BID PROPOSAL 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.

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.

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.

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 service emails are an added courtesy the Department provides. It is suggested that bidders check IDOT's website at http://www.idot.illinois.gov/doing-business/procurements/construction-services/construction-bulletins/transportation-bulletin/index#TransportationBulletin 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 DOT.D&Econtracts@illlinois.gov

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

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. It has the item number in large bold type 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 if you are awarded the project.
- 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.

BID SUBMITTAL CHECKLIST

☐ **Cover page** (the sheet that has the item number on it) **–** This should be the first page of your bid proposal, **followed by your bid (the Schedule of Prices/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) with an annual value over $50,000. Include the subcontractor(s) name, address, general type of work to be performed and the dollar amount. If you will use subcontractor(s) but are uncertain who or the dollar amount; check "YES" but leave the lines blank.

☐ **After page 4 –** Insert the following documents: Cost Adjustments for Steel, Bituminous and Fuel (if applicable) and the Contractor Letter of Assent (if applicable). The general rule should be, if you don't know where it goes, put it after page 4.

☐ **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 name of the apprenticeship and training program sponsor holding the certificate of registration from the US Department of Labor. If no applicable program exists, please indicate the work/job category. 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 completed Form A.

☐ **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 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(s) 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(s) 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".

☐ **Proposal Bid Bond –** (Insert after the proposal signature page) Submit your proposal Proposal Bid Bond (if applicable) using the current Proposal Bid Bond form provided in the proposal package. The Power of Attorney page should be stapled to the Proposal Bid Bond. If you are using an electronic bond, include your bid bond number on the Proposal Bid Bond and attach the Proof of Insurance printed from the Surety's Web Site.

☐ **Disadvantaged Business Utilization Plan and/or Good Faith Effort –** The last items 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 of a Good Faith Effort, it is to 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 10:30 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 Web page for the current letting.

QUESTIONS: pre-letting up to execution of the contract

Contractor 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

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 November 6, 2015

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.
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. 60T93
COOK County
Section 2012-052I
Route FAI 90/94
Project ACNHPP-ACHPP-000V(039)
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

☐ An Annual Bid Bond is included or is on file with IDOT.

Prepared by

Checked by F

(Printed by authority of the State of Illinois)

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RETURN WITH BID

Illinois Department of Transportation

PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of _____

   _____

   Taxpayer Identification Number (Mandatory) _____

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

   Contract No. 60T93
   COOK County
   Section 2012-052I
   Project ACNHPP-ACHPP-000V(039)
   Route FAI 90/94
   District 1 Construction Funds

   Replacement of 15 existing REVLAC mechanical drum signs with LED dynamic message signs and additional CCTV cameras along with replacement of two existing flip disk DMS located along FAI 90/94 (Kennedy Expressway) in Chicago.

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 will govern performance and payments.

3. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned bidder 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 bid proposal he/she waives all right to plead any misunderstanding regarding the same.

4. **EXECUTION OF CONTRACT AND CONTRACT BOND.** The undersigned bidder 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, or as specified in the special provisions, 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 bid proposals will be made payable to the Treasurer, State of Illinois.

If a combination bid is submitted, the proposal guaranties which accompany the individual bid 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 will fail to execute a contract bond as required herein, it is hereby agreed that the amount of the proposal guaranty will 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 will become void or the proposal guaranty check will 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 bid proposals, the amount must be equal to the sum of the proposal guaranties which would be required for each individual bid proposal. If the guaranty check is placed in another bid proposal, state below where it may be found.

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

Item _____

Section No. _____

County _____

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

6. **COMBINATION BIDS.** The undersigned bidder 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 contract 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 will 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 transact business or conduct affairs in the State of Illinois prior to submitting the bid.

9. **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.

10. **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)

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT NUMBER - 60T93

State Job # - C-91-501-12

County Name - COOK- -
Code - 31 - -
District - 1 - -
Section Number - 2012-052I

Project Number
ACNHPP-ACHPP-000V/039/

Route
FAI 90
FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X0323524	REM EX SURVEIL CAM EQ	EACH	1.000				
X0323898	CCTV DOME CAMERA	EACH	4.000				
X0323914	FOC SPLICE - LATERAL	EACH	15.000				
X0323957	FOC SPLICE - MAINLINE	EACH	1.000				
X0324599	ROD AND CLEAN EX COND	FOOT	4,500.000				
X0324807	CCTV CABINET EQUIPMNT	EACH	10.000				
X0326464	CCTV CAM STR 80 FT MT	EACH	5.000				
X0326492	REM EX SGN LT UNT SLV	EACH	53.000				
X0326948	CCTV CAMERA STR 50 MH	EACH	9.000				
X0326949	CCTV CAMERA ST FD 30D	FOOT	90.000				
X0327129	DYN MS SN POW CAB CIP	EACH	15.000				
X0327130	DMS F NTCIP 1203 V2 C	EACH	2.000				
X0327563	MOD CNTRLR F CCTV PWR	EACH	2.000				
X0327571	CCTV EQUIP CABINET GM	EACH	1.000				
X0327601	CCTV CAM STR FD 80 MH	FOOT	105.000				

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District - 1 - -
Section Number - 2012-052I

Project Number
ACNHPP-ACHPP-000V/039/

Route
FAI 90
FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X1400119	CON AT ST 4 PVC GS IO	FOOT	1,500.000				
X1400120	JBX SS AS 42X36X12 IO	EACH	18.000				
X1400121	CCTV CAM STR 80FT DLD	EACH	1.000				
X1400122	FXD POS CCTV CAMRVDMS	EACH	15.000				
X1400123	FO INTRFC RC BLDG A	EACH	1.000				
X1400124	FO INTRFC RC BLDG C	EACH	1.000				
X1400125	FO INTRFC RC BLDG D	EACH	1.000				
X1400126	FO INTRFC RC BLDG E	EACH	1.000				
X1400127	CAT 6 ETHERNET CABLE	FOOT	850.000				
X1400128	REM/RPL CTBRKR W40A2P	EACH	15.000				
X1400129	REM/RPL CTBRKR 125A3P	EACH	1.000				
X1400130	RVLCDMSFA CM1,2,13,15	EACH	4.000				
X1400131	RVLCDMSFA3,7,10,12,14	EACH	5.000				
X1400132	RVLC DMS FA CM-4 & 5	EACH	2.000				
X1400133	RVLC DMS FA CM-6	EACH	1.000				

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Project Number
ACNHPP-ACHPP-000V/039/

Route
FAI 90
FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X1400134	RVLC DMS FA CM-8	EACH	1.000				
X1400135	RVLC DMS FA CM-9	EACH	1.000				
X1400136	RVLC DMS FA CM-11	EACH	1.000				
X1400137	MAINRVLCSYS DURCNSTRN	L SUM	1.000				
X1400138	BDALCCTV/DMS&EXCNTRLS	L SUM	1.000				
X1400139	CCTV CBNT EQPT DLCAM	EACH	4.000				
X1400140	REM EX NONRVLC DMS	EACH	2.000				
X1400141	REM EX DRUM SIGNS	EACH	15.000				
X7011015	TR C-PROT EXPRESSWAYS	L SUM	1.000				
X8440105	RELOC EX SIGN LTG LUM	EACH	9.000				
X8570100	DISCONNECT SWITCH	EACH	15.000				
X8710035	FIB OPT CBL 96F SM	FOOT	30,600.000				
X8710036	FIB OPT CBL 12F SM	FOOT	4,085.000				
X8780105	CONC FDN SPL	EACH	16.000				
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000				

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FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0033052	COMMUNICATIONS VAULT	EACH	14.000				
Z0076600	TRAINEES	HOUR	2,000.000		0.800		1,600.000
Z0076604	TRAINEES TPG	HOUR	2,000.000		15.000		30,000.000
66900200	NON SPL WASTE DISPOSL	CU YD	160.000				
66900450	SPL WASTE PLNS/REPORT	L SUM	1.000				
66900530	SOIL DISPOSAL ANALY	EACH	1.000				
67000400	ENGR FIELD OFFICE A	CAL MO	6.000				
67100100	MOBILIZATION	L SUM	1.000				
70106800	CHANGEABLE MESSAGE SN	CAL MO	6.000				
80400100	ELECT SERV INSTALL	EACH	2.000				
80400200	ELECT UTIL SERV CONN	L SUM	1.000				
81028240	UNDRGRD C GALVS 4	FOOT	1,340.000				
81028730	UNDRGRD C CNC 1 1/4	FOOT	18,240.000				
81100220	CON AT ST 3/4 PVC GS	FOOT	30.000				
81100320	CON AT ST 1 PVC GS	FOOT	250.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
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Project Number
ACNHPP-ACHPP-000V/039/

Route
FAI 90
FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
81100605	CON AT ST 2 PVC GALVS	FOOT	1,320.000				
81101005	CON AT ST 4 PVC GALVS	FOOT	7,035.000				
81300555	JUN BX SS AS 12X12X8	EACH	8.000				
81300960	JUN BX SS AS 42X36X12	EACH	26.000				
81400200	HD HANDHOLE	EACH	25.000				
81603055	UD 3#8 #8G XLPUSE 1	FOOT	3,750.000				
81702120	EC C XLP USE 1C 8	FOOT	1,630.000				
81702130	EC C XLP USE 1C 6	FOOT	3,790.000				
81702140	EC C XLP USE 1C 4	FOOT	12,390.000				
81702150	EC C XLP USE 1C 2	FOOT	1,340.000				
84500120	REMOV ELECT SERV INST	EACH	2.000				
87100140	FO CAB C 62.5/125 12F	FOOT	5,100.000				
89502300	REM ELCBL FR CON	FOOT	11,000.000				
89502385	REMOV EX CONC FDN	EACH	14.000				

CONTRACT NUMBER **60T93**

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.

☐ I acknowledge, understand and accept these terms and conditions.

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

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 State 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 State 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 calendar 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.

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. Information concerning the exemption process is available from the Department upon request.

B. Negotiations

Section 50-15. Negotiations.

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.

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

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 provide a submission to a vendor portal or 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, not making a submission to a vendor portal, or who withholds a bid or submission to a vendor portal in consideration of the promise for the payment of money or other valuable thing is guilty of a Class 4 felony.

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

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.

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

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.

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 or submission to a vendor portal is submitted.

F. Confidentiality

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.

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

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.

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.

☐ I acknowledge, understand and accept these terms and conditions for the above assurances.

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

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 2012.

(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.

The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50-5.

B. Felons

Section 50-10. Felons.

(a) 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.

(b) Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code and every vendor's submission to a vendor portal 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

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

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.

The bidder or contractor or subcontractor, respectively, certifies in accordance with Section 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

Section 50-14 Environmental Protection Act violations.

The bidder or contractor or subcontractor, respectively, certifies in accordance with Section 50-14 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

Section 3 of the Educational Loan Default Act, 5 ILCS 385/3.

Pursuant to the Educational Loan Default Act no State agency shall contract with an individual for goods or services if that individual is in default on an educational loan.

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

Section 33E-11 of the Criminal Code of 2012, 720 ILCS 5/3BE-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.

(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.

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

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

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

I. Drug Free Workplace

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.

The bidder certifies that if awarded a contract in excess of $5,000 it will provide a drug free workplace in compliance with the provisions of the Act.

J. Disclosure of Business Operations in Iran

Section 50-36 of the Code 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 may cause the bid, offer or proposal to be considered not responsive. The disclosure will be considered when evaluating the bid 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 on 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.**

Addtionally, Section 30-22 of the Code requires that the bidder certify that an Illinois office be maintained as the primary place of employment for persons employed for this contract.

_____**NA-FEDERAL**_____

_____

_____

The requirements of these certifications and disclosures are a material part of the contract, and the contractor shall require these certification provisions 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 or any other procurement opportunity 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 bidder 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: _____
_____
_____
_____

☐ I acknowledge, understand and accept these terms and conditions for the above certifications.

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 $50,000 and all submissions to a vendor portal 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 individual 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 individual 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 an individual 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 __
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 individual 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 an individual that is authorized to execute contracts for your organization. The individual signing can be, but does not have to be, the individual 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 an individual that is authorized to execute contracts for your company.

RETURN WITH BID

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.

RETURN WITH BID

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 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 $50,000, 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 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 for 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 the 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 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 any minor children entitled to receive (i) more than 15% in the aggregate of the total distributable income from your firm, partnership, association or corporation, or (ii) an amount in excess of two 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 State of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statues 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): _____

_____

_____

_____

RETURN WITH BID

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 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 all bids.

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 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 Act 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 Title 44, Illinois Administrative Code, Section 750.120. 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. 60T93
COOK County
Section 2012-052I
Project ACNHPP-ACHPP-000V(039)
Route FAI 90/94
District 1 Construction Funds

PART I. IDENTIFICATION

Dept. of 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				TOTAL EMPLOYEES		MINORITY EMPLOYEES	
JOB CATEGORIES	TOTAL EMPLOYEES		BLACK		HISPANIC		*OTHER MINOR.		APPREN-TICES		ON THE JOB TRAINEES					
	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								

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

FOR DEPARTMENT USE ONLY

BC 1256 (Rev. 12/11/07)

Note: See instructions on page 2

RETURN WITH BID

Contract No. 60T93
COOK County
Section 2012-052I
Project ACNHPP-ACHPP-000V(039)
Route FAI 90/94
District 1 Construction Funds

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 **Illinois 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 only 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

ADDITIONAL FEDERAL REQUIREMENTS

In addition to the Required Contract Provisions for Federal-Aid Construction Contracts (FHWA 1273), all bidders make the following certifications.

A. By the execution of this proposal, the signing bidder certifies that the bidding entity has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid. This statement made by the undersigned bidder is true and correct under penalty of perjury under the laws of the United States.

B. CERTIFICATION, EQUAL EMPLOYMENT OPPORTUNITY:

1. Have you participated in any previous contracts or subcontracts subject to the equal opportunity clause. YES _____ NO _____

2. If answer to #1 is yes, have you filed with the Joint Reporting Committee, the Director of OFCC, any Federal agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements of those organizations? YES _____ NO _____

RETURN WITH BID

Contract No. 60T93
COOK County
Section 2012-052I
Project ACNHPP-ACHPP-000V(039)
Route FAI 90/94
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

(IF A CORPORATION)

_____
Typed or printed name and title of Authorized Representative

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

(IF A JOINT VENTURE)

_____
Typed or printed name and title of Authorized Representative

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
Annual Proposal Bid Bond

This Annual Proposal Bid Bond shall become effective at 12:01 AM (CDST) on _____ and shall be valid until _____ 11:59 PM (CDST).

KNOW ALL PERSONS BY THESE PRESENTS, That We _____

as PRINCIPAL, and _____

as SURETY, and 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 may submit bid proposal(s) to the STATE OF ILLINOIS, acting through the Department of Transportation, for various improvements published in the Transportation Bulletin during the effective term indicated above.

NOW, THEREFORE, if the Department shall accept the bid proposal(s) of the PRINCIPAL; and if the PRINCIPAL shall, within the time and as specified in the bidding and contract documents; 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 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 has caused this instrument to be signed by its officer
_____ day of _____ A.D., _____.

_____
(Company Name)

By _____
(Signature and Title)

Notary for PRINCIPAL

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)

by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(Date Commission Expires)

In TESTIMONY WHEREOF, the said SURETY has caused this instrument to be signed by its officer
_____ day of _____ A.D., _____.

_____
(Company Name)

By _____
(Signature of Attorney-in-Fact)

Notary for SURETY

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)

by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(Date Commission Expires)

In lieu of completing the above section of the Annual Proposal Bid Bond form, the Principal may file an Electronic Bid Bond. By signing the proposal(s) 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

This bond may be terminated, at Surety's request, upon giving not less than thirty (30) days prior written notice of the cancellation/termination of the bond. Said written notice shall be issued to the Illinois Department of Transportation, Chief Contracts Official, 2300 South Dirksen Parkway, Springfield, Illinois, 62764, and shall be served in person, by receipted courier delivery or certified or registered mail, return receipt requested. Said notice period shall commence on the first calendar day following the Department's receipt of written cancellation/termination notice. Surety shall remain firmly bound to all obligations herein for proposals submitted prior to the cancellation/termination. Surety shall be released and discharged from any obligation(s) for proposals submitted for any letting or date after the effective date of cancellation/termination.

Illinois Department of Transportation

Return with Bid

Division of Highways
Proposal Bid Bond

Item No. _____

Letting Date _____

KNOW ALL PERSONS BY THESE PRESENTS, That We _____

as PRINCIPAL, and _____

as SURETY, and 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; 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 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 has caused this instrument to be signed by its officer
_____ day of _____ A.D., _____.

_____
(Company Name)

By _____
(Signature and Title)

Notary for PRINCIPAL

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)
by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(Date Commission Expires)

In TESTIMONY WHEREOF, the said SURETY has caused this instrument to be signed by its officer
_____ day of _____ A.D., _____.

_____
(Company Name)

By _____
(Signature of Attorney-in-Fact)

Notary for SURETY

STATE OF _____
COUNTY OF _____

Signed and attested before me on _____ (date)
by _____
(Name of Notary Public)

(Seal)

_____
(Signature of Notary Public)

_____
(Date Commission Expires)

In lieu of completing the above section of the Proposal Bid Bond form, the Principal may file an Electronic Bid Bond. By signing the proposal 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 Number _____ Letting _____

Participation Statement Item No. _____

(1) Instructions Contract No. _____

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. Trucking participation items; description must list what is anticipated towards goal credit.

(2) Work:

Please indicate: J/V _____ Manufacturer _____ Supplier (60%) _____ Subcontractor _____ Trucking _____

Pay Item No.	Description (Anticipated items for trucking)*	Quantity	Unit Price	Total
			Total	

(3) Partial Payment Items (For any of the above items which are partial pay items)
Description must be sufficient to determine a Commercially Useful Function, specifically describe the work and subcontract dollar amount:
*Applies to trucking only

(4) Commitment

When a DBE is to be a second-tier subcontractor, or if the first-tier DBE subcontractor is going to be subcontracting a portion of its subcontract, it must be clearly indicated on the DBE Participation Statement, and the details of the transaction fully explained.

In the event a DBE subcontractor second-tiers a portion of its subcontract to one or more subcontractors during the work of a contract, the prime must submit a DBE Participation Statement, with the details of the transaction(s) fully explained.

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 or 1st Tier subcontractor. 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 Contractor __ 1st Tier __ 2nd Tier

Date _____

Contact Person _____

Title _____

Firm Name _____

Address _____

City/State/Zip _____

Phone _____

Email Address _____

_____
Signature for DBE Firm __ 1st Tier __ 2nd Tier

Date _____

Contact Person _____

Title _____

Firm Name _____

Address _____

City/State/Zip _____

Phone _____

Email Address _____

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. 60T93
COOK County
Section 2012-052I
Project ACNHPP-ACHPP-000V(039)
Route FAI 90/94
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

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 2012.

(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.

The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50-5.

B. Felons

Section 50-10. Felons.

(a) 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.

(b) 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

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

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 500/50-14 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 individual 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 individual 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 100 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any individual 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 an individual 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 individual 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 an individual that is authorized to execute contracts for your organization. The individual signing can be, but does not have to be, the individual 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 an individual 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 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 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 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 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): _____

_____

_____

_____

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

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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 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 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 Officer 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. Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). Paper-based bids are to be submitted to the Chief Procurement Officer for the Department of Transportation in care of the Chief Contracts Official at the Harry R. Hanley Building, 2300 South Dirksen Parkway, in Springfield, Illinois until 10:00 a.mNovember 6, 2015. 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 10:00 a.m.

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

   Contract No. 60T93
   COOK County
   Section 2012-052I
   Project ACNHPP-ACHPP-000V(039)
   Route FAI 90/94
   District 1 Construction Funds

Replacement of 15 existing REVLAC mechanical drum signs with LED dynamic message signs and additional CCTV cameras along with replacement of two existing flip disk DMS located along FAI 90/94 (Kennedy Expressway) in Chicago.

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

Randall S. Blankenhorn,
Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2015

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-12) (Revised 1-1-15)

SUPPLEMENTAL SPECIFICATIONS

RECURRING SPECIAL PROVISIONS

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

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STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted January 1, 2012, 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 FAI Route 90/94 (I-90/94), Project ACNHPP-ACHPP-000V (039), Section 2012-052I, Cook County, Contract No. 60T93, and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

FAI Route 90/94 (I-90/94)
Project ACNHPP-ACHPP-000V (039)
Section 2012-052I
Cook County
Contract No. 60T93

LOCATION OF IMPROVEMENT

The overall area of this improvement along the Kennedy Expressway (I-90/94) begins at a point approximately 200 feet south of the centerline of W. Fulton Market Street and extends in a northerly direction to a point 500 feet north of the centerline of Foster Street on the Edens Expressway (I-94) and a point 400 feet south of Lawrence Avenue on the Kennedy Expressway (I-90). The combined total distance is 28,960 feet (5.49 miles). The project is located in Cook County within the City of Chicago. The project has three main regions:

- Ohio/Ontario Interchange: This begins on NWB Kennedy Expressway 200 feet south of the centerline of W. Fulton Market and extends in northerly direction to N. Ogden Avenue for a total distance of 4,000 feet. The interchange also includes the Ohio/Ontario Street feeder ramps, bounded on the east by the north fork of the Chicago River and on the west by the Kennedy Expressway, for an additional 3000 feet, for combined total of 7,000 feet.

- Kennedy Expressway Reversible Lanes Slip Ramps: This section begins 500 feet southeast of the centerline of W. Fullerton Avenue and continues in a northwesterly direction to W. Addison Street for a total distance of 12,600 feet.

- Kennedy Expressway at Edens Expressway Junction: This section begins on the south boundary at 800 feet north of W Montrose Avenue and continues in a northerly direction along the Edens Expressway to a point 500 feet north of the centerline of W. Foster Avenue, and to a point 400 feet south of W. Lawrence Avenue along the Kennedy Expressway, for a total of 9,360 feet.

DESCRIPTION OF IMPROVEMENT

This project will upgrade a portion of the existing REVLAC system along the Kennedy Expressway removing 15 electromechanically operated drum signs associated with the reversible lane system. These signs are to be replaced with full-color LED Dynamic Message Signs (DMS). The work to be performed under this contract also consists of removing existing power and control conductors, removing sign lighting on existing drum sign structures, installing new non-REVLAC LED DMS signs on two existing reversible lane sign structures, removing existing DMS control cabinets and installing new control cabinets, installing CCTV cameras for reversible lane DMS sign confirmation and general surveillance, with various camera structures, installation of underground conduit, conduit attached to structures, junction boxes, handholes, communication vaults, fiber optic interconnect cabinets, fiber optic cable, splices, and innerduct, integration and modification of the REVLAC PLC control system and PLC software programming, and all incidental and collateral work necessary to complete the project as shown on the plans as described herein.

This project will upgrade a portion of the existing REVLAC system along the Kennedy Expressway removing 15 electromechanically operated drum signs associated with the reversible lane system. These signs are to be replaced with full-color LED Dynamic Message Signs (DMS). The work to be performed under this contract also consists of removing existing power and control conductors, removing sign lighting on existing drum sign structures, installing new non-REVLAC LED DMS signs on two existing reversible lane sign structures, and replacing existing drum sign control cabinets with new power control cabinets. The work also includes installing fixed position and PTZ CCTV cameras for reversible lane DMS display confirmation and general surveillance on various camera structures. Infrastructure work includes installation of underground conduit, conduit attached to structures, junction boxes, handholes, communication vaults, fiber optic cable, duct, and electrical conductor installation. Control system work involves integration and modification of the REVLAC PLC logic and control, multiple implementation stages of testing, operations training and all incidental and collateral work necessary to complete the project as shown on the plans as described herein.

STATUS OF UTILITIES TO BE ADJUSTED
Effective: January 30, 1987 Revised: July 1, 1994

Utility companies involved in this project have provided the following:

No conflicts anticipated.

The above represents the best information available to the Department and is included for the convenience of the bidder. The applicable portions of Articles 105.07 and 107.39 of the Standard Specifications shall apply.

COMPLETION DATE PLUS WORKING DAYS
Effective: September 30, 1985 Revised: January 1, 2007

Revise Article 108.05 (b) of the Standard Specifications as follows:

"When a completion date plus working days is specified, the Contractor shall complete all contract items and safely open all roadways to traffic by 11:59 PM on December 15, 2016, except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within 60 working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for cleanup work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

The completion date for all work shall be December 15, 2016.

Article 108.09 or the Special Provision for “Failure to Complete the Work on Time”, shall apply to both the completion date and the number of working days.

FAILURE TO COMPLETE THE WORK ON TIME
Effective: September 30, 1985 Revised: January 1, 2007

Should the Contractor fail to complete the contract items within the required number of calendar days and/or fail to complete the work on or before the completion date as specified in the Special Provisions for COMPLETION DATE PLUS WORKING DAYS, or within such extended time as may have been allowed by the Department, the Contractor shall be liable to the Department for damages. The damages shall be in the amount of $5,000 (five thousand dollars), not as a penalty but as liquidated damages, for each calendar day or a portion thereof of overrun in the contract time or such extended time as may have been allowed.

In fixing the damages as set out herein, the desire is to establish a certain mode of calculation for the work since the Department’s actual loss, in the event of delay, cannot be predetermined, would be difficult to ascertain, and a matter of argument and unprofitable litigation. This said mode is an equitable rule for measurement of the Department’s actual loss and fairly takes into account the traveling public inconvenience and staff expended hours if the project is delayed in completion. The Department shall not be required to provide any actual loss in order to recover these liquidated damages provided herein, as said damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

TRAFFIC CONTROL PLAN
Effective: September 30, 1985 Revised: January 1, 2007

Traffic Control shall be according to the applicable sections of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", any special details and Highway Standards contained in the plans, and the Special Provisions contained herein.

Special attention is called to Article 107.09 of the Standard Specifications and the following Highway Standards, Details, Quality Standard for Work Zone Traffic Control Devices, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control.

The Contractor shall contact the District One Bureau of Traffic at least 72 hours in advance of beginning work.

STANDARDS:

701101	OFF-ROAD OPERATIONS, MULTILANE, 15' TO 24" FROM PAVEMENT EDGE
701400	APPROACH TO LANE CLOSURE, FREEWAY/EXPRESSWAY
701401	LANE CLOSURE, FREEWAY/EXPRESSWAY
701411	LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMPS, FOR SPEEDS >= 45 MPH
701428	TRAFFIC CONTROL SETUP & REMOVAL FREEWAY/EXPRESSWAY
701446	TWO LANE CLOSURE FREEWAY/EXPRESSWAY
701901	TRAFFIC CONTROL DEVICES

DISTRICT ONE DETAILS:

TC-08	FREEWAY ENTRANCE AND EXIT RAMP CLOSURE DETAILS
TC-09	TRAFFIC CONTROL DETAILS FOR FREEWAY SINGLE & MULTI-LANE WEAVE
TC-17	TRAFFIC CONTROL DETAILS FOR FREEWAY SHOULDER CLOSURES AND PARTIAL RAMP CLOSURES
TC-18	SIGNING FOR FLAGGING OPERATIONS AT WORK ZONE OPENINGS

DISTRICT BUREAU OF DESIGN:

Traffic Control Plan
Public Convenience and Safety

DISTRICT BUREAU OF TRAFFIC SPECIAL PROVISIONS:

Keeping the Expressway Open to Traffic
Failure to Open Traffic Lanes to Traffic
Traffic Control and Protection (Expressways)
Speed Display Trailer (D1)
Sign Shop Drawing Submittal

PUBLIC CONVENIENCE AND SAFETY (DIST 1)
Effective: May 1, 2012 Revised: July 15, 2012

Add the following to the end of the fourth paragraph of Article 107.09:

> "If the holiday is on a Saturday or Sunday, and is legally observed on a Friday or Monday, the length of Holiday Period for Monday or Friday shall apply."

Add the following sentence after the Holiday Period table in the fourth paragraph of Article 107.09:

> "The Length of Holiday Period for Thanksgiving shall be from 5:00 AM the Wednesday prior to 11:59 PM the Sunday After"

Delete the fifth paragraph of Article 107.09 of the Standard Specifications:

> "On weekends, excluding holidays, roadways with Average Daily Traffic of 25,000 or greater, all lanes shall be open to traffic from 3:00 P.M. Friday to midnight Sunday except where structure construction or major rehabilitation makes it impractical."

KEEPING THE EXPRESSWAY OPEN TO TRAFFIC
Effective: March 22, 1996 Revised: January 21, 2015

Whenever work is in progress on or adjacent to an expressway, 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, the State Standards and the District Freeway details. All Contractors' personnel shall be limited to these barricaded work zones and shall not cross the expressway.

The Contractor shall request and gain approval from the Illinois Department of Transportation's Expressway Traffic Operations Engineer at www.idotlcs.com twenty-four (24) hours in advance of all daily lane, ramp and shoulder closures and 7 days in advance of all permanent and weekend closures on all Freeways and/or Expressways in District One. This advance notification is calculated based on workweek of Monday through Friday and shall not include weekends or Holidays. An updated implementation and testing schedule requiring nighttime closures shall be submitted to the Traffic Operations Engineer and District One Expressway Traffic Control Supervisor after each schedule change. The Contractor shall perform the necessary coordination to keep the Traffic Operations Engineer and District One Expressway Traffic Control Supervisor informed regarding any work that affects REVLAC operations.

LOCATION: I-94 Edens: Dempster to I-90 Kennedy Junction

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS		
Sunday - Thursday	1-Lane	9:00 P.M.	to	5:00 A.M.
	2-Lane	11:00 P.M.	to	5:00 A.M.
Friday	1-Lane	10:00 P.M. (Fri)	to	8:00 A.M. (Sat)
	2-Lane	11:59 P.M. (Fri)	to	6:00 A.M. (Sat)
Saturday	1-Lane	9:00 P.M. (Sat)	to	10:00 A.M. (Sun)
	2-Lane	11:59 P.M. (Sat)	to	8:00 A.M. (Sun)

LOCATION: I-90/94 Kennedy: Harlem to I-94 Edens Junction

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS		
Sunday - Thursday	1-Lane	9:00 PM	to	5:00 AM
	2-Lane	11:59 PM	to	5:00 AM
Friday	1-Lane	10:00 PM (Fri)	to	8:00 AM (Sat)
	2-Lane	11:59 PM (Fri)	to	6:00 AM (Sat)
Saturday	1-Lane	9:00 PM (Sat)	to	10:00 AM (Sun)
	2-Lane	11:59 PM (Sat)	to	8:00 AM (Sun)

LOCATION: I-90/94 Kennedy: I-94 Edens Junction to Ohio

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS		
Sunday - Thursday	1-Lane*	9:00 PM	to	5:00 AM
	2-Lane	11:59 PM	to	5:00 AM
	3-Lane	1:00 AM	to	5:00 AM
Friday	1-Lane*	10:00 PM (Fri)	to	8:00 AM (Sat)
	2-Lane	11:59 PM (Fri)	to	6:00 AM (Sat)
	3-Lane	NOT		ALLOWED
Saturday	1-Lane*	9:00 PM (Sat)	to	10:00 AM (Sun)
	2-Lane	11:59 PM (Sat)	to	8:00 AM (Sun)
	3-Lane	1:00 AM (Sun)	to	7:00AM (Sun)

*** Kennedy 1-Lane Closure hours may be more restrictive if the Reversible Lanes are also closed.**

LOCATION: I-90/94 Kennedy: Ohio to I-290

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS		
Sunday - Thursday	1-Lane	9:00 PM	to	5:00 AM
	2-Lane	11:59 PM	to	5:00 AM
Friday	1-Lane	10:00 PM (Fri)	to	8:00 AM (Sat)
	2-Lane	11:59 PM (Fri)	to	6:00 AM (Sat)
Saturday	1-Lane	9:00 PM (Sat)	to	10:00 AM (Sun)
	2-Lane	11:59 PM (Sat)	to	8:00 AM (Sun)

LOCATION: I-90/94 Kennedy: Ohio/Ontario Feeder Ramps

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS		
Sunday - Thursday	1-Lane	9:00 PM	to	5:00 AM
	2-Lane	11:59 PM	to	5:00 AM
Friday	1-Lane	10:00 PM (Fri)	to	8:00 AM (Sat)
	2-Lane	11:59 PM (Fri)	to	6:00 AM (Sat)
Saturday	1-Lane	9:00 PM (Sat)	to	10:00 AM (Sun)
	2-Lane	11:59 PM (Sat)	to	8:00 AM (Sun)

LOCATION: I-90/94 Kennedy REVERSIBLES

WEEK NIGHT	ALLOWABLE LANE CLOSURE HOURS		
Sunday - Friday	9:00 PM	to	5:00 AM
Friday	11:00 PM (Fri)	to	6:00 AM (Sat)
Saturday	11:00 PM (Sat)	to	8:00 AM (Sun)

In addition to the hours noted above, temporary shoulder and non-system interchange partial ramp closures are allowed weekdays between 9:00 A.M. and 3:00 P.M. and between 7:00 P.M. and 5:00 A.M.

Narrow Lanes and permanent shoulder closures will not be allowed between Dec. 1st and April 1st.

Full Expressway Closures will only be permitted for a maximum of 15 minutes at a time during the low traffic volume hours of 1:00 A.M. to 5:00 A.M. Monday thru Friday and from 1:00 A.M. to 7:00 A.M. on Sunday. During Full Expressway Closures, the Contractor will be required to close off all lanes except one, using Freeway Standard Closures and approved Maintenance of Traffic Plan. Police forces should be notified and requested to close off the remaining lane at which time the work item may be removed or set in place. The District One Expressway Traffic Control Supervisor (847-705-4151) **shall be** notified at least 3 working days (weekends and holidays DO NOT count into this 72 hours notification) in advance of the proposed road closure and will coordinate the closure operations with police forces. Liquidated Damages as specified in the Failure to Open Traffic Lanes to Traffic for one lane or ramp blocked shall be assessed to the Contract for every 15 minutes beyond the initial 15 minutes all lanes are blocked.

All stage changes requiring the stopping and/or the pacing of traffic shall take place during the allowable hours for Full Expressway Closures and shall be approved by the Department. The Contractor shall notify the District One Expressway Traffic Control Supervisor at least 3 working days (weekends and holidays DO NOT count into this 72 hours notification) in advance of any proposed stage change.

A Maintenance of Traffic Plan shall be submitted to the Engineer and District One Expressway Traffic Control Supervisor at least 14 days in advance of any stages changes or full expressway closures. The Maintenance of Traffic Plan shall comply with IDOT standards and include, but not be limited to: lane and ramp closures, existing geometrics, and equipment and material location.

All nightly lane closures shall be removed during adverse weather conditions such as rain, snow, and/or fog and as determined by the Engineer. Also, the Contractor shall promptly remove their lane closures when informed Maintenance forces are out for snow and ice removal.

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.

All lane closure signs shall not be erected any earlier than one-half (1/2) hour before the starting hours listed above. Also, these signs should be taken down within one-half (1/2) hour after the closure is removed.

The Contractor will be required to cooperate with all other contractors when erecting lane closures on the expressway. All lane closures (includes the taper lengths) without a three (3) mile gap between each other, in one direction of the expressway, shall be on the same side of the pavement. Lane closures on the same side of the pavement with a one (1) mile or less gap between the end of one work zone and the start of taper of next work zone should be connected. The maximum length of any lane closure on the project and combined with any adjacent projects shall be three (3) miles. Gaps between successive permanent lane closures shall be no less than two (2) miles in length.

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.

Check barricades hall be placed every 1000’ within a land closure to prevent vehicles from driving through closed lanes.

Temporary ramp closures for service interchanges will only be permitted at night during the restricted hours listed for temporary one-lane closures within the project limits. However, no two (2) adjacent entrance and exit ramps in one direction of the expressway shall be closed at the same time.

Freeway to freeway (system interchange) full ramp closures for two lane ramps will not be permitted. Partial ramp closures of system ramps may be allowed during the 1-lane closure hours above. System ramp full closures for single lane ramps are only permitted for a maximum of four (4) hours

- between the hours of 1:00 a.m. and 5:00 a.m. on Monday thru Friday
- between the hours of 1:00 a.m. and 6:00 a.m. on Saturday, and
- between the hours of 1:00 a.m. and 7:00 a.m. on Sunday.

The Contractor shall furnish and install large (48" X 48") "DETOUR with arrow" signs as directed by the Engineer for all system ramp closures. In addition, one portable changeable message sign will be required to be placed in advance of the ramp closure. The cost of these signs and PCMS board shall be included in the cost of traffic control and protection (6 static signs maximum per closure).

Should the Contractor fail to completely open, and keep open, the ramps to traffic in accordance with the above limitations, the Contractor shall be liable to the Department for liquidated damages as noted under the Special Provision, "Failure to Open Traffic Lanes to Traffic".

FAILURE TO OPEN TRAFFIC LANES TO TRAFFIC
Effective: March 22, 1996 Revised: February 9, 2005

Should the Contractor fail to completely open and keep open all the traffic lanes to traffic in accordance with the limitations specified under the Special Provisions for "Keeping the Expressway Open to Traffic", the Contractor shall be liable to the Department for the amount of:

One lane or ramp blocked = $2000

Two lanes blocked = $5000

Not as a penalty but as liquidated and ascertained damages for each and every 15 minute interval or a portion thereof that a lane is blocked outside the allowable time limitations. Such damages may be deducted by the Department from any monies due the Contractor. These damages shall apply during the contract time including any extensions of the contract time.

TRAFFIC CONTROL AND PROTECTION (EXPRESSWAYS)
Effective: March 8, 1996 Revised: January 21, 2015

Description. This work shall include furnishing, installing, maintaining, replacing, relocating, and removing all traffic control devices used for the purpose of regulating, warning, or directing traffic. Traffic control and protection shall be provided as called for in the plans, applicable Highway Standards, District One Expressway details, Standards and Supplemental Specifications, these Special Provisions, or as directed by the Engineer.

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

The Contractor shall be responsible for the proper location, installation, and arrangement of all traffic control devices. Special attention shall be given to existing warning signs and overhead guide signs during all construction operations. Warning signs and existing guide signs with down arrows shall be kept consistent with the barricade placement at all times. The Contractor shall immediately remove, completely cover, or turn from the motorist's view all signs which are inconsistent with lane assignment patterns.

The Contractor shall coordinate all traffic control work on this project with adjoining or overlapping projects, including barricade placement necessary to provide a uniform traffic detour pattern. When directed by the Engineer, the Contractor shall remove all traffic control devices that were furnished, installed, or maintained by him under this contract, and such devices shall remain the property of the Contractor. All traffic control devices shall remain in place until specific authorization for relocation or removal is received from the Engineer.

Additional requirements for traffic control devices shall be as follows.

(a) Traffic Control Setup and Removal. The setting and removal of barricades for the taper portion of a lane closure shall be done under the protection of a vehicle with a truck/trailer mounted attenuator and arrow board per State Standard 701428 and the Traffic Control Setup and Removal Freeway/Expressway BDE Special Provision. Failure to meet this requirement will be subject to a Traffic Control Deficiency. The deficiency will be calculated as outlined in Article 105.03 of the Standard Specifications. Truck/trailer mounted attenuators shall comply with Article 1106.02(g) or shall meet the requirements of NCHRP 350 Test Level 3 with vehicles used in accordance with manufacturer’s recommendations and requirements.

(b) Sign Requirements

(1) Sign Maintenance. Prior to the beginning of construction operations, the Contractor will be provided a sign log of all existing signs within the limits of the construction zone. The Contractor is responsible for verifying the accuracy of the sign log. Throughout the duration of this project, all existing traffic signs shall be maintained by the Contractor. All provisions of Article 107.25 of the Standard Specifications shall apply except the third paragraph shall be revised to read: "The Contractor shall maintain, furnish, and replace at his own expense, any traffic sign or post which has been damaged or lost by the Contractor or a third party.

(2) Work Zone Speed Limit Signs. Work zone speed limit signs shall be installed as required in Article 701.14(b) and as shown in the plans and Highway Standards. Based upon the exiting posted speed limit, work zone speed limits shall be established and signed as follows.

a. Existing Speed Limit of 55mph or higher. The initial work zone speed limit assembly, located approximately 4200' before the closure, and shall be 55mph as shown in 701400. Additional work zone 45mph assemblies shall be used as required according to Article 701.14(b) and as shown in the Highway Standards and plans. WORK ZONE SPEED LIMIT 55 PHOTO ENFORCED assemblies may be omitted when this assembly would normally be placed within 1500 feet of the END WORK ZONE SPEED LIMIT sign. If existing speed limit is over 65mph then additional signage should be installed per 701400.

b. Existing Speed Limit of 45mph. The advance 55mph work zone speed limit assembly shown in 701400 shall be replaced with a 45mph assembly. Additional work zone 45mph assemblies shall be used as required according to Article 701.14(b) and as shown in the Highway Standards and plans. WORK ZONE SPEED LIMIT 55 PHOTO ENFORCED assemblies shall be eliminated in all cases. END WORK ZONE SPEED LIMIT signs are required.

(3) Exit Signs. The exit gore signs as shown in Standard 701411 shall be a minimum size of 48 inch by 48 inch with 12 inch capital letters and a 20 inch arrow. EXIT OPEN AHEAD signs shown in Standard 701411 shall be a minimum size of 48 inch by 48 inch with 8 inch capital letters.

(4) Uneven Lanes Signs. The Contractor shall furnish and erect "UNEVEN LANES" signs (W8-11) on both sides of the expressway, at any time when the elevation difference between adjacent lanes open to traffic equals or exceeds one inch. Signs shall be placed 500' in advance of the drop-off, within 500' of every entrance, and a minimum of every mile.

(c) Drums/Barricades. Check barricades shall be placed in work areas perpendicular to traffic every 1000', one per lane and per shoulder, to prevent motorists from using work areas as a traveled way. Check barricades shall also be placed in advance of each open patch, or excavation, or any other hazard in the work area, the first at the edge of the open traffic lane and the second centered in the closed lane. Check barricades, either Type I or II, or drums shall be equipped with a flashing light.

To provide sufficient lane widths (10' minimum) for traffic and also working room, the Contractor shall furnish and install vertical barricades with steady burn lights, in lieu of Type II or drums, along the cold milling and asphalt paving operations. The vertical barricades shall be placed at the same spacing as the drums.

(d) Vertical Barricades. Vertical barricades shall not be used in lane closure tapers, lane shifts, exit ramp gores, or staged construction projects lasting more than 12 hours. Also, vertical barricades shall not be used as patch barricades or check barricades. Special attention shall be given, and ballast provided per manufacture's specification, to maintain the vertical barricades in an upright position and in proper alignment.

(e) Temporary Concrete Barrier Wall. Prismatic barrier wall reflectors shall be installed on both the face of the wall next to traffic, and the top of sections of the temporary concrete barrier wall as shown in Standard 704001. The color of these reflectors shall match the color of the edgelines (yellow on the left and crystal or white on the right). If the base of the temporary concrete barrier wall is 12 inches or less from the travel lane, then the lower slope of the wall shall also have a 6 inch wide temporary pavement marking edgeline (yellow on the left and white on the right).

(f) Full Expressway Closures. Full Expressway Closures will only be permitted for a maximum of 15 minutes during the allowable hours listed in the Keeping the Expressway Open to Traffic Special Provision. During Full Expressway Closures, the Contractor will be required to close off all lanes except one, using Freeway Standard Closures. The Contractor will be required to provide one changeable message sign to be placed at the direction of the Engineer. The sign shall display a message as directed by the Engineer. A Maintenance of Traffic Plan shall be submitted to the Engineer and District One Expressway Traffic Control Supervisor at least 14 days in advance of the planned work; including all stage changes. The Maintenance of Traffic Plan shall include, but not be limited to: lane and ramp closures, existing geometrics, and equipment and material location. Unless otherwise approved by the Engineer, the District One Expressway Traffic Control Supervisor (847-705-4151) shall be contacted at least 3 working days in advance of the proposed road closure and will coordinate the closure operation with police forces.

Method of Measurement. This item of work will be measured on a lump sum basis for furnishing, installing, maintaining, replacing, relocating, and removing traffic control devices required in the plans and these Special Provisions. Traffic control and protection required under Standards 701101, 701400, 701401, 701402, 701406, 701411, 701416, 701426, 701428, 701446, 701901 and District details TC-8, TC-9, TC-17, TC-18 and TC-25 will be included with this item.

Basis of Payment.

(a) This work will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (EXPRESSWAYS). This price shall be payment in full for all labor, materials, transportation, handling, and incidental work necessary to furnish, install, maintain, replace, relocate, and remove all Expressway traffic control devices required in the plans and specifications.

In the event the sum total value of all the work items for which traffic control and protection is required is increased or decreased by more than ten percent (10%), the contract bid price for TRAFFIC CONTROL AND PROTECTION (EXPRESSWAYS) will be adjusted as follows:

Adjusted contract price = .25P + .75P [1±(X-0.1)]

Where: "P" is the bid unit price for Traffic Control and Protection

Where: "X" = $\left|\dfrac{\text{Difference between original and final sum total value of all work items for which traffic control and protection is required}}{\text{Original sum total value of all work items for which traffic control and protection is required.}}\right|$

The value of the work items used in calculating the increase and decrease will include only items that have been added to or deducted from the contract under Article 104.02 of the Standard Specifications and only items which require use of Traffic Control and Protection.

(b) The Engineer may require additional traffic control be installed in accordance with standards and/or designs other than those included in the plans. In such cases, the standards and/or designs will be made available to the Contractor at least one week in advance of the change in traffic control. Payment for any additional traffic control required will be in accordance with Article 109.04 of the Standard Specifications.

(c) Revisions in the phasing of construction or maintenance operations, requested by the Contractor, may require traffic control to be installed in accordance with standards and/or designs other than those included in the plans. Revisions or modifications to the traffic control shown in the contract shall be submitted by the Contractor for approval by the Engineer. No additional payment will be made for a Contractor requested modification.

(d) Temporary concrete barrier wall will be measured and paid for according to Section 704.

(e) Impact attenuators, temporary bridge rail, and temporary rumble strips will be paid for separately.

(f) Temporary pavement markings shown on the Standard will be measured and paid for according to Section 703 and Section 780.

(g) All pavement marking removal will be measured and paid for according to Section 703 or Section 783.

(h) Temporary pavement marking on the lower slope of the temporary concrete barrier wall will be measured and paid for as TEMPORARY PAVEMENT MARKING, 6".

(i) All prismatic barrier wall reflectors will be measured and paid for according to the Recurring Special Provision Guardrail and Barrier Wall Delineation.

(j) The Changeable Message Sign required for Full Expressway Closures shall not be paid for separately.

SPEED DISPLAY TRAILER (D1)
Effective: April 1, 2015

Add the following to Article 701.15(l) of the Standard Specifications:

"(l) Speed Display Trailer. A speed display trailer shall be utilized on freeways and expressways as part of Highway Standard 701400. The trailer shall be placed on the right hand side of the roadway adjacent to, or within 100 ft. (30 m) beyond, the first work zone speed limit sign.

Whenever the speed display trailer is not in use, it shall be considered non-operating equipment and shall be stored according to Article 701.11."

Add the following to Article 701.20 of the Standard Specifications:

"(k) Revised. "Speed Display Trailer will NOT be paid for by separate pay item, but it costs shall be included in the contract unit price of the various traffic control pay items.

Add the following to Article 1106.02 of the Standard Specifications:

"(o) Speed Display Trailer. The speed display trailer shall consist of a LED speed indicator display with self-contained, one-direction radar mounted on an orange see-through trailer. The height of the display and radar shall be such that it will function and be visible when located behind concrete barrier.

The speed measurement shall be by radar and provide a minimum detection distance of 1000 ft (300 m). The radar shall have an accuracy of ±1 mile per hour.

The speed indicator display shall face approaching traffic and shall have a sign legend of "YOUR SPEED" immediately above or below the speed display. The digital speed display shall show two digits (00 to 99) in mph. The color of the changeable message legend shall be a yellow legend on a black background. The minimum height of the numerals shall be 18 in. (450 mm), and the nominal legibility distance shall be at least 750 ft (250 m).

The speed indicator display shall be equipped with a violation alert that flashes the displayed detected speed when the posted limit is exceeded. The speed indicator shall have a maximum speed cutoff. The display shall include automatic dimming for nighttime operation.

The speed indicator measurement and display functions shall be equipped with the power supply capable of providing 24 hours of uninterrupted service."

SIGN SHOP DRAWING SUBMITTAL
Effective: January 22, 2013 Revised: January 1, 2015

Add the following paragraph to Article 720.03 of the Standard Specifications:

Shop drawings will be required, according to Article 105.04, for all Arterials/Expressways signs except standard highway signs covered in the MUTCD. Shop drawings shall be submitted to the Engineer for review and approval prior to fabrication. The shop drawings shall include dimensions, letter sizing, font type, colors and materials.

RAILROAD PROTECTIVE LIABILITY INSURANCE

Description. Railroad Protective Liability and Property Damage Liability Insurance shall be carried according to Article 107.11 of the Standard Specifications. A separate policy is required for each railroad unless otherwise noted.

NIRC Railroad:

NAMED INSURED & ADDRESS	NUMBER & SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
I-90 at NIRC Railroad, Chicago, IL	176 trains/day @ 30 mph	-0-

Northeast Illinois Regional Commuter Railroad Corporation Company
547 W Jackson Blvd Ste 1100
Chicago, IL, 60661

DOT/AAR No.: 522445S
RR Division: MWD
RR Mile Post: 0.95
RR Sub-Division: C&M SUB

For Freight/Passenger Information Contact: Phone: (312) 322-6900
For Insurance Information Contact: Phone: (312) 322-6900

I-90 at NIRC Railroad, Chicago, IL	72 trains/day @ 60 mph	-0-

Northeast Illinois Regional Commuter Railroad Corporation Company
547 W Jackson Blvd Ste 1100
Chicago, IL, 60661

DOT/AAR No.: 386366F
RR Division: MWD
RR Mile Post: 9.11
RR Sub-Division: C&M

For Freight/Passenger Information Contact: Phone: (312) 322-6900
For Insurance Information Contact: Phone: (312) 322-6900

NAMED INSURED & ADDRESS	NUMBER & SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
I-90 at NIRC Railroad, Chicago, IL	176 trains/day @ 30 mph	-0-

Northeast Illinois Regional Commuter Railroad Corporation Company
547 W Jackson Blvd Ste 1100
Chicago, IL, 60661

DOT/AAR No.: 372056V
RR Division: MWD
RR Mile Post: 0.95
RR Sub-Division: C&M SUB

For Freight/Passenger Information Contact: Phone: (312) 322-6900
For Insurance Information Contact: Phone: (312) 322-6900

UP Railroad:

NAMED INSURED & ADDRESS	NUMBER & SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
Ohio St Ramp at UP RR, Chicago, IL	-0-	2 trains/day @ 10 mph

Union Pacific Railroad Company
11 E Northwest Hwy
Mount Prospect, IL 60056

DOT/AAR No.: 174318E RR Mile Post: 2.03
RR Division: COMMUTER OPERA RR Sub-Division: HARVARD SUB

For Freight/Passenger Information Contact: Phone: (847) 253-5839
For Insurance Information Contact: Phone: (847) 253-5839

I-90 at NIRC Railroad, Chicago, IL	140 trains/day @ 30 mph	-0-

Union Pacific Railroad Company
11 E Northwest Hwy
Mount Prospect, IL 60056

DOT/AAR No.: 173713K RR Mile Post: 0.74
RR Division: COMMUTER OPERA RR Sub-Division: HARVARD SUB

For Freight/Passenger Information Contact: Phone: (847) 253-5839
For Insurance Information Contact: Phone: (847) 253-5839

NAMED INSURED & ADDRESS	NUMBER & SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
I-90 at NIRC Railroad, Chicago, IL	70 trains/day @ 50 mph	-0-

Union Pacific Railroad Company
11 E Northwest Hwy
Mount Prospect, IL 60056

DOT/AAR No.: 173868C RR Mile Post: 5.77
RR Division: COMMUTER OPERA RR Sub-Division: HARVARD SUB

For Freight/Passenger Information Contact: Phone: (847) 253-5839
For Insurance Information Contact: Phone: (847) 253-5839

Approval of Insurance. The original and one certified copy of each required policy shall be submitted to the following address for approval:

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

The Contractor will be advised when the Department has received approval of the insurance from the railroad(s). Before any work begins on railroad right-of-way, the Contractor shall submit to the Engineer evidence that the required insurance has been approved by the railroad(s). The Contractor shall also provide the Engineer with the expiration date of each required policy.

Basis of Payment. Providing Railroad Protective Liability and Property Damage Liability Insurance will be paid for at the contract unit price per Lump Sum for RAILROAD PROTECTIVE LIABILITY INSURANCE.

GENERAL ELECTRICAL REQUIREMENTS
Effective: March 15, 2013

Add the following to Article 801 of the Standard Specifications:

"Maintenance transfer and Preconstruction Inspection:

General. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall request a maintenance transfer and preconstruction site inspection, to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any lighting and/or traffic control systems which may be affected by the work. The request for the maintenance transfer and preconstruction inspection shall be made no less than seven (7) calendar days prior to the desired inspection date. The maintenance transfer and preconstruction inspection shall:

Establish the procedures for formal transfer of maintenance responsibility required for the construction period.

Establish the approximate location and operating condition of lighting and/or traffic control systems which may be affected by the work

Marking of Existing Cable Systems. The party responsible for maintenance of any existing lighting and/or traffic control systems at the project site will, at the Contractor's request, mark and/or stake, once per location, all underground cable routes owned or maintained by the State. A project may involve multiple "locations" where separated electrical systems are involved (i.e. different controllers). The markings shall be taken to have a horizontal tolerance of at least 304.8 mm (one (1) foot) to either side. The request for the cable locations and marking shall be made at the same time the request for the maintenance transfer and preconstruction inspection is made. The Contractor shall exercise extreme caution where existing buried cable runs are involved. The markings of existing systems are made strictly for assistance to the Contractor and this does not relieve the Contractor of responsibility for the repair or replacement of any cable run damaged in the course of his work, as specified elsewhere herein. Note that the contractor shall be entitled to only one request for location marking of existing systems and that multiple requests may only be honored at the contractor's expense. No locates will be made after maintenance is transferred, unless it is at the contractor's expense.

Condition of Existing Systems. The Contractor shall conduct an inventory of all existing electrical system equipment within the project limits, which may be affected by the work, making note of any parts which are found broken or missing, defective or malfunctioning. Megger and load readings shall be taken for all existing circuits which will remain in place or be modified. If a circuit is to be taken out in its entirety, then readings do not have to be taken. The inventory and test data shall be reviewed with and approved by the Engineer and a record of the inventory shall be submitted to the Engineer for the record. Without such a record, all systems transferred to the Contractor for maintenance during construction shall be returned at the end of construction in complete, fully operating condition."

Add the following to the 1st paragraph of Article 801.05(a) of the Standard Specifications:

"Items from multiple disciplines shall not be combined on a single submittal and transmittal. Items for lighting, signals, surveillance and CCTV must be in separate submittals since they may be reviewed by various personnel in various locations."

Revise the second sentence of the 5th paragraph of Article 801.05(a) of the Standard Specifications to read:

"The Engineer will stamp the submittals indicating their status as 'Approved', 'Approved as Noted', 'Disapproved', or 'Information Only'.

Revise the 6th paragraph of Article 801.05(a) of the Standard Specifications to read:

"Resubmittals. All submitted items reviewed and marked 'Approved as Noted', or 'Disapproved' are to be resubmitted in their entirety with a disposition of previous comments to verify contract compliance at no additional cost to the state unless otherwise indicated within the submittal comments."

Revise Article 801.11(a) of the Standard Specifications to read:

"Lighting Operation and Maintenance Responsibility. The scope of work shall include the assumption of responsibility for the continuing operation and maintenance the of existing, proposed, temporary, sign and navigation lighting, or other lighting systems and all appurtenances affected by the work as specified elsewhere herein. Maintenance of lighting systems is specified elsewhere and will be paid for separately

Energy and Demand Charges. The payment of basic energy and demand charges by the electric utility for existing lighting which remains in service will continue as a responsibility of the Owner, unless otherwise indicated. Unless otherwise indicated or required by the Engineer duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously at the Owner's expense and lighting systems shall not be kept in operation during long daytime periods at the Owner's expense. Upon written authorization from the Engineer to place a proposed new lighting system in service, whether the system has passed final acceptance or not, (such as to allow temporary lighting to be removed), the Owner will accept responsibility for energy and demand charges for such lighting, effective the date of authorization. All other energy and demand payments to the utility shall be the responsibility of the Contractor until final acceptance."

Add the following to Section 801 of the Standard Specifications:

"Lighting Cable Identification. Each wire installed shall be identified with its complete circuit number at each termination, splice, junction box or other location where the wire is accessible."

"Lighting Cable Fuse Installation. 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."

Revise Article 801.16 of the Standard Specifications to read:

"**Record Drawings**. Alterations and additions to the electrical installation made during the execution of the work shall be neatly and plainly marked in red by the Contractor on the full-size set of record drawings kept at the Engineer's field office for the project. These drawings shall be updated on a daily basis and shall be available for inspection by the Engineer during the course of the work. The record drawings shall include all plans, details, notes, schedules, single line diagrams, etc., applicable to the electrical work and other information useful to locate and maintain the electrical system. As part of the record drawings, the Contractor shall inventory all materials, new or existing, on the project and record information on inventory sheets provided by the Engineer. The inventory shall include:

- Location of Equipment, including rack, chassis, slot as applicable.
- Designation of Equipment
- Equipment manufacturer
- Equipment model number
- Equipment Version Number
- Equipment Configuration
    - o Addressing, IP or other
    - o Settings, hardware and/or programmed
- Equipment Serial Number

Upon request, if available, a full-size set of reproducible drawings of the work may be made available to the Contractor for the purpose of compliance with these requirements.

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. 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 either by filename or PDF table of contents the respective pay item number. Specific part or model numbers of items which have been selected shall be clearly visible.

The Contractor shall provide two sets of electronically produced drawings in a moisture proof pouch to be kept on the inside door of the controller cabinet or other location approved by the Engineer. These drawings shall show the final as-built circuit orientation(s) of the project in the form of a single line diagram with all luminaires numbered and clearly identified for each circuit.

In addition to the specified record drawings, the Contactor shall record GPS coordinates of the following electrical components being installed, modified or being affected in other ways by this contract:

- Last light pole on each circuit
- Handholes
- Conduit roadway crossings
- Controllers
- Control Buildings
- Structures with electrical connections, i.e. DMS, lighted signs.
- Electric Service 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:

Equipment Description	Equipment Designation	Latitude	Longitude
CCTV Camera pole	ST42	41.580493	-87.793378
FO mainline splice handhole	HHL-ST31	41.558532	-87.792571
Handhole	HH at STA 234+35	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
Conduit crossing	SB IL83 to EB I290 ramp SIDE B	41.584600	-87.793432
Light Pole	DA03	41.558532	-87.792571
Lighting Controller	X	41.651848	-87.762053
Sign Structure	FGD	41.580493	-87.793378
Video Collection Point	VCP-IK	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."

The following forms are included as described elsewhere herein.

Electrical Cable Insulation Resistance Test

Route, Common Name	Limits
Section	Controller Number
Contract	Megger Model
County	Date

Resistance Measurements (Megohms)

Circuit	Contractor Measurement	Owner Measurement	Circuit	Contractor Measurement	Owner Measurement
A			B		
C			D		
E			F		
G			H		
I			J		
K			L		
M			N		
O			P		
Q			R		
S			T		
U			V		
W			X		
Y			Z		
Service Cable Measurements					
Phase	**Contractor Measurement**	**Owner Measurement**	**Phase**	**Contractor Measurement**	**Owner Measurement**
A			B		

Representatives Present

Resident Engineer	Contractor Representative	Owner Representative
Signature	Signature	Signature

Electrical Continuity Test

Route, Common Name	Limits
Section	Controller Number
Contract	Ohmmeter Model
County	Date

Resistance Measurements (Ohms)

Contractor Measurements				**Owner Measurements**			
Circuit	**Forward**	**Reverse**	**Average**	**Circuit**	**Forward**	**Reverse**	**Average**
A - B				**A - B**			
C - D				**C - D**			
E - F				**E - F**			
G - H				**G - H**			
I - J				**I - J**			
K - L				**K - L**			
M - N				**M - N**			
O - P				**O - P**			
Q - R				**Q - R**			
S - T				**S - T**			
U - V				**U - V**			
W - X				**W - X**			
Y - Z				**Y - Z**			

Representatives Present

Resident Engineer	Contractor Representative	Owner Representative
Signature	Signature	Signature

Electrical Voltage Test

Route, Common Name	Limits
Section	Controller Number
Contract	Voltmeter Model
County	Date

Last Pole Circuit Phase To Neutral Voltage Measurements (Volts)

Phase A Circuit	Contractor Measurement	Owner Measurement	Phase B Circuit	Contractor Measurement	Owner Measurement
A			B		
C			D		
E			F		
G			H		
I			J		
K			L		
M			N		
O			P		
Q			R		
S			T		
U			V		
W			X		
Y			Z		
No Load Phase To Neutral Measurements					
Phase	Contractor Measurement	Owner Measurement	Phase	Contractor Measurement	Owner Measurement
A			B		
Full Load Phase To Neutral Measurements					
A			B		

Representatives Present

Resident Engineer	Contractor Representative	Owner Representative
Signature	Signature	Signature

ELECTRICAL ITS LOCATION INVENTORY

Project Location	
Route	Limits/Cross Reference
Common Name	Controller Number
Section	EMC Data Base Location Number
Contract	Date
GPS Coordinates	

Utility Service Information	
Electric Meter No.	Service Voltage
Utility Contact Person	Transformer KVA Rating
Transformer Location	GPS Coordinates

Equipment Information				
Item	**Manufacturer**	**Model**	**Serial No.**	**Address**
Surge Protection				
Power Supply				
Video Codec				
Media Converter				
Ethernet Switch				
Detection				
Camera				
Structure				
Controller				

ELECTRIC UTILITY SERVICE CONNECTION (COMED)
Effective: January 1, 2012

Description. This item shall consist of payment for work performed by ComEd in providing or modifying electric service as indicated. THIS MAY INVOLVE WORK AT MORE THAN ONE ELECTRIC SERVICE. For summary of the Electrical Service Drop Locations see the schedule contained elsewhere herein.

CONSTRUCTION REQUIREMENTS

General. It shall be the Contractor's responsibility to contact ComEd. The Contractor shall coordinate his work fully with the ComEd both as to the work required and the timing of the installation. No additional compensation will be granted under this or any other item for extra work caused by failure to meet this requirement. **Please contact ComEd, New Business Center Call Center, at 866 NEW ELECTRIC (1-866-639-3532) to begin the service connection process. The Call Center Representatives will create a work order for the service connection. The representative will ask the requestor for information specific to the request. The representative will assign the request based upon the location of project.**

The Contractor should make particular note of the need for the earliest attention to arrangements with ComEd for service. In the event of delay by ComEd, no extension of time will be considered applicable for the delay unless the Contractor can produce written evidence of a request for electric service within 30 days of execution.

Method Of Payment. The Contractor will be reimbursed to the exact amount of money as billed by ComEd for its services. Work provided by the Contractor for electric service will be paid separately as described under ELECTRIC SERVICE INSTALLATION. No extra compensation shall be paid to the Contractor for any incidental materials and labor required to fulfill the requirements as shown on the plans and specified herein.

For bidding purposes, this item shall be estimated as $2000

Basis Of Payment. This work will be paid for at the contract lump sum price for **ELECTRIC UTILITY SERVICE CONNECTION** which shall be reimbursement in full for electric utility service charges.

ELECTRIC SERVICE INSTALLATION
Effective: January 1, 2012

Description. This item shall consist of all material and labor required to extend, connect or modify the electric services, as indicated or specified, which is over and above the work performed by the utility. Unless otherwise indicated, the cost for the utility work, if any, will be reimbursed to the Contractor separately under ELECTRIC UTILITY SERVICE CONNECTION. This item may apply to the work at more than one service location and each will be paid separately.

Materials. Materials shall be in accordance with the Standard Specifications.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work not included by other contract pay items required to complete the electric service work in complete compliance with the requirements of the utility.

No additional compensation will be allowed for work required for the electric service, even though not explicitly shown on the Drawings or specified herein

Method Of Measurement. Electric Service Installation shall be counted, each.

Basis Of Payment. This work will be paid for at the contract unit price each for **ELECTRIC SERVICE INSTALLATION** which shall be payment in full for the work specified herein.

REMOVAL OF EXISTING SIGN LIGHTING UNIT AND SALVAGE

Add the following paragraphs in Article 842.03 of the standard specifications:

> "Existing sign lighting located on the sign structure in front of proposed DMS shall be removed. When the DMS is the only sign on the sign structure, remove sign lighting completely per Standard BE-610 Removal of Electrical Lighting From Sign Structure. Work performed to remove existing sign lighting shall be paid per sign luminaire removed under REMOVAL OF EXISTING SIGN LIGHTING UNIT AND SALVAGE. Cost also includes all work and materials required for the removal of conduits, wiring, junction boxes, and other items associated with the sign lighting system."

RELOCATE EXISTING SIGN LIGHTING LUMINAIRE

Add the following paragraphs in Article 842.03 of the standard specifications:

> "On sign structures with both DMS and non-DMS signs, remove sign lights in front of proposed DMS paid separately under pay item REMOVAL OF EXISTING SIGN LIGHTING UNIT AND SALVAGE, but all other sign lighting shall remain intact. If the removal of the sign lights in front of the proposed DMS breaks the existing circuitry, new connections shall be made to keep remaining sign lights operational. The existing sign panels must remain lighted to the approval of the Engineer. Any electrical work or materials required to adjust the location of existing sign lighting luminaires, install new electrical conduits, wiring, or other materials to maintain a cohesive sign lighting system for the remaining sign panels shall be included in the cost of RELOCATE EXISTING SIGN LIGHTING LUMINAIRE. Work performed for this item shall be paid per DMS sign structure location."

FIBER OPTIC CABLE, SINGLE MODE

Description. The Contractor shall furnish and install loose-tube, single-mode, fiber optic cable of the number of fibers specified as shown in the plans and as directed by the Engineer.

Other ancillary components, required to complete the fiber optic cable plant, including but not limited to, moisture and water sealants, cable caps, fan-out kits, etc., shall be included in the cost of fiber optic cable and will not be paid for separately.

Materials The single-mode, fiber optic cable shall incorporate a loose, buffer-tube design. The cable shall be an accepted product of the United States Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900 and meet the requirements of ANSI/ICEA Standard for Fiber Optic Outside Plant Communications Cable, ANSI/ICEA S-87-640-1999 for a single sheathed, non-armored cable, and shall be new, unused and of current design and manufacture.

Fibers.

The cables shall use dispersion unshifted fibers. The optical and physical characteristics of the un-cabled fibers shall include:

The single-mode fiber shall meet EIA/TIA-492CAAA, "Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers," and ITU recommendation G.652.D, "Characteristics of a single-mode optical fiber cable."

Physical Construction			
Requirement		**Units**	**Value**
Cladding Diameter		(µm)	125.0 ± 0.7
Core-to-Cladding Concentricity		(µm)	≤ 0.5
Cladding Non-Circularity			≤ 0.7 %
Mode Field Diameter	1310 nm	(µm)	9.2 ± 0.4
	1550 nm		10.4 ± 0.5
Coating Diameter		(µm)	245 ± 5
Colored Fiber Nominal Diameter		(µm)	253 - 259
Fiber Curl radius of curvature		(m)	> 4.0 m

Optical Characteristics				
Requirement			**Units**	**Value**
Cabled Fiber Attenuation		1310 nm	(dB/km)	≤ 0.4
		1550 nm		≤ 0.3
Point discontinuity		1310 nm	(dB)	≤ 0.1
		1550 nm		≤ 0.1
Macrobend Attenuation	Turns	Mandrel OD	(dB)	
	1	32 ± 2 mm		< 0.05 at 1550 nm
	100	50 ± 2 mm		< 0.05 at 1310 nm
	100	50 ± 2 mm		< 0.10 at 1550 nm
	100	60 ± 2 mm		< 0.05 at 1550 nm
	100	60 ± 2 mm		< 0.05 at 1625 nm
Cable Cutoff Wavelength (λ_{ccf})			(nm)	< 1260
Zero Dispersion Wavelength (λ_o)			(nm)	$1302 \leq \lambda_o \leq 1322$
Zero Dispersion Slope (S_o)			(ps/(nm²•km))	≤ 0.089
Total Dispersion	1550 nm		(ps/(nm•km))	≤ 3.5
	1285-1330 nm			≤ 17.5
	1625 nm			≤ 21.5
Cabled Polarization Mode Dispersion			(ps/km^{-2})	≤ 0.2
IEEE 802.3 GbE - 1300 nm Laser Distance			(m)	up to 5000
Water Peak Attenuation: 1383 ± 3 nm			(dB/km)	≤ 0.4

Cable Construction.

The number of fibers in each cable shall be as specified on the plans.

Optical fibers shall be placed inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be 3.0 mm. Each buffer tube shall contain up to 12 fibers. The fibers shall not adhere to the inside of the buffer tube.

Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." The fibers shall be colored with ultraviolet (UV) curable inks.

Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." Buffer tube colored stripes shall be inlaid in the tube by means of co-extrusion when required. The nominal stripe width shall be 1 mm.

For cables containing more than 12 buffer tubes, standard colors are used for tubes 1 through 12 and stripes are used to denote tubes 13 through 24. The color sequence applies to tubes containing fibers only, and shall begin with the first tube. If fillers are required, they shall be placed in the inner layer of the cable. The tube color sequence shall start from the inside layer and progress outward.

In buffer tubes containing multiple fibers, the colors shall be stable across the specified storage and operating temperature range and shall not be subject to fading or smearing onto each other. Colors shall not cause fibers to stick together.

The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrink back requirements of 7 CFR 1755.900.

Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed. Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. In dual layer cables, any fillers shall be placed in the inner layer. Fillers shall be nominally 2.5 mm or 3.0 mm in outer diameter.

The central member shall consist of a dielectric, glass reinforced plastic (GRP) rod (optional steel central member). The purpose of the central member is to provide tensile strength and prevent buckling. The central member shall be overcoated with a thermoplastic when required to achieve dimensional sizing to accommodate buffer tubes/fillers.

Each buffer tube shall contain a water-swellable yarn for water-blocking protection. The water-swellable yarn shall be non-nutritive to fungus, electrically non-conductive, and homogeneous. It shall also be free from dirt or foreign matter. This yarn will preclude the need for other water-blocking material; the buffer-tube shall be gel-free. The optical fibers shall not require cleaning before placement into a splice tray or fan-out kit.

Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation, or "S-Z", stranding process.

Water swellable yarn(s) shall be applied longitudinally along the central member during stranding.

Two polyester yarn binders shall be applied contrahelically with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking, and dielectric with low shrinkage.

For single layer cables, a water swellable tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The water swellable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter.

For dual layer cables, a second (outer) layer of buffer tubes shall be stranded over the original core to form a two layer core. A water swellable tape shall be applied longitudinally over both the inner and outer layer. The water swellable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter.

The cables shall contain one ripcord under the sheath for easy sheath removal.

Tensile strength shall be provided by the central member, and additional dielectric yarns as required.

The dielectric yarns shall be helically stranded evenly around the cable core.

The cables shall be sheathed with medium density polyethylene (MDPE). The minimum nominal jacket thickness shall be 1.4 mm. Jacketing material shall be applied directly over the tensile strength members (as required) and water swellable tape. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.The MDPE jacket material shall be as defined by ASTM D1248, Type II, Class C, Category 4 and Grades J4, E7 and E8.

The jacket or sheath shall be free of holes, splits, and blisters.

The cable jacket shall contain no metal elements and shall be of a consistent thickness.

Cable jackets shall be marked with the manufacturer’s name, month and year of manufacture, sequential meter or foot markings, a telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code (NESC), fiber count, and fiber type. The actual length of the cable shall be within -0/+1% of the length markings. The print color shall be white, with the exception that cable jackets containing one or more co-extruded white stripes, which shall be printed in light blue. The height of the marking shall be approximately 2.5 mm.

The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

The shipping, storage, and operating temperature range of the cable shall be -40°C to +70°C. The installation temperature range of the cable shall be –30°C to +70°C.

General Cable Performance Specifications

The fiber optic cable manufacturer shall provide documentation and certify that the fiber optic cable complies with the following EIA-455-*xxx* Fiber Optic Test Procedures (FOTP):

When tested in accordance with FOTP-3, "*Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components*," the change in attenuation at extreme operational temperatures (-40°C and +70°C) shall not exceed 0.15 dB/km at 1550 nm for single-mode fiber and 0.3 dB/km at 1300 nm for multimode fiber.

When tested in accordance with FOTP-82, "*Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable*," a one meter length of unaged cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.

When tested in accordance with FOTP-81, "*Compound Flow (Drip) Test for Filled Fiber Optic Cable*," the cable shall exhibit no flow (drip or leak) of filling and/or flooding material at 70°C.

When tested in accordance with FOTP-41, "*Compressive Loading Resistance of Fiber Optic Cables*," the cable shall withstand a minimum compressive load of 220 N/cm (125 lbf/in) applied uniformly over the length of the sample. The 220 N/cm (125 lbf/in) load shall be applied at a rate of 2.5 mm (0.1 in) per minute. The load shall be maintained for a period of 1 minute. The load shall then be decreased to 110 N/cm (63 lbf/in). Alternatively, it is acceptable to remove the 220 N/cm (125 lbf/in) load entirely and apply the 110 N/cm (63 lbf/in) load within five minutes at a rate of 2.5 mm (0.1 in) per minute. The 110 N/cm (63 lbf/in) load shall be maintained for a period of 10 minutes. Attenuation measurements shall be performed before release of the 110 N/cm (63 lbf/in) load. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fibers and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-104, "*Fiber Optic Cable Cyclic Flexing Test*," the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-25, "*Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies*," except that the number of cycles shall be two at three locations along a one meter cable length and the impact energy shall be atleast 4.4 Nm (in accordance with ICEA S-87-640)", the change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-33, "*Fiber Optic Cable Tensile Loading and Bending Test*," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a rated tensile load of 2670N (601 lbf) and residual load of 30% of the rated installation load. The axial fiber strain shall be ≤ 60% of the fiber proof level after completion of 60 minute conditioning and while the cable is under the rated installation load. The axial fiber strain shall be ≤ 20% of the fiber proof level after completion of 10 minute conditioning and while the cable is under the residual load. The change in attenuation at residual load and after load removal shall not exceed 0.15 dB at 1550 nm for single mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-85, "*Fiber Optic Cable Twist Test*," a length of cable no greater than 2 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-37, "*Low or High Temperature Bend Test for Fiber Optic Cable*," the cable shall withstand four full turns around a mandrel of ≤ 20 times the cable diameter after conditioning for four hours at test temperatures of -30°C and +60°C. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears, or other openings. The change in attenuation shall not exceed 0.30 dB at 1550 nm for single mode fiber and 0.50 dB at 1300 nm for multimode fiber.

Quality Assurance Provision

All cabled optical fibers > 1000 meters in length shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel. The cable manufacturer shall be TL 9000 registered.

Packaging

Top and bottom ends of the cable shall be available for testing. Both ends of the cable shall be sealed to prevent the ingress of moisture. Each reel shall have a weather resistant reel tag attached identifying the reel and cable. The reel tag shall include the following information:

- Cable Number
- Gross Weight
- Shipped Cable Length in Meters
- Job Order Number
- Product Number
- Customer Order Number
- Date Cable was Tested
- Manufacturer Order Number
- Cable Length Markings
  - a: Top (inside end of cable)
  - b: Bottom (outside end of cable)

The reel (one flange) marking shall include:

- Manufacturer
- Country of origin
- An arrow indicating proper direction of roll when handling
- Fork lift-handling illustration
- Handling Warnings.

Each cable shall be accompanied by a cable data sheet. The cable data sheet shall include the following information:

- Manufacturer Cable Number
- Manufacturer Product Number
- Manufacturer Factory Order Number
- Customer Name
- Customer Cable Number
- Customer Purchase Order Number
- Mark for Information
- Ordered Length
- Maximum Billable Length
- Actual Shipped Length
- Measured Attenuation of Each Fiber

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: -58° F to +158° F (-50° C to +70° C)
- Installation temperature: -22° F to +158° F (-30° C to +70° C)
- Operating temperature: -40° F to +158° F (-40° C to +70° C)
- Relative humidity from 0% to 95%, non-condensing

Optical Patch Cords and Pigtails.
The optical patch cords and pigtails shall comply with the following:

- The optical patch cords 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 shall 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.

CONSTRUCTION REQUIREMENTS

Experience Requirements.

Personnel involved in the installation, splicing and testing of the fiber optic cables shall meet the following requirements:

- A minimum of three (3) years experience in the installation of fiber optic cables, including fusion splicing, terminating and testing single mode fibers.

- Install two systems where fiber optic cables are outdoors in conduit and where the systems have been in continuous satisfactory operation for at least two years. The Contractor shall submit as proof, photographs or other supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the installed fiber optic systems.

- One fiber optic cable system (which may be one of the two in the preceding paragraph), which the Contractor can arrange for demonstration to the Department representatives and the Engineer.

Installers shall be familiar with the cable manufacturer's recommended procedures for installing the cable. This shall include knowledge of splicing procedures for the fusion splicer being used on this project and knowledge of all hardware such as breakout (furcation) kits and splice closures. The Contractor shall submit documented procedures to the Engineer for approval and to be used by Construction inspectors.

Personnel involved in testing shall have been trained by the manufacturer of the fiber optic cable test equipment to be used, in fiber optic cable testing procedures. Proof of this training shall be submitted to the Engineer for approval. In addition, the Contractor shall submit documentation of the testing procedures and a copy of the test equipment operation manual for approval by the Engineer.

Installation in Raceways.

Prior to installation, the Contractor shall provide a cable-pulling plan. The plan shall include the following information:

- Identify where each cable will enter the underground system and the direction each pull.
- Identify locations where the cable is pulled out of a handhole, coiled in a figure eight, and pulled back into the hand hole.
- The plan shall address the physical protection of the cable during installation and during periods of downtime.
- Identify the location of slack storage locations
- Identify the locations of splices.
- Identify distances between fiber access points and crossings.

The cable-pulling plan shall be provided to the Engineer for approval a minimum of 15 working days prior to the start of installation. The Engineer's approval shall be for the operation on the freeway and does not include an endorsement of the proposed procedures. The Contractor is responsible for the technical adequacy of the proposed procedures.

During cable pulling operations, the Contractor shall ensure that the minimum bending of the cable is maintained during the unreeling and pulling operations. Unless specified otherwise by the fiber optic cable manufacturer, the outside bend radius of the cable during installation shall be no less than 20 times the outside diameter of the fiber optic cable. Entry guide chutes shall be used to guide the cable into the handhole 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.

If figure-eight techniques are used during cable installation, the cable shall be handled manually and stored on the ground. The cable shall be placed on tarps to prevent damage from gravel, rocks, or other abrasive surfaces. Tarps should also be used in muddy conditions to keep the cable clean. Enough area to accommodate the cable length to be stored and sufficient personnel to maintain the required minimum-bending diameter as well as avoid kinking or otherwise damaging the cable shall be provided. If the cable has been figure-eighted in preparation for a forward feed, the figure-eight must be flipped over to access the outside cable end. Provide sufficient personnel to avoid kinking the cable as the figure-eight is flipped over. When removing the cable from the figure-eight, use care to avoid kinking the cable and violating the minimum-bending diameter.

Power assisted or figure-eight eliminator equipment, which is used to eliminate manual figure-eight procedures, shall not be used unless specifically allowed by the cable manufacturer in writing.

T

he pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. A dynamometer or in-line tensiometer shall be used to monitor tension in the pull-line near the winch. This device must be visible to the winch operator or used to control the winch. 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 as well as included in the record drawing package.

The use of a breakaway link (swivel) may be used to ensure that the maximum tension of the cable is not exceeded. Breakaway links react to tension at the pulling eye and shall not be used in lieu of tension measuring devices. All pulling equipment and hardware which will contact the cable during installation must maintain the cable's minimum bend radius. Equipment including sheaves, capstans, bending shoes, and quadrant blocks shall be designed for use with fiber optic cable.

The cable shall be pulled into the conduit as a single component, absorbing the pulling force in all tension elements. The central strength member and Aramid yarn shall be attached directly to the pulling eye during cable pulling. "Basket grip" type attachments, which only attach to the cable's outer jacket, shall not be permitted. A breakaway swivel, rated at 95% of the cable manufacturer's approved maximum tensile loading, shall be used on all pulls. When simultaneously pulling fiber optic cable with other cables, separate grooved rollers shall be used for each cable.

To minimize the exposure of the backbone cable and to facilitate the longer lengths of fiber optic cable, the Contractor shall use a "blown cable" (pneumatically assisted) technique to place the fiber optic cable. A Compressed air cooler shall be used when ambient air temperatures reaches 90°F or more.

Where cable is to be pulled through existing conduit which contains existing cables, optical or other, the existing cables shall be removed and reinstalled with the fiber optic cable as indicated on the plans. The removal of the cable(s) shall be paid for separately. Reinstallation of the existing cables, if indicated on the plans, along with the fiber optic cable shall be included in this item for payment.

Tracer Wire

A tracer wire shall be installed with all fiber optic cable runs. One tracer wire shall be installed along with the fiber optic cable in each raceway. If a raceway has more than one fiber optic cable, only one tracer wire per raceway is required. If there are parallel raceways, a tracer wire is required in each raceway that contains a fiber optic cable. Tracer wire shall be installed in raceway segments which are metallic to provide a continuous tracer wire system.

The tracer wire shall be a direct burial rated, number 12 AWG (minimum) solid (.0808" diameter), steel core soft drawn high strength tracer wire. The wire shall have a minimum 380 pound average tensile break strength. The wire shall have a 30 mil high density yellow polyethylene (HDPE) jacket complying with ASTM-D-1248, and a 30 volt rating.

Connection devices used shall be as approved by the tracer wire manufacturer, except wire nuts of any type are not acceptable and shall not be used.

The cost of the tracer wire shall be included in the cost of the fiber optic cable and not paid for separately.

Construction Documentation Requirements

Installation Practices for Outdoor Fiber Optic Cable Systems

The Contractor shall examine the proposed cable plant design. At least one month prior to starting installation of the fiber optic cable plant, the Contractor shall prepare and submit to the Engineer for review and approval, ten (10) copies of the Contractor's "Installation Practices for Outdoor Fiber Optic Cable Systems" manual. This manual shall address the Contractor's proposed practices covering all aspects of the fiber optic cable plant. This submittal shall include all proposed procedures, list of installation equipment, and splicing and test equipment. Test and quality control procedures shall be detailed as well as procedures for corrective action.

Operation and Maintenance Documentation

After the fiber optic cable plant has been installed, ten (10) complete sets of Operation and Maintenance Documentation plus one (1) in PDF format in CD-ROM shall be provided. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built drawings and diagrams showing the entire fiber optic cable plant including locations of all splices. This shall include detailed drawings identifying by cable type, color-coded function, and the routing of all cables in the communications system.
- 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 (terminated and un-terminated) shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter with an 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.

Fibers which are not to be terminated shall be shall be tested with a temporary fusion spliced pigtail fiber. **Mechanical splice or bare fiber adapters are not acceptable**.

The Contractor shall provide the date, time and location of any tests required by this specification to the Engineer at least 5 working (7 calendar) days before performing the test. Included with the notification shall be a record drawing of the installed fiber optic cable system. The drawings shall indicate actual installed routing of the cable, the locations of splices, and locations of cable slack with slack quantities identified.

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 test equipment used shall have been calibrated within the last two years. Documentation shall be provided. 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.

A fiber ring or fiber box shall be used to connect the OTDR to the fiber optic cable under test at both the launch and receive ends. The tests shall be conducted at 1310 and 1550 nm for all fibers.

All testing shall be witnessed by the IDOT Engineer and a copy of the test results (CD ROM or USB Drive) shall be submitted on the same day of the test. Hardcopies shall be submitted as described herein with copies on CD ROM.

At the completion of the test, the Contractor shall provide copies of the documentation of the test results to the Project Engineer. The test documentation shall be submitted as two bound copies and three CD ROM copies, and shall include the following:

Cable & Fiber Identification:

- Cable ID
- Cable Location - beginning and end point
- Fiber ID, including tube and fiber color
- Wavelength
- Pulse width (OTDR)
- Refractory index (OTDR)
- Operator Name
- Date & Time
- Setup Parameters
- Range (OTDR)
- Scale (OTDR)
- Setup Option chosen to pass OTDR “dead zone”

Test Results shall include:

- OTDR Test results
- Total Fiber Trace
- Splice Loss/Gain
- Events > 0.10 dB
- Measured Length (Cable Marking)
- Total Length (OTDR)
- Optical Source/Power Meter Total Attenuation (dB/km)

Sample Power Meter Tabulation:

Power Meter Measurements (dB)									
Location		**Fiber No.**	**Cable Length (km)**	**A to B**		**B to A**		**Bidirectional Average**	
A	**B**			**1310 nm**	**1550 nm**	**1310 nm**	**1550 nm**	**1310 nm**	**1550 nm**
		1							
		2							
Maximum Loss									
Minimum Loss									

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, GR 196, Revision 1.1, GR 196, Revision 2.0 (SR-4731) in a ".SOR" file format. A copy of the test equipment manufacture's software to read the test files, OTDR and power, shall be provided to the Department. These results shall also be provided in tabular form, see sample below:

Sample OTDR Summary				
Cable Designation:	*TCF-IK-03*	**OTDR Location:**	*Pump Sta. 67*	**Date:** *1/1/00*
Fiber Number	**Event Type**	**Event Location**	**Event Loss (dB)**	
			1310 nm	**1550 nm**
1	*Splice*	*23500 Ft.*	*.082*	*.078*
1	*Splice*	*29000 Ft.*	*.075*	*.063*
2	*Splice*	*29000 Ft.*	*.091*	*.082*
3	*Splice*	*26000 Ft.*	*.072*	*.061*
3	*Bend*	*27000 Ft.*	*.010*	*.009*

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: 0.4 dB/km at 1310 and 0.3 dB/km at 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair the cable run at the no additional cost to the state, both labor and materials. Elevated attenuation due to exceeding the pulling tension, or any other installation operation, during installation shall require the replacement of the cable run at no additional cost to the State, including labor and materials.

Splicing Requirements

Splices shall be made at locations shown on the Plans. Any other splices shall be permitted only with the approval of the Engineer. Splices will be paid for separately. All splice locations must be identified in the Record Drawings. **Cable runs which dead-end at a handhole, communications vault, interconnect cabinet, or any other type of enclosure, shall be dead ended in a splice enclosure.**

Termination of Fiber Optic Lateral Cables

Lateral Fiber Optic cables of twelve fibers or less, shall be terminated in a one (1) RU closet connection housing manufactured by Corning or an approved equal. The housing shall include one (1) factory terminated twelve (12) strand adapter panel with factory tested pigtails. Splice modules or cassettes may be used in lieu of direct terminated panels. The housing shall be capable of supporting two CCH panels. The housing shall include hardware to strain-relieve cables both internally and externally.

The housing shall be rack mounted in an existing rack in the location shown on the plans.

The connection of the lateral cable to the trunk fiber, as indicated on the plans is included in the fiber optic cables splice pay item. Termination of the lateral fiber cable in the Remote Control Building shall be included in the unit price of fiber optic cable.

Termination of Fiber Optic Trunk Cable

Trunk fiber optic cable shall be terminated in a four (4) RU closet connection housing manufactured by Corning or an approved equal. The housing shall include eight (8) factory terminated twelve (12) strand adapter panels with factory tested pigtails. Splic modules or cassettes may be used in lieu of direct terminated panels. If panels are furnished, a separate splice housing including a sufficient quantity of splice trays shall be provided. The housing shall be capable of supporting at least ten (10) CCH panels. The housing shall include hardware to strain-relieve cables both internally and externally.

The housings shall be rack mounted in an existing rack in the location shown on the plans.

Termination of the trunk fiber cable in the Remote Control Building shall be included in the unit price of fiber optic cable.

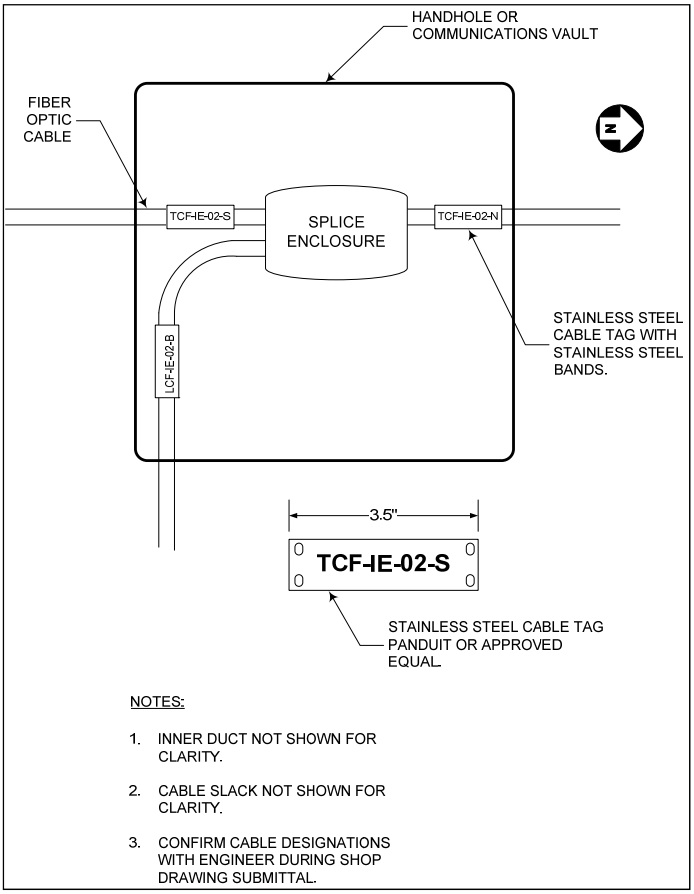
Slack Storage of Fiber Optic Cables.

Included as a part of this item, 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 handholes or in the raised base adapters of ground mounted cabinets in accordance with the fiber optic cable manufacturer's guidelines. Fiber optic cable slack shall be 100 feet for each cable at each location where all fibers are spliced and at the end of a fiber optic run as shown on the plans, above or below ground. Fiber optic cable slack shall be 50 feet for each cable at access points, above or below ground, where splicing only a 12 strand lateral is involved. If the innerduct is cut, the ends of the innerduct should extend beyond the first vertical rack so they can be secured at that point. This slack shall be measured for payment.

A fiber optic cable support assembly shall be recommended and approved by the Engineer at fiber optic cable slack locations as required herein and shown on the plans. Each support assembly shall consist of multiple brackets, racks, and/or rails required to suspend the required surplus cabling and any splice enclosures required. The support assembly shall be made from or coated with weather resistant material such that there is no corrosion of the supports. The support assemblies shall be anchored using stainless steel hardware.

The fiber optic cable support assemblies shall be provided where slack cable is required as stipulated herein and included in the contract unit price for fiber optic cable.

Fiber optic cable shall be tagged inside handholes and vaults 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 fiber buffer tubes, and the specific fiber count. Tags and straps shall be Panduit or approved equal. See figure below:



Label the destination of each trunk cable onto the cable in each handhole, vault or cable termination panel.

Method of Measurement. Fiber optic cable will be measured for payment in feet in place installed and tested. Fiber optic cable will be measured horizontally and vertically between the changes in direction, including slack cable. The entire lengths of cables installed in buildings will be measured for payment

Basis of Payment. This work will be paid for at the contract unit price per foot for **FIBER OPTIC CABLE** of the type, size, and number of fibers specified. Payment shall not be made until the cable is installed, spliced and tested in compliance with these special provisions.

FIBER OPTIC SPLICE
Effective: June 1, 2014

Description. The Contractor will 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.

Two splices are identified. A mainline splice includes all fibers in the cable sheath. In a lateral splice, the buffer tubes in the mainline cable are dressed out and those fibers identified on the plans are accessed in and spliced to lateral cables.

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 Requirements. The closures 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 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 temperatures of –18 and 38 degrees Celsius (0 and 100 degrees Fahrenheit). 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 –18 and 38 degrees Celsius (0 and 100 degrees Fahrenheit). 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 (2 in.) 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 @ 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 m (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 at from both directions 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 1.8 dB per installed kilometer at 1300nm 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 handhole or vault. No cables or enclosures will be permitted to lie 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.

Method of Measurement. Fiber optic splice of the type specified will be measured as each, completely installed and tested with all necessary splices completed within the enclosure, and the enclosure secured to the wall of the splice facility.

Basis of Payment. This item shall be paid at the contract unit price each for **FIBER OPTIC SPLICE, LATERAL** or **FIBER OPTIC SPLICE, MAINLINE** of the type specified, which shall be payment in full for the work, complete, as specified herein.

COMMUNICATIONS VAULT
Effective: March 1, 2010

Description. Work under this item shall consist of constructing a composite concrete communication vault with a cover, in accordance with the details shown on the plans and as specified herein.

Materials. The composite concrete communication vault and two piece vault lid shall be constructed of polymer concrete material, and shall be gray in color.

The composite concrete communication vault shall be 48 inches x 48 inches and shall have an effective depth of 36 inches.

The composite concrete communication vault and cover shall have a design/test loading of 22,500/33,750 lbs respectively. The cover shall have a permanently recessed logo that reads "IDOT COMMUNICATIONS", or as otherwise designated by the Engineer. The composite concrete communication vault lid shall have two ½-in x 4-in pull slots. The lid surface shall have a coefficient of friction of 0.50 in accordance with ASTM C-1028.

The Contractor shall install manufacturer-approved gasketing between the lid and the communication vault to prevent water from entering the composite concrete communication vault.

The composite concrete communication vault lid shall be secured to the vault with two 3/8-inch NC stainless steel penta-head bolts and washers to lock the lid. In addition, a "lock tool" shall be provided for composite concrete communication vault entry.

A fiber optic cable support assembly shall be recommended by the manufacturer and approved by the Engineer for fiber optic cable and splice enclosures used in the vault. Each support assembly shall consist of multiple brackets, racks, and/or rails required to suspend the required surplus cabling and any splice enclosures required.

The support assembly shall be made from or coated with weather resistant material such that there is no corrosion of the supports. The support assemblies shall be anchored to the vault using stainless steel hardware.

The fiber optic cable support assemblies shall be included in the Contract unit price for the composite concrete communication vault. Void areas between openings and conduit shall be filled with self-curing caulking consisting of a permanent, flexible rubber which is unaffected by sunlight, water, oils, mild acids or alkalis. The caulking shall be mildew resistant and non-flammable. The material shall provide a permanent bond between the conduit entering the vault and the polymer concrete. The caulking shall be gray in color.

CONSTRUCTION REQUIREMENTS

Composite concrete communication vaults shall be installed in accordance with applicable requirements of Section 800 of the Standard Specifications and as provided herein.

A manufacturer-approved knockout punch driver shall be used to provide openings in the vaults for conduit, or the required openings may be machined at the time of stackable vault fabrication. Voids between entering conduits and punch driven or machined openings shall not exceed ½-inch.

Any void areas shall be caulked from the interior and exterior of the composite concrete communication vault. The caulk shall be allowed to fully cure per the manufacturer's specifications, prior to backfilling.

The composite concrete communication vault shall be placed on 12 inches of coarse aggregate, CA-5 or CA 7 Class A, as specified in Section 1004 of the Standard Specifications. Seal and flash test the vault per the manufacturer's recommendations.

A minimum of 100 feet of excess cable per cable run shall be coiled in each composite concrete communication vault containing splices to allow moving the splice enclosure to the splicing vehicle unless otherwise indicated in the plans.

Basis of Payment. This item will be paid for at the contract unit price each for **COMMUNICATIONS VAULT,** of the size indicated, which shall be payment in full for all material and work as specified herein.

EXPOSED RACEWAYS
Effective: January 1, 2012

Revise the first paragraph of Article 811.03(a) of the Standard Specifications to read:

> "General. Rigid metal conduit installation shall be according to Article 810.05(a). Conduits terminating in junction and pull boxes shall be terminated with insulated and gasketed watertight threaded NEMA 4X conduit hubs. The hubs shall be Listed under UL 514B. The insulated throat shall be rated up to 105º C. When PVC coated conduit is utilized, the aforementioned hubs shall also be PVC coated."

Add the following to Article 811.03(b) of the Standard Specifications:

> "Where PVC coated conduit is utilized, all conduit fittings, couplings and clamps shall be PVC coated. All other mounting hardware and appurtenances shall be stainless steel."
>
> "The personnel installing the PVC coated conduit must be trained and certified by the PVC coated conduit Manufacturer or Manufacturer's representative to install PVC coated conduit. Documentation demonstrating this requirement must be submitted for review and approval."

Add the following to Article 1088.01(a) of the Standard Specifications:

> All iron and steel products, which are to be incorporated into the work, including conduit and all conduit fittings, shall be domestically manufactured or produced and fabricated as specified in Article 106."

Revise Article 1088.01(a)(3) of the Standard Specifications to read:

> "a. PVC Coated Steel Conduit. The PVC coated rigid metal conduit shall be UL Listed (UL 6). The PVC coating must have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit. Ferrous fittings for general service locations shall be UL Listed with PVC as the primary corrosion protection. Hazardous location fittings, prior to plastic coating shall be UL listed.

b. The PVC coating shall have the following characteristics:

Hardness:	85+ Shore A Durometer
Dielectric Strength:	400V/mil @ 60 Hz
Aging:	1,000 Hours Atlas Weatherometer
Temperature	The PVC compound shall conform at 0º F. to Federal Specifications PL-406b, Method 2051, Amendment 1 of 25 September 1952 (ASTM D 746)
Elongation:	200%

c. The exterior and interior galvanized conduit surface shall be chemically treated to enhance PVC coating adhesion and shall also be coated with a primer before the PVC coating to ensure a bond between the zinc substrate and the PVC coating. The bond strength created shall be greater than the tensile strength of the plastic coating.

d. The nominal thickness of the PVC coating shall be 1 mm (40 mils). The PVC exterior and urethane interior coatings applied to the conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above -1°C (30°F).

e. An interior urethane coating shall be uniformly and consistently applied to the interior of all conduit and fittings. This internal coating shall be a nominal 2 mil thickness. The interior coating shall be applied in a manner so there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating.

f. Conduit bodies shall have a tongue-in-groove gasket for maximum sealing capability. The design shall incorporate a positive placement feature to assure proper installation. Certified test results confirming seal performance at 15 psig (positive) and 25 in. of mercury (vacuum) for 72 hours shall be submitted for review when requested by the Engineer.

g. The PVC conduit shall pass the following tests:

Exterior PVC Bond test RN1:

Two parallel cuts 13 mm (1/2 inch) apart and 40 mm (1 1/2 inches) in length shall be made with a sharp knife along the longitudinal axis. A third cut shall be made perpendicular to and crossing the longitudinal cuts at one end. The knife shall then be worked under the PVC coating for 13 mm (1/2 inch) to free the coating from the metal.

Using pliers, the freed PVC tab shall be pulled with a force applied vertically and away from the conduit. The PVC tab shall tear rather than cause any additional PVC coating to separate from the substrate.

Boil Test:

Acceptable conduit coating bonds (exterior and interior) shall be confirmed if there is no disbondment after a minimum average of 200 hours in boiling water or exposure to steam vapor at one atmosphere. Certified test results from a national recognized independent testing laboratory shall be submitted for review and approval. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion. In accordance with ASTM D870, a 6" length of conduit test specimen shall be placed in boiling water. The specimen shall be periodically removed, cooled to ambient temperature and immediately tested according to the bond test (RN1). When the PVC coating separates from the substrate, the boil time to failure in hours shall be recorded.

Interior Adhesion. In accordance with ASTM D3359, a 6" conduit test specimen shall be cut in half longitudinally and placed in boiling water or directly above boiling water with the urethane surface facing down. The specimen shall be periodically removed, cooled to ambient temperature and tested in accordance with the Standard Method of Adhesion by Tape Test (ASTM D3359). When the coating disbonds, the time to failure in hours shall be recorded.

Heat/Humidity Test:

Acceptable conduit coating bonds shall be confirmed by a minimum average of 30 days in the Heat and Humidity Test. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion. In accordance with ASTM D1151, D1735, D2247 and D4585, conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. The specimens shall be periodically removed and a bond test (RN1) performed. When the PVC coating separates from the substrate, the exposure time to failure in days shall be recorded.

Interior Adhesion. In accordance with ASTM D3359, conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. When the coating disbonds, the time to failure in hours shall be recorded.

Add the following to Article 1088.01(a)(4) of the Standard Specifications:

"All liquid tight flexible metal conduit fittings shall have an insulated throat to prevent abrasion of the conductors and shall have a captive sealing O-ring gasket. The fittings shall be Listed under UL 514B. The insulated throat shall be rated up to 105º C."

Revise the second paragraph of Article 811.04 of the Standard Specifications to read:

"Expansion fittings and LFNC will not be measured for payment."

Revise Article 811.05 of the Standard Specifications to read:

"811.05 Basis of Payment. This work will be paid for at the contract unit price per foot for **CONDUIT ATTACHED TO STRUCTURE**, of the diameter specified, **RIGID GALVANIZED STEEL** or **CONDUIT ATTACHED TO STRUCTURE**, of the diameter specified, **RIGID GALVANIZED STEEL, PVC COATED."**

UNDERGROUND RACEWAYS
Effective: January 1, 2012

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, vault, 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.

UNIT DUCT
Effective: January 1, 2012

Revise the first paragraph of Article 810.04 to read:

"The unit duct shall be installed at a minimum depth of 30-inches (760 mm) unless otherwise directed by the Engineer."

Revise Article 1088.01(c) to read:

"(c) Coilable Nonmetallic Conduit.

General:

The duct shall be a plastic duct which is intended for underground use and 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 shall be made of high density polyethylene which shall meet the requirements of ASTM D 2447, for schedule 40. The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade P33. The wall thickness shall be in accordance with Table 2 for ASTM D 2447.

The duct shall be UL Listed per 651-B for continuous length HDPE coiled conduit. The duct shall also comply with NEC Article 354.100 and 354.120.

Submittal information shall demonstrate compliance with the details of these requirements.

Dimensions:

Duct dimensions shall conform to the standards listed in ASTM D2447. Submittal information shall demonstrate compliance with these requirements.

Nominal Size		**Nominal I.D.**		**Nominal O.D.**		**Minimum Wall**	
mm	in	mm	in	mm	in	mm	in
31.75	1.25	35.05	1.380	42.16	1.660	3.556 +0.51	0.140 +0.020
38.1	1.50	40.89	1.610	48.26	1.900	3.683 +0.51	0.145 +0.020

Nominal Size		**Pulled Tensile**	
mm	in	N	lbs
31.75	1.25	3322	747
38.1	1.50	3972	893

Marking:

As specified in NEMA Standard Publication No. TC-7, the duct shall be clearly and durably marked at least every 3.05 meters (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.

Performance Tests:
Polyethylene Duct testing procedures and test results shall meet the requirements of UL 651. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct. Duct crush test results shall meet or exceed the following requirements:

Duct Diameter		**Min. force required to deform sample 50%**	
mm	in	N	lbs
35	1.25	4937	1110
41	1.5	4559	1025

WIRE AND CABLE
Effective: January 1, 2012

Add the following to the first paragraph of Article 1066.02(a):

"The cable shall be rated at a minimum of 90°C dry and 75°C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals."

Revise the Aerial Electric Cable Properties table of Article 1066.03(a)(3) to read:

Aerial Electric Cable Properties

Phase Conductor				Messenger wire	
Size AWG	Stranding	Average Insulation Thickness		Minimum Size AWG	Stranding
		mm	mils		
6	7	1.1	(45)	6	6/1
4	7	1.1	(45)	4	6/1
2	7	1.1	(45)	2	6/1
1/0	19	1.5	(60)	1/0	6/1
2/0	19	1.5	(60)	2/0	6/1
3/0	19	1.5	(60)	3/0	6/1
4/0	19	1.5	(60)	4/0	6/1

Add the following to Article 1066.03(b) of the Standard Specifications:

"Cable sized No. 2 AWG and smaller shall be U.L. listed Type RHH/RHW and may be Type RHH/RHW/USE. Cable sized larger than No. 2 AWG shall be U.L. listed Type RHH/RHW/USE."

Revise Article 1066.04 to read:

"Aerial Cable Assembly. The aerial cable shall be an assembly of insulated aluminum conductors according to Section 1066.02 and 1066.03. Unless otherwise indicated, the cable assembly shall be composed of three insulated conductors and a steel reinforced bare aluminum conductor (ACSR) to be used as the ground conductor. Unless otherwise indicated, the code word designation of this cable assembly is "Palomino". The steel reinforced aluminum conductor shall conform to ASTM B-232. The cable shall be assembled according to ANSI/ICEA S-76-474."

Revise the second paragraph of Article 1066.05 to read:

> "The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing."

REMOVE EXISTING SURVEILLANCE CAMERA EQUIPMENT

Description. This item shall consist of removing the existing surveillance camera, antenna and associated equipment from the wood pole adjacent to the Kennedy Expressway Pumping Station, located at approximate S.E.B Kennedy Expressway Station 479+30, Rt. The exiting surveillance camera shall not be removed until the proposed PTZ surveillance camera is installed, tested and is operational. The existing camera shall be disposed of along with the associated CCTV control cabinet and its components.

Construction.
The contractor shall coordinate with the State Electrical Maintenance Contractor to obtain access to all equipment associated with the surveillance camera and antenna to be removed from the existing wood pole located at the Pump Station facility. Item includes removal of the CCTV camera, antenna, cabinet, mounting brackets, conduits and cabling, and all hardware associated with the CCTV camera and antenna installation, or other items as directed by the Engineer. Contractor shall not damage any other equipment attached to the wood pole.

Method of Measurement.
The unit of measurement is per EACH, which shall include all work and materials required to remove the equipment.

Basis of Payment: This item shall be paid at the contract unit per EACH for **REMOVE EXISTING SURVEILLANCE CAMERA EQUIPMENT**.

CLOSED CIRCUIT TELEVISION DOME VIDEO CAMERA

1. **Description**.

This item shall consist of furnishing an integrated Closed-Circuit Television (CCTV) Dome Camera Assembly as described herein and as indicated in the Plans and installing on 80 feet pole as shown on the plans.

2. **Definitions:**

CCTV Dome Camera	The complete camera assembly including the camera, PTZ mechanism, upper and lower dome housings, and any mounts.
Dome, lower dome, dome bubble	Clear dome (bubble) on the lower portion of the CCTV dome camera which the camera views through
Dome housing, upper dome	The upper portion of the CCTV dome cameras which houses the transformer, wires and terminations, and PTZ mechanism.
PTZ	The motorized Pan, Tilt and Zoom mechanism
Camera	The analog day/night camera

3. **Materials.**

3.1 General. The CCTV Dome Color (Day/Night) Camera shall be a rugged, non-pressurized, outdoor surveillance domed analog camera system. The CCTV Dome Camera shall be designed to perform over a wide range of environmental and lighting conditions and automatically switches from color daytime to monochrome nighttime operation. For compatibility with the existing CCTV cameras, the dome cameras shall be manufactured by Phillips/Bosch (AutoDome Series 600) or equal approved by the Engineer. The equivalent shall comply with all the requirements herein and shall provide the same operation/functionality as the installed cameras without the use of any external devices for the modification/translation of video and PTZ commands.

All equipment and materials used shall be standard components that are regularly manufactured and utilized in the manufacturer's system.

The manufacturer shall be ISO 14001 Certified. The manufacturer's quality system shall be in compliance with the I.S./ISO 9001/EN 29001, QUALITY SYSTEM. The manufacturer shall provide a three year (3) warranty. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims.

The warranty period shall begin on the date of final acceptance of the video distribution system. This warranty shall include repair or replacement of all failed components via a factory authorized repair facility. All items sent to the repair facility for repair shall be returned within two weeks of the date of receipt at the facility. The repair facility location shall be in the United States. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item at no additional cost to the State.

3.2 Physical construction. The CCTV Dome Camera shall be provided in a NEMA 4X or IP66 certified, rugged, weather-resistant package. The CCTV Dome Camera shall also comply with the following requirements:

Environmental	**Requirement**
IP Rating	IP 66
Weight (max.)	10 lbs
Overall Dimensions	10" dia. x 14"
Humidity	0 to 100%
Operating temperature	-40ºC to 50ºC
Mount	1 ½" NPT

The CCTV dome camera shall be equipped with a fan and heater controlled by a thermostat. The heater shall prevent internal fogging of the lower dome throughout the operating temperature range of the camera.

An rugged clear dome bubble shall be available from the CCTV camera manufacturer. The rugged dome shall be made from 3mm thick polycarbonate, designed to meet stringent strength standards without compromising optical clarity. The dome, by itself, shall withstand a 100 foot-pound impact. This energy is equivalent to that of a 10 lb sledgehammer being dropped from a height of 10 feet. The dome, when installed in the CCTV camera, shall exceed the UL 1598 horizontal impact standard for lighting fixtures, by a factor of 10. The submittal needs to indicate compliance with this requirement.

3.3 Power. The CCTV Dome Camera system shall be designed to operate from a 120v power source. The appropriate power supply required for the CCTV Dome Camera to operate shall be included as a part of this item. The power requirements for the camera including heat, shall comply with the following:

Electrical	**Requirement**
Voltage	18 to 30 VAC
Load	25 VA
Heater Load	45 VA
Listing	UL Listed
FCC	Class B

Surge Protection Requirements

Source	**Minimum Requirements**
Video	Peak current 10 kA (Gas Tube Arrester), peak power 1000 W (10/1000 µ)
RS-232/485, Biphase	Peak current 10 A, peak power 300 W (8/20 µ)
Alarm Inputs	Peak current 17 A, peak power 300 W (8/20 µ)
Alarm Outputs	Peak current 2 A, peak power 300 W (8/20 µ)
Relay Outputs	Peak current 7.3 A, peak power 600 W (10/1000 µ)
Power Input (Dome)	Peak current 7.3 A, peak power 600 W (10/1000 µ)
Power Output (Alarm Power Supply)	Peak current 21.4 A, peak power 1500 W(10/1000 µ)

3.4 Camera.

The CCTV Dome Camera shall incorporate a solid state CDD imaging camera with the following requirements.

3.4.1 The camera shall automatically switch from daylight color operation to a higher sensitivity nighttime monochrome mode when light levels fall below a user adjustable threshold level.

3.4.2 The camera shall provide a selectable slow shutter (frame integration) function that increases the camera's sensitivity up to 50 times by reducing the shutter speed as well as fully automatic.

3.4.3 Digital image stabilization shall be provided using electronic compensation that filters out vibrations caused by wind and other environmental conditions.

3.4.4 The camera shall feature a Sodium Vapor White Balance mode.

The camera shall also comply with the following requirements:

Camera	**Requirement**
Imager	1/4" HAD CCD
Effective Pixels	768H x 494V
Zoom Lens Power (Optical only)	36x
Aperture	*f*1.6 to *f*4.5
Focus	Auto / Manual
Iris	Auto / Manual
Max. Field of View Horizontal	57º
Video Output	1.0v +/- 0.07v
Gain Control	Auto / off
Synchronization	Internal / AC line lock, phase adj. via remote control, V-Sync
Digital Zoom	12x
Horizontal Resolution	550 TVL
Signal – Noise Ratio	>50dB
White Balance	Auto / Manual, 2000 K to 10,000K
Shutter Speed	1/1 to 1/10,000 sec

Min Illumination		**Values in lux**
Day	SensUp (Off)	0.66
	SensUp (On)	0.04
Night	SensUp (Off)	0.104
	SensUp (On)	0.0052

3.5 PTZ Mechanical

The CCTV dome camera shall have an integrated motorized PTZ mechanism as specified herein and shall be compatible and coordinated with the control system described elsewhere herein. The camera's 360° pan rotation shall is divided into 16 independent sectors with 16-character titles per sector. Any or all of the 16 sectors may be blanked from the operator. In addition to the blanking function, a privacy masking feature shall be provided that allows creation of up to six (6) rectangular masks that prohibit areas of the field of view from being seen even if the camera is panned, tilted, or zoomed.

Mechanical (Dome Drive)		**Requirement**
Pan		360º
Tilt		Up to 18º above horizon
Continuous PTZ Operation		Yes
Pre-position speed	Pan	360º/sec
	Tilt	200º/sec
Accuracy	Pan	+/- 0.1º
Variable speed	Pan	80º/sec or 150º/sec
	Tilt	40º/sec

3.6 Camera Functionality

Camera Commands

3.6.1 The camera shall allow the storage of up to 99 preset scenes with each preset programmable for 16 character titles. A tour function shall be available to consecutively display each of the preset scenes for a programmed dwell time. Any or all of the presets may be included or excluded from the tour.

3.6.2 The camera shall be capable of recording two (2) separate tours of an operator's keyboard movements consisting of, tilt, and zoom activities for a total combined duration time of 15 minutes. Recorded tours can be continuously played back.

3.6.3 When an operator stops manual control of the camera, and a programmed period of time is allowed to expire, the camera will execute one of the following programmable options: 1) return to preset #1 or 2) return to the automated tour previously executed or 3) do nothing and remain at the present position.

3.6.4 The camera shall ensure that any advanced commands required to program the camera are accessed via three levels of password protection ranging from low to high security.

3.6.5 The camera system shall provide a feature that automatically rotates, or pivots, the camera to simplify tracking of a person walking directly under the camera.

3.6.6 The camera's 360° pan rotation shall is divided into 16 independent sectors with 16-character titles per sector. Any or all of the 16 sectors may be blanked from the operator.

3.6.7 In addition to the blanking function, a privacy masking feature shall be provided that allows creation of up to six (6) rectangular masks that prohibit areas of the field of view from being seen even if the camera is panned, tilted, or zoomed

Visual Effects	**Requirement**
Sectors/Zones	8
Titling	20 characters
Max Presets	99
Motion Detection	Yes
Password Protection	Yes
On Screen Configuration Menus	Yes
Image Stabilization	Yes
Preset Tour / max presets	
Recorded Variable PTZ Tour	2
Auto Flip	Yes
Auto Return to preset after operator inactivity	Yes
Window Blanking	
Quantity	6
Grey out	Yes
Alarms	Yes

3.6.8 The manufacturer shall fully document and provide to the Department the communication protocol implemented by the CCTV dome camera. This protocol shall be open and allow third-party development of control software. If the current protocol is not NTCIP compliant, the manufacturer shall supply upgrades to make the software compliant in the future at no cost to the Department.

3.6.9 Diagnostic software shall be provided with each CCTV camera which shall allow all camera functions accessible via a Windows 7 or later based PC. A RS232, or a USB cable shall be provided to connect to the CCTV dome camera assembly after lowering. A copy of the diagnostic software shall be supplied for each CCTV camera. The program shall be capable of configuring and controlling the CCTV dome camera assembly and its functions (position, zoom, focus, iris, power, color balance, etc.) from within it. This includes storing and recalling preset positions for fast system configuration.

3.7 Interface

Control System**.** Camera commands shall be transmitted over twisted pair, RS 232, RS 422 and RS 485. The method of transmission shall be user selectable.

The camera shall provide four (4) normally open or normally closed alarm input contacts and one (1) relay output. Any or all of the input contacts may be programmed upon activation to automatically move the camera to any preposition location, close the output relay for a programmed period of time, and display an alarm indication on the on-screen display of the display monitor.

4. Testing.

The Contractor shall test each CCTV Dome Camera Assembly in the presence of the Engineer after the camera is installed. This test may be done locally at the camera support structure.

A Test Plan with testing procedures shall clearly identify each required function, performance, and property being tested, the setup conditions, the steps to be followed during the test, and the expected test results. The testing procedure shall exercise all steps to verify compliance with the allocated requirements. The Test Plan shall include provisions for a requirements traceability matrix to assure all requirements are met by inspection, analysis, and demonstration and/or testing. Each test procedure shall indicate the uniquely identified requirement(s) for which the test is intended to show compliance. The test procedures shall provide demonstration steps and test scripts to be followed to show compliance with the listed requirement(s).

As a minimum, testing shall include the following as documented in a test plan and submitted to the Engineer for approval four weeks prior to the scheduled start of testing:

- Using a portable computer with camera control and video display software installed, connect to the CCTV Camera and verify local operation of all CCTV equipment, including exercising the pan, tilt, zoom, focus, pre-set positioning and power on/off functions.
- Demonstrate camera sensitivity at low light levels to meet the specified requirements and verify resolution in transition to and from day (color) and night (monochrome) modes.
- Demonstrate the pan/tilt speed and the extent of camera horizontal and verical movement, identify any blocked field of view positions, and determine the zoom capability to identify objects at continuously increasing (equal increments) distances along the roadway from the installation site to a distinguishable limit of an object.
- Setup, select and demonstrate all pre-programmed preset positions and confirm the capability to hide established privacy zones from CCTV camera viewing.
- Demonstrate image quality locally using a temporary video monitor and end-to-end at the Central Control Center using an existing workstation and video wall. This demonstration shall include all remote PTZ functionality. Demonstrate video quality and PTZ functions at the Central Control Center and remote control buildings during day, night and the transition time.

5. Product Support.

The manufacturer shall provide technical support via email, fax and toll-free telephone. The above forms of support shall be provided Monday through Friday, 8:00am to 8:00pm EST.

6. Installation.

The Contractor shall submit shop drawings for the camera mounting adapter. Camera shall be installed on 80 feet pole with lowering device as shown on the plans and as specified herein.

7. Measurement.

Closed-Circuit Television (CCTV) Dome Cameras shall be counted as each upon successful completion of the testing described herein for payment.

8. Basis of Payment.

This item will be paid for at the contract unit price each for furnishing and installing **CLOSED CIRCUIT TELEVISION DOME CAMERA**, which shall be payment in full for all material and work as specified herein.

CCTV CABINET EQUIPMENT

Description.

This item shall consist of furnishing and installing CCTV cabinet equipment including cabinet, control equipment, and mounting hardware. This item includes equipment for the transmission of CCTV video, pan tilt zoom (PTZ) control and other control signals between CCTV camera site and an existing REVLAC remote control building and the Central Control Center. Transmission for the video and control signals shall be by single mode fiber optic cable as specified elsewhere herein and as indicated on the drawings. The video encoder transmitter equipment shall be fully interoperable with video decoder receiver equipment and provided as a pair supplied by the same manufacturer. For PTZ CCTV cameras, a data transceiver shall be combined with a video transmitter and be provided as matched pairs supplied by the same manufacturer.

All video transmitters and combined video transmitter and data transceivers installed in a CCTV Control Cabinet shall be surface mounted with separate power supply. The power, video and control cables, as applicable, from CCTV cabinet to the camera shall be included as part of this pay item including the cables between the single ground mounted CCTV control cabinet and the remote fixed position CCTV camera for DMS site CM-2. The cabinet foundation and conduits including stub-ups needed for the remote CCTV camera for DMS site CM-2 shall be paid separately.

Materials.

CCTV Cabinet. The CCTV Cabinet shall be a Hoffman Enclosures Model, Electromate Enclosures, or approved equal. The cabinet shall be NEMA-4X compliant. The nominal dimensions of the cabinet shall be minimum 36 inches high by 24 inches wide by 12 inches deep. All cabinets shall have a shelf sized to support a portable computer and a 15” CCTV monitor.

The cabinet shall be fabricated of 14 gauge Type 304 or Type 316L stainless steel. All seams shall be continuously welded and ground smooth with no holes or knockouts. The cabinet shall be fabricated with a rolled lip around three sides of the door and on all sides of the enclosure openings to exclude liquids and contaminants. A stainless steel door clamp assembly shall assure a watertight seal. A seamless gasket shall be included to assure a watertight and dust-tight seal.

The cabinet shall have provisions for padlocking in the closed position. The lock shall be Corbin #2 and two keys shall be supplied to the Department with each lock. The keys shall be removable in the locked position only.

A data pocket of high impact thermoplastic material shall be provided. The nominal dimensions of this pocket shall be 12 inches by 12 inches. Collar studs shall be provided for mounting the stainless steel backboard panel. The cabinet shall be unpainted. Cover, sides, top, and bottom shall have a smooth brushed finish.

Each cabinet shall have a maximum of three (3) 1-pole 15 ampere circuit breakers, as needed, in conjunction with a 30 ampere, 2pole main breaker, a 10' ¾" copper-clad ground rod interconnected to a cabinet ground bus bar with a #2 AWG stranded cable, data, video and power surge protection devices (SPD), video and data transmission equipment and power supplies for transmission equipment and CCTV camera, as applicable.

Each wire entering a cabinet shall be trained in a workmanlike manner and lugged at each terminal strip or fiber optic patch panel or SPD . If more than one wire has a common terminal on a terminal strip, the adjacent strip shall be used and an appropriate jumper connection shall be made, as applicable.

All cables (fiber, coaxial cable, RS232, RS485/422, Category 6 UTP, and electrical conductors) shall be labeled with a panduit type cable tag. The tag will identify the type of cable and the cable destination.

A copper grounding bus and neutral bus shall be mounted on the rear wall of the cabinets.

Each cabinet shall contain a wiring diagram of the installation in addition to the diagrams which are to be submitted to the Engineer.

Anchor bolts shall be installed for the concrete foundation mounted cabinets. These shall be considered as incidental to the cost of the cabinets.

Terminal blocks provided in cabinets shall be the heavy duty barrier type. The terminal block shall be a minimum of 2" (50.8mm) wide and 1-3/16" (30.2mm) deep. Center to center of the terminal screws or studs shall be a minimum of 21/32" (16 mm) with barriers in-between. Terminal blocks shall be rated at 45 amps 600 volts breakdown RMS line to line 11,000 V. and breakdown RMS line to ground 13,800 V. A marking strip shall be provided with each terminal block.

Surge Protection Devices. Over-voltage protection shall be provided on the power conductors, camera control conductors, and the video cables, as applicable. The specific protection shall comply with UL 1449, fourth edition and 2011 NEC article 285. Surge protection shall comply with the more stringent requirements of these standards or the requirements listed below. Incoming Power Protection. The incoming power shall be protected with a filtering surge protector that absorbs power line noise and switching transients. The specified performance shall be as follows:

Peak current	20 kA (8x20 μs waveshape)
Life Test	5% change
Clamp voltage	280 V typical @ 20 kA
Response time	≤5 ns
Continuous service current	10 amps max. 120 VAC/60 Hz
Operating Temperature	-40ºC to +75ºC (minimum)
Nominal dimensions	7.15 inches by 3.13 inches by 2.3 inches

Video Cable Protection. The coaxial cable from the camera shall be protected with gas tubes and silicon avalanche devices. The units shall include re-settable fuses to protect against sneak currents. Specific requirements include:

Frequency	0 to 20 MHz
Peak surge current	20 kA (8x20 µs waveshape)
Technology	Hybrid, solid-state
Attenuation	0.1 dB at 10 MHz
Response time	≤1 ns
Protection	Line-to-shield
Input/output connectors	BNC
Impedance	75 ohms
Temperature range	-40ºC to +75ºC (minimum)
Humidity	0% to 95% (non-condensing)
Clamping voltage	6 V
Nominal dimensions	4.5 inches by 1.5 inches by 1.25 inches

The video cable protector shall be UL listed.

Camera Control Cable Protection. The camera control cable protector shall protect the RS-422/RS-485 signal leads going to the camera dome assembly. Specific requirements include:

Technology	Hybrid, solid-state
Response time	≤5 ns
Protection	Line-to-ground
Input/output connectors	terminal block
Temperature range	-40ºC to +75ºC (minimum)
Humidity	0% to 95% (non-condensing)
Clamping voltage	7.25 V (maximum); ≤7.0 V (typical)
Nominal dimensions	4.5 inches by 3.3 inches by 1.8 inches

The protector shall protect a up to eight conductors (i.e., 4 twisted pairs).
CCTV camera pole and ground mount cabinet installations shall include the appropriate equipment for the local control and video monitoring of the video that may need to temporarily disconnect and re-connect cables for servicing or camera set-up.

Video Encoded Transmitter and Video Decoded Receiver. Digital video transmission equipment shall encode and decode analog video that is input to a transmitter and output from a receiver. The digitally encoded video transmitter and receiver shall be Part Number VT/VR14130 supplied by Interlogix, a United Technologies Corp. company, or an approved equal. The approved equal shall be interchangeable with the specified unit with respect to functionality and performance. The Contractor shall provide a combined video transmitter and receiver and data transceiver for all proposed PTZ CCTV cameras.

The digital video and video plus data transmitters shall be surface mounted in the CCTV Control Cabinet and the digital video and video plus data receivers shall be rack mounted using a card cage with a power supply module in the remote control buildings. A power supply operating from a 120-volt single phase AC power input shall be surface mounted in the CCTV Control Cabinet to power the digital video transmitter and combined video transmitter and data transceiver, as applicable to a particular location.

Digital video encoded transmitter units shall accept NTSC video via a BNC input connector.
.
The combined video and data unit capable of communicating PTZ and other control signals between the CCTV camera and the existing remote control building video matrix switcher and the Central Control Center operator workstations shall be Part Number 4930WDM supplied by Interlogix, a United Technologies Corp. company, or an approved equal. The approved equal shall be interchangeable with the specified unit with respect to functionality and performance. The CCTV Control Cabinet combined video transmitter and data transceiver shall be surface mounted and the remote building video receiver and data transceiver shall be rack mounted in a card cage with a power supply module. A power supply, separate from the video transmitter supply shall be surface mounted in the CCTV Control Cabinet to power the combined video transmitter and data transceiver.

Digital video transmission equipment and data transceivers shall be supplied to satisfy the following:

VIDEO	**Requirements**
Video channels	1x PAL/NTSC
Input level	1 Vpp (±3 dB)
Input impedance	75Ω
Differential Gain	< 2%
Differential Phase	< 0.7%
Tilt	< 1%
Frame rate	30 fps
Signal-to-Noise Ratio (SNR)	>67 dB @ Maximum Optical Loss Budget
Bandwidth	5 Hz - 10 MHz
Optical Connector	ST, SC, or FC
Connector type	BNC 75Ω (gold plated center pin)

DATA	**Requirements**
Number of channels	1 (Simplex or full-duplex)
Bit Error Rate:	<1 in 10-9 @ Maximum Optical Loss Budget2x 3 (multi- and/or unicast)
Interface	RS-232, RS422, 2-Wire RS-485
Environmental	NEMA TS-1/TS-2
Data rate	Up to 100 kb/s
Data Connector Type	Terminal Block
Optical Connector Type	Type ST, SC or FC

Management & Maintenance	**Requirements**
LED status indicators	
VT Transmitter Unit	Video Input Sync Presence Video Input Overload Operating Power
VR Receiver Unit	Video Output Sync Presence Video Output Overload Optical Carrier Detect/ Link-Lock Operating Power
Data Transceiver Unit	Optical Carrier Detect/ Link-Lock Operating Power
MTBF	>100,000 hours

Power	**Requirements**
Power consumption	
Video Transmission	6W
Data Transmission	3W
Rack-mount units	Power derived from R3 Cage Power Supply

ENVIRONMENTAL	**Requirements**
Operating temperature	-40° F to +165° F (-40 °C to +74 °C)
Storage temperature	-40° F to +185° F (-40 °C to +85 °C)
Relative humidity	0 to 95%,non-condensing

RG-6 cable shall comply with the following standards:

- NEC CMR
- CEC/C(UL) CMG

RG-6 cable shall contain a solid bare copper #18 AWG conductor, gas-injected foam, HDPE insulation, tinned copper braid shield (95% coverage), and a PVC jacket. The cable shall have a nominal impedance of 75 ohms and a maximum attenuation of 1.7 dB/ 100 meters at 5 Mhz. RG-6 cable shall meet the following properties;

- Operating Temperature Range: -30°C To +75°C
- UL Temperature Rating: 75°C
- Max. Recommended Pulling Tension: 306.926 N
- Min. Bend Radius/Minor Axis: 69.850 mm

Fiber Optic Cable Termination

The Contractor shall include all necessary wires and cables necessary to interconnect the components and equipment of the CCTV Control Cabinet as shown on the drawings. The Contractor shall provide a patch panel with a 12 port adapter plate. Single mode fiber pigtails of sufficient length shall be used to terminate every strand of the 12 strand breakout cable routed to each CCTV Control Cabinet. The patch panel shall be Corning products housing SPH-01P including the appropriate CCH panel or approved equal. The CCH panels shall be factory terminated with factory tested pigtails.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall prepare and submit a shop drawing detailing the complete CCTV control cabinet equipment installation and video and data transmission proposed for the Project. The shop drawings shall include INSTALLATION details and specifications of all components to be supplied, for approval of the Engineer. Particular emphasis shall be given to the cabling and the interconnection of all of the components.

Appropriate connectors shall be furnished and installed to connect the in-cabinet components to the integrated dome camera assembly and the fixed position CCTV camera. The Contractor shall mount the in-cabinet components and equipment as shown on the drawings or as required by the proposed solution to a cabinet back panel and connect to AC power and data and video communications, as applicable.

Testing. The Contractor shall test each installed CCTV Control Cabinet component and equipment in accordance with an approved Test Plan.

The testing procedures shall clearly identify each required function, performance, and property being tested, the setup conditions, the steps to be followed during the test, and the expected test results. The testing procedure shall exercise all steps to verify compliance with the allocated requirements. The Test Plan shall include provisions for a requirements traceability matrix to assure all requirements are met by inspection, analysis, and demonstration and/or testing. Each test procedure shall indicate the uniquely identified requirement(s) for which the test is intended to show compliance. The test procedures shall provide demonstration steps and test scripts to be followed to show compliance with the listed requirement(s).

During the Factory Demonstration Test the Contractor shall demonstrate a prototype assembly using the proposed components. This demonstration shall take place in conjunction with other subsystems tests at a location approved by the Engineer. The Factory Demonstration Test shall be completed prior to the delivery of any completed cabinet assemblies to the Project site. Any deviations from these specifications that are identified during this testing shall be corrected prior to shipment of the assembly to the project site.

An on-site test shall be conducted at the cabinet using a CCTV video monitor, portable computer, an oscilloscope and an electrical meter to verify compliance with the requirements contained herein and with the manufacturer's specification. The Contractor shall verify that the camera can be fully exercised and moved through the entire limits of Pan, Tilt, Zoom, Focus plus presets for the PTZ cameras and zoom and Iris adjustments for all provided CCTV cameras. The video monitor and an oscilloscope shall verify that the video signal meets or exceeds the specified requirements.

The Contractor shall maintain a log of all test results and a description of anomalies and failures encountered during the test. A representative of the Contractor and a representative of the Engineer shall sign the test procedure form as witnessing and concurring with the recorded results.

Equipment Installation

The CCTV Control Cabinet equipment shall be mounted in a pole mounted cabinet, except for one instance requiring a ground mounted cabinet for DMS CM-2, as shown on the drawings and on approved shop drawings submitted by the Contractor.

Shop drawings detailing the cabinet layout shall be submitted for approval. All pole mounted cabinets shall have identical dimensions.

Pole mounting shall be accomplished by fastening the cabinet to a corrosion resistant plate using a fabricated bolt pattern.

The components and equipment shall be securely mounted on a back panel compatible with the cabinet materials or on a corrosion resistant DIN rail if equipment is configured as such.

Documentation. One copy of all operations and maintenance manuals for each CCTV Control Cabinet component and equipment shall be submitted to the Engineer in both soft and hardcopy. The Department reserves the right to provide this documentation to other parties who may be contracted with in order to provide overall integration or maintenance of this item.

Warranty. The Contractor shall warranty all materials and workmanship including labor for a period of two years after the completion and acceptance of the installation, unless other warranty requirements prevail. The warranty period shall begin when the Contractor completes all construction obligations related to this item and when the components for this item have been accepted, which shall be documented as the final completion date in the construction status report. This warranty shall include repair and/or replacement of all failed components via a factory authorized repair service vendor. All items sent to this service provider for repair shall be returned within two weeks of the date of receipt at the facility. The service provider location shall be in the United States. The provider of the warranty service shall be responsible for all return shipping costs.

Repair and replacement parts shall only be obtained from the original manufacturer's authorized representative unless supplied directly by the manufacturer. A warranty certificate indicating the start and end dates of the warranty shall be supplied for each component and equipment replaced during the warranty period from the original manufacturer's authorized representative to the warranty service provider. The original certificate shall be supplied at the conclusion of the system acceptance test and shall be for a minimum of two years. The certificate shall name the Department as the recipient of the service. The Department shall have the right to transfer this service to other private parties who may be contracted to perform overall maintenance of the facility.

Method Of Measurement. CCTV Control Cabinet components and equipment shall be counted, each installed.

Basis Of Payment. This item shall be paid at the contract unit each for **CCTV CABINET EQUIPMENT – GROUND MOUNT** complete in place or **CLOSED CIRCUIT TELEVISION CABINET EQUIPMENT** complete in place or **CLOSED CIRCUIT CABINET EQUIPMENT – FOR DUAL CAMERA** complete in place.

CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, GALVANIZED STEEL, 80 FT. MOUNTING HEIGHT

Description.
This work shall consist of furnishing a CCTV camera structure complete with camera lowering device(s). The structure shall be a galvanized steel structure. Work consists of installation of CCTV camera structure with one camera lowering device and CCTV camera structure with dual lowering devices as shown on the plans. Concrete foundation paid separately.

Definitions.
CCTV Camera Structure: The complete camera structure and lowering device as one integral working system.
Shaft: The camera structure shaft.
Lowering Device: The components involved with the mounting, operation, and raising and lowering of the CCTV camera.
Structure Height: The height of the structure shall be measured as indicated on the detail drawings

Materials.
Materials shall be as specified elsewhere herein. The design of the structure shaft shall achieve a maximum, fully loaded deflection at the top of the structure, which is not greater than 1-inch

Submittals and Certifications.

The structure shall be designed in accordance with 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals with Appendix C wind pressure for a 90 mph wind zone with a 1.3 gust factor. The single lowering device pole shall be designed for use with a single arm camera lowering device with a total effective area of 2 square feet and total weight of 95 lbs and fixed camera mounted at 45 feet above base plate with a total effective area of one square feet and total weight of 25 lbs. The dual lowering device pole shall be designed for use with a dual arm camera lowering devices with a total effective area of 4 square feet and total weight of 190 lbs. The structure shall not exceed 1" deflection in a 30 mph (non-gust) wing.

The camera structure shall be designed and constructed so no structural member or other component is applied in excess of the manufacturer's recommended rating (when applicable) or the published rating, whichever is lower

Shop drawings, product data and certifications shall be submitted. The submitted information shall be complete and shall include information relative to all specified requirements suitable for verification of compliance.

THE SUBMITTALS SHALL BE ARRANGED AND CROSS-REFERENCED TO THE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS. FAILURE TO CROSS-REFERENCE THE SUBMITTAL INFORMATION WITH THE SPECIAL PROVISIONS WILL RESULT IN THE SUBMITTAL BEING RETURNED WITHOUT REVIEW.

The submittal information shall be dated, current, project specific, identified as to the project, and shall also include the following calculations and certifications as applicable to the material utilized:

- Shaft design calculations, including Registered Engineer Certification.
- Certification of intent to provide domestic steel in accordance with Article 106.01 of the Standard Specifications.
- Welding details and procedures.
- Letter of intent to provide specified weld inspection reports.
- Confirmation of coordination between anchor rod supplier and the structure manufacturer for adequacy of anchor rod assembly.
- Manufacturer's recommended installation procedures.
- Letter of intent to provide manufacturer's representative during installation and to provide specified installation certification.

All certifications shall be notarized.

Shaft.

The pole shall be a maximum of three sections for field assembly. The pole shafts shall be a round cross section and meet the requirements of ASTM A595 grade A with a minimum yield strength of 55,000 psi. The bottom section shall have a minimum .3125 wall thickness and a minimum diameter of 23". The three shafts sections shall taper at a rate of .14" per foot and have an overall height of 80'. The pole base plate shall meet the requirements of ASTM A36 and be arranged to accommodate four (4) 1 ½" x 54" x 6" anchor bolts on a 27" bolt circle. Anchor bolts shall conform to ASTM F1554 gr. 55

The pole assembly shall be equipped with a 6" x 27" reinforced hand hole opening with a 3 gauge cover and shall be attached with four (4) ¼"-20 hex head stainless steel screws. The bottom of the hand hole shall be located up 14" from the bottom. The hand hole frame shall meet ASTM A529 grade 50 and shall be made from ¾" x 3 ½" bar. There shall be a 3/8" diameter rod for wire tie off located at the top of the opening and 1 ¾" from the front of the hand hole frame and also a ½" tapped hole located 1 ¾" from the front of the frame at the bottom of the opening as shown on the drawing.

Six (6) 1" inside diameter eye rings or hooks for power, video and communication cables are required as shown on the drawing. Two (2) shall be located 38" up from the bottom, two (2) located 6" below the top of the bottom shaft and two (2) 6" below the top of the center shaft.

There shall be a 3 ½" schedule 40 (4" OD) pipe tenon 11 ¾" tall on a 3/8" thick plate welded to the top of the pole. The pipe tenon shall include a 1 ¾" x 5 ¼" slot and two (2) 5/8" holes as shown on the drawing to accommodate the Camera Lowering System arm assembly. A J-hook shall be included inside the top of the tenon assembly and shall include a removable cast aluminum pole top.

Camera Lowering Device.

Contractor shall provide camera-lowering devices on each structure as indicated in the plans. For poles with dual camera-lowering devices the lowering devices shall be oriented 90 degrees apart so that view of the highway is not obstructed by the pole shaft.

The camera lowering system shall be designed to support and lower a standard closed circuit television camera, lens, housing, PTZ mechanism, cabling, connectors and other supporting field components without damage or causing degradation of camera operations. For two locations shown on the drawings a dual camera lowering system to lower a PTZ and a fixed position CCTV camera mounted at a 90^0 angle. The camera lowering system device and the pole are interdependent; and thus, must be considered a single unit or system. The lowering system shall consist of a pole, suspension contact unit, divided support arm, and a pole adapter for attachment to a pole top tenon, pole top junction box, conduit mount adapter and camera connection box. The divided support arm and receiver brackets shall be designed to self-align the contact unit with the pole center line during installation and insure the contact unit cannot twist under high wind conditions. The dual lowering system shall double the lowering components to support and independently lower the two CCTV cameras. For maximum arm strength, round support arms are not acceptable. The camera-lowering device shall withstand wind forces of 100mph with a 30 percent gust factor using a 1.65 safety factor. The lowering device manufacturer, upon request, shall furnish independent laboratory testing documents certifying adherence to the stated wind force criteria utilizing, as a minimum effective projected area, the actual EPA or an EPA greater than that of the camera system to be attached. The camera-lowering device to be furnished shall be the product of manufacturers with a minimum of 3 years of experience in the successful manufacturing of camera lowering systems. The lowering device provider shall be able to identify a minimum of 3 previous projects where the proposed system has been installed and has successfully operated for over a one-year period of time each. A dual lowering system and assembly shall be provided with two poles as indicated on the drawings. The lowering device manufacturer shall have installed and successfully operated at least 1 project with a dual lowering system for a minimum of one year,

The lowering device manufacturer shall furnish a factory representative to assist the electrical contractor with the assembly and testing of the first single and dual camera mount lowering system onto a pole. The manufacturer shall furnish the applicable DOT engineer documentation certifying that the electrical contractor has been instructed on the installation, operation and safety features of the lowering device. The contractor shall be responsible for providing applicable maintenance personnel “on site" operational instructions.

Suspension Contact Unit.

The suspension contact unit shall have a load capacity 600 lbs. with a 4 to 1 safety factor. There shall be a locking mechanism between the fixed and moveable components of the lowering device. The movable assembly shall have a minimum of 2 latches. This latching mechanism shall securely hold the device and its mounted equipment. The latching mechanism shall operate by alternately raising and lowering the assembly using the winch and lowering cable. When latched, all weight shall be removed from the lowering cable. The fixed unit shall have a heavy duty cast tracking guide and means to allow latching in the same position each time. The contact unit housing shall be weatherproof with a gasket provided to seal the interior from dust and moisture. The entire unit shall have a minimum temperature rating of -40 degrees F to +190 degrees F (-40C to 90C).

The prefabricated components of the lift unit support system shall be designed to preclude the lifting cable from contacting the power, data and or video cabling. The lowering system manufacturer shall provide a conduit mount adapter for housing the lowering cable. This adapter shall have an mechanism to allow the connection of a contractor provided 1.25 inch PVC conduit and be located just below the cable stop block at the back of the lowering device. The Contractor shall supply internal conduit in the pole as directed by the lowering system provider. The only cable permitted to move within the pole or lowering device during lowering or raising shall be the stainless steel lowering cable. All other cables must remain stable and secure during lowering and raising operations.

The lowering device shall be specifically equipped with electrical contacts connectors designed for simultaneous Analog (Coax) and Ethernet (IP-CAT5) video transmission along with optional PTZ control. The contact connectors shall be designed for extreme environmental outdoor use.

All current carrying male pin and female socket/barrel contacts shall be Gold-plated per ASTM B-488 over Nickel plated CA 360 per QQ-N-290m.

The male and female socket contact halves of the connector block shall be made of a UL94, V-0 rated thermosetting synthetic rubber. The female barrel contacts and the male pin contacts shall be permanently and integrally encased in this rubber material to ensure optimum protection from moisture and the environment.

The female and male socket contact halves of the connector block shall be made of Hypalon. The female brass socket contacts and the male high conductivity brass pin contacts shall be permanently molded into the polymer body.

The current carrying male contacts shall be 1/8 inches in diameter. There shall be two male contacts that are longer than the rest which will make first and break last providing optimum grounding performance. The number of contacts shall be a minimum of 14 and shall be fully coordinated with the camera specified elsewhere herein.

The current carrying female contacts shall be 1/8 inches I.D. All of the contacts shall be recessed 0.125” from the face of the connector. Cored holes in the socket measuring 0.25” in diameter and 0.125” deep molded into the connector body are centered on each contact on the face of the connector to create rain-tight seals when mated with the male connector.

The wire leads from both the male and female contacts shall be permanently and integrally molded in the Hypalon body. The current carrying and signal wires molded to the connector body shall be constructed of #18/1 AWG Hypalon jacketed wire.

The contacts shall be self-wiping with a shoulder at the base of each male contact so that it will recess into the female block, thereby giving a rain-tight seal when mated. The facility manufacturing the electrical contact connector must comply with Mil Spec Q-9858 and Mil Spec I-45208.

Lowering Tool.

The camera-lowering device shall be operated by use of a portable lowering tool. The tool shall consist of a lightweight metal frame and winch assembly with cable as described herein, a quick release cable connector, an adjustable safety clutch and a variable speed industrial duty electric drill motor. This tool shall be compatible with accessing the support cable through the hand hole of the pole. The lowering tool shall attach to the pole with one single bolt. The tool will support itself and the load assuring lowering operations and provide a means to prevent freewheeling when loaded. The lowering tool shall be delivered to the State upon project completion. The lowering tool shall have a reduction gear to reduce the manual effort required to operate the lifting handle to raise and lower a capacity load. The lowering tool shall be provided with an adapter for operating the lowering device by a portable drill using a clutch mechanism. The lowering tool shall be equipped with a positive breaking mechanism to secure the cable reel during raising and lowering operations and prevent freewheeling. The manufacturer shall provide a variable speed, heavy-duty reversible drill motor and a minimum of two complete lowering tools plus any additional tools required by plan notes. The lowering tool shall be made of durable and corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

Camera Junction Box

The camera junction box shall be of two piece clamshell design with one hinge side and one latch side to facilitate easy opening. The general shape of the box shall be cylindrical to minimize the EPA. The camera junction box shall be cast aluminum with stabilizing weights on the outside of the box to increase room on the interior. The box shall be capable of having up to 40 pounds of stabilizing weights. The bottom of the Camera Junction Box shall be drilled and tapped with a 1-1/2” NPT thread to accept industry standard dome housings and be able to be modified to accept a wide variety of other camera mountings. The junction box shall be gasketed to prevent water intrusion. The bottom of the box shall incorporate a screened and vented hole to allow airflow and reduce internal condensation.

All pulleys for the camera lowering device and portable lowering tool shall have sealed, self lubricated bearings, oil tight bronze bearings, or sintered- oil impregnated, bronze bushings. The lowering cable shall be a minimum 1/8-inch diameter stainless steel aircraft cable with a minimum breaking strength of 1740 pounds with (7) strands of 19 gage wire each.

All electrical and video coaxial connections between the fixed and lowerable portion of the contact block shall be protected from exposure to the weather by a waterproof seal to prevent degradation of the electrical contacts. The data, video and electrical connections between the fixed and movable lowering device components shall be designed to conduct high frequency data bits and one (1) volt peak-to-peak video signals as well as the power requirements for operation of dome environmental controls.

The interface and locking components shall be made of stainless steel and or aluminum. All external components of the lowering device shall be made of corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

The Camera Manufacturer shall provide weights and /or counterweights as necessary to assure that the alignment of pins and connectors are proper for the camera support to be raised into position without binding. The lowering unit will have sufficient weight to disengage the camera and its control components in order that it can be lowered properly.

Installation of the lowering device and camera shall be included as a part of this item and shall not be paid for separately.

Method Of Measurement. CCTV camera structure with a single lowering system and CCTV camera poles with dual lowering devices shall be counted, each with all appurtenances installed, complete in place.

Basis Of Payment. This item shall be paid at the contract unit each for **CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, GALVANIZED STEEL, 80 FT. MOUNTING HEIGHT,** of the mounting height specified, or **CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, GALVANIZED STEEL, 80 FT. MOUNTING HEIGHT, DUAL LOWERING DEVICES,** of the mounting heights specified.

CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, 50 FT. MOUNTING HEIGHT

Description:
This item shall consist of furnishing and installing a conventional type round tapered aluminum pole complete with fixed position CCTV camera and all required hardware including bolt covers as specified herein.

Materials:
Pole Shaft. Unless otherwise indicated the shaft shall be made of aluminum alloy conforming to current ASTM designation B 221, alloy 6063 with final temper T6. The shaft shall be spun drawn to smooth circular, tubular, seamless, tapered design.

Unless otherwise indicated, the pole shall be designed and manufactured to withstand equipment dead loadings of up to and including a 34.019 kg (75 pound) camera having an effective projected area of 0.149 m2 (1.6 ft2) on a single 4 foot arm, and shall also to withstand loadings of up to and including the same camera on each of two 4 foot arms oriented at any angle from 45 to 180 degrees apart, meeting the criteria of AASHTO for 128.748 kmph (80 mph) wind loading with 167.371 km/h (104 mph) gusts. These loading requirements shall include all camera and arm orientations possible for the given pole height, up to and including the limits given. Information submitted for approval shall document satisfaction of this requirement.

The indicated mounting height shall be taken from the bottom of the pole shaft base plate and shall be obtained with a nominal arm rise of 12 inches as specified elsewhere herein. This shall determine the required length of the pole shaft regardless of the actual mounting method of the pole.

Unless otherwise indicated, poles shall have a 254.0 mm (10 inch) outside bottom diameter tapering to 152.4 mm (6 inch) outside top diameter. The shaft shall be designed to accommodate loading of the arm configuration indicated, with a minimum wall thickness of 7.92 mm (0.312 inch). Where the indicated arm configuration exceeds these minimum criteria, the wall thickness shall be increased to satisfy the design loading requirements.

Handhole. There shall be an oval shaped opening in the side of the shaft for the purpose of a handhole. Unless otherwise indicated, the centerline of the handhole shall be 457.2 mm (18") from the bottom of the shaft. The handhole shall be 101.6 mm X 203.2 mm (4" x 8") in size with the 203.2 mm (8") dimension being situated vertically and in the same plane as any one of the sides of the base. The opening in the shaft shall be reinforced with a handhole frame situated on the inside of the shaft and welded to the shaft. A 12.7 mm (1/2")-13 tapped hole shall be provided in the frame for attaching a mechanical grounding connector. The handhole cover shall be fastened to the frame with 25.4 mm (1/4")-20 size steel core nylon hex-head screws and the holes for the screws shall be tapped to match the screws. Unless otherwise indicated, the orientation of the handhole shall be such that its pole face shall be opposite to the pole face exposed to oncoming traffic and unless otherwise indicated, the handhole shall be oriented on a face 90 degrees from arm orientation.

All exposed surfaces of the shaft shall be of a smooth, even texture, free from marks and imperfections. The pole shall have a satin ground finish, 100 grit or finer.

Cap. Top of the shaft shall be enclosed with a removable cap. The cap shall be secured in place with 300 series stainless steel screws. The design of the cap shall be such that it shall not permit entry of water into the shaft.

Grommets at the top portion of the shaft two 38.1 mm (1 1/2") diameter openings shall be made and two 31.75 mm (1 1/4") inside diameter rubber grommets shall be provided, for wiring purposes through the arm(s). The grommet openings shall be at 90 degree angles from the position of the handhole, i.e., there shall be two (2) grommet openings for each shaft, 180 degrees apart from each other and at 90 degrees apart from the handhole, unless otherwise indicated.

Base Plate. The bottom portion of the shaft shall be fitted with a base. The base shall be a permanent mold casting of aluminum alloy conforming to current Aluminum Association designations 356.0 or 4356.0, with final temper T6. The base shall be welded to the shaft by the inert gas shielded arc method. All welds shall be free from cracks and pores. All shafts with base plates shall be heat treated after welding. The base shall be equipped with anchor bolt covers. Anchor bolt slots shall be provided in the base to accommodate the required bolt circle diameter. Unless otherwise indicated, poles for mounting heights of 10.668 m (35-feet) or less shall have 292.1 mm (11.5-inch) bolt circles and poles for mounting heights greater than 10.668 m (35-feet) shall have 381.0 mm (15-inch) bolt circles. The size of the slots shall be 1 1/4 inch by 2 inches as detailed on the pole drawing.

Anchor Bolt Covers. The anchor bolt covers shall be made from aluminum, conforming to current ASTM B 108, S5A F or, B 26, SG70A. The anchor bolt covers shall be fastened to the base with 6.35 mm (1/4) 20 threaded steel reinforced plastic fasteners. The fasteners shall be threaded with 6.35 mm (1/4) 20 threaded holes for bolt covers.

Vibration Damper. The pole shall be coordinated with all cameras being provided on this project to be free of susceptibility to harmful harmonics and vibrations. The pole shall incorporate an internal vibration damper. The material submitted for approval shall address this requirement.

Bundling. The shafts shall be shipped in bundles without any wrapping on the individual shafts or the entire bundle. Appropriate bundling materials shall be used to make a rigid, long lasting bundle capable of being handled, shipped and stored without shifting or breaking of contents.

Arm. The arm (bracket) shall be manufactured by the CCTV camera manufacturer and be fully coordinated with the CCTV camera pay item. All openings extending to the camera the bracket shall be free of burrs and rough edges that may be injurious to the wires.

Vibration requirements. The detailed design and fabrication of the shaft and of the arms shall be such as to withstand 128.748 kmph (80 MPH) AASHTO criteria for wind and vibrations, caused by the wind pressure. There shall be no excessive vibrations in the shaft, arm(s) under moderate wind pressure, where damage may result to the camera(s) and/or its component parts, and/or arms(s). A dampening device, as an integral part of the shaft, shall be installed in the shaft to alleviate such excessive vibrations. The proposed vibration dampening device shall be submitted for Engineer's approval.

No information contained herein shall be construed to relieve the Contractor of the above requirements.

Certification and Guarantee. The submittal information shall include a written certification of compliance with the contract requirements from the Manufacturer. The certification shall specifically identify the project route, location, section number, and contract number, as applicable and shall identify specifically the equipment covered by the certification. The certification shall be made on the Manufacturer's corporate stationary and it shall be dated and signed by a responsible officer of the company, with the signee's title listed.

In addition submittal information shall include the guarantee as specified under General Electrical Provisions.

CONSTRUCTION REQUIREMENTS

The structure shall be set plumb on the foundation without the use of shims, grout or any other leveling devices under the pole base. The arm or bracket shall be set at right angles to the centerline of the pavement, unless otherwise indicated. This item shall be coordinated with the applicable camera (with pole wire and fusing), foundation and anchor bolts, breakaway device (as applicable) which shall be provided under separate pay items, as applicable.

Poles shall not be installed until cameras are available for installation at the same time the poles are installed. Poles shall not be installed and left standing without a coordinated installation of arm and camera. POLES SHALL NOT BE PAID UNLESS THE COORDINATED ASSEMBLY, IS COMPLETE.

Basis of Payment:
This item shall be paid for at the contract unit price each for **CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, 50 FT. MOUNTING HEIGHT**, which shall be payment in full for the work as described herein.

CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE FOUNDATION
Effective: March 1, 2010

Description:
This item shall consist of the construction of a reinforced concrete foundation, of the dimensions indicated, complete with raceways. The foundation depth shall be as indicated in the Foundation Depth Table on the plans (where applicable) or as otherwise shown on the Contract Drawings or as directed by the Engineer.

The foundation shall include boring/excavation, reinforcement, concrete, grout, 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.

Materials:
Reinforcement bars shall comply with Article 706.10 of the Standard Specifications.

Unless otherwise indicated, anchor bolts shall comply with the requirements of ASTM Designation A 687. Unless otherwise indicated, nuts shall be hexagon nuts in conformance with ASTM A 194 grade 2H or ASTM A563 grade DH, and washers shall be in conformance with ASTM F436.

The entire length of the anchor bolts as well as the nuts and washers shall be hot dip galvanized in accordance with the requirements of ASTM Designation A 153.

Unless otherwise indicated, conduit raceways shall be heavy wall rigid polyvinylchloride (PVC) conduit, (Schedule 40) UL listed and in conformance with NEMA TC2 and Federal Specification WC 1094A. Raceways shall be of the number and size as indicated.

CONSTRUCTION REQUIREMENTS

The foundation depths shall be as directed by the Engineer based upon evaluation of the soil conditions encountered. The Engineer may determine soil condition by visual inspection or, where practical, by the use of a pocket pentrometer and will establish foundation depth based upon the Foundation Depth Table shown on the plans, where applicable.

The hole for the foundation shall be made by drilling with an auger, of the same diameter as the foundation. The foundation shall be cast in place and allowed to cure for 10 days minimum before the light pole is erected. If soil conditions require the use of a liner to form the hole, the liner shall be withdrawn as the concrete is deposited. The top of the foundation shall be constructed level so that no shims or other leveling device will be needed to set the light standard plumb on the foundation. A liner or form shall be used to produce a uniform smooth side to the top of the foundation. Foundation top shall be chamfered 19.05 mm (3/4 inch) unless otherwise indicated.

Extreme care shall be used in establishing the top elevation of concrete foundations, especially when foundations are installed before final grading is complete. Foundations shall not protrude above grade more than the limits indicated on the plans, except for specifically indicated locations, and where not otherwise indicated, foundation shall not protrude above grade more than 101.6 mm (4 inches) above a 1524.0 mm (60-inch) chord centered at the foundation, at any point around the circumference. Where foundation heights extend beyond specified limits, the Engineer may direct replacement of the foundation and the incorrect foundation will not be measured for payment.

The steel reinforcement, the raceway conduits and the anchor bolts shall be secured in place to each other and properly positioned in the augered hole so that at time of pouring of concrete mixture in place the above said components retain their proper positions. Special attention shall be paid to the positioning of the anchor bolts. It is of utmost importance that the anchor bolt projections on top of the foundation, after placement of the concrete, remain in a perfectly vertical position.

Method of Measurement:
The foundation shall be measured for payment in linear meters (feet) of the foundation in place, in accordance with the total length of concrete pier required, indicated as foundation depth, in the Foundation Depth Table on the Plans and as directed by the Engineer, i.e., extra foundation depth, beyond the directive of the Engineer, will not be measured for payment. Where extension above grade is required, this distance shall be measured for payment.

Basis of Payment:
This work will be paid for at the contract unit price per linear foot for **CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE FOUNDATION, 30" DIAMETER**, or **CCTV CAMERA STRUCTURE, FOUNDATION, 80 FT. MOUNTING HEIGHT**, which shall be payment in full for the work as shown on the Drawings and described herein.

DYNAMIC MESSAGE SIGN POWER CABINET, COMPLETE IN PLACE

Description.
This item shall consist of furnishing and installing ground mounted cabinets of the type and size needed to house the specified items including all relay control devices, a transformer, an ethernet switch, surge protection devices, sign vendors digital I/O interface to the DMS sign controller, circuit breakers, and shelf to support a portable computer. In addition, this item shall include anchor bolts, cable harnesses, ground rods with grounding wire, ground and neutral bus bars, terminal blocks, mounting hardware, and all miscellaneous items at locations as directed by the Engineer. The concrete foundation shall be paid separately.

Materials.
Contractor shall supply all control equipment shown on the plans for sending and receiving signals and data between this cabinet and the DMS sign. Equipment includes relays, transformers, receptacles, circuit breakers, pushbutton switches, Ethernet switch, selector switches, push button switches, surge protection devices, and any additional hardware necessary for a complete installation. PLC logic control equipment shall match existing equipment to the maximum extent possible in the existing drum sign controller cabinet.

Transformer
The transformer shall be 480 Volt to 240/120 Volt, 25 kVa, single phase. The transformer shall comply with NEMA ST 20, NEMA TP 1, NEMA 250, UL 1561. Transformer shall be factory assembled and tested and air-cooled to provide 60 Hz service. The Contractor shall properly account for air movement within the DMS Power Control cabinet. Transformer cores shall be grain-oriented, non-aging silicon steel providing one leg per phase. Coils shall be continuous windings without splices, except for taps. Internal coil connections shall be brazed or pressure type. Coil material shall be copper. The transformer shall provide two 2.5% taps above and at least two 2.5% taps below normal voltage.

Receptacles
Double duplex 120 Volt receptacles shall be straight-blade or twist-lock, with a NEMA configuration. 120 Volt receptacles shall comply with UL 498 and NEMA WD 1 for heavy duty general use type. Fire-resistant non-absorptive, hot molded phenolic composition or equal bodies and bases with metal ears integral with supporting member. Receptacles shall be surface-mounted in cast metal box. Receptacles shall have light-colored terminal facilities for neutral connections, amber or brass colored for phase conductor connections, and green-colored hexagonal machine screws for the equipment grounding conductor or connections. All contacts of the receptacles, including the grounding contact, shall be double grip bronze type with spring steel backup clips so that both sides of each male prong of the plug will be in firm contact. Provide all receptacles with self-grounding clip or mounting strap screws. Receptacles shall support back and side wiring options that accept No. 10 to 14 AWG solid and stranded wire. Receptacles shall include break-off tabs to allow easy-two-circuit conversion.

Ground Fault Circuit Interrupter Duplex Receptacles
GFCIs shall be 120 volt, 60Hz, 20 ampere with built-in test, reset buttons, and ground fault tripped indication. Circuit interruption shall occur within 1/30th of a second on a 5 milliampere earth leakage current. Interrupted current shall result in a maximum 30° C temperature rise at full-rated current after 250 cycles of overload at 200% of rated current. Receptacle shall be designed for end of run installation or with provisions for feeding through to protect other outlets on the circuit. The receptacles shall be furnished with necessary wire connectors, clips, and instructions.

Circuit Breakers
Circuit breakers shall be surface mount or bolt-on type circuit breakers and rated to conform to ANSI/UL 489. Circuit breakers shall have an AIC of 10,000 amperes symmetrical short circuit, minimum. Circuit breakers shall be thermal-magnetic molded case circuit breakers unless indicated otherwise on the drawings. Single pole breakers with handle ties or nails in lieu of multi-pole breakers are not acceptable. Single pole breakers shall be provided in full module size.

Pushbutton Switches
Pushbutton switches shall meet the following requirements:

1. One million electrical design life cycles (200,000 for logic reed) at maximum rated load.
2. Support 18 AWG to 14 AWG wire size termination.
3. Provide flush push button operator
4. Mechanically interlocked to allow activation of a single state
5. Operating temperature range of -40°C - 55 °C and relative humidity of 50 to 95%, non-condensing.
6. Rated to five million mechanical operations.
7. LED illuminated device with LEDs rated to 100,000 hour.

Relays
Industrial control relays shall meet the following requirements:

1. Rated thermal current of 10 amps
2. Rated insulation voltage of 300
3. DC Coil Voltage Range of 80-110%

a. Contact arrangement shall be convertible from N.O. to N.C.

4. Operating temperature range of -20°C - +40 °C and relative humidity of 50 to 95%, non-condensing.
5. Support wire termination of #18 AWG to #14 AWG

Surge Protection Devices
Over-voltage protection shall be provided on the power conductors and relay control signals. The specific protection is based on the elements being protected and shall comply with UL 1449, fourth edition and NEC Article 285

Ethernet Switch
A 9-port industrial hardened Gigabit Ethernet switch with power supply shall be installed and connected to DMS sign controller using multi-mode fiber optic cable to support maintenance services. This switch shall be compliant with IEEE 802.3 (10Mbps) and IEEE 802.3u (100Mbps) All fiber optic link ports shall be capable of multimode or single mode. The Ethernet switch shall require no more than 15W of power. The Ethernet switch shall support the following requirements and options:

10/100BaseTX ports:

- RJ45 connectors
- Cable type: Category 6, unshielded twisted pair (CAT 6 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)

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 (NTP),
- Simple Network Time Protocol (SNTP)
- Management via web or Telnet

Fiber connectors shall be of the ST Type. The switch shall be a Ruggedcom RS900G or approved alternative meeting these requirements.

The Ethernet switch shall be capable of operating properly over an ambient temperature range of -40 degree C to +85 degree C 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 55^0C 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)

a. Vibration in each of the 3 mutually perpendicular planes.
b. Vibration frequency sweep of 5 to 30 Hz
c. Vibration strength = 0.5g
d. 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 10V/m continuously and magnetic fields of up to 40A/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.

The Ethernet switch shall be warranted for defects in material and workmanship for two (2) years after shipment. The Warranty shall include software updates for the 2 year warranty period.

Power Cabinet

The cabinet shall be a Hoffman Enclosures, Electromate Enclosures, or approved equal. The cabinet shall be NEMA-4X compliant. The nominal dimensions of the cabinet shall be as shown on the plans.

The cabinet shall be fabricated of 14 gauge Type 304 or Type 316L stainless steel. All seams shall be continuously welded and ground smooth with no holes or knockouts. The cabinet shall be fabricated with a rolled lip around three sides of the door and on all sides of the enclosure openings to exclude liquids and contaminants. A stainless steel door clamp assembly shall assure a watertight seal. A seamless gasket shall be included to assure a watertight and dust-tight seal.

The cabinet shall have provisions for padlocking in the closed position. The lock shall be Corbin #2 and two keys shall be supplied to the Department with each lock. The keys shall be removable in the locked position only.

A data pocket of high impact thermoplastic material shall be provided. The nominal dimensions of this pocket shall be 12 inches by 12 inches. Collar studs shall be provided for mounting the stainless steel backboard panel. The cabinet shall be unpainted. Cover, sides, top, and bottom shall have a smooth brushed finish.

A copper grounding bus and neutral bus shall be mounted on the rear wall of the cabinets.

Cable harnesses, terminal boards, and mounting hardware shall be installed as needed. These items shall be considered as incidental to the cost of the contract.

Each cabinet shall contain a wiring diagram of the installation in addition to the diagrams which are to be submitted to the Engineer.

Anchor bolts shall be installed on concrete foundation mounted cabinets. These shall be considered as incidental to the cost of the cabinets.

Terminal blocks provided in cabinets shall be the heavy duty barrier type. The terminal block shall be a minimum of 2” (50.8mm) wide and 1-3/16” (30.2mm) deep. Center to center of the terminal screws or studs shall be a minimum of 21/32” (16 mm) with barriers in-between. Terminal blocks shall be rated at 45 amps 600 volts breakdown RMS line to line 11,000 V. and breakdown RMS line to ground 13,800 V. A marking strip shall be provided with each terminal block.The Contractor shall include all necessary wires and cables necessary to interconnect the components of the DMS cabinet.

CONSTRUCTION REQUIREMENTS

General

The DMS Power Cabinet shall be installed adjacent to the existing drum sign cabinet unless noted otherwise on the plans to support the incremental switchover from existing drum signs to DMS. This process is expected to require simultaneous use of the existing cabinet to control the drum sign prism rotations and the new cabinet to control the display on the DMS message. New and existing handholes shall be connected by conduit to route wires and cable between the cabinets, A disconnect switch specified and paid for separately shall be mounted to the side of this cabinet. Conduit shall enter the cabinet by means of a conduit stub out through the foundation and into a nearby handhole. The Contractor shall prepare and submit a shop drawing detailing the complete DMS Power cabinet equipment installation. The shop drawings shall identify the installation and specifications of all components to be supplied, for approval of the Engineer. Particular emphasis shall be given to the cabling and the interconnection of all of the components.

Appropriate relays, switches and connectors shall be furnished and installed to interface the in-cabinet components to the integrated DMS sign controller. A DC I/O interface supplied by the DMS manufacturer to interface with the sign controller shall be installed in the power control cabinet. The Contractor shall mount the in-cabinet components in this equipment cabinet and connect them to AC power, fiber optic communications, and control wire feeds.

Testing

The Contractor shall test each installed DMS Power Control Cabinet equipment item. Testing procedures shall clearly identify each required function, performance, and property being tested, the setup conditions, the steps to be followed during the test, and the expected test results. The testing procedure shall exercise all steps to verify compliance with the allocated requirements. The Test Plan shall include provisions for a requirements traceability matrix to assure all requirements are met by inspection, analysis, and demonstration and/or testing. Each test procedure shall indicate the uniquely identified requirement(s) for which the test is intended to show compliance. The test procedures shall provide demonstration steps and test scripts to be followed to show compliance with the listed requirement(s).

An On-site test shall be conducted from the field cabinet using an electrical meter and other measuring and test equipment and devices to verify compliance with the requirements and confirm the measured properties match the rating of the furnished equipment. The 125 VDC relay shall be verified when activated locally by the push buttons. The DC I/O interface shall interconnect to a portable (spare) sign controller equivalent to the controller installed in the DMS to verify it receives and processes the generated signals. The input and output of the transformer and the operation of the disconnect switch shall be demonstrated and verified. The DC I/O interface to REVLAC DMS controller shall be confirmed by activating the output relay to the interface which is connected to a spare DMS controller used for test verification. A portable computer connected the portable (spare) DMS controller shall verify the relay input was received and processed by the controller.

Using simulated relays the Contractor shall verify that the DMS sign can be fully exercised and controlled as part of the stand Alone test conducted immediately after a REVLAC DMS is installed and connected. The System Operation Test and Integration described under the REVLAC DMS special provision shall include verification of DMS Power Control cabinet equipment, which powers both the fixed position CCTV camera and the REVLAC DMS and transmits the signal to the DMS controller to change the sign message via a DC I/O interface.

The Contractor shall maintain a log/form of all testing and the corresponding results. A representative of the Contractor and a representative of the Engineer shall sign the log/form as witnessing each test and concurring with the recorded result. Records of all tests shall be submitted to the Engineer prior to accepting the installation.

Any deviations from these specifications that are identified during testing shall be corrected prior to installing any additional DMS.

Documentation
One copy of all operations and maintenance manuals for each DMS Power cabinet component shall be delivered for each assembly installed. The Department reserves the right to provide this documentation to other parties who may be contracted with in order to provide overall integration or maintenance of this item.

Warranty
The Contractor shall warranty all materials and workmanship including labor for a period of two years after the completion and acceptance of the installation, unless other warranty requirements prevail. The warranty period shall begin when the Contractor completes all construction obligations related to this item and when the components for this item have been accepted, which shall be documented as the final completion date in the construction status report. This warranty shall include repair and/or replacement of all failed components via a factory authorized repair service. All items sent to the service provider for repair shall be returned within two weeks of the date of receipt at the facility. The service provide shall operate from a site in the United States. Repairs shall not require more than two weeks from date of receipt and the provider of the warranty shall be responsible for all return shipping costs.

The authorized representative designated for each component shall be authorized by the original manufacturer to supply this service. A warranty certificate shall be supplied for each component from the authorized repair service provider indicating the start and end dates of the warranty. The certificate shall be supplied at the conclusion of the system acceptance test and shall be for a minimum of two years after that point. The certificate shall name the Department as the recipient of the service. The Department shall have the right to transfer this service to other private parties who may be contracted to perform overall maintenance of the facility.

The Contractor shall furnish three (3) diagrams of the internal and external connections of the equipment in each DMS power cabinet. He shall also furnish the operating and maintenance manuals for all equipment supplied. One copy of the wiring diagrams for each cabinet shall be retained in each field cabinet. Wiring diagram shall be contained in a plastic pouch that shall be permanently mounted to the door of each cabinet. Contractor shall permanently mark the cabinet for each termination and each terminal connection.

Method of Measurement
Each cabinet installed complete and in place will be counted as a single unit. Any excavation in rock will be paid for according to Article 502.13 and obstruction mitigation will be paid for according to Article 109.04.

Bases of Payment
This work will be paid for at the contract price each for **DYNAMIC MESSAGE SIGN POWER CABINET, COMPLETE IN PLACE** of size specified, installed complete and in place.

REMOVE EXISTING NON-REVLAC DMS

Description
This item shall consist of removing the existing Non-REVLAC Dynamic Message Signs (DMS) from two (2) existing sign structures that span above the Kennedy Expressway at the locations shown on the plans.

CONSTRUCTION REQUIREMENTS

The contractor shall coordinate with the State Electrical Maintenance Contractor to obtain access to all equipment associated with the Non-REVLAC DMS. Contractor shall not damage any other equipment attached to the structures. Existing conduit to the sign shall be reused by the Contractor to interconnect electrical and communication to the new DMS installed on the structure. The existing DMS shall be removed from the Project site and disposed of by the Contractor.

Method of Measurement
The unit of measurement is per EACH, which shall include all work and materials required to remove the equipment.

Basis of Payment
This item shall be paid at the contract unit per EACH for REMOVE EXISTING Non-REVLAC DMS.

DMS FRONT ACCESS, FULL MATRIX, COLOR, NTCIP 1203 V2

1.0 General Requirements

This special provision shall govern the furnishing and installation of a front access, full matrix, color, NTCIP 1203 V2 Dynamic Message Sign and associated equipment cabinets as shown in the plans and as detailed in this special provision. The DMS described in this special provision are not part of the REVLAC system, but are located over the REVLAC lanes. The high resolution, full color display shall be a full matrix configuration of 96 pixels high by 400 pixels wide (7'-10" X 28'-5"). All display elements and modules shall be solid state. No mechanical or electromechanical elements or shutters shall be used.

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, sign enclosure, documentation, warranties, mounting hardware, latest vendor maintenance diagnostic software with 20 licenses from the sign manufacturer 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, optically coupled interface from controller to sign, and reuse of existing DMS walkway platforms with collapsible railingand include 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 for a high resolution, full color display shall consist of 256 dots composed of 16 columns and 16 rows per module. The DMS shall be capable of an appropriate blank spacing between characters 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.

Characters, symbols, and digits shall generally 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 2540 pounds. The dimensions of the sign housing will not exceed 8'11" 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 be responsible to have a licensed Structural Engineer in the State of Illinois design the sign attachment to the DMS sign truss and seal 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 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 DMS to the 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 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.

Existing conduits on DMS structure shall be reused. Modifications and any additions to the existing conduits shall be included as part of the DMS installation, and shall not be measured and paid for separately.

2.0 <u>Working Sample Demonstration (Dynamic Message Sign)</u>

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 prototype 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 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 the assessment of liquidated damages in the amount of $3,000 per calendar day until a satisfactory sample and demonstration are attained.

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.

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 may 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 9001 certification 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 Manufacturer shall submit a State Department of Transportation reference for a minimum of three (3) different states that have been successfully operating a highway **full color** 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 345 pixels over 15 columns and 23 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 Specification 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 32 and 48 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 use heated, forced air 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 polycarbonate sheet 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 contain small drain holes. The drain holes shall be screened to prevent the entrance of insects and small animals and shall be replaceable.

7.7 Ventilation System

The DMS shall contain systems for cabinet ventilation and safe over-temperature shutdown.

The DMS shall contain a electronically controlled ventilation system and a failsafe thermostat designed to keep the internal DMS air temperature lower than +140°F (+60°C), when the outdoor ambient temperature is +115°F (+46°C) or less.

The ventilation system shall consist of two or more air intake ports. Intake ports shall be located near the bottom of the DMS rear wall. Each intake port shall be covered with a filter that removes airborne particles measuring 500 microns in diameter and larger. One or more ball bearing-type fans shall be mounted at each intake port. These fans shall positively pressure the DMS cabinet.

Fans and air filters shall be removable and replaceable from inside the DMS housing.

Each ventilation fan shall contain a sensor to monitor its rotational speed, measured in revolutions per minute. The fan speed shall be reported to the sign controller upon request.

The ventilation system shall move air across the rear of the LED modules in a manner such that heat is dissipated from the LED's. The airflow shall move from the bottom of the cabinet towards the top to work with natural convection to move heat away from the modules.

Each exhaust port shall be located near the top of the rear DMS wall. One exhaust port shall be provided for each air intake port. All exhaust port openings shall be screened to prevent the entrance of insects and small animals.

An aluminum hood attached to the rear wall of the DMS shall cover each air intake and exhaust port. All intakes and exhaust hoods shall be thoroughly sealed to prevent water from entering the DMS.

The DMS shall automatically shut down the LED modules to prevent damaging the LEDs if the measured internal cabinet air temperature exceeds a maximum threshold temperature. The threshold temperature shall be configurable and shall have a default factory setting of 140°F (+60°C). The factory default setting shall be overridden if the selected message priority is set above 200 or is selected as an emergency message.

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 corrosion resistant 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 corrosion resistant 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 256 LED pixels configured in a two dimensional array. The pixel array shall be a minimum of sixteen (16) pixels high by sixteen (16) pixels wide.

- The distance from the center of one pixel to the center of all adjacent pixels, both horizontally and vertically, shall be 0.81-inches (20.6mm).

- 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 96 pixels high by 400 pixels wide.

The sign shall normally display 18-inch characters using triple-stroke (23 x 15) characters with four-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 redundant and rated such that if one supply fails, the remaining supply(s) shall be able to operate 100% of the pixels in that display region at 100% brightness when the internal DMS air temperature is +140°F (60°C) or less.

Each power supply shall receive 120VAC power from separate circuits on separate circuit breakers, such that a single tripped breaker will not disconnect power from more than one supply.

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 power supply shall be monitored by a microprocessor-controlled circuit. This circuit shall monitor the voltage of each power supply. The power supply voltages 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 ± 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 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 sign housing. An auxiliary sign controller shall be located in the existing roadside DMS control cabinet at the location indicated in the plans.

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
- 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.

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: C62.41.2-2002 Cat A, B, C, C62.45-2002, ANSI/IEEE C62.41-1991, C62.45-1992, NEMA LS-1, and NEC 285.6
- Less than 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

Surge Protection devices (SPD) shall protect all internal and external communication wiring connecting to the control equipment using copper cables.

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 VAC 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 control switch, 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 at grade level in the existing roadside DMS control cabinet at the location indicated in the plans.

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:

1. Static messages
2. Flashing messages
3. 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:

1. Message time on from 0.5 to 5.0 seconds in 0.1 second increments.
2. 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:

1. Primary message time on from 0.5 to 5.0 seconds in 0.1 second increments.
2. Primary message time off from 0 to 5.0 seconds in 0.1 second increments.
3. Alternative message time on from 0.5 to 5.0 seconds in 0.1 second increments.
4. 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:

1. Power failure
2. Power recovery
3. Pixel string failure
4. Fan failure
5. Over a user selectable critical temperature
6. Power supply failure
7. Data transmission error
8. Receipt of invalid data
9. 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:

1. Actual message that is visibly displayed on the sign on an individual pixel basis (full-on, half-on or off)
2. Current sign illumination level
3. Local Control Panel switch position (central, local or local override mode)
4. Error and failure reports
5. Temperature readings
6. LED power supply voltage levels
7. Origin of display message transmission (laptop, manual or central)
8. Heater status
9. Address of sign controller
10. Uninterruptible power supply status
11. AC Surge protection status
12. Communication line protection status
13. Operational status of the following sensors

- Each temperature sensor
- Each photocell
- Each airflow sensor
- Humidity sensor
- Each power supply sensor
- Severe error condition response

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.

1. Each temperature sensor
2. Each photocell
3. Humidity sensor
4. Each Airflow sensor
5. 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. Each message 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 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 than 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 WYSIWYG 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 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 to control an auxiliary blank-out sign. This shall be a contact 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 surge protection 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 report the error condition to the central controller 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.

Copper communication lines shall be protected by two stages of surge protection 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 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 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 controls 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, 120/240 VAC, two-pole load center with 16 circuit capability. Each circuit in the sign shall be powered using 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.

16.0 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:

1. Line Transient Protection: Passes ANSI/IEEE C62.41 Category A testing
2. Safety Compliance: UL listed to UA1778
3. EMC Compliance: FCC Class B
4. Efficiency:>95% on line
5. Capacity VA/Watts @ 0.67P.F. : 425VA/285W
6. Voltage Nominal: 120 VAC
7. Voltage Range: 100-142 VAC
8. Typical run time (minutes): Full load: 3 minutes. Typical load: 5 minutes
9. Transfer time: 4 ms typical
10. Battery: Sealed, maintenance-free, valve regulated, UL 924 recognized.
11. Battery recharge time (to 95% of capacity): 8 hours with output fully loaded
12. Over current protection (on line): circuit breaker
13. Input fault current (maximum): 15A
14. Operating temperature: Range minimum -10°F -140°F (-23°C to 60°C)
15. Humidity: 5% - 95% RH (non-condensing)

17.0 Technical Assistance

The DMS manufacturer's technical representative shall provide on-site technical assistance in following areas:

1. Sign to structure installation
2. Sign controller cabinet installation
3. 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.

18.0 Testing Requirements

The equipment covered by this specification shall be subjected to design approval tests (DAT), factory demonstration tests (FDT), stand-alone tests, systems operations test and integration, 72 hours and 90 day test to determine compliance with all the specification requirements.

The Engineer will accept reasonably recent certification by an independent testing lab in lieu of the DAT to verify that these tests have previously been satisfactorily completed. Otherwise, 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 approval. The contract periods will not be extended for time lost or delays caused by retesting 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 verify compliance with the requirements specified herein. Failure to comply with the requirements of any test shall be counted as a defect, and the equipment shall be subject to rejection by the Engineer. Rejected equipment shall be tested again provided that all non-compliances have been corrected and an updated test schedule 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.

18.1 Test Procedures

The Contractor shall provide five (5) hardcopies and a final copy in PDF format on a CD-ROM of the Test Plan containing detailed step-by-step test procedures for the DAT (as required), factory demonstration test, stand-alone test, system operation test and integration, and 90-day test for the Engineer's approval at least sixty (60) days prior to the day the tests are to begin.

The testing procedures shall clearly identify each required function, performance, and property being tested, the setup conditions, the steps to be followed during the test, and the expected test results. The testing procedure shall exercise all steps to verify compliance with the allocated requirements. The Test Plan shall include provisions for a requirements traceability matrix to assure all requirements are met by inspection, analysis, and demonstration and/or testing. Each test procedure shall indicate the uniquely identified requirement(s) for which the test is intended to show compliance. The test procedures shall provide demonstration steps and test scripts to be followed to show compliance with the listed requirement(s).

The test procedures shall have the Engineer's approval prior to submission of a testing schedule.

The Contractor shall be responsible for providing the test materials, power, communications, staff and measurement instruments and devices for all of the tests unless otherwise specified.

The Contractor shall maintain a complete record of each test performed including the results of the test and a record of who witnessed the test. At the completion of each test, the test documentation shall be completed and provided to the owner's witness for review and to provide concurrence with all pass/fail results. This documentation shall be the basis for acceptance or rejection by the Engineer. Each individual test report shall be signed by the Contractor's authorized testing representative and the owner's representative witnessing the test.

18.2 Design Approval Tests

If the design approval tests have not previously been successfully completed and recorded within the past 10 years by a currently operating independent testing laboratory having credentials acceptable to 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.

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.

The design approval tests shall cover the following:

18.2.1 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:

1. 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.
2. 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.
3. 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.

18.2.2 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.

18.2.3 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.

18.2.4 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.

18.2.5 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.

18.2.6 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.

19.0 Factory Demonstration Test

The DMS vendor shall be responsible for conducting Factory Demonstration Test at the DMS Vendor’s Manufacturing Facility. These tests shall be performed on a single representative unit being supplied. The Engineer shall be notified a minimum of sixty (60) calendar days before the start of the test. 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 Test on the unit at the vendor’s manufacturing facility. If the same DMS vendor is also supplying the REVLAC DMS, the FAT may be conducted consecutively for each type of DMS. All tests shall be conducted in accordance with the approved test procedures. The test shall focus on demonstrating required physical and functional properties of the DMS that cannot easily be altered by shipping, handling and on-site installation. The FAT shall demonstrate compliance with the requirements sufficiently showing the Engineer it is ready for shipment to the Project site. . Proposed 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 piece of 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.

Operation under varying lighting conditions including the condition of bright background lighting, simulated or actual, and legibility at the specified viewing distance shall be demonstrated.

Functional Test

The sign controller and auxiliary controller shall demonstrate full compliance with the functional requirements including required display capabilities and features such as alternating and graphic messages.

19.2 Consequences of Factory Test Failure

If the tested unit fails to pass a particular demonstration test, the unit shall be corrected or another unit substituted in its place and the testing continued. Depending on the significance of the function or property failing a test the Engineer may defer passing a particular test to a subsequent required formal test.

If a unit is modified as a result of a demonstration test failure, a report shall be prepared and delivered to the Engineer prior to shipment of the units. The report shall describe the nature of the failure, the corrective action taken and the implication to the other units being shipped.

20.0 Stand-Alone Test

The Contractor shall conduct an approved stand-alone test of the equipment installation at the field site. The test shall, exercise all stand-alone (non-network) functional operations of the field equipment with all of the related DMS equipment and power and communication infrastructure installed as per the plans. Full required functionality of a locally connected laptop shall be demonstrated of the laptop.

The test shall follow the test procedures contained in the approved Test Plan intended to show compliance with the requirements applicable to a standalone condition. Uniquely numbered requirements contained in these specifications shall be allocated to this test and shall be verified by the test procedures.

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 Operation Test Integration

The Contractor shall conduct approved system operation tests on the installed DMS field equipment after integration with the existing central control equipment. The tests shall, , exercise all required remote control functions using the required NTCIP protocol and display the current message and return the status of the required elements from the controller. The test shall exercise all remote control, monitoring and communication functions of the field equipment using the existing central control equipment.

The test shall follow the test procedures contained in the approved Test Plan intended to show compliance with the requirements applicable to an integrated system condition. Uniquely numbered requirements contained in these specifications shall be allocated to this test and shall be verified by the test procedures.

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. The report shall describe the nature of the failure, corrective action taken and the implication to the other units.

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 acceptance of the System shall be made after installation at all designated locations and integration into the existing System, together with submittal of all required documents, completion of training, delivery of all spare parts and successful completion of all tests, unless otherwise specified herein. The roadside Dynamic Message Sign System shall have operated continuously and successfully for ninety (90) consecutive calendar days with no downtime attributable to furnished equipment malfunction or failure and no software anomalies or failures requiring a modification or fix.

24.0 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 and adhere to the latest standard.

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
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

24.1 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.

24.2 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.

24.3 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.

24.4 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	Shall be at least 12

	Clause 2.4.1.1.1.1	
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	FSORS

	2.7.1.1.1.2	
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

24.5 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

MULTI Tag	DESCRIPTION
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 increments

Table 4: Required MULTI Tags

24.6 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

24.7 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.

24.8 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.

25.0 <u>As-Built Documentation</u>

The Contractor shall provide to the Engineer the following documentation of the complete installed equipment prior to testing. Sufficient documentation shall be provided in hardcopy and in PDF format on a CD-ROM 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:

1. 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.

2. 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.
3. 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.
4. 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.
5. 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.
6. 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, jigs and test equipment.
7. 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.
8. 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.

9. 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:

1. Computer programmer's manuals and computer user's manuals (5 hardcopies and 1 CD-ROM in PDF format for 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.
2. 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.
3. Manufacturer's documentation (including schematics) for all plug in circuit cards used in the microcomputer chassis.
4. Computer program logic in flow chart form (5 hardcopies and 1 CD-ROM in PDF format).
5. Narrative descriptions of programs and input output formats (5 hardcopies and 1 CD-ROM in PDF format).
6. 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.
7. 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), cables and fiber strands 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.

26.0 Spare Parts Requirements

The Contractor shall provide spare parts listed below. The cost of spare parts/equipment shall be included in the price for each DMS.

1. Two Led Display Modules Per Sign
2. Two Led Driver Boards Per Sign
3. One Power Supplies Per Sign
4. One Photo Sensor
5. One Temp. Sensor
6. One DMS Controller
7. One Surge Protection Device Per Sign
8. One Fan Of Each Type
9. One Fan Control Unit
10. Two Sets Of Filters Per Sign

27.0 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:

1. Hands-on operation of all sign control hardware
2. Explanation of all system commands, their function and usage.
3. Insertion of data
4. Required preventative maintenance
5. Servicing procedures
6. 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 Contractor 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 hardcopies and one CD_ROM in PDF format 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 session on DVDs and provide the recordings to the Engineer for later use. The training shall be conducted at a District One facility designated by the Engineer, after the completion of the System Operation Test and Integration. The Contractor shall submit the proposed date(s) of training session(s) for approval of the Engineer a minimum of 30 days before the proposed testing date.

28.0 Warranty

Equipment and spare 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 (5) years from the date of final Project acceptance and shall be warranted for quality of work for twelve months from the date of final Project acceptance. If component manufacturer's warranties are for a longer period, they shall apply. Any hardware, software, or equipment found to be defective as confirmed upon restoration of full operation by replacing or correcting the suspected defect, shall be replaced free of charge during the warranty period. For software problems, modified, updated or new software shall be loaded on the primary and auxiliary controllers and tested to verify correction of the problem.

The Contractor shall assign to the Department all manufacturer's normal warranties or guarantees, on all electronic, electrical and mechanical equipment, materials, technical data, and products furnished for and installed on the Project. 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.

29.0 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 the cost of furnishing all labor, materials, documentation, warranties, training, tools, equipment, hardware, software, devices, conduits, wires and cables, parts, and mountings to install, test, and make the location operational with the specified DMS in this pay item. Existing conduits on DMS structure shall be reused. Modifications and any additions to the existing conduits shall be included in cost of the DMS installation, and shall not be measured and paid for separately.

30.0 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 the items listed under Method of Measurement.

ROD AND CLEAN EXISTING CONDUIT

Description

This work will consist of inserting a duct rod or electrical fish rod or tape of sufficient length and rigidity into an electrical conduit opening in one electrical handhole, and pushing the said rod through the conduit to emerge at the next or subsequent handhole or junction box in the conduit system at the location shown on the plans. The duct rod may be inserted and removed by any standard construction method which causes no damage to the conduit system. The size of the conduit may vary from two inch (2") to four inch (4"), but there will be no differentiation in cost for the size of the conduit.

CONSTRUCTION REQUIREMENTS

The conduit system which is to be rodded and cleaned may exist with various amounts of standing water in the manholes. The contractor shall pump the water or sufficient water from the manholes to drain the conduit and to afford compatible working conditions for the installation of the duct rods and/or cables. The pumping of the manholes will be incidental to the work of rodding and cleaning of the conduit.

Prior to removal, of the duct rod, a duct cleaning attachment such as a properly sized wire brush or cleaning mandrel shall be attached to the duct rod, which by removal of the duct rod will be pulled through the conduit to remove sand, grit, or other light obstructions from the duct to provide a clean, clear passage for the installation of cable. Whenever the installation of cables is not performed as an adjunct to or immediately following the cleaning of the duct, a light weight pulling line such as a 1/8" polyethylene line or conduit measuring tape shall be placed and will remain in the conduit to facilitate future work. When great difficulty of either inserting the duct rod or removal of the cleaning mandrel is encountered, the duct may require further cleaning by use of a compressed air gun, or a low pressure water hose. In the case of a broken duct line, the conduit shall be excavated and repaired. The existence and location of breaks in the duct line may be determined by rodding, but the excavation and repair work required will not be a part of this pay item.

Method of Measurement

ROD AND CLEAN EXISTING CONDUIT will be measured per lineal foot for conduit cleaned. Measurements will be made from point to point horizontally.

Basis of Payment

This work will be paid for at the contract unit price per lineal foot for ROD AND CLEAN EXISTING CONDUIT for the installation of new electric cables. Such price will include the furnishing of all necessary tools, equipment, and polyethylene line as required to prepare a conduit for the installation of cable. When the number of cables to be installed requires the use of more than one conduit in the same run, each additional conduit required will be rodded and cleaned as a separate unit and paid for at the contract unit price.

MODIFY CONTROLLER FOR CCTV POWER

Description: This work shall consist of providing an un-switched 120/240 volt, 30 ampere power circuit to an existing controller for new CCTV cabinet power as shown on the plans and specified herein. The existing controller may be either a lighting controller, DMS sign controller, or other existing traffic control cabinet

Method Of Measurement. The modification of the existing lighting controller for CCTV power shall be counted as each.

Basis Of Payment. This work shall be paid for at the contract price each for **MODIFY CONTROLLER FOR CCTV POWER**, which shall be payment for the work as described herein and as indicated in the plans.

DISCONNECT SWITCH

Description. This item shall consist of, furnishing and installing a disconnect switch mounted outside of Dynamic Message Sign Power cabinet as shown in the plan.

Material:
A heavy duty service disconnect switch shall be provided on side of Dynamic Message Sign power cabinet as shown on the plans. It shall be enclosed in a NEMA Type 4X watertight housing. The switch shall have an external lockable handle and shall provide for locking in either the “On” or “Off” position. Fuses and padlocks shall be included. Disconnect switch shall be double-throw 60 Amp, fused, 480 VAC, two pole, 3 wire. This switch shall function as a disconnect with overcurrent protection. The switch shall have interlocks to prevent the cover from being opened when the switch is in an "on" position and to prevent the switch from being turned on with the door open. The type of fuse selected shall be based on the estimated load, include a rejecter kit and submitted for approval.

Installation: Installation shall be according to plans and Illinois Department of Transportation standard. The disconnect switch’s size and type shall be according to the plan.

Basis of Payment: This item shall be paid for at the contract unit price per each for DISCONNECT SWITCH.

CONCRETE FOUNDATIONS (SPECIAL)

Description. This item shall consist of furnishing and installing a reinforced concrete foundation for ground mounted CCTV cabinet and DMS power cabinet as shown on the plans.

Materials.
The material shall be in accordance with standard specification section 878.02.

Installation.
The concrete foundation shall be installed in accordance with standard specification section 878.03. Provide concrete work pad in front of the cabinet door and conduit stubs as shown on the plans. The hand rail support shall be provided for cabinet for CM-10 DMS.

Method Of Measurement. The concrete foundation shall be counted, each installed.

Basis Of Payment. This item shall be paid at the contract unit each for **CONCRETE FOUNDATIONS (SPECIAL)** as specified.

CONDUIT ATTACHED TO STRUCTURE, 4" DIA., PVC COATED, GALVANIZED STEEL (INSTALL ONLY)

Description. This item shall consist of retrieving from Illinois Department of Transportation Electrical Maintenance Section storage and installing conduit, as specified herein, and as indicated on the Plans. It shall be the responsibility of the contractor to transport the conduit from the storage site to the job site.

CONSTRUCTION REQUIREMENTS

Inspection and Acceptance: The Contractor shall examine the conduit in the presence of the Engineer. After accepting the conduit, the Contractor shall be held responsible for preservation of the condition of this conduit, as it was at the time of acceptance, until the Final Project Acceptance.

Transportation: The Contractor shall transport, handle and store (as applicable) the conduit in complete compliance with the manufacturer's recommendations. The Contractor shall make arrangements to transfer the conduit from the Illinois Department of Transportation's storage yard to the job site. This shall be done on weekdays between the hours of 8:00 a.m. and 4:00 p.m. excluding Federal, State, and City holidays. Twenty-four hours advance notice is necessary before pickup of the conduit.

Installation: Installation shall be according to plans and Illinois Department of Transportation standard specification Art. 811.03. Contractor shall provide all hardware and conduit supports needed to install the conduit in accordance with the plans and specifications. This includes the installation of expansion couplings in accordance with Standard Specifications 1088.02 Expansion Fittings for Raceways at all locations where movement is constrained.

Method of Measurement: This work will be measured for payment in feet in place. Measurements will be made in straight lines along the centerline of the conduit between ends and changes in direction. Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

Expansion fittings will not be measured for payment.

Basis of Payment: This item shall be paid for at the contract unit price per foot for **CONDUIT ATTACHED TO STRUCTURE, 4" DIA., PVC COATED, GALVANIZED STEEL (INSTALL ONLY)**

JUNCTION BOX, STAINLESS STEEL, ATTACHED TO STRUCTURE, 42" X 36" X 12" (INSTALL ONLY)

Description. This item shall consist of retrieving from Illinois Department of Transportation Electrical Maintenance Section storage and installing junction box, as specified herein, and as indicated on the Plans. It shall be the responsibility of the contractor to transport the junction box from the storage site to the job site.

CONSTRUCTION REQUIREMENTS

Inspection and Acceptance: The Contractor shall examine the junction box in the presence of the Engineer. After accepting them, the Contractor shall be held responsible for preservation of the condition of each junction box, as it was at the time of acceptance, until the Final Acceptance Inspection.

Transportation: The Contractor shall transport, handle and store (as applicable) the junction box in complete conformance with the manufacturer's recommendations. The Contractor shall make arrangements to transfer the street lighting equipment from the Illinois Department of Transportation's storage to the job site. This shall be done on weekdays between the hours of 8:00 a.m. and 4:00 p.m., excluding Federal, State, and City holidays. Twenty-four hours advance notice is necessary before pickup of the street lighting equipment.

Installation: Installation shall be according to plans and Illinois Department of Transportation Standard Specification Art. 813.03. Contractor shall provide all hardware needed to install the junction box in accordance with these documents and the Standard Specifications.

Basis of Payment: This item shall be paid at the contract unit per EACH for **JUNCTION BOX, STAINLESS STEEL, ATTACHED TO STRUCTURE, 42" X 36" X 12" (INSTALL ONLY)**.

FIXED POSITION CCTV CAMERA FOR REVLAC DMS

Description.
This item shall consist of furnishing and installing a prepackaged fixed outdoor Closed-Circuit Television (CCTV) camera assembly that includes the lens, camera housing and pole mounting bracket as described herein and as indicated in the Plans.

General Requirements
The fixed position CCTV camera shall be capable of automatically switching from normal color operation under daytime illumination to increased sensitivity when available light is decreased (night time) by removal of the infrared cut filter that is used to achieve enhanced image color rendition. The filter can be switched manually via the alarm input through the camera menu.

The fixed position CCTV camera shall be capable of masking out a specific area to prevent it from being viewed to comply with privacy laws and particular site requirements.

Support increasing camera sensitivity by increasing the integration time on the CCD (e.g., lowering shutter time from 1/60s to 1/6s) accomplished by integrating the video signal from multiple consecutive video fields thereby reducing signal noise.

The fixed position CCTV camera shall be capable of automatically compensating for back-light caused by bright areas without having to define a window or area.

The manufacturer shall be ISO 14001 Certified. The manufacturer's quality system shall be in compliance with the I.S./ISO 9001/EN 29001, QUALITY SYSTEM.

The camera mounting backet and pole attachment hardware shall be coordinated with the proposed pole to account for any unique characteristics of each installation site.

Materials
Fixed CCTV Camera
The fixed position CCTV Camera shall be designed to perform over a wide range of environmental and lighting conditions and automatically switch from color daytime to monochrome nighttime operation. For compatibility with the existing fixed position CCTV cameras and to minimize spare parts inventory, the fixed position CCTV cameras shall be manufactured by Phillips/Bosch (Dinion AN 5000 Kit) or equal, approved by the Engineer. The equivalent camera shall comply with all the requirements stated herein and shall provide the same operation/functionality as the existing installed cameras without the use of any external devices for the modification/translation of video.

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he fixed position CCTV camera shall comply with the following environmental requirements:

Environmental Condition	Requirement
Operating Humidity	20% to 93%
Operating temperature	-40ºC to 50ºC
Storage Temperature	-40ºC to 70ºC

The fixed position CCTV Camera shall be designed to operate from a 24V power source. The appropriate power supply, if required for the fixed position CCTV Camera to operate, shall be included as a part of this item. The power requirements for the camera shall comply with the following:

Electrical	Requirement
Voltage	18 to 30 VAC
Total Load	45 W
Listing	UL Listed
FCC	Part 15, Class B

Surge Protection for power and communication cables shall comply with UL 1449, fourth edition and 2011 NEC Article 285 and the following surge protection requirements:

Source	Minimum Requirements
Video	Peak current 10 kA (Gas Tube Arrester), peak power 1000 W (10/1000 µ)
Alarm Inputs	Peak current 17 A, peak power 300 W (8/20 µ)
Alarm Outputs	Peak current 2 A, peak power 300 W (8/20 µ)
Relay Outputs	Peak current 7.3 A, peak power 600 W (10/1000 µ)
Power Input	Peak current 7.3 A, peak power 600 W (10/1000 µ)

The fixed position CCTV Camera shall incorporate a solid state CDD imaging camera with the following requirements.

The camera shall automatically switch from daylight color operation to a higher sensitivity nighttime monochrome mode when light levels fall below a user adjustable threshold level.

The camera shall provide a selectable slow shutter (frame integration) function that increases the camera's sensitivity up to 50 times by reducing the shutter speed as well as fully automatic.

Digital image stabilization shall be provided using electronic compensation that filters out vibrations caused by wind and other environmental conditions.

The camera shall provide six distinct pre-programmed operational modes stored in the camera and a video motion detection function that provides four fully programmable areas.

The camera shall accept CS-mount type and C-mount type lenses.

The camera shall provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.

The camera shall provide the capability to extend the dynamic range of the camera to both provide a sharper image, simultaneously, in both the high-light and low-light areas of the scene and for increased accuracy in reproducing color in harsh lighting conditions.

The fixed position CCTV camera shall utilize Peak White Invert technology to reduce glare from highlight area.

The fixed position CCTV camera shall provide a built-in test pattern generator.

The camera shall comply with the following requirements:

Camera	**Requirement**
Imager	1/3-inch 960H CCD sensor with High Dynamic Range
Effective Pixels	976H x 494V
Focus	Manual
Zoom	Manual
Iris	Manual
Angle of View (H X V)	W: 97.2 X 72.4 T: 26.2 X 19.7
Video Output	1.0v +/- 0.07v, Composite, 75 ohm
Auto Gain Control	On / off (0 - 40dB) selectable
Synchronization	Internal / AC line lock
Digital Zoom	16x
Horizontal Resolution	720 TVL
Signal – Noise Ratio	>54dB
White Balance	Auto Tracking White (outdoor)
Shutter Speed	1/60 to 1/10,000 sec

Min Illumination		**Values in lux (50 IRE)**
Day	SensUp (Off)	0.09
	SensUp (On 10X)	0.009
Night	SensUp (Off)	0.04
	SensUp(On 10X)	0.004

Interface.
The manufacturer shall fully document and provide to the Department the communication protocol implemented by the fixed position CCTV camera to make setting adjustments and report status.

Camera interface and diagnostic software shall be provided with the fixed position CCTV camera subsystem which shall allow access to all available camera functions via a Windows based portable computer. A USB cable interface and other hardware shall be provided to interconnect the portable computer to both a fixed position CCTV camera and a CCTV monitor using the bidirectional coax cable used to transmit video from the camera. The program shall be capable of configuring and obtaining status of the fixed position CCTV camera.

Alarm Handling.
The fixed position CCTV camera shall provide an alarm input that may be triggered by either a normally opened or normally closed contact.

The fixed position CCTV camera shall provide the capability on alarm to display up to a 17 character, programmable alarm message.

The fixed position CCTV camera shall provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, upon video motion detection, or when camera shifting to monochrome mode.

Housing and Mount.
The camera housing shall be constructed of an aluminum casing, neoprene gaskets, UV-resistant polymer end caps, and all stainless steel hardware. The housing viewing window shall be 3 mm (0.12 in.) thick glass.

The camera housing shall be equipped with a heater, blower, and incorporate a sunshield to protect against environmental extremes and glare. The heater shall be thermostatically controlled and prevent internal fogging of the housing throughout the operating temperature range of the camera.

The camera housing mount shall have a swivel head that rotates 360º and tilts 180º. To ensure neatness of installation, the mount shall be designed to allow feed through wiring.

The camera/lens tray shall be easily removed from the housing.

The cylindrical camera housing shall have nominal dimensions of 19 inches long, 5 inches high and 7 inches wide.

The camera housing shall meet IP66 and NEMA-4X enclosure protection standards.

Submittals
Manufacturer's data, user and installation manuals for all equipment and interface and control software and documentation. Shop Drawings of the pole mounted fixed position CCTV camera full schematic of subsystem, including wiring details enabling for all available alarms and local camera interface and configuration control interconnections. It shall include but not limited to:

1. Test plan
2. User manual.
3. Bill of Materials/Parts list.
4. Wiring and connection diagram.
5. Maintenance Manual.

Testing.
The Contractor shall test each fixed position CCTV Camera Assembly in the presence of the Engineer after the camera is installed. This test may be done locally at the camera support structure.

Testing shall demonstrate local maintenance functionality by using a portable computer loaded with the provided camera interface and video display software and locally connected to the fixed position CCTV Camera through a USB port using a special cable and associated hardware to interconnect the coax cable provided with the fixed position CCTV camera subsystem. Test shall verify the capability to check status, change camera settings, adjust focus, and update firmware (provided by the vendor for testing).

Testing shall demonstrate camera sensitivity at low light levels to meet the specified requirements and transition to and from color and black & white modes of camera operation.

Testing shall demonstrate all pre-programmed privacy zones for the CCTV camera.

Verify and demonstrate the built-in test pattern generator.

Validate the furnished and installed CCTV camera system is fully compatible in all respects with the existing remote control building matrix switcher and Traffic System Center matrix switch and DVR.

Confirm the camera field of view and zoom setting is optimized for capturing the full and maximum detail of the DMS display from both the existing remote control building and the ComCenter using existing display equipment.

A CCTV camera authorized manufacturer's representative or qualified technician shall be on site to inspect and test the CCTV camera system after installation to identify deficiencies and errors in the installation.

Product Support.
The manufacturer shall provide technical support via email, fax and toll-free telephone. The above forms of support shall be provided Monday through Friday, 8:00am to 8:00pm EST.

Installation.
The camera shall be installed as shown on the plans on either a lowering device on 80ft pole or with a fixed mounting on 50 feet poles or an existing pole.

Waranty
The manufacturer shall provide a three year (3) warranty. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims.

The warranty period shall begin on the date of final acceptance of the Project. This warranty shall include repair or replacement of all failed components via a factory authorized repair facility. All items sent to the repair facility for repair shall be returned within two weeks of the date of receipt at the facility. The repair facility location shall be in the United States. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item at no additional cost to the State.

Basis of Payment.
This item will be paid for at the contract unit price each for **FIXED POSITION CCTV CAMERA FOR REVLAC DMS**, which shall be payment in full for all material and work as specified herein.

REMOVE EXISTING DRUM SIGNS

Description
This item shall consist of removing the existing drum signs with all associated conduit and wiring from existing structures that span above the Kennedy Expressway at the locations shown on the plans. Of the fifteen (15) existing drum signs to be removed, five (5) are installed on cantilever structures, nine (9) are installed on bridge structures and one (1) is mounted to an existing bridge. The existing drum signs shall be returned to the Department or disposed of the project site as directed by the Engineer.

CONSTRUCTION REQUIREMENTS

The contractor shall coordinate with the State Electrical Maintenance Contractor to obtain access to all equipment associated with the drum signs to be removed. Contractor shall not damage any other equipment attached to the structures.

Method of Measurement
The unit of measurement is per each, which shall include all work and materials required to remove the equipment.

Basis of Payment
This item shall be paid at the contract unit per EACH for REMOVE EXISTING DRUM SIGN.

FIBER OPTIC INTERFACE AT REMOTE CONTROL BUILDING

Description
This item shall consist of furnishing and installing fiber optic interface equipment needed for each remote control building as shown on the plans. This item includes drilling holes through and on building walls, installing conduit support cable tray, furnishing and installing video and data receivers/transceivers together with both new and existing card cage and power supply, and providing coax cable to connect receivers/transceivers to the existing VICON PILOT video switcher.

Materials
Transmission Equipment: The video and data receivers/transceivers shall be from same manufacturer which provided video and data transmitter installed in the CCTV equipment cabinet. The video and data receivers/transceivers shall be installed in either a proposed or existing card cage specifically designed for the furnished cards as shown on the plans. The proposed card cage shall be rack mounted with a power supply and supplied by the manufacturer of the video and data transmission cards. The video and data receivers/transceivers installed in the existing IFS card cage shall match the requirements of the existing data and video receiver/transceivers units.

CONSTRUCTION REQUIREMENTS

The installation shall be as shown on the plans and as directed by the Engineer. The Contractor shall notify the Engineer and coordinate with the State Electrical Maintenance Contractor (EMC) a week before the building work is scheduled for arrange access to the building. The Contractor shall be responsible to perform all the work at the building needed to install jumper cables from patch panel to video and data transmission equipment, interconnect transmission cards and existing Vicon Video Switcher with coax cable, install receiver/transceiver equipment and interconnect with the existing video switcher.

Method Of Measurement. Fiber optic interface at remote control building shall be counted, each completely furnished, installed, tested and operational.

Basis Of Payment. This item shall be paid at the contract unit each for **FIBER OPTIC INTERFACE AT REMOTE CONTROL BUILDING** as specified.

CAT. 6 ETHERNET CABLE

Description. This item shall consist of furnishing and installing Ethernet cable inside PTZ CCTV camera poles, between the DMS sign controller and the DMS Power Cabinet as shown on the drawings, in accordance standards and manufacturer's recommendations.

Materials: Category 6 cable shall comply with the following standards:

ANSI/TIA/EIA-568-C.2-Category 6
UL® 444, Safety Vol.1, Sec 13
ISO/IEC 11801 Class E
ETL Verified
RoHS 2002/95/EC
E196163-P
EN71-3, EPA 3050B
PVC: CMR; CSA, CMG, FT4; Plenum: CMP, FT6

Category 6 cable be comprised of four unshielded twisted pairs of wires using 23 AWG solid tinned copper conductors. The cable shall have a nominal impedance of 100 ohms and a maximum attenuation of 19.7 dB/ 100 meters at 100 Mhz and 32.8 dB/100 meters at 250 MHz; Category 6 Ethernet cable shall be rated for outdoor use.

Category 6 cable shall meet the following properties.

- Rating Temperature Voltage — 167° F (75° C); 300V
- Maximum frequency of 550 Mhz.

Installation. Installation shall be in accordance with all applicable sections of Section 873 of the Standard Specifications, and as directed by the Engineer. After termination the Contractor shall perform a wire map test to ensure continuity of wires, absence of shorts, grounding, or any other wire pulling or termination problems or errors.

Method Of Measurement. Ethernet cable will be measured for payment by the linear foot furnished, installed and tested in place.

Basis Of Payment. This work shall be paid for at the contract price per foot for **CAT. 6 ETHERNET CABLE**, which shall be payment for the work as described herein and as indicated in the plans.

REMOVE AND REPLACE EXISTING CIRCUIT BREAKER

Description. This item shall consist of the removing an existing circuit breaker, furnishing and installing a circuit breaker in existing panels as shown in the plan.

Material:
Material shall be according Art. 1068.01 (e) (3), Breaker shall fit in existing breaker frame and match the properties and performance of the existing breaker.

Installation: Installation shall be according to plans and Illinois Department of Transportation standard. The circuit breaker size and type shall be according to the plans. The removed breaker shall remain the property of the Department and shall be delivered to a Department facility within the District.

Basis of Payment: This item shall be paid for at the contract unit price per each for **REMOVE AND REPLACE EXISTING CIRCUIT BREAKER.**

REVLAC DMS FRONT ACCESS, LED

This specification covers all REVLAC front access LED dynamic message sign (DMS) for Signs CM-1 through CM-15 as shown on the plans. This special provision shall govern the furnishing and installation of a Front Access LED DMSon existing sign structures. The DMS described in this special provision are part of the REVLAC system. The DMS shall provide a high resolution, full color, and full matrix configuration. All display elements and modules shall be solid state. No mechanical or electromechanical elements or shutters shall be used.

Equipment to be furnished at each DMS field site shown on the plans shall include, but not be limited to the following: LED display, sign controller, cabling, sign enclosure, documentation, training, spare parts, warranties, mounting hardware, latest vendor maintenance interface software with 20 licenses from the sign manufacturer.

PART 1 GENERAL

1.01 REFERENCES

- **A.** Standard for Electric Signs, UL and CUL recognized
- **B.** IEC 60950
- **C.** Federal Communications Commission Regulation Part 15
- **D.** National Electric Code (NFPA 70)
- **E.** PCB conformal coating to meet MIL-I-46058C, Type SR and IPC-CC-830
- **F.** NEMA Standards Publication 250, Enclosures for Electrical Equipment
- **G.** IBC 209/ASCE7-05

1.02 SUBMITTAL

A. 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 within 60 calendar days of contract award, unless noted otherwise.

B. Shop drawings shall be submitted in accordance with Article 105.04 of the Standard Specifications and as specified in these special provisions.

C. The Contractor shall furnish five sets of submittal data and one CD-ROM in PDF format directly to the Engineer in hardcopy and final submittal in PDF format on a CD-ROM. Two copies of this information, with appropriate notations, will be returned to the Contractor after the review for resolution, updating and re-submittal.

D. 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.

E. All items shall be submitted together.

F. 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.

G. The Contractor shall provide a complete technical submittal within 60 calendar days of contract award, unless noted otherwise and shall not proceed with LED sign manufacture until the Engineer has approved the submittal.

H. The Contractor shall submit the following:

1. All DMS manufacturer qualifications, as specified herein.

2. DMS shop drawings including pixel layout, module design mounting details, and sign controller design and installation details.

3. LED manufacturer's data sheet including make and model of the LEDs, luminance of LED at listed currents, the maximum and minimum operating temperatures, power consumption and MTBF.

4. DMS Riser diagrams, AC Site Power Requirements, LED driver circuity and power supply layout, controller wiring diagram and panel schedule including legs and Amps per leg.

5. DMS installation plan and details

6. DMS control software operator's manual.

7. DMS maintenance and troubleshooting manual.

8. Detailed message image layouts of the required message set. The DMS manufacturer shall create sign legends for each DMS sign as shown on the plans using the software program recommended by the manufacturer. Once the legends have been created they shall approved by the Engineer for acceptance. The DMS manufacturer shall submit an accurate representation of the sign legends on the DMS sign using sign controller program.

9. DC I/O interface module design, interface diagram and functional specification

10. Test plan for all the tests defined in Product Testing Procedure.

1.03 QUALIFICATIONS

A. DMS Manufacturer shall:

1. 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.

2. Have been in the business of manufacturing permanently mounted LED dynamic message signs for Intelligent Transportation Systems, managing vehicular roadway traffic for a minimum period of ten (10) years prior to the contract bid date. An "LED" display contains pixels constructed solely of high-intensity discrete LEDs. These outdoor displays must utilize a sign cabinet meeting NEMA 3R design requirements.

3. Have in operation a minimum of one thousand (100) large outdoor permanently mounted LED DMS in North America as defined above. Each of these LED DMS shall have operated successfully for a minimum period of one (1) year prior to the contract bid date.

4. Have in operation, as of the contract bid date, a minimum of five (5) outdoor LED DMS utilized for transportation applications. These DMS systems shall be communicating over carrier direct leased or switched lines, wireless carrier (cellular), spread spectrum radio, or fiber optic backbones. Each of the five DMS systems shall contain a minimum of two (2) permanently mounted DMS. All systems shall be owned and operated by five different agencies.

5. 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. 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.

6. 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.
7. Shop drawings shall be submitted in accordance with Article 105.04 of the Standard Specifications and as specified in these special provisions.
8. Provide a toll-free technical help desk number that will be manned during normal business hours 8 A.M. – 5 P.M. CST.

B. Manufacturing experience with the following types of electronic sign products shall not satisfy the requirements of this DMS specification:

1. Indoor displays of any size or type
2. Portable or mobile signs of any size or type
3. Back-lit displays
4. Blank out sings
5. Neon signs
6. Split-flap displays
7. Rotating drum, prism or plank signs
8. LED lens displays
9. Any type of display that is not pixilated and cannot be programmed to show a nearly infinite quantity of messages
10. Displays that have a pixel technology comprised of something other than high-intensity light emitting diodes (LED). Examples of unacceptable technologies are incandescent lamp, liquid crystal, fiber optic, flip disk, flip-fiber combination, and flip-LED combination.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain electronics displays and equipment through one source from a single manufacturer.
B. UL and CUL recognized
C. NEC compliant
D. FCC Class A Compliant
E. Designed to current UBC or IBC standards

1.06 WARRANTY AND SUPPORT

A. 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 to include parts returned to the factory resulting from defects and/or failure in design, materials and workmanship. Unless otherwise specified in the bid documents, warranty coverage shall become effective on the date of final acceptance of the DMS system by the Department.

B. Provide toll-free service coordination

C. Provide technical phone support during business hours 8 A.M. – 5 P.M. CST.

D. The equipment and parts furnished for the DMS and DMS control system shall be new, of the latest model, fabricated under documented and internally audited quality standards.

E. 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 notarized 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

F. The Manufacturer shall be responsible for providing additional training on any DMS equipment if new and unusual problems or repairs are encountered during the Warranty Period.

1.07 SPARE PARTS

One set of spare parts shall be provided as noted in the list below. The following spare parts are intended to cover each sign delivered under this specification.

A. Two (2) LED display modules and power supply (for every sign)

B. One (1) photo sensor (for every five (5) signs)

C. One (1) controller (for every sign)

D. Three (3) air filters of every type (for every sign)

E. One (1) fan assembly of each type (for every five (5) signs)

F. One (1) Temp Sensor (for every five (5) signs)

G. One (1) surge suppressor (for every sign)

1.08 TRAINING

A. The Contractor shall supply training for maintenance personnel in the operation and maintenance of all field equipment prior to any equipment's being made operational in the field. These personnel shall be designated from the IDOT.

B. Training shall be limited to a maximum of 15 people and shall be provided at a time and location approved by the Engineer. Recommended test equipment, literature and drawings for the classes shall be furnished by the Contractor. At the conclusion of classes all items furnished which are not currently owned by the IDOT shall become the property of the DOT. The training shall include, but not be limited to, the following:

1. Hands-on operation of all sign control hardware

2. Explanation of all system commands, their function and usage.

3. Insertion of data

4. Required preventative maintenance

5. Servicing procedures

6. System trouble-shooting or problem identification procedures

C. A minimum of 24 hours of instruction shall be provided for the operational and maintenance procedures for the system. Training shall be provided by personnel thoroughly familiar with the equipment operation. This may be the Contractor's personnel, equipment manufacturer representatives, or a combination of the two. The Contractor 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 in hardcopy and the final version in PDF format on CD-ROM that will become the property of the Department after training period is over. Training sessions may be combined and/or shortened with the agreement of the IDOT and the Contractor.

D. The Contractor shall record the entire training on DVDs or video media approved by the Engineer and shall provide the recordings to the Engineer for later use.

1.09 TERMINOLOGY

Due to the varying definitions used in Dynamic Message Sign technology, this section defines specific terms as they apply to this specification.

A. Sign: The sign housing and its contents.

B. Sign Controller: Located 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.

C. Central Controller: The MS Windows Server computer system and related software, which operates the system from a remote control site.

D. Workstation: This computer operates as a remote client to the central controller. A workstation operator may dial-in to the central controller and gain access to the functions of the central by using the appropriate access codes.

E. LED: Light Emitting Diode

F. Pixel: Any of the small discrete elements that, when arranged in a pixel matrix, create a character. A pixel contains a cluster of LEDs.

G. Pitch: Distance measured from center to center of adjacent pixels within a matrix. This distance is measured both horizontally and vertically.

H. 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.

I. Message: Text; the information shown on the sign.

J. 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).

K. Neutral State: Sign is blank, or displaying a predefined message that is displayed regularly.

1.10 AS-BUILT DOCUMENTATION

The Contractor shall provide to the Engineer the following documentation of the complete installed equipment. 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.

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:

1. 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.

2. . Where the design allows operation in a number of different modes, an operational description of each mode shall be included.

3. 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.

4. The manufacturer's recommended procedures and checks necessary for preventive maintenance. This shall be specified for certain time intervals 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.

5. Data necessary for isolation and repair of failure or malfunctions, assuming the maintenance technicians are 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.

6. Detailed instructions shall be given only where failure to follow special procedures would result in damage to the equipment, improper operation or danger to operating or maintenance personnel. 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, jigs and test equipment.

7. 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.

8. 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 components and parts 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 groups of components, assemblies, etc.

B. 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. Software Manuals

The DMS vendor shall provide manuals and data for the computer software system and components thereof. These shall include the following:

1. Computer programmer's manuals and computer user's manuals (5 hardcopies each plus 1 CD-ROM in PDF format). Instructions for performing a back-up of all software and message libraries.

2. Two original copies of the controller's operating system manual and and an instruction manual for translating source to object code.

3. Manufacturer's documentation (including schematics) for all plug in circuit cards used in the microcomputer chassis.

4. Two copies of source programs, for sign controller software, shall be provided on CD-ROM. An unrestricted license for software use by the Department shall be provided to the Engineer.

5. DMS vendor shall provide the protocol(s) the sign controller supports for communication with a remote central controller.

C. Final Documentation

Final documentation shall reflect all field changes and software modifications and shall be provided after installation. Final documentation shall be approved prior to the final Project acceptance process has begun. This document shall include installation drawings, wiring and cable diagrams, wiring lists, and schematics for all elements of the sign controller's DC I/O Interface to the PLC based communication system.

PART 2 PRODUCTS

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.

2.01 DMS ENCLOSURE

A. General

1. 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.

2. The sign shall be designed for a minimum life of 20 years.

3. 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.

4. All cables shall be securely clamped/tied in the sign housing. No adhesive attachments will be allowed.

5. 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 Specification 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. IBC 209/ASCE7-05 certification will be an acceptable alternative for satisfactorily demonstrating compliance with sign housing structural integrity.
6. The complete sign housing shall be designed and manufactured in-house by the LED DMS Sign Manufacturer.
7. The dynamic message sign, including the sign housing and all modules and assemblies, shall be designed and manufactured in the USA.
8. The sign housing shall be capable of withstanding a wind loading of +97 M.P.H. without permanent deformation or other damages.
9. 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.
10. 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.
11. 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.
12. DMS shall operate from the following power sources: 120/240 VAC, 60 Hz single-phase, including neutral and earth ground, the maximum power requirement for DMS shall be less than 14,000 Watts.
13. The display housing shall meet IP-55 standards.
14. Displays shall operate in a minimum ambient temperature range of -40 to +120º F (-40 to +50º C) and under 95% relative humidity. 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.
15. Electrical display components shall be 100% solid-state.
16. Table below shows anticipated active area dimensions, weights, and power numbers for the various DMS. The DMS shall display messages that are continuous, uniform, and unbroken in appearance.

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.

DMS Sign No.	Overall Height (ft)	Overall Width (ft)	Active Matrix Height (ft)	Active Matrix Width (ft)	Max. Weight (lbs/kg)	Max Load in AMP at 240V	Max. Power (watts)
CM1 CM2 CM13 CM15	11'3-5/8"	19'8-3/8"	10'9-5/8"	19'2-3/8"	2600/1179	40	9600
CM3 CM7 CM10 CM12 CM14	12'6"	18'6"	12'0"	18'0"	2700/1225	42	10080
CM4 CM5	12'6"	23'3-5/8"	12'0"	22'9-5/8"	3400/1542	53	12720
CM6	11'3-5/8"	17'3-5/8"	10'9-5/8"	16'9-5/8"	2300/1043	36	8640
CM8	13'8-3/8"	23'3-5/8"	13'2-3/8"	22'9-5/8"	3700/1678	57	13680
CM9	11'3-5/8"	26'10-13/16"	10'9-5/8"	26'4-13/16"	3500/1588	54	12960
CM11	11'3-5/8"	22'1-3/16"	10'9-5/8"	21'7-3/16"	2900/1316	45	10800

B. Housing Frame

1. To meet the anti-corrosive, degradation, and oxidation requirements, the display housing aluminum sheet quality shall be no less than the properties of alloy 5052-H32.

2. Adequate filtered ventilation shall be provided, either through convection or with fans through the rear of the display.

3. Steel mounting points that can be used for mounting purposes shall be provided with the display and have the ability to be adjusted for alternative mounting methods.

4. Shall include lifting supports that can be removed after installation with plugs provided for holes left in the housing to achieve housing rating compliance.

5. The size and type of each housing frame shall be coordinated with the existing sign structure where it will be installed. The shop drawings of existing sign structures may be available upon request for different type of existing sign structure.

C. Exterior Finish

1. The LED display border pieces shall be coated with an automotive-grade acrylic urethane paint.

D. Front Face Construction

1. To meet the display readability requirements, the front face must be constructed in such a manner that it provides high contrast, low sunlight reflection and durability in all weather and site conditions.

2. Minimum features of front face shall:
- **a.** Provide UV resistance to prevent discoloring.
- **b.** Use surface materials in the active LED area, such as metal, plastic, or other face materials, designed for low sunlight reflectivity.
- **c.** Provide water shedding ability (designed to meet IP-55 Standards)
- **d.** Water-tightness shall be achieved by weather-stripping around each module and a self-sealing latching mechanism.

E. Serviceability

1. The display housing shall provide safe and convenient front service access for all modular assemblies, components, devices, wiring, and other materials located within the housing.

2. All internal components shall be removable and replaceable by a single technician with basic hand tools.

3. Service access shall be easily obtained by removal of one or more modules in front of the associated internal component.

4. Displays shall be designed with service features that minimize potential bodily harm and avoid the use of small items that could fall during removal and replacement of components.

5. The existing catwalks shall be extended if needed to provide safe access to any replaceable component, wire or cable termination or interconnection, and test point. This work shall be part the installation work for the DMS.

2.02 DISPLAY COMPONENTS

A. DMS modules shall be constructed for good readability, long life, and ease of service. Each display module shall be constructed as follows to ensure quality and life of the display:

1. Each module within the product family shall be designed with the same physical footprint of 14.4" x 14.4" allowing for potential upgrades from one pixel pitch to another.

2. All modules and their components shall be fully encapsulated and sealed to provide protection from the environment.

3. An LED module shall consist of LEDs with all drive electronics mounted on a single conformal coated Printed Circuit Board (PCB).

4. LEDs shall be auto-inserted in order to maintain quality and uniformity of the LEDs within each LED module.

5. All PCBs shall be wave-soldered to ensure uniformity, quality, and durability of all solder joints.

6. All PCBs shall be cleaned in a manner so as not to contain more than 2 parts per million contaminants.

7. Module signal and electrical connections shall be of the positive locking and removable type. Removal of a module from the display shall not require a de-soldering operation.

8. Module signal shall be redundant in that the signal can reach the module from multiple sources in the event of a loss in signal path from either direction.

9. All LED display modules in a single display shall be identical in construction and interchangeable throughout the display.

10. All module rows shall include louvers for sunlight shading and enhanced contrast.

11. Modules shall be individually attached to the cabinet frame.

12. Removal of one or more modules shall not affect the display's structural integrity.

13. The distance from the center of one line of pixels to the center of all adjacent lines shall be 20.32 mm (0.80 inches) both horizontally and vertically.

14. The failure of a single pixel, module or power supply shall not cause the failure of any other pixel, module or power supply in the display.

15. All modules shall have no less than a 50° vertical and 110° horizontal half-intensity viewing angle and a readability angle of 90° vertical and 160° horizontal.

16. The transition of the viewing intensity shall be consistent throughout the viewing cone.

B. Pixels shall be constructed with discrete LEDs, and these discrete LEDs shall conform to the following specifications:

1. LEDs shall be non-diffused, ultra-bright, solid-state light emitting diodes.
2. The red LEDs shall be constructed of AlInGaP technology with a peak wavelength of 639 ± 5 nm , green and blue LEDs shall be constructed of InGaN technology with peak wavelength of 525 ± 5 nm and 470 ± 5 nm, respectively.
3. The LED lens diameter shall be 0.157 inches (4 mm).
4. Each color of LEDs used in all DMSs provided for this contract shall be from the same bin.
5. LED life shall be an estimated minimum of 100,000 hours.
6. Display shall have a minimum intensity of 10,000 cd/m^2 for RGB maximum light output.

C. Power Supply

1. One regulated, auto-ranging AC to DC power supply per module shall power the LED modules and protect the LED pixel, DMS, and driver circuitry in the event of power spikes or surges. Failure of one power supply shall cause no more than one individual module to go blank.
2. Each power supply and their connectors shall be fully sealed to protect from corrosive environmental factors.

D. Internal Wiring

1. Wiring for DMS modules and other internal components shall be installed in the housing in a neat and professional manner.
2. Wiring shall not impede the removal of display modules, power supplies or other display components.
3. Wires shall not make contact with or be bent around sharp metal edges.
4. Module power and signal wiring shall be cut to a length, labeled and installed such that it is not possible to connect a module to the wrong set of wires.
5. All wiring shall conform to the National Electric Code.

E. The display shall be protected from electrical spikes and transients.

F. The manufacturer shall provide an earth ground lug in the display.

2.03 DISPLAY PERFORMANCE

A. Display Specifications

1. The display shall contain a full LED matrix with approximate active heights and widths listed in Table 2.1.
2. The DMS shall present messages that are continuous, uniform, and unbroken in appearance.
3. The DMS shall be capable of producing over 144 quadrillion shades of color.
4. Each display pixel shall be comprised of RGB LEDs for full color.
5. The DMS shall be capable of displaying alphanumeric characters in various heights and fonts.
6. The display shall be able to display messages composed of any combination of alphanumeric text, punctuation symbols, and graphic images.
7. Displays shall be legible during dawn and dusk hours when sunlight is shining directly on the display face or when the sun is directly behind (silhouetting) the display.
8. A minimum of 3 photoelectric sensors shall be used to determine ambient lighting conditions and automatically adjust the luminous intensity accordingly.

B. Sign Controller

1. 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.
2. All signal inputs shall be optically or magnetically isolated.
3. Each controller shall be connected to a light sensor allowing each DMS to automatically adjust to a minimum of 100 levels of brightness according to display direction and lighting conditions. Brightness levels shall be adjustable at the controller.
4. The controller shall have the capability of being connected to an NTP Server to maintain reliable time.
5. Messages, schedules, display configuration, and time and date shall be stored in non-volatile memory. No external power or battery backup will be required to maintain this data.
6. Controller can be configured using a unique name for the display.

C. DC I/O Interface module

DC I/O Interface module shall be located in the DMS Power cabinet. This module shall convert/translate control signals coming from existing PLC5 REVLAC control system into input signals recognized by the sign controller for displaying a user selected message.

The existing PLC5 central control systems sends a 2 second pulse signal of 125VDC for three different messages associated with OPEN STATE, CLOSE STATE and BLACK. This pulse signal shall activate three dry contract control relays inside the DMS Power cabinet which will then send a 125VDC continuous signal to the DC I/O Interface. The design and functional specifications for this interface shall be developed by the DMS manufacturer.

The DC I/O interface cable shall be provided as part of the DMS. The DC I/O interface cable shall be connected between DC I/O interface module located in DMS power cabinet and the DMS sign.

D. Control and Communications

1. Each single-face display shall be controlled and monitored by its own controller.

2. The controller shall be a stand-alone processor, which does not require continuous communication with central control software in order to perform all functions.

3. The controller shall be able to receive instructions from and provide information to a computer containing control software using the following communication modes:

a. **Ethernet --** via 10/100base-T Ethernet connection, 10base-T Wireless Ethernet Bridge connection, or fiber optic 10base-FL. Controller shall auto-negotiate between 10/100base T for copper based Ethernet systems.

b. RS232 wireless or landline modem communications and direct connection to a portable computer.

2.04 CONTROL SOFTWARE

A. General Software Features

1. The control software for the displays shall be Windows® based.

2. Software shall have the ability to automatically detect and configure displays within a local area network or configure displays with the use of a Display Creation Wizard.

3. Software shall provide features for creating, editing, scheduling, publishing, and deleting presentations.

a. Software shall include profanity protection.

a. Software shall include a security authentication process involving a password protection capability associated with user IDs assigned to each authorized user specific access privileges.

4. Software shall manage presentations and schedules on displays.

5. Software shall allow access to an on-line media kit allowing the user to download pre-created content for any size of display. User shall be able to select specific content from a pre-defined list or choose to download all or updated content from the pre-defined list.

B. Messaging

1. Software shall have the ability to create and edit presentations with ease in a graphical representation of the display.

2. Software shall have the ability to preview entire presentations or schedules before being displayed.

3. The display shall have the ability to store approximately 4 GB of display content.

4. Presentations can be varied by 0.1 second intervals with variable zoning restrictions applied to individual frames.

5. Presentations shall run in a continuous playlist.

6. The software shall have the ability to schedule up to 200 presentations in a single schedule.

7. Software shall use visual effects in presentations for entry frame transitions.

8. Software shall have the ability to schedule presentations to run and stop by defining a starting time/date and an ending time/date.

9. The contents of a text box shall be capable of being left, center or right justified horizontally.

10. Text shall have several possible display modes, including outline, drop shadow, bold, italic, and underline.

11. Software shall have the ability to copy and paste text from most Windows® applications.

12. 12. Software shall have the ability to import images in BMP, JPEG, PSD, PNG, TIF, and TIFF GIF file.

13. Presentations may be retrieved from the display for editing.

14. Presentations shall consist of a series of layouts, each containing a set of elements.

15. Each layout may have an image in the background with the ability to overlay text, graphics, and video elements.

16. Windows may be placed free form at any location within the frame. Windows may be overlapped.

17. Text windows have a transparent background.

C. Display of Alphanumeric Text

1. For presentation creation, the display shall be supplied with a minimum of five (5) ASCII English alphanumeric character font sets.

2. Each font shall include the following characters at a minimum:
- **a.** The letters “A” through “Z” in both upper and lower case
- **b.** Decimal digits “0” through “9
- **c.** A blank or space character
- **d.** Punctuation marks: . , ! ? - ‘ ’ “ ”
- **e.** Other characters, such as: # & * + / ( ) [ ] < >
- **f.** Interface to a full character map.

3. Font files shall include data that provides inter-character spacing and inter-paragraph spacing.

D. Display of Graphic Images

1. The display and control software provided for this contract shall have the capability of displaying image files that can be formatted to fit any size of DMS by either cropping or resizing the original image.

2. The Contractor shall build the sign legends associated with each of the three states defined herein and as detailed on the plans for each DMS in a sign graphic program SignCAD or Guidsign for export to the DMS software in one of the compatible formats listed above. The DMS software shall support both MUTCD Series fonts such as Series E (Modified) and Clearview 5W for display messages.

E. Display Communication and Protocol

All communications between the display control software and display(s) shall be accomplished using a protocol meeting the following specifications:

1. Communications shall include multi-layer protocol consisting of data-link and application layers at a minimum.

2. The messaging shall be capable of being triggered using dry contact closures. The DC I/O interface shall support a minimum of three (4) contact closures issued by an existing Allen Bradley PLC.

3. Commands issued via control signals from a PLC5 central control system will be interpreted by the sign controller via a DC I/O interface module located inside the DMS housing.

4. The display controller shall also be capable of supporting an Ethernet based protocol and data-link protocol that uses a check summing technique to guarantee packet integrity. Packets must be discarded if the packet's check sum is not valid.

5. For future IP connectivity, each display on a configured network would be assigned a unique IP address. Each display would respond to every packet addressed to it, except in the case of broadcast addressing. Displays would never initiate communication on the network. Each response would indicate the success or failure of the display to act upon the received packet.

F. Diagnostics and Status Information

The software shall be capable of displaying operational status of each display. This shall minimally include the following information:

1. Display Name – Name of the display as entered by the operator

2. Address – An identification number associated with a specific sign. This shall support a future networked capability by which the software can locate the sign to establish communications

3. Communications Status – Pictorially represented as "Normal", "Failed" or I/O input.

4. Current Message – As {name of message being displayed} or "Blank"

5. Last Reset – Date and time of last communications with sign

6. Available Memory – Pictorially and numerically represented memory available in the LED controller

7. Brightness – The intensity control of the LEDs at which the display is currently operating, set as "Automatic" or "Manual"

8. Firmware Version – Current firmware version of the LED controller

9. Schedule Status – Indicates if a schedule is active at the display

10. Test Patterns – The display shall be capable of running test patterns to assist in troubleshooting.

PART 3 EXECUTION

3.01 EXAMINATION AND SUBMITTALS

A. Contractor is required to supply all mounting provisions to mount the new DMS equipment to existing structures. Verify that appropriate conduit is in place for power and data to display. The Contractor is responsible for inspecting the existing sign structures including catwalk, power and communication infrastructure and providing notification of any deficiency that would impair or prevent installation of the proposed DMS until the deficiency is corrected. The IDOT will confirm the deficiency and make arrangements to correct prior to installation. No additional time or increase in cost will be allowed by the IDOT for the time required to correct the deficiency. This inspection should occur immediately after notice to proceed is issued.

B. Contractor shall measure and record the existing input relay signal from the PLC5 Central Control system and the output relay signal to at each existing drum sign at each existing power control cabinet. This information will be used by the DMS vendor in building the DC I/O interface to the sign controller and in building a test module capable of generating the same signals.

C. The Contractor shall be responsible to have a Licensed Structural Engineer in the State of Illinois design the sign mounting to the existing truss, bridge and cantilever structures and sign the drawings. These drawings shall be submitted to the Engineer for approval before work can commence. Shop drawings for the structures may be available upon request. The Contractor shall supply all corrosion resistant mounting hardware necessary to attach the DMS to a 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 to the structure that maybe required to mount or access/maintain the DMS.

3.02 INSTALLATION

A. The Contractor shall use their designed mounting hardware and materials to mount each DMS and associated conduit and appurtenances to route power and control signals to each sign. This work shall be done in accordance with the IDOT standard specifications. 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 structure that is not to correct an existing deficiency.

B. The existing drum sign structures includes overhead single span steel truss, cantilever aluminum truss structures and cantilever single chord steel truss. One drum sign is mounted to an existing bridge girder. Each sign structure has metal grating catwalk and hand rail. The metal grating is extended under the drum sign structure. The contractor shall field investigate each structure for any modification needed for metal grating spanned across the structure for removal of existing drum sign and installation of the DMS sign on the existing structure. The metal grating catwalk shall be extended as described above if needed to safely access and maintain each installed DMS.

C. Power and signal entrances shall be designated by etched markings on the housing. Separate conduit shall be used to route the power, and signal wires.

D. Existing conduits on DMS structure shall be reused. Modifications and any replacement or additions to the existing conduits shall be included in cost of the DMS installation, and shall not be paid for separately.

E. The Contractor shall provide the materials and services needed to properly earth ground each DMS. All earth grounding shall conform to the National Electrical Code.

F. The vendor shall have technical representative on site during the initial installation as well as to assist in trouble shooting and field testing following each installation.

PART 4 PRODUCT TESTING PROCEDURE

The Contractor shall be responsible to coordinate with DMS manufacturer, EMC, and the Engineer to successfully complete all tests for REVLAC Dynamic Message Signs. The equipment covered by this specification shall be subjected to tests listed below as approved by the Engineer to determine conformance with the specification requirements.

A. Factory Demonstration Test (FDT) - This test is intended to demonstrate an equivalent prototype involving actual components and simulations and emulations of actual inputs and outputs of the proposed solution that will meet the functional and operational requirements.

B. On-Site Test – This test is to verify at a building or yard near the Project site that all shipped signs can be properly assembled and tested using simulated signal inputs and a portable computer to verify compliance with the requirements.

C. Stand-Alone Test – This test is used to verify compliance with the requirements applicable to a particular subsystem prior to integration into the REVLAC System.

D. System Operation Test and Integration – This test is intended to test the fully integrated system end to end, which will be repeated in both “dry” runs and “installed” implementations of various combinations of drum and DMS signs, to verify compliance with requirements that have not been met in an earlier test.

E. 90-Day Operational Test – This test will confirm the installed System meets the required operating performance requirements under “live” conditions and record, diagnosis, troubleshoot and correct/fix any equipment degradation, malfunction or instability, and any software anomalies or problems.

The Contractor, in coordination with DMS vendor, PLC subcontractor and EMC shall arrange for and conduct the tests in accordance with the testing requirements stated herein. Unless otherwise specified, the Contractor is responsible for satisfying all inspection requirements prior to a request for the Engineer's inspection. The contract periods will not be extended for time lost or delays caused by testing prior to Department approval of any particular inspection or test. The Engineer reserves the right to have his/her representative witness any and all tests. The results of each test shall comply with the requirements specified herein. Failure to comply with the requirements allocated to any test shall be counted as a defect, and the equipment shall be subject to rejection by the Engineer. Rejected equipment shall be retested provided that all non-compliances have been corrected, and an updated test schedule submitted to the Engineer.

Final acceptance of the System shall be made after installation at all designated locations and integration into the PLC5 Central Control system as shown on the plans and addressed in the specifications, together with submittal of all required documents, completion of training, delivery of all spare parts and successful completion of all tests, unless otherwise specified herein.

The Contractor shall provide five (5) hardcopies and a final copy in PDF format on a CD-ROM of the Test Plan containing detailed step-by-step test procedures for the factory demonstration test, On-Site test, stand-alone test, system operation test and integration, and 90-day operational test for the Engineer's approval at least sixty (60) days prior to the day the tests are to begin.

The testing procedures shall clearly identify each required function, performance, and property being tested, the setup conditions, the steps to be followed during the test, and the expected test results. The testing procedure shall exercise all steps to verify compliance with the allocated requirements. The Test Plan shall include provisions for a requirements traceability matrix to assure all requirements are met by inspection, analysis, and demonstration and/or testing. Each test procedure shall indicate the uniquely identified requirement(s) for which the test is intended to show compliance. The test procedures shall provide demonstration steps and test scripts to be followed to show compliance with the listed requirement(s).

The test procedures shall have the Engineer's approval prior to submission of a testing schedule.

The Contractor shall be responsible for providing the test materials, power, communications, staff and measurement instruments and devices for all of the tests unless otherwise specified.

The Contractor shall be responsible to provide temporary testing module for the FDT and On-Site test. The testing module shall have a three push button control to generate messages on a DMS display associated with OPEN STATE, CLOSE STATE and BLANK. The testing module shall be able to convert 120VAC power to 125VDC power to trigger control relays which shall than trigger 125VDC continuous signal to the proposed DMS I/O interface module located inside the DMS enclosure. The relay signal shall be identical to what the existing system generates to change the drum signs.

The Contractor shall maintain a complete record of each test performed including the results of the test and a record of who witnessed the test. At the completion of each test, the test documentation shall be completed and provided to the owner's witness for review and to provide concurrence with a pass/fail result. This documentation shall be the basis for acceptance or rejection by the Engineer. All test reports shall be signed by the Contractor's authorized testing representative and the owner's representative witnessing the tests.

The Contractor shall be responsible to have technical assistance from DMS manufacturer and PLC Subconsultant as needed during all tests.

4.01 FACTORY DEMONSTRATION TEST

The Contractor shall be responsible for conducting a Factory Demonstration Test (FDT) on a single DMS unit being an average representation of the required sizes of DMS, including a fixed position CCTV camera at the DMS Vendor's Manufacturing Facility. The Engineer shall be notified a minimum of sixty (60) calendar days before the start of tests as shown on the submitted testing schedule. The Contractor shall pay for all travel expenses, including airfare, rental car, hotel, meals, etc., for up to two (2) department personnel or designated representatives for the Engineer to witness the FDT . If the Engineer determinse an extended stay is needed to witness the FDT due to test failure, the Contractor shall be responsible to pay all expenses for any extended stay needed for department personnel. FDT shall be conducted in accordance with the test procedures of the submitted and approved Test Plan.

FDT shall include, but not be limited to:

A. Physical test:

The purpose of this test is to demonstrate that each element of the DMS complies with the requirements of the Specifications. At minimum it shall cover materials, design, construction, markings and workmanship.

B. Operational test:

The purpose of this test is to demonstrate that DMS complies with the requirements of the Specification. It shall cover demonstration of DMS operation with temporary testing module provided by the Contractor. At minimum the operational test shall demonstrate following:

1. Complete Display functions
2. DC I/O interface operation
3. Displaying all unique sign Legends and Messages intended to be displayed on the fifteen (15) REVLAC DMS
4. Data Communications and Power functions
5. Local/Remote Functionality
6. Sign controller software functions

7. Operation of the variation of the LED intensity based on various levels of ambient light.

8. Captured display image by the fixed position CCTV camera located at a representative distance from the DMS display modules.

Consequences of FDT Failure: The equipment shall be corrected or another equipment substituted in its place and the test successfully repeated. The substitute equipment shall have passed all other tests successfully. If any DMS equipment or software/firmware modifications are necessary as a result of any test or demonstration failure, full retesting for compliance with these specifications may be required and a test report shall be prepared and delivered to the Engineer prior to retesting or deferring the test for the equipment. The report shall describe the nature of the failure and corrective action taken or that will be taken. If a developing failure pattern is observed, the Engineer may direct that design and fabrication/construction modifications be made to all Dynamic Message Signs without additional cost to the Department or extension of the contract period.

4.02 ON-SITE TEST

The Contractor shall be responsible for conducting On-Site test on each REVLAC DMS. The On-Site test shall be performed at a site near the Project location approved by the Engineer. The Contractor shall provide an updated test schedule showing the On-Site test forall fifteen (15) Dynamic Message Signs to the Engineer thirty (30) calendar days before the start of these tests. The On-Site test shall be witnessed by the Engineer. The Contractor shall conduct the On-Site tests in accordance with the test procedures of the submitted and approved Test Plan. The On-Site test shall be performed in accordance with the following:

A. On-Site test shall be performed prior to removal of existing drum sign where it is planned to installed for each REVLAC DMS.

B. Assemble the shipped sign to verify tight and secure interconnection of the sign elements resulting in a visibly and functionally single unit.

C. Test the DMS functions in accordance with specifications and demonstrate that the DMS has not been damaged during shipment.

D. Demonstrate the operation of DMS with temporary testing module. The Contractor shall be responsible to arrange for any temporary power needed for testing. DMS shall display correct messages associated with each REVLAC DMS as shown on the plans for OPEN STATE, CLOSE STATE and BLANK mode when a signal identical to that generated by the final configuration is received by the DC I/O interface for the DMS.

Consequences of On-Site Test Failure: The component or DMSshall be corrected or another component or DMS substituted in its place and the test successfully repeated. The substitute equipment shall have passed all other tests successfully. If any DMS component replacement or software/firmware modifications are necessary as a result of any test failure, full retesting for compliance with these specifications shall be required and a test report shall be prepared and delivered to the Engineer prior to retesting of the equipment. The report shall describe the nature of the failure, corrective action taken and an analysis of the implications to all other DMS.

If a developing failure pattern is observed, the Engineer may direct that design and fabrication/construction modifications be made to all units and each retested without additional cost to the Department or extension of the contract period.

Each sign successfully passing the On-Site test shall be disassembled and securely stored in preparation for delivery to its designated field site.

4.03 STAND-ALONE TEST

The Contractor shall perform a Stand-Alone test for the REVLAC System consisting of DMS, DMS power control cabinet, and fixed position CCTV cameras and supported by modifications to the existing PLC5 Central Center subsystem performed by the designated subcontractor. The Stand-Alone test for the REVLAC DMS shall commence after each DMS is mounted on the existing structure and connected to the power control cabinet as shown on the plans. This test shall be performed in conjunction with preparation for commencing the system operation test and integration immediately following successful completion and under the same traffic control setup. The Contractor shall provide an updated test schedule showing the Stand- Alone tests with the exact date, and time of each test to the Engineer thirty (30) calendar days before the start of these tests. Each Stand-Alone test shall be witnessed by the Engineer. The Stand-Alone test shall be performed in accordance with the test procedures of the submitted and approved Test Plan. The Stand-Alone test shall include, but not limited to:

A. The Contractor shall provide traffic control in compliance with the lane closure periods allowed per the Special Provision “Keeping the Expressway Open to Traffic”.

B. Exercise all the input and output functions of the unit under test and demonstrate all operational features.

C. Using a local REVLAC DMS power control cabinet portable computer connection to the sign controller, verify the current status of the sign and simulate PLC signal output to demonstrate that each DMS displays the correct messages associated with Open State, Closed State and Blank signals and perform test patterns for each LED color.

D. If any component, equipment, interconnection, control or power wiring has been replaced or modified to make the subsystem or equipment fully operational, a report shall be prepared and delivered to the Engineer. The report shall describe the nature of the failure and the corrective action taken and the expected implication to the same component(s) or equipment already installed.

4.04 SYSTEM OPERATION TEST AND INTEGRATION

System operation test shall follow immediately after successful completion of the Stand-Alone test. This test shall be used for end-to-end testing of the REVLAC System consisting of DMS, fixed position CCTV cameras, DMS power control cabinet and supported by modifications to the existing PLC5 Central Center subsystem as performed by the designated PLC subcontractor. The Contractor shall provide an updated System Operation test schedule with the exact date and time, for each test to the Engineer thirty (30) calendar days before the start of these tests. The System Operation test shall be witnessed by the Engineer. The System Operation test shall be performed in accordance with the test procedures of the submitted and approved Test Plan.

The System Operation Test and Integration shall include, but not limited to:

A. The Contractor shall provide traffic control in compliance with the Special Provision "Keeping the Expressway Open to Traffic".

B. The REVLAC System operation and integration shall generally follow the process shown by the flow diagram in the plans. This approach involves verification the modified PLC5 Central System will successfully perform its required functions in the various combinations of DMS and drum sign through to final configuration before replacing a drum sign associated with each interim implementation. The PLC logic for each interim implementation will also be tested prior to replacing an existing drum sign.

C. The video from the fixed position CCTV shall verified as part of the sequence of steps to change the operating mode of the REVLAC. The near optimum video capture of the DMS display message verified during the fixed position CCTV camera standalone test shall be demonstrated at the associated remote control building and the Central Control Center. Adjustment shall be made at the CCTV control cabinet if needed.

D. The integration of DMS into the existing PLC5 REVLAC central control systems shall be included as part of the pay item "BUDGETARY ALLOWANCE OF DMS INTEGRATION AND MODIFICATION OF EXISTING PLC CONTROLS". The Contractor shall have the designated PLC Subcontractor provide the following information prior to the start of the System Operation test and Integration:

1. Preparation and submittal of a functional specification for PLC logic control of complete REVLAC system using existing and proposed equipment in conjunction with user interface for monitoring and control.

2. Demonstration the revised PLC logic meets the approved functional and operational requirements by means of a simulation/emulation program. New PLC logic will be required for each interim implementation involving various combinations of existing drum sign and proposed DMS including the final configuration involving proposed DMS, power control cabinet and fixed position CCTV cameras at the 15 field sites.

3. Modification and revisions to the existing PLC5 REVLAC central control system to integrate proposed equipment with existing equipment and a user interface that controls existing bidirectional entry gates supported by automatically displayed existing gate video and proposed DMS video. Implementation will involve conducting a “dry run” of the interim PLC logic that involves measuring the input relay signal at the existing drum sign power control cabinet and change in the drum sign message for each of the 3 lines comprising a message. This is accomplished by temporarily loading the interim logic to the secondary PLC during a scheduled closure and reloading the existing logic at the end of the closure. If successful, a subsequent scheduled closure will involve replacement of a drum sign in conjunction with loading the interim logic to the primary and secondary PLC. The “dry run” will precede each scheduled replacement of a drum sign. The first “dry run” will be the final configuration involving full replacement of all drum signs with DMS. All non-critical sign sites will be completed before the start of critical sign sites.

4. On-site presence during each “dry run” and interim implementation through final configuration to load (and unload as applicable) the revised PLC logic and to perform any required troubleshooting and adjustments to correct any problems that arise. A log will be maintained to document all events during a “dry run”, interim implementation and final implementation.

5. A detailed test report documenting the tests performed and results achieved shall be completed and turned over to the Engineer. The result of each individual test shall be signed by the Contractor and the Engineer or representative. The report shall include a process for correcting problems and retesting for all failed tests. System simulation program and functional specification for operation of complete REVLAC system using proposed equipment.

Consequence of System Test Failure: If a System Operation test fails because of subsystem component(s), the particular component(s) shall be corrected or substituted with other component(s) and the failed tests shall be repeated. If a component has been replaced, or modified as a result of a system operation test failure, a report shall be prepared and delivered to the Engineer prior to retest. If a critical DMS fails and cannot be corrected before expiration of the allowed closure period, the DMS shall be put into a blank state. The REVLAC will be allowed to open with a single critical sign in a blank state for a limited period of time. The Contractor shall remove all traffic control devices and continue to troubleshoot the problem if the source has not been established. Only troubleshooting that does not require traffic control and lane closure for worker safety shall be allowed. The Contractor shall expedite delivery of all parts and services to correct the problem to make the critical site DMS operational. The Contractor will not be assessed damages if the REVALC remains operational in a degraded state. The Engineer reserves the right to discontinue REVLAC operations and assess damages if the failed DMS results in a traffic incident partially or wholly attributable to the failed DMS. No new closures will be allowed, unless otherwise approved by the Engineer, until the failed critical DMS sign location becomes operational. No additional time will be granted for failures controllable by the Contractor.

4.05 90-DAY OPERATIONAL TEST

Following successful completion of the System Operation Test and Integration, a 90-calendar day operational test shall be performed.

The purpose of the 90-day Operational Test is to demonstrate REVLAC performance including the reliability of subsystem equipment for a 90 calendar day period. In the event of a failure of any Contractor supplied components, or of any existing system elements that are directly adversely affected, the system shall be subjected to an additional 30 day test period. Failure shall be defined as any interruption of operation that can be attributed to the installed components and does not involve an isolated event resolved within 4 hours with operations restored. All failures shall be resolved within 24 hours. If the same failure occurs three (3) times, the Contractor shall propose and implement a permanent fix to all delivered equipment of the same manufacturer and model and the 90-day test shall begin anew.

In the event that greater than 20% of similar equipment items malfunction during the test period, the Engineer may declare a system defect and require replacement of all items of that equipment. When a system defect is declared, the 90-day test period shall be restarted.

During the 90-Day Operational Test the Contractor shall provide support for all installed equipment including problem troubleshooting and replacement of items not operating as specified. The Contractor shall maintain detailed daily records in the form of a maintenance and activity log. The log shall include the time, date, identity and location of components and or equipment on which work is performed, the assigned cost of materials and equipment restoration, if any, a description of the work performed, materials or special equipment used to restore failed components and equipment and the time required to complete the activity. The log shall contain the current test status of all equipment items. The maintenance and activity log shall be available to the Engineer upon request. All daily maintenance and activity logs shall be bound at the successful completion of the 90-Day Operational Test, indexed, and submitted to the Engineer.

4.06 FINAL SYSTEM ACCEPTANCE

Final system acceptance shall be defined as when all work and materials required by the contract documents have been completed and approved. This includes submittal of all documents in final version, delivery of spare parts to the Project site or other designated location, installation completed in compliance with the plans and specifications, verification by inspection, analysis, test and or demonstration of compliance with all requirements as recorded in the requirements traceability matrix, , and completion of all training.

METHOD OF MEASUREMENT

The DMS shall be paid for at the contract unit price as each, which cost shall include the cost of furnishing all labor, materials, documentation, warranties, tools, training, parts, PLC services and equipment to install, test, and integrate at a specified location operational with the specified DMS in this pay item.

BASIS OF PAYMENT

This work shall be paid for at the contract unit price each for **REVLAC DMS FRONT ACCESS, LED of the size listed in** plans which price shall include furnishing and installing the DMS sign, documentation, warranties, spare parts, training, and diagnostic software as directed by the engineer.

MAINTENANCE OF REVLAC SYSTEM DURING CONSTRUCTION

This provision includes all work required to maintain the existing REVLAC system, including the following:

1. Prior to the date the Contractor's field activities (electrical or otherwise) at the job site are scheduled to begin, the Contractor shall coordinate with the State Electrical Maintenance Contractor (EMC). The EMC shall receive the approved Project Schedule and all updates, including the testing schedule.

2. Any damage and disruption of operations caused to the REVLAC System by the Contractor shall be rectified immediately, unless directed otherwise by the Engineer.

3. Any miscellaneous work, materials, and coordination, which are not paid under other pay items associated with this Project shall be furnished and installed as part of this pay item.

4. The work for this pay item shall include any coordination with The State Electrical Maintenance Contractor to maintain the REVLAC system during construction.

5. Existing drum signs while in place shall remain operational during construction. The State Electrical Maintenance Contractor (EMC) shall relinquish maintenance responsibilities of the drum signs and associated power control cabinets, existing non-REVLAC DMS proposed to be replaced, existing PTZ camera proposed to be removed, and existing PLC logic proposed to be modified when field construction for that particular item is scheduled to begin as shown on the Engineer approved Project Schedule.

6. Contractor shall coordinate all work impacting the existing drum signs during construction including access to the existing power control cabinets associated with each drum sign.

7. Maintenance responsibility of the remote control buildings will remain with The State Electrical Maintenance Contractor (EMC), and Contractor shall coordinate access and any planned installation with the EMC, especially during fiber optic installation and terminations involving the existing Vicon matrix switcher and use of existing rack and partial video transmission cage space. Contractor shall coordinate with the EMC for access to the existing electrical panels at the remote control buildings for the purpose of upgrading service to the REVLAC DMS sites.

8. The EMC will retain maintenance responsibilities of Video Distribution System (VDS), but Contractor shall coordinate with the EMC during removal of the general surveillance PTZ CCTV camera, and when Contractor's work may impact the VDS system.

9. The maintenance of roadways shall remain with the State since no roadwork is required for this project.

10. Maintenance of all materials, wires, cables equipment and subsystem installed under this Contract shall be transferred to the EMC after Final Project Acceptance, subject to the terms and conditions and scope of work of the maintenance Contract with the State.

11. During construction, after fixed position CCTV cameras and structures are installed, power for the CCTV control cabinet shall feed temporarily from the existing Drum Sign roadside control cabinet until the new DMS Power control cabinets are installed and are operational. The handholes for these two cabinets shall be interconnected to support this temporary power provision and to support the incremental replacement of the drum signs with DMS by re-routing existing PLC control signal wiring. The cost for this work will be included in MAINTENANCE OF REVLAC SYSTEM DURING CONSTRUCTION.

Basis of Payment: This item shall be paid for at the contract lump sum price or fraction thereof for **MAINTENANCE OF REVLAC SYSTEM DURING CONSTRUCTION**, which shall include all work as described herein.

BUDGETARY ALLOWANCE FOR CCTV AND DMS INTEGRATION AND MODIFICATION OF EXISTING PLC CONTROLS

Description: This item provides for the integration of the proposed fixed position CCTV camera video and proposed DMS signs into the existing REVLAC PLC5 central control system and changes to the user interface. It also provides for revising the existing Vicon matrix switcher software to input, process and display the fixed position CCTV cameras within the sequence of user interface steps to change the current REVLAC operating mode as processed and controlled by the PLC logic. The fixed position CCTV camera System Operation Test and Integration will require the revised and tested PLC logic to display as a part of the user interface the current DMS message as a condition of proceeding with a REVLAC operating mode change. Final system acceptance is dependent on the accurate, timely and reliable performance of the revised PLC5 logic functioning in conjunction with the equipment furnished and installed by the Contractor. Contractor shall hire the Department designated and approved subcontractor for this work as needed. The designated subcontractor was responsible for the designing, developing and testing of the original PLC logic and had significant involvement in the REVLAC system integration. The designated subcontractor has continued to provide PLC logic support since completion of the REVLAC implementation.

This item is to establish an account from which funds will be distributed for the payment of the PLC5 integration with DMS and fixed position CCTV camera video. A budgetary allowance has been established because the final cost is unknown.

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 REVLAC system will be generally configured to collect video images of existing entry gates and DMS messages and execute a sequence of steps. These steps are initiated by an IDOT operator that uses the images to validate equipment status during the transition in operating mode of the REVLAC System. The REVALC System involves five monitoring locations (i.e., four remote control buildings and the ComCenter).

All REVLAC fixed position CCTV cameras shall be installed, individually tested, and integrated with the revised PLC5 logic. These cameras shall be successfully system tested using the revised and tested PLC logic after replacement of an existing drum sign.

The five monitoring locations to be addressed by this contract under this item are the following:

1. Central Control Center at the District 1 Headquarters in Schaumburg
2. REVLAC Remote Control Building A
3. REVLAC Remote Control Building C
4. REVLAC Remote Control Building D
5. REVLAC Remote Control Building E

The REVLAC System shall utilize existing fixed position CCTV camera images of the existing entry gates and existing video matrix switchers, and shall include all materials and equipment necessary to integrate the new fixed position CCTV cameras and DMS into the modified REVLAC System. The work under this Special Provision includes the integration of video from camera equipment provided under this contract, with existing CCTV equipment video as indicated in the contract documents, It also includes integration of the proposed fixed position CCTV camera video into the existing user interface operating sequences of the REVLAC system. The work includes reprogramming of the video matrix switching system to connect additional fixed position CCTV cameras for integration of the respective video into the operating mode transition sequences.

Existing REVLAC fixed position CCTV camera video of the entry gates currently is transmitted to the remote control buildings and ComCenter for viewing when the operating mode is changed. This video will continue to be used when changing operating modes of the REVLAC System.

The existing central control software is RSLogix5. The Contractor is not responsible for providing new software for this installation. Contractor shall hire the designated and approved subcontractor for modifying and testing the RSLogix5 logic and assisting in the integration with new fixed position CCTV cameras, and new DMS, as directed by the Engineer. The re-programing of the exising Vicon Pilot matrix switcher will also be paid for under this allowance but performed by another party designated by the Engineer. The PLC subcontractor shall coordinate with this party in establishing the video sequence input of the existing gates and proposed DMS into the modified PLC logic that is displayed as part of a REVLAC operating mode change.

Under a separate item the Contractor shall connect the proposed fixed position CCTV cameras to the existing Vicon matrix switcher located at each remote control building to allow the REVLAC System to use this video within the modified user interface that is used to transition to a new operating mode.

Method of Measurement. This item shall be measured by the invoices submitted by the designated and approved subcontractor for completion of a portion of the subcontractor's work as described herein.

Basis Of Payment. This work will be paid for at the expended allowance amount within the included price for **BUDGETARY ALLOWANCE FOR CCTV AND DMS INTEGRATION AND MODIFICATION OF EXISTING PLC CONTROLS**.

GROUNDING OF ITS SUBSYSTEMS
Effective: March 12, 2009

The grounding of ITS subsystems shall meet the requirement of Section 806 of the Standard Specifications. In addition, amend Article 806.03 of the Standard Specifications to include:

General: All ITS subsystems (CCTV camera systems, dynamic message sign system, etc.), associated equipment, and appurtenances shall be properly grounded in strict conformance with the NEC and as shown on the plans.

Testing shall be according to Section 801.13(a)(5) of the Standard Specifications.

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 cable shall include one neutral conductor of the same size as the phase (hot) conductor.

b) The equipment-grounding conductor shall be green color-coded. The following is in addition to Section 801.04 of the Standard Specifications.

    a. Equipment grounding conductors shall be XLP insulated No. 6, unless otherwise noted on the Plans, and 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.

    b. Equipment grounding connector shall be bonded, using a listed grounding conductor, to all ramp meters, DMS, and detector cabinets, handholes, and other metallic enclosures throughout the ITS subsystems, except where noted herein. A listed electrical joint compound shall be applied to all conductor terminations, connector threads, and contact points.

    c. All metallic and non-metallic raceways containing ITS 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.

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.

Basis of Payment: Payment shall be included in the various items associated with ITS.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

This work shall be according to Article 669 of the Standard Specifications and the following:

Qualifications. The term environmental firm shall mean an environmental firm with at least five (5) documented leaking underground storage tank (LUST) cleanups or that is pre-qualified in hazardous waste by the Department. Documentation includes but not limited to verifying remediation and special waste operations for sites contaminated with gasoline, diesel, or waste oil in accordance with all Federal, State, or local regulatory requirements and shall be provided to the Engineer for approval. The environmental firm selected shall not be a former or current consultant or have any ties with any of the properties contained within and/or adjacent to this construction project.

General. This Special Provision will likely require the Contractor to subcontract for the execution of certain activities.

All contaminated materials shall be managed as either "uncontaminated soil" or non-special waste. This work shall include monitoring and potential sampling, analytical testing, and management of a material contaminated by regulated substances. The Environmental Firm shall continuously monitor all soil excavation for worker protection and soil contamination. **Phase I Preliminary Engineering information is available through the District's Environmental Studies Unit.** Soil samples or analysis without the approval of the Engineer will be at no additional cost to the Department. The lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit whichever is less.

The Contractor shall manage any excavated soils and sediment within the following areas:

1. Station 60+20 to Station 60+70 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
2. Station 62+80 to Station 63+20 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
3. Station 71+30 to Station 71+80 (Interstate 90/94, S.E.B Kennedy Expressway), 0 to 100 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.

4. Station 78+50 to Station 79+50 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
5. Station 82+20 to Station 82+70 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
6. Station 10+70 to Station 11+20 (Interstate 90/94, Ramp B), 0 to 50 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
7. Station 85+60 to Station 86+00 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
8. Station 107+60 to Station 108+00 (Interstate 90/94, Ramp C, W.B Ontario Street), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
9. Station 25+10 to Station 25+40 (Interstate 90/94, Ramp A), 0 to 55 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
10. Station 31+25 to Station 31+50 (Interstate 90/94, Ramp C, W.B Ontario Street), 0 to 70 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
11. Station 514+20 to Station 514+80 (Interstate 90/94, C.L. Ohio/Ontario Street), 0 to 100 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
12. Station 518+20 to Station 519+00 (Interstate 90/94, C.L. Ohio/Ontario Street), 0 to 100 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
13. Station 523+00 to Station 523+50 (Interstate 90/94, C.L. Ohio/Ontario), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
14. Station 528+00 to Station 529+00 (Interstate 90/94, C.L. Ohio/Ontario), 0 to 100 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.

15. Station 260+50 to Station 261+50 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
16. Station 265+30 to Station 265+50 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 60 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
17. Station 269+50 to Station 270+00 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 110 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
18. Station 287+00 to Station 288+00 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
19. Station 292+60 to Station 292+20 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
20. Station 296+00 to Station 296+60 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
21. Station 326+50 to Station 327+00 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
22. Station 442+60 to Station 443+20 (Interstate 90/94, S.E.B Kennedy Expressway), 0 to 60 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
23. Station 446+20 to Station 446+80 (Interstate 90/94, S.E.B Kennedy Expressway), 0 to 60 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
24. Station 343+00 to Station 343+50 (Interstate 90/94, N.W.B Kennedy Expressway), 0 to 75 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
25. Station 461+00 to Station 461+30 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 100 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.

26. Station 464+80 to Station 465+30 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 140 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
27. Station 474+25 to Station 475+75 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 60 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
28. Station 479+25 to Station 480+25 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 110 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
29. Station 70+50 to Station 71+50 (Interstate 90/94, N.B. Edens Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
30. Station 73+25 to Station 74+00 (Interstate 90/94, N.B. Edens Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
31. Station 104+50 to Station 105+00 (Interstate 90/94, N.B. Edens Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
32. Station 461+00 to Station 461+50 (Interstate 90/94, S.B. Edens Expressway), 0 to 80 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
33. Station 462+75 to Station 463+50 (Interstate 90/94, S.B. Edens Expressway), 0 to 80 feet LT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
34. Station 3622+80 to Station 3623+50 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 120 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
35. Station 3626+75 to Station 3627+25 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
36. Station 3637+50 to Station 3638+25 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.

37. Station 58+50 to Station 59+25 (Interstate 90/94, N.B. Edens Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
38. Station 63+00 to Station 63+50 (Interstate 90/94, N.B. Edens Expressway), 0 to 180 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.
39. Station 611+00 to Station 613+00 (Interstate 90/94, S.E.B. Kennedy Expressway), 0 to 100 feet RT. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs, and Metals.

EMC REVLAC MAINTENANCE RESPONSIBILITIES

General

The Electrical Maintenance Contractor (EMC) is responsible for maintaining the REVLAC System in conjunction with other maintenance responsibilities for the State. The specific REVLAC related maintenance activities described herein are intended to provide the Contractor an understanding of the ongoing maintenance performed by the EMC. Furthermore, it shall be used to identify the extent of coordination needed to accommodate maintenance activities during construction. Contractor shall also use this information to know what to expect from the EMC when problems affecting REVLAC operations occur that require immediate attention.

Description

Maintenance obligations and duties of the EMC related to REVLAC operations is provided below. This abridged information is extracted verbatim from the EMC's Contract with the State and does not provide the means and methods used by the EMC to comply with these requirements. The Contractor shall coordinate with the EMC to determine the means and methods to assess and eliminate or mitigate potential conflicts and delays.

Routine Maintenance

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.

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.

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.

Buildings, Huts, Base Stations, And Tower Equipment

There are twenty-two (22) 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.

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)
- 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.

IDOT DISTRICT 1 HEADQUARTERS - 201 W. Center Ct. –Schaumburg
Items to be maintained include:

- REVLAC Work Stations, REVLAC Event Logger, REVLAC Alarm Monitor
- SWARMS Workstation
- Dell Laptops for PLC Programming 2- Dell 23 in Monitors, 2- Panasonic 7in monitors
- HP Laptop for PLC Programming
- Supervisory Control Panels (for REVLAC)
- 3- 42 in. Phillips LCD monitors, 12- 42 in. LG LCD monitors, 6- 46 in. NEC LCD monitors and appurtenances
- 2-REVLAC alarm summary computers
- 4-Marshall monitors VR82DP2C, 12-Marshall monitors V-R44P, 2- 8.4 in. Marshall monitors VR84DP2C
- NetCam work station
- Allegiant Video Matrix with Three Bosch controllers
- VICON video switch

Dynamic Message Remote System
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

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.

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.

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, handholes, tracer cables, cable distribution equipment & accessories, video, and data for continued operation of all systems.

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.

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. 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.

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.

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.

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.

Contractor Immediate Response And Repair
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.

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.

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.

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.

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 …….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

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.

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, 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.

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, by shoveling and plowing as necessary, and salting, all sidewalks, paths, driveways and parking areas, for the months of November through March.

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.

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

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.

COATED GALVANIZED STEEL CONDUIT (BDE)
Effective: January 1, 2013 Revised: January 1, 2015

Revise Article 811.03(b) of the Standard Specifications to read:

"(b) Coated Galvanized Steel Conduit. In addition to the methods described in Article 810.05(a) the following methods shall be observed when installing coated conduit.

Coated conduit pipe vise jaw adapters shall be used when the conduit is being clamped to avoid damaging the coating.

Coated conduit shall be cut with a roller cutter or by other means approved by the conduit manufacturer.

After any cutting or threading operations are completed, the bare steel shall be touched up with the conduit manufacturer's touch up compound."

COILABLE NONMETALLIC CONDUIT (BDE)
Effective: August 1, 2014 Revised: January 1, 2015

Revise Article 1088.01(c) of the Standard Specifications to read:

"(c) Coilable Nonmetallic Conduit. The conduit shall be a high density polyethylene duct which is intended for underground use can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties or performance. The conduit and its manufacture shall be according to UL 651A for Schedule 40 conduit, except Schedule 80 shall be used under pavement, stabilized shoulder, paved median, paved driveway, curb and/or gutter and sidewalk.

Performance Tests. Testing procedures and test results shall meet the requirements of UL 651A. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the conduit."

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)
Effective: June 1, 2010 Revised: November 1, 2014

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/cleandiesel/verification/verif-list.htm), or verified by the California Air Resources Board (CARB) (http://www.arb.ca.gov/diesel/verdev/vt/cvt.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.

CONTRACT CLAIMS (BDE)
Effective: April 1, 2014

Revise the first paragraph of Article 109.09(a) of the Standard Specifications to read:

"(a) Submission of Claim. All claims filed by the Contractor shall be in writing and in sufficient detail to enable the Department to ascertain the basis and amount of the claim. As a minimum, the following information must accompany each claim submitted."

Revise Article 109.09(e) of the Standard Specifications to read:

"(e) Procedure. The Department provides two administrative levels for claims review.

Level I Engineer of Construction
Level II Chief Engineer/Director of Highways or Designee

(1) Level I. All claims shall first be submitted at Level I. Two copies each of the claim and supporting documentation shall be submitted simultaneously to the District and the Engineer of Construction. The Engineer of Construction, in consultation with the District, will consider all information submitted with the claim and render a decision on the claim within 90 days after receipt by the Engineer of Construction. Claims not conforming to this Article will be returned without consideration. The Engineer of Construction may schedule a claim presentation meeting if in the Engineer of Construction's judgment such a meeting would aid in resolution of the claim, otherwise a decision will be made based on the claim documentation submitted. If a Level I decision is not rendered within 90 days of receipt of the claim, or if the Contractor disputes the decision, an appeal to Level II may be made by the Contractor.

(2) Level II. An appeal to Level II shall be made in writing to the Engineer of Construction within 45 days after the date of the Level I decision. Review of the claim at Level II shall be conducted as a full evaluation of the claim. A claim presentation meeting may be scheduled if the Chief Engineer/Director of Highways determines that such a meeting would aid in resolution of the claim, otherwise a decision will be made based on the claim documentation submitted. A Level II final decision will be rendered within 90 days of receipt of the written request for appeal.

Full compliance by the Contractor with the provisions specified in this Article is a contractual condition precedent to the Contractor's right to seek relief in the Court of Claims. The Director's written decision shall be the final administrative action of the Department. Unless the Contractor files a claim for adjudication by the Court of Claims within 60 days after the date of the written decision, the failure to file shall constitute a release and waiver of the claim."

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)
Effective: September 1, 2000 Revised: November 2, 2015

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, which may include, but is not limited to:
>
> (a) Withholding progress payments;
>
> (b) Assessing sanctions;
>
> (c) Liquidated damages; and/or
>
> (d) Disqualifying the Contractor from future bidding as non-responsible.

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 **12.00**% 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:
http://www.idot.illinois.gov/doing-business/certifications/disadvantaged-business-enterprise-certification/il-ucp-directory/index.

BIDDING PROCEDURES. Compliance with this Special Provision is required prior to the award of the contract and the failure of the low bidder to comply will render the bid not responsive.

In order to assure the timely award of the contract, the low bidder shall submit:

(a) The bidder shall submit a Disadvantaged Business Utilization Plan on completed Department forms SBE 2025 and 2026.

(1) The final Utilization Plan must be submitted within five calendar days after the date of the letting.

(2) To meet the five day requirement, the bidder may send the Utilization Plan electronically by scanning and sending to **DOT.DBE.UP@illinois.gov** or faxing to (217) 785-1524. The subject line must include the bid Item Number and the Letting date. The Utilization Plan should be sent as one .pdf file, rather than multiple files and emails for the same Item Number. It is the responsibility of the bidder to obtain confirmation of email or fax delivery.

Alternatively, the Utilization Plan may be sent by certified mail or delivery service within the five business day period. If a question arises concerning the mailing date of a Utilization Plan, the mailing date will be established by the U.S. Postal Service postmark on the original certified mail receipt from the U.S. Postal Service or the receipt issued by a delivery service. It is the responsibility of the bidder to ensure the postmark or receipt date is affixed within the five days if the bidder intends to rely upon mailing or delivery to satisfy the submission day requirement. The Utilization Plan is to be submitted to:

Illinois Department of Transportation
Bureau of Small Business Enterprises
Contract Compliance Section
2300 South Dirksen Parkway, Room 319
Springfield, Illinois 62764

The Department will not accept a Utilization Plan if it does not meet the five day submittal requirement and the bid will be declared not responsive. In the event the bid is declared not responsive due to a failure to submit a Utilization Plan or failure to comply with the bidding procedures set forth herein, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty, and may deny authorization to bid the project if re-advertised for bids. The Department reserves the right to invite any other bidder to submit a Utilization Plan at any time for award consideration or to extend the time for award.

(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 Utilization 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 scanned or 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 Utilization 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 is not met, evidence of good faith efforts; the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor is selected over a DBE for work on the contract.

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 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. In accordance with subsection (c)(6) of the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

(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. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period in order to cure the deficiency.

(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 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 DBE regular dealer or DBE 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 DBE Participation Commitment 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) 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 or AER 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.

(c) SUBCONTRACT. The Contractor must provide DBE subcontracts to IDOT upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.

(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 listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

As stated above, 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 1200 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. The good faith efforts shall be documented by the Contractor. If the Department requests documentation under this provision, the Contractor shall submit the documentation within seven days, which may be extended for an additional seven days if necessary at the request of the Contractor. The Department shall provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

(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 Resident 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 DBE 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. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

EQUAL EMPLOYMENT OPPORTUNITY (BDE)
Effective: April 1, 2015

FEDERAL AID CONTRACTS. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

"EQUAL EMPLOYMENT OPPORTUNITY

In the event of the Contractor's noncompliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act, or the Illinois Department of Human Rights Rules and Regulations, the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political sub-divisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

During the performance of this Contract, the Contractor agrees as follows:

(1) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

(2) That, if it hires additional employees in order to perform this contract or any portion hereof, it will determine the availability (according to the Illinois Department of Human Rights Rules and Regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.

(3) That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status or an unfavorable discharge from military service.

(4) That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations. If any labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with such Act and Rules and Regulations, the Contractor will promptly so notify the Illinois Department of Human Rights and IDOT and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

(5) That it will submit reports as required by the Illinois Department of Human Rights Rules and Regulations, furnish all relevant information as may from time to time be requested by the Illinois Department of Human Rights or IDOT, and in all respects comply with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

(6) That it will permit access to all relevant books, records, accounts, and work sites by personnel of IDOT and the Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

(7) That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that the provisions will be binding upon the subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by subcontractors; and further it will promptly notify IDOT and the Illinois Department of Human Rights in the event any subcontractor fails or refuses to comply with these provisions. In addition, the Contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations."

STATE CONTRACTS. Revise Section II of Check Sheet #5 of the Recurring Special Provisions to read:

"II. EQUAL EMPLOYMENT OPPORTUNITY

In the event of the Contractor's noncompliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act or the Illinois Department of Human Rights Rules and Regulations, the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political sub-divisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

During the performance of this Contract, the Contractor agrees as follows:

1. That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

2. That, if it hires additional employees in order to perform this contract or any portion hereof, it will determine the availability (according to the Illinois Department of Human Rights Rules and Regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.

3. That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status, or an unfavorable discharge from military service.

4. That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations. If any labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with such Act and Rules and Regulations, the Contractor will promptly so notify the Illinois Department of Human Rights and IDOT and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

5. That it will submit reports as required by the Illinois Department of Human Rights Rules and Regulations, furnish all relevant information as may from time to time be requested by the Illinois Department of Human Rights or IDOT, and in all respects comply with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

6. That it will permit access to all relevant books, records, accounts and work sites by personnel of IDOT and the Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

7. That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that the provisions will be binding upon the subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by subcontractors; and further it will promptly notify IDOT and the Illinois Department of Human Rights in the event any subcontractor fails or refuses to comply with these provisions. In addition, the Contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations."

PRECAST CONCRETE HANDHOLE (BDE)
Effective: August 1, 2014

Revise the third paragraph of Article 814.03 of the Standard Specifications to read:

"Handholes shall be constructed as shown on the plans and shall be cast-in-place, composite concrete, or precast units. Heavy duty handholes shall be either cast-in-place or precast units."

Add the following to Article 814.03 of the Standard Specifications:

"(c) Precast Concrete. Precast concrete handholes shall be fabricated according to Article 1042.17. Where a handhole is contiguous to a sidewalk, preformed joint filler of 1/2 inch (13 mm) thickness shall be placed between the handhole and the sidewalk."

Add the following to Section1042 of the Standard Specifications:

"**1042.17 Precast Concrete Handholes.** Precast concrete handholes shall be according to Articles 1042.03(a)(c)(d)(e)."

PROGRESS PAYMENTS (BDE)
Effective: November 2, 2013

Revise Article 109.07(a) of the Standard Specifications to read:

"(a) Progress Payments. At least once each month, the Engineer will make a written estimate of the quantity of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than $1000.00 will be approved for payment other than the final payment.

Progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics' Lien Act, 770 ILCS 60/23(c).

If a Contractor or subcontractor has defaulted on a loan issued under the Department's Disadvantaged Business Revolving Loan Program (20 ILCS 2705/2705-610), progress payments may be reduced pursuant to the terms of that loan agreement. In such cases, the amount of the estimate related to the work performed by the Contractor or subcontractor, in default of the loan agreement, will be offset, in whole or in part, and vouchered by the Department to the Working Capital Revolving Fund or designated escrow account. Payment for the work shall be considered as issued and received by the Contractor or subcontractor on the date of the offset voucher. Further, the amount of the offset voucher shall be a credit against the Department's obligation to pay the Contractor, the Contractor's obligation to pay the subcontractor, and the Contractor's or subcontractor's total loan indebtedness to the Department. The offset shall continue until such time as the entire loan indebtedness is satisfied. The Department will notify the Contractor and Fund Control Agent in a timely manner of such offset. The Contractor or subcontractor shall not be entitled to additional payment in consideration of the offset.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved."

RIGID METAL CONDUIT (BDE)
Effective: August 1, 2014

Add the following to Article 1088.01(a) of the Standard Specifications:

"(6) Stainless Steel Conduit. The conduit shall be Type 304 or Type 316 stainless steel, shall be manufactured according to UL Standard 6A, and shall meet ANSI Standard C80.1. Conduit fittings shall be Type 304 or Type 316 stainless steel and shall be manufactured according to UL Standard 514B.

All conduit supports, straps, clamps. And other attachments shall be Type 304 or Type 316 stainless steel. Attachment hardware shall be stainless steel according to Article 1006.31."

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"."

TRAINING SPECIAL PROVISIONS (BDE)
Effective: October 15, 1975

This Training Special Provision supersedes Section 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be **4**. In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather then clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The Contractor shall provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

Method of Measurement. The unit of measurement is in hours.

Basis of Payment. This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price, and total price have been included in the schedule of prices.

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION (TPG)

Effective: August 1, 2012 Revised: February 1, 2014

In addition to the Contractor's equal employment opportunity affirmative action efforts undertaken as elsewhere required by this Contract, the Contractor is encouraged to participate in the incentive program to provide additional on-the-job training to certified graduates of IDOT funded pre-apprenticeship training programs outlined by this Special Provision.

It is the policy of IDOT to fund IDOT pre-apprenticeship training programs throughout Illinois to provide training and skill-improvement opportunities to assure the increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The intent of this IDOT Training Program Graduate (TPG) Special Provision is to place certified graduates of these IDOT funded pre-apprentice training programs on IDOT project sites when feasible, and provide the graduates with meaningful on-the-job training intended to lead to journey-level employment. IDOT and its sub-recipients, in carrying out the responsibilities of a state contract, shall determine which construction contracts shall include "Training Program Graduate Special Provisions." To benefit from the incentives to encourage the participation in the additional on-the-job training under this Training Program Graduate Special Provision, the Contractor shall make every reasonable effort to employ certified graduates of IDOT funded Pre-apprenticeship Training Programs to the extent such persons are available within a reasonable recruitment area.

Participation pursuant to IDOT's requirements by the Contractor or subcontractor in this Training Program Graduate (TPG) Special Provision entitles the Contractor or subcontractor to be reimbursed at $15.00 per hour for training given a certified TPG on this contract. As approved by the Department, reimbursement will be made for training persons as specified herein. This reimbursement will be made even though the Contractor or subcontractor may receive additional training program funds from other sources for other trainees, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving other reimbursement. For purposes of this Special Provision the Contractor is not relieved of requirements under applicable federal law, the Illinois Prevailing Wage Act, and is not eligible for other training fund reimbursements in addition to the Training Program Graduate (TPG) Special Provision reimbursement.

No payment shall be made to the Contractor if the Contractor or subcontractor fails to provide the required training. It is normally expected that a TPG will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project through completion of the contract, so long as training opportunities exist in his work classification or until he has completed his training program. Should the TPG's employment end in advance of the completion of the contract, the Contractor shall promptly notify the designated IDOT staff member under this Special Provision that the TPG's involvement in the contract has ended and supply a written report of the reason for the end of the involvement, the hours completed by the TPG under the Contract and the number of hours for which the incentive payment provided under this Special Provision will be or has been claimed for the TPG.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting its performance under this Special Provision.

METHOD OF MEASUREMENT: The unit of measurement is in hours.

BASIS OF PAYMENT: This work will be paid for at the contract unit price of $15.00 per hour for certified TRAINEES TRAINING PROGRAM GRADUATE. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

The Contractor shall provide training opportunities aimed at developing full journeyworker in the type of trade or job classification involved. The initial number of TPGs for which the incentive is available under this contract is **4**. During the course of performance of the Contract the Contractor may seek approval from the Department for additional incentive eligible TPGs. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the TPGs are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this Special Provision. The Contractor shall also insure that this Training Program Graduate Special Provision is made applicable to such subcontract if the TPGs are to be trained by a subcontractor and that the incentive payment is passed on to each subcontractor.

For the Contractor to meet the obligations for participation in this TPG incentive program under this Special Provision, the Department has contracted with several entities to provide screening, tutoring and pre-training to individuals interested in working in the applicable construction classification and has certified those students who have successfully completed the program and are eligible to be TPGs. A designated IDOT staff member, the Director of the Office of Business and Workforce Diversity (OBWD), will be responsible for providing assistance and referrals to the Contractor for the applicable TPGs. For this contract, the Director of OBWD is designated as the responsible IDOT staff member to provide the assistance and referral services related to the placement for this Special Provision. For purposes of this Contract, contacting the Director of OBWD and interviewing each candidate he/she recommends constitutes reasonable recruitment.

Prior to commencing construction, the Contractor shall submit to the Department for approval the TPGs to be trained in each selected classification. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. No employee shall be employed as a TPG in any classification in which he/she has successfully completed a training course leading to journeyman status or in which he/she has been employed as a journeyman. Notwithstanding the on-the-job training purpose of this TPG Special Provision, some offsite training is permissible as long as the offsite training is an integral part of the work of the contract and does not comprise a significant part of the overall training.

Training and upgrading of TPGs of IDOT pre-apprentice training programs is intended to move said TPGs toward journeyman status and is the primary objective of this Training Program Graduate Special Provision. Accordingly, the Contractor shall make every effort to enroll TPGs by recruitment through the IDOT funded TPG programs to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance and entitled to the Training Program Graduate Special Provision $15.00 an hour incentive.

The Contractor or subcontractor shall provide each TPG with a certificate showing the type and length of training satisfactorily completed.

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012 Revised: April 2, 2015

The Contractor shall submit 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 for DBE goal credit.

The report shall be submitted to the Engineer on Department form “SBE 723” within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur.

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.

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor 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 DOT-assisted contracts. 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 contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. Davis-Bacon and Related Act Provisions

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for

debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded,"

as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the

certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONSTRUCTION CONTRACTS

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision shall be the minimum paid by contractors and subcontractors to laborers and mechanics.