 Front St	Prime Pkwy Albany St	MC	Permanent Signals		T-1A	T-1	2169
TS	7289	IL 31 Front St	Shamrock Ln	MC	Permanent Signals		T-1A	T-1	2170

TS	7290	IL 120 Elm St E Jct	IL 31 Richmond Rd	MC	Permanent Signals		T-1A	T-1	2171
TS	7295	IL 31	IL 176 Terra Cotta Ave	MC	Permanent Signals		T-1A	T-1	2172
TS	7296	IL 176 Crystal Lake Rd	Valley View Rd	MC	Permanent Signals		T-1A	T-1	2173
TS	7300	IL 31 Front St	Bull Valley C J Miller Rd	MC	Permanent Signals		T-1A	T-1	2174
TS	7305	IL 31	Crystal Lake Ave	MC	Permanent Signals		T-1A	T-1	2175
TS	7310	IL 31 Barnard Mill Rd	Johnsburg Rd	MC	Permanent Signals		T-1A	T-1	2176
TS	7311	IL 31	Running Brook Farm	MC	Permanent Signals		T-1A	T-1	2177
TS	7315	IL 31	Three Oaks Rd	MC	Permanent Signals		T-1A	T-1	2178
TS	7320	IL 47	Algonquin Rd Huntley	MC	Permanent Signals		T-1A	T-1	2179
TS	7322	IL 47	Reed Rd	MC	Permanent Signals		T-1A	T-1	2180
TS	7323	IL 47 Eastwood Dr	McConnell Rd	MC	Permanent Signals		T-1A	T-1	2181
TS	7325	IL 47 Eastwood Dr	Lake Ave	MC	Permanent Signals		T-1A	T-1	2182
TS	7329	IL 47	Kreutzer Rd	MC	Permanent Signals		T-1A	T-1	2183
TS	7330	IL 47	Main St in Huntley	MC	Permanent Signals		T-1A	T-1	2184
TS	7335	IL 120 Elm St	Chapel Hill Rd	MC	Permanent Signals		T-1A	T-1	2185
TS	7340	IL 120 Elm St	River Rd	MC	Permanent Signals		T-1A	T-1	2186
TS	7342	IL 120	Thompson Rd	MC	Permanent Signals		T-1A	T-1	2187
TS	7345	IL 120	E Wonder Lake Ridge	MC	Permanent Signals		T-1A	T-1	2188
TS	7740	IL 176 Crystal Lake Rd	River Rd	MC	Permanent Signals		T-1A	T-1	2189

TS	7741	IL 176 Crystal Lake Rd	Newport Ct	MC	Permanent Signals		T-1A	T-1	2190
TS	7795	IL 62 Algonquin Rd	Eastgate Dr	MC	Permanent Signals		T-1A	T-1	2191
TS	7797	IL 31 Main St	Huntington Dr	MC	Permanent Signals		T-1A	T-1	2192
TS	7996	IL 31 Main St	Edgewood Dr	MC	Permanent Signals		T-1A	T-1	2193
TS	11580	IL 62 Algonquin Rd	Harrison St	MC	Permanent Signals		T-1A	T-1	2194
TS	11880	IL 176	Roberts Rd	MC	Permanent Signals		T-1A	T-1	2195
TS	11885	IL 31 Richmond Rd	Pearl St	MC	Permanent Signals		T-1A	T-1	2196
TS	11890	IL 31 Front St	Lillian St Grove Ave	MC	Permanent Signals		T-1A	T-1	2197
TS	11895	IL 31 Richmond Rd	McCullom Lake Rd	MC	Permanent Signals		T-1A	T-1	2198
TS	11896	IL 31 Richmond Rd	Diamond Dr	MC	Permanent Signals		T-1A	T-1	2199
TS	11897	IL 31 Richmond Rd	Blake Rd	MC	Permanent Signals		T-1A	T-1	2200
TS	11900	IL 120 Elm St	Ringwood Curran Rd	MC	Permanent Signals		T-1A	T-1	2201
TS	11905	IL 120 Elm St	Meadow Ln	MC	Permanent Signals		T-1A	T-1	2202
TS	11910	IL 120 Elm St	Industrial Dr Oak Dr	MC	Permanent Signals		T-1A	T-1	2203
TS	11915	IL 120 Elm St	Crystal Lake Rd	MC	Permanent Signals		T-1A	T-1	2204
TS	11920	IL 120 Elm St	Green St	MC	Permanent Signals		T-1A	T-1	2205
TS	11925	IL 120 Elm St	Riverside Dr	MC	Permanent Signals		T-1A	T-1	2206
TS	12170	IL 62 Algonquin Rd	Algon Center Shop	MC	Permanent Signals		T-1A	T-1	2207
TS	15080	Russel Ct	IL 47 Seminary Ave	MC	Permanent Signals		T-1A	T-1	2208

TS	15087	IL 47 Eastwood Ave	Irving Ave	MC	Permanent Signals		T-1A	T-1	2209
TS	15088	IL 47 Eastwood Ave	IL 120 McHenry Ave	MC	Permanent Signals		T-1A	T-1	2210
TS	15089	IL 120 McHenry Ave	Raffel Rd	MC	Permanent Signals		T-1A	T-1	2211
TS	20913	US 14 Division St	Crowley Rd	MC	Permanent Signals		T-1A	T-1	2212
TS	21240	IL 47	IL 176 S Junction	MC	Permanent Signals		T-1A	T-1	2213
TS	21241	IL 47	IL 176 N Junction	MC	Permanent Signals		T-1A	T-1	2214
TS	21460	US 14 Division St	Airport Rd McGuire Rd	MC	Permanent Signals		T-1A	T-1	2215
TS	21463	US 14 Division St	IL 23	MC	Permanent Signals		T-1A	T-1	2216
TS	21470	US 14 NW Hwy	Kishwaukee Valley Rd	MC	Permanent Signals		T-1A	T-1	2217
TS	21640	IL 62 Algonquin Rd	Sandbloom Countryside	MC	Permanent Signals		T-1A	T-1	2218
TS	21815	US 14 NW Hwy	Jandus Lake Julian	MC	Permanent Signals		T-1A	T-1	2219
TS	21970	US 20 Grant Hwy	IL 23 State St	MC	Permanent Signals		T-1A	T-1	2220
TS	21971	IL 23 State St	IL 176 Telegraph St	MC	Permanent Signals		T-1A	T-1	2221
TS	22100	IL 120 Rand Rd	Lily Lake Rd	MC	Permanent Signals		T-1A	T-1	2222
TS	22220	US 14 NW Hwy	Algonquin Cary Silver	MC	Permanent Signals		T-1A	T-1	2223
TS	22242	County Line Rd	Haegers Bend Rd	MC	Permanent Signals		T-1A	T-1	2224
TS	452	US 30 Lincoln Hwy	Gougar Rd	WI	Permanent Signals		T-1A	T-1	2225
TS	924	IL 1 Main St	Crete Monee Rd	WI	Permanent Signals		T-1A	T-1	2226

TS	1084	IL 113	IL 129 & IL 53	WI	Permanent Signals		T-1A	T-1	2227
TS	4290	US 30 Plainfield Rd	Larkin Ave	WI	Permanent Signals		T-1A	T-1	2228
TS	4295	IL 7 Larkin Ave	Theodore St	WI	Permanent Signals		T-1A	T-1	2229
TS	4730	IL 7 Larkin Ave	Hillcrest Shop Ctr Ent	WI	Permanent Signals		T-1A	T-1	2230
TS	6385	IL 59	Caton Farm Rd	WI	Permanent Signals		T-1A	T-1	2231
TS	7350	Weber Rd	Normantown Budler Rd	WI	Permanent Signals		T-1A	T-1	2232
TS	7352	I 55	Weber Rd S Ramps	WI	Permanent Signals		T-1A	T-1	2233
TS	7354	I 55	Weber Rd N Ramps	WI	Permanent Signals		T-1A	T-1	2234
TS	7385	I 80	Richards St N Ramp	WI	Permanent Signals		T-1A	T-1	2235
TS	7386	US 52	Manhattan Foxford Dr	WI	Permanent Signals		T-1A	T-1	2236
TS	7387	US 52 Old Manhattan	Laraway Rd	WI	Permanent Signals		T-1A	T-1	2237
TS	7390	I 80	Richards St S Ramp	WI	Permanent Signals		T-1A	T-1	2238
TS	7395	US 30 Lincoln Hwy	I 80 E Ramps	WI	Permanent Signals		T-1A	T-1	2239
TS	7400	US 30 Lincoln Hwy	I 80 W Ramps	WI	Permanent Signals		T-1A	T-1	2240
TS	7405	US 6 Channahon Rd	IL 7 Larkin Belt Line Rd	WI	Permanent Signals		T-1A	T-1	2241
TS	7410	US 6 Maple Rd	Walnut St Draper Ave	WI	Permanent Signals		T-1A	T-1	2242
TS	7411	US 45 96th Ave	Lincoln Way Ln	WI	Permanent Signals		T-1A	T-1	2243
TS	7412	US 45 96th Ave	Laraway Rd	WI	Permanent Signals		T-1A	T-1	2244

TS	7413	US 45 96th Ave	Nebraska St	WI	Permanent Signals		T-1A	T-1	2245
TS	7414	IL 45 96th Ave	Old Frankfort Way	WI	Permanent Signals		T-1A	T-1	2246
TS	7415	US 30 North St Lincoln Hwy	US 45 96th Ave	WI	Permanent Signals		T-1A	T-1	2247
TS	7420	US 30 Lincoln Hwy	IL 7 Theodore St	WI	Permanent Signals		T-1A	T-1	2248
TS	7425	US 30 Lincoln Hwy	IL 59 Division St	WI	Permanent Signals		T-1A	T-1	2249
TS	7426	IL 59	Fort Beggs	WI	Permanent Signals		T-1A	T-1	2250
TS	7430	US 30 Plainfield Rd	Caton Farm Gaylord Rd	WI	Permanent Signals		T-1A	T-1	2251
TS	7432	US 6 Southwest Hwy	I 355 Tlwy E Ramps	WI	Permanent Signals		T-1A	T-1	2252
TS	7433	US 6 Southwest Hwy	Cedar	WI	Permanent Signals		T-1A	T-1	2253
TS	7434	US 6 Southwest Hwy	Silvercross Hospital	WI	Permanent Signals		T-1A	T-1	2254
TS	7435	US 30 Lincoln Maple	Cedar Rd	WI	Permanent Signals		T-1A	T-1	2255
TS	7437	US 30 Lincoln Hwy	Prairie Dr	WI	Permanent Signals		T-1A	T-1	2256
TS	7439	US 30 Lincoln Hwy	Williams Walmart Ent	WI	Permanent Signals		T-1A	T-1	2257
TS	7440	US 30 Maple Ave	Nelson Rd	WI	Permanent Signals		T-1A	T-1	2258
TS	7445	US 30 Cass St	Walnut St	WI	Permanent Signals		T-1A	T-1	2259
TS	7450	US 30 Lincoln Hwy	Washington St	WI	Permanent Signals		T-1A	T-1	2260
TS	7455	US 30 Maple Ave	Vine St	WI	Permanent Signals		T-1A	T-1	2261
TS	7460	US 30 Cass St	Briggs St	WI	Permanent Signals		T-1A	T-1	2262

TS	7465	US 30 Maple Ave	Vine Old New Lenox Rd	WI	Permanent Signals		T-1A	T-1	2263
TS	7470	US 30 Joliet Rd	Renwick Rd Brown St	WI	Permanent Signals		T-1A	T-1	2264
TS	7471	IL 59	St Mary Immaculate	WI	Permanent Signals		T-1A	T-1	2265
TS	7472	US 30	Lily Cache	WI	Permanent Signals		T-1A	T-1	2266
TS	7473	IL 59	Fraser	WI	Permanent Signals		T-1A	T-1	2267
TS	7474	IL 59 Division St	Renwick Rd	WI	Permanent Signals		T-1A	T-1	2268
TS	7475	US 30 Lincoln Hwy	Wolf Rd	WI	Permanent Signals		T-1A	T-1	2269
TS	7480	US 45 LaGrange Rd 96th Ave	191st St	WI	Permanent Signals		T-1A	T-1	2270
TS	7482	US 45 LaGrange Rd 96th Ave	I 80 S Ramps	WI	Permanent Signals		T-1A	T-1	2271
TS	7483	US 45 LaGrange Rd 96th Ave	I 80 N Ramps	WI	Permanent Signals		T-1A	T-1	2272
TS	7485	US 45 LaGrange Rd 96th Ave	195th St Willow Ln	WI	Permanent Signals		T-1A	T-1	2273
TS	7492	IL 59	School	WI	Permanent Signals		T-1A	T-1	2274
TS	7493	IL 59	Seil	WI	Permanent Signals		T-1A	T-1	2275
TS	7495	US 52 Jefferson St	IL 59 Brook Forest Ave	WI	Permanent Signals		T-1A	T-1	2276
TS	7496	US 52 Jefferson St	Brookshore Dr	WI	Permanent Signals		T-1A	T-1	2277
TS	7497	US 52 Jefferson St	River Rd	WI	Permanent Signals		T-1A	T-1	2278
TS	7500	IL 1 Main St In	Exchange St	WI	Permanent Signals		T-1A	T-1	2279

		Crete							
TS	7503	IL 1 Dixie Hwy	Church Rd	WI	Permanent Signals		T-1A	T-1	2280
TS	7504	IL 1 Dixie Hwy	Chestnut	WI	Permanent Signals		T-1A	T-1	2281
TS	7505	IL 1 Dixie Hwy	Indiana Ave 303rd St	WI	Permanent Signals		T-1A	T-1	2282
TS	7510	IL 7 IL 53 Broadway St	IL 7 Renwick Rd	WI	Permanent Signals		T-1A	T-1	2283
TS	7515	IL 7 IL 53 Broadway St	IL 7 Theodore St	WI	Permanent Signals		T-1A	T-1	2284
TS	7520	IL 7 159th St	Bell Rd W Junction	WI	Permanent Signals		T-1A	T-1	2285
TS	7525	IL 7 159th St	Cedar Rd	WI	Permanent Signals		T-1A	T-1	2286
TS	7529	IL 7 159th St	Adelman	WI	Permanent Signals		T-1A	T-1	2287
TS	7530	IL 7 Larkin Ave	Moen Ave	WI	Permanent Signals		T-1A	T-1	2288
TS	7532	IL 7 Larkin Ave	Meadow Ave	WI	Permanent Signals		T-1A	T-1	2289
TS	7535	IL 7 Theodore St	Arbor Ln Crest Dr	WI	Permanent Signals		T-1A	T-1	2290
TS	7540	IL 7 Larkin Ave	North Ridge Plaza Dr	WI	Permanent Signals		T-1A	T-1	2291
TS	7545	IL 7 IL 53 Broadway St	Stateville Division 16th	WI	Permanent Signals		T-1A	T-1	2292
TS	7550	IL 50 Cicero Ave	Governors Hwy	WI	Permanent Signals		T-1A	T-1	2293
TS	7553	I 57	Manhattan Monee East	WI	Permanent Signals		T-1A	T-1	2294
TS	7554	I 57	Manhattan Monee West	WI	Permanent Signals		T-1A	T-1	2295
TS	7555	IL 53 Baltimore St	IL 102 Water St	WI	Permanent Signals		T-1A	T-1	2296
TS	7560	IL 53 Broadway St	Airport Rd	WI	Permanent Signals		T-1A	T-1	2297

TS	7565	IL 53 Independence Ave	Joliet Rd	WI	Permanent Signals		T-1A	T-1	2298
TS	7567	Joliet Rd	Bluff Rd Donovan Rd	WI	Permanent Signals		T-1A	T-1	2299
TS	7570	IL 53 Chicago St	Laraway Rd	WI	Permanent Signals		T-1A	T-1	2300
TS	7575	IL 53 Independence Ave	Normantown Devonwood	WI	Permanent Signals		T-1A	T-1	2301
TS	7577	IL 59	Vermette Circle	WI	Permanent Signals		T-1A	T-1	2302
TS	7578	IL 59	Walmart Shorewood	WI	Permanent Signals		T-1A	T-1	2303
TS	7580	IL 53	Kankakee River Peotone	WI	Permanent Signals		T-1A	T-1	2304
TS	7585	US 30 IL 59	IL 126 Main Plainfield	WI	Permanent Signals		T-1A	T-1	2305
TS	7586	US 30 IL 59 Division St	Naperville Rd	WI	Permanent Signals		T-1A	T-1	2306
TS	7587	IL 59 Division St	Meijer Ent	WI	Permanent Signals		T-1A	T-1	2307
TS	7588	IL 59 Division St	143rd St Whiskey Rd	WI	Permanent Signals		T-1A	T-1	2308
TS	7590	IL 59 Brook Forest	Black Rd	WI	Permanent Signals		T-1A	T-1	2309
TS	7592	IL 59	Industrial Walmart	WI	Permanent Signals		T-1A	T-1	2310
TS	7593	IL 59	Vertin Blvd Target Ent	WI	Permanent Signals		T-1A	T-1	2311
TS	7595	IL 59	Theodore	WI	Permanent Signals		T-1A	T-1	2312
TS	7600	IL 102 Water St	Kahler Rd	WI	Permanent Signals		T-1A	T-1	2313
TS	7603	IL 171 Archer Ave	151st St	WI	Permanent Signals		T-1A	T-1	2314

TS	7605	IL 171 Archer Ave	143rd St	WI	Permanent Signals		T-1A	T-1	2315
TS	7607	IL 171 Archer Ave	Smith Rd	WI	Permanent Signals		T-1A	T-1	2316
TS	7608	IL 171	I 355 Tlwy Ramp A SB	WI	Permanent Signals		T-1A	T-1	2317
TS	7609	IL 171	I 355 Tlwy Ramp D NB	WI	Permanent Signals		T-1A	T-1	2318
TS	7610	IL 171 Collins St	Woodruff Rd	WI	Permanent Signals		T-1A	T-1	2319
TS	7615	IL 394	Exchange St	WI	Permanent Signals		T-1A	T-1	2320
TS	7616	IL 394 IL 1	Goodenow Rd	WI	Permanent Signals		T-1A	T-1	2321
TS	7619	IL 394	IL 1 Village Woods	WI	Permanent Signals		T-1A	T-1	2322
TS	7859	IL 53 Independence Ave	Honeytree Dr	WI	Permanent Signals		T-1A	T-1	2323
TS	7866	IL 53 Independence Ave	Enterprise Dr	WI	Permanent Signals		T-1A	T-1	2324
TS	9105	IL 53 Independence Ave	135th St Romeo Rd	WI	Permanent Signals		T-1A	T-1	2325
TS	9115	IL 53 Independence Ave	Belmont Dr	WI	Permanent Signals		T-1A	T-1	2326
TS	9120	IL 53 Independence Ave	Murphy Dr	WI	Permanent Signals		T-1A	T-1	2327
TS	9125	135th St Romeo Rd	New Ave	WI	Permanent Signals		T-1A	T-1	2328
TS	9130	IL 53 Independence Ave	Taylor Rd	WI	Permanent Signals		T-1A	T-1	2329

TS	11045	US 45 96th Ave	Colorado Ave	WI	Permanent Signals		T-1A	T-1	2330
TS	11135	IL 53 Baltimore St	1st St	WI	Permanent Signals		T-1A	T-1	2331
TS	11625	IL 53 Independence Blvd	Lewis University	WI	Permanent Signals		T-1A	T-1	2332
TS	11630	US 45 96th Ave	St Francis Rd	WI	Permanent Signals		T-1A	T-1	2333
TS	11955	US 30 IL 59 Division St	Lockport St	WI	Permanent Signals		T-1A	T-1	2334
TS	12260	I 55	US 6 E Ramps	WI	Permanent Signals		T-1A	T-1	2335
TS	12265	I 55	US 6 W Ramps	WI	Permanent Signals		T-1A	T-1	2336
TS	12266	US 6 Eames St	Tryon St	WI	Permanent Signals		T-1A	T-1	2337
TS	12267	US 6 Eames St	Bluff Rd Navajo Dr	WI	Permanent Signals		T-1A	T-1	2338
TS	12268	US 6 Eames St	Roberts Steve Rittof Dr	WI	Permanent Signals		T-1A	T-1	2339
TS	12269	US 6 Eames St	Bell Rd	WI	Permanent Signals		T-1A	T-1	2340
TS	12271	IL 126	McKinley Woods Rd	WI	Permanent Signals		T-1A	T-1	2341
TS	20561	IL 7 IL 53	Canton Farm Rd	WI	Permanent Signals		T-1A	T-1	2342
TS	20600	US 6 Channahon Rd	Brandon Rd	WI	Permanent Signals		T-1A	T-1	2343
TS	20968	US 30 143rs St	NewYanDuke Rd	WI	Permanent Signals		T-1A	T-1	2344
TS	20969	IL 126	Drauden Steiner Rd	WI	Permanent Signals		T-1A	T-1	2345
TS	20971	IL 126 Lockport St	New Van Dyke Rd	WI	Permanent Signals		T-1A	T-1	2346
TS	20972	US 30 Lincoln Hwy	135th St	WI	Permanent Signals		T-1A	T-1	2347
TS	20979	US 30 Lincoln Hwy	127th St	WI	Permanent Signals		T-1A	T-1	2348

TS	21020	US 6 Maple Rd	Briggs St Fernwood	WI	Permanent Signals		T-1A	T-1	2349
TS	21393	US 30 Lincoln Hwy	111th St	WI	Permanent Signals		T-1A	T-1	2350
TS	21435	IL 53 Chicago Rd	Manhattan Rd	WI	Permanent Signals		T-1A	T-1	2351
TS	21437	IL 53 Chicago Rd	W Strawn E Access Rd	WI	Permanent Signals		T-1A	T-1	2352
TS	21465	IL 59	103rd St	WI	Permanent Signals		T-1A	T-1	2353
TS	21516	IL 43 Harlem Ave	Benton	WI	Permanent Signals		T-1A	T-1	2354
TS	21565	US 45 LaGrange Rd 96th Ave	La Porte Rd	WI	Permanent Signals		T-1A	T-1	2355
TS	21570	IL 53 Chicago St	Mills Rd	WI	Permanent Signals		T-1A	T-1	2356
TS	21590	Joliet Rd	International Dr Pkwy	WI	Permanent Signals		T-1A	T-1	2357
TS	21820	I 80 N Ramp	IL 53 Chicago St	WI	Permanent Signals		T-1A	T-1	2358
TS	21825	US 6 US 52 McDonough St	IL 53 Chicago St	WI	Permanent Signals		T-1A	T-1	2359
TS	21860	IL 59	111th St	WI	Permanent Signals		T-1A	T-1	2360
TS	21861	IL 59	Royal Worthington Dr	WI	Permanent Signals		T-1A	T-1	2361
TS	21862	IL 59	127th St	WI	Permanent Signals		T-1A	T-1	2362
TS	21863	IL 59	119th St	WI	Permanent Signals		T-1A	T-1	2363
TS	21864	IL 59	135th St	WI	Permanent Signals		T-1A	T-1	2364
TS	21880	US 6 Channahon Rd	Caterpillar Dr J Manville	WI	Permanent Signals		T-1A	T-1	2365
TS	21881	US 6 Channahon Rd	Caterpillar E Dr	WI	Permanent Signals		T-1A	T-1	2366

TS	21882	US 6 Channahon Rd	Empress Casino Ent	WI	Permanent Signals		T-1A	T-1	2367
TS	21883	US 6 Eames St	McClintock Rd	WI	Permanent Signals		T-1A	T-1	2368
TS	21893	IL 59	Cantore Rd	WI	Permanent Signals		T-1A	T-1	2369
TS	21895	IL 59	95th Wolfs Crossing Rd	WI	Permanent Signals		T-1A	T-1	2370
TS	21900	US 6 Channahon Rd	Empress Rd	WI	Permanent Signals		T-1A	T-1	2371
TS	21925	Houbolt Rd	I 80 N Ramps	WI	Permanent Signals		T-1A	T-1	2372
TS	21926	Houbolt Rd	I 80 S Ramps	WI	Permanent Signals		T-1A	T-1	2373
TS	22055	IL 43 Harlem Ave	St Francis Rd	WI	Permanent Signals		T-1A	T-1	2374
TS	22180	US 52 Jefferson St	I 55 E Ramps	WI	Permanent Signals		T-1A	T-1	2375
TS	22185	US 52 Jefferson St	I 55 W Ramps	WI	Permanent Signals		T-1A	T-1	2376
TS	22191	US 52 Jefferson St	I 55 East Frontage Rd	WI	Permanent Signals		T-1A	T-1	2377
TS	75111	IL 7 159th St	I 355 Tlwy W Ramp	WI	Permanent Signals		T-1A	T-1	2378
TS	75112	IL 7 150th St	I 355 Tlwy E Ramp	WI	Permanent Signals		T-1A	T-1	2379

TS	78	US 12 20 45 Mannheim Rd	Gladys Ave	CO	Span Wire Installation		T-1B	T-1	1
TS	1668	US 45 LaGrange	156th St Lowes Ent	CO	Span Wire Installation		T-1B	T-1	2
TS	2690	IL 56 Butterfield Rd	Washington Blvd	CO	Span Wire Installation		T-1B	T-1	3
TS	2817	IL 58 Golf Rd	Conti Tower Walmart Ent	CO	Span Wire Installation		T-1B	T-1	4
TS	3320	IL 72 Higgins	Gabrieski	CO	Span Wire Installation		T-1B	T-1	5

		Rd	Reserve Dr						
TS	3519	Thorton Lansing Rd	Stony Island Volbrech	CO	Span Wire Installation		T-1B	T-1	6
TS	4040	135th St	Central Ave	CO	Span Wire Installation		T-1B	T-1	7
TS	5127	IL 394 E Ramp	Gleenwood Dyer Rd	CO	Span Wire Installation		T-1B	T-1	8
TS	5128	IL 394 W Ramp	Gleenwood Dyer Rd	CO	Span Wire Installation		T-1B	T-1	9
TS	8770	111th St	Oketo Ave	CO	Span Wire Installation		T-1B	T-1	10
TS	11723	183rd St	Central Ave	CO	Span Wire Installation		T-1B	T-1	11
TS	11815	IL 171 Archer Ave	123rd St McCarthy Rd	CO	Span Wire Installation		T-1B	T-1	12
TS	14861	IL 171 Archer Ave	Derby Rd	CO	Span Wire Installation		T-1B	T-1	13
TS	14863	123rd St McCarthy Rd	Derby Rd	CO	Span Wire Installation		T-1B	T-1	14
TS	21500	IL 83 Glenwood Dyer Rd	Burnham Ave	CO	Span Wire Installation		T-1B	T-1	15
TS	21523	143rd St	Will Cook Rd	CO	Span Wire Installation		T-1B	T-1	16
TS	6163	IL 19 Irving Park Rd	Catalpa Ave	DU	Span Wire Installation		T-1B	T-1	17
TS	6366	IL 59 Sutton Rd	Smith Rd	DU	Span Wire Installation		T-1B	T-1	18
TS	20333	IL 53 Bryant Ave	Spring Ave	DU	Span Wire Installation		T-1B	T-1	19
TS	776	US 20 IL 72 SB	IL 47	KA	Span Wire Installation		T-1B	T-1	20
TS	777	US 20 IL 72 NB	IL 47	KA	Span Wire Installation		T-1B	T-1	21
TS	7336	IL 47	I 90 North Ramp	KA	Span Wire Installation		T-1B	T-1	22
TS	7337	IL 47	I 90 South Ramp	KA	Span Wire Installation		T-1B	T-1	23

TS	11980	IL 25	Grant St	KA	Span Wire Installation		T-1B	T-1	24
TS	6690	US 45	Rollins Rd	LA	Span Wire Installation		T-1B	T-1	25
TS	6790	IL 22 Half Day Rd	Westminster Hewitt	LA	Span Wire Installation		T-1B	T-1	26
TS	6925	IL 60/IL 83	Midlothian Ave	LA	Span Wire Installation		T-1B	T-1	27
TS	6943	IL 120 Belvidere Rd	Atkinson Rd	LA	Span Wire Installation		T-1B	T-1	28
TS	6980	IL 83 Ivanhoe Rd	IL 137 Buckley Rd	LA	Span Wire Installation		T-1B	T-1	29
TS	7053	IL 173	Kenosha	LA	Span Wire Installation		T-1B	T-1	30
TS	22052	IL 21 Milwaukee Ave	Continental Dr	LA	Span Wire Installation		T-1B	T-1	31
TS	7233	US 14	Ridgefield	MC	Span Wire Installation		T-1B	T-1	32
TS	7239	US 14	Doty Rd	MC	Span Wire Installation		T-1B	T-1	33
TS	7313	IL 31	Ringwood Rd	MC	Span Wire Installation		T-1B	T-1	34
TS	15085	County Club Rd	IL 47 Eastwood Dr	MC	Span Wire Installation		T-1B	T-1	35
TS	21973	IL 23	Coral Pleasant Grove	MC	Span Wire Installation		T-1B	T-1	36
TS	7388	New Lenox Rd	Briggs St	WI	Span Wire Installation		T-1B	T-1	37
TS	7393	I 80 Ramps	Briggs St	WI	Span Wire Installation		T-1B	T-1	38
TS	7511	IL 7 159th St	Gougar Rd	WI	Span Wire Installation		T-1B	T-1	39
TS	7514	IL 7 159th St	Bell Rd	WI	Span Wire Installation		T-1B	T-1	40
TS	7583	IL 126	Essington Rd	WI	Span Wire Installation		T-1B	T-1	41
TS	7618	IL 394	Richton Rd	WI	Span Wire Installation		T-1B	T-1	42
TS	7626	IL 7 159th St	Parker Rd	WI	Span Wire Installation		T-1B	T-1	43
TS	9715	I 55	Arsenal Rd West Ramp	WI	Span Wire Installation		T-1B	T-1	44
TS	9716	I 55	Arsenal Rd East	WI	Span Wire Installation		T-1B	T-1	45

			Ramp						
TS	11140	I 55 SB Exit Ramp	IL 113	WI	Span Wire Installation		T-1B	T-1	46
TS	20974	US 30 Lincoln Hwy	US 30 143rd St	WI	Span Wire Installation		T-1B	T-1	47

FL	28	US 12 Lee St	Park Pl	CO	Overhead Beacons		T-2A	T-2	1
FL	490	107th St	Kean Ave	CO	Overhead Beacons		T-2A	T-2	2
FL	566	123rd St McCarthy Rd	86th St	CO	Overhead Beacons		T-2A	T-2	3
FL	1301	US 20 Lake St	Elgin O'Hare	DU	Overhead Beacons		T-2A	T-2	4
FL	1302	IL 53 Rohlwing Rd	Elgin O'Hare	DU	Overhead Beacons		T-2A	T-2	5
FL	1303	Elgin OHare	US 20 Lake St	DU	Overhead Beacons		T-2A	T-2	6
FL	1304	Elgin OHare	IL 53 Rohlwing Rd Middle Sign	DU	Overhead Beacons		T-2A	T-2	7
FL	1305	Elgin OHare	IL 53 Rohlwing Rd West Sign	DU	Overhead Beacons		T-2A	T-2	8
FL	170	IL 31 Batavia Ave	Moosehart Entrance	KA	Overhead Beacons		T-2A	T-2	9
FL	204	IL 47	Burlington Blacktop	KA	Overhead Beacons		T-2A	T-2	10
FL	210	IL 47	Main St Kaneville	KA	Overhead Beacons		T-2A	T-2	11
FL	221	IL 72	State St	KA	Overhead Beacons		T-2A	T-2	12
FL	228	IL 47	Plato Rd	KA	Overhead Beacons		T-2A	T-2	13
FL	10697	IL 72 Higgins Rd	Big Timber Rd	KA	Overhead Beacons		T-2A	T-2	14
FL	765	IL 132 Grand Ave	Fairfield Rd	LA	Overhead Beacons		T-2A	T-2	15
FL	1210	US 41 Skokie Hwy	Between Deerfield Rd &	LA	Overhead Beacons		T-2A	T-2	16

			West Park Ave						
FL	1306	IL 137 Buckley Rd	IL 137 Amstutz Expressway	LA	Overhead Beacons		T-2A	T-2	17
FL	825	IL 23	Kishwaukee Valley Rd	MC	Overhead Beacons		T-2A	T-2	18
FL	830	IL 47	IL 173	MC	Overhead Beacons		T-2A	T-2	19
FL	835	IL 47	Charles Rd	MC	Overhead Beacons		T-2A	T-2	20
FL	840	IL 120	Charles Rd	MC	Overhead Beacons		T-2A	T-2	21
FL	851	IL 173	Alden Rd	MC	Overhead Beacons		T-2A	T-2	22
FL	855	IL 173	Wilmont Rd	MC	Overhead Beacons		T-2A	T-2	23
FL	16	US 6 Southwest Hwy	Parker Rd	WI	Overhead Beacons		T-2A	T-2	24
FL	18	US 6 Southwest Hwy	Cougar Rd	WI	Overhead Beacons		T-2A	T-2	25
FL	149	US 45 LaGrange Rd	Steger Rd	WI	Overhead Beacons		T-2A	T-2	26
FL	890	US 45 LaGrange Rd	Manhattan Monee Rd	WI	Overhead Beacons		T-2A	T-2	27
FL	913	IL 50 Cicero Ave	Peotone Rd	WI	Overhead Beacons		T-2A	T-2	28
FL	915	IL 50 Cicero Ave	Stuenkel Rd	WI	Overhead Beacons		T-2A	T-2	29
FL	925	Governors Hwy	Stuenkel Rd	WI	Overhead Beacons		T-2A	T-2	30
FL	930	Manhattan Monee Rd	Cedar Rd	WI	Overhead Beacons		T-2A	T-2	31
FL	1085	IL 129	Coal City Rd	WI	Overhead Beacons		T-2A	T-2	32
FL	1086	IL 129	Strip Mine Rd	WI	Overhead Beacons		T-2A	T-2	33
FL	2515	US 45 LaGrange Rd	US 52 Joliet Rd	WI	Overhead Beacons		T-2A	T-2	34

FL	20	I 55	I 294 Tollway N Ramp	CO	Low Mount Beacons		T-2B	T-2	1
FL	21	US 12 Lee St	Park Pl	CO	Low Mount Beacons		T-2B	T-2	2
FL	22	Kedzie Ave	131st St	CO	Low Mount Beacons		T-2B	T-2	3
FL	27	I 55	I 294 Tollway	CO	Low Mount Beacons		T-2B	T-2	4
FL	52	I 290 Congress Pkwy	Old Chi Post Office	CO	Low Mount Beacons		T-2B	T-2	5
FL	53	I 290 Congress Pkwy	Old Chi Post Office	CO	Low Mount Beacons		T-2B	T-2	6
FL	54	I 290 Congress Pkwy	Drawbridge	CO	Low Mount Beacons		T-2B	T-2	7
FL	55	I 290 Congress Pkwy	Drawbridge	CO	Low Mount Beacons		T-2B	T-2	8
FL	158	Wolf Rd	151st St	CO	Low Mount Beacons		T-2B	T-2	9
FL	195	I 80 I 94 EB Right	Torrence Ave	CO	Low Mount Beacons		T-2B	T-2	10
FL	196	I 80 I 94 EB Left	Torrence Ave	CO	Low Mount Beacons		T-2B	T-2	11
FL	197	I 80 I 94 WB Right	Torrence Ave	CO	Low Mount Beacons		T-2B	T-2	12
FL	198	I 80 I 94 WB Left	Torrence Ave	CO	Low Mount Beacons		T-2B	T-2	13
FL	330	US 14 Northwest Hwy	IL 68 Dundee Rd	CO	Low Mount Beacons		T-2B	T-2	14
FL	332	US 14 Northwest Hwy	UP RR CN RR	CO	Low Mount Beacons		T-2B	T-2	15
FL	335	US 14 Miner St	Des Plaines River Rd	CO	Low Mount Beacons		T-2B	T-2	16
FL	480	87th St	Southwest Hwy	CO	Low Mount Beacons		T-2B	T-2	17

FL	530	Ashland Ave Wood St	140th St	CO	Low Mount Beacons		T-2B	T-2	18
FL	531	140th St	Ashland Ave	CO	Low Mount Beacons		T-2B	T-2	19
FL	590	Palatine Frontage EB	Wheeling East of	CO	Low Mount Beacons		T-2B	T-2	20
FL	591	Palatine Frontage WB	Wolf West of	CO	Low Mount Beacons		T-2B	T-2	21
FL	595	Sheridan Rd	Burnham Pl	CO	Low Mount Beacons		T-2B	T-2	22
FL	600	Sheridan Rd	Main St	CO	Low Mount Beacons		T-2B	T-2	23
FL	601	Sheridan Rd	Main St NB	CO	Low Mount Beacons		T-2B	T-2	24
FL	1008	123RD WB McCarthy Rd	Walker Rd	CO	Low Mount Beacons		T-2B	T-2	25
FL	1009	123rd EB McCarthy Rd	Walker Rd	CO	Low Mount Beacons		T-2B	T-2	26
FL	1123	IL 83 Cal Sag Rd	Ridgeland Ave NB	CO	Low Mount Beacons		T-2B	T-2	27
FL	1140	US 12 20 45 Mannheim Rd	Canterbury Waterford	CO	Low Mount Beacons		T-2B	T-2	28
FL	1141	Grand Ave EB Near Right	Elmwood Park Metra RR Crossing	CO	Low Mount Beacons		T-2B	T-2	29
FL	1142	Grand Ave EB Far Right	Elmwood Park Metra RR Crossing	CO	Low Mount Beacons		T-2B	T-2	30
FL	1143	Grand Ave WB Near Right	Elmwood Park Metra RR Crossing	CO	Low Mount Beacons		T-2B	T-2	31
FL	1144	Grand Ave WB Far Right	Elmwood Park Metra RR Crossing	CO	Low Mount Beacons		T-2B	T-2	32
FL	1151	IL 59 SB Near	Lake Cook Rd North of	CO	Low Mount Beacons		T-2B	T-2	33

FL	1152	IL 59 SB Far	Lake Cook Rd North of	CO	Low Mount Beacons		T-2B	T-2	34
FL	1153	Lake Cook Rd WB Near	IL 59 East of	CO	Low Mount Beacons		T-2B	T-2	35
FL	1154	Lake Cook Rd WB Far	IL 59 East of	CO	Low Mount Beacons		T-2B	T-2	36
FL	1222	US 12 20 45 LaGrange Rd NB	Weeping Willow Rd	CO	Low Mount Beacons		T-2B	T-2	37
FL	1223	US 12 20 45 LaGrange Rd SB	Weeping Willow Rd	CO	Low Mount Beacons		T-2B	T-2	38
FL	1251	IL 43 Waukegan Rd	Volts Rd	CO	Low Mount Beacons		T-2B	T-2	39
FL	1290	203rd	Crawford NB	CO	Low Mount Beacons		T-2B	T-2	40
FL	1291	203rd	Crawford SB	CO	Low Mount Beacons		T-2B	T-2	41
FL	1295	US 14 Northwest Hwy WB	Seegers Rd Broadway	CO	Low Mount Beacons		T-2B	T-2	42
FL	1296	US 14 Northwest Hwy WB Left Side	Seegers Rd Broadway	CO	Low Mount Beacons		T-2B	T-2	43
FL	1297	Wolf Rd NB	Camp McDonald Rd	CO	Low Mount Beacons		T-2B	T-2	44
FL	1298	Oakton St EB	IL 83 Busse Rd	CO	Low Mount Beacons		T-2B	T-2	45
FL	1300	US 14 Northwest Hwy EB Minor St	Cumberland Pkwy Metra Dr	CO	Low Mount Beacons		T-2B	T-2	46
FL	1320	US 20 Lake St	Bluff City Blvd	CO	Low Mount Beacons		T-2B	T-2	47
FL	1321	US 20 Lake St	Barrington Rd	CO	Low Mount Beacons		T-2B	T-2	48
FL	1471	US 34 Ogden Ave	W of Joliet Pl	CO	Low Mount Beacons		T-2B	T-2	49

FL	1472	US 34 Ogden Ave	Leland Ave	CO	Low Mount Beacons		T-2B	T-2	50
FL	1825	IL 1 Halsted St	171st St NB	CO	Low Mount Beacons		T-2B	T-2	51
FL	1945	Desplaines Riv Rd	IL 19 Irving Pk	CO	Low Mount Beacons		T-2B	T-2	52
FL	2620	IL 50 Cicero Ave	Southwest Hwy	CO	Low Mount Beacons		T-2B	T-2	53
FL	2690	IL 56 Butterfield Rd	Washington Blvd	CO	Low Mount Beacons		T-2B	T-2	54
FL	2760	IL 58 Golf Rd WB	Gannon Dr	CO	Low Mount Beacons		T-2B	T-2	55
FL	2761	IL 58 Golf Rd EB	Gannon Dr	CO	Low Mount Beacons		T-2B	T-2	56
FL	3150	IL 62 Algonquin Rd	Bateman Rd	CO	Low Mount Beacons		T-2B	T-2	57
FL	3151	IL 62 Algonquin Rd	Bateman Rd	CO	Low Mount Beacons		T-2B	T-2	58
FL	3152	IL 62	Bateman Rd NB	CO	Low Mount Beacons		T-2B	T-2	59
FL	3153	IL 62	Bateman Rd SB	CO	Low Mount Beacons		T-2B	T-2	60
FL	3154	IL 62	Old Sutton Rd NB	CO	Low Mount Beacons		T-2B	T-2	61
FL	3155	IL 62	Old Sutton Rd SB	CO	Low Mount Beacons		T-2B	T-2	62
FL	3156	IL 62 EB	Old Sutton Rd	CO	Low Mount Beacons		T-2B	T-2	63
FL	3157	IL 62 WB	Old Sutton Rd	CO	Low Mount Beacons		T-2B	T-2	64
FL	3160	IL 68 Dundee Rd WB	Old Sutton Rd	CO	Low Mount Beacons		T-2B	T-2	65
FL	3161	IL 68 Dundee Rd EB	Old Sutton Rd	CO	Low Mount Beacons		T-2B	T-2	66
FL	3162	IL 68 Dundee Rd	Old Sutton Rd SB	CO	Low Mount Beacons		T-2B	T-2	67

FL	3163	IL 68 Dundee Rd	Old Sutton Rd NB	CO	Low Mount Beacons		T-2B	T-2	68
FL	3168	IL 68 Dundee Rd	Sterling Ave	CO	Low Mount Beacons		T-2B	T-2	69
FL	3300	IL 72 Higgins Rd EB	East of Canfield	CO	Low Mount Beacons		T-2B	T-2	70
FL	3325	IL 72 Higgins Rd WB	Gannon Dr	CO	Low Mount Beacons		T-2B	T-2	71
FL	3326	IL 72 Higgins Rd EB	Gannon Dr	CO	Low Mount Beacons		T-2B	T-2	72
FL	3540	95th NW	IL 171 Archer Ave	CO	Low Mount Beacons		T-2B	T-2	73
FL	3542	95th NE	IL 171 Archer Ave	CO	Low Mount Beacons		T-2B	T-2	74
FL	3544	IL 171 Archer Ave NE	95th St	CO	Low Mount Beacons		T-2B	T-2	75
FL	3546	IL 171 Archer Ave SW	95th St	CO	Low Mount Beacons		T-2B	T-2	76
FL	3555	IL 171 Archer Ave	55th St EB	CO	Low Mount Beacons		T-2B	T-2	77
FL	3556	IL 171 Archer Ave	55th St EB	CO	Low Mount Beacons		T-2B	T-2	78
FL	3357	IL 171 Archer Ave	55th St WB	CO	Low Mount Beacons		T-2B	T-2	79
FL	3558	IL 171 Archer Ave	55th St WB	CO	Low Mount Beacons		T-2B	T-2	80
FL	3575	IL 171 Archer Ave	47th St E Ramp NB	CO	Low Mount Beacons		T-2B	T-2	81
FL	3936	Crawford Ave Pulaski Rd	123rd St NB	CO	Low Mount Beacons		T-2B	T-2	82
FL	4034	135th St EB	W of Ridgeland Ave	CO	Low Mount Beacons		T-2B	T-2	83
FL	4036	135th St WB	W of Ridgeland Ave	CO	Low Mount Beacons		T-2B	T-2	84

FL	4660	IL 59 NB	West Bartlett Rd	CO	Low Mount Beacons		T-2B	T-2	85
FL	5240	Francisco	Broadway	CO	Low Mount Beacons		T-2B	T-2	86
FL	5930	Willow Rd	Old Willow Rd west of	CO	Low Mount Beacons		T-2B	T-2	87
FL	9670	IL 83 Elmhurst Rd NB	Lincoln St	CO	Low Mount Beacons		T-2B	T-2	88
FL	9671	IL 83 Elmhurst Rd SB	Lincoln St	CO	Low Mount Beacons		T-2B	T-2	89
FL	11245	US 12 45 Lee St	US 12 45 Manheim Rd WB	CO	Low Mount Beacons		T-2B	T-2	90
FL	11246	US 12 45 Lee St	US 12 45 Mannheim Rd NB	CO	Low Mount Beacons		T-2B	T-2	91
FL	11715	Western Ave	Sauk Trail Rd WB	CO	Low Mount Beacons		T-2B	T-2	92
FL	11720	IL 50 Cicero Ave	175th St	CO	Low Mount Beacons		T-2B	T-2	93
FL	11725	Dixie Hwy	Flossmoor Rd Cambridge Ave	CO	Low Mount Beacons		T-2B	T-2	94
FL	11744	IL 394	Sauk Trail SB Median	CO	Low Mount Beacons		T-2B	T-2	95
FL	11745	IL 394 Ford Right side	Sauk Trail Rd SB	CO	Low Mount Beacons		T-2B	T-2	96
FL	11751	US 6 159th St WB	Park Ave Right Side	CO	Low Mount Beacons		T-2B	T-2	97
FL	11755	Ashland Ave Wood St	Thronton Blue Island Rd	CO	Low Mount Beacons		T-2B	T-2	98
FL	11760	US 12 20 95th St	76th Ave SB to WB	CO	Low Mount Beacons		T-2B	T-2	99
FL	11765	US 12 20 95th St	88th Ave EB	CO	Low Mount Beacons		T-2B	T-2	100
FL	11770	Southwest Hwy NEB	Ridgeland Ave	CO	Low Mount Beacons		T-2B	T-2	101

FL	11870	IL 72 Higgins Rd	Lee St Trammer Crow SB	CO	Low Mount Beacons		T-2B	T-2	102
FL	12015	IL 56 Butterfield Rd	Taft Ave EB	CO	Low Mount Beacons		T-2B	T-2	103
FL	12025	Lawrence Ave	25th Ave Ruby Ave EB	CO	Low Mount Beacons		T-2B	T-2	104
FL	21475	IL 171 Archer Ave	Bell Rd WB	CO	Low Mount Beacons		T-2B	T-2	105
FL	21476	IL 171 Archer Ave	131st St NB Left Side	CO	Low Mount Beacons		T-2B	T-2	106
FL	21477	IL 171 Archer Ave	131st St NB Right Side	CO	Low Mount Beacons		T-2B	T-2	107
FL	21478	IL 171 Archer Ave	131st St SB Left Side	CO	Low Mount Beacons		T-2B	T-2	108
FL	21479	IL 171 Archer Ave	131st St SB Right Side	CO	Low Mount Beacons		T-2B	T-2	109
FL	33576	IL 171 Archer Ave	47th St E Ramp NB	CO	Low Mount Beacons		T-2B	T-2	110
FL	587	IL 83 Kingery Hwy	91st St EB	DU	Low Mount Beacons		T-2B	T-2	111
FL	635	IL 59 Neltner Blvd	Joliet St	DU	Low Mount Beacons		T-2B	T-2	112
FL	640	IL 59 Neltner Blvd	Ingalton Ave	DU	Low Mount Beacons		T-2B	T-2	113
FL	1117	IL 38 Roosevelt Rd	Garys Mill Rd NB	DU	Low Mount Beacons		T-2B	T-2	114
FL	1118	IL 38 Roosevelt Rd	Garys Mill Rd SB	DU	Low Mount Beacons		T-2B	T-2	115
FL	1165	IL 83 SB	Red Oak St	DU	Low Mount Beacons		T-2B	T-2	116
FL	1166	IL 83 NB	Red Oak St	DU	Low Mount Beacons		T-2B	T-2	117
FL	1308	US 20 WB	Garden Rd	DU	Low Mount Beacons		T-2B	T-2	118

FL	1309	US 20 EB	Garden Rd	DU	Low Mount Beacons		T-2B	T-2	119
FL	1310	IL 19 Irving Pk WB	Bloomingdale Rd	DU	Low Mount Beacons		T-2B	T-2	120
FL	8853	IL 59 Neltner Blvd	Hawthorn Ln SB	DU	Low Mount Beacons		T-2B	T-2	121
FL	15100	IL 19 Irving Park Rd WB	Wood Dale Rd	DU	Low Mount Beacons		T-2B	T-2	122
FL	15101	IL 19 Irving Park Rd EB	Wood Dale Rd	DU	Low Mount Beacons		T-2B	T-2	123
FL	121	IL 25 NB Stearns	CCP RR Betw Gilbert	KA	Low Mount Beacons		T-2B	T-2	124
FL	122	IL 25 SB Stearns	CCP RR Betw Gilbert	KA	Low Mount Beacons		T-2B	T-2	125
FL	140	US 20 Oak St	Damisch Pingree Grove	KA	Low Mount Beacons		T-2B	T-2	126
FL	150	US 20 Oak St	W of Marshall Rd	KA	Low Mount Beacons		T-2B	T-2	127
FL	151	US 20 Oak St	Marshall Rd	KA	Low Mount Beacons		T-2B	T-2	128
FL	160	US 20 Oak St	1/2 Mi W of Marshall	KA	Low Mount Beacons		T-2B	T-2	129
FL	171	IL 31 SB	Mooseheart Rd	KA	Low Mount Beacons		T-2B	T-2	130
FL	172	IL 31 NB	Mooseheart Rd	KA	Low Mount Beacons		T-2B	T-2	131
FL	173	IL 31	Mooseheart Rd EB	KA	Low Mount Beacons		T-2B	T-2	132
FL	191	IL 47	IL 64 North Ave EB	KA	Low Mount Beacons		T-2B	T-2	133
FL	201	IL 47 SB	Burlington Blacktop	KA	Low Mount Beacons		T-2B	T-2	134
FL	203	IL 47 NB	Burlington Blacktop	KA	Low Mount Beacons		T-2B	T-2	135
FL	211	IL 47 NB	Main St Kaneville	KA	Low Mount Beacons		T-2B	T-2	136

FL	212	IL 47 SB	Main St Kaneville	KA	Low Mount Beacons		T-2B	T-2	137
FL	222	IL 47 NB	Plato Rd Right Side	KA	Low Mount Beacons		T-2B	T-2	138
FL	223	IL 47 NB	Plato Rd Left Side	KA	Low Mount Beacons		T-2B	T-2	139
FL	224	IL 47 SB	Plato Rd Left Side	KA	Low Mount Beacons		T-2B	T-2	140
FL	225	IL 47 SB	Plato Rd Right Side	KA	Low Mount Beacons		T-2B	T-2	141
FL	754	IL 25 JFK Memorial Dr NB	Cherokee Rd Bolz Rd	KA	Low Mount Beacons		T-2B	T-2	142
FL	857	IL 38 EB	St Charles Boy School	KA	Low Mount Beacons		T-2B	T-2	143
FL	858	IL 38 EB	Meredith	KA	Low Mount Beacons		T-2B	T-2	144
FL	859	IL 38 WB	Meredith	KA	Low Mount Beacons		T-2B	T-2	145
FL	10698	IL 72 Higgins Rd	Big Timber Rd EB	KA	Low Mount Beacons		T-2B	T-2	146
FL	10699	IL 72 Higgins Rd	Big Timber Rd WB	KA	Low Mount Beacons		T-2B	T-2	147
FL	21984	US 20	Brier Hill WB	KA	Low Mount Beacons		T-2B	T-2	148
FL	21985	US 20	Allen Rd EB	KA	Low Mount Beacons		T-2B	T-2	149
FL	21986	US 20 NB	Brier Hill Rd Allen Rd	KA	Low Mount Beacons		T-2B	T-2	150
FL	21987	US 20 SB	Brier Hill Rd Allen Rd	KA	Low Mount Beacons		T-2B	T-2	151
FL	660	US 12 IL 59	IL 134 Long Lake Rd	LA	Low Mount Beacons		T-2B	T-2	152
FL	661	US 12 IL 59	IL 134 Long Lake Rd	LA	Low Mount Beacons		T-2B	T-2	153
FL	701	IL 53 Long Grove Rd	Robert Parker Coffin Rd	LA	Low Mount Beacons		T-2B	T-2	154

FL	715	IL 59 Grand Ave	Monaville Rd	LA	Low Mount Beacons		T-2B	T-2	155
FL	716	IL 59 Grand Ave	Monaville Rd SB	LA	Low Mount Beacons		T-2B	T-2	156
FL	727	IL 60 Town Line Rd	Lake Forest Academy Rd	LA	Low Mount Beacons		T-2B	T-2	157
FL	740	IL 120	Almond Lake	LA	Low Mount Beacons		T-2B	T-2	158
FL	741	IL 120 WB	Almond Rd	LA	Low Mount Beacons		T-2B	T-2	159
FL	742	IL 120 EB	Fish Lake Rd	LA	Low Mount Beacons		T-2B	T-2	160
FL	743	IL 120 WB	Fish Lake Rd	LA	Low Mount Beacons		T-2B	T-2	161
FL	746	IL 120	Fish Lake Rd NB	LA	Low Mount Beacons		T-2B	T-2	162
FL	747	IL 120	Fish Lake Rd SB	LA	Low Mount Beacons		T-2B	T-2	163
FL	748	IL 120 Belvidere Rd WB S	Bacon Rd	LA	Low Mount Beacons		T-2B	T-2	164
FL	749	IL 120 Belvidere Rd WB	Bacon Rd	LA	Low Mount Beacons		T-2B	T-2	165
FL	766	US 14 Northwest Hwy SEB	Cuba Rd	LA	Low Mount Beacons		T-2B	T-2	166
FL	767	US 14 Northwest Hwy NWB	Cuba Rd	LA	Low Mount Beacons		T-2B	T-2	167
FL	768	US 14 Northwest Hwy	Cuba Rd EB	LA	Low Mount Beacons		T-2B	T-2	168
FL	769	US 14 Northwest Hwy	Cuba Rd WB	LA	Low Mount Beacons		T-2B	T-2	169
FL	967	US 12 Rand Rd	Old Rand Rd SB	LA	Low Mount Beacons		T-2B	T-2	170
FL	998	US 12 NB	Sullivan Lake Rd Molidor Rd	LA	Low Mount Beacons		T-2B	T-2	171

FL	999	US 12 SB	Sullivan Lake Rd Molidor Rd	LA	Low Mount Beacons		T-2B	T-2	172
FL	1150	US 14 Northwest Hwy	Berry Rd	LA	Low Mount Beacons		T-2B	T-2	173
FL	1193	US 12 Rand Rd Off Ramp	IL 59 Barrington Rd	LA	Low Mount Beacons		T-2B	T-2	174
FL	1211	US 41 Skokie Hwy	Deerfield Rd & West Park Ave	LA	Low Mount Beacons		T-2B	T-2	175
FL	1212	US 41 Skokie Hwy	West Park Ave NB	LA	Low Mount Beacons		T-2B	T-2	176
FL	2113	IL 60	Wilson Rd SB	LA	Low Mount Beacons		T-2B	T-2	177
FL	2116	IL 173 EB	Tiffany Rd	LA	Low Mount Beacons		T-2B	T-2	178
FL	2117	IL 173 WB	Tiffany Rd	LA	Low Mount Beacons		T-2B	T-2	179
FL	2118	IL 173	Tiffany Rd SB	LA	Low Mount Beacons		T-2B	T-2	180
FL	2121	IL 173	Linden Lane	LA	Low Mount Beacons		T-2B	T-2	181
FL	6625	IL 176 Maple Ave WB	US 45 Lake St	LA	Low Mount Beacons		T-2B	T-2	182
FL	6916	IL 176 Ivanhoe Rd EB	Hawley Rd	LA	Low Mount Beacons		T-2B	T-2	183
FL	6917	IL 176 Ivanhoe Rd WB	Hawley Rd	LA	Low Mount Beacons		T-2B	T-2	184
FL	11945	US 12	State Park Rd East St	LA	Low Mount Beacons		T-2B	T-2	185
FL	12315	IL 83 Baron Blvd SB	Washington St	LA	Low Mount Beacons		T-2B	T-2	186
FL	21755	US 45	Grass Lake Rd SB	LA	Low Mount Beacons		T-2B	T-2	187
FL	100	IL 31 NB	Half Mile Trail	MC	Low Mount Beacons		T-2B	T-2	188
FL	101	IL 31 SB	Half Mile Trail	MC	Low Mount Beacons		T-2B	T-2	189
FL	752	IL 23 State Rd	River Rd	MC	Low Mount Beacons		T-2B	T-2	190

		NB							
FL	753	IL 23 State Rd SB	River Rd	MC	Low Mount Beacons		T-2B	T-2	191
FL	760	IL 23 State Rd	River Rd EB	MC	Low Mount Beacons		T-2B	T-2	192
FL	761	IL 23 State Rd	River Rd WB	MC	Low Mount Beacons		T-2B	T-2	193
FL	764	US 12 NB	Sunset	MC	Low Mount Beacons		T-2B	T-2	194
FL	836	IL 47 SB	O'Brien Rd / Vander Karr Rd	MC	Low Mount Beacons		T-2B	T-2	195
FL	837	IL 47 NB	O'Brien Rd / Vander Karr Rd	MC	Low Mount Beacons		T-2B	T-2	196
FL	852	IL 173 EB	Alden Rd	MC	Low Mount Beacons		T-2B	T-2	197
FL	853	IL 173 WB	Alden Rd	MC	Low Mount Beacons		T-2B	T-2	198
FL	856	IL 173 WB	West of Converse Rd	MC	Low Mount Beacons		T-2B	T-2	199
FL	7233	US 14 EB	Ridgefield Rd	MC	Low Mount Beacons		T-2B	T-2	200
FL	7234	US 14WB	Ridgefield Rd	MC	Low Mount Beacons		T-2B	T-2	201
FL	7239	US 14 EB	Doty West of	MC	Low Mount Beacons		T-2B	T-2	202
FL	7240	US 14 WB	Doty West of	MC	Low Mount Beacons		T-2B	T-2	203
FL	11880	IL 176 Crystal Lake Rd	Roberts Rd	MC	Low Mount Beacons		T-2B	T-2	204
FL	11948	US 12	Solon Rd NB	MC	Low Mount Beacons		T-2B	T-2	205
FL	11949	US 12	Solon Rd SB	MC	Low Mount Beacons		T-2B	T-2	206
FL	21967	US 20	South Union Rd SB	MC	Low Mount Beacons		T-2B	T-2	207
FL	21968	US 20 NB	Beck Rd	MC	Low Mount Beacons		T-2B	T-2	208
FL	21969	US 20 SB	Beck Rd	MC	Low Mount Beacons		T-2B	T-2	209

FL	21970	US 20 NB	South Union Rd	MC	Low Mount Beacons		T-2B	T-2	210
FL	21971	US 20	Beck Rd WB	MC	Low Mount Beacons		T-2B	T-2	211
FL	21972	US 20	Beck Rd EB	MC	Low Mount Beacons		T-2B	T-2	212
FL	21973	US 20 NB	Coral Rd	MC	Low Mount Beacons		T-2B	T-2	213
FL	21974	US 20 SB	Coral Rd	MC	Low Mount Beacons		T-2B	T-2	214
FL	21976	IL 23 State St NB	Coral Pleasant Grove Rd	MC	Low Mount Beacons		T-2B	T-2	215
FL	21977	IL 23 State St SB	Coral Pleasant Grove Rd	MC	Low Mount Beacons		T-2B	T-2	216
FL	21978	US 20	Coral Rd EB	MC	Low Mount Beacons		T-2B	T-2	217
FL	21979	US 20	Coral Rd WB	MC	Low Mount Beacons		T-2B	T-2	218
FL	21980	US 20	Harmony Rd EB	MC	Low Mount Beacons		T-2B	T-2	219
FL	21981	US 20	Harmony Rd WB	MC	Low Mount Beacons		T-2B	T-2	220
FL	21982	US 20 NB	Harmony Rd	MC	Low Mount Beacons		T-2B	T-2	221
FL	21983	US 20 SB	Harmony Rd	MC	Low Mount Beacons		T-2B	T-2	222
FL	19	US 6 Southwest Hwy	Parker Rd EB	WI	Low Mount Beacons		T-2B	T-2	223
FL	23	US 6 Southwest Hwy	Parker Rd WB	WI	Low Mount Beacons		T-2B	T-2	224
FL	145	US 45 LaGrange Rd NB	Steger Rd	WI	Low Mount Beacons		T-2B	T-2	225
FL	146	US 45 LaGrange Rd SB	Steger Rd	WI	Low Mount Beacons		T-2B	T-2	226
FL	154	183rd St EB	Wolf Rd	WI	Low Mount Beacons		T-2B	T-2	227
FL	155	183rd St WB	Wolf Rd	WI	Low Mount Beacons		T-2B	T-2	228

FL	156	183rd St	Wolf Rd NB	WI	Low Mount Beacons		T-2B	T-2	229
FL	157	183rd St	Wolf Rd SB	WI	Low Mount Beacons		T-2B	T-2	230
FL	865	I 80	Wheeler Ave WB	WI	Low Mount Beacons		T-2B	T-2	231
FL	866	I 80	Wheeler Ave EB	WI	Low Mount Beacons		T-2B	T-2	232
FL	900	US 52 State St	North St WB	WI	Low Mount Beacons		T-2B	T-2	233
FL	901	US 52 State St SB	North St	WI	Low Mount Beacons		T-2B	T-2	234
FL	902	US 52 State St NB	North St	WI	Low Mount Beacons		T-2B	T-2	235
FL	927	IL 53 Bolingbrook Dr	Royce Rd	WI	Low Mount Beacons		T-2B	T-2	236
FL	1029	IL 126 SW RS East of RR	East of IL 59	WI	Low Mount Beacons		T-2B	T-2	237
FL	1030	IL 126 SW RS West of RR	East of IL 59	WI	Low Mount Beacons		T-2B	T-2	238
FL	1034	IL 126	Essington Rd WB	WI	Low Mount Beacons		T-2B	T-2	239
FL	1088	IL 129	Strip Mine Rd NB	WI	Low Mount Beacons		T-2B	T-2	240
FL	1089	IL 129	Strip Mine Rd SB	WI	Low Mount Beacons		T-2B	T-2	241
FL	1091	IL 394 SB Left	Richton Rd	WI	Low Mount Beacons		T-2B	T-2	242
FL	1092	IL 394 SB Right	Richton Rd	WI	Low Mount Beacons		T-2B	T-2	243
FL	1093	IL 394 NB Left	Richton Rd	WI	Low Mount Beacons		T-2B	T-2	244
FL	1094	IL 394 NB Right	Richton Rd	WI	Low Mount Beacons		T-2B	T-2	245
FL	1096	IL 394 NB Left	Burville Rd	WI	Low Mount Beacons		T-2B	T-2	246
FL	1097	IL 394 NB Right	Burville Rd	WI	Low Mount Beacons		T-2B	T-2	247
FL	1098	IL 394 SB Left	Burville Rd	WI	Low Mount Beacons		T-2B	T-2	248
FL	1099	IL 394 SB Right	Burville Rd	WI	Low Mount Beacons		T-2B	T-2	249

FL	1125	I 80	IL 53 Water St	WI	Low Mount Beacons		T-2B	T-2	250
FL	1126	I 80	IL 53 Water St EB Left	WI	Low Mount Beacons		T-2B	T-2	251
FL	1127	I 80	IL 53 Water St WB	WI	Low Mount Beacons		T-2B	T-2	252
FL	1128	I 80	IL 53 Water St WB Left	WI	Low Mount Beacons		T-2B	T-2	253
FL	1131	IL 53 NB	Manhattan Rd	WI	Low Mount Beacons		T-2B	T-2	254
FL	1132	IL 53 NB	Manhattan Rd	WI	Low Mount Beacons		T-2B	T-2	255
FL	1133	IL 53 SB	Manhattan Rd	WI	Low Mount Beacons		T-2B	T-2	256
FL	1134	IL 53 SB	Manhattan Rd	WI	Low Mount Beacons		T-2B	T-2	257
FL	1136	IL 53 NB	New River Rd	WI	Low Mount Beacons		T-2B	T-2	258
FL	1137	IL 53 SB	New River Rd	WI	Low Mount Beacons		T-2B	T-2	259
FL	9126	135th St Romeo Rd WB	E of New Ave	WI	Low Mount Beacons		T-2B	T-2	260
FL	20600	US 6 Channahon Rd	Brandon Rd WB	WI	Low Mount Beacons		T-2B	T-2	261

TRAFFIC SIGNAL LOCATIONS CURRENTLY OFF STATE MAINTENANCE AS OF 5-31-12

Expected to come on State Maintenance by End of Year 2012 with the Rest in 2013 through 2015

Sys	Loc. #	Main Route	Cross Street	Co.	Type of Equipment		System Type	Pay Item	Qty
TS	10	I 55	Central Ave	CO	Permanent Signals		T-1A	T-1	1
TS	20	I 57 West Leg Ryan	119th @ Ashland	CO	Permanent Signals		T-1A	T-1	2
TS	1165	US 14 IL 58 Dempster St	US 14/IL 43 Waukegan Rd	CO	Permanent Signals		T-1A	T-1	3
TS	1255	US 14	Mt Prospect Rd	CO	Permanent Signals		T-1A	T-1	4

		Northwest Hwy							
TS	1280	US 14 Baldwin Rd	Quentin Rd	CO	Permanent Signals		T-1A	T-1	5
TS	1350	US 30 Lincoln Hwy	IL 43 Harlem Ave	CO	Permanent Signals		T-1A	T-1	6
TS	1395	US 30 Lincoln Hwy	Orchard Dr	CO	Permanent Signals		T-1A	T-1	7
TS	1440	US 30 Lincoln Hwy	Brookwood Dr	CO	Permanent Signals		T-1A	T-1	8
TS	1590	US 41 Skokie Blvd	Old Orchard Rd	CO	Permanent Signals		T-1A	T-1	9
TS	1595	US 41 Skokie Blvd	Old Orchard North Ent	CO	Permanent Signals		T-1A	T-1	10
TS	1600	US 41 Skokie Blvd	Old Orchard Center Ent	CO	Permanent Signals		T-1A	T-1	11
TS	1605	US 41 Skokie Blvd	Old Orchard SC South Ent	CO	Permanent Signals		T-1A	T-1	12
TS	1935	IL 19 Irving Park Rd	Bartlett Rd	CO	Permanent Signals		T-1A	T-1	13
TS	1987	IL 19 Irving Park Rd	Taft Ave / Cargo Access Dr	CO	Permanent Signals		T-1A	T-1	14
TS	2035	IL 21 Milwaukee Ave	Oak Mill Mall Ent	CO	Permanent Signals		T-1A	T-1	15
TS	2040	IL 21 Milwaukee Ave	Oakton St	CO	Permanent Signals		T-1A	T-1	16
TS	2225	IL 43 Harlem Ave	127th St	CO	Permanent Signals		T-1A	T-1	17
TS	2300	IL 43 Waukegan Rd	East Lake Ave	CO	Permanent Signals		T-1A	T-1	18
TS	2465	IL 50 Cicero Ave	73rd St State Rd	CO	Permanent Signals		T-1A	T-1	19
TS	2710	IL 58 Golf Rd	IL 72 Higgins Rd	CO	Permanent Signals		T-1A	T-1	20

TS	2730	IL 58 Golf Rd	Bartlett Rd	CO	Permanent Signals		T-1A	T-1	21
TS	2945	IL 62 Algonquin Rd	Busse Rd	CO	Permanent Signals		T-1A	T-1	22
TS	3180	IL 68 Dundee Rd	Shermer Rd	CO	Permanent Signals		T-1A	T-1	23
TS	3250	IL 72 Higgins Rd	Roselle Rd	CO	Permanent Signals		T-1A	T-1	24
TS	3251	IL 72 Higgins Rd	Ash Rd	CO	Permanent Signals		T-1A	T-1	25
TS	3295	IL 72 Higgins Rd	Bartlett Rd	CO	Permanent Signals		T-1A	T-1	26
TS	3297	IL 72 Higgins Rd	Arboretum Dr	CO	Permanent Signals		T-1A	T-1	27
TS	3345	IL 83 Torrence Ave	IL 83 Glenwood Dyer Rd	CO	Permanent Signals		T-1A	T-1	28
TS	3385	IL 83 147th St SibleyBlvd	Broadway Ave	CO	Permanent Signals		T-1A	T-1	29
TS	3735	26th St	Des Plaines Ave	CO	Permanent Signals		T-1A	T-1	30
TS	3805	Central Ave	47th St	CO	Permanent Signals		T-1A	T-1	31
TS	3940	111th St	86th Ave	CO	Permanent Signals		T-1A	T-1	32
TS	4875	McCormick Blvd	Church St	CO	Permanent Signals		T-1A	T-1	33
TS	5015	Dempster St	Crawford Ave / Pulaski Rd	CO	Permanent Signals		T-1A	T-1	34
TS	5017	Dempster St	Hamlin Ave	CO	Permanent Signals		T-1A	T-1	35
TS	5020	Dempster St	East Prairie Ave	CO	Permanent Signals		T-1A	T-1	36
TS	5025	Dempster St	St Louis Ave / Lincolnwood Dr	CO	Permanent Signals		T-1A	T-1	37
TS	5030	Dempster St	Keeler Ave	CO	Permanent Signals		T-1A	T-1	38

TS	5035	McCormick Rd	Dempster St	CO	Permanent Signals		T-1A	T-1	39
TS	5045	Devon Ave	McCormick Blvd	CO	Permanent Signals		T-1A	T-1	40
TS	5155	Golf Rd	Harms Rd	CO	Permanent Signals		T-1A	T-1	41
TS	5195	Governors Hwy	Poplar Ave	CO	Permanent Signals		T-1A	T-1	42
TS	5340	McCormick Blvd	Howard St	CO	Permanent Signals		T-1A	T-1	43
TS	5465	McCormick Blvd	Main St	CO	Permanent Signals		T-1A	T-1	44
TS	5475	McCormick Blvd	Pratt Ave	CO	Permanent Signals		T-1A	T-1	45
TS	5480	McCormick Blvd	Touhy Ave	CO	Permanent Signals		T-1A	T-1	46
TS	5483	Touhy Ave	Kedzie Ave	CO	Permanent Signals		T-1A	T-1	47
TS	5485	McCormick Blvd	Oakton St	CO	Permanent Signals		T-1A	T-1	48
TS	5610	Palatine Rd	Quentin Rd	CO	Permanent Signals		T-1A	T-1	49
TS	5640	Palatine Rd	Wolf Rd	CO	Permanent Signals		T-1A	T-1	50
TS	5670	Colfax Ave	Quentin Rd	CO	Permanent Signals		T-1A	T-1	51
TS	5740	Roosevelt Rd	Laramie Ave	CO	Permanent Signals		T-1A	T-1	52
TS	10880	IL 43 Waukegan Rd	Dewes St / River Dr	CO	Permanent Signals		T-1A	T-1	53
TS	10905	IL 43 Waukegan Rd	Glenview Rd	CO	Permanent Signals		T-1A	T-1	54
TS	10920	IL 43 Waukegan Rd	Grove St	CO	Permanent Signals		T-1A	T-1	55
TS	11270	US 20 Lake St	Bartlett Rd	CO	Permanent Signals		T-1A	T-1	56
TS	11765	US 12 20 95th St	88th Ave	CO	Permanent Signals		T-1A	T-1	57

TS	11985	US 14 Northwest Hwy	Hicks Rd N Junction	CO	Permanent Signals		T-1A	T-1	58
TS	13070	Des Plaines River Rd	Perry St	CO	Permanent Signals		T-1A	T-1	59
TS	13745	IL 19 Irving Park Rd	Barrington Rd	CO	Permanent Signals		T-1A	T-1	60
TS	13750	IL 19 Irving Park Rd	Menards	CO	Permanent Signals		T-1A	T-1	61
TS	14190	5th Ave	Washington	CO	Permanent Signals		T-1A	T-1	62
TS	14195	5th Ave	Madison	CO	Permanent Signals		T-1A	T-1	63
TS	14200	5th Ave	Lake St	CO	Permanent Signals		T-1A	T-1	64
TS	14220	9th Ave	Lake St	CO	Permanent Signals		T-1A	T-1	65
TS	14730	Hicks Rd	First Bank Dr / Palatine Mall Ent	CO	Permanent Signals		T-1A	T-1	66
TS	22240	IL 62 Algonquin Rd	Penny Rd	CO	Permanent Signals		T-1A	T-1	67
TS	660	IL 53 Rohlwing Rd	Thorndale Ave	DU	Permanent Signals		T-1A	T-1	68
TS	990	IL 53 Rohlwing Rd	Nordic Rd	DU	Permanent Signals		T-1A	T-1	69
TS	995	IL 53 Rohlwing Rd	Ardmore Ave	DU	Permanent Signals		T-1A	T-1	70
TS	1988	IL 19 Irving Park Rd	Division St	DU	Permanent Signals		T-1A	T-1	71
TS	5995	I 290	US 20 & York Rd S Rp	DU	Permanent Signals		T-1A	T-1	72
TS	6060	US 20 Lake St	IL 53 (Rohlwing Rd)	DU	Permanent Signals		T-1A	T-1	73
TS	6155	IL 53 Rohlwing Rd	IL 19 Irving Park Rd	DU	Permanent Signals		T-1A	T-1	74
TS	6156	IL 53 Rohlwing	Bryn Mawr Ave	DU	Permanent Signals		T-1A	T-1	75

		Rd							
TS	6157	IL 53 Rohlwing Rd	West Thorndale Ave	DU	Permanent Signals		T-1A	T-1	76
TS	6158	IL 53 Rohlwing Rd	Norwood Ave	DU	Permanent Signals		T-1A	T-1	77
TS	6215	IL 64 North Ave	IL 53 Columbine Ave	DU	Permanent Signals		T-1A	T-1	78
TS	6260	IL 59 Joliet Rd	IL 56 Butterfield Rd	DU	Permanent Signals		T-1A	T-1	79
TS	6270	IL 56 Butterfield Rd	Batavia Rd	DU	Permanent Signals		T-1A	T-1	80
TS	6315	IL 56 Butterfield Rd	Naperville Rd	DU	Permanent Signals		T-1A	T-1	81
TS	6320	IL 56 Butterfield Rd	Winfield Rd	DU	Permanent Signals		T-1A	T-1	82
TS	6330	IL 56 Butterfield Rd	Herrick Rd Weisbrook	DU	Permanent Signals		T-1A	T-1	83
TS	6335	IL 56 Butterfield Rd	Orchard Rd	DU	Permanent Signals		T-1A	T-1	84
TS	6355	IL 59 Ingalton Rd	IL 64 North Ave	DU	Permanent Signals		T-1A	T-1	85
TS	7851	IL 53 Rohlwing Rd	Mitchel Ct	DU	Permanent Signals		T-1A	T-1	86
TS	11105	US 20 Lake St	Swift Rd	DU	Permanent Signals		T-1A	T-1	87
TS	12335	US 20 Lake St	I 355 Tollway E Ramp	DU	Permanent Signals		T-1A	T-1	88
TS	12340	US 20 Lake St	I 355 Tollway W Ramp	DU	Permanent Signals		T-1A	T-1	89
TS	12513	US 20 Lake St	Marcus Dr	DU	Permanent Signals		T-1A	T-1	90
TS	15305	IL 38 Roosevelt Rd	Villa Oaks Dr	DU	Permanent Signals		T-1A	T-1	91

TS	15310	IL 38 Roosevelt Rd	Ardmore Ave	DU	Permanent Signals		T-1A	T-1	92
TS	20370	IL 56 Butterfield Rd	Cromwell Dr	DU	Permanent Signals		T-1A	T-1	93
TS	20660	IL 56 Butterfield Rd	East Loop Dr	DU	Permanent Signals		T-1A	T-1	94
TS	815	IL 31 State St	Big Timber Rd	KA	Permanent Signals		T-1A	T-1	95
TS	858	IL 38 State St	Williamsburg Ave	KA	Permanent Signals		T-1A	T-1	96
TS	878	IL 64 North Ave	Burlington Rd	KA	Permanent Signals		T-1A	T-1	97
TS	4330	IL 31 State St	Chicago Rawhide Driveway	KA	Permanent Signals		T-1A	T-1	98
TS	4457	IL 25	West Bartlett Rd Middle St	KA	Permanent Signals		T-1A	T-1	99
TS	9020	IL 64 Main St	7th Ave	KA	Permanent Signals		T-1A	T-1	100
TS	20373	IL 31	Red Gate Rd	KA	Permanent Signals		T-1A	T-1	101
TS	935	IL 137 Buckley Rd	I 94 West Ramp NB Exit	LA	Permanent Signals		T-1A	T-1	102
TS	945	US 12	Grand Ave	LA	Permanent Signals		T-1A	T-1	103
TS	957	US12 Rand Rd	Quentin Rd Collection	LA	Permanent Signals		T-1A	T-1	104
TS	6535	US 41	IL 21 Milwaukee Ave	LA	Permanent Signals		T-1A	T-1	105
TS	6540	US 41	IL 22 Half Day Rd	LA	Permanent Signals		T-1A	T-1	106
TS	6545	US 41	IL 60 Kennedy Rd Town Line Rd	LA	Permanent Signals		T-1A	T-1	107
TS	6560	US 41	IL 173 Rockland Rd	LA	Permanent Signals		T-1A	T-1	108
TS	6567	US 41	Amhurst Parkway	LA	Permanent Signals		T-1A	T-1	109

TS	6580	US 41	Wadsworth Rd	LA	Permanent Signals		T-1A	T-1	110
TS	6710	IL 21 Milwaukee Ave	IL 137	LA	Permanent Signals		T-1A	T-1	111
TS	6735	IL 22 Half Day Rd	IL 43 Waukegan Rd	LA	Permanent Signals		T-1A	T-1	112
TS	7020	IL 131 Green Bay Rd	IL 176 Rockland Rd	LA	Permanent Signals		T-1A	T-1	113
TS	7049	IL 131 Green Bay Rd	21st St	LA	Permanent Signals		T-1A	T-1	114
TS	7050	IL 131 Green Bay Rd	IL 173 Rosecrans Rd 17th St	LA	Permanent Signals		T-1A	T-1	115
TS	7054	IL 131 Green Bay Rd	Russell Rd	LA	Permanent Signals		T-1A	T-1	116
TS	7105	IL 137 Buckley Rd	Oplaine Rd	LA	Permanent Signals		T-1A	T-1	117
TS	7110	IL 137 Buckley Rd	St Marys Rd	LA	Permanent Signals		T-1A	T-1	118
TS	7132	IL 173 Rosecrans Rd	Delaney Rd	LA	Permanent Signals		T-1A	T-1	119
TS	7135	IL 176 Slocum Lake Rd	Darrell Rd	LA	Permanent Signals		T-1A	T-1	120
TS	11115	IL 43 Waukegan Rd	Bannockburn Office Ent	LA	Permanent Signals		T-1A	T-1	121
TS	11935	IL 22 Half Day Rd	Telegraph Rd	LA	Permanent Signals		T-1A	T-1	122
TS	12275	US 41 Skokie Hwy	IL 176 Rockland Rd E Ramp	LA	Permanent Signals		T-1A	T-1	123
TS	12290	US 12	Eagle Point Rd Sayton Rd N Junction	LA	Permanent Signals		T-1A	T-1	124
TS	12295	US 12	Ela Rd	LA	Permanent Signals		T-1A	T-1	125
TS	12390	IL 22 Half Day	Ridge Rd E Junction Willow	LA	Permanent Signals		T-1A	T-1	126

		Rd	Rd						
TS	12391	IL 22 Half Day Rd	Tennyson Ln Ridge Rd W Junction	LA	Permanent Signals		T-1A	T-1	127
TS	14016	IL 21 Milwaukee Ave	Adler Park N Fire Station Ent	LA	Permanent Signals		T-1A	T-1	128
TS	14965	IL 120 Belvidere Rd	Genesee	LA	Permanent Signals		T-1A	T-1	129
TS	15035	Sherdian Rd	Belvidere Rd	LA	Permanent Signals		T-1A	T-1	130
TS	21085	IL 137 Sheridan Rd	22nd St MLK King Dr	LA	Permanent Signals		T-1A	T-1	131
TS	21120	US 41	Stearns School Rd	LA	Permanent Signals		T-1A	T-1	132
TS	21635	IL 83	Petite Lake Rd	LA	Permanent Signals		T-1A	T-1	133
TS	22155	IL 31	James R Rakow Rd	MC	Permanent Signals		T-1A	T-1	134
TS	22156	IL 31	Virginia St	MC	Permanent Signals		T-1A	T-1	135
TS	22157	IL 31	Klasen Rd	MC	Permanent Signals		T-1A	T-1	136
TS	22245	IL 62 Algonquin Rd	County Line Rd	MC	Permanent Signals		T-1A	T-1	137
TS	7416	US 30 North St Lincoln Hwy	Elsner Rd	WI	Permanent Signals		T-1A	T-1	138
TS	7418	US 30	Pfieffer Dr	WI	Permanent Signals		T-1A	T-1	139
TS	7431	US 6 Southwest Hwy	I 355 Tlwy W Ramps	WI	Permanent Signals		T-1A	T-1	140
TS	7490	US 52 Doris Ave	IL 53 Chicago St	WI	Permanent Signals		T-1A	T-1	141
TS	11950	US 52 IL 53 Chicago St	Patterson Rd	WI	Permanent Signals		T-1A	T-1	142
TS	20970	IL 126 Lockport St	Wallin Dr	WI	Permanent Signals		T-1A	T-1	143

TS	21134	US 30 Lincoln Hwy	Retail Dr Vancina Ln	WI	Permanent Signals		T-1A	T-1	144
TS	21135	US 30 Lincoln Hwy	School Rd Schmuhl Rd	WI	Permanent Signals		T-1A	T-1	145

TS	14183	5th Ave	Main St Charles	CO	Span Wire Installation		T-1B	T-1	1
TS	992	IL 53 Rohlwing Rd	Spring Lake Medinah	DU	Span Wire Installation		T-1B	T-1	2
TS	5985	I 290 Ramps K & O	US 20 Lake St	DU	Span Wire Installation		T-1B	T-1	3
TS	6150	IL 19 Irving Park Rd	Oleary Dr	DU	Span Wire Installation		T-1B	T-1	4
TS	12373	IL 64 North Ave	Atlantic Dr	DU	Span Wire Installation		T-1B	T-1	5
TS	7333	IL 47	Plank Rd	KA	Span Wire Installation		T-1B	T-1	6
TS	7442	US 30	Marley	WI	Span Wire Installation		T-1B	T-1	7
TS	7552	IL 50 Governors Hwy	Court St	WI	Span Wire Installation		T-1B	T-1	8

FL	190	IL 47	IL 64 North Ave	KA	Overhead Beacons		T-2A	T-2	1
FL	860	IL 38	Meredith	KA	Overhead Beacons		T-2A	T-2	2
FL	895	US 45 IL 52 Main St	Wilmington Peotone Rd	WI	Overhead Beacons		T-2A	T-2	3
FL	11950	US 52 IL 53 Chicago St	Patterson Rd	WI	Overhead Beacons		T-2A	T-2	4

FL	20405	IL 21 Milwaukee Ave	US 45 Des Plaines River Rd	CO	Low Mount Beacons		T-2B	T-2	1
FL	762	IL 72 EB	Randall Rd	KA	Low Mount Beacons		T-2B	T-2	2
FL	763	IL 72 WB	Randall Rd	KA	Low Mount Beacons		T-2B	T-2	3

FL	781	IL 173 Rosecrans Rd EB	Kilbourne Rd	LA	Low Mount Beacons		T-2B	T-2	4
FL	782	IL 173 Rosecrans Rd WB	Kilbourne Rd	LA	Low Mount Beacons		T-2B	T-2	5
FL	783	IL 173 Rosecrans Rd	Kilbourne Rd NB	LA	Low Mount Beacons		T-2B	T-2	6
FL	784	IL 173 Rosecrans Rd	Kilbourne Rd SB	LA	Low Mount Beacons		T-2B	T-2	7
FL	105	IL 31 NB	Edgewood Rd	MC	Low Mount Beacons		T-2B	T-2	8
FL	106	IL 31 SB	Edgewood Rd	MC	Low Mount Beacons		T-2B	T-2	9
FL	110	IL 31 NB	Ames Rd	MC	Low Mount Beacons		T-2B	T-2	10
FL	111	IL 31 SB	Ames Rd	MC	Low Mount Beacons		T-2B	T-2	11
FL	11881	IL 176 Crystal Lake Rd WB	Briarwood	MC	Low Mount Beacons		T-2B	T-2	12
FL	11882	IL 176 Crystal Lake Rd	Briarwood SB	MC	Low Mount Beacons		T-2B	T-2	13
FL	11883	IL 176 Crystal Lake Rd	Briarwood NB	MC	Low Mount Beacons		T-2B	T-2	14
FL	11884	IL 176 EB	Briarwood	MC	Low Mount Beacons		T-2B	T-2	15
FL	11952	US 52 IL 53 Chicago St	Patterson Rd NB	WI	Low Mount Beacons		T-2B	T-2	16
FL	11953	US 52 IL 53 Chicago St	Patterson Rd SB	WI	Low Mount Beacons		T-2B	T-2	17

TRAFFIC SIGNAL LOCATIONS - PROPOSED TRANSFERS FROM LOCAL TO STATE MAINTAINED (2012-2013)

Sys	Loc. #	Main Route	Cross Street	Co.	Type of Equipment		System Type	Pay Item	Qty
TS	870	IL 64	Kirk	KA	Permanent Signals		T-1A	T-1	1

TS	8980	IL 64	Dunham	KA	Permanent Signals		T-1A	T-1	2
TS	9000	IL 64	Tyler	KA	Permanent Signals		T-1A	T-1	3
TS	9023	IL 64	Smith Kautz	KA	Permanent Signals		T-1A	T-1	4
TS	9024	IL 64	Pheasent Run	KA	Permanent Signals		T-1A	T-1	5
TS	12070	IL 64	Powis	KA	Permanent Signals		T-1A	T-1	6
TS	21745	IL 64	38th Charlestowne	KA	Permanent Signals		T-1A	T-1	7
TS	21746	IL 64	Charlestowne Mall	KA	Permanent Signals		T-1A	T-1	8
TS	21747	IL 64	Lakeside Foxfield	KA	Permanent Signals		T-1A	T-1	9
TS	14980	Grand Ave	Baldwin	LA	Permanent Signals		T-1A	T-1	10
TS	14985	Grand Ave	McAree	LA	Permanent Signals		T-1A	T-1	11
TS	14990	Grand Ave	Genessee	LA	Permanent Signals		T-1A	T-1	12
TS	14995	Grand Ave	County St.	LA	Permanent Signals		T-1A	T-1	13
TS	15000	Grand Ave	West St	LA	Permanent Signals		T-1A	T-1	14
TS	15005	Grand Ave	Jackson	LA	Permanent Signals		T-1A	T-1	15
TS	15010	Grand Ave	Butrick	LA	Permanent Signals		T-1A	T-1	16
TS	15015	Grand Ave	Lewis Ave	LA	Permanent Signals		T-1A	T-1	17
TS	15065	Sheridan Rd	Miraflores Ave	LA	Permanent Signals		T-1A	T-1	18
TS	15080	Sheridan Rd	Greenwood	LA	Permanent Signals		T-1A	T-1	19

Sys	Loc. #	Main Route	Cross Street	Co.	Type of Equipment		System Type	Pay Item	Qty
TS	Various	I 57	Stuenkel Rd Ramp	CO	Permanent Signals		T-1A	T-1	1
TS	Various	US 45	142nd	CO	Permanent Signals		T-1A	T-1	2
TS	Various	IL 72	Prairie Stone	CO	Permanent Signals		T-1A	T-1	3
TS	Various	IL 83	Wallace	CO	Permanent Signals		T-1A	T-1	4
TS	Various	US 30	Owen Ridgemoor	CO	Permanent Signals		T-1A	T-1	5
TS	Various	I 94	IL 173 Ramp	LA	Permanent Signals		T-1A	T-1	6
TS	Various	US 20	McLean Blvd	KA	Permanent Signals		T-1A	T-1	7
TS	Various	IL 31	Quarry	KA	Permanent Signals		T-1A	T-1	8

EXTRA SYSTEM LOCATIONS ON STATE MAINTENANCE AS OF 5-31-12

Sys	Loc. #	Main Route	Cross St	Co	Description	Equipment Type	System Type	Pay Item	Qty
X	BRAN	Moveable Bridge	River @ Brandon	WI	Bridge & Traffic Controls	Various	BR	X-1	1
X	BCASS	Moveable Bridge	River @ Cass St	WI	Bridge & Traffic Controls	Various	BR	X-1	2
X	BJACK	Moveable Bridge	River @ Jackson St	WI	Bridge & Traffic Controls	Various	BR	X-1	3
X	BJEFF	Moveable Bridge	River @ Jefferson St	WI	Bridge & Traffic Controls	Various	BR	X-1	4
X	BMCDN	Moveable Bridge	River @ Jefferson St	WI	Bridge & Traffic Controls	Various	BR	X-1	5
X	BRUBY	Moveable	River @ Ruby St	WI	Bridge & Traffic	Various	BR	X-1	6

		Bridge			Controls				
X	BRIDGE	Moveable Bridge	Office / Joliet	WI	Bridge/Traffic/Ltg Control	Various	BR	X-1	7
X	H290-A	HAR	I 290 IB @ Ashland Ave	CO	Hwy Advisory Radio	Radio	HAR	X-1	8
X	H290-E	HAR	I 290 OB @ Westchester	CO	Hwy Advisory Radio	Radio	HAR	X-1	9
X	H290-T	HAR	I 290 IB @ Thorndale Ave	CO	Hwy Advisory Radio	Radio	HAR	X-1	10
X	H394-186	HAR	IL 394 IB @ 186th St	CO	Hwy Advisory Radio	Radio	HAR	X-1	11
X	H55-TW	HAR	I 55 IB @ I 294	CO	Hwy Advisory Radio	Radio	HAR	X-1	12
X	H90-N	HAR	I 90 IB @ Nagle Ave	CO	Hwy Advisory Radio	Radio	HAR	X-1	13
X	H90-TW	HAR	I 190 IB @ I 294	CO	Hwy Advisory Radio	Radio	HAR	X-1	14
X	H94-159	HAR	I 94 OB @ 159th St	CO	Hwy Advisory Radio	Radio	HAR	X-1	15
X	H94-P	HAR	I 94 IB @ Pratt Ave	CO	Hwy Advisory Radio	Radio	HAR	X-1	16
X	H94-T	HAR	I 94 IB @ Tower Rd	CO	Hwy Advisory Radio	Radio	HAR	X-1	17
X	M6105	Alsip Yard	11801 S Ridgeland Ave	CO	Maintenance Yard	Various	MY	X-1	18
X	M6110	Arlington Heights Yd	210 E Noyse	CO	Maintenance Yard	Various	MY	X-1	19
X	M6115	Bishop Ford	16915 Van Dam Rd	CO	Maintenance Yard	Various	MY	X-1	20

		Yard							
X	M6120	Dan Ryan Yard	6543 S Wentworth Ave	CO	Maintenance Yard	Cam/Various	MY	X-1	21
X	M6125	Edens Yard	2 Happ Rd	CO	Maintenance Yard	Various	MY	X-1	22
X	M6130	Eisenhower Yard	5201 W Flournoy St	CO	Maintenance Yard	Various	MY	X-1	23
X	M6135	Rodenburg Yd/BS/CC	1480 Rodenburg Rd	CO	Maint Yd/Base Sta/Com	Cam/Various	MY	X-1	24
X	M6140	ETP	3501 Normal Ave Cgo	CO	Maint Yd/Equip	AVL/Various	MY	X-1	25
X	M6145	Harvey Yard	16738 S Lathrop Ave	CO	Maintenance Yard	Various	MY	X-1	26
X	M6150	Hillside Yard/BS	East Ave & May St	CO	Maint Yd/Base Station	Cam/Various	MY	X-1	27
X	M6155	Biesterfield Brdg Off	1101 Biesterfield Rd	CO	Bridge Office/Yard	Cam/Various	MY	X-1	28
X	M6160	I 57 Yard	16010 S Crawford Ave	CO	Maintenance Yard	Various	MY	X-1	29
X	M6165	Southside Sign Shop	15940 Pulaski Rd	CO	Maintenance Yard	Various	MY	X-1	30
X	M6170	Kennedy Yard	5027 N Central Ave	CO	Maintenance Yard	Various	MY	X-1	31
X	M6175	Landscape Yard	1260 W Augusta Blvd	CO	Maintenance Yard	Various	MY	X-1	32
X	M6180	Northbrook Yard	1916 Techny Rd	CO	Maintenance Yard	Various	MY	X-1	33
X	M6185	Northside Sign Shop	7151 Forest Preserve Dr	CO	Maintenance Yard	Cam/Various	MY	X-1	34
X	M6190	Northside	4051 N Harlem	CO	Maintenance Yard	Various	MY	X-1	35

		Yard	Ave						
X	M6195	Stevenson Yard	Joliet Rd & 1st Ave	CO	Maint Yd/Mat Lab	Various	MY	X-1	36
X	M6199	IDOT Mat Lab	101 Center Ct Schaum	CO	Material Lab	Various	MY	X-1	37
X	M6210	Naperville Yard	28 W 731 Ogden Ave	DU	Maintenance Yard	Various	MY	X-1	38
X	M6215	Oakbrook Yard	17 W 125 Butterfield Rd	DU	Maintenance Yard	Various	MY	X-1	39
X	M6310	Elgin Sign Shop	595 S State St	KA	Sign Shop & Mat Lab	Various	MY	X-1	40
X	M6315	ISP 2	777 S State St	KA	State Police Office	Various	MY	X-1	41
X	M6320	St Charles Yard	38 W 027 IL 38	KA	Maint Yd/Storage	Various	MY	X-1	42
X	M6325	Shales Pkwy Stor	525 Shales Pkwy	KA	Maintenance Yard	Various	MY	X-1	43
X	M6410	Grayslake Yard	219 N Baron Blvd	LA	Maintenance Yard	Various	MY	X-1	44
X	M6415	Gurnee Yard	3516 W Washington St	LA	Maintenance Yard	Various	MY	X-1	45
X	M6420	Lake Zurich SS/Yd	700 S Ela Rd	LA	Sign Shop/Maint Yd	Various	MY	X-1	46
X	M6505	Woodstock Yard	11916 Catalpa Lane	MC	Maintenance Yard	Various	MY	X-1	47
X	M6605	Birds Bridge Yard	I 55 & US 6	WI	Maintenance Yard	Various	MY	X-1	48
X	M6610	I 55 Yard	Route 5	WI	Maintenance Yard	Various	MY	X-1	49
X	M6615	Joliet Yard	Caton Farm Rd &	WI	Maintenance Yard	Various	MY	X-1	50

			IL 53						
X	M6620	Monee Storage Yd	IL 50 & US 6	WI	Maintenance Yard	Various	MY	X-1	51
X	M6625	New Lenox Yard	I 80 & US 30	WI	Maintenance Yard	Various	MY	X-1	52
X	M6630	New Lenox SS	I 80 & US 30	WI	Sign Shop & Mat Lab	Various	MY	X-1	53
X	RI57IB	Prairieview Rest Area	I 57 IB @ Peotone	WI	Rest Area	Ltg/Pumps	RA	X-1	54
X	RI57OB	Prairieview Rest Area	I 57 OB @ Peotone	WI	Rest Area	Ltg/Pumps	RA	X-1	55
X	VAC1	Matteson Viaduct 214	Governors Hwy & 214th St	CO	Viaduct Access Control	Floats	VA	X-1	56
X	VAC2	Matteson Viaduct 219	Governors Hwy & 219th St	CO	Viaduct Access Control	Floats	VA	X-1	57
X	WS30	Weigh Station	US 30 E of Torrence	CO	Chicago Heights	Ltg/Signs	WS	X-1	58
X	WS83	Weigh Station	IL 83 & St Charles	DU	Elmhurst	Ltg/Signs	WS	X-1	59
X	WS41IB	Weigh Station	US 41 IB @ Rosecrans	LA	Rosecrans	Ltg/Signs	WS	X-1	60
X	WS41OB	Weigh Station	US 41 OB @ Wadsworth	LA	Wadsworth	Ltg/Signs	WS	X-1	61
X	WS12	Weigh Station	US 12 & Burlington Rd	MC	Richmond	Ltg/Signs	WS	X-1	62
X	WS14	Weigh Station	US 14 & Crowley Rd	MC	Harvard	Ltg/Signs	WS	X-1	63
X	55IB	Weigh	I 55 IB W of IL 53	WI	Bolingbrook	Ltg/Signs	WS	X-1	64

		Station							
X	55OB	Weigh Station	I 55 OB W of IL 53	WI	Bolingbrook	Ltg/Signs	WS	X-1	65
X	80IB	Weigh Station	I 80 IB E of Townline	WI	Frankfort	Ltg/Signs	WS	X-1	66
X	80OB	Weigh Station	I 80 OB E of Townline	WI	Frankfort	Ltg/Signs	WS	X-1	67
X	57IB	Weigh Station	I 57 N of US 52	WI	Peotone	Ltg/Signs	WS	X-1	68
X	57OB	Weigh Station	I 57 N of US 52	WI	Peotone	Ltg/Signs	WS	X-1	69

PROPOSED EXTRA SYSTEM LOCATIONS

Sys	Loc. #	Main Route	Cross St	Co	Description	Equipment Type	System Type	Pay Item	Qty
X	H57-123	HAR	I 57 IB @ 123rd St	CO	Hwy Advisory Radio	Radio	HR	X-1	1
X	H80-EB	HAR	I 80 EB Lincoln Oasis	CO	Hwy Advisory Radio	Radio	HR	X-1	2
X	H80-WB	HAR	I 80 WB @ Jarnecke	CO	Hwy Advisory Radio	Radio	HR	X-1	3
X	H9094-R	HAR	I 90 94 OB @ Roosevelt	CO	Hwy Advisory Radio	Radio	HR	X-1	4
X	H9094-59	HAR	I 90 94 IB @ 59th St	CO	Hwy Advisory Radio	Radio	HR	X-1	5
X	H94-75	HAR	I 94 OB @ 75th St	CO	Hwy Advisory Radio	Radio	HR	X-1	6
X	H94-91	HAR	I 94 IB @ 91st St	CO	Hwy Advisory	Radio	HR	X-1	7

					Radio				
X	H94-119	HAR	I 94 IB @ 119th St	CO	Hwy Advisory Radio	Radio	HR	X-1	8

AGREEMENT TO PLAN QUANTITY (BDE)

Effective: January 1, 2012

Revise the second paragraph of Article 202.07(a) of the Standard Specifications to read:

"When the plans or work have been altered, or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured. When plan quantities are revised by the issuance of revised plan sheets that are made part of the contract, and the Contractor and the Engineer have agreed in writing that the revised quantities are accurate, no further measurement will be required and payment will be made for the revised quantities shown."

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term "equipment" refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted using the phased in approach shown below. Equipment that is of a model year older than the year given for that equipment's respective horsepower range shall be retrofitted:

Effective Dates	Horsepower Range	Model Year
June 1, 2010 [1/]	600-749	2002
	750 and up	2006
June 1, 2011 [2/]	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 [2/]	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

1/ Effective dates apply to Contractor diesel powered off-road equipment assigned to the contract.

2/ Effective dates apply to Contractor and subcontractor diesel powered off-road equipment assigned to the contract.

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (http://www.epa.gov/otaq/retrofit/verif-list.htm), or verified by the California Air Resources Board (CARB) (http://www.arb.ca.gov/diesel/verde/verdev.htm); or

b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be $1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected. Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

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CONSTRUCTION AIR QUALITY - DIESEL VEHICLE EMISSIONS CONTROL (BDE)

Effective: April 1, 2009 Revised: January 2, 2012

Diesel Vehicle Emissions Control. The reduction of construction air emissions shall be accomplished by using cleaner burning diesel fuel. The term “equipment” refers to any and all diesel fuel powered devices rated at 50 hp and above, to be used on the project site in excess of seven calendar days over the course of the construction period on the project site (including any “rental” equipment).

All equipment on the jobsite, with engine ratings of 50 hp and above, shall be required to: use Ultra Low Sulfur Diesel fuel (ULSD) exclusively (15 ppm sulfur content or less).

Diesel powered equipment in non-compliance will not be allowed to be used on the project site, and is also subject to a notice of non-compliance as outlined below.

The Contractor shall certify that only ULSD will be used in all jobsite equipment. The certification shall be presented to the Department prior to the commencement of the work.

If any diesel powered equipment is found to be in non-compliance with any portion of this specification, the Engineer will issue the Contractor a notice of non-compliance and identify an appropriate period of time, as outlined below under environmental deficiency deduction, in which to bring the equipment into compliance or remove it from the project site.

Any costs associated with bringing any diesel powered equipment into compliance with these diesel vehicle emissions controls shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall also not be grounds for a claim.

Environmental Deficiency Deduction. When the Engineer is notified, or determines that an environmental control deficiency exists, he/she will notify the Contractor in writing, and direct the Contractor to correct the deficiency within a specified time period. The specified time-period, which begins upon Contractor notification, will be from 1/2 hour to 24 hours long, based on the urgency of the situation and the nature of the deficiency. The Engineer shall be the sole judge regarding the time period.

The deficiency will be based on lack of repair, maintenance and diesel vehicle emissions control.

If the Contractor fails to correct the deficiency within the specified time frame, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be $1,000.00 for each deficiency identified.

If a Contractor or subcontractor accumulates three environmental deficiency deductions in a contract period, the Contractor will be shutdown until the deficiency is corrected. Such a shutdown will not be grounds for any extension of contract time, waiver of penalties, or be grounds for any claim.

CONSTRUCTION AIR QUALITY - IDLING RESTRICTIONS (BDE)

Effective: April 1, 2009

Idling Restrictions. The Contractor shall establish truck-staging areas for all diesel powered vehicles that are waiting to load or unload material at the jobsite. Staging areas shall be located where the diesel emissions from the equipment will have a minimum impact on adjacent sensitive receptors. The Department will review the selection of staging areas, whether within or outside the existing highway right-of-way, to avoid locations near sensitive areas or populations to the extent possible. Sensitive receptors include, but are not limited to, hospitals, schools, residences, motels, hotels, daycare facilities, elderly housing and convalescent facilities. Diesel powered engines shall also be located as far away as possible from fresh air intakes, air conditioners, and windows. The Engineer will approve staging areas before implementation.

Diesel powered vehicle operators may not cause or allow the motor vehicle, when it is not in motion, to idle for more than a total of 10 minutes within any 60 minute period, except under any of the following circumstances:

1) The motor vehicle has a gross vehicle weight rating of less than 8000 lb (3630 kg).
2) The motor vehicle idles while forced to remain motionless because of on-highway traffic, an official traffic control device or signal, or at the direction of a law enforcement official.
3) The motor vehicle idles when operating defrosters, heaters, air conditioners, or other equipment solely to prevent a safety or health emergency.
4) A police, fire, ambulance, public safety, other emergency or law enforcement motor vehicle, or any motor vehicle used in an emergency capacity, idles while in an emergency or training mode and not for the convenience of the vehicle operator.
5) The primary propulsion engine idles for maintenance, servicing, repairing, or diagnostic purposes if idling is necessary for such activity.
6) A motor vehicle idles as part of a government inspection to verify that all equipment is in good working order, provided idling is required as part of the inspection.
7) When idling of the motor vehicle is required to operate auxiliary equipment to accomplish the intended use of the vehicle (such as loading, unloading, mixing, or processing cargo; controlling cargo temperature; construction operations, lumbering operations; oil or gas well servicing; or farming operations), provided that this exemption does not apply when the vehicle is idling solely for cabin comfort or to operate non-essential equipment such as air conditioning, heating, microwave ovens, or televisions.
8) When the motor vehicle idles due to mechanical difficulties over which the operator has no control.
9) The outdoor temperature is less than 32 °F (0 °C) or greater than 80 °F (26 °C).

When the outdoor temperature is greater than or equal to 32 °F (0 °C) or less than or equal to 80 °F (26 °C), a person who operates a motor vehicle operating on diesel fuel shall not cause or allow the motor vehicle to idle for a period greater than 30 minutes in any 60 minute period while waiting to weigh, load, or unload cargo or freight, unless the vehicle is in a line of vehicles that regularly and periodically moves forward.

The above requirements do not prohibit the operation of an auxiliary power unit or generator set as an alternative to idling the main engine of a motor vehicle operating on diesel fuel.

Environmental Deficiency Deduction. When the Engineer is notified, or determines that an environmental control deficiency exists based on non-compliance with the idling restrictions, he/she will notify the Contractor, and direct the Contractor to correct the deficiency.

If the Contractor fails to correct the deficiency a monetary deduction will be imposed. The monetary deduction will be $1,000.00 for each deficiency identified.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000 Revised: August 2, 2011

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract that the Contractor signs with a subcontractor.

> The Contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined that the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform 0.00% of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

(a) The bidder documents that enough DBE participation has been obtained to meet the goal: or

(b) The bidder documents that a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217)785-4611, or by visiting the Department's website at www.dot.il.gov.

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement. The failure of the bidder to comply will render the bid not responsive.

(a) The bidder shall submit a Disadvantaged Business Utilization Plan on Department forms SBE 2025 and 2026 with the bid.

(b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number, and telefax number of a responsible official of the bidder designated for purposes of notification of plan approval or disapproval under the procedures of this Special Provision.

(c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:

(1) The names and addresses of DBE firms that will participate in the contract;

(2) A description, including pay item numbers, of the work each DBE will perform;

(3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price, and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;

(4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subcontractors whose participation is submitted to meet the contract goal;

(5) if the bidder is a joint venture comprised of DBE companies and non-DBE companies, the plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,

(6) If the contract goal if not met, evidence of good faith efforts.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan submitted by the apparent successful bidder is approved. All information submitted by the bidder must be complete, accurate and adequately document that enough DBE participation has been obtained or document that good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work performance to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. The Utilization Plan will not be approved by the Department if the Utilization Plan does not document sufficient DBE participation to meet the contract goal unless the apparent successful bidder documented in the Utilization Plan that it made a good faith effort to meet the goal. This means that the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts that the bidder has made. Mere *pro forma* efforts, in other words, efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

(a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive.

Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases, and will be considered by the Department.

(1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.

b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable.

(5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.

(7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.

(b) If the Department determines that the apparent successful bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided that it is otherwise eligible for award. If the Department determines that the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification shall include a statement of reasons for the determination.

(c) The bidder may request administrative reconsideration of a determination adverse to the bidder within the five working days after the receipt of the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217)785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The determination shall become final if a request is not made and delivered. A request may provide additional written documentation and/or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for consideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR Part 26.55, the provisions of which govern over the summary contained herein.

(a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.

(b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.

(c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the prime Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.

(d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:

    (1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.

    (2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission is receives as a result of the lease arrangement.

(e) DBE as a material supplier:

    (1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
    (2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.
    (3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a regular dealer or manufacturer.

CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the Participation Statement.

(a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217)785-4611. Telefax number (217)785-1524.

(b) TERMINATION OR REPLACEMENT. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in the Special Provision.

(c) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, than a new Request for Approval of Subcontractor shall not be required. However, the Contractor must document efforts to assure that the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.

(d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

(1) That the replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or

(2) That the DBE is aware that its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or

(3) That the DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

(e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE subcontractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subcontractor, the Contractor shall give notice in writing to the DBE subcontractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

(1) The listed DBE subcontractor fails or refuses to execute a written contract;

(2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;

(3) The listed DBE subcontractor fails or refuses to meet the prime Contractor's reasonable, nondiscriminatory bond requirements;

(4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable state law.

(6) You have determined that the listed DBE subcontractor is not a responsible contractor;

(7) The listed DBE subcontractor voluntarily withdraws from the projects and provides to you written notice of its withdrawal;

(8) The listed DBE is ineligible to receive DBE credit for the type of work required;

(9) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;

(10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime Contractor can self-perform the work for which the DBE contractor was engaged or so that the prime Contractor can substitute another DBE or non-DBE contractor after contract award.

When a DBE is terminated, or fails to complete its work on the Contract for any reason the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established Contract goal.

(f) PAYMENT RECORDS. The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than thirty calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Regional Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes that the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the BDE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.

(g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

(h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor my request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of “Good Faith Effort Procedures” of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department.

ERRATA FOR THE 2012 STANDARD SPECIFICATIONS (BDE)

Effective: April 1, 2012 Revised: August 1, 2012

Page 182 Article 354.12. In the second line of the first paragraph change “Article 353.12” to “Article 353.13”.

Page 183 Article 355.10. In the second line of the first paragraph change “Article 353.12” to “Article 353.13”.

Page 185 Article 356.10. In the second line of the first paragraph change “Article 353.12” to “Article 353.13”.

Page 337 Article 505.04. Revise the subparagraph “(i) Match Making.” to “(i) Match Marking.”.

Page 360 Article 506.07. In the first line of the second paragraph change “AASHTO/AWS D1.5/D1.5:” to “AASHTO/AWS D1.5M/D1.5:”.

Page 361 Article 506.08. In the third line of the sixth paragraph change “506.08(a)” to “506.08(b)”.

Page 531 Article 609.07. In the first paragraph delete “TYPE B, C, or D INLET BOX STANDARD 609001 or”.

Page 601 Article 701.18(h). In the first line of the first paragraph change “Standard 701426.” “Standard 701426 and 701427.”.

Page 609 Article 703.05. In the first line of the second paragraph delete “or Type II”.

Page 989 Article 1083.02(a). In the seventh line of the first paragraph change “Table 14.7.5.2-2” to “Table 14.7.5.2-1”.

Page 1019 Article 1095.01(b)(1)e. In the table for daylight reflectance for the color yellow, change “75 % min.” to “45 % min.”.

FLAGGER AT SIDE ROADS AND ENTRANCES (BDE)

Effective: April 1, 2009

Revise the second paragraph of Article 701.13(a) of the Standard Specifications to read:

“The Engineer will determine when a side road or entrance shall be closed to traffic. A flagger will be required at each side road or entrance remaining open to traffic within the operation where two-way traffic is maintained on one lane of pavement. The flagger shall be positioned as shown on the plans or as directed by the Engineer.”

Revise the first and second paragraph of Article 701.20(i) of the Standard Specifications to read:

"Signs, barricades, or other traffic control devices required by the Engineer over and above those specified will be paid for according to Article 109.04. All flaggers required at side roads and entrances remaining open to traffic including those that are shown on the Highway Standards and/or additional barricades required by the Engineer to close side roads and entrances will be paid for according to Article 109.04."

PAYMENTS TO SUBCONTRACTORS (BDE)

Effective: June 1, 2000 Revised: January 1, 2006

Federal regulations found at 49 CFR §26.29 mandate the Department to establish a contract clause to require Contractors to pay subcontractors for satisfactory performance of their subcontracts and to set the time for such payments.

State law also addresses the timing of payments to be made to subcontractors and material suppliers. Section 7 of the Prompt Payment Act, 30 ILCS 540/7, requires that when a Contractor receives any payment from the Department, the Contractor shall make corresponding, proportional payments to each subcontractor and material supplier performing work or supplying material within 15 calendar days after receipt of the Department payment. Section 7 of the Act further provides that interest in the amount of two percent per month, in addition to the payment due, shall be paid to any subcontractor or material supplier by the Contractor if the payment required by the Act is withheld or delayed without reasonable cause. The Act also provides that the time for payment required and the calculation of any interest due applies to transactions between subcontractors and lower-tier subcontractors and material suppliers throughout the contracting chain.

This Special Provision establishes the required federal contract clause, and adopts the 15 calendar day requirement of the State Prompt Payment Act for purposes of compliance with the federal regulation regarding payments to subcontractors. This contract is subject to the following payment obligations.

When progress payments are made to the Contractor according to Article 109.07 of the Standard Specifications, the Contractor shall make a corresponding payment to each subcontractor and material supplier in proportion to the work satisfactorily completed by each subcontractor and for the material supplied to perform any work of the contract. The proportionate amount of partial payment due to each subcontractor and material supplier throughout the contracting chain shall be determined by the quantities measured or otherwise determined as eligible for payment by the Department and included in the progress payment to the Contractor. Subcontractors and material suppliers shall be paid by the Contractor within 15 calendar days after the receipt of payment from the Department. The Contractor shall not hold retainage from the subcontractors. These obligations shall also apply to any payments made by subcontractors and material suppliers to their subcontractors and material suppliers; and to all payments made to lower tier subcontractors and material suppliers throughout the contracting chain. Any payment or portion of a payment subject to this provision may only be withheld from the subcontractor or material supplier to whom it is due for reasonable cause.

This Special Provision does not create any rights in favor of any subcontractor or material supplier against the State or authorize any cause of action against the State on account of any payment, nonpayment, delayed payment, or interest claimed by application of the State Prompt Payment Act. The Department will not approve any delay or postponement of the 15 day requirement except for reasonable cause shown after notice and hearing pursuant to Section 7(b) of the State Prompt Payment Act. State law creates other and additional remedies available to any subcontractor or material supplier, regardless of tier, who has not been paid for work properly performed or material furnished. These remedies are a lien against public funds set forth in Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c), and a recovery on the Contractor's payment bond according to the Public Construction Bond Act, 30 ILCS 550.

PAYROLLS AND PAYROLL RECORDS (BDE)

Effective: January 2, 2012

Revise Section IV of Check Sheet #5 of the Recurring Special Provisions to read:

"IV. COMPLIANCE WITH THE PREVAILING WAGE ACT

1. Prevailing Wages. All wages paid by the Contractor and each subcontractor shall be in compliance with The Prevailing Wage Act (820 ILCS 130), as amended, except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto. If the Department of Labor revises the wage rates, the Contractor will not be allowed additional compensation on account of said revisions.

2. Payroll Records. The Contractor and each subcontractor shall make and keep, for a period of three years from the later of the date of final payment under the contract or completion of the contract, records of the wages paid to his/her workers. The payroll records shall include each worker's name, address, telephone number, social security number, classification, rate of pay, number of hours worked each day, starting and ending times of work each day, total hours worked each week, itemized deductions made, and actual wages paid. Upon seven business days' notice, these records shall be available at a location within the State, during reasonable hours, for inspection by the Department; the Department of Labor; and Federal, State or local law enforcement agencies and prosecutors.

3. Submission of Payroll Records. The Contractor and each subcontractor shall submit payroll records to the Engineer each week from the start to the completion of their respective work, except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted to the Engineer. The submittals shall be on the Department's form SBE 48, or an approved facsimile. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate box ("No Work", "Suspended", or "Complete") checked on the form.

Each submittal shall be accompanied by a statement signed by the Contractor or subcontractor, or an officer, employee or officer thereof, which avers that: (i) he or she has examined the records and such records are true and accurate; (ii) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required by the Act; and (iii) the Contractor or subcontractor is aware that filing a payroll record that he/she knows to be false is a Class A misdemeanor.

4. Employee Interviews. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor."

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: April 2, 2005 Revised: April 1, 2011

To account for the preparatory work and operations necessary for the movement of subcontractor personnel, equipment, supplies, and incidentals to the project site and for all other work or operations that must be performed or costs incurred when beginning work approved for subcontracting according to Article 108.01 of the Standard Specifications, the Contractor shall make a mobilization payment to each subcontractor.

This mobilization payment shall be made at least 14 days prior to the subcontractor starting work. The amount paid shall be equal to 3 percent of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor's work.

The mobilization payment to the subcontractor is an advance payment of the reported amount of the subcontract and is not a payment in addition to the amount of the subcontract; therefore, the amount of the advance payment will be deducted from future progress payments.

This provision shall be incorporated directly or by reference into each subcontract approved by the Department.

TRACKING THE USE OF PESTICIDES (BDE)

Effective: August 1, 2012

Add the following paragraph after the first paragraph of Article 107.23 of the Standard Specifications:

"Within 48 hours of the application of pesticides, including but not limited to herbicides, insecticides, algaecides, and fungicides, the Contractor shall complete and return to the Engineer, Operations form "OPER 2720"."

TRAFFIC CONTROL DEFICIENCY DEDUCTION (BDE)

Effective: August 1, 2011

Revise the third sentence of the third paragraph of Article 105.03(b) of the Standard Specifications to read:

"The daily monetary deduction will be $2,500."

UTILITY COORDINATION AND CONFLICTS (BDE)

Effective: April 1, 2011 Revised: January 1, 2012

Revise Article 105.07 of the Standard Specifications to read:

"**105.07 Cooperation with Utilities.** The Department reserves the right at any time to allow work by utilities on or near the work covered by the contract. The Contractor shall conduct his/her work so as not to interfere with or hinder the progress or completion of the work being performed by utilities. The Contractor shall also arrange the work and shall place and dispose of the materials being used so as not to interfere with the operations of utility work in the area.

The Contractor shall cooperate with the owners of utilities in their removal and rearrangement operations so work may progress in a reasonable manner, duplication or rearrangement of work may be reduced to a minimum, and services rendered by those parties will not be unnecessarily interrupted.

The Contractor shall coordinate with any planned utility adjustment or new installation and the Contractor shall take all precautions to prevent disturbance or damage to utility facilities. Any failure on the part of the utility owner, or their representative, to proceed with any planned utility adjustment or new installation shall be reported promptly by the Contractor to the Engineer."

Revise the first sentence of the last paragraph of Article 107.19 of the Standard Specifications to read:

"When the Contractor encounters unexpected regulated substances due to the presence of utilities in unanticipated locations, the provisions of Article 107.40 shall apply; otherwise, if the Engineer does not direct a resumption of operations, the provisions of Article 108.07 shall apply."

Revise Article107.31 of the Standard Specification to read:

"**107.31 Reserved.**"

Add the following four Articles to Section 107 of the Standard Specifications:

"**107.37 Locations of Utilities within the Project Limits.** All known utilities existing within the limits of construction are either indicated on the plans or visible above ground. For the purpose of this Article, the limits of proposed construction are defined as follows:

(a) Limits of Proposed Construction for Utilities Paralleling the Roadway.

(1) The horizontal limits shall be a vertical plane, outside of, parallel to, and 2 ft (600 mm) distant at right angles from the plan or revised slope limits.

In cases where the limits of excavation for structures are not shown on the plans, the horizontal limits shall be a vertical plane 4 ft (1.2 m) outside the edges of structure footings or the structure where no footings are required.

(2) The upper vertical limits shall be the regulations governing the roadbed clearance for the specific utility involved.

(3) The lower vertical limits shall be either the top of the utility at the depth below the proposed grade as prescribed by the governing agency or the limits of excavation, whichever is less.

(b) Limits of Proposed Construction for Utilities Crossing the Roadway in a Generally Transverse Direction.

(1) Utilities crossing excavations for structures that are normally made by trenching such as sewers, underdrains, etc. and all minor structures such as manholes, inlets, foundations for signs, foundations for traffic signals, etc., the limits shall be the space to be occupied by the proposed permanent construction, unless otherwise required by the regulations governing the specific utility involved.

(2) For utilities crossing the proposed site of major structures such as bridges, sign trusses, etc., the limits shall be as defined above for utilities extending in the same general direction as the roadway.

It is understood and agreed that the Contractor has considered in the bid all of the permanent and temporary utilities in their present and/or adjusted positions as indicated in the contract. It is further understood the actual location of the utilities may be located anywhere within the tolerances provided in 220 ILCS 50/2.8 or Administrative Code Title 92 Part 530.40(c), and the proximity of some utilities to construction may require extraordinary measures by the Contractor to protect those utilities.

No additional compensation will be allowed for any delays, inconveniences, or damages sustained by the Contractor due to the presence of or any claimed interference from known utility facilities or any adjustment of them, except as specifically provided in the contract.

107.38 Adjustments of Utilities within the Project Limits. The adjustment of utilities consists of the relocation, removal, replacement, rearrangements, reconstruction, improvement, disconnection, connection, shifting, new installation, or altering of an existing utility facility in any manner.

Utilities which are to be adjusted shall be adjusted by the utility owner or the owner's representative or by the Contractor as a contract item. Generally, arrangements for adjusting known utilities will be made by the Department prior to project construction; however, utilities will not necessarily be adjusted in advance of project construction and, in some cases, utilities will not be removed from the proposed construction limits as described in Article 107.37. When utility adjustments must be performed in conjunction with construction, the utility adjustment work will be indicated in the contract.

The Contractor may make arrangements for adjustment of utilities indicated in the contract, but not scheduled by the Department for adjustment, provided the Contractor furnishes the Department with a signed agreement with the utility owner covering the adjustments to be made. The cost of any such adjustments shall be the responsibility of the Contractor.

107.39 Contractor's Responsibility for Locating and Protecting Utility Property and Services. At points where the Contractor's operations are adjacent to properties or facilities of utility companies, or are adjacent to other property, damage to which might result in considerable expense, loss, or inconvenience, work shall not be commenced until all arrangements necessary for the protection thereof have been made.

Within the State of Illinois, a State-Wide One Call Notice System has been established for notifying utilities. Outside the city limits of the City of Chicago, the system is known as the Joint Utility Locating Information for Excavators (JULIE) System. Within the city limits of the City of Chicago the system is known as DIGGER. All utility companies and municipalities which have buried utility facilities in the State of Illinois are a part of this system.

The Contractor shall call JULIE (800-892-0123) or DIGGER (312-744-7000), a minimum of 48 hours in advance of work being done in the area, and they will notify all member utility companies involved their respective utility should be located.

For utilities which are not members of JULIE or DIGGER, the Contractor shall contact the owners directly. The plan general notes will indicate which utilities are not members of JULIE or DIGGER.

The following table indicates the color of markings required of the State-Wide One Call Notification System.

Utility Service	**Color**
Electric Power, Distribution and Transmission	Safety Red
Municipal Electric Systems	Safety Red
Gas Distribution and Transmission	High Visibility Safety Yellow
Oil Distribution and Transmission	High Visibility Safety Yellow
Telephone and Telegraph System	Safety Alert Orange
Community Antenna Television Systems	Safety Alert Orange
Water Systems	Safety Precaution Blue
Sewer Systems	Safety Green
Non-Potable Water and Slurry Lines	Safety Purple
Temporary Survey	Safety Pink
Proposed Excavation	Safety White (Black when snow is on the ground)

The State-Wide One Call Notification System will provide for horizontal locations of utilities. When it is determined that the vertical location of the utility is necessary to facilitate construction, the Engineer may make the request for location from the utility after receipt of notice from the Contractor. If the utility owner does not field locate their facilities to the satisfaction of the Engineer, the Engineer will authorize the Contractor in writing to proceed to locate the facilities in the most economical and reasonable manner, subject to the approval of the Engineer, and be paid according to Article 109.04.

The Contractor shall be responsible for maintaining the excavations or markers provided by the utility owners.

The Contractor shall take all necessary precautions for the protection of the utility facilities. The Contractor shall be responsible for any damage or destruction of utility facilities resulting from neglect, misconduct, or omission in the Contractor's manner or method of execution or non-execution of the work, or caused by defective work or the use of unsatisfactory materials. Whenever any damage or destruction of a utility facility occurs as a result of work performed by the Contractor, the utility company will be immediately notified. The utility company will make arrangements to restore such facility to a condition equal to that existing before any such damage or destruction was done.

In the event of interruption of utility services as a result of accidental breakage or as a result of being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of service. If water service is interrupted, repair work shall be continuous until the service is restored. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

107.40 Conflicts with Utilities. Except as provided hereinafter, the discovery of a utility in an unanticipated location will be evaluated according to Article 104.03. It is understood and agreed that the Contractor has considered in the bid all facilities not meeting the definition of a utility in an unanticipated location and no additional compensation will be allowed for any delays, inconveniences, or damages sustained by the Contractor due to the presence of or any claimed interference from such facilities.

When the Contractor discovers a utility in an unanticipated location, the Contractor shall not interfere with said utility, shall take proper precautions to prevent damage or interruption of the utility, and shall promptly notify the Engineer of the nature and location of said utility.

(a) Definition. A utility in an unanticipated location is defined as an active or inactive utility, which is either:

(1) Located underground and (a) not shown in any way in any location on the contract documents; (b) not identified in writing by the Department to the Contractor prior to the letting; or (c) not located relative to the location shown in the contract within the tolerances provided in 220 ILCS 50/2.8 or Administrative Code Title 92 Part 530.40(c); or

(2) Located above ground or underground and not relocated as provided in the contract.

Service connections shall not be considered to be utilities in unanticipated locations.

(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work applicable to the utility or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows:

(1) Minor Delay. A minor delay occurs when the Contractor's operation is completely stopped by a utility in an unanticipated location for more than two hours, but not to exceed three weeks.

(2) Major Delay. A major delay occurs when the Contractor's operation is completely stopped by a utility in an unanticipated location for more than three weeks.

(3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the contractor's rate of production decreases by more than 25 percent and lasts longer than seven days.

(c) Payment. Payment for Minor, Major and Reduced Rate of Production Delays will be made as follows.

(1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

(2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to three weeks plus the cost of move-out to either the Contractor's yard or another job, whichever is less. Rental equipment may be paid for longer than three weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

(3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Whether covered by (1), (2) or (3) above, additional traffic control required as a result of the operation(s) delayed will be paid for according to Article 109.04 for the total length of the delay.

If the delay is clearly shown to have caused work, which would have otherwise been completed, to be done after material or labor costs have increased, such increases may be paid. Payment for materials will be limited to increased cost substantiated by documentation furnished by the Contractor. Payment for increased labor rates will include those items in Article 109.04(b)(1) and (2), except the 35 percent and ten percent additives will not be permitted. On a working day contract, a delay occurring between November 30 and May 1, when work has not started, will not be considered as eligible for payment of measured labor and material costs.

Project overhead (not including interest) will be allowed when all progress on the contract has been delayed, and will be calculated as 15 percent of the delay claim.

(d) Other Obligations of Contractor. Upon payment of a claim under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this Provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this Provision."

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

The Contractor shall provide a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used on the jobsite; or used for the delivery and/or removal of equipment/material to and from the jobsite. The jobsite shall also include offsite locations, such as plant sites or storage sites, when those locations are used solely for this contract.

The report shall be submitted on the form provided by the Department within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur. The report shall be submitted to the Engineer and a copy shall be provided to the district EEO Officer.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

PROJECT LABOR AGREEMENT - QUARTERLY EMPLOYMENT REPORT

Public Act 97-0199 requires the Department to submit quarterly reports regarding the number of minorities and females employed under Project Labor Agreements. To assist in this reporting effort, the Contractor shall provide a quarterly workforce participation report for all minority and female employees working under the project labor agreement of this contract. The data shall be reported on Construction Form BC 820, Project Labor Agreement (PLA) Workforce Participation Quarterly Reporting Form available on the Department's website http://www.dot.il.gov/const/conforms.html.

The report shall be submitted no later than the 15th of the month following the end of each quarter (i.e. April 15 for the January – March reporting period). The form shall be emailed to DOT.PLA.Reporting@illinois.gov or faxed to (217) 524-4922.

Any costs associated with complying with this provision shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

Illinois Department of Transportation

PROJECT LABOR AGREEMENT

This Project Labor Agreement ("PLA") is entered into this _____ day of _____, by and between the Illinois Department of Transportation ("IDOT" or "Department") in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades Council made signatory hereto by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of itself and each of its affiliated members (individually and collectively, the "Union"). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT's Prime Contractor and each of its relevant subcontractors of whatever tier ("Subcontractor" or "Subcontractors") on Project Name (hereinafter, the "Project").

ARTICLE 1 - INTENT AND PURPOSES

1.1. This PLA is entered into in furtherance of Illinois Executive Order No. 2010-03 and P.A. 097-0199. It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays or other disruptions to the prosecution of the work.

1.2. As a condition of the award of the contract for performance of work on the Project, IDOT's Prime Contractor and each of its Subcontractors shall be required to sign a "Contractor Letter of Assent", in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company or entity that does not agree in writing to become bound by the terms of this PLA prior to commencing such work.

1.3. It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The Parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.

1.4. In the event of a variance or conflict, whether explicit or implicit, between the terms and conditions of this PLA and the provisions of any other applicable national, area, or local collective bargaining agreement, the terms and conditions of this PLA shall supersede and control.

For any work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors, and for any instrument calibration work and loop checking performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, the preceding sentence shall apply only with respect to Articles I, II, V, VI, and VII.

1.5. Subject to the provisions of paragraph 1.4 of this Article, it is the parties' intent to respect the provisions of any other collective bargaining agreements that may now or hereafter pertain, whether between the Prime Contractor and one or more of the Unions or between a Subcontractor and one or more of the Unions. Accordingly, except and to the extent of any contrary provision set forth in this PLA, the Prime Contractor and each of its Subcontractors agrees to be bound and abide by the terms of the following in order of precedence: (a) the applicable collective bargaining agreement between the Prime Contractor and one or more of the Unions made signatory hereto; (b) the applicable collective bargaining agreement between a Subcontractor and one or more of the Unions made signatory hereto; or (c) the current applicable area collective bargaining agreement for the relevant Union that is the agreement certified by the Illinois Department of Labor for purposes of establishing the Prevailing Wage applicable to the Project. The Union will provide copies of the applicable collective bargaining agreements pursuant to part (c) of the preceding sentence to the Prime Contractor. Assignments by the Contractors amongst the trades shall be consistent with area practices; in the event of unresolved disagreements as to the propriety of such assignments, the provisions of Article VI shall apply.

1.6. Subject to the limitations of paragraphs 1.4 and 1.5 of this Article, the terms of each applicable collective bargaining agreement as determined in accordance with paragraph 1.5 are incorporated herein by reference, and the terms of this PLA shall be deemed incorporated into such other applicable collective bargaining agreements only for purposes of their application to the Project.

1.7. To the extent necessary to comply with the requirements of any fringe benefit fund to which the Prime Contractor or Subcontractor is required to contribute under the terms of an applicable collective bargaining agreement pursuant to the preceding paragraph, the Prime Contractor or Subcontractor shall execute all "Participation Agreements" as may be reasonably required by the Union to accomplish such purpose; provided, however, that such Participation Agreements shall, when applicable to the Prime Contractor or Subcontractor solely as a result of this PLA, be amended as reasonably necessary to reflect such fact. Upon written notice from any applicable fringe benefit fund, IDOT will withhold from the Prime Contractor payment of any delinquencies arising from this Project.

1.8. In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

2.1 The term Construction Work as used herein shall include all "construction, prosecution, completion, or repair" work performed by a "laborer or mechanic" at the "site of the work" for the purpose of "building" the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5.

2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.

2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.

2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.

2.5 Unions commit to furnishing qualified and skilled craft persons as required by the Prime Contractor and its Subcontractors in fulfillment of their obligations to complete the Project. In order to promote the long-term development of a skilled and knowledgeable work force, the parties are encouraged to utilize apprentices to the maximum extent permitted by the applicable collective bargaining agreement.

2.6 The parties are mutually committed to promoting a safe working environment for all personnel at the job site. It shall be the responsibility of each employer to which this PLA applies to provide and maintain safe working conditions for its employees, and to comply with all applicable federal, state, and local health and safety laws and regulations.

2.7 The use or furnishing of alcohol or drugs and the conduct of any other illegal activity at the job-site is strictly prohibited. The parties shall take every practical measure consistent with the terms of applicable collective bargaining agreements to ensure that the job-site is free of alcohol and drugs.

2.8 All parties to this PLA agree that they shall not discriminate against any employee based on race, creed, color, national origin, union activity, age, or gender as required by all applicable federal, state, and local laws.

2.9 The Parties hereto agree that engineering consultants and materials testing employees, to the extent subject to the terms of this PLA, shall be fully expected to objectively and responsibly perform their duties and obligations owed to the Department without regard to the potential union affiliation of such employees or of other employees on the Project.

ARTICLE III - ADMINISTRATION OF AGREEMENT

3.1 In order to assure that all parties have a clear understanding of the PLA and to promote harmony, a post-award pre-job conference will be held among the Prime Contractor, all Subcontractors and Union representatives prior to the start of any Construction Work on the Project. No later than the conclusion of such pre-job conference, the parties shall, among other matters, provide to one another contact information for their respective representatives (including name, address, phone number, facsimile number, e-mail). Nothing herein shall be construed to limit the right of the Department to discuss or explain the purpose and intent of this PLA with prospective bidders or other interested parties prior to or following its award of the job.

3.2 Representatives of the Prime Contractor and the Unions shall meet as often as reasonably necessary following award until completion of the Project to assure the effective implementation of this PLA.

3.3 Not less than once per month, Prime Contractor and all Subcontractors shall make available in writing to the Unions a Project status report that shall include, though not necessarily be limited to, planned activities for the next 30 day period and estimated numbers of employees by craft required for the next 30 day period. The purpose of this Project status report is to promote effective workforce planning and to facilitate resolution of any potential jurisdictional or other problems.

3.4 Not later than the earlier of (a) five business days following the pre-job conference, or (b) commencement of Construction Work, the Unions and Prime Contractor (on behalf of itself and all its subcontractors of whatever tier) shall confer and jointly designate a slate of three (3) permanent arbitrators (each a “Permanent Arbitrator”) for the purpose of hearing disputes pursuant to Articles V and VII of this PLA. The slate of Permanent Arbitrators shall be selected from among the following individuals: Thomas F. Gibbons, Robert Perkovich, Byron Yaffee, and Glenn A. Zipp. In the event that the Unions and Prime Contractor are not able to agree on a full slate of three Permanent Arbitrators, the Department, after consultation with the Unions and Prime Contractor, shall designate such additional Permanent Arbitrators as may be necessary to establish the full slate. A single Permanent Arbitrator shall be selected from the slate of three on a rotating basis to adjudicate each arbitrable matter as it arises. In the event a Permanent Arbitrator is not available to adjudicate a particular matter in the order of rotation, the arbitration assignment shall pass to the next available Permanent Arbitrator.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

4.1 The standard work day for Construction Work on the Project shall be an established consecutive eight (8) hour period between the hours of 7:00 a.m. and 5:00 p.m. with one-half hour designated as unpaid period for lunch. The standard work week shall be five (5) consecutive days of work commencing on Monday. Starting time shall be established at the pre-job conference, and shall be applicable to all craft employees on the Project unless otherwise expressly agreed in writing. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate.

If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.

4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.

4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

4.4 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, employment begins and ends at the Project site; employees shall be at their place of work at the starting time; and employees shall remain at their place of work until quitting time.

4.5 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, there shall be no limit on production by workmen, no restrictions on the full use of tools or equipment, and no restrictions on efficient use of manpower or techniques of construction other than as may be required by safety regulations.

4.6 The parties recognize that specialized or unusual equipment may be installed on the Project. In such cases, the Union recognizes the right of the Prime Contractor or Subcontractor to involve the equipment supplier or vendor's personnel in supervising the setting up of the equipment, making modifications and final alignment, and performing similar activities that may be reasonably necessary prior to and during the start-up procedure in order to protect factory warranties. The Prime Contractor or Subcontractor shall notify the Union representatives in advance of any work at the job-site by such vendor personnel in order to promote a harmonious relationship between the equipment vendor's personnel and other Project employees.

4.7 For the purpose of promoting full and effective implementation of this PLA, authorized Union representatives shall have access to the Project job-site during scheduled work hours. Such access shall be conditioned upon adherence to all reasonable visitor and security rules of general applicability that may be established for the Project site at the pre-job conference or from time to time thereafter.

ARTICLE V - GRIEVANCE AND ARBITRATION PROCEDURES

5.1 Except as provided in Articles VI or VII, it is specifically agreed among the parties that any grievance or dispute arising out of the interpretation or application of this PLA shall be settled by means of the expedited arbitration process set forth in Paragraph 5.2 below. No such grievance or dispute shall be recognized unless called to the attention of the Prime Contractor and relevant Subcontractor by the Union or to the Union by the Prime Contractor or relevant Subcontractor within five (5) working days after the alleged violation was committed or discovered by the grieving party.

5.2 Grievances shall be settled according to the following procedure:

5.2.A. Step 1. The dispute shall be referred to the Steward of the craft union involved and a representative of the Prime Contractor and relevant Subcontractor at the job-site.

5.2.B. Step 2. In the event that the Steward and the contractors' representatives at the job-site cannot reach agreement within two (2) working days after a meeting is arranged and held, the matter shall be referred to the Union Business Manager and to executive representatives of the Prime Contractor and relevant Subcontractor.

5.2.C. Step 3. In the event the dispute is not resolved within five (5) working days after completion of Step 2, the relevant parties shall request a Permanent Arbitrator as determined in accordance with paragraph 3.4 of this PLA, who shall, within ten (10) working days, hear the grievance and make a written decision. Such decisions shall be final and binding on all parties. The parties shall each pay the expense of their own representative. The expense of the Permanent Arbitrator shall be divided equally between (1) the Prime Contractor and/or relevant Subcontractor, and (2) the involved Union.

5.3 Any failure of a party to comply fully with such final and binding decision of the Permanent Arbitrator may result in removal of the non-complying party from the site, in a holdback from the Prime Contractor or Subcontractor of any amounts awarded, or in such other relief as the Department may reasonably determine is necessary to promote final resolution of the dispute.

5.4 In the event any dispute or grievance should arise, the parties expressly agree that it shall be resolved without occurrence of any strike, work stoppage, slow-down or other prohibited activities as provided in Article VII of this PLA. Individuals or parties violating this section shall be subject to immediate discharge or other discipline.

ARTICLE VI - JURISDICTIONAL DISPUTES

6.1 As used in this Agreement, the term "jurisdictional dispute" shall be defined as any dispute, difference or disagreement involving the assignment of particular work to one class or craft of employees rather than to a different class or craft of employees, regardless of that Contractor's contractual relationship to any other employer, contractor, or organization on the site.

6.2 It is agreed by and between the parties to this Agreement that any and all jurisdictional disputes shall be resolved in the following manner; each of the steps hereinafter listed shall be initiated by the parties in sequence as set forth:

(a) Negotiation by and between the Local Business Representative of the disputing Union and Employer shall take place within two (2) business days. Business days are defined as Monday through Friday excluding contract holidays. Such negotiations shall be pursued until it is apparent that the dispute cannot be resolved at the local level.

(b) The International Representatives of the disputing Union shall meet or confer and attempt to resolve said dispute. This meeting shall take place within two (2) business days. Business days are defined as Monday through Friday excluding contract holidays.

(c) The parties to the Jurisdictional Dispute shall submit the dispute directly to an Arbitrator after complying with paragraph (2b) above. The parties shall meet with the Arbitrator within three (3) business days. Business days are defined as Monday through Friday excluding contract holidays. An Arbitrator will be selected based on availability from the slate of permanent Arbitrators. The Arbitrator's bench decision will be given the day of the hearing and will be final and legally binding on this project only. The Arbitrator's bench decision will be implemented without delay. The cost of Arbitration will be shared equally by the disputing parties. Any party to the dispute can require that a "long form" written decision be provided from the Arbitrator, however the cost of the "long form" written decision will be the responsibility of the party making the request.

Notes:

- A jurisdictional dispute may be submitted based upon a pre-job assignment.
- If any party to the jurisdictional disputes does not fully comply with the steps and time limits with each step, then the party in non-compliance will lose by "automatic default".
- Time limits at any step can be extended if all parties to the jurisdictional dispute mutually agree in writing.
- All parties to a jurisdictional dispute can mutually agree to waive the time limits in steps (a) and (b) and proceed directly to an expedited arbitration hearing.

(d) In rendering his decision, the Arbitrator shall determine:

(1) First whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between the National or International Unions to the dispute governs;

(2) Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider whether there is a previous decision of record governing the case;

(3) If the Arbitrator finds that a previous decision of record governs the case, the Arbitrator shall apply the decision of record in rendering his decision except under the following circumstances. After notice to the other parties to the dispute prior to the hearing that it intends to challenge the decision of record, if a trade challenging the decision of record is able to demonstrate that the recognized and established prevailing practice in the locality of the work has been contrary to the applicable decision of record, and that historically in that locality the work in dispute has not been performed by the other craft or crafts, the Arbitrator may rely on such prevailing practice rather than the decision of record.

If the craft relying on the decision of record demonstrates that it has performed the work in dispute in the locality of the job, then the Arbitrator shall apply the decision of record in rendering his decision. If the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wagers or by the use of vertical agreements, the Arbitrator shall rely on the decision of record rather than the prevailing practice in the locality.

(4) If no decision of record is applicable, the Arbitrator shall then consider the established trade practice in the industry and prevailing practice in the locality; and

(5) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interest of the consumer or the past practice of the employer shall not be ignored.

The Arbitrator shall set forth the basis for his decision and shall explain his findings regarding the applicability of the above criteria. If lower-ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the job in dispute.

(6) Agreements of record are applicable only to the party's signatory to such agreements. Decisions of record are applicable to all trades.

(7) The Arbitrator is not authorized to award back pay or any other damages for a mis-assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an Arbitrator.

6.3 The signatory parties to this Agreement agree that jurisdictional disputes cannot and shall not interfere with the efficient and continuous operations required for the successful application of this Agreement. In the event a dispute arises, the Contractor's assignment shall be followed until the dispute is resolved.

6.4 Equipment or material delivered to the job site will be unloaded promptly without regard to jurisdictional disputes which will be handled as per the provisions of this Agreement. The Contractor will supply the Union with delivery schedules, allowing as much time as possible to insure the appropriate crafts will be available to unload the materials or equipment.

6.5 All signatory affiliates agree that upon request, a representative shall be assigned without delay to attempt a settlement in the event of a question on assignments.

ARTICLE VII - WORK STOPPAGES AND LOCKOUTS

7.1 During the term of this PLA, no Union or any of its members, officers, stewards, employees, agents or representatives shall instigate, support, sanction, maintain, or participate in any strike, picketing, walkout, work stoppage, slow down or other activity that interferes with the routine and timely prosecution of work at the Project site or at any

other contractor’s or supplier’s facility that is necessary to performance of work at the Project site.

Hand billing at the Project site during the designated lunch period and before commencement or following conclusion of the established standard workday shall not, in itself, be deemed an activity that interferes with the routine and timely prosecution of work on the Project.

7.2 Should any activity prohibited by paragraph 7.1 of this Article occur, the Union shall undertake all steps reasonably necessary to promptly end such prohibited activities. No Union complying with its obligations under this Article shall be liable for acts of employees for which it has no responsibility or for the unauthorized acts of employees it represents. Any employee who participates in or encourages any activity prohibited by paragraph 7.1 shall be immediately suspended from all work on the Project for a period equal to the greater of (a) 60 days; or (b) the maximum disciplinary period allowed under the applicable collective bargaining agreement for engaging in comparable unauthorized or prohibited activity.

7.3 During the term of this PLA, the Prime Contractor and its Subcontractors shall not engage in any lockout at the Project site of employees covered by this Agreement.

7.4 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.5 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.6 of this Article.

7.6 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breach of this Article is alleged:

7.6.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to Article III of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.

7.6.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.

7.6.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or

parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.

7.6.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

7.6.E Such Award may be enforced by any court of competent jurisdiction upon the filing of the Award and such other relevant documents as may be required. Facsimile or other hardcopy written notice of the filing of such enforcement proceedings shall be given to the other relevant parties. In a proceeding to obtain a temporary order enforcing the Permanent Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Permanent Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

7.7 Individuals found to have violated the provisions of this Article are subject to immediate termination. In addition, IDOT reserves the right to terminate this PLA as to any party found to have violated the provisions of this Article.

7.8 Any rights created by statue or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.

7.9 The fees and expenses of the Permanent Arbitrator shall be borne by the party or parties found in violation, or in the event no violation is found, such fees and expenses shall be borne by the moving party.

ARTICLE VIII – MISCELLANEOUS

8.1 If any Article or provision of this PLA shall be declared invalid, inoperative or unenforceable by operation of law or by final non-appealable order of any tribunal of competent jurisdiction, such provision shall be deemed severed or limited, but only to the extent required to render the remaining provisions of this PLA enforceable consistent with the intent of the parties. The remainder of this PLA or the application of such Article or provision to persons or circumstances other than those as to which it has been held invalid, inoperative or unenforceable shall not be affected thereby.

8.2 The term of this PLA shall commence as of and from the date of the notice of award to the Prime Contractor and shall end upon final acceptance by IDOT of all work on the Project by the parties hereto.

8.3 This PLA may not be changed or modified except by the subsequent written agreement of the parties. All parties represent that they have the full legal authority to enter into this PLA. This PLA may be executed by the parties in one or more counterparts.

8.4 Any liability arising out of this PLA shall be several and not joint. IDOT shall not be liable to any person or other party for any violation of this PLA by any other party, and no Contractor or Union shall be liable for any violation of this PLA by any other Contractor or Union.

8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

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Execution Page

Illinois Department of Transportation

_____
William R. Frey, Interim Director of Highways

_____
Matthew R. Hughes, Director - Finance & Administration

_____
Ellen Schanzle-Haskins, Chief Counsel

_____ _____
Ann L. Schneider, Secretary (Date)

Illinois AFL-CIO Statewide Project Labor Agreement Committee, representing the local unions listed below:

_____ _____
(Date)

List Union Locals:

**** RETURN WITH BID ****

Exhibit A – Contractor Letter of Assent

_____
(Date)

To All Parties:

In accordance with the terms and conditions of the contract for Construction Work on [ ], this Letter of Assent hereby confirms that the undersigned Prime Contractor or Subcontractor agrees to be bound by the terms and conditions of the Project Labor Agreement established and entered into by the Illinois Department of Transportation in connection with said Project.

It is the understanding and intent of the undersigned party that this Project Labor Agreement shall pertain only to the identified Project. In the event it is necessary for the undersigned party to become signatory to a collective bargaining agreement to which it is not otherwise a party in order that it may lawfully make certain required contributions to applicable fringe benefit funds, the undersigned party hereby expressly conditions its acceptance of and limits its participation in such collective bargaining agreement to its work on the Project.

_____
(Authorized Company Officer)

_____
(Company)

**** RETURN WITH BID ****

ILLINOIS DEPARTMENT OF LABOR

PREVAILING WAGES FOR
VARIOUS COUNTIES
EFFECTIVE SEPTEMBER 2012

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at http://www.state.il.us/agency/idol/ or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.

Cook County Prevailing Wage for September 2012

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	*M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		32.850	0.000	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
CEMENT MASON		ALL		42.350	44.350	2.0	1.5	2.0	11.21	11.40	0.000	0.320
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMM. ELECT.		BLD		37.500	40.150	1.5	1.5	2.0	8.420	9.980	1.100	0.700
ELECTRIC PWR EQMT OP		ALL		43.350	48.350	1.5	1.5	2.0	10.38	13.50	0.000	0.430
ELECTRIC PWR GRNDMAN		ALL		33.810	48.350	1.5	1.5	2.0	8.090	10.53	0.000	0.330
ELECTRIC PWR LINEMAN		ALL		43.350	48.350	1.5	1.5	2.0	10.38	13.50	0.000	0.430
ELECTRICIAN		ALL		42.000	44.800	1.5	1.5	2.0	12.83	13.07	0.000	0.750
ELEVATOR CONSTRUCTOR		BLD		48.560	54.630	2.0	2.0	2.0	11.03	11.96	2.910	0.000
FENCE ERECTOR		ALL		33.740	35.740	1.5	1.5	2.0	12.61	10.18	0.000	0.250
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		43.800	46.300	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER		ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.78	9.020	0.000	0.500
LATHER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MILLWRIGHT		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		FLT	1	51.300	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	2	49.800	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	3	44.350	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	4	36.850	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
ORNAMNTL IRON WORKER		ALL		40.800	43.300	2.0	2.0	2.0	12.86	15.61	0.000	0.500
PAINTER		ALL		40.000	44.750	1.5	1.5	1.5	9.750	11.10	0.000	0.770
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
PIPEFITTER		BLD		44.050	47.050	1.5	1.5	2.0	8.460	13.85	0.000	1.820
PLASTERER		BLD		40.250	42.670	1.5	1.5	2.0	10.85	10.94	0.000	0.550
PLUMBER		BLD		44.750	46.750	1.5	1.5	2.0	11.59	9.060	0.000	0.780
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.080	8.220	0.000	0.430
SHEETMETAL WORKER		BLD		40.810	44.070	1.5	1.5	2.0	10.13	17.79	0.000	0.630
SIGN HANGER		BLD		29.460	29.960	1.5	1.5	2.0	4.800	2.980	0.000	0.000
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.200	0.000	0.450
STEEL ERECTOR		ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
STONE MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
TERRAZZO FINISHER		BLD		35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400

TERRAZZO MASON		BLD		39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550
TILE MASON		BLD		41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR		HWY		28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER	E	ALL	1	33.850	34.500	1.5	1.5	2.0	8.150	8.500	0.000	0.150
TRUCK DRIVER	E	ALL	2	34.100	34.500	1.5	1.5	2.0	8.150	8.500	0.000	0.150
TRUCK DRIVER	E	ALL	3	34.300	34.500	1.5	1.5	2.0	8.150	8.500	0.000	0.150
TRUCK DRIVER	E	ALL	4	34.500	34.500	1.5	1.5	2.0	8.150	8.500	0.000	0.150
TRUCK DRIVER	W	ALL	1	32.550	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.000
TRUCK DRIVER	W	ALL	2	32.700	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.000
TRUCK DRIVER	W	ALL	3	32.900	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.000
TRUCK DRIVER	W	ALL	4	33.100	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.000
TUCKPOINTER		BLD		40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

COOK COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

TRUCK DRIVERS (WEST) - That part of the county West of Barrington Road.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous

materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.
ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS ELECTRICIAN

Installation, operation, inspection, maintenance, repair and service of radio, television, recording, voice sound vision production and reproduction, telephone and telephone interconnect, facsimile, data apparatus, coaxial, fibre optic and wireless equipment, appliances and systems used for the transmission and reception of signals of any nature, business, domestic, commercial, education, entertainment, and residential purposes, including but not limited to, communication and telephone, electronic and sound equipment, fibre optic and data communication systems, and the performance of any task directly related to such installation or service whether at new or existing sites, such tasks to include the placing of wire and cable and electrical power conduit or other raceway work within the equipment room and pulling wire and/or cable through conduit and the installation of any incidental conduit, such that the employees covered hereby can complete any job in full.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of

scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators; Hydraulic

Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches; Bobcats (up to and including ¾ cu yd.) .

Class 4. Bobcats and/or other Skid Steer Loaders (other than bobcats up to and including ¾ cu yd.); Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dowell Machine with Air Compressor; Dredges; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Hydraulic Backhoes; Backhoes with shear attachments; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Trenching Machine; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; All Locomotives, Dinky; Off-Road Hauling Units (including articulating)/2 ton capacity or more; Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Scoops - Tractor Drawn; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper; Scraper - Prime Mover in Tandem (Regardless of Size): Tank Car Heater; Tractors, Push, Pulling Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Fireman on Boilers; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Hydro- Blaster; Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Tractaire; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. Bobcats (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Gradall and machines of like nature.

OPERATING ENGINEER - FLOATING

Class 1. Craft Foreman; Diver/Wet Tender; and Engineer (hydraulic dredge).

Class 2. Crane/Backhoe Operator; 70 Ton or over Tug Operator; Mechanic/Welder; Assistant Engineer (Hydraulic Dredge); Leverman (Hydraulic Dredge); Diver Tender; Friction and Lattice Boom Cranes.

Class 3. Deck Equipment Operator, Machineryman; Maintenance of Crane (over 50 ton capacity); Tug/Launch Operator; Loader/Dozer and like equipment on Barge; and Deck Machinery, etc.

Class 4. Deck Equipment Operator, Machineryman/Fireman (4 Equipment Units or More); Off Road Trucks (2 ton capacity or more); Deck Hand, Tug Engineer, Crane Maintenance 50 Ton Capacity and Under or Backhoe Weighing 115,000 pounds or less; and Assistant Tug Operator.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

TRAFFIC SAFETY

Work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION - EAST & WEST

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck

Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

Du Page County Prevailing Wage for September 2012

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	*M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		32.850	0.000	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
CEMENT MASON		ALL		38.000	40.000	2.0	1.5	2.0	8.950	16.35	0.000	0.380
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMMUNICATION TECH		BLD		32.650	34.750	1.5	1.5	2.0	9.250	14.46	0.400	0.610
ELECTRIC PWR EQMT OP		ALL		35.400	48.110	1.5	1.5	2.0	5.000	10.97	0.000	0.270
ELECTRIC PWR GRNDMAN		ALL		27.380	48.110	1.5	1.5	2.0	5.000	8.490	0.000	0.210
ELECTRIC PWR LINEMAN		ALL		42.390	48.110	1.5	1.5	2.0	5.000	13.14	0.000	0.320
ELECTRIC PWR TRK DRV		ALL		28.350	48.110	1.5	1.5	2.0	5.000	8.790	0.000	0.220
ELECTRICIAN		BLD		36.200	39.820	1.5	1.5	2.0	9.250	16.27	4.380	0.680
ELEVATOR CONSTRUCTOR		BLD		48.560	54.630	2.0	2.0	2.0	11.03	11.96	2.910	0.000
FENCE ERECTOR	NE	ALL		33.740	35.740	1.5	1.5	2.0	12.61	10.18	0.000	0.250
FENCE ERECTOR	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		43.800	46.300	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER	E	ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
IRON WORKER	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.78	9.020	0.000	0.500
LATHER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MILLWRIGHT		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
ORNAMNTL IRON WORKER	E	ALL		40.800	43.300	2.0	2.0	2.0	12.86	15.61	0.000	0.500
ORNAMNTL IRON WORKER	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
PAINTER		ALL		40.880	42.880	1.5	1.5	1.5	9.650	8.200	0.000	1.250
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
PIPEFITTER		BLD		41.000	43.000	1.5	1.5	2.0	10.75	14.59	0.000	1.660
PLASTERER		BLD		40.080	42.480	1.5	1.5	2.0	9.550	12.30	0.000	0.990
PLUMBER		BLD		41.000	43.000	1.5	1.5	2.0	10.75	14.59	0.000	1.660
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.080	8.220	0.000	0.430
SHEETMETAL WORKER		BLD		41.660	43.660	1.5	1.5	2.0	9.540	11.57	0.000	0.780
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.200	0.000	0.450
STEEL ERECTOR	E	ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
STEEL ERECTOR	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
STONE MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
TERRAZZO FINISHER		BLD		35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400

TERRAZZO MASON	BLD	39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550
TILE MASON	BLD	41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR	HWY	28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER	ALL 1	32.550	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 2	32.700	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 3	32.900	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 4	33.100	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TUCKPOINTER	BLD	40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

DUPAGE COUNTY

IRON WORKERS AND FENCE ERECTOR (WEST) - West of Route 53.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Low voltage installation, maintenance and removal of telecommunication facilities (voice, sound, data and video) including telephone and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area networks), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand

to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators; Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches; Bobcats (up to and including ¾ cu yd.) .

Class 4. Bobcats and/or other Skid Steer Loaders (other than bobcats up to and including ¾ cu yd.); Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall .

Class 7. Mechanics.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dowell Machine with Air Compressor; Dredges; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Hydraulic Backhoes; Backhoes with shear attachments; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Trenching Machine; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; All Locomotives, Dinky; Off-Road Hauling Units (including articulating)/2 ton capacity or more; Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Scoops - Tractor Drawn; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper; Scraper - Prime Mover in Tandem (Regardless of Size): Tank Car Heater; Tractors, Push, Pulling Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Fireman on Boilers; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed

and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Hydro- Blaster; Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Tractaire; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. Bobcats (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Gradall and machines of like nature.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yeards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

Kane County Prevailing Wage for September 2012

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	*M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		32.850	0.000	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
CEMENT MASON		ALL		41.550	43.550	2.0	1.5	2.0	9.500	13.76	0.000	0.500
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMMUNICATION TECH	N	BLD		35.770	37.870	1.5	1.5	2.0	12.07	9.370	0.000	0.450
COMMUNICATION TECH	S	BLD		36.390	38.490	1.5	1.5	2.0	10.02	10.19	0.000	1.090
ELECTRIC PWR EQMT OP		ALL		35.400	48.110	1.5	1.5	2.0	5.000	10.97	0.000	0.270
ELECTRIC PWR GRNDMAN		ALL		27.380	48.110	1.5	1.5	2.0	5.000	8.490	0.000	0.210
ELECTRIC PWR LINEMAN		ALL		42.390	48.110	1.5	1.5	2.0	5.000	13.14	0.000	0.320
ELECTRIC PWR TRK DRV		ALL		28.350	48.110	1.5	1.5	2.0	5.000	8.790	0.000	0.220
ELECTRICIAN	N	ALL		43.080	47.380	1.5	1.5	2.0	12.06	11.41	0.000	0.540
ELECTRICIAN	S	BLD		43.560	47.920	1.5	1.5	2.0	10.02	12.20	0.000	1.310
ELEVATOR CONSTRUCTOR		BLD		48.560	54.630	2.0	2.0	2.0	11.03	11.96	2.910	0.000
FENCE ERECTOR		ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		43.800	46.300	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER		ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.52	9.280	0.000	0.500
LATHER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.52	9.280	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.52	9.280	0.000	0.500
MILLWRIGHT		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
ORNAMNTL IRON WORKER		ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
PAINTER		ALL		40.880	42.880	1.5	1.5	1.5	9.650	8.200	0.000	1.250
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
PIPEFITTER		BLD		41.000	43.000	1.5	1.5	2.0	10.75	14.59	0.000	1.660
PLASTERER		BLD		40.250	42.670	1.5	1.5	2.0	10.85	10.94	0.000	0.550
PLUMBER		BLD		41.000	43.000	1.5	1.5	2.0	10.75	14.59	0.000	1.660
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.080	8.220	0.000	0.430
SHEETMETAL WORKER		BLD		41.660	43.660	1.5	1.5	2.0	9.540	11.57	0.000	0.780
SIGN HANGER		BLD		26.070	27.570	1.5	1.5	2.0	3.800	3.550	0.000	0.000
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.200	0.000	0.450
STEEL ERECTOR		ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
STONE MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
TERRAZZO FINISHER		BLD		35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400
TERRAZZO MASON		BLD		39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550

TILE MASON	BLD	41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR	HWY	28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER	ALL 1	32.550	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 2	32.700	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 3	32.900	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 4	33.100	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TUCKPOINTER	BLD	40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

KANE COUNTY

ELECTRICIANS AND COMMUNICATIONS TECHNICIAN (NORTH) - Townships of Burlington, Campton, Dundee, Elgin, Hampshire, Plato, Rutland, St. Charles (except the West half of Sec. 26, all of Secs. 27, 33, and 34, South half of Sec. 28, West half of Sec. 35), Virgil and Valley View CCC and Elgin Mental Health Center.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous

materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Construction, installation, maintenance and removal of telecommunication facilities (voice, sound, data and video), telephone, security systems, fire alarm systems that are a component of a multiplex system and share a common cable, and data inside wire, interconnect, terminal equipment, central offices, PABX and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area network), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by

setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators; Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches; Bobcats (up to and including ¾ cu yd.) .

Class 4. Bobcats and/or other Skid Steer Loaders (other than bobcats

up to and including ¾ cu yd.); Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dowell Machine with Air Compressor; Dredges; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Hydraulic Backhoes; Backhoes with shear attachments; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Trenching Machine; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; All Locomotives, Dinky; Off-Road Hauling Units (including articulating)/2 ton capacity or more; Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Scoops - Tractor Drawn; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper; Scraper - Prime Mover in Tandem (Regardless of Size): Tank Car Heater; Tractors, Push, Pulling Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Fireman on Boilers; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep

Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Hydro- Blaster; Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Tractaire; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. Bobcats (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Gradall and machines of like nature.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials

that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

Lake County Prevailing Wage for September 2012

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	*M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		32.850	0.000	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
CEMENT MASON		ALL		40.800	42.800	2.0	1.5	2.0	10.25	13.78	0.000	0.500
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMMUNICATION TECH		BLD		34.650	36.750	1.5	1.5	2.0	10.40	11.09	1.040	0.520
ELECTRIC PWR EQMT OP		ALL		35.400	48.110	1.5	1.5	2.0	5.000	10.97	0.000	0.270
ELECTRIC PWR GRNDMAN		ALL		27.380	48.110	1.5	1.5	2.0	5.000	8.490	0.000	0.210
ELECTRIC PWR LINEMAN		ALL		42.390	48.110	1.5	1.5	2.0	5.000	13.14	0.000	0.320
ELECTRIC PWR TRK DRV		ALL		28.350	48.110	1.5	1.5	2.0	5.000	8.790	0.000	0.220
ELECTRICIAN		BLD		39.150	43.070	1.5	1.5	2.0	12.73	14.33	0.000	0.630
ELEVATOR CONSTRUCTOR		BLD		48.560	54.630	2.0	2.0	2.0	11.03	11.96	2.910	0.000
FENCE ERECTOR		ALL		33.740	35.740	1.5	1.5	2.0	12.61	10.18	0.000	0.250
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		43.800	46.300	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER		ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.78	9.020	0.000	0.500
LATHER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MILLWRIGHT		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		FLT	1	51.300	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	2	49.800	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	3	44.350	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	4	36.850	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
ORNAMNTL IRON WORKER		ALL		40.800	43.300	2.0	2.0	2.0	12.86	15.61	0.000	0.500
PAINTER		ALL		40.000	44.750	1.5	1.5	1.5	9.750	11.10	0.000	0.770
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
PIPEFITTER		BLD		44.050	47.050	1.5	1.5	2.0	8.460	13.85	0.000	1.820
PLASTERER		BLD		39.190	41.190	2.0	1.5	2.0	10.25	15.58	0.000	0.500
PLUMBER		BLD		44.500	47.500	1.5	1.5	2.0	11.05	12.40	0.000	1.700
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.080	8.220	0.000	0.430
SHEETMETAL WORKER		BLD		40.810	44.070	1.5	1.5	2.0	10.13	17.79	0.000	0.630
SIGN HANGER		BLD		29.460	29.960	1.5	1.5	2.0	4.800	2.980	0.000	0.000
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.200	0.000	0.450
STEEL ERECTOR		ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
STONE MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970

TERRAZZO FINISHER	BLD		35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400
TERRAZZO MASON	BLD		39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550
TILE MASON	BLD		41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR	HWY		28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER	ALL	1	35.850	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER	ALL	2	36.000	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER	ALL	3	36.200	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER	ALL	4	36.400	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TUCKPOINTER	BLD		40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

LAKE COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATION TECHNICIAN

Low voltage construction, installation, maintenance and removal of telecommunication facilities (voice, sound, data and video) including outside plant, telephone, security systems and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area network), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone,

granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators; Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches; Bobcats (up to and including ¾ cu yd.) .

Class 4. Bobcats and/or other Skid Steer Loaders (other than bobcats up to and including ¾ cu yd.); Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall

Class 7. Mechanics

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dowell Machine with Air Compressor; Dredges; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Hydraulic Backhoes; Backhoes with shear attachments; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Trenching Machine; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; All Locomotives, Dinky; Off-Road Hauling Units (including articulating)/2 ton capacity or more; Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Scoops - Tractor Drawn; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper; Scraper - Prime Mover in Tandem (Regardless of Size): Tank Car Heater; Tractors, Push, Pulling Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Fireman on Boilers; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Hydro- Blaster; Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Tractaire; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. Bobcats (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Gradall and machines of like nature.

OPERATING ENGINEER - FLOATING

Class 1. Craft Foreman; Diver/Wet Tender; and Engineer (hydraulic dredge).

Class 2. Crane/Backhoe Operator; 70 Ton or over Tug Operator; Mechanic/Welder; Assistant Engineer (Hydraulic Dredge); Leverman (Hydraulic Dredge); Diver Tender; Friction and Lattice Boom Cranes.

Class 3. Deck Equipment Operator, Machineryman; Maintenance of Crane (over 50 ton capacity); Tug/Launch Operator; Loader/Dozer and like equipment on Barge; and Deck Machinery, etc.

Class 4. Deck Equipment Operator, Machineryman/Fireman (4 Equipment Units or More); Off Road Trucks (2 ton capacity or more); Deck Hand, Tug Engineer, Crane Maintenance 50 Ton Capacity and Under or Backhoe Weighing 115,000 pounds or less; and Assistant Tug Operator.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry

trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

Mchenry County Prevailing Wage for September 2012

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	*M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		32.850	0.000	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
CEMENT MASON		ALL		41.550	43.550	2.0	1.5	2.0	9.500	13.76	0.000	0.500
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMMUNICATION TECH		BLD		35.770	37.870	1.5	1.5	2.0	12.07	9.370	0.000	0.450
ELECTRIC PWR EQMT OP		ALL		35.400	48.110	1.5	1.5	2.0	5.000	10.97	0.000	0.270
ELECTRIC PWR GRNDMAN		ALL		27.380	48.110	1.5	1.5	2.0	5.000	8.490	0.000	0.210
ELECTRIC PWR LINEMAN		ALL		42.390	48.110	1.5	1.5	2.0	5.000	13.14	0.000	0.320
ELECTRIC PWR TRK DRV		ALL		28.350	48.110	1.5	1.5	2.0	5.000	8.790	0.000	0.220
ELECTRICIAN		ALL		43.080	47.380	1.5	1.5	2.0	12.06	11.41	0.000	0.540
ELEVATOR CONSTRUCTOR		BLD		48.560	54.630	2.0	2.0	2.0	11.03	11.96	2.910	0.000
FENCE ERECTOR	E	ALL		33.740	35.740	1.5	1.5	2.0	12.61	10.18	0.000	0.250
FENCE ERECTOR	S	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		43.800	46.300	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER	E	ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
IRON WORKER	S	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
IRON WORKER	W	ALL		35.090	36.840	2.0	2.0	2.0	8.250	20.59	0.000	0.700
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.52	9.280	0.000	0.500
LATHER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.52	9.280	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.52	9.280	0.000	0.500
MILLWRIGHT		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
ORNAMNTL IRON WORKER	E	ALL		40.800	43.300	2.0	2.0	2.0	12.86	15.61	0.000	0.500
ORNAMNTL IRON WORKER	S	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
PAINTER		ALL		40.880	42.880	1.5	1.5	1.5	9.650	8.200	0.000	1.250
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.76	0.000	0.530
PIPEFITTER		BLD		44.050	47.050	1.5	1.5	2.0	8.460	13.85	0.000	1.820
PLASTERER		BLD		40.250	42.670	1.5	1.5	2.0	10.85	10.94	0.000	0.550
PLUMBER		BLD		44.500	47.500	1.5	1.5	2.0	11.05	12.40	0.000	1.700
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.080	8.220	0.000	0.430
SHEETMETAL WORKER		BLD		41.660	43.660	1.5	1.5	2.0	9.540	11.57	0.000	0.780
SIGN HANGER		BLD		26.070	27.570	1.5	1.5	2.0	3.800	3.550	0.000	0.000
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.200	0.000	0.450
STEEL ERECTOR	E	ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
STEEL ERECTOR	S	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400

STONE MASON	BLD	40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
TERRAZZO FINISHER	BLD	35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400
TERRAZZO MASON	BLD	39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550
TILE MASON	BLD	41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR	HWY	28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER	ALL 1	35.850	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER	ALL 2	36.000	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER	ALL 3	36.200	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER	ALL 4	36.400	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TUCKPOINTER	BLD	40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

MCHENRY COUNTY

FENCE ERECTOR (EAST) - That part of the county East and Northeast of a line following Route 31 North to Route 14, northwest to Route 47 north to the Wisconsin State Line.

IRONWORKERS (EAST) - That part of the county East of Rts. 47 and 14.

IRONWORKERS (SOUTH) - That part of the county South of Route 14 and East of Route 47.

IRONWORKERS (WEST) - That part of the county West of Route 47.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given

local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Construction, installation, maintenance and removal of telecommunication facilities (voice, sound, data and video), telephone, security systems, fire alarm systems that are a component of a multiplex system and share a common cable, and data inside wire, interconnect, terminal equipment, central offices, PABX and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area network), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all

rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator;

Generators; Heaters, Mechanical; Hoists, Inside Elevators; Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches; Bobcats (up to and including ¾ cu yd.) .

Class 4. Bobcats and/or other Skid Steer Loaders (other than bobcats up to and including ¾ cu yd.); Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall .

Class 7. Mechanics.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dowell Machine with Air Compressor; Dredges; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Hydraulic Backhoes; Backhoes with shear attachments; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Trenching Machine; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; All Locomotives, Dinky; Off-Road Hauling Units (including articulating)/2 ton capacity or more; Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Scoops - Tractor Drawn; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper; Scraper - Prime Mover in Tandem (Regardless of Size): Tank Car Heater; Tractors, Push, Pulling Sheeps Foot, Disc,

Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Fireman on Boilers; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Hydro- Blaster; Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Tractaire; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. Bobcats (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders.

Class 7. Gradall and machines of like nature.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yeards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic;

Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

Will County Prevailing Wage for September 2012

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	*M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		32.850	0.000	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	45.670	2.0	2.0	2.0	11.19	16.07	0.000	0.530
CEMENT MASON		ALL		41.000	43.000	2.0	2.0	2.0	9.500	14.43	0.000	0.500
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMMUNICATION TECH		BLD		32.200	33.700	1.5	1.5	2.0	12.32	10.80	0.000	0.320
ELECTRIC PWR EQMT OP		ALL		43.350	48.350	1.5	1.5	2.0	10.38	13.50	0.000	0.430
ELECTRIC PWR GRNDMAN		ALL		33.810	48.350	1.5	1.5	2.0	8.090	10.53	0.000	0.330
ELECTRIC PWR LINEMAN		ALL		43.350	48.350	1.5	1.5	2.0	10.38	13.50	0.000	0.430
ELECTRICIAN		BLD		39.500	43.060	1.5	1.5	2.0	13.17	15.11	0.000	1.200
ELEVATOR CONSTRUCTOR		BLD		48.560	54.630	2.0	2.0	2.0	11.03	11.96	2.910	0.000
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		43.800	46.300	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER		ALL		40.250	41.250	2.0	2.0	2.0	9.390	20.41	0.000	0.700
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.78	9.020	0.000	0.500
LATHER		ALL		41.520	45.670	2.0	2.0	2.0	11.19	16.07	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MILLWRIGHT		ALL		41.520	45.670	2.0	2.0	2.0	11.19	16.07	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		FLT	1	51.300	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	2	49.800	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	3	44.350	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		FLT	4	36.850	51.300	1.5	1.5	2.0	11.70	8.050	1.900	1.150
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
PAINTER		ALL		40.000	44.750	1.5	1.5	1.5	9.750	11.10	0.000	0.770
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	45.670	2.0	2.0	2.0	11.19	16.07	0.000	0.530
PIPEFITTER		BLD		44.050	47.050	1.5	1.5	2.0	8.460	13.85	0.000	1.820
PLASTERER		BLD		40.250	42.670	1.5	1.5	2.0	10.85	10.94	0.000	0.550
PLUMBER		BLD		44.000	46.000	1.5	1.5	2.0	10.65	11.00	0.000	1.310
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.080	8.220	0.000	0.430
SHEETMETAL WORKER		BLD		41.660	43.660	1.5	1.5	2.0	9.540	11.57	0.000	0.780
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.200	0.000	0.450
STONE MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
TERRAZZO FINISHER		BLD		35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400
TERRAZZO MASON		BLD		39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550
TILE MASON		BLD		41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR		HWY		28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER		ALL	1	35.650	36.200	1.5	1.5	2.0	7.250	6.319	0.000	0.250

TRUCK DRIVER	ALL	2	35.800	36.200	1.5	1.5	2.0	7.250	6.319	0.000	0.250
TRUCK DRIVER	ALL	3	36.000	36.200	1.5	1.5	2.0	7.250	6.319	0.000	0.250
TRUCK DRIVER	ALL	4	36.200	36.200	1.5	1.5	2.0	7.250	6.319	0.000	0.250
TUCKPOINTER	BLD		40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

WILL COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Installation, operation, inspection, maintenance, repair and service of radio, television, recording, voice, sound and vision production and reproduction, telephone and telephone interconnect, facsimile, equipment and appliances used for domestic, commercial, educational and entertainment purposes, pulling of wire through conduit but not the installation of conduit.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes

for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators; Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches; Bobcats (up to and including ¾ cu yd.) .

Class 4. Bobcats and/or other Skid Steer Loaders (other than bobcats up to and including ¾ cu yd.); Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall .

Class 7. Mechanics.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt

Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dowell Machine with Air Compressor; Dredges; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Hydraulic Backhoes; Backhoes with shear attachments; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Trenching Machine; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; All Locomotives, Dinky; Off-Road Hauling Units (including articulating)/2 ton capacity or more; Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Scoops - Tractor Drawn; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper; Scraper - Prime Mover in Tandem (Regardless of Size): Tank Car Heater; Tractors, Push, Pulling Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Fireman on Boilers; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Hydro- Blaster; Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Tractaire; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. Bobcats (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders.

Class 7. Gradall and machines of like nature.

OPERATING ENGINEER - FLOATING

Class 1. Craft Foreman; Diver/Wet Tender; and Engineer (hydraulic dredge).

Class 2. Crane/Backhoe Operator; 70 Ton or over Tug Operator; Mechanic/Welder; Assistant Engineer (Hydraulic Dredge); Leverman (Hydraulic Dredge); Diver Tender; Friction and Lattice Boom Cranes.

Class 3. Deck Equipment Operator, Machineryman; Maintenance of Crane (over 50 ton capacity); Tug/Launch Operator; Loader/Dozer and like equipment on Barge; and Deck Machinery, etc.

Class 4. Deck Equipment Operator, Machineryman/Fireman (4 Equipment Units or More); Off Road Trucks (2 ton capacity or more); Deck Hand, Tug Engineer, Crane Maintenance 50 Ton Capacity and Under or Backhoe Weighing 115,000 pounds or less; and Assistant Tug Operator.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yeards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.