

107

November 5, 2021 Letting

Notice to Bidders, Specifications and Proposal



**Contract No. 62M86
Various Counties
Section 2020-213-I
Various Routes
District 1 Construction Funds**

Prepared by

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Checked by

(Printed by authority of the State of Illinois)



- 1. TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. November 5, 2021 prevailing time at which time the bids will be publicly opened from the iCX SecureVault.
- 2. DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 62M86
Various Counties
Section 2020-213-I
Various Routes
District 1 Construction Funds**

This contract is for annual maintenance of electrical systems including the Signal Systems, Lighting Systems, Pump Station Systems, Surveillance System and other Electrical Systems, many subsystems and components, mechanical system and including buildings, structures and grounds located within District 1.

- 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

Omer Osman, P.E.
Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2021

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

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 4-1-16) (Revised 1-1-21)

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STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted April 1, 2016, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of Various Routes, Section 2020-213-I, Various Counties, Contract No. 62M86, and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

**Various Routes
Section 2020-213-I
Various Counties
Contract No. 62M86**

DESCRIPTION OF WORK

Annual maintenance and operations of 2564 Traffic Signal locations, 1405 Surveillance locations, 47 Pump Stations, 570 Lighting locations, 111 Various locations, 1600 Light Towers, 20,000 Light Poles, 59 Dynamic Message Signs, 258 Traffic Monitoring Cameras, 256 Reversible Lane Access Control items, 40 Ramp Gates, 16 Communication Huts and which includes but is not limited to electrical systems, mechanical systems, communication systems, buildings and structures, and equipment such as, I-NET, EMCMS, underpass fixtures, illuminated signs, Bluetooth devices, the fiber network, layer 2 and layer 3 network equipment, alarm monitoring systems, 500 planned locations of various equipment, plus non-routine work which can include 6,150 ft. galvanized steel conduit; 1,800 ft electrical cable assembly; 9,000 ft. electric cable; 13,500 ft. fiber cable; 27 handholes; 38 inspections of standby generators; 7,500 ft. of unit duct; 100 breakaway devices; 27 lighting controllers; 160 ft light pole foundation; 25 metal light pole foundations; 25 light pole kits; 2 light towers; 4000 ft. light tower clean and paint; 20 fluorescent luminaires; 2 times wash walls at Hubbard's Cave, 12 pump rebuilds; 100 pump vibration testing and analysis; 500 sq. yds. wet pit cleaning; 1500 ft. detector loop; 2 steel mast arm assemblies and poles; 68 LED signal heads; 5 video detection systems; 1 wireless interconnect system; 10 single lane and 10 two lane traffic control, as located within District 1 or maintained by District 1 in surrounding counties, such as Kendall, Grundy and LaSalle, as specified herein.

1.2 SCHEDULE OF PRICES – BIDDING SHEETS

Bidders must submit the Schedule of Prices (Routine and Non-Routine Maintenance Items) fully completed with monthly and yearly costs/extensions by scanning to the Illinois Department of Transportation bid site for Contract 62M86 as “miscellaneous documents” for a valid bid.

ROUTINE MAINTENANCE ITEMS

Pay Code & Name	Number of Equipment Locations to Maintain	Unit	Bid Price per Location	Monthly Cost	Yearly Cost
T-1A – Traffic Signal Metal Poles and Post Type	2564	EA	\$	\$	\$
T-1B – Traffic Signal Span Wire Type	29	EA	\$	\$	\$
T-2A – Flashing Overhead Mount Beacons	20	EA	\$	\$	\$
T-2B – Flashing Low Mount Beacons	278	EA	\$	\$	\$
S-1 – Ramp Metering Controls	105	EA	\$	\$	\$
S-2 – Cabinets and Detection	671	EA	\$	\$	\$
S-3 – DMS (Dynamic Message Signs)	59	EA	\$	\$	\$
S-4 – REVLAC (Reversible Land Control System)	256	EA	\$	\$	\$
S-5 – Cameras (for Traffic Monitoring)	258	EA	\$	\$	\$

S-6 – Buildings/Huts, Towers/Monopole, Fiber Optic Connections, Network Equipment	16	EA	\$	\$	\$
S-7 – Ramp Gates (Homeland Security Installations)	40	EA	\$	\$	\$
L-1 – Expressway Lighting	219	EA	\$	\$	\$
L-2 – Arterial Lighting (includes Signs)	222	EA	\$	\$	\$
L-3 – Combo Lighting	114	EA	\$	\$	\$
L-4 – Navigational Lighting	19	EA	\$	\$	\$
P-1 – Pump Stations	44	EA	\$	\$	\$
V-1 – Various Equipment	111	EA	\$	\$	\$
Total:	5025	--	--	\$	\$

PLANNED LOCATIONS: 500	Refer to Article 6.0 Payment of Master Auth. & Invoices
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Planned Locations are locations which at the time of Contract development were not ON-Maintenance or are future new locations to be maintained by the Contractor. Those locations with known addresses are shown in Section 3.

If the number of Contractor monthly maintained locations exceeds 5525 locations (total bidding number of locations (5025) plus the number of Planned Locations (500) the Contractor shall receive the bid price each, for an Additional Location through non-routine pay item GRM1.

Revised 9/2/2021

NON-ROUTINE MAINTENANCE ITEMS

Item	Item Description	Unit	Quantity	Unit Cost	Extension
GA01	Aerial Cable, with Messenger Wire, 4-1/C up to No. 2	FT	1500	\$	\$
GC01	Conduit, Galvanized Steel, Attached to Structure 3/4" to 2 1/2"	FT	2500	\$	\$
GC02	Conduit, Galvanized Steel, Attached to Structure 3" to 5"	FT	200	\$	\$
GC03	Conduit, Galvanized Steel, Attached to Structure, PVC Coated, 3/4" to 2 1/2"	FT	2000	\$	\$
GC04	Conduit, Galvanized Steel, Attached to Structure, PVC Coated, 3" to 5"	FT	200	\$	\$
GC05	Conduit, Galvanized Steel, in Ground, 3/4" to 2 1/2"	FT	1000	\$	\$
GC06	Conduit, Galvanized Steel, in Ground, 3" to 5"	FT	250	\$	\$
GC07	Conduit, Non-Metallic, Coillable, in Ground, Up to 1 1/2"	FT	3000	\$	\$
GC08	Conduit, Removal	FT	2000	\$	\$
GE01	Electric Cable Assembly, XLP, 3/C No. 2, 1/C No. 6 Green	FT	800	\$	\$
GE02	Electric Cable Assembly, XLP, 3/C No. 4, 1/C No. 6 Green	FT	1000	\$	\$
GE03	Electric Cable, XLP, 1/C up to No. 4	FT	6000	\$	\$

GE04	Electric Cable, XLP, 1/C No. 2 to No. 2/0	FT	2500	\$	\$
GE05	Electric Cable, XLP, 1/C No. 3/0 to No. 500 MCM	FT	1000	\$	\$
GE06	Electric Cable, Pull or Remove	FT	7000	\$	\$
GE07	Electric Cable, THWN, 1/C from No. 14 to No. 8	FT	6000	\$	\$
GEC1	Ethernet Cable, Outside Plant CAT 5e	FT	2500	\$	\$
GF01	Fiber Optic Trunk/Distribution Lateral Cable up to 96 SM	FT	11000	\$	\$
GF02	Fiber Optic Cable, Hybrid, 12 MM & 24 SM	FT	2500	\$	\$
GF03	Fiber Optic Termination Panel 12F or 24F	EA	5	\$	\$
GF04	Fiber Optic Patch Panel 96 SM	EA	5	\$	\$
GF05	Fiber Optic Splice Enclosure	EA	5	\$	\$
GF06	Fiber Optic Innerduct, up to 1 1/2"	FT	11000	\$	\$
GF07	Fiber Optic Cable, Install Only	FT	11000	\$	\$
GFR1	Foundation, Concrete, Type 1	FT	20	\$	\$
GFR2	Foundation Removal	EA	25	\$	\$

GGR1	Ground Rod	EA	20	\$	\$
GH01	Handhole	EA	10	\$	\$
GH02	Handhole, Fiber Optic	EA	5	\$	\$
GH03	Handhole, Heavy-Duty	EA	5	\$	\$
GH04	Handhole, Heavy-Duty, Double	EA	5	\$	\$
GH05	Handhole, Heavy-Duty, Special	EA	2	\$	\$
GH06	Handhole, Remove	EA	8	\$	\$
GH07	Handhole, Re-build	EA	8	\$	\$
GH08	Handhole, Re-build Existing to Heavy-Duty Type	EA	10	\$	\$
GIG1	Inspection, Standby Generator	EA	38	\$	\$
GJ01	Junction Box, and all appurtenances, Remove	EA	10	\$	\$
GJ02	Junction Box, Stainless Steel, up to 6" Depth	EA	10	\$	\$
GJ03	Junction Box, stainless Steel, 10" Depth	EA	5	\$	\$
GLH1	Certified Electrician/Journeyman	HR	750	\$	\$

GLH2	IT Support	HR	750	\$	\$
GLH3	Maintenance Helper	HR	500	\$	\$
GLH4	Foreman	HR	500	\$	\$
GPV1	Pavement Sealcoating	SY	1000	\$	\$
GR01	Receptacle, Electrical Outlet, GFC1 Type	EA	30	\$	\$
GR02	Receptacle, Convenience, 20 Amp	EA	20	\$	\$
GR03	Receptacle, for Welding, 3 Pole, 60 Amp, Furnish and Install	EA	2	\$	\$
GRB1	Radio Tower Beacon Relamp	EA	10	\$	\$
GRM1	Routine Maintenance Additional Location	EA	100	\$	\$
GSD1	Sidewalk, Remove and Replace	SF	500	\$	\$
GTC1	Single Lane, Traffic Control	EA	10	\$	\$
GTC2	Two Lane, Traffic Control	EA	10	\$	\$
GU01	Uniduct, XLP, 3/C No. 6 & 1/C No. 8 Green, 1"	FT	3000	\$	\$
GU02	Uniduct, XLP, 3/C No. 4 & 1/C No. 6 Green, 1 1/4"	FT	3000	\$	\$

GU03	Uniduct, XLP, 3/C No. 2 & 1/C No. 6 Green, 1 1/2"	FT	1500	\$	\$
GVB1	Budgetary Allowance for Electrical Maint. System	LS	1	\$ 200,000.00**	\$ 200,000.00**
LA01	Arm or Twin Arm with Luminaire, Install Only	EA	10	\$	\$
LA02	Mast Arm or Twin Mast Arm	EA	10	\$	\$
LB01	Breakaway Device, T-Base	EA	100	\$	\$
LBB1	Breaker, Branch, 20A to 70A	EA	10	\$	\$
LBB2	Breaker, Main, 80A to 250A	EA	5	\$	\$
LBT1	Buck Boost Transformer	EA	5	\$	\$
LC01	Controller, Duplex Console, with Radio	EA	4	\$	\$
LC02	Controller, Duplex Console, Without Radio	EA	3	\$	\$
LC03	Controller, Lighting, Install only	EA	8	\$	\$
LC04	Controller, Lighting, Remove & Salvage	EA	6	\$	\$
LC05	Controller, Single Door Console, Without Radio	EA	4	\$	\$
LC06	Controller, Combination Lighting	EA	2	\$	\$

LCL1	Clock, Digital Astronomical	EA	8	\$	\$
LCN1	Contactor, 125A to 250A	EA	3	\$	\$
LCN2	Contactor, 30A to 100A	EA	3	\$	\$
LD01	Decal Set, Lighting Unit, Pole	EA	120	\$	\$
LD02	Decal Set, Lighting Unit, Tower	EA	50	\$	\$
LD03	Decal Set, Lighting Unit, Tunnel or Underpass with Bracket	EA	150	\$	\$
LD04	Decal Set, Lighting Unit, Tower with Camera	EA	50	\$	\$
LDS1	Disconnect Switch	EA	3	\$	\$
LDS2	ON/OFF Switch	EA	12	\$	\$
LDS3	Motion Sensor	EA	10	\$	\$
LF01	Foundation, Light Pole, Concrete	L.FT.	100	\$	\$
LF02	Foundation, Light Pole, Metal	EA	25	\$	\$
LF03	Foundation, Light Tower, up to 54" Diameter	L.FT.	60	\$	\$
LF04	Foundation, Lighting Controller	EA	8	\$	\$

LP01	Light Pole, Kit	EA	25	\$	\$
LP02	Light Pole Unit, Install Only	EA	25	\$	\$
LP03	Light Pole Unit, Removal & Salvage	EA	25	\$	\$
LP04	Wood Pole Unit, Install only	EA	15	\$	\$
LP05	Wood Pole, Removal & Salvage	EA	15	\$	\$
LPN1	Panel, Distribution	EA	2	\$	\$
LT01	Light Tower, 110' or less	EA	1	\$	\$
LT02	Light Tower, 111' or more	EA	1	\$	\$
LT03	Light Tower, in Place, Clean and Paint	FT	4000	\$	\$
LT04	Light Tower, Remove and Re-erect	EA	2	\$	\$
LT05	Light Tower, Install only	EA	2	\$	\$
LU01	Luminaire, LED - 14K, Pole	EA	100	\$	\$
LU02	Luminaire, LED - 28K, Pole	EA	200	\$	\$
LU03	Luminaire, Pole, Install Only	EA	20	\$	\$

LU04	Luminaire Shield, Pole	EA	20	\$	\$
LU05	Luminaire, Keeper	EA	100	\$	\$
LU06	Luminaire, Removal & Salvage	EA	300	\$	\$
LU07	Luminaire, LED - 28K, Tower	EA	50	\$	\$
LU08	Luminaire, LED - 50K, Tower	EA	50	\$	\$
LU09	Luminaire, LED - 65K, Tower	EA	20	\$	\$
LU10	Luminaire, Tower, Install only	EA	12	\$	\$
LU11	Luminaire Shield, Tower	EA	12	\$	\$
LU12	Luminaire, Navigation, LED	EA	10	\$	\$
LU13	Luminaire, Fluorescent	EA	10	\$	\$
LU14	Luminaire, Fluorescent, for Wet Locations	EA	10	\$	\$
LU15	Luminaire, LED, for Building Roof	EA	6	\$	\$
LU16	Luminaire, LED, for Wall	EA	10	\$	\$
LU17	Emergency Exit Light Fixture	EA	10	\$	\$

LU18	Luminaire, LED, Underpass or Tunnel	EA	30	\$	\$
LW01	Wash Hubbard's Cave, Tiled Tunnel Walls	EA	2	\$	\$
PALR	Alarm, Intrusion Override Key Switch	EA	50	\$	\$
PCCS	Coating, Concrete Surface	SF	6000	\$	\$
PI01	Inspection, Automatic Bus Transfer System	EA	4	\$	\$
PI02	Inspection, Auto Transfer Switch	EA	40	\$	\$
PI03	Inspection, Switchgear System	LS	1	\$	\$
PI04	Inspection, Motor Starter, Soft Start Type	EA	5	\$	\$
PI05	Inspection, Backflow Preventer	EA	8	\$	\$
PI06	Inspection, Pump	EA	35	\$	\$
PRBA	Pump Rebuild A	EA	4	\$	\$
PRBB	Pump Rebuild B	EA	8	\$	\$
PS01	Pump, Vibration Testing and Analysis	EA	100	\$	\$
PVB1	Budgetary Allowance for Pump Repair Services/Replacement	LS	N/A	\$ 400,000.00**	\$ 400,000.00**

PW01	Wet Pit, Cleaning and Power Wash	SY	500	\$	\$
SBTD	Bluetooth Detector	EA	7	\$	\$
S300	Cabinet, Type 3, for Surveillance	EA	1	\$	\$
S334	Cabinet, Type 334, for Surveillance	EA	3	\$	\$
SC01	Cable, Electrical in Conduit, 4/C No. 18, Shielded Loop Detector	FT	1000	\$	\$
SCC1	Camera & Cabinet Control Maintenance	EA	12	\$	\$
SCC2	Camera Lowering Device	EA	4	\$	\$
SCC3	Camera Lowering Device Tower	EA	9	\$	\$
SCC4	CCTV Camera Pole	EA	4	\$	\$
SCC5	CCTV Dome Video Camera, High Definition	EA	10	\$	\$
SCL1	Controller, Linux ATC	EA	20	\$	\$
SDET	Detection Integration Device	EA	10	\$	\$
SDL1	Detector Loop, Round, Square or Rectangular	FT	300	\$	\$
SDL2	Detector, Inductive Loop, Amp 2-Channel Rack Mount	EA	10	\$	\$

SDMI	DMS Inverter and Batteries, Skyline DMS	EA	3	\$	\$
SDMS	DMS Sign Walk In Expressway	EA	2	\$	\$
SEMC	Ethernet Media Converter	EA	10	\$	\$
SEMS	Ethernet Managed Switch	EA	10	\$	\$
SIAS	Inspection, Automatic Suppression System	EA	2	\$	\$
SRIC	Ramp Metering Inspection & Cleaning	EA	118	\$	\$
SS01	Signaling Load Relay, Mechanical	EA	88	\$	\$
ST01	Telecommunication Cable, Inline Connectors & Termination	EA	50	\$	\$
ST02	Telecommunication Cable, No 19/6 Pair	FT	500	\$	\$
SUPS	UPS System, Inspection	EA	1	\$	\$
SVB1	Budgetary Allowance For Ramp Gates	LS	1	\$ 80,000.00**	\$ 80,000.00**
SWD1	Wireless in Pavement Detector	EA	50	\$	\$
SWD2	Wireless Vehicle Detection Solar Repeater	EA	3	\$	\$
SWD3	Wireless Vehicle Detection System	EA	12	\$	\$

SWP1	Surveillance Watch & Protect	HR	300	\$	\$
TC01	Full Actuated Controller in Type IV Cabinet	EA	30	\$	\$
TC02	Full Actuated Controller in Type V Cabinet	EA	1	\$	\$
TC03	Full Actuated Controller in Cabinet With RR Equipment	EA	3	\$	\$
TC04	Full Actuated Controller	EA	20	\$	\$
TC05	Install Existing Traffic Signal Controller	EA	5	\$	\$
TC06	Install Existing Traffic Signal Controller and Cabinet	EA	3	\$	\$
TC07	Controller and Cabinet Modification	EA	5	\$	\$
TC08	Traffic Signal Master Controller	EA	5	\$	\$
TC09	Install Telephone Line and Modem	EA	1	\$	\$
TC10	Install Updated Software or PROM Set at Existing Local or Master Controller	EA	1	\$	\$
TC11	UPS System	EA	5	\$	\$
TC12	Relocate or Install Existing UPS System	EA	1	\$	\$
TC13	Cellular Communications System	EA	1	\$	\$

TD01	Drill Existing Handhole	EA	15	\$	\$
TE01	Electric Cable No. 14 2/C	FT	3000	\$	\$
TE02	Electric Cable No. 14 3/C	FT	2000	\$	\$
TE03	Electric Cable No. 14 5/C	FT	5000	\$	\$
TE04	Electric Cable No. 14 7/C	FT	2000	\$	\$
TE05	Electric Cable No. 14 2/C, Twisted Shielded	FT	1500	\$	\$
TEC1	Electric Cable in Conduit, Tracer No. 14 1/C	FT	2000	\$	\$
TEC2	Electric Cable No. 14, 3/C, Railroad	FT	500	\$	\$
TF01	Concrete Foundation, Type A	FT	60	\$	\$
TF02	Concrete Foundation, Type D	FT	4	\$	\$
TF03	Concrete Foundation, Type C	FT	4	\$	\$
TF04	Concrete Foundation, Type E 30 inch Diameter	FT	60	\$	\$
TF05	Concrete Foundation, Type E 36 inch Diameter	FT	60	\$	\$
TF06	Concrete Foundation, Type E 42 inch Diameter	FT	60	\$	\$

TF07	Concrete Foundation, Rebuild/Modify, Type D	EA	1	\$	\$
TFB1	Flashing Beacon, Post Mount, 1 Face	EA	2	\$	\$
TFB2	Flashing Beacon, Solar, Post Mount, 1 Face	EA	4	\$	\$
TGS1	Traffic Signal Additional Grounding and Electric Service Upgrade	EA	5	\$	\$
TGS2	Electric Service Relocation	EA	5	\$	\$
TGS3	Electric Service Installation, Ground Mounted	EA	5	\$	\$
TL01	Inductive Loop Detector	EA	250	\$	\$
TL02	Detector Loop	FT	1500	\$	\$
TMA1	Steel Mast Arm Assembly and Pole 28 ft to 40 ft	EA	1	\$	\$
TMA2	Steel Mast Arm Assembly and Pole 42 ft to 55 ft	EA	1	\$	\$
TMA3	Relocate or Install Existing Mast Arm Assembly and Pole From Contract Spare Parts	EA	1	\$	\$
TPP1	Pedestrian Push-Button Post, Galvanized Steel	EA	3	\$	\$
TPP2	Pedestrian Push-Button Latching and Non-Latching	EA	25	\$	\$
TPP3	Relocate Existing Pedestrian Push-Button	EA	15	\$	\$

TPP4	Pedestrian Push-Button, Replace Within Existing Housing	EA	16	\$	\$
TPP5	Pedestrian Push-Button Accessible Pedestrian Signals (APS) Type	EA	8	\$	\$
TSB1	Traffic Signal Backplate, Reflective	EA	16	\$	\$
TSD1	LED Signal Display	EA	15	\$	\$
TSL1	LED Signal Head, 3 Section	EA	15	\$	\$
TSL2	LED Signal Head, 4 Section	EA	5	\$	\$
TSL3	LED Signal Head, 5 Section	EA	5	\$	\$
TSL4	LED Signal Head, Optically Programmed, 3 Section	EA	2	\$	\$
TSL5	LED Signal Head, Optically Programmed, 5 Section	EA	2	\$	\$
TSL6	LED Signal Face, Lens Cover	EA	12	\$	\$
TSL7	LED Signal Face, Visor Heater	EA	12	\$	\$
TSL8	LED Pedestrian Signal Head	EA	8	\$	\$
TSL9	LED Pedestrian Signal Head, Countdown	EA	16	\$	\$
TSR1	Remove Signal Section or Head	EA	5	\$	\$

TSR2	Relocate or Install Existing Signal Section or Head	EA	10	\$	\$
TT01	Span Wire Traffic Signal Installation with Electric Service and UPS	EA	1	\$	\$
TTP1	Traffic Signal Post, 10 ft to 18 ft	EA	10	\$	\$
TTP2	Remove Traffic Signal Post	EA	8	\$	\$
TTP3	Remove Mast Arm Assembly and Pole	EA	2	\$	\$
TTP4	Relocate Existing Traffic Signal Post, 10 ft to 18 ft	EA	1	\$	\$
TVB1	Budgetary Allowance for Maintaining TS System Management & Communications	LS	1	\$ 150,000.00**	\$ 150,000.00**
TVD1	Video Detection System, Complete Intersection	EA	1	\$	\$
TVD2	Video Detection System, One Approach	EA	2	\$	\$
TVD3	Video Detection System, Two Approach	EA	2	\$	\$
TWD1	Radar Detection System, Complete Intersection	EA	1	\$	\$
TWD2	Radar Detection System, One Approach	EA	2	\$	\$
TWD3	Radar Detection System, Two Approach	EA	2	\$	\$
TWI1	Wireless Interconnect System	EA	1	\$	\$

** Budgetary Allowance, a fixed bid amount due to unknown work quantities or material items at the time of Contract development.

Routine Total: \$

Non-Routine Total: \$

Total Bid Contract 62M86: \$

1.3 BIDDING INFORMATION

1. The undersigned bidder submits herewith, in accordance with the rules and instructions, a schedule of prices for the items of work for which bids are sought.
2. The Contractor, for specified unit prices listed under the Schedule of Prices, shall conform to all requirements as specified herein these articles.
3. Each Pay Item shall have a unit price and a total price (extension).
4. The unit prices bids are in U.S. dollars and cents.
5. The unit price shall govern if no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity.
6. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.
7. A bid will be declared unacceptable if neither unit price nor a total price is shown.
8. The Department is under no obligation to authorize non-routine pay item work. Non-routine work will be authorized based on preventative maintenance assessments, ongoing operational needs, and system inspections.
9. The quantities appearing in the bid schedule are approximate and are provided for obtaining a gross sum for the comparison of bids.
10. Payment to the Contractor awarded the Contract will be made only for actual quantities of work performed and accepted or materials furnished according to the Contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased, or omitted.
11. The Contractor's unit prices are expected to be realistic and no additional compensation will be allowed due to a variance in quantities; however, the Engineer retains the right to seek a revised unit price when quantities exceed Department expected usage.
12. The Engineer also retains the right to use force account procedures or use other procurement means available to the Department where unit prices reflect pricing significantly higher than Department projected norms. The Contractor is cautioned against unbalanced bidding and is directed to Article 104.01 of the Standard Specifications.

1.3.1 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK

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

The prospective bidder shall be responsible for any pre-existing maintenance deficiencies that may exist at the time this contract is awarded, and his/her bid shall reflect these deficiencies. If this bid is accepted, he/she will be responsible for all errors in his proposal resulting from his failure or neglect

to comply with these instructions. The Department will, in no case, be responsible for any change in anticipated profits resulting from such failure or neglect.

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

1.3.2 PROPOSAL GUARANTY

Each proposal shall be accompanied by either a bid bond on the Department form, executed by a corporate surety company, satisfactory to the Department, or a bank cashier's check or a properly certified check for Seven Hundred Thousand Dollars (\$700,000) made payable to the Treasurer, State of Illinois. The proposal guaranty checks will be returned as prescribed in Section 103.03 of the Standard Specifications. Bid bonds will not be returned.

1.3.3 REQUIREMENT OF CONTRACT BOND

The successful bidder, at the time of execution of the Contract, shall deposit with the Department a surety bond in the amount of twenty million dollars (\$20,000,000). The form of the bond shall be acceptable to the Department.

1.3.4 INSURANCE

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

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

Employers Liability

Each Accident \$12,500,000

Commercial General Liability

General Aggregate Limit \$12,500,000

Products-Completed Operations

Aggregate Limit \$12,500,000

Each Occurrence Limit \$12,500,000

Commercial Automobile Liability Bodily Injury & Property Damage

Liability Limit Each Occurrence \$ 12,500,000

Umbrella Liability Refer to Art.107.27

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

The customary exclusion that negates coverage when working within 50 feet of a railroad track shall be eliminated from the Liability policy and the certificates submitted shall plainly state that coverage extends to work being done on or over track right-of-way. The Contractor shall carry a railroad protective insurance policy for the purpose of maintaining traffic signal facilities and appurtenances on railroad right-of-way (R.O.W.).

The policy shall cover the Contractor's crews performing normal routine maintenance on traffic signal heads and other traffic signal related items attached directly to the railroad's truss or structure containing the railroad's warning devices. (This coverage is required for all existing locations with traffic signal heads attached directly to railroad structures, or with existing railroad interconnects.)

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

The Contractor shall provide insurance coverage for all EMC Spare Parts Inventory in the possession of the Contractor or in the EMC Spare Parts Warehouse or other specified areas, for losses due to fire, theft, or vandalism. Estimated value of current stock on hand is approximately \$500,000.

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

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

1.3.5 INDEMNIFICATION

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

1.3.6 QUALIFICATIONS TO BID

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

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

1.4 MANDATORY PRE-BID MEETING

A mandatory pre-bid meeting will be conducted for bidders to receive a packet of additional charts, data, and specifications as part of the Contract to assist in the bidding process, and to submit the Bidder's Special Qualifications requirements. Only those bidders who submit the Bidder's Special Qualifications submittal will receive this additional Contract information.

The Pre-Bid Meeting will be held at 10:30AM, on Monday, October 18, 2021 at:

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

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

Copies of Contract 62M86 will not be available at the mandatory Pre-Bid Meeting. The Contract may be printed from the Illinois Department of Transportation website.

Although Department personnel will not answer questions at the Pre-Bid Meeting, each prospective bidder may submit a list of questions. The Department will allow each prospective bidder one

representative who may read the questions out loud for the other prospective bidders in attendance. The Department may or may not answer the questions in an Addendum. Questions may also be submitted on the Illinois Department of Transportation website for Contract 62M86, and these will be answered on the website.

The Department also welcomes the prospective bidders to submit a list of possible missing information or possible errors in the Contract. These items would be addressed, as necessary, in an Addendum.

If it is determined that a prospective bidder is qualified to perform the work, the Department will notify the bidder through the Illinois Department of Transportation website stating they are approved to bid on the Electrical Maintenance Contract 62M86.

1.4.1 BIDDERS' SPECIAL QUALIFICATIONS SUBMITTAL

The required submittal information is listed in points 1 through 10, as applicable to Contract article specifications herein.

The Special Bidder's Qualifications Submittal shall be presented to the Bureau Chief of Traffic Operations or his/her representative at the conclusion of the mandatory Pre-Bid Meeting.

The Special Qualifications submittal shall include:

1. Name of the bidding company and its owners and/or officers
2. An organizational chart that illustrates the structure of the organization, and meets personnel requirements as stated herein Article 3.3.
3. Resumes of the EMC Project Manager, each System Manager, and the designated Railroad Specialist (RR expertise) shall be provided to support their position qualifications.
4. Location address, square footage, and photos of:
 - Bidder's Current Headquarters
 - Proposed EMC Office
 - Proposed EMC Dispatch Center
 - Proposed Shop Facilities
5. The name of the proposed Fleet Management software for this Contract and details of its operations to meet the Contract requirements herein.
6. A report which provides the number, type, year of manufacture of vehicles in use in the bidder's current operations, and the number of any additional vehicles to be purchased or leased for work on this Contract.
7. A report which summarizes the number and types of maintenance/construction equipment currently owned or leased by the bidder and quantity and name of additional equipment to be purchased or leased for work on this Contract.
8. A report which details the bidder's familiarity and capability in installing and maintaining CCTV and video distribution systems.
9. A report which describes the bidder's familiarity with Allen-Bradley PLC equipment and troubleshooting of ladder logic used in the REVLAC system.
10. A report which describes the bidder's work on fiber optic systems.

11. A copy of the Contractor's confined space entry policy which shall be in full compliance with all OSHA requirements for the duration of this Contract.

1.4.2 COVERSHEET

The coversheet of the Bidders' Special Qualifications Submittal shall be signed by an official of Company with signature authority, and the proposed EMC Project Manager and shall contain a statement that each has read the Contract and understands the method of payment for work as described herein and that the Special Qualification information submitted is accurate and truthful.

1.4.3 RECEIPT AND ANALYSIS OF SUBMITTAL

All bidders who submit a Bidders' Special Qualifications Submittal, in person, at the time of the Pre-Bid Meeting official conclusion (the time as such to be recorded on the meeting sign-in sheet) will be furnished with a receipt which states that the Special Bidder Qualifications submittal was received within the required time deadline.

The submitted information will be analyzed and, if requested by the Department, the prospective bidder shall facilitate an inspection of its facilities and/or equipment. The Department shall determine the aggregate suitability and acceptability of the qualification information submitted

If it is determined that a prospective bidder is qualified to perform the work, the Department will notify the bidder through the Illinois Department of Transportation website stating they are approved to bid on the Electrical Maintenance Contract 62M86.

1.4.4 SITE INSPECTIONS

After the conclusion of the Pre-Bid Meeting, a Department representative will meet with a representative of each prospective bidder/Contractor who submitted a Special Bidder's Qualifications Submittal to determine the bidder's desired site inspections, and a preferred date of inspection. Bidders are expected to be familiar with the type and extent of systems covered under the Contract.

ARTICLE 2.0 BASIC CONTRACT REQUIREMENTS AND ADMINISTRATION

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ARTICLE 2.0 BASIC CONTRACT REQUIREMENTS AND ADMINISTRATION

2.1 BIDDING

Unless labor, equipment, or material purchase, is specifically noted herein as paid through non-routine maintenance, Article 2.0 Basic Contract Requirements and Administration work shall be paid through, is part of, and is included in routine maintenance bid items.

The list of locations and description of equipment/items provided herein each System and Section 3 are for bidding purposes only. Actual quantities of locations with equipment to be maintained is the responsibility of the Contractor as of January 1, 2022. The Contractor will be provided with a hard copy list of current locations to be maintained as of January 1, 2022.

2.2 TERM

The Contract shall be valid for operations from 12:00 a.m. on January 1, 2022 through 11:59 p.m. (midnight) on December 31, 2022.

The Contractor shall assure the Department that at 12:00 a.m. on January 1, 2022 the maintenance transfer is complete and transparent to the public, that the District's electrical systems remain continuously monitored, maintained, and fully operational.

All authorized routine and non-routine contract work shall be completed within each calendar year including but not limited to:

- Completion of work, submitted documentation, Department approval of work, and invoicing of all routine and non-routine work
- Approval of all EMCMS entry data and reports
- Confirmation of maintenance status of all IDOT owned locations
- Completion, submittal, and Department approval of all Preventive Maintenance Reports
- Submittal and Department approval of all certified payroll and EMCMS systems work reports
- Submittal and Department approval of all DBE/EEO reports

2.3 START-UP

Once the Contract is executed and the pre-construction submittals have been approved, the Contractor shall begin preparations to assume routine and non-routine maintenance responsibilities as specified herein. Preparatory work, including development of traffic signal patrol routes, transfer of contract spare parts inventory, purchase of materials for routine maintenance repairs, transfer of SCADA equipment, transfer of alarm receivers, and EMCMS equipment installation in the Contractor Dispatch, EMC Office, and other areas is required.

The Contractor shall inspect all locations to assure continued maintenance and operation of all systems specified in this Contract as of January 1, 2022. The Contractor shall be given access to all locations for inspection after the Pre-Construction Meeting, as arranged with the Engineer. The Contractor shall provide the Engineer a punch item list of items needing repair or replacement, and/or outstanding maintenance issues, per the view of the incoming Contractor, prior to January 1, 2022, however the Contractor is obligated to maintain all equipment, including the punch list items, as of January 1, 2022. The Department shall review all items on the punch list and respond in an equitable manner, authorizing repair or replacement work viewed as necessary.

The Contractor shall prepare their required secure and locked facility storage areas for delivery during the last half of December 2021 for Department owned contract spare parts not stored in the EMC Contract Spare Parts Storage Facility. The incoming Contractor shall arrange the transfer with the outgoing Contractor, which shall be supervised by Department personnel. Refer to Article 2.6.5 EMC Spare Parts Special Storage Facility/Area.

Refer to System Articles Herein for:

- Lock and Key Purchase and Replacement Requirements
- Contractor Owned Spare Parts Procurement Prior to Start of Contract

2.4 RENEWAL

The Department has the sole discretion to renew this Contract for two (2) additional terms. The Contractor shall accept the renewal of the Contract if offered by the Department. The Contract shall be terminated and closed if not renewed at the end of each contract year. The original Contract term and the renewal term shall be considered independent with respect to completion of work, payment, and withholding of payment as well as all associated work documentation.

The first renewal would extend the Contract for one additional term from 12:00 a.m. January 1, 2023, through 11:59 p.m. (midnight) December 31, 2023, per all revisions or amendments as defined. The second renewal would extend the Contract for one final term from 12:00 a.m. January 1, 2024, through 11:59 p.m. (midnight) December 31, 2024, per all revisions or amendments as defined. The Contract shall be terminated and closed December 31, 2024 without extensions or renewal.

Upon notification of the contract renewal date by the Department, the Contractor shall complete and submit IDOT's contract renewal form within fifteen (15) days of notification, together with documentation of the contract bond extension and copies of the required insurance policies for the renewal year as well as any other documentation required by the Department. Submittals required will be found on the Illinois Department of Transportation website.

If the Contract is renewed, the Department shall make the effort, if circumstances allow, to re-authorize in the renewal year, any work items cancelled from the prior contract year.

2.5 END/TRANSITION

It is the obligation of the Contractor to cooperate fully to facilitate the transition from this contract to any subsequent contract, and other transfers as noted herein. The Department will withhold the last routine monthly payment, or portion thereof, until the Engineer is satisfied that all work and documentation due the Department is completed, submitted, and approved.

2.5.1 LOCK AND KEY TRANSFER

On the last day of the contract termination year the outgoing Contractor shall make arrangements to submit to the Engineer all keys to IDOT System equipment, including alarm keys and keys to traffic signal cabinets, railroad cabinets, lighting cabinets, high mast towers, pump station gates, doors and hatches, base station fences and doors, navigational lighting equipment (including I-55 & Harlem Avenue bridge) and IDOT ramp gate keys, REVLAC, communication towers, special anti-theft locking devices coded key nut drivers and huts Keys. All existing, replacement and/or new locks added to the electrical systems during the Contract become the property of the Department. The Contractor shall relinquish to the Department any key boxes with all keys labeled with corresponding index book.

2.5.2 SPARE PARTS TRANSFER

During the last half of December of 2024, (or other date if this Contract is not renewed or cancelled) the Department owned contract spare parts not stored in the EMC Contract Spare Parts Storage Facility (warehouse) or any other spare parts owned by the Department in the possession of the outgoing Contractor shall be delivered to the incoming Contractor upon an agreed date, to locked and secure storage areas as approved by the Engineer, and as supervised by Department personnel.

The Contractor owned spare parts shall be used for contract work for the remaining days of the term of the Contract. The Contractor shall replace missing Department owned contract spare parts in kind due to damage or loss caused by any reason.

2.5.3 DOCUMENTATION TRANSFER

During the last weeks of December of 2024, (or other date if this Contract is not renewed or cancelled) the Contractor shall meet with the Engineer and decide which EMC Documentation from years 2022 through 2024 shall be made available to the upcoming Contractor. Items which must be transferred include Monthly Pay Meeting Agendas with Ticket reporting, MCHD Collection reports, and other spreadsheets, forms, and logs developed during the Contract which are not on the EMCMS.

2.6 CONTRACTOR FACILITIES

Required Contractor facilities within District 1, for the duration of this Contract, shall include facilities available for access or operations 24/7:

- EMC Office
(may be located in Contractor Headquarters or another Contractor Facility)
- EMC Dispatch Center (a 24/7 operation)
(may be located in Contractor Headquarters or another Contractor Facility)
- EMC Equipment Service Shop (or area)
- EMC Spare Parts Storage Facility (leased warehouse space)
- EMC Spare Parts Special Storage Facility/Areas
(Area of EMC Office or in another Contractor Facility)

Each facility must be approved by the Engineer prior to the Pre-Construction Meeting. The required facilities may be in separate locations but must be permanent structures. All facilities must meet OSHA requirements and State of Illinois safety and building codes. Refer to specific requirements for each required facility/area within this Article.

The Contractor may have other facilities for Contract work, if approved by the Engineer, geographically located as to support timely maintenance operations, and meet one-hour arrival times for incident response.

The Contractor shall provide insurance coverage for losses due to fire, theft or vandalism for all Department owned contract spare parts inventory in the possession of the Contractor at all times; including the approved/designated EMC Spare Parts Storage Facility, the EMC Spare Parts Storage Facility/Area for Items Needing Special Handling, or other storage location. Estimated value of current EMC spare parts on hand is approximately \$500,000.

All Contractor owned or leased facilities shall be available for a demonstration/inspection by the Department no later than December 15, 2021, with equipment ready for the January 1, 2022 start of operations.

The Contractor shall comply with the instructions given by the Engineer relating to the care, storage, and labeling of EMC Spare Parts inventory for identification purposes. The Engineer shall be allowed access to inspect the spare parts inventory at all storage and facility locations at any time.

2.6.1 EMC OFFICE

This EMC Office may be a satellite office remote from the Contractor's headquarters or it may be a singular and clearly defined section within the Contractor's in-District headquarters. In order to facilitate communication and shared interest in contract matters, the contract management and technical/administrative functions as defined herein and represented in the Contractor's organization chart shall not be dispersed throughout various areas of the Contractor's operations but shall be established here as an identifiable group with dedicated physical space.

The EMC Office shall be equipped by the Contractor with adequate lighting, voice and data communications lines, 64-bit Windows 10 computers or above, adequate printers, internet access, EMCMS access, and ability to establish private network (VPN) to the Department's private network.

Also, there shall be a space dedicated for use by IDOT personnel only, normally from 6 AM to 6 PM, or at times of emergency EMC operations. It shall have a standard size desk, proper chair, working telephone, EMCMS service connection/ability, use of laser printer capable of printing from IDOT personnel laptops and from the EMCMS, suitable power available, and a minimum two (2) drawer file cabinet modified for padlock. A new, medium strength, unopened packaged padlock and keys shall be furnished to the Engineer at the Pre-Construction Meeting.

2.6.2 EMC DISPATCH CENTER

The EMC Dispatch Center, a 24/7 facility operation shall be used for all EMC dispatching functions. Multiple dispatching locations are not allowed in this Contract. It shall be adequately equipped and staffed to service the EMC on a first-priority basis. (The dispatching function cannot be sub-contracted, use voicemail or answering services.)

The minimum number of required telephone lines available for incoming or outgoing dispatch service is eight (8). The Contractor shall also establish one "hot-line" instant telephone line (from and to) the IDOT ComCenter from the EMC Dispatch Center.

The Dispatch Center shall have a minimum of six (6) desks and chairs for dispatch personnel, shall be equipped by the Contractor with adequate lighting, voice and data communications lines, 64-bit windows 10 computers or above for EMCMS, adequate printers, internet access, and ability to establish private network (VPN) to the Department's private network.

The equipment listed below shall be located in the Dispatch Center unless another location is approved by the Engineer. The Dispatch Center personnel shall have ability to monitor/use/clear and provide accurate data entry for:

- System Alarms, including REVLAC alarm screens
- CLMS for traffic signals
- EMCMS
- SCADA systems (Pump Stations and Lighting)
- RACS
- SolarWinds
- 360VDS monitoring
- CCTV operations
- Other equipment monitoring

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

Proper rack(s) for all computer equipment shall be furnished, which shall be a minimum of eighteen (18) inches above floor level. The space shall be kept at a temperature optimum for proper performance of the required electronic equipment, and free of dust and/or other contaminants.

2.6.3 EQUIPMENT SERVICE SHOP

The Contractor shall have a facility for the testing and repair of traffic signal controllers under this contract, which shall be adequately equipped with instruments, test rigs and tools necessary for the work which includes a minimum of, but not limited to, 100 controllers, 1230 MMU and auxiliary failures a year, on electrical-mechanical, solid-state analog, solid state digital, and microprocessor equipment.

2.6.4 EMC SPARE PARTS STORAGE FACILITY

To facilitate security and inventory control of Department owned large equipment and spare parts for use on this Contract, the Contractor shall contract with a commercial bonded warehouse for storage and services, for a minimum of 7,000 square feet.

Currently Combined Warehouse Co., 5000 South Central, Chicago, Illinois, 60638 (hereafter referred to as the EMC Spare Parts Storage Facility) is in use.

The Contractor shall have the option of retaining storage at Combined Warehouse Co., or providing an alternate commercial bonded warehouse which is suitable for storage of materials of the type used for the District's electrical maintenance, and meets the space and facility requirements of the in use EMC Spare Parts Storage Facility.

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

The storage contract/arrangements must include service for 24/7 security, 24/7 access to on-site equipment and warehouse labor to access any stored item, all warehouse material handling fees, and a mechanism for formal check-in and checkout of materials. The inventory management shall include computerized record keeping of all inventory and all transactions, including regular monthly reports and occasional reports, on demand by the Engineer.

The Engineer must approve of the designated EMC Contract Spare Parts Storage Facility prior to its contract/leasing arrangements. If the Contractor chooses to move the Department's spare parts from their current storage at Combined Warehouse Co., the Contractor is responsible for all moving costs; including all labor, transport vehicles, new racks/storage equipment, security during the move, and incidental expenses.

Once accepted by the Engineer, any change in the facility or its storage requirements for the duration of the Contract shall require approval of the Engineer and the Contractor will be responsible moving costs as noted in above paragraph.

The Contractor is responsible for the purchase and installation of all necessary equipment for the proper storage (per manufacturer's specifications) of the EMC spare parts, including but not limited to fencing, racks, cages, crates, locks and keys, identification labels, etc.

If the Engineer requests additional warehouse storage space, the Contractor shall be reimbursed through non-routine maintenance at the same rate per square foot as the approved EMC Spare Parts Storage Facility.

2.6.5 EMC SPARE PARTS SPECIAL STORAGE FACILITY/AREA

In addition to the designated EMC Spare Parts Storage Facility, the Contractor shall have an EMC Spare Parts Special Storage Facility/Area, both indoor and outdoor, for Department owned items needing special handling.

The Contractor shall obtain Engineer approval for these designated facilities/areas, some of which may be located at the Contractor's EMC Office or Dispatch Center or at Department owned facilities. Once approved, the Engineer may direct the Contractor as to a specific location for storage of certain EMC Spare Parts needing special handling.

The Contractor is responsible for the purchase and installation of all necessary equipment for the proper storage (per manufacturer's specifications) of the EMC special spare parts, including but not limited to fencing, racks, cages, locks and keys, identification labels, etc.

Engineer approved outdoor storage locations of EMC Spare Parts needing special handling shall be kept screened or fenced, with locked access, and shall be clearly identified as Department owned and be physically separated from the storage of any Contractor-owned materials and equipment.

Although there is not 24/7 access, there are currently EMC Spare Parts needing special handling (example wood poles) stored at Department maintenance yards. The Department will furnish, at the Pre-Bid Meeting, a list of current Department owned maintenance areas currently used as EMC spare parts outdoor storage areas.

Engineer approved indoor storage locations of EMC Spare Parts needing special handling such as controllers and traffic signal heads, REVLAC and Homeland Security gates, cameras and their appurtenances, expensive components, and anything which comes boxed or which could deteriorate or be damaged by exposure to the weather shall be stored indoors in a secure patrolled area, in a locked cage with sturdy racks and/or proper shelving, environmentally controlled; a clean environment suitable for storage of network switches, CCTV, and other electronic equipment items needing special regulated temperatures. The Department will furnish, at the Pre-Bid Meeting, a list of the square footage of the current indoor EMC Spare Parts Special Storage Facility/Areas.

2.7 CONTRACTOR PERFORMANCE OF WORK

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

2.7.1 SUSPENSION OF WORK

If the Department determines that work being performed on this Contract may seriously jeopardize the welfare of the motoring public, the Engineer has the authority to order the immediate suspension of the work task. Depending on the offense, the Engineer may assess liquidated damages.

2.7.2 UNSATISFACTORY WORK

Failure to perform all work and its documentation, routine, or non-routine work, in the manner specified herein or in the Standard Specifications, and within the time limit specified will result in the issuance of an Unsatisfactory Service notification. The Engineer will advise the Contractor via e-mail or written transmittal regarding the nature of the unsatisfactory service. The Contractor shall take necessary action to correct the items listed and shall respond back to the Engineer within five (5) working days from the time of receipt of the notification, explaining the reasons for the improper service and the expected date of the resolution of the listed problems.

If there is no resolution of the listed problems within ten (10) days, the Engineer may withhold all or a portion of the next monthly routine maintenance payment due to the Contractor until on-going work meets Contract specifications or work completed by the Contractor meets Contract specifications and is approved by the Engineer.

If there is no resolution of the listed problems within thirty (30) days, the Engineer may authorize a new (3rd Party) vendor or contractor to correctly perform and/or complete the work to Contract specifications. The Engineer shall deduct from the Contractor monthly routine maintenance payment as liquidated damages a 3rd Party contractor/vendor invoice.

2.7.3 LIQUIDATED DAMAGES

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

Liquidated Damage Assessment:

PER INCIDENT	PER CONTRACT SPECIFICATIONS:
\$ 1,000.00	IMPROPER/DEFICIENT TRAFFIC CONTROL
\$ 1,000.00	FAILURE TO RESPOND, PER TICKET OR PER ENGINEER DIRECTION
\$ 1,000.00	FAILURE TO RESPOND PER TIME SPECIFICATIONS (refer to System Articles herein)
\$ 1,500.00	FAILURE TO PROVIDE TIMELY ROUTINE REPAIRS AND/OR MEET NON-ROUTINE WORK DUE DATES
\$ 1,500.00	FAILURE TO PROVIDE DOCUMENTATION (QUOTES, BREAKDOWN OF WORK PERFORMED, VENDOR PAID INVOICE, TICKET INFORMATION, REPORTS, SUBMITTALS FOR ROUTINE OR NON-ROUTINE WORK)
\$ 1,500.00	FAILURE TO ACCURATELY DOCUMENT MAINTENANCE STATUS OF IDOT OWNED LOCATIONS
\$ 1,000.00	FAILURE TO PATROL ASSIGNED LOCATIONS
\$ 1,500.00	FAILURE TO SUPPLY REPLACEMENT PARTS
\$ 1,000.00	FAILURE TO FOLLOW SPECIFIED PROCEDURES
\$ 1,000.00	FAILURE TO PROVIDE PROPER STAFFING OR EQUIPMENT
\$ 1,500.00	IMPROPER USE OF MATERIALS OR METHODS
\$ 1,500.00	FAILURE TO REPLACE CONTRACT SPARE PARTS
\$ 3,000.00	FAILURE TO RETURN CONTRACT SPARE PARTS AT END OF CONTRACT

2.8 CANCELLATION

Only the Department may cancel the Contract. The Department may take possession of the incomplete work and all materials purchased under this Contract, for any reason which the Engineer deems to be in the public interest and this decision shall be final. Depending on the severity of the incident or unsatisfactory work and Department actions taken, the Contractor will be given 30 to 90 days advance notice of cancellation of this Contract.

In the event of cancellation, the Contractor shall be entitled to receive payment for services and work performed and materials or equipment furnished under the terms of the Contract prior to the effective date of cancellation, but shall not be entitled to receive any damages on account of such cancellation or any further payment whatsoever. There shall be no payment for incomplete work. Articles 2.5, 2.5.1, 2.5.2, and 2.5.3 shall also apply to the cancellation of the Contract.

Upon the receipt of a notice of cancellation, the Contractor shall immediately provide the Engineer a transfer date for the return of all EMC Spare Parts inventory in the Contractor's possession.

2.9 CONTRACTOR ADVISORY REPORT

The Contractor shall identify system elements which have become prone to recurring or imminent failure, which pose a significant liability or a safety risk, and recommend replacement or repair by submitting an advisory inspection report.

The Engineer shall review and respond to the Contractor regarding the advisory report and reserves the right to determine a course of action to rectify any identified condition. If the Engineer concurs with the Contractor's basic recommendations, a non-routine authorization will be issued for the material portion of the repair and this will reduce the Contractor's routine maintenance obligation to the labor necessary to replace the deteriorated system element. Should the Engineer determine, however, that a deteriorated condition is due to neglectful maintenance on the part of this Contractor; all remedial work, including necessary materials, shall be performed as routine maintenance.

Also repair of damage from weather-related failures of electric utility systems, broken aerial electrical lines, or damage from deteriorated electric utility systems which have been observed and reported by the Contractor to the utility and the Engineer, prior to the occurrence of damage, may also be eligible for payment subject to approval of the Engineer. Engineer approval of the work will be based on adequate contractor repair response, proper advisory inspection report documentation, and the substantiated link to a weather-related failure.

In the absence of an advisory inspection report received and acknowledged by the Engineer, if system elements fail or are observed by the Engineer to be causing recurring failures or imminent safety hazards, then the Contractor is obligated for the full cost of replacement or repair under routine maintenance. Such obligation is not limited only to individual components but may extend to the multiples of components at a location(s).

The Contractor shall list these items on the Monthly System Agenda until a solution and date resolved is obtained, or the Engineer reports to the Contractor that the item will be maintained as found/as exists.

The Department acknowledges that in this Contract there is equipment which, due to age, may be difficult to properly maintain and/or parts and materials may be difficult to obtain. The Department will actively pursue remedies for replacement of this equipment.

2.10 SUBCONTRACTING OF WORK

2.10.1 GENERAL REQUIREMENTS

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

Submittals required for Subcontractor approvals may be found on the Illinois Department of Illinois website. At the time of Contract development, a form BC260A for each subcontractor is required, plus DBE requirements of a Disadvantage Business Utilization Plan on form SBE 2026 and a DBE participation Commitment Statement on Department form SBE 2025.

The Engineer shall receive paper copies of all submittals, made to Illinois Department of Transportation personnel in Springfield or District 1 Headquarters.

2.10.2 SUBCONTRACTING LIMITATIONS

In addition to the limitations imposed by the Standard Specifications, there shall not be wholesale subcontracting of the herein defined electrical systems except for Article 11.0 Various Equipment at Various Locations. The Contractor shall perform not less than 51% of the maintenance of each electrical system (Lighting System, Pump Station System, Surveillance System, and Traffic Signal System) with his/her own forces. Work that depends on a dispersed workforce and timely response activities shall not be subcontracted.

There shall be not be geographically based subcontracting of the work, e.g., by north Cook County or by south Cook County, etc. Furthermore, the Contractor's daily management and supervision for each system and all administrative functions and dispatching, shall be done with his own forces.

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

2.10.3 SUBCONTRACTOR BILLING

For non-routine agreed price work (not pay items) performed by an approved subcontractor as named on the authorization for work, the Contractor shall be allowed administrative costs of an amount equal to five (5) percent of the total approved costs of an individual work authorization.

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

2.11 CONTRACTOR AND DEPARTMENT INTERACTION

The District 1 Electrical Maintenance Contract is a Formal Contract with the Illinois Department of Transportation. The personnel working on the EMC, both Contractor and Department, must oversee hundreds of unique, one of a kind maintenance issues each year. There must be an environment of mutual trust, a commitment to shared goals and open communication among all personnel. There are times where open, non-critical discussions are needed regarding Contract requirements herein. Every person working on this Contract must respect each other views without raising anger.

Assumptions of Contract language should not be made. Clear understanding of every task is required. If the Contractor is dissatisfied with a decision and wants further review, it must follow the correct chain of command. A Department's System Manager decision may be reviewed by the Engineer, then reviewed by the Bureau Chief of Traffic Operations, and then, and only then elevated to the District 1 Engineer.

Starting with the Pre-Construction Meeting, open discussions will be held as necessary. It is a goal to solve issues to everyone's mutual satisfaction.

2.12 CONTRACTOR AND DEPARTMENT CORRESPONDENCE

2.12.1 CONTRACT ADMINISTRATION

The EMC will be administered by the IDOT District 1 Bureau of Traffic Operations. The appointed Resident Engineer herein specified as “the Engineer” will be responsible for the control of the work. The Contractor Project Manager shall communicate with the IDOT Resident Engineer on all formal contract matters. Contractor Supervisors/Foremen and Administrative personnel shall normally communicate with the IDOT System Engineers and Technicians. All e-mail and text correspondence from IDOT EMC personnel shall be promptly answered by EMC personnel.

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

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

The names of the Department personnel will be given at the Pre-Bid Meeting and Pre-Construction Meeting.

2.12.2 FORMAL CORRESPONDENCE

All formal correspondence to IDOT regarding contractual matters shall only be submitted by the Principal or Project Manager.

2.12.3 INFORMAL CORRESPONDENCE

Informal correspondence related to day-to-day maintenance matters shall be made by means of email or text and may be made directly to the parties involved. Contractor personnel shall reply to Department personnel email requests for answers, regardless as to their status within the Department. The names of the Department personnel who will normally be corresponding with Contractor employees will be presented at the Pre-Construction Meeting.

2.12.4 FILE TRANSFER PROTOCOL

The Contractor shall furnish and install an FTP server to transmit and receive files to IDOT Engineers and Technicians through a secure access, and it shall be available 24/7. All documentation shall be converted to electronic files in a format approved by the Engineer. The files shall be accessible and in a format that allows modification on Excel, Word or as approved by the Engineer.

The FTP site shall have an Engineer approved filing system. The format of the Contract’s filing system will be provided prior to the start of any work. The Contractor shall store and maintain on the FTP all EMC reports, spreadsheets, pictures, authorizations, quotes, DBE and sub-contractor reports, Contractor and vendor invoices with backup documentation such as GB sheets and GPS reports, submittals, and documentation. A copy of the drive with all documentation shall be provide to the IDOT Engineer at the end of each contract year. The Engineer will provide a list of all personnel who will need passwords for the FTP site.

2.13 CONTRACT MEETINGS

Meetings to discuss Contract work are held as necessary, however, once per month the Contractor and Department personnel will meet to discuss System issues (Monthly System Meeting) and overall Contract issues (Monthly Pay Meeting).

Each Monthly System Meeting will be held in person if possible, with the EMC System Manager attending. The Contractor shall furnish an Agenda for each Monthly System Meeting at a minimum of one (1) day before the Meeting. The Engineer may email issues to be included on the Monthly System Meeting(s).

The Monthly Pay Meeting will be held in person if possible, with the EMC Project Manager in attending. The Contractor will furnish an Agenda for the Monthly Pay Meeting; however, the Engineer may email issues to be included on the Agenda. The format for the Agenda will be available at the Pre-Bid Meeting. The Contractor will deliver the Monthly Master Authorizations and Invoices by the date of the scheduled Monthly Pay Meeting. Currently meetings are held on the third Thursday of the month, but the schedule for the year will be agreed upon at the Pre-Construction Meeting.

Contractor Administrative personnel shall take minutes of all System and Pay Meetings, in the form of subject bullets with a date due if applicable, and name of person responsible for completion. All minutes will be sent to the Engineer for approval within three (3) days of the conclusion of the meetings. Only when the meeting minutes are approved, with Engineer digital signature, will the Contractor load the meeting minutes on the FTP site.

2.14 DAILY WORK AGENDA

The scheduling of daily work shall be a responsibility of the Contractor but governed by established schedules and/or authorized work completion dates. The Engineer shall provide the Contractor a list of the personnel who shall receive an email copy of the Daily Agenda. Most personnel will have access to view the Daily Agenda on the EMCMS.

The Contractor shall create the EMCMS Daily Agenda which shall account for all scheduled work to be performed on system equipment in the next twenty-four hours; the Patrol information, Ticket or Cable Locate number or PM Program/Contract Article number as applicable, the name of the Contractor or Sub-Contractor personnel assigned the work, and for EEO reporting, the identification of the Contractor's female employees.

The Daily Agenda shall be available for viewing and/or received through email by 8:30 a.m. on weekdays or by 2:30 p.m. on Fridays when weekend work is scheduled. If work assignments change during the day, the EMCMS shall be revised and emails re-sent. Programming is planned for year 2022 to have EMCMS auto-emailing of the Daily Agenda and revisions.

When work is not completed which was listed on a day's Daily Agenda, it shall be noted as such on the next day's Daily Agenda.

The Contractor may view the EMCMS Daily Agenda following the Pre-Bid Meeting

2.15 ADMINISTRATION RESPONSIBILITIES OF REQUIRED MONTHLY REPORTS

This Contract requires substantial documentation of work, both general items and specific system work. The Contractor shall create most documents through the EMCMS or an Excel Spreadsheet. No use of Word Documents is allowed for monthly report submittals. The EMC Administration Manager is responsible for all monthly reporting. Below is the list of required general monthly reports, in alphabetical order, which are normally created by the Contractor's Administrative staff. Refer to System Articles herein for other required monthly reports.

2.15.1 ASSET INVENTORY REPORTS

The Contractor is required to keep records of Department owned equipment, Assets, i.e., at locations in the EMCMS. Entry screens and reports are currently in development for each of the electrical systems herein. Each System has a separate and unique Asset Inventory. It is planned that all Asset Inventories will be maintained through the EMCMS beginning at some point in year 2022. Prior to that loading on the EMCMS, all Asset Reports will be kept current on Excel Spreadsheets maintained by the Contractor.

Each month the Contractor must account for Assets removed, scrapped, sent to Spare Parts Inventory, installed as new, sent to vendor for repair, or moved to a different location. This includes parts or equipment required to be supplied through routine maintenance from Contractor supplied equipment. Required documentation includes keeping current an EMCMS Asset documentation screen; EMCMS Asset Inventories for each Electrical System herein, an EMCMS Transaction Report and the Official Asset Inventory Reports.

The coding of the transfers will be similar to that of the established EMCMS Spare Parts entry and reporting. The EMC System Managers and appointed IDOT System Engineers/Technicians must sign and approve the monthly reports. The Engineer will work with the EMC Administration Manager in January 2022 to establish useable monthly documentation.

2.15.2 AUTHORIZATIONS AND INVOICING

The work process and printing of the EMCMS Monthly Routine Authorization and invoice and the two (2) EMCMS Monthly Master Authorizations and Invoices for Non-Routine work (TS and TSC) is discussed in Article 6.0 herein.

2.15.3 CERTIFIED PAYROLL

All Certified Monthly Payrolls, including Subcontractor Payroll will be submitted via the IDOT SharePoint site and hard copies will no longer be permissible. The EMC Administration Manager must setup a Trusted Account with the IDOT Contract Compliance section. Instructions for payroll submittal may be obtained through the IDOT Contract Compliance SharePoint Contractor User Guide, a pdf document.

In addition, the Federal Department of Labor is also requiring monthly web submittals of payroll information. Instructions will be available at the Pre-Construction Meeting.

Paper copies of all payroll reports should be kept by the Contractor for a minimum of seven (7) years.

2.15.4 CONTRACTOR ADVISORY

The Contractor shall follow the instructions herein Article 2.8. Administratively the submittal shall be on an Excel Spreadsheet, printable to a standard letter size paper. The 1st line shall have column headers for the CA #, date reported/found, System, Location Number, Main Route, Cross Street, Cabinet or unit number if applicable, and on 2nd line the named item, description of problem or malfunction, Contractor proposed solution, and date resolved. These items shall be listed on the Monthly System Meeting Agendas until a solution and date resolved is obtained, or the Engineer reports to the Contractor that the item should be noted as "reviewed – no action to be taken" on the spreadsheet report.

2.15.5 CUMULATIVE WORK AGENDAS

At the end of each month the EMCMS Daily Work Agendas shall be compiled by System, and date, and loaded on the FTP site. A sample of the monthly cumulative agenda report will be available at the Pre-Construction meeting.

2.15.6 DAILY AGENDA REPORTS

Refer to Article 2.14 herein.

2.15.7 DBE – DISADVANTAGED BUSINESS ENTERPRISE GOAL

The Illinois Department of Transportation Springfield sets a DBE goal (percent of contract work) at the time of contract bidding. The EMC Administration Manager shall report verbally on the DBE goal status at each

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Monthly Pay Meeting. IDOT Springfield requires a DBE form 2115 at the end of the contract year to report attained DBE goals.

The Engineer shall receive paper copies of all submittals, made to Illinois Department of Transportation personnel in Springfield or District 1 Headquarters.

2.15.8 FTP SITE REPORT LOADING

Requirements of the FTP Site are explained in Article 2.12.4. As noted throughout this Contract there are various reports which require loading on the FTP Site.

2.15.9 MCHD ADMIN PROCESS AND STATEMENT RECORDS

The EMC Administration Manager is responsible to respond to IDOT Claims or other Department requests for Ticket information, or ownership or maintainer information, and all MCHD (Motorist Cause Damage) statements/invoices to be provided to the IDOT Claims office. The IDOT Claims office bills the motorist's insurance company, or motorist for repair costs of equipment maintained on the EMC by the Contractor.

Up to sixty (60) MCHD statements/invoices may be requested of the Contractor each month, with a turn-around time requirement of two weeks. Once provided an IDOT Claim number for a Ticket, the EMCMS entry screen, MCHD Tracking, must be used to enter the MCHD information required for printing the statements/invoices. The individual MCHD statement/invoice will account for labor, equipment, and materials used for repair on its MC Ticket. Once the statement/invoice is printed it shall be approved/signed by the EMC Administration Manager. One original and one copy are required for delivery to IDOT Claims, an additional (separate) copy will be delivered to TSC. Within the following week the Contractor shall provide the damage photos for each claim to the IDOT Claims office, noting the claim number on the email.

EMC Administration Manager responsibilities include:

- At the beginning of the year providing the Engineer with averaged material costs, by system, for use on the MCHD statements/invoices (List of items is currently loaded in EMCMS)
- Entry of all Contractor LEM (labor, equipment, materials) costs for MC Tickets (repair information, required to create MCHD statements/invoices)
- Entry of all information regarding an IDOT Claim into the EMCMS screen for MCHD Tracking
- Proper loading of all MC Ticket photos of damage on the FTP site and labeling them with the IDOT Claim number when provided
- Emailing the IDOT Claims representative the damage photos of each Ticket, with the subject line the MCHD Claim number for each statement/invoice created (email must be separate for each Ticket/Claim number and not batched)
- Providing a monthly report, an Excel spreadsheet of all MCHD statements/invoices provided, with date of request, Ticket number, Claim number, statement/invoice repair amount, and date delivered to the IDOT Claims office. The report will also be submitted to TSC at the end of each month.

When state funds allow, as an accounting procedure, the Department may submit a monthly MCHD statement/invoice to IDOT Springfield Claims for special payment. In these cases, the Contractor will be paid this amount directly and a similar amount will be deducted from the monthly routine maintenance payment to the Contractor.

2.15.10 PERSONNEL CHANGES

At the end of each month the Administrative Manager shall create a spreadsheet report which lists all the new employees and removed employees from the Contract work. This personnel information must be kept current in the EMCMS. There is planned EMCMS programming work which would allow the EMC Administration Manager the privilege to add and delete EMC personnel. When this EMCMS work is complete the report will no longer be necessary.

2.15.11 RM QUANTITY RECONCILIATION REPORTS

Refer to Article 6.0 herein for monthly routine maintenance quantity report requirements for reconcile of the locations and equipment maintained, for the Monthly Master Authorizations and Invoices.

2.15.12 SCRAP DISPOSAL REPORTING

As noted in Article 4.24 the Contractor may not dispose (scrap) any materials without receiving prior approval from the Engineer. The Department's acceptance/approval signatures on the Monthly System Spare Parts Reports, conveys ownership of the scrap materials to the Contractor. When requested by the Engineer the EMC Administration Manager shall provide documentation of monthly vendor scrap tickets/loads and vendor recycling activity.

2.15.13 SPARE PARTS RECORDS

The Contractor is required to keep records of Department owned equipment, i.e., Spare Parts, at all Engineer approved locations. It is planned that all Inventories will be maintained through the EMCMS at some point in 2022. Prior to that loading on the EMCMS, all EMC Spare Parts Reports will be kept on Excel Spreadsheets maintained by the Contractor.

Each month the Contractor must account for Spare Parts removed, scrapped, installed as Asset, new to inventory, or moved to a different location. This includes parts or equipment required to be supplied through routine maintenance from Contractor supplied equipment. Required documentation includes keeping current an EMCMS Spare Parts Entry Screen, an EMCMS Entry Screen for Construction Contractor delivery or pickup of materials, EMCMS Asset Inventories for each Electrical System herein, an EMCMS Transaction Report and the Official Spare Parts Inventory Reports.

There is required coding of all transfers, and samples will be available of the entry sheets at the Pre-Bid Meeting. The EMC System Managers and appointed IDOT System Engineers/Technicians must sign and approve the monthly reports. The Engineer will work with the EMC Administration Manager in January 2022 to establish useable monthly documentation.

2.15.14 SYSTEMS WORK REPORT

At the time of Contract development, the EMCMS Systems Work Report was in program development. When programming is complete the EMC Administration Manager will be responsible each month to load information from the required Certified Payroll submissions and other pertinent work information. This information includes EMC Contract Personnel names, their union title, and total hours worked each week or month on each electrical system, by straight time, overtime, and double time, and a total of hours, with hours specified by routine work or non-routine work. A monthly Excel spreadsheet with the required information shall be submitted until the EMCMS entry screen/report is available.

2.15.15 THIRD PARTY DAMAGE BILLING

Per Article 4.8 when equipment is damaged by 3rd Parties such as construction contractors, general repair crews hired by cities or agencies, utility companies, and the like, the Contractor shall make necessary temporary repairs under routine maintenance per specifications herein, but may bill the offending party for Contractor work performed.

The EMC Administration Manager shall be the sole point of contact for all 3rd Party billing documentation.

Once the GB (General Billing) Ticket has been created and the Contractor has performed temporary repairs the offending party may be billed:

Process: Send 2nd day UPS/FEDX letter to the offending party explaining:

- The Contract with the Illinois Department of Transportation to maintain the electrical equipment
- Article 4.8 herein (written so article may be copied and attached to correspondence)
- Which equipment was found damaged and on which date

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- Photos of damage
- Billing for clearing the site and temporary repairs
- Quote for permanent repairs
- The option of their (offending party) providing an electrical contractor to perform permanent repairs
- Need for a decision on contractor within 15 days, (email accepted)
- Permanent repairs need to start within 30 days from time of this notification or they will be billed per the quote

30 Day Final Notice:

Send offending party notice through 2nd day UPS/FEDX delivery that 30 days has past and permanent repairs will begin (give date) and they will be billed for permanent repairs.

Monthly 3rd Party Damage Report:

The monthly 3rd Party Damage report submittal, an Excel spreadsheet, shall be sorted by system, and list by damage date, only those cases where the offending party has not replied to the Contractor regarding permanent repairs and/or permanent repairs have been completed by the Contractor but the offending party is not paying the invoice. The Contractor shall keep records of all 3rd Party Damage, by Ticket number, for Engineer review at any time throughout the year.

2.16 EMCMS - ELECTRICAL MAINTENANCE CONTRACT MANAGEMENT SYSTEM

2.16.1 GENERAL REQUIREMENTS

The Electrical Maintenance Contract Management System (EMCMS), as presented herein consists of hardware, software, and an information database.

Successful performance of the Electrical Maintenance Contract is highly dependent upon an emergency call-out database, electrical systems inventories, and a timely, accurate flow of information regarding contract work, documentation, and billing, which is kept and accessed on the Electrical Maintenance Management System (EMCMS).

The Contractor shall maintain the Department EMCMS, which shall continue into this Contract to assure operational continuity, and no disruption is allowed of the EMCMS functions; emergency call-out database or access to the data and reports contained within.

All costs for the EMCMS system operation, vendor maintenance agreements, programming fixes or corrections, equipment warranties, except for the existing IDOT telephone lines, network connection and power provided by the Department, shall be borne by the Contractor, and paid through routine maintenance.

It is the responsibility of the Contractor to keep the EMCMS current and correct, with the maintenance status of IDOT maintained locations, and other private locations for the benefit of the public who relies on the IDOT ComCenter to take their emergency calls. The Contractor is encouraged to review the EMCMS after the Pre-Bid Meeting to view all the EMCMS screens and reports which must be maintained on this Contract. Further information regarding maintenance of the EMCMS programs can be obtained from the EMCMS vendor.

2.16.2 SELECTION OF VENDOR

The Contractor is responsible to maintain the hardware and software in place on the EMCMS through a Vendor as of January 1, 2022. The Contractor and the Department access the various entry screens and reports of the EMCMS by password privilege. Due to the confidential data on the EMCMS accessed only by Department personnel, such as future work plans, cost estimates, etc., the Contractor is not allowed to personally maintain the EMCMS hardware and software. The Contractor shall obtain a support maintenance agreement required for the EMCMS from a 3rd party Vendor. This Vendor shall be paid by the Contractor as a Specialty Vendor

or Sub-Contractor; however, the Vendor management staff and programmers shall report only to the Engineer or Department EMCMS Supervisor.

The Contractor is encouraged to use the current maintainer of the EMCMS, Xsys Inc., 653 Steele Drive, Valparaiso, IN. 46385, for the duration of the Contract. Bidders will need to contact Xsys, Inc. (telephone 219-477-4816) to obtain a sample contract and cost estimates of Contractor hardware necessary (IDOT furnishes their own), monthly maintenance, hourly programming charges, and training. If the Contractor wishes to change the current vendor, a full maintenance plan will need to be submitted to the Engineer as soon as possible after the execution of this Contract, at least thirty (30) days prior to January 1, 2022, or the EMCMS Vendor at the time of the bidding must continue at the monthly and hourly rates supplied to the bidders. Review EMCMS vendor requirements herein.

2.16.3 VENDOR HARDWARE AND SOFTWARE MAINTENANCE

The Vendor shall provide maintenance and operational support for all hardware (IDOT and Contractor owned or leased), for the servers/operating system for the database servers and its OS, including communications/network hardware between the servers and all remote workstations, all software, the back-up server, and information as carried in the database. The vendor shall run monthly tests on the data validation to the SQL database.

Daily maintenance requirements by the vendor include preventive maintenance, the monitoring of software and hardware to assure continued operations, online monitoring of system and equipment status, and data back-ups by qualified personnel. The data back-ups shall provide the data to be synchronized on an hourly basis at most and a five-minute interval at best across redundant sites.

2.16.4 VENDOR DISASTER RECOVERY

The Contractor shall have the EMCMS vendor maintain a disaster recovery that is stored remotely. The maintenance shall include monitoring and configuration access to the IDOT EMCMS and restoration of operation within four (4) hours for a complete system recovery. The data loss should be no more than 10 minutes. A testing procedure shall be performed quarterly to test a roll over with full operation and access including data testing at point of roll over.

2.16.5 VENDOR INSTALLATION DEADLINE

The Contractor is required to have the complete EMCMS, including full data access through screens/reports, communication links between the Contractor's facilities and central computer at District 1 TSC, and all required equipment as specified elsewhere herein, in place at the EMC Office and EMC Dispatch Center for approval by the Engineer by December 15, 2021. All items necessary to assure a functional operating EMCMS system, are the responsibility of the Contractor and paid through routine maintenance. Refer to Article 2.6.1 for EMC Office requirements and Article 2.6.2 for Dispatch Center requirements.

2.16.6 VENDOR COMMUNICATIONS

- The EMCMS Vendor shall respond to Engineer or EMCMS Coordinator requests for programming fixes or corrections within one hour, providing the estimated time to complete the work. Programming fixes, where the database is not performing in currently accepted practice should be completed in 24 hours.
- The EMCMS Vendor shall respond to Engineer or EMCMS Coordinator requests for new programming work, i.e., modifications or new screens/reports within 24 hours, providing the number of hours needed to complete the work.

- When the Vendor is notified that they are approved to provide the new work, the Department will issue a non-routine maintenance authorization for the new work. This is not applicable to Article 2.16.8 planned Vendor work for a mobile Ticket.
- All modifications or new work by the Vendor will be implemented and validated in a fully operational test environment. The ability to test any fixes or change requests will be provided to Department appointed personnel.
- Upon Department acceptance of the new work on the test site the Vendor shall coordinate with the Engineer or EMCMS Coordinator for a time to move the new work to the production system, inclusive of a roll back plan in such case the introduction of the new work creates disruptions in the production system.
- Service restoration following complete interruptions to the EMCMS shall be within four (4) hours, except as otherwise permitted by the Engineer.
- The Engineer shall be immediately notified, if in the judgement of the vendor, that a component replacement is required to forestall preventable system failures. The material costs for this EMCMS equipment replacement would be paid through non-routine maintenance, however, the Contractor shall be responsible for any labor or service installation charges.
- User documentation as developed during this Contract shall be provided by the vendor and given to the Engineer at the end of this Contract.

2.16.7 VENDOR SUPPORT AND TRAINING

The EMCMS is a Windows based system and entry fields requirements are extensive and require training for Contractor and Department personnel use. By January 31st, 2022 (or 2023 or 2024 if this Contract is renewed) the Contractor shall provide the Engineer a list of all personnel who shall be accessing or entering data on the EMCMS. In past contracts approximately 40 to 60 Contractor personnel use the EMCMS.

All personnel shall be scheduled for a minimum of twenty-four hours of training through the EMCMS vendor. Training should not be completely held in one day but spread over many hourly sessions depending on the person's level of experience with the EMCMS, or the Vendor may establish many Zoom "call-in" question/answer sessions throughout the year. All Contractor Administrative personnel shall be trained on the EMCMS for the screens and reports which they access, as soon as possible after the Contractor is validated (prior to January 1st) or the first week of January, 2022. The Contractor Patrolmen shall be trained on the EMCMS as soon as possible after the new mobile Ticket is programmed. The Contractor shall provide, through routine maintenance, the training for Contractor and Department personnel. There are approximately 40 Department users.

2.16.8 VENDOR PLANNED WORK

It is a goal of the Department to have in place as soon as possible in year 2022, a mobile Ticket entry screen, i.e., the ability for a Patrolman to create a Ticket on a tablet or phone. This work plus portions of other planned work such as the Spare Parts Inventory, Asset Inventory, and Preventive Maintenance entry screens have been estimated to take as many as 1000 hours of programming time from the EMCMS vendor which will be paid through routine maintenance. The current Vendor has specified the following tablets for the new EMCMS Ticket:

Android Base Tablets

Tablet must have internet connection. Display 9.7 inches or greater. OS – Android 9.0 or greater. 4 GB Ram or Greater. Must be able to use Google Chrome as internet browser.

Apple iPad

Tablet must have internet connection. Display 10 inches or greater. Must be able to use Google Chrome as internet browser.

Windows Base Tablets

Tablet must have internet connection. Display 10 inches or greater. Must be able to use Google Chrome as internet browser.

2.16.9 EMCMS EQUIPMENT AND SOFTWARE WARRANTIES

The Contractor shall obtain and continue the EMCMS equipment and software warranties for the duration of the Contract starting January 1, 2022 and ending December 31, 2022. If this Contract is renewed the warranties shall be extended to cover each renewal year. Items for coverage include software, the

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server/operating system for the database servers and its OS, communications hardware between the servers and all remote workstations, and the back-up server. The Contractor shall provide copies of all warranty agreements to the Engineer at the January 2022 Pay Meeting (and again in January of each renewal year).

2.17 FLEET MANAGEMENT GPS SYSTEM

2.17.1 GENERAL REQUIREMENTS

The Contractor shall have or acquire the services of a fleet management system vendor with a Web-based application to store, view, and analyze data for all Electrical Maintenance Contractor and Sub-Contractor vehicles when personnel are performing work on this Contract. It is the desire of the Department to utilize the latest technology available to monitor the response to locations of work on the Electrical Maintenance Contract. Many of the work assignments herein are based on patrols of a particular area or have preventive maintenance programs which require work at a particular set of locations. Thus, a web-based application will aid the Department in the monitoring of Contract work response and provide the Contractor efficiency in dispatching personnel.

All vehicles used on Electrical Maintenance Contract work shall be equipped with an in-vehicle GPS device that sends information via wireless or satellite communication to a remote data center over a secure network for the purpose of receiving and transmitting the driver call number and vehicle information. The Contractor shall provide each driver/employee working on the EMC (including subcontractors) an identification code and a key fob or equal.

The web-based application shall be accessible simultaneously to the Contractor and the Department personnel via desktop PC, handheld smartphone, or tablet.

The Contractor must provide and maintain service for IDOT access to archived/stored data using the same or an updated browser for a period of seven years.

2.17.2 CONTRACTOR PROGRAMMING

All routes and work groups shall be named and programmed into the system for each of the patrolmen and crew(s) that perform assigned inspection and maintenance. Each patrolman and crew shall have a grouping for routine maintained ON-maintenance locations separate from OFF-maintenance locations, and other locations that are non-EMC. New locations must be entered into the GPS system within 5 working days of a maintenance transfer.

The fleet management program shall provide a seamless overlaying of multiple mapping and fleet data for a view of all Contractor work every day. The fleet management system shall update every 90 seconds at a maximum; for reporting of GPS location, direction of travel, odometer readings, a stop detail report and duration; a timeline of the vehicle activity by date and time, with driver call # , name, vehicle identification, and mapping (displays vehicles in real time performing Contract work).

The programming shall allow unlimited grouping hierarchy, unlimited geofences and landmarks, and have structured firewalls so all information is kept confidential and used by designated users. GPS tracking information shall be retained when the vehicle is out of cell coverage areas. The system shall be one which is capable to integrate to an Esri ArcGis, GeoEvent Processor, which allows overlaying of multiple mapping.

An interface shall be accessible to all Contractor assigned personnel, Contractor Dispatch personnel and all Department Engineers and Technicians working on the Electrical Maintenance Contract. Historical data for the year and renewal years, including all categories of obtained information and reporting shall be available to Department personnel.

All information shall be provided in real time 24/7, with download capabilities of scheduled work or patrols. The Contractor shall update the information daily as changes occur for personnel and equipment and the addition of landmarks through EMC and maintenance transfers. The Fleet Management GPS System shall show Contract personnel working daily on the EMC 62M86.

The EMC Administration Manager shall be the point of contact for all questions regarding the Fleet Management GPS Reporting System. The Engineer will meet with the EMC Administration Manager in early January 2022 to discuss GPS reporting. Minor changes or modifications may be necessary at that time, to meet Contract requirements.

2.18 SAFETY PROGRAMS AND TRAINING

2.18.1 BASIC ELECTRICAL SAFETY PROGRAM AND TRAINING

The Contractor shall establish a formal safety program to assure overall safety of EMC personnel, operations and the electrical systems maintained as they affect the safety of the motoring public and the public at large. The Contractor shall furnish an overall description of this program with the Pre-Qualifications Submittal.

The Contractor shall assure that all personnel be trained in, and have knowledge of, approved equipment grounding methods for all work under this contract. The Contractor shall be fully responsible for compliance with all NEC requirements. Should locations be identified for which system or equipment grounding is missing or otherwise not in compliance with NEC requirements, the Contractor is obligated to report such locations to the Engineer.

The Contractor shall be fully responsible for compliance with all OSHA requirements. Particular attention is directed to the lock-out/tag-out requirements to assure that systems undergoing maintenance work cannot be inadvertently energized, causing harm to the maintenance person.

As part of the safety program, the Contractor shall initiate a procedure that states: "When a circuit is de-energized, the Contractor shall meter the downstream circuits with an instrument to assure that they are de-energized and safe for working conditions."

The Contractor shall establish, at a minimum a one day training session per year for Contractor and Department EMC Engineers and Technicians; all personnel for applicable OSHA requirements and other safety-related topics, to include but not be limited to; lock-out/tag-out, confined space, safety, hazmat training, respirator training (as applicable), use of safety harnesses for work on signs and other structures, electrical code/grounding/lightning protection and basic first aid. The program shall be taught by a professional trainer of the Contractor's choice, an individual regularly engaged in these topics. The training shall specifically address applications to typical IDOT systems such as electrical installation and maintenance, traffic signals, highway lighting, surveillance, and pump stations. This training shall be provided for all appropriate technical personnel, including all personnel engaged in electrical wiring work.

2.18.2 CONFINED SPACE ENTRY POLICY AND TRAINING

The Contractor shall establish a confined space entry/safety policy and training program to assure overall safety of EMC personnel and operations. An overall description of the Contractor's confined space entry policy shall be submitted with the Pre-Qualifications Submittal.

Contractor's confined space entry policy shall be in full compliance with all OSHA requirements for the duration of this Contract. Employees shall be required to:

- Follow all general safety rules and regulations
- Abide by confined space regulations
- Always wear proper safety equipment

- Report unsafe conditions to Contractor supervisory personnel and IDOT Engineer
- Report any injuries sustained within a confined space

The Contractor shall own or rent sufficient quantities of safety equipment for use by Contractor personnel that are involved with work within a space, as defined as confined space within OSHA guidelines. Department Engineers and Technicians shall also be furnished this required safety equipment when accompanying the Contractor on work inspections in confined spaces. A list of this OSHA required equipment owned or to be rented by the Contractor shall be submitted with the Pre-Bid qualifications submittal.

The Contractor shall provide a confined space safety training program in January each year, by an individual trainer from a company who is involved with confined entry regulations, at a Department approved location, for Contractor employees and Department Engineers and Technicians who work/inspect in confined spaces. A second training session may be required in July each year if there are new Contractor or Department personnel who need this confined entry training. A listing of Contractor personnel who are trained or who will be trained for entry into confined spaces shall be included in the Pre-Construction Meeting submittal.

2.18.3 TRAFFIC SIGNAL TRAINING

The Contractor shall provide training within the first quarter of each year. The training shall be on traffic signal controller operations, from the controller manufacturers, for all patrolmen, traffic signal/surveillance specialists, and twelve IDOT personnel, for each of the types of controllers in use by the Traffic Signal System in District 1, or as approved by the Engineer, including but not limited to:

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

2.18.4 TRAINING AS SELECTED BY ENGINEER

The Contractor will provide a professional trainer who will provide Contractor and Department EMC Personnel instruction once per year on safety and current electrical standards and/or work practices for the Lighting System or Pump Station System, including SCADA,,or Surveillance System networks. The subject will be determined by the Engineer and the yearly training will be completed by July 1st of each year.

ARTICLE 3.0 LABOR, EQUIPMENT, AND MATERIAL REQUIREMENTS

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ARTICLE 3.0 LABOR, EQUIPMENT, AND MATERIAL REQUIREMENTS

3.1 BIDDING

Unless labor, equipment, or material purchase is specifically noted herein as paid through non-routine maintenance, Article 3.0 Labor, Equipment, and Materials shall be paid through, is part of, and is included in routine maintenance bid items.

3.2 BASIC REQUIREMENTS

The Contractor shall follow Article 108.06 Labor, Methods, and Equipment, as stated in the Standard Specifications of Road and Bridge Construction 2016 version, unless herein amended. The Contractor shall provide 24/7, days of the week, a force of qualified personnel, approved by the Engineer, sufficient in number to simultaneously perform the routine maintenance work, and separately paid non-routine work. The Contractor shall meet all response and repair requirements herein, including work schedules and work due dates.

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

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

The Engineer also reserves the authority to re-direct the Contractor's work priorities in response to Contract emergency situations, potential hazards, Contract coordination and incomplete or deficient work which may require additional labor response, and the Contractor will be allowed no additional compensation for priorities so redirected.

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

3.3 ORGANIZATION CHART

The Contractor shall produce an organization chart to document the chain of command and demonstrate compliance with the work requirements defined by the Contract, including reporting relationships of all personnel. The chart shall provide the name of individuals assigned to all positions with roles and responsibilities named. This document shall be submitted with the Pre-Bid qualifications, re-submitted at the Pre-Construction Meeting with any proposed revisions, and submitted to the Engineer at any time there is a change in personnel or the chain of command.

The Engineer may reject the personnel assigned titles/assignments if the Contractor fails to demonstrate that the assigned personnel have the proper qualifications for their defined work responsibilities.

3.4 ORGANIZATION FOR WORK PERFORMANCE

The Contractor can structure the EMC workforce to best fulfill the requirements herein, however, the workforce must have the education, skills, and experience to accomplish quality work, at timely rates of progress.

History has shown in past contracts that 70 to 80 non-management employees and 35 to 40 Patrolmen need to be employed on the EMC to perform the required and authorized work on time. These employees would

not be entirely dedicated to EMC work, but this Contract is their priority work. All personnel shall be factored into the Contractor's routine maintenance bid.

Contractor personnel shall meet all qualifications and work expertise as specified herein. They will be available for special or emergency work when requested by the Engineer. All names and resumes of these employees shall be submitted to the Engineer at the Pre-Construction Meeting.

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

3.5 EMC PROJECT MANAGER

Experience has shown that personal involvement of a Principal or officer of the company with signature authority, is necessary in all major or overall contract matters under this Contract. Therefore, the Principal or officers of the company shall appoint one individual to be the EMC Project Manager to be responsible for performance of the Contract, have the authority to fully represent the Principal in all matters on this Contract, and have supervisory authority over all personnel working on this Contract. The individual appointed to this position shall be approved by the Engineer prior to the start of the Contract.

To assure 24-hour continuity of a person in responsible charge of the Contract, the Principal or officers of the company shall establish a prioritized list of staff who are to act, with full authority to speak definitively for the EMC Project Manager in the event of illness, vacation, or other similar lack of availability of the EMC Project Manager. The Engineer shall be notified as far in advance as possible whenever a substitute EMC Project Manager will be necessary.

3.6 EMC SYSTEM MANAGERS

The EMC Project Manager shall appoint four or five EMC System Managers for the Traffic Signal System, The Surveillance System, the Pump Station System, the Lighting System, and the Various System. The Various System may be managed by the Lighting or Surveillance Manager or appointed Sub-Contractor manager. All System Managers will report to the EMC Project Manager daily.

These individuals shall:

- Have authority to commit workforce and other resources 24/7 and/or as directed by the Engineer
- Coordinate emergency operations
- Prioritize the emergency response
- Make assignments for the required Daily Work Agenda
- Make assignments for Cable Locates
- Review Tickets daily and correct as necessary
- Oversee maintenance transfers and new installation inspections
- Submit lane closure requests and implement approved traffic control plans
- Supervise all routine and non-routine work and required documentation
- Supervise all Contract required monthly submittals
- Have ability to manage staff of twenty (20) or more
- Communicate effectively
- Be proficient in the use of PC and MS Office Suite
- Possess knowledge of electrical codes such as NEC 2016
- Possess valid Electrician's card
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Communicate effectively

- Maintain valid driver's license

Work expertise requirements apply (applicable per System) for these assigned EMC System Managers unless written exception is received from the Engineer. The Engineer reserves the right to have the EMC Project Manager replace any EMC System Manager who does not have applicable credentials and/or perform to Contract requirements.

3.7 TRAFFIC SIGNALS SYSTEM MANAGER

Work performance requirements herein dictate that the assigned Traffic Signal System Manager shall have:

- A BS or BA degree from an U.S. Department of Education accredited technical institute, engineering college or business college
- IMSA level III certification
- Attended advance IMSA seminars in the last 3 years
- Advance training in NEC and MUTCD guidelines and methods in the last 3 years
- Trained in the operation of Aries, Tactics, Centracs, and TransSuite traffic signal management software
- Trained in the operation and programming of Econolite and Eagle/Siemens controllers, including those interconnected to railroad warning devices
- Trained in the operation and management of District 1 closed loop traffic signal and traffic management systems
- Trained in the District 1's Traffic Control and Protection measures and procedures
- Managed a government maintenance contract in the past five years with a technical staff of twenty-five (25) or more
- Have a minimum of ten (10) years' experience in construction, maintenance, and operation of all traffic signals and traffic signals systems currently being used in District 1
- Hands-on experience in solving trouble calls for any traffic signal cabinet or communications failure
- Work Zone safety certification
- Completed a recent OSHA Safety Standards training course that related to work assignments
- Completed a recent IDOT Traffic Control Standards training course
- Ability to communicate effectively
- Maintain valid driver's license

3.8 TRAFFIC SIGNALS SYSTEM PATROLMEN/FOREMEN/WORK CREW

Work performance requirements herein dictate that assigned employees shall have:

- IMSA level II certification by July 1, 2022
- Attended advance IMSA seminars in the last 3 years
- Trained in the operation of Aries, Tactics, Centracs, and TransSuite traffic signal management software
- Trained in the operation and programming of Econolite and Eagle/Siemens controllers, including those interconnected to railroad warning devices
- Advance training in NEC and MUTCD guidelines and methods in the last 3 years
- Ability to respond to callout tickets, trouble calls and emergencies 24/7 and shall meet the one (1) hour in-district response requirements
- Ability to maintain the integrity of all traffic signal timing, parameter programming information, traffic responsive and time of day signal systems
- Substantial experience with NEMA traffic signal closed loop systems operating in the traffic responsive mode
- Extensive experience in troubleshooting equipment malfunctions including all closed loop signal system malfunctions
- Ability to troubleshoot low voltage equipment malfunctions

- Ability to perform communication equipment repairs
- Knowledge and familiarity with single mode fiber optic cable installations
- Knowledge and familiarity with troubleshooting electronic equipment
- Valid electrician's card
- Completed a recent OSHA Safety Standards training course that related to work assignments
- Completed a recent IDOT Traffic Control Standards training course
- Ability to communicate effectively
- Maintain valid driver's license

3.9 TRAFFIC SIGNALS SYSTEM – SYSTEM AND RAILROAD EXPERTISE

Work performance requirements dictate that assigned employees shall have:

- A degree from an U.S. Department of Education accredited technical institute, engineering college or Business College
- IMSA level III certification by July 1, 2022
- Attended advance IMSA seminars in the last 3 years
- Advance training in NEC and MUTCD guidelines and methods in the last 3 years
- Experienced in the operation, testing and trouble-shooting of District 1's traffic signals that are interconnected to railroad warning devices. Has working knowledge of ICC procedures and practices for traffic signals interconnected to railroad warning devices
- Trained in the operation of Aries, Tactics, Centracs, and TransSuite traffic signal management software
- Trained in the operation and programming of Econolite and Eagle/Siemens controllers, including those interconnected to railroad warning devices
- Trained in the operation and management of District 1 closed loop traffic signal and traffic management systems
- Trained in the District 1's Traffic Control and Protection measures and procedures
- Have a minimum of ten (10) years' experience in construction, maintenance, and operation of traffic signals and traffic signals systems currently being used in District 1
- Experienced in solving trouble calls for any traffic signal cabinet or communications failure
- Maintain a current driver's license
- Maintain an electrician's card.
- Maintain equipment and Work Zone safety certification
- Be able to communicate effectively

3.10 SURVEILLANCE SYSTEM MANAGER

Work performance requirements herein dictate that the assigned Surveillance System Manager shall have:

- Knowledge equivalent to BS in Electrical Engineering or Technical School
- IMSA level II and IMSA Work Zone Temporary Traffic Control certification by July 1, 2022
- Attended in advance IMSA seminars in the last 3 years
- Proficiency in technological networks
- Advance training in NEC and MUTCD guidelines and methods in the last 3 years.
- Ability to troubleshoot Allen Bradley programmable logic controllers, PLC 5, and RS Logics 5000 controllers
- Knowledge of RSView 32 Project Development, Control Logix 5000 and Liq. V programming
- Knowledge of advanced computer skills
- Knowledge of NTCIP protocols in particular 1203, 1207, and 1209
- Suitable work experience in electrical construction and maintenance with a minimum of ten (10) years' experience
- Ability to operate and calibrate a variety of electrical test equipment

- Ability to troubleshoot technological equipment
- Ability to troubleshoot CCTV systems, fiber optic systems, and basic Ethernet network communications.
- Familiarity with fiber optic and LED DMS
- Ability to oversee the maintenance and operation of REVLAC and RACS system, VDS, CCTV, camera system, and switched Ethernet network, Ramp metering, Detector cabinets, and Dynamic Message signs
- Familiarity with ladder logic GUI programming and/or traffic signal programming
- Familiarity with telephone data line troubleshooting
- Familiarity with various Traffic detector technologies. Induction loop, Radar, magnetometers, ultrasonic, and video.
- Familiarity with dynamic data exchange communications
- Familiarity with open database architecture
- Familiarity with basic electronics and electronic components
- Familiarity with large scale FSK tone telemetry systems
- Familiarity with various types of telecommunication systems
- Familiarity with SM fiber optic installations and equipment
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Ability to communicate effectively
- Maintain valid driver's license

3.11 SURVEILLANCE PATROLMEN-FOREMEN-TELEMETRY SPECIALIST

Work performance requirements herein dictate that employees assigned duties shall have:

- Knowledge equivalent to electrical engineering or technical school certification
- IMSA level I and IMSA Work Zone Temporary Traffic Control
- Suitable work experience in electrical construction and maintenance with a minimum of eight (8) years' experience
- Advance training in NEC and MUTCD guidelines and methods in the last 3 years
- Ability to troubleshoot Allen Bradley programmable logic controllers, PLC 5, and RS Logics 5000 controllers
- Knowledge of advanced computer skills
- Knowledge of NTCIP protocols in particular 1203, 1207, and 1209
- Proficiency in technological networks
- Ability to operate and calibrate a variety of electrical test equipment
- Ability to troubleshoot CCTV systems, fiber optic systems, and basic Ethernet network communications.
- Familiarity with Daktronics, Skyline and Adaptive Microsystems LED DMS
- Ability to oversee the maintenance and operation of REVLAC System, VDS, CCTV camera system, and switch Ethernet network, Ramp metering, Detector cabinets, and Dynamic Message signs
- Familiarity with ladder logic GUI programming and/or traffic signal programming
- Familiarity with telephone data line troubleshooting
- Familiarity with various traffic detector technologies, induction loops, radar, magnetometers, ultrasonic, and video
- Familiarity with dynamic data exchange communications
- Familiarity with basic electronics and electronic components
- Familiarity with large scale FSK tone telemetry systems
- Familiarity with various types of telecommunication systems
- Familiarity with SM fiber optic installations and equipment
- Experience in splicing, termination and testing of fiber optic cable
- Familiar with Open Systems Interconnection, OSI, seven layers

- Familiar with TCP/IP Stack, five layers
- Valid electrician's card
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Ability to communicate effectively
- Maintain valid driver's license

3.12 SURVEILLANCE WORK CREW

Work performance requirements herein dictate that employees assigned duties shall have:

- IMSA level I and IMSA Work Zone Temporary Traffic Control
- Ability to perform repairs of surveillance equipment, cameras, dynamic message signs, ramp metering equipment/cabinets, loops, cable, and other equipment as listed herein
- Advance training in NEC and MUTCD guidelines and methods in the last 3 years
- Experience in splicing, termination and testing of fiber optic cable
- Extensive experience in the repair of REVLAC and RACS Equipment
- Extensive experience in the operation and maintenance of the REVLAC and RACS system
- Extensive experience in the IDOT VDS network digital and analog
- Experience with FSK tone telemetry system
- Experience with telephone data line troubleshooting
- Experience in fiber enhanced and LED DMS maintenance
- Familiarity with basic electronics and electronic components
- Familiarity with large scale FSK tone telemetry systems
- Familiarity with various types of telecommunication systems
- Familiarity with single mode fiber optic cable installations
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Ability to communicate effectively
- Maintain valid driver's license

3.13 TELEMETRY SPECIALIST

Per Article 9.3 the Telemetry Specialist shall be assigned full-time to perform EMC work at the Traffic System Center. The following equipment must be purchased or leased by the Contractor and kept at TSC at all times to perform the necessary work. The Department will provide a locked area for the storage of the equipment, one each of model number listed:

- Tempo Data Scout DSO Timms Test set or better
- OTDR Fiber Optic Tester w/launch kit ST/LC/SC Connectors – (MAX-720C-Q1-QUAD-Oi-EI-EUI-91-iADV-VFL-FOA-32-00-UPC-FIPT-400-SC-UPC-00-FR2)
- Cable Labeler – Brother Model as specified herein
- Power Meter Light Source (EXFO – FLS-600-EI-EUI-UPC/SC) 'with connectors adapters – FOAS-32, FOAS-54, and FOAS-98)
- Visual Fault Locator (EXFO - FLS-240 POCKET PAL)
- Ethernet Cable Tester – (DataScout - DS-COMBO-10G)
- Fluke TS22 Test Set w/Piercing Pin Clips (FLK-22800001)
- Greenlee Nylon Fish Net Tape – 3/16" x 100 ft. (GRE-FTN536-100)

3.14 PUMP STATION SYSTEM MANAGER

Work performance requirements herein dictate that the assigned Pump Station Manager shall have:

- Technical Institute certificate or Electrical Engineering diploma

- Extensive construction experience in mechanical and electrical of pump station or commercial and industrial work with a minimum of eight (8) years' experience
- Basic fundamental skills, knowledge and understanding of power distribution 4160 volt
- Electrical and mechanical maintenance experience, working on all types of storm water pumping station equipment a minimum of 48 pump station with pumps that are rated at 4160/480/240 volt and capacity that range from 300 GPM to 30,000 GPM
- Knowledge of implementation and preventive maintenance of vertical and submersible pumps
- Experience, training and skills to troubleshoot and repair pumps and other mechanical equipment
- Experience with low voltage motor-control centers for 3-phase (240/480) systems
- Experience with relay logic controls, SCADA systems, PLC program controls and responsible for its design, installation, testing and acceptance.
- Experience in the maintenance and operation of switchgear and, MCC, circuit protection equipment, motor controls, fire and gas alarm system.
- Experience in acceptance inspection and testing of pumping stations
- Familiarity with engine power generators and related transfer switch equipment
- Familiarity with Hazardous materials operations
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Ability to communicate effectively
- Maintain valid driver's license

3.15 PS SYSTEM FOREMAN AND WORK CREW

Work performance requirements dictate that individuals working on Department Pump Station equipment have:

- Minimum of five (5) years hands-on experience working with 240/480V 3 phase motors and pump controls
- Knowledge and ability to work on (4160 volt) electrical equipment
- Extensive experience with troubleshooting and repair of pumps, motor controls, sensors, piping, fittings, valves, monitoring systems, alarm systems, MCC, switchgear, HVAC and other electrical and mechanical equipment as specified herein
- Knowledge of pump station maintenance and operation procedures
- Extensive experience in SCADA systems, such as Alan Bradly ControlLogix 5000 and Liq V TESCO, RSVIEW 32 HMI and Workbench
- Extensive experience with pump removal, installation, breakdown and re-builds, valves, actuators, trash racks and other mechanical equipment as specified herein
- Experience with the removal and installation of submersible/column pumps
- Valid electrician's card
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Ability to communicate effectively
- Maintain valid driver's license

3.16 LIGHTING SYSTEM MANAGER

Work performance requirements herein dictate that the assigned Lighting System Manager shall have:

- Minimum of ten (10) years' experience in construction and electrical maintenance as an electrical tradesperson working on various types of highway lighting
- Experience in the operation of IDOT electrical control circuits
- Ability to interpret contract drawing and wiring diagrams
- Extensive experience in supervising multiple crews skilled to oversee troubleshooting and repair of electrical equipment and systems

- Familiarity with electrical system, weigh stations, maintenance yards, rest areas, moveable bridges, high mast light towers, light poles, sign lighting, underpass lighting, navigation signals, lighting cabinets and its controls, 120/240 volt and 240/480 volt service and equipment, breakaways, fuses, bonding and grounding
- Familiarity with cable underground work
- Familiarity with all wiring, conduits, luminaires, lamps, LED, above ground wiring, splices, underground cable splices, handholes, and different methods of installation
- Ability to manage and coordinate lighting outages, motorist caused damage repairs and cable trouble repairs
- Knowledge of computers and their operation, including MS Office suite software
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Ability to communicate effectively
- Maintain valid driver's license

3.17 LIGHTING SYSTEM NIGHT OUTAGE TECHNICIAN

Work performance requirements dictate that the individual has:

- Three years electrical work experience in highway lighting
- Excellent verbal and written communication skills
- Excellent data entry and proof-reading skills
- Excellent organizational skills
- Advance level skills with Excel spreadsheets
- Ability to work in stressful situations with time deadlines
- Familiarity with OSHA Safety Standards
- Familiarity with IDOT Traffic Control Standards
- Maintain valid driver's license

3.18 LIGHTING SYSTEM FOREMAN AND CREW

Work performance requirements herein dictate that the assigned Lighting System Crew shall have:

- Skills in all typical highway system general work, construction, and repair
- Ability to perform repairs of navigation lighting, interior lighting, power distribution, and other equipment as listed herein
- Experience in troubleshooting, special maintenance problems repair, cable repairs, lighting outage repairs, underground cable repair, lighting cabinet replacement, temporary repairs, tower inspections, HMLT and light pole knockdown replacement, under pass inspections and other maintenance work as specified herein.
- Extensive understanding of Highway lighting maintenance, lamp and luminaire components, electrical services, poles and high mast components, lighting applications, testing, investigation in the roadway lighting field.

3.19 EMC ADMINISTRATION MANAGER

The Contractor EMC Administration Manager oversees a minimum of three (3) administrative staff. He/she is responsible for the accuracy of the EMCMS, reviews daily the EMCMS entries, and is the liaison to the EMCMS programmers for corrections or new projects. This individual also coordinates the monthly submittals and monthly invoicing for all Systems. All Department personnel will communicate with this individual regarding the EMCMS and Contract administrative issues.

Work performance requirements dictate that individuals have:

- An Associates 2-Year degree from an U.S. Department of Education accredited technical institute or college
- Experience with contractor work administration
- Experience with contract purchasing
- Experience with construction billing and collection
- Excellent verbal and written communication skills
- Excellent data entry and proof-reading skills
- Excellent organization skills
- Advance level skills with Windows and Excel spreadsheets
- Ability to work in stressful situations with time deadlines
- Willingness to become familiar with all Contract Articles
- Ability to learn EMCMS processes and requirements

3.20 EMC DISPATCH SUPERVISORS

The Contractor shall employ an EMC Dispatch Supervisor and backup EMC Dispatch Supervisor so there is a Supervisor in charge of the EMC Dispatch Center 24/7.

Work performance requirements dictate that individuals have:

- An Associates 2-Year degree from an U.S. Department of Education accredited technical institute or college or five or more years of contractor work dispatching experience
- Ability to manage staff of 4 to 6 dispatchers
- Ability to learn EMCMS data entry processes and requirements
- Excellent verbal and written communication skills
- Excellent data entry and proof-reading skills
- Excellent organizational skills
- Advance level skills with Windows and Excel spreadsheets
- Ability to work in stressful situations with time deadlines
- Ability to recognize situations which will require additional dispatch help to meet workload
- Willingness to become familiar with all Contract Articles which affect Ticket and Cable Locate EMCMS data entry

3.21 EMC DISPATCHERS

The EMC Dispatch Center takes approximately 9,000 to 10,000 incident calls per year and enters EMCMS Tickets for each call. Normally four (4) or five (5) dispatchers are required in a 24/7 rotation (but up to six (6) dispatchers will be needed at the facility for severe weather or emergency situations). The EMC Project Manager can structure the dispatch workforce to best fulfill the workload, however, the EMC Dispatch Supervisor shall have the ability to call-in additional dispatchers if the workload warrants. The dispatch workforce must have the ability to quickly learn the EMCMS entry processes and reporting, and equipment/alarm monitoring as required. One or two years of college education would be preferred.

Work performance requirements dictate that individuals have:

- Substantial dispatching experience, contractor dispatching is desirable
- Experience with alarm monitoring
- Advance level skills with Windows
- Familiarity with construction terms, preferable to be electrical based
- Excellent written communication skills; good spelling
- Clear and distinct voice for telephone communications
- Excellent data entry skills
- Ability to work in stressful situations with time deadlines
- Ability to respond to the facility within one (1) hour during severe weather situations

3.22 NETWORK SYSTEM ADMINISTRATOR

The Contractor shall obtain the services of a company who will be a routine maintenance Special Vendor on the EMC, who will provide the services of a Network System Administrator. The current Network Administrator is employed by Netrix, LLC, 2801 Lakeside Dr., STE 125, Bannockburn, IL 60015. The Contractor will need to form a relationship with the Special Vendor, preferably the current vendor, through a contract or agreement for this employee's services. The Contractor shall submit details of the proposed contract/agreement at the Pre-Construction meeting.

The Contractor will need Engineer approval before this individual is assigned to the full time Network Administrator position, who shall be an efficient and reliable network professional that will monitor the Contract's VDS, ATMS, and EMCMS networks, to ensure network availability, network security, perform necessary maintenance, be on call 24/7 to provide answers in emergency situations and to support the Department and Contractor staff.

The System administrator shall be assigned to the TSC building or Engineer assigned location in District 1 on a full-time basis to complete work assignments as provided by the Engineer.

The Contractor shall supply an assigned vehicle, proper PPE, and provide safety training as necessary to follow Contractor and Department safety rules and regulations.

EMC Work requires the education, knowledge, and skill of a Network Administrator. The Contract requires this individual possess the following:

Formal Education and Certification

- College diploma or University degree in the field of computer science/engineering or information systems and 10 years related work experience, or associate degree and 12 years related experience
- Cisco Certified Network Professional (CCNP) Switching and Routing certification
- Cisco Certified Network Professional (CCNP) Security certification
- CISSP – Certified Information Systems Security Professional

Network Administrator Requirements and Qualifications

- Two years' experience working on Palo Alto Firewall
- Two years' experience working on Windows Server 2016-2019
- Two years' experience working on DHCP and DNS
- Proficient with Open Systems Interconnection, OSI, Seven layers
- Proficient in layer 1 (Physical layer), layer 2 (MAC address), layer 3 (network) Protocols, Layer 4 Transport Layer, Layer 5 Session layer, Presentation Layer, and Layer 7 User interface
- Proficient with TCP/IP Stack, Network Access, Internet, Transport, Application layers
- Proficient in Calculating Network address, subnet mask, broadcast address, and host IP address range. IPv4 and IPv6
- Extensive experience in system and network creation and development
- Solid understanding of information processing fundamentals and best practices
- Exceptional analytical, conceptual, and troubleshooting abilities
- Excellent written and verbal communication skills
- Experience conducting technology, trends, standards, and products research
- Solid track record in prioritizing and executing tasks when under pressure
- Experience providing guidance and leadership to systems engineers.
- Proven experience identifying, analyzing, and resolving system problems
- Proven project planning and management experience
- Good knowledge of applicable data privacy practices and laws
- Excellent architecture and technical support skills
- Excellent documentation skills

- Strong interpersonal and consultative skills
- Ability to present ideas in a user-friendly language
- Experience working in a team-oriented, collaborative environment

3.22.1 NETWORK SYSTEM ADMINISTER EQUIPMENT REQUIREMENTS

The Contractor Network Administrator shall be the source of various equipment as needed for the Department networks. Also refer to license requirements and applications required for Traffic Signal work in Article 10.24. The Network Administrator shall keep an inventory and loan-out the following:

- Surface Pro 7 or X keyboard, depending on Contractor equipment (23)
- Microsoft Modern Mobile Mouse (23)

3.23 VEHICLES FOR EMC WORK

In past contracts approximately over 150 vehicles per year have been needed for Contract employees and Contract work. From the first day of Contract work, the field employees shall be assigned vehicles, normally within 3 years of manufacture, which are equipped with safety warning devices such as light bars/strobes, on-board construction equipment, and all tools, computers and equipment to perform the routine and non-routine work on Department owned equipment.

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

All vehicles used by the Contractor shall conform to all applicable laws and the Department safety and traffic control requirements. Each Contractor vehicle shall carry a copy of the Contract, or applicable System Article.

At the Pre-Construction Meeting dates will be set for the Contractor to have vehicles with required on-board equipment staged at TSC (in groups) and available for inspection by the Engineer.

Types of Vehicles Used on past contracts:

- Service Patrol Truck
- Pick-up Truck
- Truck for Loop Work
- Truck for PS Work
- Truck, Dump
- Truck with Attenuator
- Truck with 30' Bucket
- Truck with 50' Bucket
- Truck with 70' Bucket

3.24 EQUIPMENT FOR EMC WORK

The Contractor is expected to be familiar with the extent of systems to be maintained under this contract and the equipment necessary to provide the specified work response. Failure to have adequate equipment to perform the work shall not be sufficient grounds for the delay of routine or other authorized work. The equipment shall be owned or under long-term lease to the Contractor, and available always for the Contractor's use. If there are continuous delays in temporary or permanent repairs, the Engineer may order specific equipment items to be furnished on Contract use vehicles.

During 2022 the programming will be available for Patrolmen to create and enter follow-up data on EMCMS Tickets, as well as enter Traffic Signal Patrol completions. The Contractor shall have a tablet for each of the Patrolmen and for other field personnel as necessary to receive and transmit through wi-fi for the EMC work.

The Contractor's personnel shall be assigned cell phones with an appropriate MB size for daily communications, text capability and taking/storing MCHD photos. Also required will be the installation of an app, Timestamp Camera Enterprise, which will allow the personnel to obtain photos with a date, time, location and GPS watermark on the photo or video, which is required for many preventive maintenance programs.

The Contractor is responsible for all communication units, the monthly billing, email service provider, access and photo transmission fees, and other provider assistance as necessary for MCHD repair photo transmissions, data transfers and proper operation of the communication units.

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

- Air hammer
- Attenuators (minimum of 6 recommended)
- Arrow board
- Augur
- Boat, (for accessing navigational light outages)
- Cable Plow
- Compactor, Air
- Compactor, Tamper
- Crane (Under 20 Ton)
- Crane (20 Ton)
- Drill, Boring 37.5 HP
- Drill, Boring 50 HP
- Drill, Boring 125 HP
- Generator 6.5 HP (small)
- Generator 13 HP (large)
- Joint Sealer, Loop
- Pavement Breaker
- Pump, Water (gas) 2"
- Pump, Water (gas) 3"
- Pump, Water (diesel) 6"
- Saw, Concrete
- Tractor, Backhoe
- Tractor, Skid Loader
- Trailer, Cable Rack
- Trailer, Flat Bed
- Trencher 40 HP Wheel mounted
- Trencher 57 HP

3.25 EQUIPMENT FOR VEHICLES ASSIGNED TO TRAFFIC SIGNALS WORK

- Digital camera or camera phone with a minimum 10 MP and flash capabilities
- Lap-Top PC with wireless internet connection, power cords to run in vehicle, and capable of operating all applications/software as required for the Traffic Signal systems
- EDI Malfunction Management Unit (MMU 16E or better)
- EDI Conflict Monitor

- Quantity of 3 - TS2 Bus Interface Unit
- Cell-Phone Interface for PC (Systems Trucks)
- 3-Point Ground Tester
- Amp-Volt Meter
- Loop Analyzer Model ILA-550
- Conduit-Cable Locator
- Light Source for Fiber Cable
- Audible tester for Fiber Cable
- Emergency Pre-emption Emitter
- Fish Tape – 100 ft.
- 10-foot Ladder
- Measuring Wheel
- ASC/2 Controller
- ASC/3 Controller
- Cobalt Controller
- EPAC TS2 M40 Series Controller
- EPAC TS1 M40 Series Controller
- Siemens M50 Series Controller
- Siemens M60 Series Controller
- Pedestrian Push Buttons
- Load Switches
- Electric Drill – ½ chuck
- Shovel
- Quantity of 8 Stop Signs
- Quantity of 8 Traffic Cones
- Quantity of 2 Lane Closure Signing
- Strobe warning lights, spotlights, and directional bar that meets or exceeds current standard

3.26 EQUIPMENT FOR VEHICLES ASSIGNED TO SURVEILLANCE SYSTEM WORK

- AC generators capable of 40-amp output to power DMS sign
- Quantity of 8 Traffic Cones
- Quantity of 2 Lane Closure Signing
- Loop Analyzer Model ILA-550 or equal
- Lineman's test set, Harris Dracon TS-21x89 or equal
- Digital multimeter, true RMS multimeter, with case & test leads Fluke model 87V or equal
- Digital AC clamp on meter with case equal to or Exceeding Fluke Model 334 with test leads or latest
- Greenlee Gt-104 Comprehensive Signaling TIMS 2 & 4 wire Freq/level noise measure. Li-Ion Battery, AC/DC adaptor charger, Cable kit Bantam-Bantam and Bantam- Alligator, soft carry case, rugged bumpers
- Cable and Pipe locator equal to or exceed RD8100 cable and pipe locator by Radio detection with Bluetooth and optional GPS integrated or approved equal for personnel performing cable locate
- Clamp on ground resistance meter equal to or exceeding Fluke 1630 Earth Ground Insulation Tester equal to or exceeding Megger MIT 230 Digital/Analog Insulation and Continuity Tester.
- Tone and Probe Kit equal to or exceeding Greenlee standard (701K-G)
- AC/DC digital clamp current meter equal to or exceeding TECPEL model DCM039
- Fiber optic power meter equal to or exceeding Fluke Simplifiber Pro Power meter model SFSINGLEMODESOURCE 1310/1550 with fixed SC port with ST and LC testing capabilities utilizing the hybrid test reference cord accessories
- Fiber optic cleaning kit with solvent dispenser, solvent dispenser pen, wipes, and LC/ST/SC port cleaning swabs.

- Network Cable Tester equal to or exceeding Fluke Microscanner2 with BNC and Ethernet Adaptors
- Angle locator, digital protractor, min. 5 in length. (used to re-set the angle of the REVLAC gate)
- Handheld video monitor, battery powered, BNC analog video input, RJ-45 ethernet jack for HD IP video viewing. ONVIF and other custom video protocols used in the IDOT VDS system.
- Laptop computer (specifications will be provided at the Pre-Bid meeting).

3.27 EQUIPMENT FOR VEHICLES ASSIGNED TO PUMP STATION SYSTEM WORK

- Gas Detector Equipment as Required per OSHA
- Air Pressure Calibrator Meri-Cal EE33 with kit or equivalent
- Tesco Workbench Firmware, and power cords to run in vehicle
- Phase Rotation Indicator
- RPM Strobe
- Megger
- Multimeter

3.28 EQUIPMENT FOR VEHICLES ASSIGNED TO LIGHTING SYSTEM WORK

- Amp Volt Meter
- Conduit Cable Locator
- Directional Bar
- Fish Tape 100 Ft
- Ladder – 14 Ft
- Measuring Wheel
- Shovel(s)
- Spotlights
- Strobe warning lights
- Tools; power and hand, including pipe wrenches, pry bar, sledge hammer

3.29 MAINTENANCE TEST EQUIPMENT

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

The Contractor is expected to maintain all test equipment in accordance with the manufacturer's specifications at all times, including certified calibration by a responsible test lab. The equipment shall have the test lab's most recent calibration ticket attached. The minimum quantities and types of required test equipment, as listed below, shall be ready for inspection by the Engineer by January 1, 2022.

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

The following equipment must be purchased or leased by the Contractor for use on the EMC:

Quantity of 10: RD8100 or better, Cable Locator (avg price \$ 7,000.00 each)

Quantity of 7: Tempo Data Scout DSO Timms Test set or better, (avg price \$ 7000.00 each)

Quantity of 7: Hilt 9000 or better, Digital Loop Analyzer/Megger (avg price \$ 3,000.00 each)

Quantity of 7: Ideal Network Securi-Test IP Digital CCTV Tester or better, (avg price \$700.00)

Quantity of 1: MMU/Conflict Monitor Testing Station (avg price \$ 10,000.00)

Quantity of 2: Fluke Oscilloscope Handheld Meter for Testing & Calibrating Piezos (avg price \$ 2,000.00)

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

- Amprobes
- Breakout Box with case
- Clamp-On Ground resistance Meters
- Coaxial Cable Tester
- Digital Low Resistance Ohmmeters
- Digital Multimeters
- Digital Tachometer
- Fall-Off Potential Ground Resistance Tester
- Gas Detectors, 4 Channel
- Hotspot Locator
- Infrared Thermometer
- Insulation Resistance Test Equipment
- Lineman's Test Set
- Multimeters with Current Probe and Thermal Probe
- OTDR Fiber Optic Tester w/launch kit
- Pipe and Cable Locator
- Pushrod Video Inspection System (equal or better than Radiodetection Pearpoint P342 Flex Probe 1" or 2" camera with a 400 foot reel
- Survey Rods
- Triaxial Gauss Meter
- Windows Computer to run Harris Mega star software

3.30 CONTRACTOR USE OF APPROVED MATERIALS

The Contractor shall not install any equipment or material prior to approval by the Engineer. Non-Engineer approved installed equipment or material is subject to removal solely at the Contractor's expense.

If the Contractor changes the supplier of any approved materials for the Contract, a new submittal for that item must be made for review and approval by the Engineer. The Contractor shall provide free access to the Bureau of Materials personnel for inspection to ensure that the approved materials are used.

The Contractor (including all supervising personnel) is expected to familiarize themselves with all requirements with respect to proper materials, methods and procedures and failure to do so will not be justifiable grounds for lack of compliance with the contract requirements.

The Contractor shall be responsible, under routine maintenance for providing spare equipment for emergency and routine service and for overhauling equipment, to meet the response and maintenance requirements as stated herein. The materials furnished by the Contractor shall be approved by the Engineer, in equal quantities, which shall be identical to the original elements except as otherwise specified herein or permitted by the Engineer.

The Contractor and the Engineer shall meet by December 1, 2021 to agree on the minimum quantity of materials which the Contractor shall have in his/her possession at the start of this Contract. Refer to lists of minimum quantities of equipment in System Articles herein.

Following an inventory related failure to meet the routine maintenance requirements of the Contract, the Engineer may direct the Contractor to maintain a minimum quantity of specific materials.

This shortage of materials, parts, or equipment shall be sufficient cause to assess liquidated damages. The Contractor shall submit anticipated schedule(s) for ordered replacement items when requested by the Engineer. The Engineer may inspect the Contractor owned spare parts inventory at any time as deemed necessary.

A shortage of any materials, parts, or equipment causing delays in the implementation of replacements of materials or repairs shall be sufficient cause to assess liquidated damages.

3.31 CATALOG CUT SUBMITTALS FOR APPROVAL

Within 60 days after contract execution, the Contractor shall submit on the Department's TOCS (Traffic Operations Construction Submittal) computer entry system the product data (for standard products and components) and detailed shop drawings (for fabricated equipment) of materials and project equipment (products) proposed for use on this Contract for both routine and non-routine maintenance. The Engineer may grant permission to delay certain submittals until the applicable work is authorized, but the 60-day requirement shall apply to all commonly used and general items.

The Contractor will receive an automatic email of the receipt of each submittal to be reviewed. The receipt of the TOCS submittal receipt email will be construed as the Contractor's assurance to the Department that the submittal information is accurate and conforms to the requirements of the contract documents. Unless otherwise indicated, manufacturer's guarantees shall be included with the submittal information.

Once the submittal has been reviewed by Department personnel the TOCS system will automatically email the Contractor as to the status of the submittal item, First there is a "Action Taken" which denotes that the submittal is either "Completed" or "Rejected Without Review). The sub-section will specify as to whether the item has been "Approved", "Approved as Noted" or "Disapproved".

Due to the highly specialized nature of Surveillance System equipment, certain items must be manufactured by the original equipment manufacturer, unless written approval is given by the Engineer. The Engineer may waive the requirements for shop drawings for certain original-manufactured fabricated equipment if original shop drawings on file remain valid for the equipment. It is the Contractor's responsibility to coordinate accordingly.

Submittals need not include all project equipment and materials in one submittal; however, the submittals for the equipment and materials for each individual pay item shall be complete in every respect. The Contractor may request, in writing, permission to make a partial submittal. The Engineer will evaluate the circumstances of the request and may agree to review such a partial submittal.

Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of the submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will be not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents.

3.32 CERTIFICATION REQUIREMENTS

Where certifications are specified, the information submitted for approval shall incorporate certification information. When a certification is available prior to equipment manufacture, the certification shall be included with the submittal information. When a certification is available only after equipment manufacture, the submittal shall include a statement of intent to furnish the certification after equipment approval and manufacture. Certifications involving inspections and/or tests of equipment shall be complete with all test data, dates, and times.

3.33 SAMPLES OF MATERIALS

The Engineer may request from the Contractor a sample of a specific item of a submittal for review and evaluation. The sample shall remain property of the Contractor and shall be returned after the review and evaluation with comments as applicable.

3.34 NEW MATERIALS INSPECTION REQUIREMENTS

The Contractor shall comply with the applicable requirements of Section 106 and 1000 of the Standard Specifications for Road and Bridge Construction. No uninspected equipment/material is to be delivered to the job site. When underground materials are furnished, the Contractor shall notify the State of Illinois, Department of Transportation, Bureau of Materials personnel to provide proper inspection for the approval of the materials, prior to delivery to the job site.

3.35 MATERIAL STARTING QUANTITIES

The Contractor and the Engineer shall meet by December 1, 2021 to agree on the minimum quantity of materials which the Contractor shall have in his possession at the start of this Contract. Refer to System Articles herein for preliminary list of Contractor starting quantities.

Following an inventory related failure to meet the routine maintenance performance requirements of the Contract, the Engineer may direct the Contractor to maintain a minimum quantity of specific materials. The additional cost of purchasing and storing the required parts inventory shall be borne solely by the Contractor.

A shortage of any materials, parts, or equipment causing delays in the implementation of replacements of materials or repairs shall be sufficient cause to assess liquidated damages. The Contractor shall submit anticipated schedule(s) for ordered replacement items when requested by the Engineer. The Engineer may inspect the Contractor's spare parts inventory at any time as deemed necessary.

4.0 EMC ROUTINE MAINTENANCE WORK

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4.0 EMC ROUTINE MAINTENANCE WORK

4.1 BIDDING

Unless labor, equipment, or material purchase, is specifically noted herein as paid through non-routine maintenance, Article 4.0 EMC Routine Maintenance Work, including Traffic Control, shall be paid through, is part of, and is included in routine maintenance bid items.

4.2 GENERAL MAINTENANCE WORK

Specific items of routine maintenance work are described under the description of work for each respective system. General requirements of routine maintenance are included in, but not limited to this Article.

The Contractor is automatically authorized and required to perform routine maintenance work on all Department owned and EMC maintained electrical equipment, devices, systems, and appurtenances, at EMC maintained locations, which includes response, scheduled or emergency work, and preventative maintenance actions and work, including providing necessary traffic control.

The Contractor shall:

- Perform routine maintenance under this Contract which prevents operational problems, minimizes trouble calls, safeguards electrical safety, promotes operational safety and which prolongs the operations life of installed systems. Some of these maintenance activities will be initiated by the Engineer, some will be jointly developed between the Contractor and the Engineer, and some are expected to be routine maintenance obligations of the Contractor.
- Install parts/equipment/materials in accordance with the best practice of the trade, and in accordance with manufacturer's recommendations. Parts/equipment/materials installed during the Contract year at a maintained or newly maintained location shall become part of the Contract and covered under routine maintenance.
- Perform all necessary delivery, installation, removals, and re-installations as stated on Department work authorizations when parts/equipment/materials are furnished by the Department from the EMC Spare Parts storage/inventory.
- Not use Department owned contract spare parts for routine maintenance work unless specifically stated herein. In emergency situations the Engineer will allow the Contractor the use of the Department owned contract spare parts if a request is made by email and a Ticket is created to document this transaction. The Contractor must replace the parts, in kind, as soon as possible. The Ticket will remain open until the parts are returned. Refer to Article 4.22.2.
- Allow the Engineer to make frequent investigations of Contractor work and periodic inspections of the respective systems and installations to determine if all maintenance operations are being performed satisfactorily and, in the manner specified in the Contract. The Contractor shall provide safe access to any part of the systems for Department inspectors.
- Document on an EMCMS Ticket all responses and work on system equipment

The Contractor shall furnish:

- New parts/equipment/materials for all EMC maintained system equipment found damaged or malfunctioning for any reason, regardless of the type of damage or who caused the damage, unless otherwise stated herein. (Examples include vehicular caused damage, third party damage, vandalism, natural causes, or incidental damage on or affecting system equipment as caused by the failure or the fault of utility company equipment.)
- New parts/equipment/materials which have been previously approved by the Engineer, in equal quantities and identical to the original elements found damaged or malfunctioning, except as otherwise specified herein or permitted by the Engineer. (When an item cannot be replaced in kind, the Contractor shall provide components equal or better than the failed devices or equipment for repairs or replacement work, if approved by the Engineer.)
- To the Engineer all Catalog cuts and description of replacement materials which will be different from the original installation.
- Documentation that all materials, repair methods and/or equipment replacements are suitable for the intended use per Specifications and Standards, and as listed in Contract requirements herein.
- Red-line record drawing(s) to reflect all changes from routine work completed. This documentation shall be transmitted monthly in the routine work submittal on the FTP site.

By signing the monthly routine maintenance work invoice the Contractor is documenting to the Engineer that the various items of equipment at all locations perform properly, that maintenance completion dates as specified or agreed are met, and that repair work as performed on system equipment meets all applicable codes, manufacturer's recommendations, and requirements herein.

The Engineer appointed for this Contract will be responsible for the routine work in conformance with Section 105 of the Standard Specifications for Road and Bridge Construction, and Contract Special Provisions.

All expressway, shoulder, or lane closures required for clearing and installing temporary or permanent repairs shall be in conformance with existing Departmental standards governing lane closures.

Preliminary Work

At the Engineer's request the Contractor shall inspect, investigate, and provide a preliminary sketch and layout with measurements, dimensions and connections of equipment, components, and material quantities for work to be performed under routine (or non-routine) maintenance. The sketch shall be provided within three (3) days of the Engineers request.

Temporary Repairs

Temporary repair/service restoration is normally required within four (4) hours of Contractor personnel arrival, however, weather situations may allow extensions and/or other specific instructions are found herein the System Articles.

Permanent Repairs

Permanent repairs shall be started promptly following temporary repairs, and shall be continued insofar as possible without interruption, until completion. If a permanent repair delay is due to parts on order, the Contractor shall note this information in the Ticket and furnish the Engineer, via email, the corresponding material requisition and purchase order for those parts or components. Specific instructions for permanent repairs and time requirements are found herein the System Articles.

Salvage of Damaged Equipment

All damaged equipment, determined by the Contractor not to be re-usable, shall be removed from the state highway right-of-way within twenty-four (24) hours from the time of the notification of the incident, exclusive of Saturdays, Sundays, and Holidays, and taken to the Contractor's shop area. For procedures and documentation of state-owned scrapped materials and parts refer to Article 2.15.12.

Restoration

Following repair work, the associated area restoration shall be equal to or better than the original area condition. For example, if the soil/sod has been disturbed during the course of his work, the Contractor shall re-grade the surface work area with black dirt, placing seed or sod.

4.3 EQUIPMENT UNDER WARRANTY

The Contractor shall keep current a list of equipment which is under warranty to the Department, in an Excel spreadsheet, by EMCMS location number, main route and cross street and unit or cabinet number if applicable. If malfunctions occur on this warranted equipment it is the responsibility of the Contractor to contact the applicable construction contractor, vendor and/or manufacturer to resolve the problem(s) and make the necessary repair or replacement. In some cases, failed equipment under warranty will need to be shipped back to the manufacturer. The Contractor shall keep documentation of all warrantee related problem(s) and shall enter the information on a Ticket.

4.4 MANUFACTURER SPECIFICATIONS

All equipment shall be maintained in accordance with manufacturer specifications and recommendations. Routine maintenance equipment service schedules and work shall be executed in accordance with equipment operations and maintenance (O & M) manuals. The Engineer shall be immediately notified if any procedure or testing process required herein contradicts any manufacturer maintenance specifications.

4.5 PROCEDURES FOR INTRUSION OR VANDALISM EVENTS

If Contractor personnel see an unauthorized individual at a maintained site, they shall notify the EMC Dispatch Center to call for police assistance, before confronting an individual.

If the Contractor arrives on the scene of major vandalism to IDOT property, the Engineer shall be notified and the incident shall be reported to the police. A copy of the police report shall be emailed to the Engineer and a copy scanned and stored on the FTP site with all documentation. Photos of major damage shall be taken by the Contractor and forwarded to the Engineer within 24 hours. Following incidents of tampering, vandalism, or theft, the Contractor shall notify the local police agency so they may more frequently monitor the area.

If an entry alarm is received, the EMC Dispatch Center shall dispatch a Patrolman to the scene. If a break-in is confirmed, the Patrolman shall notify the IDOT ComCenter who shall dispatch Police to the area and notify the Engineer. The Patrolman shall wait for the IDOT representative to arrive on the scene and make thorough inspection of the facility to ascertain if anything is missing or damaged, before the Patrolman files an official police theft report.

The Patrolman shall take photos of the damage and relay all information to the EMC Dispatch Center so a Ticket may be created. The EMC Dispatch Center shall obtain a copy of the official police report. Copies of the patrolman's photos and the police report shall be submitted to the Engineer as soon as possible.

When damage or loss of system equipment is the result of repeated and extensive theft activity which affects continuity of service, the Engineer may authorize non-routine maintenance payment of all or a portion of the permanent repair work, using contract pay items wherever applicable. The potential for the permanent work authorization, however, shall in no way relieve the Contractor from the responsibility to promptly respond.

4.6 EMERGENCY CALL-OUT PLAN

The Contractor is required to have an Emergency Call Out Plan that formalizes the 24/7 emergency response necessary to provide continuous maintenance for systems covered under this Contract. The Contractor shall appoint managerial level personnel to be on-call (on a rotating basis) after normal workday hours and on weekends, to serve as an Emergency Response Coordinator, who if severe storm or snow predictions are announced by the media, or emergency situations arise, will activate the Contractor's Emergency Call-Out Plan.

In this capacity the Emergency Response Coordinator shall coordinate work with the EMC System Managers and EMC Dispatch Center Supervisor so there is a callout of additional personnel to address the type of situation predicted or at hand. The weekly scheduled Emergency Response Coordinator and applicable phone numbers shall be furnished to the Engineer and Engineer specified Department personnel via text or email. The Engineer shall be immediately notified by text if the Contractor's Emergency Call-Out Plan has been activated.

Under storm conditions, emergency situations or other special circumstances requiring the setting of priorities from among system needs, all requiring immediate corrective action, the assigned Emergency Coordinator shall set response priorities in such a manner as to minimize hazard and inconvenience to the public and otherwise optimize the effectiveness of the contractor's forces. The Contractor shall communicate and coordinate with the Engineer in such situations.

4.7 CONTRACTOR IMMEDIATE RESPONSE

Time is of the essence for Contractor personnel to arrive at the scene, shut-down or safely isolate any potentially hazardous electrical situation, clear the pavement of any equipment debris resulting from damage to system equipment, and take corrective measures to restore normal traffic operations and assure the safety of the motoring public. Normal response time shall be one (1) hour.

Certain equipment is critical to the EMC and requires immediate response and immediate corrective action, including failures of fiber optic equipment, servers, distribution equipment, or intrusion alarms, all non-scheduled power outages, and other equipment items as specified in Systems Articles herein. This routine work may need to be provided as overtime or double-time work.

It is an objective of this Contract to have Contractor personnel respond to trouble calls as quickly as possible after obtaining an acceptable amount of information. A Ticket shall be created, and personnel dispatched to a reported incident, after being provided, at a minimum, the main route and a cross street.

The Contractor's workforce shall continuously watch for system elements that are malfunctioning or in need of replacement. When items are found the Patrolman creates a Found On Patrol (FOP) Ticket or the EMC Dispatch Center shall be immediately notified to create a FOP Ticket. The malfunctioning equipment shall be repaired or replaced as part of routine maintenance unless specifically noted in System Articles herein.

4.8 REPAIRS OF DAMAGE CAUSED BY MOTORISTS (MCHD)

The Contractor shall abide by routine maintenance damage response and repair requirements stated herein and in Systems Articles herein, for temporary and permanent repairs. Most materials, equipment and labor for repairs are furnished by the Contractor and paid through routine maintenance.

Upon arrival at the location of the motorist caused equipment damage the dispatched Patrolman or other Contractor personnel shall take a minimum of 3 digital photos of the overall damage; one for the damage with the street area showing, and two of the damaged equipment. Close-up photos of decals are not desired. Until notified by the Engineer if situations warrant, follow-up photos of the repaired equipment are not required.

The Contractor may not use Department owned, contract spare parts for motorist caused damage repairs for the Traffic Signal or Lighting Systems. However, for the Surveillance System, from January 1, 2022 until the supply is diminished, the Contractor, may use named parts and materials as specified in Article 9.0 Surveillance System, for REVLAC, Ramp Gates, and RACS motorist caused damage repairs.

The Contractor is not allowed to collect repair costs from motorists or insurance companies.

Refer to Article 2.15.9 for administrative requirements to furnish parts costs, create motorist caused damage statements of repair cost, and furnish damage photos, all to be approved by the Engineer and forwarded to the IDOT Claims Department.

When a MCHD statement of repair cost for DMS, Fiber, REVLAC Barrier, Traffic Signal cabinet or Lighting cabinet exceeds \$ 25,000 and the Contractor furnishes full documentation of labor, equipment and materials, with applicable photos of damage, and the IDOT Claims Department successfully processes the claim with the motorist's insurance company or motorist, the Contractor shall be reimbursed the repair amount over \$ 25,000.00 through the monthly routine maintenance payment. The Contractor may only collect payment from the Department for repair work necessary per incident in either Article 4.8 or 4.10.

Expressway Sand Barrels

When Contractor personnel find motorist caused damage to expressway ramp gate sand barrels the EMC Dispatch Center shall be immediately notified to create a Ticket and notify the IDOT ComCenter, who in turn will notify IDOT District One Bureau of Maintenance personnel who will replace the barrels and sand.

4.9 3RD PARTY DAMAGE REPAIRS

When equipment is damaged by 3rd Parties such as construction contractors, general repair crews hired by cities or agencies, utility companies, and the like, the Contractor shall clear the site for safety of the motorists and make necessary temporary repairs under routine maintenance, per specifications herein, including Articles 4.2 and 4.7, but may bill the offending party for Contractor work performed. It shall be the 3rd Party offender who decides if they shall use the EMC Contractor or another Illinois Department of Transportation/District 1 approved electrical contractor to complete the permanent repair. Time is also critical to perform permanent repairs, which must be completed per specifications herein.

Upon finding 3rd party damage to state property (not caused by Department personnel), the first Contractor Patrolman responding to the scene shall obtain information for the GB (General Billing) Ticket:

- Date stamped, digital photos of the damage
- The name of the contractor at the scene, address, contract, or permit number and contact name and phone numbers (It is the Contractor's responsibility to locate the offending party.)

4.9.1 3rd PARTY REPAIRS – POSSIBLE REIMBURSEMENT

If the Contractor has followed all 3rd party billing procedures as listed herein Article 2.15.15 and after four (4) months of correspondence, notifies the Engineer that funds cannot be recovered for 3rd Party Damage repairs, the Department may furnish Contract spare parts to reimburse the Contractor or may issue a non-routine pay item authorization (PIWA) where unit price items are applicable, or may issue an agreed-price authorization (AGWA) for materials where unit prices are not applicable. The Contractor shall remain responsible for labor costs. Each incident will require review by the Engineer before authorization for payment is issued. The Contractor may only collect payment from the Department for repairs for one incident as applicable to either Article 4.9.1 or 4.10.

4.9.2 WORK REQUEST MADE BY 3RD PARTY

The Engineer shall be notified by email if the Contractor receives a request from a third party requesting legally permitted work within the IDOT right of way, which is not related to the repair of system equipment damage, but for which the Contractor will receive direct payment from the third party. An example of a work request would be the relocation of a light pole for a developer. The Contractor shall obtain Engineer approval prior to the start of work.

4.10 SPECIAL DAMAGE REPAIR SITUATIONS

In special damage or repair situations where routine parts replacement costs (not labor) exceed \$ 100,000.00, for a single incident at a single location, or a single piece of equipment at a single location, or a hazmat clean up at a single location, at an EMC maintained ON-Maintenance location, the Department may make a special material only routine maintenance payment to the Contractor, not to exceed \$ 100,000.00.

The Contractor must provide proof that there was no Contractor misuse of equipment, that all preventive maintenance was performed to schedules provided herein, and that the item was maintained to the manufacturer's specifications, so as to conclude that the damage or malfunction was caused by an act of god (force majeure) such as earthquake, lightning, explosion, or that the item was mis-designed for its use or capacity when installed in system equipment, as approved by the Department. (In situations where mis-design is alleged, the Contractor must provide an inspection report from a 3rd Party design consultant as selected by the Engineer.) The fact that a part is old or no longer manufactured will not be cause for this special payment. Refer to Contractor Advisories in Article 2.9 to report aging equipment in need of replacement.

For this special payment to be applicable the Contractor must:

- Provide material quotes (3) from vendors
- Provide list of Contractor owned parts to be used and their purchase cost (provide vendor invoice)
- Provide minimum of five (5) photos of the damage or malfunctioning equipment part

It is the Engineer's option to furnish parts from the EMC Spare Parts Inventory or to use unit prices where applicable, in the determination of the amount of the special payment to the Contractor.

4.11 GRAFFITI REMOVAL

All graffiti, including advertising decals, found on system equipment and or structures and buildings shall be removed within one (1) working day. Painting over the graffiti is not allowed.

When Patrolmen find, or are informed of locations where paint, corrosion, grime, and remnants of rodent/insect infestations are not easily removed by hand or with common cleaners, a Ticket shall be created.

The Contractor shall clean this equipment with a dry ice blasting machine equal to or better than the Cold Jet SDI Select 60 with cold jet accessories (hoses, applicators, nozzles, and cables). For most situations an after cooler will be needed if a diesel air compressor is used. The after cooler shall be equal to or exceed Cold Jet aftercooler 2M0023-G1 equipped with all the necessary accessories to operate in conjunction with a Cold Jet SDI Select 60 machine or equivalent.

Applications include Pump Stations, communication shelters, control cabinets, light towers, transmission cabinets, switch gears, printed circuit boards, display modules, etc. It is expected that 4,000 sq feet of cleaning will be required throughout the Contract year.

The dry ice blasting machine shall use dry ice blocks or pellet media. It can clean from as low as 50 PSI up to 250 PSI and shall include an internal pressure regulator. For proper use of the unit it shall come equipped with blast hoses rated up to 300 PSI, applicator with light, 1" blast swath, clamp style nozzle handle, hose management system, static bond cable, after cooler (if using diesel air compressor), air hose, fittings, variable fragmenting MERN nozzle, 3" medium flow blast swath, and accessories. The unit shall be gentle enough to

remove dirt and corrosion from a printed circuit board and not harm cabinet terminals or wiring but aggressive enough to remove paint from a brick wall without damaging the bricks or mortar.

4.12 GPS DOCUMENTATION

The Contractor shall provide or maintain all GPS readings for all Contract locations in the EMCMS as of the beginning of the year and for any new locations or fiber which are transferred to this Contract during the year. The Engineer shall check random GPS readings once per month for each electrical system. If inaccurate readings are found, the Contractor will be required to re-survey a five-mile section of highway or five-mile defined area and provide new GPS readings for the EMCMS.

Datum to be used shall be North American 1983. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have minimum 2-5-meter accuracy after post processing. The device may also utilize Differential GPS to obtain the specified accuracy.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable. The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of six (6) years. The manufacturer and model of the Contractor owned GPS devices shall be submitted to the Engineer at the Pre-Construction Meeting.

4.13 PROVIDING SYSTEM SERVICES

Upon request of the Engineer, the Contractor is required to provide trained personnel for the following miscellaneous routine maintenance work:

- Provide system access to utility workers or inspectors approved by the Department
- Provide system access for other contractors and consultants who have IDOT approved contracts or permits to work on IDOT equipment
- Conduct an immediate System or component inspection upon notice of the Engineer
- Provide labor, transportation, and equipment, to assist IDOT inspectors in their inspection of any portion of a System(s)
- Provide additional special patrols, inspections, and tests to confirm proper system equipment operation
- Collect information to analyze the nature of repetitious or intermittent system malfunctions
- Travel to a designated location/installation to determine ownership, take photos of the requested area, and email photos and information back to the Department (response required within two (2) hours of request, unless directed otherwise)
- Travel to any system designated location/installation and take GPS coordinates reading per specifications as listed in Article 4.12 GPS Specifications
- Travel to the site of a hazmat spill to oversee proper pump station operations (response required within one hour of request)
- Provide Patrolman for monitoring (stand-by time) of hazardous or emergency situations

The Contractor shall enter and complete Service Request Tickets (SR) in the EMCMS for each request.

4.14 COORDINATION WITH ELECTRICAL UTILITY COMPANIES, CONTRACTORS AND OTHERS

The Contractor shall always keep incoming power service in proper condition. The Engineer shall be promptly notified by email for cases such as the planned disruption of service power to System equipment.

The Contractor shall monitor the condition of electric service wiring and equipment, telephone service wiring and equipment, natural gas service lines and accessories and water service piping and appurtenances for all

systems and facilities maintained under this contract. The Contractor shall maintain contacts with the respective utilities or providers for these services and shall coordinate with the utility and the Department to assure that services are installed in a timely manner, in compliance with requirements established for the service.

The Contractor shall fully coordinate access as required for utility company or contractor inspection, modification work as applicable, repair work as necessary and other matters as necessary to assure continuity of services and proper revisions when needed.

The Engineer may require the Contractor to inspect related non-system equipment, such as Com Ed power lines, that may interfere with the functioning and/or maintenance of systems as covered in the Contract.

The Contractor shall assist the Engineer with the inspection of work completed by others such as the construction and/or replacement of intermittent median walls by a construction contractor and the necessary inspection of the required EMC electrical ducts.

4.15 TICKETS

Work Tickets are required to be created on the EMCMS to:

- Record malfunctions and problems found (FOP Found on Patrol)
- Document Contractor response to incident calls to the EMC Dispatch Center
- Documentation of all repair work on system equipment

all of which is integral to the Contract. The average number of Tickets created on the EMCMS by the Contractor per year for the past five years is approximately 9,000. Review Ticket charts in Article 12.0.

Contractor System Managers and the EMC Dispatch Supervisor shall review the Ticket entries and coding daily to assure all required fields are entered, correct information is entered, and any duplicate Tickets are voided. IDOT inspectors also monitor the ticket coding and ticket information input and shall require the Contractor to make corrections as necessary.

The Contractor shall enter all required data for Tickets in the proper fields in the EMCMS screens and shall have all fields completed accurately and timely. The Contractor may view the EMCMS Ticket and entry requirements following the Pre-Bid Meeting.

Although the immediate response of Contractor personnel is the priority of any Declared Disaster (or potential Declared Disaster), properly documented Ticket information is necessary for the Damage Repair Submittal form and Detailed Damage Inspection Report, which are requirements for possible additional payment to the Contractor when there is a Declared Disaster.

The Ticket Entry Screen may be viewed by bidders following the Pre-Bid Meeting.

4.16 LOCATING CABLE OR OTHER COMPONENTS OF IDOT SYSTEMS

To prevent damage and facilitate work by others, the Contractor shall promptly respond to Department or 3rd party calls requesting a locate of state-owned electrical systems, cables, or components at all locations and/or facilities. A significant number of Contractor personnel with applicable training are required to perform cable locates.

The Contractor is required to perform a locate of state owned underground cables or any other components, one time for each system location(s), per project or contract, as requested by the general contractor of a construction project, or other contractor hired for work on IDOT owned equipment, before or after the transfer

of maintenance responsibilities. Each request may involve multiple locations where separated electrical systems are involved. Markings shall be given with a horizontal tolerance of one foot to either side.

If the EMCMS Cable Locate entry screen was completed, and the requesting contractor notified by the EMC Contractor that the 1st cable locate would be performed on a designated date, the EMC Contractor may charge 3rd parties for requested 2nd or more cable locates.

The Contractor shall also perform all cable locates as necessary for projects/authorized work for the electrical systems herein. Note: The Department's fiber and copper duct package has been relocated from the median to the easterly side of I-290 ROW, and all fiber optic cable locates in the area will be performed jointly by the Contractor and the Illinois Tollway fiber maintenance teams. Future permits for work in the Department ROW shall require the permit holder to coordinate the fiber optic utility locates with both the Department and the Illinois Tollway. The Illinois Tollway's Fiber Optic Maintenance and Management Vendor will participate in J.U.L.I.E. for locates on the Department's right of way.

Historically, Contractors have performed the following number of Cable Locates per year:

2020:	3574
2019:	3458
2018:	3452
2017:	3888
2016:	3792
2015:	3796
2014:	3465
2013:	2814

For each request for a cable locate, the Contractor shall give out a Cable Locate Ticket Number to Construction contractor(s), IDOT permit contractor and IDOT approved agencies, municipalities, utilities etc. The Contractor shall obtain the requestor's email address and shall notify them if there are questions about the Locate and email the requestor if a change in the scheduled Locate Date is necessary.

The Contractor shall enter all required data for cable locates in the proper fields in the EMCMS screens and shall have all fields completed accurately and timely. Entry fields include a CN, Permit # or LR section # before the locate can be scheduled. The Contractor may view the EMCMS Cable Locate and entry requirements following the Pre-Bid Meeting.

4.17 MAINTENANCE TRANSFERS

The Contractor shall cooperate with the Engineer and Construction Contractor(s) with respect to transfers of maintenance on system elements and inspection of completed construction work for Department acceptance. The Contractor shall provide the technical expertise to assist the Engineer and Department Inspectors to make equipment inspections of installations to be added or removed from routine maintenance to ascertain that the equipment is in proper working order and to verify Department assets for the inventory.

If the Contractor Patrolman or Contractor System Manager is setting up the transfer a minimum of 24-hours advance notification to the area IDOT Engineer/Tech is required as well as the names of the Contract personnel who shall be attending the transfer meeting.

If the area IDOT Engineer/Tech is setting up the transfer a minimum of 24-hours advance notification to the Contractor Patrolman and Contractor System Manager is required.

If a location is going Off-Maintenance to a construction contractor, the EMC Contractor is required to inspect the location and fix any found malfunctions or problems prior to the date of the scheduled maintenance transfer.

If a location is coming On-Maintenance, the Contractor is required to inspect the equipment to assure the Department all is in working order. The Contractor shall confirm to the Engineer that the work and test results meet or exceed the Standard Specifications for Road and Bridge Construction and manufacturer's specifications.

The official transfer inspection shall normally be attended by the Contractor Patrolman and Department representative. In some unique situations the Engineer may allow the Department's area Engineer or Tech to give verbal permission for a transfer of maintenance to the Contractor Patrolman and/or Contractor System Manager. A Contractor Patrolman for the specified transfer location or Contractor System Manager must attend the transfer meeting.

Upon the completion of the maintenance transfer the Contractor shall complete required maintenance transfer forms or equipment inventory forms as specified herein the System Articles, and immediately report transfer information to the EMC Dispatch Center to create a maintenance transfer ticket (MT). The information required for entry in the EMCMS includes location number, equipment type, pay code, name of construction/electrical contractor, ComEd account numbers, meter numbers, transformer numbers, RR interconnect information, and other TS location information such as Combo-Lighting Installations (yes or no) and provide location number to be entered in Lighting System, TS Equipment System (yes or no) name, Battery Back-Up (yes or no), TSP – Transit Signal Priority (yes or no), BRT – Bus Rapid Transit (yes or no) RLR – Red Light Running Camera (yes or no), TS intersection monitoring cameras (yes or no), EVP –Emergency Vehicle Pre-emption (yes or no) and EVP Owner

The Contractor shall:

- Confirm to the Engineer that the work and test results are within the range identified in the Standard Specifications for Road and Bridge Construction and manufacturer's specifications
- Provide new locks for system equipment if requested by the Engineer
- Notify the Engineer with respect to the completeness, workmanship, safety, and maintainability of the installation so the Engineer can make the final determination regarding acceptance.
- Take maintenance responsibility for a location and all its equipment, if directed by the Engineer.
- Take GPS recordings per Article 4.12 herein. This work shall be applicable to all systems.
- Provide the list of equipment (Department owned assets) to the Engineer and to the EMC Dispatch Center or Contractor assigned Inventory Manager for entry in the EMCMS within 48 hours.
- Enter all information from maintenance transfers, including dates, times, punch lists, tests, agreements, on the FTP site.

Refer to Electrical System Articles herein for specific transfer procedure requirements.

4.18 GENERAL EMC SPARE PARTS REQUIREMENTS

The Contractor shall use Department owned EMC Spare Parts only when directed and approved by the Engineer. The Department is not obligated to furnish specific materials, parts, or equipment for Contractor use. For inventory storage requirements refer to Article 2.6.4 and 2.6.5.

The Contractor shall deliver any part, equipment, or material from the EMC Spare Part Storage facility/warehouse/area or Contract facility location to Contract work sites within District 1, other EMC Spare Part storage facilities, shops or sites, or to State facilities as directed by the Engineer. The Contractor is responsible for timely, safe transportation and handling.

Contractor shall provide experienced personnel to inspect all items coming into the EMC spare part storage facility/warehouse/area or Contract facility location. Non-working or damaged parts/equipment/materials shall be scrapped and not moved into any EMC Spare Part Storage facility/warehouse/area or Contract facility location. Refer to Article 4.24 Disposal of Scrap.

The Contractor shall assure that only parts/equipment/materials in good working order and/or good condition shall be placed in the EMC Spare Parts Storage facilities/warehouse/areas, and items are appropriately boxed/wrapped, categorized, stored on proper shelving, and stored in the proper environment.

The Contractor will receive materials for the EMC Spare Parts Storage facilities/warehouse/areas from construction contracts or upon approval of the Engineer, a construction contractor may pick up parts/equipment/materials from an EMC Spare Parts Storage facility/warehouse/area.

With Engineer approval the Contractor can take receipt of materials at the Contractors facilities, but the materials/parts/equipment must be moved, at Contractor expense, to the EMC Spare Parts Storage facility/warehouse/area within five working days of the delivery date.

The Contractor shall also reconcile the EMC Spare Parts inventory (Excel spreadsheet) to the one issued by the leased warehouse. Any discrepancies shall be reported to the Engineer.

The Contractor is required to retain all inventory records for a period of seven (7) years following the completion of the Contract.

The EMC System Managers and appointed IDOT System Engineers/Technicians must sign and approve the monthly reports. Refer to Article 2.15.13 for EMCMS Spare Parts Entry and monthly reporting requirements.

4.19 EMC SPARE PARTS USE BY THE CONTRACTOR

If the Contractor receives Engineer approval via email documentation to use Department owned EMC Spare Parts, a SP (Spare Parts) Ticket shall be created, with the applicable System as the Ticket Sort (TS, S, PS, or L) and the EMCMS entry of "Item Reported" to be "SPARE PART(s) TO BE RETURNED and give brief description of the part/equipment/materials. The Ticket shall remain open until the EMCMS Spare Part Entry Log is received by the Engineer.

4.20 DISPOSAL OF SCRAP

The Engineer shall have the sole determination as to whether material (equipment) is reusable as system equipment. All removed items remain property of the state. The Contractor may not dispose (scrap) any materials without receiving prior approval from the Engineer in writing, (normally on the monthly EMC Spare Parts Transaction Report) which states the item name/model/type, and location where item was located.

The Contractor shall be responsible for the proper, legal disposal of all scrap items, materials, parts, equipment, etc. The estimated salvage value of scrap materials should be reflected in the routine maintenance bid price.

Refer to Article 2.15.13 for EMCMS Spare Parts Entry, Scrap documentation, and monthly reporting requirements.

4.21 EMC SPARE PARTS AUDIT

The Contractor shall conduct an audit of all EMC Spare Parts inventory in January 2022 (and in January 2023 and 2024 if this Contract is renewed). Department personnel will accompany Contractor personnel; however, Contractor personnel will note and modify all changes on Excel spreadsheets. The audit should be completed by the end of February each Contract year.

The Contractor is responsible for all record keeping for the EMC Spare Parts inventory for the duration of the Contract, including all EMCMS entries, Transaction Reports, and Inventory documentation for each System.

4.22 LAMP RECYCLING

All lamps removed as part of re-lamping operation, outage repairs or other authorized work shall become property of the Contractor and shall be disposed of in full compliance with Environmental Protection Agency (EPA) regulations. The EPA Rule 40 CFR, part 273, finalized in May 1995 established a guideline for the recycling of lamps and the mercury from scrapped lamps. Fluorescent, high-intensity, low pressure sodium, and other lamps bearing mercury may be classified as a potentially hazardous waste.

The Contractor shall recycle removed lamps to the maximum extent possible. Over the course of the Contract, the Contractor shall provide documentation of all lamp recycling activity to the satisfaction of the Engineer.

4.23 TRAFFIC CONTROL

4.23.1 TRAFFIC CONTROL AND SAFETY

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

4.23.2 TRAFFIC CONTROL PLAN

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

The Contractor shall provide two copies of their Traffic Control Plan, one shall be submitted to the IDOT Expressway/Traffic Operations Engineer for review and one provided to the Engineer prior to or at the Pre-Construction Meeting. The Contractor shall submit the names of the subcontractors for traffic control installation and maintenance at the Pre-Construction Meeting.

4.23.3 KEEPING THE EXPRESSWAY OPEN TO TRAFFIC

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

The Contractor shall request and gain approval from the Illinois Department of Transportation's Expressway Traffic Operations Engineer 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.

Bidders will be provided a chart with times of allowed closures at the Pre-Bid Meeting.

The approval for emergency closures or emergency moving operations shall be requested from the ComCenter, (847-705-4612) as soon as the need is determined, prior to the Contractor's arrival on the expressway.

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

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.

Lane closure hours will be determined by the Expressway Traffic Operations Engineer and will be made a part of the Traffic Control Plan. The Contractor shall perform work specified herein within the Allowable Expressway Lane Closures Hours.

4.23.4 TRAFFIC CONTROL DEFICIENCIES

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

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 = \$2,000.00/15 min
Two lanes blocked = \$5,000.00/15 min

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 payment due the Contractor. These damages shall apply during the contract time and during any extensions of the contract time.

5.0 EMC NON-ROUTINE WORK

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5.0 EMC NON-ROUTINE WORK

5.1 GENERAL REQUIREMENTS

Non-routine work under this Contract is specifically authorized work, not covered under the requirements of routine maintenance, for materials and work on the systems that tends to be irregular, event driven, or otherwise based on the selective direction of the Engineer in response to system needs. Non-Routine bid items are located in Article 1.0.

The Department may furnish any or all the materials or parts for non-routine work, in which case no charge for items so furnished, shall be made by the Contractor. Materials or parts furnished by the Department may be from the contract spare parts inventory or from other vendor sources available to the Department.

The Department is under no obligation to authorize any non-routine work. The Department shall authorize unit price work wherever possible or unit price work in addition to agreed work, or agreed work only, if in the best interest of the Department.

The Department is under no obligation to pay for unauthorized work or work which is not in compliance with this Contract. Non-Routine payment to the Contractor will be made only for actual quantities of work performed and accepted, materials furnished as specified, vendor invoices and requested documentation received and approved. Documentation of work and furnishing red-line drawings is paid through routine maintenance.

Article 109.04 of the Standard Specifications for Road and Bridge Construction will apply for non-routine work requirements, except that material mark-up, administrative costs, and required EMCMS processes, entries, documentation, billing, and invoicing requirements are modified as stated herein. A minimum mark-up of \$ 100.00 on an individual authorization is not allowed.

At the Engineer's request the Contractor shall inspect, investigate, and provide preliminary sketch and layout with measurements, dimensions and connections of equipment, components, and material for work to be performed under a non-routine maintenance authorization. The sketch shall be provided within three (3) days of the Engineers request. Refer to Article 4.2 General Maintenance – Preliminary Work (paid through routine maintenance).

The Contractor will be required, through routine maintenance, to assist with final field inspections of work when requested by the Engineer. The Engineer may waive the physical field inspection of any work if the completion is reasonably demonstrated by performance of the system, electronic monitoring, or other means. In such

cases, the Engineer reserves the right to follow-up and/or perform selective spot inspections. If evidence of incomplete or incorrect work is found, the Contractor shall remain responsible for corrective action.

The Contractor shall provide or obtain and modify the applicable plan sheets to reflect non-routine work performed, and/or 3rd Party Work requested and approved. This documentation shall be attached to the authorization in the EMCMS and kept on the FTP site. The Department is under no obligation to approve any non-routine work for invoicing without receiving and approving required or requested documentation.

If during the Contract year an error is found on a pay item authorization (PIWA) or agreed work authorization (AGWA), where the Department has overpaid or underpaid the Contractor, even if the work has been invoiced and paid, the Engineer shall credit or debit the Department the amount(s) due, through a non-routine authorization.

At the request of the Engineer, the Contractor shall be required to perform non-routine agreed work at locations under construction, locations off maintenance, at State of Illinois facilities, on equipment not maintained through this Contract in District 1, or equipment maintained by District 1 in other of Illinois counties. Travel time to locations out of District 1 will be paid to the Contractor per the current, per mile reimbursement for Department employee travel.

5.2 EQUIPMENT RATE SUBMITTALS (OWNED, LEASED OR RENTED)

By January 1, 2022 and prior to the start of any non-routine agreed work, the Contractor shall provide the Engineer an Excel spreadsheet listing all field use vehicles and construction equipment to be utilized on the Contract for non-routine work. The Department shall provide a format for this submittal, noting equipment name, model number, size, operating volume, purchase, or lease year, etc. The Contractor submittal shall include the applicable matching pages for each type of equipment from the Equipment Watch Rental Rate Blue Book. The Department will average the equipment operating rates for each type of equipment to arrive at an hourly operating price which will be entered into the EMCMS for non-routine agreed work for the year. A separate standby time hourly rate for equipment will not be paid.

If this Contract is renewed, the Contractor shall re-submit the applicable equipment pages from the most recent Equipment Watch Rental Rate Blue Book for the next Contract year.

Although it is not encouraged, it is permissible for the Contractor to rent equipment for specific non-routine Contract work, however, the payment by the Department will be on the basis of the Blue Book Rental Rates, not the vendor rental invoice.

5.3 LABOR RATE SUBMITTALS

By January 1, 2022 and prior to the start of any non-routine agreed work, the Contractor shall provide the Engineer an Excel spreadsheet listing all employees doing work on this Contract and if applicable, their union affiliation and title, and hourly wage for straight time, overtime, and double-time work. This information shall be entered in the EMCMS for use on agreed work authorizations. The EMC Project Manager must sign and approve all labor rate submittals to the Engineer.

Changes to labor rates on this Contract are applicable only from July 1st (and in 2023 and 2024 if this Contract is renewed) through June 30th of each year. The Contractor shall re-submit the applicable employees labor rates in June for EMCMS entry by July 1st. Agreed work authorizations shall use labor rates for the time the work was accepted by the Contractor. Labor rates will not be changed in the Final Authorization, after the work is complete.

5.4 WORK AUTHORIZATIONS

A Department authorization of work, written on the EMCMS, shall be received, and accepted by the Contractor, on the EMCMS, prior to the start of all non-routine work. Written correspondence will not be used. Any non-routine maintenance work undertaken by the Contractor prior to receiving an Engineer approved authorization is done at the Contractor's own risk. It is the Contractor's responsibility to review daily, on the EMCMS, the list of authorizations which have been transmitted to the Contractor.

If the Contractor does not believe desired completion date will be met or it is found that there is extenuating circumstances after the work has started such as Contractor inability to access the location, or safety reasons, both parties must agree on a new completion date and the Department EMCMS Coordinator shall enter in the EMCMS.

Should the Engineer determine, however, that the Contractor did not make a conscious effort to meet and agree on a new completion date, the Contractor may be assessed liquidated damages for not completing the work by the due date.

Agreed work shall be performed using first shift labor rates for straight time unless Engineer approval is given to use first shift overtime or double-time rates. Normally Contractor scheduled work for second or third shift hours will be paid through first shift labor rates.

The Contractor shall keep time records of all labor on non-routine authorizations. When requested by the Engineer the Contractor shall forward these records of Contractor or Sub-Contractor or Vendor work.

5.5 TYPES OF EMC NON-ROUTINE WORK AUTHORIZATIONS

5.5.1 UNIT PRICE AUTHORIZATIONS (PIWA)

Unit priced (Pay Item) non-routine work (PIWA) shall consist of work which has been authorized based upon the unit prices (Pay Items herein) as bid on this Contract for the various non-routine work items.

The Engineer will approve and transmit an Estimated Authorization to the Contractor on the EMCMS. Pay item quantities will be based upon the initial scope of work. The Engineer will attach special instructions and/or plans to the authorization which the Contractor should review before acceptance of the work. The Contractor shall accept the authorization in the EMCMS within three (3) days of transmittal from the Department or notify the author that a review of the authorization is necessary before acceptance.

For a savings to the Department, the Engineer may allow the use of EMC Spare Parts in a non-routine agreed work authorization, which will be clearly stated to the Contractor in the authorization instructions or attachments when the authorization is transmitted by the Engineer.

When the work is complete the Contractor enters in the EMCMS, the completion date, corrects any items of work or quantities as necessary, attaches all requested documentation, and notifies the author of the authorization via the EMCMS auto-email, to perform a Final Inspection of the completed work.

If following the Department inspection of the work, the work items and quantities or requested documentation are not correct the Contractor shall be notified by email and via the EMCMS. The Contractor must correct the errors in the EMCMS and re-notify the author by the EMCMS auto-email notification.

Correct items and quantities and requested documentation must be entered/attached in the EMCMS Final Authorization for Department review, or the Engineer will not approve/transmit the authorization for Contractor invoicing.

Mobilization:

In terms of this Contract, “mobilization” refers to programming of the EMCMS which allows the Department to authorize PIWA letters, and expenses incurred by the Department, for the next Contract year, beginning on October 1st of each year. This allows the Contractor lead time to schedule workforce, or order parts necessary for work the next calendar year. Payment for this work, materials, etc., however, will not be made until mid-February, on the January Master Invoices.

5.5.2 AGREED WORK AUTHORIZATIONS (AGWA)

Non-routine quote work shall consist of work for which bid unit prices are not applicable. In this Contract the term “Agreed Work Authorization” (AGWA) is used in the EMCMS for entry and payment of EMC Quote Work, Agreed Price Work, Force Account Work, Specialty Vendor Work, Expenses Incurred by the Department, Material Purchases for Contract Spare Parts, and Approved Sub-Contractor Work.

The Contractor shall not quote a General Foreman’s time in an authorization without prior approval of the Engineer.

For a savings to the Department the Engineer may allow the use of EMC Spare Parts in a non-routine agreed work authorization, which will be clearly stated to the Contractor in the authorization instructions or attachments when the authorization is transmitted by the Engineer. This may require a re-submittal of the authorization for Engineer approval and transmittal.

In some cases, two (2) non-routine maintenance work authorizations may be necessary for the same project, as when the situation requires both Contractor Agreed-Price work and Specialty Vendor work.

Types of AGWA

Agreed Price Work – EMCMS Quote Type # 1:

- Quote Work, necessary for this Contract because bid unit prices are not applicable, which has an agreed cost established between the Engineer and the Contractor
- Material Mark-Up allowed: 15% plus shipping costs allowed.

Force Account Work – EMCMS Quote Type # 2

- Work, necessary for this Contract because bid unit prices are not applicable, where an agreed price cannot be established between the Engineer and the Contractor
- The Engineer can direct the Contractor to perform any non-routine work as force account work which shall be measured as described in Article 109.04(b) of the Standard Specifications.
- Material Mark-Up allowed: 15% plus shipping costs allowed
- A daily time/work accounting, with the name of each individual, shall be kept on the daily general billing log, which shall be signed by the Contractor’s field supervisor and submitted to the Engineer at the completion of each work day for the authorized work.
- A summary of all daily general billing logs, as well as full documentation of materials furnished with accompanying purchase invoices from the vendor, shall be entered in the EMCMS within seven (7) working days following the completion of work. The General Billing Log form shall be provided to the Contractor.
- Overtime or Double-time work billing for any Contractor personnel will not be allowed on an agreed work authorization unless prior, written approval is received from the Engineer.

- A General Foreman's time will not be billable unless there are more than five (5) Foreman working on the authorization, at the same date and time, and then only with the prior approval of the Engineer.
- A Foreman's time will not be billable unless there are more than four (4) Linemen/Journeymen working on the authorization, at the same date and time, and then only with the prior approval of the Engineer.

Specialty Vendor Work – EMCMS Quote Type # 3:

- Quote Work, by a vendor, as requested or approved by the Engineer, who is not an approved Sub-Contractor for this Contract
- Material mark-up of 15% is not allowed.
- Article 109.05 of the Standard Specifications is not applicable. Specialty service/vendor work as authorized or originated by the Department shall be considered as work by the Contractor, and not subcontracted work for purposes of billing
- Material Mark-Up allowed: 5% of the first \$ 10,000, plus 1% over \$ 10,000 (lump sum billing-no shipping costs allowed)

Expenses Incurred by the Department – EMCMS Quote Type # 4:

- Upon request of the Engineer, the Contractor shall pay the bills for expenses incurred by the Department on this Contract
- Material mark-up of 15% is not allowed
- The Contractor shall pay the vendor invoice within seven (7) days from Department notification of the payment scheduled date. If requested by the Engineer, the Contractor shall attach a copy of the check written to the vendor in the authorization
- Mark-Up allowed: 5% of the first \$ 10,000, plus 1% over \$ 10,000 (lump sum billing-shipping costs allowed)

Approved Sub-Contractor Work – EMCMS Quote Type # 5:

- Work, which is subcontracted, if allowed by the Engineer, which shall not include work which is in turn subcontracted to an additional party
- Subcontracted work shall be limited to work performed by the subcontractors' own forces
- Materials mark-up of 15% is not allowed.
- Mark-Up allowed: 5% of the total amount (lump sum billing-no shipping costs allowed)

EMCMS – AGWA Work Process

Upon receiving an email or phone call requesting a non-routine quote work request from the Engineer, the Contractor shall create an EMCMS (Estimated) quote authorization for the work and transmit to the Engineer within five (5) working days from the initial request. Attachments to the Estimated Authorization in the EMCMS shall include vendors catalog cuts and any additional paperwork to explain details or provide justification of the labor or material costs.

If the first quote is not acceptable to the Engineer, the Contractor may be requested to provide additional EMCMS quote authorizations and/or from different vendors.

With the Engineer's approval and transmittal of the EMCMS AGWA Estimated Authorization the Engineer will attach special instructions and/or plans to the authorization which the Contractor should review before acceptance of the work. The Contractor shall accept the authorization in the EMCMS within three (3) days of transmittal from the Department or notify the author that a review of the authorization is necessary before acceptance.

If the Contractor determines, in the course of the work, that the Department accepted quote work cost will exceed the estimate, the Engineer shall be immediately notified so the original quote acceptance may be reviewed and/or re-accepted, normally through an email. In some cases, a field inspection may be required by the Engineer to verify the situation.

When the work is complete and the Contractor has corrected any items of work and quantities as necessary and attached all requested documentation, the Department's Engineer or Tech, responsible for the authorization shall be notified via the EMCMS automatic email to do the final inspection of the authorization work.

If following the inspection of the work, the work items and quantities or requested documentation are not correct the Contractor shall be notified by email and via the EMCMS. The Contractor must correct the errors in the authorization in the EMCMS and re-notify the author by the EMCMS automatic email notification.

Correct items and quantities and requested documentation must be entered/attached in the EMCMS Final Authorization for Department review, or the authorization will not be approved for Contractor invoicing.

The Contractor shall keep time records of all labor on non-routine authorizations. When requested by the Engineer the Contractor shall forward these records of Contractor or Sub-Contractor or Vendor work.

5.6 PAYMENT FOR DAMAGE CAUSED BY DEPARTMENT PERSONNEL

Per Article 4.2 the Contractor shall replace where necessary new parts or equipment for all state-maintained system equipment found damaged or malfunctioning for any reason, regardless of the type of damage or who caused the damage, in the timeframes noted herein, unless otherwise directed by the Engineer.

However, when damage to system equipment has been caused by Department personnel in the performance of their assigned duties, the Contractor shall receive payment for temporary and permanent repair work necessary, through a non-routine maintenance authorization. The Department reserves the right to furnish any or all the materials or parts for any non-routine work necessary. Materials or parts furnished by the Department may be from the Department's contract spare parts inventory or from other sources available to the Department.

The Contractor shall transmit to the Engineer as soon as possible a list of applicable pay items and quantities, or other parts with quantities used, so an authorization letter can be issued.

5.7 PAYMENT FOR DAMAGE DUE TO FEDERAL DECLARED DISASTERS

If the Governor of the State of Illinois declares an official disaster and the Federal Government has issued a statement that the State of Illinois will be reimbursed through funds provided for disaster damage repairs, the Contractor may be reimbursed for routine repairs through non-routine maintenance authorization(s).

The Contractor shall adhere to the rules and guidelines set forth by IEMA and FEMA for reimbursement. The Contractor shall accurately document all work performed through Tickets and clear photos of damaged equipment caused by the disaster. The documentation shall include all information required under the guidelines.

The Contractor shall be able to collect labor, equipment, and repair material costs for eligible repair work during the declared disaster time-period (usually no more than 48 hours) if proper documentation is provided to the Department.

The intent of the federal program is to provide aid for repairs to damaged equipment caused by a natural disaster or catastrophic failure, not repairs to equipment damaged because of preexisting and non-disaster related, i.e., inherent deficient conditions. In addition, the funding shall not relieve the Contractor of its maintenance responsibility simply because a storm of unusual character and extent causes serious damage.

The EMC Damage Repair Submittal form and FHWA summary submittal; the DDIR (Detailed Damage Inspection Report) must be completed within ten (10) working days of the end date of the declaration and submitted to the Engineer for approval before reimbursement is made to the Contractor.

The Contractor may be required to group sites for reimbursement. In IEMA and FEMA terms, a site is an individual location where damage has occurred or a site could include several adjoining locations where similar damage, related to the same cause, has occurred. As an example, flooding water that runs along or crosses under a highway has caused damage at several locations within a reasonable distance of each other. So, it would be acceptable to package these locations together as a single site. Also, if damage to traffic signals has occurred at several locations in a defined area it would be acceptable to group these locations by route or jurisdiction, to be considered a site. But grouping damages to form a large site based solely on county or city or subdivision boundaries will not be accepted.

Eligible Items of Repair Work

Emergency Repairs, which are those repairs during and immediately following a disaster to restore essential traffic, to minimize the extent of damage, or to protect the remaining facilities. (Examples would be repair of damaged equipment from disaster weather events, not motorist caused damage, nor the removal of snow or ice on operating equipment.)

Permanent Repairs, which are those repairs undertaken (after emergency repairs are complete) to restore the highway to its pre-disaster condition (but completed within the declared disaster timeframe).

Repair or replacement of traffic control devices including traffic signal system, directional and informational signs, and railroad-highway crossing warning devices, if the damage and associated repair or replacement costs can be shown to exceed "heavy maintenance".

(Heavy Maintenance is defined by the FHWA as work to repair damage normally expected from seasonal and occasionally to unusual natural conditions or occurrences. It includes work at a site required as a direct result of a disaster that can reasonably be accommodated by a State or local road authority's maintenance, emergency, or contingency programs.)

In addition:

- Work must be in the right-of-way limits of a Federal or State highways unless local roads are included in the declaration by the Governor.
- Only restoration work in kind is allowed, no new construction, correction of deficiencies, or improvements are acceptable.
- Materials are allowed; however, a vendor's invoice must be supplied, and no tax or mark-up is allowed. A Contractor employee having knowledge that the supplies or materials have actually been incorporated into the repairs shall sign the supplier's invoice.
- Labor and Equipment rates are acceptable as allowed herein the EMC.

- Debris removal
- Work necessary to minimize the extent of damage and/or to protect facilities from damage

Ineligible Items of Repair Work

- Heavy Maintenance (see above)
- Snow or Ice Removal (snow and/or ice removal is viewed as a relatively short-term event not causing physical damage to a highway)
- High wind damage, except in cases of declared storm disasters such as tornados

ARTICLE 6.0 PAYMENT OF MASTER INVOICES

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ARTICLE 6.0 PAYMENT OF MASTER INVOICES

6.1 ROUTINE MAINTENANCE PAYMENT

1. The Contractor shall receive the routine maintenance bid price for each equipment pay code times the number of ON-maintenance and Partial-maintenance locations of equipment maintained by the Contractor on the last day of the calendar month, up to the total of 5525 locations which is the Schedule of Prices total bidding number of locations (5025) plus the number of Planned Locations (500).
2. If the number of Contractor monthly maintained locations (per point # 1 above) exceeds the 5525 locations which is the Schedule of Prices total bidding number of locations (5025) plus the number of Planned Locations (500) the Contractor shall receive the bid price each, for an Additional Location through non-routine pay item GRM1.
3. If the number of Contractor monthly maintained locations (per point # 1 above) falls below the Schedule of Prices total bidding number of locations (5025) the Contractor will receive the Schedule of Prices total bidding number for the 5025 locations of equipment.

6.2 PREPARING THE MONTHLY TRANSFER RM QUANTITY REPORT

For Each Electrical System (TS, S, PS, L, and V):

1. Print EMCMS Ticket Summary Report for Ticket Type "MT" (Maintenance Transfer) with the Sort codes of "OFF", "ON" and "PAR",
2. Go to EMCMS, access the Monthly Reconcile Report
3. Select month to be reconciled (as an example for the month of May enter June 1 in the "As of Date" field)
4. Select type of maintenance transfer (ON, or OFF, or PARTIAL) (all choices will need to be printed as applicable to each system)

5. Select System (TS, S, PS, L, or V)
6. Select Equipment Pay Code (as an example for TS, select T-1A) (but all Pay Codes will need to be printed)
7. For Column headers, select:
 - Location #
 - Cabinet #
 - Location Main Route and Cross St
 - Equipment Pay Code
 - ON Maintenance Date, or OFF Maintenance Date or PARTIAL Maintenance Date
8. Sort by the desired type of maintenance transfer date (ON Maintenance Date or OFF Maintenance Date or PARTIAL Maintenance Date (if applicable) and SUBMIT
9. When report appears, go to the last page of the report where you will see the last transfer recorded for the month. Transfer to an Excel Spreadsheet Report, the list of location transfers for the month you are reconciling. Repeat process so all ON, OFF and PARTIAL maintenance transfers are accounted for in each System.
10. Compare the Excel spreadsheet information to the Ticket Summary. Is the count the same ? Are all the Locations listed in both reports ? Correct all errors.

6.3 RM MONTHLY QUANTITY REPORT

After the Contractor Administrator (or assigned individual) has reconciled the Tickets to the Quantity spreadsheet numbers (which should be sorted by county quantity) the EMCMS Monthly Quantity Worksheet shall be used to enter each System's billable and non-billable quantities plus credits and debits.

This EMCMS Monthly Quantity (Worksheet) Report, (plus the detailed Quantity spreadsheet report) shall first be sent to the applicable EMC System Manager for digital signature approval, and then sent via email as an Adobe, Pdf report to each IDOT Engineer or Technician responsible for the Monthly Routine Location Quantity Reconciliation to confirm and approve the payment quantities for the month. If the quantities are believed to be correct the RM Monthly Quantity (Worksheet) Report will be digitally signed and returned to the Contractor Administrative Manager.

If the IDOT Engineers/Technicians believe there are errors, they will notify the Contractor Administration Manager by email, and he/she shall work with the IDOT Engineers/Technicians to correct any errors and then digitally sign a re-submitted RM Monthly Quantity (Worksheet) Report.

The Contractor Administrator is responsible to inform the Contractor Dispatch Center to correct the EMCMS and/or Ticket information. The EMCMS change, however, will not be effective on the Monthly Reconcile Report until the next month, as this report "locks" the transfers which were entered in the EMCMS only through the last day of each month.

The approved RM Monthly Quantity Worksheet/Report data is planned, through the EMCMS, to automatically link to the Monthly Routine Maintenance Authorization and Report.

6.4 RM MONTHLY AUTHORIZATION AND INVOICE REPORT

Once the Monthly Quantity Reports have been approved, (digitally signed) by the IDOT Engineers/Technicians, the Contractor shall prepare the EMCMS RM Monthly Authorization and Invoice for the IDOT Engineer which lists the total payment for locations ON-Maintenance and Partial Maintenance for the prior month, plus any additional payment due the Contractor (refer to Article 6.1) or credits or debits, or a deduction for Motorist Caused Damage repair statements, which would be paid separately from a separate obligated fund.

The authorization and invoice will be created on the EMCMS, and the format allows for company letterhead paper with a 1 ½ inch header for the invoice.

6.5 NON-ROUTINE MAINTENANCE AUTHORIZATION AND INVOICE

The Contractor is paid for non-routine work once per month through two (2) non-routine authorization and invoice sets. One (TS) is for the Traffic Signals work and the other (TSC) is for the Traffic Systems Center work, Surveillance, Pump Stations, Lighting, and Various Locations. There is no individual invoicing of authorizations allowed. All invoicing will be completed on the EMCMS, which allows for company letterhead paper with a 1 ½ inch header for the invoice.

Refer to Article 5.5.1 Unit Price Authorizations (PIWA) and Article 5.5.2 Agreed-Price Work (AGWA) which discusses the creation of authorizations, transmittal to Contractor, work completion notices, document attachment in EMCMS, inspecting work, approving the final authorization and transmitting back to the Contractor. This Article discusses the monthly payment process.

To begin payment process:

1. On first working day of month the Contractor determines, from an EMCMS report, all authorized work which has been Finaled and is ready to invoice. (The Contractor may need to remind the authorization authors, through email, that they have work to inspect, so a timely invoice can be created.)
2. The Contractor prints all individual Finaled Authorizations and sends to the appropriate Foreman for signature. There are two print options. Authorizations over \$ 50,000 will have IDOT Supervisor and TS Bureau Chief signature block. Authorizations under \$ 50,000 will not have IDOT Bureau Chief signature block.
3. No later than the 5th workday of the month the Contractor creates the monthly Master Authorizations (TS and TSC) on the EMCMS and sends to the assigned IDOT Supervisor for approval.
4. Each IDOT Supervisor, for TS and TSC systems, reviews their Monthly Master Authorization (list of authorizations to be invoiced). If the list is correct, they attach a digital signature and return to the Contractor. If the list is not correct the IDOT Supervisor will send an email to the Contractor explaining the problem so the Monthly Master Authorization can be corrected and re-sent.
5. When the three (3) Monthly Master Invoice have all been pre-approved by the appointed Department personnel, the Contractor will print the hard copies on the EMCMS.

6.6 DELIVERY OF MONTHLY MASTER AUTHORIZATIONS, INDIVIDUAL AUTHORIZATIONS, AND MASTER INVOICES TO THE ENGINEER

When the monthly Routine Maintenance Authorization and Invoice, and the TS and TSC Monthly Non-Routine Authorizations and Invoices have been printed on the EMCMS, the EMC Project Manager shall sign and

acknowledge to the fact that the work has been completed in accordance with provisions of the Contract and all applicable specifications.

The Contractor shall package the Monthly Master Authorizations (TS or TSC) with the appropriate individual work authorizations as signed by the Contractor's Foreman.

The Contractor shall deliver the three (3) Monthly Master Invoices to the Engineer prior to, or no later than the monthly pay meeting.

The Resident Engineer or the assigned Engineer will sign the Monthly Masters and deliver to the IDOT Bureau Chief of Traffic Operations to sign, and then submit to the IDOT Financial Services for payment.

Payment to the Contractor normally takes six (6) to eight (8) weeks.

ARTICLE 7.0 - LIGHTING SYSTEM

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ARTICLE 7.0 - LIGHTING SYSTEM

7.1 BIDDING

Unless labor, equipment, work, or required procedure is specifically noted herein as paid through non-routine maintenance, Article 7.0 Lighting System work shall be paid through, is part of, and included in routine maintenance bid items.

7.2 DESCRIPTION OF WORK

The Lighting System consists of locations to maintain as specified in Section 3 with equipment including but not limited to highway lighting, illuminated signs, underpass/ tunnel lighting, navigational lighting, and other specific electrical items. The lighting installations include various types of lighting fixtures and lamps, lenses, reflectors, shields, poles, mast arms, high mast towers with associated equipment and cameras with associated power and communication equipment and devices including all associated hardware and software, mounting devices, supporting unistrut (U-channels), step-down or buck-boost transformers, electrical service equipment, devices, ballasts, T-bases, decals, mile markers, cables, cable brackets, foundations, conduit, control devices, radios, lighting cabinets, fenced enclosures, access gates including locks, above ground cable splice boxes, exposed conduit, uniduct, fixtures mounted on fixed bridges, piers and abutment walls, lighting SCADA equipment, and other lighting appurtenances.

All work described herein Article 7.0 shall meet requirements of Article 1.0, 2.0, 3.0, 4.0, 5.0 and 6.0 herein.

7.2.1 ROUTINE MAINTENANCE BID ITEMS (PAY CODES)

L-1 Expressway Lighting

Lighting System locations on Interstate Highways/Expressways and their extensions leading into State and/or US Routes; can include light poles, light towers, underpass lighting or tube lighting, and illuminated signs

L-2 Arterial Lighting

Lighting System locations off-expressways; can include light poles, light towers, underpass lighting, illuminated signs

L-3 Combo Lighting

Lighting System locations where luminaires are mounted on the top of traffic signal poles

L-4 Navigational Lighting

Lighting System locations where navigational fixtures are necessary

7.3 CONTROLLER/CABINET (L-1 THROUGH L-4)

The Contractor shall maintain all lighting controllers/cabinets to Department Standards.

When there is more than one service call due to the same component failure within a month, the Contractor shall replace that component with a new one instead of making temporary repairs.

The Contractor shall repair as necessary, lighting cabinet doors, hinges, meter box, junction box, etc., to keep the cabinet functioning effectively and shall seal all conduits and openings as found with duct seal and steel wool. The Cabinet shall be routinely cleaned of ants and rodent nests and add bait pellet poison add before closing.

If the cabinet pad is found to be missing, damaged or have shifted due to the ground condition, the Contractor shall repair or replace to the original condition.

The ground well/rod if defective shall be repaired or replaced.

If the old-style cabinet "High Voltage" warning decal or the State of Illinois decal, are found to be missing or damaged, the Contractor shall immediately replace with an Engineer approved replacement.

7.3.1 SCADA SYSTEM

The intention of this Contract is to upgrade the Lighting System SCADA hardware and software. The Lighting System SCADA is not working at the time this Contract was under development. The replacement equipment, three (3) new servers from the AVEVA Company (formerly Wonderware software) will be purchased by the Department through non-routine maintenance.

The lighting SCADA system enables the remote control of the lighting at the cabinets equipped with radios along the expressway system on certain arterial highways within District 1. The lighting at such locations is automatically turned on after sunset and turned off before sunrise by the photocell control at the D-1 ComCenter.

When the Contractor removes a lighting cabinet radio for repair, it must be immediately replaced with a spare radio from the Contractor's owned, spare parts stock. The Contractor is required to have two (2) working, SCADA radios available at all times. The Contractor shall repair the defective radio within seven (7) calendar days or shall replace with a new radio similar in kind or current version.

Manual remote-control features are available at the IDOT ComCenter, the Traffic Systems Center, and the EMC Dispatch Center. The Contractor shall assume responsibility for all manually initiated commands of the system, such as that required for daytime inspection of selected lighting system installations. (In no case, shall the Contractor substitute this partial control of the system for the required lock-out/tag-out procedures necessary for safe work practices.) The Contractor shall note, however, that unless there are specific arrangements with the Engineer to the contrary, all normal automatic features shall always remain operational.

The Department retains the right to suspend or terminate the Contractor's privilege to use the system for misuse of the system or any other reason. Only trained and qualified Contractor personnel shall be allowed to operate the lighting SCADA system.

7.3.2 CABINET LOG SHEETS

The Contractor shall maintain service log sheets in each lighting cabinet. New log sheets for 2022 shall be placed in the cabinet (in protective plastic) in January 2022 and the logs from years 2019, 2020 and 2021 shall be removed and submitted to the Engineer at the January 2022 System meeting.

After responding to a lighting controller/cabinet trouble call the patrolman must record the problem found and action taken for service restoration on the cabinet log sheet in addition to calling in the information for the Ticket.

7.3.3 BATTERY REPLACEMENT

As the system currently exists, the Contractor shall replace the back-up battery for clocks once per year in September through November and adjust as necessary.

7.3.4 SIGNS

The Contractor shall maintain the illuminated signs and provide outage repairs. When a sign structure is being repaired or replaced, the Contractor shall disconnect and/or reconnect the sign structure as requested by Department personnel. The Contractor shall replace the disconnect switch if it is rusted and/or inoperable to isolate sign lighting fixtures. The sign lighting fixtures and associated conduit, wiring, and disconnect shall be removed if a new reflective sign board for night visibility is installed by the Department.

7.4 LIGHT POLE UNIT (L-1 & L-2)

The Contractor shall maintain all light poles to Department Standards. All new light pole installations; standard, davit, combination, or decorative/painted shall conform with approved submittal requirements but may be from a different manufacturer than the originally installed light pole but shall meet Department specifications and UL requirements.

Standard or davit light pole mast arms shall be replaced with the same color, length, rise, diameter, and shape as the original installation. The davit arm shall be horizontal to the X-axis and 90 degrees to the shaft.

All resets of conventional light poles shall use a transformer base (T-base). The Contractor shall not use a breakaway coupling.

If the existing ground tap/lug is damaged or not functional, the pole shall be drilled, and the ground wire lugged on and not wrapped. The ground rod, if defective, shall be repaired or replaced.

Uniduct must be visible inside the pole. Below the foundation grade or flush is not acceptable.

All resets/installations of light poles shall have the proper decal installed. Light poles that are damaged and replaced due to motorist caused damage shall have new decals, including expressway accident reference numbers (mile markers), replaced by the Contractor at the time of the repair, if weather is suitable. If the weather is not suitable for decal replacement, the pole shall be listed on the monthly submittal of the Monthly Damaged Decal Report Article 7.16.

The Contractor shall repair or replace as necessary, pole handhole doors, T-base handhole doors, nut covers, and pole caps. All rodent nests as found should be removed and bait pellet poison added before closing.

Decorative Light Poles:

The Department has agreements with cities and villages to allow decorative light poles. Some of these poles are maintained by the EMC. If there is motorist caused damage to a decorative pole the Contractor is only responsible to replace the decorative pole with the Department standard. As a courtesy to the cities and villages, the Contractor shall notify them prior to the standard replacement, in case they have city/village stock of additional poles & heads.

Light Pole Foundation:

It is the Contractor's responsibility to be knowledgeable of requirements for light pole foundation construction and current approved height limitations for base extensions above the adjacent grade. Refer to Department Standards.

Minor repairs to concrete foundations shall be completed within seven (7) calendar days from the date of discovery/issuance of a ticket, or within twenty-one (21) days for a complete replacement of a concrete foundation.

7.5 LIGHT TOWER (L-1 & L-2)

The Contractor shall maintain all Light Towers (also known as High Mast Light Towers (HMLT) which can reach up to 160 feet in height. The towers have a lowering ring for mounting luminaires and for service at ground level. The lowering ring can be raised or lowered using a portable drive unit or built in drive with a remote control for safety. When performing tower work and/or inspection that require lowering the ring, the Contractor shall relamp and clean the inside and outside of all luminaires and any traffic monitoring camera if installed.

If unable to lower the tower ring the Contractor shall provide boom lift equipment necessary to perform the work or outage repair, keeping repair time schedules herein.

Certain light towers have traffic monitoring cameras installed which are maintained through the Surveillance System.

The Contractor shall maintain the light tower service pad and repair if damaged.

For rust inspection requirements refer to Article 7.22

The ground well/rod if defective shall be repaired or replaced.

Light Tower Foundation:

It is the Contractor's responsibility to be knowledgeable of requirements for light tower foundation construction and current approved Department Standards.

Minor repairs to concrete foundations shall be completed within seven (7) calendar days from the date of discovery/issuance of a ticket. A full tower foundation replacement shall be approved by the Engineer.

7.6 SPECIAL LIGHT TOWER SITUATIONS – NON-ROUTINE MAINTENANCE

If the Contractor discovers or is informed of structural damage to a light tower for any reason (motorist caused damage, PM inspection or Department inspection) the Engineer shall be immediately notified to approve the immediate removal of the light tower which will be paid through non-routine maintenance pay items where applicable and agreed-price for location specific crane expenses. Applicable Non-Routine Pay Items include:

- Light Tower (Remove and Re-Erect)
- Labor and Equipment to Clear Site for Safety
- Temporary Lighting (installation and removal)
- Traffic Control, in this situation
- Furnish Replacement Light Tower, only if not available in EMC Spare Parts Inventory
- New Foundation (if required, removal and replacement)

The Department reserves the right to use EMC Spare Parts for all material replacements as necessary.

Temporary Lighting in Place of Tower:

The Contractor shall install temporary light poles within three (3) days and shall order the material and complete the reinstallation of the light tower within a five (5) month period.

7.7 TUBE LIGHTS (L-1 & L-2)

The Contractor shall maintain the tube lighting to Department Standards at:

- L 0867 I 90 94 KENN @ Grand Ave
- L 0903 I 94 RYAN @ 99TH St Tunnel

- L 0950 I 90 94 RYAN @ Normal Ave
- L1713 US 34 OGDEN AVE @ 26TH St

7.8 UNDERPASS LIGHTING (L-1 & L-2)

The Contractor shall maintain the underpass lighting; fixtures and lamps, all mounting hardware, junction boxes and conduit and all appurtenances related to the underpass fixtures to Department standards.

7.9 COMBO LIGHTING (L-3)

The Contractor shall maintain the combo lighting (arm and head attached to traffic standard) to Department standards. Note there are situations throughout District 1 where the combo lighting is not maintained by the EMC.

7.9.1 SPECIAL COMBO LIGHTING LOCATION SURVEY

The Traffic Signal Patrolmen shall report, during the month of January 2022, each Combo Lighting Location on their patrol route, its EMCMS Traffic Signal location number, and the owner/maintainer/contractor. This information shall be submitted, via Excel spreadsheets, with the January FTP reports.

7.10 NAVIGATIONAL FIXTURES (L-4)

The Contractor shall maintain the navigational lighting; fixtures and lamps all mounting hardware, junction boxes and conduit, cables, photocells, and all appurtenances related to the navigational fixtures to Department standards. The Contractor shall also maintain the electrical service feed, back to ComEd service.

7.11 LUMINAIRES

7.11.1 HPS, LPS, MH & INC HARDWARE

The luminaire shall match the system voltage and be of the same type and characteristic as the original design and installation being replaced, unless otherwise authorized by the Engineer.

Ballasts in luminaires, with an incoming voltage on other than the District's standard voltage of 240 volts single phase, may be of a multi-tap type, as approved by the Engineer.

HPS Luminaires replacing drop-lens (reflector-type) shall be replaced with flat-glass Cobra units.

7.11.2 LED LUMINAIRES

The replacement LED luminaire and/or any components shall be of the same kind as originally installed and approved by the Engineer to match the photometric/luminous for every different type. There are LED luminaires on light poles, lighting towers, signs, airport obstruction poles, navigational, and underpass/tunnels. Refer to Section 2 Special Provisions for LED Luminaire information.

7.11.3 LUMINAIRE KEEPER

The luminaire keeper, if found to be torn, broken, ineffective, missing or uninstalled shall be replaced and installed. Replacement is also required at the time of any damage to a luminaire.

7.11.4 LAMP

When a replacement luminaire is installed it shall be equipped with a new lamp, and when there is a lamp outage it shall be replaced with a new lamp.

- The HPS lamps will be of 70, 100,150, 200, 250, 400, or 1000Watts, the lamps shall be an Sylvania LUMALUX PLUS XL ECO “LU(wattage)/PLUS/XL/ECO” bulb, the 750 HPS lamp shall be an Sylvania LUMALUX “LU(wattage)” bulb or the equivalent shall be approved by the Engineer.
- The LPS lamp shall be a Phillips “SOX 55W BY 22d” bulb or equivalent shall be approved by the Engineer.
- The FL lamps on the sign structures shall be an GE “F72T12/SP41/HO” bulb or equivalent shall be approved by the Engineer. There are approximately 200 illuminated signs remaining in the District where outages must be replaced, and power and appurtenances maintained.
- The MH lamps for the IDOT tube lighting shall be an GE “GMH39PAR30/SP15” bulb or equivalent shall be approved by the Engineer. The MH lamps for decorative side lights shall be a Sylvania “M70/U/MED” bulb or equivalent shall be approved by the Engineer. The MH lamp for 175W shall be an GE “MVR175/U/MED” bulb or equivalent shall be approved by the Engineer.
- The INC lamps shall be of heavy-duty type, of the wattage as specified and shall be approved by the Engineer.
- The LED obstruction lights shall be a Point Lighting Corporation FAA L-810, “POL-20000”. The LED lights for the navigational lights shall be LEDTRONICS brand “BBL504-01-02” bulb for the Red light and “BBL504-03-02” bulb for the Green light.

7.11.5 FUSE AND FUSE KIT

Quick dis-connect fuse holders shall be used on all light poles. Crimping shall be performed in accordance with the fuse holder manufacturer's recommendations. 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.

7.11.6 SHIELDS (FOR LIGHT TOWERS OR LIGHT POLES)

The luminaire shield, if found to be broken, or missing, shall be replaced with the same kind or better.

7.11.7 LAMP OUTAGE REPLACEMENTS

The Contractor shall provide the labor, equipment, and material to meet the response requirements for all outages and repairs, including those found on the night patrol and those found by the repair crew when the cabinet is energized. Normally the Contractor has one week, seven (7) calendar days, to repair normal outages found on the nightly outage survey (EMC maintained). Refer to Article 7.13 for exceptions.

Special Obstruction Light Outage Replacement

Replacement of the lamps for Location 0335 obstruction light pole HH26 on I 290 IB @ Western Ave., Cabinet “H”, shall be conducted within twenty-four (24) hours of notification or discovery.

7.11.8 POWER OUTAGES – LONG TERM

In cases of long-term power outages of more than one night, the Contractor shall be required to provide a generator to power the lights as requested by the Engineer.

7.11.9 CABLE

The Contractor shall repair or replace all cable and conduit including direct buried, which becomes damaged, displaced, defective or missing from any cause whatsoever.

Cable used to repair or replace faulty cable runs under routine maintenance shall be new and shall be new copper conductor XLP-insulated cable. All new cable runs shall include a separate ground wire even if it did not exist before the malfunction.

When temporary cable is installed, all splices shall be as good as splices for permanent repairs and proper grounding shall be observed. Permanent repairs shall follow as soon as possible. Temporary ground laid cable or attachment to the metal structures is not allowed.

Where a new cable run shall be provided include a ground conductor sized in accordance with the National Electrical Code and as specified in the Standard Specification for Road and Bridge Construction in Illinois.

Aerial Cable

The Department only allows aerial cable to be used for temporary repairs and the Engineer shall give prior approval of all Contractor installations of aerial cable. If aerial cable is approved, it shall be installed so that its lowest point is at least twenty-five (25) feet above ground level.

From December 1st to April 1st, when permanent cable repairs may not possible due to frozen ground, the Contractor can keep the Tickets open and wait until April to complete the permanent work. In all cases where temporary repairs are made during the winter months, or the Contractor is transferred aerial cable from a prior contract due to special issues, all permanent repairs shall be completed by May 31st.

7.12 NIGHT OUTAGE PATROL

The Contractor shall perform a night-time patrol of the Lighting system; to assure safe, operational conditions of equipment and materials, and to assure that all installations are performing at the level of service for which they are designed. The patrol survey shall include installations for which maintenance responsibility has been temporarily transferred.

Night outage patrols shall be arranged to inspect an approximate equal number of locations, during the first three full weeks of the month, (four or five nights per week). The proposed patrol outage survey shall be presented to the Engineer, for his approval, at the Pre-Construction meeting. The Contractor shall not deviate from the schedule, unless approved in advance by the Engineer.

At the request of the Engineer the Contractor shall provide the transportation for a joint inspection of the lighting system during a nighttime patrol.

The patrolman shall be provided a hand free voice activated tape recorder to record each outage found, by noting the unit number (or cabinet designation and the pole or sign's proximity to a cross-street or road). Each night the patrolman shall record his name, call number, route week, day and date and odometer reading at the beginning and end of the patrol outage survey. The patrolman shall call the EMC Dispatch Center to create a ticket when multiple outages or tower outages, off maintenance outages, or other malfunctions or damage are noted.

Outage Report # 1 – NOP Outages Found

On Monday, following the weekly completion of the Night Outage Patrol, the Contractor Night Outage Patrolman shall create an Excel spreadsheet report of categories as follows:

- Highway lighting outages

- Navigation lighting outages
- Beacon lights on radio towers and base stations
- Other outages
- Off-maintenance location outages

If the Contractor Night Outage Patrol is conducting the outage patrol for the Surveillance System, that would be an additional category.

The Excel spreadsheet report shall be loaded on the FTP site by 12 noon and shall include a column for:

1. Date of NP (Night Patrol) Outage Found
2. Outage Replacement Date (open)
3. Contractor Repair Crew Outages Found & Replaced (open)
4. County
5. EMCMS location number and name
6. Cabinet unit numbers
7. Ticket number
8. List problem reported on Ticket
9. Use column to note Tickets where work is not completed (open)

The spreadsheet shall be formatted with above columns so the user can sort for all monthly outages by each of the categories and columns shown above.

Outage Report # 2 – All Outage Replacements

On the first Monday workday of the next month the Contractor Night Outage Patrolman shall complete the monthly Excel spreadsheet Outage Report # 1 with all the Replacement information available (columns 2, 3, and 9) and load on the FTP Site.

Outage Report # 3 – Repeat Outage & Replacements

At the end of each two months the Contractor shall provide a Repeat Outage Report, an Excel spreadsheet which shows by Categories; the County, EMCMS location number and name, and cabinet unit number, of outages and replacement dates (or non-replacement dates) which have appeared in both of the last two months. This report shall be emailed to the IDOT Lighting System Manager for review.

7.13 RESPONSE AND REPAIR TIME REQUIREMENTS

Article 4.0 discusses general response requirements of routine maintenance. The following chart lists routine maintenance maximum response time, service restoration, and permanent repair times specifically allowed.

- **Service Response Time** -- amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location
- **Service Restoration Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage, the undamaged portions of the system are operational.)
- **Permanent Repair Time** – amount of time from initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement

INCIDENT OR PROBLEM	Response Time	Service Restoration Time	Permanent Repair Time
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Outage of Light Nearest RR Approach	1 hour	8 hours	8 hours
Outage of 3 or more successive lights	1 hour	8 hours	24 hours
Navigational Light Outage or Problem	1 hour	8 hours	24 hours
Tower Outage – 51% Out	1 hour	8 hours	48 hours
Control Cabinet Problem	1 hour	4 hours	7 days
Circuit Out - Breaker	1 hour	4 hours	7 days
Hanging Arm, Head, or Luminaire	1 hour	4 hours	7 days
Motorist Caused Damage or Leaning Pole	1 hour	4 hours	7 days
Circuit Out – Cable Trouble	1 hour	24 hours	21 days

FOLLOW-UP WORK FOLLOWING INSPECTIONS:

Rust Removal – Scrape, Prime (per list)	Complete work in 30 days from inspection, if weather permits
Paint – Touch Up Work (per list needing rust removal work)	Complete painting work 30 days from rust removal completion, if weather permits

7.14 PREVENTIVE MAINTENANCE PROGRAMS (PM)

The Contractor is required to perform certain preventive maintenance (PM) work within certain regular intervals or within certain time limits. The following descriptions provide a basic guide for PM work, but shall not be construed as all inclusive. There may be preventive maintenance required by the manufacturer which shall be performed in addition to these inspections. All scheduled Contractor PM work shall follow manufacturers' specifications.

All PM program work shall be scheduled on the Daily Agenda which shall list the applicable Article number.

There are four (4) types of reports for Preventive Maintenance work.

1: Tickets created on the EMCMS

Tickets shall be created for all items found broken, damaged, malfunctioning, or which do not conform to Department standards, which are repaired at the site, or which require follow-up repair or replacement. Ticket reports do not need to be submitted on the FTP site; however, the Department personnel must be able to verify the inspection through the Daily Agenda and the Contractor's GPS readings.

For the FTP site, the Contractor shall submit monthly, within five (5) working days into the next month, if noted herein the PM program, one or more of the following report types:

2: GPS Photo

A linked camera phone photo, with GPS reading and time stamp

3: GPS Report & Excel spreadsheet Report

A GPS report/Excel spreadsheet with GPS arrival date, duration, truck number, name of Contractor assigned worker, EMCMS location number and address, and the requested information in the individual PM program

4: An Excel spreadsheet report with specific information as required per PM program

The Contractor shall submit the Type # 3 and Type # 4 Report formats to the Engineer and IDOT System Manager for approval at the Pre-Construction meeting, so there is no misunderstanding of the information to be submitted throughout the year. All reports must be in a legible, Excel format. No Word documents are allowed.

The Engineer reserves the right to request a particular format for any or all reports. The FTP Site records for PM work shall be sorted by Contract Year, Month, System, then PM program in Article number order.

If the Contractor disagrees with the PM Program scheduled completion dates listed herein, or the dates must be moved due to safety or other concerns, the Department will meet with the Contractor and may modify the schedule, however, the work must be completed in the Contract year for on-maintenance locations.

Reporting requirements herein listed in Article 7.14 apply to Articles 7.15 through 7.25

Article #	PM Program	Submit Monthly	Format
7.15	Monthly Aerial Cable Report	Jan-Dec	FTP- Excel Spreadsheet & GPS Photo
7.16	Monthly Damaged Decal Report	Jan-Dec	FTP- Excel Spreadsheet
7.17	Monthly Daytime Tunnel Inspection	Jan-Dec	Tickets
7.18	Monthly Outdoor Cabinet Site Maintenance	April thru Sept	FTP – GPS Photos (2)
7.19	Twice Yearly Clock Inspection	March & November	Tickets
7.20	Yearly Control Cabinet Inspection	Jan-Nov (Min. 15 Locations)	FTP-GPS Report & Excel Spreadsheet Report
7.21	Yearly Pole & Underpass Inspection	Jan-Nov (Min. 15 Locations)	FTP -Excel Spreadsheet Report
7.22	Yearly Light Tower Safety Inspection	Jan-Nov (Min. 50 Locations)	FTP-GPS Report & Excel Spreadsheet Report
7.23	Yearly Navigational Lighting Inspection	June	Tickets
7.24	Yearly Photo-Cell Calibration	June	Tickets
7.25	Wood Pole Inspection	July 2023	Tickets

7.15 MONTHLY AERIAL CABLE REPORT

Each month the Contractor shall submit an Aerial Cable Report; an Excel spreadsheet list of all GPS information and EMCMS location numbers and street names and the cabinet designations where underground cable has been tempted out and aerial cable has been installed. The spreadsheet shall show the measurement of length of cable, and the date of permanent repairs when they are completed. (Then the record of the permanent repair may be deleted for the next month’s report. (Report Type # 4)

The Contractor shall continually document on Tickets new cases where temporary aerial cable was found installed and take GPS Photos (Report Type # 2) of the new spreadsheet entries for the FTP site.

Any situations where the aerial cable is a permanent temp situation do not need to be reported after the first monthly submittal in January 2022.

7.16 MONTHLY DAMAGED DECAL REPORT

The Contractor, through routine maintenance, furnishes and installs cabinet location number and mile marker decals for poles damaged by motorists and any new installations.

The Contractor shall keep an Excel spreadsheet of reported or observed locations where, light pole, underpass, sign, camera, and light tower identification decals, or accident reference (mile marker) decals are worn-out, missing, damaged, covered up or placed so they are illegible to police and emergency personnel. It is extremely important to the Department that the missing mile marker decals be reported monthly under this Contract.

For the monthly FTP submittal, the Contractor shall submit monthly the Damaged Decal Report, (Report # 4) an Excel spreadsheet report which lists EMCMS Location #, street name, cabinet #, decal type, and severity of Decal damage:

Damage Status:

1 - Need full cabinet for light pole/ light tower/underpass decals replaced now

2 - Individual IDOT equipment needs decals immediately

3 - Decals which were not replaced during the winter due to MCHD incident (This information shall be reported on the “MC” Ticket at the time of the repair work.)

7.17 MONTHLY DAYTIME TUNNEL INSPECTION

The Contractor shall provide Lighting System personnel, to inspect monthly the operational condition of daytime tunnel lighting equipment, ten (10) locations, to assure that systems are performing at the level of service for which they are designed. The equipment required for both day and night circuit operation shall be inspected.

Locations for Tunnel Inspections:

0115	I 55 @ Stewart’s Cave
0137	I 55 @ Pulaski Rd Tunnel
0873	I 90 94 KENN @ Erie St Tunnel
0883	I 90 94 KENN @ Hubbard’s Cave
0904	I 94 RYAN @ 95 th St CTA Tunnel
0905	I 94 RYAN @ 91 st St
1315	I 290 IKE @ Lower Wacker Dr Exit Ramp
1320	I 290 IKE @ Lower Wacker Dr Ent Ramp
1325	I 290 IKE @ Canal St (under Post Office)
1713	US 34 Ogden Ave @ 26 th St

7.18 MONTHLY OUTDOOR CABINET SITE MAINTENANCE

Site maintenance is required for L-1, L-2, lighting cabinet locations.

April through September:

The Contractor shall perform grass or weed cutting, branch cutting, removal of all trash, grass, and branches, and do insect/tick and weed killer spraying for one half of the L-1 Expressway lighting cabinets each month for the approach/path to the cabinet from the road, and ten (10) feet around the cabinet. The Engineer may request up to ten (10) additional L-2 Arterial lighting cabinets be added to the list for outdoor site maintenance each month of the program.

The Contractor shall take two (2) GPS Photos (by phone) one before work begins and the second after work has been completed. (Report Type # 2) which shall be submitted monthly on the FTP Site.

7.19 TWICE YEARLY CLOCK INSPECTION

The Contractor shall verify and adjust the time clocks twice per year at daylight savings time start in March and ending in November to assure proper operation.

7.20 YEARLY CONTROL CABINET INSPECTION

The Contractor shall inspect the Lighting System cabinets over a three-year period. The Lighting System Engineer will furnish the Contractor a schedule to be followed, which divides the Lighting System locations into three (3) Groups by Highway and/or adjacent areas, Group A in 2022, Group B in 2023, and Group C, in 2024, approximately 1/3 of the locations each year.

The Contractor shall verify all luminaires are properly operating before making test measurements.

Approximately fifteen (15) lighting system locations shall be inspected monthly and all work shall be completed by the end of November each year.

It is planned that this work shall be recorded on a tablet for the EMCMS system. Until the programming is complete the following information shall be collected and entered on an Excel spreadsheet (Report # 4) for each location:

- Location number and address
- GPS of Cabinet (verify EMCMS entries)
- Driving directions to locate the cabinet (verify EMCMS directions listed)
- CE meter number
- CE supply voltage
- Transformer size
- Transformer number
- Conduit and cable types

Inspection Process:

- Identify any objectionable current flow from one ground connection to another (which occurs from multiple grounds on the same system equipment)
- Identify highly unbalanced loads
- Measure ground resistance (If greater than 10 ohms create Ticket and make necessary repairs as directed by Lighting Engineer)
- Perform continuity test for all circuits
- Visually check SCADA CPU for proper equipment
- Check SCADA radio communications to and from cabinet
- Confirm calibration of analog input values

- Measure the current and voltage inputs by having the EMC Dispatch Center interrogate the power center. The interrogated values shall be equivalent to measured values. If the voltage is different by +/- 3 volts or if the amperage is different by +/- 2 amps, a Ticket shall be generated.

7.21 YEARLY LIGHT POLE AND UNDERPASS SAFETY INSPECTION

The Contractor shall inspect the Lighting System poles and underpasses, approximately (550) over a three-year period. The Lighting System Engineer will furnish the Contractor a schedule to be followed, which divides the Lighting System locations into three (3) Groups by Highway and/or adjacent areas, Group A in 2022, Group B in 2023, and Group C, in 2024, approximately 1/3 of the locations each year.

The Contractor shall verify all luminaires are operating before making test measurements. All outages shall be repaired prior to starting the inspection or the Contractor shall not conduct the inspection.

Approximately fifteen (15) lighting system locations shall be inspected monthly and all work shall be completed by the end of November each year.

The Contractor shall conduct a safety inspection of the light poles and underpass lighting by physically walking the entire power center. The Contractor shall insure that all lighting components are maintained in a safe and effective operating condition as originally designed or as subsequently modified by the Department.

It is planned that this work shall be recorded on a tablet for the EMCMS system, but until that programming work is complete the Contractor shall submit a monthly Report # 4 an Excel spreadsheet report for the FTP site.

Inspection Process:

Check for damage to the following:

- Poles (check for cracks, loose nuts, and bolts)
- Mast Arms (check for cracks, loose nuts, and bolts)
- Underpass fixtures
- T-base
- Luminaires
- Shields
- Shroud or Skirts (lift and check for loose and/or worn nuts and washers)
- Break away couplings
- Handhole doors
- Junction boxes
- Wiring conduit hangers
- Decals, missing, damaged, or illegible
- Decal mounting brackets
- Mile markers

7.22 YEARLY LIGHT TOWER SAFETY INSPECTION

The Engineer will provide the Contractor a list of up to 550 towers to be inspected in year 2022, and if this Contract is renewed, the same amount in years 2023 and 2024.

The goal of the Department for this inspection is for the Contractor to ensure that all light tower components are maintained in a safe and effective operating condition as originally designed or as subsequently modified by the Department.

It is planned that this work shall be recorded on a tablet for the EMCMS system. Until the programming is complete the following information shall be collected and entered on an Excel spreadsheet for each location:

Two (2) spreadsheet reports are required:

- The Rust Report lists EMCMS location number and address, cabinet number, and details the area needed for rust removal work (This rust removal work must be completed in approximately 30 days following the inspection and painting within 30 days following the rust removal work.) Submit GPS Photos, Report # 2, and GPS Report # 3 for the FTP site.

- The Structural Notes Report: a spreadsheet report which provides notes made by Contractor personnel during the Structural Engineer Inspection (see below) and confirms inventory information for each EMCMS location, address, and tower number:
 1. Number of towers and number of lamps per tower
 2. Confirms EMCMS GPS readings of the location and of each light tower
 3. List Towers with cameras

(GPS Report # 3, and Excel Report # 4 required.)

Approximately fifty (50) lighting system locations shall be inspected monthly and all work shall be completed by the end of November each year.

Inspection Process:

Check for damage to the following:

- Metal parts (for corrosion and/or rust)
- Foundation
- Mounting bolts (tightened as necessary)
- Shaft
- Handhole doors and gasket
- Lowering device including motor support cables, & transition plate assembly
- Ring assembly electrical cable (check for faulty splices)
- Fuse kits and splices
- ESCO stainless steel swage sockets for cracks
- Retaining wall
- Decals and decal mounting brackets
- Cracks found shall be clearly identified with photos of location(s), and measurements, noted on the spreadsheet and Ticket

Clean:

- The glass lens shall be washed (inside/outside) of each luminaire

- The outside of the camera dome as necessary and report any deterioration for lens replacement

Rust Inspection:

The Contractor shall inspect rust on the outside of the shaft and at all slip joints. The location and magnitude of the rust spots shall be described in detail on the inspection/spreadsheet report.

If any rust is found from the tower base to twenty (20) feet up, it is the responsibility of the Contractor to scrape, prime, and schedule for routine work re-painting.

When substantial rust is found higher than twenty (20) feet up from the base of the tower it is the responsibility of the Contractor to note this on a Ticket in addition to the spreadsheet. This painting work, if the budget

allows, will be paid through non-routine maintenance. All painting must be performed in accordance with manufacturer recommendations and specifications. GPS Photo required.

Structural Examination:

The Department hires a structural engineering company to perform structural inspections of Light Towers; and to examine the lowering system equipment. The Contractor shall be provided the yearly schedule of the structural inspection company when known, but which may be on short notice as IDOT District 1 does not dictate the schedule.

The Contractor shall provide lighting system personnel to accompany the structural engineer and provide lowering of the tower ring for inspection if required. The Contractor shall assign one experienced lighting system work crew member to keep detailed notes on the findings by location, of the structural engineer comments or Contractor observations, which shall be transferred to an Excel spreadsheet and submitted at the end of each month to the Engineer personally, not as an FTP submittal.

Special Situation:

There is barrier wall adjacent to the light tower foundations on I-290 (Eisenhower Expressway) near Wolf Road, I-90/94 Ryan Expressway at Maxwell St, I-80/90 Kingery Expressway and I-394. In order to perform required inspections and outage repairs on these towers a lane closure, as paid through routine maintenance is required, as are attenuators and a bucket truck to meet traffic control requirements as specified herein.

7.23 YEARLY NAVIGATIONAL LIGHTING INSPECTION AND RE-LAMP

The Contractor shall conduct an inspection of all 178 navigational lighting fixtures/luminaires by boat once per year, in June. Any fixture outages and/or damage shall be recorded on Tickets.

7.24 YEARLY PHOTO-CELL CALIBRATION

Each year, on the day of the summer solstice, normally June 21st, the Contractor shall clean and test and adjust if necessary:

- 0115 I 55 @ Stewart's Cave
- 0873 I 90 94 KENN @ Erie St Tunnel
- 0883 I 90 94 KENN @ Hubbard's Cave
- 0904 I 94 RYAN @ 95th St CTA Tunnel
- 1315 I 290 IKE @ Lower Wacker Dr Exit Ramp
- 1320 I 290 IKD @ Lower Wacker Dr Ent Ramp

per manufacturer's operation manual. The Engineer shall attend this inspection and provide the luminance level specifications.

7.25 WOOD POLE INSPECTION – JULY 2023

All wood poles which are in the EMC Special Storage Facility/Area shall be stored outside in fenced, locked areas. With the approval of the Engineer designated Department yard facilities are allowed for storage. All poles shall be laid flat, on top of a platform/bed made from the most deteriorated wood poles. They shall be off ground and organized into groups by length, with each pole labeled with its measurement.

Each pole shall be tagged with two (2) stainless steel asset tags, 1.5 diameter circle with one hole attached to the pole with a 2" ring shank nail." One tag shall be nailed to the bottom and one tag at twelve (12) feet up from the bottom. The tags shall read as follows:

Top line: Year placed in Spare Parts Inventory
Middle line: Inventory Number
Bottom line: Length

The Contractor and Department personnel shall inspect the wood poles in July 2023. In errors in the count shall be reported on the EMC Spare Parts Inventory. Tickets shall be created for any follow-up work to sort/move the wood poles. The Contractor is responsible for the disposal of any poles that, in the view of the Engineer, do not pass inspection.

7.26 CONTRACTOR FURNISHED SPARE PARTS, MATERIAL, AND EQUIPMENT

Refer to Section 2 for item specifications.

LIGHTING SYSTEM STARTING QUANTITIES

20	14K LED Luminaires, Pole
20	28K LED Luminaires, Pole
10	28K LED Luminaires, Tower
5	50K LED Luminaires, Tower
2	65K, LED Luminaires, Tower
25	150W Bulb HPS
25	200W Bulb HPS
25	250W Bulb HPS
50	400W Bulb HPS
15	1000W Bulb HPS
50	55W Bulb LPS
15	70W Bulb HPS
25	750W Bulb HPS
5	Aluminum Light Pole, 11.5" BC, 32 Ft, x 4.5"
10	Aluminum Light Pole, 15.0" BC, 39 Ft, x 6"
20	Aluminum Light Pole, 15.0" BC, 45 Ft, x 6"
25	Aluminum Skirt, 11.5" BC
25	Aluminum Skirt, 15.0" BC
2	Cabinet, 240 Volt, 200 Amp, with ACE 3600 Radio
3	Davit Arm, 8 Ft
2	Davit Arm, 15 Ft
3	Davit Arm, Twin, 8 Ft
2	Davit Arm, Twin, 15 Ft
3	Davit Pole, 11.5" BC, 28 Ft

3	Davit Pole, 15.0" BC, 39 Ft
15	Fiberglass Shroud, 11.5" BC
25	Fiberglass Shroud, 15.0" BC
5	Luminaire, LPS, 230 Volt, 55 W
5	Luminaire, HPS, 230 Volt, 200 W, Pole
20	Luminaire, HPS, 230 Volt, 400 W, Pole
10	Luminaire, HPS, 240 Vole, 400W, Tower
5	Luminaire, HPS, 240 Volt, 750 W, Tower
2	Luminaire, HPS, 240 Volt, 1000 W, Tower
10	T-Base, 11.5" Top, 11.5" Bottom
5	T-Base, 11.5" Top, 15" Bottom
10	T-Base, 15" Top, 17" Bottom
20	T-Base, 15" Top, 15" Bottom
3	Truss Arm, 10 Ft, 4", 34" Rise
3	Truss Arm, 10 Ft, 6", 34" Rise
5	Truss Arm, 12 Ft, 4", 34" Rise
10	Truss Arm, 12 Ft, 6", 34" Rise
5	Truss Arm, 15 Ft, 4", 34" Rise
20	Truss Arm, 15 Ft, 6", 34" Rise
5	Truss Arm, 15 Ft, 6", 72" Rise
3	Truss Arm, 8 Ft, 4", 34" Rise
5	Truss Arm, 8 Ft, 6", 34" Rise
3000 Ft	Wire, #4 Quadraplex

ARTICLE 8.0 – PUMP STATION SYSTEM

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ARTICLE 8.0 – PUMP STATION SYSTEM

8.1 BIDDING

Unless labor, equipment, work, or required procedure is specifically noted herein as paid through non-routine maintenance, Article 8.0 Pump Station System work shall be paid through, is part of, and included in the routine maintenance bid item. All Pump Stations' maintenance is bid and paid through routine maintenance Pay Item P-1.

8.2 DESCRIPTION OF WORK

There are 48 State-owned pump stations in District 1, used for pumping water collected from expressways and viaducts into sewers and area waterways. It is essential that these pump stations shall always be available and ready to operate at their designed capacity to keep the traffic moving and to ensure motorist safety. The type of equipment used varies from station to station.

The equipment at the stations include several types of: electric motor driven pumps; multiple sources of utility power (up to 4160V service); emergency generators; electrical switchgear; motor control centers; transformers; transfer switches; control systems; electrical and flow instrumentation; alarm systems; gas detection systems; lighting systems; power wiring; SCADA RTUs; central, satellite and remote engineering processors of the PS SCADA system; SCADA repeater; radio transceivers, including antenna cables, antennas and antenna towers/poles; fuel and fuel tanks; purged air water level indicating systems; compressed air systems; lubrication systems; automatic trash racks and bar screens; water systems; heating and ventilation systems; steel fencing and gates, wrought iron fencing and gates, windows, doors, locks, highway advisory radio in certain stations, and all associated equipment, including building and structures, mechanical systems, hydraulic systems, electrical systems, communication systems and appurtenances owned by the State of Illinois and under the jurisdiction of the Department.

All work described herein Article 8.0 shall meet requirements of Article 1.0, 2.0, 3.0, 4.0, 5.0 and 6.0 herein.

The Contractor shall provide labor, equipment, and materials to maintain the operation and performance of all equipment and networks at Contract maintained Pump Stations. Equipment found during response or inspections (routine or non-routine) which needs repair or replacement, or items found to be defective, malfunctioning, or non-operational are covered under this Article.

The equipment specified herein gives a good overview of the items to be maintained, however, there may be other electrical items which require maintenance. The Contractor is urged to visit the locations following the Pre-Bid Meeting to view all the electrical equipment to be maintained.

8.3 BASIC RULES OF PS OPERATION

Pump Stations shall remain in continuous operation during normal and emergency maintenance activities. It is imperative that the Contractor immediately address alarms, reports of water on pavement, reports of clogged inlets, hazmat spills, or other serious malfunctions or damage by dispatching trained personnel to check the pump station.

Although the availability/location of trained personnel dictates the call-out, during normal workday hours, the order of call-out response shall be:

1. Contractor personnel specialized in SCADA work
2. Contractor personnel specialized in PS maintenance and operation
3. Pump Station maintenance and operation personnel
4. Other Contractor personnel trained in PS operations

OSHA safety regulations must be followed at all pump stations. Any Contractor personnel entering a pump station shall be properly trained and equipped for confined space entry.

In the event of a hazmat spill or hazardous materials which affect a pump station wet pit, it is the Contractor's responsibility to provide an immediate response by an approved hazmat disposal company to remove the hazardous material, dispose properly off of state property, and ensure compliance in accordance with terms of Article 8.7.

8.4 PUMP STATION PROCEDURES

EMC personnel shall not manually operate the pumps with insufficient wet pit water elevation, for general maintenance operations, including pump inspection, wet pit cleaning, and all other wet pit work. Contractor owned pump equipment shall be used to de-water the wet pit.

Two logbooks are maintained in each pump station to document entry/inspection. The Contractor shall maintain the logbooks so that one book contains the current year information and the second logbook contains information recorded in the previous years. In January of each year, the Contractor shall transfer the sheets from the current year logbook to the previous year logbook and place blank sheets in the current year logbook. The Contractor shall furnish a new logbook for newly rehabbed pump stations. The logbook shall not be altered or removed from the station.

There are specific procedures, which are required for the safety of all personnel when entering or leaving any pump station. It is necessary to:

1. Notify the EMC Dispatch Center of arrival
2. Complete logbook chart I, with the date, time, person's name and reason for entry
3. Upon completion of inspection, record the observations in the required charts in the logbook.
4. Notify the EMC Dispatch Center to issue a Ticket for any deficiencies, observed during the inspection. Record the ticket number and the deficiency in the logbook
5. Acknowledge any alarms before departure
6. Check all pumps that are not tagged "Out of Service" and set in the auto position (H-O-A switch) immediately before departing the pump station
7. Secure all station doors and hatches
8. Turn alarm switch to ON position
9. Notify the EMC Dispatch Center of departure

8.5 ALARM AND IMMEDIATE RESPONSE SITUATIONS

8.5.1 PS ENTRY ALARM ZONE 1 RESPONSE

Upon receipt of an AEGIS and/or SCADA Pump Station Zone 1 alarm, the EMC Dispatch Center shall:

1. Create a ticket
2. Notify the IDOT ComCenter and the respective police department for the station, for a police escort for the Patrolman
3. The Patrolman shall not enter the premises without having the pump station investigated by the police and receiving the "all clear".

8.5.2 PS ALARM RESPONSE

Upon Entry of the pump station the Patrolman shall:

1. Notify the EMC Dispatch Center of the arrival information, including a notation of all alarms flashing on the annunciator and SCADA panel.
2. Record all information about the incident in the logbook
3. Perform all necessary repairs required to restore the pump station to its normal operating condition, if possible. (If follow-up repairs are needed in an emergency situation, notify the Pump Station Manager immediately to commence repairs.)
4. Notify the EMC Dispatch Center, as to status of problem, whether it was cleared or if follow-up work required before departing the pump station. (All response information shall be recorded on the ticket)
5. In the event of a power failure alarm (Zone 3), monitor the power outage status at regular intervals and notify the Pump Station System Manager or Emergency Coordinator and the IDOT ComCenter if a high-water level is imminent. (Refer to Temporary Pumping Requirements as stated herein shall be applied.)

8.5.3 PS PRE-STORM CONDITION CHECK

There is no monthly "Quick Check" required of Pump Stations, therefore, more emphasis has been placed on the Pre-Storm Condition Check in this Contract.

Upon receiving a storm warning, code Red or Black, from the IDOT ComCenter or IDOT Engineer, the Contractor shall immediately dispatch sufficient trained personnel to initiate these actions within one hour:

1. Is wet pit OK ?
2. Check the condition of the trash on bar screen(s), clean if necessary
3. Check trash rack operation status
4. Check the status of the low point inlet and catch basins for the pump station, if found clogged notify IDOT Com Center immediately to have IDOT Maintenance respond.
5. Alarm panel OK? (No alarms holding)

8.5.4 WATER ON PAVEMENT (WOP) SITUATIONS

The responding patrolman shall be equipped with the necessary measuring devices to trouble shoot and mark the water level with a reference point.

Upon observing Water on the Pavement (WOP) or extremely high-water levels at the station, the Patrolman shall immediately notify the EMC Dispatch Center, who shall in turn notify the IDOT ComCenter of the following information:

- Pumps Running -- Yes or No.
- Water Depth in Wet Well
- Depth of Water on Pavement
- Street Inlet Clogged -- Yes or No

The patrolman shall obtain a ticket number from the EMC Dispatch Center and complete the station logbook, Chart W. All ticket information and WOP report information shall be relayed to the EMC Dispatch Center within one (1) hour of receipt of information from the field.

The "WOP" Ticket shall be marked for follow-up until the pump station system is back to normal operation and there is no water on the pavement. During storm events the Engineer shall be immediately notified by telephone/text of all WOP incidents.

When there is water on the pavement the Contractor shall retrieve the archived data from the pump station PLC and email to IDOT Engineer within 24 hours.

During high water level or WOP conditions, the patrolman shall remain at the station unless approved otherwise by the Engineer and/or EMC Project Manager or Emergency Coordinator

8.5.5 PS POST-STORM CONDITION CHECK

After each major rainstorm, the pump station crew shall:

1. Clean the trash rack bin, bar screen, and the area between the automatic trash rack/bar screen and the inlet sewer to the bare concrete floor.
2. Check WOP float and probe sensor for proper operation, and remove debris
3. Check the inlet/catch basins. If clogged, notify IDOT ComCenter to send to Bureau of Maintenance to clear. (Patrolman shall follow-up within one week to be sure work was completed. If work was not completed notify the Engineer by telephone.)
4. In the event of high-water levels, the Contractor shall inspect, clean and dry all equipment submerged under water once the water level recedes to normal elevations.
5. The Contractor shall check all equipment for proper operation.

8.5.6 HIGH-WATER TEMPORARY PUMPING REQUIREMENTS

The Contractor shall provide and install temporary portable standby pumps to maintain adequate total station outflow capacity.

The Contractor shall submit a detailed temporary pumping operating plan, to the Engineer for approval, at the Pre-Construction meeting, for all maintenance activities which will directly affect normal inflow and outflow pumping operations. The Temporary Operating Plan submittal shall include a list of suppliers that, on an immediate on-call basis, can provide the Contractor with temporary pumps, or generators, to maintain the outflow capacity.

A back-up generator(s) shall be immediately mobilized to each pump station when the Contractor is notified of a high-water level or alarm, or water on the pavement due to a power failure. Upon approval of the Engineer, the Contractor may utilize the two 200KW generators which are normally kept in EMC spare parts inventory. These generators shall not be considered in the Contractor's temporary pumping operations plan.

8.6 VENDORS/SPECIALTY SERVICE WORK COMPANIES

8.6.1 VENDOR SUBMITTALS

The Contractor shall submit the following, for Engineer approval, at the Pre-Construction meeting:

- Names, addresses qualifications of at least six potential vertical/submersible services repair companies within the tri-state area of Illinois/Indiana/Wisconsin
- Name(s) of lab facilities that are certified and equipped to test oil and other lubricant fluids

8.6.2 PUMP REPAIR WORK BY SPECIALTY VENDORS

When the Contractor is unable to complete repairs to pump station equipment, the Contractor shall provide an Engineer approved Specialty Service Company to supplement his forces to meet contract requirements.

The Contractor shall provide all labor, equipment, and general services necessary to schedule and assist a specialty service company in conducting various comprehensive testing and inspections, including routine and non-routine work.

The Contractor shall coordinate the work with the service companies and provide qualified personnel to:

- Allow free and clear access to and from the pump station and all equipment
- Open and close all enclosures to provide access to the electrical equipment being inspected, replaced and/or repaired
- Notify the power utility company to schedule all power outages required for the project
- Perform all switching, de-energizing and re-energizing of electrical equipment
- Perform lock out tag out procedures
- Provide safe working conditions in accordance with OSHA requirements
- Assist in data collection when requested by the Engineer

8.7 SERVICE COMPANY FOR HAZARDOUS MATERIALS OPERATIONS

All activity with contaminated waste shall conform to the Department's Standard Specifications for Road and Bridge Construction Article 669. The Contractor shall employ for emergency hazmat response the services of, or have a full-service Subcontractor designated as the EMC hazardous waste contractor, familiar with and capable of complying with all federal, state, or local regulatory requirements/regulations pertaining to RCRA hazardous and special non-RCRA waste management, and shall be responsible for ensuring the implementation of these requirements.

The hazardous waste contractor shall have a 24-hour emergency call number and shall be capable of responding to a pump station within one (1) hour of notification.

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

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

The EMC hazardous waste contractor shall:

- Coordinate with all pertinent regulatory agencies to secure all necessary permits and approvals and shall be responsible for coordinating all permits with the IEPA
- Submit to the Engineer, for approval, a copy of all federal, state, or local required licensing documents to perform this work
- Select a hazardous/special waste landfill/disposal facility, verifying that selected landfill/disposal facility is in compliance with applicable standards for Illinois hazardous and special waste cleanup and disposal, and the disposal facility is not presently, or has never been, on a U.S. EPA's list of violators or on the RCRA list of violating facilities

- Obtain written approval of the selected landfill/disposal facility from the Engineer, who, reserves the right to review and to accept or reject the selection
- Perform all tests required and make all necessary arrangements for waste disposal approval with the selected landfill/disposal facility
- Be responsible for transporting and disposing all material classified as a “nonspecial waste”, “special waste” or hazardous waste” from the job site to the approved landfill/disposal facility, assuring that the transporter and vehicles comply with all federal, state, and local regulations governing the transportation of non-special, special or hazardous wastes.
- Shall prepare a technical report within 30 days of the conclusion of the project, describing the activities conducted during the life of the project and submit two (2) copies to the Engineer

After a hazmat incident if it is found that the incident is not due to insufficient or faulty maintenance at a pump station, the Contractor shall be paid the amount of the invoice provided by the hazmat service company for applicable pump station work, normally in the wet pit, minus any materials or pay items as furnished by the Department. This non-routine payment is not applicable to cleanup and disposal of hazardous waste on the roadway as that is handled/billed by the IDOT Bureau of Maintenance.

8.8 DAILY MAINTENANCE REQUIREMENTS

8.8.1 DAILY SCADA MAINTENANCE

The Contractor shall be responsible for proper operation and maintenance of all SCADA System equipment described herein.

The Contractor personnel with the assigned specialized SCADA duties shall:

- Review the daily operations of the SCADA System. The SCADA System shall have its periodic maintenance activities/programs checked and completed by Contractor SCADA trained personnel. This work would include, but is not limited to system back-ups, central algorithms, Windows OS debugging, Tescode and/or RSView Programming, Liquitronic 5 Firmware, modem configuration, database and archive array configuration and collating.
- Keep back-ups of all system software/firmware. Any changes to the system shall be submitted to the Engineer for approval before execution. System changes shall be documented on Tickets for documentation.
- Troubleshoot any problems related to network configuration of the system, troubleshoot any Windows OS and/or RSView processing errors, modem configuration, and telecommunication line testing (including network high-speed lines, dedicated leaded lines and dial-up lines).
- Upload and download RTU software configuration and application files, archive array configuration data and review the status of the SCADA system and alarms. The Contractor shall complete all Tescode programming setpoint changes and remote configuration. RTU programming shall be stored and updated by SCADA trained personnel for each PS SCADA panel and safely stored for Engineer review.
- Shall perform updates to OS and GUI software when released by the manufacturer.

- Shall perform software revisions, program and screen modifications required to integrate additional PLC's or devices in the pump station system into the existing central (Schaumburg), TSC (Oak Park) and satellite (Contractor Dispatch Center) processors. Processor functionality and integrity shall be maintained with each added device. Any device furnished, installed, and terminated to pump station PLC or removed from monitoring, including but not limited to the gas detectors and fire alarm systems during the contract year shall be configured and interfaced with the station PLC and HMI unit screens. This work shall be included under routine maintenance of the pump stations system. IDOT engineer shall be notified prior to any changes and modifications to the SCADA system.
- Shall configure and provision new cellular modems for existing and new pump stations under construction for integration with SCADA system. See pump station tables for list of upcoming pump stations under construction. The Contractor shall coordinate with construction contractor to assure connection and operation.
- The Contractor shall add any pump station that will become under maintenance during contract year to the SCADA system to make a complete operational system and shall develop new screens at all processors. The Contractor shall provide the list of tags, I/O's and alarms required from construction to develop the new screens and alarms. The screens shall be identical to existing pump station screens, such as the pump station information screen, control screen, main pump station screen and status screen with all devices in the pump station properly monitored.
- The Contractor shall maintain all SCADA hardware and software. This will include but is not limited to RSVIEW 32, ControlLogix5000, RSLinx, Winbench, Liq V as required and all communication media to connect to remote pump stations. Contractor shall also maintain all remote SCADA hardware and software at the pump stations. This will include but is not limited to Control Logix PLC, HMI unit, Liq V PLC. The Contractor shall provide yearly technical support as required for all pump station SCADA system software.

8.8.2 DAILY AEGIS MAINTENANCE

The Contractor shall be responsible for proper operation and maintenance of desktop receivers, transmitters and all appurtenances necessary to receive, display and route data. The former Silent Knight AEGIS system will be replaced before this Contract starts or in the first year of 2022, through non-routine maintenance. There will be transmitter units at each pump station, including any new stations added during the contract year(s) and receiver units at the EMC Dispatch Center and TSC offices.

The system shall be configured to execute a 24-hour communication check. This daily check shall be monitored and documented by dispatchers at the EMC Dispatch Center; and Tickets shall be created for any problems. The weekly report of the communication checks shall be reviewed by the Contractor Pump Station Manager to identify situations and/or problems to be addressed.

8.9 PREVENTIVE MAINTENANCE PROGRAMS (PM)

The Contractor is required to perform certain preventive maintenance (PM) work within certain regular intervals or within certain time limits. The following descriptions provide a basic guide for PM work, but shall not be construed as all inclusive. There may be preventive maintenance required by the manufacturer which shall be performed in addition to these inspections. All scheduled Contractor PM work shall follow manufacturers' specifications.

All PM program work shall be scheduled on the Daily Agenda which shall list the applicable Article number.

It is planned that all Pump Station Preventive Maintenance Programs will have an EMCMS tablet entry program completed by the end of this Contract.

Tickets shall be created for all items found broken, damaged, malfunctioning, or which do not conform to Department standards, which are repaired at the site, or which require follow-up repair or replacement. Ticket reports do not need to be submitted on the FTP site; however, the Department personnel must be able to verify the inspection through the Daily Agenda and the Contractor's GPS readings.

For the FTP site, the Contractor shall submit monthly, within five (5) working days into the next month, if noted herein the PM program, one or more of the following report types:

- GPS Photo A linked camera phone photo, with GPS reading and time stamp
- PSPM Report: One Excel spreadsheet for all PM programs as listed in chart below. It shall include GPS arrival date and time, duration, truck number, name of assigned worker, EMCMS location number and address, and the requested information or problems found.

The Contractor shall submit the PSPM Report format to the Engineer and IDOT System Manager for approval at the Pre-Construction meeting, so there is no misunderstanding of the information to be submitted throughout the year. All reports must be in a legible, Excel format. No Word documents are allowed.

The Engineer reserves the right to request a particular format for any or all reports.

The FTP Site records for PM work shall be sorted by Contract Year, Month, System, then PM program in Article number order.

If the Contractor disagrees with the PM Program scheduled completion dates listed herein, or the dates must be moved due to safety or other concerns, the Department will meet with the Contractor and may modify the schedule, however, the work must be completed in the Contract year for on-maintenance locations.

Reporting requirements herein listed in Article 8.9 apply to Articles 8.10 through 8.36.

Log or *

Article #	PM Program	Submit Monthly	Chart Photo	Report *
8.10	Monthly Site Maintenance	Outdoor-Apr-Sep.		FTP-GPS Photo (2)
8.11	Monthly Pump Operation	Jan.-Dec.	A	PSPM Report
8.12	Monthly Pump Maintenance	Jan.-Dec.	F	PSPM Report
8.13	Monthly Bar Screen Maintenance	Jan.-Dec.	As Appl.	PSPM Report
8.14	Monthly Air Compressor & Air Tank Inspection	Jan.-Dec.	S	PSPM Report
8.15	Monthly Transfer Switch Operation	Jan.-Dec.	C	PSPM Report
8.16	Monthly Air Induction Inspection	Jan.-Dec.	U	PSPM Report
8.17	Monthly + Specific Month Yearly Generator Inspection	Jan.-Dec.	K	PSPM Report
8.18	Monthly + Twice Per Year Automatic Trash Rack Insp.	Jan. – Dec. & Feb.-Mar & Aug-Sept.	As Appl.	PSPM Report

8.19	Twice Per Year Dry Pit/Wet Pit Submersible Pump Maintenance	Jan - June & July - Dec.	As Appl.	PSPM Report
8.20	Twice Per Year Vertical Pump Motor Maintenance	May and Nov.	As Appl.	PSPM Report
8.21	Twice Per Year Submittals of PS Tables	May and Nov.	N/A	Highlighted Tables
8.22	Twice Per Year Actuators, Valves, & Sluice Gate Operation Testing	Jan.- June and July - Dec.	B	PSPM Report
8.23	Twice Per Year Side Volute Discharge Pump Maintenance	Feb. - Mar. and Aug. – Sept.	As Appl.	PSPM Report
8.24	Yearly AEGIS Alarm System Insp.	January	N/A	Tickets
8.25	Yearly SCADA Inspection	Jan.- Mar.	P-100	PSPM Report
8.26	Yearly Wet Pit Inspection	Jan.- Mar.	P-9	PSPM Report
8.27	Yearly Pump Control System Insp.	Jan.- Mar.	P-6	PSPM Report
8.28	Yearly Vendor Pump Capacity, Motor Current, Voltage, Voltage Moisture and Meggar Test	Jan.- May	P-8 Z	PSPM Report
8.29	Yearly Impeller Adjustment of Vertical Axial Flow Pump Motors	Jan.- May	P-5	PSPM Report
8.30	Yearly Motor Control Center Insp.	Jan.- Nov	As Appl.	PSPM Report
8.31	Yearly Pump Station Insp. & Maint.	Jan.- Nov.	P-4	PSPM Report
8.32	Yearly Vendor Gas Detector Inspections	Submit Monthly as Completed	Leave Copy of Report at Station	Tickets and Report
8.33	Yearly Vendor Main Circuit Breaker Testing	July - Oct.	P-7	PSPM Report
8.34	Yearly Submersible Pump Insp.	July - Nov.	P-8	PSPM Report
8.35	Yearly Oil Analysis	July - Nov.	N/A	Lab Report
8.36	Yearly Fire System Inspection	November	N/A	Vendor Report
8.37	Year 2022 Yeoman-KJI-Grundfos Pump Maintenance	June 2022	N/A	PSPM Report

8.10 MONTHLY SITE MAINTENANCE

All work shall be scheduled on the Daily Agenda.

Winter Site Maintenance - November through March

The Contractor shall perform snow removal operations when the snowfall total reaches 2” inches or there is sleet/ice formation in any District 1 area. The Contractor shall provide reasonable access to each pump station via sidewalk, staircase, walkway, driveway, and parking areas by shoveling and salting, to commence within 24 hours, and shall be complete within 72 hours.

Outdoor Site Maintenance - Spring/Summer/Fall – April through September

The Contractor shall perform grass cutting, branch removal, trash removal, do insect/tick and weed killer spraying for one-half of the pump station locations every month (visiting all pump stations in a 2-month period), for the approach/path to the structure (IDOT R.O.W.) and within the fenced area and a radius of fifty (50) feet surrounding the pump station, and within five (5) feet of the access driveway on each side. Also, tree trimming shall be performed within five (5) feet of all pump station structures.

The Contractor shall take two (2) GPS Photos (by phone) one before work begins and the second after work has been completed.) which shall be submitted monthly on the FTP Site.

8.11 MONTHLY PUMP OPERATION INSPECTION - ALL STATIONS

The Contractor shall perform the following work and record on Chart A in the logbook:

- Operate each pump and check alternator or selector switch for proper sequence in accordance with recommended manufacturer's procedures. Caution: Do not draw down the wet well level past the designated stop elevation under any circumstances.
- Set the selector switch on the pump with the least number of hours as the lead pump
- Operate each unit noting the current draw and compare with the motor plate and note any deviation, and/or any abnormal operating sounds
- Record number of starts
- Take flow meter reading
- Record number of starts and hours run of each pump

8.12 MONTHLY PUMP MAINTENANCE PS # 2, 3, 25, 29, 32, 33, 35, 46, 50

The Contractor shall perform the following work and record on Chart F in the logbook:

- Inspect the oil lube system and greaser for proper lubrication and inspect both oil and grease lines for leakage or clogging.
- Inspect the automatic greaser and manual cap for proper operation and maintain the proper oil/grease level.
- Grease all fittings such as flap valves, check valves, gate valves, flow meters, and pumps.

8.13 MONTHLY BAR SCREEN MAINTENANCE PS # 2, 3, 4, 5, 7, 8, 9, 10, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 39, 40, 46, 47, 50, 51, 52

The Contractor shall perform the following work:

- Inspect the bar screen
- Rake, and manually clean the bar screen (keep free from debris)
- Remove all debris and silt in the area between the sewer and the trash rack/bar screen

Upon the completion of the inspections the Contractor will submit Report Type # 4, an Excel spreadsheet, commenting on the work completed, pump condition, listing any Tickets and Ticket information, and information from any chart or log kept at the station.

8.14 MONTHLY AIR COMPRESSOR INSPECTION PS # 24, 25, 27, 29, 33, 40, 50

The Contractor shall perform the following work and record on Chart S in the logbook:

- Check the compressor and air tank for proper operating pressure in the pump stations and drain water from tanks. (The tanks are used for reserve air supply for the bubbler control systems.)

8.15 MONTHLY TRANSFER SWITCH OPERATION INSPECTION

PS # 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 44, 46, 47, 48, 50, 51, 52

The Contractor shall perform the following work and record on Chart C in the logbook:

- Exercise the transfer switch monthly, to inspect for proper transfer and time delay to secondary power source and time delay from secondary to primary.

8.16 MONTHLY AIR INDUCTION INSPECTION

PS# 2, 7, 9, 10, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34, 35, 36, 38, 40, 50, 51, 52

The Contractor shall perform the following monthly work and record on Chart U in the logbook:

- Change the air induction filter
- Clean the bird screens
- Clean heating element insulators to maintain proper ventilation within the pump station

The Contractor shall supply and store the proper filters at each pump station.

8.17 MONTHLY & SPECIFIC MONTH GENERATOR INSPECTION

PS # 4, 8, 9, 11, 15, 18, 19, 24, 28, 34, 36, 39, 41, 42, 48, Two in EMC Spare Parts

The Contractor shall submit a GPS Photo for the monthly FTP Site submittal, a photo of work repairs or work needed, one photo minimum per station.

The Contractor shall inspect monthly:

- Check control panel and transfer switch operation
- Check engine oil and coolant levels
- Check that block heater is working
- Check battery charging system
- Check for holes or leaks and loose connections in the air cleaner
- Check fuel level and fuel transfer pump operation
- Check for exhaust system leaks or restrictions
- Drain the condensation trap
- Check all meters, gauges, and indicator lamps, battery tender
- Check oil reservoir and battery acid level and maintain proper operating levels.
- Check the air filter monthly and change at specified intervals
- Exercise generator at full load for one (1) hour
- Note any rusting on the generator and its enclosure (for future non-routine work)
- Check for fluid/fuel leaks.
- Check generator fuel and note level
- Check re-circulating pump

Diesel fuel shall always be filled to the proper level. If fuel level is less than $\frac{3}{4}$ (75%) of full level, a Ticket shall be created to schedule the refill of the tank.

Specific Month – Yearly Generator Maintenance:

The Contractor shall perform inspection and maintenance required for the generators once per year. In the past this maintenance has been performed in October of each year, however the Contractor may provide a schedule for this yearly work and submit with the January 2022 FTP submittal. Each station shall have this yearly generator work performed in the same months of the Contract year (if renewed).

- Change oil and oil filters
- Drain, flush, and replace coolant
- Replace cooling system hoses in 2022
- Replace thermostats in 2022
- Replace fan belts in 2022
- Check and adjust valves as necessary
- Conduct operational inspection to insure proper valve rotation
- Check fan hub
- Check pulley
- Check water pump
- Change the day tank breather
- Clean or replace the crankcase breather
- Change fuel filter
- Drain sediment from the fuel tank
- Clean accumulation of grease, oil and dirt on set
- Lubricate generator bearing
- Check vibration isolators for proper adjustment and conditions
- Check circuit breaker and transfer switch, and test equipment by simulating a power outage
- Check turbo pressure, adjust if necessary, to manufacturer specifications
- Provide fuel system service to perform fuel polishing only in 2022
- Check and note any rusting on the generator and its enclosure

**8.18 MONTHLY & TWICE PER YEAR AUTOMATIC TRASH RACK MAINTENANCE
PS # 4, 5, 21, 22, 23, 24, 26, 28, 35, 46**

The Contractor shall perform monthly inspections and maintenance as follows:

- Inspect and ensure the fingers, on the trash rake assemble, are fully engaged through the entire length of the bar screen
- Make the necessary adjustments for proper operation of the trash rack
- Grease the rake assembly and head shaft bearings with EP#2 waterproof grease
- Grease drum bores on rope drum
- Grease teeth on bull gear and pinion
- Lubricate chains where applicable
- Grease slide block channels
- Check limit switches

Each station shall be inspected in the same months of the Contract year (if renewed).

Twice per year in February to March and August to September the Contractor shall:

- Grease guides with Bison # 88 molybdenum disulfide
- Grease, lubricate, and perform an oil change on the worm reducer and coupling
- Band brake assembly shall be inspected and tightened evenly as required.

The Contractor shall use Bison #88 molybdenum disulfide and grease or may substitute environmentally safe grease approved by the Engineer.

The Contractor shall provide the schedule for the twice per year work in the January 2022 FTP submittal. Each station shall be inspected in the same months of the Contract year (if renewed).

8.19 TWICE PER YEAR DRY PIT/WET/PIT SUBMERSIBLE PUMP MAINTENANCE

PS # 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 51, 52

The Contractor shall perform the following work in January through June and July through December:

- Visually inspect pump impeller for clogging
- Inspect oil reservoir for contaminants
- Check and clean air release pipes/valves
- Flush the cooling system from debris
- Wash the wet pit submersible pumps with an appropriately sized pressure hose

Each station shall be inspected in the same months of the Contract year (if renewed).

8.20 TWICE PER YEAR VERTICAL PUMP MOTOR MAINTENANCE

PS # 2, 3, 25, 29, 33, 35

The Contractor shall perform the following work in May and November.

- Check motor heaters
- Clean the motor inside by using dry compressed air
- Clean the motor exterior by wiping off dirt, dust, oil, and water from external surfaces of the motor
- Remove any dust or debris from the ventilating air inlets

Each station shall be inspected in the same months of the Contract year (if renewed).

8.21 TWICE PER YEAR SUBMITTALS OF PS TABLES

The Contractor shall maintain and update all P.S. tables to be true and accurate. The Contractor shall submit tables twice per year in May and November with changes highlighted. Current tables will be available at the Pre-Bid Meeting.

8.22 TWICE PER YEAR ACTUATORS, VALVES, & SLUICE GATE OPERATION TESTING - ALL STATIONS

The Contractor shall perform the following work and record on Chart B in the logbook:

The Contractor shall test the actuators, valves, & sluice gates at all pump stations twice per year in the January through June period and again in July through December. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall:

- Operate the flap valves
- Check valves
- Check gate valves
- Check sluice gates
- Lubricate all valves and gates with safe grease
- Check the actuator's lubrication consistency and level (if necessary, it shall be filled or replaced)
- All electrical connections shall be inspected and tightened

- Check for mechanical damage

8.23 TWICE PER YEAR SIDE VOLUTE DISCHARGE PUMP MAINTENANCE – PS # 32 AND # 50

The Contractor shall perform this work in February/March and August/September:

- Lubricate the pump bearings with oil/grease when required
- Inspect packing glands for leakage
- Lubricate motor
- Clean the motor
- Inspect/clean the air release valves/pipes (replace when required)

Each station shall be inspected in the same month of the Contract year (if renewed).

8.24 YEARLY AEGIS ALARM SYSTEM INSPECTION – ALL STATIONS

The Contractor shall perform the following and record on Chart E in the logbook:

During January of each year, the Contractor shall test the AEGIS (or newly installed) alarm system by transmitting all the possible alarm codes for each station. Any errors shall be re-programmed as soon as possible.

8.25 YEARLY SCADA INSPECTION – ALL STATIONS

This SCADA system work shall be coordinated with the Engineer and completed by SCADA trained Contractor personnel.

Each pump station shall be inspected monthly between January and March. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall:

- Physically inspect all equipment and wiring
- Record the digital inputs/outputs
- Record the analog inputs
- Inspect the primary
- Inspect the secondary water level monitoring system, where applicable
- Inspect the trash rack
- Inspect creek levels reactive air systems (create Tickets for any deviations over ½ foot)

The Contractor shall physically measure the water level in the wet pit and compare that value:

- With the primary and secondary reactive air system of the SCADA unit
- With the bubbler system implemented into the MCC
- With the TLC water level monitoring system

The Contractor shall use the Meri-Cal air pressure calibration device with an associated hand pump, fittings, and valves required to calibrate the primary, and secondary reactive air system and other bubbler systems.

The Contractor shall use the calibration device any time calibration of the above equipment is required during the Contract year.

After the inspection the Contractor shall download the system control information (pull in a new image) and download the archive of the main pump starts and stops. This information shall be delivered to the Engineer.

8.26 YEARLY WET PIT INSPECTION – ALL STATIONS EXCEPT PS04

The Contractor shall inspect the wet pits yearly, in January through March. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall use his own portable pump to draw down the wet pit to a low level and maintain the existing inflow water in the wet pit.

The Contractor shall:

- Inspect all grease lines to ascertain if any are broken, clogged, or not secured
- Inspect the integrity of all equipment attached to the structure, air bell, air line, floats, etc.
- Inspect the floats for operational efficiency, and clear them of any debris
- Inspect the probes for operational efficiency, and clear them of any debris
- Take a photograph of any bowl assemblies that show any wear on the impeller and/or if the suction is clogged with debris. The photos shall be appropriately labeled and placed in a sheet album with the report in the logbook
- Inspect the silt accumulation and document levels
- Visually inspect the inlet sewer from inside of the pump station
- Maintain existing wet pit lighting, clean lens, and reflectors

Due to the complexity and size of PS04, the Contractor shall submit an agreed-price quote for its above listed Yearly Wet Pit Inspection.

8.27 YEARLY PUMP CONTROL SYSTEM INSPECTION – ALL STATIONS

The Contractor shall inspect all pump control systems within all pump stations in the January through March period. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall:

- Inspect the bubbler, electrode, and float systems, whichever secondary control system is utilized
- Check all starts, stops and alarm control elevations (Any control elevations which are different than the required elevations shall be noted and corrected.)
- Record silt level in the wet pit
- In addition to deficiency Tickets the Contractor shall create tickets for excessive silt build up and enter the numbers on the inspection report, Log P-6.

8.28 YEARLY VENDOR PUMP CAPACITY, MOTOR CURRENT, VOLTAGE, VOLTAGE MOISTURE, AND MEGGAR TEST – ALL STATIONS

The Contractor shall conduct a pump capacity, motor running current, voltage measurement, megger, and Yeoman submersible pump moisture tests. The Contractor shall utilize the services of the specialty services vendor for this test.

The Contractor shall be responsible for providing or storing water for testing, not to exceed high level elevations.

The stations shall be tested in the January through May period. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall provide all necessary equipment, tools, material and labor to set up the pump stations for capacity testing using either the recirculation method, wet pit draw down method or the discharge chamber method with discharge sewer and recirculation gates closed, as applicable for the station.

Prior to testing, the Contractor shall record all necessary name plate information for pump and motor. Pump testing will require the presence of at least two Contractor personnel equipped with communications and measuring tape and block.

The Vendor shall:

- Complete a draw down test in all the pump stations
- Record flow meter reading
- Measure accumulated pumped water in the discharge chamber where sluice gates are present to store water in the discharge chamber
- Test pumps for at least for 1 minute duration
- Record all readings, including full load current, RPM on vertical pumps, flow reading and water level change.

The following data shall be recorded on an Excel Spreadsheet and Log P-5 and placed in the Logbook:

- Water depth
- TDH
- Capacity
- Vibration
- Current
- Voltage
- Insulation resistance to ground
- Pressure

In addition the Vendor shall:

- Megger all motor windings and feeder cables

Any reading below 1 M ohm will require the Contractor to determine the source or cause of the low reading and make prompt repairs as required.

The Contractor shall submit to the Engineer:

- A copy of the results of the capacity and megger test
- A copy of all archived data from the PLC upon completion of the pump capacity test

Pumps testing below 80% shall be immediately re-tested and confirmed for low capacity.

8.29 YEARLY IMPELLER ADJUSTMENT OF VERTICAL AXIAL FLOW PUMP MOTORS PS # 2, 3, 25, 29, 33, 35

The vertical axial flow pump motors shall be checked for proper impeller settings in accordance with manufacturer's specifications. This work shall include dropping the suction bell to inspect the wear ring and impeller for wear.

This work shall be completed in the January through May period. Each station shall be inspected in the same month of the Contract year (if renewed).

If pumps do not perform according to their design, record:

- The “as found” measurements
- The adjustment setting

This work shall be completed in the January through May period. Each station shall be inspected in the same month of the Contract year (if renewed).

8.30 YEARLY MOTOR CONTROL CENTER INSPECTIONS – ALL STATIONS

The pump stations shall be inspected in the January through November period. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall perform the following inspection:

General Maintenance:

- Clean enclosure and control equipment by blowing out with low air pressure or vacuuming
- Check and clean contacts, relays, and timers
- Visually inspect for damage or out of adjustment parts.
- Remove all dust off from electrical devices and equipment
- Check motor control center indicating lamps and all switches and push buttons

Circuit Breaker Maintenance:

- Check connections
- Exercise breaker
- Check trip setting

Motor Starter Contact Maintenance:

- Check contacts and burnish or replace, if necessary
- Check coil and clean
- Inspect arc chute for cracks or burns
- Check contact pressure and measure contact resistance on all 3 phases

Oil Dash Pots:

- Check oil levels
- Inspect settings

Motor Controls:

- Inspect wiring/conductors for overheating and discoloration
- Check sizing of motor overload heaters
- Check tightness of wire terminations and connections
- Check for proper labeling, provide and install missing labels
- Check wire tags/labels, provide and install missing tags or labels
- Check fans for proper operation and clean filters
- Check fuse disconnects for proper operations, keep fuse clips clean and tight
- Check fuses for proper size, and overheating
- Test equipment ground system of the station

8.31 YEARLY PUMP STATION INSPECTION AND MAINTENANCE – ALL STATIONS

The Contractor shall conduct a yearly comprehensive inspection of the electrical and mechanical equipment at each pump station.

The Contractor shall inspect the pump stations yearly, between January and November. Each station shall be inspected in the same month of the Contract year (if renewed).

The Contractor shall:

- For stations with flat roofs, drain any large recessed areas of standing water
- Collect and dispose of all debris on the pump station roofs
- Remove any debris build up in gutters, drains or down spouts
- Patch or repair cracks found in concrete
- Clean all cabinets, walls, motors, and equipment by wiping with a damp cloth
- Wash floors with a mop and Simple Green cleaner
- Lubricate exposed trolley drive pinion and wheel teeth
- Repair all failed caulk around windows, lintels, doors, and ventilation components
- Seal all gaps or openings between structures and concrete or blacktop with material in accordance to manufacturer specifications
- Check and note any rusting on the generator and its enclosure
- Check the air induction heating elements
- Check the space heating elements
- Replace defective heating elements
- Check and lubricate, if necessary, fan motors and damper mechanisms
- Check thermostat and settings
- Clean the finned heating element and fan inlets with compressed air
- Schedule replacement of any glass blocks or broken windows
- Repair or schedule repairs of roof holes or cracks, loose or dry laps, loose fasteners, buckles, wrinkles, ridges, etc.

It is assumed that the Contractor will create follow-up Tickets for required roof and window repairs, which may be completed by a specialty vendor company. If the roof needs complete replacement the Project Manager shall meet the Engineer at the site to discuss maintenance issues. If the Engineer concurs non-routine maintenance funds will be used for complete roof replacements.

Roof Repair Procedures:

Small Holes and Cracks:

Clean surface, apply mastic (roof cement) 1/8" to 1/4" thick into the hole or crack using a roofer's trowel or gloved hand, working the mastic into the opening and 2 to 4 inches beyond.

Large Holes and Cracks:

For damaged areas larger than 1/4" repair, clean surface, use self-adhering SBS Modified Asphalt Membrane by peeling off the backing and pressing it onto the area to remove any entrapped air. A coating of mastic (roof cement) shall be applied over all repaired areas.

Loose or Dry Laps, Fishmouths, Buckles, Wrinkles, Ridges:

Cut defective material back to an adhered area. Repair area as needed with mastic and/or membrane and mastic as stated above.

Loose Mechanical Attachment, Termination Bar:

Remove loose fasteners. Re-secure base flashings (or new flashing material) through tin discs of a larger diameter or fastened to an adjacent location (new hole).

8.32 YEARLY VENDOR GAS DETECTOR INSPECTION

The Contractor shall employ the services of a vendor who is OSHA certified and approved by the pump manufacturer, or scheduled work as approved by the Engineer, to test and calibrate a gas detector system as specified herein for a pump station. Proper safety equipment must be utilized.

Complete the following:

- Clean all detectors and hydrophobic filters.
- Check calibration of all detectors and adjust each, if required
- Replace sensing element if calibration can no longer be properly performed. This work shall be completed at the time of testing but will be paid under separate contract unit price specified elsewhere herein.
- Actual alarms of the detectors and sensors to ensure reliability.
- Check gas detector internal and power supply wiring for grounds and shorts.
- Check AEGIS and SCADA system for alarm acknowledgment.
- Check all fans and dampers for start-up and/or shut down

If a replacement gas sensor is needed, it shall be replaced and be equivalent or superior in quality to the existing gas sensor and be rated and approved for its intended use by the national FM and CSA standards. The furnished gas sensor shall have the same sensing element as the existing SCOTT, MSA or Rexnord gas sensors being replaced.

The following is a list of pump stations with their corresponding gas detector system manufacturer, number of sensors and their respective locations.

PS #	Loc.	GAS DETECTOR SYSTEM	Sensor Model
01			
02		MSA 5100 with 2 sensors	1S
03		MSA 5100 with 2 sensors	1S
04			
05		MSA 5300 with 6 sensors	X
06			
07		MSA 9020 with 5 sensors	X
08			
09		MSA XE with 2 sensors	X + XIR
10		MSA 5300 with 2 sensors	1S
11		MSA XE with 2 sensors	X + XIR
12		MSA XE with 2 sensors	X + XIR
13		MSA XE with 2 sensors	X + XIR
14			
15		MSA XE with 2 sensors	X + XIR
16		MSA XE with 2 sensors	X + XIR
17		MSA 5300 with 2 sensors	1S
18		MSA XE with 2 sensors	X + XIR
19		MSA XE with 2 sensors	X + XIR
20		Rexnord 820 System with 2 sensors	
21		Scott Bacharach with 6 sensors	Gold Bell

22	Detronics 2000 with 6 sensors	
23	Detronics 2000 with 6 sensors	
24	MSA 9020 with 6 sensors	X
25	MSA XE with 2 sensors	X + XIR
26	MSA 9020 with 8 sensors	XIR
27	Honeywell XNX with 6 sensors	
28	MSA 9010 with 5 sensors	X5K
29		
30	MSA 9010 with 5 sensors	X5K
31	MSA 5000 with 1 sensor	1S
32		
33		
34	MSA 5100 with 2 sensors	1S
35		
36		
37		
38		
39	Scott Quadraplex with 2 sensors	
40		
41	MSA 9020 with 2 sensors	X
42	Scott Quadraplex with 2 sensors	
43	MSA 9020 with 2 sensors	X
44	MSA 5100 with 2 sensors	1S
45		
46	MSA 5100 with 2 sensors	1S
47	MSA 9010 with 3 sensors	XIR
48	Honeywell XNX with 3 sensors	
49		
50		
51	MSA 5100 with 2 sensors	1S
51	Detronics R8471 with 2 sensors	H2S
52	MSA 9020 with 2 sensors	X

Tickets and a written report shall be submitted to the Engineer, which shall contain any pertinent recommendations for each pump station system.

8.33 YEARLY VENDOR MAIN CIRCUIT BREAKER TESTING

PS # 25, 28, 29, 32 and 41 to be inspected during Aug-Oct period of 2022

PS # 9, 50, 52, 31 and 44 to be inspected during Aug-Oct period of 2023

PS# 13, 16, 12, 7 and 36 to be inspected in Aug-Oct period of 2024

- The Contractor shall obtain an approved engineering services company for testing the main circuit breakers, branch circuit breakers and motor starters.
- The Contractor shall coordinate with the electrical utility to turn power off and on where required.
- The Contractor shall furnish the test set and operator along with all necessary fittings, cables, and connectors to connect the test set to the circuit breakers.
- Prior to testing, a general cleanup of the buses and cabinets are required.
- Testing shall consist of visual and electrical tests as shown on Log P-7.
- Overcurrent relays and dash pots shall be inspected where present and are to be set as directed by the Engineer.
- The inspection and testing shall also include the trip unit, contact resistance and insulation tests.

8.34 YEARLY SUBMERSIBLE PUMP INSPECTION

PS # 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 51, 52

The Contractor shall remove, inspect and service all submersible pumps each year.

The pump stations shall be inspected in July through November. Each station shall be inspected in the same month of the Contract year (if renewed).

Service work shall include:

- An oil change
- Checking and recording the clearance between impeller and wear ring
- An inspection of cooling jacket passageways to assure no blockage would cause low water flow and high temperature

This work shall be done in accordance to manufacturers' specifications and instructions.

8.35 YEARLY OIL ANALYSIS – ALL STATIONS

The Contractor shall conduct an oil analysis at all pump stations between July and November of each year. Each station shall be inspected in the same month of the Contract year (if renewed).

Samples shall be taken after running the motor, pump, or engine or within fifteen minutes after the equipment is turned off.

The Contractor shall:

- Obtain suitable test containers from an approved lab facility
- Collect oil samples from the motor upper and lower bearing compartments, dry pit/wet pit submersible pumps and all generators
- Draw oil from the equipment reservoir (The oil should drain for a few seconds before collecting the sample.)
- Collect a minimum of two (2) ounces of oil

- Not use the same container for different equipment or for different compartments of the same equipment.

The Contractor shall provide the laboratory with:

- The brand and type of oil,
- Type of equipment from which the sample was taken
- Number of days since the last oil change
- Any suspected abnormalities in the equipment

Each sample of oil shall be identified with the equipment and compartment from which the sample was taken. The Contractor shall ship the oil samples to the lab facility within one month of collection.

The lab facility shall conduct a wear particle analysis to determine:

- Wear metals
- Contaminants
- Additives elements
- Viscosity
- Solid percent volume
- Water percent volume
- Fuel where required
- Particle counting and direct reading ferrography

The oil shall be changed if the lab results indicate that the oil is contaminated.

The Contractor shall create tickets for any deficiencies found from the lab testing and submit the lab reports to the Engineer, with operating software that can utilize existing data for trending.

Based upon the lab report, the Engineer may request additional analytical ferrography testing.

All charges for lab work, shipping, and changing of oil etc., shall be covered under routine maintenance.

8.36 YEARLY VENDOR FIRE EXTINGUISHER MAINTENANCE

The Contractor shall have all fire extinguishers checked yearly in November for proper pressure through a fire inspection service. It will be necessary for the Contractor to travel with the fire inspection service personnel to unlock facilities.

In some locations the dry chemical fire extinguisher will need to be submitted to the fire inspection service for hydrostatic maintenance procedures which require the extinguisher to be tested by being emptied and re-filled (every 6 years) per the NFP specifications. The Contractor shall be provided a spreadsheet with the pump station numbers and dates due for the hydrostatic maintenance.

8.37 YEAR 2022 YEOMAN – KJI --GRUNDFOS PUMP MAINTENANCE PS # 5, 7, 21, 24, 27, 29, 30, 42, 48

In June 2022, the low flow Pumps at PS 5, 21, 24, 27, 29 and 30 and all of PS 7, 42 and 48 shall have maintenance work performed.

The Contractor shall:

- Drain, flush, and refill the seal chamber with new oil

- Inspect oil for water intrusion in the motor seal chamber
- Inspect the cable for any signs of abrasion or damage
- Inspect the impeller and casing wear ring

8.38 PUMP REBUILD PROGRAM

General Requirements for All Types of Pump Rebuilds

The rebuild program locations are based upon site inspection and operational data including historical data of the pump capacity and vibration analysis. The pump rebuild program is primarily developed using operational data received by testing and inspecting pumps via various routine maintenance programs and periodic inspections.

The Pump Station Manager shall analyze the condition of the pumps and provide a report, at a minimum on a quarterly basis, which prioritizes the stations/pumps as to which should have a pump re-build.

The Contractor may submit the recommendations for pump repair or replacement any time during each calendar year.

All pump removal and reinstallation for repairs and rebuilds shall be documented in the pump station pump re-build log sheet.

Only Service Companies/Vendors in the tri-state area of Illinois/Indiana/Wisconsin shall be used by the Contractor. The exact procedure necessary for the removal and reinstallation of a complete operational pump is the responsibility of the Service Company.

Routine Work:

This following work, whether by Contractor forces or a Department approved service company, shall be paid through routine maintenance:

- The PS Foreman shall be present for removal and reinstallation of the pump
- Labor to load and unload the complete pump unit on a flatbed truck
- Labor to load and unload pump parts and equipment
- Transportation of the pump or parts to the approved service company shop for repairs and delivery of the pump or parts back to the station upon completion of the repair work
- Re-Installation of the complete pump assembly (pump and parts) including the motor
- All services for start-up and testing prior to putting the pump back in service
- Providing respective warranties which shall be loaded on the FTP site
- Contractor personnel shall coordinate with the Service Company's personnel on scheduling and shall provide service/labor to assist with removals, replacements, energizing, de-energizing, and disconnection of any motor electrical splices at the junction boxes.

Non-Routine Work:

The Contractor shall be paid, through non-routine maintenance agree-price work, if it is necessary to use an approved service company or crane service company and operator for the removal of a pump and its later reinstallation.

The Department shall pay the Contractor through non-routine maintenance pay items (if not available in EMC Spare Parts Inventory) or agreed-price work for the necessary parts and labor necessary for the pump repairs.

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If test results are unsatisfactory the Contractor shall be responsible to analyze the operational problem(s) and resolve to the satisfaction of the Engineer. Pump capacity, vibration tests, motor current, and voltage readings shall be taken upon the re-installation of a pump. The readings and tests shall conform to the pump and motor specifications or be approved by the Engineer.

General Procedures:

Case A:

- Pump is selected for the rebuild program, to be repaired on site

The Contractor shall provide the Engineer a choice of quotes from the EMC or Service Vendors for the rebuild work.

- The quote(s) are analyzed by the IDOT Engineer to determine which company shall perform the repair work through non-routine agreed price work
- Following the repair(s) the pump/part(s) shall be inspected and approved by the PS Foreman.

Case B:

- Pump is selected for the rebuild program, to be repaired with parts from EMC Spare Parts inventory by the EMC or Service Vendor

If the pump and/or EMC Spare Parts are determined (or suspected) to need reconditioning the Contractor shall create an agreed-price authorization so the parts may be sent to a service company (as approved by the Engineer).

- The pump/part(s) shall be inspected and approved by the PS Foreman after reconditioning, prior to installation

Case C:

- Pump is selected for the rebuild program to be repaired but no EMC Spare Parts are available in inventory
- The PS Foreman shall submit a report to the Engineer indicating the type, make, model and material specifications for the pump replacement parts.
- The PS Foreman and the Engineer shall review the manufacturer's pump/pump part(s) literature and test data.
- The pump/part(s) shall be inspected and approved by the PS Foreman before re-installation

MIXED FLOW PUMP ASSEMBLY – PS 25 ONLY

This work, whether by EMC or Service Vendor, shall be paid through routine maintenance:

- De-coupling and removing the motor drive from the pump assembly
- Complete removal of the pump assembly including the discharge column, drive shafting, enclosing tube, and bowl as a complete unit

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MIXED FLOW PUMP WORK – PS 2, 3, 29, 33, 35

This work, whether by EMC or Service Vendor, shall be paid through routine maintenance:

- Disassembly of the pump into the following parts: motor, oil tube sections, shafting, coupling, bearing, bowl assembly, column pipes in sections, motor stand, and set-up for inspection for service and repairs on pump station grounds

WET PIT/ DRY PIT SUBMERSIBLE AND SIDE VOLUTE DISCHARGE PUMPS

2, 3, 5, 7, 8 through 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 36 through 44, 46, 47, 48, 50, 51

This work, whether by EMC or Service Vendor, shall be paid through routine maintenance:

- Setting up for removal, disconnect electric connections
- Disconnecting the drive shaft from the rotating assembly
- Close gate valve and provide a blind flange if necessary, to stop water leaks
- Loosening the bolt of the rotating assembly from the volute
- Remove rotating assembly out from pump station
- Loading and unloading of equipment that requires inspection and repair.
- Removing and installing the open shaft and rotating assembly and setting up inspection

8.39 INTELLIGENT KEY SYSTEM

The Contractor shall research the Intelligent Key System, Medeco XT Basic product (which includes schedules, audits, groups, dashboards, and visual audit) for pump station entrance doors and stations with doors to the trash rack area. The Department will purchase through non-routine maintenance.

8.40 CONTRACTOR AND VENDOR LABOR FOR PS 26 TRASH RAKE

All labor hours necessary for the removal of old or non-useable parts, and the labor (Contractor or Vendor labor/services) necessary for a plannedtma re-installation of a trash rake at PS 26, will be paid through routine maintenance.

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ARTICLE 9.0 - SURVEILLANCE SYSTEM

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ARTICLE 9.0 - SURVEILLANCE SYSTEM

9.1 BIDDING

Unless labor, equipment, work, or required procedure is specifically noted herein as paid through non-routine maintenance, Article 9.0 Surveillance System work shall be paid through, is part of, and included in routine maintenance bid items.

9.2 DESCRIPTION OF WORK

The Surveillance System consists of locations and equipment specified in Section 3 including but not limited to buildings, huts, cabinets, ramp gates, electrical and mechanical equipment, cameras, devices, interconnecting cables, hardware, software, infrastructure and appurtenances which make up the Expressway REVLAC system, fiber optics infrastructure, network switches, switched Ethernet network, Dynamic Message Sign System (DMS), detector cabinets, ramp metering, control cabinets, continuous count site (CCS) network, INET/ATMS, video distribution network, communication towers, electrical services and its equipment including hand holes, conduits, wire, junction boxes, splice boxes, patch panels, connectors with all associated devices for a complete operational system.

The Contractor shall provide labor, equipment, and materials to maintain the operation and performance of all equipment and networks at Contract maintained Surveillance locations. Equipment found during response or inspections (routine or non-routine) which need repair or replacement, or items found to be defective, malfunctioning, or non-operational are covered under this Article.

The equipment specified herein gives a good overview of the items to be maintained, however, there may be other electrical items which require maintenance. The Contractor is urged to visit the locations following the Pre-Bid Meeting to view all the electrical equipment to be maintained.

9.2.1 ROUTINE MAINTENANCE BID ITEMS (PAY CODES)

- S-1** Ramp Metering Controls
- S-2** Cabinets and Detection
- S-3** DMS (Dynamic Message Signs)
- S-4** REVLAC (Reversible Lane Control System)
- S-5** Cameras (for Traffic Monitoring)
- S-6** Buildings/Huts, Tower/Monopole, Fiber Optic Connections, Network Equipment
- S-7** Ramp Gates (Homeland Security Installations)

9.3 RAMP METERING CONTROLS (S-1)

The Contractor shall maintain all ramp meter equipment located at a District 1 expressway ramp metering system location. A ramp metering location shall consist of all equipment centrally controlled and monitored by the District 1 INET/ATMS FSK telemetry, locally controlled by a 2070 Lite or equivalent Linux field ramp metering controller-and monitored by District 1 INET/ATMS including but not limited to following equipment: (EMCMS equipment type codes shown)

S-1A: FSK Ramp metering control cabinet Type III or IV, Type D foundation, load relay, telemetry mounting frame, FSK Transmitters, FSK Receivers, telemetry power supply, and all other appurtenances

S-1B: Type IV or Type 334 Ramp metering control cabinet mounted on Type 1 or Type D foundation, 2070 Lite or equivalent Linux field controller running TCIP (1207 & 1209) Ramp Metering Software. Ethernet manage switch, PDA, NEMA Flasher, load switches, detector input file, and all other appurtenances located or attached to the ramp meter cabinet.

S-1C: Wet pavement sensor, controller, cabling, firmware to interface wet pavement contact closure and NTCIP interface to ATMS at 71st St. and Dan Ryan

Miscellaneous:

Eight-inch LED traffic signal head, a traffic signal post of various lengths and Type A foundation. The traffic control LED signal head shall consist of single face and two signal sections.

Low mounted 8-inch LED flashing warning beacon flasher module, and all appurtenances, mounted on a wood pole, traffic signal post and foundation, or mast arm assembly and foundation

Induction loop either embedded in a sawed slot in the roadway pavement or embedded in the concrete pavement (pre-formed loops), magnetic detector, Bluetooth or radar, a loop detector sensor unit, vehicle loop detector amplifier or active channel encased in a durable housing, card rack or detector input file

Electrical service, communication equipment, inverter, batteries, and all associated devices for a complete operational system

The Contractor shall assign the Surveillance Telemetry Specialist to the TSC/Traffic Systems Center equipment room(s) each workday from 7:00AM until 3:00PM to:

- Inspect, troubleshoot, repair and/or replace the FSK tone telemetry equipment
- Interrogate 270 or Linux based module
- Take and return all calls from line providers with notification of problems
- Create Telemetry Tickets
- View daily the 360 equipment for camera outages and DMS
- Create Camera Tickets

If time allows the Engineer will provide other ramp metering troubleshooting assignments. This individual will provide the Engineer an EMCMS Ticket Summary report at the end of each workday

9.4 CABINETS & DETECTION (S-2)

The Contractor shall maintain all control cabinet equipment located at a District 1 Surveillance on or off expressway location. A control cabinet location shall consist of all equipment used to transmit the raw data pulse, or monitor and collect volumes, occupancy, speed, length-based classifications and FHWA classifications collected by the INET/ATMS or CCS systems. The S-2 pay code, shall include but is not limited to the following equipment: (EMCMS location with equipment type codes is shown).

S-2A: Location: FSK Control Cabinet, pedestal or pad mounted, foundation, telemetry mounting frame, telemetry transmitters and telemetry power supply

S-2B: Location: 334 Cabinet, type 1 foundation, 2070 Lite, ATC, or equivalent LINUX controller running NTCIP (1207 & 1209) ramp metering software, PDA, detector input file, and all other appurtenances

S-2C: Open for future use

S-2D: Open for future use

S-2E: Open for future use

S-2F: Location: Radar Vehicle Detector location, 30' pole with foundation, control cabinet, power cables, serial communications, and contact closure wiring/interconnect back FSK control cabinet

S-2G: Location: Induction Loop location, solar powered, solar panels, 30' pole with foundation, control cabinet, media converter, contact closure, Ethernet managed switch, and loop amplifier

S-2H: Location: LED display, red/green, mast arm, pole, cabinet, and wiring interconnect at 2 locations; S3015 and S3020 (I-190 @ Mannheim Rd)

S-2I: Location: Continuous Count Site (CCS) Network, Control cabinet, solar or AC powered, with IRD/PAT Traffic TRS data recorder, 20W and 40W solar panel, solar regulator, 12 volt batteries, foundation, cabling, one 6 x 6 ft loop per lane at volume sites, and two 6 x 8 foot loops per lane with a class II Piezo detector per lane at classification sites. The Department shall supply the controllers, solar panels, batteries, solar regulators, cellular modem, and piezo materials.

S-2J: Location: Radar Vehicle Detector location, standalone, 30' aluminum streetlight pole with foundation, solar panels, battery cabinet, and cabling,

S-2K: Location: Control Cabinet, expressway cross-connect, including cabinet shell, foundation, telemetry card racks, mounting frame, telemetry power supply dual line amps, S-666B8-50 terminal blocks, and A.C. duplex outlets

Bluetooth Detector locations, solar powered, normally on pole 30' with helix foundation, with cellular modem/junction box are incidental to the routine maintenance S-2 Pay Item and shall be coded separately in the EMCMS and reconciled monthly. (Note a few Bluetooth Detector locations are listed in Section 3 herein, but these are not paid separately.)

Miscellaneous:

Induction loop, magnetometers, radar vehicle detectors, Bluetooth detectors along with their related amplifiers, microprocessors, access points, antennas, pole, foundation, relays, card racks, and detector input files, electrical service, communication equipment, inverters, batteries, and all associated devices are incidental to Pay Item S-2 for a complete operational system

9.5 DMS – (DYNAMIC MESSAGE SIGNS) S-3

The Contractor shall maintain all Dynamic Message Signs at locations on or off expressways, the devices and appurtenances, color LED and amber LED, controlled by INET and a 360 Cameleon/FLIR system with associated communication equipment hardware and cellular/wireless.

The Arterial DMS structures do not have catwalks and handrails to utilize as a work platform. All work in the DMS sign enclosure will be done from a bucket truck with a lane closure. The Sign enclosures are front access which may require 2 men to open the front access door safely.

The Contractor shall provide the manpower and equipment to transport portable DMS signs to a location directed by the Engineer.

A DMS location shall consist of all equipment which is utilized to display traveler information on an electronic display attached to a sign support structure and communication equipment and shall include but is not limited to the following equipment: (EMCMS codes shown)

S-3A: Two Portable DMS signs with cameras and communication equipment

S-3B: Fourteen (14) Skyline, 18-inch, 2070 w/UPS backup, walk-in amber LED displays

- S-3C:** Three (3) Skyline, 2070 w/o UPS backup, walk-in amber LED displays
- S-3D:** Four (4) Daktronics, 18-inch, full matrix, front access, 20 mm color LED displays
- S-3E:** Two (2) Skyline, 18-inch, 170 controller's w/o UPS backup, walk-in amber LED displays
- S-3F:** Twelve (12) Daktronics, 18-inch, full matrix, front access color LED displays
- S-3G:** One (1) Skyline, 18 inches, full matrix, front access, 34 mm color LED display
- S-3H:** Five (5) Adaptive Micro Systems (AMS), 8-inch, full matrix, front access amber LED displays
- S-3I:** Two (2) AMS, 10-inch, full matrix, front access amber LED displays
- S-3J:** Seven (7) AMS, 12-inch, full matrix, front access amber LED displays
- S-3K:** One (1) Skyline, 18-inch, full matrix, front access 20 mm color LED display
- S-3L:** Eight (8) Daktronics, 18-inch, full matrix, walk-in, 20 mm color LED displays

Expressway DMS

- 170 controllers, 2070 Lite controllers with Skyline NTCIP 1203 V.1 firmware, Daktronics Vanguard 3000 and VFC Series controllers with Daktronics NTCIP 1203 V.2 firmware
- Type IV control cabinets and Type D foundation, fans, heaters, and breaker assembly
- 334 cabinets, Type 1 foundation, PDA, fans, filters, heaters controllers, and all other appurtenances associated with 334 cabinets
- Sign enclosures (walk-in and front access), load centers, display drivers, display modules, power supplies, heaters, photocells, fans, filters, temperature sensors, humidity sensors, fans, interior lighting cabling (power and communications) TVSS devices
- UPS Battery backup, 332 control cabinet, inverter, alarm status feedback, cabling, and all other appurtenances associated with UPS battery backup cabinets
- Electrical service, Communication equipment, inverter, batteries, and all associated devices for a complete operational system

Arterial DMS

- Front access sign enclosures with IDI 1300 series controllers, firmware, display drivers, display modules, fans, filters, heaters, power supplies, temperature sensors, humidity sensors, photocells, TVSS devices, interior lighting cabling (power and communications) and all other appurtenances associated with the sign enclosure
- Type III cabinets, Type D foundation, fans, heaters, door switches, and circuit breaker sub-assemblies
- DMS queue detector system solar panels, 45' pole, foundation, control cabinet, wireless contact closure radio, and yagi antenna to provide contact closure for traffic queue to activate a warning message on the DMS located at 78th Place. and Grand Ave. S22050 in Elmwood Park

Traffic Control Special Requirement Locations

Required traffic control, as paid through routine maintenance, includes listed requirements below:

S5377 - DMS-08, NB Ryan @ Chicago River

Ramps from I-55 to Dan Ryan need to be partially closed for access to sign enclosure

S5052 - DMS-30, SB Ryan @ 83rd St.

Need partial ramp closure from SB 79th/83rd St. collector distributor for access to sign enclosure.

S3482 - DMS-13 - SEB JFK @ Augusta

Use reversible lanes or SEB Division entrance for access to sign enclosure

S5196 - DMS-31L and S5197 - DMS-31E, SB Ryan locals and express @ 55th St

Use right shoulder and/or right lane to access UPS cabinets and access to sign enclosure

S5292 – DMS-32L – SB Ryan locals at 39th St

Requires SB 37th St entrance and right shoulder local lanes to be closed for servicing

S5140 – Cab. -48 – NB Ryan @ 65th (Skyway Ent.)

Requires partial NB Skyway entrance ramp closure

S5165 – Cab. -43 – SB Ryan @ 59th St.

Requires SB 59th St entrance closure

9.6 REVLAC – (REVERSIBLE LANE ACCESS CONTROL) (S-4)

The Contractor shall maintain the REVLAC System which consists of operational control access at six reversible entry/exit ramps to the Kennedy or Edens Expressways, extending 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; buildings, swing gates and their transmissions, barriers and barriers signs, changeable message signs, chevron signs, gore signs, auxiliary signs, roadside control panels, Cattrons, supervisory controls, operations cameras, and all interconnecting cable, Ethernet, fiber, and redundant fiber. The primary communications are conducted on the fiber system, along two major highways, I-290 and I-90.

The REVLAC system is to be kept operational 24/7 in automatic mode or in manual mode when repairs are required. This may entail having personnel manually crank swing gates and have sufficient personnel to both operate controls from a building if bypassing the PLC control or monitoring transition events, as well as 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 system.

S-4A Auxiliary Signs

There are thirteen (13) LED Auxiliary signs manufactured by the National Sign and Signal Co. of Battle Creek Michigan. They are operated remotely and automatically controlled by the PLC.

S-4B Restraining Barriers

The system incorporates six (6) restraining barriers manufactured by the Entwistle Company of Hudson, Massachusetts, (now no longer in business). 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.

S-4C Operations Cameras

Currently there are fifty-three (53) operations cameras which provide an overview of the REVLAC operations and changeable message signs to the dispatch operators at the IDOT Headquarters.

S-4D Buildings

There are four (4) REVLAC Buildings: A, C, D, and E. Equipment in the REVLAC Buildings includes four sets of Allen Bradley RS Logics 5000, programmable logic controllers. Each remote building (and the ComCenter location (Various System Article 11.0) utilize a redundant processor in their PLC system (one set). 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 or operate the entire system in the event of a loss of communication to/from Schaumburg. The primary communications are conducted on the fiber system, along two major highways, I-90 and I-290. Refer also to Outdoor and Indoor Site Maintenance Requirements in Article 9.11.

S-4G Swing Gates

The REVLAC system incorporates one hundred seventeen (117) swing gate systems that has mechanical and electrical equipment 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.

S-4M Changeable Message Signs

Currently there are fifteen (15) changeable message (dynamic full matrix) signs as manufactured by Daktronics. Each changeable message sign can be operated remotely and locally.

S-4P 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.

S-4S Gore Sign

There are six (6) LED gore signs manufactured by the National Sign and Signal Co. of Battle Creek Michigan. They are operated remotely and automatically controlled by the PLC.

S-4V Chevron

There are twenty-one (21) LED chevron signs manufactured by the National Sign and Signal Co. of Battle Creek Michigan. They are operated remotely and automatically controlled by the PLC.

S-4X X-Sign

There are six (6) LED "X" signs manufactured by the National Sign and Signal Co. of Battle Creek Michigan. They are operated remotely and automatically controlled by the PLC.

Miscellaneous:

Current equipment to maintain includes but is not limited to equipment as listed in S-6 General Maintenance herein. There is also a non-routine budgetary allowance for roof repairs.

9.7 CAMERAS (FOR TRAFFIC MONITORING) (S-5)

The Contractor shall maintain cameras for traffic monitoring; cameras with pan-tilt zoom (PTZ), fixed cameras, IP and analog cameras, interconnecting fiber, power, control and coax and copper cable, outdoor rated Ethernet cable, switching equipment, surge suppression, over-current devices, monitors, interfaces to communications network equipment including layer 2 and layer 3 switches, media converter, video transceivers, codecs, video transmission and distribution equipment, switching equipment, video servers, video work stations, wireless links, fiber optic patch panels, fiber jumpers, connections, poles, brackets, and

all associated hardware and appurtenances. Responsibilities include all repairs and modifications as required, removals, troubleshooting, and re-installations.

The Contractor shall assign the Surveillance Telemetry Specialist to the TSC/Traffic Systems Center each workday from 7:00AM until 3:00PM to view daily the 360 equipment for camera outages each day and create Tickets for all problems found. This individual will create Tickets and provide the Engineer an EMCMS Ticket Summary report at the end of each workday. Refer also to Article 9..

9.8 TOWERS/MONOPOLE EQUIPMENT, HUTS, AND BUILDINGS WITH EQUIPMENT, NETWORK EQUIPMENT AND FIBER OPTIC CONNECTIONS (S-6)

9.8.1 GENERAL MAINTENANCE

Currently there is equipment at six (6) towers, ten (10) huts, location FRB (former REVLAC building B), and TSC (Traffic Systems Center) on EMC maintenance. For the IDOT Schaumburg Headquarters equipment refer to Article 11.0 Various Equipment at Various Locations. Refer also to Outdoor and Indoor Site Maintenance Requirements in Article 9.11.

Maintenance includes fiber optic terminations, the network equipment, all electrical systems, control systems, mechanical systems, communications systems, alarm monitoring systems, backup systems, fiber optic systems, conduit, cable, wire, generators, software, hardware, and all associated equipment and appurtenances.

Monitoring cameras at building and hut locations will be paid separately through the S-5 pay item. There is also a non-routine budgetary allowance for full roof replacement. Single line diagrams and a network drawing will be provided at the Pre-Construction meeting. Bidders are encouraged to visit the buildings and huts after the Pre-Bid Meeting to view the equipment to be maintained, which includes but is not limited to:

- Alarm Systems and Panels
- Antenna, Antenna line, Antenna Mounts, Dehydrator Lines, and Wave Guides
- Batteries – 12 Volt and Other
- Battery Chargers and Inverters
- Cable management and ladder racks
- Cameras and Associated Equipment
- Circuit Breakers
- Computers
- Connections, Conduit, Cable, Wire, and Associated Items
- Doors, Hinges and Locks
- Electrical Distribution System
- Electrical Service Feeder Cable
- Exhaust Fans in Location FRB
- Exit Signs and Emergency Lighting
- Exterior Outlets and Outside Generator Hook-Ups
- Fencing, Gates, Locks, and Barbed Wire,
- Fiber Optic Cable
- Fire Extinguishers
- First Aid Kits and Eye Wash Stations
- Generators, Transfer Switches and Annunciator Panels
- GFIC Outlets and Regular Outlets
- Hatches
- Heat, Ventilation, and Air-Conditioning (HVAC) Systems and Equipment
- Liebert Equipment at TSC

- Lighting Systems for Outdoor or Indoor, Fixtures, Controls, and Equipment
- Monopoles
- Network Communications Equipment
- PLC Equipment
- Power for Highway Advisory Radio (HAR)
- Power Strips and Surge Protectors
- Power Supply Systems
- Rectifiers
- Roof
- Smoke and Heat Detectors
- Surge Arrestors
- Transfer Switches
- Transformers
- UPS with Batteries and By-pass Switch

9.8.2 WORK ASSIGNED TO THE CONTRACTOR NETWORK ADMINISTRATOR

- Manage day to day network administration of IDOT VDS, ATMS, EMCMS, REVLAC, Lighting, Pump Station, and Traffic Signal Systems
- Utilize NPM (network performance management) software to monitor network interfaces and equipment
- Manage critical outage and network issues via text and e-mail notifications to System Administrator, IDOT Engineers, and EMC Contractor staff
- Update NPM when new equipment is installed and connected to the IDOT Network. Program NPM to scan and identify equipment that may have been installed without IDOT or EMC knowledge
- Identify, disable, and remove rogue network connections, equipment, or software operating within the IDOT network
- Evaluate connectivity and network issues
- Troubleshoot network problems/errors
- Update and maintain network documentation, physical inventories, drawings, configurations, firmware, software, etc.
- Modify configurations, utilities, software, etc.
- Review and comment on new network equipment design/implementation into existing IDOT Networks
- Assign IP addresses for new equipment to be installed on IDOT Construction or Maintenance contracts/projects
- Configure equipment network settings for equipment supplied on IDOT Maintenance and/or Construction Contracts that will utilize communications over the IDOT VDS network
- Maintain fiber optic network documentation, GPS records of physical infra-structure, fiber assignments, record drawings, review catalog cuts, and label fiber optic patch cords.

- Input new/updated data into 3-GIS fiber optic documentation software
- Install and update network system configurations and software/firmware upgrades as necessary
- Maintain and implement latest network security measures across all IDOT Networks
- Manage, implement, and modify firewall settings as necessary to provide access for Center to Center communications through an ISP, WAN, or LAN between other State or local agencies
- Manage firewall settings and configurations for IDOT devices such as DMS, CCTV, Traffic Signal System and Pump Station devices that report status and provide control through cellular communications
- Setup and configure cellular gateways to be installed in the field for reporting status and control to servers that reside on the IDOT VDS, ATMS, CENTRAX, TACTICS, and EMCMS networks
- Maintain and document all new equipment information and any changes to terminations/ports of fiber and Ethernet connection at all locations.
- Continuously update all locations during this contract in a baseline folder on EMCMS servers. All diagrams shall be on a Visio format.

The Contractor Network Administrator shall assure continued operation of the network systems including whenever equipment is added to keep existing networks running smoothly. The Contractor Network Administrator shall troubleshoot and resolve problems until they are remedied and shall advise and provide recommendations in a timely manner to the Engineer of potential conflicts with IP addresses and equipment connections.

With the assistance of the Network Administrator, the Contractor shall maintain all network hardware, telecommunication equipment and documentation under this Contract including but not limited to switches, routers, GigE, GBIC's, SFP's, chassis, power supplies, enclosures, and all associated hardware. The Contractor shall backup equipment software, configuration and maintain all licenses at all locations.

Network equipment may require software upgrades and in the event of failure, replacement. For equipment, which is no longer supported and network modifications, the Contractor Network Administrator shall assure equipment added to the networks does not potentially impact the system to avoid disruption in service and assure continued operations.

9.8.3 COMMUNICATIONS NETWORK

The Contractor shall maintain the communication networks and its infrastructure including the INET/ATMS system, the SolarWinds Network Performance Management Network (NPM), the switched Ethernet Network, all fiber optics and wired and wireless devices.

Included in maintenance is the cable distribution equipment & accessories at all remote facilities, buildings, IDOT Headquarters, TSC, and on highways, for the transmission of video, data, and control signals and to provide interconnection points to other governmental agencies, through nodal buildings and nodal cabinets.

For proper network communications the Contractor shall furnish and install (Contractor owned) a maximum of twenty (20) Surface Pro 7 Platinum, Intel Core i7, 16 GB, 1TB, with Microsoft 365 Office installed, Microsoft

USB-C Travel Hub for Ethernet printing, and protective case, by January 15, 2022 for use by Department personnel using the EMC networks.

The Contractor shall maintain the physical infrastructure between locations and equipment and/or nodal buildings including the fiber optic network and equipment including but not limited to:

- Cameras
- Copper cabling
- Encoders
- Ethernet repeaters
- Ethernet switches
- Fiber distribution cables
- Fiber lateral cables
- Fiber optic cables
- Fiber optic jumpers\ patch cords
- Fiber patch panels
- Fiber trunk cables
- Fusion splices
- Handholes
- Laterals
- Media converters
- Modems
- Pulling pedestal
- Raceways
- Splice enclosures
- Stainless steel enclosures
- Tracer cables
- Terminations
- Transceivers
- Vaults

9.8.4 NETWORK PERFORMANCE MANAGEMENT SOFTWARE (NPM)

The SolarWinds NPM software detects and diagnoses network performance issues to provide network health. It provides automated capacity forecasting, alerting, and reporting with dynamic network maps, deep packet inspection and analysis.

The Contractor Network Administrator shall maintain the SolarWinds Network Performance Management (NPM) server and software on the IDOT District One VDS network. The Network Performance Management software, NPM, and server shall be maintained at the Traffic Systems Center and IDOT ComCenter. The Contractor Dispatch Center shall also have an NPM terminal to access the IDOT VDS network. When new equipment is installed the Contractor shall update-on the NPM servers to reflect most recent changes.

The Contractor shall troubleshoot loss of connectivity, damaged and or degraded fibers from any cause whatsoever. Upon notification of a fiber problem, the Contractor shall perform testing with power meter and OTDR to determine the source of the problem and make repairs. Damaged cable shall be replaced splice to splice or to termination location.

The Contractor Network Administrator shall assure the continued operation of NPM including the following:

- Setup and define device dependencies to ensure no unnecessary alerts are sent
- Configure network alerts for correlated events and sustained conditions

- Create performance and availability reports using out-of-the box and community-generated templates
- Create, import, or export a custom MIB poller to monitor any SNMP-enabled device
- Collect detailed information stored in device MIB table
- Monitor virtually any statistic available on networked devices

The Contractor Network Administrator shall update all electronic NPM maps record drawings when new equipment is added to reflect existing network operations, setup SNMP and any changes of terminations/ports of fiber and Ethernet connection at all locations. Existing network diagrams for nodes, huts, cabinets or other locations, and existing networks, will be provided.

The Contractor shall maintain the existing NPM Solar Winds servers located at Traffic System Center and ComCenter:

Server Type	Virtual
OS	Windows Server 2019
SQL Database Version	Microsoft SQL Server 2017 (RTM) - 14.0.1000.169
CPU	Intel Xeon 2.20GHz
RAM	32GB
Disk Space	100GB
SolarWinds Version	Orion Platform, NCM, NPM: 2020.2.5 10.1.200.20

9.8.5 FIBER CABLE MANAGEMENT SYSTEM

The 3-GIS cable management system is used to document and manage horizontal and backbone cables, hardware, assets, pathways, locations, contacts, and detail equipment connections, test results, attaches drawings, photos and documents, creates a contact directory, and cable label. The Contractor shall provide labor for data entry and red lining of plans into the fiber optic cable management system. The Contractor shall provide personnel to be trained to modify electronic record drawings, as specified in the respective articles herein, for the fiber cable management system, 3-GIS.

9.8.6 FIBER LOGGING & LABELING

The Contractor shall be responsible for record keeping of all equipment and labeling at each node, handhole, pull point, building, hut, cabinet, and equipment.

The Contractor shall insure that all fiber strands and connectors are properly tagged and labeled at each end and shall tag that they conform to the Department's labeling scheme. The Contractor Network Administrator shall perform the data entry of all changes to the existing fiber optic cable system in accordance with the D1 Standard Cable Designation Scheme which is available for review upon request.

In addition to fiber labeling the Contractor is responsible for labelling power wiring, Ethernet, RS232, RS422, RS485, cables, blue hose cables, and coax, as designated by the Engineer which require permanent labeling from a PTE 500 unit with USB connectivity, download and print laminated labels for cables, patch panels and faceplates. The labeling tape to be furnished through the year is Brother 24mm, black on white with extra

strength adhesive 8m (26.2 ft). Two Contractor owned units are needed with one to remain at the Traffic Systems Center.

9.8.7 INET/ATMS MAINTENANCE

9.8.7.1 GENERAL INFORMATION

The INET/ATMS is used to control ramp metering, provide travel/congestion times, manage incidents/events, and manage DMS messaging. The system details and network diagrams will be furnished upon request. The vendor will have full remote access to the INET/ATMS for support services for the year, however the Contractor Network Administrator shall be fully aware and active in any service support needed to the Department.

9.8.7.2 EQUIPMENT TO MAINTAIN

Servers

Dan Ryan (still on rack basement TSC) Dell 2950 JCFDQH1*
iNET™ DB (still on rack basement TSC) Dell R720 HZWN51*
iNET™ App (still on rack basement TSC) Dell R720 HPWG6X1*

New Equipment

Amber New (on rack basement TSC) Dell 330 G48FGK2*
Dan Ryan 2 (on rack basement TSC) Dell R640 8DW8H63

iNET™ Server B (on network switch rack in basement TSC) Dell R740 H4927X2
2 – USB Backup disks
1 – ethernet backup disk

iNET™ Server A (in Schaumburg IDOT office) Dell R740 H4917X2

Other servers on the EMCMS Base Network;

Snap Servers (2) Lenovo SN:MJO4M6SB, Lenovo SN:J11Y4NR
Bluetooth Dell power Edge R730 (2)DYJK0M2
360 Dell backup server at TSC
360 Dell Primary Servers at D1DQ Schaumburg
360 Dell R340
Tactcs Dell Power Edge R730 SN;H600FB2

9.8.7.3 TECHNICAL SUPPORT

Software changes of 3rd party software will be handled on a case by case basis. Once an issue has been identified as an interaction issue with 3rd party software the Vendor shall try to restore the system to a point earlier in time to mitigate the software issues. The Vendor shall notify the Engineer and Contractor Network Administrator of the issue, what the resolution is, and with an estimate of resources needed to correct the problem.

Support requests are broken down into 5 different levels of priority:

1. Critical
2. Severe
3. Moderate

4. Minor
5. Inconvenience

The Contractor Network Administrator shall become familiar with the support request format for the five levels of security.

9.9 RAMP GATES (HOMELAND SECURITY INSTALLATIONS) (S-7)

Forty-two (42) expressway ramp gates have been installed for access control on the Kennedy and Eisenhower expressways (Homeland Security). The ramp gates, the gate arm assembly, the actuator operating mechanism at Addison and the Kennedy, the bollards, cabinets, locks, traffic control cones, signs, and all appurtenances shall be maintained.

9.10 CO-LOCATED DUCT & FIBER

When the Contractor finds or is notified of damage to fiber or fiber ducts and repairs are needed, the Engineer shall be immediately notified, and the Contractor will immediately respond to the location. EMC Surveillance System fiber repairs need to begin immediately. An intergovernmental agency allows the sharing of fiber ducts and right of way for fiber installations. The Contractor shall co-operate when the location of fiber breaks must be determined.

If an offending party/vehicle is found to have damaged Surveillance System fiber, the Contractor may bill the offending party for the repairs. The Engineer shall approve of any invoice before it is sent to the offending party.

Illinois Department of Transportation Central Management Services (CMS) Fiber

- I-57 from Parnel to Dan Ryan (IDOT ROW)
- I 90-94 Dan Ryan from 103rd to 31st St in IDOT Conduit (IDOT ROW)

CMS will maintain their own fiber cable in accordance with CMS standards.

E-mail or telephone notification shall be made to the following CMS personnel:

- Frank Walters 217-725-0208
- John Leonard 217-299-6127
- Robin Woodsome 312-497-7472

Surveillance System Conduit/Handholes Allowed for Use by: Illinois Department of Innovation and Technology (DoIT)

- I-55 between IB I-55 Weigh Station in Bolingbrook to I-355
- I-55 between IB I-55 Weigh Station in Bolingbrook to west of OB I-55 Weigh Station
- I-290 from Des Plaines to I-88 Tollway

In most cases DoIT will have a representative to observe the repairs by the Contractor.

Surveillance System Fiber: on Tollway Property

- I-390 and IL-490 Elgin O-Hare western access (Tollway ROW)
- I-90 from Plaza 19 to Roselle Road (Tollway ROW)
- Roosevelt Ramp Building to ISHA Plaza 35 (Tollway ROW)

Wherever Surveillance System fiber on Tollway property is damaged, the Illinois Tollway personnel shall perform the restoration of all equipment. The Electrical Maintenance Contractor shall represent IDOT and shall oversee the repairs and assure they are performed to the Department specifications and standards. The Contractor shall perform testing in accordance with IDOT standards at the request of the Engineer.

Illinois Tollway Fiber: on IDOT Property

- I-290 between the Nordic Tower and I-90 (IDOT ROW)
- IL-355 between Army Trail Road and Nordic Road (IDOT ROW)

The Tollway shall restore their equipment in accordance with their specifications and standards.

9.11 CONTRACTOR IMMEDIATE RESPONSE & REPAIR

The Contractor is required to use as many personnel as necessary to respond to trouble calls within one (1) hour of notification, troubleshoot as necessary, provide temporary service restoration within four (4) hours or less and permanent repairs within seven (7) days, (unless an exception is stated in the chart below). The Contractor shall notify the Engineer of any repair work delays.

Due to the complexity of fiber optic work following the completion of temporary fiber optic repairs the Contractor shall agree with the Engineer as to the scope and date of permanent fiber optic repairs.

Incident or Problem	Response Time	Service Restoration Time	Permanent Repair Time
CCS site malfunction or damage	3 hours	5 days	21 days
Bluetooth Vehicle Detector (inoperable)	1 hour	72 hours	14 days
Cabinet Damage	1 hour	48 hours	ASAP
Cable Repairs (temp cable needed)	1 hour	24 hours	21 days
Camera (repair/replace)	1 hour	4 hours	48 hours
Conduit (repair/replace)	1 hour	24 hours	21 days
DMS Malfunction or Damage (repair/replace)	1 hour	4 hours	10 days
DMS Controller (repair/replace)	1 hour	4 hours	24 hours
Induction Loop Lead-in Cable (repair/replace)	1 hours	24 hours	14 days
Loop Detector Units (replace)	1 hours	24 hours	24 hours
Micro loop (replace)	1 hours	24 hours	14 days
Microwave Vehicle Detector (replace)	1 hours	24 hours	14 days
Ramp Gate (replace)	1 hour	4 hours	21 days
Ramp Metering Equipment (repair/replace)	1 hour	4 hours	10 days
Ramp Metering Controller (repair or replace)	1 hour	4 hours	24 hours
SenSys Device (replace)	1 hour	4 hours	7 days

Swing Gate (repair/replace)	1 hour	4 hours	4 hours
Telemetry Power Supply (replace)	1 hour	24 hours	24 hours
Travel Times (replace chassis/fiber/comm)	1 hour	4 hours	ASAP

9.12 PREVENTIVE MAINTENANCE PROGRAMS (PM)

The Contractor is required to perform certain preventive maintenance (PM) work within certain regular intervals or within certain time limits. The following descriptions provide a basic guide for PM work, but shall not be construed as all inclusive. There may be preventive maintenance required by the manufacturer which shall be performed in addition to these inspections. All scheduled Contractor PM work shall follow manufacturers' specifications.

All PM program work shall be scheduled on the Daily Agenda which shall list the applicable Article number.

There are four (4) types of reports for Preventive Maintenance work.

1: Tickets created on the EMCMS

Tickets shall be created for all items found broken, damaged, malfunctioning, or which do not conform to Department standards, which are repaired at the site, or which require follow-up repair or replacement. Ticket reports do not need to be submitted on the FTP site; however, the Department personnel must be able to verify the inspection through the Daily Agenda and the Contractor's GPS readings.

For the FTP site, the Contractor shall submit monthly, within five (5) working days into the next month, if noted herein the PM program, one or more of the following report types:

2: GPS Photo

A linked camera phone photo, with GPS reading and time stamp

3: GPS Report & Excel spreadsheet Report

A GPS report/Excel spreadsheet with GPS arrival date, duration, truck number, name of Contractor assigned worker, EMCMS location number and address, and the requested information in the individual PM program

4: An Excel spreadsheet report with specific information as required per PM program

The Contractor shall submit the Type # 3 and Type # 4 Report formats to the Engineer and IDOT System Manager for approval at the Pre-Construction meeting, so there is no misunderstanding of the information to be submitted throughout the year. All reports must be in a legible, Excel format. No Word documents are allowed.

The Engineer reserves the right to request a particular format for any or all reports. The FTP Site records for PM work shall be sorted by Contract Year, Month, System, then PM program in Article number order.

If the Contractor disagrees with the PM Program scheduled completion dates listed herein, or the dates must be moved due to safety or other concerns, the Department will meet with the Contractor and may modify the schedule, however, the work must be completed in the Contract year for on-maintenance locations.

Reporting requirements herein listed in Article 9.12 apply to Articles 9.13 through 9.22.4.

*If IDOT Inspector is not in attendance.

Article #	PM Program	Monthly Submittal	Report Type
9.13	Monthly Site Maintenance	Jan-Dec	FTP-GPS Photo
RAMP METERING			
9.14.1	Monthly Ramp Metering Quick Check	Jan-Dec	Tickets
9.14.2	Quarterly Ramp Meter. Cab. Inspect. & Clean.	Mar-June-Sept-Dec	FTP-GPS Report
SURVEILLANCE CABINET			
9.15.1	Yearly Cabinet Inspection & Cleaning	Jan-Nov	FTP- GPS Report
DMS			
9.16.1	Monthly DMS Night Patrol	Jan-Dec	Tickets
9.16.2	Quarterly DMS Cab.& Sign Inspect. & Clean.	Mar-June-Sept-Dec	FTP- GPS Report
9.16.3	Yearly DMS Sign Support Inspection	June-July	Tickets
REVLAC			
9.17.1	Monthly REVLAC Transition Patrol	Jan-Dec	Tickets
9.17.2	Monthly REVLAC Building Quick Check	Jan-Dec	Tickets
9.17.3	Twice Per Year REVLAC Equip Inspt/Cleaning	April-May & Sept-Oct	*GPS Photo
9.17.4	Yearly REVLAC Building Inspection & Cleaning	April-May	*GPS Photo
CAMERA			
9.18	Yearly Camera Inspection & Cleaning	March-Oct	Tickets
HUT & TOWER LOCATIONS			
9.19.1	Monthly Hut & Tower Location Quick Check	Jan-Dec	Tickets
9.19.2	Monthly Generator Testing	Jan-Dec	FTP-GPS Photo
9.19.3	Yearly Hut & Tower Inspection & Cleaning	April-June	*GPS Photo
9.19.4	Yearly Count Station Inspection	May-July	Tickets
RAMP GATE			
9.20	Yearly Ramp Gate Inspection	May	Tickets
VENDOR MAINTENANCE			
9.21.1	Yearly UPS Vendor Maintenance	March	FTP-Service Rpt
9.21.2	Yearly HVAC Vendor Maintenance	Early June	FTP-Service Rpt
9.22.3	Twice Per Year Liebert Vendor Maintenance	Early June – Late Nov	FTP-Service Rpt
9.22.4	Yearly Fire Extinguisher Vendor Maintenance	November	FTP-Service Rpt

9.13 SITE MAINTENANCE

Site maintenance is required for S-4 REVLAC buildings (A, C, D, E) and S-6 Surveillance huts and tower locations, and locations from Article 11.0 - FRB, and RRB, and TSC (winter only). All work shall be scheduled on the Daily Agenda.

Winter Site Maintenance - November through March

The Contractor shall perform snow removal operations. When the snowfall total reaches 2" inches or there is sleet/ice formation in any District 1 area, all the parking areas/lots and sidewalks of the REVLAC buildings (S-4) and Huts/Tower locations (S-6) shall be plowed/shoveled and salted, starting with the TSC location, which should be cleared and salted by 6:30AM on workdays and remaining locations completed by 10:00AM on workdays, for the safety of EMC personnel.

Outdoor Site Maintenance - Spring/Summer/Fall – April through October

The Contractor shall perform grass cutting, branch cutting and removal, trash removal, do insect/tick and weed killer spraying a minimum of once per month for the approach/path to the structure/cabinet and within the fenced area of the structure/cabinet. The TSC location is exempt from this monthly requirement.

The Contractor shall take two (2) GPS Photos (by phone) one before work begins and the second after work has been completed. (Report Type # 2) which shall be submitted monthly on the FTP Site.

Indoor Site Maintenance – Monthly All Year

The Contractor shall clean all floors once per month with Simple Green cleaner, which is approved for use in areas with electrical equipment, with plain water and an industrial specified mop and bucket. This work may be combined with other monthly site maintenance requirements. The TSC location is exempt from this monthly requirement.

The Contractor shall take two (2) GPS Photos (by phone) one before work begins and the second after work has been completed. (Report Type # 2) which shall be submitted monthly on the FTP Site.

9.14 RAMP METERING PM

9.14.1 MONTHLY RAMP METERING QUICK CHECK

The Quick Check shall be performed on approximately the same day each month. This preventive maintenance program may be performed at the same time as requirements of Article 9.13 (Outdoor Site Maintenance).

Check Operations between 7:00AM and 10:00AM and 2:00PM and 3:00PM:

- Observe the operation of the Ramp Metering Signal operation
- Verify aim of the Beacon and Signals
- Replace any outages
- Check for missing signs
- Check for pavement marking deficiencies
- Check for physical damage to cabinet, posts, signs, and loops

9.14.2 QUARTERLY RAMP METERING CABINET INSPECTION & CLEANING

Mar-June-Sept-Dec Between 7:00AM and 10:00AM and 2:00PM and 3:00PM:

The Contractor shall submit a Report Type # 3 (GPS Report) for the monthly FTP Site submittal. This PM program is one of the planned tablet EMCMS entry formats. The cabinet inspections and cleanings include:

- Replace Control Cabinet Filter Media
- Inspect Loop Detectors

- Check 2070 lite controller for proper operation (if applicable)
- Check tones for proper operation (if applicable)
- Verify functioning of bulbs, LED's, signal load relays, and flashing beacon controllers
- Telephone TSC/Contractor Telemetry Specialist for Location Turn-On
- Verify aim of beacon and signal head
- Beacon head shall face the top of the ramp, the right-hand signal facing the metering input loop (Loop 1), and the left-hand signal shall face the top of leading edge of the demand loop (Loop 2)
- Replace LED outages or failures, and damaged lenses
- Inspect cabinet PDA for proper operation (if applicable)
- Check for deficient pavement marking-Refer to TSC typical ramp meter stripping plan
- Check for missing, damaged or loose signs
- Check cabinet and signal foundation and tighten where necessary
- Check lubrication of cabinet doors, hinges, and locks
- Check tuning and operation of loop detectors and/or detector input files
- Inspect stop bar striping for deficiencies
- Check for deficient pavement markings or signage (not repaired by Contractor)

The Contractor shall wash the ramp control signal head lenses and reflectors, flashing beacons, and signs associated with each ramp metering installation, and clean the inside and outside of the cabinets. The cleaning materials and procedures shall be approved by the Surveillance Engineer prior to starting the work.

Before leaving the location, the Contractor shall verify the accuracy of the data with the Contractor Telemetry Specialist.

9.15 CABINET & DETECTION PM – YEARLY CABINET INSPECTION & CLEANING

The Contractor shall perform an inspection and cleaning of each Detector Cabinet once per year between January and November and submit a Report Type # 3 (GPS Report) for a monthly completion progress report on the FTP Site. This PM program is one of the planned tablet EMCMS entry formats. The cleaning materials and procedures shall be approved by the Surveillance System Engineer prior to the start of work.

The work includes:

- Replace Control Cabinet Filter Media
- Inspect Induction Loops
- Inspect electric service disconnect.
- Check Tones for proper operation
- Check 2070 lite controllers for proper operation (if applicable)
- Check radar speed warning sign and detector for proper operation (if applicable)
- Check Cabinet Foundation, tighten where necessary
- Check lubrication of cabinet doors, hinges, and locks
- Clean cabinet inside and out
- Inspect cabinet PDA for proper operation (if applicable)
- Check and record voltage levels for solar powered locations on the load side of the solar regulator, battery side, and solar panel side. Take necessary action to correct any issues found
- Inspect solar panel attachment to aluminum pole. If any issues, take necessary action to make location safe.
- Check radar, microloop, magnetometer (SenSys) and bluetooth detector operation (if applicable)
- Check tuning and operation of loop detectors or detector input files
- Update and record/edit cabinet inventories

9.16 DMS PM

9.16.1 MONTHLY DMS NIGHT PATROL

The Contractor shall assign a Patrolman or experienced Surveillance trained personnel to inspect the Dynamic Message Signs (DMS) each month, on the approximate same date each month, to ensure the sign display is properly illuminated at night.

Create Tickets for:

- Any blocking tree branches, or bushes which obstruct the motorist's proper site line
- Message visibility/distortions
- Panel malfunctions
- LED malfunction
- Discoloration problem
- Physical damage
- Power outage

9.16.2 QUARTERLY DMS CABINET & SIGN INSPECTION & CLEANING

March, June, September, and Dec. (between 9:30AM and 2:00PM)

The Contractor shall perform an inspection and cleaning of each DMS cabinet and sign and submit a Report Type # 3 (GPS Report) for the monthly FTP Site submittal. This PM program is one of the planned tablet EMCMS entry formats. The cleaning materials and procedures shall be approved by the Surveillance System Engineer prior to the start of work.

The inspection includes but is not limited to:

- Replace Control Cabinet Filter Media
- Verify photocells operation
- Verify functioning of fans/heaters; replace or repair
- Check cabinet and meter foundation and tighten foundation bolts at the base of cabinet
- Seal all ducts with steel wool and duct seal.
- Replace filters
- Inspect/test battery backup units (BBU's) where applicable
- Inspect/test PDA's where necessary
- Log into DMS Controller with vendor diagnostic software
- Verify proper operation in remote and local modes
- Verify proper firmware is loaded and proper sign configurations are loaded
- If necessary, load correct firmware and configuration and check with Contractor Telemetry Specialist that the DMS is operating properly
- Inspect communications and power cables incoming and outgoing
- Replace cables where insulation is deteriorated
- Verify with Contractor Telemetry Specialist the message correctness and LED intensities on the DMS sign
- Replace LED panels as needed
- Check voltage levels of power supplies and battery and adjust where needed
- Check blank-out functions, power failure, and communications failures
- Check meter housing making sure it is seated properly, and weather tight. If any problems, coordinate with utility company.
- Check for loose connections to power cables and communications cables
- Check ribbon cables in sign enclosure for worn spots or breaks in the cable/insulation.

- Verify seating of components and connections. The DMS signs are subject to vibrations which cause loose connections and ribbon cable (which rests on metal surfaces) to become worn and/or short over a period of time. The Contractor shall take immediate corrective action to correct these problems when discovered.
- Check door for proper operation and lube door handle, pad lock, and door hinges
- Hand wash outside of cabinet as directed by the Engineer

The Contractor is also required to trim all trees and bushes blocking the line sight of the DMS display to the motorists. All trimmings shall be removed from the site, removed from the right-of-way, and properly disposed.

9.16.3 YEARLY DMS SIGN SUPPORT INSPECTION

Each year, in June or July, the Contractor shall visually inspect for general safety the condition of each DMS sign support structure and catwalk, including the sign support brackets/bolts which attach the DMS sign box to the sign structure.

9.17 REVLAC PM

9.17.1 MONTHLY REVLAC TRANSITION PATROL

Once per month, on approximately the same day per month, for each month of the Contract, for the daytime reversible change (approximately 11:30 a.m.) and for the nighttime reversible change (approximately 11:30 p.m.) the Contractor shall follow an IDOT ETP (Emergency Traffic Patrol) foreman through a complete gate operation at each REVLAC location in both inbound and outbound directions, to check equipment for proper operations.

9.17.2 MONTHLY REVLAC BUILDING QUICK CHECK

This preventive maintenance program may be performed at the same time as requirements of Article 9.13 (Winter, Outdoor and Indoor Site Maintenance).

Specific items to be tested/inspected and repaired as necessary, (or create Follow-Up Tickets) but are not limited to:

Equipment

- Allen Bradley PLC processors
- All input and output cards
- Alarms, and Indicators
- Camera focus and image
- Electrical Service
- Indicator lamps

Building Interior and Exterior

- Outdoor and Indoor Site Maintenance per Article 9.13
- Seal any openings found
- Address rodent infiltration – use duct seal and steel wood to fix

Check these items: Create Tickets for Follow-Up Work:

Graffiti

Lighting Outages – specify type and size on Ticket

Roof Leaks – schedule hot tar and stone fix – specify area on Ticket

HVAC Operation

9.17.3 TWICE PER YEAR REVLAC EQUIPMENT INSPECTION & CLEANING

In mid-April through mid-May and mid-September through mid-October, the Contractor shall perform the REVLAC PM Equipment Inspection and cleaning. This PM program is one of the planned tablet EMCMS entry formats. All work shall normally be performed in presence of an IDOT Inspector. If, however, an IDOT Inspector is not in attendance the Contractor shall take one GPS Photo (Report Type # 2) of the completed work in each equipment area, (numbers 1 through 3). The work is performed in the evenings, usually starting at 9:00pm.

Contractor shall perform the following work:

1. Swing Gates

- Open control cabinet and clean out debris or corrosion
- Check for fluid leaks in the cabinets and correct, if any
- Check oil level in the drive train and top off as required by the manufacturer's requirements
- Hand clean control cabinets with biodegradable detergent and water
- Replace gate tip if more than 20% of the tip is damaged, or when directed by the Engineer
- Check proximity limit switch alignment and bracket conditions
- Check electrical connectors and wiring condition
- Check drive and control components
- Lubricate components with lubricants as listed in maintenance manual
- Lube flange bearings only if seal failure is noticed
- Lube chain and sprocket with high grade aerosol chain lube
- Repair or replace speed reducer if it leaks oil
- Check that panel doors are closed and padlocked
- Operate the gate automatically to check for shear pin damage
- Operate the gate using the hand crank to check for operation
- Inspect quazite j-box covers for damage, replace if directed by Engineer
- Check gate angle and adjust to Engineer specifications in maintenance manual

The swing gates should extend and retract smoothly, without excess vibration or noise, stop quickly at extended or retracted positions, and, when in remote operation, provide prescribed status indicator and warning light indications.

All swing gates shall be washed. Washing shall be performed with a pressure washer and process and cleaning solutions recommended by the reflective sheeting manufacturer. Washing shall not take place when the temperatures are expected to drop below freezing. Residual cleaning solution shall not be left on the pavement after the cleaning operation. Any cleaning solution shall be removed before traffic can be allowed to resume.

2. Signs

- Open control cabinet and clean out debris
- Hand clean control cabinets with biodegradable detergent and water
- Check Changeable message signs ventilation system assure all fans operational and clean filter and vents from dirt and debris
- Check LED Display and photocell operation
- Check communication system through remote control panels
- Open access covers on the sign and cabinet clean out any accumulation of bird and insect nests, dirt, and dust, rodent or corrosion debris, seal all openings.
- Clean and inspect interior and exterior sign housing

- Check and adjust voltage to LED power supply
- Inspect and verify grounding system and ground resistance.
- Clean all associated control cabinets with biodegradable detergent and water
- Clean LED sign panels with a cloth and Simple Green cleaner and water
- Clean CMS as directed by the Engineer

3. Barriers

- Check equipment access covers and hinged openings for proper closure
- Open control cabinets and clean out debris or corrosion
- Hand clean control cabinets and reflective strips with biodegradable detergent and water
- Check for fluid leaks in the cabinet and correct
- Lubricate pillow block and idler sprocket bearings with multipurpose lithium grease, NLGI No. 2, or equivalent.
- Check oil level in the drive reducer and fill with SAE No. 20 motor oil, if necessary
- Lubricate drive chains semiannually using an aerosol chain lubricant spray (WD40 or similar compounds are not acceptable)
- Check net condition and positioning and check for damage or vandalism
- Check wire condition and terminations
- Open restraining barrier cover doors and hinged openings, clean, check drive chain and sprocket alignment and wear, counterweight cable attachment and general condition and check for oil leaks
- Check tower cover weather seal for wear or damage
- Check limit switches and actuators; adjustments, clearances, and secure mounting
- Check barrier net cables conditions, for tautness/tension and proper height
- Check inside of tower and cross ramp structure for accumulation of debris, dirt, dust, corrosion, and remove animal nests, and excess grease
- Lubricate per maintenance manual

The restraining barrier should run smoothly, without excess vibration or noise, stop quickly at its raised or lowered positions, and, when in remote operation, ensure prescribed status and warning light indications are working.

4. Cattrons – Daytime Work

Contractor shall go to the IDOT Emergency Traffic Patrol (ETP) building at non-Reversible Lane changeover times to check batteries and confirm that the units link to the receiver/decoders at REVLAC Buildings A/C/D/E.

The Contractor shall inspect:

- Test battery voltage (replace batteries as needed)
- Check control transmitter, receiver/decoder, relay output rack for loose bolts/screws/clamps
- Visually check building antenna, mounting devices, cables, and connectors

Since the units are needed daily by ETP for REVLAC operations, the PM shall be performed on a maximum of five (5) units at any one time and with maximum turn-around time of one business day, returning the units the same evening. If any unit is found to be defective, the unit shall be replaced with a spare unit until the repairs are completed.

9.17.4 YEARLY REVLAC BUILDING INSPECTION & CLEANING

A preventive maintenance program shall be conducted yearly, in April and May for REVLAC Buildings A, C, D, and E. This PM program is one of the planned tablet EMCMS entry formats. All work shall normally be performed in presence of an IDOT Inspector. If, however, an IDOT Inspector is not in attendance the

Contractor shall take one GPS Photo (Report Type # 2) of the completed work in each equipment area, (numbers 1 through 12).

1. HVAC:

- Replace air filter
- Inspect and clean indoor coil, drain pan, and condensation drain line
- Inspect and clean blower motor and wheel
- Check electrical connections for tightness
- Check controls for proper orientation
- Inspect refrigerant tubing connections

2. Exhaust Fans:

- Inspect and tighten bolts and set screws
- Inspect belt wear and alignment
- Clean exterior surfaces
- Replace filters
- Inspect and lubricate bearings if needed
- Check for proper control/line voltage and operation on supply/exhaust fan starters

3. Panel boards:

- Inspect for moisture damage
- Clean any accumulation of dust or dirt
- Inspect all terminals for excessive heat with infrared scanner, repair loose connections
- Replace burned out indicating lights

4. Transformers:

- Clean excessive dirt on windings & insulators

5. Automatic Transfer Switches:

- Inspect all terminals for excessive heat with infrared scanner, repair loose connections
- Clean and remove accumulated dust and dirt
- Check for proper operation or door closure, locking bars, and mechanism

6. Batteries:

- Check and record DC voltages of each cell
- Clean and grease battery terminals
- Clean surfaces
- Check AC/DC power converter charger (if applicable)

7. Ethernet Network:

- Check Cisco Equipment
- Check fiber media converters and switches
- Clean and remove accumulated dust and dirt
- Clean filter
- Check 10 port Stratix Ethernet Switch

8. Remote Control CCTV:

- Patrolmen shall inspect all equipment for cleanliness and proper operation and check various levels and settings.

9. Alarms Checks on the following equipment:

- iMpath
- Optelicom
- Meridian
- Bosch
- Cisco
- IFS
- iMux
- Check and clean PLC
- Check media converter
- Check fiber transceiver

10. Enclosures:

- Blow dirt out of programmable controllers, I/O modules & power supplies w/compressed air
- Brush dust & construction debris off of the I/O racks, wire troughs, & horizontal surfaces
- Vacuum dust and construction debris out of cabinets
- Wipe dirt off edges of doors and door frames
- Check VDT terminal for alarms
- Clean and inspect air filter
- Check alarm LED indicator lamp on AB I/O chassis

11. General Items:

- Replace or repair corroded conduit, junction boxes and connectors
- Replace or repair damaged weather stripping and/or minor leaks
- Replace batteries in the surge arresters, building clocks, and other equipment, per manufacturers' specifications
- Check heaters for correct operations
- Check door operations
- Check Eye Wash stations, replenish as needed, replace expired stations completely

12. Roof Inspection:

- The Contractor shall thoroughly clean the roof surface of dirt, debris, and contaminates.
- The Contractor shall conduct a full roof and flashing inspection on all buildings and structures, by accessing with ladder, and physically walking the roof, checking for leaks or deterioration.
- Small Holes and Cracks: Clean surface, apply mastic (roof cement) 1/8" to 1/4" thick into the hole or crack using a roofer's trowel or gloved hand, working the mastic into the opening and 2 to 4 inches beyond.
- Large Holes and Cracks: For damaged areas larger than 1/4" repair, clean surface, use self-adhering SBS Modified Asphalt Membrane by peeling off the backing and pressing it onto the area to remove any entrapped air. A coating of mastic (roof cement) shall be applied over all repaired areas.

9.18 CAMERA PM YEARLY INSPECTION AND CLEANING

The Contractor shall provide once per year cleaning for all cameras in March through October. The Engineer reserves the right to have specified cameras cleaned when requested (as part of the yearly cleaning work). Additional camera cleaning will be paid through non-routine bid item. The Contractor shall hand clean the cameras with glass cleaner (Windex or approved brand).

9.19 HUT & TOWER LOCATIONS PM

9.19.1 MONTHLY HUT & TOWER LOCATIONS QUICK CHECKS

This preventive maintenance program may be performed at the same time as the requirements of Article 9.13 (Winter, Outdoor, and Indoor Site Maintenance).

Specific items to be tested/inspected and repaired as necessary, (or create Follow-Up Tickets) but are not limited to:

Equipment at Huts & Tower Buildings

- Alarms, and Indicators on all equipment
- Electrical Service

Building Interior and Exterior

- Applicable Outdoor and Indoor Site Maintenance per Article 9.13
- Address rodent infiltration – use duct seal and steel wool to fix
- Spray for Insects – ants, etc.
- Seal any openings found

Check these items: Create Tickets for Follow-Up Work:

Graffiti
Lighting Outages – specify type and size on Ticket
Phone line problems
Roof Leaks
HVAC Repairs

9.19.2 MONTHLY GENERATOR TESTING

The Contractor shall test the generator at thirteen (13) hut and tower locations, and Traffic Systems Center once per month, at approximately the same date each month. Locations include H55B, H55WS, H57A, H57B, H80, H94, HRIV, TFOS, THIL, TNOR, TPLA, TSTA and TSC.

The Contractor shall submit a Report Type # 2 (GPS Photo) for the monthly FTP Site submittal.

- Check control panel and transfer switch operation
- Check engine oil and coolant levels
- Check that block heater is working
- Check battery charging system/battery tender
- Check for holes or leaks and loose connections in the air cleaner
- Check fuel level and fuel transfer pump operation
- Check for exhaust system leaks or restrictions
- Drain the condensation trap
- Check all meters, gauges, and indicator lamps
- Check oil reservoir and battery acid level and maintain proper operating levels
- Check the air filter monthly and change at specified intervals
- Exercise generator at full load for one (1) hour
- Note any rusting on the generator and its enclosure (for future non-routine work)
- Check for fluid/fuel leaks
- Check generator fuel and note level
- Check re-circulating pump

Diesel fuel shall always be filled to the proper level. If fuel level is less than $\frac{3}{4}$ (75%) of full level, a Ticket shall be created to schedule the refill of the tank.

9.19.3 YEARLY HUT & TOWER LOCATION INSPECTION & CLEANING

A preventive maintenance program shall be conducted once per year, from April through June for all Huts and Tower locations. All work shall normally be performed in presence of an IDOT Inspector. If, however, an IDOT Inspector is not in attendance the Contractor shall take one GPS Photo (Report Type # 2) of the completed work in each equipment area, (numbers 1 through 10).

1. HVAC:

- Replace air filter
- Inspect and clean indoor coil, drain pan, and condensation drain line
- Inspect and clean blower motor and wheel
- Check electrical connections for tightness
- Check controls for proper orientation
- Inspect refrigerant tubing connections

2. Panel boards:

- Inspect for moisture damage
- Clean any accumulation of dust or dirt with compressed air
- Replace burned out indicating lights

3. Transformers:

- Clean excessive dirt on windings & insulators

4. Automatic Transfer Switches:

- Inspect wiring and connections for tracking, overheating, and deterioration
- Tighten control circuit wiring terminals
- Check for free movement and contact continuity in manual switches
- Adjust time delay settings as necessary
- Clean or replace main, arcing, and auxiliary contacts
- Tighten lug connections and mounting insulation bolts
- Perform transfer operation
- Calibrate phase and voltage sensitive relays
- Clean and remove accumulated dust and dirt using compressed air
- Check for proper operation or door closure, locking bars, and mechanism

5. Batteries:

- Check and record DC voltages of each cell
- Clean and grease battery terminals
- Clean surfaces
- Check AC/DC power converter charger (if applicable)

6. Ethernet Network:

- Check Cisco Equipment
- Check fiber media converters and switches
- Clean and remove accumulated dust and dirt using compressed air
- Clean filter
- Check Hirschman Fiber/Ethernet transceivers

7. Remote Control CCTV:

- Dust and clean all equipment, check operations and levels and settings

8. Alarms Checks on the following equipment:

- iMpath
- Optelicom
- Meridian
- Bosch
- Cisco
- IFS
- iMux
- Check and clean PLC
- Check media converter
- Check fiber transceiver

9. General Items:

- Replace or repair corroded conduit, junction boxes and connectors
- Replace or repair damaged weather stripping and/or minor leaks
- Replace batteries in the surge arresters, building clocks, and other equipment, per manufacturers' specifications
- Check heaters for correct operations
- Check door operations

10. Roof:

The Contractor shall thoroughly clean the roof and remove surface dirt, debris and contaminants. The roof drains shall be unclogged, and minor repairs performed (review roof repair work at REVLAC locations, Article 9.17.4).

9.19.4 YEARLY COUNT STATION INSPECTION

The Contractor shall perform manual traffic counts at five (5) percent of the Surveillance Count Stations in District 1 or as directed by the Engineer in May, June & July. The Contractor shall manually count each lane of the count station for a pre-determined one-hour duration. The Contractor work start, and end times shall be coordinated by Contractor Telemetry Specialist who shall synchronize the INET/ATMS clock used to start and end the hourly data collection sequence. These hourly counts will be used to validate the calculated INET/ATMS volumes collected along the corridor. The Department shall analyze the collected data and compare to the calculated INET/ATMS data.

9.20 RAMP GATE PM INSPECTION

All gates installed on the entrance ramps to expressways (42) shall be operated and tested once per year, in April, in presence of an IDOT inspector. The Contractor shall hand clean the gates with Simple Green or a biodegradable detergent, and water. The Contractor shall lubricate pivot bearings and locking arm with spray grease, inspect cone cabinets, and lubricate locks.

The IDOT Inspector shall determine if the striping shall be replaced. The striping work shall be performed in the field at the time of this inspection. The procedure shall be to hand clean the old striping while the gate is in its closed position, and then apply the new striping over.

If any crash barrels are found damaged the IDOT ComCenter shall be notified. The Contractor is not responsible for sand crash barrel replacement.

9.21 VENDOR MAINTENANCE

9.21.1 YEARLY UPS VENDOR INSPECTION

Contractor shall employ a factory authorized service company to perform an inspection and preventive maintenance on the UPS, its transfer switch, and its battery and the battery charger of the UPS Systems in the:

- Three (3) REVLAC Buildings A, C, D, and E.
- Five (5) Huts and Tower locations H55B, H55WS, THIL, TNOR, and TSTA.
- (Also, IDOT HQ location from Article 11.0 Various Locations)

The comprehensive inspection shall be conducted in March each year and shall include:

Performing initial and final voltage and current checks at each stage - System in bypass and de-energized

- System in bypass and energized - Check all alarms, measure, and adjust critical setting
- System energized and in normal - Perform short-term (2 minute) discharge to evaluate battery condition

The Contractor shall obtain a detailed service report from the Vendor service engineer. In addition to the readings the report shall note any deficiencies found and/or service recommendations. The Contractor shall submit the original service report on the FTP site. (Any necessary repairs will be performed through a non-routine work authorization.)

9.21.2 YEARLY HVAC VENDOR MAINTENANCE

During the month of June the Contractor shall use a certified HVAC company to clean and test the outside HVAC coil units in the REVLAC Buildings A, C, D, and E (S-5) and in the Huts and Tower Locations (S-6). The Contractor shall accompany the vendor at all facilities and shall provide the water and pressure washer necessary for this service. Any portable units shall also be inspected and cleaned.

The Contractor shall obtain a detailed service report from the Vendor service engineer. In addition to the readings the report shall note any deficiencies found and/or service recommendations. The Contractor shall submit the original service report on the FTP site. (Any necessary repairs will be performed through a non-routine work authorization.)

9.21.3 TWICE PER YEAR LIEBERT VENDOR MAINTENANCE

During early June and late November, the Contractor shall use a certified HVAC company to inspect and clean the Liebert system at the TSC building (S-6). The Contractor shall accompany the vendor at all facilities and shall provide the water and pressure washer necessary for this service.

The Contractor shall obtain a detailed service report from the Vendor service engineer. In addition to the readings the report shall note any deficiencies found and/or service recommendations. The Contractor shall submit the original service report on the FTP site. (Any necessary repairs will be performed through a non-routine work authorization.)

9.21.4 YEARLY FIRE EXTINGUISHER VENDOR MAINTENANCE

The Contractor shall have all fire extinguishers checked yearly in November for proper pressure through a fire inspection service for REVLAC Buildings A, C, D, and E. It will be necessary for the Contractor to travel with the fire inspection service personnel to unlock facilities.

In some locations the dry chemical fire extinguisher will need to be submitted to the fire inspection service for hydrostatic maintenance procedures which require the extinguisher to be tested by being emptied and re-filled (every 6 years) per the NFP specifications. The Contractor shall be provided a spreadsheet with the REVLAC Buildings location numbers and dates due for the hydrostatic maintenance.

Upon the completion of the inspections the Contractor will submit Report Type # 4, a spreadsheet list of the dates the REVLAC Buildings A, C, D, and E. were inspected and the vendor report which shall identify any corrective measures recommended. Both will be submitted on the FTP site.

9.22 WARRANTY AND MAINTENANCE AGREEMENTS

The Contractor shall obtain warranty and maintenance agreements for year 2022. The warranty and maintenance agreements shall be for the duration of this Contract, and if renewed, for years 2023 and 2024. A list of current equipment maintenance agreements will be provided at the Pre-Bid Meeting.

Prior to signing the agreements, the Contractor shall submit, for Engineer approval, the name, and qualifications of the Contractor's proposed vendors at the Pre-Construction Meeting.

The Contractor shall provide copies of all the signed maintenance agreements specified in this Contract, with contact name and telephone number, by the first Pay Meeting of each year.

REVLAC Systems

Provide AB Rockwell Software Annual Support Agreements (current contacts are Revere Electric or Englewood Electric Supply).

SmartNet Coverage for All CISCO Equipment

Provide a Software Extended Support Maintenance Agreement for 24/7 coverage (contract type SNT) and 4-hour equipment replacement delivery from a CISCO Authorized Service Vendor. (Approximate cost \$ 85,000.)

Premium Software Assurance Agreement (PSAA)

Renew Premium Software Assurance Agreements (PSAA) with 360/Flir Surveillance for VDS, Google maps and DMS Central Control System servers and clients located at TSC, District 1 ComCenter, District 3, and District 2 Radio Communications Center.

The PSAA shall provide coverage for the following:

- Support coverage Monday to Friday 8:00am to 5:00pm (PST) excluding major holidays
- Unlimited telephone, email, and online technical support
- Logon web access to online knowledge base and FAQ's
- Free access to all interim and major releases, patches, and device drivers within the product category
- Access to dedicated technical support developers
- Priority response and resolution of issues
- Remote configuration and troubleshooting assistance via internet

Skyline NTCIP Central Control Software

Renew the current Skyline NTCIP Central Control Software, Annual Maintenance License, covering the software used to maintain and operate Skyline DMS Sign within District 1.

The Skyline NTCIP Central Control Software shall include the following

- Telephone Assistance and/or via email, Monday through Friday, 8am to 5 pm MTN time
- Software upgrades, updates, and new releases or versions of software each time Skyline makes updates available

Solar Winds

Renew software operational support/maintenance agreement for the NPM software, equal to or exceeding SolarWinds Orion Network Performance Management Software. Software maintenance shall include free access to any software updates, upgrades, and 24/7 support from the vendor.

Two-Factor Authentication (2FA)

Two-Factor Authentication (2FA) works by adding an additional layer of security to the VPN user accounts. It requires an additional login credential – beyond just the username and password – to gain account access and getting that second credential requires access to VPN and then to IDOT resources.

Contractor needs to purchase the Duo MFA for 200 Users for two factor authentication (2FA) that will be used to authenticate IDOT VPN users by phone. This is normally a contract, for a monthly minimal charge per user.

Palo Alto Networks Enterprise Firewall

Renew software support maintenance for IDOT Global Network (approximately \$ 18,000 per year)

INET/ATMS

Provide a Technical Support Agreement/Software Assurance Plan with a vendor who has 24/7 on-call service capability, on-line monitoring and intervention capabilities, and experience in programming using the existing software, and:

Qualified programmer(s) who have experience with:

- Hardware and software of the type installed in the Department locations
- A data acquisition system
- Synchronized VMIC front end processors
- Coordination control of Dell Power Edge R720 servers networked to process, control, and archive data from the data acquisition system, within and outside of the Department for traffic management control information dissemination and analytical functions; in an environment similar to that of the Traffic Systems Center.

The Vendor shall:

- Respond to correct and address trouble calls and questions from the Department
- Monitor System Resources and behavior at least once per month
- Check processes, CPU usage, error logs, etc. at least once per month
- Aid and assist the Department in user and database management such as adding and deleting users, adding system detectors, DMS, changes to travel time zones, and resetting user passwords
- Provide log of error messages and actions
- Provide recommended action to be taken by Department on pending issues, which do not need immediate action, but need to be addressed before causing system interruptions
- Complete security updates
- Provide standard monthly report

The Contractor supplied maintenance work shall include custom reports from the Vendor, if requested by the Engineer, paid through non-routine maintenance.

The ATMS software relies on numerous 3rd party software platforms to run. Changes to these components can cause security risks or loss of functionality. The Software Assurance Plan must cover these components:

- Current version of Application Server - (Java or Wildfly)

Revised 9/2/2021

- Current Database server – SQL Server
- Operating System – Windows
- Browser – Firefox
- JDK – Java Development Kit
- User Interface Tool – DOJO

The vendor must provide an offsite repository which provides for a complete INET/ATMS system back up in the event of a catastrophic failure which requires a complete reloading of the INET/ATMS software and configuration.

9.23 SUGGESTED VENDORS FOR SOFTWARE/HARDWARE MAINTENANCE AGREEMENTS

**REQUIRED FOR 1/1/22 THROUGH 12/31/22
IF CONTRACT RENEWED (COVERAGE THROUGH 2024)**

REVLAC Maintenance

ESP, Engineered Software Products, Inc.
1075 Progress Circle
Lawrenceville GA 30043
Contact: Grib Murphy
700-682-8259

REVLAC Maintenance

EESCO, Englewood Electrical Supply
2401 Internationale Pkwy, Unit C
Woodridge IL 60517

UPS Maintenance (all Huts & Buildings)

Critical Uptime Services
28915 North Herky Dr
Lake Bluff, IL 60044
847-247-2850

CISCO Equipment

AT & T Datacomm Inc.
P.O. Box 66998
St. Louis, MO. 63166
Contact: Laura Langen
720-889-8692

EMCMS

Xsys, Inc.
653 Steele Dr.
Valparaiso, IN. 46385
Contact: Arman Sarkisian
219-477-4816

360 Surveillance/FLIR & Bing Maps Licensing

Traffic Signal Company
4202 Royal Fox Dr.

St. Charles, IL. 60174
Contact: Jim Barry
630-513-8000

IDOT Global Network

Solar Winds
7171 Southwest Pkwy, Bldg.400
Austin, TX. 78735
512-682-9300

INET/ATMS

Parsons Corporation
650 Algonquin Rd, Suite 104
Schaumburg, IL. 60173
847-925-0120

Skyline Products
2903 Delta Dr.
Colorado Springs, CO. 80910
866-961-4084

DMS

Daktronics
201 Daktronics Dr.
Brookings, SD. 57006
800-325-8766

Pump Station SCADA

EESCO, Englewood Electrical Supply
2401 Internationale Pkwy, Unit C
Woodridge IL 60517
630-296-2555

Pump Station AEGIS

Security Information Systems (SIS)
(Silent Knight equipment)
Kingspointe Parkway # 3
Orlando, FL. 32819
407345-1550

9.24 CONTRACTOR FURNISHED SPARE PARTS, MATERIALS, & EQUIPMENT

The Contractor shall own following quantities of material and equipment for the Surveillance System as of January 1, 2022. The Engineer shall inspect these materials and equipment during January 2022. These quantities are not specified as an estimate of expected Contract usage.

- Barrier reflective tape 4 ft sections – 48 (24 white and 24 red)
- Camera Surge Protection - 50
- Cattron batteries - 4
- Decals for gate numbering, cameras, poles, aux signs, and chevrons – 24 each letter/number
- Fuses and switches - 60
- Gate tips - 24

- Indicator lights and lamps - 10
- Photocells - 20
- Shear pins and bushings - 50
- Proximity Switch - 10

Upon request, the Contractor shall provide the Engineer an inventory of all Contractor owned materials for use on the EMC under routine maintenance.

9.24.1 LOCKS & KEYS

The Contractor shall furnish and install new locks or replace cylinder and new key (approx. 500) on Surveillance System equipment in January 2022. The Engineer shall approve of the lock and key set prior to purchase by the Contractor, which shall be equal or better than Master Lock 6125KA. As new equipment comes on maintenance during the Contract, (or renewal years) new locks shall be installed at these locations.

10.0 TRAFFIC SIGNAL SYSTEM ROUTINE MAINTENANCE

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10.0 TRAFFIC SIGNAL SYSTEM

10.1 BIDDING

Unless labor, equipment, or material purchase is specifically noted herein as paid through non-routine maintenance, Article 10.0 Traffic Signal System work shall be paid through, is part of, and is included in routine maintenance bid items.

10.2 DESCRIPTION OF WORK

The Traffic Signal System consists of electronically operated traffic control devices owned and maintained by the Department, which includes traffic signal installations, the integrated closed-loop traffic signal monitoring system (CLMS), the advance traffic signal system (ATSS) and flashing beacon installations.

The Contractor shall provide labor, equipment, and materials to maintain the operation and performance of all equipment and networks at Contract maintained Traffic Signal System locations. Equipment found during response or inspections (routine or non-routine) which need repair or replacement, or items found to be defective, malfunctioning, or non-operational are covered under this Article.

All work described herein Article 10.0 shall meet requirements of Articles 1.0, 2.0, 3.0, 4.0, 5.0 and 6.0 herein.

The equipment specified herein gives a good overview of the items to be maintained, however, there may be other electrical items which require maintenance. The Contractor is urged to visit the locations following the Pre-Bid Meeting to view all the electrical equipment to be maintained.

10.3 ROUTINE MAINTENANCE BID ITEMS

- T-1A Traffic Signal – metal pole and post type
- T-1B Traffic Signal – span wire type
- T-2A Flashing Overhead Mount Beacons
- T-2B Flashing Low Mount Beacons

10.4 TRAFFIC SIGNAL INSTALLATIONS

10.4.1 T-1A

T-1A traffic signals are considered permanent and generally constructed with metal poles and posts with underground cabling to the controller cabinet and power source.

10.4.2 T-1B

T-1B traffic signals are span wire type, typically used as an interim measure and generally constructed with wood poles with most signal heads span wire mounted with underground or aerial cabling to the controller cabinet and power source.

10.4.3 General

A traffic signal installation location shall consist of all traffic signal equipment controlled by or connected to the traffic signal controller and cabinet with the exception of T-2A and T-2B flashers and red light running equipment. Red light running equipment is not part of this contract. The Contractor shall maintain all traffic signal equipment at a traffic signal installation location, the District 1 CLMS and ATSS, including but not limited to the following:

- Traffic signal heads and mounting hardware, traffic signal posts and bases, mast arm assemblies, poles, shrouds, screening, and foundations including anchor bolts

The traffic signal heads shall consist of, but are not limited to, signal sections, all mounting hardware, back plates, reflective back plates, louvers, visors, visor heaters, signal head snow deterrent devices, aviation red obstruction lights, special signal sections with flashing white strobes, programmable and steerable beams, incandescent lamps and LED modules.

- Pedestrian and bicyclist signal heads, pedestrian and bicyclist push button detectors, pedestrian and bicyclist posts, foundations, infrared detectors, accessible pedestrian signals (APS), countdown pedestrian signals and associated signs, special pedestrian and bicyclist detection amplifiers and loop/detection.
- Master and Local traffic signal controllers are pre-timed, semi-actuated, or actuated NEMA, Caltrans or Advance Traffic Controllers (ATC) types with cabinets, foundation, associated equipment, and enclosures.

The associated equipment shall consist of but not limited to modems, telephone jacks, switching units, interface boards for copper and fiber optic type interconnect cables, Layer I, II or III switches noise suppressers and all associated components for a coordinated traffic control system.

- Controller cabinet or enclosure with all associated equipment including but not limited to system communications equipment, battery backup systems (UPS), switching units (including Layer I, II, and III switches), intersection coordinators, time switches and, where applicable, pedestal and foundation.
- Emergency vehicle preemption (EVP) equipment, intersection monitoring devices, and transit signal priority (TSP) where applicable.

The cost of repairing or replacing the EVP and TSP equipment shall be invoiced, by the Contractor, directly to the local agency, as instructed by the Traffic Signal Engineer.

- Red light running enforcement equipment is generally located within State ROW and utilizes separate facilities than the traffic signal installation except access to field cables within the controller cabinet for signal status. Red light running enforcement equipment is not the maintenance responsibility of the State or this contract. However, if the red light running system impacts the normal operation or visibility of the traffic signals or is determined to be a safety hazard by the Traffic Signal Engineer, the cost of repairing, replacing, removing or the like shall be invoiced by the Contractor directly to the local agency as instructed by the Traffic Signal Engineer.
- All vehicle detection including magnetic detector(s), wireless detector(s), video detector(s), cameras, detector loop(s), micro loops, preformed detector loops, microwave detector(s), radar detector(s) FLIR type detection camera systems and emergency vehicle detector(s) along with their related amplifiers, microprocessors, access points, video decoders, and relays.

The maintenance of video detection shall include monitors and all necessary modifications to programmable detection zones and cleaning to assure proper operation as directed by the Traffic Signal Engineer. Microwave or radio communication for video detection including transmitters, receivers, antennas, reflectors, and other miscellaneous communication equipment either on the sending end, receiving end, or in between shall be included as part of the Video Detection.

- Illuminated regulatory and warning signs.

The illumination shall be accomplished by incandescent lamps, fluorescent lamps, neon tubes, LEDs, or fiber optic lights.

- Illuminated street name signs

The illumination is generally accomplished by LEDs. For lighted street name signs not maintained by the State, the cost of repairing or replacing any associated equipment shall be invoiced, by the Contractor, directly to the local agency, as instructed by the Traffic Signal Engineer.

- Traffic signal conduit, inter-duct, and interconnect conduit and raceways between traffic signals. The conduit may be in the ground or attached to structure.

- Handholes, junction boxes, and interconnect holes

Handholes are in traveled pavement, shoulders area, sidewalks, medians, and other areas. Junction boxes are generally located attached or embedded in structures. Repair of handhole damage caused by the failure of the immediate surrounding area may be paid with non-routine maintenance item(s) if directed by the IDOT Traffic Signal Engineer.

- Traffic signal cable and interconnect cable including copper wire and fiber optic

- The Contractor, with the approval of the Traffic Signal Engineer, may temporarily use spare fibers to re-establish communication. A list of these locations shall be maintained by Contractor and reported to the Traffic Signal Engineer monthly on an FTP submittal. When field conditions permit, the Contractor shall replace the damaged fiber cable with new fiber optic cable under routine maintenance.

- Traffic signal wireless interconnect system including microwave/radio type.

- Electrical and telephone service installations

- Cellular communications that include but limited to modems, routers, antennas, gateways, switches, and converters.

- Pan, tilt and zoom (PTZ) camera installations.

- Combination traffic signal and lighting unit poles.

- In-pavement lighting, flashing beacons and hybrid beacon (pedestrian and emergency vehicle type).

- Railroad interconnected traffic signal equipment, conduit, wiring, and security systems.

- Signal heads and conduit attached to railroad cantilever structures.

- Grounding systems complete with ground rods, ground wells, and grounding cable.

- Flashing or steady burn LED enhanced warning and regulatory signs.

May include pedestrian actuation, supplemental lighting, solar panels, batteries, radio control cabinet and other all necessary appurtenances.

For flashing or steady burn lighted signs not maintained by the State, the cost of repairing or replacing any associated equipment shall be invoiced, by the Contractor, directly to the local agency, as instructed by the Traffic Signal Engineer.

- A span wire traffic signal installation T-1B includes many of the items noted above plus wood poles with down guys, span wire cable, span wire accessories, and tether wires, and all other associated

equipment.

- The Closed Loop Monitoring System (CLMS) includes approximately 348 master controllers interconnected to approximately 2375 intersection controllers maintained by this contract and another approximately 275 intersection controllers maintained by other agencies. Also included in the CLMS are the interconnect cable, conduit, handhole systems, hardware, software, supplies for the Schaumburg headquarters office, and CLMS field equipment for monitoring including dial-up and cellular communication equipment. The Lake County Division of Traffic's PASSAGE system currently includes approximately three hundred sixty-five (365) and Kane County Division of Transportation traffic management system has approximately thirty-five (35) IDOT intersection controllers with additional intersections planned. Other agencies such as DuPage County, City of Naperville and the City of Aurora also operate traffic management systems on State routes.
- An Advance Traffic Signal System (ATSS) management program is expected to be in operation prior the beginning of this contract. Initially, less than 25 existing traffic signals will be removed from the CLMS and included on the ATSS. However, steady future expansion of the ATSS is planned. Much of the existing CLMS field infrastructure such as interconnect cable, conduit, and handhole systems will continue to be used for ATSS traffic signals with new controllers, associated monitoring, switches, and communication equipment supplied and installed by others unless otherwise noted.

10.5 FLASHING BEACONS

10.5.1 Overhead Mount Type – T-2A

The Contractor shall maintain a signal head(s), flashing beacon overhead mounted, flasher controller in a housing and the complete span wire installation. The signal head shall consist of one (1) or more faces with any number of signal sections. The span wire installation shall consist of two (2) or more wood poles with down guys, span wire cable, span wire accessories, electric cable, ground rods, service installation, conduit, and handholes. Overhead flasher locations include units mounted on sign structures.

10.5.2 Low Mount Type – T-2B

The Contractor shall maintain a signal head(s), flashing beacon low mount, solar powered flasher (where applicable), flasher controller in a housing, solar panels, batteries, ground rods, service installation, a traffic signal post, foundation, conduits, cabling and handholes. The signal head may consist of one or more signal sections mounted on the same object.

10.6 COMBINATION TRAFFIC SIGNAL AND LIGHTING UNIT

All combination poles with luminaire mast arms including the luminaire(s), lighting mast arm(s), combination pole lighting controls and cabling shall be maintained under Article 10, the Traffic Signal System, and shall be considered a component of the traffic signal installation (T-1A or T-1B) and not paid for separately. The luminaire(s), the lighting mast arm, cabling for the luminaire on combination mast arm poles and control components shall be maintained in the manner listed in Article 7, Lighting System. Standard light poles that have traffic signals attached will be maintained in Article 7, except in some instances the poles may be under maintenance of other agencies.

10.7 GENERAL MAINTENANCE RESPONSIBILITIES

The Contractor shall at all times maintain stock of sufficient materials and equipment to make temporary and permanent repairs within the limits specified in Articles 4 and 10. Refer to Article 3.0 for list of equipment required on vehicles, construction equipment, and test equipment requirements. Also refer to general response and maintenance requirements as listed in Article 4.0. In addition, the Contractor shall Refer to Article 10.14 herein for Inventory requirements.

Clear snow, ice, dirt, debris or address other conditions that obstruct visibility of any traffic signal display or access to traffic signal equipment

When bagging signal heads is required, light tan colored traffic and pedestrian signal reusable covers shall be used to cover dark/un-energized signal sections and visors. Covers shall be made of outdoor fabric with urethane coating for repelling water, have elastic fully sewn around the cover ends for a tight fit over the visor, and have a minimum of two straps with buckles to secure the cover to the backplate. A center mesh strip allowing viewing without removal for signal status testing purposes shall be part of the cover. Covers shall include a message indicating the signal is not in service.

Record and maintain data base for traffic signal equipment malfunctions and LED module outages by date, location, manufacturer, type, model, and other related information

Purchase and maintain repair and testing equipment necessary to meet the response or repair time requirements of the Contract. Calibration of test equipment shall be completed in accordance with manufacturer recommendations. Refer to Article 3.0 for equipment requirements.

Maintain the District's Closed Loop Traffic Signal System (CLMS) and central/traffic (ATSS, CMS, TMS, etc.) management systems as described within this Article. This includes monitoring and maintenance of any signals included in the Lake County (PASSAGE), Kane County, DuPage County and any other Traffic Management (ATSS,TMC/TMS/CMS) system within Region One/District One. The Contractor, at no cost to the Department, will supply to the Department any new software required for the monitoring and maintenance of ATSS and TMC system signals. The signals within the TMC system network will be monitored as described in the CLMS later in this Article. The necessary computer components (use of one or more PCs is anticipated) and one or more standard phone lines and cellular communications required to interface with the TMC system are included in the CLMS and ATSS. All CLMS and ATSS requirements remain in effect for all signals transferred to this system. Refer to Article 10.4.3 and 10.24.1 for requirements.

10.8 RESPONSE AND REPAIR TIME REQUIREMENTS

The Contractor shall respond to all malfunctions of the traffic signal system in a reasonable time. In addition to the daily routine and non-routine maintenance requirements of the traffic signal system, the Contractor shall provide sufficient manpower to respond to all notification of malfunctions on a 24-hour basis, 7 days a week. The Contractor is required create Tickets on the EMCMS which tracks each response from the time of the initial report (ticket issuance) to the time of the final permanent repair. The Contractor is required to notify the Traffic Signal Engineer by email by the next business day when any response time is not met.

Article 4.0 discusses general work requirements of routine maintenance for all systems. The following chart lists maximum response, service restoration, and permanent repair times for which the Contractor will be allowed to perform corrective action on the Traffic Signal System.

FAILURE OR DAMAGE TO:

ITEM	RESPONSE TIME	SERVICE RESTORATION	PERMANENT REPAIR
Cabinet	1 hour	24 hours	21 days
Controllers and Peripheral Equipment	1 hour	4 hours	21 days
System Detector Loop	1 hour	NA	7 days
All Other Detectors	1 hour	NA	21 days
Signal Head and Lenses	1 hour	4 hours	7 days
Aviation Red Beacon	1 hour	4 hours	7 days

Mast Arm Assembly and Pole	1 hour	4 hours	7 days*
Traffic Signal Post	1 hour	4 hours	7 days
Cable and Conduit	1 hour	4 hours	7 days
Interconnect and Telemetry	1 hour	4 hours	7 days
Graffiti Removal	NA	NA	7 days
Misalignment of Signal Heads	1 hour	4 hours	4 hours
Closed Loop Monitoring System	1 hour	24 hours	14 days
Post and Poles Plumb Vertically	NA	NA	21 days
Controller, Post & Pole Foundations	NA	NA	21 days
Complaints, Calls, Controller or System Alarms, Timing, Phasing, Programming	1 hour	4 hours	NA
Patrol Truck Deficiencies	NA	24 hours	24 hours

*Mast arm assembly and pole must be set within 7 days after foundation repairs are completed or after a replacement pole and/or arm assembly become available. In the case of a new pole and/or arm assembly the Contractor must furnish a copy of the signed and dated delivery receipt from the shipping company. Temporary head placement shall meet the requirements of the current Manual on Uniform Control Devices (MUTCD) for driver visibility and temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer, at no additional cost to the Department, to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

10.9 REPAIR OF SIGNAL LAMP/MODULE OUTAGES

Signal indication and internally illuminated sign lamp outages must be replaced in the following manner:

Immediate corrective action must be provided if only one (1) signal indication remains in operation on an approach. This also includes left turn and right turn arrow indications if only one (1) signal indication remains in operation. If two (2) or more signal indications remain in operation for any given phase (movement) on any approach to an intersection, the replacement of the LED module, burned-out lamp, damaged socket, or damaged cable shall be accomplished within one (1) working day for red or red arrow indications and two (2) working days for all other indications following discovery and/or notification of the outage. LED modules not providing a full circular color, arrow, symbol and the like shall be replaced within one (1) working day for red or red arrows indications and two (2) days for all other indications following discovery and/or notification of the outage.

Immediate corrective action must be provided for partially or dark LED or incandescent type pedestrian indications and internally illuminated signs. The replacement of a LED module, damaged socket or damaged cable for a pedestrian signal indication or an internally illuminated sign such that the illuminated symbol is still identifiable must be accomplished within the next working day following discovery and/or notification. At the time of replacement of a malfunctioning LED module, burned out lamp or lamps, the reflector, lens, and LED module lens cover shall be cleaned. All replacement lamps shall meet the requirement of Article 10, Group Relamping of Flashing Beacon and Traffic Signal Locations.

10.10 SIGNAL DAMAGE EQUIPMENT REPLACEMENT

Damage to traffic signal systems requires immediate corrective action. Refer to Article 2.15.9 for EMCMS documentation requirements.

The location of a temporary or permanent traffic signal head installation shall meet the requirements of the

MUTCD and the following:

- The minimum acceptable signal display is two (2) overhead far side signal faces directed toward the through traffic movements of each approach and two (2) signal faces directed toward any separate turning movement (where provided) on each approach pending permanent repairs, except where the distance from the stop line to the far side signal exceeds one hundred fifty (150) feet which requires a near right signal face to be in place. Existing conditions may require additional signal displays as directed by the Traffic Signal Engineer.
- Signal faces on mast arm assemblies for through traffic on any one (1) approach shall not be less than eight (8) feet apart measured horizontally between center lines of face with a minimum mounting height of seventeen (17) feet above the crown of pavement surface. See the District's Detail Sheets for additional mounting requirements.
- Damaged signal heads including pedestrian signals and push buttons, including APS type, shall be replaced in-kind. Incandescent shall replace incandescent; LED's shall replace LED's and new pedestrian count-downs shall replace pedestrian count-down types unless otherwise directed by the Traffic Signal Engineer.
- Locations where pedestrian signal indications are present one (1) pedestrian signal head must face each direction of a pedestrian crosswalk.
- A span wire signal face shall contain the same type, number, and size of lenses as the signal face being replaced except that twelve inch sections shall replace eight inch or nine-inch sections. LED modules shall then be replaced with LED modules of the same make to minimize performance differences, unless directed otherwise by the Traffic Signal Engineer.

10.11 POWER OUTAGES AND FLASHING OPERATION PROCEDURES

When repairs at a signalized intersection require that the controller be disconnected and power is available, the Contractor shall place the intersection on flashing operation. If there is no flasher, the Contractor shall install a temporary flasher in the controller cabinet. The signal shall flash red for all directions unless a different flashing operation has been directed by the Traffic Signal Engineer. Transition out of flashing mode shall follow MUTCD procedures.

At signal installations where power is not available due to a power failure, or the need to disconnect power for safety, or a flasher must be installed, the Contractor shall install at least one stop sign, Illinois Standard Sign R1-1-36x36 on each approach to the intersection as a temporary means of regulating traffic. The stop sign shall be located at the stop bar and mounted at a height of 5-ft above curb or shoulder with a set-back of 12- ft from travel pavement unless otherwise directed by the Traffic Signal Engineer. The Contractor, when installing temporary stop signs, must switch the controller to the flashing operation when responding to a power failure. If the approach flash is amber, the Contractor is not to place a temporary stop sign unless the flashing operation is changed to red by direction of the Traffic Signal Engineer.

The Contractor shall furnish and equip all vehicles involved with the maintenance of traffic signal installations with a sufficient number of stop signs to be erected as specified herein.

10.12 TRAFFIC SIGNAL AND FLASHING BEACON TRANSFER INSPECTIONS

The Contractor shall furnish a trained representative for each traffic signal inspection that requires a new or existing traffic signal installation be added to the Contract or the transfer of an existing traffic signal installation of this Contract to another agency or contractor. Refer to transfer requirements in Article 4.17 and the District 1 Traffic Signal Special Provisions, and Article 10.14.3 New Equipment on Maintenance Transfers.

The Contractor shall create a Ticket for all maintenance transfers and provide technical assistance at traffic signal inspections and maintenance transfers. Refer to Article 10.12 and 10.14.3 herein, and refer to Article 6.0 for Routine Maintenance quantity reconciling requirements

When transferring a traffic signal OFF EMC Maintenance, the Contractor shall enter in the EMCMS information that completes all fields in "Location Locate". Construction Information shall include the IDOT contract, Permit number, IDOT Local Roads and Street's section number, Tollway contract number, or similar reference.

When transferring a traffic signal ON EMC Maintenance the Contractor shall enter in the EMCMS:

- Electric Utility information specific to each traffic signal location (TS#) such as account numbers, tower numbers, 24/7 contact information and any other information required by the Traffic Signal Engineer.
- GPS Longitude and Latitude
- Note any change of equipment type in the Maintenance Transfer Ticket (Example T2B changed to T1A)

The Contractor shall:

- Analyze all fiber test results ensuring performance conforms with the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions.
- Analyze all induction loop detector loops at the controller cabinet insuring that each detector loop or set of detectors conforms with the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions.
- Assure other vehicle detection, such as video, radar and electromagnetic systems, are set-up properly.
- Analyze the controller program provided by the controller manufacturer to ensure that the phase and overlap designation on the traffic signal sequence drawing is provided correctly in the controller program and cabinet wiring drawings.
- Ensure that the phase timings in the traffic signal controller are those provided by the Department.
- Assist in placing the traffic signal in operation by observing the signal display and checking of the conflict monitor or MMU while all vehicle traffic is stopped and shall report any operational discrepancies or signal outages to the Area Traffic Signal Maintenance and Operations Engineer immediately.
- Assist the Area Traffic Signal Maintenance and Operations Engineer in walking all approaches of the signal installation inspecting all traffic signal items for conformance with the Department's specifications for the project and aiming of the traffic signal heads.
- Assist in the testing and adjusting of emergency vehicle preemption equipment. The Contractor shall insure that any time railroad preemption is in operation with emergency vehicle preemption that the railroad preemption has priority over the emergency vehicle preemption equipment.
- Assist in the testing and adjusting of UPS equipment.
- Ensure that the locations containing railroad preemption are programmed in accordance with the approved railroad preemption program and that all special lock out devices are operating.

- Be responsible for inspecting each location to determine the completion of construction punch lists as directed by the Traffic Signal Engineer. The punch lists shall be prepared and provided by the Traffic Signal Engineer and the Contractor shall return written verification of punch list completion or non-completion.
- Upon request, review locations proposed for loop replacement in ongoing pavement resurfacing, patching, or grinding construction contracts.

10.13 PATROL INSPECTIONS

10.13.1 General Requirements

The Contractor shall provide a sufficient workforce and equipment to patrol all flashing beacon and traffic signal system locations.

Each traffic signal system location not interconnected to railroad warning devices shall be patrolled and inspected once every month.

Each traffic signal system location interconnected to railroad warning device shall be patrolled and inspected twice a month. There are 137 traffic signals on state routes that are interconnected to railroad warning devices and maintained by IDOT.

The Contractor shall schedule monthly or twice monthly patrols during the same week(s) of each month during the calendar year.

Patrols shall inspect for proper alignment of vehicle and pedestrian signal heads, display outages (all sections of every pedestrian and vehicular signal head), visors, backplates, alignment of posts and mast arm poles, mounting hardware, aviation obstruction lights, special traffic signal sections with red lenses and accompanying circular white halo lamps, shielding of optically programmed faces, foundations, anchor bolts, detection, communications and general operation of the traffic signal. The Contractor shall make necessary adjustments and repair or replace all worn, missing or damaged components as specified herein.

Unless otherwise permitted or requested by the Traffic Signal Engineer, except for emergencies, the Contractor is required to schedule the IDOT traffic signal patrol routes the first portion of each workday and on the approved route day. Emergency services required by IDOT or other agencies shall be attended to immediately, however, any incomplete daily patrol shall be completed (by others or the original patrolman) during the normal patrol work week. This may require patrols after the normal workday has ended to complete the normal patrol workweek.

At the Pre-Construction Meeting the Contractor shall provide the Engineer the proposed Traffic Signal monthly Patrol Route schedule by week, with the name of the assigned Patrolman. If acceptable to the Department the Contractor will enter the approved route assignments in the EMCMS by the start of the contract year. Changes to the approved routes and Patrolman assignments may not be made without the prior approval of the Traffic Signal Engineer.

The Contractor shall use the EMCMS TS Patrol Entry screen to enter the date, in each month, that each IDOT maintained location was inspected (twice monthly for RR Interconnected signals). Future EMCMS programming may add GPS tracking information, however, for the start of this Contract the Patrolmen shall take a GPS/date-stamp photo of each cabinet, (with street name in background) at the time of the inspection. Photos shall be downloaded on the FTP site, by route assignment, at the completion of the monthly inspection(s).

The daily Patrol assignments shall be listed on the Daily Agenda.

All repairs not completed at the time of the inspection shall have EMCMS Tickets created. Repairs not completed at the time of the Patrol Inspection are subject to the time limits as stated herein.

If there are missed Patrols by the end of the assigned Patrol Week the Patrolman shall send an email to the Traffic Signal Engineer explaining the reason for the delay and when the missed Patrols shall be completed.

10.13.2 Routine Patrol Duties and Responsibilities

The Contractor's responsibilities shall include but limited to inspecting, repairing, and replacing the following items:

- Align and straighten all traffic signal equipment including but not limited to signal heads, traffic signal posts, controller or service installation pedestals, mast arm assemblies and poles, foundations, and mounting hardware.
- Check all anchor bolts for mast arm poles, signal posts, controller cabinets, and, in addition, all bolts used to attach the mast arm to the pole.
- Replace missing or damaged bolt covers, mast arm shrouds, screening and handhole access covers.
- Tighten screws related to signal post base plates, back plates, anchor bolt covers, handhole access covers, service installation covers and controller cabinets.
- Repair or replace any failed or damaged signal components including signal controllers, cabinets or peripheral equipment, signal heads, back plates, or mounting hardware, posts or mast arms, illuminated signs, detectors (vehicle, bicyclist and pedestrian), cable, conduit, faded or damaged pedestrian signs, sign frames and other signal appurtenances which are part of a signal installation.
- Electrical grounds shall be maintained in accordance with the National Electrical Code.
- Signal back plates shall be replaced or re-painted if any unpainted surface is exposed. Reflectorized backplates with peeling or missing reflectorized tape shall be replaced in-kind with new reflectorized backplates.
- The Contractor shall keep current the EMCMS and an Excel spreadsheet list of locations with red-light running (RLR) cameras, emergency vehicle preemption (EVP), Transit Signal Priority (TSP), Bus Rapid Transit (BRT) and traffic monitoring cameras. While performing patrol duties, for the duration of the Contract, the Contractor Patrolman shall make note of any red-light running camera locations, emergency vehicle preemption (EVP), Transit Signal Priority (TSP), Bus Rapid Transit (BRT) and traffic monitoring camera locations, the agency responsible for their installation, and report the installations or removals at the end of each month on a cumulative yearly spreadsheet using Excel, and submit on the FTP site.

10.13.3 Controller And Cabinet Inspections

The Contractor shall provide a sufficient work force and equipment to inspect all controllers and cabinets as provided once every month:

- The patrol person shall visually inspect the inside of each controller cabinet. The visual inspection will include checking all timing intervals and time base coordination programs to ensure all settings are correct including that the clocks are set to the same hour, minute and second at all locations within the time base coordination system.
- All detector amplifiers shall be visually inspected to ensure that the vehicle detectors are receiving

vehicle calls and the calls are being placed into the controller. Loop detector amplifiers with automatic vehicle identification necessary for bus preemption shall be inspected to ensure they are receiving vehicular phase calls and bus preempt calls; and the calls are being placed into the controller. Bicycle loop detector amplifiers shall be tested for proper operation. Pedestrian push button detectors shall be tested by pushing each detector and watching for the related walk indication to appear. Other vehicle detection systems shall be tested, cleaned, and aligned for optimum operation.

- Test system communication for proper operation.
- Update database on appropriate software for closed loop monitoring system and central/traffic (ATSS, CMS, TMS, etc.) management systems on a laptop computer, tablet or other device approved by the Traffic Signal Engineer.
- Equipment manuals, box prints and cable logs are to be maintained in each controller cabinet
- GPS latitude and longitude coordinates of the controller cabinet, electric service location, UPS, mast arm pole assemblies, posts, fiber optic cable handholes and other items as listed herein, shall be recorded or verified annually for use in the District's record retention and maintenance system. Refer to Article 4.12 for GPS documentation.
- Uninterruptible Power Supply (UPS) shall be tested once every month to assure proper operation of the traffic signals upon loss of normal electric utility power. Manual transfer and power loss transfer shall be tested which shall not put the signal in flash. Nominal output voltage and current along with battery string voltage shall be measured and compared to manufacturer's expected values and recorded. Batteries not meeting minimum ratings and capacities shall be replaced under routine maintenance.
- Railroad preemption, emergency vehicle preemption and bus preemption shall be tested during the cabinet inspection. All program settings and each sequence of operation shall be verified to be correct during each inspection.
- EVP, TSP, BRT, and their equipment shall be tested during the cabinet inspection. All costs of repairing or replacing damaged or missing emergency vehicle preemption equipment is the responsibility of the local fire district or municipality and should not be reflected in the Contractor's bid price for routine maintenance items. (This includes maintaining the light detectors, light detector amplifiers, radio transmitters and receivers, antennas, confirmation lights, cable and/or related components.) TSP and BRT equipment shall be treated similarly to EVP equipment, but PACE is responsible for maintenance costs.

The Contractor shall create a ticket and notify the appropriate agency, immediately, that their EVP, TSP or BRT equipment is not operating and ask if immediate repairs are requested or if an estimate of repairs is necessary before repair work is provided. A copy of all PV (Pre-Empt Vehicle Equipment Tickets, correspondence and invoices shall be provided in the monthly routine maintenance work submittal on the FTP site.

10.13.4 Routine Work Requests – RR Tickets

The Contractor shall provide signal operating inspection tasks upon request (RR Tickets) such as:

- Inspect the timing operation of a signal installation at a specific time period and provide a recommendation for improving traffic flow
- Program timing parameter changes
- Determine the phasing or operation of a signalized installation

- Check the condition or verify the presence of equipment at a signalized location
- Provide a copy of timing parameters in use at a signalized location
- Provide recommendations to improve the safety or the operation of a signalized location
- Provide a compiled list of all locations meeting specified criteria

10.14 INVENTORY REQUIREMENTS

10.14.1 EMC Spare Parts Inventory

The Contractor shall use the EMCMS Spare Parts Inventory entry and reporting. Refer to Article 2.15.13.

10.14.2 Asset Inventory

The Contractor shall provide a complete traffic signal equipment inventory in the EMCMS of the signalized intersections including signal equipment located inside and outside of the controller cabinet, and shall maintain a library of repair and operation manuals for equipment in the IDOT traffic signal inventory. The exact format and inventory items shall be determined by the Traffic Signal Engineer. Refer to Article 2.15.1 for EMCMS (planned) Asset Inventory entry and reporting requirements.

This initial asset inventory work shall be completed by the last day of April in 2022 and kept current monthly, with maintenance transfers of new equipment using the EMCMS Entry format as designed by the Traffic Signal Engineer, and submitted on the FTP site, If this Contract is renewed the asset inventory information shall be kept current through the renewal years.

The Contractor shall also be responsible for updating and maintaining the Access data base or other data base designated by the Traffic Signal Engineer for traffic signal equipment inventory. The data base shall have corrections noted and submitted to the Traffic Signal Engineer as applicable, starting with the initial last day of April Asset Inventory.

10.14.3 New Equipment on Maintenance Transfers

The Contractor shall complete the form "IDOT District 1-Traffic Signal Inventory" for:

- A new traffic signal installation added to the Contractor's maintenance.
- Maintenance of an existing traffic signal installation when it is transferred from another agency to the Department.
- Maintenance of a traffic signal installation, which had been under construction when it is accepted for maintenance by the Department.
- A change in inventory at an existing signal installation.

The Contractor shall provide an updated form with a revised date for all locations being accepted for maintenance even if there is no change in inventory items on the form (the date shall reflect the acceptance of maintenance). The Bureau of Traffic reserves the right to make minor modifications to the form such as adding or deleting items or modifying the format, but without changing the overall scope of the form.

Refer to Article 4.17 Maintenance Transfers, for Contractor responsibilities.

10.15 INCANDESCENT RELAMPING

Most of the traffic signals in IDOT District One, including pedestrian signals, have been converted to LED type optics. The Contractor shall replace the signal displays (intersection and pedestrian signals) at all the state

maintained incandescent traffic signal locations annually. The Contractor shall complete the work by October 1st of each the calendar year.

The Contractor shall provide a schedule of all locations to be relamped by each relamping crew. The Contractor is to notify the Traffic Signal Engineer, in writing, of his planned starting date.

Upon completion of the relamping, lens washing and reflector washing, the Contractor shall furnish to the Traffic Signal Engineer a completion report no later than August 1st of the contract year.

The schedule for the second year and third year relamp program shall be approved by the Traffic Signal Engineer prior to commencement.

All Aviation Red Obstruction Lights on traffic signal posts or mast arm assemblies and poles shall be relamped at the same time the traffic signal installation is relamped as part of the yearly traffic signal group relamping. The lamps used in the Aviation Red Obstruction Lights shall meet or exceed the requirements for the fixture's lamp set by the manufacturer of the fixture.

Special traffic signals sections with red lenses and accompanying circular white halo strobe lamps shall be relamped.

The Contractor's crew must relamp the entire intersection on the same working day. Old lamps shall be disposed of in accordance with the manufacturer recommendations and Environmental Protection Agency and requirements in Article 4.0 as stated herein.

10.16 LED REPLACEMENT

The Contractor shall replace all LED displays (intersection, flashers and pedestrian signals) at one hundred (100) state maintained traffic signal locations annually. The locations to be relamped are intended to be designated by the Traffic Signal Engineer prior to March 1 of the contract year. The Contractor shall complete the work by the last day of September of each calendar year and submit on the FTP site.

Each intersection shall have a consistent make and model of LED display installed. Each LED display installed shall be labeled with the month and year of installation. The LED display shall be approved by the Traffic Signal Engineer and meet all current ITE and NEMA standards and the requirements of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions. The replaced LED display shall become the Contractor's property and shall be recycled without re-use.

10.17 UNINTERRUPTIBLE POWER SUPPLY (UPS) BATTERY REPLACEMENT

The Contractor shall replace all UPS batteries at 25 State maintained traffic signal locations each contract year. The proposed locations for battery replacement are listed herein. This list will be finalized by March 1 of each contract year by the Traffic Signal Engineer with battery replacement work for all locations completed by the last day of September of each calendar year and submitted on the FTP site.

Work shall include, but not be limited to, removal of existing batteries from State ROW, furnishing and installing new battery replacements, recycling of existing batteries, cleaning of battery cable connections and cleaning of UPS compartment shelves, vents and filters. New batteries shall meet the requirements listed in the District 1 Traffic Signal Special Provisions for Uninterruptible Power Supply including run time, sizing, rating and warranty.

Existing batteries shall be recycled meeting all applicable sections of US EPA and IL EPA publications along with the Code of Federal Regulations for transportation.

10.18 CELLULAR CONVERSION.

The contractor shall replace existing dial-up service for ten (10) closed loop traffic signal systems designated by the Traffic Signal Engineer. Work shall include but not be limited to installation, set-up, support and configure of the cellular communication system to work with IDOT District One's network. Equipment shall include but limited to 1) a rugged cellular modem certified with Verizon Wireless designed with 2 ethernet ports and an RS232 port for connection the traffic signal controller, 2) an external low profile antenna mounted to the traffic signal cabinet, 3) a router with 2 ethernet ports with static IP address assigned by IDOT, 4) for those traffic signals with controllers that are not ethernet compatible, additional hardware and cabling will be needed, 5) all appurtenances necessary to provide cellular communication for the closed-loop system. IDOT District One has installed cellular communication equipment at twenty two (22) locations within the District at the time this contract was prepared. For questions regarding these locations, please contact the Traffic Signal Engineer at 847-705-4424. The necessary SIM card will be provided by the District once testing has been completed and accepted by IDOT.

10.19 TRAFFIC SIGNAL CONTROLLER AND CABINET REPLACEMENT

10.19.1 Non-Railroad Interconnected Locations

The Contractor shall remove and replace 25 existing traffic signal controllers and cabinets with new equipment as part of routine maintenance. Work will be as described in Section 2.0 Traffic Signal System Non-Routine Pay Items General and TC01, Full Actuated Controller in Cabinet. In addition, this item shall include new inductive loop detectors. The existing UPS/Battery back-up system shall be relocated to the new cabinet, unless otherwise directed by the Traffic Signal Engineer. Locations shall be designated by the Traffic Signal Engineer.

10.19.2 Railroad Interconnected Locations

The Contractor shall remove and replace 2 existing traffic signal controllers and cabinets that are interconnected to railroad warning devices with new equipment as described in Section 2, Traffic Signal System Non-Routine Pay Items General and TC02, Full Actuated Controller In Cabinet With Railroad Equipment. In addition, this item shall include new inductive loop detectors. The existing UPS/battery back-up system shall be relocated to the new cabinet, unless otherwise directed by the Traffic Signal Engineer. Locations shall be designated by the Traffic Signal Engineer.

10.20 CONFLICT MONITOR/TESTING PROGRAM

Conflict monitors and MMUs shall be tested once every two years. One-half of the system shall be tested by November 15th of each contract year. Inspect half the number of conflict monitors and MMUs (group A) in 2022 and 2024 and the remaining conflict monitors and MMUs (group B) in 2023. The Contractor shall submit the list of groups A and B in Excel spread sheet format or other format approved by the Engineer for approval. In addition, the conflict monitor or MMU shall be tested after damage is done to the cabinet such as a lightning strike, cabinet hit or knocked-down, etc. The Contractor shall conduct a complete bench test of all conflict monitors or management malfunction units. The testing method shall be pre- approved by the Traffic Signal Engineer and shall include:

- Removing the intersection's monitor and running a complete test at the Contractor's shop with a conflict monitor/MMU tester unit.
- A spare monitor should be installed temporarily while the test is being performed or monitors may be shop-tested by rotating pre-tested monitors to the field.

- Documentation of the tested monitor should be made which includes the following:
 1. Date
 2. Name of Technician
 3. Location – including EMCMS location number, intersection name, city and/or county
 4. Serial number of conflict monitor
 5. Comments regarding fail or pass conditions

Failed monitors should either be repaired so that they pass the monitor test or replaced with a new monitor that passes the test.

Unless prior approval is given by the Traffic Signal Engineer, all the above items shall be completed by the Contractor within the same working day at a single traffic signal installation. The Contractor shall provide a schedule for this work to the Traffic Signal Engineer. Any deviation from the approved schedule shall be approved by the Traffic Signal Engineer.

The Contractor will be required to provide Progress Reports at the Traffic Signal Engineer's request showing the locations which have been completed to date.

The Contractor shall provide a final completion report, an Excel spreadsheet report, listing all the signal installations with the date the work was completed and verifying that each item has been completed, by the last day of November in each calendar year. This report shall be submitted to the Traffic Signal Engineer and loaded on the FTP site.

Conflict Monitors/ Malfunction Management Units shall not be replaced at railroad interconnected intersections without prior notification of the Traffic Signal Engineer.

10.21 MAST ARM ASSEMBLY AND POLE INSPECTION

The Contractor shall inspect mast arm assemblies, mast arm poles and mounting brackets and hardware supporting traffic signal heads or pedestrian signal heads every two (2) years. Inspect half (group A) in 2022 and 2024 and the remaining (group B) in 2023. The Contractor shall submit the list of groups A and B in Excel spread sheet format or other format approved by the Engineer for approval. The report on damaged mast arm poles shall include dimensioned photos of damaged poles. Reports shall include TS#, location, anchor bolt and foundation visual condition. (Also review Contractor Advisory Inspections in Article 2.9)

This inspection shall be completed between April 1 and the last day of August of the contract year and may be concurrent with the group relamping in Article 10.10 or done separately. The Contractor shall furnish schedules for this program a minimum of one week in advance of the start of work. The inspection shall be conducted in the same manner as described in Article 10.10, which requires reporting the Daily Work Schedule and follow-up documentation of the work. The inspection shall focus on the structural elements of the mast arm assembly and must include a close-up, arm's length investigation of the following elements:

Mast Arm

- Provide picture
- Look for cracking - picture
- Look for corrosion - picture
- Assure end cap in place/secure (replace if missing)
- Assure no openings from previous signal heads or other mounted device (cap as necessary (fender washer/molly bolt))
- Address any traffic signal head backplate issues (bent/faded)

Mast-to Pole Connection

- Provide picture

- Look for cracking - picture
- Look for corrosion - picture
- Look for bending or deformation of the connection box or surrounding area in the pole or mast - picture
- Check for voids where water can infiltrate - picture
- Seal voids with IDOT approved sealant

Pole

- Provide picture
- Lightly hit the pole around the base with the flat side of a ball peen hammer. If the pole 'thuds' instead of 'rings', there may be corrosion at the base or accumulated corrosion inside due to poor ventilation or age.
- Assure top cap in place/secure (replace if missing)
- Assure no openings from previous signal heads or other mounted device (cap as necessary (fender washer/molly bolt))

Base Plate

- Provide picture (will require shroud removal, as applicable)
- Look for corrosion or disturbance - picture
- Clean out any buildup of corrosion or other material under the base
 - Remove grout (required for inspection)
 - Replace with screening as necessary
- Shrouds (replace broken/missing with screening)
- Permanently remove all shrouds (required for inspection) on
 - 25+ year mast arms
 - Non-galvanized
 - Damaged shrouds
 - Replace with screening
- Replace shrouds after inspection (or replace with screening) on
 - Newer (less than 25 years)
 - Visibly clean/corrosion free
- If the pole is painted and not galvanized, paint the area uncovered by removing the shroud with a rust inhibitive paint. Recommend Rust-Oleum Stops Rust or similar.
- If the pole is galvanized, spray the area uncovered by removing the shroud with a cold galvanizing spray paint. Recommend Rust-Oleum Cold Galvanizing Compound Spray or similar.

Anchor Bolts

- Provide picture
- Visually inspect for loose nuts and damage.
- Strike anchor bolts with a hammer. If the bolts do not 'ring', they are suspect for corrosion or concrete deterioration.

The arm of the assembly shall be visually inspected at all signal head connections for any defects, such as cracks or buckles. The mast arm-to-pole connection shall be inspected for significant loss of section, cracks in welds or base metal, and deterioration of the connection plates. The bolts of the arm-to-pole connection shall be inspected for tightness and condition.

The pole shall be checked for external corrosion, impact damage, perforation by rust through, and any discernible deflection, distortion or cracking. The pole shall be closely checked for corrosion near the base plate, especially if mounted on a grout bed. The welds of the pole-to-base plate connection shall be checked for cracks.

The base plate shall be checked for any severe section loss or deformation.

The anchor bolts of the mast arm shall be inspected to verify that the existing nuts are not loose or missing. The anchor bolts shall also be checked for any corrosion or bending.

Mast Arm Inspection forms are to be scanned and grouped together by intersection. Each traffic signal location shall be one (1) PDF file. The file name is to be labeled in the following format:

- TS#_Date of Inspection_MAI.PDF
- Date of Inspection is to be MMYYYY – no spaces
- Example: TS12345_042016_MAI.PDF

Upon discovery of any buckles, significant structural defects (loose nuts, severe corrosion or dents, cracks in welds, plates or structure, etc.), the Contractor will immediately notify the Illinois Department of Transportation at (847)705-4424 and take corrective action as directed by the Traffic Signal Engineer to insure the assemblies do not pose an immediate hazard.

Inspection of the entire intersection must be completed on the same working day.

The Contractor shall provide the Traffic Signal Engineer a completed form MA-1 or MA-2 (single or double mast arm assemblies), "Annual Mast Arm Inspection Report Form" for each Department maintained traffic signal mast arm assembly and pole inspected monthly, which shall be submitted on the FTP site.

Digital pictures, noted by TS number, location name, county, town, and corner (SE, NW, etc.) of any deficient equipment noted in Article 10.13 shall be included with report forms on the FTP site. All work shall be completed by the last day of August of each contract year.

10.22 RAILROAD INTERCONNECTED TRAFFIC SIGNAL INSPECTION

The Illinois Commerce Commission will conduct an inspection of all Department traffic signal locations, which are interconnected with railroad crossing flashing signal warning devices with or without railroad gates. Locations not maintained by the Contractor but under the District 1 route jurisdiction system are also included. The inspection shall be completed on an annual basis during the calendar year.

In addition to the Contractor an inspection team may consist of personnel from the Department's Bureau of Traffic, the railroad responsible for the railroad crossing warning equipment, and the Illinois Commerce Commission. The Traffic Signal Engineer will schedule the inspection of each railroad interconnected location based on the availability of personnel from each involved agency.

The Contractor shall be responsible for making all necessary measurements as directed by the Traffic Signal Engineer. He shall determine all signal time intervals and controller settings, which pertain to railroad preemption. The sequences of operation shall be checked, and the Contractor shall conduct all necessary tests. Any deficiencies or recommendations shall be reported directly to the Traffic Signal Engineer.

The Contractor shall maintain and update individual security software and proms for the approximately 150 railroad interconnected signals in District 1. These items shall remain under strict security and be transferred back to the Department at the end of the Contract. The Contractor shall at all times provide and maintain one (1) Eagle/Siemens traffic signal controller and (1) Econolite traffic signal controller, at a location to be approved by the Traffic Signal Engineer, loaded with District 1 approved security software, which can be used to replace damaged equipment in the field. The controller model shall be as directed by the Traffic Signal Engineer.

10.23 DETECTOR LOOP MAINTENANCE AND REPLACEMENT

10.23.1 Traffic Signal Loop Resealing

The Contractor shall reseal all existing traffic signal detector loop wire which has become exposed or as directed by the Traffic Signal Engineer. The Contractor will clean all debris and damaged detector loop sealer from the existing saw cut. Loop detector wire that is exposed will be reinstalled into the existing saw cut and held in place by wedges prior to the resealing of the detector loop.

10.23.2 Detector Loop Replacement

The Contractor must replace all detector loops, which become inoperable. The cost of replacing the detector loop shall be part of Traffic Signal Routine Maintenance. Detector loops that are damaged by state forces shall be replaced and paid through a Non-Routine Authorization letter.

A detector loop, which is milled out during a pavement resurfacing, will be replaced as part of the Department's resurfacing contract. The Department's Electrical Maintenance Contractor will be notified by the Traffic Signal Engineer to dispatch a patrol person to the location to disconnect the loop detector cable from its terminals and place the affected phase(s) on maximum recall and/or other adjustments made as directed by the Traffic Signal Engineer.

System Detector Loops shall be replaced throughout the entire year. Non-System Loops, at the Contractor's option, between November 30th and March 1st may be replaced by a loop or with a temporary vehicle detector approved by the Traffic Signal Engineer, at no additional cost to the Department. The Department approved vehicle detector shall be installed to provide adequate detection in place of the detector loop to the satisfaction of the Traffic Signal Engineer and it shall be removed and replaced permanently by a detector loop by March 31st. If the Contractor is unable to install cable for the temporary vehicle detector due to frozen or full conduits, with prior approval from the Traffic Signal Engineer, the Contractor may temporarily span the cable overhead as long as proper clearances over the roadway can be maintained. No additional compensation shall be provided for vehicle detector cable or for any special installation requirements.

At locations where the Contractor deems the pavement condition to be unfit to replace an existing inoperable detector loop with a new loop, the Contractor shall, with prior approval from the Traffic Signal Engineer, install a video detection system or other Department approved detection system selected by the Traffic Signal Engineer. The new detection system shall be installed in accordance with the applicable specification under Non-Routine Work. Otherwise the cost of providing and installing the new detection system complete including all necessary connections, monitors, electronics handhole drilling, trench and backfill, unit duct and restoration shall be included in routine maintenance of the traffic signal installation and no extra payment shall be allowed.

10.24 LICENSES TO FURNISH

Furnish software and maintenance agreements (SMAs) to operate, support and maintain all Closed Loop Traffic Signal Systems, Video and Detection Systems, ATSS and related central/traffic (CMS, TMS, etc.) management systems for Contractor personnel and IDOT personnel's laptops and desk computers (approximately 15 locations). This shall include but is not limited to the latest versions of Centrats, Tactics, and Aries as directed by the Traffic Signal Engineer.

The Contractor shall furnish 25 intersection licenses for integration into the IDOT's ATSS system.

At the beginning of the EMC 2022 it is estimated that District 1 will have approximately two hundred fifty (250) intersections with video, radar, wireless or other detection in operation. Video and other detection types will increase each year. The Contractor shall provide license software for each of the System Patrolmen who have video and other detection types in their respective area. The System Patrolmen shall be fully instructed in the operation and maintenance of each detection system.

At the beginning of the EMC 2022 it is estimated that District 1 will have one hundred fifty (150) tilt/pan/zoom video cameras in operation. The Contractor shall provide licensed software for each of the System Patrolmen which have this video in their respective areas. The System Patrolmen shall be fully instructed in the operation and maintenance of these cameras.

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10.25 INTEGRATED CLOSED-LOOP TRAFFIC SIGNAL AND ATSS MONITORING SYSTEM

10.25.1 Contractor Responsibilities

The Contractor will, on a daily basis, monitor, review, and maintain the District 1 CLMS and ATSS systems. The Contractor shall use a local area network (LAN) computer system, with licensed software for each brand of master controller (used in District 1) to monitor the District 1 closed loop signal system. The LAN system shall communicate with each master through dial-up telephone lines or cellular communications. The LAN shall also be capable of comparing data bases with the Department's LAN at the District Headquarters in Schaumburg. The Contractor shall provide daily and weekly reports updating the status of the CLMS. The Contractor shall also provide current licensed traffic signal system software for all laptop/tablet computers used by its patrolmen.

A copy of the Official District 1 Closed-Loop Data Base shall be supplied to the Traffic Signal Engineer at the termination of this Contract. The data base shall also be electronically provided to the next Maintenance Contractor at the termination of this contract.

10.25.2 Department LAN and Software Support

The Department's tagged equipment such as desk top PCs remain the maintenance responsibility of the Department, unless otherwise noted herein.

The Contractor shall provide personnel who can demonstrate competence in the proper operation of all closed loop monitoring software currently in use by District 1. The Contractor shall provide competent personnel for LAN maintenance and repair as defined in the definition of terms under Article 12.0 for specialty service. All costs to maintain daily communication between the Contractor's LAN and the Department's LAN will be included under routine maintenance.

10.25.3 Monitoring

The Contractor shall concurrently monitor all traffic signals operating as a closed loop system or operating on a traffic management system maintained under this contract. Monitoring shall be on a 24 hour per day, 7 days per week basis. The Contractor's system monitoring functions shall include, but not be limited to, the reception of telephone calls from Closed Loop System Master Controllers and the storing, displaying, and acting upon any reported events, alarms, equipment failures, operational exceptions and programmed data collection. The Contractor shall have sufficient dedicated telephone lines, dedicated Closed Loop Monitoring System(s) with appropriate software, and qualified electrical technicians to provide for the monitoring of all closed-loop traffic control systems being maintained under this contract. The Contractor shall program all Closed Loop Systems to receive all system alarms, events, and messages on its Central Closed Loop Monitoring System(s). The Contractor shall respond to all alarms, events, and messages and provide the indicated response or corrective action within the time frame specified in the "Response and Repair Time Requirements" listed under Article 10.8. The Contractor's Dispatch Center shall also be equipped with the necessary equipment to receive all alarms, events, and messages as described above.

Before the end of the first month of the contract, the Contractor shall submit a list of alarms, events, or messages that each brand of Closed-Loop System is programmed to send to the Contractor's dispatch center for approval by the TrafficSignal Engineer.

The Contractor shall maintain the integrity of the timings and programming information contained in the local controllers and the master controllers. The Contractor shall maintain each Traffic Control System in the mode for which it has been setup and programmed (i.e., Traffic Responsive (TRP), Time-of-Day (TOD), FREE, etc.). The Contractor shall maintain its own data base of local and master controller timings, settings and programming information including graphic displays for intersections and systems. This data base shall be kept by the Contractor for use in the normal course of system maintenance. The Contractor's data base shall be the Official District 1 Closed Loop System Data Base. This data base shall also include Municipal and

County maintained Closed Loop Traffic Signal Systems that are on marked and unmarked IDOT routes. The Contractor shall insure data base agreement between IDOT Schaumburg Headquarters Data Base and the Official District 1 Closed Loop Data Base.

The Contractor shall provide a Status Report of each master controller and its local controllers (including municipal and county maintained Closed Loop Traffic Signal Systems on IDOT maintained routes) once every day, seven (7) days a week. This Status Report shall be done in addition to any field patrols done as part of Routine Maintenance. The Status Report shall document that all equipment is working properly.

In addition, this monitoring shall include, but not be limited to, system loop checks (failed, maximum presence, and no activity), local loop checks, loops with system outputs (volume/occupancy checks), (i.e.failed, Max presence, no activity), master controllers answering, local intersections on line (telemetry checks). Any exceptions found shall be reported to the Traffic Signal Engineer via email by 8:00 AM every workday and corrected within the time frame specified in the "Response and Repair Time Requirements" listed under Article 10.3. The format and content required for this email shall be approved by the Traffic Signal Engineer. Any discrepancies shall further be reported in the Closed Loop System Status Report.

All changes to Local or Master Controller programming shall have prior approval of the Traffic Signal Engineer. Minor temporary changes to alleviate any sporadic operational problems are acceptable provided it is done by a qualified IMSA certified electrical technician and reported to the Traffic Signal Engineer as soon as practical. Major re- programming will be done through a comprehensive traffic study independent of this maintenance contract. The Contractor shall keep records of all changes to local and master controller data bases with the dates the changes were implemented and the name of the individual who authorized the changes.

The Contractor shall maintain a System Operational Log accumulating in it the day to day operational information for the District's Traffic Control Systems. This log shall contain a listing of all program and mode changes that have occurred in each system and any anomalies to normal operation. The Contractor shall monitor this log for any changes from normal system operating modes and the Contractor shall report them to the Traffic Signal Engineer as soon as practical. The repeated cycle failures, loss of coordination, excessive pre-emptions or conditions that dictate manually commanded free operation shall be reported. The operational log shall be maintained by the Contractor for the duration of this contract. Up to six (6) months of the current log shall be available for inspection at any time and copies shall be provided the Traffic Signal Engineer upon request. The format, content, and method used to keep the Operational Log shall be approved by the Traffic Signal Engineer.

The Contractor shall also maintain a System Failure Log for all system alarms, events, anomalies, and reported failures. It shall contain the date, time of occurrence, the corrective action taken, a notation as to the cause, and a record thereon as to the repair time required to correct the malfunction. The System Failure Log shall be maintained by the Contractor for the duration of this contract. 6 months of the current log shall be available at any time for inspection by the Traffic Signal Engineer and copies shall be provided to the Traffic Signal Engineer upon request.

The Contractor shall prepare a System Status Report every two (2) weeks. Copies of the System Status Report shall be forwarded to the Traffic Signal Engineer and the Signal Systems Engineer on the first and third week of every month. The System Status Report shall describe the status of each system being maintained by the Contractor under this contract and a summary of failures and alarms occurring within each system during the two (2) week reporting period. The Operations Log and the Closed Loop Failures Log System Status Report shall in addition highlight any equipment failures that were not attended to, repaired or brought back into operation within the required time frame specified in the Repair Time Table and the reason for failing to meet the specified response/repair time schedule. The report format shall be approved by the Traffic Signal Engineer. Where applicable, to ensure proper system operation and alarm reporting (should a master controller go into backup), the Contractor shall maintain a location specific backup program in the backup PROMS of each Master Controller. The backup program in PROM shall duplicate the normal master programming as closely as possible. The Contractor shall be responsible for maintaining the backup programming and incorporating appropriate changes whenever normal programming changes are made at a Master or when

directed to do so by the Traffic Signal Engineer. Should a Master Controller ever need to be removed or replaced, the Contractor shall make the appropriate backup PROM switch with the replacement controller.

One month prior to the contract start date, the Contractor shall supply to the Traffic Signal Engineer for approval, his proposal for the Closed Loop Monitoring System to be located at the Contractor's place of business. The proposal shall include a detailed description of the proposed Closed Loop Monitoring System and a timetable for the installation of the system and components.

The Contractor shall assist consultants who are preparing Signal Coordination and Timing (SCAT) reports for the Department. This assistance shall be limited to a qualified Contractor representative at a system location during a consultant download of system timings at that location at the time of the download. Occasional operational questions by the consultants may also need to be answered by the Contractor as well as any required correction of items related to the maintenance of systems. In instances beyond these such as multiple requests for assistance in downloading system timing, programming errors which result in Contractor maintenance intervention, or multiple requests for assistance in programming, the Contractor will be allowed to bill the consultant. An itemized bill, including the date and system number, as well as the reason for the bill shall be submitted to the Traffic Signal Engineer in conjunction with the bill being sent to the consultant.

10.26 SITE MAINTENANCE

As part of routine maintenance, the Contractor shall trim trees and bushes blocking the line of sight of the traffic signal or flasher face to the motorists. Line of sight standards are established in the Manual on Uniform Traffic Control Devices for Streets and Highways. All trimmed branches shall be legally disposed of by the Contractor off the right-of-way. The Traffic Signal Engineer, at any time during the contract year, may request trimming of trees or bushes. This trimming must be completed immediately.

Work shall be completed monthly in the months of April through October, usually at the time of the monthly inspection. When work is completed it shall be noted on a RR (Routine Work) Ticket. The Ticket Summary shall be included with the monthly submittals on the FTP site.

10.27 PAINTING BY OTHERS ON STATE MAINTAINED FACILITIES

Other agencies will be permitted to paint traffic signal equipment, utilizing their own forces, as approved by the Traffic Signal Engineer. The Contractor is required to inspect the location, before and after the location is painted, as part of routine maintenance. Maintenance will not be transferred. The Contractor will document dates of painting in the Daily Agenda. If any damages are observed to IDOT equipment as result of the painting the Contractor will repair immediately and recover the expenditures through the 3rd party damage billing. (Refer to Article 4.9 and 2.15.15 work billing and documentation requirements for 3rd party damage expenditure recovery.)

10.28 LOCKS AND KEYS

In January of 2022, each traffic signal cabinet and UPS cabinet shall be furnished with a padlock that meets the specifications of the weather resistant padlock currently specified for District 1 pump stations or as specified by the Traffic Signal Engineer, equal or better than Master Lock 6125KA. The key number shall be approved by the Traffic Signal Engineer prior to the purchase/install. If the equipment is currently locked with a Master Lock 6125KA model the Contractor may replace the cylinder and new key (for Master Lock 6125KA) instead of replacing the entire lock. Railroad interconnected traffic signal controller cabinets and associated UPS cabinet shall have a similar lock number but different cylinder and key than standard traffic signal and UPS cabinets. It is estimated that there are 140 railroad traffic signal cabinets and 2750 standard traffic signal cabinets and similar number of UPS cabinets that require padlocks.

10.29 TRAFFIC SIGNAL OUTAGE AND OPERATION REPORT

The Contractor shall maintain a data base that tracks traffic signal outages and operation and generates a

report that provides a comprehensive list of these traffic signals locations on a daily and monthly basis. The report shall include, but is not limited to:

- Traffic signal locations that are currently dark or are in flashing red mode
- Traffic signal locations that have been dark or in flashing red mode within the last 24 hour period
- Locations identified by TS number, intersection and route, county and community
- Identify reason for dark or flashing condition with estimated time/date of restoration to normal operation
- Corrective action taken with date and time normal operation was restored

The report shall be generated from the data base and emailed to the Traffic Signal Engineer, Area Signal Engineers and IDOT ComCenter every 8 hours starting at 4am each morning. However, in the case of storms or other emergency situations, reports shall be made every 4 hours or as directed by the Traffic Signal Engineer. Monthly reports shall be submitted on the FTP site.

10.30 RAILROAD INSURANCE

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

10.31 SUBMITTALS FOR ARTICLE 10.0 TRAFFIC SIGNALS

Article #	Program	Submit Report Month End	FTP Final Due
10.4.3	Monthly Spare Fiber Used Report	Monthly	December
10.15.1	Yearly Replacement of Incandescent Displays	Monthly	September
10.15.1	Yearly Completed Relamping Report	Monthly	September
10.15.2	Daily Relamping Report	Email by 7:15AM	NA
10.16	LED Relamp Report	Monthly from March	September
10.17	Yearly UPS Battery Replacement	Monthly from March	September
10.19	Yearly Conflict Monitor Testing Report	Monthly	November
10.25	Monthly Site Maintenance	Monthly from April	October
10.27	Year 2022 Replacement of Locks and Keys	January 2022	January 2022
10.28	Daily Outage and Operations Report (8 HR Rpt)	Start 4 AM – Every 8 HR	NA

10.32 CONTRACTOR OWNED MATERIALS – SUGGESTED STARTING QUANTITIES

QTY	TRAFFIC SIGNAL SYSTEM
5	Cabinets and Econolight Controller Assemblies, TS-2, Type 1, 16 Phase
2	Cabinets and Eagle/Siemens Controller Assemblies, TS 2, Type 1, 16 Phase

10	Controllers, TS 2, Type 1
2	Econolite Master Controllers
2	Eagle/Siemens Master Controllers
10	Mast Arm Pole Assemblies of Various Lengths with Foundation Bolts
3	Electrical Service Disconnects
15	Conflict Monitors and Malfunction Management Units (MMUs)
40	Detector Amplifiers – Rack and Shelf
10	BIU's
50	Traffic Signal Posts of Various Sizes
30	Signal Heads, 12-inch, with LED Modules of various numbers of sections
20	Signal Head Mounting Hardware – Mast Arm Mounted
50	Signal Head Mounting Hardware – Post Mounted
2	Controller and Cabinet Assemblies with Railroad Security Software (one each Econolite and Eagle/Siemens), TS 2, Type 1 or Type 2

10.33 NON-ROUTINE MAINTENANCE SPECIAL PROVISIONS AND NON-ROUTINE WORK ITEMS

Refer to Article 2 for Special Provisions and non-routine work pay items.

10.34 NON-ROUTINE WORK IN RAILROAD RIGHT OF WAY

The Contractor shall be responsible for obtaining any necessary permits as required by the railroad for any non-routine work to be performed on the railroad right-of-way. The Contractor shall also be responsible to coordinate all activities between the Department and the railroad.

The Contractor shall be responsible for completing any required forms and shall coordinate all activities between the Department and the railroad. Any fees associated with obtaining the permit shall be paid by the Department in accordance with Article 109.05 of the Standard Specifications for Road and Bridge Construction, as modified and noted in Article 5.0.

10.35 LOGS AND FORMS

A sample of logs and forms as required for this Contract will be available at the Pre-Bid Meeting.

10.36 EQUIPMENT/LOCATIONS INCLUDED IN TRAFFIC ROUTINE MAINTENANCE

Review Section 3

ARTICLE 11.0 – VARIOUS SYSTEMS AT VARIOUS LOCATIONS

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ARTICLE 11.0 – VARIOUS EQUIPMENT AT VARIOUS LOCATIONS

11.1 BIDDING

Unless the labor, equipment, or materials listed in Article 11.0 Various Equipment @ Various Locations is stated as paid through non-routine maintenance, all work shall be paid through, is part of, and included in the routine maintenance bid item V-1.

All work described herein Article 11.0 shall also meet the requirements of Article 1.0, 2.0, 3.0, 4.0, 5.0 and 6.0 herein.

Note that this Article 11.0 was specifically written as to allow the Contractor to use a DBE and/or Sub-Contractor for the work required herein.

11.2 DESCRIPTION OF WORK

In Article 11.0 Various Equipment @ Various Locations the Contractor shall maintain equipment at Special Maintenance Locations, Solar Speed Stations, Highway Advisory Radio locations (cabinet shells), RACS system, Matteson Underpass Flood Warning System, Joliet Moveable Bridges, IDOT Maintenance Yards (specified equipment only), IDOT Weigh Stations (specified equipment only) and other various IDOT facilities.

The Contractor shall maintain the operations and performance of all equipment and networks in Article 11.0. which includes equipment (found during response or inspections) which needs repair or replacement, or items found to be defective, malfunctioning, or non-operational.

The equipment specified herein gives a good overview of the items to be maintained, however, there may be other electrical items which require maintenance. The Contractor is urged to visit the locations following the Pre-Bid Meeting to view all the electrical equipment to be maintained.

11.2.1 EMCMS CODES - (Equipment Locations Currently ON-Maintenance)

Equipment Types:

- V-1A Special Maintenance Locations (31)
- V-1B RACS Equipment Locations (22)
- V-1C Matteson Underpass Flood Warning System (2)
- V-1D Joliet Moveable Bridges and Office (3)
- V-1E IDOT Maintenance Yards (25)
- V-1F IDOT Weigh Stations (12)
- V-1G Various IDOT Facilities (16)

Refer to Section 3 for list of locations.

11.3 SPECIAL MAINTENANCE LOCATIONS

11.3.1 IDOT HEADQUARTERS & COMCENTER & EQUIPMENT ROOM

The Contractor shall maintain the numerous items of equipment and monopole at the IDOT Headquarters building in Schaumburg which also includes the ComCenter and Equipment room.

Maintenance includes fiber optic terminations, the network equipment, all electrical systems, control systems, mechanical systems, communications systems, alarm monitoring systems, backup systems, fiber optic

systems, conduit, cable, wire, generators, software, hardware, and all associated equipment and appurtenances.

Specific Items of Equipment to Maintain:

- Cables and wire
- CAD/Communications Stations
- CWDM and/or DWDM
- Desk Controllers in ComCenter
- EMCMS system/servers
- Fiber jumpers and patch cords
- Fiber patch panels
- Fiber optic switches
- Generator
- Lighting SCADA system/servers
- Monitors
- Pump Station SCADA system/servers (as maintained through Article 8.0)
- REVLAC & RACS equipment including operations cameras
- Servers
- Switched Ethernet network
- Transceivers
- Transfer switches
- UPS
- Video distribution amplifiers
- 360 workstation

The Contractor shall respond to Tickets regarding the HVAC in the ComCenter. If the problem is not power related, a qualified HVAC repair company/specialty vendor shall be notified, 24/7, to troubleshoot problems and immediately provide an estimate of labor, and repairs/replacements of the HVAC equipment. The Engineer shall be immediately notified, as approval is required for Special Vendor repair work, which will be paid through non-routine maintenance.

The Contractor is required to have EMC personnel to accompany any vendor working on Department equipment in the IDOT Headquarters. The IDOT ComCenter Supervisor shall be notified by the Contractor as to the expected arrival time of any specialty vendor to allow access to the IDOT Headquarters building.

11.3.2 IDOT FIBER AND FIBER CABINETS

The Contractor is to maintain the IDOT fiber in District 1, currently there are eleven (11) listed highway locations in the EMCMS and various fiber cabinets, paid through one routine maintenance item.

11.3.3 SPECIAL FIBER CABINET (CIE1)

The Contractor shall maintain all the equipment in a special Fiber Cabinet at I-80 and IL 355. This cabinet contains three (3) network switches, a UPS, media converters, fiber optic patch panels, and a cabinet heater.

11.3.4 SPECIAL TOWER LOCATION (FOS)

The Contractor shall maintain the generator, the media converter, and fiber panel in the building at the Foster Tower. The camera shall be maintained under Article 9.0.

11.3.5 ILLINOIS TOLLWAY AUTHORITY CENTRAL ADMINISTRATION BLDG AND PLAZA SITES

This location is listed as one location for payment however it includes Plaza sites # 19, # 21, # 23, # 35, # 41, and # 47. The Contractor shall maintain the IDOT patch panels, fiber cable jumpers, and Cisco SMARTnet switches through routine maintenance. Also refer to Surveillance Article 9.10 Co-Located Duct and Fiber.

There are specific procedures which must be followed for Illinois Tollway site access. The Contractor shall follow the official "Illinois Tollway Information Technology Procedure" (available on-line). For all work other than emergency cases, two business day prior notice of planned work is required to schedule any site access. A Department representative must accompany the Contractor in all cases.

11.3.6 UNIVERSITY OF ILLINOIS – CIRCLE CAMPUS – 1140 S. PAULINA ST. CHICAGO

Items to be maintained under routine maintenance include:

- 3 Bosch cameras with PTZ and mounts (paid through Article 9.0)
- Aviat Networks (planned installation)
- Control Rocket Lynx Switch
- Equipment and connections
- Equipment Cabinet NEMA 4X
- Fiber Connection
- GCM Gateway Network
- Power Supplies
- Siquira Video Encoders
- WTM4000 (planned installation)
- Power Service Panel and Disconnect Switch

11.3.7 ILLINOIS STATE POLICE DISTRICT CHICAGO - DESPLAINES

The items to be maintained include 360 workstations and a fiber optic switch. The Contractor may receive a request from the Engineer for light outage repairs or other minor electrical repairs which will be paid through non-routine maintenance.

11.3.8 ILLINOIS THOMPSON CENTER (JRTC – OR NEW LOCATION)

The Contractor shall maintain the IDOT owned fiber optic patch panels, jumpers, fiber cables, fusion splice trays and associated equipment under routine maintenance.

11.3.9 IDOT EQUIPMENT AT CONTRACTOR FACILITIES

For ease of EMCMS searches, this equipment is given an EMCMS location of V EMC.

Items to be maintained include:

- Traffic System Conflict Monitor Alarm System
- AEGIS Alarm Equipment, or Replacement
- EMCMS Equipment
- 360 Workstations
- REVLAC VDT Equipment
- Solar Winds Equipment
- Other monitoring equipment as required by the Engineer

- **Lighting SCADA System**

One (1) client and monitor, all software including OS, GUI software, FIU cabinet, SCADA CPU's, EMCMS Base network, radio power supplies and back-up batteries, rocket port, printers, radio concentrators, four VHF/UHF radio, portable UPS and batteries, and all other equipment and appurtenances

- **PS SCADA System**

Allen Bradley RSview server computer (hardware & software), EMCMS Base network, computer monitor, printer, radio equipment, rocketport multi-serial board and cables, batteries and all other equipment and appurtenances

11.3.10 SOLAR SPEED STATIONS (SSS)

The Contractor shall maintain the current ten (10) solar speed stations on maintenance. The Contractor shall maintain the post, base, solar panels, speed display, etc.

11.3.11 HIGHWAY ADVISORY RADIO (HAR)

Although the Department retains a vendor to maintain the twelve (12) locations of Highway Advisory Equipment the Contractor is required to provide the power to the maintained equipment and shall promptly respond to incidents of motorist caused damage. All equipment shall be cleared from the highway and disposed, and a new cabinet shell furnished and installed (if the former cabinet was damaged). In addition, the bacons on the HAR sign shall be replaced if damaged. The Contractor is not responsible to furnish new electrical equipment or an antenna for the new cabinet.

11.4 RACS – ROOSEVELT RAMP ACCESS CONTROL SYSTEM

The RACS system has twenty-two (22) locations of equipment currently on-EMC maintenance (at the time this Contract was developed) however, the system is not currently being used as designed. When fully maintained there are ten (10) swing gates, eight (8) operations cameras which are to provide an overview of the RACS operations to the dispatch operators at the IDOT Headquarters, three (3) DMS signs, eight (8) LED signs which are to be operated remotely, and one (1) roadside panel mounted to the outside wall of the Hillside RACS building, a local operation control device which takes control away from the PLC and transfers to local manual switches. Most of the equipment is not operating, (RACS operating cameras and 2 – 1 line DMS) and except for the swing gates, is not be serviceable.

When functioning the RACS System operates to control access at the single-entry ramp from eastbound Roosevelt Road to eastbound I-290, with the ramp entry just east of York Road. The RACS System includes, but is not limited to swing gates and their transmissions, dynamic message signs, chevron signs, auxiliary signs, a traffic detector on the IL 38 ramp, roadside control panels, supervisory controls, alarm system, operations cameras, and all interconnecting cable, Ethernet, fiber and microwave radio systems for communications.

The RACS Control System is a network of Allen Bradley Control Logix 5000 series Programmable Logic Controllers (PLC). Each Building (Hut and Ramp) utilize a separate redundant CPU in its PLC system and the user interface software in the workstations in the IDOT ComCenter facilitate the remote control of the system. Each system coordinates the communications and control of that specific location. Normally all units work as an interconnected system (network) through the communications link; however, each system may operate as a stand-alone unit for its ramp or operate the entire system in the event of a loss of communication to/from the IDOT Headquarters in Schaumburg.

The Contractor will take directions as to maintenance work from the Engineer.

Items of Equipment to Maintain (through routine maintenance) When Directed by the Engineer:

Swing Gates

The Contractor will be required to exercise and wash the gates twice per year through a preventive maintenance program and furnish and install new gates if damaged. The Contractor would be paid through non-routine maintenance for any equipment modifications or planned new equipment to be furnished and installed.

The RACS System swing gates are manufactured by B & B Electromatic of Norwood, Louisiana. These swing gates direct the traffic away from closed ramps. Each swing gate can be operated remotely, locally, and with a manual hand crank.

11.5 MATTESON UNDERPASS FLOOD WARNING SYSTEM (V-3)

(Underpass of Governors Hwy @ 214th St. and Governors Hwy @ 219th St.)

Routine Maintenance

The Matteson Underpass Flood Warning System is on-EMC Maintenance; however, it is not currently being used as designed. The EMC Contractor shall respond to all problem calls, usually to clear equipment from the roadway which impedes the traffic flow for motorists.

The Matteson Police Department may ask the Contractor to accompany them to check the equipment situation from time to time.

Non-Routine Maintenance

Any requests for equipment repair and/or equipment upgrades shall be forwarded to the Engineer. Any planned maintenance work which the Contractor would perform shall be paid through non-routine maintenance.

When working as designed the equipment includes:

- Four (4) Solar Assisted 12 Flashing Beacons with two-line message board
- Two (2) High water sensor system
- Two (2) Radio signal-based systems
- Two (2) Cellular based systems
- Four (4) 64'W X 3'H Barricade gates
- Two 14' Steel poles with foundation
- Four (4) Mast arm assembly and pole with foundation

11.6 JOLIET MOVEABLE BRIDGE EQUIPMENT (V-4)

(6 Moveable Bridge locations and Joliet Bridge Office)

At the time this Contract was in development there were two (2) moveable bridges on maintenance plus. the Joliet Bridge Office. Equipment to be furnished, removed and or installed, includes operational cameras, relays, timers, JB's, switches, alarm panels, navigation signals, lighting on the bridge and in the control buildings, river traffic controls, traffic signals and its associated equipment which is powered and controlled by the moveable bridge, and all electrical appurtenances.

Contractor shall also:

- Maintain the generators
- Trouble shoot to determine the cause of any bridge control malfunctions
- Create an EMCMS Ticket for each power related problem found on the Moveable Bridges equipment (The Ticket shall note whether an equipment repair or replacement is necessary.)

Moveable Bridges Centralized and Integrated Controls Operation Contract 60P55

While under construction the EMC Contractor shall provide qualified personnel to attend the testing, training and acceptance of new electrical bridge controls and power equipment. The Contractor will be notified of the scheduled testing and training dates and times during the contract year.

The EMC Contractor shall coordinate and cooperate with IDOT Construction and the construction contractor for the transfer on-EMC Maintenance of the new Moveable Bridges centralized control equipment. It is currently anticipated that this new equipment will come on EMC maintenance in 2023.

The new items for Contractor routine maintenance include, but are not limited to:

- Automatic Bridge Operating System
- Bridge Video Systems (7)
- Operation Cameras (84) (Fourteen per bridge)
- Operation Camera Poles 4 – 50' and 40 – 30'
- Control Equipment
- Fiber Optic Inter-connected cabinets (8)
- Public Monitoring Cameras (pedestrian traffic)
- Public Announcement Equipment
- SCADA System
- Video Server
- Wireless backup system

11.7 MAINTENANCE YARDS (V-5)

The Contractor shall maintain:

General Items:

- Brine pump, including connect/dis-connect service
- Cables, uniduct
- Conduits/raceways, handholes
- Control boxes, lighting power centers
- Controllers, clocks, photocells
- Electrical outlets
- Electrical service, main distribution panel and sub-panels
- Emergency exit lighting fixtures and signs
- Foundations, anchor rods, grounding,
- GFCI outlets, exterior and interior
- Junction boxes, fuses, disconnects,
- Light poles, aluminum, steel or wood, mast arm, luminaires
- Light towers, ring lowering system, luminaires
- Lighting fixtures, luminaires exterior and interior and control equipment
- Lighting wall packs (outdoor)
- Motion sensors
- Power and connections for wastewater pumps, pressure washer equipment, asphalt heating tanks, exhaust fans, garage doors, HVAC, and other controllers and electrical equipment
- Power to traffic monitoring cameras (maintained through the Surveillance System)
- Power controls

- Relays, contactors, breakers, electrical devices, fittings, and appurtenances
- Roof and ceiling lighting fixtures
- Salt dome and storage lighting
- Service entrance equipment
- Switches
- Wiring and associated equipment

Special Use Items

The Contractor through routine maintenance shall respond and investigate/troubleshoot and provide description of work needed on a Ticket. If requested by the Engineer, the Contractor shall provide non-routine agreed-price quotes for this equipment to be repaired or replaced:

- Air compressors
- Brine spray pumps
- Conveyor for salt dome
- Exhaust fans
- Garage door openers
- Hot asphalt box
- HVAC systems/repairs
- Lift motors/hoist system,
- Motors and pumps for asphalt heating tanks
- Pressure washer pumps
- Septic pumps
- Test equipment
- Wastewater lift stations pumps
- Welders
- Any other electromechanical equipment

The Department may purchase the replacement materials on this Contract or from other sources, for the Contractor to install through non-routine maintenance pay items or agreed price work, however, the Department has no obligation to authorize any non-routine work.

11.8 WEIGH STATIONS (V-6)

The Contractor shall maintain:

- Breakaway devices
- Cable
- Cable splice boxes
- Cameras
- Fiber optic transceiver
- Foundations
- Handholes
- Height detector poles and equipment
- Lighting System; inside and outside including cabinet, poles, mast arms, luminaire, lamp, cable, conduit, panels, lenses, reflectors, shields, ballasts, decals, control devices, radios
- Loop detectors
- Monitors, inside
- Over-height detectors
- Power to sump/waste pump, HVAC, and appurtenances
- Power to traffic monitoring cameras (maintained through Surveillance System)

- Traffic control devices, electronically operated
- Traffic signals, flashers, heads, posts
- Truck waiting warning devices
- Uniduct
- Vehicle amplifiers
- Weigh Station Open/Closed sign equipment (fiber optic message signs, interconnecting cables, controllers, including radio and power)

Excluded from routine maintenance are weigh scales, repair of circuit boards, relays, or cabinets associated with the weigh scales, or weigh-in-motion equipment.

During the Contract year the Department may have other contractors performing planned upgrade work at the weigh stations. Any damages to EMC maintained equipment by 3rd party contractors will be repaired through non-routine maintenance. It is the Department's goal that the Contractor will be informed prior to the start of this upgrade work, however, depending on the scope of the upgrade work, the location may or may not be transferred off monthly maintenance responsibilities.

Special Use items as listed in Article 11.7 Maintenance Yards, but applicable to Weigh Stations locations in Article 11.8 shall be paid through non-routine agreed-price work, if approved by the Engineer.

11.9 VARIOUS FACILITIES (V-7)

- Biesterfield Bridge Office (BBO)
- Dan Ryan Field Office (DRO)
- Cold/Storage Areas (ACS, MSY, SPS)
- Emergency Traffic Patrol (ETP)
- Hut/Building (FRB & HRB)
- Material Lab (MAT)
- Rest Areas (57IBRA & 57OBRA)
- Sign Shops (ESS, LZSS, NLSS, NSS, SSS)

The Contractor shall maintain:

Exterior and interior lighting, emergency/exit lights, light switches, GFCI outlets, convenience outlets, all electrical panels and controls, power to equipment including Material Lab test ovens and other testing equipment, former REVLAC Building (FRB) and Roosevelt Ramp Building (HRB) equipment.

Special Use items as listed in Article 11.7 Maintenance Yards, but applicable to Various Facility locations in Article 11.9 shall be paid through non-routine agreed-price work, if approved by the Engineer.

11.10 CONTRACTOR IMMEDIATE RESPONSE AND REPAIR

INCIDENT OR PROBLEM AT:	Response Time	Service Restoration Time	Permanent Repair Time
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IDOT HQ Reported Problems	1 hour	4 hours	7 days
IDOT Equipment at EMC	1 hour	4 hours	7 days
Maint. Yds, Weigh Stations, Facilities Equipment	1 hour	4 hours	7 days
District 1 Speed Stations	1 hour	ASAP	21 days
Illinois Tollway Authority Central Office/Plazas	24 hours	ASAP	7 days
University of Illinois Circle Campus	24 hours	ASAP	7 days
Illinois State Police District Chicago-Des Plaines	24 hours	ASAP	7 days
Illinois Thompson Center	24 hours	ASAP	7 days
HAR (Highway Advisory Radio)	24 hours	ASAP	7 days
Weigh Stations or Rest Area Outages	4 hours	8 hours	7 days
Maintenance Yard Outages (Exterior or Interior)	4 hours	8 hours	7 days
Facility Outages (Exterior or Interior)	4 hours	8 hours	7 days

11.11 PREVENTIVE MAINTENANCE PROGRAMS (PM)

The Contractor is required to perform certain preventive maintenance (PM) work within certain regular intervals or within certain time limits. The following descriptions provide a basic guide for PM work, but shall not be construed as all inclusive. There may be preventive maintenance required by the manufacturer which shall be performed in addition to these inspections. All scheduled Contractor PM work shall follow manufacturers' specifications.

All PM program work shall be scheduled on the Daily Agenda which shall list the applicable Article number.

There are four (4) types of reports for Preventive Maintenance work.

1: Tickets created on the EMCMS

Tickets shall be created for all items found broken, damaged, malfunctioning, or which do not conform to Department standards, which are repaired at the site, or which require follow-up repair or replacement. Ticket reports do not need to be submitted on the FTP site; however, the Department personnel must be able to verify the inspection through the Daily Agenda and the Contractor's GPS readings.

For the FTP site, the Contractor shall submit monthly, within five (5) working days into the next month, if noted herein the PM program, one or more of the following report types:

2: GPS Photo

A linked camera phone photo, with GPS reading and time stamp

3: GPS Report & Excel spreadsheet Report

A GPS report/Excel spreadsheet with GPS arrival date, duration, truck number, name of Contractor assigned worker, EMCMS location number and address, and the requested information in the individual PM program

4: An Excel spreadsheet report with specific information as required per PM program

The Contractor shall submit the Type # 3 and Type # 4 Report formats to the Engineer and IDOT System Manager for approval at the Pre-Construction meeting, so there is no misunderstanding of the information to be submitted throughout the year. All reports must be in a legible, Excel format. No Word documents are allowed.

The Engineer reserves the right to request a particular format for any or all reports. The FTP Site records for PM work shall be sorted by Contract Year, Month, System, then PM program in Article number order.

If the Contractor disagrees with the PM Program scheduled completion dates listed herein, or the dates must be moved due to safety or other concerns, the Department will meet with the Contractor and may modify the schedule, however, the work must be completed in the Contract year for on-maintenance locations.

Reporting requirements herein listed in Article 11.11 apply to Articles 11.12 through 11.25

Article	PM Program	Submit Monthly	Format
Art. 11.12	Weekly REVLAC ComCenter DVD Inspection	Jan-Dec	Tickets
Art. 11.13	Monthly Site Maintenance	Jan-Dec	FTP-GPS Photo
Art. 11.14	Monthly HQ UPS Battery Inspection & SCADA Battery Replacement (Year 2023)	Jan-Dec	FTP-GPS Photo
Art. 11.15	Monthly HQ & Moveable Bridge Generator Inspection + Specific Month for Yearly Prog.	Jan-Dec and October Refer to P-100 form in PS System	FTP-GPS Photo
Art. 11.16	Monthly Joliet Moveable Bridge Inspection	Jan-Dec	FTP-GPS Photo
Art. 11.17	Monthly Weigh Station Inspection	Jan-Dec	FTP-GPS Photo
Art. 11.18	Twice Per Year Clock Inspection – Refer to Article 7.19	March & November	Tickets
Art. 11.19	Twice Per Year RACS Inspection and Cleaning	Apr & November	Tickets
Art. 11.20	Twice Per Year Maintenance Yard & Facility Equipment Inspection	Mid-April to Mid-May	FTP-GPS Photo
Art. 11.21	Yearly Maintenance Yard & Facility Wash & Relamp	Complete by end of October	FTP-GPS Photo
Art. 11.22	Yearly Photocell Calibration	June	Tickets
Art. 11.23	Yearly Control Inspection – Refer to Art. 7.20	Jan-Nov	FTP-Excel Spreadsheet
Art. 11.24	Yearly Light Pole Inspection – Refer to Art. 7.21	Jan-Nov	FTP-Excel Spreadsheet
Art. 11.25	Yearly Light Tower Safety Inspection - Refer to Art. 7.22	Jan-Nov	FTP-GPS Report & Excel Spreadsheet

11.12 WEEKLY REVLAC COMCENTER DVD INSPECTION

The Contractor shall inspect the ComCenter DVD process video for REVLAC once per week, to confirm the transitions are recording properly. This inspection shall be scheduled on the same day of the week, for the

duration of the Contract. If problems are found, repairs or equipment replacements shall be completed within twenty-four (24) hours.

11.13 MONTHLY SITE MAINTENANCE

Site maintenance is required for Facility locations HRB (Hillside Ramp Building) FRB (Former REVLAC Building B) and FOS Foster Tower. The work shall be scheduled on the Daily Agenda.

Winter Site Maintenance - November through March

The Contractor shall perform snow removal operations when the snowfall total reaches 2" inches or there is sleet/ice formation in any District 1 area.

Outdoor Site Maintenance - Spring/Summer/Fall – April through October

The Contractor shall perform grass cutting, branch cutting and removal, trash removal, do insect/tick and weed killer spraying a minimum of once per month for the approach/path to the structure/hut and within the fenced area of the structure/hut.

The Contractor shall take two (2) GPS Photos (by phone) one before work begins and the second after work has been completed. (Report Type # 2) which shall be submitted monthly on the FTP Site.

Indoor Site Maintenance – Monthly All Year

The Contractor shall clean all floors once per month with Simple Green cleaner, which is approved for use in areas with electrical equipment, with plain water and an industrial specified mop and bucket. This work may be combined with other monthly site maintenance requirements in Article 9.0 Surveillance System.

11.14 MONTHLY HQ UPS BATTERY INSPECTION & SCADA BATTERY REPLACEMENT

The Contractor shall inspect the batteries of the UPS Systems, once per month at Schaumburg HQ. Water levels shall be checked, add if necessary. Connections shall be cleaned and tightened if necessary. A GPS Photo (Report # 2) shall be taken and submitted on the FTP site.

The Contractor may be required to replace the SCADA backup battery for the radio, and the lithium battery in each CPU of the FIUs and the back-up battery pack in each FIU of the lighting SCADA system, for equipment located in the IDOT ComCenter and EMC Dispatch Center in the September through November period of year 2023 only (if this Contract is renewed).

11.15 MONTHLY GENERATOR INSPECTION + SPECIFIC MONTH FOR YEARLY PROGRAM

The Contractor shall test the generator once per month at the IDOT Headquarters, Foster Tower, and the Joliet Moveable Bridges at approximately the same date each month:

- Check control panel and transfer switch operation
- Check engine oil and coolant levels
- Check that block heater is working
- Check battery charging system
- Check for holes or leaks and loose connections in the air cleaner
- Check fuel level and fuel transfer pump operation
- Check for exhaust system leaks or restrictions
- Drain the condensation trap
- Check all meters, gauges, and indicator lamps
- Check oil reservoir and battery acid level and maintain proper operating levels
- Check the air filter monthly and change at specified intervals

- Exercise generator
- Note any rusting on the generator and its enclosure (for future non-routine work)
- Check for fluid/fuel leaks
- Check generator fuel and note level

Diesel fuel shall always be filled to the proper level. If fuel level is less than $\frac{3}{4}$ (75%) of full level, a Ticket shall be created to schedule the refill of the tank.

The Contractor shall submit Report Type # 3, an Excel spreadsheet with the above information.

Specific Month – Yearly Generator Maintenance:

The Contractor shall perform inspection and maintenance required for the generators once per year. In the past this maintenance has been performed in October of each year, however the Contractor may provide a schedule for this yearly work and submit with the January 2021 FTP submittal. Each station shall have this yearly generator work performed in the same months of the Contract year (if renewed).

- Change oil and oil filters
- Drain, flush, and replace coolant
- Replace cooling system hoses in 2022
- Replace thermostats in 2022
- Replace fan belts in 2022
- Check and adjust valves as necessary
- Conduct operational inspection to insure proper valve rotation
- Check fan hub
- Check pulley
- Check water pump
- Change the day tank breather
- Clean or replace the crankcase breather
- Change fuel filter
- Drain sediment from the fuel tank
- Clean accumulation of grease, oil, and dirt on set
- Lubricate generator bearing
- Check vibration isolators for proper adjustment and conditions
- Check circuit breaker and transfer switch, and test equipment by simulating a power outage
- Check turbo pressure, adjust if necessary, to manufacturer specifications
- Provide fuel system service to perform fuel polishing only in 2022
- Check and note any rusting on the generator and its enclosure

A GPS Photo (Report # 2) shall be taken and submitted on the FTP site.

11.16 MONTHLY JOLIET MOVEABLE BRIDGE INSPECTION

For those moveable bridges on EMC Maintenance the Contractor shall perform a monthly inspection of the Bridge Monitoring CCTV and associated equipment:

- Camera operations
- Camera Housing
- Lens
- Monitor

The Contractor shall also check for outages of the bridge signals (TS) or exterior or interior lighting outages and replace with proper lamps.

The Contractor shall determine whether the Department Bridge Tender has any electrical power problems to report, which shall have Tickets created. A GPS Photo (Report # 2) shall be taken and submitted on the FTP site.

Once the new equipment for the Moveable Bridges is accepted ON-Maintenance from contract 60P55, the Contractor shall add equipment as listed in Article 11.6 to this monthly inspection. Any new forms to be used will be available at that time.

11.17 MONTHLY WEIGH STATION INSPECTION

The Contractor shall provide Lighting System personnel, to inspect monthly, during the daytime, each weigh station installation as follows:

- Check operation of Open/Close signs
- Replace all burned out lamps and damaged sockets
- Check lighting in scale pit
- Replace damaged, discolored, cracked or peeling signal lenses
- Repair or replace any damaged signal posts, foundations, signal heads, cable, conduit and over height vehicle detector posts from any cause whatsoever
- Check alignment of signal heads
- Check alignment of over height vehicle detectors
- Check operation and condition of loop detectors
- Align all signal posts
- Identify vehicle detector loops in need of replacement
- Create ticket for loop resealing if required
- Check proper operation of the CCTV System and monitors filing washer fluid for proper camera operation. The wiper system on the cameras at the WS80OB Weigh Station, I-80 outbound, west of 80th Ave, require refilling.
- Refer to Article 11.8 for Special Use Items

This PM program is one of the planned tablet EMCMS entry formats. A GPS Photo (Report # 2) shall be taken and submitted on the FTP site.

11.18 TWICE PER YEAR CLOCK INSPECTION (59 per inspection)

The Contractor shall perform the twice per year Clock Inspection for the Maintenance Yards, Weigh Stations and Various Facilities in March and November of each year. Refer to specifications of work in Article 7.19.

11.19 TWICE PER YEAR RACS SYSTEM INSPECTION AND CLEANING

The Contractor shall clean and test the operation of the gates and report the condition of the equipment each April and November. An IDOT Inspector shall accompany the Contractor during this inspection.

11.20 TWICE PER YEAR MAINTENANCE YARD & FACILITY EQUIPMENT INSPECTION

The Contractor shall inspect the IDOT Maintenance Yards (V-5) and Facility offices (V-7) twice per year, once in mid-April to mid-May and again mid-September to mid-October. Items for inspection include exterior and interior lighting and its control equipment, service entrance and feeder panels, emergency/exit lights, light switches, GFIC outlets, salt dome storage lighting, and proper electrical operations of lift motors and pumps, asphalt heating tanks, spray pumps and their controllers, electrical equipment, pressure washer pumps, exhaust fans, and other items as listed herein in the Special Use Equipment.

The Contractor personnel shall check-in with the IDOT Maintenance Yard Technician before starting the inspection. The IDOT Technician may direct the Contractor personnel to electrical items which need attention.

During the spring inspection the Contractor shall disconnect the beet juice or brine pumps, drain fluids, clean, and lubricate. During the fall inspection the same pumps shall be re-connected, lubricated and checked for proper electrical and mechanical operation.

Service Entrance and Feeder Panel Inspection:

Inspection Procedure:

- Clean enclosure and control equipment by blowing out with low air pressure or vacuuming
- Clean contacts, relays and timers and visually inspect for damage or out of adjustment parts
- Remove all dust from electrical devices and equipment.
- Check connections
- Exercise breaker
- Check trip setting
- Inspect wiring/conductors for overheating and discoloration
- Check tightness of wire terminations and connections
- Check for proper labeling, provide and install missing labels
- Check wire tags/labels, provide and install missing tags or labels
- Check fuse disconnects for proper operations, keep fuse clips clean and tight
- Check fuses for proper size
- Test equipment ground system

The Contractor shall submit the GPS Photo (Report # 2) on the FTP site, noting which locations have had LED fixture installations.

11.21 YEARLY MAINTENANCE YARD & FACILITY WASH & RELAMP

The Contractor shall wash and relamp the lighting fixtures inside the office buildings, storage rooms, various bays, cold storage buildings, salt domes and outside lighting on roof, wall, poles, and light towers according to schedule below.

All work shall be completed by end of October of each year. The Contractor may combine this yearly program with the Maintenance Yard Electrical Equipment Inspection, Article 11.20 herein, conducted in mid-April to mid-May and mid-September to mid-October.

If the Maintenance Yard or Facility has had a recent installation of LED lamps the Contractor shall not relamp those fixtures. (The New Lenox Yard has been removed from the program due to their LED upgrade.)

The Contractor shall submit the GPS Photo (Report # 2) on the FTP site, noting which locations have had LED fixture installations.

MAINTENANCE YARDS

YEAR 2022	YEAR 2023	YEAR 2024
Alsip	Edens	Birds Bridge
Arlington	Eisenhower	Gurnee
Bishop Ford	Grayslake	Harvey
Dan Ryan	I-57	Hillside

Joliet	Landscape	I 55
Northside	Naperville	Kennedy
Rodenburg	Northbrook	St Charles
Stevenson	Oakbrook	Woodstock

FACILITIES

YEAR 2022	YEAR 2023	YEAR 2024
Monee Storage	Biesterfield Bridge Office	Addison Cold Storage
New Lenox Sign Shop	Lake Zurich Sign Shop	Elgin Sign Shop
Southside Sign Shop	Northside Sign Shop	Shales Parkway Storage

11.22 YEARLY PHOTOCCELL CALIBRATION

Each year, on the day of the summer solstice, normally June 21st, the Schaumburg Headquarters photocell shall be cleaned, tested, and adjusted to 5 +/- 0.5 ft. cd., or as specified by the Engineer for proper lighting control operations.

11.23 YEARLY CONTROL INSPECTION (60)

The Contractor shall perform the yearly Control Inspection for the Maintenance Yards, Weigh Stations and Various Facilities in the period of January through November (in same month if Contract is renewed). Refer to specifications of work in Article 7.20. Submit an Excel Spreadsheet for the FTP Site, Report # 4.

11.24 YEARLY LIGHT POLE INSPECTION (184)

The Contractor shall perform the yearly Light Pole Inspection for the Maintenance Yards, Weigh Stations and Various Facilities in the period of January through November (in same month if Contract is renewed). Refer to specifications of work in Article 7.21. Submit an Excel Spreadsheet for the FTP Site, Report # 4.

11.25 YEARLY LIGHT TOWER INSPECTION (16)

The Contractor shall perform the yearly Light Tower Inspection for the Maintenance Yards, Weigh Stations and Various Facilities in the period of January through November (in same month if Contract is renewed). Refer to specifications of work in Article 7.22. Submit a GPS Report # 3 and Excel Spreadsheet Report # 4 for the FTP Site.

ARTICLE 12.0 – DEFINITIONS, SPECIFICATIONS & STANDARDS

Definitions of Terms Used Herein:

AEGIS District 1 Dial-up Pump Station Alarm System

ANSI American National Standards Institute

ATC Automatic Traffic Control

ATMS Advanced Traffic Management System

AVL Automatic Vehicle Locator

BASE STATION When used herein describes a short-range transceiver which connects a computer or other wireless devices to a central hub and allows a connection to a network

CLEAR/CLEARING SITE FOR SAFETY When used herein “clear” is ticket terminology, the departure of the Contractor personnel from the initial response to the site of a reported incident of damage or trouble on system equipment after verifying that the highway is safe for the motoring public. “Clearing Site for Safety” Refers to a term used herein to assure the Electrical, Mechanical and Structural integrity of IDOT property maintained under this contract is safe for workers and the motoring public. Site clearing shall comply with the most current standards (such as NEC and OSHA requirements) as applicable.

CLMS Closed-Loop (Traffic Signal) Monitoring System

CMS Changeable Message Sign

COMCENTER Illinois Department of Transportation, District 1 Communications Center

COMPLETION DATE When a completion date is specified, the Contractor shall complete all work subject to the date on or before the specified date.

CONTRACT SPARE PARTS When used herein refers to stocks of materials and equipment which are state owned, are to be kept separate from the Contractor’s materials and equipment and shall be used exclusively for the Department’s installations and systems.

DAMAGED EQUIPMENT Any piece of equipment owned or maintained by the Department that is no longer capable of functioning as originally designed, or as since modified, or any piece of equipment that has deteriorated sufficiently in the opinion of the Engineer so that failure is imminent or for which safety could be a concern

DBE Disadvantaged Business Enterprise

DEPARTMENT When used herein stands for the Illinois Department of Transportation

DID Direct Inward Dialing

DISPATCH CENTER The Contractor’s 24/7 dispatching area as required herein, also referred herein as the EMC Dispatch Center

DISTRICT 1/REGION 1 IDOT Department of Transportation area defined as Cook, DuPage, Kane, Lake, McHenry, Will, a portion of Kendall Counties, and specified locations herein, where District 1 equipment is maintained, in other Illinois counties.

DMS Dynamic Message Sign

DWDM Dense Wavelength Division Multiplexing

EFO Illinois Department of Transportation, District 1, Bureau of Traffic, Electrical Maintenance Field Office, 445 Harrison St., Oak Park, IL. 60304

EMC Electrical Maintenance Contract or the Electrical Maintenance Contractor

EMCMS Electrical Maintenance Contract Management System (database)

EMERGENCY A condition, which is a hazard to the public, or is designated by the Engineer to be a hazard of such severity that life and property are endangered, and which requires immediate corrective action

ENGINEER IDOT Resident Engineer on this Contract or authorized representative

EQUIPMENT SERVICE Refers to the servicing and/or restoration of any equipment to normal operating condition and appearance necessitated by service equipment wear-out, failure, damage or loss

EXTENSIVE Covering or affecting a large area

FIU Field Interface Unit, sometimes called an FEP, Front End Processor

FROM ANY CAUSE WHATSOEVER When used herein shall include any and all causes except those resulting in extensive damage from declared area wide disasters such as fires and floods, acts of the public enemy, or an Act of God. (The declared disaster exclusion will be valid only for the area and time period specified by IEMA and FEMA policies.)

FSK Frequency Shift Key

GCM GATEWAY Gary-Chicago-Milwaukee Corridor Transportation Information Network

GENERAL BILLING INVOICE Refers to a daily invoice created by the Contractor for time and material work or additional services rendered or work performed for, or on behalf of, a 3rd party, on any part thereof or concerning System installations and equipment owned by IDOT which is included under the scope of maintenance of this contract. Examples would include 3rd party construction related damage repair invoices, work for 3rd party permits involved with construction in the state ROW, 3rd party invoicing for additional cable locate services, etc.

GUI Graphical User Interface

HUT/SHELTER (COMMUNICATIONS) Refers to a building or structure used to house equipment which may contains equipment for IDOT Towers

IDOT INSPECTOR Employees of the Illinois Department of Transportation assigned duties by the Engineer

IMMEDIATE CORRECTIVE ACTION Refers to all activity necessary to restore the safe operating integrity of a system or system element, without delay

IMSA International Municipal Signal Association

INET Intelligent Networks

ISP/CMS Illinois State Police Area in a State of Illinois Central Management Service facility

KNOCKDOWN (KD) Refers to damage which results in the knockdown of a light pole, luminaire, or cabinet, a traffic signal or cabinet, a surveillance signal or cabinet, or camera pole and camera

LABOR, METHODS, AND EQUIPMENT Definition is applicable per the Standard Specifications for Road and Bridge Construction, per Article 108.06 Labor, Methods, and Equipment.

LIGHT TOWER Also known as High Mast Lighting Tower

LIGHTING INSTALLATION One or more lighting units powered from one common electric service

LIGHTING SCADA The standard specifications for the Illinois Department of Transportation, District 1, Lighting System Supervisory Control and Data Acquisition System

LOCATION For purposes of this Contract, a single defined locally-operational sub-portion of a defined system, usually having a unique electric service or service combination, operated from a unique control cabinet, building, etc., and having a unique system identifier in the Contract, and paid through routine maintenance. A location may also refer to a tower in a maintenance yard or equipment attached to or in a building, cabinet, tower or other structure which are paid through the location from which it is located and/or powered.

MANUAL ON TRAFFIC CONTROL DEVICES (M.U.T.C.D.) State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways"

MOSCAD Motorola Supervisory Control and Data Acquisition

MOSYS Motorist Outreach System, a computer system located at the Traffic Systems Center and ComCenter, which controls Dynamic Message Signs at various expressway locations

MOTORIST CAUSED HIGHWAY DAMAGE (MCHD) REPAIR FUND A budgeted, re-appropriated item in the state budget from which the IDOT is given the replacement costs for damaged system equipment caused by motorists, if a police accident report links the motorist to the accident.

NAGIOS A software monitoring system that enables organizations to identify and resolve IT infrastructure problems before they affect critical business processes

NEC National Electrical Code

NEMA National Electrical Manufacturers Association

NON-ROUTINE WORK Non-routine work shall refer to all maintenance work which is not included under routine work, but which is authorized and paid separately. IDOT is under no obligation to issue authorizations for non-routine work. Methods of payment include use of contract pay items, established agreed prices, or other force mechanisms.

NORMAL WEATHER Time during which regular dispatch operations continue, no storm alert procedures in effect.

OFF MAINTENANCE Term used to define a system location which is not being maintained by the state's maintenance contractor

ON MAINTENANCE Term used to define a system location which is being maintained by the state's maintenance contractor

OSHA Occupational Safety Health Administration

PATROLMAN Defines an electrician, who is assigned regular electrical system patrol and street maintenance response duties by the Contractor. Patrolmen have the responsibility for inspecting and servicing a pre-assigned select group of installations in accordance with a defined regular time schedule. The assigned installations may be from any one (1) or all, of the Electrical Systems included under the overall scope of the Contract.

PAY MEETING The Pay Meeting is held on the third Thursday of each month, to which the Contractor brings the monthly invoice for the payment of the reconciled quantities of routine maintenance work and monthly summary and completed/approved non-routine invoices from the prior month.

PERMANENT REPAIR TIME Amount of time from initial notification to the Contractor until the time permanent (non-temporary) repairs are made

PLC Programmable Logic Control

PM Preventive Maintenance or Preventive Maintenance Program

PLNC Private line telephone service which provides a direct connection between two points through an automatic ring signal at one end when initiated at the other.

POTS Plain old telephone service

PRIVATE When used in reference to EMCMS locations and/or the EMCMS entries in the Location Locate screen or the Contractor Private Non-State Maintained Locations screen, refers to locations which are currently maintained by counties or cities, and not maintained by the Contractor under Contract 62M86. Most are owned by the Department but have agreements with the Department to be separately maintained.

Some of the locations in the Contractor Private Non-State Maintained Locations screen may be listed as Owned by the County or City (those locations which are separately maintained). These locations will be corrected in the EMCMS to reflect IDOT District 1 as the Owner, but the Maintainer will remain as the County or City.

PRIVATE LOCATION When used herein refers to locations which are not maintained under the EMC but which are owned or maintained by other agencies or municipalities and are entered, maintained, and kept current in the EMCMS by the Contractor

PS Pump or Pumping Station

PS-SCADA

The standard specifications for the Illinois Department of Transportation, District 1, for Pumping Station Supervisory Control and Data Acquisition System

QA/QC Quality Assurance/Quality Control

RACS IL 38 (Roosevelt Rd) Ramp Access Control System

RAMP When used in context of the REVLAC system, it refers to an entire reversible lane entrance ramp, including, but not limited to, signs, outside gates, barrier, inside gates, and/or the highway pavement that transitions from one roadway element to another. In this Contract, it may also refer to all access control equipment and systems associated with a particular ramp location.

RESPONSE TIME Amount of time from the initial notification to the Contractor until a repair person physically arrives at the location.

REVLAC Reversible Lane Access and Control System for the Kennedy Expressway

ROUTINE MAINTENANCE Refers to all work required to staff, equip, patrol, inspect and maintain/repair electrical systems, whole and operational, at locations as defined herein, covered under and paid through routine maintenance pay items

ROW Right of Way

RUS Rural Utilities Service, USDA

SALVAGE Material/equipment which has been removed from the installed location, inspected for quality, and re-stored in Contract Spare Parts for further use, if directed by the Engineer

SCADA Supervisory Control and Data Acquisition System

SEOC State Emergency Operations Center

SERVICE RESTORATION TIME Amount of time from the initial notification to the Contractor until the time the system is safe and operational. (In cases of motorist caused damage, when the undamaged portions of the system are operational.)

SPECIALTY SERVICE Specialty Service, or Specialty Service Work shall refer to work performed by entities other than the electrical maintenance contractor who may not be prequalified subcontractors but whose services are necessary because of specialized equipment, specialized expertise or the maintenance restrictions on a particular piece of electrical system equipment. Examples of specialty service entities include traffic signal control equipment and cabinet repair, motor repair shops, pump re-build shops, communication and/or electronics repair shops, software programmers/developers, manufacturer's authorized repair agents and similar service providers. Such work is not restricted to in-shop work and such services may be field performed. Such services will not be considered as materials.

STANDARD SPECIFICATIONS

Illinois Department of Transportation's "Standards Specifications for Road and Bridge Construction"

STORM ALERT A communication issued by the IDOT ComCenter, as provided by its weather service. Upon receipt of this report, the EMC Dispatch Center storm alert procedure goes into effect.

SYSTEM When used herein refers to any or all the Electrical Systems covered by this Contract including Lighting System, Pump Station System, Surveillance System, and Traffic Signal System.

SYSTEM ENGINEER When used herein refers to IDOT Engineers in charge of maintenance for a particular electrical system for a designated IDOT Bureau.

SYSTEM TYPE When used herein refers to various types of equipment within the electrical systems

TBD To Be Determined

THIRD PARTY Any entity other than IDOT or the Contractor

TICKET Maintenance documentation record which is used by the Contractor to record various types of malfunctions, failures, damages, knockdowns, vandalism, theft or various other concerns relating to safety matters and/or the reported follow-up response information as necessary to make temporary and/or permanent repairs to restore and/or assure that the system equipment is operating in a normal manner. A ticket consists of various entry screens; dispatch, field response, crew repair follow-up, MCHD repair log, and 3rd party damage information.

TOWER (COMMUNICATIONS) When described herein refers to a 3-legged tower, monopole, pole, or similar structure which supports a telecommunications antenna operated above ground in a fixed location, free-standing, guided, or other building structure.

TRAFFIC SPECIFICATIONS The Illinois Department of Transportation's "Standard Specifications for Traffic Control Items", and "Keeping the Expressway Open to Traffic".

TSC The Illinois Department of Transportation, District 1, Bureau of Traffic, Traffic Systems Center, 445 W. Harrison, Oak Park, IL 60304

TSC SPECIFICATIONS The Illinois Department of Transportation's "Standard Specifications for Traffic Control Items" which includes current design standards for the traffic surveillance system

UPS Uninterruptible Power Supply

WEEK A period of seven (7) consecutive calendar days. Any multiple of this term shall mean a corresponding multiple of number of calendar days.

WORKDAY A normal workday is the 1st eight-hour shift, in a 24 hour day, Monday through Friday, where the Contractor works straight time. Where Articles herein specify workday, this definition applies.

YARD Any District 1 maintenance yard, sign shop, or other field facility

24/7 Refers to operations required twenty-four hours per day, seven days per week.

All definitions in referenced publications and standards shall apply, except as may be modified herein.

SPECIFICATIONS AND STANDARDS. The latest issue, at the bid date, of the following standards, including subsequent additions or revisions made prior to the bid date, shall apply to all work, materials and equipment furnished and installed under this Contract. In case of conflict with any or parts of the standards listed below the Special Provisions contained herein shall take precedence and shall govern. In case of conflict between referenced standards, the most stringent as determined by the Engineer, shall take precedence and shall govern.

ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS
Standard Specifications for Road and Bridge Construction, current version

Note: Article 801.02, Standards of Installation shall apply to all systems under this Contract and is not limited to Lighting.

Design Manual Section 3-600 published on Highway Lighting

Flaggers' Handbook

Highway Standards

Manual on Uniform Traffic Control Devices

Accommodating Utilities on Rights-of-Way of IL. State Highway System

Recurring Special Provisions for Traffic Signals, Road and Bridge

Special Provisions for Special Non-RCRA Waste and RCRA Hazardous Waste Working Conditions

BDE Special Provisions

Standard Specifications for Traffic Control Items

Supplemental Construction Specifications and Recurring Specifications, Current Version

IDOT DISTRICT 1 - STANDARDS AND SPECIFICATIONS

Confined Entry Space Policy

District 1 Highway Standards

Freeway Details Freeway Entrance and Exit Ramp Closure Details TC-8

Traffic Control Details for Freeway Shoulder and Partial Ramp Closures TC-17

Micro Computer Management Manual

Permit Specifications Governing Permit Work on State Right-of-Way

Recurring Traffic Signal Specifications

Recurring Special Provisions for Roadway Lighting

Resident Engineers Construction Guide for Electrical Equipment Construction on State Highways

Standard 2308-4 (Day or Night Moving Operations)

Standard Specifications for Electrical Maintenance Contract Management System

Standard Specifications for the Emergency Data Acquisition System

Standard Specifications Integrated Closed-Loop Traffic Signal Monitoring

Standard Specification for Pump Station Supv. Control/Data Acquisition System

Standards for Roadway Lighting by Permit on State Routes

Standard Traffic Signal Design Details

Traffic Signal Plan Preparation and Design Guide

Traffic Surveillance Special Provisions & Traffic Surveillance Typical Drawings

Keeping the Expressway Open to Traffic

NATIONAL STANDARDS AND SPECIFICATIONS

An Informational Guide for Roadway Lighting, published by American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Washington, DC 20001

Insulated Cable Engineers Assn. and Underwriters Laboratories publications when applicable for cable and other materials

National Electrical Manufacturers Association Standards, American National Standards Institute, where applicable, for signals, lamps, ballasts, and other accessories

American National Standards Institute, where applicable, for ballasts, and other accessories

ASTM Standards for materials

All applicable manuals and policies of FHWA

American National Standard Practice for Roadway Lighting, published by Illuminating Engineering Society of North America, 120 Wall St., 17th Floor, New York, NY 10005, Phone (212-248-5000)

National Electrical Code, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, approved by the American National Standards Institute,

Publication #ANSI/C2, published by IEEE, 345 E. 47th Street, New York, NY 10017

Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, an AASHTO Publication

Institute of Traffic Engineers Technical Report No. 1 (A Standard for Adjustable Face Vehicular Traffic Control Heads)

Emergency Response Guidebook by U.S. Dept. of Transportation, latest version, for further assistance call National Response Center (NRC) 1-800-424-8802

Hazardous Materials Regulations, Hazardous Materials Transportation Uniform Safety Act of 1990, Hazardous Materials Regulations and Motor Carrier Safety Regulating by U.S. Department of Transportation OSHA, all applicable regulations

RUS, all applicable regulations

IMSA Standards & manuals

Federal Communications Commission

ARTICLE 13.0 TICKET CHARTS

The below listed information is provided from data submitted by past Contractor(s) and is provided for information purposes only.

TICKET TYPES FOR EMCMS:

AL	ALARM
CT	CABLE TROUBLE
DA	DAMAGE
EQ	EQUIPMENT MALFUNCTION OR PROBLEM
GB	GENERAL BILLING BY CONTRACTOR TO 3 RD PARTY
ID	IDOT HAS PLACED A "HOLD" ON THE TICKET
LP	LOOP PROBLEM
MC	MOTORIST CAUSED HIGHWAY DAMAGE
MT	MAINTENANCE TRANSFER
OM	OFF MAINTENANCE
OT	MULTIPLE OUTAGES
SO	SINGLE OUTAGE
SR	SERVICE REQUEST
UT	UTILITY PROBLEM
VO	VOID
WA	WORKING UPON ARRIVAL/WORKING AS PROGRAMMED
WP	WATER ON PAVEMENT

TICKET SORT (SUB-GROUPS TO TICKET TYPE ENTRIES IN EMCMS):

Although we have not shown charts with the sort types, the Contractor's Dispatchers need to become familiar with the various Ticket Types for Ticket entry in the EMCMS.

AEG	AEGIS ALARM
AO	ALL OUT
BA	BARRIER (REVLAC)
BLD	BUILDING OR HUT
CAB	CABINET OR CONTROLLER
CAM	CAMERA
CCS	CONTINUOUS COUNT STATION
CE	COM ED
COM	COMCENTER
DIS	OFFICIAL DECLARED DISASTER
DMS	DYNAMIC MESSAGE SIGN
EVP	EMERGENCY VEHICLE PRE-EMPTION
FAC	STATE OWNED FACILITY
FIB	FIBER OPTIC
FLA	FLASHER OR FLASHING BEACON
FR	FLASHING RED
GAS	GAS DETECTOR
GRF	GRAFFITI
GRN	GREEN LIGHT OUT
GT	GATE

INS	INSPECTION
LP	LOOP DAMAGE
MA	MAST ARM
MB	MOVEABLE BRIDGE
MIS	MISCELLANEOUS
MOD	MODEM
NAV	NAVIGATIONAL LIGHTING
NDF	NO DAMAGE FOUND
NT	NO TRANSFER
OFF	OFF-MAINTENANCE TRANSFER
ON	ON-MAINTENANCE TRANSFER
OT	MULTIPLE OUTAGES
OWN	OWNER OR MAINTAINER CHECK
PAR	PARTIAL MAINTENANCE TRANSFER
PED	PED SIGNAL/BUTTON/MODULE
PL	POLE
PM	PREVENTIVE MAINTENANCE PROGRAM
PSY	POWER SUPPLY
PUM	PUMP
RA	REST AREA
RED	RED LIGHT OUT
REM	REMOVE LOCATION
RP	RAMP METERING
RR	ROUTINE WORK
SCA	SCADA
SN	SIGN
SP	SPARE PART TO BE RETURNED
ST	SIGNAL TURN-ON
STD	TS STANDARD
T&C	TWISTED AND CONFLICTING
TEL	TELEMETRY
TM	TIMING
TRR	TRASH RACK
TW	TOWER
UPS	UNINTERRUPTED POWER SUPPLY
WFL	WATER OR FLOOD
WIN	WIND DAMAGE
WS	WEIGH STATION
YEL	YELLOW LIGHT OUT
YRD	MAINTENANCE YARD

MCHD TICKET TOTALS BY SYSTEM – YEARS 2016 THROUGH 2020						
System	2016	2017	2018	2019	2020	5-Year Ave
TS	6417	5946	6509	6428	5473	6155
S	1702	1382	1440	1554	1105	1437
PS	743	605	615	596	475	607
L	1579	1437	1262	1219	1081	1316
Total:	10,441	9,370	9,826	9,797	8,134	9,514

MCHD TICKETS- FOUND ON PATROL – BY YEAR				
System	2018	2019	2020	3 Year Ave
TS	1129	1623	1420	1391
S	324	355	291	323
PS	118	108	95	107
L	278	252	172	234
Total:	1849	2338	1978	2055
Percent of Total Tickets:	19%	24%	24%	-

YEAR 2020 - MCHD TICKETS BY TICKET TYPE					
Ticket Type	Lighting System	PS System	Surveillance System	Traffic Signals System	Totals by Ticket Type
ALARM	-	124	2	-	126
CABLE TROUBLE	12	-	6	62	80
DAMAGE	14	0	2	29	45
EQUIPMENT PROBLEM	356	126	695	2547	3724
GEN BILLING	11	0	7	84	102
IDOT HOLD	1	0	8	0	9
LOOP PROBLEM	-	-	12	208	220
MCHD	455	0	115	503	1073
MAINT. TRANSFER	65	2	71	679	817
OFF MAINT	15	35	18	7	75
MULTI OUTAGE	25	0	8	47	80
SINGLE OUTAGE	38	1	32	492	563
SERVICE REQUEST	10	7	33	52	102
UTILITY PROBLEM	46	154	66	344	610
VOID	7	4	5	31	47
WORK ON ARRIVAL	26	14	25	388	453
WATER ON PAVMT.	-	8	-	-	8
Total:	1,081	475	1,105	5,473	8,134

YEAR 2019 - MCHD TICKETS BY TICKET TYPE					
Ticket Type	Lighting System	PS System	Surveillance System	Traffic Signals System	Totals by Ticket Type
ALARM	-	148	2	-	150
CABLE TROUBLE	32	-	4	156	192
DAMAGE	20	1	7	53	81
EQUIPMENT PROBLEM	474	177	988	3471	5110
GEN BILLING	23	0	8	93	124
IDOT HOLD	0	4	24	0	28
LOOP PROBLEM	-	-	32	275	307
MCHD	395	0	125	571	1091
MAINT. TRANSFER	56	1	23	521	601
OFF MAINT	22	15	7	12	56
MULTI OUTAGE	37	0	9	36	82
SINGLE OUTAGE	48	1	44	357	450
SERVICE REQUEST	26	42	71	68	207
UTILITY PROBLEM	55	183	146	213	597
VOID	6	4	16	61	87
WORK ON ARRIVAL	25	11	48	541	625
WATER ON PAVMT.	-	9	-	-	9
Total:	1,219	596	1,554	6,428	9,797

YEAR 2018 - MCHD TICKETS BY TICKET TYPE					
Ticket Type	Lighting System	PS System	Surveillance System	Traffic Signals System	Totals by Ticket Type
ALARM	-	173	-	-	173
CABLE TROUBLE	31	-	-	119	150
DAMAGE	31	-	8	69	108
EQUIPMENT PROBLEM	464	210	956	3421	5051
GEN BILLING	10	-	6	69	85
IDOT HOLD	4	1	16	6	27
LOOP PROBLEM	-	-	28	278	306
MCHD	394	-	106	551	1051
MAINT. TRANSFER	75	1	83	648	807
OFF MAINT	22	39	5	22	88
MULTI OUTAGE	57	4	5	28	94
SINGLE OUTAGE	58	0	35	334	427
SERVICE REQUEST	31	24	60	81	196
UTILITY PROBLEM	53	143	84	263	543
VOID	12	5	7	68	92
WORK ON ARRIVAL	20	10	41	551	622
WATER ON PAVMT.	-	5	-	1	6
Total:	1262	615	1440	6509	9826



DISTRICT 1 – FORMAL CONTRACT – ELECTRICAL MAINTENANCE

**Contract No. 62M86
Various Counties
Section 2020-213-I**

SECTION 2 – SPECIAL PROVISIONS

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SECTION 2 – SPECIAL PROVISIONS

GENERAL ITEMS

GA01

AERIAL CABLE WITH MESSENGER WIRE

Description. This item consists of furnishing, installing, testing, and connecting aerial electric cable of the size indicated for temporary lighting or service as specified by an Engineer, and as shown on the contract drawings. The cable shall be new, unless otherwise indicated.

The cost of disconnecting and abandoning in place the existing cables feeding underpass, sign, and ramp lighting and reconnecting to the temporary lighting system shall be included in the contract unit price for this item.

The cost of removing the used cable shall be included in the cost of the new cable. The rewiring to facilitate relocation of the cable due to staging or other construction requirements shall be included in the cost of this item.

Materials. Section 818 and 1066 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. The aerial electric cable will be measured in feet in place and will be taken as the length of the messenger wire. Measurement will be made in a straight line between changes in direction and to the centers of light standards and control cabinets. Sag of the aerial cable or vertical cable will not be measured for payment. When the Engineer requests the used temporary cable be replaced with new, the new cable shall be measured for payment. Used aerial cable will not be measured for payment but shall be included in the cost of the item.

Basis of Payment. This item will be paid at the contract unit price per foot for AERIAL CABLE WITH MESSENGER WIRE, 4-1/C up to No. 2 of the size and number of conductors indicated which shall be payment in full for the work described herein.

GC01–GC04

CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE

Description. This item shall consist of furnishing and installing galvanized steel or PVC coated conduit, fittings and accessories attached to structure for roadway or building, as specified herein and as shown on the contract drawings. All conduit splices shall be threaded as directed by the Engineer.

These items shall conform to Sections 1088 and 811 of the Standard Specifications for Road and Bridge Construction, current version, for this pay item, with the following exceptions:

Add the following to Article 811.03(b) of the Standard Specifications: “The personnel installing the PVC coated conduit shall be certified by the conduit manufacturer for installing PVC coated conduit.” Delete the following sentence of the third paragraph of Article 1088.01(a) (3) of the Standard Specifications: “The exterior galvanized surfaces shall be coated with a primer before the PVC coating to ensure a bond between the zinc substrate and the PVC coating.”

Conduit Wall Seals. Conduit wall seals shall be incidental to the conduit specified under this item. Conduit wall seals used in new concrete walls shall consist of a polyvinylchloride (PVC) oversize sleeve with sealing assemblies at both sides of the wall. The sealing assemblies shall be cast iron alloy or malleable iron with pressure rings and neoprene sealing grommets, membrane clamp and they shall be tightened by means of hex-head screws. Each wall seal shall accept multiple conduit sizes. The sealing assemblies' castings shall be hot-dip galvanized.

Conduit wall seals used in cored holes in existing concrete shall consist of an assembly of an oversize outside pressure disc with membrane clamp, a neoprene sealing ring and an interior pressure disc, with the discs tightened by means of not less than three stainless steel socket head cup tightening screws with stainless steel washers. Pressure discs shall be PVC-coated steel.

Installation. These items shall conform to Sections 811 of the Standard Specifications for Road and Bridge Construction, current version, for this pay item, with the following exceptions.

Method of Measurement. Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduit shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Basis of Payment. This work will be paid at the contract unit price per foot of CONDUIT, GALVANIZED STEEL or PVC coated, attached to structure for roadway or building, of the type, diameter, and number of raceways wide by the number of raceways high, which price shall be payment in full for furnishing and installing the galvanized steel conduit and fittings complete.

GC01 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, ¾ TO 2 ½"

GC02 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, 3" to 5"

GC03 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, PVC COATED, ¾" TO 2 ½"

GC04 CONDUIT, GALVANIZED STEEL, ATTACHED TO STRUCTURE, PVC COATED, 3 TO 5"

GC05–GC6 CONDUIT, GALVANIZED STEEL, IN GROUND

Description. This item shall consist of furnishing and installing galvanized steel conduit, fittings and accessories in the ground, either pushed, trenched, plowed, or directionally bored with fittings complete as specified herein and as shown on the contract drawings. All conduit splices shall be solid threaded couplings as directed by the Engineer. Trenching, backfilling, and restoration are incidental to this pay item in accordance with the District 1 Traffic Signal Specifications.

These items shall conform to Sections T420 and T642 of the Traffic Specifications and District 1 Traffic Signal Specifications, except as herein revised. All conduits shall be placed at a depth of thirty inches, except under railroad tracks the conduit shall be a minimum of five feet.

Add the following to Article 811.03 of the Standard Specifications:

“Pavement, driveways, sidewalk, and curbs shall not be removed to install electrical conduits.”

Revise Article 810.04 of the Standard Specifications to read:

“Installation. All underground conduit shall have a minimum depth of 30-inches (700 mm) below the finished grade.”

Add the following to Article 810.04 of the Standard Specifications:

“All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans.”

Add the following to Article 810.04 of the Standard Specifications:

“All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum of 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 coillable 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:

“Coillable non-metallic conduit shall be machine straightened to remove the longitudinal curvature caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 6 mm (0.25”).” The longitudinal axis of the straightened conduit shall not deviate by more than 20 mm per meter (0.25” per foot” from a straight line. The HDPE and straightening mechanism manufacturer operating temperatures shall be followed.

Add the following to Article 811.03 of the Standard Specifications:

“Pavement, driveways, sidewalk, and curbs shall not be removed to install electrical conduits.”

Method of Measurement. Conduit shall be measured for payment in feet in place.

Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduits shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Basis of Payment. This work will be paid at the contract unit price per foot for CONDUIT, GALVANIZED STEEL, IN GROUND of the type, diameter, and number of raceways wide by the number of raceways high, which price shall be payment in full for furnishing and installing the galvanized steel conduit either pushed, trenched, plowed or directionally bored with fittings, complete. Trenching, backfilling and restoration, including removal and replacement of sidewalk are incidental in accordance with the District 1 Traffic Signal Specifications.

GC05 CONDUIT, GALVANIZED STEEL, IN GROUND, ¾ TO 2 ½ INCH

GC06 CONDUIT, GALVANIZED STEEL, IN GROUND, 3 TO 5 INCH

**GC07
CONDUIT, NON-METALLIC, COILLABLE, IN GROUND**

Description. This item shall consist of furnishing and installing coillable non-metallic, fittings and accessories in the ground, either pushed, trenched, or directionally bored with fittings complete as specified herein and as shown on the contract drawings.

Materials. These items shall conform with Sections T420 and T642 of the Traffic Specifications and District 1 Traffic Signal Specifications, except herein revised. All conduit shall be placed at a depth of thirty inches, except under railroad tracks the conduit shall be a minimum of five feet.

Also, these items shall conform to Sections 1088 and 810 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item, with the following exceptions:

The duct shall be a plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The duct and its manufacture shall conform to the standards of NEMA Publication TC7 and ASTM Designation D3485.

The duct shall be made of high-density polyethylene which shall meet the requirements of ASTM Designation D 1248, Type III Class C and the requirements listed in table 2-1 of NEMA TC7. Submittal information shall demonstrate compliance of these requirements.

Duct dimensions shall conform to the standards listed in table 2-2 of NEMA TC7. Submittal information shall demonstrate compliance with these requirements.

As specified in NEMA TC7, the duct shall be clearly and durably marked at least every 10 feet with the material designation (HDPE for High Density Polyethylene), nominal size of the duct and the name and/or trademark of the manufacturer.

Method of Measurement. Conduit shall be measured for payment in feet in place.

Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduits shall be measured for payment. Liquid-tight flexible conduit shall be included in the bid price for conduit attached to structure regardless of size and type.

Coillable nonmetallic conduit installed in excess of the limits described will not be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per foot of CONDUIT, NONMETALLIC, COILLABLE, IN GROUND, 1/2" of the type, diameter, and number of raceways wide by the number of raceways high, which price shall be payment in full for furnishing and installing the conduit in ground, coillable non-metallic either pushed, trenched, or directionally bored with fittings complete. Trench and backfill will be paid for separately except the restoration of ground is incidental to this pay item.

GC08 CONDUIT, REMOVAL

Description. This work shall consist of disconnecting, removing, dismantling, and transferring off the site existing conduit, including connectors and appurtenances as herein specified and as directed by the Engineer. Except as otherwise indicated or directed by the Engineer, the existing conduit shall be deemed not salvageable upon removal and shall then be disposed of off the site.

Construction Requirements. No removal work shall be permitted without approval from the

Engineer. Any damage resulting from the removal and/or transportation of the existing conduit and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer. The Engineer shall be the sole judge to determine the extent of damage.

Method of Measurement. Conduit removal shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduit shall be measured for payment.

Basis of Payment. This item shall be paid at the contract unit price per foot for CONDUIT REMOVAL, including connectors and appurtenances, which shall be payment in full for the work as described herein.

GE01–GE02 ELECTRIC CABLE ASSEMBLY

Description. This item shall consist of furnishing and installing multi-conductor power cable, suitable for direct burial, in conduit or trench, as specified herein, complete with all testing. The cable shall be an assembly of insulated power conductors, plus an insulated ground wire cabled in accordance with UL 1277 with fillers and binder tape, and with a jacket overall. The cable shall be UL Listed for direct burial use and shall be rated 90 degrees C dry and 75 degrees C wet.

Materials. Materials shall be according to Article 1076.01 and 1066.06 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Installation. Section 870 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item, with the following exceptions:

Add the following to Article 870.03 of the Standard Specifications:

“Bored and Pulled. A remotely steerable, fluid cutting tunneling system is to be used to install the cable assembly. The tunneling system shall be electronically detectable and shall line the tunnel with a clay lining as it tunnels. The tunneling system shall be approved by the Engineer prior to its use.”

Method of Measurement. Electric cable assembly, in conduit or trench, shall be measured, per feet.

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

GE01 ELECTRIC CABLE ASSEMBLY, XLP, 3/C NO. 2, 1/C NO. 6 GREEN

GE02 ELECTRIC CABLE ASSEMBLY, XLP, 3/C NO.4, 1/C NO.6 GREEN of the size and number of conductors indicated, which shall be payment in full for furnishing, installing in conduit or trench and testing the cable as specified herein.

GE03–GE05 ELECTRICAL CABLE IN CONDUIT, XLP

Description. This work shall consist of furnishing materials and labor for installation of electric cables in conduit as shown on the contract drawings or as otherwise indicated, complete with all splicing, identification, terminating and testing. Replacing existing cable shall be included in this pay item.

Sections 817 and 1066 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item, with the following exception(s):

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

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

RHH/RHW/USE."

Method of Measurement. The cable shall be measured for payment in feet, in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment. A total of 6 ft. slack shall be allowed for the end of a run terminating at a panel and 4 ft. will similarly be allowed when terminating at a wall-mounted panel. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This item will be paid at the contract unit price per foot for furnish & installation of:

GE03 ELECTRICAL CABLE, XLP, 1/C UP to No. 4

GE04 ELECTRICAL CABLE, XLP, 1/C No. 2 to No.2/0

GE05 ELECTRICAL CABLE, XLP, 1/C No. 3/0 to No. 500 MCM

of the size, number and type of conductors indicated, which shall be payment in full for the work as described herein.

**GE06
ELECTRIC CABLE, PULL OR REMOVE**

Description. This work shall consist of pulling and/or removing an existing electric cable from a conduit.

Method of Measurement. Electric cable in conduit, pull/remove, shall be counted, each, per foot.

Basis of Payment. This work will be paid for at the contract unit price per foot per electrical cable for ELECTRIC CABLE, PULL OR REMOVE, which price shall be payment in full for removing the electric cable complete. If two or more cables in a conduit are to be removed each cable will be measured for payment separately.

**GE07
ELECTRICAL CABLE, THWN**

Description. This work shall consist of furnishing materials and labor for installation of electric cables in conduit as specified herein and indicated by the Engineer, complete with all splicing, identification, terminating and testing.

Materials. All cables shall be U.L. listed as Type THHN or THWN per Standard 83, rated for 600 volts, 90 degrees C. dry and 75 degrees C. wet. They shall be suitable for installation in wet and dry locations, expose to the weather, and shall be resistant to oils and chemicals. It shall conform to the Federal Specification J-C-30B. The U.L. listing mark, cable voltage, insulation type and ratings, as well as the cable size shall all be clearly printed on the cable in a color contrasting with the insulation color. Conductors shall be annealed uncoated copper per UL Standard 83 or 1063 and unless otherwise indicated, shall be Class B or Class C stranded. Conductors used for general building lighting and receptacle circuits may be solid.

Each cable shall be insulated with Polyvinyl Chloride (PVC) and sheathed with nylon complying with requirements of UL Standard 83 for Types THHN or THWN. The minimum thickness at any point, of the PVC insulation, shall be not less than 90 % of the specified average thickness.

Unless otherwise indicated, cable shall be solid full color coded via insulation color. Unless specifically approved by the Engineer, color coding of neutral and ground wires shall be by means of colored insulation, except where bare ground wires are indicated.

Branch circuit from panelboards, for lighting, receptacles and similar loads shall be color coded by mean of colored wire insulation. Colors shall be as selected by the Contractor, but a sufficient number of colors shall be used such that wiring in common enclosures is clearly differentiated and color combinations or runs are generally not repeated. Care shall be taken in the phasing of combined-neutral circuit runs. Switched legs shall be differentiated from un-switched legs of a circuit.

Wiring shall be color coded by means of colored wire insulation as follows:

“line”: black

neutral: white

ground: green

others: color coded using a repeating color format as approved by the Engineer. Signal cable conductor insulation shall be color coded.

Quality Control. Submittal information shall include demonstration of compliance with all specified requirements. All cables shall be new, having been manufactured within the 18 months preceding the date of delivery to the site. All cables shall be delivered to the site in full reels. Cable on the reels shall be protected from damage during shipment and handling by wood lagging or other means acceptable to the Engineer. Reels shall be tagged or otherwise identified to show the UL listing.

Installation. Wired and cables shall be carefully installed to avoid damage to insulation and cable jackets as applicable. Wire lubricant shall be used when pulling wires into conduits. The lubricant shall be no-injurious to conduits, conductors, insulations or jackets and the lubricant shall be UL listed. Each run of cable shall have sufficient slack. Where a number of wires are trained through a box, manhole or handhole, they shall be bundled using appropriate cable ties and supported to minimize pressure or strain on cable insulation. Wire and cable shall not be bent to a radius less than the manufacturer’s recommended bending radius, either in permanent placement or during installation. Cable pulling apparatus shall have no sharp edges or protrusions which could damage cables or raceways.

Wire splices will not be allowed on an SCADA system signal or control wiring. All splices must be approved by the Engineer. Splices and terminations, as required, shall be incidental to this item and shall be in conformance with Basic Materials and Methods, elsewhere herein.

All wiring shall be tagged with pre-printed, self-sticking, wrap or heat-shrink type wire markers or other markers approved by the Engineer. Handwritten wire markers are not acceptable. The tagging shall be applied at each termination and splice. The tagging shall include the full circuit and wire designation. Markers shall be permanent, of a size recommended by the manufacturer for the respective wire size and shall be applied as recommended by the marker manufacturer. All wiring shall be terminated as indicated by the Engineer.

Testing. After installation, the cable shall be tested as approved by the Engineer. Cable failing to pass the test shall be replaced with new cable at no additional cost.

Method of Measurement. The cable shall be measured for payment in feet in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment.

A total of six (6) feet slack shall be allowed for the end of a run terminating at a panel and four (4) feet will similarly be allowed when terminating at a wall-mounted panel. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This work shall be paid at the Contract unit price per foot installed ELECTRICAL CABLE, THWN, 1/C from No. 14 to No. 8 of the size and type indicated, which shall be payment in full for the work as described herein.

**GEC1
ETHERNET CABLE, OUTSIDE PLANT CAT 5e**

Description. This item shall consist of furnishing and installing an Outside Plant Category 5e Ethernet cable as described herein and as indicated in the Plans.

Material/Cable Construction.

Pair Count:	4
Conductor:	Solid annealed copper
AWG (mm):	24 (0.51)
Filling Compound:	PFM™ thixotropic gel
Insulation:	Solid polyolefin
Shield/Armor:	Electrically continuous 0.008 in (0.20 mm) polymer coated smooth aluminum tape, applied with an overlap
Dry Water Block:	SAP powder
Jacket:	Black, sunlight and weather resistant polyethylene
Characteristic Impedance Ohms:	100 ± 15
Nominal Velocity of Propagation % :	65
Performance Compliance:	ANSI/TIA-568-C.2 ANSI/ICEA S-107-704-2006 RoHS-compliant

REACH-compliant

The Outside Plant Category 5e Ethernet cable shall be equal to or exceed Superior Essex BBDNe Outside Plant Category 5e Ethernet cable.

Method of Measurement. Outside Plant Category 5e Ethernet 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.

Basis of Payment. This work will be paid for at the contract unit price per foot for Ethernet Cable, Outside Plant, Category 5e Ethernet cable as specified. Payment shall not be made until the cable is installed, spliced, and tested in compliance with these special provisions.

GF01

FIBER OPTIC TRUNK/DISTRIBUTION LATERAL CABLE UP TO 96 SM

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 uncabled 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_{cct})			(nm)	< 1260
Zero Dispersion Wavelength (λ_0)			(nm)	1302 ≤ λ_0 ≤ 1322
Zero Dispersion Slope (S_0)			(ps/(nm ² •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-swellaable yarn for water-blocking protection. The water-swellaable 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 swellaable yarn(s) shall be applied longitudinally along the central member during stranding.

Two polyester yarn binders shall be applied contra helically 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 swellaable tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The water swellaable 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 swellaable tape shall be applied longitudinally over both the inner and outer layer. The water swellaable tape shall be non-nutritive to fungus, electrically nonconductive, 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 at least 4.4 Nm (in accordance with ICEA S87-640)", 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 $\leq 60\%$ 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 $\leq 20\%$ 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 $+60^{\circ}\text{C}$. 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
- Forklift-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 or SC 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.

The 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.

Aerial Fiber Optic Cable. Aerial fiber optic cable assemblies shall be of a self-supporting figure-8 design. The fiber optic cable shall be as described herein and shall be water blocked utilizing water-swellaable materials. The cable assembly shall be designed and manufactured to facilitate midspan access.

The submittal information must include a copy of the standard installation instructions for the proposed cable. Installed cable sag shall not exceed 1% of the span distance. The submittal information must also include catalog cuts for all hardware to be utilized in the installation.

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 shall be provided. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices
- Final copies of all approved test procedures
- Complete performance data of the cable plant showing the losses at each splice location and each terminal connector
- Complete parts list including names of vendors

Testing Requirements. The Contractor shall submit detailed test procedures for approval by the Engineer. All fibers (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 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
- Operator Name
- Date & Time
- Fiber ID, including tube and fiber color
- Wavelength
- Pulse width (OTDR)
- Refractory index (OTDR)
- 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- 196CORE 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.	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: 0.5 dB/km at both 1310 and 1550 nm.

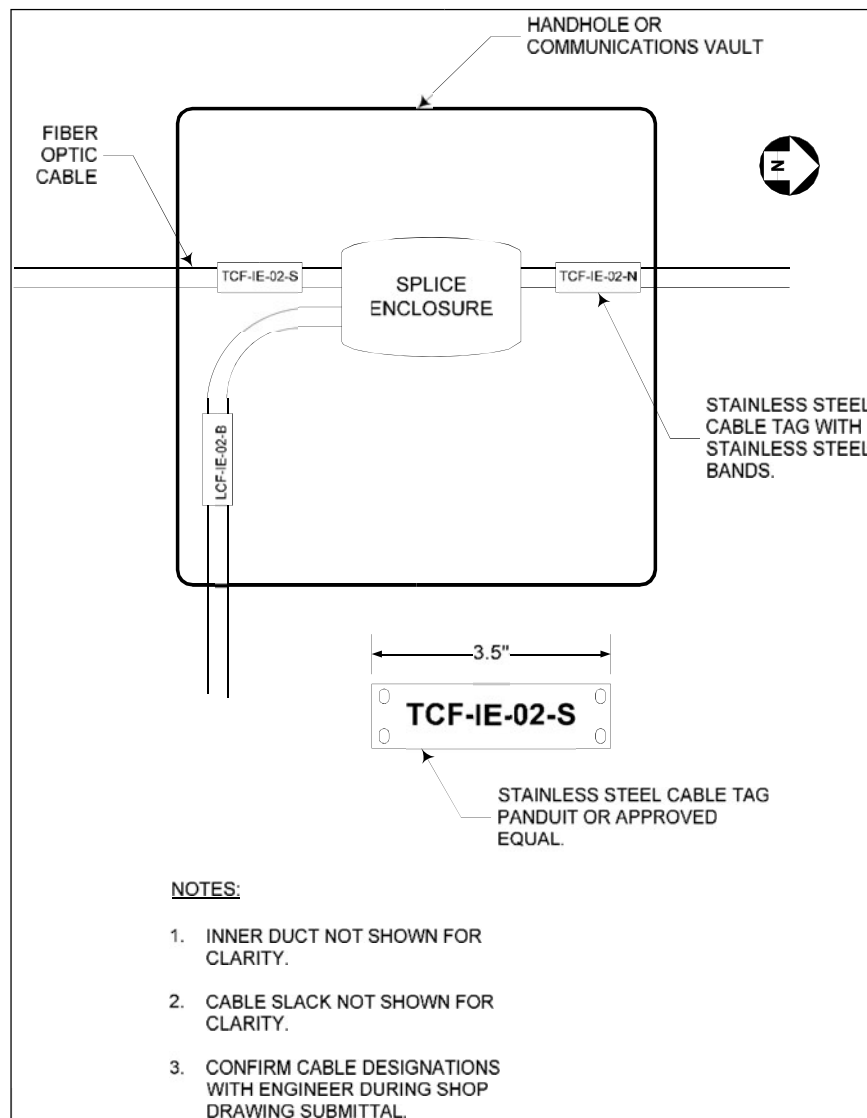
If the total loss exceeds these specifications, the Contractor shall replace or repair the cable run at the no additional cost to the state, both labor and materials. Elevated attenuation due to exceeding the pulling tension, or any other installation operation, during installation shall require the 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 deadend at a handhole, communications vault, interconnect cabinet, or any other type of enclosure, shall be dead ended in a splice enclosure.

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 splice location, above or below ground. Fiber optic cable slack shall be 50 feet for each cable at access points, above or below ground, where splicing is not 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.

Fiber optic cable shall be tagged inside handholes with yellow tape containing the text: "CAUTION - FIBER OPTIC CABLE." In addition, permanent tags, as approved by the engineer, shall be attached to all cable in a hand hole or other break-out environment. These tags shall be stainless steel, nominally 0.75" by 1.72", and permanently embossed. These tags shall be attached with stainless steel straps, and shall identify the cable number, the number of fibers, and the specific fiber count. Tags and straps shall be Panduit or approved equal. 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 TRUNK/DISTRIBUTION LATERAL CABLE UP TO 96 SM 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.

**GF02
FIBER OPTIC CABLE, HYBRID 12 MM AND 24 SM**

Description. This work shall conform with Section 871 of the Standard Specification for Road and Bridge Construction and District Traffic Signal Specifications as directed by the Signal Engineer.

Method of Measurement. The Fiber Optic Cable, Hybrid 12 MM and 24 SM, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. This work will be paid for at the contract unit price per foot for Fiber Optic Hybrid 62.5/125 multimode (MM) 12 fiber and single mode 24 fiber, which price shall include furnishing and installing the fiber optic cable, necessary slack, cable termination and testing, distribution, enclosures, breakout kits, connectors, lashing wire, messenger wire, splices, pigtail assemblies and all other materials, hardware, and labor necessary to complete the installation as directed by the Signal Engineer. The single mode fiber shall comply with the requirements in GF01. In addition to traffic signal use, this item may also be used at pumping stations and other highway systems.

GF03 FIBER OPTIC TERMINATION PANEL, 12F OR 24F

Description. Work under this item shall consist of furnishing and installing a fiber optic termination panel, type and size as specified on the plans and described herein. This equipment will be used to link field equipment using single-mode fiber optic cable.

Materials. The fiber optic termination panel shall provide storage, protection, and termination of optical fibers. The units shall be compact, stackable, and built in splice trays with routing guides. The termination panel shall be made of a durable metal and suitable for building entrance. The termination panel shall be mountable in multiple configurations including wall and DIN rail applications. Each Termination panel shall be provided with factory terminated and tested single mode pigtail ST or SC adaptors. The Fiber optic termination panel shall be equal to or exceed Corning Single-Panel Housing (SPH). The factory terminated ST or SC adaptors shall be equal to or exceed Corning Closet Connector Housing (CCH) Panel, pigtailed, ST or SC Connectors

Construction Requirements. The Fiber Optic Termination Panel shall be installed in the Traffic Signal, surveillance cabinets or pump stations as specified on the Plans. The panels shall come with cable strain relief hardware and pull out label for administrative documentation. All work shall be neat and in a workmanlike manner. Care shall be taken as to not crush or kink the fiber optic cable. If in the opinion of the engineer the cable has been crushed or kinked, the entire cable span shall be removed and replaced at the Contractor's expense.

Method of Measurement. The fiber optic termination panel, 12 F or 24F, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. Fiber Optic Termination Panel, 12F or 24F will be paid for at the Contract unit price each. This price shall be payment for furnishing and installing the Fiber Optic Termination Panel, 12F or 24F along

with any necessary fiber optic patch cords and any other materials, hardware, and labor necessary to complete the installation.

GF04 FIBER OPTIC PATCH PANEL 96 SM

Description. This item shall consist of furnishing and installing a 96 port, ST or SC style, rack or wall mounted, patch panel for single mode fiber. The hardware shall include label holders, numbered ports, front and rear cable management rings.

Splicing shall be as described in GF01.

Materials. The Fiber Optic patch panel shall be rack or wall mounted complete with strain relief, routing clips, guides, and mounting brackets for proper installation. Each Fiber Optic Patch panel shall be provided with factory terminated and tested single mode pigtail ST or SC adaptors. Each Fiber Optic patch panel shall be equipped with enough splice trays that provide positive holding and retention of the splice/heat shrink, fiber loop retention, and additional strain relief to secure the buffer tubers for the entire cable assembly being terminated. The rack mounted Fiber optic patch panels shall be equal to or exceed Corning Closet Connector housing (CCH) panel that holds up to 12 CCH pigtailed ST or SC single mode Connectors. The wall mount fiber optic patch panel shall be equal to or exceed Corning Classic Wall-Mountable Connector Housing (WCHCLSSC-12P).

Method of Measurement. The fiber optic patch panel, 96 SM, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

Basis of Payment. The work will be paid for at the Contract unit price each for Fiber Optic Patch Panel 96 SM, which shall be payment in full for furnishing, delivering, installing, trimming, and organizing fiber optic cable and testing, supplying optical pigtails and patch cords and all other materials and labor necessary to complete the installation

GF05 FIBER OPTIC SPLICE ENCLOSURE

Description. Work under this item shall consist of furnishing and installing a Fiber Optic Splice Enclosure as described herein.

Fiber Optic Splice

The Contractor shall splice optical fibers from different cable sheaths and protect them with a splice closure at the locations shown on the Plans. Fiber splicing consists of in- line fusion splices for all fibers described in the cable plan at the splice location.

Materials

Splice Closures

Splice Closures shall be designed for use under the most severe conditions such as moisture, vibration, impact, cable stress and flex temperature extremes as demonstrated by successfully passing the factory test procedures and minimum specifications listed below:

Physical Requirement

The closure shall provide ingress for up to four cables in a butt configuration. The closure shall prevent the intrusion of water without the use of encapsulates.

The closure shall be capable of accommodating splice organizer trays that accept mechanical or fusion splices. The splice closure shall have provisions for storing fiber splices in an orderly manner, mountings for splice organizer assemblies, and space for excess or un-spliced fiber. Splice organizers shall be re-enterable. The splice case shall be UL rated.

Closure re-entry and subsequent reassembly shall not require specialized tools or equipment. Further, these operations shall not require the use of additional parts.

The splice closure shall have provisions for controlling the bend radius of individual fibers to a minimum of 38 mm (1.5 in.).

Factory Testing

Compression Test

The closure shall not deform more than 10% in its largest cross-sectional dimension when subjected to a uniformly distributed load of 1335 N at temperature of -18° and 38°C (0 and 100° F). The test shall be performed after stabilizing at the required temperature for a minimum of two hours. It shall consist of placing an assembled closure between two flat parallel surfaces with the longest closure dimension parallel to the surfaces. The weight shall be placed on the upper surface for a minimum of 15 minutes. The measurement shall then be taken with weight in place.

Impact Test

The assembled closure shall be capable of withstanding an impact of 28 N-M at temperatures of -18° and 38°C (0 and 100° F). The test shall be performed after stabilizing the closure at the required temperature for a minimum of 2 hours. The test fixture shall consist of 9 kg (20 lb) cylindrical steel impacting head with a 50 mm (2in) spherical radius at the point where it contacts the closure. It shall be dropped from a height of 305 mm (12 in.) The closure shall not exhibit any cracks or fractures to the housing that would preclude it from passing the water immersion test. There shall be no permanent deformation to the original diameter or characteristic vertical dimension by more than 5%.

Cable Gripping and Sealing Testing

The cable gripping and sealing hardware shall not cause an increase in fiber attenuation in excess of 0.05 dB/fiber at 1550 nm when attached to the cables and the closure assembly. The test shall consist of measurements from six fibers, one from each buffer tube or channel, or randomly selected in the case of a single fiber bundle. The measurements shall be taken from the test fibers before and after assembly to determine the effects of the cable gripping and sealing hardware on the optical transmission of the fibers.

Vibration Test

The splice organizers shall securely hold the fiber splices and store the excess fiber. The fiber splice organizers and splice retaining hardware shall be tested per EIA Standard FOTP-II, Test Condition 1. The individual fibers shall not show an increase in attenuation in excess of 0.1 dB/fiber.

Water Immersion Test

The closure shall be capable of preventing a 3 m (10 ft) water head from intruding into the splice compartment for a period of 7 days. Testing of the splice closure is to be accomplished by the placing of the closure into a pressure vessel and filling the vessel with tap water to cover the closure. Apply continuous pressure to the vessel to maintain a hydrostatic head equivalent 3 meters (10 ft.) on the closure and cable. This process shall be continued for 30 days. Remove the closure and open to check for the presence of water. Any intrusion of water in the compartment containing the splices constitutes a failure.

Certification

It is the responsibility of the Contractor to ensure 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.

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.

As directed by the Engineer, the Contractor (at no additional cost to the Department) shall replace any cable splice not satisfying the cable splice requirements set forth in the fiber optic cable spec GF01.

The Contractor shall secure the Splice Closure to the side of the splice facility using cable support brackets. All cables shall be properly dressed and secured to rails or racks within the manhole. No cables or enclosures will be permitted to be on the floor of the splice facility. Cables that are spliced inside a building will be secured to the equipment racks or walls as appropriate and indicated on the Plans.

Method of Measurement. The fiber optic splice enclosure, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools, and equipment to install, test, and make the location operational.

Basis of Payment. The work will be paid for at the contract unit price for Fiber Optic Splice Enclosure, which shall be payment in full for furnishing, delivering, installing, trimming, and organizing the fiber optic splice, testing, and all other materials and labor necessary to complete the installation.

GF06

FIBER OPTIC INNERDUCT, UP TO 1 ½"

Description. This item shall consist of furnishing, installing, splicing, connecting, and demonstrating continuity of fiber optic cable innerduct of sizes specified herein and as shown on the contract drawings. The innerduct shall be High Density Polyethylene.

Materials.

General.

The duct shall be a spiral ribbed plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The ribbed duct shall have internally designed longitudinal ribs for reduced pulling frictions and increased lubrication effectiveness

The duct shall be made of high-density polyethylene which shall meet the requirements of ASTM D 3035. The innerduct material shall be composed of high-density polyethylene meeting the requirements of PE334470E/C as defined in ASTM D3350.

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

Duct dimensions shall conform to the standards listed in ASTM D3035, SDR-11. Submittal information shall demonstrate compliance with these requirements.

Nominal Size (Diameter)	Inside Diameter (minimum)	Outside Diameter (Average)	Wall Thickness (Min.)	Bend Radius (minimum)	Pull Strength	Weight Average (lbs/100ft.)
1"	1.030"	1.315"	0.120"	14"	500	19
1.25"	1.313"	1.660"	0.151"	17"	750	31
1.5"	1.506"	1.900"	0.173"	19"	1000	40

Marking

As specified in NEMA Standard Publication No. TC-7, the duct shall be clearly and durably marked at least every 10 feet with the material designation (HDPE for high density polyethylene), nominal size of the duct, and the name and/or trademark of the manufacturer.

Color. **Orange**

Fiber Optic Trunk Cable

(Ducts containing cables of 96 fibers)

Blue

Fiber Optic Trunk Cable

(Ducts containing cables of 12,6, or 4 fibers and 96 fiber ducts designated as distribution fibers)

Innerduct shall be colored as directed by the Engineer.

Installation.

Pulling Tension

Pulling tension of the duct shall be monitored throughout the pull and pulling tension shall not exceed those listed in the table or the specific manufacturer maximum pulling tensions as indicated in the catalog cut submittals. Failure to monitor the pulling tension will result in non-payment of that particular duct span and the span may be reinstalled with new duct at no additional cost to the State. Lubricants used shall be compatible with the duct.

Junction boxes

Where duct passes through junction and/or pull boxes, the duct shall remain continuous unless a break is specifically indicated in the plans or as directed by the Engineer.

Handholes and Communications Vaults

Where duct passes through handholes or vaults, the duct shall be looped uncut within the handhole unless otherwise indicated on the Plans or directed by the Engineer.

Bends

Minimum bending radius shall be in accordance with the above table or the manufacturer's recommended radius, whichever is larger. Bends shall be made so that the duct will not be damaged, and the internal diameter of the duct will not be effectively reduced. The degrees of bend in one duct run shall not exceed 360° between termination points.

In Trench

Where duct is installed in trench, it shall be placed in the bottom of the trench after all loose stones have been removed and all protruding stones have been removed or covered with backfill material as directed by the Engineer.

Where duct is shown to be installed in trench, it shall be installed at a depth not less than 30 inches unless otherwise indicated or specifically directed by the Engineer.

The inner duct may be plowed into place. Unless otherwise indicated or specifically approved by the Engineer, plowing of inner duct shall lay the duct in place and shall not pull the duct through the length of the cut behind a bullet-nose mandrel or similar apparatus. In all cases, plowing operations shall be non-injurious to the duct.

In Raceway

Where duct is installed in raceways, lubricating compounds shall be used where necessary to assure smooth installation.

Encased in Concrete

Concrete shall be class SI complying with Section 720 of the Standard Specifications.

Steel Reinforcement Bars. Steel reinforcement bars shall comply with Section 706.10 of the Standard Specifications.

Underground concrete-encased conduit shall be supported on interlocking plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common duct bank shall be not less than 2 inches. The interlocking spacers shall be used at a minimum interval of 8 ft.

Concrete cover overall shall not be less than 3 inches all around the encased run. Space below the conduit, and concrete fill shall be assured. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. Concrete shall be deflected during placement to minimize the possible damage to or movement of the conduits.

Conduit encased in concrete shall have steel reinforcing where installed below roadway or other paved vehicle areas (including shoulder) and the reinforcement shall extend not less than 5 feet additional from the edge of pavement unless otherwise indicated. Steel reinforcement shall not be less than No. 4 bars at corners and otherwise spaced on 12-inch centers, tied with No. 4 bars on 12-inch centers.

The Engineer shall examine all conduit joints for compliance with section 5 of this specification before concrete is poured.

Embedded

Conduit embedded in structure shall be supported on interlocking plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common structure shall be not less than 2 inches. The interlocking spacers shall be used at a minimum interval of 8 ft.

Concrete cover overall shall not be less than 3 inches all around the embedded run. Space below the conduit, and concrete fill shall be assured. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. Concrete shall be deflected during placement to minimize the possible damage to or movement of the conduits.

The Engineer shall examine all conduit joints for compliance with section 5 of this specification before concrete is poured.

Joints

All HDPE duct to HDPE duct joints shall be made with an approved duct fusion splicing device.

HDPE coilable non-metallic conduit to non-HDPE coilable non-metallic conduit joints shall be either made with an approved mechanical connector or with a chemical compound. Both methods must be specifically designed for joining HDPE coilable non-metallic conduit. Minimum pullout force for the chemical compound shall be as listed in the following table.

Nominal Size		Pullout Force	
mm	in	N	Lbs
31.75	1.25	2400	540
38.1	1.50	2535	570
50.8	2.0	3335	750
63.5	2.5	4445	1,000
76.2	3.0	6225	1,400
101.6	4.0	8890	2,000

Measurement. The duct shall be measured for payment in linear feet in place as described herein. Measurements shall be made in straight lines between horizontal changes in direction between the centers of the terminating points (poles, cabinets, junction boxes). Vertical measurement of the duct shall be as follows:

For runs terminating at junction boxes and/or control cabinets, the vertical measurement shall be taken from the bottom of the trench, or horizontal raceway, to a point 18-inches beyond the center of the junction box or control cabinet.

For runs terminating at poles, the vertical measure shall be taken from the bottom of the trench, or horizontal raceway, to a point 18-inch beyond the center of the light pole handhole regardless of light pole mounting method.

Innerduct installed in excess of the limits described herein shall not be paid for.

Basis of Payment. This item will be paid for at the contract unit price per foot installed for FIBER OPTIC INNERDUCT, UP TO 1 1/2", of the size of duct as indicated, which shall be payment in full for all material and work as specified herein.

GF07
FIBER OPTIC CABLE, INSTALL ONLY

Description. This item shall consist of retrieving from the owner's storage facility, installing, and testing a single mode fiber optic cable of the type, size, and number of fibers specified, at the locations shown in the plans. Splicing, testing, splice closures, documentation and all other miscellaneous equipment to make a complete and operational system shall be as described in GF01, termination and or patch panels, shall be as described in GF04 or GF05, fiber optic splice closure shall be as described in GF06.

Pre-Installation Testing at the Owners' Storage Facility. An optical domain reflectometer (OTDR) shall be used to evaluate the length and quality of cable reels prior to their use on the project. Testing shall be done as described in GF01. Cable which does not meet the requirements set forth in GF01 shall not be installed on the project. It is the Contractor's responsibility to ensure that the fiber is suitable for installation. If cable which does not meet GF01 and is installed, the Contractor shall remove said cable at this/her own expense. Contractor shall make the Engineer aware of the cable which does not meet the Specification. The Engineer will assign an alternate reel or length of cable for installation on the project. The Contractor will be responsible for testing all cable assigned for install under this pay item. The Contractor shall not be entitled to extra compensation for testing multiple cable reels or cable lengths.

Method of Measurement. The fiber optic cable shall be measured for payment at the contract unit price per foot which cost shall include the cost of furnishing all labor, materials, documentation, tools, and equipment to install, test, and make the location operational.

Basis of Payment. The installation of fiber optic cable shall be measured in feet of cable installed between controllers. This work will be paid for at the contract unit price per foot for Fiber Optic Cable Install Only of the type, size, and number of conductors specified, which price shall include retrieving, loading, transporting, installing, and all necessary slack to connect between controllers. Patch panels, inner duct, termination panels, and splice closures shall be paid for separately.

GFR1
FOUNDATION, CONCRETE, TYPE 1

Description. Concrete foundations shall be constructed to support ITS equipment cabinets (Type 1 foundations) at locations as indicated on the Plans. This work shall include installing any necessary hardware (entering conduits, bolts, anchor rods, grounding, etc.) as shown on the Plans. This work shall also include any topsoil, fertilizing, seeding, and mulching of the distributed areas in accordance with Sections 211, 250, and 251 of the Standard Specifications.

Materials. Type 1 concrete foundations shall be according to materials defined in Article 835.02 of Section 836 of the Standard Specifications. All anchor bolts shall be in accordance with Section 1006.09 of the Standard Specifications except that all anchor bolts shall be hot dipped galvanized full length of the anchor bolt including the hooks. Anchor bolts shall provide bolt spacing as shown in the Plans and as required by the cabinet manufacturer.

The Type 1 concrete foundations shall also be fabricated in accordance with Section 1070 of the Standard Specifications. These concrete foundations shall be fabricated from material new and unused in any previous application. The manufacturer shall provide a Certificate of Compliance that the materials are new and meet the specified requirements in accordance with the Standard Specifications and as shown on the Plans.

Construction Requirements. The Engineer will determine the final placement of the Type 1 concrete foundations. Type 1 concrete foundation dimensions shall be in accordance with those dimensions shown in

the Plans on the detail sheet "Concrete Foundation Type 1 (Model 334 Cabinet) Detail". The foundation shall be located as required in order to avoid existing and relocated utilities. The top of the foundation shall be finished level. Shimming of the appurtenance to be attached will not be permitted.

Prior to pouring the foundation, the Contractor shall check the Plans for the specific number, size, and direction of conduit entrances required at the given location. All conduits in the foundation shall be installed rigidly in place before concrete is deposited in the form. Bushings shall be provided at the ends of the conduit. Anchor rods and ground rod shall be set in place before the concrete is deposited by means of a template constructed to space the anchor rods according to the pattern of the bolt holes in the base of the appurtenance to be attached. The appurtenances shall not be erected on the foundation until the bases have cured for at least (7) days. The Concrete shall cure according to Article 1020.13 of the Standard Specifications.

Method of Measurement. Concrete foundations shall be measured for payment, in feet of the concrete foundation in-place installed in accordance with the total length of concrete foundation required for Type 1 foundations as indicated on the Plans and as directed by the Engineer. Extra foundation depth, beyond the directive of the Engineer, will not be measured for payment.

Basis of Payment. Payment will be paid for at the Contract unit price, per foot of FOUNDATION, CONCRETE, TYPE 1, of the diameter and length indicated. The price shall include payment in full for all necessary excavation, backfilling, disposal of unsuitable material form work, furnishing, installing, and testing all materials (entering conduits, bolts, anchor rods, grounding, etc.) within the limits of the foundation. Any topsoil, fertilizing, seeding, and mulching of the distributed areas as well as all associated labor is to be included in this Contract unit price.

GFR2 FOUNDATION REMOVAL

Description. This item shall consist of removing a metal foundation or concrete foundation to a level at least three feet below the adjacent grade, disposing of the foundation outside the right-of-way, backfilling the excavated areas with approved material and reconstructing the surface to match the adjoining area. If the concrete foundation is in the sidewalk area, the entire sidewalk square or squares where the concrete foundation is located shall be replaced with new sidewalk. This item shall conform to Section 444 of the Traffic Specifications and as required by the Engineer.

General. Concrete foundations shall be removed to at least 2 ft. below grade with removed material disposed of off the site. The metal foundations shall be removed completely from the ground. The removal shall extend deeper where required to facilitate roadway construction at no additional cost. Underground conduits and cables shall be separated from the foundation at 2-1/2 ft. below grade and shall be abandoned or re-used as indicated.

The space caused by the removal of the foundations shall be backfilled with trench backfill in accordance with Section 208 of the Standard Specifications.

The removal of an existing concrete foundation shall meet the requirements of Section T444 of the Traffic Specifications.

The removal of a concrete foundation three feet or less in depth below grade shall be removed completely and disposed of outside of the right-of-way. A concrete foundation greater than three feet in depth shall have the first three feet below grade removed and disposed of outside of the right-of-way.

The area where the foundations have been removed shall be backfilled and restored to meet the existing grade and terrain.

Basis of Payment. This item shall be paid at the contract unit price each for FOUNDATION REMOVAL, which shall be payment in full for the removal and disposal of a foundation as specified herein.

GGR1 GROUND ROD

Description. This item shall consist of furnishing, installing, and connecting ground rods for the grounding of service neutral conductors and for supplementing the equipment grounding system via connection at poles or other equipment throughout the system. All materials and work shall be in accordance with Article 250 of the NEC.

Articles 806, and 1087.01 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item.

For Traffic Signal Applications, the District 1 Traffic Signal Specifications and the District 1 Standard Traffic Signal Design details shall apply to this item.

Materials. Materials shall be according to the following Articles of Section 1000 - Materials

	<u>Item</u>	<u>Articles/Section</u>
(a)	Ground Rod	1087.01
(b)	Copper Ground Wire	1066.02

Installation. All connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation.

Ground rods shall be driven so that the tops of the rod are 24 inches below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections. Where indicated, ground rods shall be installed through concrete foundations. Where ground conditions, such as rock, preclude the installation of the ground rod, the ground rod may be deleted with the approval of the Engineer.

Where a ground field of electrodes is provided, such as at control cabinets, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings.

Ground rod connection shall be made by exothermic welds. Ground wire for connection to foundation steel or as otherwise indicated shall be stranded uncoated bare copper in accordance the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG. Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate the exothermic weld.

Method of Measurement. Ground rods shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a GROUND ROD, which shall be payment in full for furnishing and installing the materials and work specified herein.

GH01–GH04

HANDHOLE

Description. This item shall consist of furnishing and installing a handhole at the location shown on the plans or as diverted by the Engineer.

Material. Materials shall be according to Section 814 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item. The outside cover shall contain a legend "IDOT TSC", or "IDOT TRAFFIC", or "IDOT LIGHTING" as directed by the engineer.

Installation. The installation of a handhole shall meet the requirements of Section T428 of the Traffic Specifications, except as follows: All concrete handholes are to be cast in place against undisturbed earth. No precast concrete handholes will be accepted. All conduits will enter the handhole at a depth of 30 in. except for the conduits between the curb and first handhole for detector loops when the handhole is less than 5 ft. from the detector loop.

Basis of Payment. This work will be paid for at the contract unit price each for:

GH01 HANDHOLE

GH02 HANDHOLE, FIBER OPTIC

GH03 HANDHOLE, HEAVY-DUTY

GH04 HANDHOLE, HEAVY-DUTY, DOUBLE

which price shall be payment in full for all necessary excavating, backfilling, disposal of unsuitable materials, and furnishing all materials within the limits of the handhole.

GH05

HANDHOLE, HEAVY DUTY, SPECIAL

Description. This item shall consist of constructing a heavy-duty handhole, special extra-large cast in place, complete with heavy duty frame and cover and in accordance with the following requirements and conforming in all respects to the lines, grades, and dimensions shown on the plans or as directed by the Engineer. All handholes shall be installed in accordance with the Standard Specifications for Road and Bridge Section 814 and TSC Typical TY-1TSC-400#15.

Materials. All materials shall conform to Section 1088.05 and 1088.06 of the Standard Specifications for Road and Bridge. All handholes shall be constructed of Class S1 concrete meeting the requirements of the Standard Specifications for Road and Bridge construction Article 1020.

Construction Details. Handhole of the type specified shall be constructed in accordance with the details shown on the plans and conform to the following requirements:

Concrete. Concrete construction shall be done in accordance with the provisions of Concrete for Structures and incidental Construction contained in the Standard Specifications for Road and Bridge Construction, Section 503

Placing Castings. Castings shall be set accurately to the finished elevation so that no subsequent adjustment will be necessary. Castings shall be set flush with a sidewalk or pavement surface. When installed in an earth shoulder away from the pavement edge, the top surface of the casting shall be 25.4 mm (1 inch) above the finished surface of the ground.

Backfilling. Any backfilling necessary under a pavement, shoulder, and sidewalk or within 60 cm (2 feet) of the pavement edge shall be made with sand or stone screenings.

Forming. Forms will be required for the inside face of the handhole wall, and across all trenches leading into the handholes excavation. The ends of conduits leading into the handhole shall fit into a conduit bell which shall fit tightly against the inside form and the concrete shall be carefully placed around it to prevent leakage. Handhole walls shall be 10 inches.

French Drain. A French drain conforming to the dimensions shown on the plans shall be constructed in the bottom of the handhole excavation.

Steel Hooks. Each handhole shall be provided with four galvanized steel hooks of appropriate size, one on each wall of the handhole.

Frame and Cover. The outside of the cover shall contain a Type "G" handle for lifting and a legend "IDOT" "TSC" cast in. Frame shall be HD F&C 184 Kg (405 lbs.) **Hinges.** Type "T" hinges required only on heavy duty special only.

Cleaning. The handhole shall be thoroughly cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

Basis of Payment. This work will be paid at the contract unit price each for a HANDHOLE, HEAVY DUTY, SPECIAL, which price shall be payment in full for all necessary excavating, backfilling, disposal of surplus material and form work, frame and cover, and furnishing all materials within the outside limits of the handhole.

GH06 HANDHOLE, REMOVE

Description. This work shall consist of removing the frame and cover of an existing handhole, breaking off the top section of the handhole wall to a minimum depth of 6 inch below the surrounding grade, or as specified, disposing of the concrete debris outside the right-of-way, backfilling the hole with approved material, reconstructing the surface to match the adjoining area, and disposing of the frame and cover as directed by the Engineer. If the handhole is located in the sidewalk area, the entire sidewalk square or squares where the handhole is located shall be replaced with new sidewalk per applicable contract pay items.

Method of Measurement. Remove handhole shall be counted, each.

Basis of Payment. This work will be paid for at the contract unit price each for HANDHOLE, REMOVE which price shall be payment in full for all labor and materials necessary to complete the work as described herein.

GH07 HANDHOLE, REBUILD

Description. This item shall consist of rebuilding and bringing to grade a handhole at a location shown on the plans or as directed by the Engineer.

General. The work shall consist of removing the handhole frame and cover and the wall of the handhole to a depth of 203.2 mm (8 in.) below the finished grade. Upon completion, four (4) holes, 101.6 mm (4 in.) in depth and, 12.7 mm (1/2 in.) in diameter, shall be drilled into remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, 203.2 mm (8 in.) in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy. All concrete debris shall be removed from State right-of-way to a location approved by the Engineer. The area adjacent to each side of the handhole shall be excavated to allow forming. All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt

handhole according to applicable portions of Section 814 of the Standard Specification for Road and Bridge Construction. (The existing frame and cover shall be replaced if it was damaged during removal or as determined by the Engineer.)

Method of Measurement. Each handhole, which is rebuilt, shall be counted as a unit of payment.

Basis of Payment. This work will be paid for at the contract unit price each for HANDHOLE, REBUILD, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

GHO8 HANDHOLE, REBUILD EXISTING TO HEAVY-DUTY TYPE

Description. This item shall consist of partial removal of an existing concrete traffic single handhole, reconstruction to the specifications of heavy duty handhole including new frame and cover, at location(s) shown in the plans or as directed by the Engineer.

General. The work shall consist of removing the existing handhole frame and cover and the wall of the handhole to a depth of 381 mm (15 in.) below the finished grade. Upon completion, four (4) holes, 101.6 mm (4 in.) in depth and, 12.7 mm (1/2 in.) in diameter, shall be drilled into the top of the remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, 203.2 mm (8 in.) in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy. All concrete debris shall be removed from State right-of-way to a location approved by the Engineer. Any pavement or asphalt surface removal required to install the new concrete shall have straight and neat edges using a method approved by the Engineer. Care shall be taken to protect the existing traffic signal cable. Any cable damage shall be reported immediately and repaired as directed by the Area System Engineer.

All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt heavy duty handhole according to applicable portions of Section 814 of the Standard Specification for Road and Bridge Construction.

Method of Measurement. Each existing handhole, which is partially removed and reconstructed to a heavy-duty handhole, complete, shall be counted as a unit payment.

Basis of Payment. This work will be paid for at the contract unit price each for HANDHOLE, REBUILD EXISTING HANDHOLE TO HEAVY-DUTY TYPE, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

GIG1 INSPECTION, STANDBY GENERATOR

Description. The Contractor shall furnish a factory trained service representative to complete a comprehensive generator inspection, as specified herein, at designated locations.

Locations. This work shall be applicable to all generators and shall not be limited to generators at the Pump Stations, Base Stations, Traffic Systems Center (TSC), Fiber Huts, Moveable Bridges and two (2) in Contract Spare Parts.

Work Description. The inspection shall consist of, but not limited to the following items, which are described on form GIG1.

- Cooling System
- Fuel System
- Air Induction and Exhaust System
- Lube Oil System
- Starting System
- Engine Monitors and Safety Controls
- Generator Accessories
- Control Panel
- Gas Engine
- Megometer Test
- Load Bank Test
- Switch Gear Inspection

Method of Measurement. Each inspection that is completed according to form GIG1 and the inspection report submitted and approved by the Engineer shall be counted as unit for payment.

Basis of Payment. This item shall be paid at the contract unit price, each, for INSPECTION, STANDBY GENERATOR, which shall be payment in full for the work described herein.

GJ01 JUNCTION BOX AND ALL APPURTENANCES, REMOVE

Description. This work shall consist of completely removing an existing junction box and all appurtenances, being careful not to damage those existing conduits which will be re-used in the system. In case of an existing conduit being damaged, a new conduit will be furnished in place. The repair work will not be paid for separately but will be incidental to this bid item. The junction box and cover will be disposed of as directed by the Engineer and all debris removed beyond the right-of-way.

Method of Measurement. Each junction box, which is removed including all appurtenances, shall be counted as a unit of payment.

Basis of Payment. This work will be paid for at the contract unit price each for JUNCTION BOX AND ALL APPURTENANCES, REMOVE, which price shall be payment in full for all labor and material necessary to complete the work as described above.

GJ02–GJ03 JUNCTION BOX, STAINLESS STEEL

Description. This item shall consist of furnishing and installing a stainless-steel junction or pull box of the size indicated in locations shown on the contract drawings and as directed by the Engineer. It is not intended to use for installation of fixture.

Section 813 and 1088 of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item with the following exceptions: Revise the second sentence of the third paragraph of Article 1088.04 of the Standard Specifications to read: "The gasket shall be extruded directly onto the junction box cover."

Basis of Payment. This work shall be paid for at the contract unit price each for:
GJ02 JUNCTION BOX, STAINLESS STEEL, UP TO 6 INCH DEPTH
GJ03 JUNCTION BOX, STAINLESS STEEL, 10 INCH DEPTH

of the size indicated, which shall be payment in full for the work as described herein.

GLH1-GLH5 LABOR HOURS

Description. This item shall consist of providing a fixed hourly rate of labor for qualified personnel to perform work within District 1 on any system at any location as approved by the Engineer. Bid price hourly rate must be inclusive of all overhead, profit, travel time and all other costs not specified herein. Hours of work shall only be counted for actual work performed at the site as requested by the engineer. The hourly rate shall include the equipment and test instruments to perform work. The Contractor shall submit a fixed hourly rate that will be utilized for any project or work under this Contract.

GLH1: Union Certified Electrician/Journeyman or equivalent to troubleshoot, repair, remove or install electrical equipment in accordance with NEC 2017.

GLH2: IT Support to troubleshoot, modify, program, and upgrade the I-NET, EMCMS, network, and other IT based technologies services that have been specified herein for the applicable equipment.

GLH3: Maintenance Helper or equivalent must be proficient in MS Office Suite, must perform work of entering or importing data into spreadsheets and databases, and scanning documentation, also may assist a Journeyman Electrician and or Foreman on major projects or independently performs routine electrical work including, but not limited to replacing outlets, switches, and ballasts; removing and replacing light fixtures; and repairs of minor electrical equipment and systems.

GLH4: Foreman must be a certified electrician with a minimum of 5 years' experience as Electrician and 3 years as Foreman in a lead role who oversees planning and implementation of large electrical projects leading skilled Electricians in the installation, alteration, maintenance, and repair of electrical systems and equipment.

Method of Measurement. The measurement for payment in Hour increments shall be made for labor performed as directed and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This item will be paid at the contract unit price per Hour for:

GLH1 Certified Electrician/Journeyman
GLH2 IT Support
GLH3 Maintenance Helper
GLH4 Foreman

GPV1 PAVEMENT SEALCOATING

Description. The Contractor shall patch where necessary and seal coat the pavement, within the fenced areas, at each building, hut, and structure once per year in April, per the following specifications. The Engineer's decision shall be final as to the determination of which application and products are utilized.

Preparation. Pavement surface oils shall be removed by washing with an applicable detergent and brushing and/or pressure wash cleaning. All dirt, gravel, leaves, etc., must be removed from the pavement and the pavement must be completely dry, prior to crack sealing and seal coating.

Installation. The Contractor (or Specialty Vendor as approved by the Engineer) shall furnish and install two (2) coats of an appropriate sealcoat coal tar emulsion sealer. The product must meet or exceed both the Air Force and Federal R-P 355e GSA-FSS and the American Society for Testing and Material Specification D-3320-74T specifications. All manufacturers' mix specifications are to be followed as the proper amounts of washed silica sand provide added traction and longevity to the seal finish. A sealer latex enhancer shall be added to increase the longevity and color of the finish. The sealer shall be transported in steel hydraulically agitated tanks to ensure the application of a consistent and uniform mixture at the work site. The seal coating shall be applied at a temperature above 50 degrees F. with a spray device or drag broom assembly, but a uniform distribution is required.

The first seal coat shall be allowed to dry not less than four (4) hours but no more than six (6) hours before the second coat of seal coat is applied. The pavement shall be roped or taped off, so no traffic uses the pavement for twenty-four (24) hours after the second coat of seal coat is applied.

The Contractor (or Specialty Vendor as approved by the Engineer) shall furnish and install crack sealant where necessary. Only hot (350 F.) pour rubberized commercial parking lot crack sealant, similar or better than "Flex-A-Fill" shall be used.

Basis of Pavement. This item shall be paid at the contract unit price per square yard for PAVEMENT SEALCOATING, .12 gallons of seal per square yard for the first coat and .06 gallons per square yard for the second coat of seal coating for ASMC pavement.

GR01 ELECTRICAL OUTLET, GFCI TYPE

Description. This item shall consist of furnishing and installing a ground fault interrupter, (GFCI) with an indicator visual or audible, and all required hardware as specified herein. All required hardware is incidental to this pay item, however, the circuit breaker for the GFI outlet, shall be paid under a separate pay item.

Materials. The box and cover shall be made from heavy-duty die cast aluminum, 0.094 in. thick for damp or wet locations and shall be in compliance with the NEC Article 406-8(B). The box shall be UL listed and comply with Federal Spec. W-C586C. The ground fault interrupter shall be of specification grade, NEMA 3 configuration and comply with applicable UL, CSA and Federal Standards. The cover shall be UL listed for wet locations and comply with UL Standard 514. The GFCI shall have a light indicator when it is energized. The GFCI receptacle shall have an end of life provision when it is incapable of passing its internal test function (can no longer provide ground fault protection), it will either render itself incapable of delivering power, or indicate by visual or audible means that the device must be replaced. The GFCI shall be capable of reverse line-load mis-wire so that it will deny power to the receptacle face if it is mis-wired.

Transportation. The Contractor shall transport, handle and store (as applicable) the GFI outlets in complete conformance with the manufacturer's recommendations.

Installation. Each GFCI shall be mounted as indicated on the contract drawing or as directed by the Engineer. The installation shall be complete with necessary cable (paid under separate pay item) and connected to the applicable feeder circuit. The circuit breaker shall be labeled for the appropriate GFI.

Method of Measurement. A ground fault interrupter (GFI), shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing an ELECTRICAL OUTLET, GFCI TYPE which shall be payment in full for the item specified herein.

GR02
CONVENIENCE RECEPTACLE, 20 AMP

Description. Furnish and install convenience receptacles, 20A, Voltage as specified by the Engineer for Maintenance yards, Sign Shops and other Department facilities in District 1, as directed by the Engineer. Installation shall include all hardware, junction box, and other appurtenances. Removal of the existing receptacle, if necessary, shall be included in this work. Conduit and wire installation shall be paid through other pay items, where needed.

Method of Measurement. Electrical convenience receptacle, 20 Amp, shall be counted, each, furnished and installed.

Basis of Payment. This work shall be paid at the contract unit price each for CONVENIENCE RECEPTACLE, 20 Amp, which price shall be payment in full for furnishing, delivering storing, installing and connecting the receptacle complete.

GR03
RECEPTACLE, FOR WELDING, 3 POLE, 60 AMP, FURNISH AND INSTALL

Description. Furnish and install welding receptacle and mating plug, 60 Amp, 3 Poles, 208 Volts, complete with interlocked fusible disconnect switch, at the Maintenance Yards, Sign Shops and other Department facilities in District 1, as directed by the Engineer.

Installation. The installation shall include all hardware, junction box and other appurtenances. Removal of the existing receptacle and plug, if necessary, shall be included in this work. Conduit and wire installation shall be paid through other pay items, where needed.

Method of Measurement. Welding Receptacle and mating plug of the amperage and number of poles specified, furnished, and installed shall be counted, each.

Basis of Payment. This work shall be paid for at the contract unit price each for RECEPTACLE, FOR WELDING, 3 POLE, 60 AMP, FURNISH AND INSTALL, of the rating and number of poles specified by the Engineer, which price shall be payment in full for furnishing, delivering, storing, installing and connecting the receptacle, complete.

GRB1
RADIO TOWER BEACON RELAMP

Description. This item shall consist of furnishing the parts, labor, and equipment to restore flashing beacon light and group relamp the remaining lights at that elevation on a District 1 communication microwave tower, within 24 hours of notification, as specified herein by the Engineer.

General. The District 1 has radio towers that have flashing beacon lights manufactured by Honeywell or an equivalent, for lighting and other obstructions to aerial navigation as specified by the FAA, FCC. The optical system is designed to provide a definite 360 degrees horizontal beam. The beacon must be used with a beacon flasher or tower lighting control installed inside the control room to achieve the proper flash rate. The beacon light has either a mechanical flashers, immune to AM tower RF frequencies, or an electronic lighting controls to flash several lights on tower, including a photocell for automatic day/ night operation.

Outage. Normally the State's Radio Tower contract will replace outages, however, this pay item will be used in cases where the Engineer requests special outage replacement.

The patrolman shall inspect the beacon light to isolate any problem by checking breaker, flasher circuit and associated controls.

The defective lamp and the remaining lamps on the same level shall be replaced within 24 hours of notification to restore the beacon lighting of the tower. If it needs a new or different flashing control board, the Contractor should order the part by overnight delivery or furnish temporary lighting to restore beacon lighting within 24 hours at no extra cost to this pay item.

Method of Measurement. Microwave tower flashing beacon light restored, and group relamp of remaining lights at that elevation, shall be counted, each.

Basis of Payment. This work shall be paid at the contract unit price each for a RADIO TOWER BEACON RELAMP, which price shall be payment in full for furnishing parts, labor and equipment to restore a beacon light and relamp the remaining lights at that elevation, as specified herein.

GRM1

ROUTINE MAINTENANCE ADDITIONAL LOCATION

Description. *This pay item provides a monthly payment for each additional location of equipment maintained, each month, (maintained on-maintenance on the last day of the month) that exceeds the 5025 locations of equipment as listed for bidding in the Schedule of Prices, plus the 500 Planned Locations.*

Method of Measurement. *The Contractor shall provide the Engineer monthly, an Excel spreadsheet with quantities by county by System, and EMCMS Routine Maintenance Quantity Report which shows total number of all locations maintained by System each month.*

Basis of Payment *The work shall be paid at the Contract unit price, each, for ROUTINE MAINTENANCE ADDITIONAL LOCATION, maintained on the last day of each month, in a calendar year, which exceeds 5525 equipment locations maintained by the Contractor per month, which shall be payment in full for completing the work as described herein.*

GSD1

SIDEWALK, REMOVE AND REPLACE

Description. This work consists of the removal and disposal of existing sidewalk and the construction of new sidewalk at locations shown on the plans, in accordance with Sections 424 and 440 of the Standard Specifications for Road and Bridge Construction and as directed by the Engineer.

Method of Measurement. Sidewalk removal and replacement shall be measured for payment in place and the area computed in square feet.

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Basis of Payment. This work will be paid for at the contract unit price per square feet for SIDEWALK, REMOVE AND REPLACE, which price includes all labor, material and equipment necessary to remove and dispose of the existing sidewalk and to construct the new sidewalk as specified herein.

GTC1–GTC2 TRAFFIC CONTROL

Description. This item of work shall include furnishing, installing, maintaining, replacing, relocating, and removing all traffic control devices used for the purpose of regulating, warning, or directing traffic on Expressway during special maintenance or special construction activities throughout this Contract (since most traffic control is paid through routine maintenance).

The Engineer shall determine when this pay item is used. The Contractor shall contact the District One Bureau of Traffic in advance of beginning work as specified herein.

Basis of Payment. This work will be paid for at the contract unit price per each for
GTC1 SINGLE LANE TRAFFIC CONTROL
GTC2 TWO LANE TRAFFIC CONTROL

of the closure type indicated, which price shall be payment in full for all labor to install, maintain, replace, relocate, and remove all traffic control devices as directed by the Engineer.

Delays to the Contractor caused by complying with these requirements will be considered incidental to the item for traffic control and no additional compensation will be allowed for daytime or nighttime closures (or for traffic lanes or ramp closure) on the expressway.

GU01–GU03 UNIDUCT WITH XLP INSULATED CABLES

Description. This item shall consist of furnishing, installing splicing, connecting, and testing of electric cable in unit duct with warning tape of sizes specified herein and as shown on the contract drawings. The unit duct shall be an assembly of insulated conductors, which are factory preinstalled in a continuous flexible plastic duct. Article 810.04 shall apply for unit duct and warning tape installation.

The unit duct shall be manufactured and installed in accordance with NEC Article 354.

As stated in NEC Article 354.12, the unit duct shall not be used in exposed locations, and inside buildings except for termination purposes, and in hazardous (classified) locations.

Section 816 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. The unit duct will be measured for payment in feet in place. Measurements will be made in straight lines between changes in direction and to the centers of equipment and boxes access points. 10 feet will be allowed when terminating cable at a controller. Three feet of slack will be allowed at light pole, handholes, pull boxes, junction boxes, and similar locations.

All vertical unit duct will be measured for payment. The vertical distance required for breakaway devices, barrier walls, concrete pedestals, etc., and the depth of any burial will be measured. Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

Basis of Payment. This item will be paid at the contract unit price per linear feet for:
GU01 UNIDUCT, WITH XLP INSULATED CABLES, 3/C NO.6 & 1/C NO.8 GREEN, 1”
GU02 UNIDUCT, WITH XLP INSULATED CABLES, 3/C NO.4 & 1/C NO.6 GREEN, 1 ¼”
GU03 UNIDUCT, WITH XLP INSULATED CABLES, 3/C NO.2 & 1/C NO.6 GREEN, 1 ½”
of the size of duct as indicated, which shall be payment in full for all material and work as specified herein.

Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

**GVB1
BUDGETARY ALLOWANCE FOR ELECTRICAL MAINTENANCE**

Description. This item is to establish a budget account to allocate funds for the payment of repairs and replacement of electrical equipment or work on electrical systems, including the EMCMS, which at the time of bidding is not identifiable.

Work will be applicable to equipment at locations covered in this contract and maintained as specified herein. This item establishes a budget account to allocate funds for the payment of various types of vendor work/repair or replacement services.

The total estimated amount of the annual expenses for services performed which will be paid under this Contract, is \$200,000 as indicated for Pay Item GVB1. For bidding purposes this amount shall be used.

LIGHTING SYSTEM ITEMS

LA01

ARM, OR TWIN ARM WITH LUMINAIRE, INSTALL ONLY

Description. This item shall consist of retrieving from EMC storage facility, loading, and installing, one or two mast arms or twin arm with luminaires(s) and associated hardware on one light pole, as specified herein, at locations designated by the Engineer. Furnished arm(s) and/or luminaire(s) shall be paid separately.

Installation. Installation shall be in accordance with Article 830 of the Standard Specifications for Road and Bridge Construction, Current version.

The mast arm or arms shall be set at right angles to the centerline of the pavement, unless otherwise shown on the plan.

Each arm shall be mounted as indicated and as required for the permanent installation, or temporary lighting on wood pole installation.

This item shall be coordinated with the applicable luminaire (with pole wire and fusing), foundation and anchor bolts, breakaway device (if applicable) which shall be provided under separate pay items, as applicable.

The installation shall be complete with pole wire, fusing and connection to the applicable lighting feeder circuits, all incidentals to this item.

Arms shall not be installed until luminaires are available for installation, which shall be at the same time the pole is installed. This item shall not be paid unless the coordinated assembly of the pole and luminaire is installed, complete.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Arm, or twin arm, with luminaire(s), on light pole, shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for ARM, OR TWIN ARM WITH LUMINAIRE, INSTALL ONLY, which shall be payment in full for installing the item as specified herein.

LA02

MAST ARM, OR TWIN MAST ARM

Description. This item shall consist of furnishing and installing, new, one or two mast arms or twin arm with luminaires(s) and associated hardware on one light pole, as specified herein, at locations designated by the Engineer.

Installation. Installation shall be in accordance with Article 830 of the Standard Specifications for Road and Bridge Construction, Current version.

The mast arm or arms shall be set at right angles to the centerline of the pavement, unless otherwise shown on the plan.

Each arm shall be mounted as indicated and as required for the permanent installation, or temporary lighting on wood pole installation.

This item shall be coordinated with the applicable luminaire (with pole wire and fusing), foundation and anchor bolts, breakaway device (if applicable) which shall be provided under separate pay items, as applicable.

The installation shall be complete with pole wire, fusing and connection to the applicable lighting feeder circuits, all incidentals to this item.

Arms shall not be installed until luminaires are available for installation, which shall be at the same time the pole is installed. This item shall not be paid unless the coordinated assembly of the pole and luminaire is installed, complete.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Arm, or twin arm, with luminaire(s), on light pole, shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for ARM, OR TWIN ARM WITH LUMINAIRE, which shall be payment in full for installing the item as specified herein.

LB01 BREAKAWAY DEVICE, T-BASE

Description. This item shall consist of furnishing and installing a breakaway device, transformer base, height specified, for standard, davit, or painted davit light pole, with all associated hardware, as specified herein.

This item shall also include replacement of the old-style breakaway coupling to a T-Base Type.

The existing breakaway coupling and other appurtenances shall be removed and any necessary modifications made to the foundation such as grinding down the concrete to expose more of the anchor bolts is part of this pay item.

Materials. Materials shall be according to Article 1070.04 of the Standard Specifications for Road and Bridge Construction, Current version, except that certification shall be submitted from the supplier that the device used under the conditions of the particular design meets the 1985 AASHTO breakaway specification.

Breakaway device and transformer base information submitted for approval shall include any recommendations of the Manufacturer for storage as provided under this contract.

The packaging of the breakaway devices, transformer bases, shall incorporate the provisions recommended by the Manufacturer to accommodate storage.

Revise the second sentence of Article 1070.04(a)(1) of the Standard Specifications to read:

“Certification shall be submitted from the supplier that the device used under the conditions of the particular design meets the 1985 AASHTO breakaway specification.”

The breakaway device, transformer base for a painted davit light pole is normally installed on the Kennedy Expressway at Power Center C & D. The height, top and bottom bolt circle as specified on the plan submitted shall be used as part of this pay item.

MATERIALS FOR PAINTED DAVIT LIGHT POLES ONLY:

Preparation. Components shall receive a mild etch solvent cleaning.

Primer. Components shall receive two (2) coats of epoxy primer. The primer shall be a polyamide white epoxy primer with a corrosion inhibitor having a solid content, by volume, of not less than 65% (+/3%). Each coat shall be applied in a 3-5 dry MIL thickness.

Finish Coat. Components shall receive one finish coat of aliphatic urethane enamel having a solid content, by volume, of not less than 58% (+/3%). The finish coat shall have a dry MIL thickness of 1.5-2.5 mils. The color of the finish paint shall match that of the existing State-owned davit poles which is Benjamin Moore Iron Clad Bronzitone No. 16360. A sample of the proposed paint color shall be submitted for approval to the Engineer.

General. The cleaning and finish work shall be performed indoors, under conditions of controlled temperature, humidity, and dust in full conformance with the paint manufacturer's recommendations, and in the presence of an authorized representative of the paint manufacturer.

The paint manufacturer shall certify, in writing that the preparation and finishing of the breakaway transformer base housings has been done properly and in conformance with the Manufacturer's recommendations, and will furnish this certification, together with its standard warranty in triplicate, when the finishing is complete.

A certification from the paint manufacturer, attesting the intent to witness the finishing operation and to provide the above-referenced certification together with a copy of the paint manufacturer's standard warranty shall be included with the pole submittal information.

Installation. Installation shall be in accordance with Section 838 of the Standard Specification for Road and Bridge Construction, Current version.

Manufacturer's recommendations shall be followed during the installation process.

Add the following to Article 838.03(a) of the Standard Specifications:

"All nuts, bolts, washers, and lock washers required for the installation of the transformer base to the pole shall be included as a part of this item."

When changing from the old-style break away devices to a t-base style the anchor rods may not be exposed long enough to engage the mounting nuts properly, the top of the concrete foundation shall need to be grounded down to expose enough anchor rod for the mounting nuts to engage properly, this work shall be incidental to the pay item.

Method of Measurement. Breakaway device, transformer base of the height, top and bottom bolt circle diameter specified for standard, davit, or painted davit light pole, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for BREAKAWAY DEVICE, T-BASE, FURNISH AND INSTALL, with all associated hardware, of the bolt circle and height as specified, which shall be payment in full for furnishing the item as specified herein.

LBB1 BREAKER, BRANCH 20A TO 70A

Description. This item shall consist of furnishing and installing a circuit breaker, regular or GFI type, of the amperage and number of poles specified, with all associated hardware, for overload and short circuit protection for conductors and connected apparatus, as specified herein, as shown on the plans, (where applicable), or as directed by the Engineer.

General Requirements. All feeders, branch circuits, and auxiliary and control circuits shall have overcurrent and short circuit protection for conductors and connected apparatus. Unless otherwise indicated, the overcurrent protection shall be by means of circuit breakers.

Material. Unless otherwise indicated, circuit breakers shall be standard UL-listed molded case, thermal-magnetic bolt-on type circuit breakers with trip-free indicating handles.

Unless otherwise indicated, circuit breakers shall have a UL-listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated circuit voltage for which the breaker is applied. All breakers shall be equipped with auxiliary dry contacts. These contacts may be on the breaker body or off a breaker-attached device. Contacts shall be in a normally open configuration.

Installation. The branch breaker shall be installed into the panel in accordance with the manufacturer's recommendation and in accordance with the National Electrical Code, as indicated on the plan drawing (if applicable) or as directed by the Engineer. All the connections shall be tight to prevent any arcing. The branch breaker shall be labeled to indicate circuits. The auxiliary contact switch, if used, shall be wired as directed by the Engineer.

Method of Measurement. Breaker, branch, shall be counted, each, as a unit of payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a BREAKER, BRANCH, 20A to 70A, of the amperage and number of poles specified, which shall be payment in full to provide an installation, complete and operating.

LBB2 BREAKER, MAIN 80A TO 250A

Description. This item shall consist of removing (if upgrading), furnishing, and installing a main breaker, amperage and number poles as per plan or specified for overload and short circuit protection for conductors and connected apparatus as specified herein. All feeders, branch circuits, auxiliary, and control circuits shall have overcurrent and short circuit protection for conductors and connected apparatus. Unless otherwise indicated, the overcurrent protection shall be by means of circuit breakers.

Material. Unless otherwise indicated, main breakers shall be standard UL-listed molded case, for reverse feed applications, thermal-magnetic bolt-on type circuit breakers with trip-free indicating handles. Unless otherwise indicated, main breakers shall have a UL-489 interrupting rating of not less than 35,000 rms symmetrical amperes at 480 volts and 65,000 rms symmetrical amperes at 240 Volts. Multi-pole main breakers larger than 100 amps size shall have instantaneous adjustable magnetic trip settings. The main breaker shall be equipped with auxiliary contacts

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition. No removal work shall be permitted without approval from the Engineer. Any damage resulting from the removal and/or transportation of the main breaker shall be repaired, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. Unless otherwise indicated, power wiring shall be of the size specified for the corresponding service conductors and shall be rated RHH/RHW, 600 volts and tagged with the self-sticking cable markers. The labor and material to make the appropriate terminal connections in the cabinet as directed by the Engineer shall be incidental to this pay item.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load. The main lugs shall be secured in line with Underwriters' Laboratories standards to prevent lugs from turning or loosening when incoming cables are installed. The current carrying parts shall be secured in place to prevent flexing and loosening or damage during and after installation. At the branch circuit, breakers and associated wiring shall be labeled to identify the location of equipment and/or loads used. The auxiliary contact switch, if used, shall be wired as directed by the Engineer.

Method of Measurement. Main breaker shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for BREAKER, MAIN 80A to 250A, which shall be payment in full for furnishing and installing a main breaker as shown on the plan and as specified herein, with all related hardware necessary to provide a complete installation.

LBT1 BUCK-BOOST TRANSFORMER

Description. This item shall consist of furnishing and installing a single-phase buck-boost transformer of KVA specified complete with all the appurtenances and all required hardware, connecting cables and terminal connections as specified herein and as directed by the Engineer. The unit(s) may be installed on a sign structure or on a bridge structure or in a lighting control cabinet or at a location specified by the Engineer. Units are single-phase but can be installed as a three-phase bank.

General Requirements. The buck-boost transformer is used as an auto-transformer for slight upward (boost) or downward (buck) adjustments in voltage. Buck-boost transformers are encapsulated designs with totally enclosed, non-ventilated enclosures. In an auto-transformer, the primary and secondary are electrically and mechanically connected together. Autotransformers can be used only where local electrical codes permit and isolation of the two circuits are not required.

Material. The transformers shall be UL listed and/or CSA approved to meet or exceed all applicable NEMA, ANSI, UL, OSHA, and CSA requirements. The enclosure shall be NEMA 3R suitable for indoor/outdoor applications, coated with a UL approved ASA-61 gray finish. The transformer shall be encapsulated with electrical grade epoxy and silica sand to completely seal the core and coil from moisture and contaminants. It shall be tested in accordance with the latest issue of UL 506 and CSA C22.2 No. 47. The conductor material shall be copper, and the insulation shall be rated for class 180 degrees Celsius.

Installation. Unless otherwise indicated, power wiring shall be of the size specified for the corresponding service conductors and shall be rated RHH/RHW, 600 volts and tagged with the self-sticking cable markers. The labor and material to make the appropriate terminal connections in a junction box as directed by the engineer shall be incidental to this pay item.

The manufacturer's recommendations shall be followed in the installation. The wiring connections shall be made in accordance with the National Electric Code. The Contractor should energize the system to assure that all the components are working in accordance with their specifications and carrying rated load. The Contractor shall provide the electrical data as specified and directed by the Engineer.

Method of Measurement. Buck-Boost transformer shall be counted, each, as specified, furnished, and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a single-phase BUCK-BOOST TRANSFORMER, of the KVA specified, which shall be payment in full for furnishing all labor, materials and equipment to install the transformer(s) and related appurtenances necessary to provide a complete and operational installation.

LC01 CONTROLLER, DUPLEX CONSOLE, WITH RADIO

Description. This item shall consist of furnishing and installing a roadway lighting controller, duplex console type with radio control and associated wiring for control of highway lighting and delivering to storage a lighting controller, as specified herein. All work shall be according to the Article 7 – Lighting System in Section 1 and Standard Specification for Road and Bridges Construction.

Method of Measurement. Each lighting controller, duplex console type, with radio control, inspected and approved by the Engineer, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, DUPLEX CONSOLE TYPE, WITH RADIO, which shall be payment in full for furnishing and installing the lighting controller, complete, as specified herein.

LC02 CONTROLLER, DUPLEX CONSOLE, WITHOUT RADIO

Description. This item shall consist of furnishing and installing a roadway lighting controller, duplex console type, without radio control, including associated wiring, for the control of highway lighting, as specified herein. All work shall be according to the Article 7 – Lighting System in Section 1.

Method of Measurement. Lighting controller, duplex console type, without radio, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, DUPLEX CONSOLE, WITHOUT RADIO CONTROL, which shall be payment in full for furnishing and installing the lighting controller, complete, as specified herein.

LC03 CONTROLLER, LIGHTING, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage facility, loading, transporting, and installing a lighting controller complete with all the appurtenances and all required hardware as specified herein, at locations designated by the Engineer. The lighting controller and foundation shall be paid

separately. The Contractor shall transport, handle and store (as applicable) the lighting controller in complete conformance with the manufacturer's recommendations and as directed by the Engineer.

Installation. The lighting controller shall be installed as shown on the contract plans or as directed by the Engineer. The installation work shall be in accordance with Section 825 of the Standard Specifications for Road and Bridge Construction, current version, except the foundation will be paid separately.

Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall energize the lighting controller to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Lighting controller shall be counted of the type specified, each, installed.

Basis of Payment. This item will be paid at the contract unit price each for CONTROLLER, LIGHTING, INSTALL ONLY, of the type specified, which shall be payment in full for the complete installation as specified herein.

LC04 CONTROLLER, LIGHTING, REMOVE AND SALVAGE

Description. This item shall consist of disconnecting, completely removing, transporting to the State's storage facility, unloading as salvage and stacking or boxing if necessary, and all types of existing lighting controller or designated components thereof, as specified herein. Proper documentation of the State's salvage is required in this pay item.

General. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size, and condition.

No removal work shall be permitted without approval from the Engineer. Direct buried underground electric cables need not be removed. Cables which are abandoned shall be cut one foot below ground level. Cables in unit duct shall be removed from the duct, or as designated by the Engineer. Duct shall be abandoned and cut one foot below ground level.

Except as otherwise indicated, the cabinet, control equipment, and all associated hardware and appurtenances shall remain the property of the Department and shall be delivered to the State's storage facility as directed by the Engineer.

Unless otherwise directed by the Engineer, the concrete foundation shall be removed to at least two feet below grade and disposed of off the job site. The underground conduits and cables shall be separated from the foundation at 2.5 feet below grade and abandoned. The space caused by the removal shall be backfilled with trench backfill in accordance with Section 815 of the Standard Specifications.

Any damage resulting from the removal and/or transportation of the controller, control equipment, and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer. The Engineer shall be the sole judge to determine the extent of damage.

Method of Measurement. Each lighting controller, and all associated control equipment, which is removed, delivered to storage, unloaded, inspected, stacked and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for existing CONTROLLER, LIGHTING, REMOVE AND SALVAGE, which shall be payment in full for the work specified herein.

LC05

CONTROLLER, SINGLE DOOR, CONSOLE, WITHOUT RADIO

Description. This item shall consist of furnishing and installing a roadway lighting controller, single door, console type, without radio control, including associated wiring, for the control of roadway lighting, as specified herein. All work shall be according to the Article 7 – Lighting System/Section 1.

Method of Measurement. Lighting controller, single door enclosure, console type, without radio control, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item will be paid at the contract unit price each for CONTROLLER, SINGLE DOOR, CONSOLE, WITHOUT RADIO, which shall be payment in full for furnishing and installing the controller, as specified herein.

LC06

CONTROLLER, COMBINATION LIGHTING

Description. This item shall consist of furnishing and installing a roadway lighting controller, mounted on traffic signal cabinet for combination lighting and associated wiring as specified herein.

Material. The lighting controller shall be as follows:

Enclosure: The completed controller shall be an industrial control panel NEMA 4X with an overall dimension of 20" X 16" X 8" as shown on the plan and shall comply with UL 508 standards. The enclosure shall be made from molded fiberglass polyester with gray finish and enhanced with UV inhibitors to protect against outdoor weathering. The door fasteners shall be stainless with butterfly type twist lock including a provision for padlocking.

Electrical components; Refer to the figure L-21 BE – 235 or latest for cabinet wiring diagram and list of components. Article 1068 (d), and (e) of the Standard Specification for Road and Bridge Construction, current revision shall apply to this pay item.

Installation. The lighting controller installation shall be according to the details, location, and orientation shown on the plan.

Method of Measurement. Each lighting controller, combination type, inspected and approved by the Engineer, shall be counted, each, as a unit for payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for CONTROLLER, COMBINATION LIGHTING, which shall be payment in full for furnishing and installing the lighting controller, complete, as specified herein.

LCL1

CLOCK, DIGITAL ASTRONOMICAL

Description. This item shall consist of removing, furnishing and installing, a solid state digital astronomical time clock with necessary contactors for control of lighting, as specified herein. All boxes required for proper storage shall be included in this item.

Materials. Article 1068.01 (e) (1) of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item. The timing of the unit shall be synchronous with the 60-Hertz power line frequency.

Installation. The Contractor shall transport and handle the digital time switch in complete conformance with the manufacturer's recommendations. Manufacturer's recommendations shall be followed during the installation process.

The contact rating of the time switch shall be sufficient to energize the contactor. If an external relay is needed to energize the contactor, then the relay, wiring, and installation shall be incidental to this pay item.

The digital astronomical time switch shall be installed inside the lighting controller or as indicated on the plan drawing and wired accordingly. It shall be programmed to set time of the day and set other functions to operate the lighting.

Method of Measurement. Digital astronomical clock, furnished, removed and installed shall be counted each for payment.

Basis of Payment. This item shall be paid at the contract unit price each for a CLOCK, DIGITAL ASTRONOMICAL, which shall be payment in full for furnishing and installing as specified herein.

LCN1–LCN2 CONTACTOR

Description. This item shall consist of furnishing and installing a lighting contactor, with number of poles, with or without an auxiliary switch contact, as per plan and wiring for control of lighting as specified herein.

Material. Article 1068.01(e) (4) of the Standard Specifications for Road and Bridge Construction, Current version, shall apply to this pay item with the following exception:

Revise the first sentence of Article 1068.01(e)(4) of the Standard Specifications to read:

"Contactors shall be electrically operated, mechanically held as specified, with the number of poles required for the service and with operating coil voltage as indicated."

Ampere rating of contactors shall be not less than that required for the duty shown and shall otherwise be rated as indicated.

Contactors shall come equipped with normally open, dry, auxiliary contacts. A device attached to the CAM of the contactor may provide these contacts. Unless otherwise indicated, the contactor operating coil shall operate at 240 volts, single phase and contactors furnished under this specification shall be with continuous rating as specified per pole at 480 Volts AC.

Installation. The lighting contactor shall be carefully installed in accordance with the manufacturer's recommendation and in accordance with the design requirements represented on the plans. The wire sizes listed on the manufacturer's catalog shall be utilized and it must meet the National Electrical Code. The proper

electrical clearance between the live metal parts and grounded metal shall be maintained. The proper size wire shall be used for control circuit connections designated "L", "O" and "C" supplied with clamp type terminals. The auxiliary contact, if used, shall be wired as directed by the Engineer.

Method of Measurement. Lighting contactor shall be counted, each, as a unit of payment, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHTING CONTACTOR, of the amperage indicated below, which shall be payment in full for furnishing and installing the lighting contactor, complete, as specified herein.

LCN1 CONTACTOR, 125A TO 250A

LCN2 CONTACTOR, 30A TO 100A

LD01–LD04 DECAL SET, LIGHTING UNIT

Description. This item shall consist of furnishing and installing, a lighting unit identification decal set for a pole or underpass, a lighting unit identification decal set including bracket for underpass mounting, a lighting unit identification decal set for a light tower with painted surface only, or a light tower which has a camera mounted on the luminaire ring, at installations and at heights as designated by the Engineer. This work shall also include the removal of all existing decals as necessary to complete the installation in a neat and aesthetically pleasing manner.

Materials. Article 1069.06 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Installation. Underpass luminaires, including appurtenances, identification brackets and conduit, and associated anchors, shall not be attached and/or drilled into precast, prestressed concrete beams. However, existing anchors, which have been installed improperly, shall be left in place. (Removal of such would cause more damage to the beam, than leaving the anchors in place). Articles 830.03, 835.02 and 844.03 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Method of Measurement. Lighting unit identification decal set shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing an IDENTIFICATION (ID) DECAL SET, of the size per maximum character mounting as described below, which shall be payment in full for the work as specified herein.

LD01 DECAL SET, LIGHTING UNIT, POLE, 4 INCH, MAX 10 CHARACTERS

LD02 DECAL SET, LIGHTING UNIT, TOWER, 8 INCH, MAX 10 CHARACTERS

LD03 DECAL SET, LIGHTING UNIT, TUNNEL OR UNDERPASS W/BRACKET, 4 INCH, MAX 10 CHAR.

LD04 DECAL SET, LIGHTING UNIT, TOWER WITH CAMERA, 4 INCH, MAX 10 CHARACTERS

LDS1 DISCONNECT SWITCH

Description. This item shall consist of removing, furnishing and installing a disconnect switch, as directed by the Engineer.

Materials. The disconnect switch shall be 600 volt, 2-pole or 3-pole, up to 60-ampere, fusible, with solid neutral in a NEMA 4X stainless steel enclosure, complete with 20 ampere, 600 volt, dual element, time delay

4L, Class R fuses, having a UL listed interrupting rating of not less than 200,000 rms symmetrical amperes at rated voltage and suitable for use as service equipment for building.

Fuse holders shall be standard type fuse holders complete with fuses. All electrical materials shall conform to Article 1065, latest version of Standard Specification for Road and Bridge Construction. Raceways shall be as detailed on the plans. Wire from the base fuse to the disconnect switch and to the sign luminaires shall be as specified for pole wire.

The fuse at the base of the sign structure shall be 30 ampere with a solid neutral assembly.

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition.

No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the controller, control equipment, and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. The Contractor shall provide all equipment, transportation and labor necessary to install the equipment as specified. New wiring, conduit and luminaires will be paid by separate pay items specified elsewhere herein.

Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall energize the disconnect switch to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Removing, furnishing and installing each Disconnect Switch for a sign unit or State-owned facilities as specified above, and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for removing, furnishing, and installing a DISCONNECT SWITCH, which shall be payment in full for the work specified herein.

LDS2 ON/OFF SWITCH

Description. This item shall consist of furnishing and installing ON/OFF switch, the removal of old switch is incidental, as directed by the Engineer.

Materials. The ON/OFF switch shall be 600 volt, 2-pole, 3-pole, 2- Way or 3- Way, up to 20ampere, having a UL listed interrupting rating of not less than 20,000 rms symmetrical amperes at rated voltage and suitable for building.

All electrical materials shall conform to Article 1065, latest version of Standard Specification for Road and Bridge Construction.

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition.

No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the controller, control equipment, and associated hardware, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. The Contractor shall provide all equipment, transportation and labor necessary to install the equipment as specified. New wiring, conduit and luminaires will be paid by separate pay items specified elsewhere herein.

Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall energize the ON/OFF switch to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Removing, furnishing and installing each ON/OFF Switch for State owned facilities as specified above, and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for removing, furnishing, and installing an ON/OFF SWITCH, which shall be payment in full for the work specified herein.

LDS3 MOTION SENSOR

Description. This item shall consist of furnishing and installing a Motion Sensor with visual indicator and hardware as specified herein. All required hardware is incidental to this pay item, however, the conduit and wiring, shall be paid under a separate pay item.

Materials. The Motion Sensor shall be ceiling mount H-Moss Adaptive Technology with passive infrared to cover up to 1,500 sq. ft. areas, equivalent to or better than Hubbell model ATP1500C. It should be able to study their environment and automatically adjust the time delay and sensitivity to optimize the sensor's performance for specific application.

The motion sensor must be used in conjunction with a control unit. The control units provide a 24 volts dc power supply for one (1) to three (3) sensor. The control unit must be selected for the operating voltage of application from 120 V to 240 V, 60 Hz.

Transportation. The Contractor shall transport, handle and store (as applicable) the Motion Sensor in complete conformance with the manufacturer's recommendations.

Installation. The Motion Sensor shall be ceiling mounted as indicated on the contract drawing or as directed by the Engineer, if applicable, AAR Add-A-Relay. The installation shall be complete with necessary conduit and cable (paid under separate pay item) and connected to the applicable circuit.

The Contractor shall mount to a junction box for hard ceiling; attach to cover plate by using machine screws and punching a small hole through the ceiling tile for the sensor wires or using threaded mounting post then running sensor wires through the center of the post.

The Contractor shall use NEMA 4X enclosure cover "ACIPE" for the sensor and install the control unit inside the NEMA 4X box for the wet locations. The box and cover shall be made out of heavyduty die cast aluminum, 0.094 in. thick for damp or wet locations and shall be in compliance with the NEC Article 406-8(B). The box shall be UL listed and comply with Federal Spec. W-C586C.

Method of Measurement. A Motion Sensor shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a MOTION SENSOR which shall be payment in full for the item specified herein.

**LF01
FOUNDATION, LIGHT POLE, CONCRETE**

Description. This item shall consist of the construction of a steel reinforced concrete light pole foundation, up to 30" diameter, of the diameter specified, complete with raceways, as specified herein. Excavation in rock will be paid as specified in Section 502.12 for Excavation for Structures. The foundation depth shall be as indicated in the Foundation Depth Table on the plans (where applicable) or as directed by the Engineer.

The foundation shall include soil testing, excavation, reinforcement, concrete, anchor bolts, nuts, washers and raceways as well as clean-up and restoration of the location when such work is not provided under other paid items.

Sections 836, 1020, 1070 and also Articles 1006.08, 1006.09, 1088.01, of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item with the following:

Anchor bolts for light poles shall be heat-treated. Therefore, an exothermic ground wire connection shall not be made to the anchor bolt. Instead, a mechanical connection of the ground wire shall be made to the anchor bolt. However, the cable connections to the ground rod and the rebar cage shall be exothermic.

Method of Measurement. Light pole foundation of the diameter and depth specified shall be counted, per linear foot, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price for soil testing, furnishing and installing per linear foot for FOUNDATION, LIGHT POLE, CONCRETE of the diameter specified, of the depth indicated, which shall be payment in full for the work as specified herein.

**LF02
FOUNDATION, LIGHT POLE, METAL**

Description. This item shall consist of furnishing and installing a metal foundation of the diameter specified for a light pole, consisting of a helix type screw base, base plate, pilot point and hardware for supporting a light pole as specified herein. Excavation in rock will be paid as specified in Section 502.12 for Excavation for Structures.

Materials. Article 1070.01 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item.

Installation. Installation shall conform to Article 836.03 (b) of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Light pole foundation of the diameter specified shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for a FOUNDATION, LIGHT POLE, METAL, of the diameter, specified, which shall include all excavation or drilling except excavation in rock,

backfilling, disposal of unsuitable material, form work and furnishing all materials within the limits of the foundation.

LF03
FOUNDATION, LIGHT TOWER, UP TO 54 INCH DIAMETER

Description. This item shall consist of the construction of a steel reinforced concrete light tower foundation, up to 54 inch in diameter, complete with raceways, as specified herein. The foundation depth shall be as indicated in the Foundation Depth table on the plans (where applicable) or as directed by the Engineer.

The foundation shall include soil testing, excavation, reinforcement, concrete, anchor bolts, nuts, washers and raceways as well as clean-up and restoration of the location.

Excavation in rock shall be paid according to Section 502.05 and 502.12 of the Standard Specifications for Road and Bridge construction, current version.

Sections 837 of the Standard Specifications for Road and Bridge Construction, current version, shall apply to this pay item with the following.

Method of Measurement. Light tower foundation, up to 54" in diameter, shall be counted, per linear foot depth, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price for furnishing and installing per linear foot for FOUNDATION, LIGHT TOWER, UP TO 54 INCH DIAMETER, of the depth indicated which shall be payment in full for the work as specified herein.

LF04
FOUNDATION, LIGHTING CONTROLLER

Description. This item shall consist of furnishing and installing a concrete foundation for a lighting controller cabinet as specified herein, shown on the plans, or as directed by the Engineer. The material and labor for the ground field shall be incidental to pay item.

Materials. Concrete shall be Class SI complying with Section 1020 of the Standard Specifications, current version.

The anchor bolts shall comply with ASTM A576. The entire length of the anchor bolts shall be hot dipped galvanized steel according to ASTM 153. The nuts, lock washers, and flat washers shall be galvanized also.

The foundation shall include a 1 inch diameter galvanized steel raceway for the ground field connection.

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

The foundation shall include a ground field of (3) 5/8 inch X 10 ft. copper-clad steel ground rods connected via 2/0 bare copper wire. All connections shall be made with exothermic welds. The ground wire shall be stranded, uncoated, bare copper in accordance with the applicable requirements of ASTM Designation B-3 and B-8.

Installation. Installation shall comply with Section 825 of the Standard Specifications for Road and Bridge Construction, current version.

The foundation shall have a depth and size as shown on the contract drawing. The top of the foundation shall extend twelve inches from the surrounding finished grade and the edges shall be beveled. A poured, 4-inch thick concrete pad, 4 feet wide X 4 feet shall be provided in front of the cabinet with an expansion joint. Exact concrete pad dimensions and location shall be confirmed with the Engineer, prior to installation. The ground field shall be a 10 feet triangle as shown on the drawing. Each ground rod shall be within a ground well as detailed on the drawing. No ground well shall be placed in the concrete pad in front of the controller. The cabinet shall be caulked at the base. All the conduit entrances into the cabinet shall be sealed with a pliable waterproof material.

Method of Measurement. Lighting Controller, console type, foundation shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each, for furnishing and installing FOUNDATION, LIGHTING CONTROLLER, which shall be payment in full for the work as specified herein.

LP01 LIGHT POLE, KIT

Description. This item shall consist of removing existing damaged basic materials, and furnishing and installing new basic materials such as new lamp, fuses, fuse holder, decal, pole wire, pole cap, or photocell if specified, hardware, nut covers, hand hole door and grommets in conjunction with the use of a light pole from State's storage facility, and utilizing one or two mast arms and luminaires. This item shall also include the removal of old decals, accident reference markers and graffiti from used poles prior to installation at new locations.

Materials. Materials shall be in accordance with Section 1065 and 1066 of the Standard Specifications for Road and Bridge Construction, Current version.

Installation. Installation shall be in accordance with Section 830 of the Standard Specifications for Road and Bridge Construction, Current version.

The luminaire shall be cleaned from inside/outside, replace bulb with new one rated for minimum of 40,000 hrs. equal or better than Sylvania ET 18 – 67584 and test before installation.

Method of Measurement. Light pole kit for Contract Spare Parts light pole, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT POLE, KIT which shall be payment in full for removing damaged materials and furnishing and installing all new materials including the necessary hardware as specified herein.

LP02 LIGHT POLE UNIT, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage facility (if required), loading, transporting and installing an aluminum light pole unit which is a standard, davit, or painted davit light pole with (all sizes)

mast arm or twin mast arm, and (all types) luminaire(s), complete with appurtenances, length of 10 to 60 feet and all required hardware including bolt covers as specified herein.

Installation. Installation shall be as described in Section 830, except that the light pole shall be set plumb on the foundation without the use of shims, grout or any other leveling devices under the pole base. The mast arm or arms shall be set at right angles to the centerline of the pavement. (The leveling area of the luminaire shall be set in a plane parallel to the roadway taking into consideration the upgrade or downgrade and the super-elevation of the roadway).

The Contractor shall transport, handle and store (as applicable) the metal light pole in complete conformance with the manufacturer's recommendations.

The luminaire shall be washed and relamped as specified under Light Pole Kit. This item shall include the applicable luminaire (with pole wire and fusing), foundation, anchor bolts, and breakaway device which shall be provided under separate pay item.

Poles shall not be installed until luminaires are available for installation which shall be at the same time the poles are installed. Poles shall not be installed and left standing without a coordinated installation of mast arm and luminaire.

The removal of breakaway couplings and installation or replacement with breakaway device (TBase) is included part of the installation procedure and it will not be paid separately.

Method of Measurement. Light pole unit shall be counted, each, installed.

Basis of Payment: This item shall be paid at the contract unit price each for LIGHT POLE UNIT, INSTALL ONLY, of the length and mounting height as indicated by the Engineer, which shall be payment in full for the work as specified herein. This item shall not be paid unless the coordinated assembly, including mast arm, luminaire, and breakaway device if specified, is complete.

LP03 LIGHT POLE UNIT, REMOVAL AND SALVAGE

Description. This item shall consist of the disconnection, removal, dismantling, and transportation to the State's storage facility and unloading as salvage, a light pole unit, which is a standard, davit, or painted davit light pole with (all sizes) arm or twin arm, and (all types) luminaire(s), complete with appurtenances, as specified herein and as directed by the Engineer. Removal of the associated conduit, wire and junction boxes shall be included in this item. This pay item shall also include all storage documentation as required by the Engineer.

General. Light pole removal shall be in accordance with Section 842 of the Standard Specifications for Road and Bridge Construction, current version. Proper documentation of the Department's salvage is required.

Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged a to type, size and condition. No removal work shall be permitted without approval from the Engineer.

Any damage resulting from the removal and/or transportation of the light pole shall be repaired, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Method of Measurement. Each light pole unit, which is removed, delivered to storage, unloaded, inspected, and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT POLE UNIT, REMOVAL, SALVAGE, which shall be payment in full for the removal and disposition of light pole as specified herein.

LP04 WOOD POLE UNIT, INSTALL ONLY

Description. This item shall consist of retrieving from State's storage, loading, transporting, and installing a wood pole with mast arm(s) and luminaire(s) complete with appurtenances of the mounting height as specified herein, including all necessary hardware and accessories required. The wood light pole unit shall be paid separately.

Installation. Installation shall be in accordance with Section 830 of the Standard Specifications for Road and Bridge Construction, current version.

The Contractor shall be paid separately for CCTV and Traffic Signal installation using the nonroutine pay items if the wood pole is used for CCTV on Traffic Signal.

The Contractor shall transport and handle the light pole in complete conformance with the manufacturer's recommendation.

Mechanical Damage. Poles are not acceptable if they contain indentations attributed to loading or handling slings that are 1/4 inch or more deep over 20% or more of the pole circumference, or more than 1/2-inch-deep at any point. Other indentations or abrasions, for example, forklift damage, chain-saw damage, etc., shall not be more than 1/10 the pole diameter at the point of damage up to a maximum of 1 inch. Such damage is permitted in an oversized section, where the excess of wood shall be taken into consideration in evaluating the effects of the damage. In any case, the circumference for a given class is still required to be not less than the specification minimum."

Method of Measurement. Wood pole unit of the mounting height as specified, complete with necessary hardware shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for WOOD POLE UNIT, INSTALL ONLY, of the mounting height up to 90', shall be payment in full for installing a wood pole unit with necessary appurtenances as specified herein.

LP05 WOOD POLE, REMOVAL AND SALVAGE

Description. This item shall consist of disconnecting, completely removing, dismantling, transporting to the State's storage, and unloading as salvage, a wood pole with mast arm(s) and luminaires(s) complete with appurtenances, as specified herein. Removal of the CCTV and Traffic Signal, associated conduit, wire and junction boxes shall be included in this item. Proper documentation of the State's salvage is required with this pay item.

General. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition. No removal work shall be permitted without approval from the Engineer. Any damage resulting from the removal and/or transportation of the light pole unit shall be restored, to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Method of Measurement. Each wood pole unit, complete with CCTV, Traffic Signal, Arm and Luminaire which is removed, delivered to storage, unloaded, inspected, and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for WOOD POLE, REMOVAL AND SALVAGE, complete with CCTV, Traffic Signal, Arm and Luminaire, which shall be payment in full for the removal and disposition as specified herein.

LPN1 PANEL, DISTRIBUTION

Description. This item shall consist of removing (if upgrading) furnishing and installing, a lighting and distribution panel of the amperage (up to 400 Amps) and number of poles (up to 42) specified for lighting and/or equipment with branch breakers as specified by the Engineer.

General Requirements. The panel with all of its electrical components and parts shall be assembled in a neat orderly fashion. All of the electrical cables shall be installed in a trim, neat, professional manner. The cables shall be trained in straight horizontal and vertical directions and be parallel, next to, and adjacent to other cables whenever possible. The completed controller shall be UL listed as an industrial control Panel under UL 508 and UL 98, service entrance rated panel.

If the enclosure of the existing service or distribution panel is in good condition, the Contractor may use the existing enclosure and replace only the panel board upon approval by the Engineer.

Materials. The panel board shall be test-verified by, and listed with, Underwriters Laboratories, Inc. and shall meet all NEMA standards for panelboards. Panel board shall be designed for sequence phase connection of branch circuit devices to allow complete flexibility of circuit arrangement (1,2 or 3 poles) to evenly balance the electrical load on each phase. Main lugs shall be mechanical, solderless type, and approved for Cu or Al conductors. The chassis shall be sturdy, rigid and shall assure accurate alignment of interior with panel front. The fronts (trims) and flush-type lock/latch handle assembly shall have an appearance equivalent to an ANSI-61 light gray finish. Wiring gutters shall be furnished in accordance with Underwriters' Laboratories Inc. standards.

Main Breaker. (omit if main lug only panel) The main breaker shall be of the same manufacturer as the lighting or distribution panel. The electrical requirement shall be of the voltage, phase and ampacity of the lighting or distribution panel. The lugs of the main breaker shall be sized to handle the required cable size of the incoming cable. Unless otherwise indicated, main breakers shall be standard UL-listed molded case, thermal-magnetic bolt-on type circuit breakers with trip-free indicating handles. Unless otherwise indicated, main breakers shall have a UL-489 interrupting rating of not less than 35,000 rms symmetrical amperes at 480 volts and 65,000 rms symmetrical amperes at 240 Volts. Multi-pole main breakers larger than 100 amps size shall have instantaneous adjustable magnetic trip settings. The main breaker shall be equipped with auxiliary contacts.

The interrupting capacity shall be capable of removing a fault at the applied voltage without damage to the breaker. The breaker may be a fixed trip or interchangeable trip as specified by the engineer. The breaker shall be specified as "fully rated" unless noted otherwise. The main breaker shall be a thermal magnetic trip breaker unless noted otherwise.

Top feed or bottom feed should be as specified. The "on/off" position shall be clearly visible and designed to operate in a vertical plane "on" up, "off" down. A tripped indicated of the breaker shall be clearly visible. Lugs

on the breaker shall be suitable for 75 degrees Celsius wire. The breaker shall be UL listed for use in lighting and distribution panels.

Circuit Breakers. All feeders, branch circuits, and auxiliary and control circuits shall have overcurrent protection. Unless otherwise indicated, the overcurrent protection shall be by means of circuit breakers.

Unless otherwise indicated, circuit breakers shall be standard UL-listed, molded case, thermal magnetic, bolt-on-type circuit breakers with trip-free indicating handles.

Unless otherwise indicated circuit breakers shall have a UL-listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated circuit voltage for which the breaker is applied.

The number of branch circuit breakers shall be as indicated on the control cabinet detail drawings or lighting system wiring diagram, whichever is greater, plus two (2) spare circuit breakers.

Ground & Neutral Bus Bars. Separate ground and neutral bus bars shall be provided. The ground bus bar shall be copper, mounted on the equipment panel, fitted with 22 connectors of the type as shown on the plans, as a minimum. The neutral bar shall be similar. The heads of connector screws shall be painted white for neutral bar connectors and green for ground bar connectors.

Standards. The panel boards shall meet the following applicable industry standards, except where noted:

Underwriters' Laboratories, Inc.

- Panelboards: UL67
 - Cabinets and boxes: UL50
- Note: Only panelboards contain UL listed devices can be UL labeled.

National Electrical Code – Article 408 and 409

NEMA Standards: PB1

Federal Specifications

- Panelboards: W-P-115c
- Molded case breakers W-C-375a,b
- Fusible Switches: W-S-865c
- NFPA: 79

Removal. Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size, and condition.

No removal work shall be permitted without the approval of the Engineer.

Any damage resulting from the removal and/or transportation of the lighting distribution panel, of the size as specified, shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Installation. Service entrance equipment NEC Article 230 and UL require that a panel used as service entrance equipment must be located near the point where the supply conductors enter the building.

A disconnectable electrical bond must be provided between the neutral and ground.

A service-entrance-type UL label must be factory installed.

The main lugs shall be secured in line with Underwriters' Laboratories standards to prevent lugs from turning or loosening when incoming cables are installed.

The current carrying parts shall be secured in place to prevent flexing and loosening or damage during and after installation.

At the branch circuit, breakers and associated wiring shall be labeled to identify the location of equipment and/or loads used.

The manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made in accordance with the National Electric Code. The Contractor shall energize the system to assure that all the components are working in accordance with their specifications and carrying rated load.

Method of Measurement. Lighting and distribution panel removed, furnished, and installed shall be counted, each,

Basis of Payment. This item shall be paid at the contract unit price each for PANEL, DISTRIBUTION, of the amperage (up to 400 Amps) and number of poles (up to 42) of the amperage and number of poles specified, which shall be payment in full for removing, furnishing and installing the distribution panel, as specified herein.

LT01–LT02 LIGHT TOWER

Description. This item shall consist of furnishing, delivering to State's storage facility and unloading, as specified, and installing a light tower including a lowering device with ring, luminaires, and lamps, as specified herein. The tower foundation shall be provided under separate pay items. The specifications for this item shall be fully coordinated with the lowering device, ring, luminaire, and foundation requirements.

Materials. Materials shall be in accordance with Article 1069.08 of the Standard Specifications for Road and Bridge Construction, current version with the following exceptions:

Revise the sixth and eighth paragraphs of Article 1069.08(a) of the Standard Specifications to read:

The handhole shall have a door with a full collar of similar material that extends over the handhole frame to exclude liquids and contaminants when closed against the flange and gasketed handhole opening. The door shall be mounted with a full-height stainless steel piano hinge or not less than two stainless steel hinges or other hinge arrangement acceptable to the Engineer. A bolt through door and frame eyelet shall not constitute an acceptable hinge. Hinges shall be heavy duty, suitable for the weight of the handhole door. Hinges shall be welded to the handhole frame and shall be welded or attached with stainless steel nuts, bolts, and lock washers (5 minimum) to the handhole door. Rivets will not be allowed to attach any hardware. The door/opening shall be gasketed in a manner, which will prevent the entry of water into the pole, and the door shall have a tight compressive seal employing a tubular gasket with a flexible wire core. The gasket shall have a mechanical gripping action and be mounted on a metal edge inside the handhole door. The door shall be held closed with 12-gauge captive stainless-steel clamps. The clamps shall be held closed with spring loaded captive clamps. The clamps shall have a depth stop feature to insure uniform sealing pressure at all clamp points. A minimum of four (4) clamps shall be used around the non-hinged sides of the door assembly. A stainless-steel padlock hasp and staple shall be provided for locking the door. Door hardware shall be stainless steel. The door shall be equipped with an integral door stop mechanism."

Revise the last paragraph of 1069.08 (b), (2) Inspection, to read:

“The independent welding inspector shall send the test results directly to the Engineer at the following address:

Illinois Department of Transportation
Division of Highways, District 1
Attn: Bureau of Traffic Operations/Maintenance Section
201 West Center Court
Schaumburg, Illinois 60196-1096

The cost for all independent welding inspections shall be included in the unit price for the bid item.”

Add the following to Article 1069.08(c) of the Standard Specifications:

“The primer paint shall be white polyamide epoxy, with minimum solids by volume 65%. The primer shall be applied in two coats to a total thickness of 6-8 mils dry film thickness following manufacturer's method of application. The two primer coats shall be of different colors.

The finish paint shall be silicone-alkyd resin type paint poly-silicone enamel, minimum solids by volume 53%. The finish paint shall be applied in one coat to a 2-3 mils dry film thickness following manufacturer's method of application. The finish paint shall be applied to the outside surface only.”

Revise the second and third paragraphs of Article 1069.08(p) of the Standard Specifications to read:

“A flexible UL Listed Class II conductor shall be installed between the lightning rod and the grounding lug on the top of the tower shaft. The conductor shall be a rope lay cable consisting of 28 strands of No. 14 AWG cooper wire. The cable shall have a minimum outside diameter of 7/16”, a cross sectional area of 58 mm², and a net weight of 1668 N per 375 pounds per 1000 ft. The same conductor shall be attached with studs and exothermic welds at tower shaft sections. The grounding conductor terminations shall be UL Listed.”

Installation. Installation and shipment shall be in accordance with Article 835.04 of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Light tower shall be counted, each, furnished, and installed complete.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT TOWER, of the length as specified below, which shall be payment in full for furnishing and installing complete as specified herein. The tower foundation shall be paid under separate pay item.

LT01 LIGHT TOWER, 110 FT. OR LESS IN LENGTH
LT02 LIGHT TOWER, 111 FT. OR MORE IN LENGTH

LT03 LIGHT TOWER, IN PLACE, CLEAN AND PAINT

Description. The Contractor shall sand blast, prime a tower, standing in place on the foundation with luminaire ring assembly and hood, either complete or part of, as directed by the Engineer. The Contractor shall prepare the existing deteriorated surfaces and paint all designated surfaces of the various components of the light towers with coatings specified by the Engineer.

The work involves the surface preparation and application of coating materials on existing steel light towers greater than 80 ft. high. The Contractor shall provide all management, supervisory, administration, quality control personnel, labor forces and all other services required to carry out the surface preparation work,

coating operations, including the furnishing, handling and removal of spent abrasive material, if required and all testing and reporting as specified herein.

Tower Number, Luminaire Quantity Decals, and Accident Reference Marker Decals.

All identification decals shall be removed prior to the start of work and replaced after the finish coat has fully dried. Removal of all decals, purchase of new decals, and installation of new decals shall be incidental to this pay item. Following sufficient curing of the finish coat, new tower number and luminaire quantity decals 8 inch x 9 inch shall be affixed to the tower at locations where the existing decals were removed during the surface preparation process. The Contractor shall schedule the decal replacement six months from the time the tower was painted, allowing sufficient time for the finish coat to dry.

Responsibilities. The Contractor shall be responsible for the planning and performance of all scaffolding work, ventilation, enclosures, protective covers, and utilization of labor and equipment, supplying and maintaining of tools, test equipment, enclosures, scaffoldings, etc., purchasing and/or requisitioning of supplies, performing tests to assure proper lasting equipment performance and required dry film thickness of coatings, relocating and/or removing all temporary equipment, enclosures, scaffolding, etc. at the completion of the work, or as directed by the Engineer throughout the course of the job schedule to permit the work of others, providing the testing and inspection, equipment, and services for all surface preparation and material application, protecting all existing equipment, piping, ducts, etc. and complete coated areas from damage resulting from blasting work and/or misapplied coating materials, and removal of all debris from the work site.

General Work Provisions. All coating work shall be done in a careful workmanlike manner using the materials specified herein in strict accordance with this Specification.

Surface preparation and coating application shall be in accordance with the Coating Schedule contained herein. The manufacturer's specifications regarding the mixing, thinning, application, drying and general handling of the various materials shall be followed as being supplementary to this Specification.

The scaffolding, ladders, etc., required for surface preparation and/or painting shall be designed for loads not less than those established by the State of Illinois. All coatings shall be applied as recommended by the manufacturer. Thinning shall be done only as recommended by the manufacturer for a particular application.

The surfaces to be coated shall be dry. No coating work shall be done in damp weather (rain, fog, mist, dew, etc.) which might cause a slight amount of moisture to collect or condense on the surface. No coating work shall be done when the ambient air temperature is below 50 degrees Fahrenheit or above 100 degrees Fahrenheit. No coating work shall be done if the relative humidity exceeds 85% or if the substrate temperature is not at least 5 degrees Fahrenheit above the dew point.

Coatings shall be applied in a workmanlike manner by skilled applicators. All coatings must be evenly spread and smoothly flowed on and shall be free from runs and sags. Care shall be taken to apply a film of uniform thickness that completely covers all surfaces required to be coated and avoids local thin spots.

All coating materials shall be specified and approved in writing by the Engineer. Intermixing of materials from different manufacturers will not be permitted.

All coating materials delivered to or received at the job site shall be in original unopened and sealed containers bearing manufacturer's name, type of designation, batch number and shelf life. All coatings shall be mixed in strict accordance with the manufacturer's written instructions, and thinning will not be permitted unless specified in those instructions.

All containers of coatings shall remain unopened until ready for use. The oldest of each kind of coating shall be used first. Containers, which have been opened, shall be used first.

Any coating material found not be in conformance with the specification shall be removed from the site, and from the structure, if already applied, at the Contractor's expense. If reapplication to a formerly coated surface is required, it shall be treated as if it had never been coated insofar as this Specification is concerned.

All coatings shall be stored in an area that is well-ventilated and free from excessive heat, sparks, flame, or the direct rays of the sun. The ambient temperature of the storage areas shall be maintained within the range specified in the Coating manufacturer's printed instruction, unless otherwise specified.

Coatings, which have livered, gelled, exceeded manufacturer's recommended shelf life, or otherwise deteriorated during storage shall not be used, and shall be removed promptly from the site. Mixing of coatings shall be done in accordance with manufacturer's printed instructions. Power mixers may be used, but it should be noted that the heat generated could shorten the pot life of the coating.

Catalysts and/or thinners shall be added to the coatings strictly in accordance with the manufacturer's printed instructions. Uniform mixing shall be assured by checking for consolidated pigment remains.

If the coatings became thick in cool weather, they shall preferably be heated in the container by the use of paint heaters and not thinned by the addition of solvents. Deviations from manufacturers recommended storage temperature ranges will not be permitted without manufacturer's approval.

The Contractor shall furnish, to the Engineer, all information on materials and supplies utilized by the Contractor.

Surface Preparation. The Contractor shall be wholly responsible for finish of the work and shall not commence any coating work until the surface to be coated has been properly prepared in accordance with the surface preparation portion of the Coating Schedule contained herein. Chemical contamination shall be removed by washing with clean water, steam, neutralizing solutions, detergents, or other methods recommended by the Coating manufacturer.

Each designated surface area of each light tower to be painted shall be thoroughly washed clean using a sufficient number of cleaning cloths. The cloths shall be changed frequently to avoid using contaminated cleaning materials.

Application of Coating Materials. Coatings may be applied by brushes, roller, or paint mitt. All methods of application shall be in accordance with the best practice as recommended by the manufacturer.

When coatings are applied by brushing or rolling, the surface shall be cross-brushed or cross-rolled to secure uniformity of surface and the specified paint film thickness.

All surfaces shall be primed the same day as they are prepared. Finish coats shall be applied as soon as practicable after cleaning. If the surface becomes contaminated in the interim, it shall be refinished to the original cleanliness requirements.

Adequate ventilation must be assured, at all times, for proper drying.

Film thickness of the coating being applied shall be periodically checked using a wet film thickness gauge. Dry film thickness shall be calculated from wet film thickness and volume solids and as recommended by the coating manufacturer. In addition, each coat shall have been visually inspected for holes and thin spots before the next coat is applied.

Surfaces, which have been coated, shall not be handled, worked on, or otherwise disturbed until the coating is completely set. Sufficient time shall elapse between coats to permit them to dry hard. All layers of coated surfaces shall be unscarred and completely integral at the time of application of all succeeding coats.

Each coat shall follow the preceding coat within the time limits set by the manufacturer.

After the application of the scheduled number of coatings, the total dry film thickness (DFT) shall be within the range of the sum of the thickness of the coats as specified. The Contractor shall apply enough paint to adequately cover and to fulfill the DFT as specified in the Coating Schedule continued herein no matter how many coats are necessary.

All finished coating surfaces shall be uniform texture, free of any runs, drips, sags, or other detrimental defects, and acceptable to the Engineer.

Misplaced coating materials shall be promptly removed, and the surface shall be made thoroughly clean and satisfactory to the Engineer.

Copies of manufacturer's application guides or printed instructions shall be conspicuously posted wherever materials are being prepared for application.

Cloths, cotton and waste material which might constitute a fire hazard, shall be placed in closed metal containers or removed from the working area at the end of each day's work.

The Contractor shall provide portable fire extinguishers of suitable type and sufficient number to permit placing at least one (1) extinguisher in any areas where coating with fume-creating or flammable products is in progress, and where coatings are stored and mixed. No smoking shall be permitted in these areas and the Contractor shall be responsible for policing the work.

All protective covers shall be removed upon completion of paint application.

Testing. The Engineer shall furnish to the Contract, upon the transmittal of the authorization of work, the required tests for the tower cleaning and painting.

Test Equipment to be furnished and used by the Contractor:

Surface Temperature Thermometer

- Part # PTC 312F

Sling Psychrometer

- Part # 127012

Weather Psychometric Tables

- Part # WB235

Dry and Wet Film Thickness Gauges

Light Tower Shaft

Surface Preparation. The tower shall be spot abrasive blasted as required in accordance with SSPC SP-6 Commercial Blast Cleaning and/or Power Tool Cleaned to SSPC SP-3, depending on overall condition. The remaining surface shall then be hand tool cleaned in accordance with SSPC SP-2 to remove all loose corrosion and existing paint. All oil, grease, dirt, salt and other surface contaminants shall be removed in accordance with Steel Structures Painting Council's SSPC SP-1 Solvent Cleaning Specification.

Coating System.

Primer. The primer shall be applied to the entire designated area of each tower and be a Keeler & Long Tri-Polar Primers KL6040 series or equivalent approved by the Engineer.

Finish Coat: The finish shall be applied to the entire designated area of each tower and be a Keeler & Long Anodic Self-Priming Paint KL4400 Series or equivalent approved by the Engineer.

Luminaire Ring Assembly and Hood

Surface Preparation. All oil, grease, dirt, salt and other surface contaminants shall be removed in accordance with Steel Structures Painting Council's SSPC Sp-1 Solvent Cleaning. The surface shall then be Hand Tool Cleaned in accordance with SSPC SP-2 to remove all loose corrosion and existing paint.

Coating System. Same as finish coat listed above.

Cleats, Welds and Hand Hole Door Hardware Surfaces

Surface Preparation. Prepare surfaces using the SSPC SP-11 power tool cleaning to bare metal to remove all rust and existing coating.

Coating System.

Prime Coat. The prime coat shall be the same as the shaft prime coat described above.

Finish Coat. The finish coat shall be the same as the shaft finish coat described above.

Documentation of Work. The Contractor shall document testing information and provide the Engineer a weekly progress report on an Excel spreadsheet for each work authorization. Each tower shall be reported separately. The Contractor shall scan the Excel spreadsheet and the general billing logs to the Engineer daily (if requested by the Engineer) or weekly, for each authorization letter. The format of the spreadsheet shall be furnished to the Contractor upon the authorization of work.

Method of Measurement. The light tower length for payment of all work described herein shall be measured, in feet, in place, and shall be measured as the distance in feet from the top head frame assembly to shaft's base plate or any part thereof, spot blast clean and paint.

Basis of Payment. This item shall be paid at the contract unit price, per foot, of tower length for LIGHT TOWER, IN PLACE, CLEAN AND PAINT with applicable documentation, which shall be payment in full for all labor, materials and equipment required to complete the work as described herein.

LT04

LIGHT TOWER, REMOVE AND RE-ERECT

Description. This item shall consist of removing an existing light tower for inspection and/or retrofitting and reinstalling the tower on the foundation all during the same workday as designated by the Engineer. This pay item shall also include the removal of towers found unsafe by IDOT inspectors. Clearing the site for safety, including the removal of damaged equipment, site restoration, and all appurtenant materials and work required for removing and reinstalling shall be included as part of this item. The retrofitting work as specified by the Engineer will be paid separately. The electric power cables shall be reconnected so that tower becomes operational that evening without interruption.

General. The existing light tower shall be disconnected and removed from the existing foundation by way of removing the anchor bolt nuts and lifting the light tower from the foundation. Any damage sustained to the light tower during removal operations shall be repaired, or replaced in kind, to the satisfaction of the Engineer at Contractor's own expense.

The light tower shall be reinstalled immediately after inspection and/or modification work the same day on the foundation.

All components shall be replaced upon re-installation of the tower. The anchor nuts shall be repainted. The nuts shall be tightened in compliance with torque specifications recommended by the manufacturer of the lighting unit.

As applicable, recently calibrated dynamometers shall be employed by the Contractor for measuring the applied force during final assembly.

The Contractor shall remove the stainless steel screening at the base of the tower, prior to the removal of the tower, and after re-erecting and plumbing the tower, shall reinstall the screening and tighten all anchor bolt nuts, to the satisfaction of the Engineer. The Contractor shall exercise care in the removal of the screening, so it remains in a serviceable condition. Replacement screening shall be included in this pay item.

A penetrating oil shall be applied to all anchor bolt nuts prior to removing. The Contractor shall exercise extreme care in the removal of the anchor bolt nuts so that no damage occurs to the anchor bolt threads. If an anchor bolt nut cannot be easily removed, the Contractor shall consult the Engineer to determine the best method to be used to remove the anchor bolt nut.

Any anchor bolt nuts damaged in the removal process or which the Engineer determines should not be reused, shall be replaced with anchor bolt nuts meeting the requirements of Article 1070.03 of the Special Provisions for Road and Bridge Construction, current version, for Light Towers.

Method of Measurement. Light tower shall be counted, each, remove and re-erect.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT TOWER, REMOVE AND RE-ERECT, which shall be payment in full for performing the work as specified herein.

LT05 LIGHT TOWER, INSTALL ONLY

Description. This item shall consist of erecting a light tower as specified herein and as directed by the Engineer. Luminaire, lamp, lowering device and foundation shall be provided under separate pay items. This item shall be fully coordinated with the luminaire, lowering device, and foundation requirements. The light tower shall be paid separately.

Installation. Installation and shipment shall be in accordance with Article 835.04 of the Standard Specifications for Road and Bridge Construction, current version.

Method of Measurement. Light tower shall be counted, each, installed.

Basis of Payment. This item shall be paid at the contract unit price each for LIGHT TOWER, INSTALL ONLY, which shall be payment in full for installing the item as specified herein.

LU01 – LU02 LUMINAIRE, LED, POLE

Description. This work shall consist of furnishing and installing a light pole LED luminaire as specified herein or an equivalent. This work may include removal of an old luminaire and placing into EMC Spare Parts.

General. The luminaire including the housing, driver and optical assembly shall be assembled in the U.S.A. The luminaire shall be assembled by and manufactured by the same manufacturer. The luminaire shall be

mechanically strong and easy to maintain. The size, weight, and shape of the luminaire shall be designed so as not to incite detrimental vibrations in its respective pole, and it shall be compatible with the pole and arm. All electrical and electronic components of the luminaire shall comply with the requirements of Restriction of Hazardous Materials (RoHS) regulations. The luminaire shall be listed for wet locations by an NRTL and shall meet the requirements of UL 1598 and UL 8750

Submittal Requirements.

The Contractor shall also the following manufacturer's product data for each type of luminaire:

1. Descriptive literature and catalogue cuts for luminaire, LED driver, and surge protection device. Completed manufacturer's luminaire ordering form with the full catalog number provided
2. LED drive current, total luminaire input wattage and total luminaire current at the system operating voltage or voltage range and ambient temperature of 25 C.
3. LED efficacy per luminaire expressed in lumens per watt (l/w).
4. Initial delivered lumens at the specified color temperature, drive current, and ambient temperature.
5. IES file associated with each submitted luminaire in the IES LM-63 format.
6. Computer photometric calculation reports as specified and in the luminaire performance table.
7. TM-15 BUG rating report.
8. Isofootcandle chart with max candela point and half candela trace indicated.
9. Documentation of manufacturers experience and verification that luminaires were assembled in the U.S.A. as specified.
10. Written warranty.

Upon request by the Engineer, submittals shall also include any or all the following:

- a. TM-21 calculator spreadsheet (XLSX or PDF format) and if available, TM-28 report for the specified luminaire or luminaire family. Both reports shall be for 50,000 hours at an ambient temperature of 77 °F (25 °C).
- b. LM-79 report with National Voluntary Laboratory Accreditation Program (NVLAP) current at the time of testing in PDF format inclusive of the following: isofootcandle diagram with half candela contour and maximum candela point; polar plots through maximum plane and maximum cone; coefficient of utilization graph; candela table; and spectral distribution graph and chromaticity diagram.
- c. LM-80 report for the specified LED package in PDF format and if available, LM-84 report for the specified luminaire or luminaire family in PDF format. Both reports shall be conducted by a laboratory with NVLAP certification current at the time of testing.
- d. AGi32 calculation file matching the submittal package.
- e. In Situ Temperature Measurement Test (ISTMT) report for the specified luminaire or luminaire family in PDF format.
- f. Vibration test report in accordance with ANSI C136.31 in PDF format.

- g. ASTM B117/ASTM D1654 (neutral salt spray) test and sample evaluation report in PDF format.
- h. ASTM G154 (ASTM D523) gloss test report in PDF format.
- i. LED drive current, total luminaire input wattage, and current over the operating voltage range at an ambient temperature of 77 °F (25 °C).
- j. Power factor (pf) and total harmonic distortion (THD) at maximum and minimum supply and at nominal voltage for the dimmed states of 70%, 50%, and 30% full power.
- k. Ingress protection (IP) test reports conducted according to ANSI C136.25 requirements, for the driver and optical assembly in PDF format.
- l. Installation, maintenance, and cleaning instructions in PDF format, including recommendations on periodic cleaning methods.
- m. Documentation in PDF format that the reporting laboratory is certified to perform the required tests.

Manufacturer Experience. The luminaire shall be designed to be incorporated into a lighting system with an expected 20-year lifetime. The luminaire manufacturer shall have a minimum of 33 years' experience manufacturing HID roadway luminaires and shall have a minimum of seven (7) years' experience manufacturing LED roadway luminaires. The manufacturer shall have a minimum of 25,000 total LED roadway luminaires installed on a minimum of 100 separate installations, all within the U.S.A.

Housing.

Materials. The luminaire shall be a single device not requiring on-site assembly for installation. The driver for the luminaire shall be integral to the unit.

Finish. The luminaire shall have a baked acrylic enamel finish. The color of the finish shall be gray, unless otherwise indicated.

The finish shall have a rating of six or greater according to ASTM D1654, Section 8.0 Procedure A – Evaluation of Rust Creepage for Scribed Samples after exposure to 1000 hours of testing according to ASTM B117 for painted or finished surfaces under environmental exposure.

The luminaire finish shall have less than or equal to 30% reduction of gloss according to ASTM D523 after exposure of 500 hours to ASTM G154 Cycle 6 QUV® accelerated weathering testing.

The luminaire shall slip-fit on a mounting arm with a 2" diameter tenon (2.375" outer diameter), and shall have a barrier to limit the amount of insertion. The slip fitter clamp shall utilize four (4) bolts to clamp to the tenon arm. The luminaire shall be provided with a leveling surface and shall be capable of being tilted ±5 degrees from the axis of attachment in 2.5-degree increments and rotated to any degree with respect to the supporting arm.

All external surfaces shall be cleaned in accordance with the manufacturer's recommendations and be constructed in such a way as to discourage the accumulation of water, ice, and debris.

The effective projected area of the luminaire shall not exceed 1.6 sq. ft.

The total weight including accessories, shall not exceed 40 lb (18.14 kg). If the weight of the luminaire is less than 20 lb (9.07 kg), weight shall be added to the mounting arm or a supplemental vibration damper installed as approved by the Engineer.

A passive cooling method with no moving, rotating parts, or liquids shall be employed for heat management.

The luminaire shall include a fully prewired, 7-pin twist lock ANSI C136.41-compliant receptacle. Unused pins shall be connected as directed by the Manufacturer and as approved by the Engineer. A shorting cap shall be provided with the luminaire that is compliant with ANSI C136.10.

Vibration Testing. All luminaires shall be subjected to and pass vibration testing requirements at “3G” minimum zero to peak acceleration in accordance with ANSI C136.31 requirements using the same luminaire. To be accepted, the luminaire housing, hardware, and each individual component shall pass this test with no noticeable damage and the luminaire must remain fully operational after testing.

Labels. An internal label shall be provided indicating the luminaire is suitable for wet locations and indicating the luminaire is an NRTL listed product to UL1598 and UL8750. The internal label shall also comply with the requirements of ANSI C136.22.

An external label consisting of two black characters on a white background with the dimensions of the label and the characters as specified in ANSI C136.15 for HPS luminaires. The first character shall be the alphabetical character representing the initial lumen output as specified in Table 1 of Article 1067.06(c). The second character shall be the numerical character representing the transverse light distribution type as specified in IES RP-8 (i.e. Types 1, 2, 3, 4, or 5).

Hardware. All hardware shall be stainless steel or of other corrosion resistant material approved by the Engineer.

Luminaires shall be designed to be easily serviced, having fasteners such as quarter-turn clips of the heavy spring-loaded type with large, deep straight slot heads, complete with a receptacle and shall be according to military specification MIL-f-5591.

All hardware shall be captive and not susceptible to falling from the luminaire during maintenance operations. This shall include lens/lens frame fasteners as well hardware holding the removable driver and electronic components in place.

Provisions for any future house-side external or internal shielding should be indicated along with means of attachment.

Circuiting shall be designed to minimize the impact of individual LED failures on the operation of the other LED's.

Wiring. Wiring within the electrical enclosure shall be rated at 600v, 105°C or higher.

Driver. The driver shall be integral to the luminaire shall be capable of receiving an indefinite open and short circuit output conditions without damage.

The driver shall incorporate the use of thermal foldback circuitry to reduce output current under abnormal driver case temperature conditions and shall be rated for a lifetime of 100,000 hours at an ambient temperature exposure of 77 °F (25 °C) to the luminaire. If the driver has a thermal shut down feature, it shall not turn off the LEDs when operated at 104 °F (40 °C) or less.

The driver shall have an input voltage range of 120 to 277 volts ($\pm 10\%$) or 347 to 480 volts ($\pm 10\%$) according to the contract documents. When the driver is operating within the rated input voltage range and in an un-dimmed state, the power factor measurement shall be not less than 0.9 and the THD measurement shall be no greater than 20%.

The driver shall meet the requirements of the FCC Rules and Regulations, Title 47, Part 15 for Class A devices with regard to electromagnetic compatibility. This shall be confirmed through the testing methods in accordance with ANSI C63.4 for electromagnetic interference.

The driver shall be dimmable using the protocol listed in the Luminaire Performance Table shown in the contract.

Surge Protection. The luminaire shall comply the requirements of ANSI C136.2 for electrical transient immunity at the "Extreme" level (20KV/10KA) and shall be equipped with a surge protective device (SPD) that is UL1449 compliant with indicator light. An SPD failure shall open the circuit to protect the driver.

LED Optical Assembly. The optical assembly shall have an IP66 or higher rating in accordance with ANSI C136.25. The circuiting of the LED array shall be designed to minimize the effect of individual LED failures on the operation of other LEDs. All optical components shall be made of glass or a UV stabilized, non-yellowing material.

The optical assembly shall utilize high brightness, long life, minimum 70 CRI, 4,000K color temperature (+/- 300K) LEDs binned in accordance with ANSI C78.377. Lenses shall be UV-stabilized acrylic or glass.

Lumen depreciation at 50,000 hours of operation shall not exceed 15% of initial lumen output at the specified LED drive current and an ambient temperature of 25° C.

The luminaire may or may not have a glass lens over the LED modules. If a glass lens is used, it must be a flat lens. Material other than glass will not be acceptable. If a glass lens is not used, the LED modules may not protrude lower than the luminaire housing.

The assembly shall have individual serial numbers or other means for manufacturer tracking.

Photometric Performance. Luminaires shall be tested according to IESNA LM-79. This testing shall be performed by a test laboratory holding accreditation from the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for the IESNA LM-79 test procedure.

Data reports as a minimum shall yield an isofootcandle chart, with max candela point and half candela trace indicated, maximum plane and maximum cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, spectral distribution plots, chromaticity plots, and other standard report outputs of the above mentioned tests.

The luminaire shall have a BUG rating of Back Light B3 or less, Up Light rating of U0, and a Glare rating of G3 or less unless otherwise indicated in the luminaire performance table.

Photometric Calculations. Calculations. Submitted report shall include a luminaire classification system graph with both the recorded lumen value and percent lumens by zone along with the BUG rating according to IESNA TM-15.

Complete point-by-point luminance and veiling luminance calculations as well as listings of all indicated averages and ratios as applicable shall be provided in accordance with IESNA RP-8 recommendations. Lighting calculations shall be performed using AGi32 software with all luminance calculations performed to one decimal place (i.e. x.x cd/m²). Uniformity ratios shall also be calculated to one decimal place (i.e. x.x:1). Calculation results shall demonstrate that the submitted luminaire meets the lighting metrics specified in the project Luminaire Performance Table(s). Values shall be rounded to the number of significant digits indicated in the luminaire performance table(s).

All photometry must be **photopic**. Scotopic or mesopic factors will not be allowed. The AGi32 file shall be submitted at the request of the Engineer.

Installation. Each luminaire shall be installed according to the luminaire manufacturer's recommendations.

Luminaires which are pole mounted shall be mounted on site such that poles and arms are not left unloaded. Pole mounted luminaires shall be leveled/adjusted after poles are set and vertically aligned before being energized. When mounted on a tenon, care shall be exercised to assure maximum insertion of the mounting tenon. Each luminaire shall be checked to assure compatibility with the project power system. When the night-time check of the lighting system by the Engineer indicates that any luminaires are mis-aligned, the mis-aligned luminaires shall be corrected at no additional cost.

No luminaire shall be installed prior to approval. Where independent testing is required, full approval will not be given until complete test results, demonstrating compliance with the specifications, have been reviewed and accepted by the Engineer.

Pole wiring shall be provided with the luminaire. Pole wire shall run from handhole to luminaire. Pole wire shall be sized No. 10, rated 600 V, RHW/USE-2, and have copper conductors, stranded in conformance with ASTM B 8. Pole wire shall be insulated with cross-linked polyethylene (XLP) insulation. Pole wire shall include a phase, neutral, and green ground wire. Wire shall be trained within the pole or sign structure so as to avoid abrasion or damage to the insulation.

Pole wire shall be extended through the pole, pole grommet, luminaire ring, and any associated arm and tenon. The pole wire shall be terminated in a manner that avoids sharp kinks, pinching, pressure on the insulation, or any other arrangement prone to damaging insulation value and producing poor megger test results. Wires shall be trained away from heat sources within the luminaire. Wires shall be terminated so all strands are extended to the full depth of the terminal lug with the insulation removed far enough so it abuts against the shoulder of the lug but is not compressed as the lug is tightened.

Included with the pole wiring shall be fusing located in the handhole. Fusing shall be according to Article 1065.01 with the exception that fuses shall be 6 amperes.

Each luminaire and optical assembly shall be free of all dirt, smudges, etc. Should the optical assembly require cleaning, a luminaire manufacturer approved cleaning procedure shall be used.

Horizontal mount luminaires shall be installed in a level, horizontal plane, with adjustments as needed to ensure the optics are set perpendicular to the traveled roadway.

When the pole is bridge mounted, a minimum size stainless steel 1/4-20NC set screw shall be provided to secure the luminaire to the mast arm tenon. A hole shall be drilled and tapped through the tenon and luminaire mounting bracket and then fitted with the screw.

Warranty. The entire luminaire and all its component parts shall be covered by a 10-year warranty. Failure is when one or more of the following occur:

- 1) Negligible light output from more than 10 percent of the discrete LEDs.
- 2) Significant moisture that deteriorates performance of the luminaire.
- 3) Driver that continues to operate at a reduced output due to overheating.

The warranty period shall begin on the date of luminaire shipment. The Contractor shall verify that the Resident Engineer has noted the shipment date in the daily diary. Copy of the shipment documentation shall be submitted.

The replacement luminaire shall be of the same manufacturer, model, and photometric distribution as the original.

Method of Measurement. The rated initial minimum luminous flux (lumen output) of the light source, as installed in the luminaire, shall be according to the following table for each specified output designation.

Designation Type	Minimum Initial Luminous Flux	Old HPS Equivalent	Luminaire Model # Specified	Pay Item
G	15,500	Up to 250W	GE # ERLH014B340DGRAYAGILT	LU01
H	25,200	Up to 400W	GE # ERL2028B340DGRAYAGILT	LU02

Where delivered lumens is defined as the minimum initial delivered lumens at the specified color temperature. Luminaires with an initial luminous flux less than the values listed in the above table will not be acceptable even if they meet the requirements given in the Luminaire Performance table shown in the contract.

Basis of Payment. This work will be paid for at the contract unit price per each for **LUMINAIRE, LED, POLE**, of the output designation specified.

LU01 LUMINAIRE, LED – 14K LUMINOUS, POLE
LU02 LUMINAIRE, LED – 28K LUMINOUS, POLE

**LU03
LUMINAIRE, POLE, INSTALL ONLY**

Description. This item shall consist of retrieving an HPS or LPS luminaire from the State’s storage facility, loading, transporting, and installing on a light pole. The HPS luminaire shall be complete with a new lamp, of the wattage as specified by the Engineer, and all required hardware as specified herein. The luminaire and new lamp shall be paid separately.

Installation. Installation shall be as described in Section 821.04 of the Standard Specifications for Road and Bridge Construction, current version and within the Special Provisions.

Method of Measurement. Luminaires shall be counted each, installed.

Basis of Payment. This item will be paid at the contract unit price each for LUMINAIRE, POLE, INSTALL ONLY, which shall be payment in full for the complete installation as specified herein.

**LU04
LUMINAIRE SHIELD, POLE**

Description. This item shall consist of furnishing, delivering, and installing a luminaire shield, for highway luminaires on light poles, at locations as directed by the Engineer, to minimize off-highway light infringement.

Materials. The luminaire shields shall be curved shield, off-highway side luminaire shield, or approved equal. Highway side shields shall not be used.

Method of Measurement. Luminaire shield, pole, shall be counted, each, furnished and installed.

Basis of Pavement. This item shall be paid at the contract unit price each for furnishing and installing one, LUMINAIRE SHIELD, POLE, of the type and construction as specified, which shall be payment in full for this item specified herein.

LU05 LUMINAIRE, KEEPER

Description. This item shall consist of furnishing, delivering, and installing a luminaire keeper of the type and construction, as shown in figure L-22, to secure the luminaire to the mast arm or davit arm in case of a failure of the luminaire mounts.

Materials. The cable used for the luminaire keeper shall be 3.18 mm (0.0125") stainless steel aircraft cable. The cable shall be secured at both ends, as shown on the drawing.

Method of Measurement. Luminaire keeper shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing one, LUMINAIRE KEEPER, of the type and construction as specified, which shall be payment in full for the item specified herein.

LU06 LUMINAIRE, REMOVAL AND SALVAGE

Description. This item shall consist of disconnecting, completely removing and transporting to the State's storage facility, and unloading as salvage, a luminaire mounted on a wall, roof, or ceiling, in a maintenance yard, sign shop, weigh station, rest areas and other IDOT facilities, light pole, light tower, underpass, tunnel sign structure or navigation light fixture as specified herein. This pay item shall also include removal of the associated conduit, wire, disconnect switch and junction boxes. Proper documentation of the State's salvage is required with this pay item.

General. Luminaire removal shall be in accordance with Section 841 of the Standard Specifications for Road and Bridge Construction, current version.

Prior to the removal of any equipment, the Contractor shall arrange an inventory inspection with the Engineer. All equipment shall be inspected and logged as to type, size and condition. No removal work shall be permitted until approved by the Engineer.

Unless otherwise indicated, luminaires shall be removed, boxed in containers approved by the Engineer and delivered and unloaded at the storage facility of the State, or as designated by the Engineer.

Any damage resulting from the removal and/or transportation of the luminaire shall be repaired to its original condition, or replaced in kind, at the Contractor's own expense, to the satisfaction of the Engineer.

Existing anchors for underpass or tunnel lighting fixture which have been attached improperly shall be left in place as removal would cause more damage to the beam than leaving the anchors in place.

Method of Measurement. Each luminaire, which is removed, boxed as approved, delivered to storage, unloaded, inspected, and documented properly, shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for LUMINAIRE, REMOVAL AND SALVAGE, which shall be payment in full for the luminaire location as specified herein.

**LU07 – LU09
LUMINAIRE, LED, Tower**

Description. This work shall consist of furnishing and installing a light tower LED luminaire as specified herein or equivalent. This could include the removing an old luminaire and placing into IDOT stock.

General. The luminaire including the housing, driver and optical assembly shall be assembled in the U.S.A. The luminaire shall be assembled by and manufactured by the same manufacturer. The luminaire shall be mechanically strong and easy to maintain. The size, weight, and shape of the luminaire shall be designed so as not to incite detrimental vibrations in its respective pole, and it shall be compatible with the pole and arm. All electrical and electronic components of the luminaire shall comply with the requirements of Restriction of Hazardous Materials (RoHS) regulations. The luminaire shall be listed for wet locations by an NRTL and shall meet the requirements of UL 1598 and UL 8750

Submittal Requirements.

The Contractor shall also the following manufacturer's product data for each type of luminaire:

1. Descriptive literature and catalogue cuts for luminaire, LED driver, and surge protection device. Completed manufacturer's luminaire ordering form with the full catalog number provided
2. LED drive current, total luminaire input wattage and total luminaire current at the system operating voltage or voltage range and ambient temperature of 25 C.
3. LED efficacy per luminaire expressed in lumens per watt (l/w).
4. Initial delivered lumens at the specified color temperature, drive current, and ambient temperature.
5. IES file associated with each submitted luminaire in the IES LM-63 format.
6. Computer photometric calculation reports as specified and in the luminaire performance table.
7. TM-15 BUG rating report.
8. Isofootcandle chart with max candela point and half candela trace indicated.
9. Documentation of manufacturers experience and verification that luminaires were assembled in the U.S.A. as specified.
10. Written warranty.

Upon request by the Engineer, submittals shall also include any or all the following:

- a. TM-21 calculator spreadsheet (XLSX or PDF format) and if available, TM-28 report for the specified luminaire or luminaire family. Both reports shall be for 50,000 hours at an ambient temperature of 77 °F (25 °C).
- b. LM-79 report with National Voluntary Laboratory Accreditation Program (NVLAP) current at the time of testing in PDF format inclusive of the following: isofootcandle diagram with half candela contour

and maximum candela point; polar plots through maximum plane and maximum cone; coefficient of utilization graph; candela table; and spectral distribution graph and chromaticity diagram.

- c. LM-80 report for the specified LED package in PDF format and if available, LM-84 report for the specified luminaire or luminaire family in PDF format. Both reports shall be conducted by a laboratory with NVLAP certification current at the time of testing.
- d. AGi32 calculation file matching the submittal package.
- e. In Situ Temperature Measurement Test (ISTMT) report for the specified luminaire or luminaire family in PDF format.
- f. Vibration test report in accordance with ANSI C136.31 in PDF format.
- g. ASTM B117/ASTM D1654 (neutral salt spray) test and sample evaluation report in PDF format.
- h. ASTM G154 (ASTM D523) gloss test report in PDF format.
- i. LED drive current, total luminaire input wattage, and current over the operating voltage range at an ambient temperature of 77 °F (25 °C).
- j. Power factor (pf) and total harmonic distortion (THD) at maximum and minimum supply and at nominal voltage for the dimmed states of 70%, 50%, and 30% full power.
- k. Ingress protection (IP) test reports conducted according to ANSI C136.25 requirements, for the driver and optical assembly in PDF format.
- l. Installation, maintenance, and cleaning instructions in PDF format, including recommendations on periodic cleaning methods.
- m. Documentation in PDF format that the reporting laboratory is certified to perform the required tests.

Manufacturer Experience. The luminaire shall be designed to be incorporated into a lighting system with an expected 20-year lifetime. The luminaire manufacturer shall have a minimum of 33 years' experience manufacturing HID roadway luminaires and shall have a minimum of seven (7) years' experience manufacturing LED roadway luminaires. The manufacturer shall have a minimum of 25,000 total LED roadway luminaires installed on a minimum of 100 separate installations, all within the U.S.A.

Housing.

Material. The luminaire shall be a single device not requiring on-site assembly for installation. The driver for the luminaire shall be integral to the unit.

Finish. The luminaire shall have a baked acrylic enamel finish. The color of the finish shall be gray, unless otherwise indicated.

The finish shall have a rating of six or greater according to ASTM D1654, Section 8.0 Procedure A – Evaluation of Rust Creepage for Scribed Samples after exposure to 1000 hours of testing according to ASTM B117 for painted or finished surfaces under environmental exposure.

The luminaire finish shall have less than or equal to 30% reduction of gloss according to ASTM D523 after exposure of 500 hours to ASTM G154 Cycle 6 QUV® accelerated weathering testing.

The luminaire shall slip-fit on a mounting arm with a 2" diameter tenon (2.375" outer diameter), and shall have a barrier to limit the amount of insertion. The slip fitter clamp shall utilize four (4) bolts to clamp to the tenon arm. The luminaire shall be provided with a leveling surface and shall be capable of being tilted ± 5 degrees from the axis of attachment in 2.5-degree increments and rotated to any degree with respect to the supporting arm.

All external surfaces shall be cleaned in accordance with the manufacturer's recommendations and be constructed in such a way as to discourage the accumulation of water, ice, and debris.

The effective projected area of the luminaire shall not exceed 1.6 sq. ft.

The total weight including accessories, shall not exceed 40 lb (18.14 kg). If the weight of the luminaire is less than 20 lb (9.07 kg), weight shall be added to the mounting arm or a supplemental vibration damper installed as approved by the Engineer.

A passive cooling method with no moving, rotating parts, or liquids shall be employed for heat management.

The luminaire shall include a fully prewired, 7-pin twist lock ANSI C136.41-compliant receptacle. Unused pins shall be connected as directed by the Manufacturer and as approved by the Engineer. A shorting cap shall be provided with the luminaire that is compliant with ANSI C136.10.

Vibration Testing. All luminaires shall be subjected to and pass vibration testing requirements at "3G" minimum zero to peak acceleration in accordance with ANSI C136.31 requirements using the same luminaire. To be accepted, the luminaire housing, hardware, and each individual component shall pass this test with no noticeable damage and the luminaire must remain fully operational after testing.

Labels. An internal label shall be provided indicating the luminaire is suitable for wet locations and indicating the luminaire is an NRTL listed product to UL1598 and UL8750. The internal label shall also comply with the requirements of ANSI C136.22.

An external label consisting of two black characters on a white background with the dimensions of the label and the characters as specified in ANSI C136.15 for HPS luminaires. The first character shall be the alphabetical character representing the initial lumen output as specified in Table 1 of Article 1067.06(c). The second character shall be the numerical character representing the transverse light distribution type as specified in IES RP-8 (i.e. Types 1, 2, 3, 4, or 5).

Hardware. All hardware shall be stainless steel or of other corrosion resistant material approved by the Engineer.

Luminaires shall be designed to be easily serviced, having fasteners such as quarter-turn clips of the heavy spring-loaded type with large, deep straight slot heads, complete with a receptacle and shall be according to military specification MIL-f-5591.

All hardware shall be captive and not susceptible to falling from the luminaire during maintenance operations. This shall include lens/lens frame fasteners as well hardware holding the removable driver and electronic components in place.

Provisions for any future house-side external or internal shielding should be indicated along with means of attachment.

Circuiting shall be designed to minimize the impact of individual LED failures on the operation of the other LED's.

Wiring. Wiring within the electrical enclosure shall be rated at 600v, 105°C or higher.

Driver.

The driver shall be integral to the luminaire shall be capable of receiving an indefinite open and short circuit output conditions without damage.

The driver shall incorporate the use of thermal foldback circuitry to reduce output current under abnormal driver case temperature conditions and shall be rated for a lifetime of 100,000 hours at an ambient temperature exposure of 77 °F (25 °C) to the luminaire. If the driver has a thermal shut down feature, it shall not turn off the LEDs when operated at 104 °F (40 °C) or less.

The driver shall have an input voltage range of 120 to 277 volts ($\pm 10\%$) or 347 to 480 volts ($\pm 10\%$) according to the contract documents. When the driver is operating within the rated input voltage range and in an un-dimmed state, the power factor measurement shall be not less than 0.9 and the THD measurement shall be no greater than 20%.

The driver shall meet the requirements of the FCC Rules and Regulations, Title 47, Part 15 for Class A devices with regard to electromagnetic compatibility. This shall be confirmed through the testing methods in accordance with ANSI C63.4 for electromagnetic interference.

The driver shall be dimmable using the protocol listed in the Luminaire Performance Table shown in the contract.

Surge Protection. The luminaire shall comply the requirements of ANSI C136.2 for electrical transient immunity at the "Extreme" level (20KV/10KA) and shall be equipped with a surge protective device (SPD) that is UL1449 compliant with indicator light. An SPD failure shall open the circuit to protect the driver.

LED Optical Assembly

The optical assembly shall have an IP66 or higher rating in accordance with ANSI C136.25. The circuiting of the LED array shall be designed to minimize the effect of individual LED failures on the operation of other LEDs. All optical components shall be made of glass or a UV stabilized, non-yellowing material.

The optical assembly shall utilize high brightness, long life, minimum 70 CRI, 4,000K color temperature (+/- 300K) LEDs binned in accordance with ANSI C78.377. Lenses shall be UV-stabilized acrylic or glass.

Lumen depreciation at 50,000 hours of operation shall not exceed 15% of initial lumen output at the specified LED drive current and an ambient temperature of 25° C.

The luminaire may or may not have a glass lens over the LED modules. If a glass lens is used, it must be a flat lens. Material other than glass will not be acceptable. If a glass lens is not used, the LED modules may not protrude lower than the luminaire housing.

The assembly shall have individual serial numbers or other means for manufacturer tracking.

Photometric Performance.

Luminaires shall be tested according to IESNA LM-79. This testing shall be performed by a test laboratory holding accreditation from the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for the IESNA LM-79 test procedure.

Data reports as a minimum shall yield an isofootcandle chart, with max candela point and half candela trace indicated, maximum plane and maximum cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, spectral distribution plots, chromaticity plots, and other standard report outputs of the above mentioned tests.

The luminaire shall have a BUG rating of Back Light B3 or less, Up Light rating of U0, and a Glare rating of G3 or less unless otherwise indicated in the luminaire performance table.

Photometric Calculations.

Calculations. Submitted report shall include a luminaire classification system graph with both the recorded lumen value and percent lumens by zone along with the BUG rating according to IESNA TM-15.

Complete point-by-point luminance and veiling luminance calculations as well as listings of all indicated averages and ratios as applicable shall be provided in accordance with IESNA RP-8 recommendations. Lighting calculations shall be performed using AGi32 software with all luminance calculations performed to one decimal place (i.e. x.x cd/m²). Uniformity ratios shall also be calculated to one decimal place (i.e. x.x:1). Calculation results shall demonstrate that the submitted luminaire meets the lighting metrics specified in the project Luminaire Performance Table(s). Values shall be rounded to the number of significant digits indicated in the luminaire performance table(s).

All photometry must be **photopic**. Scotopic or mesopic factors will not be allowed. The AGi32 file shall be submitted at the request of the Engineer.

Installation.

Each luminaire shall be installed according to the luminaire manufacturer's recommendations.

Luminaires which are pole mounted shall be mounted on site such that poles, and arms are not left unloaded. Pole mounted luminaires shall be leveled/adjusted after poles are set and vertically aligned before being energized. When mounted on a tenon, care shall be exercised to assure maximum insertion of the mounting tenon. Each luminaire shall be checked to assure compatibility with the project power system. When the night-time check of the lighting system by the Engineer indicates that any luminaires are mis-aligned, the mis-aligned luminaires shall be corrected at no additional cost.

No luminaire shall be installed prior to approval. Where independent testing is required, full approval will not be given until complete test results, demonstrating compliance with the specifications, have been reviewed and accepted by the Engineer.

Pole wiring shall be provided with the luminaire. Pole wire shall run from handhole to luminaire.

Pole wire shall be sized No. 10, rated 600 V, RHW/USE-2, and have copper conductors, stranded in conformance with ASTM B 8. Pole wire shall be insulated with cross-linked polyethylene (XLP) insulation. Pole wire shall include a phase, neutral, and green ground wire. Wire shall be trained within the pole or sign structure so as to avoid abrasion or damage to the insulation.

Pole wire shall be extended through the pole, pole grommet, luminaire ring, and any associated arm and tenon. The pole wire shall be terminated in a manner that avoids sharp kinks, pinching, pressure on the insulation, or any other arrangement prone to damaging insulation value and producing poor megger test results. Wires shall be trained away from heat sources within the luminaire. Wires shall be terminated so all strands are extended to the full depth of the terminal lug with the insulation removed far enough so it abuts against the shoulder of the lug but is not compressed as the lug is tightened.

Included with the pole wiring shall be fusing located in the handhole. Fusing shall be according to Article 1065.01 with the exception that fuses shall be 6 amperes.

Each luminaire and optical assembly shall be free of all dirt, smudges, etc. Should the optical assembly require cleaning, a luminaire manufacturer approved cleaning procedure shall be used.

Horizontal mount luminaires shall be installed in a level, horizontal plane, with adjustments as needed to ensure the optics are set perpendicular to the traveled roadway.

When the pole is bridge mounted, a minimum size stainless steel 1/4-20NC set screw shall be provided to secure the luminaire to the mast arm tenon. A hole shall be drilled and tapped through the tenon and luminaire mounting bracket and then fitted with the screw.

Warranty. The entire luminaire and all of its component parts shall be covered by a 10-year warranty. Failure is when one or more of the following occur:

- 1) Negligible light output from more than 10 percent of the discrete LEDs.
- 2) Significant moisture that deteriorates performance of the luminaire.
- 3) Driver that continues to operate at a reduced output due to overheating.

The warranty period shall begin on the date of luminaire shipment. The Contractor shall verify that the Resident Engineer has noted the shipment date in the daily diary. Copy of the shipment documentation shall be submitted.

The replacement luminaire shall be of the same manufacturer, model, and photometric distribution as the original.

Method of Measurement. The rated initial minimum luminous flux (lumen output) of the light source, as installed in the luminaire, shall be according to the following table for each specified output designation.

Designation Type	Minimum Initial Luminous Flux	Old HPS Equivalent	Luminaire Model # Specified	Pay Item
H	25,200	Up to 400W	GE # ERHM01040G1740D D4BGRAYR(G007)	LU07
I	47,250	Up to 750W	GE # ERHM01050G1740D D4BGRAYR(G007)	LU08
J	63,300	Up to 1000W	GE # ERHM01060G1740D D4BGRAYR(G007)	LU09

Where delivered lumens is defined as the minimum initial delivered lumens at the specified color temperature. Luminaires with an initial luminous flux less than the values listed in the above table will not be acceptable even if they meet the requirements given in the Luminaire Performance table shown in the contract.

Basis of Payment.

The work will be paid at the contract unit price per each **LUMINAIRE, LED, TOWER**, of the output designation specified, for a luminaire which is equivalent in size and dimension to GE brand shown above to fit the applicable Department towers.

If an equivalent brand is purchased and there is need to modify the arms on the luminaire ring to fit the Department towers the Contractor shall be responsible for the cost of the modification work which must be approved by the Engineer.

- LU07 LUMINAIRE, LED – 28K LUMINOUS, TOWER
- LU08 LUMINAIRE, LED – 50K LUMINOUS, TOWER
- LU09 LUMINAIRE, LED – 65K LUMINOUS, TOWER

LU10 LUMINAIRE, TOWER, INSTALL ONLY

Description. This item shall consist of retrieving an HPS or LPS luminaire from State's storage facility, loading, transporting, and installing on a light tower. The HPS luminaire shall be complete with a new lamp, of the wattage as specified by the Engineer, and all required hardware as specified herein. The luminaire and new lamp shall be paid separately.

Installation. Installation shall be as described in Section 821.05 of the Standard Specifications for Road and Bridge Construction, current version and within the Special Provisions.

Method of Measurement. Luminaires shall be counted each, installed.

Basis of Payment. This item will be paid at the contract unit price each for LUMINAIRE, TOWER, INSTALL ONLY, which shall be payment in full for the complete installation as specified herein.

LU11 LUMINAIRE SHIELD, TOWER

Description. This item shall consist of furnishing, delivering, and installing a luminaire shield, for highway luminaires on light towers, at locations, as directed by the Engineer, to minimize off highway light infringement.

Materials. The luminaire shields shall be 15" high, curved shield, GE Lighting Systems Model ELS-HMAA060, off-highway side luminaire shield, or approved equal. Highway side shields shall not be used.

Method of Measurement. Luminaire shield, tower, shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing one, LUMINAIRE SHIELD, TOWER, of the type and construction as specified, which shall be payment in full for the item specified herein.

LU12 LUMINAIRE, NAVIGATION LED

Description. This item shall consist of furnishing and installing a navigation LED light fixture including LED lamp, of the wattage as specified, conduit connection, wiring and all appurtenances mounted on fixed and moveable bridges, piers, abutment walls and dolphins.

Materials. The existing navigation light fixtures currently installed on the Department structures meet U.S. Coast Guard Bridge Lighting Regulations. Refer to Section 822 of the Standard Specifications for Road and Bridge Construction, current version.

Replacement fixtures of equipment required under this contract shall:

- Meet current U.S.C.G. regulations.
- Be mounted in the same location and manner as the original units.
- Match the Fresnel lens color and degree spread (either 180 degrees or 360 degrees) as the existing units.
- Be equipped with a shielding device for protection from flying debris and other spurious objects.

The existing equipment was manufactured by Security Products Division of Federal Signal Corporation and identified as follows:

TYPE	DESCRIPTION
Type 1 Pier light	180 Degree red lens, cast aluminum housing
Type 1-A Pier light	180 Degree red lens, cast aluminum housing
Type 1-P Pivot type Channel or Pier light	180 Degree red lens, cast aluminum housing
Type 2 Pivot type Bridge Light	1 Green and 1 Red 180 Degree lenses, cast aluminum housing
Type 6 Channel Marker	360 Degree green or red lens, cast aluminum housing
Type 6 PSU Pivot type Channel light	360 Degree green or red lens, cast aluminum housing
Type 11 Channel light	2-360 Degree green or red lenses, cast aluminum housing

Installation. The Contractor shall provide all equipment, transportation, and labor necessary to furnish and install the equipment as specified. New wiring and conduit will be paid under separate contract pay items. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Furnishing and installing each Navigation LED luminaire, as specified above, and approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for LUMINAIRE, NAVIGATION LED, which shall be payment in full for furnishing and installing, specified herein and as directed by the Engineer.

**LU13
LUMINAIRE, FLUORESCENT**

Description. This item shall consist of furnishing and installing a fluorescent luminaire up to twenty (20) feet mounting height for maintenance yard, sign shop or other facilities, of the wattage and operating voltage as specified herein.

Materials. The housing shall be one piece constructed of die-formed cold rolled steel with longitudinal V-grooves in channel for strength. The channel cover shall be secured by latch for easy access to wire way. The luminaire shall be designed and constructed in accordance with the requirements of UL. The mounting accessories, hardware, and brackets shall be made out of steel for environmental conditions.

The finish shall be five stage iron phosphate permanent ensuring superior paint adhesion and corrosion resistance. Reflector and channel finished with a high gloss baked white enamel. Reflector is painted after fabrication.

The ballast shall be multi-voltage, thermally protected, resetting, class P, HPF, non-PCB, UL listed and CSA certified. The fluorescent fixture shall be equivalent to Lithonia Lighting model TEJS or better.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Luminaire information submitted for approval shall include any recommendations of the manufacturer for storage as provided under this contract.

The packaging of the luminaires shall incorporate the provisions recommended by the manufacturer for storage.

Installation. The luminaires shall be installed in accordance with the plans as specified by the Engineer. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, FLUORESCENT, of the length and type indicated, wattage and operating voltage indicated or shown on the plan, which shall be payment in full for the item as specified herein.

LU14 LUMINAIRE, FLUORESCENT, FOR WET LOCATIONS

Description. This item shall consist of furnishing and installing, a fluorescent luminaire with lamp for the weigh station pit area, wash bay at the maintenance yard or buildings, as specified herein, at the wattage and at locations as designated by the Engineer.

Materials. The housing shall be one piece and refractor made out of durable polycarbonate to reduce vandalism. The luminaire shall be equal or better than Lithonia Lighting model series "FHE" and UL listed for wet locations.

The cover-reflector and socket-reflector junctions shall be sealed against the entry of moisture, dirt and insects with a thick, high density Dacron felt gasket, securely attached by mechanical means, such as a retaining clip, or by a wide-temperature permanent adhesive in a manner acceptable to the Engineer.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

The packaging of the luminaires shall incorporate the provisions recommended by the manufacturer to accommodate storage. The submittal shall include these recommendations.

Installation. Manufacturer's recommendations shall be followed during the installation process. The wiring connections shall be made as shown on the drawings and in accordance with the National Electrical Code. The Contractor shall test the luminaires with the lighting controller energized to assure that all the components are working in accordance with their specifications and carrying rated load.

Wall mounted luminaires shall be either attached to structures, such as a wall, as indicated on the plans or as directed by the Engineer.

All mounting hardware shall be corrosion resistant and shall be stainless steel unless otherwise indicated. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire, fluorescent, shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, FLUORESCENT, FOR WET LOCATIONS, of the type, number of lamps and wattage indicated by the Engineer, which shall be payment in full for the item as specified herein.

LU15 LUMINAIRE, LED, FOR BUILDING ROOF

Description. This item shall consist of furnishing and installing, a LED, luminaire, with lamp and photocell, if specified, for flood lighting or roof mount, as specified herein. All boxes, recommended by the manufacturer for proper storage, shall be included in this item.

Materials. The housing shall be heavy duty, made of die cast aluminum. The luminaire shall meet NEMA specifications, high pressure sodium lamp, of specified wattage and voltage. The shield and other mounting accessories, as specified on the contract drawing, shall be included with the luminaire.

When closed, the optical assembly shall be sealed with a gasket against the entry of moisture, dirt and insects. The cover-reflector and socket-reflector joints shall be sealed against the entry of moisture, dirt and insects with a thick, high density Dacron felt gasket, securely attached by mechanical means, such as a retaining lip, or by a wide-temperature permanent adhesive in a manner acceptable to the Engineer. Submittal information shall include data relative to gasket thickness and density and the means of securing it in place. Any alternative gasket material may be approved by the Engineer. There shall be a provision for thermal breathing. A charcoal filter may be used, subject to approval by the Engineer.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Installation. The installation shall be as indicated on the plans, or as directed by the Engineer. All mounting hardware shall be corrosion resistant and shall be stainless steel unless otherwise indicated. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, LED, FOR BUILDING ROOF, of the wattage and operating voltage specified, which shall be payment in full for the item as specified herein.

LU16 LUMINAIRE, LED, FOR WALL

Description. This item shall consist of furnishing and installing, a wall mounted LED luminaire, with lamp, as specified herein. All boxes, recommended by the manufacturer for proper storage, shall be included in this item.

Materials. The housing shall be of aluminum construction consisting of a single piece extruded main frame and flat sheet back panel. Heavy-duty cast aluminum doorframe shall be hinged and latched by means of a single screw. The optical system shall be adjustable, with "sharp cutoff", reflector optical assembly consisting of a hydroformed, specular Alzak main reflector with both parabolic and cylindrical reflecting surfaces, auxiliary reflecting elements, and a support frame. Optical elements may be rotated to permit adjustment of cutoff over a range from 70 degrees through 86 degrees. The refractor shall be vandal resistant, injection molded, polycarbonate lens, UV stabilized, and complete with special UV inhibiting coating. The luminaire shall be UL listed for wet locations. The mounting accessories, hardware and brackets, shall be stainless steel, unless indicated otherwise.

The cover-reflector and socket-reflector junctions shall be sealed against the entry of moisture, dirt and insects with a thick, high density Dacron felt gasket, securely attached by mechanical means, such as a retaining lip, or by a wide-temperature permanent adhesive in a manner acceptable to the Engineer. It shall be an equivalent or better than the Paracyl luminaire.

A decal, complying with the ANSI standard, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

Luminaire information submitted for approval shall include any recommendations of the manufacturer for storage as provided under this contract.

The wattage and operating voltage as specified on the plan submitted shall be used as part of this pay item.

Installation. Wall mount luminaires shall be either attached to structures, such as a wall, as indicated or implied by the configuration on the plans, or as directed by the Engineer. The mounting hardware, junction box and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under separate pay item.

Method of Measurement. Luminaire shall be counted, each, furnished and installed.

Basis of Payment. This item shall be paid at the contract unit price each for furnishing and installing a LUMINAIRE, LED, FOR WALL, of the wattage and operating voltage specified, which shall be payment in full for the item as specified herein.

LU17 EMERGENCY EXIT LIGHT FIXTURE

Description. Furnish and install one emergency/exit light fixture at the Maintenance Yards, Sign Shops, and other Department facilities in District 1, as directed by the Engineer. The fixture shall be a 2-lamp, 120 V, with a minimum two-hour battery backup, totally enclosed industrial type fixture. Installation shall include all hardware, hangers, junction box, fuse, lamp as specified and other appurtenances. Removal of the existing fixture, if necessary, shall be included in this work. Conduit and wire installation shall be paid through other pay items, where needed.

Method of Measurement. Furnishing and installing, removing old fixture if necessary, as specified above and approved by the Engineer, shall be counted as a unit of payment.

Basis of Payment. This work shall be paid at the contract unit price each for EMERGENCY EXIT LIGHT FIXTURE, which shall be payment in full for furnishing, delivering storing, installing, and connecting the fixture, complete

**LU18
LUMINAIRE - WALL, CEILING, UNDERPASS OR TUNNEL**

Description. This item shall consist of furnishing and installing a wall mounted or ceiling mounted underpass or tunnel LED as specified by the Engineer, and all required hardware, as specified herein.

Installation. Installation shall be as described in Section 821.06 of the Standard Specifications for Road and Bridge Construction, current version and with the District 1 Special Provisions.

The mounting hardware, junction box and fuse, as specified and other appurtenances required are included as part of this pay item except the cable and conduit shall be paid under a separate pay item.

Unless otherwise indicated, attachment of underpass lighting appurtances including the placement of associated anchors, but not limited to underpass luminaires, identification brackets and conduit shall not be attached and/or drilled into precast, prestressed concrete beans. However, existing anchors, which have been installed improperly, shall be left in place, as removal may cause more damage to the beam than leaving it in place.

Method of Measurement. Luminaire shall be counted each, installed.

Basis of Payment. This item will be paid at the contract unit price each for a LUMINAIRE, LED for WALL, CEILING, UNDERPASS or TUNNEL, of the proper calculated luminaire level as to fit the applicable Department location of a wall, ceiling, underpass or tunnel location, which shall be payment in full for the complete installation as specified herein.

**LW01
WASH HUBBARD'S CAVE TUNNEL WALLS**

Description. The tiled tunnel walls at highway lighting locations L0883, (Hubbard's cave) shall be steam washed per paint and grout manufacturers' recommended pressure and temperature. Both I/B and O/B sides shall be washed to remove dirt, dust, or other foreign material. The Contractor shall inspect locations prior to bidding this item.

Hubbard's cave approximate dimensions:

Maximum Height: 14'

Length (4 sides): 741', each side Tile manufacturer: Buchtal

Grout: Epoxy coated latex modified according to ANSI Standard A118.6.

General. Protect all surrounding painted surfaces and foliage to avoid damage from contact with washing solutions. Avoid wind drift onto passersby, vehicles, or adjacent properties. Protect and/or divert pedestrian and auto traffic from the work area. Use a soft bristled brush or broom for washing, and rinse with sponge and water. Pressure water rinsing may improve cleaning results but is not required.

Materials. The detergent, used for the Tile washing, shall be ONERESTORE, made by EaCo CHEM Inc., or equal. The Contractor shall follow all manufacturer instructions for application and use of the product.

Test each type of surface before overall application to ensure suitability and desired results. Apply test areas according to the manufacturer's recommendations.

Cleaning. Protect all surrounding painted surfaces and foliage to avoid damage from contact with washing solutions. Avoid wind drift onto passersby, vehicles or adjacent properties. Protect and/or divert pedestrian and auto traffic from the work area. Block any and all drains where present and setup water recovery to recover wastewater.

Use pressurized water to rinse the tiles, then spray the chemical detergent and scrub clean, high pressure wash surface until clean. use soft bristled brush or broom for extra washing as applicable, and rinse clean with a pressure water and recover wastewater.

The Contractor shall recover wastewater and detergent chemical, the recovered wastewater shall be picked up after completion by an environmental vacuum truck and shall be disposed of in accordance with IEPA rules and guidelines as specified herein.

The Contractor shall provide the traffic control for lanes and ramps as per the Bureau of Traffic Expressway closure guidelines for Hubbard's cave and protection of workers and motorists. as part of this pay item.

Method of Measurement. Tiled tunnel walls, each installation, washed.

Basis of Payment. This item shall be paid at the contract unit price, each, for WASH HUBBARD'S CAVE TILED TUNNEL WALLS, WASH, as specified which shall be payment in full for all work specified herein.

**SPECIAL PROVISIONS FOR LUMINAIRES &
LIGHTING CONTROLLER SPECIFICATIONS &
LUMINAIRE, LED SPECIFICATIONS &
OTHER SPECIFICATIONS**

Will be available at the Pre-Bid Meeting and/or will be available on-line for bidder's review.

PUMP STATION SYSTEM ITEMS

PALR ALARM, INTRUSION OVERRIDE KEY SWITCH

Description. This item shall consist of furnishing, installing, and interfacing an intrusion override key switch to the SCADA panel and existing intrusion alarm system as specified herein and indicated by the Engineer into an existing pumping station.

Materials. The pumping station existing intrusion override key switch shall be replaced with a new High Security Switch that provides a contact closure to the SCADA panel and a contact closure to the existing intrusion alarm system when the intrusion alarm system is armed. Only the "barrel" of the existing override key assembly shall be replaced. The override key switch shall be from MEDECO High Security Locks, five pin, double D mounting, two key pulls. The Contractor shall be responsible for coordinating IDOT authorization for the lock revisions.

All equipment furnished and installed under this item shall be appropriately identified with nameplates as specified under Basic Materials and Methods, elsewhere herein.

Installation. All intrusion override switches shall be mounted as indicated or directed by the Engineer, anchored as required and in conformance with the applicable specifications for Basic Materials and Methods, elsewhere herein.

Method of Measurement. Each intrusion override key switch as furnished, installed and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the Contract unit price each for ALARM, INTRUSION OVERRIDE KEY SWITCH which shall be payment in full for the work as described herein.

PCCS COATING, CONCRETE SURFACE

Description. This item shall consist of furnishing and applying paint coating to exterior and interior concrete surfaces and all attached conduits and fittings as specified herein.

Materials. The concrete and conduit surface will receive one coat of polyamide epoxy primer 2.5 to 6 MILS DFT (Dry Film Thickness) and one coat of urethane enamel 2 to 4 MILS DFT. Unless the moisture content is above 3 LB/SF use a acrylic latex paint 2-4 MILS DFT with an approved primer 1/1/2 – 2/1/2 MILS DFT.

Application. The concrete surfaces shall be prepared to SSPC SP-2 hand tool clean or SSPC SP-3 power tool clean to remove any peeled or failed coatings. A solvent cleaning and scraping necessary to remove dirt, grease and peeling paint shall be used to prepare the floor. A moisture content test shall be performed, and results provided to the IDOT Engineer. All conduits, fittings, boxes, and switches attached and or within one foot of the concrete surfaces shall be cleaned properly and painted. The contractor may have to apply multiple coats to obtain manufacturer's recommended thickness.

Method of Measurement. A square foot of coating applied to a pump station in accordance with manufacturer's specifications, and cleanup of work site, as approved by the Engineer, shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price in square feet, for COATING, CONCRETE SURFACE, which shall be payment in full for the work described herein.

**PI01
INSPECTION, AUTOMATIC BUS TRANSFER SYSTEM**

Description. The contractor shall supply a factory trained field service technician to perform preventive maintenance testing and inspection of the automatic bus transfer scheme at PS #22, 23, 26,35. A service sheet shall be filled out listing both the “as found” and “as left” condition of the system. Equipment for the preventive maintenance, testing and inspection, include Main-TieMain transfer scheme, with associated circuit breakers, controls, and devices.

Scope of Work.

Physical inspection will include:

- Overall enclosure inspection for structural integrity
- Verification of proper door swing, hinge operation, latching and door interlocking

Insure proper operation of:

- Pilot devices such as selector switches and pushbutton
- Control and timing relays
- Protective devices
- Auxiliary electrical contacts
- Circuit breakers and switches
- Operating mechanisms and interlocks
- Other safety interlocks and mechanisms
- Review of all power cable terminations for tightness. Conductor fraying and clearances

Electrical inspection will include:

- Inspection of control wiring terminations
- Pull apart terminal blocks engagement
- Wiring conformance to factory schematics
- Compare instrument transformer ratios to meter scales
- Electrical operation of all components
- Main, tie, and main circuit breaker inspection and
- Testing in accordance with air circuit breaker test report, P-7.
- Installation conformance to specifications:
- Ensure physical arrangement conforms to factory drawings
- Ensure supplied features and options conform to factory drawings
- Ensure all wiring conforms to factory specifications
- Adherence to State and local codes

Record of inspection and test results will be kept. A check-off list will be used; detailing work performed, and results obtained. The formal report produced will list equipment as found, technical service/assistance rendered final equipment settings and recommendations. A report copy shall be submitted.

This pay item includes simulating a power failure to see if the Automatic Transfer System main tie main will properly switch over and switch back to normal upon power restoration. The breakers shall be inspected to look for signs of arcing or pitting of the arcing contacts, and for uneven or premature wearing of the main contacts. All timing circuits will be tested, and all connections will be checked for tightness.

The Electrical Maintenance Contractor shall be responsible for operation of the overall system and application. It is expected that the Contractor will have qualified personnel available with the necessary knowledge and authority regarding performance of the overall system and application so that the controller may be adjusted for optimum performance.

Method of Measurement. Each Service Automatic Bus Transfer System of each Pump Station as approved by IDOT Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for INSPECTION, AUTOMATIC BUS TRANSFER SYSTEM, which shall be payment in full for the work described herein.

PI02 INSPECTION, AUTO TRANSFER SWITCH

Description. The Contractor shall provide a factory trained service representative and shall use factory authorized testing equipment for all testing procedures to complete a comprehensive transfer switch inspection. The inspection, testing and maintenance shall be as recommended by the Manufacturer.

Scope of Work. The Inspection shall consist of the following work:

Verify that all cabled connections are on the proper terminals and torque to the proper specifications

1. Inspect unit for debris and clean
2. Check and adjust all voltage and current sensors as necessary
3. Check phase rotation of both sources
4. Check all auxiliary contacts and accessories are connected properly and adjust to the proper specifications
5. Inspect main contacts
6. Check integrity of electrical hardware of control panel
7. Perform milli-volt drop test
8. Test all light bulbs and replace if necessary
9. Inspect all mechanical interlocks
10. Inspect all electrical interlocks
11. Lubricate necessary moving parts
12. Inspect all limit switches
13. Coordinate with Generator Inspection load test for generator output and timer settings and verify with specifications
14. Exercise timer operation and control
15. Test unit and insure proper operation of all components

A report shall be submitted that includes the following:

1. Recorded values of all measurements taken such as voltage, amperage, frequency, milli-volt, etc.
2. Any adjustments made will be noted
3. Recommendations relative to repairs or upgrades
4. Note all options or features
5. Note the following per manufacturer recommendations:
 - "How to bypass unit"
 - "How to test unit"
 - "How to set times"

A record of inspection and test results will be kept. A check off list will be used detailing work performed and results obtained. The formal report produced will list equipment as found and final equipment settings and

recommendations. The Contractor shall be responsible for operation of the overall system and application. It is expected that the Contractor will have qualified personnel available with the necessary knowledge and authority regarding performance of the overall system and applications so that the controller may be adjusted for optimum performance.

Method of Measurement. Each, for the Auto Transfer Switch Inspection of each pump station as approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price, each for INSPECTION, AUTO TRANSFER SWITCH, which shall be payment in full for the work described herein.

PI03 INSPECTION, SWITCHGEAR SYSTEM

Description. This item shall consist of furnishing of services and equipment to inspect the 600Volt class switchgear, including the circuit breakers, bus, structure, instrument transformers and other devices, at a pump station. The services shall be provided by a factory trained field service technician.

Scope of Work. Preventative maintenance testing and inspection shall be performed according to the following inspection and test procedures.

Switchgear and Switchboard Assemblies:

Visual and Mechanical Inspection

- Inspect the assemblies for physical damage
- Inspect bussing compartment. Check tightness of accessible bolted bus joints by torque wrench method. Check insulators for cracks and contamination.
- Verify all electrical, Key, and mechanical interlock systems for correct operation
- Make closure attempt on locked open devices. Make opening/withdrawal attempt on locked closed devices
- Check mechanical operations of circuit breaker in cell and activate auxiliary devices
- Check ease of operation, proper grounding and interlock
- Inspect circuit breaker for contamination, physical damage
- Verify all LED's are working when the system is operating

Electrical Tests

- Insulation resistance of each bus section is measured phase to phase and phase to ground
- Electrical operation of the circuit breaker is checked in the test and connected position
- The control power source is checked
- The circuit breaker control scheme is tested
- A phasing check is made on double-ended and/or emergency source switchgear at tie points to ensure correct bus phasing.

Circuit Breakers:

Visual and Mechanical Inspection

- Check mechanical operation
- Cell fit and element alignment are checked
- Check bolt torque levels are in accordance with manufacturers or U.S. Standards specifications
- Check arc chutes for foreign matter, cracks and secure Installation
- Clean primary contact surfaces and lubricate if required

Electrical Tests

- Measure contact resistance
- Check Insulation resistance at 1000 volts D.C. for one (1) minute from pole to pole and from each pole to ground and across open contacts for each phase.
- Determine minimum long-time pick-up current and delay time at 300% of pick-up by secondary injection
- Determine short-time pick-up and time delay by secondary injection
- Determine instantaneous pick-up current by secondary injection
- Determine ground fault pick-up current and time delay by secondary injection
- Trip unit reset characteristics are verified
- Final settings are made in accordance with Engineer's prescribed settings.
- Auxiliary devices, such as under voltage relays, blown main fuses detector, shunt close, shunt trip, spring charging motor and auxiliary contacts are activated to ensure operation as applicable
- All functions of the trip units shall be tested with test kits

Metering and Instrumentation:

- Verify meter connections in accordance with single line meter and relay diagram
- Inspect for physical damage
- Electrical tests
- Ammeter accuracy is checked using current injection.
- Voltmeter accuracy is checked

SY/MAX 50PLC:

- Visual and mechanical inspection
- Inspect programmable controller Installation for physical damage
- Inspect for proper grounding
- Check for power wiring
- Check all terminal wiring
- Check all I/O wiring
- Check LI/RI wiring
- Verify correct switch settings on all modules
- Electrical tests
- Inspect sequence of operation
- Verify power supply voltages
- Verify operation of selected I/Os
- Verify resistance of LI/RI cable
- Verify input voltages
- Verify resistance of system ground

Record of inspection and test results will be kept. A check-off list will be used, detailing work performed, and results obtained. The formal report produced will list equipment as found, technical service/assistance rendered final equipment settings and recommendations. A report copy shall be submitted to the Engineer.

Method of Measurement. Lump sum for Switchgear System Inspection approved by the Engineer for the pump station shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contact unit price lump sum for INSPECTION, SWITCHGEAR SYSTEM, which shall be payment in full for the work described herein.

PI04 INSPECTION, MOTOR STARTER, SOFT START TYPE

Description. The Contractor shall supply a factory trained field service technician to perform preventive maintenance testing and inspection of the soft start type motor starter at PS #22. A service sheet for each starter shall be filled out listing both the “as found” and “as left” condition of the starters. All starters shall be inspected and tested under this pay item. Equipment included in the preventive maintenance, testing and inspection five (5) Soft start buckets with associated controls including devices associated with the transfer scheme.

Scope of Work.

Physical inspection will include:

- Overall enclosure inspection for structural integrity
- Verification of proper door swing, hinge operation, latching and door interlocking
- Insure proper operation of:
- Pilot devices such as selector switches and pushbuttons
- Soft starters
- Control and timing relays
- Overload and protective devices
- Auxiliary electrical contacts
- Circuit breakers and switches
- Operating mechanisms and interlocks
- Other safety interlocks and mechanisms
- Review of all power cable terminations for tightness conductor traying and clearances

Electrical inspection will include:

- Inspection of control wiring terminations
- Pull apart terminal blocks engagement
- Wiring conformance to factory schematics
- Compare instrument transformer ratios to meter scales
- Electrical operation of all components

- Installation conformance to specifications:
- Ensure physical arrangement conforms to factory drawings
- Ensure supplied features and options conform to factory drawings
- Ensure all wiring conforms to factory specifications
- Adherence to State and local codes

Record of inspection and test results will be kept. A check-off list will be used, detailing work performed, and results obtained. The formal report produced will list equipment as found, technical service/assistance rendered final equipment settings and recommendations. A report copy shall be submitted.

Servicing the Motor Soft starters includes final controller adjustments to ensure maximum performance, efficiency, and conformance to system limitations. Adjustments include current limit, current trip, minimum and maximum voltage, and controller stability settings as described in the instruction manual. If the adjustable voltage ramp option is provided, initial torque, and ramp times settings are adjusted. Operational features, such as jam/underload, extended start time and smooth stop, are checked and adjusted. The current calibration switch is checked for proper settings.

The Electrical Maintenance Contractor shall be responsible for operation of the overall system and application. It is expected that the Contractor will have qualified personnel available with the necessary knowledge and authority regarding performance of the overall system and application so that the controller may be adjusted for optimum performance.

Method of Measurement. Each for Servicing a Motor Starter, Soft Start Type, Inspection as approved by IDOT Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price, each for INSPECTION, MOTOR STARTER, SOFT START TYPE, which shall be payment in full for the work described herein.

PI05 INSPECTION, BACKFLOW PREVENTER

Description. This work shall consist of inspecting and testing the backflow preventer as specified at Pump Station 10, 17, 23, 31, 39, 44, 46, and 52.

Work Description. Inspection, testing, and certification of the backflow preventer shall be performed in accordance with: State of Illinois, Rules and Regulations; Title 35: Environmental Protection; Subtitle F: Public Water Supplies; Chapter II: Environmental Protection Agency; Part 653: Design, Operation and Maintenance Criteria; Subpart H: Cross-Connections. After the inspection and testing are complete, records of the test shall be submitted to the local community public works department and the Engineer. In addition, the Contractor shall provide the Engineer with documentation of the receipt of the test records by the local community public works department.

Method of Measurement. Each backflow preventer device that is inspected, tested, and certified shall be counted as a unit for payment.

Basis of Payment. This work will be paid at the contract unit price, each, for INSPECTION, BACKFLOW PREVENTER, which will be payment in full for the work described herein.

PI06 INSPECTION, PUMP

Description. This item shall consist of providing labor, equipment, and material to perform pump inspection at locations listed herein. The removal and re-installation of the main submersible pump for the purpose of inspection and testing as specified herein and conform to PR496 shall be paid for in this pay item.

Work Description. The Contractor shall inspect the pump impellor, wear ring, volute, propeller, housing and cables for any damage and provide an assessment to the Engineer. The inspectional shall include taking oil samples for testing, cleaning of the pump from debris and caked on material. The Contractor shall install the pump after inspection is completed and assure its operation by performing capacity testing. The Contractor shall procure quotes for non-routine agreed-price work for the pump repair when damage is found. This type of work will be applicable, at a minimum, for Pump Stations 5, 21, 22, 23, 24, 26, 27, and 30.

The Contractor/Service Company shall furnish all equipment, transportation, and labor necessary to perform the work as specified herein. This work shall include but not limited to the following items:

- Setting up for removal, Disconnect electric connections

- Remove the pump, inspect the condition of the housing, cable, volute, impellor, and wear ring as per manufacturer's recommendation. Inspect oil chamber for fluid leakage (contaminant) or only light seepage out of the inner hole in the casing
- Drain all the leakage fluid, and refill with a sealing fluid as recommended by the manufacturer
- Inspect oil for water intrusion in the motor seal chamber
- Drain, flush and refill the seal chamber with new oil
- Loading and unloading of equipment that requires inspection and repair
- Re-install pump, test operation

This work will consist of removing and installing the submersible main pump only at the specified locations.

The above procedure is for information only, exact procedure necessary for removal and reinstallation of a complete operational pump is the responsibility of the Contractor/Service Company. This item shall also include the loading and unloading of pump parts and equipment.

Pump capacity, motor current readings shall be taken upon Installation of pump as applicable. The readings and tests shall conform to the pump and motor specifications or be approved by the Engineer.

Method of Measurement. Each Submersible pump removed, inspected, and reinstalled as described above and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for INSPECTION, PUMP which shall be payment in full for the work described herein.

PRBA PUMP REBUILD A

Description. This item shall consist of providing transportation within the Tri-State area for removal, transportation, and reinstallation of a pump bowl from the complete pump assembly as a single unit not including the motor. The Contractor shall obtain quotes for the pump repair as directed by the Engineer. The Engineer will evaluate the specialty service quotations and authorize work. This type of work shall be applicable for Pump Stations 2, 3, 4, 29, 33 and 35.

Materials. This item shall require the furnishing of stainless-steel bolts and oil for lubrication.

Work Description. The work within this item shall require the use of a crane and chain falls. The Service Company shall provide all equipment, transportation, and labor necessary to work as described herein. The work shall include but not be limited to the following items:

- Disconnect breaker
- Uncouple motor coupling
- Lift motor and set aside
- Remove dresser coupling
- Set up chain fall on top of hatch or use a crane if required
- Lift pump and column assembly to allow space for removal of bowl assembly from bottom of column pipe. (contains the discharge pipe, bowl and oil tube assembly including the shaft and motor stand)
- Brake loose tube tension unit
- Disconnect grease line from the assembly
- Drop bowl assembly
- Break loose the oil tube and shaft coupling
- Remove bowl
- Take out shafting and oil tube assembly

The exact procedure necessary for removal and re-Installation of a complete operational pump is the responsibility of the Service Company. This item shall also include the loading and unloading of pump parts and equipment.

Pump capacity, vibration, motor current and voltage readings shall be taken upon Installation of pump. The readings and tests shall conform to the pump and motor specifications or be approved by the Engineer.

Method of Measurement. Each bowl that is removed and reinstalled per pump as described herein and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD A, which shall be payment in full for the work described herein.

PRBB PUMP REBUILD B

Description. This item shall consist of removal of an existing side volute discharge pump and motor assembly and replace with a dry pit submersible pump as furnished elsewhere herein. This item will be applicable for Pump Station 32.

Materials. The pump removal and replacement service company shall replace the gate valve of the removed pump and replace with a gate valve that is specified below.

- Gate valves shall have a CWP non-shock rating of 150 psi
- Gate valves shall be metal seated type, round, port design for high flow capacity
- Gate valve body shall be constructed of cast iron with an inner stainless steel lining. All wetted parts of the body, chest area and packing chamber shall be constructed of type 316 stainless steel for maximum corrosion resistance.
- The body shall be a wafer face-to-face design with supporting ribs between the raised face flange to provide additional valve strength. Flange bolt holes shall be drilled for through bolting, except where tapped as required in the chest area, to the ANSI class 125/150 standard.
- The gate shall be constructed of stainless steel and finish ground on both sides. The gate shall have a beveled, knife-like edge.
- The valve stem shall be constructed of stainless steel and shall have double-pitch threads. Gate guides and jams shall be provided for proper support and positive seating of the gate against a raised face seat.
- The gate valve packing shall be plastic coated for corrosion resistance. The packing chamber shall have a smooth-surface liner of uniform chamber width that shall accept extra ring type layers of packing material. Packing gland adjusting bolts shall be easily accessible.
- The gate valve superstructure shall be fabricated, angular steel. A bronze yoke sleeve shall be provided as part of the superstructure for ease of valve operation.

- Non-motorized gate valves shall be provided with bevel gear actuators to provide vertical mounting for a chain wheel actuator. The chain wheel actuator shall be as specified elsewhere herein.
- The gate valve shall be provided with chain wheel actuator for manual operation. The chain wheel shall be provided with rust-resistant chrome-plated operating chain of sufficient length to allow floor operation. The chain wheel shall be positioned 90 degrees relative to the valve/pipe center-line to assure floor operation.
- The gate valve shall be Dezurick Series L, ITT Fabri, or approved equal.

Installation. All equipment furnished, installed, or mounted for this pay item shall conform with the applicable pump station reference specifications detailed elsewhere herein.

The Contractor shall furnish the labor to remove and install all electrical wiring, conduits, relays, fuses, circuit breakers, knife switch disconnects, starters, timers, and any other electrical appurtenances required. The electrical schematic diagram and piping layout shall be submitted for approval by the Engineer.

The pumps shall be installed in compliance with the manufacturer's recommendations.

The pump shall be removable through the pump access hatch. Provide a means to guide the drawdown pump into place when the pump is lowered into the dry pit through the pump hatch. Submit details to the Engineer for approval prior to installation.

Each installed pump shall be complete with an inlet stand assembly, including anchoring flanges and an integral port suction elbow and clean out port with removable cover, this shall be indicated on submitted drawings.

Each installed pump shall be installed on a steel base support of the pump manufacturer's design and recommendation, designed to straddle the pump inlet port area for access to the pump suction pipe.

The base shall be of adequate strength and rigidity to prevent harmful vibration or deflection of the pump piping from the forces involved in the application. Data submitted for approval shall include calculations supporting an included manufacturer's certification of the adequacy of the base design. The base may be a combination of a steel frame and concrete pad, as required to properly join the pump with the new and/or existing piping as approved by the Engineer.

After assembly and Installation on the foundation, the pumping units shall be leveled, aligned, wedged in place, and grouted with a non-shrink grout. Grouting shall not take place until after the initial fitting and alignment.

The manufacturer shall inspect the pump Installation and shall certify that the pumps have been installed properly. Information submitted for approval shall include a letter of intent to provide this certification.

In addition, the services of a qualified representative of the manufacturer shall be provided to supervise the testing of the equipment, make any necessary adjustments, place it in initial trouble-free operation, and instruct the operating personnel in its operation and maintenance.

Testing. After Installation of the pumping units and all accessory equipment, the units shall be subjected to running tests under actual operating conditions. The tests shall be made at the expense of the Contractor and conducted in the presence of the Engineer. The following items shall be specifically checked:

The units are installed according to plans and specifications and the manufacturer's instructions:

- There is no pipe strain on the pump units.
- The units are properly aligned.
- Vibration limits are with Hydraulic Institute Standards.
- There is no overheating of bearings or other parts.
- The full load current is not exceeding the nameplate rating.
- The units are properly grouted and secured.

The tests shall include a timed pump run and a field capacity check. If, in the judgment of the Engineer, pump performance, as measured in the field test, is not substantially true to published characteristics, modification, adjustment or replacement of the equipment shall be made to achieve specified performance results.

Due to the required continuous operation of the station the pumps may be installed, and field tested progressively, as approved by the Engineer.

Clean-Up and Safety. The work site shall be maintained in a clean condition, free of hazards, all in conformance with the requirements of Article 107 of Standard Specifications. Special care shall be taken to assure that electrical systems are not left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc., which contain wiring either energized, or non-energized, shall be closed or shall have their covers in place and shall be locked when possible during off-work hours.

Method of Measurement. Each side volute discharge pump and motor assembly that is removed and replaced with a dry pit submersible pump as specified herein and approved by the manufacturer and the Engineer shall be counted as a unit for payment.

Basis of Payment. This work shall be paid at the contract unit price each for PUMP REBUILD B, which shall be payment in full for the work described herein.

PS01 PUMP, VIBRATION TESTING AND ANALYSIS

Description. The Contractor shall provide a Vibration and Analysis Testing Consultant who is a data analyst with a minimum of two years' experience in vibration data collection and spectrum analysis and shall have a Level II certification by a vibration institute or equivalent.

The Consultant shall conduct the testing and start-up on all the pumps and including new and/or rebuild. The Consultant shall provide recommendations for pump motor inspection, balancing, repair or replacement of pumps and motors, maintenance and troubleshooting of all associated equipment. A strobe tachometer should also be used to verify motor speed.

The Contractor shall provide the Consultant with records of the type of pump, head design, manufacturer's performance curve, moisture resistance and megger test results and other pertinent data to the pump operation prior to start- up of the above inspections and testing.

The Contractor shall conduct the first vibration test with the capacity test.

The Consultant shall be equipped with required tools, transportation, equipment, instrumentation and supplies to perform the Pump Vibration and Analysis Testing Inspection.

The Vibration and Analysis Testing Consultant shall perform vibration analysis on all pumps, utilizing a Smart Meter Plus, Model 1330F or better which will include a copy of the associated software for IDOT and the Electrical Maintenance Contractor use for the duration of the contract.

The Electrical Maintenance Contractor shall calibrate and maintain the IDOT vibration meter including all software and accessories. The first Testing shall be conducted at the same time as the Yearly Pump Station Inspection and Pump Capacity Test. The 2nd Testing shall be due November 30 of each contract year. All results shall be entered into the Log Book for each station, in Chart Z. Each inspection report shall be entered in the FTP site. Any deficiencies found on this inspection shall have appropriate EMCMS Tickets issued, and the numbers shall appear on the inspection report, Form P-5. A start-up testing on the Pump repair/replacement work shall be scheduled by the Consultant following completion of any necessary repair/replacement work.

The Consultant shall provide testing, analysis, database development, baseline data acquisition and problem identification and reporting, for all the pumping station equipment.

Full vibration signatures shall be acquired for all mechanical equipment included in the program. the baseline data is to be analyzed to determine baseline condition of all equipment. The analysis will result in a series of reports that:(1) identify specific problems, (2) provide specific corrective actions, and (3) establish a priority (based on the problem severity) for maintenance actions.

Monitoring and analysis of the operating condition of the pumps is an absolute requirement of the preventive maintenance program. Therefore, all pumps will be monitored twice per year, additional tests are required for the pumps that indicate potential problems.

Problem Identification and Reporting.

A report will be prepared each month that defines specific maintenance tasks that are required to correct incipient problems identified by the monthly data acquisition and analysis program. These reports will be submitted within five (5) working days following completion of the data acquisition. The format of the report should be designed to reduce the amount of paper work necessary to properly maintain accurate communication between the Consultant and IDOT. Each report is to provide a prioritized list of specific maintenance or inspection tasks that are required to verify or correct developing problems.

The Consultant shall notify IDOT and the Electrical Maintenance Contractor immediately when any deficiency is noted that could jeopardize equipment operation or personnel safety. Written reports will address all monitoring points but will place a priority on "exception" reports describing problems that have been identified including a detailed evaluation of pump status and recommended maintenance actions.

a. Tests must be conducted with a flooded suction so not to cause vortexing or cavitation. For data history purpose each test should be conducted with about the same amount of pump submergence as the previous test for that pump. The Electrical Maintenance Contractor shall store or provide water in order to conduct the proper test in accordance with normal operation of the pumps. Two vibration readings shall be taken at the thrust end of the motor (one should be parallel to the discharge pipe and one perpendicular to the discharge pipe), and two readings shall be taken at the coupling end of the motor and should be in the same plane. Finally, an axial reading should be taken. The transducer location shall be marked with different colors which will correspond to x and y-axis.

b. The results of the tests shall be saved on intelli-cards or 3.5-inch floppy showing the velocity in inches per second (ips). In the event that the vibration exceeds 0.3 ips the Engineer may require that the motor be uncoupled from the pump and another test be conducted. Where motor speed is below 1000 RPM, the 0.3 ips velocity "evaluation point" shall be decreased by 10% for each 100 RPM below one thousand. The worstcase reading shall be assumed to be the "true" reading.

c. Readings shall be considered "abnormal" when the vibration exceeds 0.3 ips. The test card data shall be entered into the EMCMS System for each station, no later than 48 hours after the completion of the inspection of each station, with the entire inspection report and test cards to be received by the Engineer by June 30th and November 30th of each contract year. Note the location axis of the transducer, the pump manufacturer, model number and serial number of the associated pumps must be specified for each station. Any deficiencies found on this inspection shall have appropriate Tickets issued, and the numbers shall appear on the inspection report, Form P-5.

d. If necessary, the Contractor shall balance a motor of a specified horsepower. The balancing shall be done in conjunction with the motor inspection tests. The Contractor shall record all test readings as identified in the motor inspection before and after balancing and with coupled and uncoupled drive shaft.

Coordination with Contractor PS Foreman.

The Vibration and Analysis Testing Consultant shall coordinate with the Contractor PS Foreman Consultant on all findings and results to develop an overall condition of the equipment.

Method of Measurement. This work shall be measured and paid on the basis of each pump tested in a pump station and analysis of results and reports delivered, as well as all labor costs, travel expenses, miscellaneous expenses, as specified in this pay item for each pumping station inspected.

Basis of Payment. This item shall be paid at the contract unit price each for PUMP, VIBRATION TESTING AND ANALYSIS of a pump that shall be payment in full for the work described herein.

PVB1

BUDGETARY ALLOWANCE FOR PUMP REPAIR SERVICES/REPLACEMENT

Description. This item is to establish a budget account to allocate funds for the payment of various types of repair services including replacement pumps, appurtenances, and miscellaneous system equipment required for the ongoing pump station system maintenance program but which are not accurately or completely identifiable at the time of bidding. When mentioned herein, Article 109.05 is modified whereas the Contractor shall be paid administrative costs of an amount equal to five (5) percent of the first \$10,000, and the Department shall allow an additional one (1) percent of any amount over \$10,000 of the total approved costs, on an individual work authorization.

Following is detailed information concerning each major category of work, which requires the allocation of funds for certain expenses:

1. Pump Repair Services

The annual pump rebuilding program involves many repairs for which the costs cannot be estimated or determined until the pumps are removed from operation and disassembled for examination. Most pump repairs cannot be performed by the General contractor's forces, and it is therefore necessary to have various service and/or pump manufacturing companies perform the necessary specialty service work. Specifically, the work consists of the repair of pump bowl assemblies, discharge column repairs, shafting and oil tube assembly overhaul, and other miscellaneous services.

2. Pump Bowl Replacement

The annual pump rebuilding program involves the necessity to replace certain major parts of the pump assembly called the pump suction bowl. Until the pumps are removed from operation, it is not known whether pumps suction bowl will need to be replaced with a completely new unit. When it becomes known, after disassembly of the pump that the pump bowl cannot be repaired, the Contractor is directed by the Engineer to obtain quotations for a new replacement unit.

3. Complete Pump Replacement or Trash Rack Replacement

There may be the need to replace complete pump assemblies or trash racks at certain pump stations because of the extent of their deteriorated conditions. For these cases, the Contractor must obtain quotations for direct replacements from the same manufacturer and sometimes from other pump manufacturers.

The Engineer will evaluate the specialty service quotations and purchase quotations and authorize work accordingly. The total estimated amount of the annual expenses incurred for the work, or services performed by others, or expenses, which will be paid under Article 109.05 of the Standard Specifications as herein modified in Article 5.0, is \$400,000.00 as indicated for Pay Item PVB1. For bidding purposes, this amount shall be used.

PW01
WET PIT, CLEANING AND POWER WASH

Description. This item shall include the removal of all debris from the designated pump station wet pit as described herein and a power wash of the pump station wet pit, walls, floors, beams, grating, railings, piping, ladders and stairs. This pay item is not used for PS04.

Work Description. The method by which the debris is removed from the wet pit shall include any traffic control, safety, transportation, and vacuum equipment and shall require the approval of the Engineer.

Equipment. 2500 PSI

All removed material shall be disposed of outside the State right-of-way and in accordance with the local EPA rules and regulations.

Areas outside the bar screen(s)/trash rack(s) up to the inlet sewer shall be cleaned at the same time in accordance with Article 8.

Method of Measurement. Each square yard area of wet pit silt material that is cleaned and all refuse disposed of in accordance with the above specifications and approved by the Engineer shall be counted as a unit for payment.

Basis of Payment. This item shall be paid at the contract unit price per square yard for WET PIT, CLEANING AND POWER WASH, which shall be payment in full for the work described herein.

SURVEILLANCE SYSTEM ITEMS

SBDT BLUETOOTH DETECTOR

Description. The system shall provide reliable travel time data between points along the highway project and incorporate the data into the District 1 Parsons iNet ATMS. This system shall consist of multiple Roadside Bluetooth Detectors. The system shall monitor Bluetooth signals as vehicles pass the detector stations. Continuously sent signals (Media Access Control (MAC) addresses used by cell phone wireless earpieces, laptops, and some vehicles) are anonymously collected and compared at the various locations as the vehicles pass a sequence of detector stations. The time between detection of a unique device at two or more detectors is used to determine the average travel time between roadway locations. These detectors shall send the data to a Data Server located at the TSC in Oak Park. The Data Server shall process the data and present it to the ATMS in XML format at no less than five-minute intervals.

All work shall be coordinated with the Traffic Systems Center Engineer, ATMS Integration Subcontractor, Gateway Integration Subcontractor, Manufacturer, and the Resident Engineer.

The Roadside Bluetooth Detector Manufacturer shall furnish no less than the following components, services, subsystems, and software modifications required to provide a complete operational system.

The Bluetooth detector continuously monitors and timestamps the presence of Bluetooth devices within the range of the receiver. This data is collected by the District 1 Bluetooth Data Collection Server (see Data Server Pay Item) every 5 minutes or less.

Equipment and component parts furnished shall be new, be of the latest design and manufacture, and be in an operable condition at the time of delivery and installation. All parts shall be of high-quality workmanship, and no part or attachment shall be substituted or applied contrary to the manufacturer's recommendations and standard practices. The Contractor shall be responsible for providing all materials (Mounting brackets, connectors, software and hardware) to install and place into operation, a complete and operational system.

The detector shall consist of the Bluetooth sensor, cellular modem, solar power supply, battery, processor, and antennas integrated into a NEMA 4 enclosure with no penetrations to the enclosure except for the antenna and solar panel interconnection. All devices must comply with FCC regulations governing Bluetooth and Cellular emissions. The enclosure shall be self-contained, with provision for mounting to light poles, sign trusses, and other structures using stainless steel straps.

The Bluetooth sub assembly shall have the highest allowed transceiver power. The internal microprocessor should be capable of up to 1 GB storage.

The integral cellular modem (Sim Chip supplied by IDOT District 1) shall operate within the suburban and rural environment with no external gain antennas. In order to provide the Sim Chips, the Contractor shall supply IDOT with Manufacturer, Model number, ESN, and Location for each detector.

The Bluetooth sensor shall contain advanced features designed to allow the unit to operate efficiently in a remote environment. Diagnostic heartbeat information such as voltage and temperature monitoring, as well as software stability information should be periodically sent along with the MAC addresses. The system is to be designed to be able to automatically reboot if a condition is detected that requires such action. In the case when a total system recovery is required, the sensor is to be designed to automatically re-image the system memory.

In addition, the sensor should have the ability to download software patches and upgrades over the air without

the need to physically visit the unit. These patches and upgrades shall be included in this pay item at no additional cost to the State.

Operating range: -20 to +75 degrees C

Enclosure: NEMA 4 - Constructed for outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

Battery: 12 VDC - 40 Ah (min.) Sealed Lead-Acid non-spillable, and maintenance-free

Power: Maximum consumption, including cell modem transmit 5.5 watt. Typical power consumption no greater than 2.5 watt

Solar panel: Capable of creating 30 watts of power (min.) at 12 VDC Bluetooth Range:
150 feet

Installation

The Contractor, in conjunction with the IDOT District 1 Representative, the Manufacturer and Resident Engineer, shall identify locations for the roadside detectors. It shall be the Contractor's responsibility to verify each location's viability and make any alternate site recommendations to the Department. At a minimum, the detectors shall be located outside the "Clear Zone" and within 500 feet of the locations as directed by the Engineer. The cost of the site survey shall be incidental to the cost of the Bluetooth detector pay item.

The manufacturer shall provide guidance and assistance during site survey and installation.

The Bluetooth Detectors shall be mounted on poles as shown in the plans. The recommended mounting height for the Bluetooth sensor is 12 – 15 feet above the travelled lane (or as recommended by the manufacturer).

The solar panel shall be mounted in accordance with environmental and location conditions, as recommended by the manufacturer.

Programming the Bluetooth data collection server in Oak Park shall be included in the Bluetooth detector pay item.

The Contractor shall integrate these BLUETOOTH DETECTOR's into the ATMS and Gateway systems. All work to integrate these sensors shall be incidental to the BLUETOOTH DETECTOR pay item.

The Contractor and/or the manufacturer shall provide training to fully explain how to maintain and operate the Bluetooth Detectors. One half shall be dedicated to field information and one half shall be dedicated to Server maintenance. The class shall include all necessary documentation for the control and maintenance of the detectors for a minimum of 15 people from both District 1. The class shall be held in District 1.

Warranty:

The Bluetooth manufacturer shall provide a five-year warranty, to IDOT and its Agents, on parts, labor, and postage, for all detectors, hardware and software. The warranty shall also include five years of software patches and updates. Software licenses shall not expire.

Method of Measurement. BLUETOOTH DETECTOR consists of the site verification, supply, install, testing, and alignment of a complete function Bluetooth detector installation properly reporting to IDOT's Server and shall be measured as per unit each BLUETOOTH DETECTOR.

Basis of Payment. This item shall be paid at the contract unit price, each, for BLUETOOTH DETECTOR which shall be payment in full for the work described herein.

S300 CABINET, TYPE 3, FOR SURVEILLANCE

Description. This item shall consist of furnishing and installing a new type 3 (III) cabinet at an existing surveillance installation and shall include wiring and re-installation of equipment from existing cabinet to a new cabinet.

The components of the expressway monitoring cabinet shall consist of where applicable a flasher controller. It shall be solid state. It shall consist of two components: A base, which is mounted on the ramp metering, control cabinet wall, and the flasher which plugs into and is secured to the base by a loading screw. A radio interference filter shall be supplied with the flasher controller.

The flashing beacons shall flash alternately at the rate of not less than fifty (50) nor more than sixty (60) flashes per minute. Ramp metering cabinet shall have a signal load relay installed. The signal load relay shall consist of two components, a base, which is mounted on the E.S.P. Type 3 cabinet wall, and a signal load relay which plugs into and is secured to the base by locking screw. The coil of this relay shall be connected to the mark output of the signal change tone receiver. The one set of contacts of the load relay shall be used to change the ramp signal and one set of contacts shall be used to key the mark input to the signal change transmitter. Telemetry mounting frame with frame mounting hardware. All cabinets shall be fitted with a fused thermostatically controlled fan. It shall be mounted at the top of the cabinet for a forced air fan system that has a screened air exhaust opening under roof overhang and no opening in top of cabinetry. The fan shall be capable of operating at 130 cfm. at .160" of water static pressure.

Cabinets shall be supplied in sizes with minimum inside dimensions listed below:

- TYPE ESP 3
- HEIGHT 49 1/2
- WIDTH 30"
- DEPTH 17"
- THICKNESS 3/16"
- MATERIAL Fabricated Aluminum

This cabinet shall be watertight. Doors shall be gasketed to provide a waterproof seal. Bases shall be caulked to obtain a moisture-proof bond, and replacement cabinets will be re-numbered with cabinet replacement numbers to match location.

Materials shall conform to controller cabinets as listed in the Standard Specifications for Road and Bridge items, 1085.47 except that the door shall not have any outside designation nor shall the cabinet door be equipped with a police door or louvers.

Installation shall conform to applicable portions of Section TSC T637#2 of the Traffic Surveillance Specifications.

Cabinets shall be primed and painted in accordance with Section TSC T712#1 of the Traffic Surveillance Specifications. The final coat and color shall be as directed by the Engineer.

All cabinets shall be serviced by 117 volts AC power and a telecommunication system. Each cabinet shall be equipped with a 10 ampere circuit breaker, ground rod, 115 VAC RF1 filtering surge protector (SHP-6LC Surrestor), 130 volt, 70 joules, 10 amp varistor lighting protection for each leg of the four (4) wire telecommunication system (SRA 64 C Surrestor), 130 volt, 70 joules, 10 amp varistor, lighting protection for each loop (SRA-6LC Surrestor), data line protection for each leg of the four (4) wire telecommunication system (SRA 64C Surrestor).

It will also be equipped with Handy Boxes, with G.F.I. duplex outlet and a pull chain lampholder with an A.C. outlet.

No holes shall be drilled through the cabinet exterior for internal equipment mounting.

Each wire entering a cabinet shall be terminated in a workmanlike manner at a terminal strip or switch. If more than one wire has a common terminal on a terminal strip, the adjacent strip shall be used and an appropriate jumpered connection shall be made.

All cables and wires entering a cabinet shall be dressed, harnessed, tied, laced and clamped to produce a workmanlike wiring installation.

A copper wire, combination grounding bus shall be mounted on the rear wall of the cabinets. All cabinets shall be furnished with a minimum of two (2) shelves per cabinet.

Basis of Payment. This work shall be paid at the contract unit price each for CABINET, TYPE 3 (III), FOR SURVEILLANCE, which price shall be payment in full for furnishing and installing and all work as described herein and as directed by the Engineer.

S334

CABINET, TYPE 334, FOR SURVEILLANCE

Description. This work shall consist of furnishing and installing a Type 334 cabinet for field equipment including fiber optic communications, ramp meter, and dynamic message signs as shown on the Plans and hereinafter provided.

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, an ethernet switch, surge protection devices, sign vendors' digital I/O interface to the DMS sign, 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

General. Contractor shall supply all control equipment shown on plans for sending and receiving signals and data between this cabinet and DMS sign or ramp meter installation.

Cabinet, Type 334 shall be a durable, weatherproof enclosure, constructed of 3/16 in. (4.75mm) thick aluminum or 1/8 inch (3.175 mm) thick aluminum lined with bullet resistant fiberglass panels that shall be UL listed and tested for UL752 Level 3 with a nominal thickness of 1/2 inch (12.7mm) maximum, and a nominal weight of 5.0 lbs. per square foot (24.5 kg per square meter) maximum. The cabinet shall have a nominal outside dimension of 67 in. (1.7m) height x 24 inches (600mm) wide X 30 inches (762mm) deep. Cabinet, Type 334 shall consist of the following components: double door each equipped with a Corbin # 2 Brass lock or equal for front and rear cabinet entry, housing, mounting cage, power distribution assembly, service panel, thermostatically controlled fan, and all necessary mounting hardware and wiring, and other equipment, as shown on the Plans and specified in these special provisions.

All bolts, nuts, washers, screws, hinges, and hinge pins that are subject to corrosion shall be stainless steel unless otherwise specified. All equipment under this item shall be in accordance with Section 1074.03 of the Standard Specifications except as modified herein.

Cabinet Components

The housing and the mounting cage assembly shall conform to those of the Type 334 cabinet provisions of the "Traffic Signal Control Equipment Specifications" (TSCES) issued by the State of California, Department of Transportation, and to all addenda thereto current at the time of project advertising. The housing shall be rainproof with the top of the enclosure crowned to prevent standing water. All exterior seams for the enclosure and doors shall be continuously welded and shall be smooth. The housing shall have no provisions for a police panel or door.

The cabinet shall have single front and rear doors, each equipped with a Corbin # 2 lock. The enclosure door frames shall be double flanged out on all 4 sides and shall have strikers to hold tension on and form a firm seal between the door gasketing and the frame. The front and rear doors shall be provided with catches to hold the door open at both 90 and 180 +/- 10 degrees. Gasketing shall be provided on all door openings and shall be dust tight. For horizontal support and bolt attachment, cage bottom support mounting angles shall be provided on either side, levelwith the bottom edge of the door.

The latching handles on the doors shall have provisions for padlocking in the closed position. When the door is closed and latched, the door shall be locked. The locks and handles shall be onthe right side of the front door and the left side of the rear door. The lock and lock support shall be rigidly mounted to the door. The locks shall be Corbin #2 and two keys shall be supplied to theDepartment with each lock. The keys shall be removable in the locked position only.

The front and rear doors shall be provided with louvered vents. A removable and reusable air filtershall be housed behind the door vents. The filter filtration area shall cover the vent opening area,and the filter shell shall be provided that fits over the filter providing mechanical support for the filter. The shell shall be louvered to direct the incoming air downward.

The intake (including filter with shell) and exhaust areas shall pass a minimum of 60 cubic feet (1.7 cubic meters) of air per minute for housing #1 and 26 cubic feet (0.74 cubic meters) of air perminute for housing #2. The thermostatically controlled fan with ball or roller bearings shall be mounted within the housing and vented. The fan shall provide a capacity of at least 150 cubic feet(4.25 cubic meters) of free air delivery per minute of ventilation. The fan shall be thermostaticallycontrolled and activated when the temperature inside the cabinet exceeds 75° F (24° Celsius) and shut off when the temperature is less than 64°F (18° Celsius). In addition, the fan shall be manually adjustable for automatic turn on and off. The fan circuit shall be protected at 125% of the fan motor ampacity.

The housing shall also be equipped with a heating element installed in the bottom front of the cabinet and mounted along the side of the rack. The heating element shall draw 500 watts and have an output of at least 1500 watts (7900 Btu/hr). The heater shall have a built-in quick responsethermostat with sealed contacts that has a temperature control range 40 to 100° F (5 to 39 degrees Celsius), and have a built-in thermal cut-off to automatically shut off the heater in the event of overheating.

The cabinet shall have industrial relays which 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%
4. Contact arrangement shall be convertible from N.O. to N.C.
5. Operating temperature range of -20oC - +40 oC and relative humidity of 50 to 95%, non-condensing.
6. Support wire termination of #18 AWG to #14 AWG

Load switch. The Load Switch shall comply with the following:

- Operating voltage: 80 to 135 VAC
- Maximum load current: 15 amperes
- Control signal voltage: +24 VDC
- Isolation: 2500 VDC and 10 MOhms
- Control signal inputs: Green (Walk), Yellow, and Red (Don't Walk)
- Temperature range: -20 °C to 74 °C
- Nominal dimension (H x W x D): 4.2 in X 1.75 in X 8.5 in

The load switch shall mate with any standard NEMA loadbay or with the control cabinet output file. The load switch must be fully guaranteed against all failures due to manufacturing defects for at least two years from the time of installation.

Solid State Flasher. The solid state flasher shall comply with the following:

- Operating voltage: 80 to 135 VAC
- Maximum load current: 15 amperes
- Temperature range: -20C to 74C
- Nominal dimensions (H x W x D): 4.2 in X 1.75 in X 8.5 in

The solid-state flasher shall flash alternately at the rate of not less than fifty nor more than sixty flashes per minute. A radio interference filter shall be supplied with the solid-state flasher. The Contractor shall install a NEMA flasher socket that receives its input from the power distribution assembly and converts it to a dual flashing signal for the upper and lower beacons on the advancewarning sign located at the ramp entrance. The solid-state flasher shall mate with any standard NEMA flasher socket or with the control cabinet output file. The solid-state flasher must be fully guaranteed against all failures due to manufacturing defects for at least two years from the time of installation.

The cabinet shall have surge protective 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

Each Induction loop shall have lightning protection (SRA-6LC surge protector). The Contractor shall furnish and install stud-mounted lightning protection devices. The device shall have three- terminals, two of which are connected across the loop input of the detector for differential mode protection and the third terminal grounded to protect against common mode damage. Differential mode surge shall be clamped by the semi-conductor array instantly and common mode surge shall be handled by three element gas discharge tube which fires at 400VDC and thereafter clamps the two loop leads to 30 volts in respect to ground. The device shall be installed in close proximity to the loop input. Extension of the factory leads of the device shall not be allowed.

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.

All subassemblies shall be mounted in removable 19 in. (482 mm) EIA self-standing rack assemblies. The EIA rack portion of the cage shall consist of 2 pairs of continuous, adjustable equipment mounting angles that comply with Standard EIA RS-310-B. The cage shall be centered within the cabinet and bolted to the cabinet at 4 points.

Each cabinet shall be equipped with 2 shelves. Shelves shall be the full width of the rack and 12in. (300mm) deep. The shelves shall be designed to support a minimum of 50 lbs. (23 kg).

The power distribution assembly shall be as shown on Plans and shall consist of Detector input file up to 28 isolated inputs and provides 9 AC outputs

The power distribution assembly shall be compliant with Caltrans Transportation Electrical Equipment Specifications, Chapter 6, Section 4 under PDA #3L and shall include the following equipment:

- (1) Duplex NEMA 5-15R Controller Receptacle
- (2) Duplex NEMA 5-15R Equipment Receptacle
- (1) 1 Pole 15 Amperes, 120 VAC Equip. Circuit Breaker
- (2) 1 Pole 10 Amperes, 120 VAC Field Circuit Breakers
- (1) 1 Pole 15 Amperes, 120 VAC Clean Power CB
- (1) Model 206L Power Supply Module and Socket
- (1) Model 208 Monitor Unit and Socket
- (1) Model 430 Heavy Duty Relay and Socket(Transfer Relay)
- (1) Watchdog Timer ON/OFF-RESET Control Switch
- (3) Model 200 Switch Pack Sockets
- (3) 10 Position TBK T1, T2 & T4
- (1) 4 Position TBK T3

Rating of breakers shall be shown on face of breaker or handle. Breaker function shall also be labeled below breakers on front panel. The first equipment receptacle in the circuit shall have ground-fault circuit interruption as defined in the NEC. Circuit interruption shall occur on 6 mA of ground-fault current. All conductors from the power distribution assembly routed to the cabinet wiring shall be connected to the terminal block on the common side, except for the AC power conductor between the service terminal block and main circuit breaker. All internal conductors terminating at the blocks shall be connected to the other side of the blocks.

The power supply shall be provided to supply +24 VDC to the input and output files for use by their associated devices. The power supply shall be compliant with Caltrans Transportation Electrical Equipment Specifications, Chapter 3, Section 4 under Model 206L Power Supply Unit.

The power supply unit chassis shall be vented. The power supply cage and transformers shall be securely braced to prevent damage in transit. When resident in the PDA, the units shall be held firmly in place by its stud screws and wing nut.

The power supply unit shall provide +24 VDC to the cabinet files. The unit shall be a Switch-Mode design. It shall conform to the following requirements:

Input Protection: Two 0.5 Ohm, 10-watt wire-wound power resistors with a 0.2 μ h inductance shall be provided (one on the AC+ Line & on the AC- Line). Three 20 Joule surge arrestors shall be provided between AC+ to AC, AC+ to EG, and AC- to EG. A 0.68 μ f. capacitor shall be placed between AC+ & AC- (between the resistors & arrestors).

Output Protection: The output shall be fused for over-current protection. The output shall also be protected against voltage transients by a suppressor with minimum rating of 1400 Watts.

Input and Output fuses: Input/output fuse protection shall comply with IEC-60127.

- Design Voltage: Design Voltage +24 \pm 0.5 VDC at full load, 86 F, 115 VAC incoming voltage.

- Full Load Current: Full Load Current 5 Amperes each for +24 VDC, minimum.
- Ripple Noise: 2 volts peak-to-peak and 500 mV RMS at full load.
- Efficiency: (At full load) - 80% minimum.
- Power Factor Correction: The Model 206L Power Supply shall include power factor correction circuitry resulting in a minimum full load power factor of 0.96.
- Circuit Capacitors: Circuit capacitors shall be rated for 40 volts minimum.
- LED Indicators: LED indicators shall be provided on the Front Panel indicating AC Lineinput status and fuse integrity. The indicators shall also display output status and fuse integrity of the 24 VDC output.
- Conductors between the C1 Connector and the Input File(s) shall be of adequate length to allowany conductor to be connected to any detector output terminal positions.

Two side panels shall be provided and mounted on the cabinet sidewalls. In viewing from the frontdoor, the left side panel shall be designated as the "input/Communications" and the right side panel shall be designated as the "Service Panel". The panel shall be drilled and tapped, as necessary, to mount the terminal blocks and other attachments described herein, as well as to mount the panel to the cabinet wall.

The terminal blocks shall be barrier type rated at 20 A 600 V RMS minimum. The terminal screws shall be nickel-plated brass binder head type with screw inserts of same material. The terminals of the power line service terminal block shall be labeled "AC+, AC-, and AC GND", and shall be covered with a clear insulating material to prevent inadvertent contact. Terminating lugs large enough to accommodate No. 2 conductors shall be furnished for the service terminal block. The terminal block shall be rated for 50 A at 600 V peak, minimum.

The power distribution assembly shall also protect the equipment powered by the assembly from power transients. Over voltage protection shall be provided for the power distribution assembly and shall contain, as a minimum, a surge arrester, which shall reduce the effect of power line voltage transients and be mounted to the service panel. The arrester shall have the following minimum features:

Recurrent Peak Voltage:	184 V
Energy Rating (Minimum):	50 J
Power Dissipation, Average:	0.85 W Peak Current for pulses less than
7 microseconds 1250 A Stand-by Current for 60 Hz Sinusoidal:	1mA or less

Each cabinet shall be equipped with one fluorescent lighting fixture mounted to the inside top frontportion of the cabinet. The fixture shall have an F15-T8 cool white lamp; operated from a normalpower factor, UL listed cold weather ballast. A door-activated switch shall be installed to turn thecabinet light on when the front door is opened. The door switch shall be on a separate circuit by itself and used only to turn on the cabinet light.

Each cabinet shall be supplied with a heavy-duty plastic envelope to store plans, wiring diagrams,schematics, etc. This envelope shall have metal grommets so that it hangs from the door hooks.The envelope shall have minimum dimensions of 10 in. (250mm) x 15 in. (381mm).

Foundations shall conform to those shown on the Plans. The foundation is paid for separately.

Identification. The Cabinet, Type 334 shall be identified and labeled with external markings as specified in Article 1069.06 of the Standard Specifications and as shown on the Plans.

CONSTRUCTION REQUIREMENTS

The Contractor shall deliver the Cabinet Type 334 mounted on a plyboard-shipping pallet that is bolted to the cabinet base. The cabinet shall be enclosed in a slipcover cardboard packaging shell. The housing doors shall be blocked to prevent movement during transportation to the site.

The Contractor shall securely fasten the Cabinet Type 334 on the new concrete foundation at the locations shown on the Plans. The Contractor shall confirm the orientation of the Cabinet Type 334 installation and its front door side with the Engineer prior to installation. Stainless steel bolted connections shall be provided with lock-washers, locking nuts, or other approved means to prevent the connection nuts from backing off. Dissimilar materials shall be isolated from one another by stainless steel fittings.

The Contractor shall make all power connections to the cabinet in accordance with the Plans and as required. The neutral bus shall be isolated from the cabinet and equipment ground. It shall terminate at the neutral lug ultimately attached to the meter pedestal. All conductors used in cabinet wiring shall terminate with properly sized non-insulated (if used, for DC logic only) or clearinsulated spring-spade type terminals except when soldered to a through-panel solder lug on the rear side of the terminal block or as specified otherwise. All conductors, except those which can be readily traced, shall be labeled. Labels attached to each end of the conductor shall identify the destination of the other end of the conductor. Cabling shall be routed to prevent conductors from being in contact with metal edges. Cabling shall be arranged so that any removable assembly may be removed without disturbing conductors not associated with that assembly.

All equipment in the cabinet, when required, shall be clearly and permanently labeled using marker strips. The marker strips shall be made of material that can be easily and legibly written on using a pencil or ballpoint pen. Marker strips shall be located immediately below the item that they are to identify and must be clearly visible with the items installed.

Testing. Cabinet Acceptance Test – in addition to the environmental and design approval tests specified in the FHWA Type 170 Traffic Signal control System Hardware Specification, the following water spray test shall be performed for each type of cabinet:

Spray water from a point directly overhead at an angle of 60° from the vertical axis of the cabinet. Repeat for each of eight equally spaced positions around the cabinet for a period of five minutes in each position. The water shall be sprayed using a domestic type sprinkling nozzle at a rate of not less than 10 gal./min (40 liters/min) per square foot (0.1 meters) of surface area. The cabinet shall then be inspected for leakage. Evidence of water leakage shall be cause for rejection.

Operational Standalone Test: The operational standalone test for each Cabinet, Type 334 installed shall consist of the following:

- Visual inspection of the cabinet and its contents for workmanship Verification of the cabinet grounding in accordance with Article 1074.03 (a)(4) of the Standard Specifications
- Measurement of the voltage at the input panel

Documentation. Shop drawings and wiring lists showing the proposed layout of each type of cabinet shall be submitted to the Engineer for approval prior to the start of fabrication. Wiring lists for the internal manufacturer cut sheets for all electrical equipment included in each type of cabinet shall be included in the submission.

Four copies of drawings showing the wiring for each cabinet shall be provided. One copy shall be placed in the clear plastic envelope furnished as part of the cabinet. The other three copies shall be delivered to the Engineer.

For each cabinet, four copies of a configuration of the equipment reporting to that cabinet shall be provided. The sheet shall also list field settable options for the equipment contained in the cabinet. This shall include

device addresses and output voltage settings for power supplies. One of these copies shall be placed in the clear plastic envelope furnished as part of the cabinet. The other three copies shall be delivered to the Engineer.

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. The warranty shall warrant and guarantee repair of the component parts of the Cabinet Type 334 furnished by the Contractor that prove to be defective in workmanship and materials during the first two years of operation as defined and noted above at no additional cost to the Department.

The Contractor shall provide a warranty certificate for this item and its related components to the Department. The Department reserves the right to transfer this service to other parties who may be contracted in order to provide overall maintenance of this item.

Basis of Payment. This work will be paid for at the contract unit price per each for CABINET, TYPE 334.

SC01

CABLE, ELECTRICAL IN CONDUIT, 4C/ NO. 18 SHIELDED LOOP DETECTOR

Description. This work shall consist of furnishing materials and labor for installation of shielded loop detector cables in conduit as specified herein and indicated by the Engineer, complete with all identification, terminating and testing.

Materials. Lead-ins shall be Conoga 30003 or equal cable. The jacket of high density polyethylene shall be rated to 600 volts in accordance with UL 83 Section 36.

All cables shall be UL listed.

Unless otherwise indicated all cable shall be rated 600 volts.

The cable shall be rated 90 degrees C. dry and 75 degrees C. wet and shall be suitable for installation in wet and dry locations, exposed to the weather, and shall be resistant to oils and chemicals.

The UL listing mark, cable voltage, insulation type and ratings, as well as the cable size shall all be clearly printed on the cable in a color contrasting with the insulation color.

Conductors. Conductors shall be #18 awg 7X.0152" un-coated copper. Conductors shall meet the requirements of ASTM Designation B-8 as applicable. Unless otherwise indicated, all conductors shall be stranded and twisted 4 turns per foot. The cable shall be an assembly of pairs of left hand lay twisted insulated conductors, with a core filled with a petroleum base flooding compound, overlapped conductive tape shield and a black high-density polyethylene jacket overall. This cable shall meet the requirements of IEEE Standard 383.

Insulation. The conductors shall be coded as follows: black-red-white-green

Cable insulation shall incorporate polyvinyl chloride (PVC) with a clear nylon covering overall as specified and the insulation shall meet or exceed the requirements of ICEA S-61-402, NEMA Standard Publication No. WC-5, UL Standard 83, as applicable.

Unless otherwise indicated, cable conductors shall be solid full color coded via insulation color.

Quality Control. Submittal information shall include demonstration of compliance with all specified requirements.

All cables shall be delivered to the site in full reels. Cable on the reels shall be protected from damage during shipment and handling by wood lagging or other means acceptable to the Engineer. Reels shall be tagged or otherwise identified to show the UL listing.

Installation. The loop lead-in shall be a Canoga 30003 or equal cable. The loop lead-in shall be barrel sleeved, crimped, soldered, and protected by heat shrinkable tubing to the loop #14 wire. Lead-ins shall be twisted in such a manner so as to prevent mechanical movement between the individual cables. Lead-ins shall be brought into a cabinet or handhole at the time the induction loop is placed in the pavement. Loops located over 1000 feet from cabinet require four (4) turns of No. 14 wire.

Lead-in cable Canoga 30003 or equivalent will be installed where the lead in length from point of interception to the point of termination exceeds 150 feet.

Where lead in runs are less than 150 feet the loop wire will be utilized as lead in to the point of termination w/o splices, being twisted 5 turns per foot. The loop wire will be paid for as "lead in" from last point of sawcut in pavement at dive hole to point of termination.

Loop lead-ins placed in handholes shall be coiled, taped and hung from the side of the handhole to protect against water damage. Any other method of installation will require prior written approval of the Engineer. Each loop lead-in shall be color coded and tagged in each handhole through which it passes. The loop lead-in shall be color coded and tagged at the core hole, in each junction box it passes through and at the termination point in the cabinet.

TRAFFIC SYSTEMS CENTER LOOP SPLICING REQUIREMENT

<u>MAINLINE LOOPS</u>	<u>METERING LOOPS</u>
Lane 1 Blue	Loop 1 Green
Lane 2 Brown	Loop 2 Yellow
Lane 3 Orange	Loop 3 Red
Lane 4 Violet	
Exit Black	
Entrance White	

When 2 or 3 loops are installed on an exit or entrance ramp the loop color code shall conform to the mainline loop color code and shall be marked as entrance or exit ramp loops.

In addition to color codes each loop shall be identified with a written label attached to the loop wire, or lead-in wire. The tags shall be Panduit #MP250W175-C or equivalent. All wires and cables shall be identified in each handhole or cabinet the cable passes through, or terminates in. The labels shall be attached to the cable by use of two cable ties.

Testing. After installation, the cable shall be tested as approved by the Engineer. Cable failing to pass the test shall be replaced with new cable at no additional cost.

Method of Measurement. The cable shall be measured for payment in linear foot in place. Measurements shall be made in straight lines between changes in direction and to the centers of equipment. All vertical cable and permissible cable slack shall be measured for payment. A total of six (6) feet of slack shall be allowed for the end of a run terminating at a panel and four (4) feet will similarly be allowed when terminating at a wall-mounted panel. Additional vertical distance for the height of conduit risers, etc., as applicable, will be measured for payment for equipment so mounted.

Basis of Payment. This work shall be paid at the Contract unit price per linear foot furnish and installed for CABLE, ELECTRICAL IN CONDUIT, 4/C NO. 18 SHIELDED LOOP DETECTOR.

SCC1 CAMERA AND CABINET CONTROL MAINTENANCE

Description. This item shall consist cleaning a CCTV dome camera or fixed position camera and the cabinet for the video encoder and surge suppression. Contractor shall clean camera domes or glass on camera housing with glass cleaner and non-abrasive cloth. The cabinet shall be vacuumed, and hand cleaned with biodegradable cleaner. All rodent debris shall be removed. Upon completion of cleaning the cabinet conduits shall be sealed with duct seal and steel wool. Contractor shall coordinate work as necessary to lower cameras on lighting towers for cleanings.

Method of Measurement. Contractor shall be paid per camera and cabinet cleaned.

Basis of Payment. This item shall be paid at the contract unit price, each, for CAMERA AND CABINET CONTROL MAINTENANCE.

SCC2 CAMERA LOWERING DEVICE

Description. This item shall consist of furnishing and installing an external camera lowering device for camera poles up to eight (80) feet.

The camera lowering device shall be designed to support and lower an Ethernet/IP direct closed-circuit television camera, lens, housing, PTZ mechanism, cabling, connectors and other supporting field components without damage or causing degradation of the camera operations.

The camera lowering system shall consist of a lower winch box, permanently mounted winch with crank, upper mounting box, suspension contact unit, divided support arm and camera connection box. The divided support arm and receiver brackets shall be designed to self-align the contact unit with the center line during installation and ensure the contact unit cannot twist under high wind conditions. For maximum arm strength, round support arms are not acceptable.

The construction of the camera lowering device shall be Model by MG squared CLDMG2-EXTHYIP-080 or an approved equal. The lowering device manufacturer shall furnish an authorized factory representative to oversee the first installation of the camera lowering device onto the existing structure.

The Contractor shall be trained by the manufacturer as to the installation, operation and safety features of the lowering device for the particular project.

Basis of Payment. This work shall be paid at the contract unit price each for CAMERA LOWERING DEVICE, each, which price shall be payment in full for furnishing and installing system as described herein.

SCC3 CAMERA LOWERING DEVICE TOWER

Description. This item shall consist of furnishing and installing an external camera lowering device for camera poles or communication towers 75 feet up to 150 feet.

Construction.

The camera lowering device shall be designed to support and lower an Ethernet/IP direct closed-circuit television camera, lens, housing, PTZ mechanism, cabling, connectors, and other supporting field components without damage or causing degradation of the camera operations.

The camera lowering system shall consist of a lower winch box, permanently mounted winch with crank, upper mounting box, suspension contact unit, divided support arm, up to 300 feet of outdoor rated cat6 for POE, and camera connection box. The divided support arm and receiver brackets shall be designed to self-align the contact unit with the center line during installation and ensure the contact unit cannot twist under high wind conditions.

The construction of the camera lowering device shall be by Camera Lowering Systems, CLS, Model CTMT-16HDD 150-300 or an approved equal. The lowering device manufacturer shall furnish an authorized factory representative to oversee the first installation of the camera lowering device onto the existing structure.

The Contractor shall be trained by the manufacturer as to the installation, operation and safety features of the lowering device for the application.

1½" Conduit and conduit clamps shall be paid for by non-routine pay items GC01 or GC03 depending on the application.

Camera guide wire will not be necessary.

Stainless steel banding for junction box attachment to the tower, padlock, and all cable terminations shall be included in the contract bid price each for CAMERA LOWERING DEVICE, TOWER.

The Contractor shall supply with each unit a locking box lowering tool and Drill motor with clutch. The cost of the locking box lowering tool and Drill motor with clutch shall be included in the contract bid price each for CAMERA LOWERING DEVICE, TOWER.

Basis of Payment. This work shall be paid at the contract unit price each for CAMERA LOWERING DEVICE, TOWER, each, which price shall be payment in full for furnishing and installing system as described herein.

**SCC4
CCTV CAMERA POLE**

Description. This item shall consist of furnishing and delivering to a Contract Spare Parts facility as directed by the Engineer or installing in the field, a CCTV camera pole, under 55 feet mounting height, complete with CCTV camera mounting brackets as manufactured by Union Metal Inc., or as approved by the Engineer, identical to the existing CCTV camera poles in use in District 1.

Basis of Payment. This work shall be paid at the contract unit price each for CCTV CAMERA POLE, which price shall be payment in full for furnishing and delivering to a Contract Spare Parts facility as directed by the Engineer or installing in the field, the item as specified herein.

**SCC5
CCTV DOME VIDEO CAMERA, HIGH DEFINITION**

Description. This item shall consist of furnishing and installing an integrated High Definition Closed-Circuit Television (CCTV) Dome Camera Assembly and Network Surge Suppression Device as described herein and as indicated in the Plans.

Materials.

General:

The HD (High Definition) CCTV Dome Color Camera shall be a rugged, non-pressurized, outdoor surveillance domed camera system. The HD 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. The high definition camera shall be either a Bosch Autodome IP series 7000 HD, Axis, 6155, or a Pelco Spectra 1080P HD Series in compliance with the requirement herein. Each HD CCTV Color camera shall be supplied with a Network Surge Suppression Device.

Camera shall use a standard Web browser interface for remote administration and configuration of camera parameters. The browser interface shall provide PTZ control including preset and pattern and on-screen display (OSD) for access to camera programming.

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.

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:

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 optional 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.

Power:

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

Item	Requirement
Port	RJ-45 for 100Base-TX; Auto MDI/MDI-X;
Cabling Type	Cat5 cable or better for 100Base-TX
Input Voltage	8 to 32 VAC; 24 VAC nominal; 22 to 27 VDC; 24 VDC nominal
	5 VA nominal (without heater and blower);
AC nominal	75 VA nominal (with heater and blower)
DC nominal	1 A (without heater and blower); 3 A nominal (with heater and blower)
	IEEE802.3af (without heater and blower)

Camera:

The camera shall provide a minimum of two simultaneous video streams with a 2.1 megapixel (MPx) 1920 x 1080 resolution, auto iris with 30X optical, and 12X digital zoom. The CCTV Dome Camera shall incorporate:

Item	Requirement
Sensor Type	1/2.8-inch Type Exmor CMOS sensor
Optical Zoom	
Digital Zoom	
Maximum Resolution	
Lens	f/1.6 - f/4.7, (4.3 mm - 129.0 mm optical)
Horizontal Angle of View	59° (wide) - 2° (tele)
Aspect Ratio	
Light Sensitivity	Sensitivity in lux for 90% reflectance, f/1.6 (wide angle), minimum at 30 IRE (30% of signal level) with Sensitivity Boost OFF; 4X improvement to sensitivity with Sensitivity Boost ON
Color (250 ms) Mono (33 ms) Mono (250 ms)	
Capabilities	
	850 nm and 950 nm
Infrared Range	
	with manual override
Temperature Compensation	digital
Gain Control	digital
Filtering	digital

Image	
(EIS)	

Video

	nt
ding	h, Main, or Base profiles and MJPEG
ms	ultaneous streams, the second stream is variable based on the setup of the primary stream
	, 15, 12.5, 10, 8.333, 7.5, 6, 5,3, 2.5, 2, 1 upon coding, resolution, and stream configuration)
rotocols	P/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP, IPv4, IPv6, SNMP v2c/v3, QoS, HTTP, HTTPS, LDAP (client), SSH, SSL, SMTP, FTP, and 802.1x (EAP)
ress	rotected
erface	r view and setup

PTZ Mechanical

	nt
ent	ous pan rotation
	tween 400 per second continuous pan to 5.0° per second
	d tilt of +1° to -90°
ontrol Speed	f 0.1° to 80° per second; tilt operation shall range from 0.5° to 40° per second.
reset Speed	f 280° and a tilt speed of 160° per second
	s
racy	
Pan/Tilt Speed	ases in proportion to the increasing depth of zoom
	duty and variable speed, operating at 18 to 32 VAC, 24 VAC nominal
inking	indows
	ie 180° at bottom of tilt travel
umption	VA (without heater and blower running)
	VA (with heater and blower running)

The camera shall provide a freeze frame feature that freezes a camera image as a preprogrammed preset is called+, providing a live view once positioned. Selections for on/off shall be available through the embedded Web browser.

The camera shall provide image stabilization to compensate for vibration introduced into the camera.

The camera shall support IPv6 configurations in conjunction with IPv4.

Still Picture Capture

The camera shall be capable of capturing a still image in JPEG format and automatically transferring this image to an FTP site. The resolution of the image shall be 1920 x 1080 pixels. The frequency of captures shall be user settable and shall as a minimum range from 1 picture every 30 seconds to 1 picture every five minutes.

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.

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 Contractor shall install the CCTV camera in accordance with manufacturer's instructions. The camera firmware shall be the latest stable release available at the time of installation.

Network (IP-Video) Surge Protection Device (SPD). The Network (IP-Video) SPD shall be modular in design to support multiple installation options e.g. Stand-alone or DIN rail mounting configuration. SPD shall be a single port unit to support industrial 1000/100/10-Base-T Ethernet and POE applications. SPD shall support shielded RJ45 connectors and comply with UL497B listed. SPD shall comply with the following standards: TIA/EIA-568-B.2-1, IEEE 802.3ab, IEEE 803.3af, and IEEE 803.3at.

The equipment shall be securely mounted on a mounting back panel or on a corrosion resistant DIN rail system

Documentation

In addition to the initial submittal(s) prior to procurement, the Contractor shall provide installation and operation manuals, documentation of exact equipment model and serial numbers, software/firmware version numbers, in hardcopy and PDF formats on CDROM.

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

Basis of Payment. This item will be paid for at the contract unit price each for CLOSED CIRCUIT DOME VIDEO CAMERA, HIGH DEFINITION, Color, PTZ Control, which shall be payment in full for all material and work as specified herein.

SCL1 CONTROLLER, LINUX ATC

Description. This specification shall govern the furnishing and installing of CONTROLLER, LINUX ATC in designated field locations and associated equipment cabinets as shown in the Plans and as directed by the Engineer.

Materials.

. The CONTROLLER, LINUX ATC shall comply with the following:

- Operating voltage: 110 VAC
- Temperature range: -37°C to 74°C
- Rack-mountable
- Supports ATC/Linux software (2.6.35 or later)
- Input scan rate of 100x/sec
- Compatible with ATC 5201 v06.25
- Compliant with NTCIP 1201/1207/1209
- 128 MB of DDR2 DRAM memory (minimum)
- 64 MB of FLASH memory (minimum)
- 2 MB of SRAM memory (minimum)
- Two (2) USB 2.0 ports (minimum)
- One (1) SD memory card socket (minimum)
- Seven (7) ATC serial ports (minimum)
- Six (6) Ethernet ports (minimum)

CONSTRUCTION REQUIREMENTS

General. The Contractor shall install, provision, and test all equipment. The Contractor shall prepare a shop drawing, which details the complete control cabinet assembly and all equipment to be supplied under this bid item. The submittal shall consist of the standard catalogued descriptions for each component. The Contractor shall fully document the interconnection of all of the components and the cabling. Detailed drawings shall also be provided indicating the proposed layout of the cabinet.

One copy of all operations and maintenance manuals for each control cabinet assembly's components shall be delivered for each assembly installed.

The Contractor shall demonstrate a prototype assembly using the proposed components. This demonstration shall take place at a Contractor selected and Engineer approved location. These conformance tests shall be completed prior to the delivery of any completed 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.

The Contractor shall develop and submit for the Engineer's approval, a detailed test plan that verifies that each component is compliant with the specification and that all of the interconnection cables are operational and properly configured. This test shall use standard manufacturer operating and diagnostic software. At the test, each component will be inspected to verify that it has been delivered according to the approved shop drawings.

The Contractor shall label all cables and ports using permanent cable tags. These labels shall identify the function of the cables and the ports the cables are connected to.

Installation. Thirty (30) days prior to the scheduled field installation of each CONTROLLER, LINUX ATC, the Contractor shall deliver the CONTROLLER, LINUX ATC to the Traffic Systems Center (TSC) for configuration, loading of IDOT's ramp metering and data collection software, and IP addressing prior to installation by the Contractor. The controller shall be clearly identified as to which location it is to be installed for proper configuration. After the controller is configured, the Contractor shall retrieve the controller from the TSC and install it.

All equipment, terminal blocks, connectors, wires, and connections necessary to complete the installation and make the control system operational shall be included in this item.

The CONTROLLER, LINUX ATC shall be installed and connected inside the control cabinet at the location shown in the Plans. The Contractor shall install all cables and ancillary equipment.

All cables shall be neatly dressed and labeled with their function and physical connection.

Testing. The Engineer reserves the right to inspect and/or factory test any completed assemblies, prior to the delivery of the material to the project site. The purpose of this test is to verify that aspects of the controller are fully compliant with the specifications. Any deviations from these specifications that are identified during such testing shall be corrected prior to shipment of the assembly to the project site.

The operational standalone test shall also verify that all functions of the system are fully operational. A test procedure shall be supplied for approval by the Engineer a minimum of one (1) week prior to the scheduled start of this test.

Method of Measurement. The CONTROLLER, LINUX ATC bid item will be measured for payment by the actual number of CONTROLLER, LINUX ATC assemblies furnished, installed, activated, tested, and accepted, and shall be counted, each.

Basis of Payment. This work shall be paid for at the contract unit price each for CONTROLLER, LINUX ATC, which shall be payment in full for the material and work described herein.

SDET DETECTION INTEGRATION DEVICE

Description. This specification shall govern the furnishing and installing of a Detection Integration Device and connection to a Detection Controller with associated cables complete in a surveillance/ITS cabinet as shown on the Plans and as directed by the Engineer.

Materials.

The Contractor shall provide a Sensys FLEX-DET-M Detection Integration Device or equivalent as approved by the Engineer. The device shall be installed in the surveillance/ITS cabinet as shown in the Plans.

The Detection Integration Device shall be used to capture data from inductive detector loops, microwave vehicle detection systems, and video detection systems routed to the cabinet and translate detector data for transmittal to the SENSYS System Manager server at the Oak Park TSC over the IDOT fiber optic network.

The Detection Integration Device shall have an operating temperature range -40°C to +80°C.

The Detection Integration Device shall interface with the Detection Controller.

If the existing cabinet does not have a detection controller the contractor shall supply as part of this pay item a Detection Controller as described below.

DETECTION CONTROLLER

Materials.

The Contractor shall provide a Sensys FLEX-CTRL-M-E Controller or equivalent as approved by the

Engineer. The device shall be installed in the surveillance/ITS cabinet as shown in the Plans.

The Detection Controller shall be used to control components of the Wireless Vehicle Detection System (WVDS) and to transmit and receive data from Wireless Sensor Radio Assemblies and/or Detection Integration Devices to the SENSYS System Manager server at the Oak Park TSC over the IDOT fiber optic network. The Detection Controller shall support analytics for traffic data, system performance, and diagnostic reports for the WVDS components.

The Detection Controller shall have an operating temperature range -40°C to +85°C.

The Detection Integration Device shall interface with the Ethernet switch.

All required cabling and cabinet wiring needed to and from the Detection Integration Devices shall be incidental to this item.

Integration into the Sensys system Manager server, and integration into the IDOT ATMS for the Detection Integration Device shall be incidental to this item.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall install, provision, and test the equipment to demonstrate functionality and performance within the cabinet.

One copy of all operations and maintenance manuals for the Detection Integration Device and Detection Controller shall be delivered for installed equipment.

The Contractor shall develop and submit for the Engineer's approval, a detailed test plan that verifies that each component is compliant with the specification and that all of the cables are operational and properly configured. This test shall use standard manufacturer operating and diagnostic software. At the test, each component will be inspected to verify that it has been delivered according to the approved shop drawings.

The Contractor shall label all cables and ports using permanent cable tags. These labels shall identify the function of the cables and the ports the cables are connected to.

Installation. Thirty (30) days prior to the scheduled field installation of each detection integration device/detection controller, the Contractor shall deliver the device(s) to the Traffic Systems Center (TSC) for network configuration prior to installation by the Contractor. The device(s) shall be clearly identified as to which location it is to be installed for proper configuration. The device's MAC address shall be clearly identified. After the device is configured, the Contractor shall retrieve the device(s) from the TSC and install it. All equipment, cables and connections necessary to complete the installation and make the Detection Integration Device operational shall be included in this item.

The device shall be installed and connected to the Detection Controller inside the surveillance/ITS cabinet at the location shown in the Plans. The Contractor shall install all cables and ancillary equipment.

All cables shall be neatly dressed and labeled with their function and physical connection.

Testing. An operational standalone test shall be conducted to verify that all functions of the device, both independently and within the cabinet system, are fully operational. A test procedure shall be supplied for approval by the Engineer a minimum of one (1) week prior to the scheduled start of this test.

Method of Measurement. The DETECTION INTEGRATION DEVICE bid item will be measured for payment by the actual number of DETECTION INTEGRATION DEVICE units furnished, installed, activated, tested, operational, and accepted, and shall be counted, each.

Basis of Payment. This work shall be paid for at the contract unit price each for DETECTION INTEGRATION DEVICE, which shall be payment in full for the material and work described herein.

SDL1

DETECTOR LOOP ROUND, SQUARE, OR RECTANGULAR

Description. This item shall consist of furnishing, installing, and testing an induction loop, of the dimensions shown on the plans or of the dimension from Table 1, at the locations shown. The induction loop shall be installed in accordance with all applicable portions of article 886 of the Standard Specifications for Road and Bridge. All saw cutting, cable installation, joint sealing, lead-ins and testing necessary to complete the installation shall conform with the following requirements.

Materials. The cable used for induction loop shall be IMSA 51-7, No 14-19 strand XHHW XLP600V. Encased in orange Detect-duct tubing as manufactured by Kris-Tech Wire Company, or comparable. Lead-ins shall be Conoga 30003 or equal cable.

Joint sealer (Dozseal 230) shall have sufficient strength and resiliency to withstand stresses set up by vibrations and differences in expansion and contraction due to temperature changes. Adhesion to clean dry, oil-free Portland Cement concrete shall be at least equal to the tensile strength of the concrete. The joint sealer, with qualities described above, shall be capable of curing in a maximum time of 30 minutes at all temperatures. Curing shall be defined as the capability of withstanding normal traffic loads without degradation.

Installation Details. Slots in the pavement shall be cut with a concrete sawing machine in accordance with the applicable portions of Section 420.10 of the Standard Specifications for Road and Bridge Construction. The slot must be clean, dry, and oil-free. Wire shall be inserted in the pavement slot with a blunt tool which will not damage the insulation and wedges made of loop tubing "Deteca-duct" will be installed at eighteen (18) inch intervals to keep new loops from floating. Loops should not be installed at an outside temperature below 50F (10C) degrees unless directed by Engineer.

Plastic sleeving shall be used to insulate the wire where loop wire crosses cracks and joints in the pavement. The sleeving shall be properly sealed with electrical tape to prevent joint sealer from entering sleeves. Sleeving shall extend a minimum of 8 inches each side of joint.

All mainline loops shall be round, six (6) feet in diameter, and centered in traffic lanes unless designated otherwise by the Engineer.

The Contractor shall core drill a six-foot diameter round induction loop. The width of the drill portion shall be .500", the depth shall be a maximum of 2.75". A saw cut (home run) .375 in width and the same depth as the drilled portion shall be cut to the core hole. The core hole will be a minimum 1 1/2" diameter and drilled to a depth to meet the installed P-duct. At the point where the 6' diameter loop intercepts the straight cut (home run) the wire leaving the loop will have a minimum of a 1.5" radius entering the straight cut. Interception point of home run slot and round loop shall not be cored.

Induction loops on exit and entrance ramps as well as speed/count stations shall be square or rectangular with edges perpendicular or parallel to traffic flow. Induction loops shall be centered on all ramps and in traffic lanes unless designated otherwise on the plans or by the Engineer. Traffic lanes shall be referred to by number and loop wire shall be color-coded and labeled accordingly.

A chart, which shows the coding for each installation, shall be included in each cabinet. No core holes shall be allowed at corner of any loop. Sawcuts for all induction loops and lead ins shall not be greater than 2.75 inches in depth.

All excess joint sealer shall be removed so that the level of the sealer in the saw cut is at the same level as the adjoining pavement.

All excess joint sealer shall be removed so that the level of the sealer in the saw cut is at the same level as the adjoining pavement.

All induction loops shall contain a minimum three (3) turns of No. 14 wire. Each induction loop shall have its own Canoga 30003 or equal home run or lead-in to the cabinet. Induction loops shall not be connected in series with other loops. This wire shall be free from kinks or any insulation abrasions. The loop lead-in shall be barrels sleeved, crimped, soldered and protected by heat shrinkable tubing to the loop #14 wire. Lead-ins shall be placed in such a manner that they take the most direct route to the cabinet.

Lead-in cable Canoga 30003 or equivalent will only be installed where the lead in length from point of interception to the point of termination exceeds 150 feet (45.75m). Where lead-in runs are less than 150 feet (45.75m), the loop wire will be utilized as lead-in to the point of termination w/o splices, being twisted 5 turns per foot (304.8mm). The loop wire will be paid as "lead-in" from last point of saw cut in pavement at dive hole to point of termination in cabinet.

Loop lead-ins placed in handholes shall be coiled, taped and hung from hooks on the sides of the handhole to protect against water damage. Any other method of installation will require prior written approval of the Engineer. Each loop lead-in shall be color coded and tagged at the core hole, in each junction box it passes through and at the termination point in the cabinet.

Slots shall be cut so that no bends greater than 50 degrees is used. Diagonal saw cuts (a minimum of twelve (12) inches (304.8mm) in length) shall be used at all corners to conform with this specification. Core hole at corner or cracks shall not be allowed. The Engineer shall be contacted regarding proposed changes in loop locations necessitated by badly deteriorated pavement. The Engineer may relocate such loops.

Copper wire and lead-ins shall not be installed in the curb and gutter section or through the edge of pavement. A hole shall be drilled at least 12" (304.8mm) in from the edge of pavement through which the P-duct, loop wire and lead-in shall be installed. Saw cuts through shoulders to core hole shall not be allowed. loop lead-ins shall not be allowed in saw cuts in shoulders.

Ramp Loop Table (1)

<u>W (FT.) (m)</u>	<u>S (FT.) (m)</u>
12 3.7m	8 2.4m
13 4.0m	9 2.8m
14 4.3m	10 3.1m
15 4.6m	11 3.4m
16 4.9m	12 3.7m
17 5.2m	13 4.0m
18 5.5m	14 4.3m
19 5.8m	15 4.6m
20 6.1m	16 4.9m
21 6.4m	17 5.2m
22 6.7m	18 5.5m

23	7.0m	19	5.8m
24	7.3m	20	6.1m
25	7.6m	21	6.4m

*EXAMPLE: Where lane width (W) is 12' (3.66m), loop width(s) shall be 8' (2.44m),

Length of loop shall be determined by location.

Should the induction loop and/or core hole for the induction loop and loop lead-in cable be paved over by other construction operations, it shall be the contractor's responsibility for locating and finding the induction loop and/or the core hole for the repair of a bad loop or lead-in or for the installation of a new loop or loop lead-in. The locating of the core hole and the induction loop shall be incidental to the cost of the induction loop lead-in installation.

In areas where a second loop is added in the lane of travel to create a speed trap/classification station the new loop where practical can utilize the existing loop dive for the second loop of the speed trap. If it is determined by the Engineer, the existing loop dive cannot be utilized a second loop dive shall be installed for the speed trap loop. The cost for the new loop dive shall be paid for utilizing existing pay items for conduit and asphalt remove/replace.

Traffic Systems Center - Loop Splicing Requirement

Mainline Loops

Metering Loops

Speed Count

Lane 1 - Blue

Loop 1 - Green - Input Loop

Lane 1 - Blue Exit-Black

Lane 2 - Brown Loop 2 - Yellow - Demand Loop

Lane

2

-

Brown

Entrance-White

Lane 3 - Orange

Loop 3 - Red - Passage loop

Lane 3 - Orange

Lane 4 - Violet

Lane 4 - Violet

Lane 5 - Slate

Lane 1 being the left lane in direction of traffic flow for mainline and ramps.

When 2 or 3 loops are installed on an exit or entrance ramp the loop color code shall conform to the mainline loop color code and shall be marked as entrance or exit ramp loops.

Only Speed/Count Station loops both square and rectangle shall be color coded and tagged by lane per specific locations as noted on plans, or as directed by the Engineer.

In addition to color codes each loop shall be identified with a written label attached to the loop wire, or lead-in wire. The tags shall be Panduit #MP250W175-C or equivalent. All wires and cables shall be identified in each handhole or cabinet the cable passes through, or terminates in.

The labels shall be attached to the cable by use of two cable ties.

An electronic test instrument capable of measuring large values of electrical resistance such as a major megger, shall be used to measure the resistance of the induction loop and its lead-in shall be a minimum of 500 megohms above ground under any conditions of weather or moisture. The loop and the loop lead-in shall have an inductance between 50 microhenries and 1000 microhenries. The continuity test of the loop and loop lead-in shall not have a resistance greater than five (5) ohms. Testing shall be done with the required loop tester.

Loop wire and lead-ins shall not be installed in the curb and gutter section or through the edge of pavement. A hole shall be drilled at least 12" in from the edge of pavement through which the 1" P-Duct, loop wire, and lead-in shall be installed.

Method of Measurement. A loop is considered by lineal feet plus lead-in into the dive hole.

Basis of Payment. This work shall be paid at the contract unit price per lineal foot for DETECTOR LOOP ROUND, SQUARE, OR RECTANGULAR of the size, number and type as specified, which shall be payment in full for the work described herein. The contract shall be paid lineal feet for the loop, plus the lineal footage for the home run straight cut to the core hole. The cost of the expressway lane closure shall be paid separately.

SDL2

INDUCTIVE LOOP DETECTOR, RACK OR SHELF MOUNTED

Description. This item shall conform with sections 885 and 1079.01 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Specifications, and the District 1 Standard Traffic Signal Design Details, except as revised herein.

Installation. The inductive loop detector shall be installed inside a surveillance controller cabinet. The detector shall be either card rack type or shelf-mounted type. The detector may be single channel or two-channel as directed by the Surveillance Engineer.

Where replacing an existing 4 channel shelf mounted detector the Contractor shall remove the existing 4 channel harness and furnish and install the necessary single channel harnesses to complete the installation.

Functions. The inductive loop detector shall have a front panel multiline graphic Liquid crystal display which aids in the set up and can display operational parameters and diagnostic information for all channels simultaneously.

The inductive loop detector shall conform to TS1-1989, 170/2070 requirements, and TS2-2003. For Nema TS2 the two channel and 4 channel devices shall meet the requirements for type C and D configurations respectively.

The inductive loop detector shall have a minimum of 20 levels of sensitivity control and shall have sufficient sensitivity to detect the smallest motor vehicle, including motor bikes.

The inductive loop detector shall have directional logic built in for wrong way vehicle detection.

The inductive loop detector shall support 3 different inductive loop types; normal loop, point probe, and rail mode.

The inductive loop detector shall have solid state Optically Isolated Outputs.

Materials. Materials shall be according to Article 1079.01

Basis of Payment. This work will be paid for at the contract unit price each for DETECTOR, INDUCTIVE LOOP AMP 2-CHANNEL RACK MOUNT which price shall include the necessary connections and adjustment for proper operation.

If the detector unit has more than one complete detection channel, each compound detection channel will be considered as a detector for payment.

SDMI

DMS UPS INVERTER AND BATTERIES, SKYLINE DMS

Description. The Contractor shall perform a UPS modification as specified herein and as directed by the Engineer.

Work Description. The Contractor is responsible for scheduling the work and for coordinating with the Engineer whenever Engineer-witness functions are required. The Contractors shall also advise the Engineer when each location is complete and shall provide a written certification to that affect. The Engineer reserves the right to require a final inspection of the modification at any or all of the locations certified as complete. Should deficiencies be found upon inspection, a corrective work list will be prepared.

The DMS sign location shall be kept operational at all times except when permitted by the Engineer. The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost to the pay item. All cable, conduit, fittings and accessories shall be new. All materials and work shall be in conformance with the requirements of applicable contract specifications and the National Electrical Code.

The work will generally include;

- Replacement of the existing inverter, batteries, harnesses, and rack mounting
- Reuse of AC terminal blocks, Cabinet electronics circuit breakers, Cabinet environmental circuit breakers, harnesses connecting the inverter to the pole support board or controller, inverter disconnect switch, AC sense relay, fuses, fans, heaters, etc...
- Installation of a new Alfa FXM 2000 inverter or equal
- Alpha Cell 220GXL 109 AH batteries (8) or equal
- Alpha 8 foot 48 volt battery harness (2) or equal
- Alpha Battery cable y adaptor or equal
- Alpha Rack mount kit or equal
- Misc connectors and wiring

The new inverter shall be interfaced into the DMS 170/2070 controller to report back voltage and battery status. The UPS shall be capable of reporting in the same manner as the existing inverter. It shall report door alarm, AC sense, and battery voltage signal. Battery voltage signal is used by the Controller to estimate the signs run time on the battery backup.

All work shall be tested once complete. The new inverter shall be capable of operating the DMS as the original UPS was designed. Testing shall be as defined in the Skyline Battery Backup Technical Reference Manual 21ST-0001-026 Rev. B

Method of Measurement. Each modification performed at a location as specified and approved by the Engineer shall be counted as a unit each for payment.

Basis of Payment. This item shall be paid at the Contract unit price each for DMS UPS INVERTER AND BATTERIES, SKYLINE DMS, which shall be payment in full for the work described herein.

SDMS DMS SIGN WALK IN EXPRESSWAY

General Requirements

This special provision shall govern the furnishing and installation of a Walk-In Access, Full matrix, Color, NTCIP 1203 Dynamic Message Sign (DMS) and associated equipment cabinets as shown in the plans and as detailed in this special provision. The high resolution, full color display shall be a full matrix configuration of 96 pixels high by 400 pixels wide. The size of the sign shall be as shown in the plans. All display elements and modules shall be solid state. No mechanical or electromechanical elements or shutters shall be used.

Equipment to be furnished at each dynamic message sign 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 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 are 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 DMS walkway platforms with permanent safety and mounting brackets and hardware.

Each LED DMS shall be capable of displaying three lines of text. Each line shall consist of a string of 21 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 384 dots composed of 24 columns and 16 rows. A luminous pixel shall consist of a LED pixel array. All display elements and modules shall be solid state.

All characters, symbols, and digits shall be 18 inch nominal character size and shall be clearly visible and legible at a distance of 1100 feet within a 30 degree cone of vision centered on 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 4000 pounds. The dimensions of the sign housing will not exceed 8'0" tall, 30'0" wide, and 4' 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 stamp the drawings. These drawings shall be submitted to the

Engineer for approval before work can commence. These drawings will describe the mounting required to attach the DMS to the 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 $+149^{\circ}\text{F}$ 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.

Working Sample Demonstration (Dynamic Message Sign)

To ensure timely delivery for installation, it is imperative that the DMS manufacturer be regularly engaged in the manufacture of the specified equipment and capable of immediately demonstrating a sample DMS that is in clear compliance with the key portions of the specifications. Delay from the specified timeline, and failure to present the sample in a timely manner may result in termination of the contract, at the discretion of the Engineer.

The DMS manufacturer shall provide a satisfactory, approvable demonstration of a working sample DMS within 14 calendar days after contract execution. The sample shall be a complete mock-up of a working DMS based on the proposed equipment to be furnished under this contract and identified in the submittal material. The sample demonstration may utilize a portable sample at the IDOT Traffic Systems Center, or it may be at the manufacturer's production facility if located within District 1. A demonstration of an identical installed unit for some other contract will be acceptable.

The sample demonstration will be for purposes of review and approval by the engineer. The Engineer will issue review comments based on examination of the unit and its operation at the time of the demonstration, and the Engineer may require a subsequent revised sample demonstration if, in the Engineer's judgment, the comments warrant re-work of the sample unit.

Delay in presenting the specified demonstration or delay in attaining "Approved" or "Approved as Noted" status will result in 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, but deviations from key specified requirements will not be accepted.

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.

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 (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 functionality 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.

DMS Manufacturer 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 of 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. These 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 Walk-In 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.

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.

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.

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 Amendment 1)
- 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.

Physical Construction

Wiring and Power Distribution

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.

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

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.

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, including ground rods and grounding wire between the DMS, grounding triad, and ground mounted controller cabinet. All earth grounding shall conform to the National Electrical Code.

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 or 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.

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-771 1 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.

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.

Convenience Outlets. The DMS housing shall contain a utility outlet circuit consisting of a minimum of three (3) 15-A NEMA 15-R, 120 VAC duplex outlets, with ground-fault circuit interrupters. One outlet shall be located near each end of the DMS housing interior and the third outlet shall be located near the housing's center.

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.

Front Face Construction

The DMS front face shall be constructed with multiple rigid panels, each of which supports and protects a full-height section of the LED display matrix. The panels shall be fabricated using aluminum sheeting on the exterior and polycarbonate sheeting on the interior of the panel.

Front face panels shall provide a high-contrast background for the DMS display matrix. The aluminum mask of each 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.

Face panels shall be attached to each other using stainless steel hardware. Seams that separate adjacent panels shall be sealed. Panels shall not be welded or otherwise permanently mounted to the DMS housing.

Each 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. The use of a plastic lens system will not meet the requirements and will be cause for rejection.

LED display modules shall mount to the inside of the DMS front face panels. No tools shall be needed for removal and replacement of LED display modules.

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.

Service Access. 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.

At least one (1) 80" vertically hinged door shall be located on each end (left, right or left and rightside) of the DMS housing. Each access door shall be mounted to an integral doorframe. A vertical stainless steel hinge shall support each door and all doors shall open outward. In the closed position, each door shall latch to its frame with a three-point draw-roller mechanism. The latching mechanism shall include an internal handle and release lever. Door release levers shall be located so that a person with no key and no tools cannot become trapped inside the housing.

Access doors, when open at a 90-degree angle from the DMS housing end wall, shall not extend more than 38-inches (965 mm) from the housing. The bottom edge of each door shall be at least 3.5-inches (89 mm) from the bottom edge of the DMS housing. This will provide clearance for the doors to swing open over external access platform.

Doorframes shall be double flanged on all sides to shed water. Each door shall close around its flanged frame and compress against a closed-cell foam gasket, which adheres to the door. All doors shall contain a stop that retains the door in a 90-degree open position. When a door is open, the door and its stop shall not be damaged by a 40 mph (64 km/h) wind.

Each door shall be furnished with a lock that is keyed to a Corbin #2 lock.

The DMS must be equipped with an OSHA compliant safety rail assembly, which prevents service personnel from falling out of the DMS when closed across an open access door. A rail assembly must be provided for each door in the display. The safety rail shall consist of a top rail that extends 42-inches (1,067 mm) above the interior walkway and a mid-rail that extends 21-inches (533 mm) above the interior walkway. The rail assembly shall require no tools to open and close.

The DMS cabinet shall be equipped with an OSHA compliant anchor point at each entrance location for the connection of a personal fall arrest system. These anchorages integrated to the support structure must be strong enough to withstand a force of 5,000 pounds (22.2 kilo- newton(s)) as required by OSHA. The anchorages must be located such that they will not allow a person to free-fall more than 6 feet when a 6 foot lifeline is used. The anchorages must be located just inside each access door within easy reach from the outside.

Interior work area, minimum headroom of 72-inches (1,829 mm) shall be provided. This free space shall be maintained across the entire width of the DMS housing, with the exception of structural frame members. Structural members shall be designed not to obstruct the free movement of maintenance personnel throughout the DMS.

A level aluminum walkway shall be installed in the bottom of the DMS housing. The walkway shall be a minimum of 24-inches (610 mm) wide and it shall run the entire length of the housing, from one side to the other side. The walkway's top surface shall be non-slip and shall be free of obstructions that could trip service personnel. The walk-way shall support a load of 500 pounds (136 kg) per two (2) linear feet per AASHTO STA specifications for Highway Signs section 3.6 Live Loads and it shall be constructed of multiple aluminum removable panels.

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 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: 3.9×10^{-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 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.

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.

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 glazing and the display modules. The sign controller shall control the heat tape. All heat tape terminal blocks shall be covered for safety.

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.

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.

Ventilation System

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

The DMS shall contain an 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 toward 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.

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 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.
- *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.

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 615 – 650 nm.
- Green LEDs shall utilize InGaN semiconductor technology and shall emit green light that has a peak wavelength of 525 – 535 nm.
- Blue LEDs shall utilize InGaN semiconductor technology and shall emit blue light that has a peak wavelength of 464 – 470 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.

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.

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 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 on 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.

Display of Graphic Images

The DMS control software shall support the inclusion of graphics in messages. If the NTCIP 1203v3 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 v3 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 v3 standard reaches the "approved" state.

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 -30°F to +165°F (-34°C to +74°C)
- Maximum output power rating shall be maintained over a minimum temperature range of -30°F to +140°F (-34°C to +60°C)
- 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

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.

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.

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.

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 $+70^{\circ}\text{C}$ ($+158^{\circ}\text{F}$) with a relative humidity of up to 95% non-condensing, unless otherwise noted in this specification.

Sign Controller

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.

Controller Location

The sign controller and associated communication equipment shall be installed inside the ground-mounted cabinet as shown on plans.

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.

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

Operational Requirements

Front Panel User Interface. The sign controller's front panel shall include a menu driven, 16 button keypad and a 280x472 graphical 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 RGB 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, create, preview and delete messages stored in memory
- Blank the sign.
- Start and stop the schedule.
- Configure display parameters, including display size and color technology
- Configure date and time.
- Configure communications port settings and NTCIP options
- Configure level of password protection per user.
- Select automatic or manual brightness mode of operation.

The front panel interface shall also include:

- Power switch to turn the controller on and off
- LED power "on" indicator
- Local/remote selection from LCD interfaces.
- LED to indicate when any of the NTCIP communication channels are active

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 500 changeable text based messages in non-volatile RAM. There shall be a minimum of 2 GB RAM and 8 GB of storage.

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.

Communications

All remote communication ports shall be NTCIP-compatible as defined in the "Requirements for NTCIP Compatibility" section of these specifications.

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.

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, radiosystems, 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.

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.

Controller Addressing

Thirty (30) days prior to the scheduled field installation of each DMS controller, the Contractor shall deliver the controller to the Traffic Systems Center (TSC) for network configuration prior to installation by the Contractor. The controller shall be clearly identified as to which location it is to be installed for proper configuration. The controller's MAC address shall be clearly identified. After the controller is configured, the Contractor shall retrieve the controller from the TSC and install it.

Transient Protection

The DMS and sign controller signal and power inputs shall be protected from electrical spikes and transients as follows:

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 50 kA. This device shall conform to the following requirements:

- Withstand a peak 100,000-ampere surge current, 50kA L-N, 50kA L-G
- Designed, manufactured, & tested consistent with: ANSI/IEEE C62.41.1-2002, C62.42.2-2002, C62.45-2002, NEMA LS-1, NEC 285 and IEC 61643, CE
- Less than 1 nanosecond response time
- Temperature range of -15°F to +140°F (-26°C to +60°C)
- Approximate dimensions of 3-inches (76 mm) wide by 8-inches (203 mm) long by 3-inches (76 mm) high
- High Energy Parallel Design for Category C3 & C-High Application
- UL listed to: UL 1449 Third Edition 200kA & 100kA SCCR

Control Equipment AC Power

- Withstand a peak 100,000-ampere surge current, 50kA L-N, 50kA L-G
- Designed, manufactured, & tested consistent with: ANSI/IEEE C62.41.1-2002, C62.42.2-2002, C62.45-2002, NEMA LS-1, NEC 285 and IEC 61643, CE

- Less than 1 nanosecond response time
- Temperature range of -15°F to +140°F (-26°C to +60°C)
- Approximate dimensions of 3-inches (76 mm) wide by 8-inches (203 mm) long by 3-inches(76 mm) high
- High Energy Parallel Design for Category C3 & C-High Application
- UL listed to: UL 1449 Third Edition 200kA & 100kA SCCR

Communication Signals

Transient voltage surge suppressors shall protect all communication signals connecting to the control equipment from off-site sources using copper cables. Transient voltage surge suppressors shall protect all copper communication lines used to pass data between the sign controller and sign.

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.

Local User Auxiliary Interface

When DMS sign Controller is located inside of DMS sign Enclosure.

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 laptop computers and a hinged shelf which folds from inside the cabinet and is suitable for the laptop computer to rest on.

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.

DMS Control Interface

The auxiliary control panel shall include an identical menu system to the DMS controller with all of its features and functionality.

Location

The Auxiliary Control Panel shall be installed at grade level in a location that is safe and easy for maintenance personnel to access.

Controller Signal Interface

The auxiliary control panel shall interface to the DMS controller using fiber optic. It shall be capable of operating up to 4000 feet from the DMS controller.

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 displaying a message, including static messages, flashing messages, and alternating messages.

Messages shall be capable of displaying text, graphics or a combination of both. The graphics area shall be downloaded from the central controller with each message.

It shall be possible to separately vary the flashing and alternating frequencies. Flashing

messages shall have the following adjustable timing:

- Message time on from 0.5 to 5.0 seconds in 0.1 second increments.
- Message time off from 0.5 to 5.0 seconds in 0.1 second increments

It shall be possible to flash any character or set of characters in a static message.

Alternating messages shall have the following adjustable timing:

- Primary message time on from 0.5 to 5.0 seconds in 0.1 second increments.
- Primary message time off from 0 to 5.0 seconds in 0.1 second increments.
- Alternative message time on from 0.5 to 5.0 seconds in 0.1 second increments.
- Alternate message time off from 0 to 5.0 seconds in 0.1 second increments.

It shall be possible to flash any character or set of characters in an alternating message at the adjustable frequencies listed above for flashing messages. The flashing period shall be a sub- multiple of the alternating on-time it is associated with.

Report errors and failures, including:

- Power failure
- Power recovery
- Pixel string failure
- Fan failure
- Over a user selectable critical temperature
- Power supply failure
- Data transmission error
- Receipt of invalid data
- Communication failure recovery

Message and Status monitoring:

The sign controller shall respond to the central controller whenever it receives a request for status(a poll). The return message shall be capable of providing the following information:

- Actual message that is visibly displayed on the sign on an individual pixel basis (full-on, half-on or off)
- Current sign illumination level
- Local Control Panel switch position (central, local or local override mode)
- Error and failure reports
- Temperature readings
- LED power supply voltage levels
- Origin of display message transmission (laptop, manual or central)
- Heater status
- Address of sign controller
- Uninterruptible power supply status
- AC Surge protection status
- Communication line protection status
- Operational status of the following sensors
- Each temperature sensor
- Each photocell
- Each airflow sensor

- Humidity sensor
- Each power supply sensor
- Severe error condition response

Each time the sign controller is polled by the DMS Master Controller or laptop computer, the signcontroller shall test the operation status of the sensors listed below and return this information to the DMS Master Controller. This operational status test shall determine if each of the following sensors are functioning properly:

- Each temperature sensor
- Each photocell
- Humidity sensor
- Each LED power supply

The sign controller shall provide a library with a minimum of 50 permanent messages, consisting of 30 or less characters per line, stored in PROM. The sign controller shall also be able to accept a downloaded library from the central or laptop computer of a minimum of 25 changeable messages stored in non-volatile RAM. These messages may be called for display on the sign from the keypad on the front panel of the DMS Controller.

The sign controller shall also be capable of displaying messages on the sign that are downloaded from the central controller or laptop computer but are not located in the library stored in non-volatile memory of the sign controller.

The sign shall normally display triple stroke (23 x 15) characters with four-column spacing between characters. The sign shall also be able to display single stroke (5 X 7), expanded (6 X 7) or double-stroke (7 X 7) nominal character fonts or change the default spacing between characters. The spacing options shall be one, two- or three-pixel columns. Each font may be edited and downloaded to the sign controller from the central controller or laptop computer at anytime without any software or hardware modifications.

The full matrix display shall also be capable of displaying other sized characters, graphics/ symbols, and other number of lines depending on the height of the character utilized. The interline spacing shall be variable.

The sign controller shall monitor the photocell 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 transient voltage suppression devices as required in the AC Power Section of this specification. Tripping of each stage (or both if tripped simultaneously) of the surge protection shall cause the sign controller to call central and report the error condition (for dial-up operation) or report the error condition to central on the next poll (for multi-drop operation). There shall be an option that is either enabled or disabled and is selected and downloaded from the central controller to the sign controller. When this option is enabled, tripping of the second stage of surge protection shall prevent power from reaching any components of the sign until the surge protection has been replaced. When this option is disabled, the sign will continue to function normally after the second stage of surge protection is tripped.

Communication lines shall be protected by two stages of transient voltage suppression devices as required in the Sign Controller Communication Interface Section of this specification. Tripping of each stage (or both if tripped simultaneously) of the surge protection shall cause the sign controller to call central and report the error condition (for dial-up operation) or report the error condition to central on the next poll (for multi-drop operation). There shall 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.

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.

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 from a separate circuit breaker. The system shall be protected by two stages of transient voltage suppression devices including MOVs and spark gap arrester. 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).

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.

Electronic Materials and Construction Methods

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.

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 these 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.

Technical Assistance

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

- Sign to structure installation
- Sign controller cabinet installation
- Sign to controller cabling

The initial powering up of the sign(s) shall not be executed without the permission of the DMS manufacturer's technical representative.

Testing Requirements

The equipment covered by this specification shall be subjected to design approval tests (DAT), factory demonstration tests (FDT), stand-alone tests, systems tests and 72 hour and 90 day test periods to determine conformance with all the specification requirements. The Engineer may accept certification by an independent testing lab in lieu of the design approval tests to verify that the design approval tests have previously been satisfactorily completed. The DMS vendor shall arrange for and conduct the tests in accordance with the testing requirements stated herein. Unless otherwise specified, the DMS vendor is responsible for satisfying all inspection requirements prior to submission for the Engineer's inspection and acceptance. The contract periods will not be extended for time lost or delays caused by testing prior to final Department approval of any items. The Engineer reserves the right to have his representative witness any and all tests. The results of each test shall be compared with the requirements specified herein. Failure to conform to the requirements of any test shall be counted as a defect, and the equipment shall be subject to rejection by the Engineer. Rejected equipment may be offered again for a retest provided that all non-compliances have been corrected and retest by the DMS vendor and evidence thereof submitted to the Engineer.

Final inspection and acceptance of equipment shall be made after installation at the designated location as shown on the plans, unless otherwise specified herein.

Test Procedures

The DMS vendor shall provide five (5) copies of all design approval, factory demonstration, stand-alone and system test procedures and data forms for the Engineer's approval at least sixty (60) days prior to the day the tests are to begin.

The test procedures shall include the sequence in which the tests will be conducted. The test procedures shall have the Engineer's approval prior to submission of equipment for tests.

The DMS vendor shall furnish data forms containing all of the data taken, as well as quantitative results for all tests. The data forms shall be signed by an authorized representative (company official) of the equipment manufacturer. At least one copy of the data forms shall be sent to the Engineer.

The DMS vendor shall be responsible for providing the test fixtures and test instruments for all of the tests.

Design Approval Tests

Design approval tests shall be conducted by the DMS vendor on one or more samples of equipment of each type, as approved by the Engineer, to determine if the design of the equipment meets the requirements of this Specification. The test shall be conducted in accordance with the approved test procedures as described under the Factory Demonstration Test section of this special provision.

If the design approval tests have not previously been satisfactorily completed by an independent testing lab and accepted by the Engineer, the Engineer shall be notified a minimum of thirty (30) calendar days in advance of the time these tests are to be conducted.

The design approval tests shall cover the following:

Temperature and Condensation. The DMS sign system equipment shall successfully perform all the functionality requirements listed in this specification under the following conditions in the order specified below:

- The equipment shall be stabilized at -40°F (-40°C). After stabilization at this temperature, the equipment shall be operated without degradation for two (2) hours.
- Moisture shall be caused to condense on the equipment by allowing it to warm up to room temperature in an atmosphere having relative humidity of at least 40% and the equipment shall be satisfactorily operated for two (2) hours while wet.
- The equipment shall be stabilized at 149°F (65°C). After stabilization, the equipment shall be satisfactorily operated for two (2) hours without degradation or failure.

Primary Power Variation. The equipment shall meet the specified performance requirements when the nominal input voltage is 115 V ± 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.

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.

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.

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.

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.

DMS Controller Uninterruptible Power Supply

A UPS shall be provided to allow the sign controller to notify the central controller when an improper power condition at the DMS persists for longer than 30 seconds. The UPS shall meet the following minimum specifications:

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

Factory Demonstration Tests

The DMS vendor shall be responsible for conducting Factory Demonstration Tests on all units at the DMS Vendor's Manufacturing Facility. These tests shall be performed on each unit supplied. The Engineer shall be notified a minimum of sixty (60) calendar days before the start of tests. The DMS Vendor shall provide for video conferencing of the factory demonstration tests. All tests shall be conducted in accordance with the approved test procedures of Section 17.0. All equipment shall pass the following individual tests:

Examination Tests

All 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 that it meets the requirements of the appropriate paragraphs in the Specifications.

Operational Test

All 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.

Consequences of Factory Test Failure. If any unit fails to pass its demonstration test, the unit shall be corrected and another unit substituted in its place and the test successfully repeated.

If a unit has been modified as a result of a demonstration test failure, a report shall be prepared and delivered to the Engineer prior to shipment of the unit. The report shall describe the nature of the failure and the corrective action taken.

If a failure pattern develops, the Engineer may direct that design and construction modifications be made to all units without additional cost to the Department or extension of the contract period.

Stand-Alone Tests

The DMS vendor shall conduct an approved stand-alone test of the equipment installation at the field site. The test shall, as a minimum, exercise all stand-alone (non-network) functional operations of the field equipment with all of the equipment installed as per the plans, or as directed by the Engineer. Approved data forms shall be completed and turned over to the Engineer as the basis for review and rejection or acceptance. At least thirty (30) working days' notice shall be given prior to all tests to permit the Engineer or his representative to observe each test.

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.

System Test

The DMS vendor shall conduct approved DMS system tests on the field equipment with the central equipment. The tests shall, as a minimum, exercise all remote control functions and display the return status codes from the controller.

Approved data forms shall be completed and turned over to the Engineer as the basis for review and for rejection or acceptance.

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.

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.

Final System Acceptance

Final system acceptance shall be defined as when all work and materials provided for in this item have been furnished and completely installed, and all parts of the work have been approved and accepted by the Engineer and the Dynamic Message Sign System has been operated continuously and successfully for ninety (90) calendar days with no more than five (5) working days downtime due to mechanical, electrical and/or other malfunctions.

Warranty

Equipment furnished under this Specification shall be guaranteed to perform according to these specifications and to the manufacturer’s published specifications. Equipment shall be warranted for a minimum of **five years** return to factory against defects and/or failure in design, materials and workmanship. Unless otherwise specified in the invitation for bids, warranty coverage shall become effective on the date of final acceptance of the system by the Department. The Contractor shall assign to the Department all manufacturer’s normal warranties or guarantees, on all such electronic, electrical and mechanical equipment, materials, technical data, and products furnished for and installed on the project. Defective equipment shall be repaired or replaced, at the manufacturer’s option, during the warranty period at no cost to the Department. The Contractor shall provide a written document on DMS Vendor letterhead, signed by the DMS Principle, documenting said warranties or guarantees and shall be submitted to the Engineer before project acceptance.

Center to Field Communications NTCIP Requirements

This section describes the minimum specifications for the NTCIP communication capabilities of the DMS controller and DMS control software. The contractor shall provide all the software, firmware, and services necessary to operate a dynamic message sign (DMS) system that fully complies with the NTCIP functional requirements specified herein, including incidental items that may have been inadvertently omitted.

References

These specifications reference standards through their NTCIP designated names. The following list provides the current versions of each of these standards.

Each NTCIP device covered by these project specifications shall implement the version of the standard that is specified in the following table. Refer to the NTCIP library at www.ntcip.org for information on the current status of NTCIP standards.

Document Number and Version	Document Title	Document Status
NTCIP 1101:1996 and Amendment 1	Simple Transportation Management Framework (STMF)	Approved Standard with Amendment
NTCIP 1102:2004	Octet Encoding Rules (OER) Base Protocol	Approved Standard
NTCIP 1103 v1.26a	Transportation Management Protocols	Recommended Standard
NTCIP 1201:1996 and Amendment 1	Global Object (GO) Definitions	Approved Standard

NTCIP 1203:1997 and Amendment 1	Object Definitions for Dynamic MessageSigns	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

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.

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 anytime.

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.

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 be required to support the following optional conformance groups.

Conformance Group	Reference
Time Management	NTCIP 1201
Timebase Event Schedule	NTCIP 1201
Report	NTCIP 1201
PMPP	NTCIP 1201
Font Configuration	NTCIP 1203
DMS Configuration	NTCIP 1203
MULTI Configuration	NTCIP 1203
MULTI Error Configuration	NTCIP 1203
Illumination/Brightness Control	NTCIP 1203
Scheduling	NTCIP 1203
Sign Status	NTCIP 1203
Status Error	NTCIP 1203
Pixel Error Status	NTCIP 1203

Table 2: Required Optional Conformance Groups

The following table indicates objects that are considered optional in the NTCIP standards, but are required by this specification. It also indicates modified object value ranges for certain objects. Each NTCIP device shall provide the full, standardized object range support (FSORS) of all objects required by these specifications unless otherwise indicated below.

Object	Reference	Project Requirement
moduleTable	NTCIP 1201 Clause 2.2.3	Shall contain at least one row with moduleType equal to 3 (software).
maxTimeBaseScheduleEntries	NTCIP 1201 Clause 2.4.3.1	Shall be at least 28
maxDayPlans	NTCIP 1201 Clause 2.4.4.1	Shall be at least 20
maxDayPlanEvents	NTCIP 1201 Clause 2.4.4.2	Shall be at least 12
maxEventLogConfig	NTCIP 1201 Clause 2.5.1	Shall be at least 50

eventConfigMode	NTCIP 1201 Clause 2.4.3.1	The NTCIP Component shall Support the following Event Configuration: onChange, greaterThanValue, smallerThanValue
eventConfigLogOID	NTCIP 1201 Clause 2.5.2.7	FSORS
eventConfigAction	NTCIP 1201 Clause 2.5.2.8	FSORS
maxEventLogSize	NTCIP 1201 Clause 2.5.3	Shall be at least 200
maxEventClasses	NTCIP 1201 Clause 2.5.5	Shall be at least 16
eventClassDescription	NTCIP 1201 Clause 2.5.6.4	FSORS
maxGroupAddresses	NTCIP 1201 Clause 2.7.1	Shall be at least 1
communityNamesMax	NTCIP 1201 Clause 2.8.2	Shall be at least 3
numFonts	NTCIP 1203 Clause 2.4.1.1.1.1	Shall be at least 12
maxFontCharacters	NTCIP 1203 Clause 2.4.1.1.3	Shall be at least 255
defaultFlashOn	NTCIP 1203 Clause 2.5.1.1.1.3	The DMS shall support flash "on" times ranging from 0.1 to 9.9 seconds in 0.1 second increments
defaultFlashOff	NTCIP 1203 Clause 2.5.1.1.1.4	The DMS shall support flash "off" times ranging from 0.1 to 9.9 seconds in 0.1 second increments
defaultBackgroundColor	NTCIP 1203 Clause 2.5.1.1.1.1	The DMS shall support the black background color
defaultForegroundColor	NTCIP 1203 Clause 2.5.1.1.2	The DMS shall support the amber foreground color
defaultJustificationLine	NTCIP 1203 Clause 2.5.1.1.1.6	The DMS shall support the following forms of line justification: left, center, and right
defaultJustificationPage	NTCIP 1203 Clause 2.5.1.1.1.7	The DMS shall support the following forms of page justification: top, middle, and bottom
defaultPageOnTime	NTCIP 1203 Clause 2.5.1.1.1.8	The DMS shall support page "on" times ranging from 0.1 to 25.5 seconds in 0.1 second increments

defaultPageOffTime	NTCIP 1203 Clause 2.5.1.1.1.9	The DMS shall support page "off" times ranging from 0.1 to 25.5 seconds in 0.1 second increments
defaultCharacterSet	NTCIP 1203 Clause 2.5.1.1.1.10	The DMS shall support the eight bit character set
dmsMaxChangeableMsg	NTCIP 1203 Clause 2.6.1.1.1.4	Shall be at least 100.
dmsMessageMultiString	NTCIP 1203 Clause 2.6.1.1.1.8.3	The DMS shall support any valid MULTI string containing any subset of those MULTI tags listed in Table 3 (below)
dmsControlMode	NTCIP 1203 Clause 2.7.1.1.1.1	Shall support at least the following modes: local, central, and centralOverride
dmsSWReset	NTCIP 1203 Clause 2.7.1.1.1.2	FSORS
dmsMessageTimeRemaining	NTCIP 1203 Clause 2.7.1.1.1.4	FSORS
dmsShortPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.8	FSORS
dmsLongPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.19	FSORS
dmsShortPowerLossTime	NTCIP 1203 Clause 2.7.1.1.1.10	FSORS
dmsResetMessage	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsCommunicationsLossMessage	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsTimeCommLoss	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsEndDurationMessage	NTCIP 1203 Clause 2.7.1.1.1.15	FSORS
dmsMemoryMgmt	NTCIP 1203 Clause 2.7.1.1.1.16	The DMS shall support the following Memory management Modes: normal and clearChangeableMessages

dmsMultiOtherErrorDescription	NTCIP 1203 Clause 2.4.1.1.1.20	If the vendor implements any vendor-specific MULTI tags, the DMS shall provide meaningful error messages within this object whenever one of these tags generates an error
dmsIllumControl	NTCIP 1203 Clause 2.8.1.1.1.1	The DMS shall support the following illumination control modes: Photocell, and Manual
dmsIllumNumBrightLevels	NTCIP 1203 Clause 2.8.1.1.1.4	Shall be at least 100
dmsIllumLightOutputStatus	NTCIP 1203 Clause 2.8.1.1.1.9	FSORS
numActionTableEntries	NTCIP 1203 Clause 2.9.1.1.1	Shall be at least 200
watcdogFailureCount	NTCIP 1203 Clause 2.11.1.1.1.5	FSORS
dmsStatDoorOpen	NTCIP 1203 Clause 2.11.1.1.1.6	FSORS
fanFailures	NTCIP 1203 Clause 2.11.2.1.1.8	FSORS
fanTestActivation	NTCIP 1203 Clause 2.11.2.1.1.9	FSORS
tempMinCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.1	FSORS
tempMaxCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.2	FSORS

tempMinSignHousing	NTCIP 1203 Clause 2.11.4.1.1.5	FSORS
tempMaxSignHousing	NTCIP 1203 Clause 2.11.4.1.1.6	FSORS

Table 3: Modified Object Ranges and Required Optional Objects

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	(E) DESCRIPTION
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f1	Field 1-time (12 hr)
f2	Field 1-time (24 hr)
f8	Field 8- day of month
f9	Field 9-month
f10	Field 10-2 digit year
f11	Field 11-4 digit year
fl (and /fl)	Flashing text on a line-by-line basis with flash rates controllable in 0.1-second increments.
Fo	Font
jl2	Justification- line-left
jl3	Justification- line-center
jl4	Justification- line- right
jp2	Justification- page- top
jp3	Justification- page- middle
jp4	Justification- page- bottom
mv	Moving text
nl	New line
np	New page up to 5 instances in a message (i.e. up to 6 pages/frame in a message counting first page)
pt	Page times controllable in 0.1-second increments

Table 4: Required MULTI Tags

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 module 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

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.

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 engineers shall provide an interpretation of the specification for use on the project.

As-Built Documentation

The Contractor shall provide to the Engineer the following documentation of the complete installed equipment prior to testing. Sufficient documentation shall be provided to reflect "as-built" conditions and to facilitate operation, maintenance, modification, and expansion of the system or any of its individual components. Manufacturer supplied documentation which covers the intent of this requirement may be used, subject to the approval of the Engineer.

Operator's Manuals

A manual containing a general description and detailed operating and installation instructions shall be provided for each different type or model of equipment. Five copies of the manual shall include the following information:

- A general description of the equipment including all information necessary to describe the basic use or function of the system components. This shall include a general block diagram presentation of the equipment. Where auxiliary equipment is required, tabular charts shall be included, list such equipment. These charts shall include the nomenclature physical and electrical characteristics and functions of the auxiliary equipment, unless such information is contained elsewhere in an associated manual. In the latter case, a reference shall be made to the location of the information pertaining to the auxiliary equipment.
- The theory of operation of the system components in a clear, concise manner supported by simplified schematics, logic, data flow diagrams, one-function diagrams, etc. Timing and waveform diagrams and voltage levels shall be shown as required. A logical development shall be used starting with a system block level and proceeding to a circuit analysis. Circuit analysis shall be detailed whenever circuits are not normally found in standard textbooks. This application of new theoretical concepts shall be fully described. Where the design allows operation in a number of different modes, an operational description of each mode shall be included.
- In simple, clear language, the routine of operation, from necessary preparations for placing the equipment into operation, to securing the equipment after operation. This section shall contain appropriate illustrations, with the sequence of operations presented in tabular form wherever feasible.
- The manufacturer's recommended procedures and checks necessary for preventive maintenance. This shall be specified for pre-operation, weekly, monthly, quarterly, semi-annual, annual and "as required" checks as necessary to assure reliable equipment operation. Specification, including tolerances, for all electrical, mechanical, and other applicable measurement, adjustments, or both, shall be listed.
- Data necessary for isolation and repair of failure or malfunctions, assuming the maintenance

technicians to be capable of analytical reasoning using the information provided in the submittal information. Accuracies, limits, and tolerances for all electrical, physical, or other applicable measurements shall be described. General instructions shall be included for disassembly, overhaul, and reassembly, including shop specifications or performance requirements.

- Detailed instructions shall be given only where failure to follow special procedures would result in damage to the equipment, improper operation, danger to operating or maintenance personnel. Consumption of excessive person hours, etc. Such instructions and specifications shall be included only for such maintenance as maybe accomplished by specialized technicians and engineers in a modern electromechanical shop. The instructions shall describe special test set-up, components fabrication, the use of special tools, jigs, and test equipment.
- A detailed physical description of size, weight, special mounting requirements, electrical connections, and all other pertinent information necessary for proper installation and use of the equipment shall be provided.
- The parts list shall contain all information required to describe the characteristics of the individual parts, as required for identification. It shall include a list of all equipment within a group and list all assemblies, sub-assemblies and replacement parts of units. The tabular arrangement shall be an alphanumerical order of the schematic reference symbols and shall give the associated description, manufacturer's name and part number. A table of contents or some other convenient means shall be provided for the purpose of identifying major components, assemblies, etc.
- Schematic diagrams shall be complete and accurate as required to supplement the text material and to allow the books to be a self-contained technical information source. Maximum size of these diagrams shall be limited to allow their use in close proximity to the equipment, in the class room, etc., part reference symbols, test voltages, waveforms and other aids to understanding of the circuits function shall be included on the diagrams. Test voltages, waveforms and other aids to understanding of the circuits function may be shown on either simplified schematics or 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.

Software Manuals

The DMS vendor shall provide manuals and data for the computer software system and components thereof. These shall include the following:

- Computer programmer's manuals and computer user's manuals (5 copies each). Include manuals for any CPU language used by the Contractor for this project. Include instructions for performing a back-up of all software and message libraries.
- Two original copies of the computer's operating system manual and compiler and assembly language manuals and an instruction manual for translating source to object code.
- Manufacturer's documentation (including schematics) for all plug in circuit cards used in the microcomputer chassis.
- Computer program logic in flow chart form (5 copies).
- Narrative descriptions of programs and input output formats (5 copies).
- Two copies of source programs, for master and sign controller software, shall be provided on CD-ROM. An unrestricted license for software use by the Department shall be provided to the Engineer.
- DMS vendor shall provide the communication protocol used between the DMS master controller and the DMS sign controller for use by the Department without any restrictions.

Final Documentation

Final documentation shall reflect all field changes and software modifications and shall be provided before

installation. Final documentation shall be approved prior to final system acceptance has begun. This document shall include drawings of conduit layouts, cable diagrams, wiring lists, cabinet layouts, wiring diagrams and schematics for all elements of the communications system. This shall also include detailed drawings identifying by cable type, color- coded function, the routing of all conductors (pairs) in the communications system. Upon completion of the installation, the Contractor shall submit these plans, maps, and/or drawings to reflect an as built condition, incorporating all changes made during installation, such as in pair identification and routing.

Spare Parts Requirements

The Contractor shall provide additional parts to create two (2) additional character matrixes, two (2) load modules to drive a character module, one (1) LED power supply, and one complete signcontroller unit. The cost of additional parts/equipment shall be considered incidental to the price for each DMS.

DMS Training

Operational and maintenance training for the entire system shall be provided to designated personnel during installation, testing and debugging. This training shall be provided through practical demonstrations and other related technical procedures. Training shall be limited to a maximum of 15 people and shall be provided at a time and location approved by the Engineer. The training shall include, but not be limited to, the following:

- Hands-on operation of all sign control hardware
- Explanation of all system commands, their function and usage.
- Insertion of data
- Required preventative maintenance
- Servicing procedures
- System troubleshooting or problem identification procedures

A minimum of 24 hours of instruction shall be provided for the operational and maintenance procedures for the system. The DMS vendor shall submit an agenda for the training and one complete set of training materials along with the qualification of proposed instructors to the Engineer for approval at least 30 days before the training is to begin. The Engineer will review material and approve or request changes. After approval, the vendor shall provide a minimum of 5 copies of the training material that will become the property of the Department after training period is over.

The DMS vendor shall record the entire training on DVDs and shall provide the recordings to the Engineer for later use. The training shall be conducted at District One Traffic Systems Center building, after the completion of all system integration tests. The schedule of training sessions shall be established by the DMS vendor, with the approval of the Engineer.

Warranty

The equipment and parts furnished for the DMS and DMS control system shall be new, of the latest model, fabricated under high quality standards.

Equipment and parts furnished for the DMS shall be warranted by the manufacturer to be free of defects in assembly or fabrication and materials for a minimum of five years from the date of acceptance and shall be warranted for quality of work for twelve months from the date of final acceptance. If component manufacturer's warranties are for a longer period, they shall apply. Any parts or equipment found to be defective during the warranty period shall, upon the concurrence of the defect by the manufacturer, be replaced free of charge.

The Engineer shall be furnished with a certification stating that the equipment, parts and material furnished for the DMS and DMS control system complies with all the provisions of this special provision. If there are any items which do not comply with this special provision, then a list of those exceptions shall be detailed

on the certification.

All manufacturer's warranties and guarantees for the dynamic message sign system shall be transferred to the Department on the date of final acceptance.

Method of Measurement

The DMS Sign Walk In Expressway 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 and equipment to install, test, and make the 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 DMS Sign Walk In Expressway which price shall include furnishing and installing the DMS sign, documentation, warranties, spare parts, training, and diagnostic software as directed by the engineer.

SEMC ETHERNET MEDIA CONVERTER

The Contractor shall furnish and install a field hardened unmanaged Ethernet Media Converter, copper to fiber, at a CCTV, Surveillance or DMS cabinet as shown on the plans or directed by the Engineer. The Ethernet media converter shall be either a Rugged Com, Comnet, IFS, or Antaira unmanaged media converter. The contractor shall supply a match pair to connect devices which are 200 feet or more from the nearest Layer 2 or Layer 3 Ethernet Managed Switch. The contractor shall supply the Ethernet cat 5e patch cords as necessary to connect the field device to the Ethernet media converter and to the Ethernet managed switch.

Basis of Payment. This work shall be paid for at the contract unit price each for ETHERNET MEDIA CONVERTER and for which price shall be payment in full for all the labor and materials required to complete this work as described herein.

SEMS ETHERNET MANAGED SWITCH

Description. The Contractor shall furnish and install a field hardened Ethernet Managed Switch at a Com Shelter, Pump House, DMS, CCTV, or Surveillance cabinet as shown on the plans or as directed by the Engineer.

General Requirements. The Ethernet switch shall be an environmentally hardened Ethernet switch compliant with IEEE 802.3 (1-Mbps) and IEEE 802.3u (100 Mbps). Acceptable manufactures are Rugged Com, Comnet, Control Rocket Lynx, and BCDVideo managed switches

Operating Environment. The Ethernet switch shall be capable of operating properly over an ambient temperature range of -40°C to +85°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°C in accordance with IEC 60068-2-30. The Ethernet switch shall meet the environmental requirements of traffic control equipment in accordance with NEMA TS 2 (1998), Section 2: Environmental Requirements. Specifically NEMA TS 2 1998

(Section 2.2.8)

Vibration in each of the 3 mutually perpendicular planes. Vibration frequency sweep of 5 to 30 Hz Vibration strength = 0.5g

Duration = 3 hours, 1 hour at each plane

The Manufacturer shall provide evidence of independent testing verifying performance. In general, the Ethernet Switch shall comply with the environmental requirements outlined in Table 1. The Ethernet switch shall be capable of operating properly when exposed to radiated electric fields of up to 10 V/m continuously and magnetic fields of up to 40 A/m continuously. In general, the Ethernet switch shall comply with the EMI Immunity requirements given in IEC 61850-3 and IEEE1613. The Ethernet switch shall also pass the minimum EMC immunity requirements of EN61800-3. EN61800-3 A11 is the IEC standard for EMC emissions and immunity requirements for Adjustable Speed Power Drive Systems.

Port Requirements. The Ethernet switch shall have 8 - 10/100Base TX ports, 2 – 1000Base X fiber optic Gigabit Ethernet ports. All fiber optic link ports shall be capable of Multimode or Single mode. The Ethernet switch shall have the option of both small form pluggable (SFP) optics and fixed (soldered on) optics. Single mode optics shall support distances up to 70km. The Ethernet switch shall support the following requirements and options:

10/100Base TX ports:

RJ45 connectors

Cable type: Category 5, unshielded twisted pair (CAT 5 UTP) Segment Length: 100m

Auto-negotiation support (10/100Mbps) Auto MDIX crossover capability

TVS (Transient Voltage Suppression) between Line +/-, Line+/- ground, to protect the circuitry

Full Duplex operation (IEEE 802.3x) 1000 Base X Fiber Optic ports:

SFP pluggable optics shall support multiple connector types LC or SC, bi directional single strand fiber support, and longhaul optics which allow Gigabit distances up to 70 Km.

SFP 10km wavelength 1310, singlemode fiber 9/125 typical loss budget 17 db SFP 25km wavelength 1310, singlemode fiber 9/125 typical loss budget 19 db SFP 70km wavelength 1550, singlemode fiber 9/125 typical loss budget 25db

Networking Requirements. The Ethernet switch shall support automatic address learning of up to 8192 MAC addresses. The Ethernet switch shall support the following advanced layer 2 functions:

IEEE 802.1Q VLAN, with support for up to 255 VLANs and 4096 VLAN ID's. IEEE 802.1 p priority queuing

IEEE 802.1w rapid spanning tree

IEEE 802.1Q-2005 MSTP (formerly 802.1s) IEEE 802.1Q-2005 standard GMRP

IEEE 802.3x flow control

IEEE 802.3ad-Link Aggregation IGMPv2 with 256 IGMP groups Port Rate Limiting

Configuration via test file which can be modified through standard text editor

Forwarding/filtering rate shall be 14,880 packets per second (PPS) for 10 Mps, 148,800 for 100Mps, 1,488,000 for 1000 Mps
DHCP Option 82

Network Management Functionality Requirements.

The Ethernet switch shall provide the following network management functions:

SNMPv2, SNMPv3 RMON

GVRP

Port Mirroring 802.1x port security

SSL – Secure Socket Layer SSH – Secure Shell

TFTP

Network Time Protocol (SNTP)

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

Built in Protocol analyzer which enables traces to be run from within the Ethernet switch operating system. Must be able to forward traces to an IP address or UDP port.

Traces for must include but not be limited to the following: STP, MAC, Link, IGMP, GVRP, PPP, Transport, DHCPRA, 802.1X, WEBS, SNMP, IP, TacPlus, Radius, FORW, IPASSIGN, TRANSPORT

Additionally, the Ethernet switch shall demonstrate to provide sub 15 ms failover per Ethernet switch hop in a ring topology.

Programmable Critical Failure Relay. The Ethernet switch shall provide a programmable critical failure out relay that may be configured to activate upon critical error detection such as loss of link or detection of critical system errors. This function shall be user enabled and programmable. The output contacts shall be available in a Form-C configuration with Max Current at 2A@250 VAC, .15A@125VDC, 2 @20VDC.

Power Supply Requirements. The Ethernet switch shall be supplied with provisions for operation at the following power supply inputs, 85 to 264 VAC (50/60Hz). The power supply shall be internal to the Ethernet switch. Power supply shall have two stage isolation accomplished via two transformers which step down from primary AC/DC to VDC. A power cord of not less than 5 feet in length shall be supplied as well. The Ethernet switch shall require no more than 15W of power.

'Hipot' Testing in the field. The Ethernet switch shall allow for dielectric strength ('hipot') tests in the field, in accordance with IEC 60255-5, by trained personnel. It shall be capable of enduring a test voltage of at least 2kVrms on power supply inputs above 60V and 0.5kVrms on power supply inputs below 60V. A removable grounding wire shall be provided to allow disconnecting of any transient suppression circuitry at the power supply input to allow for 'hipot' testing without activating the transient suppression circuitry.

Mounting Requirement. The Ethernet switch shall provide options for DIN Rail mounting or panel mounting via brackets.

Warranty. The Ethernet switch shall be warranted for defects in material and workmanship for five (5) years after shipment. The Warranty shall include software updates and 7 x 24 phone support for the 5 year warranty period.

Environmental Requirements. The Ethernet switch shall comply with the atmospheric, vibration, shock and bump requirements outlined in Table 1. This compliance shall be demonstrated by type withstands tests (i.e. 'type tests') as outlined in Table 1 and summarized in a Type Test Report per the test report requirements of each of the standards given in Table 1.

Table 1: Environmental Tests				
Test	Description		Test Level	Severity
IEC 60068-2-1	Cold Temp	Test Ad	-40°C, 16 hours	N/A
IEC 60068-2-2	Dry Heat	Test Bd	+85°C, 16 hours	N/A
IEC 60068-2-30	Humidity	Test Db	95% (non condensing), 55 deg. C, 6 cycles	N/A
IEC 60255-21-1	Vibration	Test Fc		Class 1
IEC 60255-21-2	Shock	Test Ea.		Class 1
IEC 60255-21-2	Bump	Test Eb		Class 1

Safety Requirements/Agency Approvals. The Ethernet switch shall comply with the following electrical safety requirements or equivalents: UL 60950 or CSA C22.2 No. 60950 (safety requirements for IT equipment). The Ethernet switch shall also have CE (Europe) qualification. The Ethernet switch shall also comply with FCC Part 15 Class A for EMI emissions.

Each Gigabit switch shall be furnished with the a SFP from the above list of SFP's by the Engineer. The network will dictate the SFP used when installed in an existing system daisy chained Gigabit switches.

Method of Measurement. The Ethernet Managed Switch shall be measured each for payment when furnished, installed, configured, warranted, made fully operational, and tested as detailed herein.

Basis of Payment. This work will be paid for at the contract price, each, for ETHERNET MANAGED SWITCH, of the type specified, which shall be for the work as specified herein

**SIAS
INSPECTION, AUTOMATIC SUPPRESSION SYSTEM**

This item shall consist of scheduling a semi-annual inspection, functional test, and certification of the Automatic Suppression Alarm System located at the Traffic Systems Center.

All work shall be performed by a trained and certified fire alarm technician twice during each contract year in accordance with the manufacture's recommendations, local code, and national code.

The following procedure minimum shall be conducted during each inspection.

- Clean smoke detectors
- Calibrate of smoke detectors
- Actual alarming of detectors and manual pull stations
- Check control panel electrical wiring for grounds and shorts
- Check control panel battery standby and charger
- Check alarm devices such as bells and horns
- Check Halon storage tanks weight and pressure
- Test interlocking equipment for shut down
- Check other specialized components as needed
- Submit written reports to purchaser with recommendations for corrections, additions, deletions, or other changes to the system.

Basis of Payment. This item shall be paid at the contract unit price each for INSPECTION, AUTOMATIC SUPPRESSION SYSTEM, which price be payment in full for all work described herein and as directed by the Engineer.

SRIC

RAMP METERING INSPECTION AND CLEANING

Description. The Contractor shall, upon request of the Engineer, provide an additional inspection and cleaning at S-1 locations within District One. The Contractor shall comply and perform each Ramp Metering Inspection as per details provided in Art. 9.0 Monthly Ramp Metering Cabinet Inspection. This additional request is not a substitute for the routine monthly maintenance as defined in Art 9.0 for S-1 locations but is an additional inspection. When this item is exercised the Routine S-1 inspection for that location shall be performed at least ten (10) days before the completion of this pay item work; additional inspection and cleaning.

Method of Measurement. This item shall be measured as each for additional inspections and cleanings performed.

Basis of Payment. This work shall be paid for at the contract unit price each for RAMP METERING INSPECTION AND CLEANING which price shall be payment in full for all labor and materials necessary to complete the work as described herein.

SS01

SIGNALING LOAD RELAY, MECHANICAL

Description. This item shall consist of furnishing and installing a signal load relay, mechanical state, in a surveillance cabinet.

The load relay shall be able to switch 20 amperes for industrial use in multiple configuration and 30 amperes in multi-pole configuration at 120 VAC or 240 VAC, in a dust covered Jones plug. Relay shall be double pole, double throw.

The load relay shall have a mechanical life in excess of 100,000 operations at rated load, meet or exceed NEMA Standard TS 2-2003 and shall be Reno Flash transfer relay TR-200 or equal, a Signal Load Relay-Mechanical type mated with Cinch series 2400 socket.

The ramp metering cabinet shall have a signal load relay installed. The signal load relay shall consist of two components, a base which is mounted on the E.S.P. Type 3 cabinet wall and a signal load relay which plugs into and is secured to the base by a locking screw. The coil of this relay shall be connected to the mark output of the signal change tone receiver. The one set of contacts of the load relay shall be used to change the ramp signals and one set of contacts shall be used to key the mark input to the signal change transmitter.

Basis of Payment. This work shall be paid at the contract unit price each for SIGNALING LOAD RELAY, MECHANICAL, which price shall be payment in full for all work as described herein and as directed by the Engineer.

ST01 TELECOMMUNICATION CABLE INLINE CONNECTORS AND TERMINATION

Description. This item shall consist of furnishing and installing U1B inline connectors and U1Y bridging inline connectors in a junction box type "J" in the expressway median barrier wall as directed, in writing, by the Engineer.

Installation. There is an existing 100C-No. 19 telecommunication cable in the expressway median barrier wall. This cable is "spliced" in junction box type "J" at each surveillance installation and every 1500 feet in the barrier wall. In the junction box type "J" the Contractor shall remove the existing S66 telephone type terminal blocks and the Plate bracket. The Contractor shall reterminate the 100C-No. 19 cable the installation incoming 6C-No. 19 cable with Scotchlok Brand U1B inline, sealed, moisture resistant four wire (1 full pair) connector for solid copper (16-19 AWG) cable. The 100 C-No. 19 cable shall be joined bundle for bundle, cable pair or cable pair in the junction box type "J" with the U1B and U1Y connectors. A special crimping tool shall be required for installing the Scotchlok inline connectors. All cabling shall be tied and placed in the "J" box in a neat workmanlike manner. The Contractor shall clean the interior of the "J" box ensuring it is free of debris, water and any corrosion. The Contractor shall ensure that the shielding of both incoming cables is properly bonded together with 10 AWG wire and stainless-steel clamps. Contractor shall be responsible for the cost of any and all expressway lane and/or shoulder closures required to complete the work in the median barrier wall. Miscellaneous hardware shall not be paid separately but considered as incidental to the cost of this item.

Basis of Payment. This work shall be paid at the contract unit price each, TELECOMMUNICATION CABLE INLINE CONNECTORS AND TERMINATION, which payment will be paid in full for all the work described herein.

ST02 TELECOMMUNICATION CABLE – NO. 19/6 PAIR

Description. This item shall consist of furnishing and installing telephone cable intended for direct burial in P-duct or G.S. conduit. The number of conductors shall be twisted into pairs stranded into a cable core and enclosed in two polyethylene jackets, with a copper shield between the inner and outer jackets.

All No. 19 electric cable shall conform with these specifications and the current addition of the Rural Electrification Specification for fully color-coded, polyethylene or crystalline propylene/ethylene copolymer-insulated, double polyethylene copolymer-insulated, double polyethylene-jacketed telephone cables for direct burial PE 39. The No. 19 cables shall be installed in complete spans.

Material and Testing. No. 19 electric cable shall meet the requirement set forth in the REA Specification PE 39.

Conductors. Each conductor shall be a solid round wire of commercially pure annealed copper. Conductors shall meet the requirements of ASTM Designation B-3, latest issue, except that the requirements for dimensions and permissible variations are waived.

Conductor Insulation. Each conductor shall be insulated with colored insulating grade high density polyethylene or crystalline propylene/ethylene copolymer. The manufacturer shall have the option of using either of the above materials.

Identification of Pairs. The polyethylene or propylene copolymer compounds used for conductor insulation shall be colored so as to identify (1) the "tip" and "ring" conductor of each pair, and (2) each pair in the completed cable.

Standards of Color. The colors of insulated conductors supplied in accordance with this specification shall fall within the limits of standards of color as defined by the Munsell Color Notations specified in paragraph 4.031.

Twisting of Pairs. The insulated conductors shall be twisted into pairs.

In order to provide sufficiently high crosstalk losses at voice and carrier frequencies, the pair twists shall be designed to enable the cable to meet the pair-to-pair capacitance unbalance requirements and the crosstalk requirements.

Core Covering. The core shall consist of an inner jacket of polyethylene applied over the completed core, a metal shield, and an outer jacket of polyethylene.

Shield. A gopher-resistant corrugated shield of fully annealed copper shall be applied longitudinally over the inner jacket. The shield shall completely cover the inner jacket and shall be so constructed that the completed cable shall meet the bending requirements given in paragraph 9 of Rural Electrification Specification PE-54. The shield shall provide 100% electrical shielding plus resistance to gopher attack or other severe service conditions.

Mutual Capacitance. The average mutual capacitance of all pairs in any reel shall be in accordance with the following table:

Number of <u>Cable Pairs</u>	Average Mutual Capacitance <u>mf/mile (mf/km)</u>
3	0.083 plus or minus 0.010 (0.052 plus or minus 0.006)
6, 12	0.083 plus or minus 0.007 (0.052 plus or minus 0.004)
18 or more	0.083 plus or minus 0.004 (0.052 plus or minus 0.002)

Mutual capacitance is the effective capacitance between the two wires of a pair.

Capacitance Unbalance: (Pair to Pair): Pair-to-pair capacitance unbalances as measured on the completed cable at a frequency of 1000 plus or minus 100 Hz shall not exceed the following values:

<u>Pair-to-Pair Capacitance Unbalance (Max)</u>	<u>Number of</u>	<u>mmf/kf (mmf/km)</u>
<u>Cable Pairs</u>	<u>Max. Individual</u>	
Less than 12	100 (181.1)	

Capacitance Unbalance - (Crosstalk Loss): The r.m.s. output-to-output far-end crosstalk loss as measured on the completed cable at a frequency of 150 kHz shall be not less than 73 db per 1,000 feet (67.8 db per kilometer) for cable sizes of 6 pairs and larger. The r.m.s. calculation shall be based on the combined total of all adjacent and alternate pair combinations within the same layer and center to first layer pair combinations.

Capacitance Unbalance - (Pair to Shield): Pair-to-shield direct capacitance unbalances as measured on the completed cable at a frequency of 1000 plus or minus 100 Hz shall not exceed the following values:

<u>Number of</u>	<u>Pair-to-Shield Capacitance Unbalance (Max)</u>
<u>Cable Pairs</u>	<u>mmf/kf (mmf/km)</u>
<u>Max. Individual</u>	
Less than 12	250 (820)

Conductor Resistance. The DC. resistance of any conductor as measured on the completed cable shall not exceed the following values when measured at or corrected to 20° C.

Maximum Resistance

<u>AWG</u>	<u>ohms/kf (ohms/km)</u>
19	8.7 (28.5)

Basis of Payment. This work will be paid for at the contract price per lineal foot for TELECOMMUNICATION CABLE - NO. 19/6 PAIR of the number of conductors specified, which price or prices shall be payment in full for furnishing all materials, making all electrical connection, and installing the cable in place.

**SUPS
 UPS SYSTEM, INSPECTION**

Description. The Contractor shall furnish a factory sales and service company to complete an annual comprehensive UPS inspection as specified herein at the Traffic Systems Center.

Location. This work shall apply to the monitoring UPS system located at 445 W. Harrison St., Oak Park, IL 60304

Work Description. Eaton Power Ware Model #9390-100 Serial # EC515CBB07 with 80 batteries. The inspection shall consist of but not be limited to the following items, which are described below:

1. Initial checks - System energized and carrying a customer's load.
 - Verify initial, as found, voltage and current on the following:
 - Rectifier input
 - Rectifier output
 - Inverter output
 - Alternate line

2. System in bypass and de-energized - Customer's load on alternate line. Verify the following:
 - Bolted, screw and crimp connections for tightness
 - Relays, seated properly
 - Wiring, for electrical and physical damage
 - Capacitors, for bulging and/or leaking
 - Proper alignment of all sliding P.C. Boards
 - Plugs, for proper electrical and physical connection
 - P.C. Boards, for over-temperaturing
 - Vacuum system (if vacuum available)

3. System in bypass and energized - Customer's load on alternate line. Verify the following:
 - a) All alarms and indicators for proper function and operation
 - b) Measure and adjust all critical logic settings
 - c) Battery Plant:
 - measure Volts per cell
 - visual inspection for leaks or bad cells
 - spot check for connection torques
 - visual inspection of interior and intercell connections

Conduct short term (2 Minute) discharge test using the inverter as the load to evaluate battery condition.
(Only with customer prior approval)

4. Final Checks - System energized and carrying customer's load.
Verify final voltage and current on the following:
 - Rectifier input
 - Rectifier output
 - Inverter output
 - Alternate line

5. Report - The service engineer shall provide a detail service report to the Engineer along with any service recommendations for additional service which they believe may be required but not covered under their service agreement.

Method of Measurement. Each inspection that is completed shall be recorded on vendor furnished forms, with all its corresponding deficiencies noted and the inspection report submitted to the Engineer. Any necessary repairs shall be paid on an as needed basis through vendor item.

Basis of Payment. This item shall be paid at the contract unit price each for the UPS SYSTEM, INSPECTION, which shall be payment in full for the work described above.

SVB1 BUDGETARY ALLOWANCE FOR RAMP GATES

Description. This item is to establish a budget account to allocate funds for materials and/or repairs for damage to Homeland Security Ramp Gates and other unexpected repairs to Surveillance equipment where costs cannot be accurately identifiable at the time of bidding. Many damaged equipment item replacements must be ordered and installed by specialty vendors since they are one-of-a-kind.

The total estimated amount of the annual expenses for services performed which will be paid under Article 9.0, is \$80,000 as indicated for Pay Item SVB1. For bidding purposes this amount shall be used.

SWD1 WIRELESS IN PAVEMENT DETECTOR

Description. This work shall consist of furnishing, installing, calibrating, and integration of a wireless in pavement detector into an existing Sensys Wireless Vehicle Detection system at the locations shown on the plans or as directed by the Engineer.

Materials. The wireless in pavement detector shall include the following elements and features:

Wireless In-Pavement Detector shall be a SENSYS Networks VSN240-F-2 Wireless Sensor including epoxy or equivalent as accepted by the Engineer:

- The Wireless Sensor shall transmit wireless vehicle detection and other output data to an Access Point Assembly or Repeater.
- The Wireless Sensor shall detect volume, occupancy and speed as shown in the plans and may be adjusted based on each deployment.
- The Wireless Sensor shall be designed for installation in pavement.
- The Wireless Sensor shall be battery powered with minimum battery life of 8 years.
- Firmware of the Wireless Sensor shall be capable of being upgraded through wireless connection
- The transmission range for a Wireless In-Pavement Detector shall meet the following requirements: Max. 150 feet with a minimum distance based on the mounting angle of the access point or repeater.
- The Wireless In-Pavement Detector shall be NEMA 6P rated.
- The Wireless In-Pavement Detector shall operate within a temperature range of -40 o C to +85 o C (ambient).
- The sensor shall have the ability to provide and record pavement temperatures.

CONSTRUCTION REQUIREMENTS

- Pre-Procurement Documentation and Pre-Installation Approvals. Contractor shall submit catalog cut sheets for all system materials to the Engineer within 30 days of the date of the Notice to Proceed. The Contractor must obtain approval of the catalog cut sheets from the prior to purchasing the Wireless Vehicle Detection System and performing any installation accordingly.
- Design locations of each sensor system component including Wireless in-pavement vehicle detectors, access points and repeater locations shall be field verified and recommended for construction by the contractor in the submittal described below:

- The Contractor is responsible for the choice of communication channels for programming each wireless device.
- Installation. Each sensor shall be first upgraded to the latest firmware version, then configured in the field by the Contractor using SENSYS TrafficDOT software and its installation parameters documented on the installation record form attached.
- Notify Engineer in writing a minimum of two weeks prior to installation.
- The Contractor shall install sensor units in the pavement at locations shown in the plans following manufacturer recommended procedures for installation. The sensor units shall not extend above the top of pavement. Final in-pavement sensor location shall be approved by the Engineer prior to installation.
- The Contractor shall coordinate with the IDOT TSC Electrical Engineer to ensure that the Wireless In-Pavement Vehicle Detector System can communicate back to the OAK Park TSC to the SENSYS System Manager server.

Local Field Test Requirements

- Verify presence and quality of Wireless In-Pavement Vehicle Detector System device data through visual checks to verify volume, occupancy, speed, and classifications as determined by the required functionality. Use a local laptop running Trafficdot software to verify that the AP is receiving vehicle detection data from each sensor.
- Configure each AP and sensor to achieve the accuracy specified below: A LIDAR gun shall be used to verify actual vehicle speed in each lane. A minimum sample of 50 cars shall be recorded on a data sheet along with the queue detection data as read from the System Manager server report. Counting error shall be no more than 5.0 percent. Speed error shall be no more than 5.0 percent.

Final System Acceptance

- All "record" documents shall be submitted to the Engineer at the time of Final Acceptance and include an electronic computer file including a sketch of each Wireless In-Pavement Detector, Wireless Detector Access Point Assembly, and Wireless Repeater; listing each device's location, identification number, wireless channel information and GPS coordinates. The Contractor shall provide a copy of the operation and maintenance manuals for the wireless in pavement detection system

Warranty

- All equipment shall be warranted and guaranteed against defects and/or failure in design, materials, and workmanship. The Contractor shall submit the warranty terms as part of the shop drawing submittal for each material item.
- System components shall be warranted against all defects and/or failure in design, materials, and workmanship for a minimum of five (5) years from the date of Final Acceptance, as recorded by the Engineer.

- The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be repaired or replaced with a new component by the manufacturer or representative within five (5) working days.
- Any component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty will be judged as unsuitable and shall be replaced by the manufacturer or representative with a new component of the same type at no additional cost. The unsuitable component shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards.
- Any repairs made by a manufacturer or representative shall be documented and that documentation shall be returned with the warranty repaired units. This documentation shall include an explanation of the exact repairs made and identification of parts replaced by part number and circuit number.
- The warranty period shall not begin until the date that the Engineer issues final acceptance to the project, as recorded by the Engineer.

Method of Measurement. Wireless in Pavement Detector will be measured per each component completed in place, accepted and operating.

Basis of Payment. This item shall be paid for at the contract unit price each for WIRELESS IN PAVEMENT DETECTOR, which prices shall be payment in full for the work described herein including all labor, patch cords, and any other materials necessary for the successful installation and testing as stated herein.

SWD2

WIRELESS VEHICLE DETECTION SOLAR REPEATER

Description. This work shall consist of furnishing, installing, configuring, and testing a Wireless Vehicle Detection Solar Repeater at the location identified in the Plans or as directed by the Engineer. All work will require close coordination with the IDOT TSC Electrical Engineer and the Engineer. This includes a pre-installation meeting with the IDOT TSC Electrical Engineer and Engineer.

Materials. The Wireless Vehicle Detection Solar Repeater shall include the following elements and features:

Wireless Repeater shall be a SENSYS Networks FLEX-RPT3-SLR FlexRepeat3 Solar Repeater, antennas, and mounting kit model # KIT-MTG or equivalent as accepted by the Engineer:

The Wireless Repeater shall be a relay of radio communications.

- To/From wireless sensors (downlink)
- To/From access point (uplink)
- To/From another repeater (uplink or downlink)

The Wireless Repeater shall be capable of tandem operation to sensors and to another access point or another repeater.

Maximum single hop range of approx. 2000 feet from supported access point or repeater with a long-range external antenna.

Maximum single hop range of approx. 300 feet from supported sensors with long range external antenna.

The Repeater shall have an operating temperature range -40 o C to +80 o C.

The Repeater shall be powered by 2 Solar Panels (0.33 W each), a 3.6V, 2.2Ah rechargeable Lithium ion battery, and a 57AH Li-SOCL₂ 3.6V backup battery

Method of Measurement: Wireless Vehicle Detection Solar Repeater shall be measured per each component completed in place, accepted, and operating.

Basis of Payment: This item shall be paid for at the contract unit price each for WIRELESS VEHICLE DETECTION SOLAR REPEATER, which prices shall be payment in full for the work described herein including all labor, antennas, mounting, and any other misc. materials necessary for the successful installation and testing as stated herein.

SWD3 WIRELESS VEHICLE DETECTION SYSTEM

Description. This work shall consist of furnishing, installing, configuring, and testing a Wireless Vehicle Detection System at the location identified in the Plans or as directed by the Engineer. All work will require close coordination with the IDOT TSC Engineer. This includes a pre-installation meeting with the IDOT TSC Engineer.

Wireless In-Pavement Detectors, Layer 2 switches, media converters, and or cellular modems and service shall not be included as part of this pay item but supplied separately.

Materials. The Wireless Vehicle Detection System shall include the following elements and features:

Wireless In-Pavement Detector shall be a SENSYS Networks VSN240-F-2 Wireless Sensor including epoxy or equivalent as accepted by the Engineer. The Wireless In-Pavement Sensor shall be paid for through pay item SWD1:

- The Wireless Sensor shall transmit wireless vehicle detection and other output data to an Access Point Assembly or Repeater.
- The Wireless Sensor shall detect volume, occupancy and speed as shown in the plans and may be adjusted based on each deployment.
- The Wireless Sensor shall be designed for installation in pavement.
- The Wireless Sensor shall be battery powered with minimum battery life of 8 years.
- Firmware of the Wireless Sensor shall be capable of being upgraded through wireless connection

The transmission range for a Wireless In-Pavement Detector shall meet the following requirements:

- Height of Access Point or Repeater: Minimum 20 feet above pavement elevation
- Distance Range to Detector: Maximum 150 feet with a minimum distance based on the mounting angle of the access point or repeater
- The Wireless In-Pavement Detector shall be NEMA 6P rated.
- The Wireless In-Pavement Detector shall operate within a temperature range of -40 o C to +85 o C (ambient).

- The sensor shall have the ability to provide and record pavement temperatures. Wireless Detector Access Point Assembly shall be a SENSYS Networks FLEX Control-M-E, or equivalent as accepted by the Engineer, including a mounting kit model KIT-MTG, surge protection device, FLEX APCC-ACC-1 Isolator, APCC-SPR Radio, and FLEX Control ACC-3 Power Supply.
- The Access Point Assembly shall receive wireless output from in-pavement detectors or Repeaters.
- The Access Point Assembly will utilize secure cellular communications or Ethernet communications over the IDOT fiber optic Network.
- The Access Point Assembly shall operate within the temperature range -40 o C to +80 o C (ambient).

- The Access Point Assembly shall be designed for rail mounting in the equipment cabinet specified herein as directed by the Engineer.
- The Access Point Assembly shall be powered by a single manufacturer approved 28V DC power supply.
- All required cabling and cabinet wiring needed from the FLEX Controller to the wireless modem shall be incidental to this item.

- Access Point Assembly Equipment Cabinet shall be a NEMA 4X equipment cabinet with 2 DIN rails for mounting the Access Point Assembly and the CDMA modem for cellular communications or layer 2 switch/ fiber optic media converter for communications over the IDOT fiber optic network.

- The cabinet shall be of nominal 20"x16"x10" dimensions, Hoffman Enclosures Model A20H1610SS6LP, Electromate Enclosures Model E-20H1610SSLP, or approved equal.
- The cabinet shall have a 120V, 1-pole, 20 amp circuit breaker and two (2) duplex outlets.
- The cabinet shall also be equipped with a surge protection unit between the circuit breaker and the duplex outlets. The surge protection device shall be an Edco SHA 1250/SHA1250-BASE-A 120VAC single phase modular filter (with base) or approved equal.

The cabinet shall be mounted to a proposed wood pole, aluminum light pole or as directed by the Engineer.

Layer 2 switch/media converter shall be as per pay item SE03 or SE04 and paid for separately.

The Wireless Cellular Modem (CDMA) shall be a Sierra Wireless MC7354 (Airlink Raven RV50) or equivalent, with an AC/DC power supply and will be mounted to the DIN rail in the equipment cabinet. The cellular provider shall be Verizon. Cellular modem and service shall be provided by the Department.

Wireless Repeater shall be a SENSYS Networks RP240-BH-LL-2 Solar Repeater and mounting kit model # KIT-MTG or equivalent as accepted by the Engineer:

- The Wireless Repeater shall be capable of transmitting data up to 1,000 feet from the Wireless In-Pavement Detector to another Wireless repeater or Wireless Detector Access Point Assembly as identified in the manufacturer's specifications.
- The Repeater shall have an operating temperature range -40 o C to +80 o C.
- The Repeater shall be powered by a Long-life 171Ah battery pack

The proposed equipment shall be integrated in to one of two existing Sensys Systems Manager Servers residing at the Traffic Systems Center in Oak Park. Contractor is responsible for the setup and integration as directed by the TSC Electrical Engineer and Engineer.

The proposed equipment shall be integrated into the existing INET ATMS. Each locations shall report Volume, Occupancy, and speed for all integrated locations.

CONSTRUCTION REQUIREMENTS

Design locations of each sensor system component including Wireless in-pavement vehicle detectors, access points and repeater locations shall be field verified and recommended for construction by the contractor in the submittal described below:

The Contractor is responsible for the choice of communication channels for programming each wireless device.

Installation. Each device (AP, repeater and sensor) shall be first upgraded to the latest firmware version, then configured in the field by the contractor using SENSYS TrafficDOT software and its installation parameters documented on the installation record form attached.

The Contractor shall request IP addresses for Access Points from the IDOT TSC Electrical Engineer in writing a minimum of two weeks prior to installation.

The Contractor shall install sensor units in the pavement at locations shown in the plans following manufacturer recommended procedures for installation. The sensor units shall not extend above the top of pavement. Final in-pavement sensor location shall be approved by the Engineer prior to installation.

The Contractor shall mount the Wireless Access Point Assembly and the Wireless Repeater units to the structures indicated on the plans or other nearby locations as directed by the Engineer and as recommended by the manufacturer, using manufacturer approved brackets and/or bandings or mountings.

The Contractor shall configure appropriate RF channels and aim all repeaters and access points to provide a greater than -79dBm signal strength and greater than 92 LQI on all wireless RF path segments unless approved by the Engineer.

The Contractor shall coordinate with the IDOT TSC Electrical Engineer to ensure that the Wireless In-Pavement Vehicle Detector System can communicate back to the OAK Park TSC to the SENSYS System Manager server.

Acceptance Testing. The Contractor shall submit a detailed system acceptance test plan to the Engineer within 60 days following the Notice to Proceed for review and approval.

The Contractor acceptance test plan shall at a minimum consider the following:

- Local Field Test
- Subsystem Test
- 30-Day "Burn-in" Period
- Separate Checklists at each testing stage

The Contractor test plans shall test all areas of system functionality described herein and be in accordance with the various equipment manufacturer recommendations. The Contractor shall provide copies of all test results to the Engineer in a format to be determined by the IDOT TSC Electrical Engineer and Engineer.

Local Field Test Requirements. The Contractor shall perform Local Field Tests at each Wireless In-Pavement Vehicle Detector System field site in the presence of the IDOT TSC Electrical Engineer and the Engineer in accordance with the test procedures detailed herein, within the plan set, in the Contract, and as recommended by the various equipment manufacturers. This requirement is meant to confirm that all Wireless In-Pavement Vehicle Detector System site equipment has been installed, connected, and configured properly. The Contractor shall verify that physical construction has been completed as detailed herein, and the plans:

- Inspect the quality and tightness of ground connections;
- Check all power supply voltages and outputs;
- Connect devices to the power sources;
- Verify installation of specified cables, connections and wireless links between the
- Wireless In-Pavement Vehicle Detector System devices and the IDOT communications system
- Verify presence and quality of Wireless In-Pavement Vehicle Detector System device data through visual checks to verify volume, occupancy, speed, and classifications as determined by the required functionality. Use a local laptop running trafficdot software to verify that the AP is receiving vehicle detection data from each sensor.
- Connect the Access Point Cat 5e cable into the communication network's assigned switch port.
- Configure the System Manager to recognize and accept data from the AP.
- Configure each AP and sensor to achieve the accuracy specified below: A LIDAR gun shall be used to verify actual vehicle speed in each lane. A minimum sample of 50 cars shall be recorded on a data sheet along with the queue detection data as read from the System Manager server report. Counting error shall be no more than 5.0 percent. Speed error shall be no more than 5.0 percent.

Subsystem Test Requirements. Following the Local Field Test, the Contractor shall conduct a Subsystem Test in the presence of the Engineer. This requirement is meant to ensure that all data collected by the Wireless In-Pavement Vehicle Detector System stations are properly and accurately transmitted to the IDOT Oak Park TSC. The Subsystem Test shall be performed based on the Engineer approved Contractor testing schedule. The Contractor shall notify the Engineer in writing the scheduled date of the Subsystem Test 14 calendar days prior to the commencement of said test. The Subsystem Test shall not be performed without prior written approval from the Engineer.

The Subsystem Test shall be performed utilizing the installed Wireless In-Pavement Vehicle Detector System devices and ancillary components in conjunction with the wireless/wireline communications system.

The Contractor shall perform the Subsystem Test, which will involve personnel on-site at the Wireless In-Pavement Vehicle Detector System stations and at the IDOT Oak Park TSC to confirm that data collected by the Wireless In-Pavement Vehicle Detector System devices is being properly and accurately received by TIMS. During the Subsystem Test, the Contractor shall provide qualified personnel to support the diagnosing and repair of Wireless In-Pavement Vehicle Detector System devices and ancillary components. These personnel shall be available for this support within 24 hours of notification of the need for their services.

The APDIAG application shall be run by the Contractor once every 30 minutes over a 6 hour period and all available parameters shall be recorded on a test data sheet. The parameters include average RSSI, LQI, # of reboots (of each sensor), stuckHi, blips, and total counts by sensor, as well as average speed and deviation from average speed (if 3 sensors are installed in the lane). This speed data is to be compared with nearby RTMS data by the Contractor and any significant differences explained. The Subsystem Test Data Sheet and Test Report is to be delivered to the Engineer for approval prior to proceeding with the 30 day burn in test.

30-Day "Burn-in" Period Requirements. Following the Subsystem Test and before Final System Acceptance, the Contractor shall oversee a 30-Day Burn-in Period. This requirement is meant to demonstrate full monitoring capabilities of the Wireless In-Pavement Vehicle Detector System devices from the TIMS Center via the installed/existing communications channels as well as the functionalities of the Standalone Test, troubleshooting and diagnostics for a 30-day period. The 30-day Burn-In Period shall be conducted based on the Engineer and approved Contractor testing schedule. The Contractor shall notify the Engineer in writing the scheduled date of the 30-Day Burn-In Test 14 calendar days prior to the

commencement of said test. The 30-Day Burn-in Period shall not be performed without prior written approval from the Engineer.

The Contractor shall produce daily reports from the System Manager and explain any anomalies noted by the IDOT TSC Engineer.

The Contractor shall correct all failures during the 30-Day Burn-in Test at no additional cost. The system may be shut down for purposes of testing and correcting identified deficiencies. For each period of system shut down, the scheduled 30-day Subsystem Test shall be extended for the same period of time plus 1 day unless otherwise directed by the Engineer. Shutdown of equipment that has been integrated into the IDOT Oak Park TSC network must be coordinated ahead of time as it may affect TSC operations.

Final System Acceptance. Final acceptance of the work associated with this project will be made after satisfactory completion of the required 30-Day "Burn-in" Test period and on the basis of the final inspection of the entire system. The final inspection of the entire system will be performed by the Engineer in the presence of a representative of the Contractor.

All "record" documents shall be submitted to the Engineer at the time of Final Acceptance and include an electronic computer file including a sketch of each Wireless In-Pavement Detector, Wireless Detector Access Point Assembly, and Wireless Repeater; listing each device's location, identification number, wireless channel information and GPS coordinates. The Contractor shall provide a copy of the operation and maintenance manuals for the wireless in pavement detection system.

Notification of Final Acceptance will be in writing from the Engineer.

Warranty. All equipment shall be warranted and guaranteed against defects and/or failure in design, materials, and workmanship.

The Contractor shall submit the warranty terms as part of the shop drawing submittal for each material item.

System components shall be warranted against all defects and/or failure in design, materials and workmanship for a minimum of five (5) years from the date of Final Acceptance, as recorded by the Engineer.

The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be repaired or replaced with a new component by the manufacturer or representative within five (5) working days.

Any component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty will be judged as unsuitable and shall be replaced by the manufacturer or representative with a new component of the same type at no additional cost. The unsuitable component shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards.

Any repairs made by a manufacturer or representative shall be documented and that documentation shall be returned with the warranty repaired units. This documentation shall include an explanation of the exact repairs made and identification of parts replaced by part number and circuit number.

The warranty period shall not begin until the date that the Engineer issues final acceptance to the project, as recorded by the Engineer.

Method of Measurement. Wireless Vehicle Detection System will be measured per each component completed in place and accepted.

Basis of Payment. This item shall be paid for at the contract unit price each for WIRELESS VEHICLE DETECTION SYSTEM, which prices shall be payment in full for the work described herein including all labor, patch cords, and any other materials necessary for the successful installation, testing, and integration as stated herein.

**SWP1
SURVEILLANCE WATCH AND PROTECT**

Description. *The Contractor shall furnish manpower as directed by the Engineer to provide watch and protect services for contractors working on, around, or needing access to IDOT Surveillance System equipment ON-Maintenance or equipment OFF-Maintenance or new equipment under construction.*

The Contractor shall be responsible for monitoring construction contractor's excavation on or around and entering Department fiber optic facilities and to help prevent damage from being done to critical Department equipment.

The Contractor shall be responsible for providing access to Surveillance System Department communication shelters, huts, or remote buildings for work being done by others as part of other IDOT construction contracts, overlapping ISTHA contracts that involve work on IDOT ROW, or IDOT Permit work.

The Contractor shall monitor work being done by others to help prevent damage or interruption of services to critical IDOT critical fiber/network equipment.

This work does not include scheduled Ticket Service Requests by Department personnel to provide access to IDOT Pump Stations.

Method of Measurement. *The work shall be measured per hour for each instance Watch and Protect is provided for the Surveillance System.*

Basis of Payment. *This work will be paid for at the contract unit price per hour for Watch and Protect, which will be payment in full for manpower requested or scheduled by the Department and provided by the Contractor.*

Revised 9/2/2021

TRAFFIC SIGNAL SYSTEM NON-ROUTINE PAY ITEMS

All Traffic Signal System Non-Routine pay items shall conform with the current Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions, and the District 1 Standard Traffic Signal Design Details except as revised herein.

All equipment removed under Traffic Signal System Non-Routine pay items shall be salvaged or disposed in accordant with Article 4.20 at the direction of the Engineer. All costs associated with salvaging or disposing shall be included in the cost of the respective pay item.

All traffic control for Traffic Signal System Non-Routine pay items shall be in accordance with Article 701 of the Standard Specifications for Road and Bridge Construction and the Traffic Control Plans submitted under Article 4.25.2. All costs associated with Traffic Control required for the performance of the work associated with the respective Traffic Signal System Non-Routine pay items shall be included in the cost of the respective pay item.

TC01–TC02 FULL ACTUATED CONTROLLER IN CABINET

Description. All equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. At the time this item is authorized, the Traffic Signal Engineer may indicate what brand of equipment is to be supplied for that authorization. Installation of controller and cabinet, including all testing and documentation, shall be included in this item. The Contractor shall provide five (5) hard copies (11 inch x 17 inch) of the cabinet wiring diagrams and in PDF format on electronic media as approved by the Signal Engineer for the new cabinet location. Cable logs must be furnished indicating the number of each cable, the field termination point, and all cables must be tagged with an I.D. number corresponding with the cable log. Existing items such as vehicle detection, emergency vehicle pre-emption, illuminated sign control, roadway lighting control, UPS/Battery Back-up System, PTZ camera equipment, TSP/BRT and other devices may be designated by the Engineer as to be relocated to the new controller and cabinet and is considered included in this item. Removal and delivery of any existing controller, cabinet, and all other related equipment in the cabinet not being reused is considered included in this item. The Contractor shall deliver the removed equipment to the Contract Spare Parts storage location per the requirements within the contract. The salvage and/or disposal of equipment shall be at the discretion of the Engineer.

Installation of the controller and testing shall be included in this item. When installing the new controller into an existing system, the new controller shall contain all necessary telemetry modules, modems, circuit panels and wiring harnesses. All items necessary to enable the controller to communicate/operate within an existing closed loop system shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for FULL ACTUATED CONTROLLER IN CABINET of the type specified as described above, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC01 Full Actuated Controller in Type IV Cabinet

TC02 Full Actuated Controller in Type V Cabinet

TC03 FULL ACTUATED CONTROLLER IN CABINET WITH RR EQUIPMENT

Description. The controller and cabinet furnished is to be installed at an intersection which is interconnected with a railroad gate controller cabinet. Equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. At the time this item is authorized, the Traffic Signal Engineer may indicate what brand of equipment is to be supplied for that authorization. At all railroad locations which are not part of a closed loop system (stand alone), the controller and cabinet shall meet the following: The controller cabinet shall contain a 56 kbps auto dial/auto answer modem or Cellular Communication System as specified by the Traffic Signal Engineer. All equipment required for dial-in/dial-out capabilities or Cellular Communications System shall be included in the item. The cabinet shall be provided with an outdoor network interface for the termination of the telephone service. It shall be mounted to the inside of the cabinet suitable to provide access for the termination of the telephone service and shall be equipped with a standard three electrode heavy duty gas tube surge arrester. Installation of controller and cabinet, including all testing and documentation, shall be included in this item. The Contractor shall provide five (5) hard copies (11 inch x 17 inch) of the cabinet wiring diagrams and in PDF format on electronic media as approved by the Signal Engineer for the new cabinet location. Cable logs must be furnished indicating the number of each cable, the field termination point, and all cables must be tagged with an I.D. number corresponding with the cable log. Existing items such as vehicle detection, emergency vehicle pre-emption, illuminated sign control, roadway lighting control, UPS/Battery Back-up System, PTZ camera equipment, TSP/BRT and other devices may be designated by the Engineer as to be relocated to the new controller and cabinet and is considered included in this item. Removal of any existing controller, cabinet, and all other related equipment in the cabinet is considered included in this item. The Contractor shall deliver the removed equipment to the Contract Spare Parts storage location per the requirements within the contract. The salvage and/or disposal of equipment shall be at the discretion of the Engineer.

Installation of the controller and testing shall be included in this item. When installing the new controller into an existing system, the new controller shall contain all necessary telemetry modules, modems, circuit panels and wiring harnesses. All items necessary to enable the controller to communicate/operate within an existing closed loop system shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for FULL ACTUATED CONTROLLER, IN TYPE IV or TYPE V CABINET WITH RAILROAD EQUIPMENT as described above, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC04 FULL ACTUATED CONTROLLER

Description. Equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. At the time this item is authorized, the Traffic Signal Engineer may indicate what brand of equipment is to be supplied for that authorization. Removal of the existing controller and related items, if required, shall be considered included in this item. The Contractor shall deliver the existing equipment to the Contract Spare Parts storage location per the requirements within the contract. The salvage and/or disposal of equipment shall be at the discretion of the Engineer.

Installation of the controller and testing shall be included in this item. When installing the new controller into an existing system, the new controller shall contain all necessary telemetry modules, modems, circuit panels

and wiring harnesses. All items necessary to enable the controller to communicate/operate within an existing closed loop system shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for FULL ACTUATED CONTROLLER as described above, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC05–TC06 INSTALL TRAFFIC SIGNAL CONTROLLER OR CONTROLLER AND CABINET FROM CONTRACT SPARE PARTS

Description. The replacement and/or addition of controller harnesses, conflict monitor harnesses detector harnesses, all necessary telemetry modules, modems, circuit panels and any items necessary to enable the controller to communicate/operate within an existing closed loop system as required to install the Contract Spare Parts controller and/or cabinet at a location directed by the Traffic Signal Engineer shall be included in this pay item. The current controller software at time of field installation shall be included in this item. The cabinet shall be the type designated on the plans. The Contractor shall provide five (5) hard copies (11 inch x 17 inch) of the cabinet wiring diagrams and in PDF format on electronic media as approved by the Signal Engineer for the new cabinet location. Cable logs must be furnished indicating the number of each cable, the field termination point, and all cables must be tagged with an I.D. number corresponding with the cable log. As included in this item, the Contractor shall transport the Contract Spare Parts equipment to the intersection and remove and transport the existing equipment to the Contractor's location for Contract Spare Parts storage. The salvage and/or disposal of equipment shall be at the discretion of the Engineer.

Existing items such as vehicle detection, emergency vehicle pre-emption, illuminated sign control, roadway lighting control, UPS/Battery Back-up System, PTZ camera equipment, TSP/BRT and other devices may be designated by the Engineer as to be relocated to the Contract Spare Parts controller and cabinet and is considered included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for INSTALL TRAFFIC SIGNAL CONTROLLER, OR CONTROLLER AND CABINET FROM CONTRACT SPARE PARTS as described above, which price shall be payment in full for all described herein and includes furnishing, installing, delivery, handling and appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC05 INSTALL EXISTING TRAFFIC SIGNAL CONTROLLER

TC06 INSTALL EXISTING TRAFFIC SIGNAL CONTROLLER AND CABINET

TC07 CONTROLLER AND CABINET MODIFICATION

Description. This work shall consist of controller and/or cabinet modifications as directed by the Engineer to provide additional phasing, phase overlaps, pedestrian movements or any cabinet and/or controller modifications to an existing traffic signal not included under the provisions of another pay item. This work to include but not limited to installing load switches, cabinet wiring, cabinet appurtenances, UPS wiring, reprogramming the controller per plans or as directed by the Engineer. All revisions to the existing documentation or providing new documentation including but not limited to the cabinet box print and cable log

shall be included. Minor revisions can be marked on the existing documentation or complete new documentation provided at the discretion of the Engineer.

Basis of Payment. This work shall be paid for at the contract unit price each to provide CONTROLLER AND CABINET MODIFICATION as described above, which price shall be payment in full for all work as described herein and includes furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC08 TRAFFIC SIGNAL MASTER CONTROLLER

Description. Equipment shall be NEMA TS 2 Type 1 unless otherwise approved by the Engineer. The master controller may be installed in an existing controller cabinet replacing an existing master controller of the same, or different, manufacturer or at a new location. In all cases the Contractor shall furnish all necessary harnesses, relays, modems, transceivers, and telephone jack to place the proposed traffic signal master controller in operation. Locations where the master controller is installed within an existing system without the local traffic signal controllers being replaced, it shall be of the same manufacturer as the local controllers. The closed loop systems presently in use are manufactured by Siemens/Eagle Signal and Econolite Corporation. At the time this item is authorized, the Traffic Signal Engineer will indicate which manufacturer's equipment is to be supplied for that authorization. At the completion of installing the proposed master controller the Contractor shall, if applicable, remove the existing master controller, harnesses, relays, modems, and transceivers that are not used and deliver them to the Contract Spare Parts storage location per the requirements within the contract. A telephone line and modem for proper communication if not pre-existing shall be paid for separately under the item "Install Telephone Line and Modem". The salvage and/or disposal of equipment shall be at the discretion of the Engineer.

Basis of Payment. This work shall be paid at the contract unit price each for TRAFFIC SIGNAL MASTER CONTROLLER as described above, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC09 INSTALL TELEPHONE LINE AND MODEM

Description. This work shall consist of providing a phone line to a traffic signal controller cabinet to provide working remote monitoring capabilities by the IDOT Traffic Signal Engineer in the Schaumburg office. The phone line shall be capable of providing regular or ISDN communication as required by the Engineer. The contractor shall provide an approved phone company junction box inside the controller cabinet, a 56K band modem as recommended by the equipment supplier, and all wiring necessary to the master controller or controller to provide proper communications. Cable and conduit from the telephone service connection to the cabinet phone junction box will be paid for separately.

The contractor shall accomplish this work in the following process utilizing District 1 staff:
As soon as practical or within one week after authorization, the Contractor shall contact IDOT's Administrative Support Manager in the District One Business Services Section at (847) 705-4011 to request a phone line installation. A follow-up contact shall include all required information pertaining to the phone installation and should be made as soon as possible or within one week after the initial request has been made. A copy of this contact must be emailed by the Contractor to the Traffic Signal Engineer. The required

information to be supplied shall include (but not be limited to): an E911 address for the new traffic signal controller (or nearby address); a nearby existing telephone number; what type of telephone service is needed; the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line will vary after the Business Services Section has received the Contractor's information and will depend on location and existing available facilities. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor as soon as possible. The contractor shall provide the Administrative Support Manager with an expected installation date.

The telephone line shall be installed and activated one month before the system final inspection.

All costs associated with the telephone line installation and activation (not including the Contract specified conduit installation between the point of telephone service and the traffic signal controller cabinet) shall be paid for by the District One Business Services Section (i.e., this will be an IDOT phone number not a Contractor phone number).

Basis of Payment. This work shall be paid for at the contract unit price each and to install a working INSTALL TELEPHONE LINE AND MODEM as described above, which price shall be paid in full for all work as described herein and directed/approved by the Traffic Signal Engineer.

TC10 INSTALL UPDATED SOFTWARE OR PROM SET AT EXISTING LOCAL OR MASTER CONTROLLER

Description. This item shall consist of installing the latest version of software, PROM or PROM Set in an existing traffic signal local or master controller. At locations that contain coordination modules, all PROMS in the controller module, telemetry module, and coordination module must be of the same version and revision. New system interface board shall be included in this item. Any modifications required for the completion of this work shall be included in the cost of this item.

Basis of Payment. This work shall be paid at the contract unit price each for INSTALL UPDATED SOFTWARE OR PROM SET AT EXISTING LOCAL OR MASTER CONTROLLER, as described above, which price shall be paid in full for all work as described herein and includes furnishing, installing, testing, and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TC11 UPS SYSTEM

Description. This work shall consist of furnishing and installing an uninterruptible power supply (UPS) system as specified. Refer to the Traffic Signal Special provisions for exact requirements. A concrete apron, as indicated in the District One Standard Traffic Signal Design Details, including all excavation and restoration shall be included in the cost of this item. This specification sets forth the minimum requirements for a system that provides an uninterruptible power supply (UPS) for a signalized intersection.

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the UPS system components shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to install UPS SYSTEM as described above, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling, replacement of any incandescent EVP confirmation beacon with LED type and all appurtenances necessary for a complete and operational unit as indicated on the drawings and as directed/approved by the Traffic Signal Engineer.

TC12 RELOCATE OR INSTALL EXISTING UPS SYSTEM

Description. This item shall conform with Sections 801 and 895 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions except as revised herein. This item includes the relocation of an existing Uninterruptible Power Supply (UPS) system when not included as part of other pay item or work. This item shall include removing a UPS from one intersection, transporting it to another intersection and installing it at a new location or installing an existing UPS from Contract Spare Parts. Any modifications or adjustments to the existing UPS, including new batteries shall be included in this item for a complete operational UPS system.

All mounting hardware shall be new and shall be included in this pay item. Any modifications to mounting hardware shall be included in this item. A concrete apron, as indicated in the District One Standard Traffic Signal Design Details, including all excavation and restoration shall be included in the cost of this item, as applicable.

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the UPS system components shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to RELOCATE OR INSTALL EXISTING UPS SYSTEM, as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling, replacement of any incandescent EVP confirmation beacon with LED type and all appurtenances and mounting hardware necessary for a complete working unit as directed/approved by the Traffic Signal Engineer.

TC13 CELLULAR COMMUNICATION SYSTEM

Description. The work shall include but not be limited to installation, set-up, support and configuration of the cellular communication system to work with IDOT District One's network. Equipment shall include but limited to 1) a rugged cellular modem certified with Verizon Wireless designed with 2 ethernet ports and an RS232 port for connection the traffic signal controller, 2) an external low profile antenna mounted to the traffic signal cabinet, 3) a router with 2 ethernet ports with static IP address assigned by IDOT, 4) for those traffic signals with controllers that are not ethernet compatible, additional hardware and cabling will be needed, 5) all appurtenances necessary to provide cellular communication for the closed-loop system. IDOT District One has installed cellular communication equipment at various locations within the District. For questions regarding these locations, please contact the Traffic Signal Engineer at 847-705-4424. The necessary SIM card will be provided by the District once testing has been completed and accepted by IDOT.

Basis of Payment. This work shall be paid at the contract unit price each for CELLULAR COMMUNICATION SYSTEM as described above, which price shall be paid in full for all work as described herein and includes

furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as directed/approved by the Traffic Signal Engineer.

TD01 DRILL EXISTING HANDHOLE

Description. Refer to Section 879 of the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for DRILL EXISTING HANDHOLE as described above, which price shall be paid in full for all work as described herein and as directed/approved by the Traffic Signal Engineer.

TE01–TE05 AND TEC1–TEC2 ELECTRIC CABLE

Description. When a new cable is being installed to replace an existing cable, the removal of the existing cable shall be included in this item. This item shall be used for cable installed in a raceway, conduit or aerial suspended.

Basis of Payment. This work will be paid at the contract unit price per foot of ELECTRIC CABLE of the type, size, and number of conductors specified, which price shall be paid in full for all work as described herein and includes furnishing the material, making all electrical connections, and installing the cable complete and as directed/approved by the Traffic Signal Engineer.

The type specified will indicate whether it is shielded and the method of installation. For example: Electric Cable No. 14, 2/C Twisted, Shielded.

TE01 Electric Cable No. 14 2/C
TE02 Electric Cable No. 14 3/C
TE03 Electric Cable No. 14 5/C
TE04 Electric Cable No. 14 7/C
TE05 Electric Cable No. 14 2/C, Twisted Shielded

TEC1 Electric Cable in Conduit, Tracer No. 14 1/C
TEC2 Electric Cable No. 14, 3/C, Railroad

TF01–TF06 CONCRETE FOUNDATIONS

Description. This work shall consist of furnishing and installing a concrete foundation as specified. Refer to the Traffic Signal Special provisions and District One Standard Traffic Signal Design Details for exact requirements. All excavation and restoration shall be included in the cost of this item.

Basis of Payment. This work will be paid at the contract unit price per foot of depth for CONCRETE FOUNDATION of the type specified, which price shall be paid in full for all necessary excavating or drilling, backfilling, disposal of unsuitable material, form work, site restoration and furnishing all materials within the limits of the foundation including anchor bolts and as directed/approved by the Traffic Signal Engineer. If rock excavation is required it will be paid in accordance with Article 109.04 of the Standard Specifications.

TF01 Concrete Foundation, Type A
TF02 Concrete Foundation, Type D

- TF03 Concrete Foundation, Type C
- TF04 Concrete Foundation, Type E 30 inch Diameter
- TF05 Concrete Foundation, Type E 36 inch Diameter
- TF06 Concrete Foundation, Type E 42 inch Diameter

TF07 CONCRETE FOUNDATION, REBUILD/MODIFY, TYPE D

Description. This item shall consist of the partial removal of an existing Type "D" Foundation at the location on the plans or as directed by the Traffic Signal Engineer. The existing foundation shall be removed to a depth of at least 2-feet below finished grade. The disposal of the concrete debris outside of the right-of-way shall be included in this item. The existing conduit shall remain in place and shall be carefully protected. The new conduits from the double handhole shall be installed, if required, as shown on the plans.

Installation. Upon completion of the above work, holes for steel dowels of the size indicated shall be drilled in the remaining concrete where indicated on the drawings.

The adjacent area shall be excavated and formed with anchor bolts and new conduit stubs to provide a concrete foundation for a Type IV cabinet as per the current Highway Standard, "Concrete Foundation Details". The Contractor shall follow the recommendations of the manufacturer, subject to approval of the Engineer.

Provide a 36 inch x 48 inch x 5 inch P.C.C. apron sidewalk on the side of the access door to the controller to facilitate servicing the controller.

Anchor bolts shall be new and shall meet all the requirements of sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for CONCRETE FOUNDATION, REBUILD/MODIFY, TYPE D, which price shall be paid in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings and as directed/approved by the Traffic Signal Engineer. The removal and reinstallation of the existing cabinet shall be included in this pay item, as well as the pulling and reinstalling of the existing cable from conduit.

TFB1 FLASHING BEACON, POST MOUNT, 1 FACE

Description. This item shall conform with sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions, and the current Highway standard, "Details of Spanwire Mounted Signals and Flashing Beacon Installation" except as revised herein. This item shall consist of installing a post mounted 12-inch L.E.D. single section red or yellow flashing beacon on a new or existing post as shown on the plans or as directed by the Traffic Signal Engineer. This item shall include furnishing and installing a flasher controller in an aluminum cabinet, or integrated within the head, service installation (post mounted), 12-inch L.E.D. red or yellow signal section with a dimmer if required by the Traffic Signal Engineer, and all other equipment necessary to complete the installation.

This item shall include the relocation the removal of existing post and relocation of existing signs, as applicable.

Basis of Payment. This work shall be paid at the contract unit price each to install FLASHING BEACON, POST MOUNT, 1 FACE as described above, which price shall be paid in full for all work and materials as described herein and includes furnishing, installing, delivery, handling and all appurtenances necessary for a complete and operational unit as indicated on the drawings and as directed/approved by the Traffic Signal Engineer.

TFB2 FLASHING BEACON, SOLAR, POST MOUNT, 1 FACE

Description. This item shall conform with sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction and District One Traffic Signal Special Provisions. This item shall consist of furnishing and installing a 12-inch single red or yellow flashing module on a new or existing post as shown on the plans or as directed by the Traffic Signal Engineer. This item shall include furnishing and installing a flasher controller that is integrated within the signal head, with discrete solar panels, LED module, battery, electronics, compact housing and capable of operating 24 hours, 7 days a week.

The flasher unit shall be installed on a standard wood or metal post. The flash pattern shall be MUTCD compliant and have alternate flash patterns available. The LED module shall be ITE VTCSH-STD Part-2 compliant.

The flasher unit shall operate over a temperature range of -40° F to 176° F.

The battery shall have a life span of a minimum of 5 years and be field replaceable. The battery and electronics may be located inside the solar panel housing or signal head.

The sections of the flasher unit shall be secured with tamper resistant stainless-steel hardware and, unless otherwise noted, the housing shall be black in color.

This item shall include the relocation the removal of existing post and relocation of existing signs, as applicable.

Basis of Payment. This work shall be paid for at the contract unit price each for FLASHING BEACON, SOLAR, POST MOUNT, 1 FACE, of the color LED as described above, which price shall be paid in full for all work and materials as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete and operational unit as indicated on the drawings and as directed/approved by the Traffic Signal Engineer.

TGS1 ADDITIONAL GROUNDING AND ELECTRIC SERVICE UPGRADE

Description. The Contractor shall perform additional electric service and grounding upgrades as specified to the traffic signal locations as designated by the Engineer.

Work Description. The contractor is responsible for scheduling the work and for coordinating with the engineer whenever Engineer-witness functions are required. The contractors shall also advise the engineer

when each location is complete and shall provide a written certification to that effect. The Engineer reserves the right to require a final inspection of the modification at any or all of the locations certified as complete. Should deficiencies be found upon inspection, a corrective work list will be prepared.

The traffic signal installations being modified shall be kept operational at all times except as expressly allowed herein or otherwise permitted by the Engineer. The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost to the pay item. All cable, conduit, fittings and accessories shall be new. All materials and work shall be in conformance with the requirements of applicable contract specifications and article 250 of the National Electrical Code.

The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for reporting any account modifications arising from the work to the Engineer in a timely manner. Although it is anticipated that all service agreements and accounts will remain as-is, if new agreements are required, the Contractor shall facilitate coordination between the Electric Utility and the Engineer, with the Department to sign any appropriate new agreements. Only momentary outage of a traffic signal location undergoing modification will be allowed, and the contractor shall provide generator power or make temporary service connections as necessary to assure continuity of operations as modifications are made.

The work will generally include:

- Replacement of the electric service entrance equipment and cables
- New grounding of the service
- New feeder conductors from the service disconnect to the controller cabinet
- Cabinet grounding modifications
- Supplementary ground electrodes at handholes
- Extension of equipment ground wires to all poles, posts, handholes, etc.
- Bonding of equipment ground to all exposed metal parts
- Testing and documentation

Replace Electric Service Entrance

The work shall include the removal of the existing service disconnecting means and the service conductors and shall include the furnishing and installing a new pole-mounted service disconnecting means and new service conductors, based on the manner of the existing service. The new electric service disconnect, cables and the service connection shall be in accordance with details included herein, and Figure L-3A, as shown in Volume 1, Article 7, unless specified otherwise by the Engineer to meet special requirements of certain locations, pedestrian traffic, etc.

Provide New System Ground of Electric Service

The work shall include the installation of a new system ground, connected to the ground bar of the service disconnect, using one or more ground rod grounding electrodes, or other means approved by the Engineer. The system ground shall have a resistance to earth not to exceed 10 ohms without connection to the additional electrodes established at poles or other points at the traffic signal location. The system ground resistance shall be verified by a contractor test, using the fall-of potential method and witnessed and approved by the engineer, with a record of the test entered by the Contractor and signed by the Contractor and the Engineer. Should more than one electrode be required to establish a low enough resistance, additional electrodes shall be connected to the grid, with re-testing. All ground electrode connections shall be exothermically welded. Ground rods and grounding electrode conductors shall be as specified and detailed.

The service grounded circuit conductor (which may or may not be a system neutral) shall be bonded to the system ground at the service disconnect and shall be isolated from ground throughout the remainder of the electrical distribution.

Extend New Conductors to Controller

A new ground terminal bar shall be installed at the traffic signal control cabinet and this bar shall be bonded to the cabinet enclosure. The work shall include the replacement of the existing feeder and the extension of new feeder conductors from the service disconnect to the traffic signal control cabinet. The cable will be a multi-conductor jacketed cable as specified and it shall include a green-insulated ground wire to bond the service ground bar to the controller cabinet ground bar. The contractor shall confirm the integrity of the existing feeder conduit run, and shall clean the run before installing the new feeder. If the size of the conduit is demonstrated to be inadequate for the new feeder cable or if it is demonstrated as not re-usable for some other reason and no other alternative is feasible, the contractor shall use a new feeder conduit run, as part of this pay item, with all cable work remaining as the Contractor's responsibility at no additional cost to the pay item.

Cabinet Grounding Modifications

The contractor shall confirm the presence of a terminal bar, with suitable terminals, for the grounded circuit conductor (white wire) at the controller cabinet and shall assure isolation of this bar from the cabinet enclosure and other grounded parts. If the existing bar is inadequate or is not isolated properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items. Similarly, the contractor shall confirm the presence of a ground bar, with suitable terminals, which is bonded to the cabinet enclosure and grounded metal parts. If the existing ground bar is inadequate or is not bonded properly, the Contractor shall provide a new bar or otherwise correct the installation, removing any incorrect items, as included in this pay item.

Supplementary Ground Electrodes

A ground rod shall be driven at traffic signal handholes present at each corner of a location (but not within the roadway) except for handholes within 15 feet of the service ground electrode. The ground rods shall be as specified and all connections directly to the ground rods shall be exothermically welded.

Extension of Equipment Ground

The contractor shall extend an equipment ground conductor from the ground bar in the controller cabinet to distributed elements of the system, bonding the equipment ground conductor to all handhole frames, metal poles and other enclosures, metal conduit, etc., including any existing supplemental ground rods that may be in place. The Contractor shall assure that good equipment ground continuity and a low-impedance ground return path is established throughout for all exposed metal parts of the installation.

It is not the intent of this work item to require re-cabling of the traffic signal load equipment to achieve grounding. In all cases, a green-insulated ground conductor shall be used whenever possible, and only if conduit space will not accommodate an insulated conductor will a bare conductor be allowed. A common conductor may be employed for multiple load circuit cables in a given conduit, but an equipment ground conductor shall be run with or shall encircle each set of circuit conductors extended from the controller cabinet.

Recognizing the intent to leave existing conductors in place and operational, the contractor may choose from among identified and prioritized acceptable alternative to affect the grounding modifications:

If an existing conduit will accommodate the installation of a ground wire, the ground wire shall be installed within the conduit with the circuit conductors. Existing conductors should only be withdrawn from a conduit run to facilitate pulling of the ground wire if absolutely necessary.

If an existing metal conduit will not accommodate the required ground wire, and if the contractor can identify end-to-end electrical continuity of the conduit, the contractor may bond to the conduit externally in an approved manner to establish ground continuity, thus using the metal conduit as the equipment ground conductor.

If a given conduit run is demonstrated to be damaged and electrically discontinuous in the presence of the Engineer, and if no other alternative is feasible, the engineer will authorize a new conduit run, to be paid under separate pay item, with all cable installation to remain part of the grounding modification work at no additional cost to the pay item. When a new conduit is installed, an insulated ground conductor must be installed within, together with the circuit conductors, regardless of the ground continuity of the new conduit, and the new conduit shall be appropriately bonded to the equipment ground.

Bonding

The Contractor shall establish equipment ground bonding to the cover frame of every handhole with an approved connection. The contractor shall establish equipment ground bonding at every metal pole, post or other enclosure or device, also with an approved connecting. At poles or post bases, it may be possible to install washers, lugs, and extra nuts where extra anchor bolt protrusion allows it. Otherwise, poles may be drilled and tapped and fitted with appropriate ground lugs. Connections at poles and other enclosures shall be pigtailed from splices whenever more than one ground conductor is connected so that ground continuity is not dependent upon ground lug connection. Splices of ground conductors (in lieu of exothermic weld connectors) will be permitted at poles and other such connection point above grade, with splices to be made using suitable copper crimp sleeves and heat-shrink insulated caps as specified.

Testing and Documentation

As noted above, the system ground resistance to earth shall be tested, in isolation from equipment ground extensions from that point. Testing shall be performed by the contractor using the fall-of-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the farthest point of each circuit extension from the controller cabinet. Results shall be recorded by the contractor and witnessed by the Engineer.

Special Considerations

Temporary signal installations and other span-wire installations shall be included in the scope of service and grounding modifications. For span-wire installations, the messenger wire shall be employed as an equipment ground conductor and taps shall be made to this wire to extend an equipment ground connection to appropriate exposed metal parts. A service grounding electrode shall be established at the electric service disconnect and a ground rod shall be installed and connected at one pole per quadrant.

Method of Measurement. Each traffic signal grounding modification and electric service upgrade as performed as specified and inspection report submitted and approved by the Engineers shall be counted as unit for payment.

Basis of Payment. This item shall be paid at the contract unit price each for TRAFFIC SIGNAL ADDITIONAL GROUNDING AND ELECTRIC SERVICE UPGRADE, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling, testing, connections, bonding and all

appurtenances necessary for a completely grounded system as indicated on the drawings and as directed/approved by the Traffic Signal Engineer.

TGS2 ELECTRIC SERVICE RELOCATION

Description. This item shall conform with Section 805 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions and the District 1 Standard Traffic Signal Design Details, except as revised herein.

Work Description. The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for reporting any account modifications arising from the work to the Engineer in a timely manner. Although it is anticipated that all service agreements and accounts will remain as-is, if new agreements are required, the Contractor shall facilitate coordination between the Electric Utility and the Engineer, with the Department to sign any appropriate new agreements. Only momentary outage of a traffic signal location undergoing modification will be allowed, and the contractor shall provide generator power or make temporary service connections as necessary to assure continuity of operations as modifications are made.

The work will generally include relocation of the existing electric utility service and appurtenances; Coordination with the utility for the removal of utility owned wood poles; Removal/disposal of Department owned wood poles as directed by the Traffic Signal Engineer.

The work shall include the removal/disconnection of the existing service disconnecting means and the service conductors and shall include relocation and installation of existing equipment at a different location as directed by the Traffic Signal Engineer. Any modifications or adjustments to the existing electric service shall be included in this item. All mounting hardware shall be new and shall be included in this pay item. Any modifications to mounting hardware shall be included in this item. Additional ground rod(s) shall be provided as necessary meeting resistance requirements.

Basis of Payment. This item shall be paid at the contract unit price each for ELECTRIC SERVICE RELOCATION, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling, testing, connections, bonding and all appurtenances necessary for a complete operational system as indicated on the drawings and as directed/approved by the Traffic Signal Engineer.

TGS3 ELECTRIC SERVICE INSTALLATION, GROUND MOUNTED

Description. This item shall conform with Section 805 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions and the District 1 Standard Traffic Signal Design Details, except as revised herein.

Work Description. The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for reporting any account modifications arising from the work to the Engineer in a timely manner. Although it is anticipated that all service agreements and accounts will remain as-is, if new agreements are required, the Contractor shall facilitate coordination between the Electric Utility and the Engineer, with the Department to sign any appropriate new agreements. Only momentary outage of a traffic signal location undergoing modification will be allowed, and the contractor shall provide generator power or

make temporary service connections as necessary to assure continuity of operations as modifications are made.

The work will generally include installation of new ground mounted electric service and installation/coordination of meter housing/meter as directed by the Traffic Signal Engineer.

Removal and disposal of existing electric service, conduit and cable, as applicable, shall be included in the cost of this item.

Basis of Payment. This item shall be paid at the contract unit price each for ELECTRIC SERVICE INSTALLTION, GROUND MOUNTED, which price shall be paid in full for all work as described herein and includes furnishing, installing, delivery, handling, testing, connections, bonding and all appurtenances necessary for a complete operational system as indicated on the drawings and as directed/approved by the Traffic Signal Engineer.

TL01 INDUCTIVE LOOP DETECTOR

This work shall consist of furnishing and/or installing a vehicle or bicycle inductive loop detector ("Amplifier"), as directed by the Traffic Signal Engineer, according to Articles/Section 1079.01 of the Standard Specifications. The bicycle inductive loop detector shall differentiate bicycles from motorized vehicles.

The inductive loop detector shall be installed inside the traffic signal controller cabinet. The detector shall be either card rack type or shelf-mounted type. The detector may be single-channel, two-channel, or four-channel, as directed by the Traffic Signal Engineer. Any necessary connections and/or cabinet modifications required shall be including in this item.

Basis of Payment. This work will be paid for at the contract unit price each for INDUCTIVE LOOP DETECTOR, which price shall be paid in full for all work as described herein and includes the necessary connections and adjustments for proper operation and as directed/approved by the Traffic Signal Engineer.

If the detector unit has more than one complete detection channel, each compound detection channel will be considered as a detector for payment.

TL02 DETECTOR LOOP

Description. This item shall conform with Sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions and the District 1 Standard Traffic Signal Design Details, except as revised herein.

1. Asphalt Pavement

Detector loop which is to be installed in the proposed asphalt pavement must be placed in the pavement below the surface coarse. The location of each dive hole shall be marked on the face of the curb or handhole with a saw cut.

2. Existing Asphalt Pavement

Detector loop which is to be installed in an existing asphalt pavement shall be located to miss existing pavement cracks, if possible. The saw cut is to be filled with sealant to 3.0mm (one-eighth inch) below the surface of the pavement.

3. Concrete Pavement

Detector loop which is to be installed in concrete pavement must be placed to miss pavement joints and cracks, if possible. The saw cut is to be filled with sealant to one-eighth inch below the surface of pavement.

Loop Preparation

All detector loop saw cuts shall be a minimum of one-and-one-half inches and a maximum of two inches, and the depth shall be equal to the saw cut. Saw cuts across the corners are NOT allowed. The saw cut shall be a minimum of five-sixteenths inches wide and cut in accordance with local and EPA dust control requirements. Detector loop(s) shall not be installed in wet conditions and the saw cuts must be free of debris and residue such as dust and water which is to be achieved by the use of compressed air, wire brushing and heat drying according to sealant manufacturer requirements. The detector wire shall be held in place by the use of form wedges of sufficient diameter and strength to hold the wire one inch below the surface of the pavement. Wedges shall be spaced no more than eighteen inches apart. The wire from the detector loop to the handhole shall have six twists per foot and have a separate unit duct raceway from the edge of pavement to the handhole. The unit duct shall be one foot into the pavement and loop under the curb and gutter. The unit duct shall be placed at a thirty inch depth.

Contractor Loop Identification

The loop detector wire shall be spliced in the handhole and each lead-in wire shall be labeled in the handhole using a Conduit 250W175C waterproof tag or approved equal secured to each wire with nylon ties. Each lead-in cable tag shall indicate the location of the loop, loop rotation (clockwise/counterclockwise), loop lead-in direction (in or out), loop cable number, location in cabinet, and number of turns in the detector loop using waterproof ink as indicated on the District 1 Loop Detail. The Contractor shall mark loop locations on as-built plans and present to the Engineer after final inspection.

Six foot round loop(s) may be substituted for six foot by six foot square loop(s) and shall be paid as 24 feet of detector loop.

Detector loop measurements shall include the saw cut and the length of the detector loop wire to the edge of pavement. The detector loop wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. Unit duct (conduit, non-metallic, coilable, "loop dives"), trench and backfill and drilling of pavement or handholes shall be included in detector loop quantities.

Basis of Payment. This work shall be paid at the contract unit price per foot for DETECTOR LOOP as described above, which price shall be paid in full for all work as described herein and as directed/approved by the Traffic Signal Engineer.

TMA1–TMA2 STEEL MAST ARM ASSEMBLY AND POLE

Description. This item shall conform to the requirements of sections 877 of the Standard Specifications for Road and Bridge Construction, the District 1 Traffic Signal Special Provisions and the current Highway Standard, "Steel Mast Arm Assembly and Pole", except as revised herein.

Prior to the final acceptance of any Steel Mast Arm Assembly and Pole, Contractor must furnish to the Engineer a certified, notarized mill analysis of the material used in the Steel Mast Arm Assembly and Pole.

This item, when applicable, shall include the relocation of existing sign panels currently installed at the location.

If the proposed mast arm assembly is replacing an existing mast arm, the relocation of any existing equipment, as directed by the Engineer, including but not limited to Signal Heads, Pushbuttons, EVP, PTZ, Video Vehicle Detection, Radar Vehicle Detection in addition to the removal of the existing mast arm assembly shall be included in this item. The Contractor shall retain ownership of the existing mast arm assembly.

The mast arm shall be fitted with stainless steel mesh in accordance with the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for furnishing and installing a STEEL MAST ARM ASSEMBLY AND POLE as described above, which price shall be paid in full for all work and materials as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete assembly as directed/approved by the Traffic Signal Engineer.

TMA1 Steel Mast Arm Assembly and Pole 28 ft to 40 ft

TMA2 Steel Mast Arm Assembly and Pole 42 ft to 55 ft

TMA3 RELOCATE OR INSTALL MAST ARM ASSEMBLY AND POLE FROM CONTRACT SPARE PARTS

Description. This item shall conform with sections 877 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Special Provisions except as revised herein. The mast arm assembly and pole shall come from Contract Spare Parts or be relocated from one foundation to another foundation at the same intersection or another intersection as indicated on the plans. All transportation costs to move the mast arm assembly and pole from Contract Spare Parts to the intersection or from intersection to intersection are included in this item. Existing holes in the mast arm assembly and pole shall be plugged as directed by the Traffic Signal Engineer. The Contractor shall install stainless steel screening at the base of the mast arm in accordance with the Standard Specifications for Road and Bridge Construction. The cost of furnishing and installing screening or a new shroud shall be included in this item.

This item, when applicable, shall include the relocation of existing sign panels currently installed at the location.

If the proposed mast arm assembly is replacing an existing mast arm, the relocation of any existing equipment, as directed by the Engineer, including but not limited to Signal Heads, Pushbuttons, EVP, PTZ, Video Vehicle Detection, Radar Vehicle Detection in addition to the removal of the existing mast arm assembly shall be included in this item. The Contractor shall retain ownership of the existing mast arm assembly.

The mast arm shall be fitted with stainless steel mesh in accordance with the Standard Specifications for Road and Bridge Construction.

Basis of Payment. This work shall be paid at the contract unit price each for RELOCATE OR INSTALL EXISTING MAST ARM ASSEMBLY AND POLE FROM CONTRACT SPARE PARTS, as described above, which price shall be paid in full for all work and materials as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary to relocate a mast arm pole assembly or install a mast arm assembly from Contract Spare Parts as directed/approved by the Traffic Signal Engineer.

Revised 9/2/2021

TPP1 PEDESTRIAN PUSH-BUTTON POST, GALVANIZED STEEL

Description. This work shall consist of furnishing a nominal 4.5 inch diameter pedestrian push-button post and installing it on a base and concrete foundation as shown on the District One Traffic Signal detail sheets. The post diameter shall be as directed by the Traffic Signal Engineer and shall be coordinated with the base construction.

See Traffic Signal Post and Base, Article/Section 1077, Concrete Article/Section 1020 and IDOT District One details sheets.

The pedestrian push-button post shall be installed plumb on a round base and concrete foundation according to the details shown on the plans. The contractor shall apply an anti-seize post compound on all nuts and bolts prior to assembly.

The foundation shall be made Class SI concrete.

Basis of Payment. This work will be paid for at the contract unit price each for PEDESTRIAN PUSH-BUTTON POST, GALVANIZED STEEL, which price shall be paid in full for all work and materials as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary as directed/approved by the Traffic Signal Engineer.

TPP2 PEDESTRIAN PUSH-BUTTON, LATCHING AND NON-LATCHING

Description. This item shall conform with sections 888 and 1074 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Special Provisions except as revised herein. The Pedestrian Push-button assembly shall be one piece cast aluminum alloy with momentary LED or latching type LED display, as directed by the Traffic Signal Engineer and include pedestrian push button station, sign, and push button extension. See District One Traffic Signal Special Provisions for Pedestrian Station and Sign Requirements.

Basis of Payment. This work shall be paid at the contract unit price each for PEDESTRIAN PUSH-BUTTON, LATCHING AND NON-LATCHING as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete working unit as directed/approved by the Traffic Signal Engineer.

TPP3 RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON

Description. This work shall consist of relocating an existing pedestrian push-button as specified. Refer to the Traffic Signal Special provisions for exact requirements. Mounting/extension brackets shall be used to assure that the push button is accessible from a paved or concrete surface and is in full compliance with ADA. Mounting/extension brackets shall not be paid for separately but shall be included in the cost of the RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON pay item.

Basis of Payment. This work shall be paid at the contract unit price each for RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON as described above, which price shall be paid in full for all work and material

as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete working unit as directed/approved by the Traffic Signal Engineer.

TPP4 PEDESTRIAN PUSH-BUTTON, REPLACE WITHIN EXISTING HOUSING

Description. This item shall conform with sections 888 and 1074 of the Standard Specifications for Road and Bridge Construction and District 1 Traffic Signal Special Provisions except as revised herein. The Pedestrian Push-button assembly shall be one-piece cast aluminum alloy with momentary LED or latching type LED display, as directed by the Traffic Signal Engineer. This item shall consist of furnishing and installing a pedestrian pushbutton into an existing pedestrian push button station, as directed by the Traffic Signal Engineer.

Basis of Payment. This work shall be paid at the contract unit price each for PEDESTRIAN PUSH-BUTTON, REPLACE WITHIN EXISTING HOUSING as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete working unit as directed/approved by the Traffic Signal Engineer.

TPP5 PEDESTRIAN PUSH-BUTTON, ACCESSIBLE PEDESTRIAN SIGNALS (APS) TYPE

Description. This item shall consist of furnishing and installing pedestrian push button accessible pedestrian signals (APS) type. Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein and include pedestrian push button station, sign, and push button extension as necessary. See District One Traffic Signal Special Provisions for Pedestrian Station and Sign Requirements.

Description.

This work shall consist of furnishing and installing pedestrian push button accessible pedestrian signals (APS) type. Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements.

The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications.

A pushbutton locator tone shall sound at each pushbutton with volume settings a maximum of 5 dBA louder than ambient sound.

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message.

A clear, verbal message shall be used to communicate the pedestrian walk interval. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: “Street Name.” Walk Sign is on to cross “Street Name.” No other messages shall be used to denote the WALK interval.

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

Pedestrian Pushbutton.

Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

A red LED indicator shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street. The recorded messages and roadway designations shall be confirmed with the engineer and included with submitted product data.

Signage.

A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall be one of the following standard MUTCD designs: R10-3b, R10-3d, or R10-3e.



Tactile Arrow.

A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided either on the pushbutton or its sign.

Vibrotactile Feature.

The pushbutton shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Training.

The Contractor shall provide APS onsite training for Department personnel and person(s) or group that requested the installation of the APS. APS features and operation shall be demonstrated during the training.

The training shall be presented by the APS equipment supplier. Time, date, and location of the training and demonstration shall be coordinated with the Engineer.

Basis of Payment. This work shall be paid at the contract unit price each for PEDESTRIAN PUSH- BUTTON, ACCESSIBLE PEDESTRIAN SIGNALS (APS) TYPE as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installation, delivery, mounting hardware, message programming, training and all appurtenances and mounting hardware necessary for a complete working unit as directed/approved by the Traffic Signal Engineer.

TSB1 TRAFFIC SIGNAL BACKPLATE, REFLECTIVE

Description. Delete second sentence of the fourth paragraph of Article 1078.03 of the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

Reflective sheeting shall be Type ZZ according to Article 1091.03, 3-inches wide and applied in the manufacturer's preferred orientation for the maximum angularity according to the vendor's recommendation. The retro reflective sheeting shall be installed under a controlled environment at the manufacturer/supplier facilities before shipment for field installation. The backplate shall be prepared and cleaned, following recommendations of the retro reflective sheeting manufacturer. Removal/disposal of the existing backplate along with installation of new backplate, where applicable, shall be included in the cost of this item.

Basis of Payment. This work shall be paid at the contract unit price each for TRAFFIC SIGNAL BACKPLATE, REFLECTIVE, which price shall be paid in full for all work and materials as described herein and as approved by the Traffic Signal Engineer.

TSD1 LED SIGNAL DISPLAY

Description. This item shall consist of installing a 12 inch LED display into an existing signal section or a new signal section. The LED display shall fit into the signal housing without any modifications to the housing and meet District 1 Traffic Signal Special Provisions. Removal of the existing lens and reflector shall be included in this item. The existing lens and reflector shall become the Contractor's property and the unit price should reflect the salvage value of these items.

Basis of Payment. This work shall be paid at the contract unit price each for LED SIGNAL DISPLAY, which price shall be paid in full for supplying and installing a display as described herein and as approved by the Traffic Signal Engineer.

TSL1-TSL5 LED SIGNAL HEAD

Description. These items shall conform with Section 880 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions, the current Highway Standard "Traffic Signal Mounting Details", Special Provision for Light Emitting Diode (LED) Signal Head, and District 1 Standard

Traffic Signal Design Details, except as revised herein. All traffic signal sections shall have twelve inch lenses unless otherwise stated on the plans or as directed by the Traffic Signal Engineer. At locations where new signal heads are replacing existing signal heads, the removal of the existing signal heads and mounting hardware shall be included in this item and the Contractor shall retain ownership of the existing used signal heads.

All mounting hardware shall be new and shall be included in the pay item for signal head. Visor type, including louvers, shall be as directed by the Traffic Signal Engineer. The pay items listed below shall include either bracket mounts or mast arm mounts as required by the plans or directed by the Traffic Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Backplates and type (standard or reflective), as directed by the Engineer, shall be included in these items.

Basis of Payment. This work shall be paid at the contract unit price each for LED SIGNAL HEAD of the number of sections specified OR LED SIGNAL HEAD, OPTICALLY PROGRAMMED of the number of sections specified, which price shall be paid in full for all work as described herein and as approved by the Traffic Signal Engineer. Removal, salvage, or disposal of existing heads and related mounting hardware and backplates shall be included in these items.

- TSL1 LED Signal Head, 3 Section
- TSL2 LED Signal Head, 4 Section
- TSL3 LED Signal Head, 5 Section
- TSL4 LED Signal Head, Optically Programmed, 3 Section
- TSL5 LED Signal Head, Optically Programmed, 5 Section

TSL6 LED SIGNAL FACE, LENS COVER

Description. This work shall consist of furnishing and installing a signal lens cover with the purpose of preventing snow buildup on and around a signal lens allowing for clear indication during inclement weather.

This item shall fit over a 12 inch signal head lens and shall include the clear lens cover, attachment collar and any clips or fasteners necessary to fit it flush. The cover shall be installed in accordance with the manufacturer's instructions and in a manner that prevents dust, debris, or moisture buildup on the inside of the lens cover that could affect the signal indication visibility.

The snow resistant signal head lens cover shall be warrantied, free from material and workmanship defects for a period of three years from final inspection.

Basis of Payment. This work shall be paid at the contract unit price each for LED SIGNAL FACE, LENS COVER, as described above, which price shall be paid in full for all work as described herein including furnishing, installing, and all mounting hardware necessary for a fully operational snow resistant signal head lens cover as approved by the Traffic Signal Engineer.

TSL7 LED SIGNAL FACE, VISOR HEATER

Revised 9/2/2021

Description. This work shall consist of furnishing and installing a heated signal visor or retrofitting an existing signal visor with a heater to prevent snow buildup on and around a signal lens allowing for clear signal indication during inclement weather.

The heater shall keep a constant temperature on every point of the heating element and shall not rise above the manufacturer's safe temperature levels. The heater shall be made from flexible material mounted to the underside of an existing or proposed signal visor. The heater shall be controlled by a temperature and humidity probe to determine if conditions for snow are present. A single probe with the LED confirmation light should be installed at the traffic signal cabinet to control the entire intersection with the confirmation light visible from the street. Power for the heater shall be supplied using an extra, unused wire from the signal head. Installation of the heater shall not create conditions where dust, debris, or water can enter the inside of the signal head. Any control modules necessary for the proper operation should be installed inside the cabinet for easy maintenance and its capacity should match the number of red signal head indications present at the intersection or as directed by the engineer.

The heating element shall operate during typical snowing conditions below 35.6 degree F and above 75% RH. The heater shall be installed such that it is de-energized when traffic signals are powered by an alternative energy source such as a generator or uninterruptible power supply (UPS).

The snow resistant heated signal visor shall be warrantied, free from material and workmanship defects for a period of three years from final inspection.

Basis of Payment. This work shall be paid at the contract unit price each for LED SIGNAL FACE, VISOR HEATER, as described above, which price shall be paid in full for all work as described herein including furnishing, installing, and all mounting hardware necessary for proper operation as approved by the Traffic Signal Engineer.

TSL8 LED PEDESTRIAN SIGNAL HEAD

Description. This item shall conform with Section 881 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions, the current Highway Standard "Traffic Signal Mounting Details" and District 1 Standard Signal Design Details, except as revised herein. All LED pedestrian signal sections shall have twelve inch lenses unless stated on the plans or as directed by the Traffic Signal Engineer. At locations where new pedestrian signal head(s) or faces are replacing an existing pedestrian signal head(s) or faces the removal shall be included in this item and the Contractor shall retain the used existing pedestrian signal head(s) or faces.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay items listed below shall include either pole mounts or post mounts as required by the plans or directed by the Traffic Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for LED PEDESTRIAN SIGNAL HEAD, as described above, which price shall be paid in full for all work as described herein including mounting hardware and as approved by the Traffic Signal Engineer.

TSL9 LED PEDESTRIAN SIGNAL HEAD, COUNTDOWN

Description. This item shall conform with Section 881 of the Standard Specifications for Road and Bridge Construction, District 1 Traffic Signal Special Provisions, the current Highway Standard "Traffic Signal Mounting Details" and District 1 Standard Signal Design Details, except as revised herein. This work shall consist of furnishing and installing a pedestrian countdown signal head, with light emitting diodes (LED) of the type specified in the plan. At locations where new pedestrian signal head(s) or faces are replacing an existing pedestrian signal head(s) or faces, the removal shall be included in this item and the Contractor shall retain the used existing pedestrian signal head(s) or faces. Existing pedestrian push button signing shall be replaced with new count-down type signs (R10-3e, 9-inch x 15-inch) with associated sign station or housing at locations where existing push buttons are not being replaced.

All mounting hardware shall be new and shall be included in the pay item for signal head. The pay item listed below shall include either pole mounts or post mounts as required by the plans or directed by the Traffic Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Pedestrian Countdown Signal Head, LED, shall be 16 inch x 18 inch and conform fully to the District 1 Traffic Signal Special Provisions.

Basis of Payment. This item shall be paid for at the contract unit price each for LED PEDESTRIAN SIGNAL HEAD, COUNTDOWN, which shall be paid in full for furnishing the equipment described above including LED(s) modules, all mounting hardware, and installing them in satisfactory operating condition and as directed/approved by the Traffic Signal Engineer.

TSR1 REMOVE SIGNAL SECTION OR HEAD

Description. This item shall conform with Section 895 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions, except as revised herein.

This item shall consist of removing an existing traffic signal head or section at a location shown on the plans or as directed by the Traffic Signal Engineer. The removal of an existing traffic signal head or section will be paid only when its removal or relocation is not included in another pay item. The existing signal section(s) or head(s), when removed, shall become the property of the Contractor and the salvage value of the head(s) or section(s) is to be reflected in the unit bid price.

A traffic signal head with multiple faces and/or pedestrian signals mounted on the same traffic signal post, mast arm pole, or street lighting pole shall be considered a single unit and shall be paid at 1 each for the complete or partial removal. The existing backplate shall be removed and replaced with a new, properly sized backplate as necessary, all remaining holes in the post or mast arm shall be plugged as directed by the Traffic Signal Engineer and any additional hardware necessary for any remaining sections shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to REMOVE SIGNAL SECTION OR HEAD, as described above, which price shall be paid in full for all work as described herein and as directed/approved by the Traffic Signal Engineer.

TSR2 RELOCATE OR INSTALL EXISTING SIGNAL SECTION OR HEAD

Description. This item shall conform with Sections 801 and 895 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions except as revised herein. This item includes the relocation of traffic signal head(s) and pedestrian signal head(s). The combination of a traffic signal head and a pedestrian signal head mounted on the same traffic signal post, mast arm pole, or street lighting pole shall be considered a single unit and shall be paid as one (1) each relocate signal head. This item shall include removing a traffic signal head from one intersection, transporting it to another intersection and installing it at a new location or installing an existing signal head from Contract Spare Parts. Any modifications or adjustments to the existing signal head or programming of the existing signal head shall be included in this item.

All mounting hardware shall be new and shall be included in this pay item. The pay item listed below shall include either mast arm mounts, pole mounts or post mounts as required by the plans or directed by the Traffic Signal Engineer. Any modifications to mounting hardware shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each to RELOCATE OR INSTALL EXISTING SIGNAL HEAD, as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete working unit as directed/approved by the Traffic Signal Engineer.

TT01 SPAN WIRE TRAFFIC SIGNAL INSTALLATION WITH ELECTRIC SERVICE AND UPS

Description. This item shall conform with Section 890 of the Standard Specifications for Road and Bridge Construction, the District 1 Traffic Signal Special Provisions, and the current Highway Standard, "Temporary Traffic Signal", except as revised herein.

The span wire traffic signal installation when completed shall become the property of the State of Illinois. All equipment and material shall be new.

The controller shall be one of the approved District 1 Closed Loop brands and the display shall be menu driven. The controller and its associated equipment shall be housed in an aluminum traffic signal controller cabinet Type IV or Type V, as designated on the plans or by the Traffic Signal Engineer and mounted on an enclosed wood stand with a three feet by four feet by 5 inches thick and a concrete pad in front of the cabinet door. The cabinet shall contain all harnesses, load switches, flasher, conflict monitor, detector harnesses and related components required to provide the sequence of operations on the plans or as directed by the Traffic Signal Engineer.

Traffic signal heads furnished for the installation shall be LED type with expanded view and have twelve inch lenses with flat black faces and tunnel visors. Each approach to a signalized intersection must have a minimum of three (3) signal heads spaced a minimum of eight feet apart.

The Electric Service Installation and UPS, as described in the District One Traffic Signal Specification, shall be included in this item.

Pedestrian signal heads and push-button detectors, if required, will be paid separately. All vehicle detection, when required, as part of a span wire signal installation, will be paid separately. When possible, the Department will provide the inductive loop detectors ("amplifiers") for the intersection from Contract Spare

Parts. If necessary, the Department shall authorize the installation of new amplifiers through a nonroutine work order.

The bottom of any span wire mounted signal head (or backplate if equipped) shall be no lower than 17-ft and the top of the signal head shall be no higher than 25-ft above the crown of the road, unless otherwise directed by the Traffic Signal Engineer.

Pavement marking, as indicated on the drawings, shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for SPAN WIRE TRAFFIC SIGNAL INSTALLATION WITH ELECTRIC SERVICE AND UPS, as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete working span wire traffic signal as approved by the Traffic Signal Engineer. Maintenance of the span wire traffic signal installation will be paid separately after the span wire signal is directed/approved for operation by the Department.

TTP1 TRAFFIC SIGNAL POST, 10 FT TO 18 FT

Description. This item shall conform with sections 875 of the Standard Specifications for Road and Bridge Construction, the District 1 Traffic Signal Special Provisions and District 1 Traffic Signal Design Details except as revised herein.

When the new post is being installed on an existing foundation to replace an existing post, the removal of the existing post shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for TRAFFIC SIGNAL POST, 10 FT TO 18 FT as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete unit as directed/approved by the Traffic Signal Engineer.

TTP2 - TTP3 REMOVE TRAFFIC SIGNAL POST AND REMOVE MAST ARM ASSEMBLY AND POLE

Description. These items consist of removing an existing traffic signal post or mast arm assembly and pole at a location shown on the plans or as directed by the Traffic Signal Engineer. The existing traffic signal post or existing mast arm assembly shall become the Contractor's property and the salvage value of the item shall be reflected in the unit price.

Basis of Payment. This work shall be paid at the contract unit price each for the pay items listed below and as described above, which price shall be paid in full for all work as described herein and as directed/approved by the Traffic Signal Engineer.

- TTP2 Remove Traffic Signal Post
- TTP3 Remove Mast Arm Assembly and Pole

TTP4 RELOCATE EXISTING TRAFFIC SIGNAL POST, 10 FT TO 18 FT

Description. This item shall conform with Sections 801 and 895 of the Standard Specifications for Road and Bridge Construction and the District 1 Traffic Signal Special Provisions except as revised herein.

The traffic signal post shall come from Contract Spare Parts or be relocated from one foundation to another foundation at the same intersection or another intersection as indicated on the plans. All transportation costs to move the traffic signal post from Contract Spare Parts to the intersection or from intersection to intersection are included in this item. Existing holes in the traffic signal post shall be plugged as directed by the Traffic Signal Engineer. This item includes the relocation of traffic signal head(s), pedestrian signal head(s), pedestrian signal pushbuttons or any other appurtenances mounted to the existing traffic signal post. Any modifications or adjustments to the existing signal head(s), pushbutton(s), appurtenances, or programming of the existing signal head(s) shall be included in this item.

All mounting hardware shall be new and shall be included in this pay item. Any modifications to mounting hardware shall be included in this item.

Basis of Payment. This work shall be paid at the contract unit price each for RELOCATE EXISTING TRAFFIC SIGNAL POST, 10 FT TO 18 FT as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling and all appurtenances and mounting hardware necessary for a complete unit as directed/approved by the Traffic Signal Engineer.

TVB1 BUDGETARY ALLOWANCE FOR MAINTAINING TRAFFIC SIGNAL SYSTEM MANAGEMENT AND COMMUNICATIONS

Description. This item is to establish a budget account to allocate funds for the payment for maintaining communications and management of traffic signal systems. This work shall include but not limited to converting closed loops traffic signals and systems to the District's ATSS. Equipment and software needed to maintain the majority of the District's closed-loop traffic signal system is no longer supported or available requiring conversion to the ATSS. Needed conversion locations are not accurately or completely identifiable at the time of bidding.

This item shall include integrating traffic signals onto the District's ATSS system. The total estimated amount of the annual expenses for services and materials is \$150,000 as indicated for Pay Item TVA1. For bidding purposes this amount shall be used.

TVD1-TVD3 VIDEO DETECTION SYSTEM

Description: This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images and provides detector outputs to a traffic controller or similar device. This work shall consist of furnishing and installing an Autoscope Vision, Iteris Vantage Next or an approved equal video vehicle detection system for a single intersection approach or all approaches at one signalized intersection. This item includes vision/camera sensors, processing equipment and all necessary hardware, cable, and accessories necessary to complete the installation in accordance with the manufacturer's specifications. The system shall also include a 10-inch LCD in-cabinet monitor with BNC connector for video input. A multi-camera video switching unit shall be provided to select video input to the monitor.

The cameras are normally installed on top of the luminaire arm. However, occasionally overhead utility wires obstruct the camera's field of view and prevent proper detector placement. When this occurs, the camera shall be installed on a J-hook below the luminaire arm.

To protect the video detection cameras from electrical surges, the interface panel shall be grounded as follows:

1. The chassis sheet metal must be tied to ground with the supplied ground wire and stud.
2. All shield wires should be tied to the chassis ground stud.
3. Terminal position three (3) of each of the camera terminations shall be tied to the ground stud.
4. All extra/spare wires in the Autoscope MVP cable should be tied to ground.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The supplier of the video detection system shall supervise the installation and testing of the video detection system. A factory certified representative from the supplier shall be on-site during installation.

The video detection system shall come with a warranty from its supplier for a minimum of two (2) years with ongoing software support by the supplier and no-cost video sensor and supervisor software.

Basis of Payment: This item will be paid for at the contract unit price each for VIDEO DETECTION SYSTEM, COMPLETE INTERSECTION; VIDEO DETECTION SYSTEM ONE APPROACH; VIDEO DETECTION SYSTEM TWO APPROACH, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a complete operating detection unit at one signalized intersection as directed/approved by the Traffic Signal Engineer.

TVD1 Video Detection System, Complete Intersection

TVD2 Video Detection System, One Approach

TVD3 Video Detection System, Two Approach

TWD1-TWD3 RADAR DETECTION SYSTEM

Description.

This work shall consist of furnishing and installing a radar vehicle detection system as specified and/or as shown on the plan. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary hardware, cable and accessories required to complete the installation in accordance with the manufacturer's specifications.

The radar vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius. It shall have a max power output of 75 watts or less.

The radar vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The radar vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection, and shall be capable of supporting a minimum of 4 detector units.

The far back radar detection shall have a detection range of 400 feet or better.

A representative from the supplier of the radar vehicle detection system shall supervise the installation and testing of the radar vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the radar vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The radar vehicle detection system shall be warranted, free from material and workmanship defects for a period of two (2) years from final inspection.

Basis of Payment.

Basis of Payment. This work shall be paid at the contract unit price each for RADAR DETECTION SYSTEM, COMPLETE INTERSECTION; RADAR VEHICLE DETECTION SYSTEM, ONE APPROACH; RADAR VEHICLE DETECTION SYSTEM, TWO APPROACH, as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and installation equipment necessary for a complete operating radar vehicle detection system as directed/approved by the Traffic Signal Engineer.

TWD1 Radar Detection System, Complete Intersection

TWD2 Radar Detection System, One Approach

TWD3 Radar Detection System, Two Approach

TWI1 WIRELESS INTERCONNECT SYSTEM

Description. The wireless interconnect system shall be compatible with Siemens/Eagle or Econolite controller closed loop systems. This item shall include all materials, labor and testing to provide the completely operational closed loop system between two (2) intersections as shown on the plans. The wireless interconnect system shall include the following components:

- a. Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio
- b. Software for Radio Configuration (Configure Frequency and Hopping Patterns)
- c. Antennas (Omni Directional or Yagi Directional)
- d. Antenna Cables, LMR400, Low Loss. Max. 100-ft from controller cabinet to antenna
- e. Brackets, Mounting Hardware, and Accessories Required for Installation
- f. RS232 Data Cable for Connection from the radio to the local or master controller
- g. All other components required for a fully functional wireless interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the wireless interconnect system components shall be included in this item.

The wireless interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed master controller and telemetry module shall be configured for use with the wireless interconnect at a minimum rate of 9600 baud.

The wireless interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance to the manufacturers recommendations.

Basis of Payment. This work shall be paid at the contract unit price each for WIRELESS INTERCONNECT SYSTEM, as described above, which price shall be paid in full for all work and material as described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and installation equipment necessary for a complete operating wireless interconnect system as directed/approved by the Traffic Signal Engineer.

TRAFFIC SIGNAL SPECIAL PROVISIONS

MAST ARM SIGN PANELS

Effective: May 22, 2002

Revised: July 1, 2015

720.01TS

Add the following to Article 720.02 of the Standard Specifications:

Sign stiffening channel systems shall be aluminum and meet the requirements of ASTM 6261-T5. Sign mounting banding, buckles and buckle straps shall be manufactured from AISI 201 stainless steel.

SIGN SHOP DRAWING SUBMITTAL

Effective: January 22, 2013

Revised: July 1, 2015

720.02TS

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.

TRAFFIC SIGNAL GENERAL REQUIREMENTS

Effective: May 22, 2002

Revised: March 25, 2016

800.01TS

These Traffic Signal Special Provisions and the "District One Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations.

- All material furnished shall be new unless otherwise noted herein.
- Traffic signal construction and maintenance work shall be performed by personnel holding current IMSA Traffic Signal Technician Level II certification. A copy of the certification shall be immediately available upon request of the Engineer.

- The work to be done under this contract consists of furnishing, installing and maintaining all traffic signal work and items as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

Definitions of Terms.

Add the following to Section 101 of the Standard Specifications:

101.56 Vendor. Company that sells a particular type of product directly to the contractor or the Equipment Supplier.

101.57 Equipment supplier. Company that supplies, represents and provides technical support for IDOT District One approved traffic signal controllers and other related equipment. The Equipment Supplier shall be located within IDOT District One and shall:

- Be full service with on-site facilities to assemble, test and trouble-shoot traffic signal controllers and cabinet assemblies.
- Maintain an inventory of IDOT District One approved controllers and cabinets.
- Be staffed with permanent sales and technical personnel able to provide traffic signal controller and cabinet expertise and support.
- Technical staff shall hold current IMSA Traffic Signal Technician Level III certification and shall attend traffic signal turn-ons and inspections with a minimum 14 calendar day notice.

Submittals.

Revise Article 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted electronically through the District's SharePoint System unless directed otherwise by the Engineer. Electronic material submittals shall follow the District's Traffic Operations Construction Submittals guidelines. General requirements include:

1. All material approval requests shall be made prior to or no later than the date of the preconstruction meeting. A list of major traffic signal items can be found in Article 801.05. Material or equipment which is similar or identical shall be the product of the same manufacturer, unless necessary for system continuity. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.
2. Product data and shop drawings shall be assembled by pay item. Only the top sheet of each pay item submittal will be stamped by the Department with the review status, except shop drawings for mast arm pole assemblies and the like will be stamped with the review status on each sheet.
3. Original manufacturer published product data and shop drawing sheets with legible dimensions and details shall be submitted for review.
4. When hard copy submittals are necessary, four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials shall be submitted. For hard copy or electronic submittals, the descriptive literature and technical data shall be adequate for determining whether the materials meet the requirements of the plans and specifications. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
5. When hard copy submittals are necessary for structural elements, four complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials shall be submitted.
6. Partial or incomplete submittals will be returned without review.
7. Certain non-standard mast arm poles and special structural elements will require additional review from IDOT's Central Office. Examples include ornamental/decorative, non-standard length mast arm pole assemblies and monotube structures. The Contractor shall account for the additional review time in his schedule.

8. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of correspondence, catalog cuts and mast arm poles and assemblies drawings.
9. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall be complete with all test data, dates, and times.
10. After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or 'Incomplete'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.
11. The Contractor shall secure approved materials in a timely manner to assure construction schedules are not delayed.
12. All submitted items reviewed and marked 'APPROVED AS NOTED', 'DISAPPROVED', or 'INCOMPLETE' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify contract compliance at no additional cost to the contract.
13. Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.
14. Contractor shall not order major equipment such as mast arm assemblies prior to Engineer approval of the Contractor marked proposed traffic signal equipment locations to assure proper placement of contract required traffic signal displays, push buttons and other facilities. Field adjustments may require changes in proposed mast arm length and other coordination.

Marking Proposed Locations.

Revise "Marking Proposed Locations for Highway Lighting System" of Article 801.09 to read "Marking Proposed Locations for Highway Lighting System and Traffic Signals."

Add the following to Article 801.09 of the Standard Specifications:

It shall be the contractor's responsibility to verify all dimensions and conditions existing in the field prior to ordering materials and beginning construction. This shall include locating the mast arm foundations and verifying the mast arms lengths.

Inspection of Electrical Systems.

Add the following to Article 801.10 of the Standard Specifications:

- (c) All cabinets including temporary traffic signal cabinets shall be assembled by an approved equipment supplier in District One. The Department reserves the right to request any controller and cabinet to be tested at the equipment supplier's facility prior to field installation, at no extra cost to this contract.

Maintenance and Responsibility.

Revise Article 801.11 of the Standard Specifications to read:

- a. Existing traffic signal installations and/or any electrical facilities at all or various locations may be altered or reconstructed totally or partially as part of the work on this Contract. The Contractor is hereby advised that all traffic control equipment, presently installed at these locations, may be the property of the State of Illinois, Department of Transportation, Division of Highways, County, Private Developer, Municipality or Transit Agency in which

they are located. Once the Contractor has begun any work on any portion of the project, all traffic signals within the limits of this contract or those which have the item "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," shall become the full responsibility of the Contractor. The Contractor shall supply the Engineer, Area Traffic Signal Maintenance and Operations Engineer, IDOT ComCenter and the Department's Electrical Maintenance Contractor with two 24-hour emergency contact names and telephone numbers.

- b. Automatic Traffic Enforcement equipment such as red lighting running and railroad crossing camera systems are owned and operated by others and the Contractor shall not be responsible for maintaining this equipment.
- c. Regional transit, County and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as PTZ cameras, switches, transit signal priority (TSP and BRT) servers and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.
- d. When the project has a pay item for "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," the Contractor must notify both the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 and the Department's Electrical Maintenance Contractor, of their intent to begin any physical construction work on the Contract or any portion thereof. This notification must be made a minimum of seven (7) working days prior to the start of construction to allow sufficient time for inspection of the existing traffic signal installation(s) and transfer of maintenance to the Contractor. The Department will attempt to full-fill the Contractor's inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested inspection date(s) cannot be scheduled by the Department. If work is started prior to an inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection. The Contractor will become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted.
- e. The Contractor is advised that the existing and/or temporary traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shut down the traffic signal installation will only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.
- f. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals and other equipment noted herein. Any inquiry, complaint or request by the Department, the Department's Electrical Maintenance Contractor or the public, shall be investigated and repairs begun within one hour. Failure to provide this service will result in liquidated damages of \$1000 per day per occurrence. In addition, the Department reserves the right to assign any work not completed within this timeframe to the Electrical Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Electrical Maintenance Contractor within one month after the incident will result in additional liquidated damages of \$1000 per month per occurrence. Unpaid bills will be deducted from the cost of the

Contract. The Department may inspect any signaling device on the Department's highway system at any time without notification.

- g. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.
- h. The Contractor shall be responsible to clear snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.
- i. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be for separately but shall be included in the contract.

Damage to Traffic Signal System.

Add the following to Article 801.12(b) of the Standard Specifications to read:

Any traffic signal control equipment damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices are only allowed at the bases of post and mast arms.

Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause, shall be the responsibility of the municipality or the Automatic Traffic Enforcement company per Permit agreement.

Traffic Signal Inspection (TURN-ON).

Revise Article 801.15(b) of the Standard Specifications to read:

It is the intent to have all electric work completed and equipment field tested by the Equipment Supplier prior to the Department's "turn-on" field inspection. If in the event the Engineer determines work is not complete and the inspection will require more than two (2) hours to complete, the inspection shall be canceled and the Contractor will be required to reschedule at another date. The maintenance of the traffic signals will not be accepted until all punch list work is corrected and re-inspected.

When the road is open to traffic, except as otherwise provided in Section 850 of the Standard Specifications, the Contractor may request a turn-on and inspection of the completed traffic signal installation at each separate location. This request must be made to the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 a minimum of seven (7) working days prior to the time of the requested inspection. The Department will attempt to full-fill the Contractor's turn-on and inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested turn-on and inspection date(s) cannot be scheduled by the Department. The Department will not grant a field inspection until written or electronic notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. The Contractor must invite local fire department personnel to the turn-on when Emergency Vehicle Preemption (EVP) is included in the project. When the contract includes the item RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM, OPTIMIZE TRAFFIC SIGNAL SYSTEM, or TEMPORARY TRAFFIC SIGNAL TIMINGS, the Contractor must notify the SCAT Consultant of the turn-on/detour implementation schedule, as well as stage changes and phase changes during construction.

The Contractor must have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and turn-on of the traffic signal installation. The Contractor shall be responsible to provide a police officer to assist with traffic control at the time of testing.

The Contractor shall provide a representative from the control equipment vendor's office who is knowledgeable of the cabinet design and controller functions to attend the traffic signal inspection for both permanent and temporary traffic signal turn-ons.

Upon demonstration that the signals are operating and all work is completed in accordance with the Contract and to the satisfaction of the Engineer, the Engineer will then allow the signals to be placed in continuous operation. The Agency that is responsible for the maintenance of each traffic signal installation will assume the maintenance upon successful completion of this inspection.

The District requires the following Final Project Documentation from the Contractor at traffic signal turn-ons in electronic format in addition to hard copies where noted. A CD/DVD shall be submitted with separate folders corresponding to each numbered title below. The CD/DVD shall be labelled with date, project location, company and contract or permit number. Record Drawings, Inventory and Material Approvals shall be submitted prior to traffic signal turn-on for review by the Department as described here-in.

Final Project Documentation:

1. Record Drawings. Signal plans of record with field revisions marked in red ink. One hard copy set of 11"x17" record drawings shall also be provided.
2. Inventory. Inventory of new and existing traffic signal equipment including cabinet types and devices within cabinets in an Excel spread sheet format. One hard copy shall also be provided.
3. Pictures. Digital pictures of a minimum 12M pixels of each intersection approach showing all traffic signal displays and equipment. Pictures shall include controller cabinet equipment in enough detail to clearly identify manufacture and model of major equipment.
4. Field Testing. Written notification from the Contractor and the equipment vendor of satisfactory field testing with corresponding material performance measurements, such as for detector loops and fiber optic systems (see Article 801.13). One hard copy of all contract required performance measurement testing shall also be provided.
5. Materials Approval. The material approval letter. A hard copy shall also be provided.
6. Manuals. Operation and service manuals of the signal controller and associated control equipment. One hard copy shall also be provided.
7. Cabinet Wiring Diagram and Cable Logs. Five (5) hard copies 11" x 17" of the cabinet wiring diagrams shall be provided along with electronic pdf and dgn files of the cabinet wiring diagram. Five hard copies of the cable logs and electronic excel files shall be

- provided with cable #, number of conductors and spares, connected device/signal head and intersection location.
8. Controller Programming Settings. The traffic signal controller's timings; backup timings; coordination splits, offsets, and cycles; TBC Time of Day, Week and Year Programs; Traffic Responsive Program, Detector Phase Assignment, Type and Detector Switching; and any other functions programmable from the keyboard. The controller manufacturer shall also supply a printed form, not to exceed 11" x 17" for recording that data noted above. The form shall include a location, date, manufacturer's name, controller model and software version. The form shall be approved by the Engineer and a minimum of three (3) copies must be furnished at each turn-on. The manufacturer must provide all programming information used within the controller at the time of turn-on.
 9. Warrantees and Guarantees. All manufacturer and contractor warrantees and guarantees required by Article 801.14.
 10. GPS coordinate of traffic signal equipment as describe in the Record Drawings section herein.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on", completeness of the required documentation and successful operation during a minimum 72 hour "burn-in" period following activation of the traffic signal. If approved, traffic signal acceptance shall be verbal at the "turn on" inspection followed by written correspondence from the Engineer. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until Departmental acceptance is granted.

All equipment and/or parts to keep the traffic signal installation operating shall be furnished by the Contractor. No spare traffic signal equipment is available from the Department.

All punch list work shall be completed within two (2) weeks after the final inspection. The Contractor shall notify the Electrical Maintenance Contractor to inspect all punch list work. Failure to meet these time constraints shall result in liquidated damage charges of \$500 per month per incident.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements shall be subject to removal and disposal at the Contractor's expense.

Record Drawings.

The requirements listed for Electrical Installation shall apply for Traffic Signal Installations in Article 801.16. Revise the 2nd paragraph of Article 801.16 of the Standard Specifications to read:

"When the work is complete, and seven days before the request for a final inspection, the reduced-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. If the contract consists of multiple intersections, each intersection shall be saved as an individual PDF file with TS# and location name in its file name.

In addition to the record drawings, copies of the final catalog cuts which have been Approved or Approved as Noted shall be submitted in PDF format along with the record drawings. The PDF files shall clearly indicate the pay item either by filename or PDF Table of Contents referencing the respective pay item number for multi-item PDF files. Specific part or model numbers of items which have been selected shall be clearly visible."

As part of the record drawings, the Contractor shall inventory all traffic signal equipment, new or existing, on the project and record information in an Excel spreadsheet. The inventory

shall include equipment type, model numbers, software manufacturer and version and quantities.

Add the following to Article 801.16 of the Standard Specifications:

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

- All Mast Arm Poles and Posts
- Traffic Signal Wood Poles
- Rail Road Bungalow
- UPS
- Handholes
- Conduit roadway crossings
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV Camera installations
- Fiber Optic Splice Locations
- Conduit Crossings

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:

- File shall be named: TSXXX-YY-MM-DD (i.e. TS22157_15-01-01)
- Each intersection shall have its own file
- Row 1 should have the location name (i.e. IL 31 @ Klausen)
- Row 2 is blank
- Row 3 is the headers for the columns
- Row 4 starts the data
- Column A (Date) – should be in the following format: MM/DD/YYYY
- Column B (Item) – as shown in the table below
- Column C (Description) – as shown in the table below
- Column D and E (GPS Data) – should be in decimal form, per the IDOT special provisions

Examples:

Date	Item	Description	Latitude	Longitude
01/01/2015	MP (Mast Arm Pole)	NEQ, NB, Dual, Combination Pole	41.580493	- 87.793378
01/01/2015	HH (Handhole)	Heavy Duty, Fiber, Intersection, Double	41.558532	- 87.792571
01/01/2015	ES (Electrical Service)	Ground mount, Pole mount	41.765532	- 87.543571
01/01/2015	CC (Controller Cabinet)		41.602248	- 87.794053
01/01/2015	RSC (Rigid Steel Crossing)	IL 31 east side crossing south leg to center HH at Klausen	41.611111	- 87.790222

01/01/2015	PTZ (PTZ)	NEQ extension pole	41.593434	- 87.769876
01/01/2015	POST (Post)		41.651848	- 87.762053
01/01/2015	MCC (Master Controller Cabinet)		41.584593	- 87.793378
01/01/2015	COMC (Communication Cabinet)		41.584600	- 87.793432
01/01/2015	BBS (Battery Backup System)		41.558532	- 87.792571
01/01/2015	CNCR (Conduit Crossing)	4-inch IL 31 n/o of Klausen	41.588888	- 87.794440

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 1 foot. 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 1 foot accuracy after post processing.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years.”

Delete the last sentence of the 3rd paragraph of Article 801.16.

Locating Underground Facilities.

Revise Section 803 to the Standard Specifications to read:

IDOT traffic signal facilities are not part of any of the one-call locating service such as J.U.L.I.E or Digger. If this Contract requires the services of an Electrical Contractor, the Contractor shall be responsible at his/her own expense for locating existing IDOT electrical facilities prior to performing any work. If this Contract does not require the services of an Electrical Contractor, the Contractor may request one free locate for existing IDOT electrical facilities from the District One Electrical Maintenance Contractor prior to the start of any work. Additional requests may be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities, locally owned equipment, and leased enforcement camera system facilities, the local Counties or Municipalities may need to be contacted: in the City of Chicago contact Digger at (312) 744-7000 and for all other locations contact J.U.L.I.E. at 1-800-892-0123 or 811.

Restoration of Work Area.

Add the following article to Section 801 of the Standard Specifications:

801.17 Restoration of work area. Restoration of the traffic signal work area shall be included in the related pay items such as foundation, conduit, handhole, underground raceways, etc. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be replaced in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded. All brick pavers disturbed in the work area shall be restored to their original configuration as directed by the Engineer. All damaged brick pavers shall be replaced with a comparable material approved by the Engineer. Restoration of the work area shall be included in the contract without any extra compensation allowed to the Contractor.

Bagging Signal Heads.

Light tan colored traffic and pedestrian signal reusable covers shall be used to cover dark/un-energized signal sections and visors. Covers shall be made of outdoor fabric with urethane coating for repelling water, have elastic fully sewn around the cover ends for a tight fit over the visor, and have a minimum of two straps with buckles to secure the cover to the backplate. A center mesh strip allows viewing without removal for signal status testing purposes. Covers shall include a message indicating the signal is not in service.

OPTIMIZE TRAFFIC SIGNAL SYSTEM

Effective: May 22, 2002

Revised: July 1, 2015

800.02TS

Description.

This work shall consist of optimizing a closed loop traffic signal system.

OPTIMIZE TRAFFIC SIGNAL SYSTEM applies when a new or existing closed loop traffic signal system is to be optimized and a formal Signal Coordination and Timing (SCAT) Report is to be prepared. The purpose of this work is to improve system performance by optimizing traffic signal timings, developing a time of day program and a traffic responsive program.

After the signal improvements are completed, the signal system shall be optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as noted herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank a CD, copies of computer simulation files for the existing optimized system and a timing database that includes intersection displays will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) The following tasks are associated with OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Appropriate signal timings and offsets shall be developed for each intersection and appropriate cycle lengths shall be developed for the closed loop signal system.
2. Traffic counts shall be taken at all intersections after the permanent traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday and on a Saturday or Sunday, as directed by the Engineer, to account for special traffic generators such as shopping centers, educational

institutes and special event facilities. The turning movement counts shall identify cars, and single-unit and multi-unit heavy vehicles.

3. As necessary, the intersections shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.
 4. A traffic responsive program shall be developed, which considers both volume and occupancy. A time-of-day program shall be developed for used as a back-up system.
 5. Proposed signal timing plan for the new or modified intersection shall be forwarded to IDOT for review prior to implementation.
 6. Consultant shall conduct on-site implementation of the timings and make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations. The consultant shall respond to IDOT comments and public complaints for a minimum period of 90 days from date of timing plan implementation.
 7. Speed and delay studies shall be conducted during each of the count periods along the system corridor in the field before and after implementation of the proposed timing plans for comparative evaluations. These studies should utilize specialized electronic timing and measuring devices.
- (b) The following deliverables shall be provided for OPTIMIZE TRAFFIC SIGNAL SYSTEM.
1. Consultant shall furnish to IDOT one (1) copy of a SCAT Report for the optimized system. The SCAT Report shall include the following elements:

<p>Cover Page in color showing a System Map</p> <p>Figures</p> <ol style="list-style-type: none"> 1. System overview map – showing system number, system schematic map with numbered system detectors, oversaturated movements, master location, system phone number, cycle lengths, and date of completion. 2. General location map in color – showing signal system location in the metropolitan area. 3. Detail system location map in color – showing cross street names and local controller addresses. 4. Controller sequence – showing controller phase sequence diagrams.
<p>Table of Contents</p> <p>Tab 1: Final Report</p> <ol style="list-style-type: none"> 1. Project Overview 2. System and Location Description (Project specific) 3. Methodology 4. Data Collection 5. Data Analysis and Timing Plan Development 6. Implementation <ol style="list-style-type: none"> a. Traffic Responsive Programming (Table of TRP vs. TOD Operation) with am, md, and pm cycle lengths 7. Evaluation <ol style="list-style-type: none"> a. Speed and Delay runs
<p>Tab 2. Turning Movement Counts</p> <ol style="list-style-type: none"> 1. Turning Movement Counts (Showing turning movement counts in the intersection diagram for each period, including truck percentage)
<p>Tab 3. Synchro Analysis</p> <ol style="list-style-type: none"> 1. AM: Time-Space diagram in color, followed by intersection Synchro report (Timing report) summarizing the implemented timings. 2. Midday: same as AM 3. PM: same as AM 4. Special weekend or off-peak traffic generators (shopping centers, educational facilities, arenas, etc.): same as AM
<p>Tab 4: Speed, Delay Studies</p> <ol style="list-style-type: none"> 1. Summary of before and after runs results in two (2) tables showing travel time and delay time. 2. Plot of the before and after runs diagram for each direction and time period.
<p>Tab 5: Environmental Report</p> <ol style="list-style-type: none"> 1. Environmental impact report including gas consumption, NO2, HCCO, improvements.
<p>Tab 6: Electronic Files</p> <ol style="list-style-type: none"> 1. Two (2) CDs for the optimized system. The CDs shall include the following elements: <ol style="list-style-type: none"> a. Electronic copy of the SCAT Report in PDF format b. Copies of the Synchro files for the optimized system c. Traffic counts for the optimized system d. New or updated intersection graphic display files for each of the system intersections and the system graphic display file including system detector locations and addresses.

Basis of Payment.

The work shall be paid for at the contract unit each for OPTIMIZE TRAFFIC SIGNAL SYSTEM, which price shall be payment in full for performing all work described herein for the entire traffic signal system. Following the completion of traffic counts, 25 percent of the bid price will be paid. Following the completion of the Synchro analysis, 25 percent of the bid price will be paid. Following the setup and fine tuning of the timings, the speed-delay study, and the TRP programming, 25 percent of the bid price will be paid. The remaining 25 percent will be paid when the system is working to the satisfaction of the engineer and an approved report and CD have been submitted.

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM

Effective: May 22, 2002

Revised: July 1, 2015

800.03TS

Description.

This work shall consist of re-optimizing a closed loop traffic signal system according to the following Levels of work.

LEVEL I applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system. The purpose of this work is to integrate the improvements to the subject intersection into the signal system while minimizing the impacts to the existing system operation. This type of work would be commonly associated with the addition of signal phases, pedestrian phases, or improvements that do not affect the capacity at an intersection.

LEVEL II applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system and detailed analysis of the intersection operation is desired by the engineer, or when a new signalized or existing signalized intersection is being added to an existing system, but optimization of the entire system is not required. The purpose of this work is to optimize the subject intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the traffic responsive program.

For the purposes of re-optimization work, an intersection shall include all traffic movements operated by the subject controller and cabinet.

After the signal improvements are completed, the signal shall be re-optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank computer discs, copies of computer simulation files for the existing optimized system and a timing database will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
 - a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
 - b. Proposed signal timing plan for the modified intersection(s) shall be forwarded to IDOT for review prior to implementation.
 - c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations. The consultant shall respond to IDOT comments and public complaints for a minimum period of 60 days from date of timing plan implementation.

2. The following deliverables shall be provided for LEVEL I Re-Optimization.
 - a. Consultant shall furnish to IDOT a cover letter describing the extent of the re-optimization work performed.
 - b. Consultant shall furnish an updated intersection graphic display for the subject intersection to IDOT and to IDOT's Traffic Signal Maintenance Contractor.
- (b) LEVEL II Re-Optimization
1. In addition to the requirements described in the LEVEL I Re-Optimization above, the following tasks are associated with LEVEL II Re-Optimization.
 - a. Traffic counts shall be taken at the subject intersection(s) after the traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday and on a Saturday and/or Sunday, as directed by the Engineer, to account for special traffic generators such as shopping centers, educational institutes and special event facilities. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.
 - b. As necessary, the intersection(s) shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.
 - c. Traffic responsive program operation shall be evaluated to verify proper pattern selection and lack of oscillation and a report of the operation shall be provided to IDOT.
 2. The following deliverables shall be provided for LEVEL II Re-Optimization.
 - a. Consultant shall furnish to IDOT one (1) copy of a technical memorandum for the optimized system. The technical memorandum shall include the following elements:
 - (1) Brief description of the project
 - (2) Printed copies of the analysis output from Synchro (or other appropriate, approved optimization software file)
 - (3) Printed copies of the traffic counts conducted at the subject intersection
 - b. Consultant shall furnish to IDOT two (2) CDs for the optimized system. The CDs shall include the following elements:
 - (1) Electronic copy of the technical memorandum in PDF format
 - (2) Revised Synchro files (or other appropriate, approved optimization software file) including the new signal and the rest of the signals in the closed loop system
 - (3) Traffic counts conducted at the subject intersection(s)
 - (4) New or updated intersection(s) graphic display file for the subject intersection(s)
 - (5) The CD shall be labeled with the IDOT system number and master location, as well as the submittal date and the consultant logo. The CD case shall include a clearly readable label displaying the same information securely affixed to the side and front.

Basis of Payment.

This work shall be paid for at the contract unit price each for RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL I or RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL II, which price shall be payment in full for performing all work described herein per intersection. Following completion of the timings and submittal of specified deliverables, 100 percent of the bid price will be paid. Each intersection will be paid for separately.

SERVICE INSTALLATION (TRAFFIC SIGNALS)

Effective: May 22, 2002

Revised: June 15, 2016

805.01TS

Revise Section 805 of the Standard Specifications to read:

Description.

This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

General.

The electric service installation shall be the electric service disconnecting means and it shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of contract preparation. The Contractor must request in writing for service and/or service modification within 10 days of contract award and must follow-up with the electric utility to assure all necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the contractor and utility company to the Engineer and Area Traffic Signal Maintenance and Operations Engineer. The service agreement and sketch shall be submitted for signature to the IDOT's Traffic Operations Programs Engineer.

Materials.

- a. General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.
- b. Enclosures.
 1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080-inch (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14-inches (350 mm) high, 9-inches (225 mm) wide and 8-inches (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the vendor.
 2. Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125-inch (3.175 mm) thick, the top 0.250-inch (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075-inch (1.91 mm) thick hinge bolted to the cabinet with stainless steel carriage bolts and nylocks nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40-inches (1000 mm) high, 16-inches (400 mm) wide and 15-inches (375 mm) in depth is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.
 3. All enclosures shall include a green external power indicator LED light with circuitry as shown in the Electrical Service-Panel Diagram detail sheet. For pole mounted service enclosures, the power indicator light shall be mounted as shown in the detail. For ground mounted enclosures, the power indicator light shall be mounted on the side of the enclosure most visible from the major roadway.

- c. Electric Utility Meter Housing and Riser. The electric meter housing and meter socket shall be supplied and installed by the contractor. The contractor is to coordinate the work to be performed and the materials required with the utility company to make the final connection at the power source. Electric utility required risers, weather/service head and any other materials necessary for connection shall also be included in the pay item. Materials shall be in accordance with the electric utility's requirements. For ground-mounted service, the electric utility meter housing shall be mounted to the enclosure. The meter shall be supplied by the utility company. Metered service shall not be used unless specified in the plans.
- d. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120 volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of -40C to +85C. The surge protector shall be UL 1449 Listed.
- e. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.
- f. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.
- g. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar, mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.
- h. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30 day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company marketing representative for service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.
- i. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10 feet (3.0m) in length, and 3/4 inch (20mm) in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the contract.

Installation.

- a. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.
- b. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.
- c. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless steel nuts and

washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment.

The service installation shall be paid for at the contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The CONCRETE FOUNDATION, TYPE A, which includes the ground rod, shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4 inch (20mm) grounding conduit, ground rod, and pole mount assembly. Any charges by the utility companies shall be approved by the engineer and paid for as an addition to the contract according to Article 109.05 of the Standard Specifications.

GROUNDING OF TRAFFIC SIGNAL SYSTEMS

Effective: May 22, 2002

Revised: July 1, 2015

806.01TS

Revise Section 806 of the Standard Specifications to read:

General.

All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. This work shall be in accordance with IDOT's District One Traffic Signal Design Details.

The grounding electrode system shall include a ground rod installed with each traffic signal controller concrete foundation and all mast arm and post concrete foundations. An additional ground rod will be required at locations where measured resistance exceeds 25 ohms. Ground rods are included in the applicable concrete foundation or service installation pay item and will not be paid for separately.

Testing shall be according to Article 801.13 (a) (4) and (5).

- (a) The grounded conductor (neutral conductor) shall be white color coded. This conductor shall be bonded to the equipment grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.
- (b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications.
 - 1. Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.
 - 2. Equipment grounding conductors shall be bonded, using a UL Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A UL listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations including spare or empty conduits.
 - 3. All metallic and non-metallic raceways shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.
 - 4. Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.

- (c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, UL listed pressure connectors, and UL listed clamps .

COILABLE NON-METALLIC CONDUIT

Effective: May 22, 2002

Revised: July 1, 2015

810.01TS

Description.

This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC).

General.

The CNC installation shall be in accordance with Sections 810 and 811 of the Standard Specifications except for the following:

Add the following to Article 810.03 of the Standard Specifications:

CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes.

Add the following to Article 811.03 of the Standard Specifications:

On temporary traffic signal installations with detector loops, CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways from the saw-cut to 10 feet (3m) up the wood pole, unless otherwise shown on the plans

Basis of Payment.

All installations of CNC for loop detection shall be included in the contract and not paid for separately.

UNDERGROUND RACEWAYS

Effective: May 22, 2002

Revised: July 1, 2015

810.02TS

Revise Article 810.04 of the Standard Specifications to read:

“Installation. All underground conduits shall have a minimum depth of 30-inches (700 mm) below the finished grade.”

Add the following to Article 810.04 of the Standard Specifications:

“All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans.”

Add the following to Article 810.04 of the Standard Specifications:

“All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum or 300 mm (12”) or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped.

The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap.

The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125") thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring."

ROD AND CLEAN EXISTING CONDUIT

Effective: January 1, 2015

Revised: July 1, 2015

810.03TS

Description.

This work shall 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 in the conduit system at the location(s) shown on the plans. The duct rod may be inserted and removed by any standard construction method which causes no damage to the conduit. The size of the conduit may vary, but there shall be no differentiation in cost for the size of the conduit.

The conduit which is to be rodded and cleaned may exist with various amounts of standing water in the handholes to drain the conduit and to afford compatible working conditions for the installation of the duct rods and/or cables. Pumping of handholes shall be included with the work of rodding and cleaning of the conduit.

Any handhole which, in the opinion of the Engineer contains excessive debris, dirt or other materials to the extent that conduit rodding and cleaning is not feasible, shall be cleaned at the Engineer's order and payment approval as a separate pay item.

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 shall 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 shall 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 conduit, the conduit must be excavated and repaired. The existence and location of breaks in the conduit may be determined by rodding, but the excavation and repair work required will be paid for separately.

This work shall be measured per lineal foot for each conduit cleaned. Measurements shall be made from point to point horizontally. No vertical rises shall count in the measurement.

Basis of Payment.

This work shall be paid for at the contract unit price per lineal foot for ROD AND CLEAN EXISTING CONDUIT for the installation of new electric cables in existing conduits. Such price shall include the furnishing of all necessary tools, equipment, and materials required to prepare a conduit for the installation of cable.

HANDHOLES

Effective: January 01, 2002

Revised: July 1, 2018

814.01TS

Description.

Add the following to Section 814 of the Standard Specifications:

All conduits shall enter the handhole at a depth of 30 inches (762 mm) except for the conduits for detector loops when the handhole is less than 5 feet (1.52 m) from the detector loop. All conduit ends should be sealed with a waterproof sealant to prevent the entrance of contaminants into the handhole.

Steel cable hooks shall be coated with hot-dipped galvanization in accordance with AASHTO Specification M111. Hooks shall be a minimum of 1/2 inch (13 mm) diameter with two 90 degree bends and extend into the handhole at least 6 inches (152 mm). Hooks shall be placed a minimum of 12 inches (305 mm) below the lid or lower if additional space is required.

Precast round handholes shall not be used unless called out on the plans.

The cover of the handhole frame shall be labeled "Traffic Signals" with legible raised letters. Only handholes serving IDOT traffic signal equipment shall have this label. Handhole covers for Red Light Running Cameras shall be labeled "RLRC".

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, or precast concrete units. Heavy duty handholes shall be either cast-in-place or precast concrete 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."

Cast-In-Place Handholes.

All cast-in-place handholes shall be concrete, with inside dimensions of 21-1/2 inches (546 mm) minimum. Frames and lid openings shall match this dimension.

For grounding purposes the handhole frame shall have provisions for a 7/16 inch (11 mm) diameter stainless steel bolt cast into the frame. The covers shall have a stainless steel threaded stint extended from the eye hook assembly for the purpose of attaching the grounding conductor to the handhole cover.

The minimum wall thickness for heavy duty hand holes shall be 12 inches (305mm).

Precast Round Handholes.

All precast handholes shall be concrete, with inside dimensions of 30 inches (762mm) diameter. Frames and covers shall have a minimum opening of 26 inches (660mm) and no larger than the inside diameter of the handhole.

For grounding purposes the handhole frame shall have provisions for a 7/16 inch (11 mm) diameter stainless steel bolt cast into the frame. For the purpose of attaching the grounding conductor to the handhole cover, the covers shall either have a 7/16 inch (11 mm) diameter stainless steel bolt cast into the cover or a stainless steel threaded stint extended from an eye hook assembly. A hole may be drilled for the bolt if one cannot be cast into the frame or cover. The head of the bolt shall be flush or lower than the top surface of the cover.

The minimum wall thickness for precast heavy duty hand holes shall be 6 inches (152 mm).

Precast round handholes shall be only produced by an approved precast vendor.

Materials.

Add the following to Section 1042 of the Standard Specifications:

“1042.17 Precast Concrete Handholes. Precast concrete handholes shall be according to Articles 1042.03(a)(c)(d)(e).”

FIBER OPTIC TRACER CABLE

Effective: May 22, 2002

Revised: July 1, 2015

817.02TS

The cable shall meet the requirements of Section 817 of the Standard Specifications, except for the following:

Add the following to Article 817.03 of the Standard Specifications:

In order to trace the fiber optic cable after installation, the tracer cable shall be installed in the same conduit as the fiber optic cable in locations shown on the plans. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a barrier type terminal strip mounted on the side wall of the controller cabinet. The barrier type terminal strip and tracer cable shall be clearly marked and identified. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable will be allowed to be spliced at handholes only. The tracer cable splice shall use a Western Union Splice soldered with resin core flux and shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. All exposed surfaces of the solder shall be smooth. The splice shall be covered with a black shrink tube meeting UL 224 guidelines, Type V and rated 600V, minimum length 4 inches (100 mm) and with a minimum 1 inch (25 mm) coverage over the XLP insulation, underwater grade.

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C per foot (meter), which price shall include all associated labor and material for installation.

**MAINTENANCE OF EXISTING TRAFFIC SIGNAL AND FLASHING BEACON
INSTALLATION**

Effective: May 22, 2002

Revised: July 1, 2015

850.01TS

General.

1. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof. If Contract work is started prior to a traffic signal inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection.
2. The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance. A copy of the certification shall be immediately available upon request of the Engineer.
3. This item shall include maintenance of all traffic signal equipment and other connected and related equipment such as flashing beacons, emergency vehicle pre-emption equipment, master controllers, uninterruptable power supply (UPS and batteries), PTZ cameras, vehicle detection,

handholes, lighted signs, telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment.

4. Regional transit, County and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as PTZ cameras, switches, transit signal priority (TSP and BRT) servers, radios and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.
5. Maintenance shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment. This equipment is operated and maintained by the local municipality and should be de-activated while on contractor maintenance.
6. The energy charges for the operation of the traffic signal installation shall be paid for by the Contractor.

Maintenance.

1. The Contractor shall check all controllers every two (2) weeks, which will include visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. The Contractor shall check signal system communications and phone lines to assure proper operation. This item includes, as routine maintenance, all portions of emergency vehicle pre-emption equipment. The Contractor shall maintain in stock at all times a sufficient amount of materials and equipment to provide effective temporary and permanent repairs. Prior to the traffic signal maintenance transfer, the contractor shall supply a detailed maintenance schedule that includes dates, locations, names of electricians providing the required checks and inspections along with any other information requested by the Engineer.
2. The Contractor is advised that the existing and/or span wire traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shut down the traffic signal installation will only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.
3. The Contractor shall provide immediate corrective action when any part or parts of the system fail to function properly. Two far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected or otherwise removed from normal operation, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall be required to place stop signs (R1-1-36) at each approach of the intersection as a temporary means of regulating traffic. When the signals operate in flash, the Contractor shall furnish and equip all their vehicles assigned to the maintenance of traffic signal installations with a sufficient number of stop signs as specified herein. The Contractor shall maintain a sufficient number of spare stop signs in stock at all times to replace stop signs which may be damaged or stolen.
4. The Contractor shall provide the Engineer with 2 (two) 24 hour telephone numbers for the maintenance of the traffic signal installation and for emergency calls by the Engineer.
5. Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of the Standard Specifications and these special provisions.
6. The Contractor shall respond to all emergency calls from the Department or others within one (1) hour after notification and provide immediate corrective action. When equipment has been

damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the contract. The Contractor may institute action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the State's Electrical Maintenance Contractor perform the maintenance work. The Contractor shall be responsible for all of the State's Electrical Maintenance Contractor's costs and liquidated damages of \$1000 per day per occurrence. The State's Electrical Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the Electrical Maintenance Contractor to make reviews of the Existing Traffic Signal Installation that has been transferred to the Contractor for Maintenance.

7. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.
8. Equipment included in this item that is damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed.
9. Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause, shall be the responsibility of the municipality or the Automatic Traffic Enforcement Company per Permit agreement.
10. The Contractor shall be responsible to clear snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.
11. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be paid for separately but shall be included in the contract.
12. Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Basis of Payment.

This work will be paid for at the contract unit price per each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION. Each intersection will be paid for separately. Maintenance of a standalone and

or not connected flashing beacon shall be paid for at the contract unit price for MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION. Each flashing beacon will be paid for separately.

TRAFFIC SIGNAL PAINTING

Effective: May 22, 2002

Revised: July 1, 2015

851.01TS

Description.

This work shall include surface preparation, powder coated finish application and packaging of new galvanized steel traffic signal mast arm poles and posts assemblies. All work associated with applying the painted finish shall be performed at the vendor's facility for the pole assembly or post or at a painting facility approved by the Engineer. Traffic signal mast arm shrouds and post bases shall also be painted the same color as the pole assemblies and posts.

Surface Preparation.

All weld flux and other contaminants shall be mechanically removed. The traffic mast arms and post assemblies shall be degreased, cleaned, and air dried to assure all moisture is removed.

Painted Finish.

All galvanized exterior surfaces shall be coated with a urethane or triglycidyl isocyanurate (TGIC) polyester powder to a dry film thickness of 2.0 mils. Prior to application, the surface shall be mechanically etched by brush blasting (Ref. SSPC-SP7) and the zinc coated substrate preheated to 450 °F for a minimum one (1) hour. The coating shall be electrostatically applied and cured by elevating the zinc-coated substrate temperature to a minimum of 400 °F.

The finish paint color shall be one of the vendor's standard colors and shall be as selected by the local agency responsible for paint costs. The Contractor shall confirm, in writing, the color selection with the local responsible agency and provide a copy of the approval to the Engineer and a copy of the approval shall be included in the material catalog submittal.

Painting of traffic signal heads, pedestrian signal heads and controller cabinets is not included in this pay item.

Any damage to the finish after leaving the vendor's facility shall be repaired to the satisfaction of the Engineer using a method recommended by the vendor and approved by the Engineer. If while at the vendor's facility the finish is damaged, the finish shall be re-applied at no cost to the contract.

Warranty.

The Contractor shall furnish in writing to the Engineer, the paint vendor's standard warranty and certification that the paint system has been properly applied.

Packaging.

Prior to shipping, the poles and posts shall be wrapped in ultraviolet-inhibiting plastic foam or rubberized foam.

Basis of Payment.

This work shall be paid for at the contract unit price each for PAINT NEW MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, PAINT NEW COMBINATION MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW COMBINATION MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, or PAINT NEW TRAFFIC SIGNAL POST of the length specified, which shall be payment in full for painting and packaging the traffic signal mast arm poles and posts described above including all shrouds, bases and appurtenances.

FULL-ACTUATED CONTROLLER (SPECIAL)

Effective: September 26, 1995
Revised: November 1, 2020
857.01TS

Description.

This work shall consist of furnishing and installing a(n) "_____" brand traffic actuated solid state digital controller meeting the requirements of the current District One Traffic Signal Special Provisions 857.02TS Full Actuated Controller and Cabinet, and 857.02TS Railroad, Full Actuated Controller and Cabinet. This pay item shall include furnishing and installing the controller complete including malfunction management unit, load switches and flasher relays, and all necessary connections for proper operation.

Materials.

Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant, Econolite Cobalt (Graphics Edition) or Eagle/Siemens M60 unless specified otherwise on the plans or elsewhere on these specifications. A NTCIP compliant controller may be used at a traffic signal interconnected to railroad warning devices but only upon the approval of the Engineer. Only controllers supplied by one of the District One approved closed loop equipment supplier will be allowed. The controller shall be the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON and include data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events.

Basis of Payment.

This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER (SPECIAL).

FULL-ACTUATED CONTROLLER AND CABINET

Effective: January 1, 2002
Revised: November 1, 2020
857.02TS

Description.

This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications, as modified herein, including malfunction management unit, load switches and flasher relays, with all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "_____" brand traffic actuated solid state controller.

Materials.

Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt (Graphics Edition) or Eagle/Siemens M60 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment suppliers will be allowed. Unless specified otherwise on the plans or these specifications, the controller shall be of the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON. A removable controller data key shall also be provided. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events and shall inhibit simultaneous display of circular

yellow and yellow arrow indications.

For integration into an ATMS such as Centracs, Tactics, or TransSuite, the controller shall have the latest version of NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing close loop management communications.

Add the following to Article 1074.03 of the Standard Specifications:

- (a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.
- (b) (1) Revise "conflict monitor" to read "Malfunction Management Unit"
- (b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.
- (b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.
- (b) (7) Surge Protection – Shall be a 120VAC Single phase Modular filter Plug-in type, supplied from an approved vendor.
- (b) (8) BIU – shall be secured by mechanical means.
- (b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.
- (b) (10) Switch Guards – All switches shall be guarded.
- (b) (11) Heating – One (1) 200 watt, thermostatically-controlled, electric heater.
- (b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a door switch. The LED Panels shall be provided from an approved vendor.
- (b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches (610mm) wide.
- (b) (14) Plan & Wiring Diagrams – 12" x 15" (305mm x 406mm) moisture sealed container attached to door.
- (b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.
- (b) (16) Field Wiring Labels – All field wiring shall be labeled.
- (b) (17) Field Wiring Termination – Approved channel lugs required.
- (b) (18) Power Panel – Provide a nonconductive shield.
- (b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.
- (b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.

Basis of Payment.

This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET; FULL-ACTUATED CONTROLLER AND TYPE V CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET; FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET (SPECIAL); FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET (SPECIAL).

RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET

Effective: January 1, 2002

Revised: November 1, 2020

857.03TS

Description.

This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications as modified herein and including conflict monitor or MMU, load switches and flasher relays, with interlock function to the railroad preemptor and all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) " _____ " brand traffic actuated solid state controller.

Controller and cabinet shall be assembled only by an approved IDOT District One traffic signal equipment supplier. The equipment shall be tested and approved in the equipment supplier's District One's facility prior to field installation.

Materials.

Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt (Graphics Edition) or Eagle/Siemens M60 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment supplier will be allowed. The controller shall be the most recent model and software version approved by IDOT for use with railroad intersections supplied by the equipment supplier at the time of the traffic signal TURN-ON unless specified otherwise on plans or this specification, and include a removable data key. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

For integration into an ATMS such as Centrats, Tactics, or TransSuite, the controller shall have the latest version of NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing communications.

Controller shall comply with Article 1073.01 as amended herein.

Controller Cabinet and Peripheral Equipment shall comply with Article 1074.03 as amended in these Traffic Signal Special Provisions.

Add the following to Articles 1073.01 (c) (2) and 1074.03 (a) (5) (e) of the Standard Specifications:

Controllers and cabinets shall be new and NEMA TS2 Type 1 or NEMA TS2 Type 2 design.

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. All railroad interconnected (including temporary railroad interconnect) controllers and cabinets shall be new, built, tested and approved by the controller equipment vendor, in the vendor's District One facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

Add the following to Article 1074.03 of the Standard Specifications:

- (a) (6) Cabinets shall be designed for NEMA TS2 Type 1 or NEMA TS2 Type 2 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.
- (b) (1) Revise "conflict monitor" to read "Malfunction Management Unit"
- (b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.
- (b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.
- (b) (7) Surge Protection – Shall be a 120VAC Single phase Modular filter Plug-in type, supplied from an approved vendor.
- (b) (8) BIU – shall be secured by mechanical means.
- (b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.
- (b) (10) Switch Guards – All switches shall be guarded.
- (b) (11) Heating – One (1) 200 watt, thermostatically-controlled, electric heater.
- (b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a door switch. The LED Panels shall be provided from an approved vendor.
- (b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches (610mm) wide.
- (b) (14) Plan & Wiring Diagrams – 12" x 15" (3.05mm x 4.06mm) moisture sealed container attached to door.
- (b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.
- (b) (16) Field Wiring Labels – All field wiring shall be labeled.
- (b) (17) Field Wiring Termination – Approved channel lugs required.
- (b) (18) Power Panel – Provide a nonconductive shield.
- (b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.
- (b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.
- (b) (21) Railroad Pre-Emption Test Switch – Shall be provided from an approved vendor

Installation.

Add the following to Article 857.03 of the Standard Specifications:

The Contractor shall arrange to install a standard voice-grade dial-up telephone line and all equipment to dial into the controller and have the controller dial out to the RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET as called for on the traffic signal installation plans. If the traffic signal installation is part of a traffic signal system, a telephone line is usually not required, unless a telephone line is called for on the traffic signal plans. The Contractor shall follow the requirements for the telephone service installation as contained in the current District One Traffic Signal Special Provision for Master Controller.

Basis of Payment.

This work will be paid for at the contract unit price each for RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE IV CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE V CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER P

CABINET (SPECIAL) or RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET (SPECIAL).

MASTER CONTROLLER

Effective: May 22, 2002

Revised: January 1, 2019

860.01TS

General.

This work shall consist of furnishing and installing a master controller, meeting the requirements of the current District One Traffic Signal Special Provisions 857.01TS FULL-ACTUATED CONTROLLER (SPECIAL), 857.02TS FULL-ACTUATED CONTROLLER AND CABINET, and 857.02TS RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET, including all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) " _____ " brand master controller.

Materials and Installation.

Revise Articles 860.02 and 860.03 of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment supplier will be allowed. Only NEMA TS 2 Type 1 Eagle/Siemens and Econolite closed loop systems shall be supplied. The latest model and software version of master controller shall be supplied.

Functional requirements in addition to those in Section 863 of the Standard Specifications include:

The system commands shall consist of, as a minimum, six (6) cycle lengths, five (5) offsets, three (3) splits, and four (4) special functions. The system commands shall also include commands for free or coordinated operation.

Traffic Responsive operation shall consist of the real time acquisition of system detector data, data validation, and the scaling of acquired volumes and occupancies in a deterministic fashion so as to cause the selection and implementation of the most suitable traffic plan.

Upon request by the Engineer, each master shall be delivered with up to three (3) complete sets of the latest edition of registered remote monitoring software with full manufacture's support. Each set shall consist of software on CD, DVD, or other suitable media approved by the Engineer, and a bound set of manuals containing loading and operating instruction. One copy of the software and support data shall be delivered to the Agency in charge of system operation, if other than IDOT. One of these two sets will be provided to the Agency Signal Maintenance Contractor for use in monitoring the system.

The approved manufacturer of equipment shall loan the District one master controller and two intersection controllers of the most recent models and the newest software version to be used for instructional purposes in addition to the equipment to be supplied for the Contract.

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the master controller. This shall be accomplished through the following process utilizing District One staff. This telephone line may be coupled with a DSL line and a phone filter to isolate the dial-up line. An E911 address is required.

The cabinet shall be provided with an Outdoor Network Interface for termination of the telephone service. It shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service at a later date.

Full duplex communication between the master and its local controllers is recommended, but at this time not required. The data rate shall be 1200 baud minimum and shall be capable of speeds to 38,400 or above as technology allows. The controller, when installed in an Ethernet topology, may operate non-serial communications.

The cabinet shall be equipped with a 9600 baud, auto dial/auto answer modem. It shall be a US robotics 33.6K baud rate or equal.

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact Teresa Caldwell, Business Services Manager in the District One Business Services Section at (847) 705-4010 to request a phone line installation. A follow-up contact shall include all required information pertaining to the phone installation and should be made as soon as possible or within one week after the initial request has been made. A copy of this contact must be emailed by the Contractor to the Traffic Signal Systems Engineer. The required information to be supplied shall include (but not limited to): An E911 address for the new traffic signal controller (or nearby address); a nearby existing telephone number; what type of telephone service is needed; the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line will vary after the Business Services Section has received the Contractor's information and will depend on location and existing available facilities. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor as soon as possible. The contractor shall provide the Administrative Support Manager with an expected installation date

The telephone line shall be installed and activated one month before the system final inspection.

All costs associated with the telephone line installation and activation (not including the Contract specified conduit installation between the point of telephone service and the traffic signal controller cabinet) shall be paid for by the District One Business Services Section (i.e., this will be an IDOT phone number not a Contractor phone number).

Basis of Payment.

This work will be paid for at the contract unit price each for MASTER CONTROLLER or MASTER CONTROLLER (SPECIAL).

UNINTERRUPTABLE POWER SUPPLY, SPECIAL

Effective: January 1, 2013

Revised: May 19, 2016

862.01TS

This work shall be in accordance with section 862 of the Standard Specification except as modified herein

Add the following to Article 862.01 of the Standard Specifications:

The UPS shall have the power capacity to provide normal operation of a signalized intersection that utilizes all LED type signal head optics, for a minimum of 6 (six) hours.

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Add the following to Article 862.03 of the Standard Specifications:

The UPS shall additionally include, but not be limited to, a battery cabinet, where applicable. For Super-P (Type IV) and Super-R (Type V) cabinets, the battery cabinet is integrated to the traffic signal cabinet, and shall be included in the cost for the traffic signal cabinet of the size and type indicated on the plans.

The UPS shall provide reliable emergency power to the traffic signals in the event of a power failure or interruption.

Revise Article 862.04 of the Standard Specifications to read:

Installation.

When a UPS is installed at an existing traffic signal cabinet, the UPS cabinet shall partially rest on the lip of the existing controller cabinet foundation and be secured to the existing controller cabinet by means of at least four (4) stainless steel bolts. The UPS cabinet shall be completely enclosed with the bottom and back constructed of the same material as the cabinet.

When a UPS is installed at a new signal cabinet and foundation, it shall be mounted as shown on the plans.

At locations where UPS is installed and an Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron shall be provided and be in accordance with Articles 424 and 202 of the Standard Specifications. The concrete apron shall also, follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the UPS including the addition of alarms.

Materials.

Revise Article 1074.04(a)(1) of the Standard Specifications to read:

The UPS shall be line interactive or double conversion and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection(s) normal traffic signal operating load. The UPS must be able to maintain the intersection's normal operating load plus 20 percent (20%) of the intersection's normal operating load. When installed at a railroad-interconnected intersection the UPS must maintain the railroad pre-emption load, plus 20 percent (20%) of the railroad preemption-operating load. The total connected traffic signal load shall not exceed the published ratings for the UPS.

The UPS shall provide a minimum of 6 (six) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 1000 W active output capacity, with 86 percent minimum inverter efficiency).

Revise the first paragraph of Article 1074.04(a)(3) of the Standard Specifications to read:

The UPS shall have a minimum of four (4) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.

Revise Article 1074.04(a)(10) of the Standard Specifications to read:

The UPS shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation.

Revise Article 1074.04(a)(17) of the Standard Specifications to read:

When the intersection is in battery backup mode, the UPS shall bypass all internal cabinet lights, ventilation fans, cabinet heaters, service receptacles, luminaires, any lighted street name signs, any automated enforcement equipment and any other devices directed by the Engineer.

Revise Article 1074.04(b)(2)b of the Standard Specifications to read:

Batteries, inverter/charger and power transfer relay shall be housed in a separate NEMA Type 3R cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125-inch thick and have a natural mill finish.

Revise Article 1074.04(b)(2)c of the Standard Specifications to read:

No more than three batteries shall be mounted on individual shelves for a cabinet housing six batteries and no more than four batteries per shelf for a cabinet housing eight batteries.

Revise Article 1074.04(b)(2)e of the Standard Specifications to read:

The battery cabinet housing shall have the following nominal outside dimensions: a width of 25 in. (785 mm), a depth of 16 in. (440 mm), and a height of 41 to 48 in. (1.1 to 1.3 m). Clearance between shelves shall be a minimum of 10 in. (250 mm).

End of paragraph 1074.04(b)(2)e

The door shall be equipped with a two position doorstop, one a 90° and one at 120°.

Revise Article 1074.04(b)(2)g of the Standard Specifications to read:

The door shall open to the entire cabinet, have a neoprene gasket, an Aluminum continuous piano hinge with stainless steel pin, and a three point locking system. The cabinet shall be provided with a main door lock which shall operate with a traffic industry conventional No. 2 key. Provisions for padlocking the door shall be provided.

Add the following to Article 1074.04(b)(2) of the Standard Specifications:

j. The battery cabinet shall have provisions for an external generator connection.

Add the following to Article 1074.04(c) of the Standard Specifications:

- (8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.
- (9) The UPS shall include standard RS-232 and internal Ethernet interface.
- (10) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate. Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.
- (11) The bypass switch shall include an internal power transfer relay that allows removal of the battery back-up unit, while the traffic signal is connected to utility power, without impacting normal traffic signal operation.

Revise Article 1074.04(d)(3) of the Standard Specifications to read:

All batteries supplied in the UPS shall be either gel cell or AGM type, deep cycle, completely sealed, prismatic lead calcium based, silver alloy, valve regulated lead acid (VRLA) requiring no maintenance. All batteries in a UPS installation shall be the same type; mixing of gel cell and AGM types within a UPS installation is not permitted.

Revise Article 1074.04(d)(4) of the Standard Specifications to read:

Batteries shall be certified by the manufacturer to operate over a temperature range of -13 to 160 °F (-25 to + 71 °C) for gel cell batteries and -40 to 140 °F (-40 to + 60 °C) for AGM type batteries.

Add the following to Article 1074.04(d) of the Standard Specifications:

(9) The UPS shall consist of an even number of batteries that are capable of maintaining normal operation of the signalized intersection for a minimum of 6 (six) hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of four batteries shall be provided.

(10) Battery Heater mats shall be provided, when gel cell type batteries are supplied.

Add the following to the Article 1074.04 of the Standard Specifications:

(e) Warranty. The warranty for an uninterruptable power supply (UPS) and batteries (full replacement) shall cover a minimum of 5 years from date the equipment is placed in operation.

(f) Installation. Bypass switch shall completely disconnect the traffic signal cabinet from the utility provider.

(g) The UPS shall be set-up to run the traffic signal continuously, without going to a red flashing condition, when switched to battery power unless otherwise directed by the Engineer. The Contractor shall confirm set-up with the Engineer. The continuous operation mode when switched to battery may require modification to unit connections and these modifications are included in the unit price for this item.

Revise Article 862.05 of the Standard Specifications to read:

Basis of Payment.

This work will be paid for at the contract unit price per each for UNINTERRUPTABLE POWER SUPPLY, SPECIAL or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL. Replacement of Emergency Vehicle Priority System confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, SPECIAL or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item. The concrete apron and earth excavation required shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item.

UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED

Effective: January 1, 2012

Revised: July 1, 2015

862.02TS

This item shall consist of furnishing and installing an uninterruptable power supply. This item shall meet the same requirements as the current District One Traffic Signal Special Provision 862.01TS UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Installation.

The UPS shall be mounted on its own Type A square concrete foundation. The concrete foundation shall extend 2 inch past each side of the UPS cabinet and the edges shall have a continuous 1 inch chamfer at a 45 degree angle.

At locations where UPS is to be installed and Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron shall be provided with a dimension of 36 inches in front of the UPS cabinet, 5 inches deep, and a width sized appropriately to the width of the concrete foundation. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

This item shall include any required modifications to an existing traffic signal controller.

Basis of Payment.

This item will be paid for at the contract unit price each for UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED. Replacement of Emergency Vehicle Priority System confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED item. The concrete foundation, concrete apron and earth excavation required shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED item.

FIBER OPTIC CABLE

Effective: May 22, 2002

Revised: July 1, 2015

871.01TS

Add the following to Article 871.01 of the Standard Specifications:

The Fiber Optic cable shall be installed in conduit or as specified on the plans.

Add the following to Article 871.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be 24 Port Fiber Wall Enclosure, unless otherwise indicated on plans. The fiber optic cable shall provide twelve fibers per tube for the amount of fibers called for in the Fiber Optic Cable pay item in the Contract. Fiber Optic cable may be gel filled or have an approved water blocking tape.

Add the following to Article 871.04 of the Standard Specifications:

A minimum of six multimode fibers from each cable shall be terminated with approved mechanical connectors at the distribution enclosure. Fibers not being used shall be labeled "spare." Fibers not attached to the distribution enclosure shall be capped.. A minimum of 13.0 feet (4m) of extra cable length shall be provided for controller cabinets. The controller cabinet extra cable length shall be stored as directed by the Engineer.

Add the following to Article 871.06 of the Standard Specifications:

The distribution enclosure and all connectors will be included in the cost of the fiber optic cable.

Testing shall be in accordance with Article 801.13(d). Electronic files of OTDR signature traces shall be provided in the Final project documentation with certification from the Contractor that attenuation of each fiber does not exceed 3.5 dB/km nominal at 850nm for multimode fiber and 0.4 bd/km nominal at 1300nm for single mode fiber.

ELECTRIC CABLE

Effective: May 22, 2002
Revised: July 1, 2015
873.01TS

Delete "or stranded, and No. 12 or" from the last sentence of Article 1076.04 (a) of the Standard Specifications.

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

GROUNDING EXISTING HANDHOLE FRAME AND COVER

Effective: May 22, 2002
Revised: July 1, 2015
873.02TS

Description.

This work shall consist of all materials and labor required to bond the equipment grounding conductor to the existing handhole frame and handhole cover. All installations shall meet the requirements of the details in the "District One Standard Traffic Signal Design Details," and applicable portions of the Standard Specifications and District One Traffic Signal Special Provisions 806.01TS GROUNDING OF TRAFFIC SIGNAL SYSTEMS and 817.01TS GROUNDING CABLE.

The equipment grounding conductor shall be bonded to the handhole frame and to the handhole cover. Two (2) ½-inch diameter x 1 ¼-inch long hex-head stainless steel bolts, spaced 1.75-inches apart center-to-center shall be fully welded to the frame and to the cover to accommodate a heavy duty UL listed grounding compression terminal. The grounding compression terminal shall be secured to the bolts with stainless steel split-lock washers and nylon-insert locknuts.

Welding preparation for the stainless steel bolt hex-head to the frame and to the cover shall include thoroughly cleaning the contact and weldment area of all rust, dirt and contaminates. The Contractor shall assure a solid strong weld. The welds shall be smooth and thoroughly cleaned of flux and spatter. The grounding installation shall not affect the proper seating of the cover when closed.

The grounding cable shall be paid for separately.

Method of Measurement.

Units measured for payment will be counted on a per handhole basis, regardless of the type of handhole and its location.

Basis of Payment.

This work shall be paid for at the contract unit price each for GROUNDING EXISTING HANDHOLE FRAME AND COVER which shall be payment in full for grounding the handhole complete.

EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C

Effective: January 1, 2013
Revised: July 1, 2015
873.03TS

This work shall consist of furnishing and installing lead-in cable for light detectors installed at existing and/or proposed traffic signal installations as part of an emergency vehicle priority system. The work includes installation of the lead-in cables in existing and/or new conduit. The electric cable shall be shielded and have (3) stranded conductors, colored blue, orange, and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the vendor of the Emergency Vehicle Priority System Equipment.

Basis of Payment.

This work will be paid for at the contract unit price per foot for EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

RAILROAD INTERCONNECT CABLE

Effective: May 22, 2002

Revised: July 1, 2015

873.04TS

The cable shall meet the requirements of Section 873 of the Standard Specifications, except for the following:

Add to Article 873.02 of the Standard Specifications:

- c) The railroad interconnect cable shall be three conductor stranded #14 copper cable in a clear polyester binder, shielded with #36 AWG tinned copper braid with 85% coverage, and insulated with .016" polyethylene (black, blue, red). The jacket shall be black 0.045 PVC or polyethylene.

Add the following to Article 873.06 of the Standard Specifications:

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for ELECTRIC CABLE IN CONDUIT, RAILROAD, NO. 14 3C, which price shall be payment in full for furnishing, installing, and making all electrical connections in the traffic signal controller cabinet. Connections in the railroad controller cabinet shall be performed by railroad personnel.

TRAFFIC SIGNAL POST

Effective: May 22, 2002

Revised: November 01, 2018

875.01TS

Revise Article 1077.01 (c) of the Standard Specifications to read:

(c) Anchor Rods. The anchor rods shall be a minimum of 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

Revise the first sentence of Article 1077.01 (d) of the Standard Specifications to read:

All posts shall be steel and bases shall be cast iron. All posts and bases shall be hot dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

PEDESTRIAN SIGNAL POST

Effective: January 1, 2020

Revised:

875.02TS

Description.

This work shall consist of furnishing and installing a metal pedestrian signal post. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

Materials.

- j. General. The pedestrian signal post shall be designed to support the traffic signal loading shown on the plans. The design and fabrication shall be according to the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, as published by AASHTO.
- k. Post. The post shall be made of steel or aluminum and have an outside diameter of 4 1/2 in. The post shall be threaded for assembly to the base. Aluminum posts shall be according to the specifications for Schedule 80 aluminum pipe. Steel posts shall be according to the specifications for Schedule 40 steel pipe.
- l. Base. The base of a steel post shall be cast iron. The base of an aluminum post shall be aluminum. The base shall be threaded for the attachment to the threaded post. The base shall be approximately 10 in. high and 6 3/4 in. square at the bottom. The bottom of the base shall be designed to accept four 5/8 in. diameter anchor rods evenly spaced in a 6 in. diameter circle. The base shall be true to pattern, with sharp clean cutting ornamentation, and equipped with access doors for cable handling. The door shall be fastened to the base with stainless steel screws. A grounding lug shall be provided inside the base.
- m. Anchor Rods. The anchor rods shall be 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and trapezoidal washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

The aluminum post and base shall be drilled at the third points around the diameter and 1/4 in. by 2 in. stainless steel bolts shall be inserted to prevent the post from turning and wobbling.

- n. Finish. The steel post, steel post cap and the cast iron base shall be hot-dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions. If the post and the base are threaded after the galvanization, the bare exposed metal shall be immediately cleaned to remove all cutting solvents and oils, and then spray painted with two coats of an approved galvanized paint.

The aluminum post shall have a natural finish, 100 grit or finer.

Installation.

The pedestrian signal post shall be erected plumb, securely bolted to a concrete foundation, and grounded to a ground rod according to the details shown on the plans. No more than 3/4 in. of the post threads shall protrude above the base.

A post cap shall be furnished and installed on the top of the post. The post cap shall match the material of the post. The Contractor shall apply an anti-seize paste compound on all nuts and bolts prior to assembly.

Prior to the assembly, the Contractor shall apply two additional coats of galvanized paint on the threads of the post and the base. The Contractor shall use a fabric post tightener to screw the post to the base.

Basis of Payment.

This work will be paid for at the contract unit price per each for PEDESTRIAN SIGNAL POST, of the length specified.

MAST ARM ASSEMBLY AND POLE

Effective: May 22, 2002

Revised: July 01, 2015

877.01TS

Revise the second sentence of Article 1077.03 (a)(3) of the Standard Specifications to read:

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer.

Add the following to Article 1077.03 (a)(3) of the Standard Specifications:

If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

CONCRETE FOUNDATIONS

Effective: May 22, 2002

Revised: November 01, 2018

878.01TS

Add the following to Article 878.03 of the Standard Specifications:

All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. at the threaded end.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

Add the following to the first paragraph of Article 878.05 of the Standard Specifications:

The concrete apron in front of the cabinet and UPS shall be included in this pay item.

REMOVE AND REPLACE ANCHOR BOLTS

Effective: January 1, 2014

Revised: July 1, 2015

878.02TS

This item shall consist of replacing anchor rods at existing concrete foundations for traffic signal posts. At locations specified on the plans for new traffic signal post installation, the Contractor shall inspect the existing post foundations prior to removing the existing traffic signal post. The Contractor shall verify that the pattern, spacing, and condition of the existing anchor bolts are acceptable for reuse with a new post. The Contractor shall replace unacceptable anchor bolts as approved by the Engineer.

Anchor bolts shall be according to Article 1006.09 and shall be hot dipped galvanized.

Installation.

Existing anchor bolts shall be cut flush with the top of concrete foundation.

The bolt circle of the new anchor bolts shall be rotated a minimum of 2.5-inches away from the existing anchor bolts. New anchor bolts shall be $\frac{3}{4}$ -inch diameter with minimum 9-inch embedment into the existing concrete foundation and 3-inch threaded length above the top of foundation. New anchor bolts shall be installed using a HIT-RE 500 exposed adhesive anchoring system.

Method of Measurement.

The removal and replacement of anchor bolts will be measured for payment as per each foundation requiring anchor bolt replacement. This shall include all anchor bolts replaced, labor, equipment, and materials required for replacing anchor bolts at an existing foundation as specified herein.

Basis of Payment.

This item will be paid for at the contract unit price each for REMOVE AND REPLACE ANCHOR BOLTS.

CONCRETE FOUNDATION, PEDESTRIAN POST

Effective: April 1, 2019

Revised: November 1, 2020

878.03TS

This item shall follow Section 878. Traffic Signal Concrete Foundation of the Standard Specifications.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

Basis of Payment.

This work will be paid for at the contract unit price per foot of depth of CONCRETE FOUNDATION, TYPE A 12-INCH DIAMETER.

LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD

Effective: May 22, 2002

Revised: July 1, 2015

880.01TS

Materials.

Add the following to Section 1078 of the Standard Specifications:

1. LED modules proposed for use and not previously approved by IDOT District One will require independent testing for compliance to current VTCSEH-ITE standards for the product and be Intertek ETL Verified. This would include modules from new vendors and new models from IDOT District One approved vendors.
2. The proposed independent testing facility shall be approved by IDOT District One. Independent testing must include a minimum of two (2) randomly selected modules of each type of module (i.e. ball, arrow, pedestrian, etc.) used in the District and include as a minimum Luminous Intensity and Chromaticity tests. However, complete module performance verification testing may be required by the Engineer to assure the accuracy of the vendor's published data and previous test results. An IDOT representative will select sample modules from the local warehouse and mark the modules for testing. Independent test results shall meet current ITE standards and vendor's published data. Any module failures shall require retesting of the module type. All costs associated with the selection of sample modules, testing, reporting, and retesting, if applicable, shall be the responsibility of the LED module vendor and not be a cost to this contract.
3. All signal heads shall provide 12" (300 mm) displays with glossy yellow or black polycarbonate housings. All head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all signals heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to

the inspector at the signal turn-on. Post top mounting collars are required on all posts, and shall be constructed of the same material as the brackets.

4. The LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship or material defects within the first 7 years from the date of traffic signal TURN-ON. LED signal modules which exhibit luminous intensities less than the minimum values specified in Table 1 of the ITE Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement (June 27, 2005) [VTSCH], or applicable successor ITE specifications, or show signs of entrance of moisture or contaminants within the first 7 years of the date of traffic signal TURN-ON shall be replaced or repaired. The vendor's written warranty for the LED signal modules shall be dated, signed by a vendor's representative and included in the product submittal to the State.

(a) Physical and Mechanical Requirements

1. Modules can be manufactured under this specification for the following faces:
 - a. 12 inch (300 mm) circular, multi-section
 - b. 12 inch (300 mm) arrow, multi-section
2. The maximum weight of a module shall be 4 lbs. (1.8 kg).
3. Each module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.
5. The lens of the module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face. Polymeric lens shall provide a surface coating or chemical surface treatment applied to provide abrasion resistance. The lens of the module shall be integral to the unit, convex with a smooth outer surface and made of plastic. The lens shall have a textured surface to reduce glare.
6. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.
7. Each module shall have a symbol of the type of module (i.e. circle, arrow, etc.) in the color of the module. The symbol shall be 1 inch (25.4 mm) in diameter. Additionally, the color shall be written out in 1/2 inch (12.7mm) letters next to the symbol.

(b) Photometric Requirements

4. The LEDs utilized in the modules shall be AlInGaP technology for red and InGaN for green and amber indications, and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

(c) Electrical

1. Maximum power consumption for LED modules is per Table 2.
2. Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.
3. The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).

4. When a current of 20 mA AC (or less) is applied to the unit, the voltage read across the two leads shall be 15 VAC or less.
5. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.
6. LED arrows shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

(d) Retrofit Traffic Signal Module

1. The following specification requirements apply to the Retrofit module only. All general specifications apply unless specifically superseded in this section.
2. Retrofit modules can be manufactured under this specification for the following faces:
 - a. 12 inch (300 mm) circular, multi-section
 - b. 12 inch (300 mm) arrow, multi-section
3. Each Retrofit module shall be designed to be installed in the doorframe of a standard traffic signal housing. The Retrofit module shall be sealed in the doorframe with a one-piece EPDM (ethylene propylene rubber) gasket.
4. The maximum weight of a Retrofit module shall be 4 lbs. (1.8 kg).
5. Each Retrofit module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.
6. Electrical conductors for modules, including Retrofit modules, shall be 39.4 inches (1m) in length, with quick disconnect terminals attached.
7. The lens of the Retrofit module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

(e) The following specification requirements apply to the 12 inch (300 mm) arrow module only. All general specifications apply unless specifically superseded in this section.

1. The arrow module shall meet specifications stated in Section 9.01 of the Equipment and Material Standards of the Institute of Transportation Engineers (November 1998) [ITE Standards], Chapter 2 (Vehicle Traffic Control Signal Heads) or applicable successor ITE specifications for arrow indications.
2. The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.

(f) The following specification requirement applies to the 12 inch (300 mm) programmed visibility (PV) module only. All general specifications apply unless specifically superseded in this section.

1. The LED module shall be a module designed and constructed to be installed in a programmed visibility (PV) signal housing without modification to the housing.

Basis of Payment.

Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

Revise the second paragraph of Article 880.04 of the Standard Specifications to read:

If the work consists of retrofitting an existing polycarbonate traffic signal head with light emitting diodes (LEDs), it will be paid for as a SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for removal of the existing module, furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition. The type specified will indicate the number of signal faces, the number of signal sections in each signal face and the method of mounting.

FLASHING BEACON INSTALLATION, RELOCATION AND REMOVAL

Effective: January 1, 2007

Revised: July 1, 2015

880.02TS

This work shall consist of furnishing and installing a new flashing beacon installation, solar powered flashing beacon installation, relocation of existing flashing beacon, and/or the removal of the existing flashing beacon installation as shown on the plans and as described herein. The energy charges for the operation of the flashing beacon installation shall be paid for by the Department unless otherwise directed by the Engineer.

The installation, relocation and removal of flashing beacon installation shall be according to the applicable portions of Sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction and District 1 Flashing Beacon Installation Details except as revised herein. LED signal heads shall be as modified in 880.01TS LED SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD Special Provision.

- (a) Flashing Beacon Installation. This item shall consist of installing a post mounted 12 inch (300 mm) L.E.D. single section red or yellow flashing beacon on a new or existing post as shown on the plans or as directed by the Engineer. This item shall include furnishing and installing a flasher controller in an aluminum cabinet, or integrated within the signal head, 12 inch (300 mm) L.E.D. red or yellow signal section with a dimmer if required by the Engineer, and all other hardware necessary to complete the installation.
- (b) Solar Powered Flashing Beacon Installation. This item shall consist of installation of a solar powered flashing beacon, post mounted as shown on the plans or as directed by the Engineer. This item shall consist of furnishing and installing a 12 inch (300 mm) single red or yellow flashing module on a new or existing post as shown on the plans or as directed by the Engineer. This item shall included furnishing and installing a flasher controller that is integrated within the signal head, with discrete solar panels, LED module, battery, electronics, compact housing and be capable of operating 24 hours, 7 days a week. The flasher unit shall be installed on standard wood or metal posts. The flash pattern shall be MUTCD compliant and have alternate flash patterns available. The battery shall have a life span of a minimum of 5 years and be field replaceable. The battery and electronics may be located inside the solar panel housing or signal head. The sections of the flasher unit shall be secured with tamper resistant stainless steel hardware and unless otherwise noted, the housing shall be black in color.
- (c) Relocate Existing Flashing Beacon. Relocation of an existing flashing beacon installation, as shown on the plans or as directed by the Engineer, shall meet the above requirements. This work shall include the complete relocation of the existing flashing beacon installation, the backfilling of the holes created by the removal of the poles, restoration of the surface to match the adjoining area.

- (d) Remove Existing Flashing Beacon Installation Complete. Removal of an existing flashing beacon installation shall be as shown on the plans or as directed by the Engineer and shall be according to applicable portions of Section 895 of the Standard Specifications. This work shall include a complete removal of an existing flashing beacon installation, backfilling of the holes created by the removal of the poles and restoration of the surface to match the adjoining area. The flashing beacon installation will be removed only after the permanent signal installation is accepted for maintenance, or as directed by the Engineer.

Basis of Payment.

This work shall be paid for at the contract unit price each for FLASHING BEACON INSTALLATION; SOLAR POWERED FLASHING BEACON INSTALLATION; RELOCATE EXISTING FLASHING BEACON or REMOVE EXISTING FLASHING BEACON INSTALLATION COMPLETE. The price shall be payment in full for all labor and material necessary to complete the work described above.

LED SIGNAL FACE, LENS COVER

Effective: July 01, 2021
886.03TS

Description.

This work shall consist of furnishing and installing a signal lens cover with the purpose or preventing snow buildup on and around a signal lens allowing for clear indication during inclement weather.

This item shall fit over a 12 inch signal head lens and shall include the clear lens cover, attachment collar and any clips or fasteners necessary to fit it flush. The cover shall be installed in accordance with the manufacturer's instructions and in a manner that prevents dust, debris, or moisture buildup on the inside of the lens cover that could affect the signal indication visibility.

The snow resistant signal head lens cover shall be warranted, free from material and workmanship defects for a period of three years from final inspection.

Basis of Payment.

This work shall be paid for at the contract unit price each for LED SIGNAL FACE, LENS COVER, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, and all mounting hardware necessary for a fully operational snow resistant signal head lens cover.

LED SIGNAL FACE, VISOR HEATER

Effective: July 01, 2021
886.03TS

Description.

This work shall consist of furnishing and installing a heated signal visor or retrofitting an existing signal visor with a heater to prevent snow buildup on and around a signal lens allowing for clear signal indication during inclement weather.

The heater shall keep a constant temperature on every point of the heating element and shall not rise above the manufacturer's safe temperature levels. The heater shall be made from flexible material mounted to the underside of an existing or proposed signal visor. The heater shall be controlled by a temperature and humidity probe to determine if conditions for snow are present. A single probe with the LED confirmation light should be installed at the traffic signal cabinet to control the entire intersection with the confirmation light visible from the street. Power for the heater shall be supplied using an extra, unused wire from the signal head. Installation of the heater shall not create conditions where dust, debris, or water can enter the inside of the signal head. Any control modules necessary for the proper operation should be installed inside

the cabinet for easy maintenance and its capacity should match the number of red signal head indications present at the intersection or as directed by the engineer.

The heating element shall operate during typical snowing conditions below 35.6 degree F and above 75% RH. The heater shall be installed such that it is de-energized when traffic signals are powered by an alternative energy source such as a generator or uninterruptible power supply (UPS).

The snow resistant heated signal visor shall be warranted, free from material and workmanship defects for a period of three years from final inspection.

Basis of Payment.

This work shall be paid for at the contract unit price each for LED SIGNAL FACE, VISOR HEATER, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, and all mounting hardware necessary for proper operation.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

Effective: May 22, 2002

Revised: July 1, 2015

881.01TS

Add the following to the third paragraph of Article 881.03 of the Standard Specifications:

No mixing of different types of pedestrian traffic signals or displays will be permitted.

Add the following to Article 881.03 of the Standard Specifications:

(a) Pedestrian Countdown Signal Heads.

- (1) Pedestrian Countdown Signal Heads shall not be installed at signalized intersections where traffic signals and railroad warning devices are interconnected.
- (2) Pedestrian Countdown Signal Heads shall be 16 inch (406mm) x 18 inch (457mm), for single units with glossy yellow or black polycarbonate housings. All pedestrian head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on.
- (3) Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. "Egg Crate" type sun shields are not permitted. Numerals shall measure 9 inches (229mm) in height and easily identified from a distance of 120 feet (36.6m).

Materials.

Add the following to Article 1078.02 of the Standard Specifications:

General.

1. The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to "0" and turn off when the steady Upraised Hand

(symbolizing Don't Walk) signal turns on. Module shall not have user accessible switches or controls for modification of cycle.

2. At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.
3. The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.
4. If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.
5. If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.
6. The next cycle, following the preemption event, shall use the correct, initially programmed values.
7. If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.
8. The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.
9. The countdown numerals shall be two (2) "7 segment" digits forming the time display utilizing two rows of LEDs.
10. The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, "Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules," or applicable successor ITE specifications, except as modified herein.
11. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.
12. In the event of a power outage, light output from the LED modules shall cease instantaneously.
13. The LEDs utilized in the modules shall be AllnGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and GaN technology for Lunar White (Walking Person) indications.
14. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

Basis of Payment.

Add the following to the first paragraph of Article 881.04 of the Standard Specifications:

The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

Add the following to Article 881.04 of the Standard Specifications:

If the work consists of retrofitting an existing polycarbonate pedestrian signal head and pedestrian countdown signal head with light emitting diodes (LEDs), it will be paid for as a PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price

shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition.

TRAFFIC SIGNAL BACKPLATE

Effective: May 22, 2002

Revised: July 1, 2021

882.01TS

Delete 1st sentence of Article 1078.03 of the Standard Specifications and add "All backplates shall be louvered, formed ABS plastic or composite aluminum".

Delete first sentence of the second paragraph of Article 1078.03 of the Standard Specifications and add "The backplate shall be composed of one or two piece.

Delete second sentence of the fourth paragraph of Article 1078.03 the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

When retro reflective sheeting is specified, it shall be Type ZZ sheeting according to Article 1091.03 and applied in preferred orientation for the maximum angularity according to the vendor's recommendations. The retroreflective sheeting shall be installed under a controlled environment at the vendor/equipment supplier before shipment to the contractor. The formed plastic backplate shall be prepared and cleaned, following recommendations of the retroreflective sheeting manufacturer.

DETECTOR LOOP

Effective: May 22, 2002

Revised: July 1, 2018

886.01TS

Procedure.

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall mark the proposed loop locations and contact the Area Traffic Signal Maintenance and Operations Engineer (847) 705-4424 to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the pouring of the Portland cement concrete surface, using the same notification process as above.

Installation.

Revise Article 886.04 of the Standard Specifications to read:

Loop detectors shall be installed according to the requirements of the "District One Standard Traffic Signal Design Details." Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut (homerun on preformed detector loops) unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a water proof tag, from an approved vendor, secured to each wire with nylon ties.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

- (a) Type I. All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement, curb and handhole shall be cut with a 1/4 inch (6.3 mm) deep x 4 inches (100 mm) saw cut to mark location of each loop cable.

- (b) Loop sealant shall be two-component thixotropic chemically cured polyurethane from an approved vendor. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface. If installed above the surface the excess shall be removed immediately.
- (c) Preformed. This work shall consist of furnishing and installing a rubberized or cross linked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:
- (d) Preformed detector loops shall be installed in the sub-base under the Portland cement concrete pavement. Loop lead-ins shall be extended to a temporary protective enclosure near the proposed handhole location. The protective enclosure shall provide sufficient protection from other construction activities and may be buried for additional protection.
- (e) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. CNC, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.
- (f) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 5/8 inch (16 mm) outside diameter (minimum), 3/8 inch (9.5 mm) inside diameter (minimum) Class A oil resistant synthetic cord reinforced hydraulic hose with 250 psi (1,720 kPa) internal pressure rating or a similarly sized XLPE cable jacket. Hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to insure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. For XLPE jacketed preformed loops, all splice connections shall be soldered, sealed, and tested before being sealed in a high impact glass impregnated plastic splice enclosure. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application specific. Homerun wire pairs shall be twisted a minimum of eight turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to insure complete moisture blockage and further protect the wire. The preformed loops shall be constructed to allow a minimum of 6.5 feet of extra cable in the handhole.

Method of Measurement.

Add the following to Article 886.05 of the Standard Specifications:

Preformed detector loops will be measured along the detector loop embedded in the pavement, rather than the actual length of the wire. Detector loop measurements shall include the saw cut and the length of the detector loop wire to the edge of pavement. The detector loop wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. CNC, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I or PREFORMED DETECTOR LOOP as specified in the plans, which price shall be payment in full for furnishing and installing the detector loop and all related connections for proper operation.

DETECTOR LOOP REPLACEMENT AND/OR INSTALLATION (ROADWAY GRINDING, RESURFACING, & PATCHING OPERATIONS)

Effective: January 1, 1985

Revised: January 5, 2016
886.02TS

The following Traffic Signal Special Provisions and the "District 1 Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction" Sections 810, 886, 1079 and 1088.

The intent of this Special Provision is to prescribe the materials and construction methods commonly used to replace traffic signal detector loops and replace magnetic signal detectors with detector loops during roadway resurfacing, grinding and patching operations. Loop detector replacement will not require the transfer of traffic signal maintenance from the District Electrical Maintenance Contractor to this contract's electrical contractor. Replacement of magnetic detector will require wiring revisions inside the control cabinet and therefore the transfer of maintenance will be required. All material furnished shall be new. The locations and the details of all installations shall be as indicated on the Plans or as directed by the Engineer.

The work to be provided under this contract consists of furnishing and installing all traffic signal work as specified on the Plans and as specified herein in a manner acceptable and approved by the Engineer.

Notification of Intent to Work.

Contracts such as pavement grinding or patching which result in the destruction of traffic signal detection require a notification of intent to work and an inspection. A minimum of seven (7) working days prior to the detection removal, the Contractor shall notify the:

- Traffic Signal Maintenance and Operations Engineer at (847)705-4424
- IDOT Electrical Maintenance Contractor at (773) 287-7600

at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection.

Failure to provide proper notification may require the District's Electrical Maintenance Contractor to be called to investigate complaints of inadequate traffic signal timing. All costs associated with these expenses will be paid for by the Contractor at no additional expense to the Department according to Section 109 of the "Standard Specifications."

Acceptance of Material.

The Contractor shall provide:

1. All material approval requests shall be submitted a minimum of seven (7) days prior to the delivery of equipment to the job site, or within 30 consecutive calendar days after the contract is awarded, or within 15 consecutive calendar days after the preconstruction meeting, whichever is first.
2. Four (4) copies of a letter listing the vendor's name and model numbers of the proposed equipment shall be supplied. The letter will be reviewed by the Traffic Design Engineer to determine whether the equipment to be used is approved. The letters will be stamped as approved or not approved accordingly and returned to the Contractor.
3. One (1) copy of material catalog cuts.
4. The contract number, permit number or intersection location must be on each sheet of the letter and material catalog cuts as required in items 2 and 3.

Inspection of Construction.

When the road is open to traffic, except as otherwise provided in Section 801 and 850 of the Standard Specifications, the Contractor must request a turn-on and inspection of the completed detector loop installation at each separate location. This request must be made to the Traffic Signal Maintenance and

Operations Engineer at (847)705-4424 a minimum of seven (7) working days prior to the time of the requested inspection.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on." If approved, traffic signal acceptance shall be verbal at the "turn on" inspection followed by written correspondence from the Engineer. If this work is not completed in time, the Department reserves the right to have the work completed by others at the Contractor's expense.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid price, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements will be subject to removal and disposal at the Contractor's expense.

Restoration of Work Area.

Restoration of the traffic signal work area due to the detector loop installation and/or replacement shall be included in the cost of this item. All roadway surfaces such as shoulders, medians, sidewalks, pavement shall be replaced as shown in the plans or in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded.

Removal, Disposal and Salvage of Existing Traffic Signal Equipment.

The removal, disposal, and salvage of existing traffic signal equipment shall be included in the cost of this item. All material and equipment removed shall become the property of the Contractor and disposed of by the Contractor outside the State's right-of-way. No additional compensation shall be provided to the Contractor for removal, disposal or salvage expense for the work in this contract.

DETECTOR LOOP REPLACEMENT.

This work shall consist of replacing existing detector loops which are destroyed during grinding, resurfacing, or patching operations.

If damage to the detector loop is unavoidable, replacement of the existing detection system will be necessary. This work shall be completed by an approved Electrical Contractor as directed by the Engineer.

Replacement of the loops shall be accomplished in the following manner: The Engineer shall mark the location of the replacement loops. The Traffic Signal Maintenance and Operations Engineer shall be called to approve loop locations prior to the cutting of the pavement. The Contractor may reuse the existing coiled non-metallic conduit (CNC) located between the existing handhole and the pavement if it hasn't been damaged. CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes. All burrs shall be removed from the edges of the existing conduit which could cause damage to the new detector loop during installation. If the existing conduit is damaged beyond repair, if it cannot be located, or if additional conduits are required for each proposed loop; the Contractor shall be required to drill through the existing pavement into the appropriate handhole, and install 1" (25 mm) CNC. This work and the required materials shall not be paid for separately but shall be included in the pay item Detector Loop Replacement. Once suitable CNC raceways is established, the loop may be cut, installed, sealed and spliced to the twisted-shielded lead-in cable in the handhole.

All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement or the curb shall be cut with a 1/4" (6.3 mm) deep x 4" (100 mm) saw-cut to mark location of each loop lead-in.

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall have the proposed loop locations marked and contact the Traffic Signal Maintenance and Operations Engineer (847)705-4424 to inspect and approve the layout.

Loop detectors shall be installed according to the requirements of the "District 1 Standard Traffic Signal Design Details." Saw-cuts from the loop to the edge of pavement shall be made perpendicular to the edge

of pavement when possible in order to minimize the length of the saw-cut unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a water proof tag, from an approved vendor, secured to each wire with nylon ties. The lead-in wire, including all necessary connections for proper operation, from the edge of pavement to the handhole, shall be included in the detector loop pay item.

Loop sealant shall be a two-component thixotropic chemically cured polyurethane. The sealant shall be installed 1/8" (3 mm) below the pavement surface. If installed above the surface the excess shall be removed immediately.

Round loop(s) 6 ft (1.8 m) diameter may be substituted for 6 ft (1.8 m) by 6 ft (1.8 m) square loop(s) and shall be paid for as 24 feet (7.2 m) of detector loop.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

Heat shrink splices shall be used according to the "District 1 Standard Traffic Signal Design Details."

Detector loop replacement shall be measured along the sawed slot in the pavement containing the loop cable up to the edge of pavement, rather than the actual length of the wire in the slot. Drilling handholes, sawing the pavement, furnishing and installing CNC to the appropriate handhole, cable splicing to provide a fully operable detector loop, testing and all trench and backfill shall be included in this item.

Basis of Payment.

Detector Loop Replacement shall be paid for at the contract unit price per foot (meter) of DETECTOR LOOP REPLACEMENT.

MAGNETIC DETECTOR REMOVAL AND DETECTOR LOOP INSTALLATION.

This work shall consist of the removal of existing magnetic detectors, magnetic detector lead-in cable and magnetic detection amplifiers and related control equipment wiring, installation of detector lead-in cable, detector loops, detector amplifiers and related equipment wiring. The detector loop, cable, and amplifier shall be installed according to the applicable portions of the "Standard Specifications" and the applicable portions of the Special Provision for "Detector Loop Replacement." All drilling of handholes, furnishing and installing CNC, cable splicing, trench and backfill, removal of equipment, and removing cable from conduit shall be included in this item.

Basis of Payment.

Magnetic Detector Removal and Detector Loop Installation shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I, per each for INDUCTIVE LOOP DETECTOR, and foot (meter) for ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 14 1 PAIR.

RADAR VEHICLE DETECTION SYSTEM

Effective: July 01, 2015

Revised: May 9, 2017

886.03TS

Description.

This work shall consist of furnishing and installing a radar vehicle detection system as specified and/or as shown on the plan. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary

hardware, cable and accessories required to complete the installation in accordance with the manufacturer's specifications.

The radar vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius. It shall have a max power output of 75 watts or less.

The radar vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The radar vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection and shall be capable of supporting a minimum of 2 detector units.

The stop bar radar vehicle detection system shall have true presence capabilities in which it can detect stopped, slow moving or turning vehicles similar to the Departments in-pavement detection. This is especially important at side streets where driveways are near the intersection. The radar shall be able to drop the call if the vehicle leaves the detection zone. A manufacture statement confirming proper operation is required along each catalog cut submittal. The Department will not allow substitutes for other types of detection.

The far back radar detection shall have a detection range of 400 feet or better.

A representative from the supplier of the radar vehicle detection system shall supervise the installation and testing of the radar vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the radar vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The radar vehicle detection system shall be warrantied, free from material and workmanship defects for a period of two years from final inspection.

Basis of Payment.

This work shall be paid for at the contract unit price each for RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, STOP BAR; RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, FAR BACK; RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, STOP BAR AND FAR BACK, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a fully operational radar vehicle detection system.

VIDEO VEHICLE DETECTION SYSTEM

Effective: January 1, 2020

886.04TS

Description.

This work shall consist of furnishing and installing a video vehicle detection system as specified and/or as shown on the plans. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary hardware, cables and accessories required to complete the installation in accordance with the manufacturer's specifications.

The video vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius.

The video vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The video vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection and shall be capable of supporting a minimum of 2 detector units. The video vehicle detection system shall include a display inside the cabinet that has a minimum 10" screen with a minimum 1280x800 resolution.

The video vehicle detection system shall be one of the following systems or an approved equivalent:

- Autoscope Vision
- Iteris Vantage Next

A representative from the supplier of the video vehicle detection system shall supervise the installation and testing of the video vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the video vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The video detection system shall be warrantied, free from material and workmanship defects for a period of two years from final inspection.

Basis of Payment.

This work shall be paid for at the contract unit price each for VIDEO VEHICLE DETECTION SYSTEM, SINGLE APPROACH, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a fully operational video vehicle detection system.

EMERGENCY VEHICLE PRIORITY SYSTEM

Effective: May 22, 2002

Revised: July 1, 2015

887.01TS

Revise Section 887 of the Standard Specifications to read:

It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle pre-emption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency.

All new installations shall be equipped with Confirmation Beacons as shown on the "District One Standard Traffic Signal Design Details." The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signaled by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signaled by a continuous indication.

All light operated systems shall include security and transit preemption software and operate at a uniform rate of 14.035 Hz \pm 0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the EMERGENCY VEHICLE PRIORITY SYSTEM.

Basis of Payment.

The work shall be paid for at the contract unit price each for furnishing and installing LIGHT DETECTOR and LIGHT DETECTOR AMPLIFIER. Furnishing and installing the confirmation beacon shall be included in the cost of the Light Detector. Any required modifications to the traffic signal controller shall be included in the cost of the LIGHT DETECTOR AMPLIFIER. The preemption detector amplifier shall be paid for on a basis of (1) one each per intersection controller and shall provide operation for all movements required in the pre-emption phase sequence.

RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT

Effective: January 1, 2002

Revised: July 1, 2015

887.02TS

This item shall consist of relocating the existing emergency vehicle priority system, detector unit (single channel or dual channel) from its existing location to a new traffic signal post or mast arm assembly and pole, and connecting it to an emergency vehicle priority system, phasing unit. If the existing Emergency Vehicle Priority System, Detector Unit Assembly includes a Confirmation Beacon, the Confirmation Beacon shall also be relocated and connected to the Emergency Vehicle Priority System, Detector Unit and shall be included at no cost in this item.

The emergency vehicle system is not to be inoperative for more than 8 hours and the Contractor must notify the Municipality or Fire Protection District 72 hours prior to the disconnection of the equipment.

Basis of Payment.

This item will be paid for at the contract unit price each for RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT.

RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT

Effective: January 1, 2002

Revised: July 1, 2015

887.03TS

This item shall consist of relocating the existing emergency vehicle priority system phasing unit from an existing traffic signal controller cabinet to a new traffic signal controller cabinet, as indicated in the plans or as directed by the Engineer.

The work shall include disconnecting the emergency vehicle priority system phasing unit(s) and reconnecting it into the new traffic signal controller cabinet.

The emergency vehicle system is not to be inoperative for more than 8 hours and the Contractor must notify the Municipality or Fire Protection District 72 hours prior to the disconnection of the equipment. The Contractor must demonstrate to the satisfaction of the Engineer that the emergency vehicle system operates properly.

Basis of Payment.

This item will be paid for on a basis of one (1) each per intersection for RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT.

CONFIRMATION BEACON

Effective: January 1, 2002

Revised: July 1, 2015

887.04TS

This item shall consist of furnishing and installing a Traffic Signal Emergency Confirmation Beacon (single channel or dual channel) at the locations specified on the plans and as described as follows for intersections which have existing emergency preemption systems previously installed.

Confirmation Beacon, Single Channel - Where the light detector is used to detect a single direction of traffic, one LED lamp for only that direction shall be provided. In cases where the detector covers opposing directions of traffic and has a single output, a separate lamp for each direction shall be provided but they shall have identical indications.

Confirmation Beacon, Dual Channel - A separate LED lamp with appropriate separate indications for each direction shall be provided.

It shall be the Contractor's responsibility to verify the existing brand of emergency vehicle equipment at the intersection and the confirmation beacons must be completely compatible with all existing components. The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. No new holes may be drilled into signal poles, mast arms, or posts. The Confirmation Beacon shall be mounted to the existing light detector hardware as shown on the mounting detail in the plans. In order to maintain uniformity between communities, the Confirmation Beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signaled by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signaled by a continuous indication.

Any modification required to the existing light detector installation to meet the requirements of the mounting detail shown in the plans shall be included in this item.

Basis of Payment.

This work will be paid for at the contract unit price per each for CONFIRMATION BEACON.

PEDESTRIAN PUSH-BUTTON

Effective: May 22, 2002

Revised: July 1, 2015

888.01TS

Description.

Revise Article 888.01 of the Standard Specifications to read:

This work shall consist of furnishing and installing a latching (single call) or non-latching (dual call) pedestrian push-button and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9" x 15" sign with arrow(s) for a count-down pedestrian signal. The pedestrian station sign size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9" x 12" sign with arrow(s).

Installation.

Add the following to Article 888.03 of the Standard Specifications:

A mounting bracket and/or extension shall be used to assure proper orientation when two pedestrian push buttons are required for one post. The price of the bracket and/or extension shall be included in the cost of the pedestrian push button. The contractor is not allowed to install a push-button assembly with the sign below the push-button in order to meet mounting requirements.

Materials.

Revise Article 1074.02(a) of the Standard Specifications to read:

The pedestrian push-button housing shall be constructed of aluminum alloy according to ASTM B 308 6061-T6 and powder coated yellow, unless otherwise noted on the plans. The housing shall be furnished with suitable mounting hardware.

Revise Article 1074.02(e) of the Standard Specifications to read:

Stations shall be designed to be mounted to a post, mast arm pole or wood pole. The station shall be aluminum and shall accept a 3 inch (75mm) round push-button assembly and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9" x 15" sign with arrow(s) for a count-down pedestrian signal. The pedestrian station size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9" x 12" sign with arrow(s).

Add the following to Article 1074.02 of the Standard Specifications:

- (f) Location. Pedestrian push-buttons and stations shall be mounted to a post, mast arm pole or wood pole as shown on the plans and shall be fully ADA accessible from a paved or concrete surface. See the District's Detail sheets for orientation and mounting details.

Basis of Payment.

Revise Article 888.04 of the Standard Specifications to read:

This work will be paid for at the contract unit price per each for PEDESTRIAN PUSH-BUTTON or PEDESTRIAN PUSH-BUTTON, NON-LATCHING.

ACCESSIBLE PEDESTRIAN SIGNALS

Effective: April 1, 2003

Revised: July 1, 2015

888.02TS

Description.

This work shall consist of furnishing and installing pedestrian push button accessible pedestrian signals (APS) type. Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements.

The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications.

A pushbutton locator tone shall sound at each pushbutton with volume settings a maximum of 5 dBA louder than ambient sound.

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message.

A clear, verbal message shall be used to communicate the pedestrian walk interval. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: “Street Name.” Walk Sign is on to cross “Street Name.” No other messages shall be used to denote the WALK interval.

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

Pedestrian Pushbutton.

Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

A red LED indicator shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street. The recorded messages and roadway designations shall be confirmed with the engineer and included with submitted product data.

Signage.

A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall be one of the following standard MUTCD designs: R10-3b, R10-3d, or R10-3e.



Tactile Arrow.

A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided either on the pushbutton or its sign.

Vibrotactile Feature.

The pushbutton shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Training.

The Contractor shall provide APS onsite training for Department personnel and person(s) or group that requested the installation of the APS. APS features and operation shall be demonstrated during the training. The training shall be presented by the APS equipment supplier. Time, date, and location of the training and demonstration shall be coordinated with the Engineer.

Basis of Payment.

This work will be paid for at the contract unit price each for a pedestrian push button, ACCESSIBLE PEDESTRIAN SIGNALS type and shall include furnishing, installation, mounting hardware, message programming, and training.

TEMPORARY TRAFFIC SIGNAL INSTALLATION

Effective: May 22, 2002

Revised: January 1, 2017

890.01TS

Revise Section 890 of the Standard Specifications to read:

Description.

This work shall consist of furnishing, installing, maintaining, and removing a temporary traffic signal installation as shown on the plans, including but not limited to temporary signal heads, emergency vehicle priority systems, interconnect, vehicle detectors, uninterruptable power supply, and signing. Temporary traffic signal controllers and cabinets interconnected to railroad traffic control devices shall be new. When temporary traffic signals will be operating within a county or local agency Traffic Management System, the equipment must be NTCIP compliant and compatible with the current operating requirements of the Traffic Management System.

General.

Only an approved controller equipment supplier will be allowed to assemble temporary traffic signal and railroad traffic signal cabinet. Traffic signal inspection and TURN-ON shall be according to 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS special provision.

Construction Requirements.

(a) Controllers.

1. Only controllers supplied by one of the District approved closed loop equipment supplier will be approved for use at temporary signal locations. All controllers used for temporary traffic signals shall be fully actuated NEMA microprocessor based with RS232 data entry ports compatible with existing monitoring software approved by IDOT District 1, installed in NEMA TS2 cabinets with 8 phase back panels, capable of supplying 255 seconds of cycle length and individual phase length settings up to 99 seconds. On projects with one lane open and two way traffic flow, such as bridge deck repairs, the temporary signal controller shall be capable of providing an adjustable all red clearance setting of up to 30 seconds in length. All controllers used for temporary traffic signals shall meet or exceed the requirements of Section 857 of the Standard Specifications with regards to internal time base coordination and preemption. All railroad interconnected temporary controllers and cabinets shall be new and shall satisfy the requirements of Article 857.02 of the Standard Specifications and as modified herein.
2. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved closed loop equipment suppliers will be approved for use at temporary traffic signal locations. All control equipment for the temporary traffic signal(s) shall be furnished by the Contractor unless otherwise stated in the plans. On projects with multiple temporary traffic signal installations, all controllers shall be the same manufacturer brand and model number with the latest version software installed at the time of the signal TURN-ON.

- (b) Cabinets. All temporary traffic signal cabinets shall have a closed bottom made of aluminum alloy. The bottom shall be sealed along the entire perimeter of the cabinet base to ensure a water, dust and insect-proof seal. The bottom shall provide a minimum of two (2) 4 inch (100 mm) diameter holes to run the electric cables through. The 4 inch (100 mm) diameter holes

- shall have a bushing installed to protect the electric cables and shall be sealed after the electric cables are installed.
- (c) Grounding. Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 806 of the Standard Specifications and shall meet the requirements of the 806.01TS GROUNDING OF TRAFFIC SIGNAL SYSTEMS special provision.
- (d) Traffic Signal Heads. All traffic signal sections shall be 12 inches (300 mm). Pedestrian signal sections shall be 16 inch (406mm) x 18 inch (457mm). Traffic signal sections shall be LED with expandable view, unless otherwise approved by the Engineer. Pedestrian signal heads shall be Light Emitting Diode (LED) Pedestrian Countdown Signal Heads except when a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing. When a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing, Light Emitting Diode (LED) Pedestrian Signal Heads shall be furnished. The temporary traffic signal heads shall be placed as indicated on the temporary traffic signal plan or as directed by the Engineer. If no traffic staging is in place or will not be staged on the day of the turn on, the temporary traffic signal shall have the signal head displays, signal head placements and controller phasing match the existing traffic signal or shall be as directed by the engineer. The Contractor shall furnish enough extra cable length to relocate heads to any position on the span wire or at locations illustrated on the plans for construction staging. The temporary traffic signal shall remain in operation during all signal head relocations. Each temporary traffic signal head shall have its own cable from the controller cabinet to the signal head.
- (e) Interconnect.
1. Temporary traffic signal interconnect shall be provided using fiber optic cable or wireless interconnect technology as specified in the plans. The Contractor may request, in writing, to substitute the fiber optic temporary interconnect indicated in the contract documents with a wireless interconnect. The Contractor must provide assurances that the radio device will operate properly at all times and during all construction staging. If approved for use by the Engineer, the Contractor shall submit marked-up traffic signal plans indicating locations of radios and antennas and installation details. If wireless interconnect is used, and in the opinion of the engineer, it is not viable, or if it fails during testing or operations, the Contractor shall be responsible for installing all necessary poles, fiber optic cable, and other infrastructure for providing temporary fiber optic interconnect at no cost to the contract.
 2. The existing system interconnect and phone lines are to be maintained as part of the Temporary Traffic Signal Installation specified for on the plan. The interconnect, including any required fiber splices and terminations, shall be installed into the temporary controller cabinet as per the notes or details on the plans. All labor and equipment required to install and maintain the existing interconnect as part of the Temporary Traffic Signal Installation shall be included in the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION. When shown in the plans, temporary traffic signal interconnect equipment shall be furnished and installed. The temporary traffic signal interconnect shall maintain interconnect communications throughout the entire signal system for the duration of the project. Any temporary signal within an existing closed loop traffic signal system shall be interconnected to that system using similar brand control equipment at no additional cost to the contract.
 3. Temporary wireless interconnect. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This work shall include all temporary wireless interconnect components, at the adjacent existing traffic signal(s) to provide a completely operational closed loop system. This work shall include all materials, labor and

testing to provide the completely operational closed loop system as shown on the plans. The radio interconnect system shall include the following components:

- a. Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio
- b. Software for Radio Configuration (Configure Frequency and Hopping Patterns)
- c. Antennas (Omni Directional or Yagi Directional)
- d. Antenna Cables, LMR400, Low Loss. Max. 100-ft from controller cabinet to antenna
- e. Brackets, Mounting Hardware, and Accessories Required for Installation
- f. RS232 Data Cable for Connection from the radio to the local or master controller
- g. All other components required for a fully functional radio interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the radio interconnect system components shall be included in the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION.

The radio interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed or existing master controller and telemetry module shall be configured for use with the radio interconnect at a minimum rate of 9600 baud.

The radio interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance to the vendors recommendations.

- (f) Emergency Vehicle Pre-Emption. All emergency vehicle preemption equipment (light detectors, light detector amplifiers, confirmation beacons, etc.) as shown on the temporary traffic signal plans shall be provided by the Contractor. It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle preemption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency. All light operated systems shall operate at a uniform rate of 14.035 hz \pm 0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District. All labor and material required to install and maintain the Emergency Vehicle Preemption installation shall be included in the item Temporary Traffic Signal Installation.
- (g) Vehicle Detection. All temporary traffic signal installations shall have vehicular detection installed at all approaches of the intersection and as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system shall be approved by IDOT prior to Contractor furnishing and installing. The Contractor shall install, wire, and adjust the alignment of the microwave vehicle sensor or video vehicle detection system in accordance to the manufacturer's recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the microwave vehicle sensor or video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. An equipment supplier shall be present and assist the contractor in setting up and maintaining the microwave vehicle sensor or video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item Temporary Traffic Signal Installation.
- (h) Uninterruptable Power Supply. All temporary traffic signal installations shall have Uninterruptable Power Supply (UPS). The UPS cabinet shall be mounted to the temporary

- traffic signal cabinet and shall be according to the applicable portions of Section 862 of the Standard Specifications and as modified in 862.01TS UNITERRUPTABLE POWER SUPPLY, SPECIAL Special Provision.
- (i) Signs. All existing street name and intersection regulatory signs shall be removed from existing poles and relocated to the temporary signal span wire. If new mast arm assembly and pole(s) and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost. Any intersection regulatory signs that are required for the temporary traffic signal shall be provided as shown on the plans or as directed by the Engineer. Relocation, removing, bagging and installing the regulatory signs for the various construction stages shall be provided as shown on the plans or as directed by the Engineer. If Illuminated Street Name Signs exist they shall be taken down and stored by the contractor and reflecting street name signs shall be installed on the temporary traffic signal installation.
 - (j) Energy Charges. The electrical utility energy charges for the operation of the temporary traffic signal installation shall be paid for by others if the installation replaces an existing signal. Otherwise charges shall be paid for under 109.05 of the Standard Specifications.
 - (k) Maintenance. Maintenance shall meet the requirements of the Standard Specifications and 850.01TS MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION Special Provisions. Maintenance of temporary signals and of the existing signals shall be included in the cost of the TEMPORARY TRAFFIC SIGNAL INSTALLATION pay item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as he begins any physical work on the Contract or any portion thereof. In addition, a minimum of seven (7) days prior to assuming maintenance of the existing traffic signal installation(s) under this Contract, the Contractor shall request that the Resident Engineer contact the Bureau of Traffic Operations (847) 705-4424 for an inspection of the installation(s).
 - (l) Temporary Traffic Signals for Bridge Projects. Temporary Traffic Signals for bridge projects shall follow the State Standards, Standard Specifications, Special Provisions and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification. In addition all electric cable shall be aurally suspended, at a minimum height of 18 feet (5.5m) on temporary wood poles (Class 5 or better) of 45 feet (13.7 m) minimum height. The signal heads shall be span wire mounted or bracket mounted to the wood pole or as directed by the Engineer. The Controller cabinet shall be mounted to the wood pole as shown in the plans, or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system may be used in place of detector loops as approved by the Engineer.
 - (m) Temporary Portable Traffic Signal for Bridge Projects.
 - 1. The controller and cabinet shall be NEMA type designed for NEMA TS2 Type 1 operation. Controller and LED signal displays shall meet the applicable Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION special provision.
 - 2. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.
 - 3. General.
 - a. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted

on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of 12 days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.

- b. All signal heads located over the travel lane shall be mounted at a minimum height of 17 feet (5m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 feet (2.5m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.
- c. The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.
- d. As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with microwave sensors or other approved methods of vehicle detection and traffic actuation.
- e. All portable traffic signal units shall be interconnected using hardwire communication cable. Radio communication equipment may be used only with the approval of the Engineer. If radio communication is used, a site analysis shall be completed to ensure that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.
- f. The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV and other applicable portions of the currently adopted version of the Manual on Uniform Traffic Control Devices (MUTCD) and the Illinois MUTCD. The signal system shall be designed to continuously operate over an ambient temperature range between -30 °F (-34 °C) and 120 °F (48 °C). When not being utilized to inform and direct traffic, portable signals shall be treated as non-operating equipment according to Article 701.11.

Basis of Payment.

This work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION, or TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION, the price of which shall include all costs for the modifications required for traffic staging, changes in signal phasing as required in the Contract plans, microwave vehicle sensors, video vehicle detection system, any maintenance or adjustment to the microwave vehicle sensors/video vehicle detection system, the temporary wireless interconnect system, temporary fiber optic interconnect system, all material required, the installation and complete removal of the temporary traffic signal, and any changes required by the Engineer. Each intersection will be paid for separately.

TEMPORARY TRAFFIC SIGNAL TIMING

Effective: May 22, 2002

Revised: July 1, 2015

890.02TS

Description.

This work shall consist of developing and maintaining appropriate traffic signal timings for the specified intersection for the duration of the temporary signalized condition, as well as impact to existing traffic signal timings caused by detours or other temporary conditions.

All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in optimizing Closed Loop Traffic signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMING.

- (a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings.
- (b) Consultant shall be responsible for making fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
- (c) Consultant shall provide monthly observation of traffic signal operations in the field.
- (d) Consultant shall provide on-site consultation and adjust timings as necessary for construction stage changes, temporary traffic signal phase changes, and any other conditions affecting timing and phasing, including lane closures, detours, and other construction activities.
- (e) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.
- (f) Return original timing plan once construction is complete.

Basis of Payment.

The work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL TIMING, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on and/or detour implemented, 50 percent of the bid price will be paid. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or detour.

ILLUMINATED SIGN, LED

Effective: May 22, 2002

Revised: July 1, 2015

891.01TS

Revise the second paragraph of Article 1084.01(a) to read:

The exterior surface of the housing shall be acid-etched and shop painted with one coat of zinc-chromate primer and two coats of exterior enamel. The housing shall be the same color (yellow or black) to match the existing or proposed signal heads. The painting shall be according to Section 851 of the Standard Specifications.

Add the following to Article 1084.01 (b) of the Standard Specifications:

The message shall be formed by rows of LEDs. The sign face shall be 24 inches (600 mm) by 24 inches (600 mm).

Revise Article 1084.01(d) to read:

Mounting hardware shall be black polycarbonate or galvanized steel and similar to mounting Signal Head hardware and bracket specified herein and shall provide tool free access to the interior.

LED INTERNALLY ILLUMINATED STREET NAME SIGN

Effective: May 22, 2002

Revised: July 1, 2018

891.02TS

Description.

This work shall consist of furnishing and installing a LED internally illuminated street name sign.

Materials.

The illuminated street name sign shall be as follows.

(a) Description.

The LEDs shall be white in color. The LED internally illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. White translucent Type ZZ reflective sheeting sign faces with the street name applied in transparent green shall be installed on the street sign acrylic panels which shall be affixed to the interior of the sign enclosure. Sheeting material shall be of one continuous piece. Paneling shall not be allowed. Hinged door(s) shall be provided for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

(b) Environmental Requirements.

The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50°C (-40 to +122°F) for storage in the ambient temperature range of -40 to +75°C (-40 to +167°F).

(c) General Construction.

1. The LED components, power supply, and wiring harness shall be arranged as to allow for maintenance, up to and including the replacement of all three components. The LED Light Engine shall be mounted in the top and/or bottom of the sign housing and no components of the light source shall sit between the sign faces.
2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI C136.31-2001 standards.

(d) Mechanical Construction.

1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum with the maximum sign dimensions of 30" in height, 96" in length, 10.75" in depth (including the drip edge) and shall not weight more than 110 pounds. All housing corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal.
2. The sign doors shall be continuous TIG welded along the two corners with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full length stainless steel hinge. The sign shall also be fabricated in a way to ensure that no components fall out while a technician is opening or working inside the sign enclosure. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by an appropriate number of quarter-turn fasteners to form a watertight seal between the door and the housing.
3. The sign face shall be constructed of .125" white translucent polycarbonate or acrylic. Sign legend shall be according to D1 Mast Arm Mounted Street Name Sign detail and MUTCD. The sign face legend background shall consist of translucent Type ZZ white reflective sheeting and transparent green film applied to the front of the sign face. The legend shall be framed by a white border. A logo symbol and/or name of the community may be included with approval of the Engineer.
4. All fasteners and hardware shall be corrosion resistant stainless steel. No special tools shall be required for routine maintenance.
5. All wiring shall be secured by insulated wire compression nuts or barrier type terminal blocks.

6. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and shall provide a weather tight seal.
7. A photoelectric switch shall be mounted inside control cabinet to control lighting functions for day and night display. Each sign shall be individually fused.
8. Brackets and Mounting: LED internally illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets unless indicated otherwise in the plans.

(e) Electrical.

1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.
2. The LED Light Engine shall operate from a 60 +/- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +/- 10%.
3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage and at a temperature of +25°C (+77°F), shall not exceed 20%.
4. The LED Light Engine shall cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed 120 Watts. The signs shall be installed such that they are not energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power supply (UPS).

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m².
2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.
3. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

(g) Quality Assurance.

The LED Light Engine shall be manufactured in accordance with a vendor quality assurance (QA) program. The production QA shall include statistically controlled routine tests to ensure minimum performance levels of the LED Light Engine build to meet this specification. QA process and test result documentations shall be kept on file for a minimum period of seven (7) years. The LED Light Engine that does not satisfy the production QA testing performance requirements shall not be labeled, advertised, or sold as conforming to these specifications. Each LED Light Engine shall be identified by a manufacturer's serial number for warranty purposes. LED Light Engines shall be replaced or repaired if they fail to function as intended due to workmanship or material defects within the first sixty (60) months from the date of acceptance. LED Light Engines that exhibit luminous intensities less than the minimum value specified in Photometric Section within the first thirty-six (36) months from the date of acceptance shall be replaced or repaired.

Installation.

The sign shall be located on a steel traffic signal mast arm no further than 8-feet from the center of the pole to the center of the sign at a height of between 16 to 18-feet above traveled pavement. Mounting hardware shall be from an approved vendor, utilizing stainless steel components.

Basis of Payment.

This work will be paid for at the contract unit price each for LED INTERNALLY ILLUMINATED STREET NAME SIGN, of the length as specified in the contract plans which shall be payment in full for furnishing and installing the LED internally illuminated street name sign, complete with circuitry and mounting hardware including photo cell, circuit breaker, fusing, relay, connections and cabling as shown on the plans for proper operation and installation.

The Illuminated street name sign cable will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, STREET NAME SIGN, NO. 14 3C, TYPE SOOW, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

MODIFY EXISTING CONTROLLER CABINET

Effective: May 22, 2002

Revised: July 1, 2015

895.01TS

The work shall consist of modifying an existing controller cabinet as follows:

- (a) Uninterruptable Power Supply (UPS). The addition of uninterruptable power supply (UPS) to an existing controller cabinet could require the relocation of the existing controller cabinet items to allow for the installation of the uninterruptable power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications and the wiring of UPS alarms.
- (b) Light Emitting Diode (LED) Signal Heads, Light Emitting Diode (LED) Optically Programmed Signal Heads and Light Emitting Diode (LED) Pedestrian Signal Heads. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(b)(2) of the Standard Specifications and the recommended load requirements of the light emitting diode (LED) signal heads that are being installed at the existing traffic signal. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.
- (c) Light Emitting Diode (LED), Signal Head, Retrofit. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(b)(2) of the Standard Specifications and the recommended load requirements of light emitting diode (LED) traffic signal modules, pedestrian signal modules, and pedestrian countdown signal modules as specified in the plans. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.
- (d) This item shall include the upgrade of all non-railroad controller software to the latest version available at the time of the signal TURN-ON.

Basis of Payment.

Modifying an existing controller cabinet will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER CABINET. This shall include all material and labor required to complete the work as described above, the removal and disposal of all items removed from the controller cabinet, as directed by the Engineer. The equipment for the Uninterruptable Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptable Power Supply, Special or Uninterruptable Power Supply, Ground Mounted.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

Effective: May 22, 2002

Revised: July 1, 2015

895.02TS

Add the following to Article 895.05 of the Standard Specifications:

The traffic signal equipment which is to be removed and is to become the property of the Contractor shall be disposed of outside the right-of-way at the Contractor's expense.

All equipment to be returned to the State shall be delivered by the Contractor to the State's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the State's Electrical Maintenance Contractor to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within 30 days of removing it from the traffic signal installation. The Contractor shall provide one hard copy and one electronic file of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. The Contractor shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned according to these requirements, it will be rejected by the State's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until the acceptance of a receipt drawn by the State's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up or delivery of all equipment to be returned to agencies other than the State. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.

MODIFY EXISTING TYPE "D" FOUNDATION

Effective: January 1, 2002

Modified: July 1, 2015

895.03TS

This item shall consist of the partial removal of an existing Type "D" Foundation at the location shown on the plans, or as directed by the Engineer. The existing foundation shall be removed to a depth of at least twelve (12) inches below finished grade. All concrete debris shall be disposed of outside the right-of-way. The existing conduit shall remain in place and shall be carefully protected. The new conduits from the double handhole shall be installed, if required, as shown on the plans.

The removal of the existing traffic signal controller and cabinet shall be included in this pay item, as well as the removing and reinstalling of the existing cable(s) from conduit.

Upon completion of the above work, holes for steel dowels of the size indicated shall be drilled in the remaining concrete where indicated on the drawings.

The adjacent area shall be excavated and forming with anchor bolts and new conduit stubs provided to provide a concrete foundation for a Type IV or Type V cabinet. The Contractor shall follow the recommendations of the vendor, subject to approval of the Engineer, in forming and constructing the foundation.

Provide a three (3) foot by four (4) foot wide Portland cement concrete apron sidewalk, five (5) inches thick, on the side of the access door to the controller to facilitate servicing the controller and cabinet.

Anchor bolts shall be new and shall meet all the requirements of Section 1006.09 of the Standard Specifications.

Basis of Payment.

This work shall be paid for at the contract unit price each for MODIFY EXISTING TYPE "D" FOUNDATION.

REBUILD EXISTING HANDHOLE

Effective: January 1, 2002

Revised: July 1, 2015

895.04TS

This item shall consist of rebuilding and bringing to grade a handhole at a location shown on the plans or as directed by the Engineer. The work shall consist of removing the handhole frame and cover and the walls of the handhole to a depth of eight (8) inches below the finished grade.

Upon completion of the above work, four (4) holes, four (4) inches in depth and one half (1/2) inch in diameter, shall be drilled into the remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, eight (8) inches in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy.

All concrete debris shall be disposed of outside the right-of-way.

The area adjacent to each side of the handhole shall be excavated to allow forming. All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt handhole according to applicable portions of Section 814 of the Standard Specification and as modified in 814.01TS HANDHOLES Special Provision. The existing frame and cover shall be replaced if it was damaged during removal or as determined by the Engineer.

Basis of Payment.

This work shall be paid for at the contract unit price each for REBUILD EXISTING HANDHOLE, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

REBUILD EXISTING HANDHOLE TO HEAVY-DUTY HANDHOLE

Effective: January 1, 2002

Revised: July 1, 2015

895.05TS

This item shall consist of partial removal of an existing concrete traffic signal handhole, reconstruction to the specifications of heavy duty handhole including new frame and cover, and bringing it to grade at location(s) shown in the plans or as directed by the Engineer. This work shall consist of removing the existing handhole frame and cover and the walls of the handhole to a depth of fifteen (15) inches below the finished grade.

Upon completion of the above work, four (4) holes, four (4) inches in depth, and one-half (1/2) inch in diameter shall be drilled into the top of the remaining concrete; one hole centered into each of the four handhole walls. Four (4) #3 steel dowels eight inches in length, shall be furnished and installed in the drilled holes with a masonry epoxy.

All concrete debris shall be disposed of outside the right-of-way.

Any pavement or asphalt surface removal required to install the new concrete shall have straight and neat edges using a method approved by the Engineer. Care shall be taken to protect the existing traffic signal cable. Any cable damage shall be reported immediately and repaired as directed by the Area Traffic Signal Engineer.

All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt heavy duty handhole according to applicable portions of Section 814 of the Standard Specification and as modified in 814.01TS HANDHOLES Special Provision.

Basis of Payment.

This work shall be paid for at the contract unit price each for REBUILD EXISTING HANDHOLE TO HEAVY-DUTY HANDHOLE.

RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON

Effective: August 4, 2017

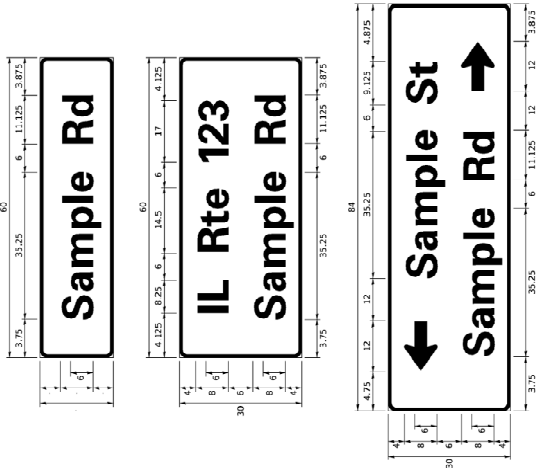
895.06TS

Relocation.

Revise the last paragraph of Article 895.02 of the Standard Specifications to read:

When relocating an existing pedestrian push-button, the related sign shall be removed and installed at the new location. The push-button shall be installed according to Article 888.03. Mounting / extension brackets shall be used to assure that the push button is accessible from a paved or concrete surface and is in full compliance with ADA. Mounting / extension brackets shall not be paid for separately but shall be included in the cost of the RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON pay item.

SIGN PANEL - TYPE 1 OR TYPE 2



DESIGN SERIES	AREA (SQ FT)	SIGN PANEL TYPE	SHEETING TYPE	CITY	REQUIRED
D DR C		1 OR 2	ZZ		

COMMON STREET NAME ABBREVIATIONS AND WIDTHS

NAME	ABBREVIATION	WIDTH (IN FT)	WIDTH (IN INCHES)
AVENUE	AVE	15.000	12.250
BULEVARD	BLVD	17.125	20.000
CIRCLE	CT	11.125	15.000
DRIVE	DR	8.625	10.125
HIGHWAY	HWY	18.375	22.000
L. ILLINOIS	ILL	7.000	5.250
PLACE	PL	7.125	7.750
ROAD	RD	9.625	11.125
SHOULDER	SHL	11.625	15.000
STREET	ST	12.625	14.625
TERRACE	TR	7.750	9.125
TRAIL	TR	10.375	12.250
UNITED STATES	US		

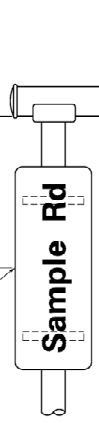
GENERAL NOTES

- WHERE MAST ARM MOUNTED STREET NAME SIGNS ARE SPECIFIED, THE MAST ARM ASSEMBLY AND POLES SHALL BE APPLICABLE, PLUS TWO (2) SIGN PANELS 2'-6" X 8'-0" MOUNTED AS SHOWN. THE DESIGN SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, TRANSPORTATION OFFICIALS FOR 80 M.P.H. WIND VELOCITY.
- ALL SIGNS SHALL CONSIST OF A WHITE LEGEND AND BORDER (TYPE ZZ SHEETING) ON A GREEN BACKGROUND (TYPE ZZ SHEETING).
- THE SIGN LEGEND SHALL BE IN 8-POINT BOLD CAPS. THE ORIGINAL LETTERS SHALL NOT BE GREYER THAN ALL BORDERS IF POSSIBLE, BUT MAY BE REDUCED TO 5 WHEN SPACING IS CRITICAL. A MINIMUM OF 2.00" SHALL BE INCLUDED BETWEEN THE WORD AND THE RIGHT AND LEFT EDGES OF THE SIGN.
- A REFERRED METHOD FOR THE SIGN DESIGN IS TO USE SERIES "Y" LETTER ON A ONE-LINE SIGN OR "N, HERD" AND A MAXIMUM OF 8"-0" IN WIDTH. IF SERIES "Y" DOES NOT FIT ON A 8"-0" SIGN, THEN SERIES "C" SHOULD BE USED. IF SERIES "C" DOES NOT FIT ON A 8"-0" SIGN, A 20" HIGH TRACABLE SIGN CAN BE USED. THE CROSSROAD DESIGNATION AS TO STREET, AVENUE, ETC. SHOULD BE SPELLED OUT ON THE SECOND LINE IF THE ABBREVIATION CANNOT FIT ON THE FIRST LINE.
- LED ILLUMINATED STREET NAME SIGNS CAN BE USED IN PLACE OF REGULAR SIGN PANELS BUT ANY SPECIAL WOUNDING AND LETTERING SHALL BE APPROVED BY THE DEPARTMENT. GENERAL DESIGN REQUIREMENTS AS LISTED ABOVE (COLOR, FONT, SIZE, ETC.) MUST BE FOLLOWED.
- STRENGTH ALUMINUM CHANNEL FINISHING SYSTEM SHALL BE USED FOR ALL SIGNS ATTACHED TO SIGNAL POLES AND POSTS.

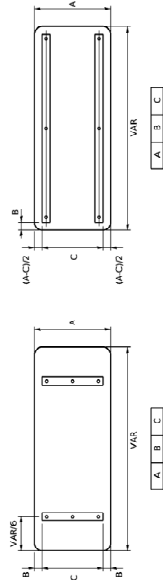
- LOCAL SUPPLIERS:
- I.O. HERBERT COMPANY, INC. PART #PPH03S (MED. CHANNEL)
 - MIDLOTHIAN, VA SIGN CHANNELS
 - WESTERN REMIX, INC. SIGN SCREWS
 - WOODRIDGE, IL BRACKETS
- CHANNEL DIMENSIONS WITH STAINLESS STEEL STAMPING

OTHER BRANDS OF MOUNTING HARDWARE ARE ACCEPTABLE BASED UPON THE DEPARTMENTS APPROVAL AND COMPATIBILITY WITH THE CHANNELS/MOUNT OF THE ABOVE PRODUCT.

MOUNTING LOCATION



SUPPORTING CHANNELS



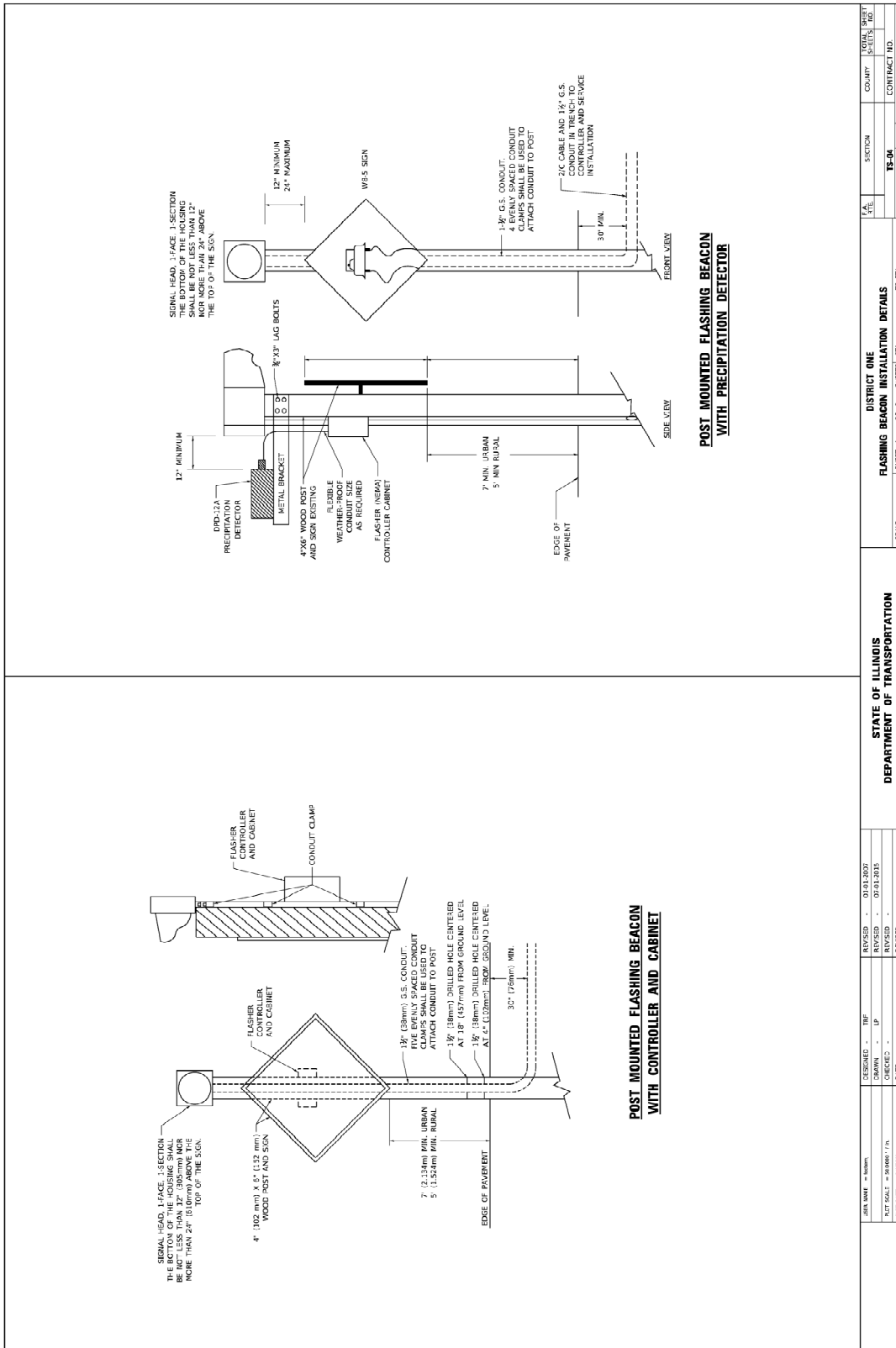
A	B	C
30"	2"	24"

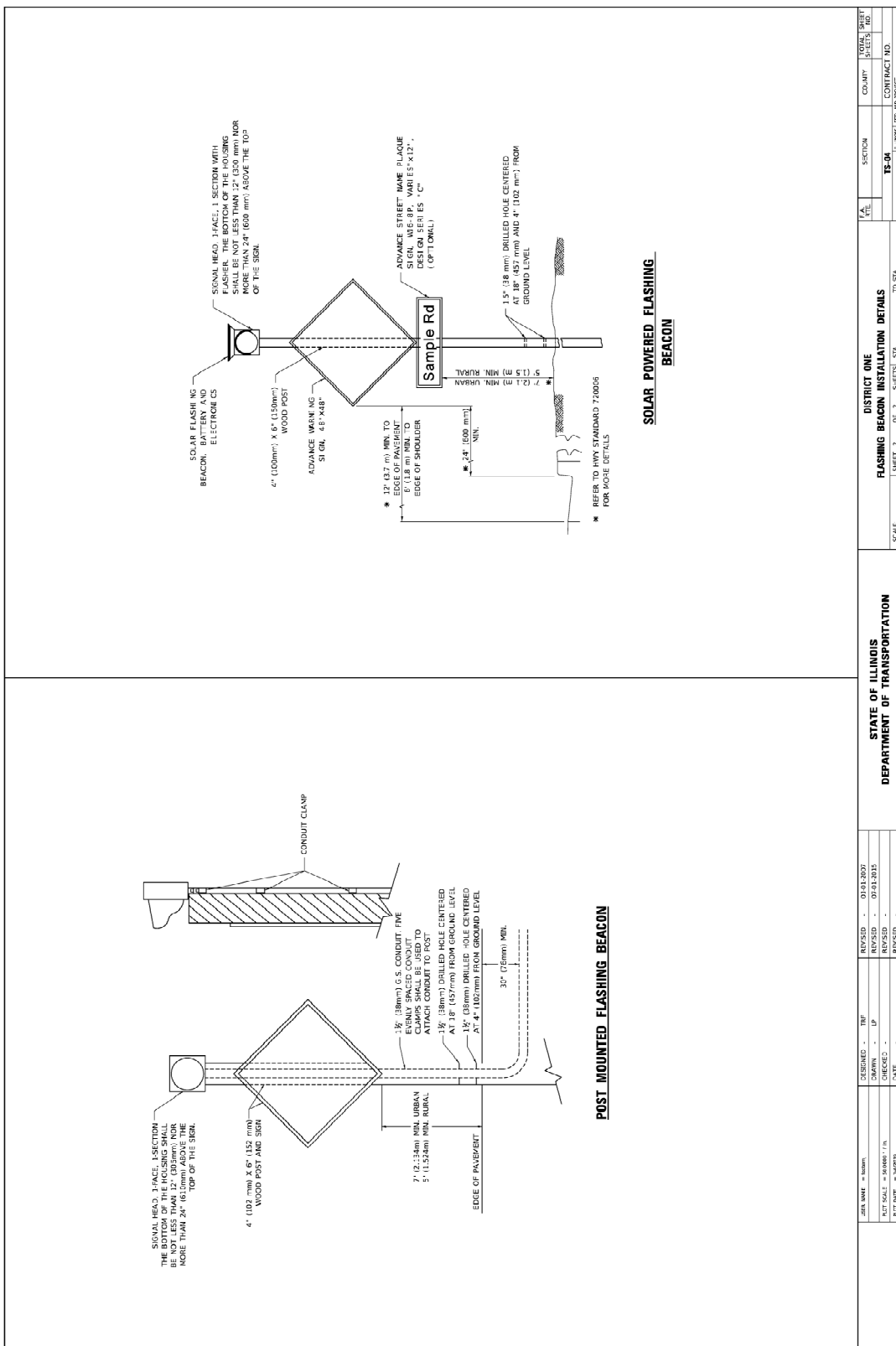
A	B	C
30"	2"	17"

STANDARD ALPHABETS SPACING CHART
(8") UPPER CASE AND (8") LOWER CASE

CHARACTER	FHMA SERIES "C"			FHMA SERIES "0"			
	LEFT SPACING (INCH)	WIDTH SPACING (INCH)	RIGHT SPACING (INCH)	CHARACTER SPACING (INCH)	LEFT SPACING (INCH)	RIGHT SPACING (INCH)	
A	0.240	5.132	0.240	A	0.240	5.804	0.240
B	0.880	4.482	0.480	B	0.950	5.446	0.480
C	0.720	4.482	0.220	C	0.800	5.446	0.800
D	0.880	4.482	0.220	D	0.950	5.446	0.800
E	0.880	4.082	0.240	E	0.950	5.446	0.240
F	0.720	4.482	0.220	F	0.800	5.446	0.800
G	0.880	4.482	0.880	G	0.950	5.446	0.800
H	0.880	4.482	0.880	H	0.950	5.446	0.800
I	0.240	4.082	0.880	I	0.240	5.132	0.880
J	0.880	4.482	0.480	J	0.950	5.654	0.480
K	0.880	4.482	0.240	K	0.950	4.952	0.240
L	0.880	4.482	0.240	L	0.950	5.446	0.240
M	0.880	4.482	0.880	M	0.950	5.446	0.800
N	0.880	4.482	0.880	N	0.950	5.446	0.800
O	0.720	4.722	0.220	O	0.800	5.654	0.800
P	0.880	4.482	0.220	P	0.950	5.446	0.800
Q	0.880	4.482	0.220	Q	0.950	5.446	0.800
R	0.880	4.482	0.480	R	0.950	5.446	0.480
S	0.480	4.482	0.480	S	0.400	5.446	0.480
T	0.240	4.082	0.240	T	0.240	4.952	0.240
U	0.880	4.482	0.880	U	0.950	5.446	0.800
V	0.880	4.482	0.880	V	0.950	5.446	0.800
W	0.240	6.084	0.240	W	0.240	7.114	0.240
X	0.240	4.722	0.240	X	0.400	5.446	0.460
Y	0.240	5.122	0.240	Y	0.240	6.884	0.240
Z	0.240	5.122	0.240	Z	0.240	6.884	0.240
1	0.320	3.842	0.440	1	0.400	4.952	0.720
2	0.320	3.842	0.440	2	0.400	4.952	0.720
3	0.320	3.842	0.440	3	0.400	4.952	0.720
4	0.320	3.842	0.440	4	0.400	4.952	0.720
5	0.320	3.842	0.440	5	0.400	4.952	0.720
6	0.320	3.842	0.440	6	0.400	4.952	0.720
7	0.320	3.842	0.440	7	0.400	4.952	0.720
8	0.320	3.842	0.440	8	0.400	4.952	0.720
9	0.320	3.842	0.440	9	0.400	4.952	0.720
0	0.080	2.882	0.980	0	0.350	3.252	0.980
10	0.160	4.722	0.160	10	0.150	5.664	0.160
11	0.160	4.722	0.160	11	0.150	5.664	0.160
12	0.160	4.722	0.160	12	0.150	5.664	0.160
13	0.000	5.202	0.000	13	0.000	6.244	0.000
14	0.240	3.362	0.240	14	0.240	4.002	0.240
15	0.240	3.362	0.240	15	0.240	4.002	0.240
16	0.720	1.680	0.880	16	0.800	2.000	0.800
17	0.480	4.482	0.480	17	0.500	5.446	0.800
18	0.240	4.482	0.240	18	0.240	5.000	0.800
19	0.240	4.482	0.240	19	0.240	5.446	0.800
20	0.240	4.482	0.240	20	0.240	5.446	0.800
21	0.240	4.482	0.240	21	0.240	5.446	0.800
22	0.240	4.482	0.240	22	0.240	5.446	0.800
23	0.240	4.482	0.240	23	0.240	5.446	0.800
24	0.240	4.482	0.240	24	0.240	5.446	0.800
25	0.240	4.482	0.240	25	0.240	5.446	0.800
26	0.240	4.482	0.240	26	0.240	5.446	0.800
27	0.240	4.482	0.240	27	0.240	5.446	0.800
28	0.240	4.482	0.240	28	0.240	5.446	0.800
29	0.240	4.482	0.240	29	0.240	5.446	0.800
30	0.240	4.482	0.240	30	0.240	5.446	0.800

DESIGNED - LDF	DRAWN - LP	REVISION -
CHECKED - LP	SCALE -	SHEET -
DATE -	PROJECT -	DISTRICT ONE
		MAST ARM MOUNTED STREET NAME SIGNS
		DISTRICT ONE
		STATE OF ILLINOIS
		DEPARTMENT OF TRANSPORTATION
		12-02
		SECTION
		COUNTY
		TOTAL SHEET
		CONTRACT NO.



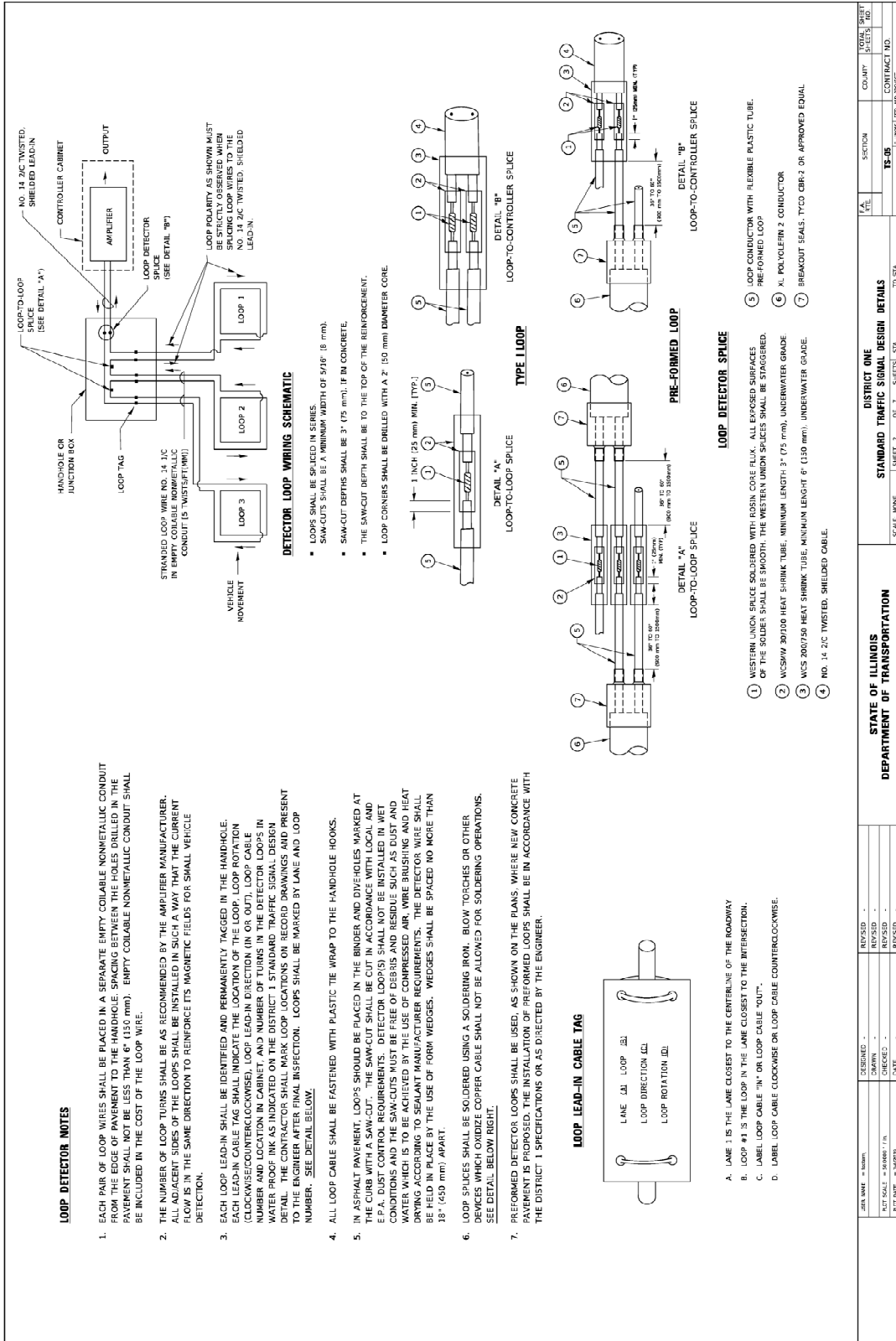


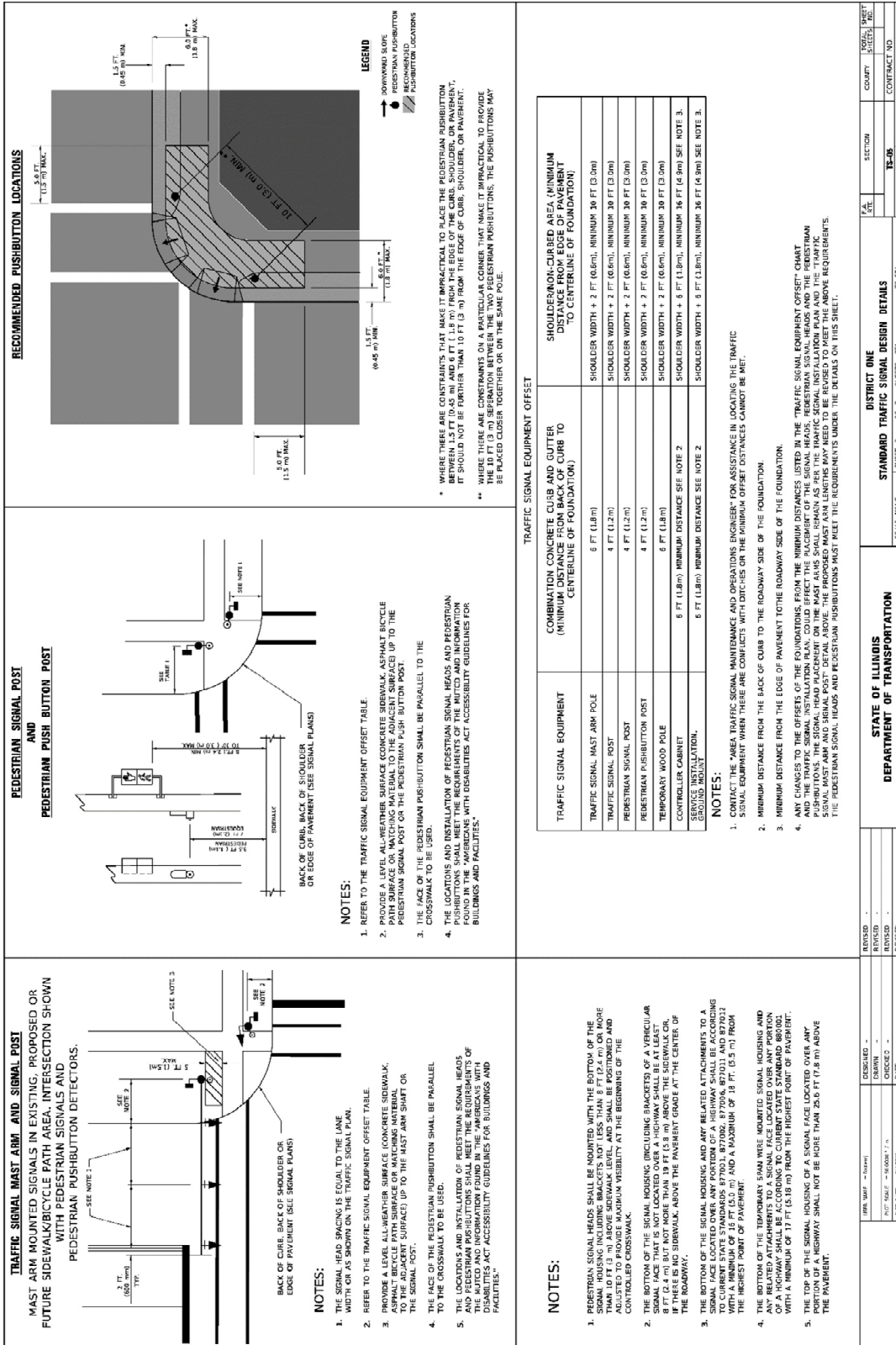
STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		DISTRICT ONE FLASHING BEACON INSTALLATION DETAILS		COUNTY		SECTION	
SCALE		SHEET 1 OF 2 - 3-ETD-304		CONTRACT NO.		15-04	
DESIGNED - TRF		REVISED - 01.01.2007		CONTRACT NO.		15-04	
DRAWN - LP		REVISED - 07.01.2015		COUNTY		SECTION	
CHECKED -		REVISED -		CONTRACT NO.		15-04	
DATE		REVISED -		COUNTY		SECTION	
JOB NAME -		REVISED -		CONTRACT NO.		15-04	
POST SCALE - 1/8"=1'-0"		REVISED -		COUNTY		SECTION	
POST DATE - 02/07/15		REVISED -		CONTRACT NO.		15-04	
TOTAL SHEET NO.		TOTAL SHEET NO.		CONTRACT NO.		15-04	
TOTAL SHEET NO.		TOTAL SHEET NO.		CONTRACT NO.		15-04	

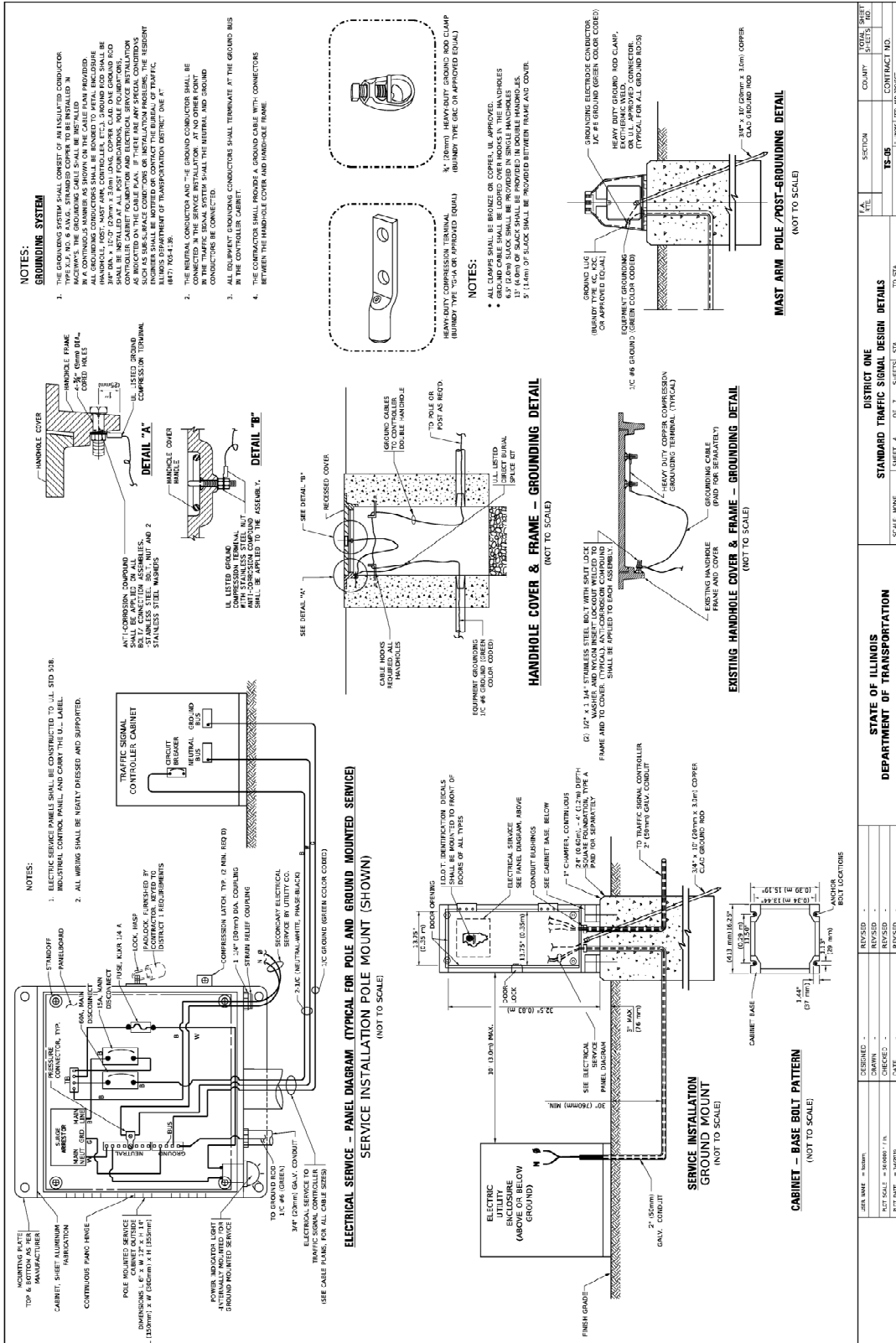
TRAFFIC SIGNAL LEGEND
(NOT TO SCALE)

ITEM	EXISTING	PROPOSED	ITEM	EXISTING	PROPOSED	ITEM	EXISTING	PROPOSED	ITEM	EXISTING	PROPOSED
CONTROLLER CABINET			HANDHOLE			SIGNAL HEAD WITH BACKLATE			SIGNAL HEAD WITH BACKLATE		
COMMUNICATION CABINET			SQUARE			-IP PROGRAMMABLE SIGNAL HEAD			-IP PROGRAMMABLE SIGNAL HEAD		
MASTER CONTROLLER			HEAVY DUTY HANDHOLE			-RB RETROREFLECTIVE BACKLATE			-RB RETROREFLECTIVE BACKLATE		
MASTER MASTER CONTROLLER			ROUND			PEDESTRIAN SIGNAL HEAD AT RAILROAD INTERSECTIONS			PEDESTRIAN SIGNAL HEAD AT RAILROAD INTERSECTIONS		
UNINTERRUPTIBLE POWER SUPPLY			DOUBLE HANDHOLE			PEDESTRIAN SIGNAL HEAD WITH COUNTDOWN TIMER			PEDESTRIAN SIGNAL HEAD WITH COUNTDOWN TIMER		
SERVICE INSTALLATION -IP/ POLE MOUNTED			JUNCTION BOX			ILLUMINATED SIGN "NO LEFT TURN/NO RIGHT TURN"			ILLUMINATED SIGN "NO LEFT TURN/NO RIGHT TURN"		
SERVICE INSTALLATION -GM GROUND MOUNTED METERED			RAILROAD CANTILEVER MAST ARM			NUMBER OF CONDUCTORS, ELECTRIC CABLE NO. 14, UNLESS NOTED OTHERWISE. ALL DETECTOR LOOP CABLE TO BE SHIELDED			NUMBER OF CONDUCTORS, ELECTRIC CABLE NO. 14, UNLESS NOTED OTHERWISE. ALL DETECTOR LOOP CABLE TO BE SHIELDED		
TELEPHONE CONNECTION			RAILROAD FLASHING SIGNAL			GROUND CABLE IN CONDUIT, NO. 6 SOLD COPPER (GREEN)			GROUND CABLE IN CONDUIT, NO. 6 SOLD COPPER (GREEN)		
STEEL MAST ARM ASSEMBLY AND POLE			RAILROAD CROSSING GATE			ELECTRIC CABLE IN CONDUIT, TRACER NO. 14 J/C			ELECTRIC CABLE IN CONDUIT, TRACER NO. 14 J/C		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE			RAILROAD CROSSBUCK			COAXIAL CABLE			COAXIAL CABLE		
SIGNAL POST -GM BARRIL MOUNTED - TEMPORARY			RAILROAD CONTROLLER CABINET UNDERGROUND CONDUIT (UC), GALVANIZED STEEL			VELOCITE ITEM			VELOCITE ITEM		
WOOD POLE			TEMPORARY SPAN WIRE, TETHER WIRE, AND CABLE			ABANDON ITEM			TEMPORARY SPAN WIRE, TETHER WIRE, AND CABLE		
GUY WIRE			SYSTEM ITEM			CONTROLLER CABINET AND FOUNDATION TO BE REMOVED			CONTROLLER CABINET AND FOUNDATION TO BE REMOVED		
SIGNAL HEAD			INTERSECTION ITEM			MAST ARM POLE AND FOUNDATION TO BE REMOVED			MAST ARM POLE AND FOUNDATION TO BE REMOVED		
SIGNAL HEAD WITH BACKLATE			REMOVE ITEM			SIGNAL POST AND FOUNDATION TO BE REMOVED			SIGNAL POST AND FOUNDATION TO BE REMOVED		
SIGNAL HEAD OPTICALLY PROGRAMMED			ABANDON ITEM			DEFECTOR LOOP, TYPE 1			DEFECTOR LOOP, TYPE 1		
FLASHER INSTALLATION -FSI SOLAR POWERED			RELOCATE ITEM			PREFORMED DETECTOR LOOP			PREFORMED DETECTOR LOOP		
PEDESTRIAN SIGNAL HEAD			CONTROLLER CABINET AND FOUNDATION TO BE REMOVED			SAMPLING (SYSTEM) DETECTOR			SAMPLING (SYSTEM) DETECTOR		
PEDESTRIAN PUSH BUTTON -APB ACCESSIBLE PEDESTRIAN PUSH BUTTON			FOUNDATION TO BE REMOVED			INTERSECTION AND SAMPLING (SYSTEM) DETECTOR			INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		
RADAR DETECTION SENSOR			FOUNDATION TO BE REMOVED			CURB AND SAMPLING (SYSTEM) DETECTOR			CURB AND SAMPLING (SYSTEM) DETECTOR		
VIDEO DETECTION CAMERA			DEFECTOR LOOP, TYPE 1			WIRELESS DETECTOR SENSOR			WIRELESS DETECTOR SENSOR		
RADAR/VIDEO DETECTION ZONE			PREFORMED DETECTOR LOOP			WIRELESS ACCESS POINT			WIRELESS ACCESS POINT		
PAN, TILT, ZOOM (PTZ) CAMERA			SAMPLING (SYSTEM) DETECTOR								
EMERGENCY VEHICLE LIGHT DETECTOR			INTERSECTION AND SAMPLING (SYSTEM) DETECTOR								
CONFIRMATION BEACON			CURB AND SAMPLING (SYSTEM) DETECTOR								
WIRELESS INTERCONNECT			WIRELESS DETECTOR SENSOR								
WIRELESS INTERCONNECT RADIO REPEATER			WIRELESS ACCESS POINT								

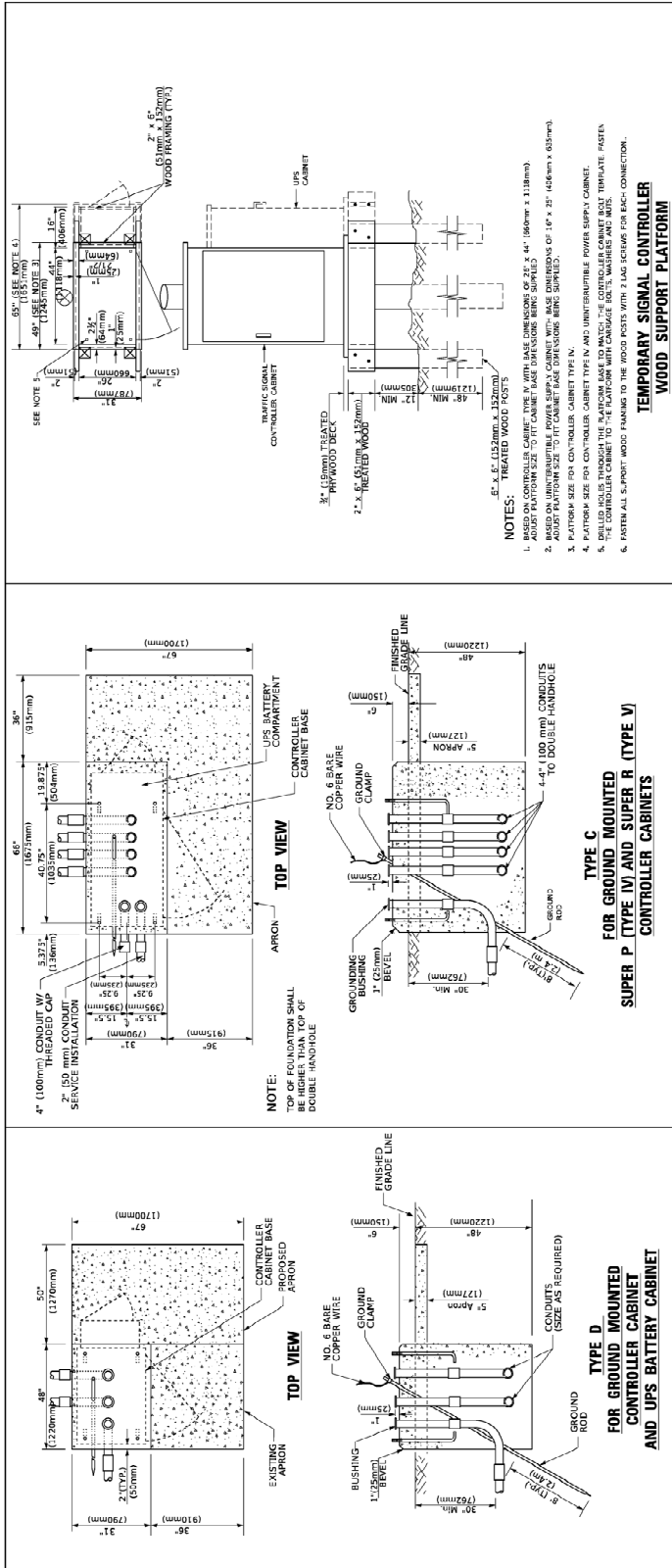
DISTRICT ONE STANDARD TRAFFIC SIGNAL DESIGN DETAILS		COUNTY: _____ SECTION: _____ TOTAL SHEETS: _____ CONTRACT NO: _____	
STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		SCALE: _____ SHEET 1 OF 7 - 3/27/13 STA. _____ TO STA. _____	
DESIGNED: _____ IP _____ DRAWN: _____ IP _____ CHECKED: _____ IP _____ DATE: _____ BY/DATE: _____	REVISION: _____ REVISION: _____ REVISION: _____ REVISION: _____		







STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		DISTRICT ONE STANDARD TRAFFIC SIGNAL DESIGN DETAILS		COUNTY		TOTAL SHEET	
SCALE	WORK	SHEET NO.	OF	DATE	NO.	NO.	NO.
SCALE	WORK	SHEET 4	OF	7	3-15-21	15-05	15-05
				CONTRACT NO.			



**TEMPORARY SIGNAL CONTROLLER
WOOD SUPPORT PLATFORM**

Height from Length	Foundation Depth	Foundation Diameter	Special Rebar	Quantity of Rebars	Size of Rebar
Greater than or equal to 30' (9.14 m)	12'-0" (3.66 m)	30" (762mm)	24" (609mm)	8	615
Greater than or equal to 20' (6.10 m) less than 30' (9.14 m)	11'-0" (3.4 m)	36" (914mm)	33" (838mm)	12	722
Greater than or equal to 10' (3.05 m) less than 20' (6.10 m)	13'-0" (4.0 m)	36" (914mm)	33" (838mm)	12	722
Greater than or equal to 5' (1.52 m) less than 10' (3.05 m)	15'-0" (4.6 m)	36" (914mm)	33" (838mm)	12	722
Greater than or equal to 4' (1.22 m) less than 5' (1.52 m)	21'-0" (6.4 m)	42" (1067mm)	33" (838mm)	16	825
Greater than or equal to 3' (0.91 m) less than 4' (1.22 m)	25'-0" (7.6 m)	42" (1067mm)	33" (838mm)	16	825

NOTES:

- These foundations are for steel arm or aluminum mast arm assemblies with concrete sets (concrete sets are not shown). The apron platform must be fastened to the support posts with 7/8" dia bolts for each connection. The apron platform must be fastened to the support posts with 7/8" dia bolts for each connection. The apron platform must be fastened to the support posts with 7/8" dia bolts for each connection. The apron platform must be fastened to the support posts with 7/8" dia bolts for each connection.
- Foundation mast arm assemblies under 55 feet tall must use 30" diameter foundation.
- Foundation mast arm assemblies under 55 feet tall must use 30" diameter foundation.
- For mast arm assemblies with dual arms refer to state standard 81300.

DEPTH OF FOUNDATION

FOUNDATION	DEPTH
TYPE A - SIGN POLE	4'-0" (1.22m)
TYPE B - SIGN POLE WITH WIND BRACE	4'-0" (1.22m)
TYPE C - CONTROLLER	4'-0" (1.22m)
TYPE D - SQUARE	4'-0" (1.22m)

DEPTH OF MAST ARM FOUNDATIONS, TYPE E

DISTRICT ONE	SECTION	COUNTY	TOTAL SHEET	SHEET NO.
STANDARD TRAFFIC SIGNAL DESIGN DETAILS	15-05		1	1

VERTICAL CABLE LENGTH

FEET	METER
20.54	6.04
13.0	4.0
6.0	2.0
3.0	1.0

VERTICAL CABLE LENGTH

FEET	METER
20.54	6.04
13.0	4.0
6.0	2.0
3.0	1.0

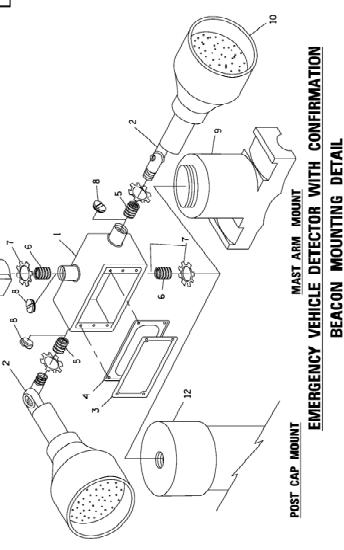
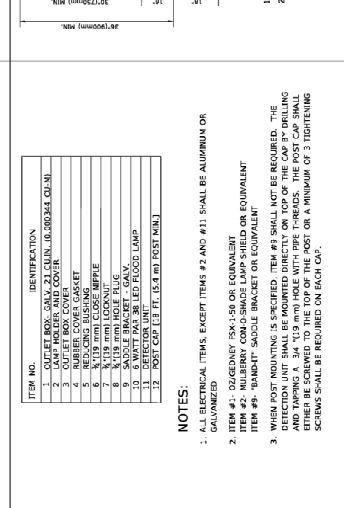
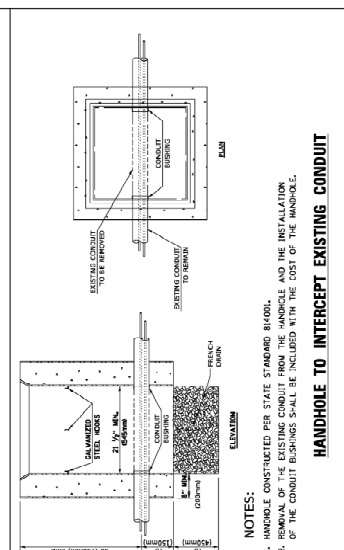
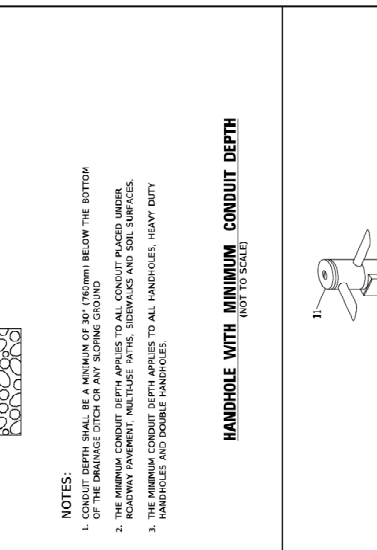
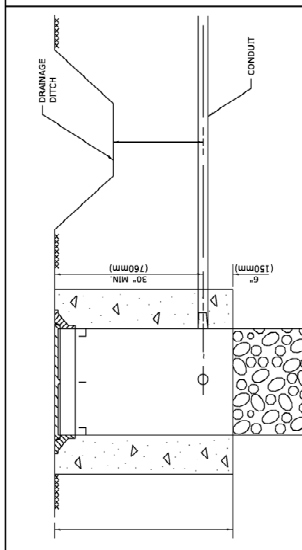
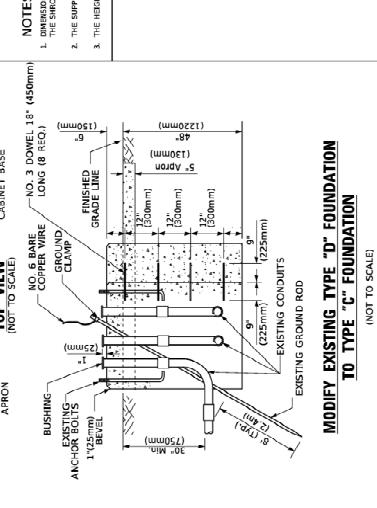
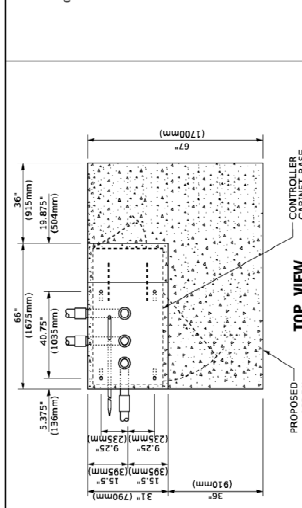
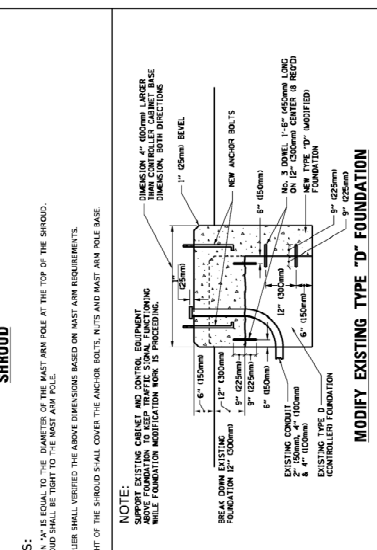
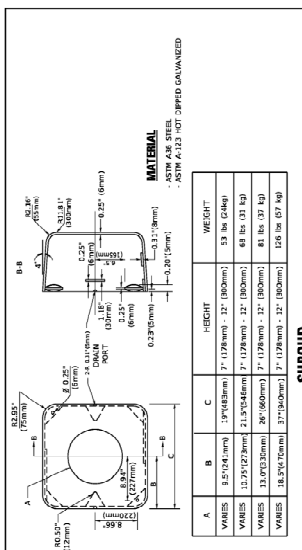
CABLE SLACK

FEET	METER
1.5	0.5
2.0	0.6
2.0	0.6
1.5	0.5
1.5	0.5
5.0	1.6

DESIGNED - REVISOR -
DRAWN - REVISOR -
CHECKED - REVISOR -
DATE - APPROVED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**SCALE: HORIZ. = 1"=40'-0" (1:304.8)
VERT. = 1"=10'-0" (1:304.8)**



BLENDED FINELY DIVIDED MINERALS (BDE)

Effective: April 1, 2021

Revise the second paragraph of Article 1010.01 of the Standard Specifications to read:

“Different sources or types of finely divided minerals shall not be mixed or used alternately in the same item of construction, except as a blended finely divided mineral product according to Article 1010.06.”

Add the following article to Section 1010 of the Standard Specifications:

“1010.06 Blended Finely Divided Minerals. Blended finely divided minerals shall be the product resulting from the blending or intergrinding of two or three finely divided minerals. Blended finely divided minerals shall be according to ASTM C 1697, except as follows.

- (a) Blending shall be accomplished by mechanically or pneumatically intermixing the constituent finely divided minerals into a uniform mixture that is then discharged into a silo for storage or tanker for transportation.
- (b) The blended finely divided mineral product will be classified according to its predominant constituent or the manufacturer’s designation and shall meet the chemical requirements of its classification. The other finely divided mineral constituent(s) will not be required to conform to their individual standards.”

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017

Revised: April 1, 2019

Revise Article 107.40(b) of the Standard Specifications to read:

“(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows.

- (1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.

- (2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.
- (3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days.”

Revise Article 107.40(c) of the Standard Specifications to read:

“(c) Payment. Payment for Minor, Major, and Reduced Rate of Production Delays will be made as follows.

- (1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

- (2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the Contractor’s yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

- (3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven calendar days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Payment for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be determined according to Article 109.13.”

Revise Article 108.04(b) of the Standard Specifications to read:

“(b) No working day will be charged under the following conditions.

- (1) When adverse weather prevents work on the controlling item.
- (2) When job conditions due to recent weather prevent work on the controlling item.
- (3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.
- (4) When delays caused by utility or railroad adjustments prevent work on the controlling item.
- (5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.
- (6) When any condition over which the Contractor has no control prevents work on the controlling item.”

Revise Article 109.09(f) of the Standard Specifications to read:

“(f) Basis of Payment. After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

The above Basis of Payment is an essential element of the contract and the claim cost recovery of the Contractor shall be so limited.”

Add the following to Section 109 of the Standard Specifications.

“109.13 Payment for Contract Delay. Compensation for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be allowed when such costs result from a delay meeting the criteria in the following table.

Contract Type	Cause of Delay	Length of Delay
Working Days	Article 108.04(b)(3) or Article 108.04(b)(4)	No working days have been charged for two consecutive weeks.
Completion Date	Article 108.08(b)(1) or Article 108.08(b)(7)	The Contractor has been granted a minimum two week extension of contract time, according to Article 108.08.

Payment for each of the various costs will be according to the following.

- (a) Escalated Material and/or Labor Costs. When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.
- (b) Extended Project Overhead. For the duration of the delay, payment for extended project overhead will be paid as follows.
 - (1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

Original Contract Amount	Supervisory and Administrative Personnel
Up to \$5,000,000	One Project Superintendent
Over \$ 5,000,000 - up to \$25,000,000	One Project Manager, One Project Superintendent or Engineer, and One Clerk
Over \$25,000,000 - up to \$50,000,000	One Project Manager, One Project Superintendent, One Engineer, and One Clerk
Over \$50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

(2) Home Office and Unabsorbed Overhead. Payment for home office and unabsorbed overhead will be calculated as 8 percent of the total delay cost.

(c) Extended Traffic Control. Traffic control required for an extended period of time due to the delay will be paid for according to Article 109.04.

When an extended traffic control adjustment is paid under this provision, an adjusted unit price as provided for in Article 701.20(a) for increase or decrease in the value of work by more than ten percent will not be paid.

Upon payment for a contract delay under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this provision."

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.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000

Revised: March 2, 2019

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 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 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, in the absence of unlawful discrimination and in an arena of fair and open competition, DBE companies can be expected to perform **0.00%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

- (a) The bidder documents enough DBE participation has been obtained to meet the goal or,
- (b) The bidder documents 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 a material bidding requirement and failure of the bidder to comply will render the bid not responsive.

The bidder shall submit a DBE Utilization Plan (form SBE 2026), and a DBE Participation Statement (form SBE 2025) for each DBE company proposed for the performance of work to achieve the contract goal, with the bid. If the Utilization Plan indicates the contract goal will not be met, documentation of good faith efforts shall also be submitted. 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. The required forms and documentation must be submitted as a single .pdf file using the "Integrated Contractor Exchange (iCX)" application within the Department's "EBids System".

The Department will not accept a Utilization Plan if it does not meet the bidding procedures set forth herein and the bid will be declared not responsive. In the event the bid is declared not responsive, 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.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan is approved. All information submitted by the bidder must be complete, accurate and adequately document enough DBE participation has been obtained or document the 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. This means 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 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 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 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 the 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 it is otherwise eligible for award. If the Department determines 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 will also include a statement of reasons for the adverse 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 to cure the deficiency.
- (c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. 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 reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person 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 reconsideration, 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 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 emailed to the Department at DOT.DBE.UP@illinois.gov.
- (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, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure 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 copies of DBE subcontracts to the Department 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) 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) The DBE is aware 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) 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 Contractor;
- (3) The listed DBE subcontractor fails or refuses to meet the 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) The Contractor has determined the listed DBE subcontractor is not a responsible contractor;
- (7) The listed DBE subcontractor voluntarily withdraws from the projects and provides written notice to the Contractor 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 subcontractor 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 Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE contractor was engaged or so that the 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 will provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

- (f) FINAL PAYMENT. 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 30 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 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 may 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.

DISPOSAL FEES (BDE)

Effective: November 1, 2018

Replace Articles 109.04(b)(5) – 109.04(b)(8) of the Standard Specifications with the following:

- “(5) Disposal Fees. When the extra work performed includes paying for disposal fees at a clean construction and demolition debris facility, an uncontaminated soil fill operation or a landfill, the Contractor shall receive, as administrative costs, an amount equal to five percent of the first \$10,000 and one percent of any amount over \$10,000 of the total approved costs of such fees.
- (6) Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.
- (7) Statements. No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with itemized statements of the cost of such force account work. Statements shall be accompanied and supported by invoices for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor’s stock, then in lieu of the invoices, the Contractor shall furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

Itemized statements at the cost of force account work shall be detailed as follows.

- a. Name, classification, date, daily hours, total hours, rate, and extension for each laborer and foreman. Payrolls shall be submitted to substantiate actual wages paid if so requested by the Engineer.
- b. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

- c. Quantities of materials, prices and extensions.
 - d. Transportation of materials.
 - e. Cost of property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions, and social security tax.
- (8) Work Performed by an Approved Subcontractor. When extra work is performed by an approved subcontractor, the Contractor shall receive, as administrative costs, an amount equal to five percent of the total approved costs of such work with the minimum payment being \$100.
- (9) All statements of the cost of force account work shall be furnished to the Engineer not later than 60 days after receipt of the Central Bureau of Construction form "Extra Work Daily Report". If the statement is not received within the specified time frame, all demands for payment for the extra work are waived and the Department is released from any and all such demands. It is the responsibility of the Contractor to ensure that all statements are received within the specified time regardless of the manner or method of delivery."

MOBILIZATION (BDE)

Effective: April 1, 2020

Replace Articles 671.02(a), (b), and (c) of the Standard Specifications with the following:

- "(a) Upon execution of the contract, 90 percent of the pay item will be paid.
- (b) When 90 percent of the adjusted contract value is earned, the remaining ten percent of the pay item will be paid along with any amount bid in excess of six percent of the original contract amount."

PORTLAND CEMENT CONCRETE – HAUL TIME (BDE)

Effective: July 1, 2020

Revise Article 1020.11(a)(7) of the Standard Specifications to read:

“(7) Haul Time. Haul time shall begin when the delivery ticket is stamped. The delivery ticket shall be stamped no later than five minutes after the addition of the mixing water to the cement, or after the addition of the cement to the aggregate when the combined aggregates contain free moisture in excess of two percent by weight (mass). If more than one batch is required for charging a truck using a stationary mixer, the time of haul shall start with mixing of the first batch. Haul time shall end when the truck is emptied for incorporation of the concrete into the work. The maximum haul time shall be as follows.

Concrete Temperature at Point of Discharge, °F (°C)	Maximum Haul Time ^{1/} (minutes)	
	Truck Mixer or Truck Agitator	Nonagitator Truck
50 - 64 (10 - 17.5)	90	45
> 64 (> 17.5) - without retarder	60	30
> 64 (> 17.5) - with retarder	90	45

1/ To encourage start-up testing for mix adjustments at the plant, the first two trucks will be allowed an additional 15 minutes haul time whenever such testing is performed.

For a mixture which is not mixed on the jobsite, a delivery ticket shall be required for each load. The following information shall be recorded on each delivery ticket: (1) ticket number; (2) name of producer and plant location; (3) contract number; (4) name of Contractor; (5) stamped date and time batched; (6) truck number; (7) quantity batched; (8) amount of admixture(s) in the batch; (9) amount of water in the batch; and (10) Department mix design number.

For concrete mixed in jobsite stationary mixers, the above delivery ticket may be waived, but a method of verifying the haul time shall be established to the satisfaction of the Engineer.”

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2019

Revised: January 1, 2020

Revise Section 669 of the Standard Specifications to read:

“SECTION 669. REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

669.01 Description. This work shall consist of the transportation and proper disposal of regulated substances. This work shall also consist of the removal, transportation, and proper disposal of underground storage tanks (UST), their contents and associated underground piping to the point where the piping is above the ground, including determining the content types and estimated quantities.

669.02 Equipment. The Contractor shall notify the Engineer of the delivery of all excavation, storage, and transportation equipment to a work area location. The equipment shall comply with OSHA and American Petroleum Institute (API) guidelines and shall be furnished in a clean condition. Clean condition means the equipment does not contain any residual material classified as a non-special waste, non-hazardous special waste, or hazardous waste. Residual materials include, but are not limited to, petroleum products, chemical products, sludges, or any other material present in or on equipment.

Before beginning any associated soil or groundwater management activity, the Contractor shall provide the Engineer with the opportunity to visually inspect and approve the equipment. If the equipment contains any contaminated residual material, decontamination shall be performed on the equipment as appropriate to the regulated substance and degree of contamination present according to OSHA and API guidelines. All cleaning fluids used shall be treated as the contaminant unless laboratory testing proves otherwise.

669.03 Pre-Construction Submittals and Qualifications. Prior to beginning this work, or working in areas with regulated substances, the Contractor shall submit a “Regulated Substances Pre-Construction Plan (RSPCP)” to the Engineer for review and approval using form BDE 2730. The form shall be signed by an Illinois licensed Professional Engineer or Professional Geologist.

As part of the RSPCP, the Contractor(s) or firm(s) performing the work shall meet the following qualifications.

- (a) Regulated Substances Monitoring. Qualification for environmental observation and field screening of regulated substances work and environmental observation of UST removal shall require either pre-qualification in Hazardous Waste by the Department or demonstration of acceptable project experience in remediation and operations for contaminated sites in accordance with applicable Federal, State, or local regulatory requirements using BDE 2730.

Qualification for each individual performing regulated substances monitoring shall require a minimum of one-year of experience in similar activities as those required for the project.

- (b) Underground Storage Tank Removal. Qualification for underground storage tank (UST) removal work shall require licensing and certification with the Office of the State Fire Marshall (OSFM) and possession of all permits required to perform the work. A copy of the permit shall be provided to the Engineer prior to tank removal.

The qualified Contractor(s) or firm(s) shall also document it does not have any current or former ties with any of the properties contained within, adjoining, or potentially affecting the work.

The Engineer will require up to 21 calendar days for review of the RSPCP. The review may involve rejection or revision and resubmittal; in which case, an additional 21 days will be required for each subsequent review. Work shall not commence until the RSPCP has been approved by the Engineer. After approval, the RSPCP shall be revised as necessary to reflect changed conditions in the field and documented using BDE 2730A "Regulated Substances Pre-Construction Plan (RSPCP) Addendum" and submitted to the Engineer for approval.

CONSTRUCTION REQUIREMENTS

669.04 Regulated Substances Monitoring. Regulated substances monitoring includes environmental observation and field screening during regulated substances management activities at the contract specific work areas. As part of the regulated substances monitoring, the monitoring personnel shall perform and document the applicable duties listed on form BDE 2732 "Regulated Substances Monitoring Daily Record (RSMDR)".

- (a) Environmental Observation. Prior to beginning excavation, the Contractor shall mark the limits of the contract specific work areas. Once work begins, the monitoring personnel shall be present on-site continuously during the excavation and loading of material.
- (b) Field Screening. Field screening shall be performed during the excavation and loading of material from the contract specific work areas, except for material classified according to Article 669.05(b)(1) or 669.05(c) where field screening is not required.

Field screening shall be performed with either a photoionization detector (PID) (minimum 10.6eV lamp) or a flame ionization detector (FID), and other equipment as appropriate, to monitor for potential contaminants associated with regulated substances. The PID or FID shall be calibrated on-site, and background level readings taken and recorded daily, and as field and weather conditions change. Field screen readings on the PID or FID in excess of background levels indicates the potential presence of regulated substances requiring handling as a non-special waste, special waste, or hazardous waste. PID or FID readings may be used as the basis of increasing the limits of removal with the approval of the Engineer but shall in no case be used to decrease the limits.

669.05 Regulated Substances Management and Disposal. The management and disposal of soil and/or groundwater containing regulated substances shall be according to the following:

- (a) Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in soil established pursuant to Subpart F of 35 Ill. Adm. Code 1100.605, the soil shall be managed as follows:
- (1) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC, but still considered within area background levels by the Engineer, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable. If the soils cannot be utilized within the right-of-way, they shall be managed and disposed of at a landfill as a non-special waste.
 - (2) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County identified in 35 Ill. Admin. Code 742 Appendix A. Table G, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of at a clean construction and demolition debris (CCDD) facility or an uncontaminated soil fill operation (USFO) within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (3) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site at a CCDD facility or an USFO within an MSA County excluding Chicago or within the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site at a CCDD facility or an USFO within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (5) When the Engineer determines soil cannot be managed according to Articles 669.05(a)(1) through (a)(4) above and the materials do not contain special waste or hazardous waste, as determined by the Engineer, the soil shall be managed and disposed of at a landfill as a non-special waste.

- (6) When analytical results indicate soil is hazardous by characteristic or listing pursuant to 35 Ill. Admin. Code 721, contains radiological constituents, or the Engineer otherwise determines the soil cannot be managed according to Articles 669.05(a)(1) through (a)(5) above, the soil shall be managed and disposed of off-site as a special waste or hazardous waste as applicable.
- (b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site according to Article 202.03. However, the excavated soil cannot be taken to a CCDD facility or an USFO for any of the following reasons.
- (1) The pH of the soil is less than 6.25 or greater than 9.0.
 - (2) The soil exhibited PID or FID readings in excess of background levels.
- (c) Soil Analytical Results Exceed Most Stringent MAC but Do Not Exceed Tiered Approach to Corrective Action Objectives (TACO) Residential. When the soil analytical results indicate that detected levels exceed the most stringent MAC but do not exceed TACO Tier 1 Soil Remediation Objectives for Residential Properties pursuant to 35 Ill. Admin. Code 742 Appendix B Table A, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site according to Article 202.03. However, the excavated soil cannot be taken to a CCDD facility or an USFO.
- (d) Groundwater. When groundwater analytical results indicate the detected levels are above Appendix B, Table E of 35 Ill. Admin. Code 742, the most stringent Tier 1 Groundwater Remediation Objectives for Groundwater Component of the Groundwater Ingestion Route for Class 1 groundwater, the groundwater shall be managed off-site as a special waste or hazardous waste as applicable. Special waste groundwater shall be containerized and trucked to an off-site treatment facility, or may be discharged to a sanitary sewer or combined sewer when permitted by the local sewer authority. Groundwater discharged to a sanitary sewer or combined sewer shall be pre-treated to remove particulates and measured with a calibrated flow meter to comply with applicable discharge limits. A copy of the permit shall be provided to the Engineer prior to discharging groundwater to the sanitary sewer or combined sewer.

Groundwater encountered within trenches may be managed within the trench and allowed to infiltrate back into the ground. If the groundwater cannot be managed within the trench, it may be discharged to a sanitary sewer or combined sewer when permitted by the local sewer authority, or it shall be containerized and trucked to an off-site treatment facility as a special waste or hazardous waste. The Contractor is prohibited from discharging groundwater within the trench through a storm sewer. The Contractor shall install backfill plugs within the area of groundwater contamination.

One backfill plug shall be placed down gradient to the area of groundwater contamination. Backfill plugs shall be installed at intervals not to exceed 50 ft (15 m). Backfill plugs are to be 4 ft (1.2 m) long, measured parallel to the trench, full trench width and depth. Backfill plugs shall not have any fine aggregate bedding or backfill, but shall be entirely cohesive soil or any class of concrete. The Contractor shall provide test data that the material has a permeability of less than 10^{-7} cm/sec according to ASTM D 5084, Method A or per another test method approved by the Engineer.

The Contractor shall use due care when transferring contaminated material from the area of origin to the transporter. Should releases of contaminated material to the environment occur (i.e., spillage onto the ground, etc.), the Contractor shall clean-up spilled material and place in the appropriate storage containers as previously specified. Clean-up shall include, but not be limited to, sampling beneath the material staging area to determine complete removal of the spilled material.

The Contractor shall provide engineered barriers, when required, and shall include materials sufficient to completely line excavation surfaces, including sloped surfaces, bottoms, and sidewall faces, within the areas designated for protection.

The Contractor shall obtain all documentation including any permits and/or licenses required to transport the material containing regulated substances to the disposal facility. The Contractor shall coordinate with the Engineer on the completion of all documentation. The Contractor shall make all arrangements for collection and analysis of landfill acceptance testing. The Contractor shall coordinate waste disposal approvals with the disposal facility.

The Contractor shall provide the Engineer with all transport-related documentation within two days of transport or receipt of said document(s). For management of special or hazardous waste, the Contractor shall provide the Engineer with documentation that the Contractor is operating with a valid Illinois special waste transporter permit at least two weeks before transporting the first load of contaminated material.

Transportation and disposal of material classified according to Article 669.05(a)(5) or 669.05(a)(6) shall be completed each day so that none of the material remains on-site by the close of business, except when temporary staging has been approved.

Any waste generated as a special or hazardous waste from a non-fixed facility shall be manifested off-site using the Department's county generator number provided by the Bureau of Design and Environment. An authorized representative of the Department shall sign all manifests for the disposal of the contaminated material and confirm the Contractor's transported volume. Any waste generated as a non-special waste may be managed off-site without a manifest, a special waste transporter, or a generator number.

The Contractor shall select a landfill permitted for disposal of the contaminant within the State of Illinois. The Department will review and approve or reject the facility proposed by the Contractor to use as a landfill. The Contractor shall verify whether the selected disposal facility is compliant with those applicable standards as mandated by their permit and whether the disposal facility is presently, has previously been, or has never been, on the United States Environmental Protection Agency (U.S. EPA) National Priorities List or the Resource Conservation and Recovery Act (RCRA) List of Violating Facilities. The use of a Contractor selected landfill shall in no manner delay the construction schedule or alter the Contractor's responsibilities as set forth.

669.06 Non-Special Waste Certification. An authorized representative of the Department shall sign and date all non-special waste certifications. The Contractor shall be responsible for providing the Engineer with the required information that will allow the Engineer to certify the waste is not a special waste.

(a) Definition. A waste is considered a non-special waste as long as it is not:

- (1) a potentially infectious medical waste;
- (2) a hazardous waste as defined in 35 Ill. Admin. Code 721;
- (3) an industrial process waste or pollution control waste that contains liquids, as determined using the paint filter test set forth in subdivision (3)(A) of subsection (m) of 35 Ill. Admin. Code 811.107;
- (4) a regulated asbestos-containing waste material, as defined under the National Emission Standards for Hazardous Air Pollutants in 40 CFR Part 61.141;
- (5) a material containing polychlorinated biphenyls (PCB's) regulated pursuant to 40 CFR Part 761;
- (6) a material subject to the waste analysis and recordkeeping requirements of 35 Ill. Admin. Code 728.107 under land disposal restrictions of 35 Ill. Admin. Code 728;
- (7) a waste material generated by processing recyclable metals by shredding and required to be managed as a special waste under Section 22.29 of the Environmental Protection Act; or
- (8) an empty portable device or container in which a special or hazardous waste has been stored, transported, treated, disposed of, or otherwise handled.

- (b) Certification Information. All information used to determine the waste is not a special waste shall be attached to the certification. The information shall include but not be limited to:
- (1) the means by which the generator has determined the waste is not a hazardous waste;
 - (2) the means by which the generator has determined the waste is not a liquid;
 - (3) if the waste undergoes testing, the analytic results obtained from testing, signed and dated by the person responsible for completing the analysis;
 - (4) if the waste does not undergo testing, an explanation as to why no testing is needed;
 - (5) a description of the process generating the waste; and
 - (6) relevant material safety data sheets.

669.07 Temporary Staging. Soil classified according to Articles 669.05(a)(2), (b)(1), or (c) may be temporarily staged at the Contractor's option. Soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) shall be managed and disposed of without temporary staging to the greatest extent practicable. If circumstances beyond the Contractor's control require temporary staging of these latter materials, the Contractor shall request approval from the Engineer in writing.

Temporary staging shall be accomplished within the right-of-way and the Contractor's means and methods shall be described in the approved or amended RSPCP. Staging areas shall not be located within 200 feet (61 m) of a public or private water supply well; nor within 100 feet (30 m) of sensitive environmental receptor areas, including wetlands, rivers, streams, lakes, or designated habitat zones.

The method of staging shall consist of containerization or stockpiling as applicable for the type, classification, and physical state (i.e., liquid, solid, semisolid) of the material. Materials of different classifications shall be staged separately with no mixing or co-mingling.

When containers are used, the containers and their contents shall remain intact and inaccessible to unauthorized persons until the manner of disposal is determined. The Contractor shall be responsible for all activities associated with the storage containers including, but not limited to, the procurement, transport, and labeling of the containers. The Contractor shall not use a storage container if visual inspection of the container reveals the presence of free liquids or other substances that could cause the waste to be reclassified as a hazardous or special waste.

When stockpiles are used, they shall be covered with a minimum 20-mil plastic sheeting or tarps secured using weights or tie-downs. Perimeter berms or diversionary trenches shall be provided to contain and collect for disposal any water that drains from the soil. Stockpiles shall be managed to prevent or reduce potential dust generation.

When staging non-special waste, special waste, or hazardous waste, the following additional requirements shall apply:

- (a) Non-Special Waste. When stockpiling soil classified according to Article 669.05(a)(1) or 669.05(a)(5), an impermeable surface barrier between the materials and the ground surface shall be installed. The impermeable barrier shall consist of a minimum 20-mil plastic liner material and the surface of the stockpile area shall be clean and free of debris prior to placement of the liner. Measures shall also be taken to limit or discourage access to the staging area.
- (b) Special Waste and Hazardous Waste. Soil classified according to Article 669.05(a)(6) shall not be stockpiled but shall be containerized immediately upon generation in containers, tanks or containment buildings as defined by RCRA, Toxic Substances Control Act (TSCA), and other applicable State or local regulations and requirements, including 35 Ill. Admin. Code Part 722, Standards Applicable to Generators of Hazardous Waste.

The staging area(s) shall be enclosed (by a fence or other structure) to restrict direct access to the area, and all required regulatory identification signs applicable to a staging area containing special waste or hazardous waste shall be deployed.

Storage containers shall be placed on an all-weather gravel-packed, asphalt, or concrete surface. Containers shall be in good condition and free of leaks, large dents, or severe rusting, which may compromise containment integrity. Containers must be constructed of, or lined with, materials that will not react or be otherwise incompatible with the hazardous or special waste contents. Containers used to store liquids shall not be filled more than 80 percent of the rated capacity. Incompatible wastes shall not be placed in the same container or comingled.

All containers shall be legibly labeled and marked using pre-printed labels and permanent marker in accordance with applicable regulations, clearly showing the date of waste generation, location and/or area of waste generation, and type of waste. The Contractor shall place these identifying markings on an exterior side surface of the container.

Storage containers shall be kept closed, and storage pads covered, except when access is needed by authorized personnel.

Special waste and hazardous waste shall be transported and disposed within 90 days from the date of generation.

669.08 Underground Storage Tank Removal. For the purposes of this section, an underground storage tank (UST) includes the underground storage tank, piping, electrical controls, pump island, vent pipes and appurtenances.

Prior to removing an UST, the Engineer shall determine whether the Department is considered an "owner" or "operator" of the UST as defined by the UST regulations (41 Ill. Adm. Code Part 176). Ownership of the UST refers to the Department's owning title to the UST during storage, use or dispensing of regulated substances. The Department may be considered an "operator" of the UST if it has control of, or has responsibility for, the daily operation of the UST. The Department may however voluntarily undertake actions to remove an UST from the ground without being deemed an "operator" of the UST.

In the event the Department is deemed not to be the "owner" or "operator" of the UST, the OSFM removal permit shall reflect who was the past "owner" or "operator" of the UST. If the "owner" or "operator" cannot be determined from past UST registration documents from OSFM, then the OSFM removal permit will state the "owner" or "operator" of the UST is the Department. The Department's Office of Chief Counsel (OCC) will review all UST removal permits prior to submitting any removal permit to the OSFM. If the Department is not the "owner" or "operator" of the UST then it will not register the UST or pay any registration fee.

The Contractor shall be responsible for obtaining permits required for removing the UST, notification to the OSFM, using an OSFM certified tank contractor, removal and disposal of the UST and its contents, and preparation and submittal of the OSFM Site Assessment Report in accordance with 41 Ill. Admin. Code Part 176.330.

The Contractor shall contact the Engineer and the OSFM's office at least 72 hours prior to removal to confirm the OSFM inspector's presence during the UST removal. Removal, transport, and disposal of the UST shall be according to the applicable portions of the latest revision of the "American Petroleum Institute (API) Recommended Practice 1604".

The Contractor shall collect and analyze tank content (sludge) for disposal purposes. The Contractor shall remove as much of the regulated substance from the UST system as necessary to prevent further release into the environment. All contents within the tank shall be removed, transported and disposed of, or recycled. The tank shall be removed and rendered empty according to IEPA definition.

The Contractor shall collect soil samples from the bottom and sidewalls of the excavated area in accordance with 35 Ill. Admin. Code Part 734.210(h) after the required backfill has been removed during the initial response action, to determine the level of contamination remaining in the ground, regardless if a release is confirmed or not by the OSFM on-site inspector.

In the event the UST is designated a leaking underground storage tank (LUST) by the OSFM's inspector, or confirmation by analytical results, the Contractor shall notify the Engineer and the District Environmental Studies Unit (DESU). Upon confirmation of a release of contaminants and notifications to the Engineer and DESU, the Contractor shall report the release to the Illinois Emergency Management Agency (IEMA) (e.g., by telephone or electronic mail) and provide them with whatever information is available ("owner" or "operator" shall be stated as the past registered "owner" or "operator", or the IDOT District in which the tank is located and the DESU Manager).

The Contractor shall perform the following initial response actions if a release is indicated by the OSFM inspector:

- (a) Take immediate action to prevent any further release of the regulated substance to the environment, which may include removing, at the Engineer's discretion, and disposing of up to 4 ft (1.2 m) of the contaminated material, as measured from the outside dimension of the tank;
- (b) Identify and mitigate fire, explosion and vapor hazards;
- (c) Visually inspect any above ground releases or exposed below ground releases and prevent further migration of the released substance into surrounding soils and groundwater; and
- (d) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors and free product that have migrated from the tank excavation zone and entered into subsurface structures (such as sewers or basements).

The tank excavation shall be backfilled according to applicable portions of Sections 205, 208, and 550 with a material that will compact and develop stability. All uncontaminated concrete and soil removed during tank extraction may be used to backfill the excavation, at the discretion of the Engineer.

After backfilling the excavation, the site shall be graded and cleaned.

669.09 Regulated Substances Final Construction Report. Not later than 90 days after completing this work, the Contractor shall submit a "Regulated Substances Final Construction Report (RSFCR)" to the Engineer using form BDE 2733 and required attachments. The form shall be signed by an Illinois licensed Professional Engineer or Professional Geologist.

669.10 Method of Measurement. Non-special waste, special waste, and hazardous waste soil will be measured for payment according to Article 202.07(b) when performing earth excavation, Article 502.12(b) when excavating for structures, or by computing the volume of the trench using the maximum trench width permitted and the actual depth of the trench.

Groundwater containerized and transported off-site for management, storage, and disposal will be measured for payment in gallons (liters).

Backfill plugs will be measured in cubic yards (cubic meters) in place, except the quantity for which payment will be made shall not exceed the volume of the trench, as computed by using the maximum width of trench permitted by the Specifications and the actual depth of the trench, with a deduction for the volume of the pipe.

Engineered Barriers will be measured for payment in square yards (square meters).

669.11 Basis of Payment. The work of preparing, submitting and administering a Regulated Substances Pre-Construction Plan will be paid for at the contract lump sum price for REGULATED SUBSTANCES PRE-CONSTRUCTION PLAN.

Regulated substances monitoring, including completion of form BDE 2732 for each day of work, will be paid for at the contract unit price per calendar day, or fraction thereof to the nearest 0.5 calendar day, for REGULATED SUBSTANCES MONITORING.

The installation of engineered barriers will be paid for at the contract unit price per square yard (square meter) for ENGINEERED BARRIER.

The work of UST removal, soil excavation, soil and content sampling, the management of excavated soil and UST content, and UST disposal, will be paid for at the contract unit price per each for UNDERGROUND STORAGE TANK REMOVAL.

The transportation and disposal of soil and other materials from an excavation determined to be contaminated will be paid for at the contract unit price per cubic yard (cubic meter) for NON-SPECIAL WASTE DISPOSAL, SPECIAL WASTE DISPOSAL, or HAZARDOUS WASTE DISPOSAL.

The transportation and disposal of groundwater from an excavation determined to be contaminated will be paid for at the contract unit price per gallon (liter) for SPECIAL WASTE GROUNDWATER DISPOSAL or HAZARDOUS WASTE GROUNDWATER DISPOSAL. When groundwater is discharged to a sanitary or combined sewer by permit, the cost will be paid for according to Article 109.05.

Backfill plugs will be paid for at the contract unit price per cubic yard (cubic meter) for BACKFILL PLUGS.

Payment for temporary staging of soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) will be paid for according to Article 109.04. The Department will not be responsible for any additional costs incurred, if mismanagement of the staging area, storage containers, or their contents by the Contractor results in excess cost expenditure for disposal or other material management requirements.

Payment for accumulated stormwater removal and disposal will be according to Article 109.04. Payment will only be allowed if appropriate stormwater and erosion control methods were used.

Payment for decontamination, labor, material, and equipment for monitoring areas beyond the specified areas, with the Engineer's prior written approval, will be according to Article 109.04.

When the waste material for disposal requires sampling for landfill disposal acceptance, the samples shall be analyzed for TCLP VOCs, SVOCs, RCRA metals, pH, ignitability, and paint filter test. The analysis will be paid for at the contract unit price per each for SOIL DISPOSAL ANALYSIS using EPA Methods 1311 (extraction), 8260B for VOCs, 8270C for SVOCs, 6010B and 7470A for RCRA metals, 9045C for pH, 1030 for ignitability, and 9095A for paint filter.

The work of preparing, submitting and administering a Regulated Substances Final Construction Report will be paid for at the contract lump sum price REGULATED SUBSTANCES FINAL CONSTRUCTION REPORT.”

STEEL COST ADJUSTMENT (BDE)

Effective: April 2, 2004

Revised: August 1, 2017

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract. Failure to indicate “Yes” for any item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

- Metal Piling (excluding temporary sheet piling)
- Structural Steel
- Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in have a contract value of \$10,000 or greater.

The adjustments shall apply to the above items when they are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply when the item is added as extra work and paid for at a lump sum price or by force account.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

- (a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.
- (b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

$$SCA = Q \times D$$

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$$D = MPI_M - MPI_L$$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price,. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

Basis of Payment. Steel cost adjustments may be positive or negative but will only be made when there is a difference between the MPI_L and MPI_M in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(MPI_L - MPI_M) \div MPI_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling) Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness Other piling	23 lb/ft (34 kg/m) 32 lb/ft (48 kg/m) 37 lb/ft (55 kg/m) See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Mesh Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail Steel Plate Beam Guardrail, Type A w/steel posts Steel Plate Beam Guardrail, Type B w/steel posts Steel Plate Beam Guardrail, Types A and B w/wood posts Steel Plate Beam Guardrail, Type 2 Steel Plate Beam Guardrail, Type 6 Traffic Barrier Terminal, Type 1 Special (Tangent) Traffic Barrier Terminal, Type 1 Special (Flared)	20 lb/ft (30 kg/m) 30 lb/ft (45 kg/m) 8 lb/ft (12 kg/m) 305 lb (140 kg) each 1260 lb (570 kg) each 730 lb (330 kg) each 410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms Traffic Signal Post Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 – 12 m) Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 – 16.5 m) Light Pole w/Mast Arm, 30 - 50 ft (9 – 15.2 m) Light Pole w/Mast Arm, 55 - 60 ft (16.5 – 18 m) Light Tower w/Luminaire Mount, 80 - 110 ft (24 – 33.5 m) Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 – 42.5 m) Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 – 48.5 m)	11 lb/ft (16 kg/m) 14 lb/ft (21 kg/m) 21 lb/ft (31 kg/m) 13 lb/ft (19 kg/m) 19 lb/ft (28 kg/m) 31 lb/ft (46 kg/m) 65 lb/ft (97 kg/m) 80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence) Steel Railing, Type SM Steel Railing, Type S-1 Steel Railing, Type T-1 Steel Bridge Rail	64 lb/ft (95 kg/m) 39 lb/ft (58 kg/m) 53 lb/ft (79 kg/m) 52 lb/ft (77 kg/m)
Frames and Grates Frame Lids and Grates	250 lb (115 kg) 150 lb (70 kg)

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

“109.14 Subcontractor and Disadvantaged Business Enterprise Payment Reporting.

The Contractor shall report all payments made to the following parties:

- (a) first tier subcontractors;
- (b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;
- (c) material suppliers or trucking firms that are part of the Contractor’s submitted DBE utilization plan.

The report shall be made through the Department’s on-line subcontractor payment reporting system within 21 days of making the payment.”

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017

Revised: April 1, 2019

Replace the second paragraph of Article 109.12 of the Standard Specifications with the following:

“This mobilization payment shall be made at least seven days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor’s work.

Value of Subcontract Reported on Form BC 260A	Mobilization Percentage
Less than \$10,000	25%
\$10,000 to less than \$20,000	20%
\$20,000 to less than \$40,000	18%
\$40,000 to less than \$60,000	16%
\$60,000 to less than \$80,000	14%
\$80,000 to less than \$100,000	12%
\$100,000 to less than \$250,000	10%
\$250,000 to less than \$500,000	9%
\$500,000 to \$750,000	8%
Over \$750,000	7%”

TRAFFIC CONTROL DEVICES - CONES (BDE)

Effective: January 1, 2019

Revise Article 701.15(a) of the Standard Specifications to read:

“(a) Cones. Cones are used to channelize traffic. Cones used to channelize traffic at night shall be reflectorized; however, cones shall not be used in nighttime lane closure tapers or nighttime lane shifts.”

Revise Article 1106.02(b) of the Standard Specifications to read:

“(b) Cones. Cones shall be predominantly orange. Cones used at night that are 28 to 36 in. (700 to 900 mm) in height shall have two white circumferential stripes. If non-reflective spaces are left between the stripes, the spaces shall be no more than 2 in. (50mm) in width. Cones used at night that are taller than 36 in. (900 mm) shall have a minimum of two white and two fluorescent orange alternating, circumferential stripes with the top stripe being fluorescent orange. If non-reflective spaces are left between the stripes, the spaces shall be no more than 3 in. (75 mm) in width.

The minimum weights for the various cone heights shall be 4 lb for 18 in. (2 kg for 450 mm), 7 lb for 28 in. (3 kg for 700 mm), and 10 lb for 36 in. (5 kg for 900 mm) with a minimum of 60 percent of the total weight in the base. Cones taller than 36 in. shall be weighted per the manufacturer’s specifications such that they are not moved by wind or passing traffic.”

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

Revised: November 1, 2021

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 Sunday through Saturday 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.

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: March 2, 2020

Add the following to Article 701.03 of the Standard Specifications:

“(q) Temporary Sign Supports 1106.02”

Revise the third paragraph of Article 701.14 of the Standard Specifications to read:

“For temporary sign supports, the Contractor shall provide a FHWA eligibility letter for each device used on the contract. The letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support per the manufacturer’s specifications.”

Revise the first paragraph of Article 701.15 of the Standard Specifications to read:

“**701.15 Traffic Control Devices.** For devices that must meet crashworthiness standards, the Contractor shall provide a manufacturer’s self-certification or a FHWA eligibility letter for each Category 1 device and a FHWA eligibility letter for each Category 2 and Category 3 device used on the contract. The self-certification or letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device.”

Revise the first six paragraphs of Article 1106.02 of the Standard Specifications to read:

“**1106.02 Devices.** Work zone traffic control devices and combinations of devices shall meet crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, plastic drums, and delineators, with no attachments (e.g. lights). Category 1 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 1 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include vertical panels with lights, barricades, temporary sign supports, and Category 1 devices with attachments (e.g. drums with lights). Category 2 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 2 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1 or 2. Category 3 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 3 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2029. Category 3 devices shall be crash tested for Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. It is preferable for Category 4 devices manufactured after December 31, 2019 to be MASH-16 compliant; however, there are currently no crash tested devices in this category, so it remains exempt from the NCHRP 350 or MASH compliance requirement.

For each type of device, when no more than one MASH-16 compliant is available, an NCHRP 350 or MASH-2009 compliant device may be used, even if manufactured after December 31, 2019.”

Revise Articles 1106.02(g), 1106.02(k), and 1106.02(l) to read:

“(g) Truck Mounted/Trailer Mounted Attenuators. The attenuator shall be approved for use at Test Level 3. Test Level 2 may be used for normal posted speeds less than or equal to 45 mph.

(k) Temporary Water Filled Barrier. The water filled barrier shall be a lightweight plastic shell designed to accept water ballast and be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings.

(l) Movable Traffic Barrier. The movable traffic barrier shall be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings. The barrier shall be capable of being moved on and off the roadway on a daily basis.”

ILLINOIS WORKS APPRENTICESHIP INITIATIVE – STATE FUNDED CONTRACTS (BDE)

Effective: June 2, 2021

Revised: September 2, 2021

Illinois Works Jobs Program Act (30 ILCS 559/20-1 et seq.). For contracts having an awarded contract value of \$500,000 or more, the Contractor shall comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules. The goal of the Illinois Apprenticeship Works Initiative is that apprentices will perform either 10% of the total labor hours actually worked in each prevailing wage classification or 10% of the estimated labor hours in each prevailing wage classification, whichever is less. The Contractor may seek from the Department of Commerce and Economic Opportunity (DCEO) a waiver or reduction of this goal in certain circumstances pursuant to 30 ILCS 559/20-20(b). The Contractor shall ensure compliance during the term of the contract and will be required to report on and certify its compliance. An apprentice use plan, apprentice hours, and a compliance certification shall be submitted to the Engineer on forms provided by the Department and/or DCEO.

VEHICLE AND EQUIPMENT WARNING LIGHTS (BDE)

Effective: November 1, 2021

Add the following paragraph after the first paragraph of Article 701.08 of the Standard Specifications:

“The Contractor shall equip all vehicles and equipment with high-intensity oscillating, rotating, or flashing, amber or amber-and-white, warning lights which are visible from all directions. The lights shall be in operation while the vehicle or equipment is engaged in construction operations.”

SECTION 3 – LIST OF LOCATIONS

LIGHTING SYSTEM - EQUIPMENT PAY CODE - L-1 LOCATIONS

1	L	0103	I 55 STEV @	CO	L-1	ON
		A	MLK ML KING DR			
2	L	0105	I 55 STEV @	CO	L-1	ON
		B	MICHIGAN			
3	L	0110	I 55 STEV @	CO	L-1	ON
		C	WENTWORTH			
4	L	0115	I 55 STEV @	CO	L-1	ON
		D	STEWART'S CAVE (AVE)			
5	L	0120	I 55 STEV @	CO	L-1	ON
		E	LOOMIS ST			
6	L	0123	I 55 STEV INCL NAV LTG @	CO	L-1	ON
		E1	ASHLAND AVE			
7	L	0125	I 55 STEV @	CO	L-1	ON
		F	DAMEN AVE			
8	L	0130	I 55 STEV @	CO	L-1	ON
		G	CALIFORNIA AVE			
9	L	0133	I 55 STEV @	CO	L-1	ON
		G1	KEDZIE AVE			
10	L	0135	I 55 STEV @	CO	L-1	ON
		H	PULASKI RD			
11	L	0137	I 55 STEV @	CO	L-1	ON
		H1	PULASKI RD TUNNEL			
12	L	0140	I 55 STEV @	CO	L-1	ON
		I	IL 50 CICERO AVE			
13	L	0155	I 55 STEV @	CO	L-1	ON
		J	CENTRAL AVE			
14	L	0160	I 55 STEV @	CO	L-1	ON
		K	64TH ST			
15	L	0165	I 55 STEV @	CO	L-1	ON
		L	IL 43 HARLEM AVE			
16	L	0173	I 55 STEV @	CO	L-1	ON

			IL 171 1ST AVE NORTH			
17	L	0175	I 55 STEV @	CO	L-1	ON
		N	IL 171 1ST AVE SOUTH			
18	L	0180	I 55 STEV @	CO	L-1	ON
		O	85TH AVE			
19	L	0184	I 55 STEV @	CO	L-1	ON
		P	91ST AVE			
20	L	0187	I 55 STEV @	CO	L-1	ON
		R	US 12 20 45 LAGRANGE RD			
21	L	0188	I 55 STEV @	CO	L-1	ON
		R1	US 12 20 45 SB RAMP			
22	L	0193	I 55 STEV @	CO	L-1	ON
		S1	I 294 TLWY SB TO EB JOLIET RD			
23	L	0195	I 55 STEV @	CO	L-1	ON
		T	COUNTY LINE RD			
24	L	0203	I 55 STEV @	CO	L-1	ON
		A	MADISON ST			
25	L	0205	I 55 STEV @	CO	L-1	ON
		B	IL 83 KINGERY HWY SOUTH			
26	L	0210	I 55 STEV @	CO	L-1	ON
		C	IL 83 KINGERY HWY NORTH			
27	L	0215	I 55 STEV @	CO	L-1	ON
		D	CASS AVE			
28	L	0220	I 55 STEV @	CO	L-1	ON
		E	KEARNEY RD (SOUTH OF CASS)			
29	L	0225	I 55 STEV @	CO	L-1	ON
		F	LEMONT RD			
30	L	0230	I 55 STEV PLUS RAMPS @	CO	L-1	ON
		G	WOODWARD AVE			
31	L	0305	I 55 STEV & I 355 TLWY RAMPS @	CO	L-1	ON
		H	JOLIET RD NEAR I 355			
32	L	0307	I 55 STEV @	CO	L-1	ON
		H1	INTERNATIONAL DR			

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33	L	0310	I 55 STEV @ I IL 53	CO	L-1	ON
34	L	0313	I 55 STEV @ I1 IL 53 (WEST)	CO	L-1	ON
35	L	0315	I 55 STEV @ K2 NAPERVILLE RD (EAST OF)	CO	L-1	ON
36	L	0321	I 55 STEV @ L IL 126	CO	L-1	ON
37	L	0328	I 55 STEV @ M US 30 LINCOLN HWY	CO	L-1	ON
38	L	0335	I 55 STEV @ N US 52 JEFFERSON ST	CO	L-1	ON
39	L	0345	I 55 STEV @ P I 80	CO	L-1	ON
40	L	0352	I 55 STEV @ R US 6 EAMES ST	CO	L-1	ON
41	L	0355	I 55 STEV @ S1 BLUFF RD	CO	L-1	ON
42	L	0360	I 55 STEV @ T ARSENAL RD FRONTAGE RD	CO	L-1	ON
43	L	0370	I 55 STEV @ V LORENZO RD	CO	L-1	ON
44	L	0375	I 55 STEV @ X IL 129	CO	L-1	ON
45	L	0385	I 55 STEV @ Z REED RD	CO	L-1	ON
46	L	0403	I 57 @ A YALE AVE	CO	L-1	ON
47	L	0405	I 57 @ B RACINE AVE	CO	L-1	ON
48	L	0410	I 57 @ C 107TH PL	CO	L-1	ON
49	L	0415	I 57 @	CO	L-1	ON

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		D	112TH ST				
50	L	0420	I 57 @	CO		L-1	ON
		E	120TH ST				
51	L	0425	I 57 @	CO		L-1	ON
		F	127TH ST				
52	L	0430	I 57 @	CO		L-1	ON
		G	VERMONT ST				
53	L	0435	I 57 @	CO		L-1	ON
		H	138TH ST				
54	L	0455	I 57 @	CO		L-1	ON
		L	US 6 159TH ST				
55	L	0465	I 57 @	CO		L-1	ON
		M	163RD ST BARRY LN				
56	L	0480	I 57 @	CO		L-1	ON
		T	175TH ST				
57	L	0485	I 57 @	CO		L-1	ON
		U	I 80				
58	L	0489	I 57 @	CO		L-1	ON
		V	FLOSSMOOR RD				
59	L	0492	I 57 @	CO		L-1	ON
		W	VOLLMER RD				
60	L	0495	I 57 @	CO		L-1	ON
		X	US 30 LINCOLN HWY				
61	L	0497	I 57 @	CO		L-1	ON
		Y	SAUK TRAIL RD				
62	L	0499	I 57 @	CO		L-1	ON
		Z	STEGER RD				
63	L	0510	I 57 @	CO		L-1	ON
		A	STUENKEL RD				
64	L	0515	I 57 @	CO		L-1	ON
		B	DRALLE				
65	L	0525	I 57 @	CO		L-1	ON
		M	MANHATTEN MONEE RD				

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66	L	0535	I 57 @ D BRUNS RD TO PAULING RD	CO	L-1	ON
67	L	0540	I 57 @ E PAULING RD	CO	L-1	ON
68	L	0560	I 57 @ Y WILMINGTON PEOTONE RD	CO	L-1	ON
69	L	0603	I 80 94 @ A BURNHAM AVE	CO	L-1	ON
70	L	0605	I 80 94 @ B TORRENCE AVE	CO	L-1	ON
71	L	0610	I 80 @ E 169TH ST	CO	L-1	ON
72	L	0615	I 80 @ F CRAWFORD AVE	CO	L-1	ON
73	L	0618	I 80 @ F1 175TH ST	CO	L-1	ON
74	L	0620	I 80 @ G CENTRAL AVE	CO	L-1	ON
75	L	0625	I 80 @ H RIDGELAND AVE	CO	L-1	ON
76	L	0703	I 80 @ I IL 43 HARLEM AVE	CO	L-1	ON
77	L	0707	I 80 @ B 80TH AVE WEST	CO	L-1	ON
78	L	0713	I 80 @ D 88TH AVE WEST	CO	L-1	ON
79	L	0715	I 80 @ F US 45 96TH AVE	CO	L-1	ON
80	L	0717	I 80 @ G 104 AVE EAST	CO	L-1	ON
81	L	0724	I 80 @ K IL 355	CO	L-1	ON
82	L	0730	I 80 @	CO	L-1	ON

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		P	BRIGGS ST				
83	L	0750	I 80 @	CO		L-1	ON
		U	IL 53 CHICAGO ST				
84	L	0755	I 80 @	CO		L-1	ON
		V	WATER ST				
85	L	0760	I 80 @	CO		L-1	ON
		W	CENTER ST EAST				
86	L	0765	I 80 @	CO		L-1	ON
		X	CENTER ST WEST				
87	L	0770	I 80 @	CO		L-1	ON
		Y	IL 7 LARKIN AVE				
88	L	0775	I 80 @	CO		L-1	ON
		Z	HOUBOLT RD HOLLYWOOD RD				
89	L	0835	I 90 KENN @	CO		L-1	ON
		G	SAYRE AVE				
90	L	0840	I 90 KENN @	CO		L-1	ON
		H	MOODY AVE				
91	L	0845	I 90 KENN @	CO		L-1	ON
		I	EDMUNDS ST				
92	L	0847	I 90 KENN @	CO		L-1	ON
		J	LAWRENCE AVE				
93	L	0853	I 90 94 KENN @	CO		L-1	ON
		L	KIMBALL AVE				
94	L	0855	I 90 94 KENN @	CO		L-1	ON
		M	CALIFORNIA AVE				
95	L	0857	I 90 94 KENN @	CO		L-1	ON
		N	LEAVITT ST				
96	L	0860	I 90 94 KENN @	CO		L-1	ON
		O	CORTLAND ST				
97	L	0863	I 90 94 KENN @	CO		L-1	ON
		P	BLACKHAWK ST				
98	L	0865	I 90 94 KENN @	CO		L-1	ON
		R	AUGUSTA BLVD				

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99	L	0867	I 90 94 KENN @ S GRAND AVE	CO	L-1	ON
100	L	0870	I 90 94 KENN @ S1 ONTARIO ST OHIO ST	CO	L-1	ON
101	L	0873	I 90 94 KENN @ S2 ERIE ST TUNNEL	CO	L-1	ON
102	L	0875	I 90 94 KENN @ W HUBBARD ST	CO	L-1	ON
103	L	0883	I 90 94 KENN @ T HUBBARD ST CAVE	CO	L-1	ON
104	L	0903	I 94 RYAN @ N 99TH ST TUNNEL	CO	L-1	ON
105	L	0910	I 94 RYAN @ P 83RD ST	CO	L-1	ON
106	L	0915	I 94 RYAN @ R 74TH ST	CO	L-1	ON
107	L	0917	I 90 94 RYAN @ R1 67TH ST MARQUETTE AVE	CO	L-1	ON
108	L	0920	I 90 94 RYAN @ S0 63RD ST	CO	L-1	ON
109	L	0925	I 90 94 RYAN @ T 59TH ST	CO	L-1	ON
110	L	0927	I 90 94 RYAN @ T1 55TH ST GARFIELD AVE	CO	L-1	ON
111	L	0930	I 90 94 RYAN @ U 47TH ST	CO	L-1	ON
112	L	0935	I 90 94 RYAN @ V ROOT ST	CO	L-1	ON
113	L	0940	I 90 94 RYAN @ W 35TH ST	CO	L-1	ON
114	L	0945	I 90 94 RYAN @ X 27TH ST	CO	L-1	ON
115	L	0950	I 90 94 RYAN @	CO	L-1	ON

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		Y	NORMAL AVE				
116	L	0955	I 90 94 RYAN @	CO		L-1	ON
		Z	WALLACE ST				
117	L	0960	I 90 94 RYAN INCL NAV LTG @	CO		L-1	ON
		A	21ST PL				
118	L	0965	I 90 94 RYAN @	CO		L-1	ON
		B	17TH ST				
119	L	1003	IL 394 FORD @	CO		L-1	ON
		A	SAUK TRAIL RD				
120	L	1004	IL 394 FORD @	CO		L-1	ON
		N	US 30 LINCOLN HWY				
121	L	1005	IL 394 FORD @	CO		L-1	ON
		B	GLENWOOD DYER RD				
122	L	1008	IL 394 FORD @	CO		L-1	ON
		D1	THORNTON LANSING RD				
123	L	1010	I 94 FORD @	CO		L-1	ON
		C	I 80 (NORTH OF)				
124	L	1015	I 94 FORD @	CO		L-1	ON
		D	I 80 (SOUTH OF)				
125	L	1017	I 94 FORD @	CO		L-1	ON
		E1	172ND ST				
126	L	1020	I 94 FORD @	CO		L-1	ON
		E	166TH ST				
127	L	1025	I 94 FORD @	CO		L-1	ON
		F	159TH ST				
128	L	1030	I 94 FORD @	CO		L-1	ON
		G	MICHIGAN CITY RD				
129	L	1035	I 94 FORD @	CO		L-1	ON
		H	DOLTON AVE				
130	L	1040	I 94 FORD @	CO		L-1	ON
		X	137TH ST				
131	L	1046	I 94 FORD @	CO		L-1	ON
		V	130TH ST EAST				

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132	L	1047	I 94 FORD @ W 130TH ST WEST	CO	L-1	ON
133	L	1050	I 94 FORD @ J 119TH ST	CO	L-1	ON
134	L	1055	I 94 FORD @ K 111TH ST	CO	L-1	ON
135	L	1060	I 94 FORD @ Y 115TH ST	CO	L-1	ON
136	L	1065	I 94 FORD @ L 103RD ST	CO	L-1	ON
137	L	1070	I 94 FORD @ M INDIANA AVE	CO	L-1	ON
138	L	1075	I 94 FORD @ P STONY ISLAND 106TH	CO	L-1	ON
139	L	1080	I 94 FORD @ R STONY ISLAND 101ST	CO	L-1	ON
140	L	1085	I 94 FORD @ S STONY ISLAND 98TH PL	CO	L-1	ON
141	L	1090	I 94 FORD @ T STONY ISLAND WOODLAWN	CO	L-1	ON
142	L	1203	I 94 EDENS @ A WILSON AVE	CO	L-1	ON
143	L	1103	I 94 EDENS US 41 @ T CLAVEY RD	CO	L-1	ON
144	L	1210	I 94 EDENS @ C US 14 CALDWELL PETERSON	CO	L-1	ON
145	L	1215	I 94 EDENS @ D PRATT AVE	CO	L-1	ON
146	L	1220	I 94 EDENS @ E TOUHY AVE	CO	L-1	ON
147	L	1225	I 94 EDENS @ F NILES CENTER RD	CO	L-1	ON
148	L	1230	I 94 EDENS @	CO	L-1	ON

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		G	OAKTON RD			
149	L	1235	I 94 EDENS @	CO	L-1	ON
		H	IL 58 DEMPSTER ST			
150	L	1240	I 94 EDENS @	CO	L-1	ON
		J	GOLF RD			
151	L	1245	I 94 EDENS @	CO	L-1	ON
		K	GLENVIEW RD			
152	L	1250	I 94 EDENS @	CO	L-1	ON
		L	LAKE AVE			
153	L	1255	I 94 EDENS @	CO	L-1	ON
		M	WINNETKA RD			
154	L	1260	I 94 EDENS @	CO	L-1	ON
		N	WILLOW RD			
155	L	1265	I 94 EDENS @	CO	L-1	ON
		O	TOWER RD			
156	L	1270	I 94 EDENS @	CO	L-1	ON
		P	IL 68 DUNDEE RD (SOUTH OF)			
157	L	1275	I 94 EDENS @	CO	L-1	ON
		R	IL 68 DUNDEE RD			
158	L	1303	I 290 IKE @	CO	L-1	ON
		A	WACKER DR			
159	L	1315	I 290 IKE @	CO	L-1	ON
		D	LOWER WACKER DR EXIT RAMP			
160	L	1320	I 290 IKE @	CO	L-1	ON
		E	LOWER WACKER DR ENT RAMP			
161	L	1335	I 290 IKE @	CO	L-1	ON
		H	WESTERN AVE LEAVITT ST			
162	L	1340	I 290 IKE @	CO	L-1	ON
		I	KEDZIE AVE			
163	L	1345	I 290 IKE @	CO	L-1	ON
		J	PULASKI AVE CRAWFORD AVE			
164	L	1350	I 290 IKE @	CO	L-1	ON
		K	IL 50 CICERO AVE			

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165	L	1355	I 290 IKE @ L CENTRAL AVE	CO	L-1	ON
166	L	1360	I 290 IKE @ M OAK PARK AVE	CO	L-1	ON
167	L	1365	I 290 IKE @ N DESPLAINES AVE	CO	L-1	ON
168	L	1370	I 290 IKE @ O IL 171 1ST AVE	CO	L-1	ON
169	L	1375	I 290 IKE @ P 17TH AVE	CO	L-1	ON
170	L	1380	I 290 IKE @ R 25TH AVE	CO	L-1	ON
171	L	1385	I 290 IKE @ S WESTCHESTER BLVD	CO	L-1	ON
172	L	1386	I 290 IKE @ W US 12 20 45 MANNHEIM RD	CO	L-1	ON
173	L	1387	I 290 IKE @ X WOLF RD EXIT RAMP	CO	L-1	ON
174	L	1388	I 290 IKE @ Y ORCHARD AVE	CO	L-1	ON
175	L	1390	I 290 IKE @ T LAVERNE AVE WOLF RD	CO	L-1	ON
176	L	1391	I 290 IKE @ Z I 88 SPLIT (WEST OF)	CO	L-1	ON
177	L	1393	I 290 IKE @ U ROOSEVELT RD EXIT RAMP	CO	L-1	ON
178	L	1415	I 290 @ Y YORK RD	CO	L-1	ON
179	L	1420	I 290 @ A GRAND AVE	CO	L-1	ON
180	L	1425	I 290 @ B IL 83 VILLA AVE	CO	L-1	ON
181	L	1430	I 290 @	CO	L-1	ON

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		C	IL 83 ELMHURST RD NORTH			
182	L	1435	I 290 @	CO	L-1	ON
		D	IL 83 ELMHURST RD SOUTH			
183	L	1440	I 290 @	CO	L-1	ON
		E	ADDISON RD			
184	L	1445	I 290 @	CO	L-1	ON
		F	MILL RD			
185	L	1450	I 290 @	CO	L-1	ON
		G	ITASCA RD			
186	L	1455	I 290 @	CO	L-1	ON
		H	I 290 IKE IL 355 SPLIT & CENTRAL			
187	L	1458	I 290 @	CO	L-1	ON
		I	US 20 LAKE ST			
188	L	1460	I 290 @	CO	L-1	ON
		J	IL 19 IRVING PARK RD			
189	L	1468	I 290 @	CO	L-1	ON
		L	DEVON AVE			
190	L	1471	I 290 @	CO	L-1	ON
		L1	THORNDALE AVE (SOUTH OF)			
191	L	1495	I 290 @	CO	L-1	ON
		T	ARMY TRAIL RD			
192	L	1504	I 290 IL 53 @	CO	L-1	ON
		S	BIESTERFIELD RD			
193	L	1505	I 290 IL 53 @	CO	L-1	ON
		M	SCHAUMBURG RD			
194	L	1510	I 290 IL 53 @	CO	L-1	ON
		N	IL 72 HIGGINS RD (SOUTH OF)			
195	L	1520	I 290 IL 53 @	CO	L-1	ON
		P	IL 58 GOLF RD			
196	L	1525	I 290 IL 53 @	CO	L-1	ON
		R	IL 62 ALGONQUIN RD			
197	L	1535	I 290 IL 53 @	CO	L-1	ON
		U	EUCLID ST			

198	L	1540	I 290 IL 53 @ V US 14 NORTHWEST HWY	CO	L-1	ON
199	L	1545	I 290 IL 53 @ W PALATINE RD	CO	L-1	ON
200	L	1550	I 290 IL 53 @ X US 12 RAND RD	CO	L-1	ON
201	L	1580	I 290 IL 53 @ Y IL 68 DUNDEE RD	CO	L-1	ON
202	L	1590	I 290 IL 53 @ Z LAKE COOK RD	CO	L-1	ON

LIGHTING SYSTEM - EQUIPMENT PAY CODE L-1 LOCATIONS

1	L	0190	I 55 STEV @ S WOLF RD	CO	L-1	PAR
2	L	0316	I 55 @ K1 WEBER RD (EAST OF)	WI	L-1	PAR
3	L	0343	I 55 @ O IL 59 BROOKFOREST AVE	WI	L-1	PAR
4	L	0363	I 55 @ A ARSENAL RD	WI	L-1	PAR
5	L	0365	I 55 @ U N RIVER RD WILMINGTON RD	WI	L-1	PAR
6	L	0470	I 57 @ N 167TH ST WEST	CO	L-1	PAR
7	L	0475	I 57 @ O 167TH ST EAST	CO	L-1	PAR
8	L	0810	I 190 KENN @ C MANNHEIM RD SB SCOTT ST	CO	L-1	PAR
9	L	0815	I 190 KENN @ D DESPLAINES RIVER RD	CO	L-1	PAR
10	L	0850	I 90 94 KENN @ K KEDVALE AVE	CO	L-1	PAR
11	L	0905	I 94 RYAN @	CO	L-1	PAR

		O	91ST ST				
12	L	1032	I 94 FORD @	CO		L-1	PAR
		G1	147TH ST SIBLEY BLVD				
13	L	1205	I 94 EDENS @	CO		L-1	PAR
		B	FOSTER AVE				
14	L	1280	I 94 EDENS @	CO		L-1	PAR
		S	LAKE COOK RD				
15	L	1325	I 290 IKE @	CO		L-1	PAR
		F	CANAL ST				
16	L	1410	I 290 @	DU		L-1	PAR
		X	IL 64 NORTH AVE				
17	L	1515	I 290 IL 53 @	CO		L-1	PAR
		O	IL 72 HIGGINS RD				

PLANNED L-1 LOCATIONS

1	L	0317	I 55 @	WI		L-1	OFF
		K	WEBER RD NORTH				
2	L	0380	I 55 @	WI		L-1	OFF
		Y	IL 113				
3	L	0440	I 57 @	CO		L-1	OFF
		I	SPAULDING AVE				
4	L	0445	I 57 @	CO		L-1	OFF
		J	147TH ST				
5	L	0450	I 57 @	CO		L-1	OFF
		K	KEDZIE AVE				
6	L	0453	I 57 @	CO		L-1	OFF
		K1	150TH ST				
7	L	0728	I 80 @	WI		L-1	OFF
		N	US 30 LINCOLN HWY				
8	L	0735	I 80 @	WI		L-1	OFF
		R	RICHARD ST NORTH				
9	L	0740	I 80 @	WI		L-1	OFF
		S	RICHARD ST SOUTH				

10	L	0820	I 90 KENN @ D1 EAST RIVER RD	CO	L-1	OFF
11	L	0825	I 90 KENN @ E CUMBERLAND AVE	CO	L-1	OFF
12	L	0830	I 90 KENN @ F ORIOLE AVE (BY CANFIELD)	CO	L-1	OFF
13	L	0886	I 90 94 KENN @ U W WASHINGTON BLVD	CO	L-1	OFF
14	L	0888	I 90 94 KENN @ V E WASHINGTON BLVD	CO	L-1	OFF
15	L	0890	I 90 94 KENN @ Z VAN BUREN ST	CO	L-1	OFF
16	L	0970	I 90 94 RYAN @ C MAXWELL ST	CO	L-1	OFF
17	L	0975	I 90 94 RYAN @ D POLK ST	CO	L-1	OFF
18	L	1330	I 290 IKE @ G RACINE AVE	CO	L-1	OFF
19	L	1397	I 290 IKE @ V ARTHUR AVE	CO	L-1	OFF
20	L	1405	I 290 @ W ST CHARLES RD	DU	L-1	OFF

LIGHTING SYSTEM - EQUIPMENT PAY CODE L-2 LOCATIONS

1	L	0150	CENTRAL AVE @ X 39TH ST	CO	L-2	ON
2	L	0170	IL 43 HARLEM AVE @ Y PORTAGE TRAIL RD	CO	L-2	ON
3	L	0171	IL 171 1ST AVE @ V 55TH ST	CO	L-2	ON
4	L	0177	IL 171 1ST AVE @ Z 47TH ST	CO	L-2	ON
5	L	0803	US 12 45 MANNHEIM @	CO	L-2	ON

		A	DEVON AVE ZEMKE BLVD				
6	L	1362	IL 43 HARLEM AVE @	CO		L-2	ON
		M1	JACKSON BLVD				
7	L	1603	US 12 RAND RD @	CO		L-2	ON
		AD	US 12 45 LEE ST				
8	L	1605	US 12 RAND RD @	CO		L-2	ON
		AR	EUCLID ST				
9	L	1607	US 12 RAND RD @	CO		L-2	ON
		XI	LAKE COOK RD				
10	L	1610	US 14 NORTHWEST HWY @	CO		L-2	ON
		AA	BALDWIN RD				
11	L	1615	US 14 DEMPSTER ST @	CO		L-2	ON
		AM	IL 21 MILWAUKEE AVE				
12	L	1617	US 14 DEMPSTER ST @	CO		L-2	ON
		XH	IL 43 WAUKEGAN RD				
13	L	1626	US 14 DEMPSTER ST @	CO		L-2	ON
		XL	I 294 TLWY				
14	L	1627	BUSSE HWY @	CO		L-2	ON
		XM	I 294 TLWY				
15	L	1628	OAKTON ST @	CO		L-2	ON
		XN	I 294 TLWY				
16	L	1629	TOUHY AVE @	CO		L-2	ON
		XR	I 294 TLWY				
17	L	1630	US 20 LAKE ST @	CO		L-2	ON
		AC	IL 59 SUTTON RD				
18	L	1635	US 20 LAKE ST @	CO		L-2	ON
		AY	SHALES PKWY BLUFF CITY RD				
19	L	1636	IL 19 IRVING PARK RD @	CO		L-2	ON
		RN	IL 390 TLWY				
20	L	1637	IL 43 @	CO		L-2	ON
		RB	I 94 TLWY SPUR				
21	L	1640	US 45 DESPLAINES RIVER RD @	CO		L-2	ON
		AX	IL 21 MILWAUKEE AVE				

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22	L	1641	US 45 DESPLAINES RIVER RD @ AO IL 58 GOLF RD	CO	L-2	ON
23	L	1645	US 45 IL 21 MILWAUKEE AVE @ AV HINTZ RD	CO	L-2	ON
24	L	1647	US 45 IL 21 MILWAUKEE AVE @ AK LAKE COOK RD	CO	L-2	ON
25	L	1650	IL 59 SUTTON RD @ AH IL 58 GOLF RD	CO	L-2	ON
26	L	1653	IL 58 GOLF RD @ RG ROSELLE RD	CO	L-2	ON
27	L	1655	IL 58 GOLF RD @ AJ WOLF RD	CO	L-2	ON
28	L	1656	IL 58 GOLF RD @ RH HIGHLAND BLVD	CO	L-2	ON
29	L	1657	IL 58 GOLF RD @ RE IL 72 HIGGINS RD	CO	L-2	ON
30	L	1658	IL 58 GOLF RD @ RI GANNON DR	CO	L-2	ON
31	L	1659	IL 58 GOLF RD @ RJ SOUTHBRIDGE LN	CO	L-2	ON
32	L	1660	IL 59 @ AI IL 68 DUNDEE RD	CO	L-2	ON
33	L	1662	IL 59 @ AW IL 72 HIGGINS RD	CO	L-2	ON
34	L	1663	IL 59 @ AZ SHOE FACTORY RD	CO	L-2	ON
35	L	1664	I 90 KENN ENT EXT ALGONQUIN @ AF ARLINGTON HEIGHTS RD	CO	L-2	ON
36	L	1667	BARRINGTON RD @ XE CENTRAL AVE	CO	L-2	ON
37	L	1668	IL 72 HIGGINS RD @ XK BARRINGTON RD	CO	L-2	ON
38	L	1670	IL 62 ALGONQUIN RD @	CO	L-2	ON

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		AP	PALATINE RD				
39	L	1673	IL 72 HIGGINS RD @	CO		L-2	ON
		RD	SPRING MILL DR				
40	L	1674	IL 72 HIGGINS RD @	CO		L-2	ON
		RF	CHURCHILL RD				
41	L	1675	US 14 NORTHWEST HWY @	CO		L-2	ON
		AG	IL 68 DUNDEE RD				
42	L	1677	IL 72 HIGGINS RD @	CO		L-2	ON
		RC	ROSELLE RD				
43	L	1680	IL 72 HIGGINS RD @	CO		L-2	ON
		AL	TOUHY AVE LEE ST				
44	L	1683	IL 83 ELMHURST RD @	CO		L-2	ON
		AS	PALATINE RD				
45	L	1685	BUSSE HWY @	CO		L-2	ON
		AB	OAKTON ST				
46	L	1687	PALATINE RD @	CO		L-2	ON
		AT	WHEELING RD				
47	L	1690	PALATINE RD @	CO		L-2	ON
		AU	SCHOENBECK RD				
48	L	1691	WILLOW RD @	CO		L-2	ON
		XD	I 294 TLWY				
49	L	1694	IL 72 TOUHY AVE EB @	CO		L-2	ON
		RZ	I 90 TLWY				
50	L	1695	IL 72 TOUHY AVE WEST @	CO		L-2	ON
		RY	I 90 TLWY				
51	L	1696	ELMHURST RD @	CO		L-2	ON
		XV	I 90 TLWY				
52	L	1698	WOLF RD @	CO		L-2	ON
		AQ	I 90 TLWY				
53	L	1706	US 12 20 45 LAGRANGE RD @	CO		L-2	ON
		BK	CHICAGO SAN & SHIP CANAL				
54	L	1707	IL 38 ROOSEVELT RD @	CO		L-2	ON
		YA	BOEGER ST				

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55	L	1708	US 38 ROOSEVELT RD @ YB US 12 20 45 MANNHEIM RD	CO	L-2	ON
56	L	1709	US 12 20 45 LAGRANGE RD @ BF 22ND ST CERMAK RD	CO	L-2	ON
57	L	1712	US 12 45 MANNHEIM RD @ YD ERIE ST PROVISO RR BRID	CO	L-2	ON
58	L	1713	US 34 OGDEN AVE @ BZ 26TH ST	CO	L-2	ON
59	L	1714	US 34 OGDEN AVE @ BY IL 50 CICERO AVE SOUTH	CO	L-2	ON
60	L	1716	US 34 OGDEN AVE @ BW WOLF RD	CO	L-2	ON
61	L	1717	IL 38 ROOSEVELT RD @ BB I 294 TLWY	CO	L-2	ON
62	L	1730	IL 43 HARLEM AVE @ BX 65TH TO 71ST	CO	L-2	ON
63	L	1732	IL 64 NORTH AVE @ BG IL 171 1ST AVE	CO	L-2	ON
64	L	1735	22ND ST CERMAK RD @ BC IL 171 1ST AVE	CO	L-2	ON
65	L	1760	DAMEN AVE @ YV WEBSTER AVE	CO	L-2	ON
66	L	1762	WESTERN AVE @ YX LOGAN BLVD	CO	L-2	ON
67	L	1763	SACRAMENTO AVE @ YY WELLINGTON AVE	CO	L-2	ON
68	L	1764	KOSTNER AVE @ YZ BERTEAU AVE	CO	L-2	ON
69	L	1798	IL 64 NORTH AVE @ YW 25TH AVE PS 12	CO	L-2	ON
70	L	1802	US 12 20 45 LAGRANGE RD @ CV 87TH ST	CO	L-2	ON
71	L	1803	US 12 20 95TH ST @	CO	L-2	ON

		CW	US 12 20 45 LAGRANGE RD 96TH AVE			
72	L	1804	US 45 LAGRANGE RD @	CO	L-2	ON
		CX	107TH ST			
73	L	1805	US 45 LAGRANGE RD @	CO	L-2	ON
		CY	111TH ST			
74	L	1810	US 12 20 95TH ST @	CO	L-2	ON
		CB	IL 43 HARLEM AVE			
75	L	1815	US 30 LINCOLN HWY @	CO	L-2	ON
		CP	IL 43 HARLEM AVE			
76	L	1820	US 30 LINCOLN HWY @	CO	L-2	ON
		CR	GOVERNORS HWY CRAWFORD			
77	L	1823	US 30 LINCOLN HWY @	CO	L-2	ON
		CS	TORRENCE AVE			
78	L	1825	US 45 96TH AVE @	CO	L-2	ON
		CE	IL 83 CAL SAG RD			
79	L	1827	IL 50 CICERO AVE @	CO	L-2	ON
		CH	127TH ST			
80	L	1837	IL 43 HARLEM AVE @	CO	L-2	ON
		CN	143RD ST			
81	L	1845	IL 83 KINGERY RD @	CO	L-2	ON
		CC	IL 171 ARCHER AVE NORTH			
82	L	1860	111TH ST @	CO	L-2	ON
		CF	AUSTIN AVE			
83	L	1861	111TH ST @	CO	L-2	ON
		CG	LARAMIE AVE			
84	L	1877	IL 83 147TH ST @	CO	L-2	ON
		ZA	SACRAMENTO AVE			
85	L	1887	US 6 159TH ST @	CO	L-2	ON
		CL	MYRTLE AVE			
86	L	1888	US 6 159TH ST @	CO	L-2	ON
		CM	WOODBIDGE AVE			
87	L	1903	US 20 LAKE ST @	DU	L-2	ON
		DW	WALNUT ST			

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88	L	1905	US 34 OGDEN AVE @ DB IL 59	DU	L-2	ON
89	L	1910	US 34 OGDEN AVE @ DA IL 83 KINGERY HWY	DU	L-2	ON
90	L	1913	IL 38 ROOSEVELT RD @ DU IL 83 NB RAMP	DU	L-2	ON
91	L	1914	IL 83 KINGERY HWY @ DV IL 56 EB RAMP	DU	L-2	ON
92	L	1920	IL 38 ROOSEVELT RD @ PF GARYS MILL RD	DU	L-2	ON
93	L	1922	IL 53 @ DS I 88 TLWY	DU	L-2	ON
94	L	1925	IL 53 @ DM IL 56 BUTTERFIELD RD	DU	L-2	ON
95	L	1930	IL 53 @ DR BURLINGTON AVE BNSF RR BRIDGE	DU	L-2	ON
96	L	1931	IL 59 @ UF I 88 TLWY	DU	L-2	ON
97	L	1935	IL 56 BUTTERFIELD RD @ DD IL 59	DU	L-2	ON
98	L	1940	IL 56 BUTTERFIELD RD @ DJ HIGHLAND AVE	DU	L-2	ON
99	L	1942	IL 56 BUTTERFIELD RD @ DP 22ND ST CERMAK RD	DU	L-2	ON
100	L	1946	IL 83 KINGERY HWY @ UZ IL 390	DU	L-2	ON
101	L	1948	MEACHAM MEDINAH RD @ UI IL 390 TLWY	DU	L-2	ON
102	L	1949	US 20 LAKE ST @ P IL 390 TLWY	DU	L-2	ON
103	L	1951	IL 59 @ PG GARYS MILL RD	DU	L-2	ON
104	L	1959	IL 64 NORTH AVE @	DU	L-2	ON

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		DN	IL 83 KINGERY HWY				
105	L	1960	IL 64 NORTH AVE @	DU		L-2	ON
		DE	MAIN ST (IN LOMBARD)				
106	L	1962	IL 64 NORTH AVE @	DU		L-2	ON
		PY	WESTMORE KRAMER AVE				
107	L	1963	IL 64 NORTH AVE @	DU		L-2	ON
		PZ	ARDMORE AVE				
108	L	1964	IL 64 NORTH AVE @	DU		L-2	ON
		PH	SWIFT RD (WEST OF)				
109	L	1965	IL 64 NORTH AVE @	DU		L-2	ON
		PI	MAIN ST GLEN ELLYN RD				
110	L	1966	IL 64 NORTH AVE @	DU		L-2	ON
		PJ	EVERGREEN AVE				
111	L	1967	IL 64 NORTH AVE @	DU		L-2	ON
		PK	LINDA AVE (EAST OF)				
112	L	1968	IL 64 NORTH AVE @	DU		L-2	ON
		PL	SCHMALE RD				
113	L	1969	IL 64 NORTH AVE @	DU		L-2	ON
		PM	GARY AVE				
114	L	1970	IL 64 NORTH AVE @	DU		L-2	ON
		PN	KUHN RD				
115	L	1971	IL 64 NORTH AVE @	DU		L-2	ON
		PO	MORTON RD				
116	L	1972	IL 64 NORTH AVE @	DU		L-2	ON
		PP	ST CHARLES RD				
117	L	1973	IL 64 NORTH AVE @	DU		L-2	ON
		PR	PRINCE CROSSING RD				
118	L	1974	IL 64 NORTH AVE @	DU		L-2	ON
		PS	WOODCREST DR (EAST OF)				
119	L	1975	IL 83 KINGERY HWY @	DU		L-2	ON
		DL	55TH ST				
120	L	1980	IL 83 KINGERY HWY @	DU		L-2	ON
		DI	BLUFF RD				

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121	L	1983	IL 83 KINGERY HWY @ DO 22ND ST CERMAK RD	DU	L-2	ON
122	L	1985	IL 83 KINGERY HWY @ DT ST CHARLES RD	DU	L-2	ON
123	L	1990	IL 64 NORTH AVE @ PC CONTE PKWY WOODLAND	DU	L-2	ON
124	L	1991	IL 64 NORTH AVE @ PD POWIS RD	DU	L-2	ON
125	L	1992	IL 64 NORTH AVE @ PE KAUTZ RD	DU	L-2	ON
126	L	1994	IL 83 KINGERY @ UU IL 64 NORTH AVE (SOUTH OF) PS 44	DU	L-2	ON
127	L	1996	IL 56 BUTTERFIELD RD @ UQ IL 59 PS 48	DU	L-2	ON
128	L	2002	IL 47 @ KB US 20 IL 72 SOUTH	KA	L-2	ON
129	L	2003	US 20 @ KS IL 47 IL 72 NORTH	KA	L-2	ON
130	L	2005	US 20 LAKE ST @ KI MCLEAN BLVD	KA	L-2	ON
131	L	2010	US 20 ELGIN BYPASS @ KX RANDALL RD	KA	L-2	ON
132	L	2012	US 30 @ KF US 31	KA	L-2	ON
133	L	2015	IL 47 @ KG US 30 IL 56	KA	L-2	ON
134	L	2020	IL 31 @ KH BIG TIMBER RD WEST	KA	L-2	ON
135	L	2025	IL 31 @ KJ BIG TIMBER RD EAST	KA	L-2	ON
136	L	2030	IL 31 @ KM INDIAN MOUNDS RD	KA	L-2	ON
137	L	2035	IL 31 @	KA	L-2	ON

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		KL	JUDSON COLLAGE ENT			
138	L	2040	IL 31 @	KA	L-2	ON
		KK	RIVER RD			
139	L	2045	IL 38 @	KA	L-2	ON
		KO	IL 47			
140	L	2048	IL 47 @	KA	L-2	ON
		KA	I 90 TLWY			
141	L	2050	IL 47 @	KA	L-2	ON
		KE	BIG TIMBER RD			
142	L	2055	IL 47 @	KA	L-2	ON
		KP	PLANK RD			
143	L	2060	IL 47 @	KA	L-2	ON
		KV	GALENA RD			
144	L	2065	IL 56 BUTTERFIELD RD @	KA	L-2	ON
		KR	KIRK RD FARNSWORTH RD			
145	L	2070	IL 72 @	KA	L-2	ON
		KT	RANDALL RD			
146	L	2075	IL 56 BUTTERFIELD @	KA	L-2	ON
		KZ	GALENA RD			
147	L	2103	US 30 BRIARCLIFF RD @	KE	L-2	ON
		EA	US 34 OWESGO RD			
148	L	2105	US 30 BASELINE RD @	KE	L-2	ON
		EB	IL 47			
149	L	2203	US 12 RAND RD @	LA	L-2	ON
		LX	IL 134 LONG LAKE RD			
150	L	2205	IL 22 HALF DAY RD @	LA	L-2	ON
		LS	I 94 TLWY			
151	L	2207	DEERFIELD RD @	LA	L-2	ON
		LA	NORTHLAND AVE			
152	L	2211	US 41 @	LA	L-2	ON
		LE	DEERFIELD RD			
153	L	2215	US 41 @	LA	L-2	ON
		LR	IL 60 TOWN LINE RD			

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154	L	2217	US 41 @	LA	L-2	ON
		LB	IL 120 BELVIDERE RD			
155	L	2221	US 41 @	LA	L-2	ON
		LU	IL 173 ROSECRANS RD			
156	L	2222	IL 173 ROSECRANS RD @	LA	L-2	ON
		VG	I 94 TLWY			
157	L	2224	US 41 @	LA	L-2	ON
		LV	KELLY RD			
158	L	2227	I 94 US 41 @	LA	L-2	ON
		LL	RUSSELL RD			
159	L	2230	US 41 @	LA	L-2	ON
		LD	WASHINGTON ST (EAST OF)			
160	L	2235	IL 120 BELVIDERE RD @	LA	L-2	ON
		VA	COHASSET CT			
161	L	2236	IL 120 BELVIDERE RD @	LA	L-2	ON
		VB	GREENLEAF ST			
162	L	2237	IL 120 BELVIDERE RD @	LA	L-2	ON
		VC	IL 43 WAUKEGAN RD			
163	L	2239	IL 43 WAUKEGAN RD @	LA	L-2	ON
		VD	LAKEHURST RD			
164	L	2243	US 41 SKOKIE HWY @	LA	L-2	ON
		LP	WEST PARK AVE			
165	L	2245	IL 21 @	LA	L-2	ON
		LF	IL 120 BELVIDERE RD			
166	L	2247	IL 21 @	LA	L-2	ON
		LC	I 94 TLWY			
167	L	2250	IL 21 @	LA	L-2	ON
		LM	IL 137 BUCKLEY RD			
168	L	2255	IL 43 WAUKEGAN RD @	LA	L-2	ON
		LN	IL 137 BUCKLEY RD			
169	L	2256	IL 59 @	LA	L-2	ON
		LK	GRASS LAKE RD			
170	L	2260	IL 120 BELVIDERE RD @	LA	L-2	ON

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		LH	MILL RD WILDWOOD RD				
171	L	2265	IL 120 BELVIDERE RD @	LA		L-2	ON
		LO	OPLAINE RD				
172	L	2267	IL 60 TOWN LINE RD @	LA		L-2	ON
		VE	BRADLEY DR RIVERWOODS RD				
173	L	2268	IL 60 TOWN LINE RD @	LA		L-2	ON
		VF	SAUNDERS RD				
174	L	2270	IL 131 GREEN BAY RD @	LA		L-2	ON
		LY	IL 137 BUCKLEY RD				
175	L	2274	IL 137 BUCKLEY RD @	LA		L-2	ON
		LJ	I 94 TLWY				
176	L	2275	IL 137 SHERIDAN RD @	LA		L-2	ON
		LW	WADSWORTH RD				
177	L	2276	IL 137 SHERIDAN RD @	LA		L-2	ON
		LQ	MARTIN LUTHER KING MLK				
178	L	2280	AMSTUTZ HWY @	LA		L-2	ON
		B	GRAND AVE				
179	L	2285	AMSTUTZ EXPY @	LA		L-2	ON
		A	GREENWOOD AVE				
180	L	2287	IL 83 @	LA		L-2	ON
		VH	ROLLING RD HOOK RD				
181	L	2290	IL 22 @	LA		L-2	ON
		LZ	ELA RD				
182	L	2294	US 41 SKOKIE HWY @	LA		L-2	ON
		VO	IL 176 ROCKLAND RD PS41				
183	L	2305	US 14 @	MC		L-2	ON
		MA	IL 31				
184	L	2307	IL 31 MAIN ST @	MC		L-2	ON
		MB	IL 62 ALGONQUIN RD				
185	L	2310	US 14 @	MC		L-2	ON
		MC	IL 47				
186	L	2313	IL 31 MAIN ST @	MC		L-2	ON
		MD	GREENWOOD CT MEYER DR				

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187	L	2315	US 14 @	MC	L-2	ON
		MZ	IL 176			
188	L	2325	IL 23 @	MC	L-2	ON
		MK	I 90 TLWY			
189	L	2330	IL 47 @	MC	L-2	ON
		MS	IL 176 SOUTH TERRA COTTA AVE			
190	L	2335	IL 47 @	MC	L-2	ON
		MN	IL 176 NORTH TERRA COTTA AVE			
191	L	2402	US 6 @	WI	L-2	ON
		WZ	IL 355 TLWY			
192	L	2404	US 30 @	WI	L-2	ON
		WA	IL 7 LARKIN AVE			
193	L	2405	IL 126 @	WI	L-2	ON
		WN	WALLIN DR LINCOLN HWY			
194	L	2410	US 30 CASS AVE @	WI	L-2	ON
		WC	PILCHER PARK ENT			
195	L	2415	US 30 CASS AVE @	WI	L-2	ON
		WD	STEVENS ST			
196	L	2420	US 45 @	WI	L-2	ON
		WW	US 52			
197	L	2425	IL 1 DIXIE HALSTED @	WI	L-2	ON
		WF	UNION ST			
198	L	2428	IL 7 159TH @	WI	L-2	ON
		WY	I 355 TLWY			
199	L	2430	IL 7 @	WI	L-2	ON
		WB	IL 53 BROADWAY ST			
200	L	2435	IL 50 CICERO AVE @	WI	L-2	ON
		WG	GOVERNORS HWY			
201	L	2440	IL 53 BROADWAY @	WI	L-2	ON
		WH	CHANEY AVE EJE RR			
202	L	2442	IL 53 CHICAGO ST @	WI	L-2	ON
		HD	US 52 DORIS AVE			
203	L	2448	IL 171 @	WI	L-2	ON

		WQ	IL 355 TLWY			
204	L	2450	IL 171 @	WI	L-2	ON
		WJ	KRONMEYER AVE EJE RR			
205	L	2452	IL 113 @	WI	L-2	ON
		HB	IL 53 FRONT IL 129 WASHINGTON			
206	L	2455	IL 394 @	WI	L-2	ON
		WK	BEMIS RD			
207	L	2460	IL 394 @	WI	L-2	ON
		WL	FAITHORN RD BURVILLE RD			
208	L	2465	IL 394 @	WI	L-2	ON
		WM	COTTAGE GROVE AVE			
209	L	2470	IL 394 @	WI	L-2	ON
		WT	ELMS COURT RD			
210	L	2475	IL 394 @	WI	L-2	ON
		WO	EXCHANGE ST			
211	L	2478	IL 394 @	WI	L-2	ON
		WV	IL 1			
212	L	2485	IL 394 @	WI	L-2	ON
		WR	RICHTON RD			
213	L	2490	IL 394 @	WI	L-2	ON
		WX	STEGER RD			

LIGHTING SYSTEM - EQUIPMENT PAY CODE L-2 LOCATIONS

1	L	0805	US 12 45 MANNHEIM RD @	CO	L-2	PAR
		B	LAWRENCE AVE			
2	L	1678	IL 72 HIGGINS RD @	CO	L-2	PAR
		XF	MORNINGSIDE DR (BY PLUM GROVE RD)			
3	L	1710	US 12 45 MANNHEIM RD @	CO	L-2	PAR
		BD	IL 19 IRVING PK RD			
4	L	1830	IL 1 HALSTED ST @	CO	L-2	PAR
		CK	I 80 I 294 TLWY			
5	L	1835	IL 1 HALSTED ST @	CO	L-2	PAR
		CA	RIDGE RD HOMEWOOD LANSING RD			

6	L	1886	US 6 159TH ST @ CJ CN RR BRIDGE LINCOLN AVE	CO	L-2	PAR
7	L	1912	IL 38 ROOSEVELT RD @ DH YORK RD	DU	L-2	PAR
8	L	1947	IL 53 ROHLWING RD @ UV IL 390 TLWY	DU	L-2	PAR
9	L	2480	IL 394 @ WU GOODENOW RD	WI	L-2	PAR

LIGHTING SYSTEM PLANNED L-2 LOCATIONS

1	L	0460	CRAWFORD AVE PULASKI RD @ P 159TH ST	CO	L-2	OFF
2	L	1604	US 12 RAND RD @ XC IL 68 DUNDEE RD	CO	L-2	OFF
3	L	1703	US 12 20 45 LAGRANGE RD @ BA IL 171 ARCHER NE RAMP	CO	L-2	OFF
4	L	1705	US 12 20 45 LAGRANGE RD @ BL IL 171 ARCHER SW RAMP	CO	L-2	OFF
5	L	1850	IL 83 KINGERY RD @ CD IL 171 ARCHER AVE SOUTH	CO	L-2	OFF
6	L	1885	US 6 159TH ST @ CT HAMILTON AVE LEAVITT ST	CO	L-2	OFF
7	L	2220	US 41 @ LG IL 132 GRAND AVE	LA	L-2	OFF

LIGHTING SYSTEM - EQUIPMENT PAY CODE L-3 LOCATIONS

1	L	4612	TOUHY AVE MCCORMICK BLVD	CO	L-3	ON
2	L	4613	GREEN BAY RD WINNETKA AVE	CO	L-3	ON
3	L	4614	GROSS POINT RD CHURCH ST	CO	L-3	ON
4	L	4616	IL 21 MILWAUKEE AVE	CO	L-3	ON

MAIN ST (IN NILES)						
5	L	4618	DEMPSTER ST	CO	L-3	ON
			CRAWFORD AVE			
6	L	4619	DEMPSTER ST	CO	L-3	ON
			EAST PRAIRIE AVE			
7	L	4620	DEMPSTER ST	CO	L-3	ON
			ST LOUIS AVE LINCOLNWOOD DR			
8	L	4621	US 41 SKOKIE BLVD	CO	L-3	ON
			GOLF RD SIMPSON ST			
9	L	4622	US 41 SKOKIE BLVD	CO	L-3	ON
			FOSTER ST			
10	L	4623	US 41 SKOKIE BLVD	CO	L-3	ON
			OLD ORCHARD RD			
11	L	4624	US 41 SKOKIE BLVD	CO	L-3	ON
			GROSS POINT RD			
12	L	4628	IL 59	CO	L-3	ON
			US 20 LAKE ST NORTH RAMP			
13	L	4629	IL 59	CO	L-3	ON
			US 20 LAKE ST NORTH RAMP			
14	L	4631	US 14 NW HWY	CO	L-3	ON
			BENTON ST			
15	L	4632	US 14 NW HWY	CO	L-3	ON
			PLUM GROVE RD			
16	L	4633	US 14 NW HWY	CO	L-3	ON
			SMITH RD			
17	L	4634	IL 68 DUNDEE RD	CO	L-3	ON
			WILKE RD NORTH			
18	L	4636	IL 68 DUNDEE RD	CO	L-3	ON
			KENNICOTT AVE			
19	L	4638	IL 68 DUNDEE RD	CO	L-3	ON
			PFINGSTEN RD			
20	L	4639	IL 68 DUNDEE RD	CO	L-3	ON
			LANWEHR RD			

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21	L	4642	US 14 MINOR ST DESPLAINES RIVER RD	CO	L-3	ON
22	L	4643	US 45 IL 21 MILWAUKEE AVE IL 68 DUNDEE RD	CO	L-3	ON
23	L	4666	IL 50 CICERO AVE TOUHY AVE	CO	L-3	ON
24	L	4669	IL 72 HIGGINS RD PRAIRIE STONE PARKWAY	CO	L-3	ON
25	L	4671	IL 62 ALGONQUIN RD MEACHAM RD	CO	L-3	ON
26	L	4697	IL 72 TOUHY AVE MOUNT PROSPECT RD	CO	L-3	ON
27	L	4711	US 12 45 MANNHEIM RD US 20 LAKE ST	CO	L-3	ON
28	L	4718	IL 43 HARLEM AVE DIVISION ST	CO	L-3	ON
29	L	4719	IL 43 HARLEM AVE AUGUSTA BLVD	CO	L-3	ON
30	L	4720	IL 43 HARLEM AVE CHICAGO AVE	CO	L-3	ON
31	L	4721	IL 43 HARLEM AVE ONTARIO ST	CO	L-3	ON
32	L	4722	IL 43 HARLEM AVE LAKE ST	CO	L-3	ON
33	L	4723	IL 43 HARLEM AVE SOUTH BLVD	CO	L-3	ON
34	L	4725	IL 43 HARLEM AVE RANDOLPH ST	CO	L-3	ON
35	L	4726	IL 43 HARLEM AVE WASHINGTON ST	CO	L-3	ON
36	L	4727	IL 43 HARLEM AVE MADISON ST	CO	L-3	ON
37	L	4728	IL 43 HARLEM AVE	CO	L-3	ON

			IL 38 ROOSEVELT RD				
38	L	4729	IL 43 HARLEM AVE 16TH ST	CO	L-3	ON	
39	L	4775	IL 38 ROOSEVELT RD AUSTIN BLVD	CO	L-3	ON	
40	L	4792	IL 43 HARLEM AVE FOSTER PLACE	CO	L-3	ON	
41	L	4794	IL 43 HARLEM AVE LAWRENCE AVE	CO	L-3	ON	
42	L	4796	IL 43 HARLEM AVE CULLOM AVE	CO	L-3	ON	
43	L	4807	US 45 LAGRANGE RD 142ND ST	CO	L-3	ON	
44	L	4808	US 45 LAGRANGE RD 143RD ST	CO	L-3	ON	
45	L	4811	US 12 20 95TH ST KILBOURNE AVE	CO	L-3	ON	
46	L	4863	US 45 LAGRANGE RD 131ST ST	CO	L-3	ON	
47	L	4864	US 45 LAGRANGE RD SOUTHMOOR SANDBURG HS ENT	CO	L-3	ON	
48	L	4865	US 45 LAGRANGE RD 135TH ST	CO	L-3	ON	
49	L	4866	US 45 LAGRANGE RD 144TH PL	CO	L-3	ON	
50	L	4867	US 45 LAGRANGE RD 147TH ST	CO	L-3	ON	
51	L	4868	US 45 LAGRANGE RD 149TH ST	CO	L-3	ON	
52	L	4869	US 45 LAGRANGE RD 151ST ST	CO	L-3	ON	
53	L	4870	US 45 LAGRANGE RD 153RD ST	CO	L-3	ON	

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54	L	4871	US 45 LAGRANGE RD 154TH PL DARVIN ENT	CO	L-3	ON
55	L	4872	US 45 LAGRANGE RD 156TH PL LOWE'S ENT	CO	L-3	ON
56	L	4873	US 45 LAGRANGE RD 163RD ST	CO	L-3	ON
57	L	4875	IL 7 SW HWY RIDGELAND AVE	CO	L-3	ON
58	L	4876	IL 50 CICERO AVE SW HWY 93RD ST	CO	L-3	ON
59	L	5649	IL 59 SUTTON RD IL 58 GOLF RD	CO	L-3	ON
60	L	5660	BARRINGTON RD HASSEL RD	CO	L-3	ON
61	L	5661	BARRINGTON RD I 90 TOLLWAY	CO	L-3	ON
62	L	5662	BARRINGTON RD CENTRAL AVE	CO	L-3	ON
63	L	5737	IL 171 FOREST AVE RIDGEWOOD RD	CO	L-3	ON
64	L	5740	US 12 20 45 LAGRANGE RD US 34 OGDEN AVE	CO	L-3	ON
65	L	5745	US 34 OGDEN AVE LOCUST AVE	CO	L-3	ON
66	L	4902	US 20 LAKE ST BLOOMINGDALE RD	DU	L-3	ON
67	L	4906	US 20 LAKE ST MARCUS DR	DU	L-3	ON
68	L	4907	US 20 LAKE ST LOMBARD AVE FOXDALE RD	DU	L-3	ON
69	L	4908	US 20 LAKE ST ITASCA RD	DU	L-3	ON
69	L	4909	US 20 LAKE ST	DU	L-3	ON

			MILL RD			
70	L	4911	US 20 LAKE ST	DU	L-3	ON
			JFK DR			
71	L	4915	IL 38 ROOSEVELT RD	DU	L-3	ON
			LORRAINE ST			
72	L	1916	IL 38 ROOSEVELT RD	DU	L-3	ON
			PRESIDENT ST			
73	L	4917	IL 38 ROOSEVELT RD	DU	L-3	ON
			NAPERVILLE RD			
74	L	4918	IL 38 ROOSEVELT RD	DU	L-3	ON
			MAIN ST (IN WHEATON)			
75	L	4919	IL 38 ROOSEVELT RD	DU	L-3	ON
			WEST ST WARRENVILLE RD			
76	L	4921	IL 38 ROOSEVELT RD	DU	L-3	ON
			COUNTY FARM RD			
77	L	4932	IL 59	DU	L-3	ON
			BROOKDALE RD BRUCE LN			
78	L	4933	IL 59	DU	L-3	ON
			NORTH AURORA RD)			
79	L	4934	IL 59	DU	L-3	ON
			MERDIAN PARKWAY GLACIER PARK AVE			
80	L	4944	22ND ST CERMAK RD	DU	L-3	ON
			WINDSOR DR			
81	L	4945	22ND ST CERMAK RD	DU	L-3	ON
			YORK RD			
82	L	4946	HIGHLAND AVE	DU	L-3	ON
			EASTGATE RD			
83	L	4948	IL 59	DU	L-3	ON
			LIBERTY ST JEFFERSON AVE			
84	L	4949	IL 59	DU	L-3	ON
			MEIJER ENT WESTRIDGE CT			
85	L	4950	IL 59	DU	L-3	ON
			AURORA AVE NEW YORK AVE			

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86	L	4955	IL 64 NORTH AVE BERTEAU AVE	DU	L-3	ON
87	L	4956	IL 64 NORTH AVE EMROY AVE	DU	L-3	ON
88	L	4957	IL 64 NORTH AVE YORK RD	DU	L-3	ON
89	L	4958	IL 64 NORTH AVE MYRTLE AVE	DU	L-3	ON
90	L	4993	IL 19 IRVING PARK RD WOOD DALE RD	DU	L-3	ON
91	L	5904	IL 19 IRVING PARK RD YORK RD	DU	L-3	ON
92	L	4047	IL 38 ROOSEVELT RD 14TH ST	KA	L-3	ON
93	L	4067	IL 64 NORTH AVE BURLINGTON RD	KA	L-3	ON
94	L	4080	IL 25 RIVER ST IL 25 WILSON ST	KA	L-3	ON
95	L	4081	IL 25 WASHINGTON AVE IL 25 WILSON ST	KA	L-3	ON
96	L	4085	IL 31 BATAVIA AVE WILSON ST	KA	L-3	ON
97	L	4110	US 30 BASELINE RD ORCHARD RD	KE	L-3	ON
98	L	4209	IL 43 WAUKEGAN RD HIGH SCHOOL DR (DEERFIELD)	LA	L-3	ON
99	L	4403	IL 126 LOCKPORT RD WALLIN DR COMBO'S ONLY	WI	L-3	ON
100	L	4416	US 30 LINCOLN HWY RIDGEMORE RD OWENS RD	WI	L-3	ON
101	L	4417	US 30 LINCOLN HWY WOLF RD	WI	L-3	ON
102	L	4422	US 45 96TH AVE	WI	L-3	ON

			191ST ST			
103	L	5406	IL 7 159TH ST	WI	L-3	ON
			S BELL RD			
104	L	5407	IL 7 159TH ST	WI	L-3	ON
			N BELL RD			
105	L	5408	IL 7 159TH ST	WI	L-3	ON
			PARKER RD			
106	L	5409	IL 7 159TH ST	WI	L-3	ON
			CEDAR RD			
107	L	5436	WEBER RD	WI	L-3	ON
			NORMANTOWN RD			
108	L	5451	US 6 EAMES ST	WI	L-3	ON
			I 55 WEST FRONTAGE RD			
109	L	5460	US 52 JEFFERSON ST	WI	L-3	ON
			RIVER RD			

LIGHTING SYSTEM - EQUIPMENT PAY CODE L-4 LOCATIONS

1	L	9TH	CGO SAN & SHIP CANAL @	WI	L-4	ON
			IL 7 9TH ST			
2	L	127TH	CAL SAG CHANNEL @	CO	L-4	ON
			127TH ST			
3	L	ASH	CAL SAG CHANNEL @	CO	L-4	ON
			ASHLAND AVE			
4	L	CENT	CHICAGO SAN & SHIP CANAL @	CO	L-4	ON
			CENTRAL AVE			
5	L	CICE	CAL SAG CHANNEL @	CO	L-4	ON
			IL 50 CICERO AVE			
6	L	FORD	LITTLE CALUMET RIVER @	CO	L-4	ON
			I 94 FORD			
7	L	HALS	LITTLE CALUMET RIVER @	CO	L-4	ON
			IL 1 HALSTED ST			
8	L	HARL	CAL SAG CHANNEL @	CO	L-4	ON
			IL 43 HARLEM AVE			

9	L	I80	DESPLAINES RIVER @ I 80 (ACCESS BY BOAT)	WI	L-4	ON
10	L	IL43	CHICAGO SAN & SHIP CANAL @ IL 43 HARLEM AVE NB	CO	L-4	ON
11	L	IL83	CAL SAG CHANNEL @ IL 83 KINGERY HWY	CO	L-4	ON
12	L	KEDZ	CAL SAG CHANNEL @ KEDZIE AVE	CO	L-4	ON
13	L	KING	CHICAGO SAN & SHIP CANAL @ IL 83 KINGERY HWY	CO	L-4	ON
14	L	LAG	CHICAGO SAN & SHIP CANAL @ US 12 20 45 LAGRANGE RD	CO	L-4	ON
15	L	LEM	CHICAGO SAN & SHIP CANAL @ LEMONT RD STATE ST	CO	L-4	ON
16	L	STEV	DESPLAINES RIVER @ I 55 STEV	WI	L-4	ON
17	L	SWH	CAL SAG CHANNEL @ IL 7 SOUTHWEST HWY	CO	L-4	ON
18	L	US45	CAL SAG CHANNEL @ US 45 96TH AVE	CO	L-4	ON
19	L	WSR	CHICAGO SAN & SHIP CANAL @ WILLOW SPRINGS RD	CO	L-4	ON

PUMP STATION SYSTEM – PAY CODE P-1 LOCATIONS

1	PS	2	I 94 EDENS @ WINNETKA RD	CO	P-1	ON
				NORTHFIELD		
2	PS	3	I 94 EDENS @ CALDWELL PETERSON	CO	P-1	ON
				CHICAGO		
3	PS	5	I 290 IKE EXPY @ DESPLAINES AVE	CO	P-1	ON
				CHICAGO		
4	PS	7	I 290 IKE EXPY @ WELLS ST	CO	P-1	ON
				CHICAGO		
5	PS	9	US 45 MANNHEIM RD @	CO	P-1	ON

			US 20 LAKE ST	STONE PARK		
6	PS	10	US 14 DEMPSTER @	CO	P-1	ON
			IL 21 MILWAUKEE AVE	NILES		
7	PS	11	IL 50 CICERO AVE @	CO	P-1	ON
			158TH ST	OAK FOREST		
8	PS	12	IL 64 NORTH AVE @	CO	P-1	ON
			25TH AVE (WEST OF)	MELROSE PARK		
9	PS	13	US 41 SKOKIE BLVD @	CO	P-1	ON
			OAKTON ST (SOUTH OF)	SKOKIE		
10	PS	15	79TH ST @	CO	P-1	ON
			KEDZIE AVE	CHICAGO		
11	PS	16	IL 72 HIGGINS RD @	CO	P-1	ON
			US 12 45 (EAST OF)	ROSEMONT		
12	PS	17	IL 58 GOLF RD @	CO	P-1	ON
			US 45 RIVER RD	DESPLAINES		
13	PS	18	US 6 159TH ST @	CO	P-1	ON
			PARK AVE	SOUTH HOLLAND		
14	PS	19	US 6 159TH ST @	CO	P-1	ON
			IL 50 CICERO AVE	OAK FOREST		
15	PS	20	I 290 IKE EXPY @	CO	P-1	ON
			WOLF RD (WEST OF)	HILLSIDE		
16	PS	21	I 94 RYAN @	CO	P-1	ON
			72ND ST	CHICAGO		
17	PS	22	I 90 94 KENN @	CO	P-1	ON
			FULTON AVE	CHICAGO		
18	PS	23	I 90 94 KENN @	CO	P-1	ON
			ROSCOE ST	CHICAGO		
19	PS	24	I 190 KENN @	CO	P-1	ON
			MANNHEIM RD (EAST OF)	ROSEMONT		
20	PS	25	US 12 20 95TH ST @	CO	P-1	ON
			IL 43 HARLEM AVE	BRIDGEVIEW		
21	PS	26	I 90 94 RYAN @	CO	P-1	ON
			ROOSEVELT RD	CHICAGO		

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22	PS	27	I 94 FORD @ 110TH ST (DOTY)	CO CHICAGO	P-1	ON
23	PS	28	IL 50 CICERO AVE @ US 34 OGDEN AVE	CO CICERO	P-1	ON
24	PS	29	I 90 94 RYAN @ WALLACE ST	CO CHICAGO	P-1	ON
25	PS	30	I 55 STEV @ HOMAN AVE	CO CHICAGO	P-1	ON
26	PS	31	111TH ST @ CENTRAL AVE	CO OAK LAWN	P-1	ON
27	PS	32	IL 64 NORTH AVE @ 1ST AVE	CO MELROSE PARK	P-1	ON
28	PS	33	PALATINE RD @ IL 21 MILWAUKEE AVE	CO PROSPECT HEIGHTS	P-1	ON
29	PS	34	I 290 IKE @ EMROY AVE	DU ELMHURST	P-1	ON
30	PS	35	I 57 @ 127TH ST	CO BLUE ISLAND	P-1	ON
31	PS	36	IL 43 HARLEM AVE @ 176TH ST	CO TINLEY PARK	P-1	ON
32	PS	37	US 41 SKOKIE HWY @ IL 176 ROCKLAND RD	LA LAKE BLUFF	P-1	ON
33	PS	39	IL 60 KENNEDY RD @ US 41 SKOKIE (WEST OF)	LA LAKE FOREST	P-1	ON
34	PS	40	US 45 LAKE AVE @ IL 60 TOWNE LINE (NORTH OF)	LA MUNDELEIN	P-1	ON
35	PS	41	US 41 SKOKIE HWY @ IL 176 ROCKLAND (NORTH OF)	LA LAKE BLUFF	P-1	ON
36	PS	42	IL 47 @ IL 72	KA STARKS	P-1	ON
37	PS	43	US 41 SKOKIE HWY @ IL 132 GRAND AVE (NORTH OF)	LA GURNEE	P-1	ON
38	PS	44	IL 83 KINGERY HWY @	DU	P-1	ON

			IL 64 NORTH AVE (SOUTH OF)	VILLA PARK		
39	PS	46	US 41 SKOKIE HWY @ CLAVEY RD	LA	P-1	ON
40	PS	47	IL 59 @ NORTH AURORA AVE	DU	P-1	ON
41	PS	48	IL 56 BUTTERFIELD RD @ IL 59 (WEST OF)	DU	P-1	ON
42	PS	50	IL 22 HALF DAY RD @ US 41 SKOKIE HWY	LA	P-1	ON
43	PS	51	127TH ST @ CRAWFORD AVE (EAST OF)	CO	P-1	ON
44	PS	52	IL 59 @ IL 126	WI	P-1	ON

PUMP STATION SYSTEM PLANNED P-1 LOCATIONS

1	PS	4	I 290 IKE @ 1ST Ave (EAST OF)	CO	P-1	OFF
2	PS	8	US 14 NW HWY @ US 12 20 45 MANNHEIM (EAST OF)	CO	P-1	OFF
3	PS	14	WOOD ASHLAND @ 138TH	CO	P-1	OFF
4	PS	38	US 41 SKOKIE HWY @ DEERPATH AVE	LA	P-1	OFF

SURVEILLANCE SYSTEM - EQUIPMENT PAY CODE S-1 LOCATIONS

1	S	2005	I 57 NB IB @ A2 IL 1 HALSTED ST	CO	S-1B	ON
2	S	3085	I 90 KENN SE IB @ E120 CUMBERLAND AVE ENT	CO	S-1A	ON
3	S	3095	I 90 KENN SE IB @ F118 CANFIELD AVE ENT	CO	S-1A	ON
4	S	3110	I 90 KENN SE IB @ F114 IL 43 HARLEM AVE	CO	S-1A	ON
5	S	3125	I 90 KENN SE IB @	CO	S-1A	ON

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		G112	IL 43 HARLEM AVE			S-1	
6	S	3135	I 90 KENN SE IB @	CO		S-1A	ON
		G110	SAYRE AVE			S-1	
7	S	3140	I 90 KENN NW OB @	CO		S-1A	ON
		H101	NAGLE AVE			S-1	
8	S	3155	I 90 KENN SE IB @	CO		S-1A	ON
		H106	BRYN MAWR AVE			S-1	
9	S	3165	I 90 KENN NW OB @	CO		S-1A	ON
		H97	FOSTER AVE			S-1	
10	S	3175	I 90 KENN SE IB @	CO		S-1A	ON
		I102	FOSTER AVE			S-1	
11	S	3185	I 90 KENN SE IB @	CO		S-1A	ON
		I100	CENTRAL AVE ENT			S-1	
12	S	3210	I 90 KENN NW OB @	CO		S-1A	ON
		J91	LAWRENCE AVE			S-1	
13	S	3215	I 90 KENN SE IB @	CO		S-1A	ON
		J94A	LAWRENCE AVE			S-1	
14	S	3245	I 90 94 KENN NW OB @	CO		S-1A	ON
		K77	KEELER AVE			S-1	
15	S	3270	I 90 94 KENN SE IB @	CO		S-1A	ON
		K84	PULASKI RD			S-1	
16	S	3275	I 90 94 KENN SE IB @	CO		S-1A	ON
		K86	IL 19 IRVING PARK RD			S-1	
17	S	3310	I 90 94 KENN SE IB @	CO		S-1A	ON
		L76	AVONDALE AVE			S-1	
18	S	3320	I 90 94 KENN NW OB @	CO		S-1A	ON
		L65	KIMBALL AVE			S-1	
19	S	3325	I 90 94 KENN SE IB @	CO		S-1A	ON
		L72	KIMBALL AVE			S-1	
20	S	3340	I 90 94 KENN SE IB @	CO		S-1A	ON
		L70	KEDZIE AVE			S-1	
21	S	3350	I 90 94 KENN NW OB @	CO		S-1A	ON
		M57	CALIFORNIA AVE			S-1	

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22	S	3365	I 90 94 KENN SE IB @	CO	S-1A	ON
		M66	SACRAMENTO BLVD		S-1	
23	S	3385	I 90 94 KENN SE IB @	CO	S-1A	ON
		M62	DIVERSEY AVE		S-1	
24	S	3390	I 90 94 KENN NW OB @	CO	S-1A	ON
		N51	FULLERTON AVE		S-1	
25	S	3405	I 90 94 KENN SE IB @	CO	S-1A	ON
		N58	FULLERTON AVE		S-1	
26	S	3415	I 90 94 KENN SE IB @	CO	S-1A	ON
		N56	WEBSTER AVE		S-1	
27	S	3420	I 90 94 KENN OB ENT @	CO	S-1A	ON
		O45	ARMITAGE AVE		S-1	
28	S	3435	I 90 94 KENN IB ENT @	CO	S-1A	ON
		O52	ARMITAGE AVE		S-1	
29	S	3445	I 90 94 KENN NW OB @	CO	S-1A	ON
		P41A	IL 64 NORTH AVE		S-1	
30	S	3450	I 90 94 KENN SE IB @	CO	S-1A	ON
		P48	IL 64 NORTH AVE		S-1	
31	S	3460	I 90 94 KENN NW OB @	CO	S-1A	ON
		R39	DIVISION ST		S-1	
32	S	3465	I 90 94 KENN SE IB @	CO	S-1A	ON
		R44	DIVISION ST		S-1	
33	S	3480	I 90 94 KENN SE IB @	CO	S-1A	ON
		R42	AUGUSTA BLVD		S-1	
34	S	3485	I 90 94 KENN NW OB @	CO	S-1A	ON
		R35	OGDEN AVE		S-1	
35	S	3525	I 90 94 KENN SE IB @	CO	S-1A	ON
		Y28	LAKE ST ENT		S-1	
36	S	3565	I 90 94 KENN NW OB @	CO	S-1A	ON
		Y23	WASHINGTON BLVD		S-1	
37	S	4010	I 94 EDENS SB IB @	CO	S-1A	ON
		2	WILSON AVE		S-1	
38	S	4015	I 94 EDENS NB OB @	CO	S-1A	ON

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		3	WILSON AVE			S-1	
39	S	4020	I 94 EDENS SB IB @	CO		S-1A	ON
		B4	ELSTON AVE			S-1	
40	S	4025	I 94 EDENS NB OB @	CO		S-1A	ON
		B5	FOSTER AVE			S-1	
41	S	4040	I 94 EDENS SB IB @	CO		S-1A	ON
		C8	PETERSON AVE			S-1	
42	S	4045	I 94 EDENS NB OB @	CO		S-1A	ON
		C9	PETERSON AVE			S-1	
43	S	4050	I 94 EDENS SB IB @	CO		S-1A	ON
		C10	PETERSON AVE			S-1	
44	S	4065	I 94 EDENS SB IB @	CO		S-1A	ON
		E12	TOUHY AVE			S-1	
45	S	4070	I 94 EDENS NB OB @	CO		S-1A	ON
		E15	TOUHY AVE			S-1	
46	S	4075	I 94 EDENS SB IB @	CO		S-1A	ON
		E16	TOUHY AVE			S-1	
47	S	4080	I 94 EDENS NB OB @	CO		S-1A	ON
		E17	TOUHY AVE			S-1	
48	S	4100	I 94 EDENS OB @	CO		S-1A	ON
		H21	DEMPSTER ST			S-1	
49	S	4105	I 94 EDENS SB IB @	CO		S-1A	ON
		H22	DEMPSTER ST			S-1	
50	S	4110	I 94 EDENS NB OB @	CO		S-1A	ON
		H23	DEMPSTER ST			S-1	
51	S	4115	I 94 EDENS SB IB @	CO		S-1A	ON
		H24	DEMPSTER ST			S-1	
52	S	5015	I 94 RYAN NB IB @	CO		S-1B	ON
		68	95TH ST ENT			S-1	
53	S	5035	I 94 RYAN SB OB @	CO		S-1B	ON
		65	87TH ST ENT			S-1	
54	S	5040	I 94 RYAN NB IB @	CO		S-1B	ON
		64	87TH ST ENT			S-1	

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55	S	5055	I 94 RYAN NB IB @	CO	S-1B	ON
		62	83RD ST ENT		S-1	
56	S	5070	I 94 RYAN NB IB @	CO	S-1B	ON
		58	79TH ST ENT		S-1	
57	S	5075	I 94 RYAN SB OB @	CO	S-1B	ON
		59	79TH ST ENT		S-1	
58	S	5105	I 94 RYAN NB IB @	CO	S-1B	ON
		56	75TH ST ENT		S-1	
59	S	5115	I 94 RYAN NB IB @	CO	S-1C	ON
		52	71ST ST ENT		S-1	
60	S	5120	I 94 RYAN SB OB @	CO	S-1B	ON
		53	71ST ST ENT		S-1	
61	S	5125	I 94 RYAN SB OB @	CO	S-1B	ON
		49	67TH ST ENT		S-1	
62	S	5145	I 94 RYAN NB IB @	CO	S-1B	ON
		46	63RD ST ENT		S-1	
63	S	5160	I 90 94 RYAN SB OB @	CO	S-1B	ON
		45	59TH ST ENT		S-1	
64	S	5195	I 90 94 RYAN SB OB @	CO	S-1B	ON
		41	55TH ST ENT		S-1	
65	S	5210	I 90 94 RYAN NB IB @	CO	S-1B	ON
		42	55TH ST ENT		S-1	
66	S	5225	I 90 94 RYAN SB OB @	CO	S-1B	ON
		37	47TH ST ENT		S-1	
67	S	5235	I 90 94 RYAN NB IB @	CO	S-1B	ON
		38	47TH ST ENT		S-1	
68	S	5250	I 90 94 RYAN SB OB @	CO	S-1B	ON
		35A	43RD ST ENT		S-1	
69	S	5255	I 90 94 RYAN NB IB @	CO	S-1B	ON
		36	43RD ST ENT		S-1	
70	S	5290	I 90 94 RYAN SB OB @	CO	S-1B	ON
		31	39TH ST ENT		S-1	
71	S	5405	I 90 94 RYAN NB IB @	CO	S-1A	ON

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		D4	TAYLOR			S-1	
72	S	6255	I 94 FORD NB IB @	CO		S-1B	ON
		M2	99TH PL WABASH ENT			S-1	
73	S	8040	I 290 IKE EB IB @	CO		S-1A	ON
		G8	ASHLAND AVE			S-1	
74	S	8060	I 290 IKE WB OB ENT @	CO		S-1A	ON
		H11A	DAMEN AVE & PAULINA			S-1	
75	S	8085	I 290 IKE WB OB @	CO		S-1A	ON
		H15	WESTERN AVE			S-1	
76	S	8095	I 290 IKE EB IB @	CO		S-1A	ON
		H16	CALIFORNIA AVE			S-1	
77	S	8105	I 290 IKE WB OB @	CO		S-1A	ON
		I19	SACRAMENTO BLVD			S-1	
78	S	8110	I 290 IKE EB IB @	CO		S-1A	ON
		I20	HOMAN AVE			S-1	
79	S	8120	I 290 IKE EB IB @	CO		S-1A	ON
		J22	INDEPENDENCE BLVD			S-1	
80	S	8135	I 290 IKE WB OB @	CO		S-1A	ON
		J27	INDEPENDENCE BLVD			S-1	
81	S	8140	I 290 IKE EB IB @	CO		S-1A	ON
		J26	KOSTNER AVE			S-1	
82	S	8160	I 290 IKE WB OB @	CO		S-1A	ON
		K33	IL 50 CICERO AVE			S-1	
83	S	8165	I 290 IKE EB IB @	CO		S-1A	ON
		K30	LARAMIE AVE			S-1	
84	S	8175	I 290 IKE EB IB @	CO		S-1A	ON
		L32	CENTRAL AVE			S-1	
85	S	8195	I 290 IKE WB OB @	CO		S-1A	ON
		L39	CENTRAL AVE			S-1	
86	S	8210	I 290 IKE WB OB @	CO		S-1A	ON
		M43	AUSTIN BLVD			S-1	
87	S	8230	I 290 IKE EB IB @	CO		S-1A	ON
		M40	IL 43 HARLEM AVE			S-1	

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88	S	8240	I 290 IKE WB OB @	CO	S-1A	ON
		M49	IL 43 HARLEM AVE		S-1	
89	S	8255	I 290 IKE WB OB @	CO	S-1A	ON
		N53	DES PLAINES AVE		S-1	
90	S	8265	I 290 IKE EB IB @	CO	S-1A	ON
		O48	IL 171 1ST AVE		S-1	
91	S	8280	I 290 IKE WB OB @	CO	S-1A	ON
		O59	IL 171 1ST AVE		S-1	
92	S	8285	I 290 IKE EB IB @	CO	S-1A	ON
		P52	9TH AVE		S-1	
93	S	8295	I 290 IKE EB IB @	CO	S-1A	ON
		P54	17TH AVE		S-1	
94	S	8310	I 290 IKE WB OB @	CO	S-1A	ON
		P65	17TH AVE		S-1	
95	S	8315	I 290 IKE EB IB @	CO	S-1A	ON
		R58	25TH AVE		S-1	
96	S	8320	I 290 IKE EB IB @	CO	S-1A	ON
		R60	25TH AVE		S-1	
97	S	8340	I 290 IKE WB OB @	CO	S-1A	ON
		R69	ADDISON CREEK		S-1	
98	S	8345	I 290 IKE EB IB @	CO	S-1A	ON
		S64	MANNHEIM RD SE		S-1	
99	S	8350	I 290 IKE EB IB @	CO	S-1A	ON
		S66	MANNHEIM RD SW		S-1	
100	S	8370	I 290 IKE WB OB @	CO	S-1A	ON
		S75	MANNHEIM RD NW		S-1	
101	S	8375	I 290 IKE EB IB @	CO	S-1A	ON
		T70	HILLSIDE CAR MAX ENT		S-1	
102	S	9055	I 290 EB IB @	DU	S-1A	ON
		X86	IL 64 NORTH AVE		S-1	
103	S	9075	I 290 EB IB @	DU	S-1A	ON
		X90	IL 64 NORTH AVE		S-1	
104	S	9130	I 290 WB OB @	DU	S-1A	ON

		A101	IL 83 KINGERY HWY			S-1	
105	S	9140	I 290 WB OB @	DU		S-1A	ON
		A103	IL 83 KINGERY HWY			S-1	

PLANNED S-1 LOCATIONS

1	S	3075	I 90 KENN NW OB @	CO		S-1A	OFF
		E113	CUMBERLAND AVE EXIT			S-1	
2	S	3080	I 90 KENN NW OB @	CO		S-1A	OFF
		E115	CUMBERLAND AVE ENT			S-1	
3	S	3105	I 90 KENN NW OB @	CO		S-1A	OFF
		F109	IL 43 HARLEM AVE			S-1	
4	S	3240	I 90 94 KENN SE IB @	CO		S-1A	OFF
		J92	MONTROSE AVE			S-1	
5	S	3595	I 90 94 KENN NW OB @	CO		S-1A	OFF
		Y15	MONROE ST			S-1	
6	S	5385	I 90 94 RYAN SB OB @	CO		S-1A	OFF
		C5	ROOSEVELT RD			S-1	
7	S	5390	I 90 94 RYAN NB IB @	CO		S-1A	OFF
		C6	ROOSEVELT ENT			S-1	
8	S	9030	I 290 EB IB @	DU		S-1A	OFF
		W80	ST CHARLES RD			S-1	
9	S	9035	I 290 EB IB @	DU		S-1A	OFF
		W82	ST CHARLES RD			S-1	
10	S	9040	I 290 WB OB @	DU		S-1A	OFF
		W83	ST CHARLES RD			S-1	
11	S	9045	I 290 WB OB @	DU		S-1A	OFF
		W85	ST CHARLES RD			S-1	

SURVEILLANCE SYSTEM - EQUIPMENT PAY CODE S-2 LOCATIONS

1	S	1000	I 55 STEV NE IB @	CO		S-2A	ON
		B0	MARTIN LUTHER KING MLK DR			S-2	
2	S	1005	I 55 STEV SW OB @	CO		S-2A	ON
		B1	MARTIN LUTHER KING MLK DR			S-2	
3	S	1010	I 55 STEV SW OB @	CO		S-2A	ON

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		B3	STATE ST			S-2	
4	S	1015	I 55 STEV NE IB @	CO		S-2A	ON
		C2	26TH ST & WENTWORTH			S-2	
5	S	1020	I 55 STEV SW OB @	CO		S-2A	ON
		C5	26TH ST & WENTWORTH			S-2	
6	S	1025	I 55 STEV NE IB @	CO		S-2A	ON
		C4	W WENTWORTH AVE			S-2	
7	S	1030	I 55 STEV SW OB @	CO		S-2A	ON
		C7	W WENTWORTH AVE			S-2	
8	S	1035	I 55 STEV SW OB @	CO		S-2A	ON
		Y15	I 90 94 RYAN INTER			S-2	
9	S	1040	I 55 STEV NE IB @	CO		S-2A	ON
		Y16	I 90 94 RYAN INTER			S-2	
10	S	1045	I 55 STEV SW OB @	CO		S-2A	ON
		Y17	I 90 94 RYAN INTER			S-2	
11	S	1047	I 55 STEV NE IB @	CO		S-2K	ON
		MCD18	I 90 94 RYAN CROSS CON			S-2	
12	S	1050	I 55 STEV NE IB @	CO		S-2A	ON
		Y18	I 90 94 RYAN I 55 INTER			S-2	
13	S	1055	I 55 STEV NE IB @	CO		S-2A	ON
		6	ARCHER AVE & MARY ST			S-2	
14	S	1060	I 55 STEV NE IB @	CO		S-2A	ON
		8	LOCK ST			S-2	
15	S	1065	I 55 STEV NE IB @	CO		S-2A	ON
		10	WOOD ST			S-2	
16	S	1075	I 55 STEV NE IB @	CO		S-2A	ON
		12	HOYNE AVE			S-2	
17	S	1080	I 55 STEV NE IB @	CO		S-2A	ON
		14	PENN RR			S-2	
18	S	1100	I 55 STEV NE IB @	CO		S-2A	ON
		16	KEDZIE & CALIFORNIA AVE			S-2	
19	S	1105	I 55 STEV NE IB @	CO		S-2A	ON
		18	KEDZIE & CALIFORNIA AVE			S-2	

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20	S	1110	I 55 STEV NE IB @	CO	S-2A	ON
		20	KEDZIE & CALIFORNIA AVE		S-2	
21	S	1115	I 55 STEV SW OB @	CO	S-2A	ON
		9	PULASKI RD ATSF RR (EAST)		S-2	
22	S	1120	I 55 STEV SW OB @	CO	S-2A	ON
		H11	PULASKI RD		S-2	
23	S	1125	I 55 STEV NE IB @	CO	S-2A	ON
		22	PULASKI RD		S-2	
24	S	1130	I 55 STEV SW OB @	CO	S-2A	ON
		13	IL 50 CICERO AVE		S-2	
25	S	1135	I 55 STEV SW OB @	CO	S-2A	ON
		TDC1	IL 50 CICERO AVE		S-2	
26	S	1140	I 55 STEV SW OB @	CO	S-2A	ON
		15	IL 50 CICERO AVE OB EXIT		S-2	
27	S	1150	I 55 STEV NE IB @	CO	S-2A	ON
		26	IL 50 CICERO AVE IB RS		S-2	
28	S	1160	I 55 STEV NE IB @	CO	S-2A	ON
		24	IL 50 CICERO AVE		S-2	
29	S	1165	I 55 STEV SW OB @	CO	S-2A	ON
		17	CENTRAL AVE		S-2	
30	S	1170	I 55 STEV NE IB @	CO	S-2A	ON
		28	CENTRAL AVE		S-2	
31	S	1175	I 55 STEV NE IB @	CO	S-2A	ON
		30	CENTRAL AVE IL 43 HARLEM		S-2	
32	S	1180	I 55 STEV NE IB @	CO	S-2A	ON
		32	60TH IB RS		S-2	
33	S	1185	I 55 STEV SW OB @	CO	S-2A	ON
		19	CENTRAL AVE IL 43 HARLEM		S-2	
34	S	1190	I 55 STEV SW OB @	CO	S-2A	ON
		21	CENTRAL AVE IL 43 HARLEM		S-2	
35	S	1195	I 55 STEV SW OB @	CO	S-2A	ON
		23	IL 43 HARLEM AVE		S-2	
36	S	1205	I 55 STEV NE IB @	CO	S-2A	ON

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		34	IL 43 HARLEM AVE			S-2	
37	S	1210	I 55 STEV SW OB @	CO		S-2A	ON
		25	IL 43 HARLEM AVE			S-2	
38	S	1215	I 55 STEV NE IB @	CO		S-2A	ON
		36	IL 43 HARLEM AVE			S-2	
39	S	1220	I 55 STEV SW OB @	CO		S-2A	ON
		27	75TH WEST			S-2	
40	S	1225	I 55 STEV SW OB @	CO		S-2A	ON
		29	LAWNDALE NW QUAD			S-2	
41	S	1235	I 55 STEV NE IB @	CO		S-2A	ON
		38	LAWNDALE AVE IB			S-2	
42	S	1240	I 55 STEV SW OB @	CO		S-2A	ON
		31	LAWNDALE			S-2	
43	S	1245	I 55 STEV NE IB @	CO		S-2A	ON
		40	LAWNDALE EXIT			S-2	
44	S	1250	I 55 STEV NE IB @	CO		S-2A	ON
		42	B&O RR 83RD (WEST)			S-2	
45	S	1255	I 55 STEV NE IB @	CO		S-2A	ON
		44	86TH W			S-2	
46	S	1260	I 55 STEV NE IB @	CO		S-2A	ON
		46	88TH W			S-2	
47	S	1265	I 55 STEV NE IB @	CO		S-2A	ON
		P50	91ST W			S-2	
48	S	1270	I 55 STEV SW OB @	CO		S-2A	ON
		R43	97TH W			S-2	
49	S	1275	I 55 STEV SW OB @	CO		S-2A	ON
		R45	US 12 20 45 LAGRANGE RD			S-2	
50	S	1280	I 55 STEV SW OB @	CO		S-2A	ON
		R47	US 12 20 45 LAGRANGE RD			S-2	
51	S	1285	I 55 STEV NE IB @	CO		S-2A	ON
		R52	US 12 20 45 LAGRANGE RD			S-2	
52	S	1290	I 55 STEV NE IB @	CO		S-2A	ON
		R54	US 12 20 45 LAGRANGE RD SW			S-2	

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53	S	1295	I 55 STEV SW OB @	CO	S-2A	ON
		R49	WILLOW SPRINGS RD (EAST)		S-2	
54	S	1300	I 55 STEV SW OB @	CO	S-2A	ON
		R49A	WILLOW SPRINGS RD OB (EAST)		S-2	
55	S	1315	I 55 STEV SW OB @	CO	S-2A	ON
		S53	I 294 TLWY		S-2	
56	S	1320	I 55 STEV SW OB @	CO	S-2A	ON
		S55	JOLIET RD		S-2	
57	S	1325	I 55 STEV SW OB @	CO	S-2A	ON
		57	COUNTY LINE RD (EAST)		S-2	
58	S	1330	I 55 STEV SW OB @	DU	S-2A	ON
		59	COUNTY LINE RD (WEST)		S-2	
59	S	1335	I 55 STEV SW OB @	DU	S-2A	ON
		61	COUNTY LINE RD (1.0 MILE WEST)		S-2	
60	S	1340	I 55 STEV SW OB @	DU	S-2A	ON
		63	MADISON ST		S-2	
61	S	1345	I 55 STEV NE IB @	DU	S-2A	ON
		58	IL 83 (EAST)		S-2	
62	S	1350	I 55 STEV NE IB @	DU	S-2A	ON
		60	IL 83 (WEST)		S-2	
63	S	1355	I 55 STEV SW OB @	DU	S-2A	ON
		65	CLARENDON HILLS RD		S-2	
64	S	1360	I 55 STEV NE IB @	DU	S-2A	ON
		62	CLARENDON HILLS RD (0.5 MILE WEST		S-2	
65	S	1365	I 55 STEV NE IB @	DU	S-2A	ON
		64	CASS AVE (EAST)		S-2	
66	S	1370	I 55 STEV NE IB @	DU	S-2A	ON
		66	CASS AVE (WEST)		S-2	
67	S	1375	I 55 STEV NE IB @	DU	S-2A	ON
		68	CASS AVE (1.0 MILE WEST)		S-2	
68	S	1380	I 55 STEV SW OB @	DU	S-2A	ON
		67	LEMONT RD (0.5 MILE EAST)		S-2	
69	S	1385	I 55 STEV NE IB @	DU	S-2A	ON

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		70	LEMONT RD (EAST)			S-2	
70	S	1390	I 55 STEV NE IB @	DU		S-2A	ON
		72	LEMONT RD (WEST)			S-2	
71	S	1395	I 55 STEV NE IB @	DU		S-2A	ON
		74	LEMONT RD (0.5 MILE WEST)			S-2	
72	S	1400	I 55 STEV NE IB @	DU		S-2A	ON
		76	WOODWARD AVE			S-2	
73	S	1401	I 55 NE IB @	WI		S-2F	ON
		RVD9	I 355 TLWY (WOODWARD)			S-2	
74	S	1402	I 55 SW OB @	WI		S-2F	ON
		RVD6	I 355 TLWY NB			S-2	
75	S	1403	I 55 SW OB @	WI		S-2F	ON
		RVD5	I 355 TLWY (WEST OF WOODWARD)			S-2	
76	S	1404	I 55 NE IB @	WI		S-2F	ON
		RVD7	I 355 TLWY NB			S-2	
77	S	1405	I 55 SW OB @	WI		S-2F	ON
		RVD8	I 355 TLWY NB			S-2	
78	S	1406	I 55 SW OB @	WI		S-2F	ON
		RVD4	I 355 TLWY SB			S-2	
79	S	1407	I 55 SW OB @	WI		S-2F	ON
		RVD2	I 355 TLWY JOLIET RD			S-2	
80	S	1408	I 55 SW OB @	WI		S-2F	ON
		RVD3	I 355 TLWY			S-2	
81	S	1425	I 55 SW OB @	WI		S-2A	ON
		69	JOLIET RD EXIT			S-2	
82	S	1427	I 55 SW OB @	WI		S-2F	ON
		RVD1	I 355 TLWY ENT			S-2	
83	S	1430	I 55 SW OB @	WI		S-2A	ON
		71	JOLIET RD (0.5 MILE WEST)			S-2	
84	S	1435	I 55 NE IB @	WI		S-2A	ON
		82	UPTON RD (WEST)			S-2	
85	S	1440	I 55 SW OB @	WI		S-2A	ON
		73	IL 53 (0.5 MILE EAST)			S-2	

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86	S	1445	I 55 NE IB @	WI	S-2A	ON
		84	IL 53 (EAST)		S-2	
87	S	1450	I 55 NE IB @	WI	S-2A	ON
		86	IL 53 (WEST)		S-2	
88	S	1455	I 55 NE IB @	WI	S-2A	ON
		88	SCHMIDT RD (EAST)		S-2	
89	S	1460	I 55 SW OB @	WI	S-2A	ON
		75	SCHMIDT RD (WEST) WEIGH STATI		S-2	
90	S	1465	I 55 NE IB @	WI	S-2A	ON
		90	NAPERVILLE RD (0.5 MILE E) WEIG		S-2	
91	S	1470	I 55 NE IB @	WI	S-2A	ON
		92	NAPERVILLE RD (WEST)		S-2	
92	S	1475	I 55 SW OB @	WI	S-2G	ON
		77	WEBER RD (0.5 MILE NORTH)		S-2	
93	S	1495	I 55 SW OB @	WI	S-2G	ON
		85	WEBER RD (0.5 MILE SOUTH)		S-2	
94	S	1500	I 55 SW OB @	WI	S-2G	ON
		87	WEBER RD (1.0 MILE NORTH)		S-2	
95	S	1505	I 55 NE IB @	WI	S-2G	ON
		94	WEBER RD (0.5 MILE NORTH)		S-2	
96	S	1510	I 55 SW OB @	WI	S-2G	ON
		89	IL 126 EXIT		S-2	
97	S	1515	I 55 SW OB @	WI	S-2G	ON
		91	IL 126		S-2	
98	S	1520	I 55 NE IB @	WI	S-2G	ON
		96	IL 126 (0.25 MILE SOUTH)		S-2	
99	S	1525	I 55 NE IB @	WI	S-2B	ON
		98	IL 126 (0.5 MILE SOUTH)		S-2	
100	S	1530	I 55 SW OB @	WI	S-2B	ON
		93	LOCKPORT RD (0.5 MILE NORTH)		S-2	
101	S	1535	I 55 SW OB @	WI	S-2B	ON
		95	LOCKPORT RD (NORTH)		S-2	
102	S	1540	I 55 SW OB @	WI	S-2B	ON

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		97	LOCKPORT RD (SOUTH)			S-2	
103	S	1545	I 55 NE IB @	WI		S-2B	ON
		100	RENEWICK RD (NORTH)			S-2	
104	S	1550	I 55 NE IB @	WI		S-2B	ON
		100A	US 30 (0.5 MILE NORTH)			S-2	
105	S	1555	I 55 SW OB @	WI		S-2B	ON
		101	US 30 (NORTH)			S-2	
106	S	1560	I 55 SW OB @	WI		S-2B	ON
		103	US 30 (SOUTH)			S-2	
107	S	1565	I 55 SW OB @	WI		S-2B	ON
		105	US 30 (0.5 MILE SOUTH)			S-2	
108	S	1572	I 55 SW OB @	WI		S-2B	ON
		107	CATON FARM RD (0.5 MILE NORTH)			S-2	
109	S	1575	I 55 NE IB @	WI		S-2B	ON
		102	CATON FARM RD			S-2	
110	S	1580	I 55 NE IB @	WI		S-2B	ON
		104	CATON FARM (0.5 MILE SOUTH)			S-2	
111	S	1585	I 55 SW OB @	WI		S-2B	ON
		109	US 52 (0.5 MILE NORTH)			S-2	
112	S	1590	I 55 NE IB @	WI		S-2B	ON
		106	US 52 (0.5 MILE NORTH)			S-2	
113	S	1595	I 55 NE IB @	WI		S-2B	ON
		108	BLACK RD			S-2	
114	S	1600	I 55 SW OB @	WI		S-2B	ON
		111	US 52 (0.5 MILE NORTH)			S-2	
115	S	1608	I 55 SW OB @	WI		S-2B	ON
		113	US 52 (NORTH)			S-2	
116	S	1610	I 55 SW OB @	WI		S-2B	ON
		115	US 52 (SOUTH)			S-2	
117	S	1615	I 55 NE IB @	WI		S-2B	ON
		110	IL 59 (0.5 MILE NORTH)			S-2	
118	S	1620	I 55 SW OB @	WI		S-2B	ON
		117	IL 59 (NORTH)			S-2	

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119	S	1625	I 55 SW OB @	WI	S-2B	ON
		119	IL 59 (SOUTH)		S-2	
120	S	1630	I 55 SW OB @	WI	S-2B	ON
		121	I 80 (0.5 MILE NORTH)		S-2	
121	S	1635	I 55 SW OB @	WI	S-2B	ON
		123	I 80 (NORTH)		S-2	
122	S	1640	I 55 SW OB @	WI	S-2B	ON
		125	I 80 (SOUTH)		S-2	
123	S	1665	I 55 SW OB @	WI	S-2B	ON
		135	US 6 (SOUTH)		S-2	
124	S	1740	I 55 SW OB @	WI	S-2B	ON
		165	RIVER RD		S-2	
125	S	1745	I 55 SW OB @	WI	S-2B	ON
		167	LORENZO RD (EAST)		S-2	
126	S	1750	I 55 SW OB @	WI	S-2B	ON
		169	LORENZO RD (WEST)		S-2	
127	S	1755	I 55 SW OB @	WI	S-2B	ON
		171	LORENZO RD (0.5 MILE WEST)		S-2	
128	S	2000	I 57 SB OB @	CO	S-2A/F	ON
		A3	C&W RR (0.5 MILE S OF WENTWORTH)		S-2	
129	S	2015	I 57 SB OB @	CO	S-2A/F	ON
		B7	IL 1 HALSTED ST		S-2	
130	S	2020	I 57 NB IB @	CO	S-2A/F	ON
		B4	100TH ST		S-2	
131	S	2025	I 57 NB IB @	CO	S-2A/F	ON
		B6	104TH ST		S-2	
132	S	2030	I 57 SB OB @	CO	S-2A/F	ON
		C9	107TH ST		S-2	
133	S	2035	I 57 NB IB @	CO	S-2A	ON
		C8	111TH ST		S-2	
134	S	2040	I 57 SB OB @	CO	S-2A	ON
		C11	111TH ST		S-2	
135	S	2050	I 57 SB OB @	CO	S-2A/F	ON

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		D13	111TH ST			S-2
136	S	2055	I 57 NB IB @	CO		S-2A/F ON
		D12	119TH ST			S-2
137	S	2060	I 57 NB IB @	CO		S-2A/F ON
		E14	119TH ST			S-2
138	S	2065	I 57 NB IB @	CO		S-2A/F ON
		D12A	119TH ST			S-2
139	S	2075	I 57 NB IB @	CO		S-2A/F ON
		F16	127TH ST			S-2
140	S	2080	I 57 SB OB @	CO		S-2A ON
		F19	127TH ST			S-2
141	S	2085	I 57 NB IB @	CO		S-2A/F ON
		G18	127TH ST			S-2
142	S	2095	I 57 NB IB @	CO		S-2A ON
		G20	CAL SAG CHANNEL			S-2
143	S	2100	I 57 NB IB @	CO		S-2A/F ON
		H22	CALUMET RIVER (SOUTH OF)			S-2
144	S	2105	I 57 NB IB @	CO		S-2A/F ON
		H24	IHB RR THORNTON RD			S-2
145	S	2110	I 57 NB IB @	CO		S-2A/F ON
		I26	IHB RR (NORTH OF LEVITT)			S-2
146	S	2145	I 57 SB OB @	CO		S-2A ON
		K29	155TH ST			S-2
147	S	2155	I 57 SB OB @	CO		S-2A ON
		L33	US 6 159TH ST			S-2
148	S	2160	I 57 NB IB @	CO		S-2A ON
		L34	US 6 159TH ST			S-2
149	S	2165	I 57 SB OB @	CO		S-2A/F ON
		L35	US 6 159TH ST			S-2
150	S	2170	I 57 NB IB @	CO		S-2A ON
		L36	US 6 159TH ST			S-2
151	S	2175	I 57 SB OB @	CO		S-2A/F ON
		M37	163RD ST			S-2

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152	S	2180	I 57 SB OB @	CO	S-2A	ON
		N39	167TH ST		S-2	
153	S	2190	I 57 SB OB @	CO	S-2A/F	ON
		N43	167TH ST		S-2	
154	S	2195	I 57 NB IB @	CO	S-2A	ON
		O38	167TH ST		S-2	
155	S	2205	I 57 NB IB @	CO	S-2A	ON
		O42	167TH ST		S-2	
156	S	2210	I 57 SB OB @	CO	S-2A/F	ON
		T45	CICERO AVE (WEST)		S-2	
157	S	2215	I 57 SB OB @	CO	S-2A/F	ON
		T47	CICERO AVE (0.5 MILE WEST)		S-2	
158	S	2220	I 57 NB IB @	CO	S-2A	ON
		T44	I 80 INTERCHANGE		S-2	
159	S	2225	I 57 NB IB @	CO	S-2A	ON
		T46	I 80 INTERCHANGE		S-2	
160	S	2230	I 57 SB OB @	CO	S-2A	ON
		T49	I 80 INTERCHANGE		S-2	
161	S	2235	I 57 NB IB @	CO	S-2A	ON
		U48	I 80 INTERCHANGE		S-2	
162	S	2240	I 57 SB OB @	CO	S-2A	ON
		U51	I 80 INTERCHANGE		S-2	
163	S	2245	I 57 SB OB @	CO	S-2A	ON
		U53	I 80 INTERCHANGE		S-2	
164	S	3000	I 190 NW OB @	CO	S-2A	ON
		C131	O'HARE AIRPORT PARKING LOT C		S-2	
165	S	3005	I 190 KENN NW OB @	CO	S-2A	ON
		C127	US 12 45 MANNHEIM RD		S-2	
166	S	3007	I 190 KENN NW OB @	CO	S-2A	ON
		C127A	US 12 45 MANNHEIM RD		S-2	
167	S	3010	I 190 KENN NW OB @	CO	S-2A	ON
		C129	US 12 45 MANNHEIM RD		S-2	
168	S	3015	I 190 SE IB @	CO	S-2H	ON

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		C134	US 12 45 MANNHEIM RD			S-2	
169	S	3020	I 190 SE IB @	CO		S-2H	ON
		C136	US 12 45 MANNHEIM RD			S-2	
170	S	3025	I 90 KENN NW OB @	CO		S-2A	ON
		C123	I 90 TOLL PLAZA			S-2	
171	S	3030	I 90 KENN NW OB @	CO		S-2A	ON
		C125	I 90 TOLL PLAZA			S-2	
172	S	3035	I 90 KENN SE IB @	CO		S-2A	ON
		C130	I 90 TOLL PLAZA			S-2	
173	S	3040	I 90 KENN SE IB @	CO		S-2A	ON
		C132	I 90 TOLL PLAZA			S-2	
174	S	3045	I 90 KENN NW OB @	CO		S-2A	ON
		D119	DES PLAINES RIVER RD			S-2	
175	S	3050	I 90 KENN NW OB @	CO		S-2A	ON
		D121	DES PLAINES RIVER RD			S-2	
176	S	3055	I 90 KENN SE IB @	CO		S-2A	ON
		D126	DES PLAINES RIVER RD			S-2	
177	S	3060	I 90 KENN SE IB @	CO		S-2A	ON
		D128	DES PLAINES RIVER RD			S-2	
178	S	3065	I 90 KENN SE IB @	CO		S-2A	ON
		D124	EAST RIVER RD			S-2	
179	S	3070	I 90 KENN SE IB @	CO		S-2A	ON
		D122	CUMBERLAND SB EXIT			S-2	
180	S	3100	I 90 KENN NW OB @	CO		S-2A	ON
		F107	IL 43 HARLEM AVE			S-2	
181	S	3115	I 90 KENN SE IB @	CO		S-2A	ON
		F116	IL 43 HARLEM AVE			S-2	
182	S	3120	I 90 KENN NW OB @	CO		S-2A	ON
		G105	IL 43 HARLEM AVE			S-2	
183	S	3130	I 90 KENN NW OB @	CO		S-2A	ON
		G103	SAYRE AVE			S-2	
184	S	3145	I 90 KENN SE IB @	CO		S-2A	ON
		H108	NAGLE AVE			S-2	

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185	S	3150	I 90 KENN NW OB @	CO	S-2A	ON
		H99	BRYN MAWR AVE		S-2	
186	S	3160	I 90 KENN SE IB @	CO	S-2A	ON
		H104	MEADE AVE		S-2	
187	S	3170	I 90 KENN NW OB @	CO	S-2A	ON
		I95	FOSTER AVE		S-2	
188	S	3180	I 90 KENN NW OB @	CO	S-2A	ON
		I93	CENTRAL AVE		S-2	
189	S	3190	I 90 KENN SE IB @	CO	S-2A	ON
		I100A	CENTRAL AVE		S-2	
190	S	3195	I 90 KENN SE IB @	CO	S-2A	ON
		I98	MILWAUKEE AVE		S-2	
191	S	3200	I 90 KENN NW OB @	CO	S-2A	ON
		J87	LAWRENCE AVE		S-2	
192	S	3205	I 90 KENN NW OB @	CO	S-2A	ON
		J89	LAWRENCE AVE		S-2	
193	S	3220	I 90 KENN SE IB @	CO	S-2A	ON
		J96	LAWRENCE AVE		S-2	
194	S	3230	I 90 KENN SE IB @	CO	S-2A	ON
		94	IL 50 CICERO AVE		S-2	
195	S	3232	I 90 KENN SE IB @	CO	S-2K	ON
		MCD12	MONTROSE AVE		S-2	
196	S	3250	I 90 94 KENN NW OB @	CO	S-2A	ON
		79	KOSTNER AVE		S-2	
197	S	3253	I 90 94 KENN NW OB @	CO	S-2A	ON
		77A	KEELER AVE		S-2	
198	S	3255	I 90 94 KENN SE IB @	CO	S-2A	ON
		90	KEELER AVE		S-2	
199	S	3260	I 90 94 KENN NW OB @	CO	S-2A	ON
		73	PULASKI RD		S-2	
200	S	3290	I 90 94 KENN NW OB @	CO	S-2A	ON
		L67	ADDISON RD		S-2	
201	S	3295	I 90 94 KENN NW OB @	CO	S-2A	ON

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		L69	ADDISON RD			S-2	
202	S	3300	I 90 KENN MEDIAN @	CO		S-2L	ON
		78	ADDISON RD			S-2	
203	S	3315	I 90 94 KENN NW OB @	CO		S-2A	ON
		L63	KIMBALL AVE			S-2	
204	S	3330	I 90 94 KENN SE IB @	CO		S-2A	ON
		L74	KIMBALL AVE			S-2	
205	S	3335	I 90 94 KENN NW OB @	CO		S-2A	ON
		L61	BELMONT AVE			S-2	
206	S	3345	I 90 94 KENN NW OB @	CO		S-2A	ON
		M55	SACRAMENTO BLVD			S-2	
207	S	3375	I 90 94 KENN SE IB @	CO		S-2A	ON
		M64	CALIFORNIA AVE			S-2	
208	S	3380	I 90 94 KENN NW OB @	CO		S-2A	ON
		M53	DIVERSEY AVE			S-2	
209	S	3395	I 90 94 KENN SE IB @	CO		S-2A	ON
		N60	FULLERTON AVE			S-2	
210	S	3400	I 90 94 KENN NW OB @	CO		S-2A	ON
		N49	FULLERTON AVE			S-2	
211	S	3410	I 90 94 KENN NW OB @	CO		S-2A	ON
		N47	WEBSTER AVE			S-2	
212	S	3425	I 90 94 KENN IB EXIT @	CO		S-2A	ON
		O54	ARMITAGE AVE			S-2	
213	S	3430	I 90 94 KENN OB EXIT @	CO		S-2A	ON
		O43	ARMITAGE AVE			S-2	
214	S	3440	I 90 94 KENN NW OB @	CO		S-2A	ON
		P41	NORTH AVE			S-2	
215	S	3455	I 90 94 KENN SE IB @	CO		S-2A	ON
		O50	NORTH AVE			S-2	
216	S	3462	I 90 94 KENN NW OB @	CO		S-2A	ON
		R39A	DIVISION ST			S-2	
217	S	3470	I 90 94 KENN SE IB @	CO		S-2A	ON
		R46	DIVISION ST			S-2	

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218	S	3475	I 90 94 KENN NW OB @	CO	S-2A	ON
		R37	AUGUSTA BLVD		S-2	
219	S	3490	I 90 94 KENN SE IB @	CO	S-2A	ON
		R40	CHICAGO AVE		S-2	
220	S	3495	I 90 94 KENN NW OB @	CO	S-2A	ON
		S31	OHIO ST		S-2	
221	S	3500	I 90 94 KENN NW OB @	CO	S-2A	ON
		S33	OHIO ST		S-2	
222	S	3505	I 90 94 KENN SE IB @	CO	S-2A	ON
		S38	OHIO ST		S-2	
223	S	3510	I 90 94 KENN SE IB @	CO	S-2A	ON
		S32	OHIO ST FEEDER		S-2	
224	S	3515	I 90 94 KENN SE IB @	CO	S-2A	ON
		S34	OHIO ST FEEDER		S-2	
225	S	3545	I 90 94 KENN NW OB @	CO	S-2A	ON
		Y27	RANDOLPH ST		S-2	
226	S	3585	I 90 94 KENN NW OB @	CO	S-2A	ON
		Y19	MADISON AVE		S-2	
227	S	3645	I 90 94 KENN SE IB @	CO	S-2A	ON
		Z2	CIRCLE INT RYAN IB @ HARRISON		S-2	
228	S	3650	I 90 94 KENN NW OB @	CO	S-2A	ON
		Z3	CIRCLE INT IKE OB @ HALSTED		S-2	
229	S	4000	I 94 EDENS SB IB @	CO	S-2A	ON
		A2A	WILSON AVE		S-2	
230	S	4005	I 94 EDENS NB OB @	CO	S-2A	ON
		A1	WILSON AVE		S-2	
231	S	4016	I 94 EDENS NB OB MEDIAN @	CO	S-2K	ON
		MCD10	WILSON AVE		S-2	
232	S	4018	I 94 EDENS SB IB @	CO	S-2K	ON
		MCD11	WILSON AVE		S-2	
233	S	4030	I 94 EDENS SB IB @	CO	S-2A	ON
		B6	IL 50 CICERO AVE		S-2	
234	S	4035	I 94 EDENS NB OB @	CO	S-2A	ON

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		C7	PETERSON AVE			S-2	
235	S	4055	I 94 EDENS NB OB @	CO		S-2A	ON
		D11	DEVON AVE			S-2	
236	S	4060	I 94 EDENS NB OB @	CO		S-2A	ON
		D13	PRATT AVE			S-2	
237	S	4085	I 94 EDENS NB OB @	CO		S-2A	ON
		E19	NILES CENTER RD			S-2	
238	S	4090	I 94 EDENS SB IB @	CO		S-2A	ON
		G18	OAKTON ST			S-2	
239	S	4095	I 94 EDENS SB IB @	CO		S-2A	ON
		G20	LINCOLN AVE			S-2	
240	S	4120	I 94 EDENS SB IB @	CO		S-2A	ON
		H26	CHURCH ST			S-2	
241	S	4125	I 94 EDENS NB OB @	CO		S-2A	ON
		J25	GOLF RD			S-2	
242	S	4130	I 94 EDENS NB OB @	CO		S-2A	ON
		K27	OLD ORCHARD			S-2	
243	S	4135	I 94 EDENS SB IB @	CO		S-2A	ON
		K28	OLD ORCHARD			S-2	
244	S	4140	I 94 EDENS SB IB @	CO		S-2A	ON
		K30	GLENVIEW AVE			S-2	
245	S	4145	I 94 EDENS NB OB @	CO		S-2A	ON
		L29	LAKE AVE			S-2	
246	S	4150	I 94 EDENS SB IB @	CO		S-2A	ON
		L32	LAKE AVE			S-2	
247	S	4155	I 94 EDENS SB IB @	CO		S-2A	ON
		L34	LAKE AVE			S-2	
248	S	4160	I 94 EDENS NB OB @	CO		S-2A	ON
		M31	US 41 SKOKIE BLVD			S-2	
249	S	4165	I 94 EDENS SB IB @	CO		S-2A	ON
		M36	US 41 SKOKIE BLVD			S-2	
250	S	4170	I 94 EDENS NB OB @	CO		S-2A	ON
		M33	WINNETKA RD			S-2	

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251	S	4175	I 94 EDENS OB @	CO	S-2A	ON
		N35	WILLOW		S-2	
252	S	4180	I 94 EDENS OB @	CO	S-2A	ON
		N37	WILLOW RD		S-2	
253	S	4185	I 94 EDENS SB IB @	CO	S-2A	ON
		N38	WILLOW RD		S-2	
254	S	4190	I 94 EDENS SB IB @	CO	S-2A	ON
		N40	WILLOW RD		S-2	
255	S	4195	I 94 EDENS SB IB @	CO	S-2A	ON
		O42	TOWER RD (0.5 MILE SOUTH)		S-2	
256	S	4200	I 94 EDENS NB OB @	CO	S-2A	ON
		O39	TOWER RD		S-2	
257	S	4205	I 94 EDENS SB IB @	CO	S-2A	ON
		O44	TOWER RD		S-2	
258	S	4210	I 94 EDENS SB IB @	CO	S-2A	ON
		P46	TOWER RD (0.5 MILE NORTH)		S-2	
259	S	4215	I 94 EDENS SB IB @	CO	S-2A	ON
		P48	IL 68 DUNDEE (0.5 MILE SOUTH)		S-2	
260	S	4220	I 94 EDENS NB OB @	CO	S-2A	ON
		R41	IL 68 DUNDEE RD		S-2	
261	S	4225	I 94 EDENS SB IB @	CO	S-2A	ON
		R50	IL 68 DUNDEE RD		S-2	
262	S	4230	I 94 EDENS SB IB @	CO	S-2A	ON
		R52	IL 68 DUNDEE RD		S-2	
263	S	4235	I 94 EDENS SB IB @	CO	S-2A	ON
		R54	I 294 TLWY		S-2	
264	S	4240	I 94 EDENS SB IB @	CO	S-2A	ON
		S56	LAKE COOK RD		S-2	
265	S	4245	US 41 SKOKIE HWY SB IB @	LA	S-2A	ON
		S58	LAKE COOK RD		S-2	
266	S	4250	US 41 SKOKIE HWY SB IB @	LA	S-2A	ON
		T60	LAKE COOK RD (0.5 MILE NORTH)		S-2	
267	S	4255	US 41 SKOKIE HWY NB OB @	LA	S-2A	ON

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		T45	BOB O LINK GOLF CLUB			S-2	
268	S	4260	US 41 SKOKIE HWY SB IB @	LA		S-2A	ON
		T62	CHANTILLY BLVD			S-2	
269	S	4265	US 41 SKOKIE HWY NB OB @	LA		S-2A	ON
		T43	CLAVEY RD			S-2	
270	S	5005	I 94 RYAN SB OB @	CO		S-2B	ON
		71	97TH ST			S-2	
271	S	5010	I 94 RYAN SB OB @	CO		S-2B	ON
		69	97TH ST			S-2	
272	S	5020	I 94 RYAN SB OB @	CO		S-2B	ON
		67	95TH ST EXIT			S-2	
273	S	5030	I 94 RYAN NB IB @	CO		S-2B	ON
		66	87TH ST OR 90TH ST EXIT			S-2	
274	S	5045	I 94 RYAN SB OB @	CO		S-2B	ON
		63	87TH ST ENT			S-2	
275	S	5060	I 94 RYAN SB OB @	CO		S-2B	ON
		61	83RD ST EXIT			S-2	
276	S	5065	I 94 RYAN NB IB @	CO		S-2B	ON
		60	79TH ST EXIT			S-2	
277	S	5080	I 94 RYAN NB IB @	CO		S-2B	ON
		58A	79TH ST EXIT			S-2	
278	S	5085	I 94 RYAN SB OB @	CO		S-2B	ON
		57	76TH ST ENT			S-2	
279	S	5090	I 94 RYAN SB OB @	CO		S-2B	ON
		57A	76TH ST CD ENT			S-2	
280	S	5095	I 94 RYAN SB OB @	CO		S-2B	ON
		55	75TH ST EXIT			S-2	
281	S	5100	I 94 RYAN NB IB @	CO		S-2B	ON
		54	75TH ST EXIT			S-2	
282	S	5110	I 94 RYAN SB OB @	CO		S-2B	ON
		51	75TH ST EXIT			S-2	
283	S	5122	I 94 RYAN NB IB @	CO		S-2B	ON
		50	67TH ST EXIT			S-2	

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284	S	5135	I 94 RYAN SB OB @	CO	S-2B	ON
		47	65TH ST SKYWAY EXIT		S-2	
285	S	5140	I 94 RYAN NB IB @	CO	S-2B	ON
		48	65TH ST SKYWAY ENT		S-2	
286	S	5150	I 94 RYAN SB OB @	CO	S-2B	ON
		45A	63RD ST EXIT		S-2	
287	S	5155	I 90 94 RYAN NB @	CO	S-2B	ON
		46A	59TH ST EXIT		S-2	
288	S	5165	I 94 RYAN SB OB @	CO	S-2B	ON
		43	59TH ST		S-2	
289	S	5170	I 90 94 RYAN NB @	CO	S-2B	ON
		44	59TH ST		S-2	
290	S	5220	I 94 RYAN SB OB @	CO	S-2B	ON
		39	53RD ST		S-2	
291	S	5230	I 94 RYAN NB IB @	CO	S-2B	ON
		40	47TH ST EXIT		S-2	
292	S	5240	I 94 RYAN SB OB @	CO	S-2B	ON
		35	47TH ST EXIT		S-2	
293	S	5245	I 94 RYAN NB IB @	CO	S-2B	ON
		38A	43RD ST EXIT		S-2	
294	S	5260	I 94 RYAN SB OB @	CO	S-2B	ON
		33	43RD ST EXIT		S-2	
295	S	5265	I 94 RYAN NB IB @	CO	S-2B	ON
		34	39TH ST EXIT		S-2	
296	S	5295	I 90 94 RYAN NB @	CO	S-2B	ON
		32	39TH ST EXIT		S-2	
297	S	5300	I 90 94 RYAN SB @	CO	S-2B	ON
		29	35TH ST		S-2	
298	S	5305	I 90 94 RYAN NB @	CO	S-2B	ON
		30	35TH ST		S-2	
299	S	5310	I 90 94 RYAN SB @	CO	S-2B	ON
		27	35TH ST		S-2	
300	S	5315	I 90 94 RYAN SB @	CO	S-2B	ON

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		25	33RD ST			S-2	
301	S	5320	I 90 94 RYAN NB @	CO		S-2B	ON
		28	33RD ST			S-2	
302	S	5325	I 90 94 RYAN SB @	CO		S-2B	ON
		23	31ST ST			S-2	
303	S	5330	I 90 94 RYAN NB @	CO		S-2B	ON
		26	31ST ST			S-2	
304	S	5335	I 90 94 RYAN NB IB @	CO		S-2A	ON
		X20	29TH ST			S-2	
305	S	5340	I 90 94 RYAN SB OB @	CO		S-2A	ON
		X21	29TH ST			S-2	
306	S	5345	I 90 94 RYAN NB IB @	CO		S-2A	ON
		X22	29TH ST			S-2	
307	S	5350	I 90 94 RYAN NB IB @	CO		S-2A	ON
		X24	29TH ST			S-2	
308	S	5355	I 90 94 RYAN SB OB @	CO		S-2A	ON
		X19	26TH ST & PRINCETON AVE			S-2	
309	S	5360	I 90 94 RYAN NB IB @	CO		S-2A	ON
		Z12	FORD AVE			S-2	
310	S	5365	I 90 94 RYAN NB IB @	CO		S-2A	ON
		Z14	FORD AVE			S-2	
311	S	5370	I 90 94 RYAN NB IB @	CO		S-2A	ON
		Z10	22ND ST & EMERALD AVE			S-2	
312	S	5375	I 90 94 RYAN SB OB @	CO		S-2A	ON
		Z13	22ND ST & EMERALD AVE			S-2	
313	S	6000	I 94 FORD SB OB @	CO		S-2A	ON
		7	I 94 I 80 INTERCHANGE (EAST)			S-2	
314	S	6005	I 94 FORD NB IB @	CO		S-2A	ON
		6	I 94 I 80 INTERCHANGE (EAST)			S-2	
315	S	6010	I 94 FORD NB IB @	CO		S-2A	ON
		8	TORRENCE SLIP TO I 80 WB			S-2	
316	S	6015	I 94 FORD NB IB @	CO		S-2A	ON
		12	I 94 I 80 INTERCHANGE (EAST)			S-2	

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317	S	6035	I 94 FORD NB IB @	CO	S-2B	ON
		C40	171ST ST		S-2	
318	S	6040	I 94 FORD NB IB @	CO	S-2B	ON
		E38	163RD ST		S-2	
319	S	6045	I 94 FORD NB IB @	CO	S-2A	ON
		F32	US 6 159TH ST		S-2	
320	S	6050	I 94 FORD NB IB @	CO	S-2A	ON
		F34	US 6 159TH ST		S-2	
321	S	6055	I 94 FORD NB IB @	CO	S-2A	ON
		F36	US 6 159TH ST		S-2	
322	S	6060	I 94 FORD SB OB @	CO	S-2A	ON
		F47	US 6 159TH ST		S-2	
323	S	6065	I 94 FORD SB OB @	CO	S-2A	ON
		F49	US 6 159TH ST		S-2	
324	S	6070	I 94 FORD SB OB @	CO	S-2A	ON
		F45	PENN CENTRAL RR		S-2	
325	S	6075	I 94 FORD SB OB @	CO	S-2A	ON
		F43	PULASKI RD		S-2	
326	S	6080	I 94 FORD NB IB @	CO	S-2A	ON
		G28	IL 83 147TH ST SIBLEY BLVD		S-2	
327	S	6085	I 94 FORD NB IB @	CO	S-2A	ON
		G30	IL 83 147TH ST SIBLEY BLVD		S-2	
328	S	6090	I 94 FORD SB OB @	CO	S-2A	ON
		G37	IL 83 147TH ST SIBLEY BLVD		S-2	
329	S	6095	I 94 FORD SB OB @	CO	S-2A	ON
		G39	IL 83 147TH ST SIBLEY BLVD		S-2	
330	S	6100	I 94 FORD SB OB @	CO	S-2A	ON
		G41	IL 83 147TH ST SIBLEY BLVD		S-2	
331	S	6105	I 94 FORD NB IB @	CO	S-2A	ON
		H24	DOLTON ST		S-2	
332	S	6110	I 94 FORD NB IB @	CO	S-2A	ON
		H26	DOLTON ST		S-2	
333	S	6120	I 94 FORD SB OB @	CO	S-2A	ON

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		H35	DOLTON ST			S-2	
334	S	6125	I 94 FORD SB OB @	CO		S-2A	ON
		H31	B & O RR (NORTH)			S-2	
335	S	6130	I 94 FORD NB IB @	CO		S-2A	ON
		X22	138TH ST			S-2	
336	S	6135	I 94 FORD SB OB @	CO		S-2A	ON
		X29	138TH ST			S-2	
337	S	6140	I 94 FORD NB IB @	CO		S-2A	ON
		X20	133RD ST			S-2	
338	S	6145	I 94 FORD NB IB @	CO		S-2A	ON
		I16	130TH ST			S-2	
339	S	6150	I 94 FORD NB IB @	CO		S-2A	ON
		I18	130TH ST			S-2	
340	S	6155	I 94 FORD SB OB @	CO		S-2A	ON
		I25	130TH ST			S-2	
341	S	6160	I 94 FORD SB OB @	CO		S-2A	ON
		I27	130TH ST			S-2	
342	S	6165	I 94 FORD SB OB @	CO		S-2A	ON
		J23	128TH ST			S-2	
343	S	6170	I 94 FORD SB OB @	CO		S-2A	ON
		J21	124TH ST			S-2	
344	S	6175	I 94 FORD SB OB @	CO		S-2A	ON
		J19	125TH ST			S-2	
345	S	6180	I 94 FORD NB IB @	CO		S-2A	ON
		H12	115TH ST			S-2	
346	S	6185	I 94 FORD NB IB @	CO		S-2A	ON
		H14	115TH ST			S-2	
347	S	6190	I 94 FORD SB OB @	CO		S-2A	ON
		H15	115TH ST			S-2	
348	S	6195	I 94 FORD SB OB @	CO		S-2A	ON
		J17	115TH ST			S-2	
349	S	6200	I 94 FORD NB IB @	CO		S-2A	ON
		K8	111TH ST			S-2	

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350	S	6205	I 94 FORD NB IB @	CO	S-2A	ON
		K10	111TH ST		S-2	
351	S	6210	I 94 FORD SB OB @	CO	S-2A	ON
		K11	111TH ST		S-2	
352	S	6215	I 94 FORD SB OB @	CO	S-2A	ON
		K13	111TH ST		S-2	
353	S	6220	I 94 FORD SB OB @	CO	S-2A	ON
		L7	107TH ST STONY ISLAND ENT		S-2	
354	S	6225	I 94 FORD SB OB @	CO	S-2A	ON
		L9	107TH MEDIAN		S-2	
355	S	6230	I 94 FORD NB IB @	CO	S-2A	ON
		L6	103RD ST MEDIAN		S-2	
356	S	6235	I 94 FORD NB IB @	CO	S-2A	ON
		L4	ELLIS AVE STONY ISLAND ENT		S-2	
357	S	6240	I 94 FORD SB OB @	CO	S-2A	ON
		L5	ELLIS AVE STONY ISLAND EXIT		S-2	
358	S	6245	I 94 FORD SB OB @	CO	S-2A	ON
		M3	RHODES ST		S-2	
359	S	6250	I 94 FORD SB OB @	CO	S-2B	ON
		M1	MICHIGAN AVE		S-2	
360	S	7000	I 80 WB @	CO	S-2B	ON
		2	INDIANA STATE LINE		S-2	
361	S	7005	I 80 EB @	CO	S-2B	ON
		1	WENTWORTH (WEST)		S-2	
362	S	7010	I 80 EB @	CO	S-2B	ON
		3	BURNHAM (WEST)		S-2	
363	S	7015	I 80 EB @	CO	S-2B	ON
		5	RAILROAD AVE (WEST)		S-2	
364	S	7020	I 80 WB @	CO	S-2B	ON
		4	TORRENCE AVE		S-2	
365	S	7025	I 80 EB @	CO	S-2B	ON
		9	I 80 I 94 IL 394		S-2	
366	S	7030	I 80 WB @	CO	S-2B	ON

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		10	I 80 I 94 IL 394			S-2	
367	S	8000	I 290 IKE EB IB @	CO		S-2A	ON
		B2	FRANKLIN ST			S-2	
368	S	8010	I 290 IKE WB OB @	CO		S-2A	ON
		G1	MORGAN (NEAR SANGAMON)			S-2	
369	S	8015	I 290 IKE WB OB @	CO		S-2A	ON
		G3	RACINE AVE			S-2	
370	S	8020	I 290 IKE EB IB @	CO		S-2A	ON
		G4	RACINE ENT			S-2	
371	S	8025	I 290 IKE WB OB @	CO		S-2A	ON
		G5	RACINE AVE			S-2	
372	S	8030	I 290 IKE EB IB @	CO		S-2A	ON
		G6	RACINE AVE			S-2	
373	S	8035	I 290 IKE WB OB @	CO		S-2A	ON
		G7	ASHLAND AVE			S-2	
374	S	8045	I 290 IKE WB OB ENT @	CO		S-2A	ON
		G9	DAMEN AVE & PAULINA			S-2	
375	S	8050	I 290 IKE EB IB @	CO		S-2A	ON
		G10	DAMEN AVE & PAULINA			S-2	
376	S	8055	I 290 IKE WB OB EXT @	CO		S-2A	ON
		H11	DAMEN AVE & PAULINA			S-2	
377	S	8065	I 290 IKE EB IB ENT @	CO		S-2A	ON
		H12	DAMEN AVE & PAULINA			S-2	
378	S	8070	I 290 IKE EB IB EXT @	CO		S-2A	ON
		H12A	DAMEN AVE & PAULINA			S-2	
379	S	8075	I 290 IKE WB OB @	CO		S-2A	ON
		H13	OAKLEY AVE			S-2	
380	S	8080	I 290 IKE EB IB @	CO		S-2A	ON
		H14	OAKLEY AVE			S-2	
381	S	8090	I 290 IKE WB OB @	CO		S-2A	ON
		H17	WESTERN AVE			S-2	
382	S	8100	I 290 IKE EB IB @	CO		S-2A	ON
		I18	SACRAMENTO BLVD			S-2	

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383	S	8115	I 290 IKE WB OB @	CO	S-2A	ON
		I23	HOMAN AVE		S-2	
384	S	8125	I 290 IKE EB IB @	CO	S-2A	ON
		J24	INDEPENDENCE BLVD		S-2	
385	S	8130	I 290 IKE WB OB @	CO	S-2A	ON
		J25	INDEPENDENCE BLVD		S-2	
386	S	8145	I 290 IKE WB OB @	CO	S-2A	ON
		J29	KOSTNER AVE		S-2	
387	S	8150	I 290 IKE EB IB @	CO	S-2A	ON
		K28	IL 50 CICERO AVE		S-2	
388	S	8155	I 290 IKE WB OB @	CO	S-2A	ON
		K31	IL 50 CICERO AVE		S-2	
389	S	8170	I 290 IKE WB OB @	CO	S-2A	ON
		K35	LARAMIE AVE		S-2	
390	S	8180	I 290 IKE EB IB @	CO	S-2A	ON
		L34	CENTRAL AVE		S-2	
391	S	8185	I 290 IKE EB IB @	CO	S-2A	ON
		L34S	CENTRAL AVE		S-2	
392	S	8190	I 290 IKE WB OB @	CO	S-2A	ON
		L37	CENTRAL AVE		S-2	
393	S	8200	I 290 IKE EB IB @	CO	S-2A	ON
		L36	AUSTIN BLVD		S-2	
394	S	8205	I 290 IKE WB OB @	CO	S-2A	ON
		M41	AUSTIN BLVD		S-2	
395	S	8215	I 290 IKE EB IB @	CO	S-2A	ON
		M38	EAST AVE		S-2	
396	S	8220	I 290 IKE WB OB @	CO	S-2A	ON
		M45	EAST AVE		S-2	
397	S	8225	I 290 IKE MEDIAN @	CO	S-2K	ON
		MCD1	EAST AVE		S-2	
398	S	8235	I 290 IKE WB OB @	CO	S-2A	ON
		M47	IL 43 HARLEM AVE		S-2	
399	S	8245	I 290 IKE EB IB @	CO	S-2A	ON

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		N42	DES PLAINES AVE			S-2	
400	S	8250	I 290 IKE WB OB @	CO		S-2A	ON
		N51	DES PLAINES AVE			S-2	
401	S	8260	I 290 IKE EB IB @	CO		S-2A	ON
		O44	DES PLAINES RIVER			S-2	
402	S	8270	I 290 IKE WB OB @	CO		S-2A	ON
		O55	IL 171 1ST AVE			S-2	
403	S	8275	I 290 IKE WB OB @	CO		S-2A	ON
		O57	IL 171 1ST AVE			S-2	
404	S	8290	I 290 IKE WB OB @	CO		S-2A	ON
		P61	9TH AVE			S-2	
405	S	8300	I 290 IKE EB IB @	CO		S-2A	ON
		P56	17TH AVE			S-2	
406	S	8305	I 290 IKE WB OB @	CO		S-2A	ON
		P63	17TH AVE			S-2	
407	S	8325	I 290 IKE WB OB @	CO		S-2A	ON
		R67	25TH AVE			S-2	
408	S	8335	I 290 IKE EB IB @	CO		S-2A	ON
		R62	ADDISON CREEK			S-2	
409	S	8360	I 290 IKE WB OB @	CO		S-2A	ON
		S71	MANNHEIM RD			S-2	
410	S	8380	I 290 IKE WB OB @	CO		S-2A	ON
		T77	HILLSIDE AVE WOLF RD EXIT			S-2	
411	S	9000	I 290 IKE EB IB @	CO		S-2A	ON
		V72	WOLF RD			S-2	
412	S	9005	I 290 IKE MEDIAN @	CO		S-2K	ON
		MCD3	WOLF RD			S-2	
413	S	9010	I 290 EB IB @	CO		S-2A	ON
		V74	BUTTERFIELD RD			S-2	
414	S	9060	I 290 WB OB @	DU		S-2A	ON
		X87	IL 64 NORTH AVE			S-2	
415	S	9065	I 290 EB IB @	DU		S-2A	ON
		X88	IL 64 NORTH AVE			S-2	

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416	S	9070	I 290 WB OB @	DU	S-2A	ON
		X89	IL 64 NORTH AVE		S-2	
417	S	9080	I 290 WB OB @	DU	S-2A	ON
		X91	IL 64 NORTH AVE		S-2	
418	S	9085	I 290 EB IB @	DU	S-2A	ON
		X92	EMROY AVE		S-2	
419	S	9090	I 290 WB OB @	DU	S-2A	ON
		Y93	YORK RD & LAKE ST		S-2	
420	S	9095	I 290 EB IB @	DU	S-2A	ON
		Y94	YORK RD & LAKE ST		S-2	
421	S	9100	I 290 WB OB @	DU	S-2A	ON
		Y95	YORK RD & LAKE ST		S-2	
422	S	9105	I 290 EB IB @	DU	S-2A	ON
		Y96	YORK RD & LAKE ST		S-2	
423	S	9110	I 290 WB OB @	DU	S-2A	ON
		Y97	YORK RD & LAKE ST		S-2	
424	S	9115	I 290 WB OB @	DU	S-2A	ON
		Y99	CHURCH RD		S-2	
425	S	9120	I 290 EB IB @	DU	S-2A	ON
		Y98	GRAND AVE		S-2	
426	S	9125	I 290 EB IB @	DU	S-2A	ON
		A100	IL 83 KINGERY HWY		S-2	
427	S	9135	I 290 EB IB @	DU	S-2A	ON
		A102	IL 83 KINGERY HWY		S-2	
428	S	9145	I 290 WB OB @	DU	S-2A	ON
		B105	WOOD DALE RD		S-2	
429	S	9155	I 290 WB OB @	DU	S-2A	ON
		E109	ADDISON RD		S-2	
430	S	9160	I 290 EB IB @	DU	S-2A	ON
		E104	ADDISON RD (WEST)		S-2	
431	S	9165	I 290 WB OB @	DU	S-2A	ON
		F111	MILL RD		S-2	
432	S	9170	I 290 IL 53 EB IB @	DU	S-2A	ON

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		G106	ITASCA RD			S-2	
433	S	9175	I 290 IL 53 EB IB @	DU		S-2A	ON
		G110	NORDIC RD			S-2	
434	S	9180	I 290 IL 53 EB IB @	DU		S-2A	ON
		J112	NORDIC RD			S-2	
435	S	9190	I 290 IL 53 EB IB @	DU		S-2A	ON
		J114	IL 19 IRVING PARK RD (NORTH)			S-2	
436	S	9195	I 290 IL 53 WB OB @	DU		S-2A	ON
		J113	THORNDALE (0.5 MILE SOUTH OF)			S-2	
437	S	9200	I 290 IL 53 EB IB @	DU		S-2A	ON
		116	THORNDALE (SOUTH OF)			S-2	
438	S	9205	I 290 IL 53 OB @	DU		S-2A	ON
		117	THORNDALE (SOUTH OF)			S-2	
439	S	9210	I 290 IL 53 IB @	DU		S-2A	ON
		119	THORNDALE NE QUAD			S-2	
440	S	9215	I 290 IL 53 EB IB @	DU		S-2A	ON
		118	THORNDALE NW QUAD			S-2	
441	S	9225	I 290 IL 53 OB @	DU		S-2A	ON
		121	DEVON AVE			S-2	
442	S	9230	I 290 IL 53 OB @	CO		S-2A	ON
		L123	DEVON AVE (NORTH)			S-2	
443	S	9235	I 290 IL 53 EB IB @	CO		S-2A	ON
		L122	BIESTERFIELD RD			S-2	
444	S	9240	I 290 IL 53 OB ENT @	CO		S-2A	ON
		L123A	BIESTERFIELD RD			S-2	
445	S	9245	I 290 IL 53 EB IB @	CO		S-2A	ON
		M124	BIESTERFIELD RD (NORTH)			S-2	
446	S	9250	I 290 IL 53 EB IB @	CO		S-2A	ON
		M126	WGN RADIO STATION TOWER			S-2	
447	S	9255	I 290 IL 53 EB IB @	CO		S-2A	ON
		M128	IL 72 HIGGINS RD (1.5 MILE SOUTH			S-2	
448	S	9260	I 290 IL 53 EB IB @	CO		S-2A	ON
		N130	IL 72 HIGGINS RD (1.0 MILE SOUTH			S-2	

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449	S	9270	I 290 IL 53 OB @	CO	S-2A	ON
		O127	IL 72 HIGGINS RD		S-2	
450	S	9275	I 290 IL 53 EB IB @	CO	S-2A	ON
		O132	IL 72 HIGGINS RD		S-2	
451	S	9285	I 290 IL 53 OB @	CO	S-2A	ON
		P129	WOODFIELD DR		S-2	
452	S	9295	I 290 IL 53 OB @	CO	S-2A	ON
		P131	I 90 TLWY		S-2	
453	S	9300	I 290 IL 53 EB IB @	CO	S-2A	ON
		P138	I 90 TLWY		S-2	
454	S	10000	I 290 IL 53 OB @	CO	S-2A	ON
		133	I 90 TLWY		S-2	
455	S	10003	I 290 IL 53 EB IB @	CO	S-2A	ON
		140	I 90 TLWY		S-2	
456	S	10005	IL 53 NB OB @	CO	S-2A	ON
		135	IL 62 ALGONQUIN RD		S-2	
457	S	10010	IL 53 SB IB @	CO	S-2A	ON
		142	IL 62 ALGONQUIN RD		S-2	
458	S	10015	IL 53 SB IB @	CO	S-2A	ON
		144	ALGONQUIN RD (0.5 MILE NORTH)		S-2	
459	S	10020	IL 53 SB IB @	CO	S-2A	ON
		146	KIRCHOFF RD		S-2	
460	S	10025	IL 53 NB OB @	CO	S-2A	ON
		137	KIRCHOFF RD		S-2	
461	S	10030	IL 53 NB OB @	CO	S-2A	ON
		143	INDUSTRIAL AVE		S-2	
462	S	10035	IL 53 NB OB @	CO	S-2A	ON
		139	EUCLID ST		S-2	
463	S	10040	IL 53 SB IB @	CO	S-2A	ON
		148	EUCLID ST		S-2	
464	S	10045	IL 53 SB IB @	CO	S-2A	ON
		150	EUCLID ST		S-2	
465	S	10047	IL 53 NB OB @	CO	S-2A	ON

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		141	EUCLID ST			S-2	
466	S	10050	IL 53 NB OB @	CO		S-2A	ON
		145	US 14 NORTHWEST HWY			S-2	
467	S	10055	IL 53 SB IB @	CO		S-2A	ON
		152	US 14 NORTHWEST HWY			S-2	
468	S	10060	IL 53 NB OB @	CO		S-2A	ON
		147	PALATINE RD			S-2	
469	S	10065	IL 53 NB OB @	CO		S-2A	ON
		149	PALATINE RD			S-2	
470	S	10070	IL 53 SB IB @	CO		S-2A	ON
		154	PALATINE RD			S-2	
471	S	10075	IL 53 SB IB @	CO		S-2A	ON
		156	PALATINE RD			S-2	
472	S	10080	IL 53 NB OB @	CO		S-2A	ON
		151	ANDERSON DR			S-2	
473	S	10085	IL 53 NB OB @	CO		S-2A	ON
		153	US 12 RAND RD			S-2	
474	S	10090	IL 53 SB IB @	CO		S-2A	ON
		158	US 12 RAND RD			S-2	
475	S	10095	IL 53 NB OB @	CO		S-2A	ON
		155	IL 68 DUNDEE RD			S-2	
476	S	10100	IL 53 NB OB @	CO		S-2A	ON
		157	IL 68 DUNDEE RD			S-2	
477	S	10105	IL 53 SB IB @	CO		S-2A	ON
		160	IL 68 DUNDEE RD			S-2	
478	S	10110	IL 53 SB IB @	CO		S-2A	ON
		162	IL 68 DUNDEE RD			S-2	
479	S	10115	IL 53 NB OB @	CO		S-2A	ON
		159	LAKE COOK RD (0.5 MILE SOUTH)			S-2	
480	S	11000	I 355 TLWY SB IB @	DU		S-2A	ON
		G108	SCHICK RD			S-2	
481	S	11005	I 355 TLWY NB OB @	DU		S-2A	ON
		I1	US 20 LAKE ST			S-2	

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482	S	11010	I 355 TLWY SB IB @	DU	S-2A	ON
		12	US 20 LAKE ST		S-2	
483	S	11015	I 355 TLWY SB IB @	DU	S-2A	ON
		14	US 20 LAKE ST		S-2	
484	S	11020	I 355 TLWY SB IB @	DU	S-2A	ON
		16	KINGS POINT DR		S-2	
485	S	12000	LAKE SHORE DR NB OB @	CO	S-2A	ON
		1	MARQUETTE RD (SOUTH)		S-2	
486	S	12005	LAKE SHORE DR SB IB @	CO	S-2A	ON
		2	MARQUETTE RD (SOUTH)		S-2	
487	S	12010	LAKE SHORE DR NB OB @	CO	S-2A	ON
		3	HAYES DR		S-2	
488	S	12015	LAKE SHORE DR SB IB @	CO	S-2A	ON
		4	59TH ST (SOUTH)		S-2	
489	S	12020	LAKE SHORE DR NB OB @	CO	S-2A	ON
		5	59TH ST (SOUTH)		S-2	
490	S	12025	LAKE SHORE DR SB IB @	CO	S-2A	ON
		6	53RD ST (SOUTH)		S-2	
491	S	12030	LAKE SHORE DR NB OB @	CO	S-2A	ON
		7	48TH ST (SOUTH)		S-2	
492	S	12035	LAKE SHORE DR SB IB @	CO	S-2A	ON
		8	47TH ST (SOUTH)		S-2	
493	S	12040	LAKE SHORE DR NB OB @	CO	S-2A	ON
		9	47TH ST (SOUTH)		S-2	
494	S	12045	LAKE SHORE DR SB IB @	CO	S-2A	ON
		10	43RD ST (SOUTH)		S-2	
495	S	12050	LAKE SHORE DR NB OB @	CO	S-2A	ON
		11	OAKWOOD BLVD (SOUTH)		S-2	
496	S	12055	LAKE SHORE DR SB IB @	CO	S-2A	ON
		12	OAKWOOD BLVD (SOUTH)		S-2	
497	S	12060	LAKE SHORE DR NB OB @	CO	S-2A	ON
		13	OAKWOOD BLVD (NORTH)		S-2	
498	S	12065	LAKE SHORE DR SB IB @	CO	S-2A	ON

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		14	35TH ST (SOUTH)			S-2	
499	S	12070	LAKE SHORE DR NB OB @	CO		S-2A	ON
		15	31ST ST (SOUTH)			S-2	
500	S	12075	LAKE SHORE DR SB IB @	CO		S-2A	ON
		16	31ST ST (NORTH)			S-2	
501	S	12080	LAKE SHORE DR NB OB @	CO		S-2A	ON
		17	31ST ST (SOUTH OF)			S-2	
502	S	12085	LAKE SHORE DR SB IB @	CO		S-2A	ON
		18	31ST ST (NORTH OF)			S-2	
503	S	12090	LAKE SHORE DR NB OB @	CO		S-2A	ON
		19	25TH ST			S-2	
504	S	12095	LAKE SHORE DR SB IB @	CO		S-2A	ON
		20	23RD ST			S-2	
505	S	12100	LAKE SHORE DR NB OB @	CO		S-2A	ON
		21	23RD ST (NORTH)			S-2	
506	S	12105	LAKE SHORE DR NB OB @	CO		S-2K	ON
		MCD7	23RD ST (NORTH OF CAB 21)			S-2	
507	S	12106	LAKE SHORE DR SB IB @	CO		S-2A	ON
		22	18TH ST			S-2	
508	S	12107	LAKE SHORE DR NB OB @	CO		S-2A	ON
		21A	18TH ST			S-2	
509	S	12110	LAKE SHORE DR NB OB @	CO		S-2A	ON
		23	MCFETRIDGE DR (SOUTH)			S-2	
510	S	12115	LAKE SHORE DR SB IB @	CO		S-2A	ON
		24	BALBO AVE (SOUTH)			S-2	
511	S	12120	LAKE SHORE DR NB OB @	CO		S-2A	ON
		25	JACKSON BLVD			S-2	
512	S	13025	LAKE SHORE DR SB IB @	CO		S-2A	ON
		26	RANDOLPH ST			S-2	
513	S	13030	LAKE SHORE DR NB OB @	CO		S-2A	ON
		27	RANDOLPH ST			S-2	
514	S	13035	LAKE SHORE DR SB IB @	CO		S-2A	ON
		28	RANDOLPH ST			S-2	

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515	S	13040	LAKE SHORE DR NB OB @	CO	S-2A	ON
		29	RANDOLPH ST		S-2	
516	S	13045	LAKE SHORE DR SB IB @	CO	S-2A	ON
		30	WACKER DR		S-2	
517	S	13055	LAKE SHORE DR SB IB @	CO	S-2A	ON
		32	GRAND AVE		S-2	
518	S	13060	LAKE SHORE DR NB OB @	CO	S-2A	ON
		33	WACKER DR		S-2	
519	S	13065	LAKE SHORE DR SB IB @	CO	S-2A	ON
		34	ERIE ST		S-2	
520	S	13070	LAKE SHORE DR NB OB @	CO	S-2A	ON
		35	CHICAGO AVE (SOUTH)		S-2	
521	S	13075	LAKE SHORE DR SB IB @	CO	S-2A	ON
		36	CHICAGO AVE		S-2	
522	S	13080	LAKE SHORE DR NB OB @	CO	S-2A	ON
		37	CHICAGO AVE		S-2	
523	S	13085	LAKE SHORE DR SB IB @	CO	S-2A	ON
		38	CHESTNUT ST		S-2	
524	S	13090	LAKE SHORE DR NB OB @	CO	S-2A	ON
		39	CHESTNUT ST		S-2	
525	S	13095	LAKE SHORE DR SB IB @	CO	S-2A	ON
		40	MICHIGAN AVE		S-2	
526	S	13100	LAKE SHORE DR NB OB @	CO	S-2A	ON
		41	MICHIGAN AVE		S-2	
527	S	13105	LAKE SHORE DR SB IB @	CO	S-2A	ON
		42	MICHIGAN AVE		S-2	
528	S	13110	LAKE SHORE DR NB OB @	CO	S-2A	ON
		43	DIVISION ST		S-2	
529	S	13115	LAKE SHORE DR SB IB @	CO	S-2A	ON
		44	DIVISION ST		S-2	
530	S	13120	LAKE SHORE DR NB OB @	CO	S-2A	ON
		45	DIVISION ST		S-2	
531	S	13125	LAKE SHORE DR SB IB @	CO	S-2A	ON

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		46	NORTH AVE			S-2	
532	S	13130	LAKE SHORE DR NB OB @	CO		S-2A	ON
		47	NORTH AVE			S-2	
533	S	13135	LAKE SHORE DR SB IB @	CO		S-2A	ON
		48	NORTH AVE			S-2	
534	S	13140	LAKE SHORE DR NB OB @	CO		S-2A	ON
		49	NORTH AVE			S-2	
535	S	13145	LAKE SHORE DR SB IB @	CO		S-2A	ON
		50	NORTH AVE			S-2	
536	S	13150	LAKE SHORE DR NB OB @	CO		S-2A	ON
		51	ARMITAGE AVE			S-2	
537	S	13155	LAKE SHORE DR SB IB @	CO		S-2A	ON
		52	FULLERTON PARKWAY			S-2	
538	S	13160	LAKE SHORE DR NB OB @	CO		S-2A	ON
		53	FULLERTON PARKWAY			S-2	
539	S	13165	LAKE SHORE DR SB IB @	CO		S-2A	ON
		54	FULLERTON PARKWAY			S-2	
540	S	13170	LAKE SHORE DR NB OB @	CO		S-2A	ON
		55	DIVERSEY AVE			S-2	
541	S	13175	LAKE SHORE DR SB IB @	CO		S-2A	ON
		56	DIVERSEY AVE			S-2	
542	S	13180	LAKE SHORE DR NB OB @	CO		S-2A	ON
		57	BELMONT AVE			S-2	
543	S	13185	LAKE SHORE DR SB IB @	CO		S-2A	ON
		58	BELMONT AVE			S-2	
544	S	13190	LAKE SHORE DR NB OB @	CO		S-2A	ON
		59	BELMONT AVE			S-2	
545	S	13195	LAKE SHORE DR SB IB @	CO		S-2A	ON
		60	BELMONT AVE			S-2	
546	S	13200	LAKE SHORE DR NB OB @	CO		S-2A	ON
		61	BELMONT AVE			S-2	
547	S	13205	LAKE SHORE DR SB IB @	CO		S-2A	ON
		62	ADDISON ST			S-2	

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548	S	13210	LAKE SHORE DR NB OB @	CO	S-2A	ON
		63	ADDISON ST		S-2	
549	S	13215	LAKE SHORE DR SB IB @	CO	S-2A	ON
		64	IL 19 IRVING PARK RD		S-2	
550	S	13220	LAKE SHORE DR NB OB @	CO	S-2A	ON
		65	IL 19 IRVING PARK RD		S-2	
551	S	13225	LAKE SHORE DR SB IB @	CO	S-2A	ON
		66	IL 19 IRVING PARK RD		S-2	
552	S	13230	LAKE SHORE DR NB OB @	CO	S-2A	ON
		67	IL 19 IRVING PARK RD		S-2	
553	S	13235	LAKE SHORE DR SB IB @	CO	S-2A	ON
		68	MONTROSE AVE		S-2	
554	S	13240	LAKE SHORE DR NB OB @	CO	S-2A	ON
		69	MONTROSE AVE		S-2	
555	S	13245	LAKE SHORE DR SB IB @	CO	S-2A	ON
		70	WILSON AVE		S-2	
556	S	13250	LAKE SHORE DR NB OB @	CO	S-2A	ON
		71	WILSON AVE		S-2	
557	S	13255	LAKE SHORE DR SB IB @	CO	S-2A	ON
		72	WILSON AVE		S-2	
558	S	13260	LAKE SHORE DR NB OB @	CO	S-2A	ON
		73	LAWRENCE AVE		S-2	
559	S	13265	LAKE SHORE DR SB IB @	CO	S-2A	ON
		74	LAWRENCE AVE		S-2	
560	S	13270	LAKE SHORE DR NB OB @	CO	S-2A	ON
		75	LAWRENCE AVE		S-2	
561	S	13275	LAKE SHORE DR SB IB @	CO	S-2A	ON
		76	FOSTER AVE		S-2	
562	S	13280	LAKE SHORE DR NB OB @	CO	S-2A	ON
		77	FOSTER AVE		S-2	
563	S	13285	LAKE SHORE DR SB IB @	CO	S-2A	ON
		78	FOSTER AVE		S-2	
564	S	13290	LAKE SHORE DR NB OB @	CO	S-2A	ON

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		79	BRYN MAWR AVE			S-2	
565	S	13295	LAKE SHORE DR SB IB @	CO		S-2A	ON
		80	BRYN MAWR AVE			S-2	
566	S	13297	LAKE SHORE DR NB OB @	CO		S-2A	ON
		81	BRYN MAWR AVE			S-2	
567	S	15000	I 80 EB @	CO		S-2A	ON
		2	I 294 TLWY			S-2	
568	S	15005	I 80 EB @	CO		S-2A	ON
		4E	KEDZIE AVE			S-2	
569	S	15010	I 80 WB @	CO		S-2A	ON
		1	KEDZIE AVE (0.5 MILE WEST)			S-2	
570	S	15015	I 80 EB @	CO		S-2A	ON
		6E	CRAWFORD AVE			S-2	
571	S	15020	I 80 EB @	CO		S-2A	ON
		8E	IL 50 CICERO AVE (0.5 MILE EAST			S-2	
572	S	15025	I 80 EB @	CO		S-2A	ON
		10	IL 50 CICERO AVE			S-2	
573	S	15030	I 80 WB @	CO		S-2A	ON
		3	I 57 (EAST)			S-2	
574	S	15035	I 80 WB @	CO		S-2A	ON
		5	I 57 (WEST)			S-2	
575	S	15040	I 80 WB @	CO		S-2A	ON
		7	CENTRAL AVE			S-2	
576	S	15045	I 80 EB @	CO		S-2A	ON
		12	183RD ST			S-2	
577	S	15050	I 80 EB @	CO		S-2A	ON
		14	RIDGELAND AVE			S-2	
578	S	15055	I 80 WB @	CO		S-2A	ON
		9	OAK PARK AVE			S-2	
579	S	15060	I 80 EB @	CO		S-2A	ON
		16	IL 43 HARLEM AVE (EAST)			S-2	
580	S	15065	I 80 EB @	WI		S-2A	ON
		18	IL 43 HARLEM AVE (WEST)			S-2	

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581	S	15067	I 80 WB @	CO	S-2K	ON
		MCD13	HARLEM AVE		S-2	
582	S	15070	I 80 WB @	WI	S-2A	ON
		11	76TH ST		S-2	
583	S	15075	I 80 EB @	WI	S-2A	ON
		20	80TH AVE		S-2	
584	S	15080	I 80 WB @	WI	S-2A	ON
		13	187TH ST		S-2	
585	S	15085	I 80 WB @	WI	S-2A	ON
		15	METRA RR BRIDGE (EAST)		S-2	
586	S	15090	I 80 WB @	WI	S-2A	ON
		17	METRA RR BRIDGE (WEST)		S-2	
587	S	15095	I 80 EB @	WI	S-2A	ON
		22	US 45 LAGRANGE RD (EAST)		S-2	
588	S	15100	I 80 EB @	WI	S-2A	ON
		24	US 45 LAGRANGE RD (WEST)		S-2	
589	S	15105	I 80 EB @	WI	S-2C	ON
		25	LAGRANGE RD (0.5 MILE WEST)		S-2	
590	S	15110	I 80 EB @	WI	S-2C	ON
		27	LAGRANGE RD (1.0 MILE WEST)		S-2	
591	S	15115	I 80 EB @	WI	S-2C	ON
		29	WOLF RD (0.5 MILE EAST)		S-2	
592	S	15120	I 80 EB @	WI	S-2C	ON
		31	WOLF RD (WEST)		S-2	
593	S	15125	I 80 EB @	WI	S-2C	ON
		33	WOLF RD (0.5 MILE WEST)		S-2	
594	S	15130	I 80 EB @	WI	S-2C	ON
		35	MAPLE (0.5 MILE EAST)		S-2	
595	S	15135	I 80 EB @	WI	S-2C	ON
		37	MAPLE RD		S-2	
596	S	15140	I 80 EB @	WI	S-2C	ON
		39	NORFOLK SOUTHERN RR		S-2	
597	S	15145	I 80 EB @	WI	S-2C	ON

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		41	PARKER RD (EAST)			S-2	
598	S	15150	I 80 EB @	WI		S-2C	ON
		43	PARKER RD (0.5 MILE WEST)			S-2	
599	S	15155	I 80 EB @	WI		S-2C	ON
		45	I 355 EAST			S-2	
600	S	15160	I 80 EB @	WI		S-2C	ON
		47	I 355			S-2	
601	S	15165	I 80 EB @	WI		S-2C	ON
		49	I 355 WEST (CEDAR RD)			S-2	
602	S	15170	I 80 EB @	WI		S-2C	ON
		51	I 355 (0.5 MILE WEST)			S-2	
603	S	15175	I 80 EB @	WI		S-2C	ON
		53	FRANCIS RD (0.5 MILE EAST)			S-2	
604	S	15180	I 80 EB @	WI		S-2C	ON
		55	FRANCIS RD			S-2	
605	S	15185	I 80 EB @	WI		S-2D	ON
		57	US 30 (0.25 MILE EAST)			S-2	
606	S	15205	I 80 EB @	WI		S-2D	ON
		61	BRIGGS (1.0 MILE EAST)			S-2	
607	S	15215	I 80 EB @	WI		S-2D	ON
			BRIGGS (EAST)			S-2	
608	S	15235	I 80 EB @	WI		S-2D	ON
		67	RICHARDS ST (WEST)			S-2	
609	S	15245	I 80 EB @	WI		S-2D	ON
		69	MEADOW CENTER ST EXIT WB			S-2	
610	S	15255	I 80 EB @	WI		S-2E	ON
		71	LARKIN (0.5 MILE EAST)			S-2	
611	S	15265	I 80 EB @	WI		S-2D	ON
		73	LARKIN (0.5 MILE WEST)			S-2	
612	S	15275	I 80 EB @	WI		S-2E	ON
		75	HOUBOLT (0.5 MILE EAST)			S-2	
613	S	15285	I 80 EB @	WI		S-2D	ON
		77	HOUBOLT EXIT EB			S-2	

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614	S	15295	I 80 EB @	WI	S-2D	ON
		79	I 55 (EAST)		S-2	
615	S	15305	I 80 EB @	WI	S-2E	ON
		81	RIVER RD		S-2	
616	S	15315	I 80 EB @	WI	S-2D	ON
		83	I 55 (1.0 MILE WEST)		S-2	
617	S	15325	I 80 EB @	WI	S-2D	ON
		85	SHEPLEY RD (0.25 MILE EAST)		S-2	
618	S	16000	IL 394 SB OB @	CO	S-2B	ON
		11	I 80 94 SW QUAD IL 39		S-2	
619	S	16005	IL 394 NB IB @	CO	S-2B	ON
		14	I 80 94 SE QUAD IL 39		S-2	
620	S	16010	IL 394 NB IB @	CO	S-2B	ON
		16	THORTON LANSING RD (SOUTH)		S-2	
621	S	16020	IL 394 NB IB @	CO	S-2F	ON
		18	186TH ST		S-2	
622	S	20000	US 12 IL 59 @	LA	S-2I	ON
		1040	IL 134 LONG LAKE BIG HOLLOW RD		S-2	
623	S	20005	IL 59 SUTTON RD @	CO	S-2I	ON
		1050	US 20 LAKE ST		S-2	
624	S	20010	I 90 94 KENN @	CO	S-2I	ON
		1121	51ST ST		S-2	
625	S	20015	I 90 94 KENN @	CO	S-2I	ON
		1125	51ST ST		S-2	
626	S	20020	US 6 159TH ST @	CO	S-2I	ON
		1170	PULASKI RD CRAWFORD AVE		S-2	
627	S	20025	IL 53 @	DU	S-2I	ON
		1310	75TH		S-2	
628	S	20030	IL 64 NORTH AVE @	DU	S-2I	ON
		1320	IL 59 SUTTON RD		S-2	
629	S	20035	IL 31 IL 56 LINCOLNWAY ST @	KA	S-2I	ON
		1420	IL 56 STATE ST		S-2	
630	S	20040	US 45 @	LA	S-2I	ON

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		1500	IL 176			S-2	
631	S	20045	IL 22 HALF DAY RD @	LA		S-2I	ON
		1520	IL 83			S-2	
632	S	20050	IL 31 @	MC		S-2I	ON
		1610	US 14 NORTHWEST HWY			S-2	
633	S	20055	US 45 LAGRANGE RD @	WI		S-2I	ON
		1730	US 30 LINCOLN HWY			S-2	
634	S	20060	IL 38 ROOSEVELT RD @	DU		S-2I	ON
		1330	FINLEY RD (WEST)			S-2	
635	S	20065	IL 131 GREEN BAY RD @	LA		S-2I	ON
		1530	20TH ST (SOUTH)			S-2	
636	S	20070	IL 43 HARLEM AVE @	CO		S-2I	ON
		1280	TECHNY RD			S-2	
637	S	20075	IL 68 DUNDEE RD @	CO		S-2I	ON
		1290	PORTWINE RD			S-2	
638	S	20080	PEPLOW RD @	KA		S-2I	ON
		1430	RAMM RD (NORTH)			S-2	
639	S	20085	IL 58 GOLF RD @	CO		S-2I	ON
		1260	BIRCH AVE			S-2	
640	S	20090	IL 50 CICERO AVE @	CO		S-2I	ON
		1200	99TH ST (SOUTH)			S-2	
641	S	20095	IL 83 KINGERY HWY @	DU		S-2I	ON
		1340	55TH ST (NORTH)			S-2	
642	S	20100	IL 59 @	LA		S-2I	ON
		1540	HILLCREST DR (SOUTH)			S-2	
643	S	20105	INDEPENDENCE RD @	WI		S-2I	ON
		1740	TAYLOR ST (NORTH)			S-2	
644	S	20110	IL 7 SOUTHWEST HWY @	CO		S-2I	ON
		1190	131ST ST			S-2	
645	S	20115	US 14 NORTHWEST HWY @	CO		S-2I	ON
		1270	CHATHAM PL (WEST)			S-2	
646	S	20120	DEVON AVE @	CO		S-2I	ON
		1230	ARLINGTON HEIGHTS RD (EAST)			S-2	

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647	S	20125	WOOD DALE AVE @	DU	S-21	ON
		1350	MARK ST (SOUTH)	WOOD DALE	S-2	
648	S	20130	GALLIGAN RD @	KA	S-21	ON
		1440	FREEMAN RD (SOUTH)		S-2	
649	S	20135	WILSON AVE @	LA	S-21	ON
		1550	MARSHALL BLVD (NORTH)		S-2	
650	S	20140	IL 176 PARK AVE @	LA	S-21	ON
		1560	BLUE SPRUCE LN (EAST)		S-2	
651	S	20145	IL 126 PLAINFIELD RD @	WI	S-21	ON
		1750	143RD ST (NORTH)		S-2	
652	S	20150	US 14 @	MC	S-21	ON
		1620	DEEP CUT RD (SE)		S-2	
653	S	20155	CAMPTON HILLS RD @	KA	S-21	ON
		1450	LYNN DR (EAST)		S-2	
654	S	20160	KEDZIE AVE @	CO	S-21	ON
		1250	TOUHY AVE (SOUTH)		S-2	
655	S	20165	IL 72 HIGGINS @	CO	S-21	ON
		1240	I 294 TLWY (EAST)		S-2	
656	S	20170	LAKE ST @	LA	S-21	ON
		1570	WEST ST (WEST)		S-2	
657	S	20175	7TH ST @	WI	S-21	ON
		1760	PEPPERMILL RD (WEST)		S-2	
658	S	20180	MANHATTEN RD @	WI	S-21	ON
		1770	ELWOOD (1.0 MILE NORTH)		S-2	
659	S	20185	I 57 @	WI	S-21	ON
		1780	KENNEDY RD (EAST)		S-2	
660	S	20190	PEOTONE BEECHER RD @	WI	S-21	ON
		1790	KEDZIE AVE (WEST)		S-2	
661	S	20195	I 80 @	WI	S-21	ON
		1850	SHEPLEY RD HOLT RD (NORTH)		S-2	
662	S	20196	I 80 @	WI	S-21	ON
		1840	CHERRY HILL RD		S-2	
663	S	20200	I 55 @	WI	S-21	ON

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		1860	IL 113 (SOUTH)			S-2	
664	S	20205	IL 83 147TH ST SIBLEY BLVD @	CO		S-2I	ON
		1180	MINERVA AVE (WEST)			S-2	
665	S	20210	COSSITT AVE @	CO		S-2I	ON
		1210	SUNSET AVE (EAST)			S-2	
666	S	20215	US 12 45 MANNHEIM RD @	CO		S-2I	ON
		1220	ROADWAY SHIPPING TERMINAL ENT			S-2	
667	S	20220	IL 59 @	DU		S-2I	ON
		1995	75TH ST (SOUTH)			S-2	
668	S	22450	I 190 @	CO		S-2K	ON
		S2K	MANNHEIM RD SB			S-2	
669	S	23100	I 55 @	WI		S-2J	ON
		NA	IL 129			S-2	
670	S	23200	I 57 @	WI		S-2J	ON
		NA	US 30 (NORTH)			S-2	
671	S	23300	I 57 @	WI		S-2J	ON
		NA	PEOTONE WILMINGTON EXIT			S-2	

PLANNED S-2 LOCATIONS

1	S	1305	I 55 STEV SW OB @	CO		S-2A	OFF
		S51	I 294			S-2	
2	S	1310	I 55 STEV NE IB @	CO		S-2A	OFF
		S56	109TH ST			S-2	
3	S	1480	I 55 SW OB @	WI		S-2G	OFF
		79	WEBER RD EXIT			S-2	
4	S	1485	I 55 SW OB @	WI		S-2G	OFF
		81	WEBER RD NORTH (AIS)			S-2	
5	S	1490	I 55 SW OB @	WI		S-2G	OFF
		83	WEBER RD (SOUTH)			S-2	
6	S	1645	I 55 SW OB @	WI		S-2B	OFF
		127	I 80 (0.5 MILE SOUTH)			S-2	
7	S	1650	I 55 SW OB @	WI		S-2B	OFF
		129	I 80 (1.0 MILE SOUTH)			S-2	

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8	S	1655	I 55 SW OB @	WI	S-2B	OFF
		131	CANAL RD		S-2	
9	S	1660	I 55 SW OB @	WI	S-2B	OFF
		133	US 6 (NORTH)		S-2	
10	S	1670	I 55 SW OB @	WI	S-2B	OFF
		137	AMOCO RD		S-2	
11	S	1675	I 55 SW OB @	WI	S-2B	OFF
		139	BLUFF RD (1.0 MILE NORTH)		S-2	
12	S	1680	I 55 SW OB @	WI	S-2B	OFF
		141	BLUFF RD (0.5 MILE NORTH)		S-2	
13	S	1685	I 55 SW OB @	WI	S-2B	OFF
		143	BLUFF RD (NORTH)		S-2	
14	S	1690	I 55 SW OB @	WI	S-2B	OFF
		145	BLUFF RD (NORTH)		S-2	
15	S	1695	I 55 SW OB @	WI	S-2B	OFF
		147	DESPLAINES RIVER (NORTH)		S-2	
16	S	1700	I 55 SW OB @	WI	S-2B	OFF
		149	ARSENAL RD (NORTH OF)		S-2	
17	S	1705	I 55 SW OB @	WI	S-2B	OFF
		151	ARSENAL RD		S-2	
18	S	1710	I 55 SW OB @	WI	S-2B	OFF
		153	ARSENAL RD (SOUTH OF)		S-2	
19	S	1715	I 55 SW OB @	WI	S-2B	OFF
		155	ARSENAL RD (0.5 MILE SOUTH OF)		S-2	
20	S	1720	I 55 NE IB @	WI	S-2B	OFF
		112A	ARSENAL RD (1.0 MILE SOUTH OF)		S-2	
21	S	1723	I 55 NE IB @	WI	S-2B	OFF
		112	BLODGETT RD (0.25 MILE EAST)		S-2	
22	S	1725	I 55 SW OB @	WI	S-2G	OFF
		159	BLODGETT RD (0.5 MILE WEST)		S-2	
23	S	1730	I 55 SW OB @	WI	S-2G	OFF
		161	RIVER RD (1.0 MILE EAST)		S-2	
24	S	1735	I 55 SW OB @	WI	S-2G	OFF

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		163	RIVER RD (0.5 MILE EAST)			S-2	
25	S	2115	I 57 SB OB @	CO		S-2A	OFF
		I23	IL 83 SIBLEY (0.5 MILE SOUTH)			S-2	
26	S	2120	I 57 SB OB @	CO		S-2A	OFF
		J25	IL 83 147TH ST SIBLEY BLVD			S-2	
27	S	2125	I 57 NB IB @	CO		S-2A	OFF
		J28	IL 83 147TH ST SIBLEY BLVD			S-2	
28	S	2135	I 57 NB IB @	CO		S-2A	OFF
		J32	I 294 TLWY			S-2	
29	S	2140	I 57 SB OB @	CO		S-2A	OFF
		K27	KEDZIE AVE (NORTH)			S-2	
30	S	3067	I 90 KENN SE IB @	CO		S-2A	OFF
		MCD6	EAST RIVER RD			S-2	
31	S	3090	I 90 KENN NW OB @	CO		S-2A	OFF
		F111	CANFIELD AVE			S-2	
32	S	3235	I 90 94 KENN NW OB @	CO		S-2A	OFF
		81	MONTROSE AVE			S-2	
33	S	3238	I 90 94 KENN SE IB @	CO		S-2A	OFF
		92A	MONTROSE AVE			S-2	
34	S	3520	I 90 94 KENN SE IB @	CO		S-2A	OFF
		S36	GREEN ST			S-2	
35	S	3530	I 90 94 KENN SE IB @	CO		S-2A	OFF
		Y30	LAKE ST			S-2	
36	S	3540	I 90 94 KENN SE IB @	CO		S-2A	OFF
		Y26	RANDOLPH ST			S-2	
37	S	3558	I 90 94 KENN SE IB @	CO		S-2A	OFF
		Y22S	WASHINGTON BLVD			S-2	
38	S	3560	I 90 94 KENN SE IB @	CO		S-2A	OFF
		Y22	WASHINGTON BLVD			S-2	
39	S	3580	I 90 94 KENN SE IB @	CO		S-2A	OFF
		Y18	MADISON AVE			S-2	
40	S	3610	I 90 94 KENN SE IB @	CO		S-2A	OFF
		Z12	MONROE ST			S-2	

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41	S	3615	I 90 94 KENN SE IB @	CO	S-2A	OFF
		Z14	MONROE ST		S-2	
42	S	3620	I 90 94 KENN SE IB @	CO	S-2A	OFF
		Z8	ADAMS ST		S-2	
43	S	3630	I 90 94 KENN NW OB @	CO	S-2A	OFF
		Z11	ADAMS ST		S-2	
44	S	3640	I 90 94 KENN NW OB @	CO	S-2A	OFF
		Z1	CIRCLE INT IKE IB @ HALSTED		S-2	
45	S	3655	I 90 94 KENN SE IB @	CO	S-2A	OFF
		Z4	I 290 CIRCLE INTERCHANGE		S-2	
46	S	3660	I 90 94 KENN NW OB @	CO	S-2A	OFF
		Z5	I 290 CIRCLE INTERCHANGE		S-2	
47	S	3665	I 90 94 KENN IB VAN B @	CO	S-2A	OFF
		Z6	I 290 CIRCLE INTERCHANGE		S-2	
48	S	3670	I 90 94 KENN NW OB @	CO	S-2A	OFF
		Z7	I 290 CIRCLE INTERCHANGE		S-2	
49	S	3675	I 90 94 KENN NW OB @	CO	S-2K	OFF
		MCD5	I 290 CIRCLE INTERCHANGE		S-2	
50	S	5380	I 90 94 RYAN SB OB @	CO	S-2A	OFF
		A11	16TH ST & UNION AVE		S-2	
51	S	5393	I 90 94 RYAN NB IB @	CO	S-2A	OFF
		C6A	TAYLOR		S-2	
52	S	5395	I 90 94 RYAN NB IB @	CO	S-2A	OFF
		C8	ROOSEVELT RD		S-2	
53	S	5400	I 90 94 RYAN SB OB @	CO	S-2A	OFF
		C3	TAYLOR		S-2	
54	S	5410	I 90 94 RYAN SB OB @	CO	S-2A	OFF
		D1	POLK ST		S-2	
55	S	9015	I 290 EB IB @	CO	S-2A	OFF
		V76	I 294 TLWY		S-2	
56	S	9020	I 290 WB OB @	CO	S-2A	OFF
		V81	I 294 TLWY		S-2	
57	S	9025	I 290 EB IB @	CO	S-2A	OFF

		W78	MAPLE AVE			S-2	
58	S	9050	I 290 EB IB @	DU		S-2A	OFF
		X84	CN RR C & NW RR			S-2	
59	S	9150	I 290 WB OB @	DU		S-2A	OFF
		E107	WOOD DALE RD (WEST)			S-2	
60	S	13050	LAKE SHORE DR NB OB @	CO		S-2A	OFF
		31	ILLINOIS EXIT			S-2	
61	S	22015	I 290 @	DU		S-2I	OFF
		1140	IL 83 KINGERY HWY			S-2	

SURVEILLANCE SYSTEM - EQUIPMENT PAY CODE S-3 LOCATIONS

1	S	1007	I 55 STEV OB @	CO		S-3F	ON
		DMS7	MARTIN LUTHER KING DR			S-3	
2	S	1112	I 55 STEV MEDIAN @	CO		S-3F	ON
		DMS5	KEDZIE AVE (WEST)			S-3	
3	S	1262	I 55 STEV IB @	CO		S-3A	ON
		DMS23	1ST AVE (WEST)			S-3	
4	S	1282	US 12 20 45 LAGRANGE NB @	CO		S-3J	ON
		DMS104	87TH ST			S-3	
5	S	1283	US 12 20 45 LAGRANGE SB @	CO		S-3J	ON
		DMS105	I 55 NE			S-3	
6	S	1332	I 55 STEV IB @	DU		S-3A	ON
		DMS24	COUNTY LINE RD (WEST)			S-3	
7	S	1570	I 55 NE @	WI		S-3C	ON
		DMS34	CATON FARM			S-3	
8	S	1605	I 55 NE @	WI		S-3C	ON
		DMS33	US 6			S-3	
9	S	2052	I 57 SB OB @	CO		S-3E	ON
		DMS29	119TH ST			S-3	
10	S	2177	I 57 NB IB @	CO		S-3K	ON
		DMS44	163RD ST			S-3	
11	S	2265	I 57 NB IB @	CO		S-3E	ON
		DMS28	I 80 183RD ST (SOUTH)			S-3	

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12	S	3096	I 90 KENN IB @	CO	S-3A	ON
		DMS19	CANFIELD AVE		S-3	
13	S	3176	I 90 KENN IB @	CO	S-3F	ON
		DMS18	FOSTER AVE		S-3	
14	S	3281	I 90 94 KENN IB @	CO	S-3F	ON
		DMS17	PULASKI RD		S-3	
15	S	3331	I 90 94 KENN IB @	CO	S-3A	ON
		DMS16	KIMBALL AVE		S-3	
16	S	3416	I 90 94 KENN IB @	CO	S-3A	ON
		DMS14	WEBSTER		S-3	
17	S	3417	I 90 94 KENN OB @	CO	S-3F	ON
		DMS15	DAMEN AVE		S-3	
18	S	3482	I 90 94 KENN IB @	CO	S-3F	ON
		DMS13	AUGUSTA BLVD		S-3	
19	S	4072	TOUHY AVE WB OB @	CO	S-3H	ON
		DMS106	I 94 EDENS		S-3	
20	S	4073	TOUHY AVE EB IB @	CO	S-3H	ON
		DMS107	I 94 EDENS		S-3	
21	S	4086	I 94 EDENS IB @	CO	S-3A	ON
		DMS21	NILES CENTER RD		S-3	
22	S	4206	I 94 EDENS IB @	CO	S-3A	ON
		DMS22	TOWER RD		S-3	
23	S	5052	I 94 RYAN SB @	CO	S-3B	ON
		DMS30	83RD ST		S-3	
24	S	5053	I 94 RYAN NB @	CO	S-3B	ON
		DMS2	83RD ST		S-3	
25	S	5186	I 90 94 RYAN NB @	CO	S-3B	ON
		DMS3L	57TH ST LOCALS		S-3	
26	S	5188	I 90 94 RYAN NB @	CO	S-3B	ON
		DMS3E	57TH ST		S-3	
27	S	5196	I 90 94 RYAN SB @	CO	S-3B	ON
		DMS31L	55TH ST LOCALS		S-3	
28	S	5197	I 90 94 RYAN SB @	CO	S-3B	ON

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		DMS31E	55TH ST			S-3	
29	S	5292	I 90 94 RYAN SB @	CO		S-3B	ON
		DMS32L	39TH ST LOCALS			S-3	
30	S	5293	I 90 94 RYAN SB @	CO		S-3B	ON
		DMS32E	39TH ST			S-3	
31	S	5296	I 90 94 RYAN NB @	CO		S-3B	ON
		DMS4L	37TH ST LOCALS			S-3	
32	S	5298	I 90 94 RYAN NB @	CO		S-3B	ON
		DMS4E	37TH ST			S-3	
33	S	5377	I 90 94 RYAN @	CO		S-3B	ON
		DMS8	S BRANCH OF CHICAGO RIVER			S-3	
34	S	6103	I 94 FORD IB @	CO		S-3B	ON
		DMS26	145TH ST			S-3	
35	S	6104	I 94 FORD OB @	CO		S-3D	ON
		DMS25	145TH ST			S-3	
36	S	6177	I 94 FORD SB @	CO		S-3B	ON
		DMS20	119TH ST			S-3	
37	S	6178	I 94 FORD NB @	CO		S-3B	ON
		DMS06	124TH ST			S-3	
38	S	7001	I 80 WB @	CO		S-3C	ON
		DMS1	STATE LINE			S-3	
39	S	8002	I 290 IKE IB @	CO		S-3F	ON
		DMS12	OLD POST OFFICE (EAST)			S-3	
40	S	8072	I 290 IKE IB @	CO		S-3F	ON
		DMS11	DAMEN AVE			S-3	
41	S	9132	IL 83 KINGERY NB @	DU		S-3J	ON
		DMS102	I 290			S-3	
42	S	9133	IL 83 KINGERY SB @	DU		S-3J	ON
		DMS103	I 290			S-3	
43	S	9167	I 290 @	DU		S-3K	ON
		DMS43	MILL RD			S-3	
44	S	9252	I 290 IB @	DU		S-3E	ON
		DMS35	BIESTERFIELD RD (NORTH)			S-3	

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45	S	10029	I 290 IL 53 EXIT @	CO	S-3E	ON
		DMS36	INDUSTRIAL AVE		S-3	
46	S	11017	I 290 @	DU	S-3K	ON
		DMS42	ARMY TRAIL RD		S-3	
47	S	15107	I 80 EB @	WI	S-3F	ON
		DMS39	US 45 LAGRANGE RD (WEST)		S-3	
48	S	15121	I 80 WB @	WI	S-3F	ON
		DMS40	WOLF RD (WEST)		S-3	
49	S	15210	I 80 EB @	WI	S-3F	ON
		DMS41	CHERRY HILL RD (WEST)		S-3	
50	S	16015	IL 394 NB @	CO	S-3D	ON
		DMS27	186TH ST		S-3	
51	S	22050	GRAND AVE EB IB @	CO	S-3H	ON
		DMS101	77TH AVE		S-3	
52	S	22100	US 41 SKOKIE HWY OB @	LA	S-3J	ON
		DMS111	WEST PARK AVE (SOUTH)		S-3	
53	S	22150	STONY ISLAND AVE SB OB @	CO	S-3J	ON
		DMS108	98TH PL		S-3	
54	S	22200	US 6 159TH ST EB IB @	CO	S-3J	ON
		DMS109	CRAWFORD AVE (WEST)		S-3	
55	S	22250	US 6 159TH ST WB OB @	CO	S-3H	ON
		DMS110	DIXIE HWY (WEST)		S-3	
56	S	22300	US 41 SKOKIE HWY OB @	LA	S-3I	ON
		DMS112	IL 22 HALF DAY RD (SOUTH)		S-3	
57	S	22350	US 45 MANNHEIM RD NB @	CO	S-3H	ON
		DMS113	I 290 IKE (SOUTH)		S-3	
58	S	22400	US 45 MANNHEIM RD SB @	CO	S-3H	ON
		DMS114	I 290 IKE (NORTH)		S-3	
59	S	22455	US 12 45 MANNHEIM RD NB @	CO	S-3K	ON
		DMS115	LAWRENCE AVE (SOUTH OF)		S-3	

PLANNED S-3 LOCATIONS

1	S	5406	I 90 94 RYAN @	CO	S-3F	OFF
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		DMS9	TAYLOR ST			S-3
2	S	5407	I 90 94 RYAN MEDIAN @	CO		S-3F OFF
		DMS10	TAYLOR ST			S-3

SURVEILLANCE SYSTEM - EQUIPMENT PAY CODE S-4 LOCATIONS

1	S	A	BLDG A REVLAC @ I 90 94 KENN 950 W ONTARIO	CO		S-4 ON
2	S	C	BLDG C REVLAC @ I 90 94 KENN 2735 GEORGE ST	CO		S-4 ON
3	S	D	BLDG D REVLAC @ I 90 94 KENN 3002 N FRANCISCO	CO		S-4 ON
4	S	E	BLDG E REVLAC @ I 90 94 KENN 4755 WILSON	CO		S-4 ON
5	S	IE01	I 94 EDENS IB GATE IE01 @ 5 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
6	S	IE02	I 94 EDENS IB GATE IE02 @ 9 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
7	S	IE03	I 94 EDENS IB GATE IE03 @ 12 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
8	S	IE04	I 94 EDENS IB GATE IE04 @ 16 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
9	S	IE05	I 94 EDENS IB GATE IE05 @ 17 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
10	S	IE06	I 94 EDENS IB GATE IE06 @ 17 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
11	S	IE07	I 94 EDENS IB GATE IE07 @ 17 FT LAWRENCE AVE (SOUTH OF)	CO		S-4G ON S-4
12	S	IE08	I 94 EDENS IB GATE IE08 @ 17 FT WILSON AVE (NORTH OF)	CO		S-4G ON S-4
13	S	IE09	I 94 EDENS IB GATE IE09 @ 17 FT WILSON AVE (NORTH OF)	CO		S-4G ON S-4
14	S	IE10	I 94 EDENS IB GATE IE10 @ 10 FT WILSON AVE (NORTH OF)	CO		S-4G ON S-4

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15	S	IE11	I 94 EDENS IB GATE IE11 @ 9 FT WILSON AVE (NORTH OF)	CO	S-4G S-4	ON
16	S	IE12	I 94 EDENS IB GATE IE12 @ 22 FT WILSON AVE (SOUTH OF)	CO	S-4G S-4	ON
17	S	IE13	I 94 EDENS IB GATE IE13 @ 16 FT WILSON AVE (SOUTH OF)	CO	S-4G S-4	ON
18	S	IE14	I 94 EDENS IB GATE IE14 @ 8 FT WILSON AVE (SOUTH OF)	CO	S-4G S-4	ON
19	S	IE15	I 94 EDENS IB GATE IE15 @ 5 FT WILSON AVE (SOUTH OF)	CO	S-4G S-4	ON
20	S	IEAS1	I 94 EDENS IB AUX SIGN IEAS1 @ LAWRENCE AVE (NORTH OF)	CO	S-4A S-4	ON
21	S	IEAS2	I 94 EDENS IB AUX SIGN IEAS2 @ LAWRENCE AVE (SOUTH OF)	CO	S-4A S-4	ON
22	S	IEB1	I 94 EDENS IB BARRIER IEB1 @ 28 FT WILSON AVE (NORTH OF)	CO	S-4B S-4	ON
23	S	IECC1	I 94 EDENS IB OPS CAM IECC1 @ LAWRENCE AVE (SOUTH OF)	CO	S-4C S-4	ON
24	S	IECC2	I 94 EDENS IB OPS CAM IECC2 @ LAWRENCE AVE (SOUTH OF)	CO	S-4C S-4	ON
25	S	IECC3	I 94 EDENS IB OPS CAM IECC3 @ LAWRENCE AVE (SOUTH OF)	CO	S-4C S-4	ON
26	S	IECC4	I 94 EDENS IB OPS CAM IECC4 @ LAWRENCE AVE (SOUTH OF)	CO	S-4C S-4	ON
27	S	IECC5	I 94 EDENS IB OPS CAM IECC5 @ WILSON AVE (SOUTH OF)	CO	S-4C S-4	ON
28	S	IECC6	I 94 EDENS IB OPS CAM IECC6 @ WILSON AVE (SOUTH OF)	CO	S-4C S-4	ON
29	S	IECC7	I 94 EDENS OPS CAM INCL @ LAWRENCE AVE	CO	S-4C S-4C	ON
30	S	IECC9	I 94 EDENS OPS CAM INCL @ FOSTER AVE	CO	S-4C S-4C	ON
31	S	IECM12	I 94 EDENS IB MESSAGE SIGN @	CO	S-4M	ON

			LAWRENCE AVE (SOUTH OF)		S-4	
32	S	IECM13	I 94 EDENS IB MESSAGE SIGN @ FOSTER AVE	CO	S-4M	ON
33	S	IEG1	I 94 EDENS IB GORE SIGN IEG1 @ WILSON AVE (NORTH OF)	CO	S-4S	ON
34	S	IER1	I 94 EDENS IB PANEL IER1 @ FOSTER AVE	CO	S-4P	ON
35	S	IER2	I 94 EDENS IB PANEL IER2 @ WILSON AVE (NORTH OF)	CO	S-4P	ON
36	S	IER3	I 94 EDENS IB PANEL IER3 @ LAWRENCE AVE (SOUTH OF)	CO	S-4P	ON
37	S	IEV1	I 94 EDENS IB CHEVRON IEV1 @ LAWRENCE AVE (SOUTH OF)	CO	S-4V	ON
38	S	IEV2	I 94 EDENS IB CHEVRON IEV2 @ LAWRENCE AVE (SOUTH OF)	CO	S-4V	ON
39	S	IEV3	I 94 EDENS IB CHEVRON IEV3 @ LAWRENCE AVE (SOUTH OF)	CO	S-4V	ON
40	S	IEX1	I 94 EDENS IB X SIGN IEX1 @ WILSON AVE (SOUTH OF)	CO	S-4X	ON
41	S	IS01	I 90 94 KENN IB GATE IS01 @ 12 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON
42	S	IS02	I 90 94 KENN IB GATE IS02 @ 15 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON
43	S	IS03	I 90 94 KENN IB GATE IS03 @ 18 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON
44	S	IS04	I 90 94 KENN IB GATE IS04 @ 21 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON
45	S	IS05	I 90 94 KENN IB GATE IS05 @ 23 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON
46	S	IS06	I 90 94 KENN IB GATE IS06 @ 23 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON
47	S	IS07	I 90 94 KENN IB GATE IS07 @ 23 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G	ON

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48	S	IS08	I 90 94 KENN IB GATE IS08 @ 23 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G S-4	ON
49	S	IS09	I 90 94 KENN IB GATE IS09 @ 23 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G S-4	ON
50	S	IS10	I 90 94 KENN IB GATE IS10 @ 14 FT SACRAMENTO AVE (NORTH OF)	CO	S-4G S-4	ON
51	S	IS11	I 90 94 KENN IB GATE IS11 @ 14 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
52	S	IS12	I 90 94 KENN IB GATE IS12 @ 23 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
53	S	IS13	I 90 94 KENN IB GATE IS13 @ 23 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
54	S	IS14	I 90 94 KENN IB GATE IS14 @ 23 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
55	S	IS15	I 90 94 KENN IB GATE IS15 @ 23 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
56	S	IS16	I 90 94 KENN IB GATE IS16 @ 23 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
57	S	IS17	I 90 94 KENN IB GATE IS17 @ 23 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
58	S	IS18	I 90 94 KENN IB GATE IS18 @ 22 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
59	S	IS19	I 90 94 KENN IB GATE IS19 @ 21 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
60	S	IS20	I 90 94 KENN IB GATE IS20 @ 18 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
61	S	IS21	I 90 94 KENN IB GATE IS21 @ 16 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
62	S	IS22	I 90 94 KENN IB GATE IS22 @ 14 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
63	S	IS23	I 90 94 KENN IB GATE IS23 @ 12 FT KEDZIE AVE (SOUTH OF)	CO	S-4G S-4	ON
64	S	IS24	I 90 94 KENN IB GATE IS24 @	CO	S-4G	ON

		10 FT	KEDZIE AVE (SOUTH OF)			S-4	
65	S	ISAS1	I 90 94 KENN IB AUX SIGN ISAS1 @ KEDZIE AVE (SOUTH OF)	CO		S-4A	ON
66	S	ISAS2	I 90 94 KENN IB AUX SIGN ISAS2 @ KEDZIE AVE (SOUTH OF)	CO		S-4A	ON
67	S	ISB1	I 90 94 KENN IB BARRIER ISB1 @ 36.21 FT SACRAMENTO AVE (NORTH OF)	CO		S-4B	ON
68	S	ISCC1	I 90 94 KENN IB OPS CAM ISCC1 @ SACRAMENTO AVE (NORTH OF)	CO		S-4C	ON
69	S	ISCC2	I 90 94 KENN IB OPS CAM ISCC2 @ SACRAMENTO AVE (NORTH OF)	CO		S-4C	ON
70	S	ISCC4	I 90 94 KENN IB OPS CAM ISCC4 @ SACRAMENTO AVE (NORTH OF)	CO		S-4C	ON
71	S	ISCC5	I 90 94 KENN IB OPS CAM ISCC5 @ SACRAMENTO AVE NORTH ON BARRIER	CO		S-4C	ON
72	S	ISCC6	I 90 94 KENN IB OPS CAM ISCC6 @ SACRAMENTO AVE (NORTH OF)	CO		S-4C	ON
73	S	ISCC7	I 90 94 KENN IB OPS CAM ISCC7 @ SACRAMENTO AVE (NORTH OF)	CO		S-4C	ON
74	S	ISCC8	I 90 94 KENN IB OPS CAM ISCC8 @ SACRAMENTO AVE (NORTH OF)	CO		S-4C	ON
75	S	ISCC9	I 90 94 KENN OPS CAM INCL @ KEDZIE AVE	CO		S-4C	ON
76	S	ISCC10	I 90 94 KENN OPS CAM INCL @ AVONDALE AVE	CO		S-4C	ON
77	S	ISCM10	I 90 94 KENN IB MESSAGE SIGN @ SACRAMENTO AVE	CO		S-4M	ON
78	S	ISCM11	I 90 94 KENN IB MESSAGE SIGN @ KIMBALL AVE	CO		S-4M	ON
79	S	ISG1	I 90 94 KENN IB GORE SIGN ISG1 @ KEDZIE AVE (SOUTH OF)	CO		S-4S	ON
80	S	ISR1	I 90 94 KENN IB PANEL ISR1 @ KEDZIE AVE (SOUTH OF)	CO		S-4P	ON

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81	S	ISR2	I 90 94 KENN IB PANEL ISR2 @ KEDZIE AVE (SOUTH OF)	CO	S-4P S-4	ON
82	S	ISR3	I 90 94 KENN IB PANEL ISR3 @ KEDZIE AVE (SOUTH OF)	CO	S-4P S-4	ON
83	S	ISV1	I 90 94 KENN IB CHEVRON ISV1 @ KEDZIE AVE (SOUTH OF)	CO	S-4V S-4	ON
84	S	ISV2	I 90 94 KENN IB CHEVRON ISV2 @ KEDZIE AVE (SOUTH OF)	CO	S-4V S-4	ON
85	S	ISV3	I 90 94 KENN IB CHEVRON ISV3 @ KEDZIE AVE (SOUTH OF)	CO	S-4V S-4	ON
86	S	ISX1	I 90 94 KENN IB X SIGN ISX1 @ KEDZIE AVE (SOUTH OF)	CO	S-4X S-4	ON
87	S	IW01	I 90 KENN IB GATE IW01 @ 5 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
88	S	IW02	I 90 KENN IB GATE IW02 @ 9 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
89	S	IW03	I 90 KENN IB GATE IW03 @ 11 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
90	S	IW04	I 90 KENN IB GATE IW04 @ 14 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
91	S	IW05	I 90 KENN IB GATE IW05 @ 17 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
92	S	IW06	I 90 KENN IB GATE IW06 @ 17 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
93	S	IW07	I 90 KENN IB GATE IW07 @ 17 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
94	S	IW08	I 90 KENN IB GATE IW08 @ 17 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
95	S	IW09	I 90 KENN IB GATE IW09 @ 17 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
96	S	IW10	I 90 KENN IB GATE IW10 @ 8 FT MONTROSE AVE (NORTH OF)	CO	S-4G S-4	ON
97	S	IW11	I 90 KENN IB GATE IW11 @	CO	S-4G	ON

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		9 FT	MONTROSE AVE (NORTH OF)			S-4	
98	S	IW12	I 90 KENN IB GATE IW12 @	CO		S-4G	ON
		20 FT	MONTROSE AVE (NORTH OF)			S-4	
99	S	IW13	I 90 KENN IB GATE IW13 @	CO		S-4G	ON
		19 FT	MONTROSE AVE			S-4	
100	S	IW14	I 90 KENN IB GATE IW14 @	CO		S-4G	ON
		14 FT	MONTROSE AVE			S-4	
101	S	IW15	I 90 KENN IB GATE IW15 @	CO		S-4G	ON
		10 FT	MONTROSE AVE (SOUTH OF)			S-4	
102	S	IW16	I 90 KENN IB GATE IW16 @	CO		S-4G	ON
		6 FT	MONTROSE AVE (SOUTH OF)			S-4	
103	S	IW17	I 90 KENN IB GATE IW17 @	CO		S-4G	ON
		5 FT	MONTROSE AVE (SOUTH OF)			S-4	
104	S	IW18	I 90 KENN IB GATE IW18 @	CO		S-4G	ON
		5 FT	MONTROSE AVE (SOUTH OF)			S-4	
105	S	IW19	I 90 KENN IB GATE IW19 @	CO		S-4G	ON
		5 FT	MONTROSE AVE (SOUTH OF)			S-4	
106	S	IW20	I 90 KENN IB GATE IW20 @	CO		S-4G	ON
		5 FT	MONTROSE AVE (SOUTH OF)			S-4	
107	S	IWAS1	I 90 KENN IB AUX SIGN IWAS1 @	CO		S-4A	ON
			CICERO AVE (WEST OF)			S-4	
108	S	IWAS2	I 90 KENN IB AUX SIGN IWAS2 @	CO		S-4A	ON
			CICERO AVE			S-4	
109	S	IWB1	I 90 KENN IB BARRIER IWB1 @	CO		S-4B	ON
		28.94 FT	MONTROSE AVE (NORTH OF)			S-4	
110	S	IWCC1	I 90 KENN IB OPS CAM IWCC1 @	CO		S-4C	ON
			CICERO AVE			S-4	
111	S	IWCC2	I 90 KENN IB OPS CAM IWCC2 @	CO		S-4C	ON
			CICERO AVE (SOUTH OF)			S-4	
112	S	IWCC3	I 90 KENN IB OPS CAM IWCC3 @	CO		S-4C	ON
			MONTROSE AVE (NORTH OF)			S-4	
113	S	IWCC5	I 90 KENN IB OPS CAM IWCC5 @	CO		S-4C	ON
			MONTROSE AVE (NORTH OF)			S-4	

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114	S	IWCC7	I 90 KENN IB OPS CAM IWCC7 @ MONTROSE AVE (SOUTH OF)	CO	S-4C S-4	ON
115	S	IWCC8	I 90 94 KENN OPS CAM INCL @ LAWRENCE	CO	S-4C S-4C	ON
116	S	IWCC10	I 90 94 KENN OPS CAM INCL @ CICERO AVE	CO	S-4C S-4C	ON
117	S	IWCM14	I 90 KENN IB MESSAGE SIGN @ LAWRENCE AVE (SOUTH OF)	CO	S-4M S-4	ON
118	S	IWCM15	I 90 KENN IB MESSAGE SIGN @ MONTROSE AVE (NORTH OF)	CO	S-4M S-4	ON
119	S	IWG1	I 90 KENN IB GORE SIGN IWG1 @ MONTROSE AVE (NORTH OF)	CO	S-4S S-4	ON
120	S	IWR1	I 90 KENN IB PANEL IWR1 @ LAWRENCE AVE (SOUTH OF)	CO	S-4P S-4	ON
121	S	IWR2	I 90 KENN IB PANEL IWR2 @ MONTROSE AVE (NORTH OF)	CO	S-4P S-4	ON
122	S	IWR3	I 90 KENN IB PANEL IWR3 @ MONTROSE AVE (NORTH OF)	CO	S-4P S-4	ON
123	S	IWV1	I 90 KENN IB CHEVRON IWV1 @ MONTROSE AVE (NORTH OF)	CO	S-4V S-4	ON
124	S	IWV2	I 90 KENN IB CHEVRON IWV2 @ MONTROSE AVE (NORTH OF)	CO	S-4V S-4	ON
125	S	IWV3	I 90 KENN IB CHEVRON IWV3 @ MONTROSE AVE (NORTH OF)	CO	S-4V S-4	ON
126	S	IWV4	I 90 KENN IB CHEVRON IWV4 @ MONTROSE AVE (NORTH OF)	CO	S-4V S-4	ON
127	S	IWV5	I 90 KENN IB CHEVRON IWV5 @ MONTROSE AVE (SOUTH OF)	CO	S-4V S-4	ON
128	S	IWX1	I 90 KENN IB X SIGN IWX1 @ MONTROSE AVE (NORTH OF)	CO	S-4X S-4	ON
129	S	OM01	I 90 94 KENN OB GATE OM01 @ 12 FT GRAND AVE (SOUTH OF)	CO	S-4G S-4	ON
130	S	OM02	I 90 94 KENN OB GATE OM02 @	CO	S-4G	ON

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		12 FT	GRAND AVE (SOUTH OF)			S-4	
131	S	OM03	I 90 94 KENN OB GATE OM03 @	CO		S-4G	ON
		12 FT	GRAND AVE (SOUTH OF)			S-4	
132	S	OM04	I 90 94 KENN OB GATE OM04 @	CO		S-4G	ON
		15 FT	GRAND AVE (SOUTH OF)			S-4	
133	S	OM05	I 90 94 KENN OB GATE OM05 @	CO		S-4G	ON
		14 FT	GRAND AVE (SOUTH OF)			S-4	
134	S	OM06	I 90 94 KENN OB GATE OM06 @	CO		S-4G	ON
		14 FT	GRAND AVE (SOUTH OF)			S-4	
135	S	OM07	I 90 94 KENN OB GATE OM07 @	CO		S-4G	ON
		20 FT	GRAND AVE (SOUTH OF)			S-4	
136	S	OM08	I 90 94 KENN OB GATE OM08 @	CO		S-4G	ON
		20 FT	GRAND AVE (SOUTH OF)			S-4	
137	S	OM09	I 90 94 KENN OB GATE OM09 @	CO		S-4G	ON
		18 FT	GRAND AVE (SOUTH OF)			S-4	
138	S	OM10	I 90 94 KENN OB GATE OM10 @	CO		S-4G	ON
		6 FT	GRAND AVE (SOUTH OF)			S-4	
139	S	OM11	I 90 94 KENN OB GATE OM11 @	CO		S-4G	ON
		2 FT	GRAND AVE (SOUTH OF)			S-4	
140	S	OM12	I 90 94 KENN OB GATE OM12 @	CO		S-4G	ON
		16 FT	GRAND AVE (SOUTH OF)			S-4	
141	S	OM13	I 90 94 KENN OB GATE OM13 @	CO		S-4G	ON
		17 FT	GRAND AVE (SOUTH OF)			S-4	
142	S	OM14	I 90 94 KENN OB GATE OM14 @	CO		S-4G	ON
		17 FT	GRAND AVE (SOUTH OF)			S-4	
143	S	OM15	I 90 94 KENN OB GATE OM15 @	CO		S-4G	ON
		15 FT	GRAND AVE (SOUTH OF)			S-4	
144	S	OM16	I 90 94 KENN OB GATE OM16 @	CO		S-4G	ON
		13 FT	GRAND AVE (SOUTH OF)			S-4	
145	S	OM17	I 90 94 KENN OB GATE OM17 @	CO		S-4G	ON
		11 FT	GRAND AVE (SOUTH OF)			S-4	
146	S	OM18	I 90 94 KENN OB GATE OM18 @	CO		S-4G	ON
		7 FT	GRAND AVE (SOUTH OF)			S-4	

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147	S	OM19	I 90 94 KENN OB GATE OM19 @ 7 FT GRAND AVE (SOUTH OF)	CO	S-4G ON S-4
148	S	OM20	I 90 94 KENN OB GATE OM20 @ 9 FT GRAND AVE (SOUTH OF)	CO	S-4G ON S-4
149	S	OM21	I 90 94 KENN OB GATE OM21 @ 9 FT GRAND AVE (SOUTH OF)	CO	S-4G ON S-4
150	S	OMAS1	I 90 94 KENN OB AUX SIGN OMAS1 @ GRAND AVE (SOUTH OF)	CO	S-4A ON S-4
151	S	OMAS2	I 90 94 KENN OB AUX SIGN OMAS2 @ GRAND AVE (SOUTH OF)	CO	S-4A ON S-4
152	S	OMB1	I 90 94 KENN OB BARRIER OMB1 @ 22.27 FT GRAND AVE (NORTH OF)	CO	S-4B ON S-4
153	S	OMCC1	I 90 94 KENN OB OPS CAM OMCC1 @ GRAND AVE (NORTH OF)	CO	S-4C ON S-4
154	S	OMCC2	I 90 94 KENN OB OPS CAM OMCC2 @ GRAND AVE (NORTH OF)	CO	S-4C ON S-4
155	S	OMCC3	I 90 94 KENN OB OPS CAM OMCC3 @ OGDEN AVE (SOUTH OF)	CO	S-4C ON S-4
156	S	OMCC4	I 90 94 KENN OB OPS CAM OMCC4 @ GRAND AVE (NORTH OF)	CO	S-4C ON S-4
157	S	OMCC5	I 90 94 KENN OB OPS CAM OMCC5 @ OGDEN AVE SOUTH ON BARRIER	CO	S-4C ON S-4
158	S	OMCC6	I 90 94 KENN OB OPS CAM OMCC6 @ OGDEN AVE SOUTH ON BARRIER	CO	S-4C ON S-4
159	S	OMCC7	I 90 94 KENN OB OPS CAM OMCC7 @ OGDEN AVE (SOUTH OF)	CO	S-4C ON S-4
160	S	OMCC8	I 90 94 KENN OPS CAM INCL @ WAYMAN ST	CO	S-4C ON S-4C
161	S	OMCC9	I 90 94 KENN OPS CAM INCL @ GREEN ST	CO	S-4C ON S-4C
162	S	OMCC10	I 90 94 KENN OPS CAM INCL @ GRAND AVE (WEST)	CO	S-4C ON S-4C

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163	S	OMCC1 1	I 90 94 KENN OPS CAM INCL @ OHIO ST (WEST)	CO	S-4C S-4C	ON
164	S	OMCM1	I 90 94 KENN OB MESSAGE SIGN @ FULTON ST (NW OF)	CO	S-4M S-4	ON
165	S	OMCM2	I 90 94 KENN OB MESSAGE SIGN @ GREEN ST (SE OF)	CO	S-4M S-4	ON
166	S	OMCM6	I 90 94 KENN OB MESSAGE SIGN @ GRAND AVE (SE OF)	CO	S-4M S-4	ON
167	S	OMCM7	I 90 94 KENN OB MESSAGE SIGN @ OHIO ST (NE OF)	CO	S-4M S-4	ON
168	S	OMG1	I 90 94 KENN OB GORE SIGN OMG1 @ OGDEN AVE (SOUTH OF)	CO	S-4S S-4	ON
169	S	OMR1	I 90 94 KENN OB PANEL OMR1 @ GRAND AVE (NORTH OF)	CO	S-4P S-4	ON
170	S	OMV1	I 90 94 KENN OB CHEVRON OMV1 @ GRAND AVE (SOUTH OF)	CO	S-4V S-4	ON
171	S	OMV2	I 90 94 KENN OB CHEVRON OMV2 @ GRAND AVE (SOUTH OF)	CO	S-4V S-4	ON
172	S	OMV3	I 90 94 KENN OB CHEVRON OMV3 @ GRAND AVE (SOUTH OF)	CO	S-4V S-4	ON
173	S	OMV4	I 90 94 KENN OB CHEVRON @ OGDEN (NORTH OF)	CO	S-4V S-4	ON
174	S	OMX1	I 90 94 KENN OB X SIGN OMX1 @ GRAND AVE (NORTH OF)	CO	S-4X S-4	ON
175	S	OO01 12 FT	I 90 94 KENN OB GATE OO01 @ MILWAUKEE AVE (EAST OF)	CO	S-4G S-4	ON
176	S	OO02 12 FT	I 90 94 KENN OB GATE OO02 @ MILWAUKEE AVE	CO	S-4G S-4	ON
177	S	OO03 13 FT	I 90 94 KENN OB GATE OO03 @ MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
178	S	OO04 13 FT	I 90 94 KENN OB GATE OO04 @ MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON

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179	S	OO05	I 90 94 KENN OB GATE OO05 @ 13 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
180	S	OO06	I 90 94 KENN OB GATE OO06 @ 20 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
181	S	OO07	I 90 94 KENN OB GATE OO07 @ 20 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
182	S	OO08	I 90 94 KENN OB GATE OO08 @ 8 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
183	S	OO09	I 90 94 KENN OB GATE OO09 @ 8 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
184	S	OO10	I 90 94 KENN OB GATE OO10 @ 20 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
185	S	OO11	I 90 94 KENN OB GATE OO11 @ 20 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
186	S	OO12	I 90 94 KENN OB GATE OO12 @ 16 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
187	S	OO13	I 90 94 KENN OB GATE OO13 @ 12 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
188	S	OO14	I 90 94 KENN OB GATE OO14 @ 6 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
189	S	OO15	I 90 94 KENN OB GATE OO15 @ 4 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
190	S	OO16	I 90 94 KENN OB GATE OO16 @ 4 FT MILWAUKEE AVE (WEST OF)	CO	S-4G S-4	ON
191	S	OOAS1	I 90 94 KENN OB AUX SIGN OOAS1 @ MILWAUKEE AVE (EAST OF)	CO	S-4A S-4	ON
192	S	OOAS2	I 90 94 KENN OB AUX SIGN OOAS2 @ MILWAUKEE AVE (EAST OF)	CO	S-4A S-4	ON
193	S	OOAS3	I 90 94 KENN OB AUX SIGN OOAS3 @ MILWAUKEE AVE (EAST OF)	CO	S-4A S-4	ON
194	S	OOB1	I 90 94 KENN OB BARRIER OOB1 @ 28 FT MILWAUKEE AVE (WEST OF)	CO	S-4B S-4	ON
195	S	OCCC1	I 90 94 KENN OB OPS CAM OCCC1 @	CO	S-4C	ON

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			MILWAUKEE AVE (WEST OF)			S-4	
196	S	OCCC2	I 90 94 KENN OB OPS CAM OCCC2 @ MILWAUKEE AVE (WEST OF)	CO		S-4C	ON
197	S	OCCC3	I 90 94 KENN OB OPS CAM OCCC3 @ MILWAUKEE AVE (EAST OF)	CO		S-4C	ON
198	S	OCCC4	I 90 94 KENN OB OPS CAM OCCC4 @ MILWAUKEE AVE EAST ON BARRIER	CO		S-4C	ON
199	S	OCCC5	I 90 94 KENN OB OPS CAM OCCC5 @ MILWAUKEE AVE (EAST OF)	CO		S-4C	ON
200	S	OCCC6	I 90 94 KENN OB OPS CAM OCCC6 @ MILWAUKEE AVE (EAST OF)	CO		S-4C	ON
201	S	OCCC7	I 90 94 KENN OB ONTARIO FEEDER @ HALSTED ST OPS CAM INCL	CO		S-4C	ON
202	S	OCCC8	I 90 94 KENN OB ONTARIO FEEDER @ UNION AVE OPS CAM INCL	CO		S-4C	ON
203	S	OCCC10	I 90 94 KENN OPS CAM INCL @ CHICAGO RIVER	CO		S-4C	ON
204	S	OOCM3	I 90 94 KENN OB MESSAGE SIGN @ I 90 94 KENN SPLIT	CO		S-4M	ON
205	S	OOCM4	I 90 94 KENN OB MESSAGE SIGN @ I 90 94 KENN SPLIT (EAST OF)	CO		S-4M	ON
206	S	OOCM5	I 90 94 KENN OB MESSAGE SIGN @ ONTARIO CHICAGO RIVER	CO		S-4M	ON
207	S	OOG1	I 90 94 KENN OB GORE SIGN OOG1 @ MILWAUKEE AVE (WEST OF)	CO		S-4S	ON
208	S	ORR1	I 90 94 KENN OB PANEL ORR1 @ MILWAUKEE AVE (EAST OF)	CO		S-4P	ON
209	S	ORR2	I 90 94 KENN OB PANEL ORR2 @ MILWAUKEE AVE (EAST OF)	CO		S-4P	ON
210	S	ORR3	I 90 94 KENN OB PANEL ORR3 @ MILWAUKEE AVE (EAST OF)	CO		S-4P	ON
211	S	ORR4	I 90 94 KENN OB PANEL ORR4 @ MILWAUKEE AVE (EAST OF)	CO		S-4P	ON

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212	S	OOV1	I 90 94 KENN OB CHEVRON OOV1 @ MILWAUKEE AVE	CO	S-4V S-4	ON
213	S	OOV2	I 90 94 KENN OB CHEVRON OOV2 @ MILWAUKEE AVE	CO	S-4V S-4	ON
214	S	OOV3	I 90 94 KENN OB CHEVRON OOV3 @ MILWAUKEE AVE (WEST OF)	CO	S-4V S-4	ON
215	S	OOX1	I 90 94 KENN OB X SIGN OOX1 @ MILWAUKEE AVE (WEST OF)	CO	S-4X S-4	ON
216	S	OS01	I 90 94 KENN OB GATE OS01 @ 6 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
217	S	OS02	I 90 94 KENN OB GATE OS02 @ 10 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
218	S	OS03	I 90 94 KENN OB GATE OS03 @ 14 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
219	S	OS04	I 90 94 KENN OB GATE OS04 @ 16 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
220	S	OS05	I 90 94 KENN OB GATE OS05 @ 20 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
221	S	OS06	I 90 94 KENN OB GATE OS06 @ 21 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
222	S	OS07	I 90 94 KENN OB GATE OS07 @ 21 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
223	S	OS08	I 90 94 KENN OB GATE OS08 @ 21 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
224	S	OS09	I 90 94 KENN OB GATE OS09 @ 21 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
225	S	OS10	I 90 94 KENN OB GATE OS10 @ 21 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
226	S	OS11	I 90 94 KENN OB GATE OS11 @ 13 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
227	S	OS12	I 90 94 KENN OB GATE OS12 @ 14 FT LOGAN BLVD (NORTH OF)	CO	S-4G S-4	ON
228	S	OS13	I 90 94 KENN OB GATE OS13 @	CO	S-4G	ON

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		23 FT	LOGAN BLVD (NORTH OF)			S-4	
229	S	OS14	I 90 94 KENN OB GATE OS14 @	CO		S-4G	ON
		23 FT	LOGAN BLVD (NORTH OF)			S-4	
230	S	OS15	I 90 94 KENN OB GATE OS15 @	CO		S-4G	ON
		23 FT	LOGAN BLVD (NORTH OF)			S-4	
231	S	OS16	I 90 94 KENN OB GATE OS16 @	CO		S-4G	ON
		23 FT	LOGAN BLVD (NORTH OF)			S-4	
232	S	OS17	I 90 94 KENN OB GATE OS17 @	CO		S-4G	ON
		23 FT	LOGAN BLVD (NORTH OF)			S-4	
233	S	OS18	I 90 94 KENN OB GATE OS18 @	CO		S-4G	ON
		21 FT	LOGAN BLVD (NORTH OF)			S-4	
234	S	OS19	I 90 94 KENN OB GATE OS19 @	CO		S-4G	ON
		20 FT	LOGAN BLVD (NORTH OF)			S-4	
235	S	OS20	I 90 94 KENN OB GATE OS20 @	CO		S-4G	ON
		18 FT	LOGAN BLVD (NORTH OF)			S-4	
236	S	OS21	I 90 94 KENN OB GATE OS21 @	CO		S-4G	ON
		16 FT	LOGAN BLVD (NORTH OF)			S-4	
237	S	OSAS1	I 90 94 KENN OB AUX SIGN OSAS1 @	CO		S-4A	ON
			LOGAN BLVD (NORTH OF)			S-4	
238	S	OSAS2	I 90 94 KENN OB AUX SIGN OSAS2 @	CO		S-4A	ON
			LOGAN BLVD (NORTH OF)			S-4	
239	S	OSB1	I 90 94 KENN OB BARRIER OSB1 @	CO		S-4B	ON
		38.25 FT	DIVERSEY AVE (SOUTH OF)			S-4	
240	S	OSCC1	I 90 94 KENN OB OPS CAM OSCC1 @	CO		S-4C	ON
			DIVERSEY AVE (SOUTH OF)			S-4	
241	S	OSCC2	I 90 94 KENN OB OPS CAM OSCC2 @	CO		S-4C	ON
			DIVERSEY AVE (SOUTH OF)			S-4	
242	S	OSCC3	I 90 94 KENN OB OPS CAM OSCC3 @	CO		S-4C	ON
			DIVERSEY AVE (SOUTH OF)			S-4	
243	S	OSCC4	I 90 94 KENN OB OPS CAM OSCC4 @	CO		S-4C	ON
			DIVERSEY AVE (SOUTH OF)			S-4	
244	S	OSCC5	I 90 94 KENN OB OPS CAM OSCC5 @	CO		S-4C	ON
			DIVERSEY AVE SOUTH ON BARRIER			S-4	

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245	S	OSCC6	I 90 94 KENN OB OPS CAM OSCC6 @ DIVERSEY AVE SOUTH ON BARRIER	CO	S-4C S-4	ON
246	S	OSCC8	I 90 94 KENN OPS CAM INCL @ CM9 LOGAN BLVD	CO	S-4C S-4C	ON
247	S	OSCC9	I 90 94 KENN OPS CAM INCL @ CM8 FULLERTON AVE	CO	S-4C S-4C	ON
248	S	OSCM8	I 90 94 KENN OB MESSAGE SIGN @ FULLERTON AVE	CO	S-4M S-4	ON
249	S	OSCM9	I 90 94 KENN OB MESSAGE SIGN @ DIVERSEY AVE (SOUTH OF)	CO	S-4M S-4	ON
250	S	OSG1	I 90 94 KENN OB GORE SIGN OSG1 @ LOGAN BLVD (NORTH OF)	CO	S-4S S-4	ON
251	S	OSR1	I 90 94 KENN OB PANEL OSR1 @ DIVERSEY AVE (SOUTH OF)	CO	S-4P S-4	ON
252	S	OSR2	I 90 94 KENN OB PANEL OSR2 @ DIVERSEY AVE (SOUTH OF)	CO	S-4P S-4	ON
253	S	OSV1	I 90 94 KENN OB CHEVRON OSV1 @ LOGAN BLVD (NORTH OF)	CO	S-4V S-4	ON
254	S	OSV2	I 90 94 KENN OB CHEVRON OSV2 @ LOGAN BLVD (NORTH OF)	CO	S-4V S-4	ON
255	S	OSV3	I 90 94 KENN OB CHEVRON OSV3 @ LOGAN BLVD (NORTH OF)	CO	S-4V S-4	ON
256	S	OSX1	I 90 94 KENN OB X SIGN OSX1 @ DIVERSEY AVE (SOUTH OF)	CO	S-4X S-4	ON

BISHOP FORD - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	BF01A	I 90 94 FORD IB CAB T @ ELLIS AVE	CO	S-5	ON
2	S	BF02	I 90 94 FORD @ STONY ISLAND	CO	S-5	ON
3	S	BF02A	I 90 94 FORD IB CAB L @ 103RD	CO	S-5	ON
4	S	BF02B	I 90 94 FORD CAB R @	CO	S-5	ON

			STONY ISLAND NB EXIT @ 103RD			
5	S	BF02C	I 90 94 FORD IB CAB P @	CO	S-5	ON
			STONY ISLAND SB EXIT			
6	S	BF02D	I 90 94 FORD CAB S @	CO	S-5	ON
			STONY ISLAND @ 98TH ST			
7	S	BF05	I 94 FORD SB OB @	CO	S-5	ON
			147TH SB ENT			
8	S	BF0B	I 94 FORD @	CO	S-5	ON
			MICHIGAN AVE TOWER MMN2			
9	S	BF0D	I 94 FORD @	CO	S-5	ON
			M L KING DR TOWER MCD3			
10	S	BF11	I 94 FORD @	CO	S-5	ON
			170TH ST TOWER E1IJ3			
11	S	BF11A	I 94 FORD @	CO	S-5	ON
			I 80 WB @ I 94 NB TOWER CGH1			
12	S	BF11B	I 94 FORD @	CO	S-5	ON
			I 94 WEST OF IL 394 TOWER CIJ3			
13	S	BF11C	I 94 FORD @	CO	S-5	ON
			I 80 (SOUTH OF) TOWER D1CD			

DAN RYAN - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	DR01	I 90 94 RYAN @	CO	S-5	ON
			ARCHER AVE			
2	S	DR01A	I 90 94 RYAN @	CO	S-5	ON
			ARCHER AVE			
3	S	DR02	I 90 94 RYAN @	CO	S-5	ON
			I 55 STEVENSON			
4	S	DR02B	I 90 94 RYAN @	CO	S-5	ON
			28TH PL			
5	S	DR03C	I 90 94 RYAN @	CO	S-5	ON
			35TH ST TOWER WAB2			
6	S	DR04C	I 90 94 RYAN @	CO	S-5	ON
			45TH ST TOWER VMN2			

7	S	DR05B	I 90 94 RYAN @ 50TH ST TOWER UIJ3	CO	S-5	ON
8	S	DR06B	I 90 94 RYAN @ 58TH ST TOWER TGH2	CO	S-5	ON
9	S	DR07A	I 94 RYAN @ 63RD ST TOWER SAB1	CO	S-5	ON
10	S	DR07C	I 94 RYAN @ 67TH ST TOWER RIGH2	CO	S-5	ON
11	S	DR08A	I 94 RYAN @ 72ND ST TOWER RKL3	CO	S-5	ON
12	S	DR09A	I 94 RYAN @ 81ST ST TOWER POP3	CO	S-5	ON
13	S	DR09C	I 94 RYAN @ 86TH ST TOWER PEF5	CO	S-5	ON
14	S	DR10A	I 94 RYAN @ 90TH ST TOWER OKL3	CO	S-5	ON
15	S	DR11	I 94 RYAN @ 96TH ST TOWER OAB1	CO	S-5	ON

DAN RYAN - PLANNED S-5 LOCATION

1	S	DR0A	I 94 RYAN @ POLK ST TOWER DCD1	CO	S-5	OFF
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EDENS - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	ED00	I 94 EDENS NW SPLIT @ 4755 WILSON BLDG E	CO	S-5	ON
2	S	ED0A	I 94 EDENS @ LAWRENCE AVE	CO	S-5	ON
3	S	ED01	I 94 EDENS @ FOSTER TOWER BLDG	CO	S-5	ON

I-57 - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	FS00	I 57 @ PERRY 98TH ST	CO	S-5	ON
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2	S	FS0A	I 57 @ WENTWORTH AVE TOWER AGH2	CO	S-5	ON
3	S	FS01 B7	I 57 @ HALSTED ST (SOUTH OF) H57A HUT	CO	S-5	ON
4	S	FS01A B4	I 57 @ 100TH ST	CO	S-5	ON
5	S	FS02 B6	I 57 @ 104TH ST	CO	S-5	ON
6	S	FS02A C7	I 57 @ 107TH ST THROOP	CO	S-5	ON
7	S	FS03 C8	I 57 @ 110TH ST	CO	S-5	ON
8	S	FS03A D13	I 57 @ 114TH ST	CO	S-5	ON
9	S	FS03B DMS29	I 57 @ 116TH ST (SOUTH OF) DMS29	CO	S-5	ON
10	S	FS04 E14	I 57 @ 121ST ST	CO	S-5	ON
11	S	FS05 F16	I 57 @ 125TH ST (SOUTH OF)	CO	S-5	ON
12	S	FS05A G18	I 57 @ 128TH ST OAK ST CAB G18	CO	S-5	ON
13	S	FS05B	I 57 @ BROADWAY (NORTH OF) CAB G20	CO	S-5	ON
14	S	FS06 H22	I 57 @ CHARLES DR (NORTH OF 138TH ST)	CO	S-5	ON
15	S	FS06A	I 57 @ THORNTON RD (SOUTH OF) CAB H21	CO	S-5	ON
16	S	FS09A	I 57 @ 155TH CAB K29	CO	S-5	ON
17	S	FS10	I 57 @ 159TH US 6 CAB L33	CO	S-5	ON
18	S	FS10A	I 57 @	CO	S-5	ON

			159TH US 6 CAB L33			
19	S	FS10B	I 57 NB @	CO	S-5	ON
		DMS44	163RD DMS44			
20	S	FS11	I 57 @	CO	S-5	ON
			CRAWFORD PULASKI (SOUTH OF) CAB			
21	S	FS11A	I 57 @	CO	S-5	ON
			167TH CAB N39			
22	S	FS12	I 57 @	CO	S-5	ON
			167TH ST (SOUTHWEST OF) CAB N43			
23	S	FS12A	I 57 @	CO	S-5	ON
			CICERO AVE CAB T45			
24	S	FS12B	I 57 @	CO	S-5	ON
			173RD CAB T47			
25	S	FS13	I 57 @	CO	S-5	ON
			175TH ST (SOUTH OF) 57B HUT			
26	S	FS13A	I 57 @	CO	S-5	ON
			I 80 (NORTH OF) CAB T46			

I-57 - PLANNED S-5 LOCATIONS

1	S	FS07	I 57 @	CO	S-5	OFF
			141ST ST CAB I26			
2	S	FS07A	I 57 @	CO	S-5	OFF
			NORRIS OAKLEY CAB I23			
3	S	FS08	I 57 @	CO	S-5	OFF
			SIBLEY ONTO I 57			
4	S	FS08A	I 57 @	CO	S-5	OFF
			SIBLEY (SW OF) CAB J25			
5	S	FS08B	I 57 @	CO	S-5	OFF
			I 294 TRI STATE TLWY CAB J32			
6	S	FS09	I 57 @	CO	S-5	OFF
			KEDZIE (NORTH OF) CAB K27			

IDOT HEADQUARTERS - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	HQ01	ROSELLE RD @	CO	S-5	ON
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			CENTRAL IDOT MATERIALS BLDG			
2	S	HQ02	ROSELLE RD @	CO	S-5	ON
			CENTRAL IDOT MATERIALS BLDG			
3	S	HQ03	ROSELLE RD @	CO	S-5	ON
			CENTRAL IDOT MATERIALS BLDG			

I 80 - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	IE14A	I 80 @ HARLEM AVE	WI	S-5	ON
2	S	IE15A	I 80 @ 80TH AVE	WI	S-5	ON
3	S	IE17	I 80 @ US 45 (WEST OF)	CO	S-5	ON
4	S	IE18	I 80 @ 104TH AVE	CO	S-5	ON
5	S	IE19	I 80 @ WOLF RD	CO	S-5	ON
6	S	IE20	I 80 @ 116TH ST I 80 WEIGH STATION	WI	S-5	ON
7	S	IE21	I 80 @ 187TH ST	WI	S-5	ON
8	S	IE22	I 80 @ PARKER RD	WI	S-5	ON
9	S	IE23	I 80 @ I 355 TLWY (EAST OF)	WI	S-5	ON
10	S	IE24	I 80 @ FRANCIS RD	WI	S-5	ON
11	S	IE23A	I 80 @ I 355 MICHAEL LN (WEST OF)	WI	S-5	ON

I-80 - PLANNED S-5 LOCATIONS

1	S	IE25	I 80 @ US 30 (EAST OF) TOWER NKL2	WI	S-5	OFF
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2	S	IE25A	I 80 @ US 30 TOWER NQR1	WI	S-5	OFF
3	S	IE25B	I 80 @ US 30 TOWER NIJ2	WI	S-5	OFF

EISENHOWER (IKE) - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	IK0A	CHICAGO RIVER SE BRIDGE HOUSE I 290 IKE IB @ CHICAGO RIVER	CO	S-5	ON
2	S	IK0B	CHICAGO RIVER SE BRIDGE HOUSE I 290 IKE IB @ CHICAGO RIVER WEST C	CO	S-5	ON
3	S	IK0C	CHICAGO RIVER SE BRIDGE HOUSE I 290 IKE OB @ CHICAGO RIVER LOWER	CO	S-5	ON
4	S	IK0D	CHICAGO RIVER SE BRIDGE HOUSE I 290 IKE OB @ CHICGO RIVER UPPER	CO	S-5	ON
5	S	IK0I	I 290 IKE WB (AT HUT) @ I 90 94 HALSTED ST	CO	S-5	ON
6	S	IK0J	I 290 IKE HALSTED EAST I 90 94 HALSTED ST	CO	S-5	ON
7	S	IK0K	I 290 IKE UIC (ROOF) CAM 2 601 S MORGAN ST CHICAGO	CO	S-5	ON
8	S	IK0L	I 290 IKE UIC (ROOF) CAM 3 601 S MORGAN ST CHICAGO	CO	S-5	ON
9	S	IK0M	I 290 IKE UIC (ROOF) CAM 1 601 S MORGAN ST CHICAGO	CO	S-5	ON
10	S	IK01	I 290 IKE @ PAULINA ST (UPPER) CAB G9	CO	S-5	ON
11	S	IK01A	I 290 IKE @ PAULINA ST (LOWER) CAB G9	CO	S-5	ON
12	S	IK03	I 290 IKE @ SACRAMENTO CAB I19	CO	S-5	ON
13	S	IK04	I 290 IKE @ INDEPENDENCE (UPPER CAMERA) CAB	CO	S-5	ON
14	S	IK04A	I 290 IKE @	CO	S-5	ON

INDEPENDENCE (LOWER CAM) CAB J27						
15	S	IK06	I 290 IKE @ CENTRAL AVE CAB L39	CO	S-5	ON
16	S	IK08	I 290 IKE TSC CAM @ TSC BLDG 445 W HARRISON-OAK PARK	CO	S-5	ON
17	S	IK09A	I 290 IKE @ DESPLAINES AVE CAB N53	CO	S-5	ON
18	S	IK10	I 290 IKE @ 1ST AVE	CO	S-5	ON
19	S	IK11	I 290 IKE @ 25TH AVE CAB R58	CO	S-5	ON
20	S	IK13A	I 290 IKE @ MANNHEIM RD	CO	S-5	ON
21	S	IK13B	I 290 IKE @ MANNHEIM RD	CO	S-5	ON
22	S	IK14	I 290 IKE @ I 88 EAST BOUND TLWY MERGE CAB V72	CO	S-5	ON
23	S	IK14A	I 290 IKE @ HILLSIDE TOWER & HUT	CO	S-5	ON
24	S	IK14B	I 290 IKE @ HILLSIDE TOWER & HUT	CO	S-5	ON
25	S	IK14C	I 290 IKE @ HILLSIDE TOWER & HUT	CO	S-5	ON
26	S	IK14D	I 290 IKE @ WOLF RD TOWER YKL1	CO	S-5	ON
27	S	IK14E	I 290 IKE @ BUTTERFIELD RD TOWER ZAB3	CO	S-5	ON
28	S	IK14F	I 290 IKE @ I 88 I 290 SPLIT	CO	S-5	ON
29	S	IK17	I 290 IKE @ NORTH AVE TOWER XEF1	CO	S-5	ON
30	S	IK18	I 290 IKE @ YORK RD TOWER YCD1	DU	S-5	ON

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31	S	IK19	I 290 IKE @ GRAND AVE TOWER AGH1	CO	S-5	ON
32	S	IK21	I 290 IKE @ ADDISON RD MEDIAN CAB E109	CO	S-5	ON
33	S	IK22	I 290 @ MILL RD	DU	S-5	ON
34	S	IK23	I 290 I 355 @ NORDIC TOWER & HUT	DU	S-5	ON
35	S	IK23A	I 290 I 355 @ NORDIC TOWER & HUT	DU	S-5	ON
36	S	IK23B	I 290 I 355 @ NORDIC TOWER & HUT	DU	S-5	ON
37	S	IK25A	I 290 IL 390 (NORTH OF)	DU	S-5	ON
38	S	IK25B	I 290 @ DEVON AVE CAB 121	DU	S-5	ON
39	S	IK25C	I 290 IL 390 (SOUTH OF)	DU	S-5	ON
40	S	IK26	I 290 IL 53 @ BIESTERFIELD NB EXIT (SOUTH OF)	CO	S-5	ON
41	S	IK26A	I 290 IKE @ BIESTERFIELD RD (SOUTH OF) CAB 12	CO	S-5	ON
42	S	IK27	I 290 IL 53 @ BIESTERFIELD NB (NORTH OF) CAB M	CO	S-5	ON
43	S	IK27A	I 290 IKE @ BIESTERFIELD NB (NORTH OF) CAB M	CO	S-5	ON
44	S	IK28A	I 290 IKE IL 53 @ SCHAUMBURG RD TOWER MAB1	CO	S-5	ON
45	S	IK28B	I 290 IKE @ IL 72 HIGGINS SB ENT RAMP CAB O132	CO	S-5	ON
46	S	IK29	I 290 IKE IL 53 @ HIGGINS SB EXT RAMP TOWER OAB2	CO	S-5	ON
47	S	IK29A	I 290 IKE @	CO	S-5	ON

			IL 72 HIGGINS NB ENT RAMP CAB O127			
48	S	IK29B	I 290 IKE IL 53 @ WOODFIELD DR TOWER OCD3	CO	S-5	ON
49	S	IK29C	I 290 IKE @ WOODFIELD DR ENT RAMP CAB 129	CO	S-5	ON
50	S	IK29D	I 290 IKE IL 53 @ GOLF RD TOWER PMN1	CO	S-5	ON
51	S	IK30	I 290 IKE @ I 90 IL 53 TOWER PUV2	CO	S-5	ON
52	S	IK30A	I 290 IKE @ I 90 IL 53 TOWER RAB4	CO	S-5	ON
53	S	IK30B	I 290 IKE IL 53 @ IL 62 ALGONQUIN RD TOWER RAB1	CO	S-5	ON

EISENHOWER (IKE) - PLANNED S-5 LOCATIONS

1	S	IK15	I 290 IKE @ ST CHARLES RD TOWER WAB1	CO	S-5	OFF
2	S	IK0E	I 290 IKE IB @ JEFFERSON ST EAST CAM SIGN TRUSS	CO	S-5	OFF
3	S	IK0F	I 290 IKE OB @ JEFFERSON ST WEST CAM SIGN TRUSS	CO	S-5	OFF
4	S	IK0G	I 290 IKE OB @ PS 05 701 W VAN BUREN NORTH CAM	CO	S-5	OFF
5	S	IK0H	I 290 IKE OB @ PS 05 701 W VAN BUREN SOUTH CAM	CO	S-5	OFF

IL 59 - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	IL59A	IL 59 CAM @ I 88 TLWY TOWER UFC2D2	DU	S-5	ON
2	S	IL59B	IL 59 CAM @ I 88 TLWY TOWER UFC1D1	DU	S-5	ON
3	S	IL59D	IL 59 CAM @ NORTH AURORA RD	DU	S-5	ON

KENNEDY - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	KE0B	I 90 94 KENN @ HUBBARDS CAVE GENERAL	CO	S-5	ON
2	S	KE0C	I 90 94 KENN @ HUBBARDS CAVE UNDERPASS	CO	S-5	ON
3	S	KE0D	I 90 94 KENN @ HUBBARDS CAVE UNDERPASS	CO	S-5	ON
4	S	KE0E	I 90 94 KENN @ HUBBARDS CAVE GENERAL	CO	S-5	ON
5	S	KE0F	I 90 94 KENN @ HUBBARDS CAVE GENERAL	CO	S-5	ON
6	S	KE01	I 90 94 KENN @ GRAND AVE GENERAL	CO	S-5	ON
7	S	KE01A	I 90 94 KENN @ 950 W ONTARIO BLDG A	CO	S-5	ON
8	S	KE01B	I 90 94 KENN @ UNION AVE	CO	S-5	ON
9	S	KE03	I 90 94 KENN @ WEBSTER AVE UNDERPASS	CO	S-5	ON
10	S	KE03A	I 90 94 KENN @ WEBSTER DAMEN AVE GENERAL	CO	S-5	ON
11	S	KE03B	I 90 94 KENN @ DAMEN AVE UNDERPASS	CO	S-5	ON
12	S	KE04	I 90 94 KENN @ FULLERTON NORTH AIS UNDERPASS	CO	S-5	ON
13	S	KE04A	I 90 94 KENN @ FULLERTON UNDERPASS	CO	S-5	ON
14	S	KE04B	I 90 94 KENN @ FULLERTON SOUTH AIS UNDERPASS	CO	S-5	ON
15	S	KE04C	I 90 94 KENN @ WESTERN UNDERPASS	CO	S-5	ON
16	S	KE04D	I 90 94 KENN @ LOGAN WESTERN GENERAL	CO	S-5	ON

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17	S	KE04E	I 90 94 KENN @ LOGAN BLVD UNDERPASS	CO	S-5	ON
18	S	KE05	I 90 94 KENN @ DIVERSEY UNDERPASS	CO	S-5	ON
19	S	KE05A	I 90 94 KENN @ CALIFORNIA DIVERSEY GENERAL	CO	S-5	ON
20	S	KE05C	I 90 94 KENN @ SACRAMENTO (SE OF) BLDG D	CO	S-5	ON
21	S	KE05B	I 90 94 KENN @ CALIFORNIA UNDERPASS	CO	S-5	ON
22	S	KE05D	I 90 94 KENN @ SACRAMENTO UNDERPASS	CO	S-5	ON
23	S	KE06	I 90 94 KENN @ KIMBALL UNDERPASS	CO	S-5	ON
24	S	KE06A	I 90 94 KENN @ KIMBALL (NORTH WEST OF) GENERAL	CO	S-5	ON
25	S	KE06C	I 90 94 KENN @ AVONDALE AVE	CO	S-5	ON
26	S	KE07	I 90 94 KENN @ IRVING PARK RD UNDERPASS	CO	S-5	ON
27	S	KE07A	I 90 94 KENN @ KEELER IRVING PK GENERAL	CO	S-5	ON
28	S	KE07B	I 90 94 KENN @ KEELER AVE UNDERPASS	CO	S-5	ON
29	S	KE07C	I 90 94 KENN @ KOSTNER AVE UNDERPASS	CO	S-5	ON
30	S	KE07D	I 90 94 KENN @ KOSTNER (NORTH WEST OF) GENERAL	CO	S-5	ON
31	S	KE08	I 90 94 KENN @ LAWRENCE AVE	CO	S-5	ON
32	S	KE09	I 90 94 KENN @ BRYN MAWR CAB H99	CO	S-5	ON
33	S	KE11	I 90 KENN @	CO	S-5	ON

			HARLEM AVE			
34	S	KE12	I 90 KENN @	CO	S-5	ON
			CANFIELD AVE			
35	S	KE13	I 90 KENN @	CO	S-5	ON
			CUMBERLAND AVE			
36	S	KE13A	I 90 KENN @	CO	S-5	ON
			EAST RIVER RD			
37	S	KE13B	I 90 KENN @	CO	S-5	ON
			CUMBERLAND AVE			
38	S	KE14	I 90 KENN @	CO	S-5	ON
			I 190 I 90 MERGE			
39	S	KE14B	I 90 KENN @	CO	S-5	ON
			DESPLAINES RIVER RD			
40	S	KE15	I 90 KENN CAB C @	CO	S-5	ON
			MANNHEIM RD (EAST OF) BY PS24			
41	S	KEFOS	I 90 94 KENN @	CO	S-5	ON
			FOSTER AVE AIS CAB CMS18			

KENNEDY - PLANNED S-5 LOCATIONS

1	S	KE0A	I 90 94 KENN @	CO	S-5	OFF
			JACKSON (SOUTH OF) PS05			

KINGERY - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	KI01	I 80 94 @	CO	S-5	ON
			WILDWOOD DR TOWER BGH7			
2	S	KI0A	I 80 94 @	CO	S-5	ON
			STATE LINE TOWER AGH9			
3	S	KI01A	I 80 94 @	CO	S-5	ON
			TORRENCE STATE LINE TOWER BGH1			
4	S	KI02	I 80 94 @	CO	S-5	ON
			PAXTON AVE TOWER DCD4			
5	S	KI0B	I 80 94 @	CO	S-5	ON
			WILLIAM ST TOWER AGH2			

I 355 (FORMERLY NORTH-SOUTH EXPY) - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	NS01	I 355 TLWY SB @ LAKE ST CAB I4	DU	S-5	ON
2	S	NS01A	I 355 TLWY @ ARMY TRAIL RD (NORTH OF)	DU	S-5	ON
3	S	NS02	IL 355 TLWY SB @ ARMY TRAIL RD	DU	S-5	ON

STEVENSON I 55 - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	ST00	LAKE SHORE DR @ 25TH ST	CO	S-5	ON
2	S	ST00A	I 55 STEV @ MLK ML KING DR	CO	S-5	ON
3	S	ST01	I 55 STEV @ CANAL ST (WEST OF)	CO	S-5	ON
4	S	ST01A	I 55 STEV @ I 90 94 KENN	CO	S-5	ON
5	S	ST01B	I 55 STEV @ I 90 94 RYAN	CO	S-5	ON
6	S	ST01C	I 55 STEV @ HALSTED ST (EAST OF)	CO	S-5	ON
7	S	ST04	I 55 STEV @ CALIFORNIA (WEST OF) DMS5	CO	S-5	ON
8	S	ST06	I 55 STEV @ CICERO (EAST OF) CAB 13	CO	S-5	ON
9	S	ST06A	I 55 STEV @ CICERO EXIT RAMP CAB 15	CO	S-5	ON
10	S	ST07	I 55 STEV @ CENTRAL (EAST OF) CAB 26	CO	S-5	ON
11	S	ST08	I 55 STEV @ CENTRAL (WEST OF) CAB 32	CO	S-5	ON
12	S	ST09	I 55 STEV @ HARLEM AVE (EAST OF) CAB 21	CO	S-5	ON

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13	S	ST10	I 55 STEV @ HARLEM AVE CAB 23	CO	S-5	ON
14	S	ST10A	I 55 STEV @ 1ST AVE (EAST OF) CAB 27	CO	S-5	ON
15	S	ST11	I 55 STEV @ 1ST AVE (EAST OF) CAB 38	CO	S-5	ON
16	S	ST11A	I 55 STEV @ 1ST AVE (WEST OF) CAB 40	CO	S-5	ON
17	S	ST12	I 55 STEV @ 1ST AVE (WEST OF) CAB 42	CO	S-5	ON
18	S	ST12A	I 55 STEV @ 1ST AVE (WEST OF) CAB 44	CO	S-5	ON
19	S	ST13	I 55 STEV @ EAST AVE (EAST OF) DMS23	CO	S-5	ON
20	S	ST14	I 55 STEV @ LAGRANGE RD (EAST OF) CAB R43	CO	S-5	ON
21	S	ST14A	I 55 STEV @ LAGRANGE RD (NW QUAD) CAB R47	CO	S-5	ON
22	S	ST14B	I 55 STEV @ LAGRANGE RD (SW QUAD) CAB R54	CO	S-5	ON
23	S	ST15	I 55 STEV @ WILLOW SPRINGS RD CAB R49A	CO	S-5	ON
24	S	ST16	I 55 STEV @ WOLF RD	CO	S-5	ON
25	S	ST16A	I 55 STEV @ I 294 TLWY (WEST OF)	CO	S-5	ON
26	S	ST17	I 55 STEV @ COUNTY LINE (EAST OF)	CO	S-5	ON
27	S	ST18	I 55 STEV @ COUNTY LINE (WEST OF)	DU	S-5	ON
28	S	ST18A	I 55 STEV @ MADISON ST	DU	S-5	ON
29	S	ST19	I 55 STEV @	DU	S-5	ON

			IL 83			
30	S	ST20	I 55 STEV @ PORTSMOUTH DR	DU	S-5	ON
31	S	ST20A	I 55 STEV @ CASS AVE	DU	S-5	ON
32	S	ST22	I 55 STEV @ LEMONT RD (EAST OF)	DU	S-5	ON
33	S	ST23	I 55 STEV @ LEMONT RD	DU	S-5	ON
34	S	ST23A	I 55 STEV @ I 355 & LEMONT (BETWEEN)	DU	S-5	ON
35	S	ST24	I 55 STEV @ I 355	DU	S-5	ON
36	S	ST24A	I 55 STEV @ JOLIET RD	WI	S-5	ON
37	S	ST25	I 55 STEV @ IL 53 & JOLIET RD (BETWEEN)	WI	S-5	ON
38	S	ST26	I 55 STEV @ IL 53	WI	S-5	ON
39	S	ST27	I 55 STEV @ SCHMIDT RD (EAST OF)	WI	S-5	ON
40	S	ST28	I 55 STEV @ WEIGH STATION (IB SOUTH OF)	WI	S-5	ON
41	S	ST29	I 55 STEV @ WINDHAM PKWY	WI	S-5	ON
42	S	ST31	I 55 STEV @ WEBER RD & 113TH (BETWEEN)	WI	S-5	ON
43	S	ST32	I 55 STEV @ IL 126 (NORTH OF)	WI	S-5	ON
44	S	ST32A	I 55 STEV @ IL 126 (SOUTH OF)	WI	S-5	ON
45	S	ST34	I 55 STEV @ LOCKPORT ST	WI	S-5	ON

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46	S	ST35	I 55 STEV @ 159TH (SOUTH OF)	WI	S-5	ON
47	S	ST35A	I 55 STEV @ DAN IRELAND	WI	S-5	ON
48	S	ST36	I 55 STEV @ US 30 (NORTH OF)	WI	S-5	ON
49	S	ST36A	I 55 STEV @ US 30 (SOUTH OF)	WI	S-5	ON
50	S	ST37	I 55 STEV @ US 30 & CATON FARM (BETWEEN)	WI	S-5	ON
51	S	ST37A	I 55 STEV @ CATON FARM RD	WI	S-5	ON
52	S	ST38	I 55 STEV @ CATON FARM RD (SOUTH OF)	WI	S-5	ON
53	S	ST39	I 55 STEV @ BLACK RD (SOUTH OF)	WI	S-5	ON
54	S	ST40	I 55 STEV @ JEFFERSON (NORTH OF)	WI	S-5	ON
55	S	ST40A	I 55 STEV @ JEFFERSON (SOUTH OF)	WI	S-5	ON
56	S	ST42	I 55 STEV @ SEIL RD	WI	S-5	ON
57	S	ST43	I 55 STEV @ I 80 NEQ	WI	S-5	ON
58	S	ST43A	I 55 STEV @ I 80 SEQ	WI	S-5	ON
59	S	ST44	I 55 STEV @ I 55 MAINTENANCE YARD (NEAR)	WI	S-5	ON
60	S	ST45	I 55 STEV @ US 6	WI	S-5	ON
61	S	ST46	I 55 STEV @ BLUFF RD SB EXT RAMP	WI	S-5	ON
62	S	ST47	I 55 STEV @	WI	S-5	ON

			DESPLAINES RIVER (NORTH OF)			
63	S	ST47A	I 55 STEV OB NAV LTG LSTEV @ DESPLAINES BRIDGE (UNDER SB)	WI	S-5	ON
64	S	ST47B	I 55 STEV @ DESPLAINES BRIDGE (UNDER NB)	WI	S-5	ON
65	S	ST48	I 55 STEV IB NAV LTG LSTEV @ DESPLAINES RIV (SOUTH OF) NB	WI	S-5	ON
66	S	ST48A	I 55 STEV @ ARSENAL RD OB ENT TOWER TCD1	WI	S-5	ON
67	S	ST50	I 55 STEV @ ARSENAL RD IB ENT TOWER AEF1	WI	S-5	ON
68	S	ST51	I 55 STEV @ DESPLAINES RIVER RD SB	WI	S-5	ON
69	S	ST52	I 55 STEV @ LORENZO RD SB	WI	S-5	ON

STEVENSON I 55 - PLANNED S-5 LOCATIONS

1	S	ST30	I 55 STEV @ WEBER RD	WI	S-5	OFF
2	S	ST30A	I 55 STEV @ WEBER RD NWQ	WI	S-5	OFF

US 45 - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	US45A	US 45 MANNHEIM RD NB @ IL 72 HIGGINS RD	CO	S-5	ON
2	S	US45B	US 45 MANNHEIM RD NB @ ZEMKE BLVD	CO	S-5	ON
3	S	US45C	US 45 MANNHEIM RD NB @ LAWRENCE AVE	CO	S-5	ON
4	S	US45D	US 45 MANNHEIM RD NB @ MONTROSE AVE	CO	S-5	ON
5	S	US45E	US 45 MANNHEIM RD NB @ IL 19 IRVING PARK RD	CO	S-5	ON

MAINTENANCE YARDS - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	DRMY	DAN RYAN MAINTENANCE YARD 6543 S WENT WORTH AVE	CO	S-5	ON
2	S	NSMY	NORTH SIDE MAINTENANCE YARD @ 4051 N HARLEM	CO	S-5	ON
3	S	TRODY	RODENBURG MAINTENANCE YARD TOWER @ 1480 RODENBURG RD	CO	S-5	ON

MISCELLANEOUS - EQUIPMENT PAY CODE S-5 LOCATIONS

1	S	BOY1	BIESTERFIELD BRIDGE OFFICE @ 1101 BIESTERFIELD RD	CO	S-5	ON
2	S	PS23	I 90 94 KENN @ ROSCOE ADDISON PS23	CO	S-5	ON
3	S	PS44	IL 83 KINGERY HWY @ NORTH AVE (SOUTH OF) PS 44	DU	S-5	ON

SURVEILLANCE SYSTEM -EQUIPMENT PAY CODE S-6 LOCATIONS

1	S	H80	I 80 HUT @ IL 394	CO	S-H/T S-6	ON
2	S	H94	I 90 94 RYAN HUT @ STATE ST 66TH ST	CO	S-H/T S-6	ON
3	S	H55A	I 55 STEV HUT @ I 55 @ 26TH ST WALLACE	CO	S-H/T S-6	ON
4	S	H55B	I 55 STEV HUT @ 26TH & NORMAL AVE	CO	S-H/T S-6	ON
5	S	H57A	I 57 HUT @ PARNELL AVE	CO	S-H/T S-6	ON
6	S	H57B	I 57 HUTS (2) @ I 80	CO	S-H/T S-6	ON
7	S	H55WS	I 55 STEV HUT @ WEIGH STATION (EAST OF)	WI	S-H/T S-6	ON
8	S	HRR	I 190 @ RIVER ROAD	CO	S-H/T S-6	ON
9	S	TFOS	FOSTER TOWER EQUIP @	CO	S-H/T	ON

			I 94 @ FOSTER AVE		S-6	
10	S	THIL	HILLSIDE TOWER & HUTS (3) @	CO	S-H/T	ON
			I 294 I 88 @ 5250 W HARRISON ST		S-6	
11	S	TNOR	NORDIC TOWER @	DU	S-H/T	ON
			I 290 I 355 TLWY @ NORDIC RD		S-6	
12	S	TPLA	PLATO TOWER @	KA	S-H/T	ON
			IL 47 @ MCDONALD RD		S-6	
13	S	TSC	TRAFFIC SYSTEMS CENTER TSC @	CO	S-H/T	ON
			445 W HARRISON ST OAK PARK		S-6	
14	S	TSCH	SCHAUMBURG TOWER & HUT @	CO	S-H/T	ON
			IDOT MAT LAB ROSELLE @ CENTRAL		S-6	
15	S	TSTA	STATE LINE TOWER & HUT @	CO	S-H/T	ON
			I 80 @ IND STATE LINE		S-6	
16	S	Z1A	I 290 CAB IN SH290A HUT @	CO	S-H/T	ON
			I 90 94 KENN @ HALSTED		S-6	

PLANNED S-6 LOCATIONS

1	S	H290A	I 90 94 @	CO	S-H/T	OFF
			HALSTED ST		S-6	

SURVEILLANCE SYSTEM - EQUIPMENT PAY CODES S-7 LOCATIONS

1	S	IKIBAS	I 290 IKE IB RAMP GATE IKIBAS @	CO	HS-G	ON
		25 FT	ASHLAND AVE		S-7	
2	S	IKIBCA	I 290 IKE IB RAMP GATE IKIBCA @	CO	HS-G	ON
		25 FT	CALIFORNIA AVE		S-7	
3	S	IKIBCE	I 290 IKE IB RAMP GATE IKIBCE @	CO	HS-G	ON
		30 FT	CENTRAL AVE		S-7	
4	S	IKIBDA	I 290 IKE IB RAMP GATE IKIBDA @	CO	HS-G	ON
		23 FT	DAMEN AVE		S-7	
5	S	IKIBHO	I 290 IKE IB RAMP GATE IKIBHO @	CO	HS-G	ON
		23 FT	HOMAN AVE		S-7	
6	S	IKIBIN	I 290 IKE IB RAMP GATE IKIBIN @	CO	HS-G	ON
		23 FT	INDEPENDENCE AVE		S-7	
7	S	IKIBKO	I 290 IKE IB RAMP GATE IKIBKO @	CO	HS-G	ON

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		27.5 FT	KOSTNER AVE		S-7	
8	S	IKIBLA	I 290 IKE IB RAMP GATE IKIBLA @	CO	HS-G	ON
		23 FT	LARAMIE AVE		S-7	
9	S	IKIBOA	I 290 IKE IB RAMP GATE IKIBOA @	CO	HS-G	ON
		25 FT	OAKLEY AVE		S-7	
10	S	KEIBAD	I 90 94 KENN IB RAMP GATE KEIBAD @	CO	HS-G	ON
		31.1 FT	ADDISON ST		S-7	
11	S	KEIBAR	I 90 94 KENN IB RAMP GATE KEIBAR @	CO	HS-G	ON
		25 FT	ARMITAGE AVE		S-7	
12	S	KEIBAU	I 90 94 KENN IB RAMP GATE KEIBAU @	CO	HS-G	ON
		25 FT	AUGUSTA BLVD		S-7	
13	S	KEIBCE	I 90 KENN IB RAMP GATE KEIBCE @	CO	HS-G	ON
		25 FT	CENTRAL AVE		S-7	
14	S	KEIBCN	I 90 KENN IB RAMP GATE KEIBCN @	CO	HS-G	ON
		23 FT	CANFIELD AVE		S-7	
15	S	KEIBCU	I 90 KENN IB RAMP GATE KEIBCU @	CO	HS-G	ON
		27.5 FT	CUMBERLAND AVE		S-7	
16	S	KEIBD1	I 90 94 KENN IB RAMP GATE KEIBD1 @	CO	HS-G	ON
		30 FT	DIVISION ST		S-7	
17	S	KEIBDV	I 90 94 KENN IB RAMP GATE KEIBDV @	CO	HS-G	ON
		30 FT	DIVERSEY AVE		S-7	
18	S	KEIBFO	I 90 KENN IB RAMP GATE KEIBFO @	CO	HS-G	ON
		30 FT	FOSTER AVE		S-7	
19	S	KEIBFU	I 90 94 KENN IB RAMP GATE KEIBFU @	CO	HS-G	ON
		30 FT	FULLERTON AVE		S-7	
20	S	KEIBHAN	I 90 KENN IB RAMP GATE KEIBHAN @	CO	HS-G	ON
		23 FT	HARLEM AVE NB		S-7	
21	S	KEIBHAS	I 90 KENN IB RAMP GATE KEIBHAS @	CO	HS-G	ON
		23 FT	HARLEM AVE SB		S-7	
22	S	KEIBIR	I 90 94 KENN IB RAMP GATE KEIBIR @	CO	HS-G	ON
		30 FT	IRVING PARK RD		S-7	
23	S	KEIBKE	I 90 94 KENN IB RAMP GATE KEIBKE @	CO	HS-G	ON
		23 FT	KEDZIE AVE		S-7	

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24	S	KEIBKI	I 90 94 KENN IB RAMP GATE KEIBKI @ 30 FT KIMBALL AVE B	CO	HS-G	ON
					S-7	
25	S	KEIBMO	I 90 KENN IB RAMP GATE KEIBMO @ 30 FT MONTROSE AVE	CO	HS-G	ON
					S-7	
26	S	KEIBNA	I 90 KENN IB RAMP GATE KEIBNA @ 23 FT NAGLE AVE	CO	HS-G	ON
					S-7	
27	S	KEIBNO	I 90 94 KENN IB RAMP GATE KEIBNO @ 25 FT NORTH AVE	CO	HS-G	ON
					S-7	
28	S	KEIBPU	I 90 94 KENN IB RAMP GATE KEIBPU @ 27.5 FT PULASKI RD	CO	HS-G	ON
					S-7	
29	S	KEIBSA	I 90 KENN IB RAMP GATE KEIBSA @ 23 FT SAYRE AVE	CO	HS-G	ON
					S-7	
30	S	KEIBWE	I 90 94 KENN IB RAMP GATE KEIBWE @ 27.5 FT WEBSTER AVE	CO	HS-G	ON
					S-7	
31	S	KEOBAD	I 90 94 KENN OB RAMP GATE KEOBAD @ 27.5 FT ADDISON ST	CO	HS-G	ON
					S-7	
32	S	KEOBAR	I 90 94 KENN OB RAMP GATE KEOBAR @ 25 FT ARMITAGE AVE	CO	HS-G	ON
					S-7	
33	S	KEOBKA	I 90 94 KENN OB RAMP GATE KEOBKA @ 30 FT CALIFORNIA AVE	CO	HS-G	ON
					S-7	
34	S	KEOBDI	I 90 94 KENN OB RAMP GATE KEOBDI @ 30 FT DIVISION ST	CO	HS-G	ON
					S-7	
35	S	KEOBFO	I 90 KENN OB RAMP GATE KEOBFO @ 23 FT FOSTER AVE	CO	HS-G	ON
					S-7	
36	S	KEOBFU	I 90 94 KENN OB RAMP GATE KEOBFU @ 30 FT FULLERTON AVE	CO	HS-G	ON
					S-7	
37	S	KEOBKI	I 90 94 KENN OB RAMP GATE KEOBKI @ 30 FT KIMBALL AVE	CO	HS-G	ON
					S-7	
38	S	KEOBNA	I 90 KENN OB RAMP GATE KEOBNA @ 23 FT NAGLE AVE	CO	HS-G	ON
					S-7	
39	S	KEOBNO	I 90 94 KENN OB RAMP GATE KEOBNO @ 27.5 FT NORTH AVE	CO	HS-G	ON
					S-7	
40	S	KEOBOG	I 90 94 KENN OB RAMP GATE KEOBOG @	CO	HS-G	ON

30 FT OGDEN AVE

S-7

TRAFFIC SIGNALS - EQUIPMENT PAY CODE T-1A LOCATIONS

1	TS	5	I 55 STEV NE OFF RAMP @ IL 43 HARLEM AVE	CO	T-1A	ON	SUMMIT
2	TS	10	I 55 STEV @ CENTRAL AVE	CO	T-1A	ON	FOREST VIEW
3	TS	20	I 57 @ ASHLAND AVE 119TH ST	CO	T-1A	ON	CALUMET PARK
4	TS	22	131ST ST @ KEDZIE AVE	CO	T-1A	ON	BLUE ISLAND
5	TS	25	I 57 E RAMP @ MARSHFIELD 127TH ST	CO	T-1A	ON	CALUMET PARK
6	TS	35	I 57 W RAMP @ PAULINA ST 127TH	CO	T-1A	ON	CALUMET PARK
7	TS	45	DIXIE HWY @ I 80 TLWY	CO	T-1A	ON	HAZEL CREST
8	TS	48	171ST ST @ DIXIE HWY	CO	T-1A	ON	HAZEL CREST
9	TS	50	I 80 WB @ KEDZIE AVE	CO	T-1A	ON	HAZEL CREST
10	TS	60	I 94 EDENS SPUR N RAMP BROOKSIDE @ IL 43 WAUKEGAN RD	CO	T-1A	ON	NORTHBROOK
11	TS	61	I 94 EDENS SPUR S RAMP @ IL 43 WAUKEGAN RD	CO	T-1A	ON	NORTHBROOK
12	TS	65	I 94 EDENS ESTES @ IL 50 CICERO AVE	CO	T-1A	ON	LINCOLNWOOD
13	TS	75	I 290 IKE S FRONTAGE RD HARRISON @ US 12 20 45 MANNHEIM RD	CO	T-1A	ON	WESTCHESTER
14	TS	77	I 290 IKE RAMP F @ US 12 20 45 MANNHEIM RD	CO	T-1A	ON	HILLSIDE
15	TS	80	I 290 IKE RAMP B & G @ US 12 20 45 MANNHEIM RD	CO	T-1A	ON	HILLSIDE

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16	TS	85	I 290 IKE @ IL 43 HARLEM AVE	CO	T-1A	ON	FOREST PARK
17	TS	90	I 290 IKE IL 53 E FRONTAGE RD @ IL 58 GOLF RD	CO	T-1A	ON	SCHAUMBURG
18	TS	91	I 290 IKE IL 53 W FRONTAGE MCCONNOR @ IL 58 GOLF RD	CO	T-1A	ON	SCHAUMBURG
19	TS	95	I 290 IKE IL 53 W FRONTAGE RD @ IL 72 HIGGINS RD	CO	T-1A	ON	SCHAUMBURG
20	TS	96	I 290 IKE IL 53 E FRONTAGE RD @ IL 72 HIGGINS RD	CO	T-1A	ON	SCHAUMBURG
21	TS	100	I 290 IKE @ IL 171 1ST AVE	CO	T-1A	ON	MAYWOOD
22	TS	105	I 290 IKE @ 17TH AVE	CO	T-1A	ON	MAYWOOD
23	TS	110	I 290 IKE @ AUSTIN BLVD	CO	T-1A	ON	OAK PARK
24	TS	115	I 290 IKE @ DESPLAINES HARRISON	CO	T-1A	ON	FOREST PARK
25	TS	125	IL 50 IL 83 CICERO @ IL 83 128TH ST	CO	T-1A	ON	ALSIP
26	TS	130	I 294 TLWY E RAMP @ CERMAK RD 22ND ST	CO	T-1A	ON	WESTCHESTER
27	TS	135	I 294 TLWY W RAMP @ CERMAK RD 22ND ST	DU	T-1A	ON	OAKBROOK
28	TS	140	I 294 TLWY E RAMP @ WILLOW RD	CO	T-1A	ON	GLENVIEW
29	TS	145	I 294 TLWY W RAMP @ WILLOW RD	CO	T-1A	ON	GLENVIEW
30	TS	150	US 6 159TH ST @ US 45 96TH AVE LAGRANGE RAMP	CO	T-1A	ON	ORLAND PARK
31	TS	155	US 6 159TH ST @ IL 1 HALSTED ST	CO	T-1A	ON	HARVEY
32	TS	156	179TH ST @	CO	T-1A	ON	

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			WOLF RD	ORLAND PARK		
33	TS	157	183RD ST @	WI	T-1A	ON
			WOLF RD	ORLAND PARK		
34	TS	158	IL 7 WOLF RD @	CO	T-1A	ON
			151ST ST	ORLAND PARK		
35	TS	159	IL 7 WOLF RD @	CO	T-1A	ON
			153RD ST	ORLAND PARK		
36	TS	160	US 6 159TH ST @	CO	T-1A	ON
			IL 7 WOLF RD NORTH JCT	ORLAND PARK		
37	TS	161	US 6 WOLF RD @	CO	T-1A	ON
			US 6 173RD ST SOUTH JCT	ORLAND PARK		
38	TS	162	US 6 WOLF RD @	CO	T-1A	ON
			BROOKHILL DR	ORLAND PARK		
39	TS	163	IL 7 159TH ST @	CO	T-1A	ON
			WILL COOK RD	ORLAND PARK		
40	TS	164	IL 7 159TH ST @	CO	T-1A	ON
			113TH CT	ORLAND PARK		
41	TS	165	US 6 159TH ST @	CO	T-1A	ON
			IL 43 HARLEM AVE	ORLAND PARK		
42	TS	170	US 6 159TH ST @	CO	T-1A	ON
			IL 50 CICERO AVE	OAK FOREST		
43	TS	175	US 6 159TH ST @	CO	T-1A	ON
			IL 83 TORRENCE AVE	CALUMET CITY		
44	TS	180	US 6 159TH ST @	CO	T-1A	ON
			76TH AVE	TINLEY PARK		
45	TS	185	US 6 159TH ST @	CO	T-1A	ON
			80TH AVE	ORLAND PARK		
46	TS	190	US 6 159TH ST @	CO	T-1A	ON
			94TH ST	ORLAND PARK		
47	TS	195	US 6 IL 83 TORRENCE AVE @	CO	T-1A	ON
			170TH ST	CALUMET CITY		
48	TS	196	IL 38 @	KA	T-1A	ON
			IL 47	ELBURN		

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49	TS	197	IL 47 @ IL 64	KA	T-1A	ON	LILY LAKE
50	TS	198	IL 38 @ MEREDITH PL	KA	T-1A	ON	VIRGIL TOWNSHIP
51	TS	200	US 6 159TH ST @ CARSE AVE	CO	T-1A	ON	SOUTH HOLLAND
52	TS	205	US 6 159TH ST @ CENTRAL AVE	CO	T-1A	ON	OAK FOREST
53	TS	210	US 6 159TH ST @ COTTAGE GROVE AVE	CO	T-1A	ON	SOUTH HOLLAND
54	TS	220	US 6 159TH ST @ DIXIE HWY	CO	T-1A	ON	MARKHAM
55	TS	225	US 6 159TH ST @ ELLIS AVE	CO	T-1A	ON	SOUTH HOLLAND
56	TS	230	US 6 159TH ST @ GREENWOOD RD	CO	T-1A	ON	CALUMET CITY
57	TS	235	US 6 159TH ST @ 71ST CT	CO	T-1A	ON	ORLAND PARK
58	TS	240	US 6 159TH ST @ 84TH AVE	CO	T-1A	ON	TINLEY PARK
59	TS	255	US 6 159TH ST @ OAK PARK AVE	CO	T-1A	ON	TINLEY PARK
60	TS	265	US 6 159TH ST @ PARKWAY THE PARK	CO	T-1A	ON	CALUMET CITY
61	TS	270	US 6 159TH ST @ PAXTON AVE	CO	T-1A	ON	CALUMET CITY
62	TS	275	US 6 159TH ST @ RIDGELAND AVE	CO	T-1A	ON	OAK FOREST
63	TS	280	US 6 159TH ST @ RING RD	CO	T-1A	ON	CALUMET CITY
64	TS	285	US 6 159TH ST @ SCHOOL ST	CO	T-1A	ON	SOUTH HOLLAND
65	TS	290	US 6 159TH ST @	CO	T-1A	ON	

			SOUTH PARK AVE CHICAGO RD	SOUTH HOLLAND		
66	TS	293	US 6 159TH ST 162ND ST @ WAUSAU AVE	CO	T-1A	ON
67	TS	295	US 6 159TH ST @ STATE ST INDIANA AVE	CO	T-1A	ON
68	TS	300	US 6 159TH ST @ THORNTON BLUE ISLAND RD	CO	T-1A	ON
69	TS	305	US 6 162ND ST @ VAN DAM RD	CO	T-1A	ON
70	TS	310	US 6 159TH ST 162ND ST @ WAUSAU AVE	CO	T-1A	ON
71	TS	315	US 6 159TH ST @ WOOD ST	CO	T-1A	ON
72	TS	320	US 6 159TH ST @ WOODLAWN EAST AVE	CO	T-1A	ON
73	TS	330	US 6 159TH ST @ 88TH AVE	CO	T-1A	ON
74	TS	345	US 6 IL 83 TORRENCE AVE @ RIVER OAKS SOUTH ENT 6	CO	T-1A	ON
75	TS	350	US 6 IL 83 TORRENCE AVE @ RIVER OAKS SOUTH ENT 5	CO	T-1A	ON
76	TS	355	US 6 IL 83 TORRENCE AVE @ RIVER OAKS SOUTH ENT 4	CO	T-1A	ON
77	TS	365	US 12 RAND RD @ US 12 45 DESPLAINES RIVER RD	CO	T-1A	ON
78	TS	370	US 12 RAND RD @ US 12 ELK BLVD	CO	T-1A	ON
79	TS	375	US 12 RAND RD @ IL 58 GOLF RD	CO	T-1A	ON
80	TS	385	US 12 RAND RD @ BALDWIN RD WILLIAMS DR	CO	T-1A	ON
81	TS	390	US 12 RAND RD @ CAMP MCDONALD RD	CO	T-1A	ON

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82	TS	392	US 12 RAND RD @ SCHOENBECK RD	CO	T-1A	ON	MT PROSPECT
83	TS	395	US 12 RAND RD @ EUCLID AVE	CO	T-1A	ON	MT PROSPECT
84	TS	400	US 12 RAND RD @ HINTZ RD	CO	T-1A	ON	ARLINGTON HTS
85	TS	405	US 12 RAND RD @ KENNICOTT DR	CO	T-1A	ON	ARLINGTON HTS
86	TS	410	US 12 RAND RD @ LAKE COOK RD	CO	T-1A	ON	PALATINE
87	TS	415	US 12 RAND RD @ CLARENCE AVE DRYDEN AVE	CO	T-1A	ON	ARLINGTON HTS
88	TS	419	US 12 RAND RD @ OLIVE	CO	T-1A	ON	PROSPECT HTS
89	TS	420	US 12 RAND RD @ THOMAS AVE WILLOW RD	CO	T-1A	ON	MT PROSPECT
90	TS	421	US 12 RAND RD @ BEVERLY	CO	T-1A	ON	ARLINGTON HTS
91	TS	425	US 12 RAND RD @ WOLF RD	CO	T-1A	ON	DESPLAINES
92	TS	427	I 294 TLWY RAMP B @ US 12 20 95TH ST	CO	T-1A	ON	OAK LAWN
93	TS	430	US 12 20 95TH ST @ US 12 20 45 LAGRANGE RD	CO	T-1A	ON	HICKORY HILLS
94	TS	435	US 12 20 95TH ST @ IL 50 CICERO AVE	CO	T-1A	ON	OAK LAWN
95	TS	440	US 12 20 95TH ST @ 52ND AVE	CO	T-1A	ON	OAK LAWN
96	TS	445	US 12 20 95TH ST @ 54TH AVE	CO	T-1A	ON	EVERGREEN PK
97	TS	450	US 12 20 95 @ 78TH AVE	CO	T-1A	ON	EVERGREEN PK
98	TS	460	US 12 20 95TH ST @	CO	T-1A	ON	

			CAMPBELL AVE		EVERGREEN PK		
99	TS	465	US 12 20 95TH ST @		CO	T-1A	ON
			CENTRAL AVE			OAK LAWN	
100	TS	470	US 12 20 95TH ST @		CO	T-1A	ON
			CHICAGO RIDGE MALL DR ENT B			CHICAGO RIDGE	
101	TS	475	US 12 20 95TH ST @		CO	T-1A	ON
			COOK AVE			OAK LAWN	
102	TS	480	US 12 20 95TH ST @		CO	T-1A	ON
			CRAWFORD PULASKI			EVERGREEN PK	
103	TS	481	US 12 20 95TH ST @		CO	T-1A	ON
			KEELER AVE			OAK LAWN	
104	TS	490	US 12 20 95TH ST @		CO	T-1A	ON
			KOSTNER AVE			OAK LAWN	
105	TS	492	US 12 20 95TH ST @		CO	T-1A	ON
			KILBOURNE AVE			OAK LAWN	
106	TS	495	US 12 20 95TH ST @		CO	T-1A	ON
			K MART SHOPPING CTR			OAK LAWN	
107	TS	500	US 12 20 95TH ST @		CO	T-1A	ON
			MILLARD AVE			EVERGREEN PK	
108	TS	502	US 20 LAKE ST @		CO	T-1A	ON
			NAPERVILLE RD ELIZABETH			BARTLETT	
109	TS	503	US 20 LAKE ST @		CO	T-1A	ON
			LAMBERT ROSE LANE			ELGIN	
110	TS	505	US 12 20 95TH ST @		CO	T-1A	ON
			CHICAGO RIDGE MALL DR ENT A NASHV			CHICAGO RIDGE	
111	TS	510	US 12 20 95TH ST @		CO	T-1A	ON
			OAK PARK AVE			OAK LAWN	
112	TS	515	US 12 20 95TH ST @		CO	T-1A	ON
			MELVINA AVE			OAK LAWN	
113	TS	520	US 12 20 95TH ST @		CO	T-1A	ON
			RIDGELAND AVE			OAK LAWN	
114	TS	530	US 12 20 95TH ST @		CO	T-1A	ON
			SOUTHWEST HWY			OAK LAWN	

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115	TS	535	US 12 20 95TH ST @ WESTERN AVE	CO	T-1A	ON	EVERGREEN PK
116	TS	537	WESTERN AVE @ 92ND PL	CO	T-1A	ON	EVERGREEN PK
117	TS	540	US 12 20 95TH ST @ HOMAN AVE	CO	T-1A	ON	EVERGREEN PK
118	TS	545	IL 83 @ 3RD AVE	DU	T-1A	ON	ELMHURST
119	TS	550	IL 83 @ 22ND ST	DU	T-1A	ON	OAKBROOK TERRACE
120	TS	557	IL 134 @ WILSON RD	LA	T-1A	ON	FOX LAKE
121	TS	558	US 12 IL 59 @ HARTIGAN HOME DEPOT	LA	T-1A	ON	FOX LAKE
122	TS	559	US 12 IL 59 @ IL 134	LA	T-1A	ON	FOX LAKE
123	TS	565	IL 83 KINGERY HWY @ 63RD ST	DU	T-1A	ON	WILLOWBROOK
124	TS	570	IL 83 @ 75TH ST	DU	T-1A	ON	WILLOWBROOK
125	TS	580	IL 83 @ BLUFF RD	DU	T-1A	ON	WILLOWBROOK
126	TS	585	IL 83 @ CENTRAL AVE S FRONTAGE RD	DU	T-1A	ON	BURR RIDGE
127	TS	587	IL 83 @ 91ST ST	DU	T-1A	ON	DARIEN
128	TS	590	IL 83 @ FOSTER AVE	DU	T-1A	ON	BENSENVILLE
129	TS	595	IL 83 @ GROVE AVE SHERWOOD DR	DU	T-1A	ON	BENSENVILLE
130	TS	600	IL 83 @ HILLSIDE DR	DU	T-1A	ON	BENSENVILLE
131	TS	605	IL 83 @	DU	T-1A	ON	

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			ELMHURST SC KMART	ELMHURST		
132	TS	610	IL 83 @ MARK ST	DU	T-1A	ON
133	TS	615	IL 83 @ MIDWAY RD	DU	T-1A	ON
134	TS	620	IL 83 @ HODGES RD OAKBROOK CT	DU	T-1A	ON
135	TS	625	IL 83 @ 16TH ST	DU	T-1A	ON
136	TS	630	IL 83 @ CHICAGO ELMHURST STONE	DU	T-1A	ON
137	TS	635	IL 83 @ PLAINFIELD RD		T-1A	ON
138	TS	637	IL 83 @ 72ND CT	DU	T-1A	ON
139	TS	640	IL 83 @ RIVERSIDE DR	DU	T-1A	ON
140	TS	645	IL 83 @ ST CHARLES RD	DU	T-1A	ON
141	TS	661	IL 83 BUSSE @ IL 390 TLWY WB FRONTAGE THORNDALE	DU	T-1A	ON
142	TS	662	IL 83 BUSSE @ IL 390 TLWY EB FRONTAGE THORNDALE	DU	T-1A	ON
143	TS	665	IL 25 DUNDEE @ I 90 TLWY	KA	T-1A	ON
144	TS	670	IL 25 @ VILLA AVE	KA	T-1A	ON
145	TS	675	US 20 @ IL 31 US 20 BYPASS	KA	T-1A	ON
146	TS	677	US 20 @ NESLER RD	KA	T-1A	ON
147	TS	682	US 20 @ MCLEAN BLVD	KA	T-1A	ON

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148	TS	688	US 30 @ TREASURE DR GASTVILLE ST	KE	T-1A	ON	OSWEGO
149	TS	693	US 20 @ PLANK RD COOMBS RD	KA	T-1A	ON	ELGIN
150	TS	695	US 30 @ US 34 OGDEN AVE	KE	T-1A	ON	MONTGOMERY
151	TS	696	US 34 OGDEN AVE @ HILL AVE	KE	T-1A	ON	OSWEGO
152	TS	698	US 34 OGDEN AVE @ HAFENRICHTER RD FARNSWORTH RD	KE	T-1A	ON	AURORA
153	TS	700	US 30 BASELINE RD @ US 30 IL 47	KA	T-1A	ON	SUGAR GROVE
154	TS	703	IL 47 @ KESLINGER RD	KA	T-1A	ON	ELBURN
155	TS	710	US 30 @ IL 31 SOUTH RAMP	KA	T-1A	ON	MONTGOMERY
156	TS	715	US 30 @ BRIARCLIFF RD	KE	T-1A	ON	OSWEGO
157	TS	717	IL 59 @ MONAVILLE RD W	LA	T-1A	ON	LAKE VILLA
158	TS	720	US 30 @ DOUGLAS RD	KE	T-1A	ON	MONTGOMERY
159	TS	722	US 30 @ 5TH ST	KE	T-1A	ON	MONTGOMERY
160	TS	725	US 30 IL 47 @ JERICHO RD	KA	T-1A	ON	SUGAR GROVE
161	TS	727	US 30 @ GRIFFEN DR	KA	T-1A	ON	MONTGOMERY
162	TS	728	US 30 @ GORDON RD	KA	T-1A	ON	MONTGOMERY
163	TS	730	US 30 @ ORCHARD RD	KA	T-1A	ON	MONTGOMERY
164	TS	731	US 30 @	KE	T-1A	ON	

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			GOODWIN DR	OSWEGO		
165	TS	732	HILL AVE @	KE	T-1A	ON
			GOODWIN DR	OSWEGO		
166	TS	733	US 30 US 34 @	KE	T-1A	ON
			COMMERCIAL DRIVE MENARDS	OSWEGO		
167	TS	735	IL 31 IL 56 LINCOLNWAY ST @	KA	T-1A	ON
			I 88 TLWY IL 56	NORTH AURORA		
168	TS	737	IL 31 @	KA	T-1A	ON
			OAK ST	NORTH AURORA		
169	TS	740	IL 19 @	KA	T-1A	ON
			IL 25	ELGIN		
170	TS	741	IL 19 IRVING PARK RD @	CO	T-1A	ON
			SHALES PKWY	ELGIN		
171	TS	742	IL 19 IRVING PARK RD @	CO	T-1A	ON
			POPLAR CREEK	ELGIN		
172	TS	743	IL 19 IRVING PARK RD @	CO	T-1A	ON
			ROHRSEN RD	ELGIN		
173	TS	744	IL 19 IRVING PARK RD @	CO	T-1A	ON
			SCHAUMBURG RD	STREAMWOOD		
174	TS	745	IL 25 RIVER RD @	KA	T-1A	ON
			IL 58 SUMMIT ST	ELGIN		
175	TS	747	IL 58 SUMMIT @	CO	T-1A	ON
			SHALES PKWY COUNTRYFIELD RD	ELGIN		
176	TS	750	IL 25 RIVER RD @	KA	T-1A	ON
			IL 25 WILSON AVE	BATAVIA		
177	TS	755	IL 38 @	KA	T-1A	ON
			IL 25	GENEVA		
178	TS	760	IL 25 @	KA	T-1A	ON
			IL 62 ALGONQUIN RD	CARPENTERSVILLE		
179	TS	765	IL 25 @	KA	T-1A	ON
			IL 68 DUNDEE RD	EAST DUNDEE		
180	TS	770	IL 25 @	KA	T-1A	ON
			IL 72 HIGGINS RD	EAST DUNDEE		

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181	TS	775	IL 25 @ BRANDT DR	KA ELGIN	T-1A	ON
182	TS	776	US 20 @ IL 47 IL 72 SOUTH INT	KA PINGREE GROVE	T-1A	ON
183	TS	777	US 20 @ IL 47 IL 72 NORTH INT	KA PINGREE GROVE	T-1A	ON
184	TS	785	IL 25 WASHINGTON ST @ WILSON AVE	KA BATAVIA	T-1A	ON
185	TS	793	IL 25 BROADWAY @ SULLIVAN RD		T-1A	ON
186	TS	795	IL 31 @ THIRD ST	KA GENEVA	T-1A	ON
187	TS	805	IL 38 @ IL 31	KA GENEVA	T-1A	ON
188	TS	810	IL 31 STATE @ TOLLGATE RD AIRPORT DR	KA ELGIN	T-1A	ON
189	TS	814	IL 25 BROADWAY @ ILLINOIS		T-1A	ON
190	TS	815	IL 31 @ BIG TIMBER RD	KA ELGIN	T-1A	ON
191	TS	820	IL 31 STATE @ WEST RIVER DAVIS	KA ELGIN	T-1A	ON
192	TS	830	IL 31 @ MIDDLE ST	KA ELGIN	T-1A	ON
193	TS	833	IL 31 @ WATKINS US 30 NORTH RAMP		T-1A	ON
194	TS	835	IL 31 @ WEBSTER ST AUCUTT RD		T-1A	ON
195	TS	837	IL 31 @ CATERPILLAR ENTRANCE	KE MONTGOMERY	T-1A	ON
196	TS	845	IL 38 @ EASTSIDE AVE	KA GENEVA	T-1A	ON
197	TS	854	IL 31 LA FOX RD @	KA	T-1A	ON

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			BOWES RD		SOUTH ELGIN		
198	TS	856	IL 38 @		KA	T-1A	ON
			BRICHER RD 14TH ST				
199	TS	857	IL 38 @		KA	T-1A	ON
			PECK RD				
200	TS	858	IL 38 @		KA	T-1A	ON
			WILLIAMSBURG AVE				
201	TS	859	IL 38 @		KA	T-1A	ON
			LAFOX ST				
202	TS	860	US 30 @		KA	T-1A	ON
			CROSS ST				
203	TS	861	US 30 @		KA	T-1A	ON
			MUNICIPAL DRIVE				
204	TS	862	US 30 @		KA	T-1A	ON
			DUGAN RD				
205	TS	865	IL 47 @		KA	T-1A	ON
			GALENA BLVD				
206	TS	868	IL 47 @		KA	T-1A	ON
			BLISS RD WHEELER RD				
207	TS	869	IL 47 @		KA	T-1A	ON
			WAUBONSEE DR				
208	TS	870	IL 64 MAIN ST @		KA	T-1A	ON
			KIRK RD				
209	TS	871	IL 47 @		KA	T-1A	ON
			WAUBONSEE DR OLD OAKS N ENT				
210	TS	872	IL 56 @		KA	T-1A	ON
			GALENA BLVD EAST RAMP				
211	TS	873	IL 56 @		KA	T-1A	ON
			GALENA BLVD WEST RAMP				
212	TS	877	IL 64 MAIN ST @		KA	T-1A	ON
			PECK RD				
213	TS	878	IL 64 NORTH AVE @		KA	T-1A	ON
			LA FOX RD BURLINGTON RD				

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214	TS	880	IL 68 PENNY RD @ IL 72 HIGGINS RD	KA	T-1A	ON	EAST DUNDEE
215	TS	883	IL 68 DUNDEE RD @ GOLFVIEW LN	KA	T-1A	ON	CARPENTERSVILLE
216	TS	885	IL 72 MAIN ST @ RIVER ST	KA	T-1A	ON	EAST DUNDEE
217	TS	888	IL 53 ROHLWING RD @ IL 390 TLWY WB FRONTAGE NORTH	DU	T-1A	ON	ITASCA
218	TS	889	IL 53 ROHLWING RD @ IL 390 TLWY EB FRONTAGE SOUTH	DU	T-1A	ON	ITASCA
219	TS	890	IL 72 MAIN ST @ VAN BUREN ST	KA	T-1A	ON	EAST DUNDEE
220	TS	895	IL 72 MAIN ST @ 1ST ST	KA	T-1A	ON	WEST DUNDEE
221	TS	900	IL 72 MAIN ST @ 2ND ST	KA	T-1A	ON	WEST DUNDEE
222	TS	902	IL 72 HIGGINS RD @ REINKING RD	KA	T-1A	ON	PINGREE GROVE
223	TS	904	IL 72 @ RICHARD J BROWN BLVD -W OF REINKING	KA	T-1A	ON	PINGREE GROVE
224	TS	905	IL 72 MAIN ST @ ROCK RD	KA	T-1A	ON	EAST DUNDEE
225	TS	924	IL 1 @ CRETE MONEE RD	WI	T-1A	ON	CRETE
226	TS	925	IL 176 @ I 94 TLWY WEST RAMP	LA	T-1A	ON	LAKEMOOR
227	TS	930	IL 176 @ I 94 TLWY EAST RAMP LAMBS FARM	LA	T-1A	ON	LIBERTYVILLE
228	TS	935	IL 137 BUCKLEY RD @ I 94 TLWY WEST RAMP	LA	T-1A	ON	LIBERTYVILLE
229	TS	936	IL 137 BUCKLEY RD @ I 94 TLWY EAST RAMP	LA	T-1A	ON	LIBERTYVILLE
230	TS	940	US 12 RAND @	LA	T-1A	ON	

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			IL 22 MAIN ST	LAKE ZURICH		
231	TS	941	IL 22 @	LA	T-1A	ON
			VILLAGE SQ NORTH LAKE COMMONS	LAKE ZURICH		
232	TS	945	US 12 @	LA	T-1A	ON
			GRAND AVE	FOX LAKE		
233	TS	955	US 12 RAND @	LA	T-1A	ON
			QUENTIN RD	KILDEER		
234	TS	957	US 12 @	LA	T-1A	ON
			QUENTIN RD COLLECTION	KILDEER		
235	TS	960	US 12 RAND RD @	LA	T-1A	ON
			OLD RAND RD LAKE SHORE DR	WAUCONDA		
236	TS	965	US 12 @	LA	T-1A	ON
			LONG GROVE RD	LINDENHURST		
237	TS	966	IL 53 @	LA	T-1A	ON
			LONG GROVE RD	KILDEER		
238	TS	967	US 12 RAND RD @	LA	T-1A	ON
			OLD RAND RD SOUTH	LAKE ZURICH		
239	TS	969	US 12 @	LA	T-1A	ON
			DEER PARK	DEER PARK		
240	TS	975	US 12 @	LA	T-1A	ON
			CUBA RD	LAKE ZURICH		
241	TS	982	HIGHLAND AVE @	DU	T-1A	ON
			EAST GATE	LOMBARD		
242	TS	990	IL 53 ROHLWING RD @	DU	T-1A	ON
			NORDIC RD	ITASCA		
243	TS	992	IL 53 ROHLWING RD @	DU	T-1A	ON
			SPRING LAKE DR	ITASCA		
244	TS	995	IL 53 ROHLWING RD @	DU	T-1A	ON
			ARDMORE AVE	ITASCA		
245	TS	1000	IL 31 @	KA	T-1A	ON
			IL 72	WEST DUNDEE		
246	TS	1007	123 RD ST MCCARTHY RD @	CO	T-1A	ON
			WILL COOK RD	LEMONT		

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247	TS	1008	123 RD ST MCCARTHY RD @ WALKER RD	CO	T-1A	ON	LEMONT
248	TS	1009	123 RD ST MCCARTHY RD @ BELL RD	CO	T-1A	ON	LEMONT
249	TS	1010	US 12 20 45 MANNHEIM RD @ US 20 LAKE ST	CO	T-1A	ON	MELROSE PARK
250	TS	1011	123 RD ST MCCARTHY RD @ WOLF RD	CO	T-1A	ON	PALOS PARK
251	TS	1015	US 12 20 45 MANNHEIM RD @ IL 38 ROOSEVELT RD	CO	T-1A	ON	WESTCHESTER
252	TS	1020	US 12 20 45 MANNHEIM RD @ WASHINGTON BLVD	CO	T-1A	ON	BELLWOOD
253	TS	1022	US 20 LAKE ST @ IL 59 NORTH RAMP	CO	T-1A	ON	BARTLETT
254	TS	1023	US 20 LAKE ST @ IL 59 SOUTH RAMP	CO	T-1A	ON	BARTLETT
255	TS	1025	US 12 20 45 LAGRANGE RD @ 31ST ST	CO	T-1A	ON	LAGRANGE PARK
256	TS	1030	US 12 20 45 LAGRANGE RD @ 47TH ST	CO	T-1A	ON	LAGRANGE PARK
257	TS	1035	US 12 20 45 LAGRANGE RD @ 55TH ST	CO	T-1A	ON	COUNTRYSIDE
258	TS	1040	US 12 20 45 LAGRANGE RD @ 67TH ST	CO	T-1A	ON	HODGKINS
259	TS	1043	US 12 20 45 LAGRANGE RD @ 63RD ST	CO	T-1A	ON	HODGKINS
260	TS	1045	US 12 20 45 LAGRANGE RD @ 87TH ST	CO	T-1A	ON	WILLOW SPRINGS
261	TS	1050	US 12 20 45 LAGRANGE RD @ CERMAK RD	CO	T-1A	ON	WESTCHESTER
262	TS	1055	US 12 20 45 LAGRANGE RD @ COUNTRYSIDE PLAZA	CO	T-1A	ON	COUNTRYSIDE
263	TS	1060	US 12 20 45 LAGRANGE RD @	CO	T-1A	ON	

			JOLIET RD	COUNTRYSIDE		
264	TS	1065	US 12 20 45 LAGRANGE RD @ PLAINFIELD RD	CO	T-1A	ON
265	TS	1070	US 12 20 45 MANNHEIM RD @ RANDOLPH ST	CO	T-1A	ON
266	TS	1075	US 12 20 45 MANNHEIM RD @ ST CHARLES RD	CO	T-1A	ON
267	TS	1080	US 12 20 45 MANNHEIM RD @ MADISON ST	CO	T-1A	ON
268	TS	1084	IL 113 (MAIN ST) IL 129 WASHINGTON ST & IL 53		T-1A	ON
269	TS	1090	US 12 45 ELK BLVD @ US 45 DESPLAINES RIVER RD	CO	T-1A	ON
270	TS	1095	US 12 45 MANNHEIM RD @ IL 19 IRVING PARK RD	CO	T-1A	ON
271	TS	1100	US 12 45 MANNHEIM RD @ IL 72 HIGGINS RD	CO	T-1A	ON
272	TS	1102	IL 72 HIGGINS RD @ WILLOW CREEK HEALTH CLUB	CO	T-1A	ON
273	TS	1104	IL 72 HIGGINS RD LEE ST @ I 90 NW RAMP	CO	T-1A	ON
274	TS	1105	US 12 45 MANNHEIM RD @ ARMITAGE AVE	CO	T-1A	ON
275	TS	1106	IL 72 HIGGINS RD LEE ST @ I 90 SE RAMP	CO	T-1A	ON
276	TS	1110	US 12 45 MANNHEIM RD @ FULLERTON AVE	CO	T-1A	ON
277	TS	1114	US 12 45 MANNHEIM RD @ WRIGHTWOOD	CO	T-1A	ON
278	TS	1115	US 12 45 MANNHEIM RD @ MELROSE CROSSING N ENT	CO	T-1A	ON
279	TS	1120	US 12 45 MANNHEIM RD @ MELROSE CROSSING S ENT	CO	T-1A	ON

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280	TS	1125	US 12 45 MANNHEIM RD @ LAWRENCE AVE	CO	T-1A	ON	SCHILLER PARK
281	TS	1135	US 12 45 MANNHEIM RD @ TOUHY AVE	CO	T-1A	ON	
282	TS	1137	US 12 45 MANNHEIM RD @ LUNT AVE	CO	T-1A	ON	DESPLAINES
283	TS	1140	US 12 45 MANNHEIM RD @ UNITED PKWY	CO	T-1A	ON	SCHILLER PARK
284	TS	1145	US 12 45 MANNHEIM RD @ MONTROSE	CO	T-1A	ON	CHICAGO
285	TS	1150	US 12 IL 53 RAND RD @ IL 53 HICKS RD	CO	T-1A	ON	PALATINE
286	TS	1165	US 14 IL 58 DEMPSTER ST @ US 14 IL 43 WAUKEGAN RD	CO	T-1A	ON	MORTON GROVE
287	TS	1170	US 14 NORTHWEST HWY @ US 14 BALDWIN RD @ COLFAX	CO	T-1A	ON	
288	TS	1172	US 14 NORTHWEST HWY @ STERLING AVE	CO	T-1A	ON	PALATINE
289	TS	1175	US 14 CALDWELL AVE @ US 14 IL 43 WAUKEGAN RD	CO	T-1A	ON	MORTON GROVE
290	TS	1180	US 14 NORTHWEST HWY @ IL 53 EAST RAMP	CO	T-1A	ON	PALATINE
291	TS	1185	US 14 NORTHWEST HWY @ IL 53 WEST RAMP	CO	T-1A	ON	PALATINE
292	TS	1190	US 14 NORTHWEST HWY @ BENTON ST	CO	T-1A	ON	PALATINE
293	TS	1200	US 14 DEMPSTER ST @ CUMBERLAND AVE	CO	T-1A	ON	NILES
294	TS	1205	US 14 DEMPSTER ST @ DEE RD	CO	T-1A	ON	PARK RIDGE
295	TS	1210	US 14 DEMPSTER ST @ GREENWOOD AVE	CO	T-1A	ON	PARK RIDGE
296	TS	1213	US 14 DEMPSTER ST @	CO	T-1A	ON	

			WESTERN AVE		PARK RIDGE		
297	TS	1215	US 14 CALDWELL AVE @	CO	T-1A	ON	
			GROSS POINT RD		NILES		
298	TS	1220	US 14 DEMPSTER ST @	CO	T-1A	ON	
			HARLEM AVE		NILES		
299	TS	1225	US 14 NORTHWEST HWY @	CO	T-1A	ON	
			HICKS PL LINCOLN ST				
300	TS	1235	US 14 NORTHWEST HWY @	CO	T-1A	ON	
			HICKS PL LINCOLN ST		PALATINE		
301	TS	1236	US 14 @	CO	T-1A	ON	
			ALGONQUIN RD				
302	TS	1237	US 14 @	CO	T-1A	ON	
			LINCOLN AVE				
303	TS	1238	US 14 @	CO	T-1A	ON	
			FOXMOOR RD				
304	TS	1240	US 14 DEMPSTER ST @	CO	T-1A	ON	
			LUTHER LN		PARK RIDGE		
305	TS	1250	US 14 NORTHWEST HWY @	CO	T-1A	ON	
			US POST OFFICE		PALATINE		
306	TS	1255	US 14 NORTHWEST HWY PROSPECT AVE	CO	T-1A	ON	
			MT PROSPECT RD				
307	TS	1260	US 14 CALDWELL AVE @	CO	T-1A	ON	
			OAKTON ST		NILES		
308	TS	1265	US 14 DEMPSTER ST @	CO	T-1A	ON	
			OZARK		NILES		
309	TS	1270	US 14 NORTHWEST HWY @	CO	T-1A	ON	
			PALATINE RD		PALATINE		
310	TS	1275	US 14 DEMPSTER ST @	CO	T-1A	ON	
			POTTER RD		PARK RIDGE		
311	TS	1280	US 14 BALDWIN RD @	CO	T-1A	ON	
			QUENTIN RD		PALATINE		
312	TS	1285	US 14 DEMPSTER ST @	CO	T-1A	ON	
			RAND RD		DESPLAINES		

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313	TS	1290	US 14 NORTHWEST HWY @ ROHLWING RD	CO	T-1A	ON
314	TS	1295	US 14 DEMPSTER ST @ SHERMER RD	CO	T-1A	ON NILES
315	TS	1300	US 14 NORTHWEST HWY @ SMITH RD	CO	T-1A	ON PALATINE
316	TS	1305	US 14 CALDWELL AVE @ TOUHY AVE	CO	T-1A	ON NILES
317	TS	1310	US 14 NORTHWEST HWY @ WILKE RD	CO	T-1A	ON
318	TS	1315	US 14 NORTHWEST HWY @ PLUM GROVE RD	CO	T-1A	ON PALATINE
319	TS	1320	US 20 LAKE ST @ BLUFF CITY RD	CO	T-1A	ON LOVEL ELGIN
320	TS	1325	US 20 LAKE ST @ OAK ST	CO	T-1A	ON BARTLETT
321	TS	1330	US 20 LAKE ST @ PARK	CO	T-1A	ON BARTLETT
322	TS	1335	US 20 LAKE ST @ 44TH ST	CO	T-1A	ON MELROSE PARK
323	TS	1338	I 294 TLWY RAMP @ US 20 LAKE ST	CO	T-1A	ON NORTHLAKE
324	TS	1340	US 30 LINCOLN HWY @ US 30 IL 83 GLENWOOD DYER RD	CO	T-1A	ON LYNWOOD
325	TS	1345	US 30 LINCOLN HWY 14TH ST @ IL 1 CHICAGO RD	CO	T-1A	ON CHICAGO HTS
326	TS	1350	US 30 LINCOLN HWY @ IL 43 HARLEM AVE	CO	T-1A	ON MATTESON
327	TS	1355	US 30 LINCOLN HWY @ IL 50 CICERO AVE	CO	T-1A	ON MATTESON
328	TS	1357	IL 50 CICERO AVE @ 207TH ST BIRCHWOOD	CO	T-1A	ON MATTESON
329	TS	1358	IL 50 CICERO AVE @	CO	T-1A	ON

			MORNING GLORY VILLAGE COMMONS	MATTESON		
330	TS	1360	US 30 LINCOLN HWY @ COTTAGE GROVE AVE	CO	T-1A	ON
331	TS	1365	US 30 LINCOLN HWY @ DIVISON ST	CO	T-1A	ON
332	TS	1370	US 30 LINCOLN HWY @ FORD MOTOR PLANT	CO	T-1A	ON
333	TS	1375	US 30 LINCOLN HWY @ GOVERNORS HWY CRAWFORD	CO	T-1A	ON
334	TS	1376	GOVERNORS HWY @ 212 PL	CO	T-1A	ON
335	TS	1380	US 30 LINCOLN HWY @ HALSTED AVE	CO	T-1A	ON
336	TS	1385	US 30 LINCOLN HWY @ MAIN ST	CO	T-1A	ON
337	TS	1390	US 30 LINCOLN HWY @ OLYMPIAN WAY	CO	T-1A	ON
338	TS	1395	US 30 LINCOLN HWY @ ORCHARD	CO	T-1A	ON
339	TS	1400	US 30 LINCOLN HWY @ RIDGELAND AVE	CO	T-1A	ON
340	TS	1405	US 30 IL 83 LINCOLN HWY @ SAUK TRAIL RD	CO	T-1A	ON
341	TS	1410	US 30 LINCOLN HWY @ STATE ST INDIANA AVE	CO	T-1A	ON
342	TS	1414	US 30 LINCOLN HWY @ CENTER AVE	CO	T-1A	ON
343	TS	1415	US 30 LINCOLN HWY @ TORRENCE AVE	CO	T-1A	ON
344	TS	1420	US 30 LINCOLN HWY @ WESTERN AVE	CO	T-1A	ON
345	TS	1425	US 30 LINCOLN HWY @ WOODLAWN AVE	CO	T-1A	ON

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346	TS	1430	US 30 LINCOLN HWY @ LINDENWOOD LINCOLN MALL	CO	T-1A	ON	MATTESON
347	TS	1435	US 30 LINCOLN HWY @ ASHLAND AVE	CO	T-1A	ON	CHICAGO HTS
348	TS	1437	US 30 LINCOLN HWY @ ACCESS RD TRANSPORTATION	CO	T-1A	ON	FORD HTS
349	TS	1440	US 30 LINCOLN HWY @ BROOKWOOD DR	CO	T-1A	ON	OLYMPIA FIELDS
350	TS	1445	US 30 LINCOLN HWY @ HILLTOP	CO	T-1A	ON	CHICAGO HTS
351	TS	1450	US 30 LINCOLN HWY @ KOSTNER AVE	CO	T-1A	ON	MATTESON
352	TS	1455	US 34 OGDEN AVE @ IL 43 HARLEM	CO	T-1A	ON	
353	TS	1460	US 34 OGDEN AVE @ 39TH MILLER	CO	T-1A	ON	LYONS
354	TS	1465	US 34 OGDEN AVE @ GILBERT RD WILLOW SPRINGS RD	CO	T-1A	ON	LAGRANGE PARK
355	TS	1470	US 34 OGDEN AVE @ JOLIET RD	CO	T-1A	ON	LYONS
356	TS	1485	US 41 IL 50 CICERO AVE @ US 41 LINCOLN AVE	CO	T-1A	ON	SKOKIE
357	TS	1490	US 41 SKOKIE BLVD @ IL 58 DEMPSTER ST	CO	T-1A	ON	SKOKIE
358	TS	1495	US 41 SKOKIE BLVD @ CHURCH ST	CO	T-1A	ON	SKOKIE
359	TS	1500	US 41 LINCOLN AVE @ CRAWFORD AVE PULASKI RD	CO	T-1A	ON	LINCOLNWOOD
360	TS	1503	TOUHY AVE @ ST LOUIS	CO	T-1A	ON	LINCOLNWOOD
361	TS	1505	US 41 LINCOLN AVE @ DEVON AVE	CO	T-1A	ON	LINCOLNWOOD
362	TS	1510	US 41 SKOKIE BLVD @	CO	T-1A	ON	

			EAST LAKE		WILMETTE		
363	TS	1515	US 41 SKOKIE BLVD @ EDENS PLAZA		CO	T-1A	ON
364	TS	1520	US 41 SKOKIE BLVD @ EMERSON		CO	T-1A	ON
365	TS	1525	US 41 SKOKIE BLVD @ GOLF RD		CO	T-1A	ON
366	TS	1530	US 41 SKOKIE BLVD @ GROSS POINT RD		CO	T-1A	ON
367	TS	1535	US 41 SKOKIE BLVD @ HIBBARD		CO	T-1A	ON
368	TS	1540	US 41 SKOKIE BLVD @ HOWARD ST		CO	T-1A	ON
369	TS	1545	US 41 SKOKIE BLVD @ KOSTNER AVE		CO	T-1A	ON
370	TS	1555	US 41 SKOKIE BLVD @ FOSTER AVE		CO	T-1A	ON
371	TS	1560	US 41 SKOKIE BLVD @ MAIN ST		CO	T-1A	ON
372	TS	1565	US 41 SKOKIE BLVD @ NEW GLENVIEW RD		CO	T-1A	ON
373	TS	1570	US 41 SKOKIE BLVD @ NILES CENTER RD		CO	T-1A	ON
374	TS	1574	NILES CENTER RD @ FARGO		CO	T-1A	ON
375	TS	1575	US 41 SKOKIE RD @ OAKTON ST		CO	T-1A	ON
376	TS	1577	US 41 SKOKIE RD @ SEARLE PKWY		CO	T-1A	ON
377	TS	1580	US 41 SKOKIE BLVD @ OLD GLENVIEW RD		CO	T-1A	ON
378	TS	1590	US 41 SKOKIE BLVD @ OLD ORCHARD		CO	T-1A	ON

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379	TS	1595	US 41 SKOKIE BLVD @ OLD ORCHARD SHOPPING CTR NORTH E	CO WILMETTE	T-1A	ON
380	TS	1600	US 41 SKOKIE BLVD @ OLD ORCHARD SHOPPING CTR CTR	CO WILMETTE	T-1A	ON
381	TS	1605	US 41 SKOKIE BLVD @ OLD ORCHARD SHOPPING CTR SOUTH E	CO WILMETTE	T-1A	ON
382	TS	1610	US 41 LINCOLN AVE @ PRATT	CO LINCOLNWOOD	T-1A	ON
383	TS	1613	CRAWFORD AVE @ PRATT	CO LINCOLNWOOD	T-1A	ON
384	TS	1615	US 41 LINCOLN AVE @ TOUHY AVE	CO SKOKIE	T-1A	ON
385	TS	1617	TOUHY AVE @ KILBOURN AVE	CO LINCOLNWOOD	T-1A	ON
386	TS	1620	US 41 SKOKIE BLVD @ WILMETTE AVE	CO WILMETTE	T-1A	ON
387	TS	1625	US 45 DESPLAINES RIVER RD @ IL 58 GOLF RD	CO DESPLAINES	T-1A	ON
388	TS	1626	US 45 DESPLAINES RIVER RD @ NAZARETH WAY HOLY FAMILY	CO DESPLAINES	T-1A	ON
389	TS	1630	US 45 LAGRANGE RD @ 107TH ST	CO PALOS HTS	T-1A	ON
390	TS	1631	111TH ST @ 84TH AVE	CO PALOS HILLS	T-1A	ON
391	TS	1632	111TH ST @ KEAN AVE	CO PALOS HILLS	T-1A	ON
392	TS	1633	107TH ST @ 104TH	CO PALOS HTS	T-1A	ON
393	TS	1634	104TH AVE FLAVIN RD @ 95TH ST	CO PALOS TWNSHP	T-1A	ON
394	TS	1635	US 45 LAGRANGE RD @ 111TH ST	CO PALOS HILLS	T-1A	ON
395	TS	1640	US 45 LAGRANGE RD @	CO	T-1A	ON

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			131ST ST	ORLAND PARK		
396	TS	1641	US 45 LAGRANGE RD @ CREEK RD	CO	T-1A	ON
				PALOS PARK		
397	TS	1645	US 45 LAGRANGE RD @ 135TH ST	CO	T-1A	ON
				ORLAND PARK		
398	TS	1650	US 45 LAGRANGE RD @ 143RD ST	CO	T-1A	ON
				ORLAND PARK		
399	TS	1651	US 45 LAGRANGE RD @ 142ND ST	CO	T-1A	ON
				ORLAND PARK		
400	TS	1655	US 45 LAGRANGE RD @ 147TH ST	CO	T-1A	ON
				ORLAND PARK		
401	TS	1660	US 45 LAGRANGE RD @ 149TH ST	CO	T-1A	ON
				ORLAND PARK		
402	TS	1664	US 45 LAGRANGE RD @ 154TH ST DARVIN ENT	CO	T-1A	ON
				ORLAND PARK		
403	TS	1665	US 45 LAGRANGE RD @ 151ST ST	CO	T-1A	ON
				ORLAND PARK		
404	TS	1668	US 45 LAGRANGE RD @ 156TH ST LOWES	CO	T-1A	ON
				ORLAND PARK		
405	TS	1670	US 45 LAGRANGE RD @ 153RD ST	CO	T-1A	ON
				ORLAND PARK		
406	TS	1675	US 45 DESPLAINES RIVER RD @ CENTRAL RD	CO	T-1A	ON
				DESPLAINES		
407	TS	1676	CENTRAL RD @ EAST RIVER RD	CO	T-1A	ON
				DESPLAINES		
408	TS	1677	CENTRAL RD @ OAKTON COMMUNITY COLLEGE CIRCLE DR	CO	T-1A	ON
				DESPLAINES		
409	TS	1680	US 45 DESPLAINES RIVER RD @ EUCLID AVE	CO	T-1A	ON
				MT PROSPECT		
410	TS	1685	US 45 DESPLAINES RIVER RD @ KENSINGTON FOUNDRY	CO	T-1A	ON
				MT PROSPECT		
411	TS	1690	US 45 LAGRANGE RD @ MCCARTHY RD 123 RD ST	CO	T-1A	ON
				PALOS PARK		

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412	TS	1695	US 45 DESPLAINES RIVER RD @ OLD WILLOW RD SEMINOL LN	CO	T-1A	ON	PROSPECT HTS
413	TS	1700	US 45 LAGRANGE RD @ 167TH ST	CO	T-1A	ON	ORLAND HILLS
414	TS	1701	US 45 LAGRANGE RD @ 163RD ST	CO	T-1A	ON	ORLAND HILLS
415	TS	1705	US 45 LAGRANGE RD @ LAKEVIEW PLAZA DR	CO	T-1A	ON	ORLAND PARK
416	TS	1710	US 45 LAGRANGE RD @ CARL SANDBURG HIGH SCHOOL	CO	T-1A	ON	PALOS PARK
417	TS	1712	US 45 DESPLAINES RIVER RD @ CAMP MCDONALD RD	CO	T-1A	ON	MT PROSPECT
418	TS	1720	US 45 IL 21 MILWAUKEE AVE @ HINTZ RD	CO	T-1A	ON	WHEELING
419	TS	1724	US 45 IL 21 MILWAUKEE AVE @ LAKE COOK RD SOUTH RAMP B & C	CO	T-1A	ON	WHEELING
420	TS	1726	US 45 IL 21 MILWAUKEE AVE @ LAKE COOK RD NORTH RAMP A & D	CO	T-1A	ON	WHEELING
421	TS	1730	US 45 IL 21 MILWAUKEE AVE @ WOLF RD	CO	T-1A	ON	WHEELING
422	TS	1735	US 45 IL 21 MILWAUKEE AVE @ APPLE DR	CO	T-1A	ON	PROSPECT HTS
423	TS	1740	US 45 IL 21 MILWAUKEE AVE @ PALATINE NORTH RAMP	CO	T-1A	ON	PROSPECT HTS
424	TS	1745	US 45 IL 21 MILWAUKEE AVE @ PALATINE SOUTH RAMP	CO	T-1A	ON	PROSPECT HTS
425	TS	1750	US 45 LAGRANGE RD @ 144TH PL	CO	T-1A	ON	ORLAND PARK
426	TS	1755	IL 1 HALSTED @ IL 1 CUTOFF PARKSIDE	CO	T-1A	ON	CHICAGO HTS
427	TS	1760	IL 1 HALSTED ST @ IL 1 VINCENNES	CO	T-1A	ON	PHOENIX
428	TS	1765	IL 83 SIBLEY 147TH ST @	CO	T-1A	ON	

			IL 1 HALSTED	HARVEY		
429	TS	1770	IL 1 CHICAGO @ 15TH	CO	T-1A	ON
				CHICAGO HTS		
430	TS	1775	IL 1 CHICAGO @ 16TH ST	CO	T-1A	ON
				CHICAGO HTS		
431	TS	1780	IL 1 CHICAGO @ 26TH ST	CO	T-1A	ON
				CHICAGO HTS		
432	TS	1785	IL 1 HALSTED @ 123RD	CO	T-1A	ON
				CHICAGO		
433	TS	1790	IL 1 HALSTED @ 127TH ST	CO	T-1A	ON
				CALUMET PARK		
434	TS	1795	IL 1 HALSTED @ 138TH	CO	T-1A	ON
				RIVERDALE		
435	TS	1800	IL 1 HALSTED @ 149TH	CO	T-1A	ON
				HARVEY		
436	TS	1805	IL 1 HALSTED ST @ 152ND	CO	T-1A	ON
				PHOENIX		
437	TS	1810	IL 1 HALSTED @ 157TH ST	CO	T-1A	ON
				HARVEY		
438	TS	1827	IL 1 HALSTED ST @ 174TH ST	CO	T-1A	ON
				EAST HAZEL CREST		
439	TS	1830	IL 1 HALSTED @ 183RD ST	CO	T-1A	ON
				HOMEWOOD		
440	TS	1835	IL 1 HALSTED @ HOLBROOK	CO	T-1A	ON
				GLENWOOD		
441	TS	1840	IL 1 HALSTED @ 187TH	CO	T-1A	ON
				HOMEWOOD		
442	TS	1845	IL 1 HALSTED CUT OFF @ RIEGEL RD CHICAGO RD	CO	T-1A	ON
				CHICAGO HTS		
443	TS	1850	IL 1 HALSTED @ JOE ORR RD	CO	T-1A	ON
				CHICAGO HTS		
444	TS	1855	IL 1 HALSTED @ RIDGE RD	CO	T-1A	ON
				HOMEWOOD		

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445	TS	1860	IL 1 CHICAGO @ SAUK TRAIL RD	CO	T-1A	ON	SOUTH CHICAGO HTS
446	TS	1865	IL 1 CHICAGO @ STEGER RD	CO	T-1A	ON	STEGER
447	TS	1870	IL 1 HALSTED @ VOLLMER RD	CO	T-1A	ON	GLENWOOD
448	TS	1875	IL 1 HALSTED @ MAPLE GATE 3	CO	T-1A	ON	HOMEWOOD
449	TS	1880	IL 1 HALSTED @ 175TH	CO	T-1A	ON	HOMEWOOD
450	TS	1885	IL 1 CHICAGO VINCENNES @ DIXIE HWY	CO	T-1A	ON	CHICAGO HTS
451	TS	1890	IL 7 SOUTHWEST HWY @ IL 43 HARLEM AVE	CO	T-1A	ON	WORTH
452	TS	1895	IL 7 SOUTHWEST HWY @ IL 83 CAL SAG 80TH AVE	CO	T-1A	ON	PALOS PARK
453	TS	1899	80TH AVE @ 123RD MCCARTHY	CO	T-1A	ON	PALOS PARK
454	TS	1900	IL 7 SOUTHWEST HWY @ 111TH ST	CO	T-1A	ON	WORTH
455	TS	1903	IL 7 SOUTHWEST HWY @ 117TH	CO	T-1A	ON	PALOS HTS
456	TS	1904	IL 7 SOUTHWEST HWY @ METRA TRAIN STATION 114TH PL	CO	T-1A	ON	PALOS HTS
457	TS	1905	IL 7 SOUTHWEST HWY @ 131ST ST	CO	T-1A	ON	ORLAND PARK
458	TS	1910	IL 7 SOUTHWEST HWY @ 135TH ST	CO	T-1A	ON	ORLAND PARK
459	TS	1911	131ST ST @ 76TH AVE	CO	T-1A	ON	ORLAND PARK
460	TS	1913	131ST ST @ 86TH AVE	CO	T-1A	ON	PALOS HILLS
461	TS	1920	IL 7 143RD ST @	CO	T-1A	ON	

			WEST AVE 100TH AVE	ORLAND PARK		
462	TS	1925	IL 19 IRVING PARK RD @	CO	T-1A	ON
			IL 43 HARLEM AVE	NORRIDGE		
463	TS	1930	IL 19 IRVING PARK RD @	CO	T-1A	ON
			IL 59 NEW SUTTON RD	STREAMWOOD		
464	TS	1932	IL 19 IRVING PARK RD @	CO	T-1A	ON
			MADISON ST	STREAMWOOD		
465	TS	1935	IL 19 IRVING PARK RD @	CO	T-1A	ON
			BARTLETT RD	STREAMWOOD		
466	TS	1937	IL 59 @	CO	T-1A	ON
			GULF KEYS	STREAMWOOD		
467	TS	1940	IL 171 CUMBERLAND AVE @	CO	T-1A	ON
			IL 19 IRVING PARK RD	CHICAGO		
468	TS	1945	IL 19 IRVING PARK RD @	CO	T-1A	ON
			DESPLAINES RIVER RD	SCHILLER PARK		
469	TS	1948	DESPLAINES RIVER RD @	CO	T-1A	ON
			IVANHOE	SCHILLER PARK		
470	TS	1950	IL 19 IRVING PARK RD @	CO	T-1A	ON
			FOREST PRESERVE DR	NORRIDGE		
471	TS	1953	IL 19 IRVING PARK RD @	CO	T-1A	ON
			JUDD AVE	SCHILLER PARK		
472	TS	1955	IL 19 IRVING PARK RD @	CO	T-1A	ON
			ORIOLE	NORRIDGE		
473	TS	1957	IL 19 IRVING PARK RD @	CO	T-1A	ON
			SEYMOUR AVE	FRANKLIN PARK		
474	TS	1960	IL 19 IRVING PARK RD @	CO	T-1A	ON
			RUBY 25TH	SCHILLER PARK		
475	TS	1965	IL 19 IRVING PARK RD @	CO	T-1A	ON
			SPRINGINSGUTH	SCHAUMBURG		
476	TS	1970	IL 19 IRVING PARK RD @	CO	T-1A	ON
			WESLEY TERRACE	SCHILLER PARK		
477	TS	1975	IL 19 IRVING PARK RD @	CO	T-1A	ON
			WISE RD	SCHAUMBURG		

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478	TS	1976	IL 19 IRVING PARK RD @ MERCURY	CO	T-1A	ON	SCHAUMBURG
479	TS	1980	IL 19 IRVING PARK RD @ SUNNYDALE	CO	T-1A	ON	STREAMWOOD
480	TS	1985	IL 19 IRVING PARK RD @ EAST AVE	CO	T-1A	ON	HANOVER PARK
481	TS	1995	IL 21 MILWAUKEE AVE @ IL 58 GOLF RD	CO	T-1A	ON	NILES
482	TS	2000	IL 21 MILWAUKEE AVE @ BALLARD	CO	T-1A	ON	NILES
483	TS	2005	IL 21 MILWAUKEE AVE @ CENTRAL RD	CO	T-1A	ON	GLENVIEW
484	TS	2010	IL 21 MILWAUKEE AVE @ DEARLOVE RD GLENVIEW RD	CO	T-1A	ON	GLENVIEW
485	TS	2015	IL 21 MILWAUKEE AVE @ GREENWOOD AVE	CO	T-1A	ON	NILES
486	TS	2025	IL 21 MILWAUKEE AVE @ MAIN ST (IN	CO	T-1A	ON	
487	TS	2030	IL 21 MILWAUKEE AVE @ MARYLAND ST CHURCH ST	CO	T-1A	ON	
488	TS	2035	IL 21 MILWAUKEE AVE @	CO	T-1A	ON	
489	TS	2040	IL 21 MILWAUKEE AVE @ OAKTON ST	CO	T-1A	ON	
490	TS	2045	IL 21 MILWAUKEE AVE @ SANDERS RD	CO	T-1A	ON	GLENVIEW
491	TS	2050	IL 21 MILWAUKEE AVE @ EUCLID WEST LAKE	CO	T-1A	ON	GLENVIEW
492	TS	2055	IL 21 MILWAUKEE AVE @ CASTILLIAN CT AON DR	CO	T-1A	ON	GLENVIEW
493	TS	2065	IL 21 MILWAUKEE AVE @ GOLF MILL NORTH DR	CO	T-1A	ON	NILES
494	TS	2070	IL 38 ROOSEVELT RD @	CO	T-1A	ON	

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			HAMILTON HARRISON ST	HILLSIDE		
495	TS	2075	IL 38 ROOSEVELT RD @ WOLF RD	CO	T-1A	ON
496	TS	2077	IL 38 ROOSEVELT RD @ FENCL	CO	T-1A	ON
497	TS	2080	IL 43 HARLEM AVE @ IL 43 OAKTON ST	CO	T-1A	ON
498	TS	2085	IL 43 WAUKEGAN RD @ IL 43 OAKTON ST	CO	T-1A	ON
499	TS	2087	OAKTON ST @ NILES CIVIC CENTER PLAZA	CO	T-1A	ON
500	TS	2090	IL 43 IL 58 WAUKEGAN RD @ IL 58 GOLF RD	CO	T-1A	ON
501	TS	2100	IL 43 WAUKEGAN RD @ IL 68 DUNDEE RD	CO	T-1A	ON
502	TS	2110	IL 43 HARLEM AVE @ 16TH ST	CO	T-1A	ON
503	TS	2115	IL 43 HARLEM AVE @ 23RD ST	CO	T-1A	ON
504	TS	2120	IL 43 HARLEM AVE @ 25TH ST	CO	T-1A	ON
505	TS	2125	IL 43 HARLEM AVE @ 26TH ST	CO	T-1A	ON
506	TS	2130	IL 43 HARLEM AVE @ 39TH ST PERSHING RD	CO	T-1A	ON
507	TS	2135	IL 43 HARLEM AVE @ 47TH ST	CO	T-1A	ON
508	TS	2145	IL 43 HARLEM AVE @ 60TH ST	CO	T-1A	ON
509	TS	2150	IL 43 HARLEM AVE @ 63RD ST	CO	T-1A	ON
510	TS	2155	IL 43 HARLEM AVE @ 63RD ST CUTOFF	CO	T-1A	ON

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511	TS	2160	IL 43 HARLEM AVE @ 65TH ST	CO	T-1A	ON
512	TS	2165	IL 43 HARLEM AVE @ 71ST ST	CO	T-1A	ON BRIDGEVIEW
513	TS	2170	IL 43 HARLEM AVE @ 75TH PL	CO	T-1A	ON BRIDGEVIEW
514	TS	2175	IL 43 HARLEM AVE @ 79TH PL	CO	T-1A	ON BRIDGEVIEW
515	TS	2180	IL 43 HARLEM AVE @ 83RD ST	CO	T-1A	ON BRIDGEVIEW
516	TS	2185	IL 43 HARLEM AVE @ 87TH ST	CO	T-1A	ON BRIDGEVIEW
517	TS	2190	IL 43 HARLEM AVE @ 88TH ST SOUTHFIELD SHOPPING CTR	CO	T-1A	ON BRIDGEVIEW
518	TS	2195	IL 43 HARLEM AVE @ 90TH ST CAMBRIDGE ST	CO	T-1A	ON BRIDGEVIEW
519	TS	2200	IL 43 HARLEM AVE @ 99TH ST	CO	T-1A	ON CHICAGO RIDGE
520	TS	2205	IL 43 HARLEM AVE @ 103RD ST	CO	T-1A	ON CHICAGO RIDGE
521	TS	2210	IL 43 HARLEM AVE @ 111TH ST	CO	T-1A	ON WORTH
522	TS	2225	IL 43 HARLEM AVE @ 127TH ST	CO	T-1A	ON PALOS HTS
523	TS	2226	IL 171 ARCHER AVE @ 127TH ST	CO	T-1A	ON LEMONT
524	TS	2235	IL 43 HARLEM AVE @ 135TH ST	CO	T-1A	ON PALOS HTS
525	TS	2240	IL 43 HARLEM AVE @ 151TH ST	CO	T-1A	ON ORLAND PARK
526	TS	2245	IL 43 HARLEM AVE @ 175TH ST	CO	T-1A	ON TINLEY PARK
527	TS	2250	IL 43 HARLEM AVE @	CO	T-1A	ON

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			157TH ST		ORLAND PARK		
528	TS	2255	IL 43 HARLEM AVE @		CO	T-1A	ON
			183RD ST				
					TINLEY PARK		
529	TS	2256	183RD ST @		CO	T-1A	ON
			OAK PARK AVE				
					TINLEY PARK		
530	TS	2265	IL 43 HARLEM AVE @		CO	T-1A	ON
			ARMITAGE AVE				
					ELMWOOD PARK		
531	TS	2275	IL 43 HARLEM AVE @		CO	T-1A	ON
			BLOOMINGDALE				
					ELMWOOD PARK		
532	TS	2280	IL 43 HARLEM AVE @		CO	T-1A	ON
			22ND ST CERMAK RD				
					BERWYN		
533	TS	2285	IL 43 WAUKEGAN RD @		CO	T-1A	ON
			CHESTNUT ST				
					GLENVIEW		
534	TS	2300	IL 43 WAUKEGAN RD @		CO	T-1A	ON
			EAST LAKE				
					GLENVIEW		
535	TS	2305	IL 43 HARLEM AVE @		CO	T-1A	ON
			FOREST PRESERVE DR				
					NORRIDGE		
536	TS	2310	IL 43 HARLEM AVE @		CO	T-1A	ON
			FOSTER AVE				
					HARWOOD HTS		
537	TS	2325	IL 43 HARLEM AVE @		CO	T-1A	ON
			LAWRENCE AVE				
					HARWOOD HTS		
538	TS	2335	IL 43 HARLEM AVE @		CO	T-1A	ON
			92ND PL STANFORD DR				
					BRIDGEVIEW		
539	TS	2340	IL 43 HARLEM AVE @		CO	T-1A	ON
			84TH ST				
					BRIDGEVIEW		
540	TS	2345	IL 43 HARLEM AVE @		CO	T-1A	ON
			77TH ST				
					BRIDGEVIEW		
541	TS	2355	IL 43 HARLEM AVE @		CO	T-1A	ON
			41ST ST JOLIET RD				
					STICKNEY		
542	TS	2362	LAKE ST @		CO	T-1A	ON
			BONNIE BRAE				
					RIVER FOREST		
543	TS	2367	IL 43 WAUKEGAN RD @		LA	T-1A	ON
			OAKMONT AVE				
					DEERFIELD		

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544	TS	2375	IL 43 HARLEM AVE @ MONTROSE AVE AGATITE	CO	T-1A	ON	NORRIDGE
545	TS	2377	IL 43 HARLEM AVE @ MONTROSE AVE WEST	CO	T-1A	ON	HARWOOD HTS
546	TS	2395	IL 43 HARLEM AVE @ RIVERSIDE DR LONGCOMMON RD	CO	T-1A	ON	RIVERSIDE
547	TS	2401	IL 38 ROOSEVELT RD @ LATHROP	CO	T-1A	ON	FOREST PARK
548	TS	2406	IL 43 WAUKEGAN RD @ FOUNDERS RD	CO	T-1A	ON	NORTHFIELD
549	TS	2410	IL 43 HARLEM AVE @ TOUHY AVE	CO	T-1A	ON	NILES
550	TS	2411	IL 43 HARLEM AVE @ PIONEER PARK JOSWIAK PARK	CO	T-1A	ON	NILES
551	TS	2420	IL 43 HARLEM AVE @ WHEELER	CO	T-1A	ON	ORLAND PARK
552	TS	2425	IL 43 WAUKEGAN AVE @ WILLOW RD	CO	T-1A	ON	NORTHFIELD
553	TS	2430	IL 43 HARLEM AVE @ WILSON AVE	CO	T-1A	ON	HARWOOD HTS
554	TS	2435	IL 43 WAUKEGAN RD @ WINNETKA RD	CO	T-1A	ON	NORTHFIELD
555	TS	2443	IL 50 CICERO AVE @ 34TH ST ACCESS DR	CO	T-1A	ON	CICERO
556	TS	2445	IL 50 CICERO AVE @ 31ST ST	CO	T-1A	ON	CICERO
557	TS	2450	IL 50 CICERO AVE @ 39TH ST PERSHING RD	CO	T-1A	ON	STICKNEY
558	TS	2451	IL 50 CICERO AVE @ BURBANK STATION	CO	T-1A	ON	BURBANK
559	TS	2455	IL 50 CICERO AVE @ 65TH ST	CO	T-1A	ON	CHICAGO
560	TS	2456	IL 50 CICERO AVE @	CO	T-1A	ON	

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			66TH ST	CHICAGO		
561	TS	2460	IL 50 CICERO AVE @	CO	T-1A	ON
			67TH ST MARQUETTE	BEDFORD PARK		
562	TS	2465	IL 50 CICERO AVE @	CO	T-1A	ON
			73RD ST STATE RD	BEDFORD PARK		
563	TS	2470	IL 50 CICERO AVE @	CO	T-1A	ON
			79TH ST	BURBANK		
564	TS	2475	IL 50 CICERO AVE @	CO	T-1A	ON
			83RD ST	BURBANK		
565	TS	2480	IL 50 CICERO AVE @	CO	T-1A	ON
			87TH ST	OAK LAWN		
566	TS	2485	IL 50 CICERO AVE @	CO	T-1A	ON
			94TH ST	OAK LAWN		
567	TS	2490	IL 50 CICERO AVE @	CO	T-1A	ON
			99TH ST	OAK LAWN		
568	TS	2495	IL 50 CICERO AVE @	CO	T-1A	ON
			103RD ST	OAK LAWN		
569	TS	2500	IL 50 CICERO AVE @	CO	T-1A	ON
			107TH ST	OAK LAWN		
570	TS	2505	IL 50 CICERO AVE @	CO	T-1A	ON
			110TH ST	OAK LAWN		
571	TS	2510	IL 50 CICERO AVE @	CO	T-1A	ON
			111TH ST	OAK LAWN		
572	TS	2512	111TH ST @	CO	T-1A	ON
			JODAN DR LARAMIE	OAK LAWN		
573	TS	2525	IL 50 CICERO AVE @	CO	T-1A	ON
			80TH	BURBANK		
574	TS	2530	IL 50 CICERO AVE @	CO	T-1A	ON
			91ST ST	OAK LAWN		
575	TS	2535	IL 50 CICERO AVE @	CO	T-1A	ON
			76TH PL FORD CITY SOUTH	BEDFORD PARK		
576	TS	2540	IL 50 CICERO AVE @	CO	T-1A	ON
			88TH AVE	OAK LAWN		

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577	TS	2545	IL 50 CICERO AVE @ 75TH PL FORD CITY NORTH	CO	T-1A	ON	BEDFORD PARK
578	TS	2550	IL 50 CICERO AVE @ 72ND ST	CO	T-1A	ON	BEDFORD PARK
579	TS	2560	IL 50 CICERO AVE @ 123RD ST	CO	T-1A	ON	ALSIP
580	TS	2565	IL 50 IL 83 CICERO AVE @ IL 83 127TH ST	CO	T-1A	ON	ALSIP
581	TS	2566	IL 83 127TH ST @ I 294 TLWY EAST RAMP	CO	T-1A	ON	ALSIP
582	TS	2567	IL 83 127TH ST @ I 294 TLWY WEST RAMP	CO	T-1A	ON	ALSIP
583	TS	2570	IL 50 CICERO AVE @ 151ST ST	CO	T-1A	ON	OAK FOREST
584	TS	2575	IL 50 CICERO AVE @ 155TH ST	CO	T-1A	ON	OAK FOREST
585	TS	2580	IL 50 CICERO AVE @ 167TH ST	CO	T-1A	ON	OAK FOREST
586	TS	2585	IL 50 CICERO AVE @ 183RD ST	CO	T-1A	ON	COUNTRY CLUB HILLS
587	TS	2590	IL 50 CICERO AVE @ DEVON AVE	CO	T-1A	ON	LINCOLNWOOD
588	TS	2595	IL 50 CICERO AVE @ FIELDCREST DR 166TH	CO	T-1A	ON	OAK FOREST
589	TS	2600	IL 50 CICERO AVE @ FLOSSMOOR RD	CO	T-1A	ON	COUNTRY CLUB HILLS
590	TS	2605	IL 50 CICERO AVE @ PRATT AVE	CO	T-1A	ON	LINCOLNWOOD
591	TS	2610	IL 50 CICERO AVE @ ROOSEVELT RD	CO	T-1A	ON	CICERO
592	TS	2620	IL 50 CICERO AVE @ SOUTHWEST HWY	CO			
593	TS	2625	IL 50 CICERO AVE @	CO	T-1A	ON	

			TOUHY AVE	LINCOLNWOOD		
594	TS	2630	IL 50 CICERO AVE @ MATTESON TOWN CTR MALL	CO	T-1A	ON
595	TS	2635	IL 50 CICERO AVE @ VOLLMER RD	CO	T-1A	ON
596	TS	2640	IL 50 IL 83 CICERO AVE @ IL 83 147TH SIBLEY BLVD	CO	T-1A	ON
597	TS	2645	IL 50 IL 83 CICERO AVE @ CAL SAG RD	CO	T-1A	ON
598	TS	2649	IL 50 IL 83 CICERO AVE @ RIVERCREST EAST ENT	CO	T-1A	ON
599	TS	2650	IL 50 IL 83 CICERO AVE @ 135TH ST	CO	T-1A	ON
600	TS	2655	IL 50 IL 83 CICERO AVE @ MIDLOTHIAN TURNPIKE	CO	T-1A	ON
601	TS	2665	IL 53 EAST RAMP @ IL 62 ALGONQUIN RD	CO	T-1A	ON
602	TS	2670	IL 53 WEST RAMP @ IL 62 ALGONQUIN RD	CO	T-1A	ON
603	TS	2677	IL 53 HICKS RD @ LAKE COOK RD	CO	T-1A	ON
604	TS	2693	IL 56 BUTTERFIELD RD @ DARMSTADT RD	CO	T-1A	ON
605	TS	2700	IL 58 GOLF RD @ IL 59	CO	T-1A	ON
606	TS	2705	IL 58 GOLF RD @ IL 62 ALGONQUIN RD	CO	T-1A	ON
607	TS	2707	IL 62 ALGONQUIN RD @ LOWES	CO	T-1A	ON
608	TS	2708	IL 62 ALGONQUIN RD @ MARKET PLACE	CO	T-1A	ON
609	TS	2710	IL 58 GOLF RD @ IL 72 HIGGINS RD	CO	T-1A	ON

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610	TS	2715	IL 58 GOLF RD @ IL 83 ELMHURST RD	CO MT PROSPECT	T-1A	ON
611	TS	2720	IL 58 GOLF RD @ ARLINGTON HEIGHTS RD	CO ARLINGTON HTS	T-1A	ON
612	TS	2725	IL 58 GOLF RD @ BARRINGTON RD	CO HOFFMAN ESTATES	T-1A	ON
613	TS	2730	IL 58 GOLF RD @ BARTLETT RD	CO HOFFMAN ESTATES	T-1A	ON
614	TS	2735	IL 58 DEMPSTER ST @ BRONX AVE	CO SKOKIE	T-1A	ON
615	TS	2740	IL 58 GOLF RD @ BUSSE RD	CO MT PROSPECT	T-1A	ON
616	TS	2745	IL 58 DEMPSTER ST @ CTA SKOKIE SWIFT	CO SKOKIE	T-1A	ON
617	TS	2750	IL 58 GOLF RD @ DEE RD	CO NILES	T-1A	ON
618	TS	2755	IL 58 GOLF RD @ EAST RIVER RD	CO DESPLAINES	T-1A	ON
619	TS	2760	IL 58 GOLF RD @ GANNON DR	CO HOFFMAN ESTATES	T-1A	ON
620	TS	2765	IL 58 GOLF RD @ GOEBBERT RD	CO ARLINGTON HTS	T-1A	ON
621	TS	2767	IL 58 GOLF RD @ INTERNATIONAL PLAZA	CO ARLINGTON HTS	T-1A	ON
622	TS	2770	IL 58 GOLF RD @ GALLAGHER WAY	CO ROLLING MEADOWS	T-1A	ON
623	TS	2775	IL 58 GOLF RD @ GREENWOOD AVE	CO NILES	T-1A	ON
624	TS	2780	IL 58 GOLF RD @ HARLEM AVE	CO GLENVIEW	T-1A	ON
625	TS	2785	IL 58 GOLF RD @ 6TH AVE	CO DESPLAINES	T-1A	ON
626	TS	2790	IL 58 GOLF RD @	CO	T-1A	ON

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			HIGHLAND BLVD	SCHAUMBURG		
627	TS	2795	IL 58 GOLF RD @	CO	T-1A	ON
			JONES SALEM DR	SCHAUMBURG		
628	TS	2800	IL 58 GOLF RD @	CO	T-1A	ON
			KRAFT FOODS	GLENVIEW		
629	TS	2805	IL 58 DEMPSTER ST @	CO	T-1A	ON
			LOCKWOOD AVE	SKOKIE		
630	TS	2815	IL 58 GOLF RD @	CO	T-1A	ON
			WILKE RD	ROLLING MEADOWS		
631	TS	2817	IL 58 GOLF RD @	CO	T-1A	ON
			CONTINENTAL TOWERS WALMART	ROLLING MEADOWS		
632	TS	2820	IL 58 DEMPSTER @	CO	T-1A	ON
			NILES CENTER RD	SKOKIE		
633	TS	2825	IL 58 GOLF RD @	CO	T-1A	ON
			OAKTON COMMUNITY COLLEGE	DESPLAINES		
634	TS	2830	IL 58 GOLF RD @	CO	T-1A	ON
			PLUM GROVE RD	SCHAUMBURG		
635	TS	2835	IL 58 GOLF RD @	CO	T-1A	ON
			POTTER RD	DESPLAINES		
636	TS	2840	IL 58 GOLF RD @	CO	T-1A	ON
			ROSELLE RD	SCHAUMBURG		
637	TS	2845	IL 58 GOLF RD @	CO	T-1A	ON
			SHERMER RD	MORTON GROVE		
638	TS	2850	IL 58 GOLF RD @	CO	T-1A	ON
			WASHINGTON ST	NILES		
639	TS	2855	IL 58 GOLF RD @	CO	T-1A	ON
			WESTERN AVE	NILES		
640	TS	2860	IL 58 GOLF RD @	CO	T-1A	ON
			RING RD APOLLO DR	ROLLING MEADOWS		
641	TS	2865	IL 58 GOLF RD @	CO	T-1A	ON
			WOLF RD SEGERS DR	DESPLAINES		
642	TS	2870	IL 58 GOLF RD @	CO	T-1A	ON
			MOON LAKE RD WALNUT LN	HOFFMAN ESTATES		

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643	TS	2875	IL 58 GOLF RD @ MEIER RD	CO	T-1A	ON	ARLINGTON HTS
644	TS	2880	IL 58 GOLF RD @ VALLEY LAKE	CO	T-1A	ON	SCHAUMBURG
645	TS	2885	IL 58 GOLF RD @ FOUR FLAGS SHOPPING CTR	CO	T-1A	ON	NILES
646	TS	2890	HAWTHORNE SUTTON @ IL 68 DUNDEE	CO	T-1A	ON	BARRINGTON HILLS
647	TS	2892	IL 59 NEW SUTTON RD @ BARTLETT RD	CO	T-1A	ON	BARRINGTON HILLS
648	TS	2895	IL 59 @ IL 72 HIGGINS RD	CO	T-1A	ON	HOFFMAN ESTATES
649	TS	2897	IL 59 NEW SUTTON RD @ PENNY RD	CO	T-1A	ON	
650	TS	2899	IL 59 @ ARBORETUM BLVD	CO	T-1A	ON	SOUTH BARRINGTON
651	TS	2900	IL 59 HOUGH RD @ BARRINGTON RD	CO	T-1A	ON	BARRINGTON
652	TS	2905	IL 59 HOUGH RD @ HILLSIDE AVE	CO	T-1A	ON	BARRINGTON
653	TS	2910	IL 59 SUTTON RD @ SCHAUMBURG RD	CO	T-1A	ON	STREAMWOOD
654	TS	2915	IL 59 IL 68 SUTTON RD @ IL 62 ALGONQUIN RD IL 68 DUNDEE RD	CO	T-1A	ON	BARRINGTON HILLS
655	TS	2920	IL 62 ALGONQUIN RD @ IL 68 DUNDEE BRINKER	CO	T-1A	ON	BARRINGTON HILLS
656	TS	2922	IL 62 ALGONQUIN RD @ PALATINE	CO	T-1A	ON	BARRINGTON HILLS
657	TS	2925	IL 62 ALGONQUIN RD @ IL 83 ELMHURST	CO	T-1A	ON	MT PROSPECT
658	TS	2935	IL 62 ALGONQUIN RD @ ARLINGTON HEIGHTS RD	CO	T-1A	ON	ARLINGTON HTS
659	TS	2936	IL 62 ALGONQUIN RD @	CO	T-1A	ON	

			RESERVE DR	ARLINGTON HTS		
660	TS	2938	I 90 N RAMP A ELK GROVE TWP DR @	CO	T-1A	ON
			ARLINGTON HEIGHTS RD			
661	TS	2939	I 90 SOUTH RAMP G @	CO	T-1A	ON
			ARLINGTON HEIGHTS RD			
662	TS	2940	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			BARRINGTON RD			
663	TS	2945	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			BUSSE RD			
664	TS	2950	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			DEMPSTER ST			
665	TS	2955	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			ELA RD			
666	TS	2957	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			WINSTON			
667	TS	2960	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			FREEMAN HUNTINGTON			
668	TS	2965	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			GOEBBERT RD			
669	TS	2967	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			MEIJER PAPPAS DEUX			
670	TS	2970	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			HARPER COLLEGE			
671	TS	2975	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			LINNEMAN RD			
672	TS	2980	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			MAGNOLIA COMMERCE RD			
673	TS	2985	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			NEW WILKE RD			
674	TS	2990	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			ROSELLE RD			
675	TS	2995	IL 64 NORTH AVE @	CO	T-1A	ON
			IL 171 1ST AVE			

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676	TS	2997	IL 171 1ST AVE @ STRIEBY DR	CO	T-1A	ON	MELROSE PARK
677	TS	3000	IL 64 NORTH AVE @ 5TH AVE	CO	T-1A	ON	RIVER GROVE
678	TS	3005	IL 64 NORTH AVE @ 7TH AVE	CO	T-1A	ON	MELROSE PARK
679	TS	3010	IL 64 NORTH AVE @ 9TH AVE	CO	T-1A	ON	MELROSE PARK
680	TS	3015	IL 64 NORTH AVE @ 19TH AVE BROADWAY	CO	T-1A	ON	MELROSE PARK
681	TS	3020	IL 64 NORTH AVE @ 25TH AVE	CO	T-1A	ON	NORTHLAKE
682	TS	3025	IL 64 NORTH AVE @ 76TH AVE LATHROP	CO	T-1A	ON	ELMWOOD PARK
683	TS	3035	IL 64 NORTH AVE @ CORNELL AVE 35TH	CO	T-1A	ON	MELROSE PARK
684	TS	3040	IL 64 NORTH AVE @ GEORGE ST	CO	T-1A	ON	MELROSE PARK
685	TS	3045	IL 64 NORTH AVE @ HAWTHORNE 32ND	CO	T-1A	ON	MELROSE PARK
686	TS	3050	IL 64 NORTH AVE @ INDIAN BOUNDRY RD RUBY	CO	T-1A	ON	MELROSE PARK
687	TS	3065	IL 64 NORTH AVE @ NORTHWEST AVE	CO	T-1A	ON	NORTHLAKE
688	TS	3067	US 20 @ RAILROAD AVE	CO	T-1A	ON	NORTHLAKE
689	TS	3075	IL 64 NORTH AVE @ RAILROAD AVE	CO	T-1A	ON	NORTHLAKE
690	TS	3083	IL 64 NORTH AVE @ ROY ST	CO	T-1A	ON	NORTHLAKE
691	TS	3085	IL 64 NORTH AVE @ THATCHER AVE	CO	T-1A	ON	ELMWOOD PARK
692	TS	3090	IL 64 NORTH AVE @	CO	T-1A	ON	

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			WOLF RD	NORTHLAKE		
693	TS	3095	IL 68 DUNDEE RD @	CO	T-1A	ON
			IL 83 ELMHURST RD	WHEELING		
694	TS	3100	IL 68 DUNDEE RD @	CO	T-1A	ON
			ARLINGTON HEIGHTS RD	ARLINGTON HTS		
695	TS	3110	IL 68 DUNDEE RD @	CO	T-1A	ON
			BUFFALO GROVE RD	BUFFALO GROVE		
696	TS	3112	IL 68 DUNDEE RD @	CO	T-1A	ON
			BUFFALO GROVE HIGH SCHOOL	BUFFALO GROVE		
697	TS	3115	IL 68 DUNDEE RD @	CO	T-1A	ON
			CHARLEMAGNE TORRE PINES	NORTHBROOK		
698	TS	3122	IL 68 DUNDEE RD @	CO	T-1A	ON
			DENISE DR DEERGROVE	PALATINE		
699	TS	3125	IL 68 DUNDEE RD @	CO	T-1A	ON
			HUEHL RD	NORTHBROOK		
700	TS	3130	IL 68 DUNDEE RD @	CO	T-1A	ON
			KENNICOTT	ARLINGTON HTS		
701	TS	3135	IL 68 DUNDEE RD @	CO	T-1A	ON
			LANDWEHR RD	NORTHBROOK		
702	TS	3137	IL 68 DUNDEE RD @	CO	T-1A	ON
			ANTHONY TRAIL	NORTHBROOK		
703	TS	3140	IL 68 DUNDEE RD @	CO	T-1A	ON
			MIDWAY RD	NORTHBROOK		
704	TS	3145	IL 68 DUNDEE RD @	CO	T-1A	ON
			OLD MCHENRY WHEELING RD	WHEELING		
705	TS	3150	IL 68 DUNDEE RD @	CO	T-1A	ON
			RIDGE AVE	ARLINGTON HTS		
706	TS	3155	IL 68 DUNDEE RD @	CO	T-1A	ON
			GOLFVIEW TERRACE	BUFFALO GROVE		
707	TS	3160	IL 68 DUNDEE RD @	CO	T-1A	ON
			PFINGSTEN RD	NORTHBROOK		
708	TS	3165	IL 68 DUNDEE RD @	CO	T-1A	ON
			QUENTIN RD	PALATINE		

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709	TS	3168	IL 68 DUNDEE RD @ STERLING AVE	CO PALATINE	T-1A	ON
710	TS	3175	IL 68 DUNDEE RD @ SCHOENBECK RD	CO WHEELING	T-1A	ON
711	TS	3185	IL 68 DUNDEE RD @ SKOKIE BLVD	CO NORTHBROOK	T-1A	ON
712	TS	3190	IL 68 DUNDEE RD @ SMITH RD	CO PALATINE	T-1A	ON
713	TS	3195	IL 68 DUNDEE RD @ WESTERN AVE	CO NORTHBROOK	T-1A	ON
714	TS	3204	IL 68 DUNDEE RD @ PORTWINE RD	CO WHEELING	T-1A	ON
715	TS	3205	IL 68 DUNDEE RD @ WILKE RD EAST FRONTAGE RD	CO ARLINGTON HTS	T-1A	ON
716	TS	3210	IL 68 DUNDEE RD @ WEIDNER CROFTON LN	CO BUFFALO GROVE	T-1A	ON
717	TS	3213	IL 68 DUNDEE RD @ BUFFALO GROVE FIRE HOUSE	CO BUFFALO GROVE	T-1A	ON
718	TS	3215	IL 72 HIGGINS RD @ LANDMEIER RD	CO ELK GROVE	T-1A	ON
719	TS	3220	IL 72 HIGGINS RD @ MALL DR	CO SCHAUMBURG	T-1A	ON
720	TS	3225	IL 72 HIGGINS RD @ MARTINGALE RD	CO SCHAUMBURG	T-1A	ON
721	TS	3230	IL 72 HIGGINS RD @ MEACHAM RD	CO SCHAUMBURG	T-1A	ON
722	TS	3235	IL 72 TOUHY AVE @ MT PROSPECT RD	CO DESPLAINES	T-1A	ON
723	TS	3245	IL 72 HIGGINS RD @ PLUM GROVE RD	CO SCHAUMBURG	T-1A	ON
724	TS	3250	IL 72 HIGGINS RD @ ROSELLE RD	CO HOFFMAN ESTATES	T-1A	ON
725	TS	3251	IL 72 HIGGINS RD @	CO	T-1A	ON

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			ASH ST	HOFFMAN ESTATES		
726	TS	3255	IL 72 HIGGINS RD @	CO	T-1A	ON
			SALEM DR	SCHAUMBURG		
727	TS	3260	IL 72 TOUHY AVE @	CO	T-1A	ON
			WOLF RD	DESPLAINES		
728	TS	3262	IL 72 HIGGINS RD @	CO	T-1A	ON
			I 90 TLWY WB EXT RAMP	CHICAGO		
729	TS	3265	IL 72 HIGGINS RD @	CO	T-1A	ON
			OHARE PLAZA ENT 2	PARK RIDGE		
730	TS	3270	IL 72 TOUHY AVE @	CO	T-1A	ON
			IL 72 LEE ST	DESPLAINES		
731	TS	3280	BUSSE HWY @	CO	T-1A	ON
			OAKTON ST DEE RD			
732	TS	3290	IL 72 HIGGINS RD @	CO	T-1A	ON
			BARRINGTON RD	HOFFMAN ESTATES		
733	TS	3295	IL 72 HIGGINS RD @	CO	T-1A	ON
			BARTLETT RD	HOFFMAN ESTATES		
734	TS	3297	IL 72 HIGGINS RD @	CO	T-1A	ON
			ARBORETUM BLVD	SOUTH BARRINGTON		
735	TS	3300	IL 72 HIGGINS RD @	CO	T-1A	ON
			CANFIELD RD	PARK RIDGE		
736	TS	3305	IL 72 HIGGINS RD @	CO	T-1A	ON
			IL 171 CUMBERLAND	CHICAGO		
737	TS	3310	IL 72 HIGGINS RD @	CO	T-1A	ON
			DEE EAST RIVER RD	PARK RIDGE		
738	TS	3315	IL 72 HIGGINS RD @	CO	T-1A	ON
			ELMHURST RD	ELK GROVE		
739	TS	3318	ELMHURST RD @	CO	T-1A	ON
			LANDMEIER RD	ELK GROVE		
740	TS	3319	ELMHURST RD @	CO	T-1A	ON
			I 90 DDI	ELK GROVE		
741	TS	3325	IL 72 HIGGINS RD @	CO	T-1A	ON
			GANNON	HOFFMAN ESTATES		

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742	TS	3330	IL 72 HIGGINS RD @ GOVERNORS MOON LAKE	CO	T-1A	ON	HOFFMAN ESTATES
743	TS	3335	IL 72 HIGGINS RD @ KING RD STANLEY	CO	T-1A	ON	ELK GROVE
744	TS	3340	IL 72 HIGGINS RD @ BEVERLY RD	CO	T-1A	ON	HOFFMAN ESTATES
745	TS	3345	IL 83 TORRENCE AVE @ IL 83 GLENWOOD DYER	CO	T-1A	ON	LYNWOOD
746	TS	3350	IL 83 ELMHURST RD @ IL 83 OAKTON ST	CO	T-1A	ON	DESPLAINES
747	TS	3355	IL 83 ELMHURST RD @ IL 83 OLD MCHENRY	CO	T-1A	ON	WHEELING
748	TS	3360	IL 83 CAL SAG RD @ 104TH AVE	CO	T-1A	ON	PALOS PARK
749	TS	3365	IL 83 IL 171 N CAL SAG NORTH @ 107TH ST	CO	T-1A	ON	LEMONT
750	TS	3375	IL 83 CAL SAG RD @ 127TH ST	CO	T-1A	ON	ALSIP
751	TS	3380	IL 83 TORRENCE AVE @ 186TH ST	CO	T-1A	ON	LANSING
752	TS	3385	IL 83 SIBLEY BLVD 147TH ST @ BROADWAY	CO	T-1A	ON	HARVEY
753	TS	3390	IL 83 ELMHURST RD @ CAMP MCDONALD RD	CO	T-1A	ON	PROSPECT HTS
754	TS	3395	IL 83 SIBLEY BLVD 147TH ST @ CHICAGO RD	CO	T-1A	ON	DOLTON
755	TS	3400	IL 83 SIBLEY BLVD 147TH ST @ CRAWFORD AVE	CO	T-1A	ON	MIDLOTHIAN
756	TS	3405	IL 83 ELMHURST RD @ DEMPSTER ST THACKER	CO	T-1A	ON	DESPLAINES
757	TS	3410	IL 83 BUSSE RD @ DEVON AVE	CO	T-1A	ON	ELK GROVE
758	TS	3415	IL 83 SIBLEY 147TH ST WESTERN AVE @	CO	T-1A	ON	

			DIXIE HWY	HARVEY		
759	TS	3420	IL 83 ELMHURST RD @	CO	T-1A	ON
			EUCLID AVE	MT PROSPECT		
760	TS	3425	IL 83 BUSSE RD @	CO	T-1A	ON
			GREENLEAF	ELK GROVE		
761	TS	3430	IL 83 ELMHURST RD @	CO	T-1A	ON
			HINTZ RD	WHEELING		
762	TS	3435	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			HOMAN AVE	MIDLOTHIAN		
763	TS	3440	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			INDIANA AVE	SOUTH HOLLAND		
764	TS	3445	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			KEELER AVE	MIDLOTHIAN		
765	TS	3450	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			KEDZIE AVE	MIDLOTHIAN		
766	TS	3455	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			KILBOURN	MIDLOTHIAN		
767	TS	3460	IL 83 BUSSE RD @	CO	T-1A	ON
			LANDMEIER RD	ELK GROVE		
768	TS	3465	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			LASALLE MARKHAM	DOLTON		
769	TS	3470	IL 83 SIBLEY BLVD 147TH ST @	CO	T-1A	ON
			LOOMIS ST	HARVEY		
770	TS	3480	IL 83 TORRENCE AVE @	CO	T-1A	ON
			MICHIGAN CITY RD	CALUMET CITY		
771	TS	3485	IL 83 ELMHURST RD @	CO	T-1A	ON
			PALATINE RD	PROSPECT HTS		
772	TS	3490	IL 83 BUSSE RD @	CO	T-1A	ON
			PRATT RD	ELK GROVE		
773	TS	3495	IL 83 TORRENCE AVE @	CO	T-1A	ON
			RIDGE RD	LANSING		
774	TS	3500	IL 83 ELMHURST RD @	CO	T-1A	ON
			RANDHURST SHOPPING CTR	MT PROSPECT		

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775	TS	3502	KENSINGTON RD @ RANDHURST MALL PERIMETER DRIVE	CO	T-1A	ON
776	TS	3505	IL 83 CAL SAG RD @ RIDGELAND AVE	CO	T-1A	ON
777	TS	3510	IL 83 SIBLEY BLVD 147TH ST @ ROBEY	CO	T-1A	ON
778	TS	3515	IL 83 TORRENCE AVE @ THORNTON LANSING RD	CO	T-1A	ON
779	TS	3519	THORTON LANSING RD @ STONY ISLAND VOLLBRECHT RD	CO	T-1A	ON
780	TS	3520	IL 83 SIBLEY BLVD 147TH ST @ WOOD ST	CO	T-1A	ON
781	TS	3525	IL 83 SIBLEY BLVD 147TH ST @ WALLACE ST	CO	T-1A	ON
782	TS	3530	IL 83 CAL SAG RD @ 119TH ST	CO	T-1A	ON
783	TS	3532	IL 83 CAL SAG RD @ 76TH AVE	CO	T-1A	ON
784	TS	3535	IL 83 ELMHURST RD @ HUNTINGTON COMMONS	CO	T-1A	ON
785	TS	3540	IL 83 ELMHURST RD @ WILLOW RD	CO	T-1A	ON
786	TS	3545	IL 171 ARCHER AVE @ 63RD ST	CO	T-1A	ON
787	TS	3550	IL 171 1ST AVE FRONTAGE @ JOLIET RD	CO	T-1A	ON
788	TS	3555	IL 171 ARCHER AVE @ 55TH ST	CO	T-1A	ON
789	TS	3557	IL 171 ARCHER AVE @ 59TH ST	CO	T-1A	ON
790	TS	3560	IL 171 ARCHER AVE @ ROBERTS RD	CO	T-1A	ON
791	TS	3565	IL 171 ARCHER AVE @	CO	T-1A	ON

			STATE ST	LEMONT		
792	TS	3566	IL 171 ARCHER AVE @	CO	T-1A	ON
			135TH ST	LEMONT		
793	TS	3567	IL 171 ARCHER AVE @	CO	T-1A	ON
			ACCESS DR TARGET ENT	LEMONT		
794	TS	3570	IL 171 ARCHER AVE @	CO	T-1A	ON
			WILLOW SPRINGS RD	WILLOW SPRINGS		
795	TS	3572	IL 171 ARCHER AVE @	CO	T-1A	ON
			NOLTON	WILLOW SPRINGS		
796	TS	3575	IL 171 1ST AVE EAST RAMPS @	CO	T-1A	ON
			47TH ST	LYONS		
797	TS	3580	IL 394 FORD @	CO	T-1A	ON
			STEGER RD	CRETE		
798	TS	3585	IL 171 1ST AVE @	CO	T-1A	ON
			26TH ST	NORTH RIVERSIDE		
799	TS	3590	IL 171 1ST AVE @	CO	T-1A	ON
			31ST ST	NORTH RIVERSIDE		
800	TS	3595	IL 171 1ST AVE @	CO	T-1A	ON
			31ST ST CUTOFF GOLFVIEW	NORTH RIVERSIDE		
801	TS	3600	IL 171 1ST AVE @	CO	T-1A	ON
			CERMAK RD	NORTH RIVERSIDE		
802	TS	3605	IL 171 1ST AVE @	CO	T-1A	ON
			CERMAK CUT OFF	NORTH RIVERSIDE		
803	TS	3610	IL 171 1ST AVE @	CO	T-1A	ON
			CHICAGO	MAYWOOD		
804	TS	3615	IL 171 1ST AVE @	CO	T-1A	ON
			DESPLAINES RIVER RD	RIVER GROVE		
805	TS	3620	IL 171 1ST AVE @	CO	T-1A	ON
			FOREST RIDGEWOOD	NORTH RIVERSIDE		
806	TS	3625	IL 171 1ST AVE @	CO	T-1A	ON
			FULLERTON	RIVER GROVE		
807	TS	3630	IL 171 1ST AVE @	CO	T-1A	ON
			LAKE ST			

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808	TS	3660	IL 171 1ST AVE @ THATCHER RD CUT OFF	CO	T-1A	ON	RIVER GROVE
809	TS	3675	IL 171 1ST AVE @ 17TH ST LOYOLA HOSPITAL	CO	T-1A	ON	BROADVIEW
810	TS	3680	5TH AVE @ DESPLAINES RIVER RD	CO	T-1A	ON	RIVER GROVE
811	TS	3685	5TH AVE @ TRITON COLLEGE NORTH ENTRANCE	CO	T-1A	ON	RIVER GROVE
812	TS	3690	5TH AVE @ TRITON COLLEGE SOUTH ENTRANCE	CO	T-1A	ON	RIVER GROVE
813	TS	3691	31ST ST @ PRAIRIE AVE	CO	T-1A	ON	LAGRANGE
814	TS	3693	30TH ST @ MAPLE AVE	CO	T-1A	ON	LAGRANGE PARK
815	TS	3695	17TH AVE MAPLE @ 31ST ST LOGAN	CO	T-1A	ON	LAGRANGE PARK
816	TS	3701	22ND ST CERMAK RD @ 12TH AVE	CO	T-1A	ON	NORTH RIVERSIDE
817	TS	3705	17TH AVE @ ROOSEVELT RD	CO	T-1A	ON	BROADVIEW
818	TS	3715	25TH ST @ LAKE ST	CO	T-1A	ON	MELROSE PARK
819	TS	3720	25TH AVE @ LEXINGTON DR	CO	T-1A	ON	BROADVIEW
820	TS	3725	ROOSEVELT RD @ 25TH AVE	CO	T-1A	ON	BROADVIEW
821	TS	3740	26TH @ EAST END AVE @	CO	T-1A	ON	
822	TS	3745	26TH @ HIGHLAND BLVD	CO	T-1A	ON	
823	TS	3750	26TH ST @ NORTH RIVERSIDE PLAZA	CO	T-1A	ON	NORTH RIVERSIDE
824	TS	3755	26TH ST @	CO	T-1A	ON	

			RIDGELAND AVE	BERWYN		
825	TS	3760	31ST ST @	CO	T-1A	ON
			DESPLAINES AVE	NORTH RIVERSIDE		
826	TS	3765	31ST ST @	CO	T-1A	ON
			GOLFVIEW LN CUTOFF TO 1ST	BROOKFIELD		
827	TS	3770	31ST ST @	CO	T-1A	ON
			KEMMAN GRAND	LAGRANGE PARK		
828	TS	3775	31ST ST @	CO	T-1A	ON
			WOLF RD	WESTCHESTER		
829	TS	3780	39TH ST PERSHING RD @	CO	T-1A	ON
			CENTRAL AVE	STICKNEY		
830	TS	3785	39TH ST PERSHING RD @	CO	T-1A	ON
			LARAMIE AVE	STICKNEY		
831	TS	3790	39TH ST PERSHING RD @	CO	T-1A	ON
			OAK PARK AVE	STICKNEY		
832	TS	3795	39TH ST PERSHING RD @	CO	T-1A	ON
			RIDGELAND AVE	STICKNEY		
833	TS	3800	39TH ST PERSHING RD @	CO	T-1A	ON
			AUSTIN BLVD	STICKNEY		
834	TS	3805	CENTRAL AVE @	CO	T-1A	ON
			47TH ST	FOREST VIEW		
835	TS	3820	47TH ST @	CO	T-1A	ON
			PLAINFIELD RD	BROOKFIELD		
836	TS	3825	47TH ST @	CO	T-1A	ON
			WOLF RD	WESTERN SPRINGS		
837	TS	3830	55TH ST @	CO	T-1A	ON
			BRAINARD	COUNTRYSIDE		
838	TS	3835	CENTER AVE @	CO	T-1A	ON
			ARCHER AVE	SUMMIT		
839	TS	3840	55TH ST @	CO	T-1A	ON
			COUNTY LINE RD	HINSDALE		
840	TS	3845	55TH ST @	CO	T-1A	ON
			EAST AVE	COUNTRYSIDE		

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841	TS	3855	55TH ST @ PLAINFIELD	CO	T-1A	ON	COUNTRYSIDE
842	TS	3860	55TH ST @ WILLOW SPRINGS RD	CO	T-1A	ON	COUNTRYSIDE
843	TS	3865	55TH ST @ WOLF RD	CO	T-1A	ON	WESTERN SPRINGS
844	TS	3870	55TH ST @ LAUREL AVE	CO	T-1A	ON	LYONS
845	TS	3875	79TH ST @ AUSTIN BLVD	CO	T-1A	ON	BURBANK
846	TS	3880	79TH ST @ CENTRAL	CO	T-1A	ON	BURBANK
847	TS	3885	79TH ST @ NARRAGANSETT	CO	T-1A	ON	BURBANK
848	TS	3890	79TH ST @ ROBERTS RD	CO	T-1A	ON	BRIDGEVIEW
849	TS	3893	79TH ST @ WILLOW SPRINGS RD	CO	T-1A	ON	WILLOW SPRINGS
850	TS	3895	79TH ST @ SAYRE	CO	T-1A	ON	BEDFORD PARK
851	TS	3900	79TH ST @ STATE RD	CO	T-1A	ON	BURBANK
852	TS	3915	87TH ST @ KOSTNER AVE	CO	T-1A	ON	
853	TS	3920	CRAWFORD AVE PULASKI RD @ SOUTHWEST HWY COLUMBUS 87TH	CO	T-1A	ON	
854	TS	3925	103RD ST @ CRAWFORD AVE PULASKI RD	CO	T-1A	ON	OAK LAWN
855	TS	3930	103RD ST @ KEDZIE	CO	T-1A	ON	EVERGREEN PK
856	TS	3935	103RD ST VIRGINIA AVE @ SOUTHWEST HWY	CO	T-1A	ON	WORTH
857	TS	3936	123RD ST @	CO	T-1A	ON	

			CRAWFORD AVE PULASKI RD	ALSIP		
858	TS	3940	111TH ST @	CO	T-1A	ON
			86TH AVE			PALOS HILLS
859	TS	3942	111TH ST @	CO	T-1A	ON
			POSSUM DR COLLEGE PKWY			PALOS HILLS
860	TS	3945	111TH ST @	CO	T-1A	ON
			CENTRAL			CHICAGO RIDGE
861	TS	3950	111TH ST @	CO	T-1A	ON
			RIDGELAND			CHICAGO RIDGE
862	TS	3960	115TH ST @	CO	T-1A	ON
			CRAWFORD AVE PULASKI RD			ALSIP
863	TS	3965	115TH ST @	CO	T-1A	ON
			KEDZIE AVE			MERRIONETTE PARK
864	TS	3970	119TH ST @	CO	T-1A	ON
			VINCENNES RD			
865	TS	3975	127TH ST @	CO	T-1A	ON
			76TH AVE			PALOS PARK
866	TS	3980	127TH ST @	CO	T-1A	ON
			ASHLAND AVE			CALUMET CITY
867	TS	3985	127TH ST @	CO	T-1A	ON
			CENTRAL AVE			CRESTWOOD
868	TS	3990	127TH ST @	CO	T-1A	ON
			CRAWFORD AVE PULASKI RD			ALSIP
869	TS	3995	127TH ST @	CO	T-1A	ON
			KEDZIE AVE			BLUE ISLAND
870	TS	4000	127TH ST @	CO	T-1A	ON
			RIDGELAND			PALOS HTS
871	TS	4005	127TH ST @	CO	T-1A	ON
			THROOP			CALUMET PARK
872	TS	4010	127TH ST @	CO	T-1A	ON
			WOOD ST			CALUMET PARK
873	TS	4030	135TH ST @	CO	T-1A	ON
			LONG			CRESTWOOD

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874	TS	4035	135TH ST @ RIDGELAND	CO PALOS HTS	T-1A	ON
875	TS	4045	138TH ST @ ASHLAND WOOD	CO RIVERDALE	T-1A	ON
876	TS	4050	142ND ST MAIN @ CHICAGO	CO DOLTON	T-1A	ON
877	TS	4055	142ND ST MAIN @ INDIANA	CO RIVERDALE	T-1A	ON
878	TS	4060	142ND ST MAIN @ LINCOLN	CO DOLTON	T-1A	ON
879	TS	4075	147TH ST @ CENTRAL AVE	CO OAK FOREST	T-1A	ON
880	TS	4076	147TH ST @ RIDGELAND AVE	CO OAK FOREST	T-1A	ON
881	TS	4080	154TH ST @ CHICAGO SOUTH PARK	CO SOUTH HOLLAND	T-1A	ON
882	TS	4085	167TH ST @ WOOD ST	CO HAZEL CREST	T-1A	ON
883	TS	4090	DIXIE HWY @ GOVERNORS HWY 175TH ST	CO HOMewood	T-1A	ON
884	TS	4092	GOVERNORS HWY @ METRA	CO HAZEL CREST	T-1A	ON
885	TS	4108	183RD ST @ RIDGELAND AVE	CO TINLEY PARK	T-1A	ON
886	TS	4115	IL 171 CUMBERLAND AVE @ ADDISON	CO CHICAGO	T-1A	ON
887	TS	4120	ALGONQUIN RD @ MT PROSPECT RD	CO DESPLAINES	T-1A	ON
888	TS	4125	ALGONQUIN RD @ OAKTON ST	CO PARK RIDGE	T-1A	ON
889	TS	4130	ALGONQUIN RD @ WOLF RD	CO DESPLAINES	T-1A	ON
890	TS	4135	ASHLAND AVE @	CO	T-1A	ON

			BROADWAY @ NORTH WATER ST	BLUE ISLAND		
891	TS	4145	BALLARD RD @	CO	T-1A	ON
			DEE RD			
892	TS	4146	BALLARD RD @	CO	T-1A	ON
			NESSET DR			
893	TS	4155	BALLARD RD @	CO	T-1A	ON
			POTTER			
894	TS	4160	BALLARD RD @	CO	T-1A	ON
			RAND RD			
895	TS	4165	BARRINGTON RD @	CO	T-1A	ON
			BOURBON PKWY WEATHERSFIELD WAY			
896	TS	4170	BARRINGTON RD @	CO	T-1A	ON
			BODE RD			
897	TS	4175	BARRINGTON RD @	CO	T-1A	ON
			HASSEL			
898	TS	4176	BARRINGTON RD @	CO	T-1A	ON
			CENTRAL RD			
899	TS	4178	I 90 TLWY @	CO	T-1A	ON
			BARRINGTON RD			
900	TS	4180	BARRINGTON RD @	CO	T-1A	ON
			SCHAUMBURG RD			
901	TS	4182	BARRINGTON RD @	CO	T-1A	ON
			HOLMES WAY			
902	TS	4185	BARRINGTON RD @	CO	T-1A	ON
			MUNDHANK RD			
903	TS	4188	BARRINGTON RD @	CO	T-1A	ON
			TENNIS CLUB LN LAKEWOOD BLVD			
904	TS	4190	BELMONT AVE @	CO	T-1A	ON
			80TH AVE PACIFIC			
905	TS	4200	IL 171 CUMBERLAND AVE @	CO	T-1A	ON
			BELMONT			
906	TS	4203	IL 171 CUMBERLAND AVE @	CO	T-1A	ON
			THATCHER WOODS SHOPPING CNTR			

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907	TS	4204	BELMONT AVE @ PLAINFIELD RD	CO	T-1A	ON	RIVER GROVE
908	TS	4205	BELMONT AVE @ DESPLAINES RIVER RD	CO	T-1A	ON	FRANKLIN PARK
909	TS	4210	BELMONT AVE @ FOREST PRESERVE DR	CO	T-1A	ON	RIVER GROVE
910	TS	4215	BELMONT AVE @ 77TH AVE OVERHILL	CO	T-1A	ON	ELMWOOD PARK
911	TS	4220	BRAINARD AVE @ BURNHAM	CO	T-1A	ON	
912	TS	4225	RIEGEL CHICAGO @ BROADWAY @ RIEGEL CHICAGO @ JOE ORR RD	CO	T-1A	ON	CHICAGO HTS
913	TS	4230	BURNHAM AVE @ 170TH	CO	T-1A	ON	LANSING
914	TS	4235	BURNHAM AVE @ RIDGE	CO	T-1A	ON	LANSING
915	TS	4240	BURNHAM AVE @ RIVER OAKS DR	CO	T-1A	ON	CALUMET CITY
916	TS	4245	BUSSE RD @ POTTER RD	CO	T-1A	ON	PARK RIDGE
917	TS	4250	BUSSE RD @ DEMPSTER ST	CO	T-1A	ON	MT PROSPECT
918	TS	4255	CANFIELD @ DEVON	CO	T-1A	ON	PARK RIDGE
919	TS	4260	CANFIELD @ TALCOTT	CO	T-1A	ON	PARK RIDGE
920	TS	4270	111TH ST @ CRAWFORD AVE PULASKI RD	CO	T-1A	ON	ALSIP
921	TS	4280	IL 43 HARLEM AVE @ 143RD ST	CO	T-1A	ON	ORLAND PARK
922	TS	4285	IL 43 HARLEM AVE @ FOSTER SHOPPING CTR	CO	T-1A	ON	HARWOOD HTS
923	TS	4290	US 30 PLAINFIELD RD @	WI	T-1A	ON	

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			LARKIN AVE	CREST HILL		
924	TS	4295	IL 7 LARKIN AVE @	WI	T-1A	ON
			THEODORE AVE	CREST HILL		
925	TS	4305	IL 25 @	KA	T-1A	ON
			GOLFVIEW LN	CARPENTERSVILLE		
926	TS	4310	IL 25 @	KA	T-1A	ON
			KING RD	CARPENTERSVILLE		
927	TS	4315	IL 25 @	KA	T-1A	ON
			BESINGER DR	CARPENTERSVILLE		
928	TS	4320	IL 25 @	KA	T-1A	ON
			HELM RD	CARPENTERSVILLE		
929	TS	4325	IL 25 @	KA	T-1A	ON
			ROBIN RD	CARPENTERSVILLE		
930	TS	4330	IL 31 @	KA	T-1A	ON
			CHICAGO RAWHIDE DRIVEWAY	ELGIN		
931	TS	4375	JOE ORR RD @	CO	T-1A	ON
			ASHLAND AVE	CHICAGO HTS		
932	TS	4390	IL 25 @	KA	T-1A	ON
			LAKE MARION HAZARD RD	CARPENTERSVILLE		
933	TS	4410	BURNHAM AVE @	CO	T-1A	ON
			152ND ST	CALUMET CITY		
934	TS	4415	BURNHAM AVE @	CO	T-1A	ON
			156TH ST	CALUMET CITY		
935	TS	4425	BURNHAM AVE @	CO	T-1A	ON
			MICHIGAN CITY RD	CALUMET CITY		
936	TS	4430	BURNHAM AVE @	CO	T-1A	ON
			154TH ST PULASKI	CALUMET CITY		
937	TS	4435	IL 83 SIBLEY BLVD @	CO	T-1A	ON
			BURNHAM RD	CALUMET CITY		
938	TS	4457	IL 25 @	KA	T-1A	ON
			WEST BARTLETT RD	BARTLETT		
939	TS	4458	IL 25 @	KA	T-1A	ON
			KENYON RD	BARTLETT		

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940	TS	4595	US 20 LAKE ST @ FAIRFIELD CT	DU	T-1A	ON	BLOOMINGDALE
941	TS	4600	US 20 LAKE ST @ BLOOMINGDALE RD	DU	T-1A	ON	BLOOMINGDALE
942	TS	4605	US 20 LAKE ST @ CIRCLE AVE	DU	T-1A	ON	BLOOMINGDALE
943	TS	4610	US 20 LAKE ST @ SPRINGBROOK CTR	DU	T-1A	ON	BLOOMINGDALE
944	TS	4642	IL 31 @ MOOSEHEART RD	KA	T-1A	ON	BATAVIA
945	TS	4645	IL 31 @ WILSON AVE	KA	T-1A	ON	BATAVIA
946	TS	4660	IL 59 @ WEST BARTLETT RD	CO	T-1A	ON	BARTLETT
947	TS	4670	IL 59 @ STEARNS RD	DU	T-1A	ON	BARTLETT
948	TS	4685	US 14 NORTHWEST HWY @ BERRY RD	LA	T-1A	ON	BARRINGTON
949	TS	4705	IL 83 MAIN ST @ LAKE ST	LA	T-1A	ON	ANTIOCH
950	TS	4710	IL 83 MAIN ST (IN ANTIOCH) @ NORTH AVE	LA	T-1A	ON	ANTIOCH
951	TS	4712	IL 83 MAIN ST @ ORCHARD ST	LA	T-1A	ON	ANTIOCH
952	TS	4715	IL 43 HARLEM AVE @ 48TH ST AMOCO OIL	CO	T-1A	ON	FOREST VIEW
953	TS	4725	IL 50 CICERO AVE @ 37TH ST CITCO OIL	CO	T-1A	ON	STICKNEY
954	TS	4730	LARKIN AVE @ HILLCREST SC	WI	T-1A	ON	CREST HILL
955	TS	4735	CENTRAL AVE @ 51ST ST	CO	T-1A	ON	FOREST VIEW
956	TS	4740	CENTRAL RD @	CO	T-1A	ON	

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			DEE RD	GLENVIEW		
957	TS	4742	CENTRAL RD @	CO	T-1A	ON
			DEARLOVE RD GLENVIEW RD	GLENVIEW		
958	TS	4745	CENTRAL RD @	CO	T-1A	ON
			GREENWOOD AVE	GLENVIEW		
959	TS	4755	CENTRAL CARPENTER @	CO	T-1A	ON
			PRATT AVE	SKOKIE		
960	TS	4760	ROOSEVELT RD @	CO	T-1A	ON
			CENTRAL	CICERO		
961	TS	4765	CENTRAL RD @	CO	T-1A	ON
			WOLF RD	DESPLAINES		
962	TS	4775	22ND ST CERMAK RD @	CO	T-1A	ON
			57TH	CICERO		
963	TS	4780	22ND ST CERMAK RD @	CO	T-1A	ON
			58TH	CICERO		
964	TS	4785	22ND ST CERMAK RD @	CO	T-1A	ON
			AUSTIN BLVD	CICERO		
965	TS	4790	22ND ST CERMAK RD @	CO	T-1A	ON
			CENTRAL	CICERO		
966	TS	4795	22ND ST CERMAK RD @	CO	T-1A	ON
			CERMAK PLAZA NORTH ENTRANCE	BERWYN		
967	TS	4800	22ND ST CERMAK RD @	CO	T-1A	ON
			DESPLAINES RIVER RD	NORTH RIVERSIDE		
968	TS	4805	22ND ST CERMAK RD @	CO	T-1A	ON
			EAST RD	BERWYN		
969	TS	4810	22ND ST CERMAK RD @	CO	T-1A	ON
			HOME AVE	BERWYN		
970	TS	4815	22ND ST CERMAK RD @	CO	T-1A	ON
			LOMBARD	BERWYN		
971	TS	4820	22ND ST CERMAK RD @	CO	T-1A	ON
			NORTH RIVERSIDE PLAZA WEST	NORTH RIVERSIDE		
972	TS	4825	22ND ST CERMAK RD @	CO	T-1A	ON
			NORTH RIVERSIDE PLAZA EAST	NORTH RIVERSIDE		

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973	TS	4830	22ND ST CERMAK RD @ OAK PARK	CO BERWYN	T-1A	ON
974	TS	4835	22ND ST CERMAK RD @ RIDGELAND	CO BERWYN	T-1A	ON
975	TS	4840	22ND ST CERMAK RD @ RIVERSIDE WESLEY	CO BERWYN	T-1A	ON
976	TS	4845	22ND ST CERMAK RD @ WOLF RD	CO WESTCHESTER	T-1A	ON
977	TS	4850	22ND ST CERMAK RD @ WESTBROOK	CO WESTCHESTER	T-1A	ON
978	TS	4851	22ND ST CERMAK RD @ ENTERPRISE DRIVE	CO WESTCHESTER	T-1A	ON
979	TS	4855	CHICAGO RD @ INDIANWOOD DRIVE	CO THORNTON	T-1A	ON
980	TS	4861	CHICAGO HEIGHTS GLENWOOD RD @ HOLBROOK RD	CO GLENWOOD	T-1A	ON
981	TS	4870	CHURCH ST @ NILES CENTER RD	CO SKOKIE	T-1A	ON
982	TS	4885	CRAWFORD AVE PULASKI RD @ 99TH ST	CO OAK LAWN	T-1A	ON
983	TS	4890	119TH ST @ CRAWFORD AVE PULASKI RD	CO ALSIP	T-1A	ON
984	TS	4892	CRAWFORD PULASKI @ JEWEL ALDI 120TH ST	CO ALSIP	T-1A	ON
985	TS	4900	CRAWFORD AVE @ 167TH ST	CO MARKHAM	T-1A	ON
986	TS	4905	CRAWFORD AVE @ 175TH ST	CO COUNTRY CLUB HILLS	T-1A	ON
987	TS	4910	CRAWFORD AVE @ DEVON	CO LINCOLNWOOD	T-1A	ON
988	TS	4915	CRAWFORD AVE @ GOLF RD SIMPSON	CO SKOKIE	T-1A	ON
989	TS	4920	CRAWFORD AVE @	CO	T-1A	ON

			HARRISON OLD ORCHARD	SKOKIE		
990	TS	4930	CRAWFORD AVE @ VOLLMER RD	CO	T-1A	ON
991	TS	4940	87TH ST @ CALIFORNIA AVE	CO	T-1A	ON
992	TS	4943	CRAWFORD AVE PULASKI RD @ 203RD ST	CO	T-1A	ON
993	TS	4945	CRAWFORD AVE PULASKI RD @ GOVERNORS HWY	CO	T-1A	ON
994	TS	4950	CRAWFORD AVE HUNTER @ WILMETTE	CO	T-1A	ON
995	TS	4955	CUMBERLAND AVE @ DEVON	CO	T-1A	ON
996	TS	4960	IL 171 CUMBERLAND AVE @ FOREST PRESERVE DR	CO	T-1A	ON
997	TS	4965	IL 171 CUMBERLAND AVE @ LAWRENCE	CO	T-1A	ON
998	TS	4970	IL 171 CUMBERLAND AVE @ MONTROSE	CO	T-1A	ON
999	TS	4985	DESPLAINES RIVER RD @ GRAND AVE	CO	T-1A	ON
1000	TS	4990	DESPLAINES RIVER RD @ LAWRENCE AVE	CO	T-1A	ON
1001	TS	4995	OAKTON ST @ DESPLAINES RIVER RD	CO	T-1A	ON
1002	TS	5005	DESPLAINES RIVER RD @ TOUHY AVE	CO	T-1A	ON
1003	TS	5010	DESPLAINES RIVER RD @ FULLERTON AVE	CO	T-1A	ON
1004	TS	5015	DEMPSTER ST @ CRAWFORD	CO	T-1A	ON
1005	TS	5017	DEMPSTER ST @	CO	T-1A	ON

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			HAMLIN AVE	SKOKIE		
1006	TS	5020	DEMPSTER ST @	CO	T-1A	ON
			EAST PRAIRIE	SKOKIE		
1007	TS	5025	DEMPSTER ST @	CO	T-1A	ON
			ST LOUIS LINCOLN	SKOKIE		
1008	TS	5030	DEMPSTER ST @	CO	T-1A	ON
			KEELER BROWNSTONE	SKOKIE		
1009	TS	5035	DEMPSTER ST @	CO	T-1A	ON
			MCCORMICK BLVD	SKOKIE		
1010	TS	5040	DEVON AVE @	CO	T-1A	ON
			DEE RD	PARK RIDGE		
1011	TS	5045	DEVON AVE @	CO	T-1A	ON
			MCCORMICK BLVD	LINCOLNWOOD		
1012	TS	5047	US 41 LINCOLN @	CO	T-1A	ON
			FIRE STATION	LINCOLNWOOD		
1013	TS	5050	DIXIE HWY @	CO	T-1A	ON
			167TH ST 170TH	MARKHAM		
1014	TS	5055	DIXIE HWY @	CO	T-1A	ON
			HOLBROOK	FLOSSMOOR		
1015	TS	5060	DIXIE HWY @	CO	T-1A	ON
			JOE ORR RD	CHICAGO HTS		
1016	TS	5065	JOLIET RD @	CO	T-1A	ON
			EAST AVE	HODGKINS		
1017	TS	5066	JOLIET RD @	CO	T-1A	ON
			QUARRY MALL ENT	HODGKINS		
1018	TS	5067	JOLIET RD @	CO	T-1A	ON
			CIRCUIT CITY QUARRY MALL ENT	COUNTRYSIDE		
1019	TS	5070	PLAINFIELD RD @	CO	T-1A	ON
			EAST AVE	MCCOOK		
1020	TS	5075	EAST END AVE @	CO	T-1A	ON
			SAUK TRAIL	SOUTH CHICAGO HTS		
1021	TS	5080	ELMHURST RD @	CO	T-1A	ON
			DEVON AVE	ELK GROVE		

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1022	TS	5090	EUCLID AVE @ WOLF RD	CO MT PROSPECT	T-1A	ON
1023	TS	5095	FOREST PRESERVE DRIVE @ MONTROSE	CO HARWOOD HTS	T-1A	ON
1024	TS	5100	FOREST PRESERVE DRIVE @ OAK PARK	CO HARWOOD HTS	T-1A	ON
1025	TS	5110	FRANKLIN AVE @ WOLF RD	CO FRANKLIN PARK	T-1A	ON
1026	TS	5115	FULLERTON AVE @ THATCHER	CO RIVER GROVE	T-1A	ON
1027	TS	5120	FOUNDRY KENSINGTON @ WOLF RD	CO MT PROSPECT	T-1A	ON
1028	TS	5125	GLENWOOD DYER RD @ COTTAGE GROVE	CO GLENWOOD	T-1A	ON
1029	TS	5130	GLENWOOD DYER RD @ MAIN ST GLENWOOD LANSING	CO GLENWOOD	T-1A	ON
1030	TS	5135	GLENVIEW RD @ GREENWOOD	CO GLENVIEW	T-1A	ON
1031	TS	5140	GOLF RD SIMPSON @ CENTRAL PARK AVE	CO SKOKIE	T-1A	ON
1032	TS	5145	EMERSON ST GOLF RD @ EAST PRAIRIE MCDANIEL	CO SKOKIE	T-1A	ON
1033	TS	5150	GOLF RD @ GROSS POINT RD	CO SKOKIE	T-1A	ON
1034	TS	5151	GOLF RD @ KNOX AVE	CO SKOKIE	T-1A	ON
1035	TS	5152	GROSS POINT RD @ KENTON	CO SKOKIE	T-1A	ON
1036	TS	5155	GOLF RD @ HARMS RD CENTRAL AVE	CO	T-1A	ON
1037	TS	5157	GOLF RD @ WOODS DR	CO	T-1A	ON
1038	TS	5160	GOLF RD @	CO	T-1A	ON

			LAVERGNE AVE	SKOKIE		
1039	TS	5165	GOLF RD @	CO	T-1A	ON
			LAWLER AVE	SKOKIE		
1040	TS	5170	EMERSON ST GOLF RD @	CO	T-1A	ON
			MCCORMICK BLVD	SKOKIE		
1041	TS	5175	GOLF RD @	CO	T-1A	ON
			GLENVIEW COUNTRY CLUB			
1042	TS	5180	GOVERNORS HWY @	CO	T-1A	ON
			FLOSSMOOR	FLOSSMOOR		
1043	TS	5185	GOVERNORS HWY @	CO	T-1A	ON
			KEDZIE	FLOSSMOOR		
1044	TS	5195	GOVERNORS HWY @	CO	T-1A	ON
			POPLAR	RIGHTON PARK		
1045	TS	5200	GOVERNORS HWY @	CO	T-1A	ON
			VOLLMER	FLOSSMOOR		
1046	TS	5205	GRAND AVE @	CO	T-1A	ON
			OAK STRUCKMAN	RIVER GROVE		
1047	TS	5215	IL 171 1ST AVE THATCHER @	CO	T-1A	ON
			GRAND	RIVER GROVE		
1048	TS	5220	GRAND AVE @	CO	T-1A	ON
			WOLF RD	NORTHLAKE		
1049	TS	5235	GREENWOOD AVE @	CO	T-1A	ON
			LAKE AVE	GLENVIEW		
1050	TS	5240	GROSS POINT RD @	CO	T-1A	ON
			CHURCH ST	SKOKIE		
1051	TS	5245	GROSS POINT RD @	CO	T-1A	ON
			HARRISON ST OLD ORCHARD	SKOKIE		
1052	TS	5250	GROSS POINT RD @	CO	T-1A	ON
			LARAMIE CAROL	SKOKIE		
1053	TS	5255	GROSS POINT RD @	CO	T-1A	ON
			OAKTON CENTRAL	MORTON GROVE		
1054	TS	5260	GROSS POINT RD @	CO	T-1A	ON
			TOUHY AVE	NILES		

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1055	TS	5270	GUNNISON @ NAGLE	CO	T-1A	ON	HARWOOD HTS
1056	TS	5275	GUNNISON @ OAK PARK AVE	CO	T-1A	ON	HARWOOD HTS
1057	TS	5285	KEDZIE AVE @ 123RD	CO	T-1A	ON	
1058	TS	5300	HICKS RD @ EUCLID	CO	T-1A	ON	ROLLING MEADOWS
1059	TS	5305	HICKS RD @ ILLINOIS INDUSTRIAL	CO	T-1A	ON	PALATINE
1060	TS	5320	HIBBARD @ LAKE AVE	CO	T-1A	ON	WILMETTE
1061	TS	5325	HOWARD ST @ US 41 LINCOLN	CO	T-1A	ON	SKOKIE
1062	TS	5330	HOWARD ST @ GROSS POINT RD MENARD	CO	T-1A	ON	NILES
1063	TS	5335	JOLIET RD @ BRAINARD	CO	T-1A	ON	
1064	TS	5340	MCCORMICK BLVD @ HOWARD ST	CO	T-1A	ON	SKOKIE
1065	TS	5345	INDIANA @ 137TH	CO	T-1A	ON	RIVERDALE
1066	TS	5350	INDIANA @ 138TH	CO	T-1A	ON	RIVERDALE
1067	TS	5355	JOLIET RD @ BRAINARD	CO	T-1A	ON	COUNTRYSIDE
1068	TS	5360	JOLIET RD @ LAWNDALE	CO	T-1A	ON	MCCOOK
1069	TS	5365	JOLIET RD @ WILLOW SPRINGS	CO	T-1A	ON	COUNTRYSIDE
1070	TS	5370	JOLIET RD @ WOLF RD	CO	T-1A	ON	COUNTRYSIDE
1071	TS	5375	JOLIET RD @	CO	T-1A	ON	

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			UNIVERSAL OIL PRODUCTS ENT	MCCOOK		
1072	TS	5380	KEDZIE AVE @	CO	T-1A	ON
			119TH OAKHILL CEMETERY			MERRIONETTE PARK
1073	TS	5385	KEDZIE AVE @	CO	T-1A	ON
			123RD			ALSIP
1074	TS	5390	KENSINGTON @	CO	T-1A	ON
			WHEELING RD			MT PROSPECT
1075	TS	5395	KIRCHOFF RD @	CO	T-1A	ON
			WILKE RD			ROLLING MEADOWS
1076	TS	5425	LAKE COOK RD @	CO	T-1A	ON
			QUENTIN RD			PALATINE
1077	TS	5430	LAKE COOK RD @	CO	T-1A	ON
			SHERIDAN RD			HIGHLAND PARK
1078	TS	5435	LAWRENCE AVE @	CO	T-1A	ON
			DEE EAST RIVER RD			NORRIDGE
1079	TS	5445	LEE ST @	CO	T-1A	ON
			TOUHY AVE			DESPLAINES
1080	TS	5448	OAKTON ST @	CO	T-1A	ON
			RIVER DR			MORTON GROVE
1081	TS	5450	LEHIGH AVE @	CO	T-1A	ON
			OAKTON			
1082	TS	5455	LEHIGH AVE @	CO	T-1A	ON
			TOUHY AVE			
1083	TS	5460	MADISON ST @	CO	T-1A	ON
			JACKSON BLVD			FOREST PARK
1084	TS	5465	MCCORMICK BLVD @	CO	T-1A	ON
			MAIN ST (SKOKIE)			SKOKIE
1085	TS	5475	MCCORMICK BLVD @	CO	T-1A	ON
			PRATT			LINCOLNWOOD
1086	TS	5477	MCCORMICK BLVD @	CO	T-1A	ON
			NORTHEAST PKWY			LINCOLNWOOD
1087	TS	5480	MCCORMICK BLVD @	CO	T-1A	ON
			TOUHY			SKOKIE

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1088	TS	5483	TOUHY AVE @ KEDZIE AVE	CO SKOKIE	T-1A	ON
1089	TS	5485	MCCORMICK BLVD @ OAKTON ST	CO SKOKIE	T-1A	ON
1090	TS	5490	MILWAUKEE AVE @ TOUHY AVE	CO	T-1A	ON
1091	TS	5495	IL 21 MILWAUKEE AVE @ IL 42 WAUKEGAN RD	CO	T-1A	ON
1092	TS	5505	NORTHWEST HWY @ OAKTON ST	CO PARK RIDGE	T-1A	ON
1093	TS	5510	NORTHWEST HWY @ POTTER RD	CO PARK RIDGE	T-1A	ON
1094	TS	5515	OAK PARK AVE @ 31ST	CO BERWYN	T-1A	ON
1095	TS	5520	OAK PARK AVE	CO BERWYN	T-1A	ON
1096	TS	5525	ROOSEVELT RD @ OAK PARK	CO BERWYN	T-1A	ON
1097	TS	5535	OAKTON ST @ FLORENCE	CO PARK RIDGE	T-1A	ON
1098	TS	5540	OAKTON ST @ GREENWOOD AVE	CO PARK RIDGE	T-1A	ON
1099	TS	5545	OAKTON ST @ MT PROSPECT	CO DESPLAINES	T-1A	ON
1100	TS	5550	OAKTON ST @ WOLF RD	CO DESPLAINES	T-1A	ON
1101	TS	5556	US 34 OGDEN AVE @ 25TH PL 26TH ST	CO CICERO	T-1A	ON
1102	TS	5557	IL 50 CICERO AVE @ CONNECTOR	CO CICERO	T-1A	ON
1103	TS	5558	US 34 OGDEN AVE @ CONNECTOR	CO CICERO	T-1A	ON
1104	TS	5570	US 34 OGDEN AVE @	CO	T-1A	ON

CLARENCE						
1105	TS	5575	US 34 OGDEN AVE @ CLINTON	CO	T-1A	ON
1106	TS	5580	US 34 OGDEN AVE @ EAST AVE	CO	T-1A	ON
1107	TS	5590	US 34 OGDEN AVE @ HOME AVE	CO	T-1A	ON
1108	TS	5600	OLD PLUM GROVE RD @ MEACHAM RD	CO	T-1A	ON
1109	TS	5605	PALATINE RD @ KENNICOTT DR	CO	T-1A	ON
1110	TS	5610	PALATINE RD @ QUENTIN RD	CO	T-1A	ON
1111	TS	5620	PALATINE RD @ SCHOENBECK	CO	T-1A	ON
1112	TS	5625	PALATINE RD @ WHEELING RD	CO	T-1A	ON
1113	TS	5630	PALATINE RD @ WINDSOR DRIVE	CO	T-1A	ON
1114	TS	5640	PALATINE RD @ WOLF RD	CO	T-1A	ON
1115	TS	5645	PALATINE RD @ ELA RD	CO	T-1A	ON
1116	TS	5652	PALATINE RD @ HUNTINGTON RD	CO	T-1A	ON
1117	TS	5670	COLFAX AVE @ QUENTIN RD	CO	T-1A	ON
1118	TS	5675	RIDGELAND AVE @ 96TH ST	CO	T-1A	ON
1119	TS	5680	RIDGELAND AVE @ 98TH ST	CO	T-1A	ON
1120	TS	5690	RIDGELAND AVE @ RIDGELAND COMMONS SHOPPING	CO	T-1A	ON

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1121	TS	5695	RIDGE RD @ ASHLAND AVE RIEGEL RD	CO HOMEWOOD	T-1A	ON
1122	TS	5710	RIEGEL RD @ HOLBROOK	CO HOMEWOOD	T-1A	ON
1123	TS	5725	ROOSEVELT RD @ 9TH AVE	CO BROADVIEW	T-1A	ON
1124	TS	5730	ROOSEVELT RD @ AUSTIN	CO CICERO	T-1A	ON
1125	TS	5735	ROOSEVELT RD @ EAST	CO BERWYN	T-1A	ON
1126	TS	5740	ROOSEVELT RD @ LARAMIE	CO CICERO	T-1A	ON
1127	TS	5745	ROOSEVELT RD @ MAYFIELD	CO CICERO	T-1A	ON
1128	TS	5750	ROOSEVELT RD @ RIDGELAND	CO BERWYN	T-1A	ON
1129	TS	5755	SAUK TRAIL @ STATE RD	CO SOUTH CHICAGO HTS	T-1A	ON
1130	TS	5760	SAUK TRAIL @ TORRENCE	CO SAUK VILLAGE	T-1A	ON
1131	TS	5770	SHERMER RD @ WILLOW RD	CO NORTHBROOK	T-1A	ON
1132	TS	5780	STATE RD @ CENTRAL 80TH ST	CO BURBANK	T-1A	ON
1133	TS	5785	STATE ST @ ILLINOIS	CO LEMONT	T-1A	ON
1134	TS	5790	STATE RD @ STEGER	CO CRETE	T-1A	ON
1135	TS	5795	ST CHARLES RD @ TAFT	CO BERKELEY	T-1A	ON
1136	TS	5800	ST CHARLES RD @ WOLF RD	CO BERKELEY	T-1A	ON
1137	TS	5810	TALCOTT @	CO	T-1A	ON

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			DEE RD	PARK RIDGE		
1138	TS	5812	US 14 @	MC	T-1A	ON
			WAL MART ENT	HARVARD		
1139	TS	5815	TALCOTT @	CO	T-1A	ON
			TOUHY	PARK RIDGE		
1140	TS	5825	TOUHY AVE @	CO	T-1A	ON
			CRAWFORD AVE	LINCOLNWOOD		
1141	TS	5830	TOUHY AVE @	CO	T-1A	ON
			DEE RD	PARK RIDGE		
1142	TS	5835	TOUHY AVE @	CO	T-1A	ON
			KOSTNER AVE	LINCOLNWOOD		
1143	TS	5840	TOUHY AVE @	CO	T-1A	ON
			MOBILE	NILES		
1144	TS	5841	TOUHY AVE @	CO	T-1A	ON
			MEADE AVE	NILES		
1145	TS	5843	TOUHY AVE @	CO	T-1A	ON
			MELVINA	NILES		
1146	TS	5845	TOUHY AVE @	CO	T-1A	ON
			RIVERSIDE	NILES		
1147	TS	5850	WASHINGTON RANDOLPH @	CO	T-1A	ON
			LATHROP	OAK PARK		
1148	TS	5855	91ST ST @	CO	T-1A	ON
			WESTERN AVE	EVERGREEN PK		
1149	TS	5860	WESTERN AVE @	CO	T-1A	ON
			98TH ST	EVERGREEN PK		
1150	TS	5865	WESTERN AVE @	CO	T-1A	ON
			99TH ST	EVERGREEN PK		
1151	TS	5870	WESTERN AVE @	CO	T-1A	ON
			119TH	BLUE ISLAND		
1152	TS	5875	123RD ST @	CO	T-1A	ON
			WESTERN AVE	BLUE ISLAND		
1153	TS	5880	139TH ST @	CO	T-1A	ON
			WESTERN AVE	DIXMOOR		

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1154	TS	5885	WESTERN AVE @ MONEE	CO	T-1A	ON
					PARK FOREST	
1155	TS	5890	WESTERN AVE @ STEGER RD	CO	T-1A	ON
					PARK FOREST	
1156	TS	5895	WESTERN AVE @ VOLLMER RD	CO	T-1A	ON
					FLOSSMOOR	
1157	TS	5900	WESTERN AVE @ ILLINOIS 16TH	CO	T-1A	ON
					PARK FOREST	
1158	TS	5925	WILLOW RD @ SANDERS RD	CO	T-1A	ON
					GLENVIEW	
1159	TS	5927	WILLOW RD @ PROTECTION PKWY WATERVIEW DR	CO	T-1A	ON
					GLENVIEW	
1160	TS	5930	WILLOW RD @ OLD WILLOW RD	CO	T-1A	ON
					NORTHBROOK	
1161	TS	5931	WILLOW RD @ RAVINA WAY	CO	T-1A	ON
					GLENVIEW	
1162	TS	5932	WILLOW RD @ PATRIOT	CO	T-1A	ON
					GLENVIEW	
1163	TS	5933	WILLOW RD @ WESTLEIGH DR FOUNDERS DR	CO	T-1A	ON
					NORTHBROOK	
1164	TS	5935	WILLOW SPRINGS RD @ PLAINFIELD	CO	T-1A	ON
					COUNTRYSIDE	
1165	TS	5940	WIRETON RD @ FRANCISCO	CO	T-1A	ON
					BLUE ISLAND	
1166	TS	5944	WOLF RD @ EDWARD RD	CO	T-1A	ON
					PROSPECT HTS	
1167	TS	5945	WOLF RD @ CAMP MCDONALD RD	CO	T-1A	ON
					PROSPECT HTS	
1168	TS	5950	WOLF RD @ WILLOW RD OLD WILLOW RD	CO	T-1A	ON
					PROSPECT HTS	
1169	TS	5955	WOLF RD @ HOWARD	CO	T-1A	ON
					DESPLAINES	

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1170	TS	5965	171ST ST @ WOOD ST	CO HAZEL CREST	T-1A	ON
1171	TS	5975	I 55 STEV NORTH FRONTAGE @ CASS AVE	DU DARIEN	T-1A	ON
1172	TS	5985	I 290 IKE RAMPS K & O @ US 20 LAKE ST	DU ELMHURST	T-1A	ON
1173	TS	5990	I 290 IKE @ YORK RD N RMP WINTHROP	DU ELMHURST	T-1A	ON
1174	TS	5995	I 290 IKE @ US 20 YORK RD S RAMP LAKE ST	DU ELMHURST	T-1A	ON
1175	TS	6015	US 20 LAKE ST @ IL 83 W RAMPS K & M	DU ADDISON	T-1A	ON
1176	TS	6020	US 20 LAKE ST @ ADDISON RD	DU ADDISON	T-1A	ON
1177	TS	6025	US 20 LAKE ST @ CHURCH ST	DU ELMHURST	T-1A	ON
1178	TS	6035	US 20 LAKE ST @ GLEN ELLYN RD	DU BLOOMINGDALE	T-1A	ON
1179	TS	6037	US 20 LAKE ST @ EUCLID AVE LAKE VIEW DR	DU BLOOMINGDALE	T-1A	ON
1180	TS	6040	US 20 LAKE ST @ IL 83 GRAND E RAMPS J & L	DU ELMHURST	T-1A	ON
1181	TS	6043	US 20 LAKE ST @ GREENBRIAR DR	DU ADDISON	T-1A	ON
1182	TS	6045	US 20 LAKE ST @ MEDINAH RD	DU BLOOMINGDALE	T-1A	ON
1183	TS	6046	US 34 OGDEN AVE @ COMMONS DR	DU AURORA	T-1A	ON
1184	TS	6047	US 34 OGDEN AVE @ 75TH ST	DU AURORA	T-1A	ON
1185	TS	6048	US 34 OGDEN AVE @ LONG GROVE	DU AURORA	T-1A	ON
1186	TS	6049	US 34 OGDEN AVE @	DU	T-1A	ON

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			EOLA RD	AURORA		
1187	TS	6050	US 34 OGDEN AVE @	DU	T-1A	ON
			MONTGOMERY RD	AURORA		
1188	TS	6051	US 34 OGDEN AVE @	DU	T-1A	ON
			FRONTENAC	AURORA		
1189	TS	6052	US 34 OGDEN AVE @	KA	T-1A	ON
			COPLEY HOSPITAL ENT	AURORA		
1190	TS	6053	US 34 OGDEN AVE @	KA	T-1A	ON
			RIDGE RD WATERFORD DR	AURORA		
1191	TS	6060	US 20 LAKE ST @	DU	T-1A	ON
			IL 53 ROHLWING RD	ADDISON		
1192	TS	6061	IL 53 ROHLWING RD @	DU	T-1A	ON
			MALL ENT	ADDISON		
1193	TS	6062	IL 53 ROHLWING RD @	DU	T-1A	ON
			WOODLAND AVE	ADDISON		
1194	TS	6065	US 20 LAKE ST @	DU	T-1A	ON
			SPRINGFIELD DR	ROSELLE		
1195	TS	6070	US 20 LAKE ST @	DU	T-1A	ON
			VILLA AVE WOOD DALE RD	ADDISON		
1196	TS	6075	US 20 LAKE ST @	DU	T-1A	ON
			WALNUT ST	ELMHURST		
1197	TS	6077	US 20 LAKE ST @	CO	T-1A	ON
			NORTH AVE EAST BARTLETT RD	BARTLETT		
1198	TS	6080	US 20 LAKE ST @	DU	T-1A	ON
			WEST AVE	ELMHURST		
1199	TS	6085	US 20 LAKE ST @	DU	T-1A	ON
			ROSEDALE AVE	BLOOMINGDALE		
1200	TS	6089	IL 59 @	DU	T-1A	ON
			MCCOY FOX RIVER COMMONS	NAPERVILLE		
1201	TS	6090	IL 59 @	DU	T-1A	ON
			US 34 OGDEN AVE	AURORA		
1202	TS	6092	IL 59 @	DU	T-1A	ON
			87TH ST WHITE EAGLE DR	AURORA		

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1203	TS	6095	US 34 OGDEN AVE @ CASS AVE	DU WESTMONT	T-1A	ON
1204	TS	6100	US 34 OGDEN AVE @ PASQUINELLI DR MIDDAUGH DR	DU WESTMONT	T-1A	ON
1205	TS	6110	US 34 OGDEN AVE @ IL 83 WEST RAMPS A & B	DU WESTMONT	T-1A	ON
1206	TS	6115	US 34 OGDEN AVE @ IL 83 EAST RAMPS C & D	DU HINSDALE	T-1A	ON
1207	TS	6116	US 34 OGDEN AVE @ SALT CREEK LN OAK ST	DU HINSDALE	T-1A	ON
1208	TS	6118	US 34 OGDEN AVE @ YORK RD	DU HINSDALE	T-1A	ON
1209	TS	6120	US 34 OGDEN AVE @ CROSS ST	DU DOWNERS GROVE	T-1A	ON
1210	TS	6125	US 34 OGDEN AVE @ BELMONT RD FINLEY RD	DU DOWNERS GROVE	T-1A	ON
1211	TS	6130	US 34 OGDEN AVE @ MADISON ST	DU HINSDALE	T-1A	ON
1212	TS	6135	US 34 OGDEN AVE @ OAKWOOD RD	DU WESTMONT	T-1A	ON
1213	TS	6140	IL 19 IRVING PARK RD @ MARSHALL	DU BENSENVILLE	T-1A	ON
1214	TS	6145	IL 19 IRVING PARK RD @ MEDINAH RD	DU ROSELLE	T-1A	ON
1215	TS	6155	IL 19 IRVING PARK RD @ IL 53 ROHLWING RD	DU ITASCA	T-1A	ON
1216	TS	6156	IL 53 ROHLWING RD @ BRYN MAWER AVE	DU ITASCA	T-1A	ON
1217	TS	6157	IL 53 ROHLWING RD @ WEST THORNDALE AVE	DU ITASCA	T-1A	ON
1218	TS	6158	IL 53 ROHLWING RD @ NORWOOD AVE	DU ITASCA	T-1A	ON
1219	TS	6160	IL 19 IRVING PARK RD @	DU	T-1A	ON

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			SPRUCE AVE	BENSENVILLE		
1220	TS	6163	IL 19 IRVING PK RD @	DU	T-1A	ON
			CATALPA AVE	ITASCA		
1221	TS	6164	IL 19 IRVING PARK RD @	DU	T-1A	ON
			BLOOMINGDALE RD	ITASCA		
1222	TS	6165	IL 19 IRVING PARK RD @	DU	T-1A	ON
			WALNUT AVE			
1223	TS	6170	IL 19 IRVING PARK RD @	DU	T-1A	ON
			PROSPECT AVE	WOOD DALE		
1224	TS	6175	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			FABYAN PKWY WASHINGTON ST	WEST CHICAGO		
1225	TS	6180	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			JOLIET RD	WEST CHICAGO		
1226	TS	6185	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			KRESS RD	WEST CHICAGO		
1227	TS	6190	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			MEYERS RD	LOMBARD		
1228	TS	6195	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			SUMMIT AVE	OAKBROOK TERRACE		
1229	TS	6198	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			VILLA AVE (SOUTH OF)	OAKBROOK TERRACE		
1230	TS	6200	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			WINFIELD RD	WINFIELD		
1231	TS	6205	IL 59 @	DU	T-1A	ON
			IL 38 N RAMP DAYTON AVE	WEST CHICAGO		
1232	TS	6206	IL 59 @	DU	T-1A	ON
			IL 38 S RAMP ROOSEVELT BROWNING	WEST CHICAGO		
1233	TS	6210	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			COURTYARD SHOPPING CTR	OAKBROOK TERRACE		
1234	TS	6215	IL 53 @	DU	T-1A	ON
			IL 64 NORTH AVE	LOMBARD		
1235	TS	6220	IL 53 @	DU	T-1A	ON

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			75TH ST	WOODRIDGE		
1236	TS	6225	IL 53 @	DU	T-1A	ON
			HOBSON RD	WOODRIDGE		
1237	TS	6230	IL 53 @	DU	T-1A	ON
			PARK AVE	GLEN ELLYN		
1238	TS	6235	IL 53 @	DU	T-1A	ON
			ST CHARLES RD	LOMBARD		
1239	TS	6237	IL 53 COLUMBINE AVE @	DU	T-1A	ON
			MADISON ST	LOMBARD		
1240	TS	6240	IL 53 @	DU	T-1A	ON
			SUMMERHILL DR BELL TECH ENT	WOODRIDGE		
1241	TS	6245	IL 53 @	DU	T-1A	ON
			83RD ST	WOODRIDGE		
1242	TS	6250	IL 53 @	DU	T-1A	ON
			59TH ST FOUR LAKES ENT	LISLE		
1243	TS	6255	IL 53 @	DU	T-1A	ON
			WOODRIDGE DR SEVEN BRIDGES ENT	WOODRIDGE		
1244	TS	6256	IL 53 @	DU	T-1A	ON
			HIGH TRAIL SEVEN BRIDGES ENT	WOODRIDGE		
1245	TS	6260	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			IL 59	WARRENVILLE		
1246	TS	6265	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			22ND ST	OAKBROOK		
1247	TS	6270	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			BATAVIA RD	WARRENVILLE		
1248	TS	6275	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			FINLEY RD	DOWNERS GROVE		
1249	TS	6280	I 88 N RAMP IL 56 BUTTERFIELD @	DU	T-1A	ON
			HIGHLAND AVE	LOMBARD		
1250	TS	6290	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			LAMBERT AVE	WHEATON		
1251	TS	6293	IL 56 BUTTERFIELD RD @	DU	T-1A	ON

			FOUNTAIN SQUARE RD	LOMBARD		
1252	TS	6295	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			MEYERS RD	OAKBROOK		
1253	TS	6300	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			MIDWEST RD SUMMIT AVE	OAKBROOK TERRACE		
1254	TS	6305	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			PARK BLVD	GLEN ELLYN		
1255	TS	6310	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			FAIRFIELD AVE	LOMBARD		
1256	TS	6315	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			NAPERVILLE RD	WHEATON		
1257	TS	6320	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			WINFIELD RD	WINFIELD		
1258	TS	6325	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			EOLA RD	AURORA		
1259	TS	6330	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			HERRICK RD WEISBROOK RD	WHEATON		
1260	TS	6335	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			ORCHARD RD	WHEATON		
1261	TS	6340	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			GLENBARD SOUTH HIGH SCHOOL	GLEN ELLYN		
1262	TS	6345	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			TRANS AM PLAZA	OAKBROOK TERRACE		
1263	TS	6350	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			WOODCREEK DR LLOYD AVE	DOWNERS GROVE		
1264	TS	6352	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			HOME DEPOT ENT ESPLANADE DR	DOWNERS GROVE		
1265	TS	6355	IL 64 NORTH AVE @	DU	T-1A	ON
			IL 59	WEST CHICAGO		
1266	TS	6360	IL 59 @	DU	T-1A	ON
			75TH ST	AURORA		
1267	TS	6362	IL 59 @	DU	T-1A	ON
			BEEBE DR COSTCO ENT	NAPERVILLE		

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1268	TS	6365	IL 59 @ ARMY TRAIL RD	DU BARTLETT	T-1A	ON
1269	TS	6370	IL 59 @ BATAVIA RD	DU WARRENVILLE	T-1A	ON
1270	TS	6377	IL 59 @ STRUCKMAN BLVD	DU BARTLETT	T-1A	ON
1271	TS	6378	IL 59 @ APPLE VALLEY DR HOME DEPOT ENT	DU BARTLETT	T-1A	ON
1272	TS	6379	IL 59 @ WOODLAND HILLS PKWY	DU BARTLETT	T-1A	ON
1273	TS	6380	IL 59 @ NORTH AURORA RD	DU NAPERVILLE	T-1A	ON
1274	TS	6385	IL 59 @ CATON FARM RD	WI JOLIET	T-1A	ON
1275	TS	6390	IL 59 @ FOREST AVE	DU WEST CHICAGO	T-1A	ON
1276	TS	6395	IL 59 @ CONTINENTAL DR MEADOW DR	DU WARRENVILLE	T-1A	ON
1277	TS	6400	IL 64 NORTH AVE @ IL 83	DU ELMHURST	T-1A	ON
1278	TS	6405	IL 64 NORTH AVE @ ADDISON RD	DU	T-1A	ON
1279	TS	6410	IL 64 NORTH AVE @ ARDMORE AVE	DU VILLA PARK	T-1A	ON
1280	TS	6415	IL 64 NORTH AVE @ BERTEAU AVE	DU ELMHURST	T-1A	ON
1281	TS	6420	IL 64 NORTH AVE @ BLOOMINGDALE RD	DU GLENDALE HTS	T-1A	ON
1282	TS	6425	IL 64 NORTH AVE @ COUNTY FARM RD	DU CAROL STREAM	T-1A	ON
1283	TS	6430	IL 64 NORTH AVE @ EMROY AVE MELROSE AVE	DU ELMHURST	T-1A	ON

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1284	TS	6435	IL 64 NORTH AVE @ GARY AVE	DU	T-1A	ON	CAROL STREAM
1285	TS	6440	IL 64 NORTH AVE @ GRACE ST	DU	T-1A	ON	LOMBARD
1286	TS	6445	IL 64 NORTH AVE @ KUHN RD	DU	T-1A	ON	CAROL STREAM
1287	TS	6446	IL 64 NORTH AVE @ BENNETT DR	DU	T-1A	ON	CAROL STREAM
1288	TS	6450	IL 64 NORTH AVE @ MAIN ST GLEN ELLYN RD	DU	T-1A	ON	GLENDALE HTS
1289	TS	6455	IL 64 NORTH AVE @ MAIN ST	DU	T-1A	ON	LOMBARD
1290	TS	6456	IL 64 NORTH AVE @ LOMBARD RD	DU	T-1A	ON	LOMBARD
1291	TS	6460	IL 64 NORTH AVE @ MYRTLE AVE	DU	T-1A	ON	ELMHURST
1292	TS	6465	IL 64 NORTH AVE @ SCHMALE RD	DU	T-1A	ON	CAROL STREAM
1293	TS	6470	IL 64 NORTH AVE @ MICHIGAN AVE NORTH PARK MALL ENT	DU	T-1A	ON	VILLA PARK
1294	TS	6475	IL 64 NORTH AVE @ SWIFT RD	DU	T-1A	ON	LOMBARD
1295	TS	6480	IL 64 NORTH AVE @ VILLA AVE	DU	T-1A	ON	VILLA PARK
1296	TS	6490	IL 64 NORTH AVE @ WEST ST	DU	T-1A	ON	ELMHURST
1297	TS	6495	IL 64 NORTH AVE @ WESTWOOD AVE	DU	T-1A	ON	ADDISON
1298	TS	6500	IL 64 NORTH AVE @ YORK RD	DU	T-1A	ON	ELMHURST
1299	TS	6505	IL 64 NORTH AVE @ ELMHURST PLAZA	DU	T-1A	ON	VILLA PARK

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1300	TS	6510	US 12 IL 59 @ IL 120	LA LAKEMOOR	T-1A	ON
1301	TS	6511	US 12 IL 59 @ OLD BELVIDERE RD VOLO VILLAGE	LA VOLO	T-1A	ON
1302	TS	6512	US 12 IL 59 @ SULLIVAN LAKE MOLIDOR	LA VOLO	T-1A	ON
1303	TS	6515	US 12 IL 59 EAST RAMP @ IL 176	LA WAUCONDA	T-1A	ON
1304	TS	6516	US 12 IL 59 WEST RAMP @ IL 176	LA WAUCONDA	T-1A	ON
1305	TS	6517	IL 176 LIBERTY ST @ WAUCONDA CROSSING	LA WAUCONDA	T-1A	ON
1306	TS	6520	US 12 IL 59 @ BONNER RD	LA WAUCONDA	T-1A	ON
1307	TS	6525	US 14 NORTHWEST HWY @ IL 59 HOUGH RD	LA BARRINGTON	T-1A	ON
1308	TS	6530	US 14 NORTHWEST HWY @ KELSEY PLUM TREE RD	LA	T-1A	ON
1309	TS	6531	IL 22 @ KELSEY	LA NORTH BARRINGTON	T-1A	ON
1310	TS	6532	US 14 NORTHWEST HWY @ PEPPER RD	LA NORTH BARRINGTON	T-1A	ON
1311	TS	6535	US 41 @ IL 21 MILWAUKEE AVE	LA GURNEE	T-1A	ON
1312	TS	6540	US 41 @ IL 22 HALF DAY RD	LA HIGHLAND PARK	T-1A	ON
1313	TS	6543	IL 22 @ US 41 NORTH RAMP	LA HIGHLAND PARK	T-1A	ON
1314	TS	6545	US 41 SKOKIE HWY @ IL 60 KENNEDY RD	LA LAKE FOREST	T-1A	ON
1315	TS	6551	IL 132 GRAND AVE @ 1ST ST	LA GURNEE	T-1A	ON

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1316	TS	6555	US 41 SKOKIE HWY @ IL 137 BUCKLEY	LA GURNEE	T-1A	ON
1317	TS	6560	US 41 @ IL 173	LA ROSECRANS	T-1A	ON
1318	TS	6565	US 41 SKOKIE HWY @ 22ND ST MLK KING DR	LA	T-1A	ON
1319	TS	6567	US 41 @ AMHURST PKWY	LA WAUKEGAN	T-1A	ON
1320	TS	6568	IL 173 @ I 94 OFF RAMP	LA ROSECRANS	T-1A	ON
1321	TS	6569	IL 173 @ I 94 TLWY ON RAMP	LA ROSECRANS	T-1A	ON
1322	TS	6570	US 41 SKOKIE HWY @ DELANEY RD	LA GURNEE	T-1A	ON
1323	TS	6575	US 41 @ OLD ELM RD	LA	T-1A	ON
1324	TS	6580	US 41 @ WADSWORTH RD	LA	T-1A	ON
1325	TS	6585	US 41 @ WESTLEIGH RD	LA	T-1A	ON
1326	TS	6590	US 41 @ WEST PARK AVE	LA HIGHLAND PARK	T-1A	ON
1327	TS	6594	US 45 IL 21 MILWAUKEE AVE @ OLD HALF DAY RD	LA LIBERTYVILLE	T-1A	ON
1328	TS	6595	US 45 IL 21 MILWAUKEE AVE @ US 45 OLE HALF DAY	LA LINCOLNSHIRE	T-1A	ON
1329	TS	6598	US 45 @ PORT CLINTON RD	LA VERNON HILLS	T-1A	ON
1330	TS	6600	US 45 IL 21 MILWAUKEE AVE @ IL 22	LA LINCOLNSHIRE	T-1A	ON
1331	TS	6605	US 45 @ IL 60	LA MUNDELEIN	T-1A	ON
1332	TS	6610	US 45 @	LA	T-1A	ON

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			IL 83	LONG GROVE		
1333	TS	6612	US 45 @	CO	T-1A	ON
			IL 83 E RAMPS B & D	PALOS TWNSHP		
1334	TS	6613	US 45 @	CO	T-1A	ON
			IL 83 W RAMPS A&C	PALOS HILLS		
1335	TS	6615	US 45 @	LA	T-1A	ON
			IL 132 GRAND AVE	GURNEE		
1336	TS	6617	US 45 @	LA	T-1A	ON
			STEARNS SCHOOL RD SAND LAKE RD	LINDENHURST		
1337	TS	6618	US 45 @	LA	T-1A	ON
			DADA DR GRANT AVE	GURNEE		
1338	TS	6620	US 45 @	LA	T-1A	ON
			IL 173	ANTIOCH		
1339	TS	6622	IL 173 ROSECRANS DR @	LA	T-1A	ON
			GREGORY DR	ANTIOCH		
1340	TS	6625	US 45 LAKE @	LA	T-1A	ON
			IL 176 MAPLE			
1341	TS	6630	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			APTAKISIC RD	LINCOLNSHIRE		
1342	TS	6635	US 45 @	LA	T-1A	ON
			BRAE LOCH RD	GURNEE		
1343	TS	6640	US 45 @	LA	T-1A	ON
			BUTTERFIELD RD	VERNON HILLS		
1344	TS	6641	US 45 @	LA	T-1A	ON
			OAKWOOD RD	VERNON HILLS		
1345	TS	6645	US 45 @	LA	T-1A	ON
			CENTER RD	GRAYSLAKE		
1346	TS	6650	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			DEERFIELD RD	RIVERWOODS		
1347	TS	6655	US 45 @	LA	T-1A	ON
			DEERPATH RD			
1348	TS	6657	US 45 @	LA	T-1A	ON

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			COMMUTER LOT RANNEY AVE	VERNON HILLS		
1349	TS	6658	US 45 @	LA	T-1A	ON
			BUFFALO GROVE RD FAIRWAY DR	VERNON HILLS		
1350	TS	6660	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			INVERRARY RD	BUFFALO GROVE		
1351	TS	6665	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			KNIGHTSBRIDGE PKWY	LINCOLNSHIRE		
1352	TS	6670	US 45 @	LA	T-1A	ON
			GRASS LAKE RD MILLBURN RD	MILLBURN		
1353	TS	6675	US 45 @	LA	T-1A	ON
			PETERSON RD	LIBERTYVILLE		
1354	TS	6680	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			BUSCH PKWY	LINCOLNSHIRE		
1355	TS	6685	US 45 @	LA	T-1A	ON
			WASHINGTON ST	GURNEE		
1356	TS	6695	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			MARRIOTT LINCOLNSHIRE ENT	LINCOLNSHIRE		
1357	TS	6698	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			AUDUBON WAY	LINCOLNSHIRE		
1358	TS	6700	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			IL 60	VERNON HILLS		
1359	TS	6702	IL 60 TOWNLINE RD @	LA	T-1A	ON
			RIVERTREE CT MELLODY FARM ENT	VERNON HILLS		
1360	TS	6705	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			IL 132 GRAND AVE	GURNEE		
1361	TS	6708	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			CASEY RD	LIBERTYVILLE		
1362	TS	6710	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			IL 137	LIBERTYVILLE		
1363	TS	6715	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			IL 176	LIBERTYVILLE		
1364	TS	6718	IL 21 MILWAUKEE @	LA	T-1A	ON

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			N HOLLISTER CUNEO PROP S ENT	LIBERTYVILLE		
1365	TS	6720	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			HAWTHORN CTR DRIVE # 6 RING RD	VERNON HILLS		
1366	TS	6725	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			HAWTHORN CTR DRIVE # 7 RING RD	VERNON HILLS		
1367	TS	6730	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			WASHINGTON ST	GURNEE		
1368	TS	6732	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			SIX FLAGS RIVERSIDE DR GREAT AMERIC	GURNEE		
1369	TS	6735	IL 22 @	LA	T-1A	ON
			IL 43	GURNEE		
1370	TS	6740	IL 22 @	LA	T-1A	ON
			IL 59	NORTH BARRINGTON		
1371	TS	6742	IL 22 @	LA	T-1A	ON
			OLD BARRINGTON RD	NORTH BARRINGTON		
1372	TS	6745	IL 22 @	LA	T-1A	ON
			IL 83	LONG GROVE		
1373	TS	6750	MAIN ST (LAKE ZURICH) @	LA	T-1A	ON
			MIDLOTHIAN CHURCH	LAKE ZURICH		
1374	TS	6751	IL 22 @	LA	T-1A	ON
			BUESCHING RD	LAKE ZURICH		
1375	TS	6753	MIDLOTHIAN RD @	LA	T-1A	ON
			OAKWOOD RD	LAKE ZURICH		
1376	TS	6757	IL 22 @	LA	T-1A	ON
			OLD RAND RD	LAKE ZURICH		
1377	TS	6758	IL 22 @	LA	T-1A	ON
			EAST MAIN ST (LAKE ZURICH)	LAKE ZURICH		
1378	TS	6759	IL 22 @	LA	T-1A	ON
			WEST MAIN ST (LAKE ZURICH)	LAKE ZURICH		
1379	TS	6760	IL 22 @	LA	T-1A	ON
			PORT CLINTON RD OLD HALF DAY RD	LINCOLNSHIRE		

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1380	TS	6765	IL 22 @ QUENTIN RD	LA KILDEER	T-1A	ON
1381	TS	6767	IL 22 @ CORPORATE DR KEMPER INSURANCE ENT	LA LAKE ZURICH	T-1A	ON
1382	TS	6770	IL 22 @ RIVERWOODS RD BRADLEY RD	LA LINCOLNSHIRE	T-1A	ON
1383	TS	6775	IL 22 @ ELA RD	LA LAKE ZURICH	T-1A	ON
1384	TS	6780	IL 22 @ BARCLAY BLVD	LA LINCOLNSHIRE	T-1A	ON
1385	TS	6785	IL 22 @ OLD MILL GROVE RD OAKWOOD RD	LA LAKE ZURICH	T-1A	ON
1386	TS	6790	IL 22 @ WESTMINSTER WAY HEWITT DR	LA LINCOLNSHIRE	T-1A	ON
1387	TS	6795	IL 43 WAUKEGAN RD @ IL 60	LA LAKE FOREST	T-1A	ON
1388	TS	6800	IL 43 WAUKEGAN RD @ IL 137 BUCKLEY RD	LA NORTH CHICAGO	T-1A	ON
1389	TS	6805	IL 43 WAUKEGAN RD @ IL 176	LA LAKE BLUFF	T-1A	ON
1390	TS	6806	IL 43 WAUKEGAN RD @ WESTMORELAND DR MIDDLE FORK	LA LAKE FOREST	T-1A	ON
1391	TS	6810	IL 43 WAUKEGAN RD @ 22ND ST MARTIN L KING DR	LA NORTH CHICAGO	T-1A	ON
1392	TS	6815	IL 43 WAUKEGAN RD @ ABBOTT LABS GATE 1	LA NORTH CHICAGO	T-1A	ON
1393	TS	6820	IL 43 WAUKEGAN RD @ ABBOTT LABS GATE 2	LA NORTH CHICAGO	T-1A	ON
1394	TS	6830	IL 43 WAUKEGAN RD @ FOSTER AVE	LA	T-1A	ON
1395	TS	6835	IL 53 @	LA	T-1A	ON

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			IL 83	LONG GROVE		
1396	TS	6837	IL 83 @ ROBERT PARKER COFFIN RD	LA LONG GROVE	T-1A	ON
1397	TS	6838	IL 53 @ MENARDS ENT	LA LONG GROVE	T-1A	ON
1398	TS	6839	IL 53 @ OLD MCHENRY RD	LA LONG GROVE	T-1A	ON
1399	TS	6840	IL 59 @ IL 132 GRAND AVE	LA LAKE VILLA	T-1A	ON
1400	TS	6843	IL 173 @ TIFFANY RD	LA ANTIOCH	T-1A	ON
1401	TS	6847	IL 173 @ WALMART ENT	LA ANTIOCH	T-1A	ON
1402	TS	6850	IL 59 @ GRAND AVE WASHINGTON ST	LA FOX LAKE	T-1A	ON
1403	TS	6855	IL 59 @ GRASS LAKE RD	LA ANTIOCH	T-1A	ON
1404	TS	6857	IL 59 @ BEACH GROVE RD	LA ANTIOCH	T-1A	ON
1405	TS	6860	IL 59 @ MILLER RD	LA BARRINGTON	T-1A	ON
1406	TS	6865	IL 60 TOWNE LINE RD @ BUTTERFIELD RD	LA	T-1A	ON
1407	TS	6870	IL 60 @ DEERPATH RD	LA VERNON HILLS	T-1A	ON
1408	TS	6875	IL 60 @ LAKEVIEW PKWY HAWTHORN CT	LA VERNON HILLS	T-1A	ON
1409	TS	6880	IL 60 @ HAWTHORN CTR DRIVE 3	LA VERNON HILLS	T-1A	ON
1410	TS	6885	IL 60 @ HAWTHORN CTR DRIVE 4	LA VERNON HILLS	T-1A	ON
1411	TS	6890	IL 60 @ HAWTHORN CTR DRIVE # 5	LA VERNON HILLS	T-1A	ON

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1412	TS	6895	IL 60 @ ST MARY'S RD	LA VERNON HILLS	T-1A	ON
1413	TS	6900	IL 60 @ ASPEN DR	LA VERNON HILLS	T-1A	ON
1414	TS	6905	IL 60 @ OAK CREEK PLAZA	LA MUNDELEIN	T-1A	ON
1415	TS	6906	IL 120 BELVIDERE RD @ CEDAR LAKE RD	LA LAKE VILLA	T-1A	ON
1416	TS	6908	IL 60 @ CEDAR LAKE RD	LA ROUND LAKE	T-1A	ON
1417	TS	6909	IL 60 @ PETERSON RD	LA ROUND LAKE PARK	T-1A	ON
1418	TS	6910	IL 60 IL 83 @ SCHANK NORTH JCT	LA MUNDELEIN	T-1A	ON
1419	TS	6911	IL 60 @ CONNECTOR TARGET	LA MUNDELEIN	T-1A	ON
1420	TS	6912	IL 60 @ FAIRFIELD RD	LA FREMONT TWNSHP	T-1A	ON
1421	TS	6915	IL 60 IL 83 @ IL 176	LA MUNDELEIN	T-1A	ON
1422	TS	6916	IL 176 @ HAWLEY ST EAST	LA MUNDELEIN	T-1A	ON
1423	TS	6917	IL 176 @ HAWLEY ST WEST	LA HAWTHORN WOODS	T-1A	ON
1424	TS	6920	IL 60 IL 83 @ DIAMOND LAKE RD	LA MUNDELEIN	T-1A	ON
1425	TS	6930	IL 60 IL 83 @ HAWLEY ST	LA MUNDELEIN	T-1A	ON
1426	TS	6935	IL 60 IL 83 @ WILLOW SPRINGS RD SOUTH JCT	LA MUNDELEIN	T-1A	ON
1427	TS	6940	IL 83 @ IL 120 BELVIDERE RD	LA	T-1A	ON
1428	TS	6945	IL 83 @	LA	T-1A	ON

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			IL 132 GRAND AVE	LAKE VILLA		
1429	TS	6948	IL 83 @ MONAVILLE RD	LA LAKE VILLA	T-1A	ON
1430	TS	6949	IL 83 @ ENGLE DR WALMART	LA LAKE VILLA	T-1A	ON
1431	TS	6955	IL 83 @ APTAKISIC RD LONG GROVE RD	LA LONG GROVE	T-1A	ON
1432	TS	6957	IL 83 @ HILLTOP RD	LA LONG GROVE	T-1A	ON
1433	TS	6960	IL 83 @ ARLINGTON HEIGHTS RD	LA BUFFALO GROVE	T-1A	ON
1434	TS	6965	IL 83 @ DEERFIELD PKWY CHECKER DR	LA BUFFALO GROVE	T-1A	ON
1435	TS	6970	IL 83 @ GRASS LAKE RD	LA BUFFALO GROVE	T-1A	ON
1436	TS	6975	IL 83 @ BUFFALO GROVE RD	LA BUFFALO GROVE	T-1A	ON
1437	TS	6982	IL 83 @ PETERSON RD	LA GRAYSLAKE	T-1A	ON
1438	TS	6990	IL 83 @ GILMER RD OAKWOOD DR	LA LONG GROVE	T-1A	ON
1439	TS	6992	IL 83 @ WESTMORELAND DR	LA LONG GROVE	T-1A	ON
1440	TS	6995	IL 120 BELVIDERE RD @ IL 134	LA HAINESVILLE	T-1A	ON
1441	TS	7000	IL 120 BELVIDERE RD @ HAINESVILLE RD	LA HAINESVILLE	T-1A	ON
1442	TS	7005	IL 120 BELVIDERE RD @ KNIGHT AVE	LA PARK CITY	T-1A	ON
1443	TS	7010	IL 120 BELVIDERE RD @ OPLAINE RD	LA WAUKEGAN	T-1A	ON
1444	TS	7018	IL 131 GREEN BAY RD @ CAVIN RD	LA NORTH CHICAGO	T-1A	ON

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1445	TS	7020	IL 131 GREEN BAY RD @ IL 176 ROCKLAND RD SCRANTON AVE	LA LAKE BLUFF	T-1A	ON
1446	TS	7026	IL 131 GREEN BAY RD @ KENOSHA RD	LA BEACH PARK	T-1A	ON
1447	TS	7030	IL 131 GREEN BAY RD @ WADSWORTH RD	LA BEACH PARK	T-1A	ON
1448	TS	7035	IL 131 GREEN BAY RD @ WASHINGTON ST	LA WAUKEGAN	T-1A	ON
1449	TS	7040	IL 131 GREEN BAY RD @ YORKHOUSE RD	LA BEACH PARK	T-1A	ON
1450	TS	7045	IL 131 GREEN BAY RD @ 10TH ST	LA NORTH CHICAGO	T-1A	ON
1451	TS	7048	IL 173 @ HUNT CLUB RD	LA OLD MILL CREEK	T-1A	ON
1452	TS	7049	IL 131 GREEN BAY RD @ 21ST ST	LA ZION	T-1A	ON
1453	TS	7050	IL 131 GREEN BAY RD @ IL 173	LA WADSWORTH	T-1A	ON
1454	TS	7053	IL 173 @ KENOSHA	LA ZION	T-1A	ON
1455	TS	7054	IL 131 GREEN BAY RD @ RUSSELL RD STATE LINE RD	LA ZION	T-1A	ON
1456	TS	7055	IL 132 GRAND AVE @ GREAT AMERICA ENT LAWSON BLVD	LA GURNEE	T-1A	ON
1457	TS	7060	IL 132 GRAND AVE @ HUNT CLUB RD	LA GURNEE	T-1A	ON
1458	TS	7062	IL 132 GRAND AVE @ BROOKSIDE DR	LA GURNEE	T-1A	ON
1459	TS	7065	IL 132 GRAND AVE @ OPLAINE RD	LA GURNEE	T-1A	ON
1460	TS	7070	IL 132 GRAND AVE @ SAND LAKE RD	LA LINDENHURST	T-1A	ON

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1461	TS	7075	IL 132 GRAND AVE @ GRANADA BLVD LINDENHURST DR	LA LINDENHURST	T-1A	ON
1462	TS	7078	IL 132 GRAND AVE @ FAIRFIELD RD	LA LAKE VILLA	T-1A	ON
1463	TS	7080	IL 132 GRAND AVE @ DEEP LAKE RD	LA LAKE VILLA	T-1A	ON
1464	TS	7081	IL 132 GRAND AVE @ MUNN RD	LA LINDENHURST	T-1A	ON
1465	TS	7085	IL 132 GRAND AVE @ DILLEYS RD	LA GURNEE	T-1A	ON
1466	TS	7090	IL 134 @ FAIRFIELD RD	LA	T-1A	ON
1467	TS	7094	IL 137 @ BUTTERFIELD SQUARE	LA LIBERTYVILLE	T-1A	ON
1468	TS	7095	IL 137 @ BUTTERFIELD FIELD RD	LA LIBERTYVILLE	T-1A	ON
1469	TS	7100	IL 137 BUCKLEY RD @ MERIDIAN DR GEORGIA RD	LA NORTH CHICAGO	T-1A	ON
1470	TS	7105	IL 137 BUCKLEY RD @ OPLAINE RD	LA GREEN OAKS	T-1A	ON
1471	TS	7110	IL 137 BUCKLEY RD @ ST MARYS RD	LA GREEN OAKS	T-1A	ON
1472	TS	7115	IL 137 BUCKLEY RD @ GREAT LAKES DR	LA NORTH CHICAGO	T-1A	ON
1473	TS	7120	IL 137 BUCKLEY RD @ MISSISSIPPI ST	LA NORTH CHICAGO	T-1A	ON
1474	TS	7125	IL 137 BUCKLEY RD @ ABBOTT NO ENTRANCE GATE 3	LA NORTH CHICAGO	T-1A	ON
1475	TS	7129	IL 173 @ SAVAGE RD DEERCREST DR	LA ANTIOCH	T-1A	ON
1476	TS	7130	IL 173 @ DEEP LAKE RD	LA ANTIOCH	T-1A	ON
1477	TS	7132	IL 173 @	LA	T-1A	ON

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			DELANY RD	WADSWORTH		
1478	TS	7135	IL 176 @	LA	T-1A	ON
			DARRELL RD	HIGHLAND PARK		
1479	TS	7137	IL 176 @	LA	T-1A	ON
			WESTRIDGE DR	ISLAND LAKE		
1480	TS	7139	IL 176 @	LA	T-1A	ON
			BEECH ST EASTWAY DR	ISLAND LAKE		
1481	TS	7140	IL 176 @	LA	T-1A	ON
			FAIRFIELD RD	WAUCONDA		
1482	TS	7142	IL 176 @	LA	T-1A	ON
			GILMER	WAUCONDA		
1483	TS	7145	IL 176 @	LA	T-1A	ON
			MIDLOTHIAN RD	WAUCONDA		
1484	TS	7150	IL 176 @	LA	T-1A	ON
			OLD RAND RD MAIN ST IN WAUCONDA	WAUCONDA		
1485	TS	7152	IL 176 @	LA	T-1A	ON
			LARKDALE DR	LAKE ZURICH		
1486	TS	7155	IL 176 @	LA	T-1A	ON
			BROWN ST	LIBERTYVILLE		
1487	TS	7160	IL 137 BUCKLEY RD @	LA	T-1A	ON
			LEWIS AVE	NORTH CHICAGO		
1488	TS	7170	IL 137 BUCKLEY RD @	LA	T-1A	ON
			ILLINOIS ST	GRAYSLAKE		
1489	TS	7175	IL 137 BUCKLEY RD @	LA	T-1A	ON
			RAY ST			
1490	TS	7185	LAKE COOK RD @	LA	T-1A	ON
			HART RD			
1491	TS	7190	IL 137 SHERIDAN RD @	LA	T-1A	ON
			BEACH RD	BEACH PARK		
1492	TS	7195	IL 137 SHERIDAN RD @	LA	T-1A	ON
			WADSWORTH RD	ZION		
1493	TS	7200	IL 137 SHERIDAN RD @	LA	T-1A	ON

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			YORKHOUSE RD	BEACH PARK		
1494	TS	7210	US 12 @	MC	T-1A	ON
			IL 31	RICHMOND		
1495	TS	7215	US 12 @	MC	T-1A	ON
			IL 173	RICHMOND		
1496	TS	7217	IL 173 KENOSHA RD @	MC	T-1A	ON
			WILMOT RD	SPRING GROVE		
1497	TS	7220	US 12 @	MC	T-1A	ON
			FOX LAKE RD	FOX LAKE		
1498	TS	7223	US 12 @	MC	T-1A	ON
			WINN RD SPRING GROVE RD			
1499	TS	7225	US 12 @	MC	T-1A	ON
			WINN RD SPRING GROVE RD	SPRING GROVE		
1500	TS	7230	US 14 @	MC	T-1A	ON
			IL 22	CARY		
1501	TS	7233	US 14 @	MC	T-1A	ON
			RIDGEFIELD	CRYSTAL LAKE		
1502	TS	7235	US 14 @	MC	T-1A	ON
			IL 47	WOODSTOCK		
1503	TS	7236	US 14 @	MC	T-1A	ON
			LAKE AVE	WOODSTOCK		
1504	TS	7237	US 14 @	MC	T-1A	ON
			LAKE SHORE AVE WEST	WOODSTOCK		
1505	TS	7238	US 14 @	MC	T-1A	ON
			DEAN ST	WOODSTOCK		
1506	TS	7239	US 14 @	MC	T-1A	ON
			DOTY	WOODSTOCK		
1507	TS	7240	US 14 @	MC	T-1A	ON
			IL 173 W S JCT BRINK ST	HARVARD		
1508	TS	7241	US 14 @	MC	T-1A	ON
			LAKE SHORE DR	WOODSTOCK		
1509	TS	7245	US 14 @	MC	T-1A	ON
			CARY RD WEST MAIN ST			

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1510	TS	7246	US 14 @ CARY EAST MAIN ST	MC CARY	T-1A	ON
1511	TS	7248	US 14 @ CARY SQUARE SC	MC CARY	T-1A	ON
1512	TS	7260	US 14 @ THREE OAKS RD	MC	T-1A	ON
1513	TS	7270	US 14 @ IL 173 E N JCT DIGGINS ST AYER ST	MC HARVARD	T-1A	ON
1514	TS	7275	US 14 @ FIRST ST	MC CARY	T-1A	ON
1515	TS	7280	IL 31 MAIN ST (IN ALGONQUIN) @ IL 62 ALGONQUIN RD	MC ALGONQUIN	T-1A	ON
1516	TS	7281	IL 62 ALGONQUIN RD @ IL 31 NB RAMPS A & B	MC ALGONQUIN	T-1A	ON
1517	TS	7282	IL 62 ALGONQUIN RD @ IL 31 SB RAMPS C & D	MC ALGONQUIN	T-1A	ON
1518	TS	7285	IL 31 FRONT ST @ IL 120 WEST JCT	MC MCHENRY	T-1A	ON
1519	TS	7288	IL 31 @ PRIME PKWY ALBANY ST	MC MCHENRY	T-1A	ON
1520	TS	7289	IL 31 @ SHAMROCK LN	MC MCHENRY	T-1A	ON
1521	TS	7290	IL 31 NORTH RICHMOND @ IL 120 ELM E JCT	MC MCHENRY	T-1A	ON
1522	TS	7295	IL 31 @ IL 176 TERRA COTTA AVE	MC CRYSTAL LAKE	T-1A	ON
1523	TS	7296	IL 176 @ VALLEY VIEW DR	MC PRAIRIE GROVE	T-1A	ON
1524	TS	7298	IL 176 @ SMITH RD	MC PRAIRIE GROVE	T-1A	ON
1525	TS	7300	IL 31 @ BULL VALLEY RD	MC MCHENRY	T-1A	ON

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1526	TS	7305	IL 31 @ CRYSTAL LAKE RD	MC CRYSTAL LAKE	T-1A	ON
1527	TS	7310	IL 31 @ JOHNSBURG RD	MC JOHNSBURG	T-1A	ON
1528	TS	7311	IL 31 @ RUNNING BROOK FARM	MC JOHNSBURG	T-1A	ON
1529	TS	7315	IL 31 @ THREE OAKS RD	MC CRYSTAL LAKE	T-1A	ON
1530	TS	7320	IL 47 @ ALGONQUIN RD HUNTLEY RD	MC HUNTLEY	T-1A	ON
1531	TS	7322	IL 47 @ REED RD	MC HUNTLEY	T-1A	ON
1532	TS	7323	IL 47 @ MCCONNELL RD	MC WOODSTOCK	T-1A	ON
1533	TS	7324	IL 47 @ HUNTLEY CROSSING DR	KA HUNTLEY	T-1A	ON
1534	TS	7325	IL 47 @ LAKE AVE WOODSTOCK DR	MC WOODSTOCK	T-1A	ON
1535	TS	7328	IL 47 @ REGENCY PKWY	KA HUNTLEY	T-1A	ON
1536	TS	7329	IL 47 @ KREUTZER RD	MC HUNTLEY	T-1A	ON
1537	TS	7330	IL 47 @ MAIN ST (IN HUNTLY)	MC HUNTLEY	T-1A	ON
1538	TS	7331	IL 47 @ FREEMAN RD	KA HUNTLEY	T-1A	ON
1539	TS	7332	IL 47 @ DEL WEBB ENT	KA HUNTLEY	T-1A	ON
1540	TS	7333	IL 47 @ PLANK RD	KA PLATO	T-1A	ON
1541	TS	7335	IL 120 @ CHAPEL HILL RD	MC MCHENRY	T-1A	ON
1542	TS	7336	IL 47 NORTH RAMP @	KA	T-1A	ON

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			I 90 TLWY	HUNTLEY		
1543	TS	7337	IL 47 SOUTH RAMP @	KA	T-1A	ON
			I 90 TLWY	HUNTLEY		
1544	TS	7339	IL 47 @	KA	T-1A	ON
			BIG TIMBER RD	HUNTLEY		
1545	TS	7340	IL 120 @	MC	T-1A	ON
			RIVER RD	MCHENRY		
1546	TS	7342	IL 120 @	MC	T-1A	ON
			THOMPSON RD	WONDER LAKE		
1547	TS	7345	IL 120 @	MC	T-1A	ON
			WONDER LAKE RD	WONDER LAKE		
1548	TS	7375	IL 50 @	WI	T-1A	ON
			CORNING AVE	PEOTONE		
1549	TS	7385	I 80 @	WI	T-1A	ON
			RICHARDS ST NORTH RAMP	JOLIET		
1550	TS	7386	US 52 @	WI	T-1A	ON
			MANHATTAN RD FOXFORD DR	MANHATTAN		
1551	TS	7387	US 52 @	WI	T-1A	ON
			LARAWAY RD	JOLIET		
1552	TS	7390	I 80 @	WI	T-1A	ON
			RICHARDS ST SOUTH RAMP	JOLIET		
1553	TS	7394	I 80 NORTH @	WI	T-1A	ON
			BRIGGS	JOLIET		
1554	TS	7405	US 6 CHANNAHON RD @	WI	T-1A	ON
			IL 7 LARKIN AVE	ROCKDALE		
1555	TS	7410	US 6 MAPLE ST @	WI	T-1A	ON
			WALNUT CT DRAPER AVE	JOLIET		
1556	TS	7411	US 45 LAGRANGE RD 96TH AVE @	WI	T-1A	ON
			LINCOLN WAY LN ALSIP NURSERY	FRANKFORT		
1557	TS	7412	US 45 LAGRANGE RD @	WI	T-1A	ON
			LARAWAY RD	FRANKFORT		
1558	TS	7413	US 45 LAGRANGE RD 96TH AVE @	WI	T-1A	ON
			NEBRASKA AVE	FRANKFORT		

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1559	TS	7414	US 45 LAGRANGE RD 96TH AVE @ OLD FRANKFORT WAY	WI FRANKFORT	T-1A	ON
1560	TS	7415	US 30 NORTH ST LINCOLN HWY @ US 45 96TH AVE	WI FRANKFORT	T-1A	ON
1561	TS	7416	US 30 @ ELSNER RD	WI FRANKFORT	T-1A	ON
1562	TS	7417	US 45 LAGRANGE RD @ 183RD ST	CO TINLEY PARK	T-1A	ON
1563	TS	7418	US 30 @ PFIEFFER DR	WI FRANKFORT	T-1A	ON
1564	TS	7420	US 30 @ IL 7 THEODORE RD	WI CREST HILL	T-1A	ON
1565	TS	7425	US 30 @ IL 59 COMMERCIAL DR	WI PLAINFIELD	T-1A	ON
1566	TS	7426	IL 59 @ FORT BEGGS ST	WI PLAINFIELD	T-1A	ON
1567	TS	7430	US 30 PLAINFIELD RD @ CANTON FARM RD GAYLORD RD	WI CREST HILL	T-1A	ON
1568	TS	7431	US 6 SOUTHWEST HWY @ I 355 WEST RAMPS	WI NEW LENOX	T-1A	ON
1569	TS	7432	US 6 SOUTHWEST HWY @ I 355 EAST RAMPS	WI NEW LENOX	T-1A	ON
1570	TS	7433	US 6 SOUTHWEST HWY @ CEDAR RD	WI NEW LENOX	T-1A	ON
1571	TS	7434	US 6 @ SILVER CROSS BLVD HOSPITAL ENT	WI NEW LENOX	T-1A	ON
1572	TS	7435	US 30 LINCOLN HWY MAPLE ST @ CEDAR RD	WI NEW LENOX	T-1A	ON
1573	TS	7436	US 6 SOUTHWEST HWY @ PARKER	WI NEW LENOX	T-1A	ON
1574	TS	7437	US 30 LINCOLN HWY @ PRAIRIE DR	WI NEW LENOX	T-1A	ON

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1575	TS	7439	US 30 @ WILLIAMS ST	WI NEW LENOX	T-1A	ON
1576	TS	7442	US 30 @ MARLEY RD	WI NEW LENOX	T-1A	ON
1577	TS	7445	US 30 LINCOLN HWY CASS ST @ WALNUT RD	WI JOLIET	T-1A	ON
1578	TS	7450	US 30 LINCOLN HWY CASS ST @ WASHINGTON ST	WI JOLIET	T-1A	ON
1579	TS	7460	US 30 LINCOLN HWY CASS ST @ BRIGGS ST	WI JOLIET	T-1A	ON
1580	TS	7470	US 30 PLAINFIELD RD @ RENWICK RD BROWN ST	WI PLAINFIELD	T-1A	ON
1581	TS	7471	IL 59 @ ST MARYS RD	WI PLAINFIELD	T-1A	ON
1582	TS	7472	US 30 LINCOLN HWY @ LILY CACHE	WI PLAINFIELD	T-1A	ON
1583	TS	7473	IL 59 @ FRASER RD	WI PLAINFIELD	T-1A	ON
1584	TS	7474	IL 59 DIVISION ST @ RENWICK RD @ RENWICK RD	WI PLAINFIELD	T-1A	ON
1585	TS	7475	US 30 LINCOLN HWY @ WOLF RD	WI MOKENA	T-1A	ON
1586	TS	7476	US 30 LINCOLN HWY @ LOCUST ST	WI FRANKFORT	T-1A	ON
1587	TS	7478	US 30 LINCOLN HWY @ OWENS RD RIDGEMORE RD	WI MOKENA	T-1A	ON
1588	TS	7479	US 30 LINCOLN HWY @ JOLIET HWY	WI MOKENA	T-1A	ON
1589	TS	7480	US 45 MANNHEIM RD @ 191ST ST	WI MOKENA	T-1A	ON
1590	TS	7481	US 45 LAGRANGE RD @ HICKORY CREEK MARKET PL ENT	WI MOKENA	T-1A	ON

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1591	TS	7482	I 80 SOUTH RAMP @ US 45 96TH AVE	WI MOKENA	T-1A	ON
1592	TS	7483	I 80 RAMP B @ US 45 96TH AVE	WI TINLEY PARK	T-1A	ON
1593	TS	7485	US 45 MANNHEIM RD @ 195TH ST WILLOW LN	WI MOKENA	T-1A	ON
1594	TS	7490	US 52 DORIS AVE @ IL 53 CHICAGO ST	WI JOLIET	T-1A	ON
1595	TS	7492	IL 59 @ SCHOOL ST	WI SHOREWOOD	T-1A	ON
1596	TS	7493	IL 59 @ SEIL RD	WI SHOREWOOD	T-1A	ON
1597	TS	7495	US 52 JEFFERSON ST @ IL 59 BROOK FOREST COTTAGE	WI SHOREWOOD	T-1A	ON
1598	TS	7496	US 52 @ BROOKSHORE DR	WI SHOREWOOD	T-1A	ON
1599	TS	7497	US 52 JEFFERSON ST @ RIVER RD	WI SHOREWOOD	T-1A	ON
1600	TS	7500	IL 1 MAIN ST @ EXCHANGE ST	WI CRETE	T-1A	ON
1601	TS	7504	IL 1 DIXIE HWY @ CHESTNUT LN	WI BEECHER	T-1A	ON
1602	TS	7505	IL 1 DIXIE HWY @ INDIANA AVE 303RD ST	WI BEECHER	T-1A	ON
1603	TS	7510	IL 7 IL 53 BROADWAY ST @ IL 7 RENWICK RD	WI ROMEOVILLE	T-1A	ON
1604	TS	7511	IL 7 159TH ST @ GOUGAR RD	WI LOCKPORT	T-1A	ON
1605	TS	7514	IL 7 159TH ST @ BELL RD SOUTH	WI HOMER GLEN	T-1A	ON
1606	TS	7515	IL 7 IL 53 BROADWAY ST @ IL 7 THEODORE ST	WI CREST HILL	T-1A	ON
1607	TS	7516	IL 171 STATE ST @	WI	T-1A	ON

DIVISION ST 16TH ST						
1608	TS	7517	IL 171 STATE ST @	WI	T-1A	ON
			IL 7 9TH ST @			
1609	TS	7518	IL 171 STATE ST @	WI	T-1A	ON
			2ND ST			
1610	TS	7519	IL 171 STATE ST @	WI	T-1A	ON
			10TH ST			
1611	TS	7520	IL 7 159TH ST @	WI	T-1A	ON
			BELL RD NORTH	HOMER GLEN		
1612	TS	7525	IL 7 159TH ST @	WI	T-1A	ON
			CEDAR RD	LOCKPORT		
1613	TS	7529	IL 7 159TH ST @	WI	T-1A	ON
			ADELMAN	LOCKPORT		
1614	TS	7530	IL 7 LARKIN AVE @	WI	T-1A	ON
			MOEN AVE	ROCKDALE		
1615	TS	7532	IL 7 LARKIN AVE @	WI	T-1A	ON
			MEADOW AVE	ROCKDALE		
1616	TS	7535	IL 7 THEODORE ST @	WI	T-1A	ON
			ARBOR LN CREST DR	CREST HILL		
1617	TS	7540	IL 7 LARKIN AVE @	WI	T-1A	ON
			NORTH RIDGE PLAZA DRIVE	JOLIET		
1618	TS	7543	IL 7 9TH ST @	WI	T-1A	ON
			THORNTON ST	LOCKPORT		
1619	TS	7545	IL 7 IL 53 BROADWAY ST @	WI	T-1A	ON
			DIVISION ST 16TH ST STATEVILLE RD	LOCKPORT		
1620	TS	7546	I 57 WEST RAMP @	WI	T-1A	ON
			STUENKEL RD	UNIVERSITY PARK		
1621	TS	7548	IL 50 CICERO AVE @	WI	T-1A	ON
			UNIVERSITY PKWY STUNKEL RD	UNIVERSITY PARK		
1622	TS	7549	IL 171 STATE ST @	WI	T-1A	ON
			13TH METRA STATION	UNIVERSITY PARK		
1623	TS	7550	IL 50 CICERO AVE @	WI	T-1A	ON

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			GOVERNORS HWY	UNIVERSITY PARK		
1624	TS	7552	IL 50 WALNUT ST @ COURT ST	WI MONEE	T-1A	ON
1625	TS	7553	I 57 @ MANHATTAN MONEE RD EAST RAMP	WI MONEE	T-1A	ON
1626	TS	7554	I 57 @ MANHATTAN MONEE RD WEST RAMP	WI MONEE	T-1A	ON
1627	TS	7555	IL 53 BALTIMORE ST @ IL 102 WATER ST	WI WILMINGTON	T-1A	ON
1628	TS	7560	IL 53 @ AIRPORT RD	WI ROMEDEVILLE	T-1A	ON
1629	TS	7563	IL 53 @ MATERIAL RD	WI ROMEDEVILLE	T-1A	ON
1630	TS	7565	IL 53 @ JOLIET RD	WI ROMEDEVILLE	T-1A	ON
1631	TS	7567	JOLIET RD @ BLUFF RD	WI ROMEDEVILLE	T-1A	ON
1632	TS	7570	IL 53 CHICAGO ST @ LARAWAY RD	WI JOLIET	T-1A	ON
1633	TS	7577	IL 59 @ VERMETTE CIR	WI JOLIET	T-1A	ON
1634	TS	7578	IL 59 @ WALMART ENT	WI SHOREWOOD	T-1A	ON
1635	TS	7585	US 30 IL 59 DIVISION ST @ IL 126 MAIN ST	WI PLAINFIELD	T-1A	ON
1636	TS	7586	US 30 IL 59 DIVISION ST @ NAPERVILLE RD	WI PLAINFIELD	T-1A	ON
1637	TS	7587	IL 59 @ MEIJER ENTRANCE	WI PLAINFIELD	T-1A	ON
1638	TS	7588	US 30 IL 59 DIVISION ST @ US 30 143RD ST	WI PLAINFIELD	T-1A	ON
1639	TS	7592	IL 59 @	WI	T-1A	ON

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			INDUSTRIAL DR	PLAINFIELD		
1640	TS	7593	IL 59 @	WI	T-1A	ON
			VERTIN BLVD TARGET ENT	SHOREWOOD		
1641	TS	7595	IL 59 @	WI	T-1A	ON
			THEODORE ST	JOLIET		
1642	TS	7600	IL 102 WATER ST @	WI	T-1A	ON
			EAST KAHLER RD WEST KAHLER RD	WILMINGTON		
1643	TS	7603	IL 171 ARCHER AVE @	WI	T-1A	ON
			151ST ST	LOCKPORT		
1644	TS	7605	IL 171 ARCHER AVE @	WI	T-1A	ON
			143RD ST	HOMER		
1645	TS	7607	IL 171 ARCHER AVE @	WI	T-1A	ON
			SMITH RD	LOCKPORT		
1646	TS	7608	IL 171 ARCHER AVE @	WI	T-1A	ON
			I 355 SB RAMP A	LOCKPORT		
1647	TS	7609	IL 171 ARCHER AVE @	WI	T-1A	ON
			I 355 NB RAMP D	LOCKPORT		
1648	TS	7610	IL 171 COLLINS ST @	WI	T-1A	ON
			WOODRUFF ST	JOLIET		
1649	TS	7615	IL 394 @	WI	T-1A	ON
			EXCHANGE ST	CRETE		
1650	TS	7616	IL 394 IL 1 @	WI	T-1A	ON
			GOODENOW RD	CRETE		
1651	TS	7619	IL 394 @	WI	T-1A	ON
			IL 1 VILLAGE WOODS DR	CRETE TWNSHP		
1652	TS	7626	IL 7 159TH ST SW HWY @	WI	T-1A	ON
			PARKER RD	HOMER GLEN		
1653	TS	7635	IL 19 IRVING PARK RD @	CO	T-1A	ON
			RODENBURG RD	SCHAUMBURG		
1654	TS	7637	IL 19 IRVING PARK RD @	CO	T-1A	ON
			WRIGHT BLVD	SCHAUMBURG		
1655	TS	7645	IL 43 HARLEM AVE @	CO	T-1A	ON

GRAND FULLERTON						
1656	TS	7655	IL 62 ALGONQUIN RD @ LEXINGTON DR	CO	T-1A	ON
					HOFFMAN ESTATES	
1657	TS	7695	US 20 LAKE ST @ BEAR FLAG DR ONTARIOVILLE	DU	T-1A	ON
					HANOVER PARK	
1658	TS	7740	IL 176 @ RIVER RD	MC	T-1A	ON
					ISLAND LAKE	
1659	TS	7741	IL 176 @ NEWPORT CT	MC	T-1A	ON
					ISLAND LAKE	
1660	TS	7795	IL 62 ALGONQUIN RD @ EASTGATE DR	MC	T-1A	ON
					ALGONQUIN	
1661	TS	7797	IL 31 @ HUNTINGTON DR	MC	T-1A	ON
					ALGONQUIN	
1662	TS	7800	IL 56 BUTTERFIELD RD @ MACARTHUR DR	DU	T-1A	ON
					OAKBROOK TERRACE	
1663	TS	7825	IL 83 @ ROLLINS RD	LA	T-1A	ON
					ROUND LAKE BEACH	
1664	TS	7830	IL 53 @ MAPLE AVE	DU	T-1A	ON
					LISLE	
1665	TS	7835	IL 53 @ IL 56 BUTTERFIELD RD	DU	T-1A	ON
					GLEN ELLYN	
1666	TS	7850	IL 53 ROHLWING RD @ ARMY TRAIL RD	DU	T-1A	ON
					ADDISON	
1667	TS	7851	IL 53 ROHLWING RD @ MITCHEL CT	DU	T-1A	ON
					ADDISON	
1668	TS	7855	US 34 OGDEN AVE @ MAIN ST (IN LISLE)	DU	T-1A	ON
					LISLE	
1669	TS	7859	IL 53 @ HONEYTREE DR	WI	T-1A	ON
					ROMEDEVILLE	
1670	TS	7860	BARRINGTON RD @ TOWER DR	CO	T-1A	ON
					HANOVER PARK	
1671	TS	7866	IL 53 @ ENTERPRISE DR	WI	T-1A	ON
					ROMEDEVILLE	

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1672	TS	7870	US 20 LAKE ST @ BARTELS ARLINGTON DR	DU	T-1A	ON
1673	TS	7875	US 20 LAKE ST @ BRYN MAWR AVE	DU	T-1A	ON
1674	TS	7885	IL 62 ALGONQUIN RD @ QUENTIN RD	CO	T-1A	ON
1675	TS	7947	IL 43 HARLEM AVE @ 34TH ST STANLEY BURLINGTON	CO	T-1A	ON
1676	TS	7950	IL 43 HARLEM AVE @ 32ND ST W ADDISON RD	CO	T-1A	ON
1677	TS	7994	IL 31 @ LONGMEADOW PKWY	KA	T-1A	ON
1678	TS	7996	IL 31 @ EDGEWOOD DR	MC	T-1A	ON
1679	TS	7997	IL 62 @ LONGMEADOW PKWY	KA	T-1A	ON
1680	TS	7998	IL 31 ALGONQUIN BYPASS @ MAIN ST QUARRY ACCESS	MC	T-1A	ON
1681	TS	8125	55TH ST @ IL 83 EAST RAMP	DU	T-1A	ON
1682	TS	8126	55TH ST @ IL 83 WEST RAMP	DU	T-1A	ON
1683	TS	8225	IL 38 ROOSEVELT RD @ COUNTY FARM RD	DU	T-1A	ON
1684	TS	8325	15TH ST @ HIGHLAND BLVD	DU	T-1A	ON
1685	TS	8370	US 34 OGDEN AVE @ FAIRVIEW AVE	DU	T-1A	ON
1686	TS	8375	22ND ST @ MIDWEST RD SUMMIT AVE	DU	T-1A	ON
1687	TS	8377	22ND ST @ SHOPS OF OAK BROOK	DU	T-1A	ON
1688	TS	8780	IL 58 GOLF RD @	CO	T-1A	ON

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			WOODFIELD MALL CTR ENT ROOSEVELT BL	SCHAUMBURG		
1689	TS	8785	IL 58 GOLF RD @	CO	T-1A	ON
			WOODFIELD MALL W ENT	SCHAUMBURG		
1690	TS	8790	IL 58 GOLF RD @	CO	T-1A	ON
			WOODFIELD MALL E ENT HYATT HARTLEY	SCHAUMBURG		
1691	TS	8800	IL 64 NORTH AVE @	CO	T-1A	ON
			WINSTON PLAZA ENT	MELROSE PARK		
1692	TS	8830	US 34 OGDEN AVE @	DU	T-1A	ON
			WASHINGTON ST	WESTMONT		
1693	TS	8850	IL 59 @	DU	T-1A	ON
			JAMES ST	WEST CHICAGO		
1694	TS	8853	IL 59 @	DU	T-1A	ON
			HAWTHORN LN	WEST CHICAGO		
1695	TS	8855	IL 59 @	DU	T-1A	ON
			WASHINGTON ST	WEST CHICAGO		
1696	TS	8860	IL 59 @	DU	T-1A	ON
			MAIN ST	WEST CHICAGO		
1697	TS	8905	GOLF RD @	CO	T-1A	ON
			LAMON AVE	SKOKIE		
1698	TS	8910	IL 43 HARLEM AVE @	CO	T-1A	ON
			167TH ST	TINLEY PARK		
1699	TS	8920	IL 43 HARLEM AVE @	CO	T-1A	ON
			171ST ST	TINLEY PARK		
1700	TS	8935	IL 43 HARLEM AVE @	CO	T-1A	ON
			163RD ST BREMENTOWN	TINLEY PARK		
1701	TS	8940	IL 19 IRVING PARK RD @	CO	T-1A	ON
			PARK BLVD	STREAMWOOD		
1702	TS	8970	IL 53 @	DU	T-1A	ON
			22ND ST	GLEN ELLYN		
1703	TS	8975	IL 31 @	KA	T-1A	ON
			ILLINOIS ST	ST CHARLES		
1704	TS	8980	IL 64 MAIN ST @	KA	T-1A	ON

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			DUNHAM RD	ST CHARLES		
1705	TS	8990	IL 25 5TH AVE @	KA	T-1A	ON
			IL 64 NORTH AVE	ST CHARLES		
1706	TS	8992	IL 64 MAIN ST @	KA	T-1A	ON
			OAK ST	ST CHARLES		
1707	TS	8995	IL 25 5TH AVE @	KA	T-1A	ON
			ILLINOIS ST	ST CHARLES		
1708	TS	9000	IL 64 MAIN ST @	KA	T-1A	ON
			TYLER RD	ST CHARLES		
1709	TS	9010	IL 64 MAIN ST @	KA	T-1A	ON
			IL 31 WEST 2ND AVE	ST CHARLES		
1710	TS	9015	IL 64 MAIN ST @	KA	T-1A	ON
			WEST 3RD ST	ST CHARLES		
1711	TS	9016	IL 64 MAIN ST @	KA	T-1A	ON
			7TH ST	ST CHARLES		
1712	TS	9017	IL 64 MAIN ST @	KA	T-1A	ON
			15TH ST	ST CHARLES		
1713	TS	9020	IL 64 MAIN ST @	KA	T-1A	ON
			7TH AVE	ST CHARLES		
1714	TS	9022	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			KAUTZ RD	WEST CHICAGO		
1715	TS	9023	IL 64 NORTH AVE @	KA	T-1A	ON
			KAUTZ RD SMITH RD	ST CHARLES		
1716	TS	9024	IL 64 MAIN ST @	KA	T-1A	ON
			PHEASANT RUN ENT	ST CHARLES		
1717	TS	9035	IL 19 IRVING PARK RD @	DU	T-1A	ON
			ROSELLE RD	ROSELLE		
1718	TS	9037	IL 19 IRVING PARK RD @	DU	T-1A	ON
			LAWRENCE AVE	ROSELLE		
1719	TS	9040	IL 19 IRVING PARK RD @	DU	T-1A	ON
			PARK ST	ROSELLE		
1720	TS	9047	IL 38 @	KA	T-1A	ON
			MEIJER ENT	ST CHARLES		

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1721	TS	9065	IL 64 MAIN ST @ 1ST AVE RIVERSIDE AVE	KA ST CHARLES	T-1A	ON
1722	TS	9070	IL 64 MAIN ST @ 1ST STREET	KA ST CHARLES	T-1A	ON
1723	TS	9085	IL 72 HIGGINS RD @ DEVON AVE	CO ROSEMONT	T-1A	ON
1724	TS	9087	IL 72 HIGGINS RD @ WINTRUST BANK ACCESS RD	CO ROSEMONT	T-1A	ON
1725	TS	9090	IL 72 HIGGINS RD @ SCOTT ST	CO ROSEMONT	T-1A	ON
1726	TS	9100	IL 19 IRVING PARK RD @ MAPLE AVE	DU ROSELLE	T-1A	ON
1727	TS	9105	IL 53 INDEPENDENCE BLVD @ 135TH ST ROMEO RD	WI ROMEOVILLE	T-1A	ON
1728	TS	9115	IL 53 INDEPENDENCE BLVD @ BELMONT AVE	WI ROMEOVILLE	T-1A	ON
1729	TS	9120	IL 53 INDEPENDENCE BLVD @ MURPHY DR	WI ROMEOVILLE	T-1A	ON
1730	TS	9125	NEW AVE @ 135TH ST ROMEO RD	WI ROMEOVILLE	T-1A	ON
1731	TS	9130	IL 53 INDEPENDENCE BLVD @ TAYLOR RD	WI ROMEOVILLE	T-1A	ON
1732	TS	9150	IL 83 SIBLEY BLVD 147TH ST @ I 294 RAMP N	CO POSEN	T-1A	ON
1733	TS	9152	I 294 TLWY WEST RAMP (X) @ IL 83 147TH ST	CO POSEN	T-1A	ON
1734	TS	9155	IL 83 147TH ST @ CLEVELAND AVE	CO POSEN	T-1A	ON
1735	TS	9160	IL 83 SIBLEY BLVD 147TH ST @ HARRISON ST	CO POSEN	T-1A	ON
1736	TS	9185	CUMBERLAND AVE @ TALCOTT AVE	CO PARK RIDGE	T-1A	ON
1737	TS	9190	IL 171 CUMBERLAND AVE @	CO	T-1A	ON

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			TOUHY AVE	PARK RIDGE		
1738	TS	9205	GREENWOOD AVE @	CO	T-1A	ON
			TALCOTT AVE	PARK RIDGE		
1739	TS	9215	NORTHWEST HWY @	CO	T-1A	ON
			MEACHAM AVE	PARK RIDGE		
1740	TS	9220	NORTHWEST HWY @	CO	T-1A	ON
			WASHINGTON ST	PARK RIDGE		
1741	TS	9222	TOUHY AVE @	CO	T-1A	ON
			SUMMIT	PARK RIDGE		
1742	TS	9235	BUSSE HWY @	CO	T-1A	ON
			GREENWOOD AVE	PARK RIDGE		
1743	TS	9240	BUSSE HWY @	CO	T-1A	ON
			MEACHAM TOUHY PARK RIDGE	PARK RIDGE		
1744	TS	9245	COURTLAND @	CO	T-1A	ON
			DEVON AVE	PARK RIDGE		
1745	TS	9247	US 14 NORTHWEST HWY @	CO	T-1A	ON
			SUMMIT	PARK RIDGE		
1746	TS	9250	US 14 NORTHWEST HWY @	CO	T-1A	ON
			PROSPECT AVE PARK RIDGE	PARK RIDGE		
1747	TS	9255	TOUHY AVE @	CO	T-1A	ON
			WASHINGTON ST	PARK RIDGE		
1748	TS	9295	WESTERN AVE @	CO	T-1A	ON
			26TH ST	PARK FOREST		
1749	TS	9300	WESTERN AVE @	CO	T-1A	ON
			BEACON BLVD	CHICAGO HTS		
1750	TS	9335	CRAWFORD AVE PULASKI RD @	CO	T-1A	ON
			107TH ST	OAK LAWN		
1751	TS	9360	22ND ST CERMAK RD @	CO	T-1A	ON
			MID CITY BANK N RIVERSIDE	NORTH RIVERSIDE		
1752	TS	9380	IL 131 GREEN BAY RD @	LA	T-1A	ON
			22ND ST MLK MARTIN LUTHER KING DR	NORTH CHICAGO		
1753	TS	9407	IL 137 SHERIDAN RD @	LA	T-1A	ON

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			10TH ST	NORTH CHICAGO		
1754	TS	9415	IL 137 SHERIDAN RD @	LA	T-1A	ON
			14TH ST	NORTH CHICAGO		
1755	TS	9420	IL 137 SHERIDAN RD @	LA	T-1A	ON
			16TH ST	NORTH CHICAGO		
1756	TS	9425	IL 137 SHERIDAN RD @	LA	T-1A	ON
			18TH ST	NORTH CHICAGO		
1757	TS	9450	IL 59 @	DU	T-1A	ON
			DIEHL RD	NAPERVILLE		
1758	TS	9455	IL 59 @	DU	T-1A	ON
			BRUCE LN BROOKDALE RD	NAPERVILLE		
1759	TS	9472	IL 59 @	DU	T-1A	ON
			I 88 TLWY N & S RAMPS	NAPERVILLE		
1760	TS	9495	US 34 OGDEN @	DU	T-1A	ON
			IROQUOIS	NAPERVILLE		
1761	TS	9605	US 34 OGDEN @	DU	T-1A	ON
			NAPER BLVD NAPERVILLE RD	NAPERVILLE		
1762	TS	9625	IL 83 ELMHURST RD @	CO	T-1A	ON
			LONNQUIST	MT PROSPECT		
1763	TS	9630	US 14 NORTHWEST HWY @	CO	T-1A	ON
			IL 83 ELMHURST RD MAIN ST	MT PROSPECT		
1764	TS	9640	US 14 NORTHWEST HWY @	CO	T-1A	ON
			EMERSON ST	MT PROSPECT		
1765	TS	9645	US 12 RAND RD @	CO	T-1A	ON
			BUSINESS CTR	MT PROSPECT		
1766	TS	9653	BUSSE RD @	CO	T-1A	ON
			CENTRAL RD	MT PROSPECT		
1767	TS	9654	CENTRAL RD @	CO	T-1A	ON
			BOSCH	MT PROSPECT		
1768	TS	9660	IL 83 ELMHURST RD MAIN St @	CO	T-1A	ON
			CENTRAL RD	MT PROSPECT		
1769	TS	9665	IL 83 ELMHURST RD @	CO	T-1A	ON
			COUNCIL TRAIL	MT PROSPECT		

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1770	TS	9670	IL 83 ELMHURST RD @ LINCOLN ST	CO MT PROSPECT	T-1A	ON
1771	TS	9690	US 14 NORTHWEST HWY @ CENTRAL RD	CO MT PROSPECT	T-1A	ON
1772	TS	9700	IL 31 @ KNELL RD	KA MONTGOMERY	T-1A	ON
1773	TS	9701	I 55 NB RAMPS @ BLUFF RD	WI CHANNAHON	T-1A	ON
1774	TS	9702	I 55 SB RAMPS @ BLUFF RD	WI CHANNAHON	T-1A -P/T	ON
1775	TS	9711	ARSENAL RD @ EXXON MOBIL MAIN GATE	WI CHANNAHON	T-1A	ON
1776	TS	9712	ARSENAL RD @ MOBIL GATE 2	WI ELWOOD	T-1A	ON
1777	TS	9714	ARSENAL RD @ BASELINE	WI ELWOOD	T-1A	ON
1778	TS	9717	ARSENAL RD @ I 55 WEST FRONTAGE CONNECTOR	WI CHANNAHON	T-1A	ON
1779	TS	9727	143RD ST @ OAK PARK JUSTAMERE RD	CO MIDLOTHIAN	T-1A	ON
1780	TS	9950	US 6 159TH ST @ OAK FOREST HOSPITAL	CO OAK FOREST	T-1A	ON
1781	TS	10125	IL 43 HARLEM AVE @ HARLEM IRVING PLAZA	CO NORRIDGE	T-1A	ON
1782	TS	10555	US 34 OGDEN AVE @ WHEATON NAPERVILLE RD	DU NAPERVILLE	T-1A	ON
1783	TS	10595	IL 43 WAUKEGAN RD @ KRAFT FOOD THREE LAKES	CO GLENVIEW	T-1A	ON
1784	TS	10597	IL 43 WAUKEGAN RD @ GOLF GATE SHOPPING ACCESS	CO GLENVIEW	T-1A	ON
1785	TS	10665	IL 43 WAUKEGAN RD @ DEERPATH RD	LA LAKE FOREST	T-1A	ON

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1786	TS	10670	IL 43 WAUKEGAN RD @ EVERETT RD	LA LAKE FOREST	T-1A	ON
1787	TS	10675	IL 43 WAUKEGAN RD @ WESTLEIGH RD	LA LAKE FOREST	T-1A	ON
1788	TS	10676	IL 43 WAUKEGAN RD @ GLOUCESTER CROSSING	LA LAKE FOREST	T-1A	ON
1789	TS	10750	IL 7 SOUTHWEST HWY @ DUFFY	LA	T-1A	ON
1790	TS	10822	LAKE COOK RD @ GREEN BAY RD	LA HIGHLAND PARK	T-1A	ON
1791	TS	10877	LAWRENCE AVE @ OCTAVIA AVE	CO HARWOOD HTS	T-1A	ON
1792	TS	10880	IL 43 WAUKEGAN RD @ DEWES	CO GLENVIEW	T-1A	ON
1793	TS	10900	IL 43 WAUKEGAN RD @ CARILLON SQUARE	CO GLENVIEW	T-1A	ON
1794	TS	10905	IL 43 WAUKEGAN RD @ GLENVIEW RD	CO GLENVIEW	T-1A	ON
1795	TS	10910	US 34 OGDEN AVE @ WARWICK AVE	DU WESTMONT	T-1A	ON
1796	TS	10915	IL 64 NORTH AVE @ JEWEL FOODS PLANT ENT	CO MELROSE PARK	T-1A	ON
1797	TS	10920	IL 43 WAUKEGAN RD @ GROVE	CO GLENVIEW	T-1A	ON
1798	TS	10945	IL 38 @ GLEN GARY DR	KA GENEVA	T-1A	ON
1799	TS	10950	IL 38 @ 3RD ST	KA GENEVA	T-1A	ON
1800	TS	10952	IL 38 @ 7TH ST	KA GENEVA	T-1A	ON
1801	TS	10955	IL 38 @ ANDERSON BLVD	KA GENEVA	T-1A	ON
1802	TS	10970	US 12 45 MANNHEIM RD @	CO	T-1A	ON

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			BELMONT AVE	FRANKLIN PARK		
1803	TS	10975	BELMONT AVE PACIFIC AVE	CO	T-1A	ON
			ROSE ST 25TH AVE	FRANKLIN PARK		
1804	TS	11015	US 12 45 MANNHEIM RD @	CO	T-1A	ON
			GRAND AVE	FRANKLIN PARK		
1805	TS	11030	US 12 45 MANNHEIM RD @	CO	T-1A	ON
			SEYMOUR	FRANKLIN PARK		
1806	TS	11035	US 12 45 MANNHEIM RD @	CO	T-1A	ON
			WAVELAND	FRANKLIN PARK		
1807	TS	11040	DES PLAINES RIVER RD @	CO	T-1A	ON
			KING	FRANKLIN PARK		
1808	TS	11045	US 45 LAGRANGE RD 96TH AVE @	WI	T-1A	ON
			COLORADO AVE	FRANKFORT		
1809	TS	11047	US 45 LAGRANGE RD 96TH AVE @	WI	T-1A	ON
			MARKET ST (MARIANOS)	FRANKFORT		
1810	TS	11060	73RD @		T-1A	ON
			GRAND AVE			
1811	TS	11074	BELMONT AVE @	CO	T-1A	ON
			ORIOLE AVE 76TH ST	ELMWOOD PARK		
1812	TS	11080	55TH ST @	CO	T-1A	ON
			ELECTRO MOTIVE DRIVE	MCCOOK		
1813	TS	11083	IL 59 @	DU	T-1A	ON
			DUKE PKWY	AURORA		
1814	TS	11085	IL 59 @	DU	T-1A	ON
			FERRY RD	NAPERVILLE		
1815	TS	11086	55TH ST @	CO	T-1A	ON
			SERGO DR	MCCOOK		
1816	TS	11115	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			BANNOCKBURN OFFICE PLAZA	BANNOCKBURN		
1817	TS	11125	MADISON ST @	DU	T-1A	ON
			JOLIET RD I 55 FRONTAGE RD	BURR RIDGE		
1818	TS	11130	IL 59 @	CO	T-1A	ON

			SHOE FACTORY RD	HOFFMAN ESTATES		
1819	TS	11133	IL 72 HIGGINS RD @	CO	T-1A	ON
			SHOE FACTORY RD	HOFFMAN ESTATES		
1820	TS	11135	IL 53 @	WI	T-1A	ON
			1ST ST	WILMINGTON		
1821	TS	11141	IL 53 BALTIMARE RD @	WI	T-1A	ON
			STRIPMINE RD	WILMINGTON		
1822	TS	11142	IL 53 @	WI	T-1A	ON
			COAL CITY RD	WILMINGTON		
1823	TS	11161	TOUHY AVE @	CO	T-1A	ON
			NORTHPOINT PLAZA CIRCUIT CITY	NILES		
1824	TS	11170	IL 58 GOLF RD @	CO	T-1A	ON
			MICHAEL MANOR	NILES		
1825	TS	11175	US 12 45 MANNHEIM RD @	CO	T-1A	ON
			DEVON AVE ZEMKE	ROSEMONT		
1826	TS	11180	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			FAIRFIELD AVE	LOMBARD		
1827	TS	11185	DEVON AVE @	CO	T-1A	ON
			KENTON LEMONT	LINCOLNWOOD		
1828	TS	11190	US 30 LINCOLN HWY @	CO	T-1A	ON
			MATTESON SHOPPING CTR	MATTESON		
1829	TS	11210	IL 58 GOLF RD @	CO	T-1A	ON
			MILWAUKEE PLAZA TOYS R US	NILES		
1830	TS	11245	US 12 45 LEE ST @	CO	T-1A	ON
			US 12 45 MANNHEIM RD	DESPLAINES		
1831	TS	11250	TOUHY AVE @	CO	T-1A	ON
			CENTRAL AVE	NILES		
1832	TS	11270	US 20 LAKE ST @	CO	T-1A	ON
			BARTLETT RD	BARTLETT		
1833	TS	11280	IL 59 HOUGH RD @	CO	T-1A	ON
			MAIN ST LAKE COOK RD	BARRINGTON		
1834	TS	11282	MAIN ST LAKE COOK RD @	CO	T-1A	ON

			APPLEBEE	BARRINGTON		
1835	TS	11290	US 12 RAND RD @	CO	T-1A	ON
			IL 53 W RAMP	ARLINGTON HTS		
1836	TS	11295	US 12 RAND RD @	CO	T-1A	ON
			IL 53 E RAMP WILKE RD	ARLINGTON HTS		
1837	TS	11303	WEST LAKE AVE @	CO	T-1A	ON
			GREENWOOD RD	GLENVIEW		
1838	TS	11305	PFINGSTEN RD @	CO	T-1A	ON
			WEST LAKE AVE	GLENVIEW		
1839	TS	11320	ARLINGTON HEIGHTS RD @	CO	T-1A	ON
			NORTHWEST POINT SOUTH DRIVE	ELK GROVE		
1840	TS	11325	IL 43 HARLEM AVE @	CO	T-1A	ON
			161ST ST	TINLEY PARK		
1841	TS	11330	US 6 159TH ST @	CO	T-1A	ON
			PARK CTR	TINLEY PARK		
1842	TS	11345	US 30 LINCOLN HWY @	CO	T-1A	ON
			MATTESON AVE HOLIDAY PLAZA DR	MATTESON		
1843	TS	11350	US 6 IL 83 TORRENCE AVE @	CO	T-1A	ON
			168TH LANDINGS SHOPPING CTR	LANSING		
1844	TS	11355	MARGARET ST @	CO	T-1A	ON
			WILLIAMS ST			
1845	TS	11356	MARGARET @	CO	T-1A	ON
			SCHWAB ST	THORNTON		
1846	TS	11360	WILLIAMS ST @		T-1A	ON
			ELEANOR ST			
1847	TS	11390	IL 64 NORTH AVE @	DU	T-1A	ON
			MENARDS GLENDALE SQUARE	GLENDALE HTS		
1848	TS	11410	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			DOWNERS DR	DOWNERS GROVE		
1849	TS	11415	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			LOMBARD SHOPPING CTR	LOMBARD		

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1850	TS	11420	US 34 OGDEN AVE @ SARATOGA AVE	DU DOWNERS GROVE	T-1A	ON
1851	TS	11425	US 34 OGDEN AVE @ MAIN ST	DU DOWNERS GROVE	T-1A	ON
1852	TS	11460	IL 83 SIBLEY BLVD 147TH ST @ WOODLAWN AVE	CO DOLTON	T-1A	ON
1853	TS	11465	IL 83 SIBLEY BLVD 147TH ST @ GREENWOOD RD	CO DOLTON	T-1A	ON
1854	TS	11470	IL 83 SIBLEY BLVD 147TH ST @ ENGLE	CO DOLTON	T-1A	ON
1855	TS	11475	IL 83 SIBLEY BLVD 147TH ST @ COTTAGE GROVE AVE DOLTON	CO DOLTON	T-1A	ON
1856	TS	11482	IL 31 IL 56 LINCOLNWAY ST @ AIRPORT RD	KA NORTH AURORA	T-1A	ON
1857	TS	11483	IL 31 @ IL 56 STATE ST	KA NORTH AURORA	T-1A	ON
1858	TS	11484	IL 56 @ HART RD MITCHELL RD	KA NORTH AURORA	T-1A	ON
1859	TS	11485	IL 56 @ KIRK RD	KA AURORA	T-1A	ON
1860	TS	11486	IL 56 BUTTERFIELD RD @ CHURCH ST	KA AURORA	T-1A	ON
1861	TS	11488	IL 56 BUTTERFIELD RD @ RADDANT RD	KA AURORA	T-1A	ON
1862	TS	11580	IL 62 ALGONQUIN RD @ HARRISON ST	MC ALGONQUIN	T-1A	ON
1863	TS	11605	IL 22 @ ELM RD OXFORD DR	LA LINCOLNSHIRE	T-1A	ON
1864	TS	11615	IL 21 MILWAUKEE AVE @ HAWTHORN CTR RIVERTREE CT	LA VERNON HILLS	T-1A	ON

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1865	TS	11625	IL 53 @ UNIVERSITY PKWY	WI ROMEDEVILLE	T-1A	ON
1866	TS	11630	US 45 LAGRANGE RD 96TH AVE @ ST FRANCES RD	WI FRANKFORT	T-1A	ON
1867	TS	11633	US 30 @ 80TH AVE	WI FRANKFORT	T-1A	ON
1868	TS	11634	US 30 @ FRANKFORT SQUARE HUNTERWOOD DR	WI FRANKFORT	T-1A	ON
1869	TS	11635	IL 171 ARCHER AVE @ 65TH ST	CO BEDFORD PARK	T-1A	ON
1870	TS	11640	US 12 20 95TH ST @ KEAN AVE	CO HICKORY HILLS	T-1A	ON
1871	TS	11645	IL 50 CICERO AVE @ 23RD ST	CO CICERO	T-1A	ON
1872	TS	11655	IL 53 @ MAIN ST	DU LISLE	T-1A	ON
1873	TS	11660	IL 53 @ SHORT ST	DU LISLE	T-1A	ON
1874	TS	11662	IL 53 @ I 88 NORTH RAMP	DU LISLE	T-1A	ON
1875	TS	11665	IL 53 @ WARRENVILLE RD	DU LISLE	T-1A	ON
1876	TS	11670	IL 53 @ BURLINGTON AVE	DU LISLE	T-1A	ON
1877	TS	11675	US 34 OGDEN AVE @ BLACKHAWK DR	DU WESTMONT	T-1A	ON
1878	TS	11680	US 34 OGDEN AVE @ IL 53 NORTH RAMP	DU LISLE	T-1A	ON
1879	TS	11685	US 34 OGDEN AVE @ IL 53 SOUTH RAMP	DU LISLE	T-1A	ON
1880	TS	11690	IL 68 DUNDEE RD @ NORTHGATE	CO WHEELING	T-1A	ON

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1881	TS	11695	US 14 NORTHWEST HWY @ ELM ST	CO PARK RIDGE	T-1A	ON
1882	TS	11700	IL 60 @ BRADLEY DR RIVERWOODS DR	LA LAKE FOREST	T-1A	ON
1883	TS	11701	IL 60 @ W W GRAINGER ENT	LA LONG GROVE	T-1A	ON
1884	TS	11705	IL 60 @ I 94 TLWY E RAMP NB EXT	LA METTAWA	T-1A	ON
1885	TS	11706	IL 60 @ I 94 TLWY W RAMP SB EXT	LA METTAWA	T-1A	ON
1886	TS	11707	IL 60 @ CONWAY FARMS	LA LAKE FOREST	T-1A	ON
1887	TS	11708	IL 60 @ LAKE FOREST ACADEMY	LA LAKE FOREST	T-1A	ON
1888	TS	11710	US 6 159TH ST @ ARROYO DR	CO OAK FOREST	T-1A	ON
1889	TS	11715	WESTERN AVE @ SAUK TRAIL	CO PARK FOREST	T-1A	ON
1890	TS	11716	WESTERN AVE @ MAIN ST PARK FOREST	CO PARK FOREST	T-1A	ON
1891	TS	11720	IL 50 CICERO AVE @ 175TH ST	CO COUNTRY CLUB HILLS	T-1A	ON
1892	TS	11725	DIXIE HWY @ FLOSSMOOR RD CAMBRIDGE DR	CO FLOSSMOOR	T-1A	ON
1893	TS	11730	HICKS RD @ NORTHRUP	CO ROLLING MEADOWS	T-1A	ON
1894	TS	11735	HICKS RD @ HELEN	CO PALATINE	T-1A	ON
1895	TS	11745	IL 394 BISHOP FORD FRWY @ SAUK TRAIL	CO SAUK VILLAGE	T-1A	ON
1896	TS	11750	US 6 159TH ST @ PARK AVE HARVEY	CO HARVEY	T-1A	ON

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1897	TS	11755	ASHLAND AVE WOOD ST @ THORNTON BLUE ISLAND RD	CO DIXMOOR	T-1A	ON
1898	TS	11765	US 12 20 95TH ST @ 88TH AVE	CO HICKORY HILLS	T-1A	ON
1899	TS	11770	RIDGELAND AVE @ IL 7 SOUTHWEST HWY	CO CHICAGO RIDGE	T-1A	ON
1900	TS	11785	US 12 20 95TH ST @ CALIFORNIA AVE	CO EVERGREEN PK	T-1A	ON
1901	TS	11790	US 12 20 95TH ST @ UTICA	CO EVERGREEN PK	T-1A	ON
1902	TS	11795	US 12 20 95TH ST @ MARIANO ENT	CO EVERGREEN PK	T-1A	ON
1903	TS	11800	CERMAK RD 22ND ST @ 1ST AVE CUT OFF	CO	T-1A	ON
1904	TS	11805	IL 171 1ST AVE @ 47TH ST W RAMP	CO MCCOOK	T-1A	ON
1905	TS	11810	IL 171 1ST AVE FRONTAGE @ RAMPS B & B1	CO MCCOOK	T-1A	ON
1906	TS	11815	IL 171 ARCHER AVE @ 123ST MCCARTHY RD	CO LEMONT	T-1A	ON
1907	TS	11825	US 34 OGDEN AVE @ SCHWARTZ AVE	DU LISLE	T-1A	ON
1908	TS	11830	US 34 OGDEN AVE @ YACKLEY RD	DU LISLE	T-1A	ON
1909	TS	11835	US 34 OGDEN AVE @ INDIANA AVE WESTERN AVE	DU LISLE	T-1A	ON
1910	TS	11840	US 34 OGDEN AVE @ OLD TAVERN RD	DU LISLE	T-1A	ON
1911	TS	11860	IL 68 DUNDEE RD @ ELA RD	CO BARRINGTON	T-1A	ON
1912	TS	11861	US 14 NORTHWEST HWY @ IL 68 DUNDEE RD EAST RAMP	CO PALATINE	T-1A	ON
1913	TS	11862	US 14 NORTHWEST HWY @	CO	T-1A	ON

			IL 68 DUNDEE RD WEST RAMP	PALATINE		
1914	TS	11865	NORTH MAIN ST VINCENNES @	CO	T-1A	ON
			GLENWOOD DYER (MAIN)	GLENWOOD		
1915	TS	11870	IL 72 HIGGINS RD @	CO	T-1A	ON
			LEE RAMP TRAMMEL CROW	DESPLAINES		
1916	TS	11875	US 41 @	LA	T-1A	ON
			CLAVEY RD OLD SKOKIE RD	HIGHLAND PARK		
1917	TS	11876	SKOKIE VALLEY RD @	LA	T-1A	ON
			CLAVEY RD	HIGHLAND PARK		
1918	TS	11877	US 41 @	LA	T-1A	ON
			SKOKIE VALLEY RD	HIGHLAND PARK		
1919	TS	11880	IL 176 @	MC	T-1A	ON
			ROBERTS RD	ISLAND LAKE		
1920	TS	11885	IL 31 RICHMOND @	MC	T-1A	ON
			PEARL ST	MCHENRY		
1921	TS	11890	IL 31 FRONT @	MC	T-1A	ON
			LILLIAN GROVE AVE	MCHENRY		
1922	TS	11895	IL 31 @	MC	T-1A	ON
			MCCULLOM LAKE RD	MCHENRY		
1923	TS	11896	IL 31 @	MC	T-1A	ON
			DIAMOND DR	MCHENRY		
1924	TS	11897	IL 31 @	MC	T-1A	ON
			BLAKE RD	MCHENRY		
1925	TS	11900	IL 120 @	MC	T-1A	ON
			RINGWOOD CURRANT RD	MCHENRY		
1926	TS	11905	IL 120 @	MC	T-1A	ON
			MEADOW RD	MCHENRY		
1927	TS	11910	IL 120 @	MC	T-1A	ON
			INDUSTRIAL DR OAK AVE	MCHENRY		
1928	TS	11915	IL 120 ELM ST @	MC	T-1A	ON
			GREEN ST	MCHENRY		
1929	TS	11920	IL 120 ELM @	MC	T-1A	ON

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			GREEN ST	MCHENRY		
1930	TS	11925	IL 120 @	MC	T-1A	ON
			RIVERSIDE DR	MCHENRY		
1931	TS	11930	IL 120 BELVIDERE RD @	LA	T-1A	ON
			HUNT CLUB RD	GURNEE		
1932	TS	11935	IL 22 @	LA	T-1A	ON
			TELEGRAPH	BANNOCKBURN		
1933	TS	11937	IL 22 HALF DAY RD @	LA	T-1A	ON
			DEERFIELD BANNOCKBURN FIRE STA	BANNOCKBURN		
1934	TS	11940	IL 59 @	LA	T-1A	ON
			WILSON RD RIDGE RD	FOX LAKE		
1935	TS	11945	US 12 @		T-1A	ON
			STATE PARK RD EAST ST			
1936	TS	11950	US 52 IL 53 CHICAGO ST @	WI	T-1A	ON
			PATTERSON RD	JOLIET		
1937	TS	11955	US 30 IL 59 DIVISION ST @	WI	T-1A	ON
			LOCKPORT ST	PLAINFIELD		
1938	TS	11965	IL 64 NORTH AVE @	CO	T-1A	ON
			POLK PLAZA SHOPPING CTR	MELROSE PARK		
1939	TS	11970	IL 59 @	DU	T-1A	ON
			83RD ST MONTGOMERY RD	AURORA		
1940	TS	11975	IL 25 RIVER ST @	DU	T-1A	ON
			IL 56 STATE ST			
1941	TS	11978	IL 25 BROADWAY @		T-1A	ON
			INDIAN TRAIL			
1942	TS	11985	US 14 NORTHWEST HWY @	CO	T-1A	ON
			HICKS RD N JCT	PALATINE		
1943	TS	12000	US 6 IL 83 TORRENCE AVE @	CO	T-1A	ON
			173RD ST BERNICE RD	LANSING		
1944	TS	12005	HICKS RD @	CO	T-1A	ON
			SELLSTROM DR OLD HICKS RD	PALATINE		
1945	TS	12010	IL 58 DEMPSTER ST @	CO	T-1A	ON

			GROSS POINT RD	SKOKIE		
1946	TS	12015	IL 56 BUTTERFIELD RD @	CO	T-1A	ON
			TAFT AVE	HILLSIDE		
1947	TS	12020	IL 59 @	DU	T-1A	ON
			JOLIET ST	WEST CHICAGO		
1948	TS	12021	IL 59 @	DU	T-1A	ON
			MACK RD	WARRENVILLE		
1949	TS	12035	CRAWFORD AVE PULASKI RD @	CO	T-1A	ON
			93RD ST	OAK LAWN		
1950	TS	12065	IL 19 IRVING PARK RD @	DU	T-1A	ON
			CHURCH RD	BENSENVILLE		
1951	TS	12070	IL 64 NORTH AVE @	DU	T-1A	ON
			POWIS RD	ST CHARLES		
1952	TS	12075	IL 72 HIGGINS RD @	CO	T-1A	ON
			HUNTINGTON BLVD	HOFFMAN ESTATES		
1953	TS	12090	TOUHY AVE @	CO	T-1A	ON
			BARCLAY PL HYATT DR	LINCOLNWOOD		
1954	TS	12091	IL 25 STEARNS @	KA	T-1A	ON
			IL 25 DUNHAM	ST CHARLES TOWNSHIP		
1955	TS	12092	IL 25 STEARNS @	KA	T-1A	ON
			GILBERT ST	ST CHARLES TOWNSHIP		
1956	TS	12093	IL 25 STEARNS @	KA	T-1A	ON
			STEARNS RD	ST CHARLES TOWNSHIP		
1957	TS	12094	IL 31 @	KA	T-1A	ON
			MCLEAN BLVD	ST CHARLES TOWNSHIP		
1958	TS	12100	STATE ST @	CO	T-1A	ON
			TAFT	SOUTH HOLLAND		
1959	TS	12101	STATE ST @	CO	T-1A	ON
			168TH ST	SOUTH HOLLAND		
1960	TS	12102	STATE ST @	CO	T-1A	ON
			ARMORY DR	SOUTH HOLLAND		
1961	TS	12105	142ND ST @	CO	T-1A	ON

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			COTTAGE GROVE	DOLTON		
1962	TS	12115	IL 1 HALSTED @	CO	T-1A	ON
			PARK PLACE PLAZA	HOMEWOOD		
1963	TS	12120	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			ROCKLAND RD	LIBERTYVILLE		
1964	TS	12125	IL 83 BUSSE RD @	CO	T-1A	ON
			HOWARD ST	ELK GROVE		
1965	TS	12135	111TH ST @	CO	T-1A	ON
			KOSTNER	OAK LAWN		
1966	TS	12140	IL 59 @	DU	T-1A	ON
			LIBERTY ST JEFFERSON	NAPERVILLE		
1967	TS	12160	IL 53 IL 68 DUNDEE RD @	CO	T-1A	ON
			IL 53 EAST RAMP	ARLINGTON HTS		
1968	TS	12165	27TH ST @	CO	T-1A	ON
			LAKE ST	MELROSE PARK		
1969	TS	12170	IL 62 ALGONQUIN RD @	MC	T-1A	ON
			ALGONQUIN TOWN CTR	ALGONQUIN		
1970	TS	12215	IL 83 @	DU	T-1A	ON
			67TH ST	WILLOWBROOK		
1971	TS	12220	IL 171 ARCHER AVE @	CO	T-1A	ON
			66TH PL	BEDFORD PARK		
1972	TS	12250	IL 64 NORTH AVE @	DU	T-1A	ON
			I 355 TLWY E RMP	LOMBARD		
1973	TS	12255	IL 64 NORTH AVE @	DU	T-1A	ON
			I 355 TLWY W RMP	LOMBARD		
1974	TS	12259	US 6 @	WI	T-1A	ON
			E FRONTAGE RD	CHANNAHON		
1975	TS	12260	I 55 STEV @	WI	T-1A	ON
			US 6 EAST RAMP	CHANNAHON		
1976	TS	12261	I 55 STEV FRONTAGE RD WB @	WI	T-1A	ON
			US 6 EAMES ST	CHANNAHON		
1977	TS	12265	I 55 STEV @	WI	T-1A	ON
			US 6 WEST RAMP	CHANNAHON		

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1978	TS	12266	US 6 EAMES RD @ TRYON ST	WI CHANNAHON	T-1A	ON
1979	TS	12267	US 6 EAMES RD @ BLUFF RD	WI CHANNAHON	T-1A	ON
1980	TS	12268	US 6 EAMES RD @ ROBERTS RD STEVE RITTOF DR	WI CHANNAHON	T-1A	ON
1981	TS	12269	US 6 EAMES RD @ BELL RD	WI CHANNAHON	T-1A	ON
1982	TS	12271	US 6 @ MCKINLEY WOODS DR	WI CHANNAHON	T-1A	ON
1983	TS	12275	US 41 EAST FRONTAGE SKOKIE VALLEY @ IL 176 ROCKLAND RD	LA LAKE BLUFF	T-1A	ON
1984	TS	12277	IL 43 WAUKEGAN RD @ KNOLLWOOD RD NORTH SHORE DR	LA LAKE BLUFF	T-1A	ON
1985	TS	12280	US 41 WEST FRONTAGE SHAGBARK @ IL 176 ROCKLAND RD	LA LAKE BLUFF	T-1A	ON
1986	TS	12285	US 12 RAND RD @ NORTH LAKE COM PAULUS RD WHITNEY RD	LA LAKE ZURICH	T-1A	ON
1987	TS	12286	US 12 @ HONEY LAKE RD	LA LAKE ZURICH	T-1A	ON
1988	TS	12290	US 12 @ EAGLE POINT RD SAYTON RD	LA FOX LAKE	T-1A	ON
1989	TS	12295	US 12 @ ELA RD	LA LAKE ZURICH	T-1A	ON
1990	TS	12297	US 12 @ JUNE TERRACE	LA LAKE ZURICH	T-1A	ON
1991	TS	12305	US 45 @ IL 120 BELVIDERE RD	LA GRAYSLAKE	T-1A	ON
1992	TS	12310	IL 59 @ AURORA MARKETPLACE AUDREY	DU AURORA	T-1A	ON

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1993	TS	12315	IL 83 @ WASHINGTON ST	DU	T-1A	ON
1994	TS	12317	IL 83 @ BRIGHTON LN	LA GRAYSLAKE	T-1A	ON
1995	TS	12320	IL 38 ROOSEVELT RD @ FINLEY RD	DU LOMBARD	T-1A	ON
1996	TS	12325	IL 38 ROOSEVELT RD @ MAIN ST (IN LOMBARD)	DU LOMBARD	T-1A	ON
1997	TS	12330	US 45 @ WINCHESTER RD	DU	T-1A	ON
1998	TS	12335	US 20 LAKE ST @ I 355 TLWY E RAMP	DU ADDISON	T-1A	ON
1999	TS	12340	US 20 LAKE ST @ I 355 TLWY W RAMP	DU ADDISON	T-1A	ON
2000	TS	12360	US 34 OGDEN AVE @ TRADE ST AURORA MARKETPLACE	DU AURORA	T-1A	ON
2001	TS	12373	IL 64 NORTH AVE @ ATLANTIC DR	DU WEST CHICAGO	T-1A	ON
2002	TS	12375	IL 64 NORTH AVE @ PRINCE CROSSING RD	DU WEST CHICAGO	T-1A	ON
2003	TS	12376	IL 64 NORTH AVE @ FAIR OAKS RD	DU CAROL STREAM	T-1A	ON
2004	TS	12377	IL 64 NORTH AVE @ TERESA LN MENARDS ENT	DU WEST CHICAGO	T-1A	ON
2005	TS	12380	IL 22 @ I 94 TLWY E RAMP	LA BANNOCKBURN	T-1A	ON
2006	TS	12385	IL 22 @ I 94 TLWY W RAMP	LA LINCOLNSHIRE	T-1A	ON
2007	TS	12390	IL 22 @ RIDGE RD EAST	LA HAWTHORN WOODS	T-1A	ON
2008	TS	12391	IL 22 @ TENNYSON LN RIDGE RD WEST	LA HIGHLAND PARK	T-1A	ON

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2009	TS	12400	IL 50 CICERO AVE @ SOUTHWICK DR	CO MATTESON	T-1A	ON
2010	TS	12403	IL 50 CICERO AVE @ WAL MART ENT	CO MATTESON	T-1A	ON
2011	TS	12404	IL 50 CICERO AVE @ NORTH GATEWAY DR	CO MATTESON	T-1A	ON
2012	TS	12420	US 34 OGDEN AVE @ I 355 TLWY E RAMP	DU LISLE	T-1A	ON
2013	TS	12421	US 34 OGDEN AVE @ I 355 TLWY W RAMP	DU LISLE	T-1A	ON
2014	TS	12424	IL 38 ROOSEVELT RD @ BAKER HILL DR	DU GLEN ELLYN	T-1A	ON
2015	TS	12425	IL 38 ROOSEVELT RD @ I 355 TLWY E RAMP	DU LOMBARD	T-1A	ON
2016	TS	12426	IL 38 ROOSEVELT RD @ I 355 TLWY W RAMP	DU GLEN ELLYN	T-1A	ON
2017	TS	12430	ARMY TRAIL RD @ I 355 EAST RAMP NB	DU ADDISON	T-1A	ON
2018	TS	12431	ARMY TRAIL RD @ I 355 WEST RAMP SB	DU ADDISON	T-1A	ON
2019	TS	12500	US 20 LAKE ST @ ITASCA RD	DU ADDISON	T-1A	ON
2020	TS	12505	US 20 LAKE ST @ LOMBARD AVE	DU ADDISON	T-1A	ON
2021	TS	12510	US 20 LAKE ST @ MILL RD	DU ADDISON	T-1A	ON
2022	TS	12513	US 20 LAKE ST @ MARCUS DR	DU ADDISON	T-1A	ON
2023	TS	12515	US 20 LAKE ST @ KENNEDY DR	DU ADDISON	T-1A	ON
2024	TS	12520	IL 53 ROHLWING RD @ FULLERTON AVE	DU ADDISON	T-1A	ON
2025	TS	12530	IL 43 HARLEM AVE @	CO	T-1A	ON

			100TH PL	BRIDGEVIEW		
2026	TS	12540	ARLINGTON HEIGHTS RD @ CENTRAL RD	CO ARLINGTON HTS	T-1A	ON
2027	TS	12555	US 14 NORTHWEST HWY @ ARLINGTON HTS RD	CO ARLINGTON HTS	T-1A	ON
2028	TS	12595	ARLINGTON HTS RD @ US 12 RAND RD	CO ARLINGTON HTS	T-1A	ON
2029	TS	12600	ARLINGTON HEIGHTS RD @ NORTH POINT SC	CO ARLINGTON HTS	T-1A	ON
2030	TS	12615	CENTRAL RD @ KIRCHOFF RD	CO ARLINGTON HTS	T-1A	ON
2031	TS	12620	CENTRAL RD @ ARTHUR ST	CO ARLINGTON HTS	T-1A	ON
2032	TS	12625	US 12 RAND RD @ Southpoint Town and Country CTR	CO ARLINGTON HTS	T-1A	ON
2033	TS	12630	US 12 RAND RD @ PALATINE RD	CO ARLINGTON HTS	T-1A	ON
2034	TS	12635	US 12 RAND RD @ NORTHPOINT CENTER	CO ARLINGTON HTS	T-1A	ON
2035	TS	12640	US 12 RAND RD @ ARLINGTON PLAZA	CO ARLINGTON HTS	T-1A	ON
2036	TS	12660	US 14 NORTHWEST HWY DAVIS @ EUCLID AVE	CO ARLINGTON HTS	T-1A	ON
2037	TS	12665	US 14 NORTHWEST HWY @ MCKINLEY ARTHUR DAVIS	CO ARLINGTON HTS	T-1A	ON
2038	TS	12670	US 14 NORTHWEST HWY @ KENSINGTON RD DOUGLAS	CO ARLINGTON HTS	T-1A	ON
2039	TS	12675	US 14 NORTHWEST HWY @ EVERGREEN	CO ARLINGTON HTS	T-1A	ON
2040	TS	12680	US 14 NORTHWEST HWY @ DUNTON AVE	CO ARLINGTON HTS	T-1A	ON
2041	TS	12685	US 14 NORTHWEST HWY @	CO	T-1A	ON

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			VAIL AVE	ARLINGTON HTS		
2042	TS	12690	US 14 NORTHWEST HWY @	CO	T-1A	ON
			WALNUT AVE RIDGE AVE	ARLINGTON HTS		
2043	TS	12700	US 12 RAND RD @	CO	T-1A	ON
			ANNEX	ARLINGTON HTS		
2044	TS	12770	IL 50 CICERO AVE @	CO	T-1A	ON
			22ND ST CERMAK RD			
2045	TS	12775	22ND CERMAK RD @	CO	T-1A	ON
			49TH AVE			
2046	TS	12780	22ND CERMAK RD @	CO	T-1A	ON
			50TH AVE			
2047	TS	12785	22ND CERMAK RD @	CO	T-1A	ON
			LARAMIE AVE			
2048	TS	12790	22ND CERMAK RD @	CO	T-1A	ON
			54TH AVE			
2049	TS	12795	IL 50 CICERO @	CO	T-1A	ON
			16TH ST			
2050	TS	12825	IL 50 CICERO AVE @	CO	T-1A	ON
			19TH ST	CICERO		
2051	TS	12830	IL 50 CICERO AVE @	CO	T-1A	ON
			29TH ST	CICERO		
2052	TS	12915	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			MCDONALDS ENT CADWELLS CR	DEERFIELD		
2053	TS	12920	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			KATES RD	DEERFIELD		
2054	TS	12925	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			LONGFELLOW AVE OSTERMAN AVE	DEERFIELD		
2055	TS	12930	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			DEERFIELD COMMONS BLVD	DEERFIELD		
2056	TS	12935	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			DEERFIELD RD	DEERFIELD		
2057	TS	12937	IL 43 WAUKEGAN RD @	LA	T-1A	ON

			DEERFIELD FIRE STATION	DEERFIELD		
2058	TS	12940	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			HAZEL AVE ELDER	DEERFIELD		
2059	TS	12945	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			GREENWOOD AVE	DEERFIELD		
2060	TS	12950	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			DEERFIELD HIGH SCHOOL	DEERFIELD		
2061	TS	12952	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			NORTH AVE	DEERFIELD		
2062	TS	12966	IL 43 WAUKEGAN RD @	CO	T-1A	ON
			CHESTNUT ST (BY DEERBROOK MALL)	DEERFIELD		
2063	TS	12985	TOUHY AVE @	CO	T-1A	ON
			MAPLE	DESPLAINES		
2064	TS	12995	OAKTON ST @	CO	T-1A	ON
			WEBSTER	DESPLAINES		
2065	TS	13005	ALGONQUIN RD @	CO	T-1A	ON
			SEYMOUR	DESPLAINES		
2066	TS	13020	IL 58 GOLF RD @	CO	T-1A	ON
			MT PROSPECT RD	DESPLAINES		
2067	TS	13022	IL 58 GOLF RD @	CO	T-1A	ON
			MARIANOS ACCESS DR	DESPLAINES		
2068	TS	13025	US 12 45 LEE ST MANNHEIM RD @	CO	T-1A	ON
			PRAIRIE AVE	DESPLAINES		
2069	TS	13026	US 12 45 LEE ST MANNHEIM @	CO	T-1A	ON
			THACKER ST	DESPLAINES		
2070	TS	13027	US 12 45 GRACELAND @	CO	T-1A	ON
			THACKER ST	DESPLAINES		
2071	TS	13035	US 12 45 LEE ST @	CO	T-1A	ON
			US 14 MINER ST ELLENWOOD ST	DESPLAINES		
2072	TS	13040	US 14 MINER ST @	CO	T-1A	ON
			PEARSON ST	DESPLAINES		

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2073	TS	13050	US 12 45 GRACELAND @ PRAIRIE AVE	CO DESPLAINES	T-1A	ON
2074	TS	13065	US 12 45 MANNHEIM RD @ PROSPECT AVE	CO DESPLAINES	T-1A	ON
2075	TS	13070	DES PLAINES RIVER RD @ PERRY ST	CO DESPLAINES	T-1A	ON
2076	TS	13071	US 12 45 LEE ST @ PERRY ST	CO DESPLAINES	T-1A	ON
2077	TS	13072	DES PLAINES RIVER RD @ PEARSON	CO DESPLAINES	T-1A	ON
2078	TS	13075	US 14 MINER ST @ DESPLAINES RIVER RD	CO DESPLAINES	T-1A	ON
2079	TS	13078	US 14 MINER ST @ BUSSE RD	CO DESPLAINES	T-1A	ON
2080	TS	13080	US 14 NORTHWEST HWY @ STATE ST	CO DESPLAINES	T-1A	ON
2081	TS	13083	US 14 NW HWY @ BROADWAY	CO DESPLAINES	T-1A	ON
2082	TS	13085	US 12 RAND RD @ 3RD AVE	CO DESPLAINES	T-1A	ON
2083	TS	13140	IL 72 HIGGINS RD @ LIVELY BLVD	CO ELK GROVE	T-1A	ON
2084	TS	13145	IL 53 ROHLWING RD @ NERGE RD	CO ELK GROVE	T-1A	ON
2085	TS	13150	IL 53 ROHLWING RD @ BIESTERFIELD RD	CO ELK GROVE	T-1A	ON
2086	TS	13202	LARKIN AVE FOOTHILL @ AIRLITE	KA ELGIN	T-1A	ON
2087	TS	13205	IL 31 STATE @ WALNUT NATIONAL	KA ELGIN	T-1A	ON
2088	TS	13215	IL 31 STATE @ CHICAGO	KA ELGIN	T-1A	ON
2089	TS	13225	IL 31 STATE @	KA	T-1A	ON

			WING	ELGIN		
2090	TS	13265	IL 25 DUNDEE LIBERTY ST @ CONGDON AVE	KA ELGIN	T-1A	ON
2091	TS	13270	IL 25 DUNDEE @ LUDA ST	KA ELGIN	T-1A	ON
2092	TS	13275	IL 25 DUNDEE @ PAGE AVE	KA ELGIN	T-1A	ON
2093	TS	13285	IL 58 SUMMIT @ HIAWATHA	CO ELGIN	T-1A	ON
2094	TS	13290	IL 25 BLUFF CITY RD @ IL 25 LIBERTY	KA ELGIN	T-1A	ON
2095	TS	13295	IL 25 BLUFF CITY RD @ IL 25 ST CHARLES RD	KA ELGIN	T-1A	ON
2096	TS	13404	IL 72 @ TYRRELL RD	KA GILBERTS	T-1A	ON
2097	TS	13412	IL 72 @ BIG TIMBER RD	KA RUTLAND TWNShP	T-1A	ON
2098	TS	13414	IL 72 GILBERTS RD HIGGINS RD @ GALVIN DR	KA ELGIN	T-1A	ON
2099	TS	13440	IL 19 IRVING PARK RD @ CHICAGO @ WILLARD	CO ELGIN	T-1A	ON
2100	TS	13470	WOLF RD @ DEMPSTER THACKER	CO DESPLAINES	T-1A	ON
2101	TS	13685	DESPLAINES AVE @ JACKSON ST	CO FOREST PARK	T-1A	ON
2102	TS	13687	DESPLAINES AVE @ CTA	CO FOREST PARK	T-1A	ON
2103	TS	13700	ROOSEVELT RD @ CIRCLE AVE	CO FOREST PARK	T-1A	ON
2104	TS	13739	IL 83 @ LIBRARY LN	LA GRAYSLAKE	T-1A	ON
2105	TS	13740	IL 83 @	LA	T-1A	ON

			CENTER AVE	GRAYSLAKE		
2106	TS	13741	IL 83 @	LA	T-1A	ON
			FREDERICK ST	GRAYSLAKE		
2107	TS	13742	IL 120 @	LA	T-1A	ON
			LAKE ST	GRAYSLAKE		
2108	TS	13745	IL 19 IRVING PARK RD @	CO	T-1A	ON
			BARRINGTON RD	HANOVER PARK		
2109	TS	13746	IL 120 BELVIDERE RD @	LA	T-1A	ON
			ALLEGHENY RD	GRAYSLAKE		
2110	TS	13750	IL 19 IRVING PARK RD @	CO	T-1A	ON
			TRADEWINDS	HANOVER PARK		
2111	TS	13755	IL 19 IRVING PARK RD @	CO	T-1A	ON
			KINGSBURY	HANOVER PARK		
2112	TS	13756	IL 19 IRVING PARK RD @	CO	T-1A	ON
			WESTVIEW CTR	HANOVER PARK		
2113	TS	13760	US 20 LAKE ST @	CO	T-1A	ON
			METRA COMMUTER LOT CHURCH	HANOVER PARK		
2114	TS	13762	US 20 LAKE ST @	CO	T-1A	ON
			CENTER	HANOVER PARK		
2115	TS	13765	US 20 LAKE ST @	CO	T-1A	ON
			BARRINGTON RD	HANOVER PARK		
2116	TS	13770	US 20 LAKE ST @	DU	T-1A	ON
			GREENBROOK BLVD	HANOVER PARK		
2117	TS	13775	BARRINGTON @	CO	T-1A	ON
			WALNUT	HANOVER PARK		
2118	TS	13785	150TH ST @	CO	T-1A	ON
			DIXIE HWY	HARVEY		
2119	TS	13790	154TH ST @	CO	T-1A	ON
			DIXIE HWY	HARVEY		
2120	TS	13795	150TH ST @	CO	T-1A	ON
			WOOD ST	HARVEY		
2121	TS	13800	154TH ST @	CO	T-1A	ON

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			WOOD ST	HARVEY		
2122	TS	13805	155TH ST @	CO	T-1A	ON
			WOOD ST	HARVEY		
2123	TS	13810	156TH ST @	CO	T-1A	ON
			WOOD ST	HARVEY		
2124	TS	13815	158TH ST @	CO	T-1A	ON
			WOOD ST	HARVEY		
2125	TS	13820	154TH ST @	CO	T-1A	ON
			PARK	HARVEY		
2126	TS	13825	155TH ST @	CO	T-1A	ON
			PARK	HARVEY		
2127	TS	13830	157TH ST @	CO	T-1A	ON
			PARK	HARVEY		
2128	TS	13835	150TH ST @	CO	T-1A	ON
			MORGAN	HARVEY		
2129	TS	13845	GREEN BAY @	CO	T-1A	ON
			KENILWORTH AVE PARK DR			
2130	TS	13855	US 34 OGDEN AVE @	CO	T-1A	ON
			BRAINARD	LAGRANGE		
2131	TS	13860	US 34 OGDEN AVE @	CO	T-1A	ON
			WAIOLA	LAGRANGE		
2132	TS	13865	US 34 OGDEN AVE @	CO	T-1A	ON
			KENSINGTON	LAGRANGE		
2133	TS	13870	US 34 OGDEN AVE @	CO	T-1A	ON
			EBERLE AVE EAST AVE	BROOKFIELD		
2134	TS	13871	US 34 OGDEN AVE @	CO	T-1A	ON
			DU BOIS	BROOKFIELD		
2135	TS	13872	US 34 OGDEN AVE @	CO	T-1A	ON
			MAPLE	BROOKFIELD		
2136	TS	13873	US 34 OGDEN AVE @	CO	T-1A	ON
			PRAIRIE	BROOKFIELD		
2137	TS	13880	US 12 20 45 LAGRANGE RD @	CO	T-1A	ON
			HARRIS	LAGRANGE		

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2138	TS	13885	US 12 20 45 LAGRANGE RD @ COSSIT	CO LAGRANGE	T-1A	ON
2139	TS	13890	47TH ST @ WILLOW SPRINGS RD	CO LAGRANGE	T-1A	ON
2140	TS	13895	47TH ST @ EDGEWOOD	CO LAGRANGE	T-1A	ON
2141	TS	13900	47TH ST @ BRAINARD AVE	CO LAGRANGE	T-1A	ON
2142	TS	13905	US 12 20 45 LAGRANGE RD @ BURLINGTON AVE HILLGROVE	CO	T-1A	ON
2143	TS	13910	US 12 20 45 LAGRANGE RD @ US 34 OGDEN AVE	CO LAGRANGE PARK	T-1A	ON
2144	TS	13912	US 34 OGDEN @ LOCUST	CO LAGRANGE	T-1A	ON
2145	TS	13915	US 12 20 45 LAGRANGE RD @ HARDING	CO LAGRANGE PARK	T-1A	ON
2146	TS	13920	US 12 20 45 LAGRANGE RD @ HOMESTEAD	CO LAGRANGE PARK	T-1A	ON
2147	TS	13923	31ST ST @ BRAINARD AVE	CO LAGRANGE PARK	T-1A	ON
2148	TS	13925	31ST ST @ FOREST	CO LAGRANGE PARK	T-1A	ON
2149	TS	13930	31ST ST @ RAYMOND AVE HARRISON ST	CO LAGRANGE PARK	T-1A	ON
2150	TS	13940	IL 83 TORRENCE AVE @ 178TH ST	CO LANSING	T-1A	ON
2151	TS	13942	US 6 IL 83 TORRENCE AVE @ I 80 94	CO LANSING	T-1A	ON
2152	TS	13985	IL 21 MILWAUKEE AVE @ WINCHESTER RD	LA LIBERTYVILLE	T-1A	ON
2153	TS	13990	IL 21 MILWAUKEE AVE @ COOK ST	LA LIBERTYVILLE	T-1A	ON
2154	TS	13995	IL 21 MILWAUKEE AVE @	LA	T-1A	ON

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			CHURCH ST	LIBERTYVILLE		
2155	TS	14005	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			VALLEY PARK DR	LIBERTYVILLE		
2156	TS	14007	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			CONDELL DR	LIBERTYVILLE		
2157	TS	14013	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			S ARTAIUS PKWY CUNEO N ENT	LIBERTYVILLE		
2158	TS	14015	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			RED TOP DR GREENTREE BLVD	LIBERTYVILLE		
2159	TS	14016	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			ADLER DR	LIBERTYVILLE		
2160	TS	14017	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			GOLF RD	LIBERTYVILLE		
2161	TS	14018	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			GREGGS PKWY NORTH ARTAIUS PKWY	LIBERTYVILLE		
2162	TS	14020	IL 176 @	LA	T-1A	ON
			BUTTERFIELD RD	LIBERTYVILLE		
2163	TS	14025	IL 176 @	LA	T-1A	ON
			GARFIELD AVE BRAINARD AVE	LIBERTYVILLE		
2164	TS	14030	IL 176 @	LA	T-1A	ON
			DAWES ST	LIBERTYVILLE		
2165	TS	14035	IL 176 @	LA	T-1A	ON
			4TH AVE FOURTH AVE	LIBERTYVILLE		
2166	TS	14062	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			MARIANO ENT	LOMBARD		
2167	TS	14065	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			HIGHLAND AVE	LOMBARD		
2168	TS	14155	US 34 OGDEN AVE @	CO	T-1A	ON
			IL 171 1ST AVE	LYONS		
2169	TS	14157	US 34 OGDEN AVE @	CO	T-1A	ON
			LAWNDALE	LYONS		

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2170	TS	14160	IL 171 1ST AVE @ PLAINFIELD RD	CO LYONS	T-1A	ON
2171	TS	14165	IL 171 1ST AVE @ 44TH ST	CO LYONS	T-1A	ON
2172	TS	14170	US 34 OGDEN AVE @ PLAINFIELD RD	CO LYONS	T-1A	ON
2173	TS	14175	US 34 OGDEN AVE @ CUSTER	CO BROOKFIELD	T-1A	ON
2174	TS	14183	5TH AVE @ MAIN ST CHARLES	CO	T-1A	ON
2175	TS	14190	5TH AVE @ WASHINGTON	CO MAYWOOD	T-1A	ON
2176	TS	14195	5TH AVE @ MADISON	CO MAYWOOD	T-1A	ON
2177	TS	14200	5TH AVE @ LAKE ST	CO MAYWOOD	T-1A	ON
2178	TS	14205	5TH AVE @ CHICAGO	CO MAYWOOD	T-1A	ON
2179	TS	14215	17TH AVE @ MADISON	CO MAYWOOD	T-1A	ON
2180	TS	14220	9TH AVE @ LAKE ST	CO MAYWOOD	T-1A	ON
2181	TS	14245	9TH AVE @ CHICAGO	CO MAYWOOD	T-1A	ON
2182	TS	14265	IL 64 NORTH AVE @ 15TH AVE	CO MELROSE PARK	T-1A	ON
2183	TS	14270	GOLF RD @ OVERLOOK DR	CO MORTON GROVE	T-1A	ON
2184	TS	14275	IL 43 IL 58 WAUKEGAN RD @ EMERSON ST	CO MORTON GROVE	T-1A	ON
2185	TS	14280	IL 43 IL 58 WAUKEGAN RD @ BECKWITH RD	CO MORTON GROVE	T-1A	ON
2186	TS	14285	IL 58 DEMPSTER ST @	CO	T-1A	ON

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			PRAIRIE VIEW DR PARK DR	MORTON GROVE		
2187	TS	14290	IL 58 DEMPSTER ST @ LEHIGH AVE	CO MORTON GROVE	T-1A	ON
2188	TS	14295	IL 58 DEMPSTER ST @ FERRIS AVE	CO MORTON GROVE	T-1A	ON
2189	TS	14300	IL 58 DEMPSTER ST @ FERNALD AVE	CO MORTON GROVE	T-1A	ON
2190	TS	14305	IL 58 DEMPSTER ST @ AUSTIN AVE	CO MORTON GROVE	T-1A	ON
2191	TS	14310	IL 58 DEMPSTER ST @ MENARD AVE	CO MORTON GROVE	T-1A	ON
2192	TS	14315	IL 58 DEMPSTER ST @ CENTRAL AVE	CO MORTON GROVE	T-1A	ON
2193	TS	14325	OAKTON ST @ AUSTIN AVE	CO MORTON GROVE	T-1A	ON
2194	TS	14330	OAKTON ST @ MENARD AVE	CO MORTON GROVE	T-1A	ON
2195	TS	14340	US 45 @ DIAMOND LAKE RD	LA MUNDELEIN	T-1A	ON
2196	TS	14350	US 45 LAKE @ HAWLEY ST	LA MUNDELEIN	T-1A	ON
2197	TS	14355	MIDLOTHIAN RD @ HAWLEY ST	LA MUNDELEIN	T-1A	ON
2198	TS	14370	US 45 @ ALLANSON RD	LA MUNDELEIN	T-1A	ON
2199	TS	14372	US 45 @ COURTLAND ST	LA MUNDELEIN	T-1A	ON
2200	TS	14375	IL 171 CUMBERLAND AVE @ FOSTER	CO NORRIDGE	T-1A	ON
2201	TS	14395	IL 43 HARLEM AVE @ CULLOM	CO NORRIDGE	T-1A	ON
2202	TS	14400	IL 43 WAUKEGAN RD @ WALTERS AVE	CO NORTHBROOK	T-1A	ON

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2203	TS	14402	IL 43 WAUKEGAN RD @ VOLTZ RD	CO NORTHBROOK	T-1A	ON
2204	TS	14430	IL 43 WAUKEGAN RD @ SHERMER RD	CO NORTHBROOK	T-1A	ON
2205	TS	14460	WILLOW RD @ CENTRAL SOUTH HAPP	CO NORTHFIELD	T-1A	ON
2206	TS	14465	WILLOW RD @ NORTHFIELD RD OLD WILLOW RD	CO NORTHFIELD	T-1A	ON
2207	TS	14466	WILLOW RD @ CLARKSON PARK CHURCHILL ST	CO NORTHFIELD	T-1A	ON
2208	TS	14470	WILLOW RD @ WAGNER RD	CO NORTHFIELD	T-1A	ON
2209	TS	14475	WILLOW RD @ SUNSET RIDGE	CO NORTHFIELD	T-1A	ON
2210	TS	14480	IL 43 WAUKEGAN RD @ CHRISTIAN HERITAGE WESTLEIGH DR	CO NORTHBROOK	T-1A	ON
2211	TS	14485	WINNETKA RD @ HIBBARD	CO NORTHFIELD	T-1A	ON
2212	TS	14491	22ND ST @ OAK BROOK CENTER EAST	DU OAKBROOK	T-1A	ON
2213	TS	14492	22ND ST @ OAK BROOK CENTER WEST	DU OAKBROOK	T-1A	ON
2214	TS	14495	22ND ST CERMAK RD @ YORK RD	DU OAKBROOK	T-1A	ON
2215	TS	14496	22ND ST @ JORIE BLVD ENTERPRISE DR	DU OAKBROOK	T-1A	ON
2216	TS	14497	22ND ST CERMAK RD @ WINDSOR DR	DU OAKBROOK	T-1A	ON
2217	TS	14715	PALATINE RD @ SMITH	CO PALATINE	T-1A	ON
2218	TS	14720	PALATINE RD @	CO	T-1A	ON

			BROCKWAY	PALATINE		
2219	TS	14725	PALATINE RD @	CO	T-1A	ON
			PLUM GROVE RD	PALATINE		
2220	TS	14730	HICKS RD @	CO	T-1A	ON
			FIRST BANK DR PALATINE MALL	PALATINE		
2221	TS	14741	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			CARRIAGE WAY ESSEX WAY	ROLLING MEADOWS		
2222	TS	14744	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			WEBER RD OLD WILKE	ROLLING MEADOWS		
2223	TS	14750	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			HAMMOND DR	SCHAUMBURG		
2224	TS	14760	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			MOTOROLA W DR PLUM GROVE RD	SCHAUMBURG		
2225	TS	14770	I 290 EAST FRONTAGE @	CO	T-1A	ON
			WOODFIELD RD	SCHAUMBURG		
2226	TS	14775	I 290 WEST FRONTAGE @	CO	T-1A	ON
			WOODFIELD RD	SCHAUMBURG		
2227	TS	14820	NILES CENTER RD @	CO	T-1A	ON
			HOWARD ST	SKOKIE		
2228	TS	14835	TOUHY AVE @	CO	T-1A	ON
			NILES CENTER RD CARPENTER	SKOKIE		
2229	TS	14840	TOUHY AVE @	CO	T-1A	ON
			LARAMIE AVE	SKOKIE		
2230	TS	14845	TOUHY AVE @	CO	T-1A	ON
			LECLAIRE	SKOKIE		
2231	TS	14855	US 12 45 MANNHEIM RD @	CO	T-1A	ON
			HIRSCH SOFFEL AVE	STONE PARK		
2232	TS	14861	IL 171 ARCHER AVE @	CO	T-1A	ON
			DERBY	LEMONT		
2233	TS	14863	123RD ST MCCARTHY RD @	CO	T-1A	ON
			DERBY	LEMONT		
2234	TS	14865	IL 72 @	KA	T-1A	ON

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			LOCUST DR	WEST DUNDEE		
2235	TS	14867	IL 72 @	KA	T-1A	ON
			TARTANS DR	WEST DUNDEE		
2236	TS	14875	IL 72 MAIN ST @	KA	T-1A	ON
			5TH ST	WEST DUNDEE		
2237	TS	14880	IL 31 @	KA	T-1A	ON
			HILLSIDE SPRING HILL ENT D	WEST DUNDEE		
2238	TS	14885	IL 31 @	KA	T-1A	ON
			SPRUCE DR ALDI ENT	WEST DUNDEE		
2239	TS	14890	IL 31 @	KA	T-1A	ON
			HUNTLEY RD	CARPENTERSVILLE		
2240	TS	14900	IL 31 @	KA	T-1A	ON
			WILLOW RD STROM DR	WEST DUNDEE		
2241	TS	14904	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			PULASKI DR	WAUKEGAN		
2242	TS	14905	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			LAKEHURST RD	WAUKEGAN		
2243	TS	14910	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			FOUNTAIN SQUARE PL	WAUKEGAN		
2244	TS	14915	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			NORTHPOINT BLVD	WAUKEGAN		
2245	TS	14916	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			BUR WOOD DR (BURWOOD)	WAUKEGAN		
2246	TS	14917	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			LAKESIDE DR BAXTER ENT	WAUKEGAN		
2247	TS	14925	IL 120 BELVIDERE RD @	LA	T-1A	ON
			GREENLEAF ST NORTH RAMP	WAUKEGAN		
2248	TS	14930	GREENLEAF SOUTH RAMP @	LA	T-1A	ON
			IL 120 EB RAMP	WAUKEGAN		
2249	TS	14940	IL 120 BELVIDERE RD @	LA	T-1A	ON
			LEWIS AVE	WAUKEGAN		
2250	TS	14945	BELVIDERE RD @	LA	T-1A	ON
			GLEN ROCK AVE	WAUKEGAN		

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2251	TS	14950	BELVIDERE RD @ JACKSON AVE	LA WAUKEGAN	T-1A	ON
2252	TS	14955	BELVIDERE RD @ MCALISTER AVE	LA WAUKEGAN	T-1A	ON
2253	TS	14960	IL 120 BELVIDERE RD @ COUNTY ST MARTIN LUTHER	LA WAUKEGAN	T-1A	ON
2254	TS	14965	BELVIDERE RD @ GENESEE ST	LA WAUKEGAN	T-1A	ON
2255	TS	14970	BELVIDERE RD @ KELLER AVE	LA WAUKEGAN	T-1A	ON
2256	TS	14972	BELVIDERE RD @ PIONEER CT LAKE PLAZA	LA WAUKEGAN	T-1A	ON
2257	TS	14974	BELVIDERE RD @ BELVIDERE MALL EAST ENT	LA WAUKEGAN	T-1A	ON
2258	TS	14980	GRAND AVE @ BALDWIN AVE	LA WAUKEGAN	T-1A	ON
2259	TS	14985	GRAND AVE @ MCAREE AVE	LA WAUKEGAN	T-1A	ON
2260	TS	14990	GRAND AVE @ GENESEE ST	LA WAUKEGAN	T-1A	ON
2261	TS	14995	GRAND AVE @ COUNTY ST	LA WAUKEGAN	T-1A	ON
2262	TS	15000	GRAND AVE @ WEST ST	LA WAUKEGAN	T-1A	ON
2263	TS	15005	GRAND AVE @ JACKSON AVE	LA WAUKEGAN	T-1A	ON
2264	TS	15010	GRAND AVE @ BUTRICK ST	LA WAUKEGAN	T-1A	ON
2265	TS	15015	GRAND AVE @ LEWIS AVE	LA WAUKEGAN	T-1A	ON
2266	TS	15020	IL 131 GREEN BAY RD @ IL 132 GRAND AVE	LA WAUKEGAN	T-1A	ON
2267	TS	15022	IL 131 GREEN BAY RD @	LA	T-1A	ON

			BROOKSIDE AVE	WAUKEGAN		
2268	TS	15030	IL 137 GENESEE ST SHERIDAN RD @	LA	T-1A	ON
			SOUTH AVE	WAUKEGAN		
2269	TS	15035	SHERIDAN RD @	LA	T-1A	ON
			BELVIDERE RD	WAUKEGAN		
2270	TS	15065	IL 137 SHERIDAN RD @	LA	T-1A	ON
			MIRAFLORES AVE	WAUKEGAN		
2271	TS	15080	IL 47 @	MC	T-1A	ON
			RUSSEL CT	WOODSTOCK		
2272	TS	15086	IL 120 @	MC	T-1A	ON
			FLEMING RD	WOODSTOCK		
2273	TS	15087	IL 47 @	MC	T-1A	ON
			IRVING AVE JUDD	WOODSTOCK		
2274	TS	15088	IL 47 @	MC	T-1A	ON
			IL 120	WOODSTOCK		
2275	TS	15089	IL 120 @	MC	T-1A	ON
			RAFFEL RD	WOODSTOCK		
2276	TS	15090	IL 19 IRVING PK RD @	DU	T-1A	ON
			ADDISON RD	WOOD DALE		
2277	TS	15100	IL 19 IRVING PK RD @	DU	T-1A	ON
			WOOD DALE RD	WOOD DALE		
2278	TS	15105	US 12 45 MANNHEIM RD @	CO	T-1A	ON
			DORCHESTER BALMORAL	WESTCHESTER		
2279	TS	15110	IL 38 ROOSEVELT RD @	CO	T-1A	ON
			WESTCHESTER BLVD	WESTCHESTER		
2280	TS	15115	22ND ST CERMAK RD @	CO	T-1A	ON
			MAYFAIR	WESTCHESTER		
2281	TS	15120	US 12 20 45 MANNHEIM RD @	CO	T-1A	ON
			CANTERBURY RD	WESTCHESTER		
2282	TS	15131	IL 137 SHERIDAN RD AMSTUTZ EXPY @	LA	T-1A	ON
			GENESEE + OVERHEAD FLASHER	WAUKEGAN		

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2283	TS	15175	IL 56 BUTTERFIELD RD @ BRADFORD DR	DU WHEATON	T-1A	ON
2284	TS	15178	IL 56 BUTTERFIELD RD @ LEASK LANE	DU WHEATON	T-1A	ON
2285	TS	15230	IL 38 ROOSEVELT RD @ LORRAINE RD	DU WHEATON	T-1A	ON
2286	TS	15235	IL 38 ROOSEVELT RD @ PRESIDENT ST	DU WHEATON	T-1A	ON
2287	TS	15240	IL 38 ROOSEVELT RD @ NAPERVILLE RD	DU WHEATON	T-1A	ON
2288	TS	15245	IL 38 ROOSEVELT RD @ MAIN ST (IN WHEATON)	DU WHEATON	T-1A	ON
2289	TS	15250	IL 38 ROOSEVELT RD @ WEST ST WARRENVILLE RD	DU WHEATON	T-1A	ON
2290	TS	15255	IL 38 ROOSEVELT RD @ CARLETON AVE	DU WHEATON	T-1A	ON
2291	TS	15260	IL 38 ROOSEVELT RD @ ADARE DR SADDLE RD	DU WHEATON	T-1A	ON
2292	TS	15261	IL 38 ROOSEVELT RD @ COMMUNITY DR HAZELTON AVE	DU WHEATON	T-1A	ON
2293	TS	15305	IL 38 ROOSEVELT RD @ VILLA OAKS DR	DU OAKBROOK TERRACE	T-1A	ON
2294	TS	15310	IL 38 ROOSEVELT RD @ ARDMORE AVE	DU VILLA PARK	T-1A	ON
2295	TS	15315	IL 64 NORTH AVE @ WESTMORE RD	DU VILLA PARK	T-1A	ON
2296	TS	15320	GREEN BAY RD @ WINNETKA AVE	CO WINNETKA	T-1A	ON
2297	TS	20323	IL 31 @ SILVER GLEN RD	KA ST CHARLES TWNSHP	T-1A	ON
2298	TS	20330	IL 53 @ DUPAGE BLVD BAKER HILL DR	DU GLEN ELLYN	T-1A	ON

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2299	TS	20335	IL 53 @ PERSHING AVE	DU GLEN ELLYN	T-1A	ON
2300	TS	20341	TOUHY AVE @ LAWNDALE AVE	CO LINCOLNWOOD	T-1A	ON
2301	TS	20345	TOUHY AVE @ LINCOLNWOOD TOWN CTR ENT	CO LINCOLNWOOD	T-1A	ON
2302	TS	20350	IL 22 HALF DAY RD @ LAKESIDE DR	LA BANNOCKBURN	T-1A	ON
2303	TS	20355	NILES CENTER RD CARPENTER @ VILLAGE CROSSING ENT D	CO SKOKIE	T-1A	ON
2304	TS	20360	IL 59 @ MERIDIAN PKWY GLACIER PARK	DU NAPERVILLE	T-1A	ON
2305	TS	20365	US 6 159TH ST @ 91ST AVE PARK HILL DR	CO ORLAND HILLS	T-1A	ON
2306	TS	20366	IL 50 IL 83 CICERO AVE @ 137TH ST	CO CRESTWOOD	T-1A	ON
2307	TS	20370	IL 56 BUTTERFIELD RD @ CROMWELL DR	DU WHEATON	T-1A	ON
2308	TS	20373	IL 31 @ RED GATE RD	KA ST CHARLES	T-1A	ON
2309	TS	20375	IL 176 @ BRADLEY DR	LA LIBERTYVILLE	T-1A	ON
2310	TS	20380	US 14 NORTHWEST HWY @ ELA ROAD	CO BARRINGTON	T-1A	ON
2311	TS	20385	BALLARD RD @ BENDER RD E RIVER RD	CO DESPLAINES	T-1A	ON
2312	TS	20390	IL 38 @ ST CHARLES MALL	KA ST CHARLES	T-1A	ON
2313	TS	20395	MCCORMICK BLVD @ LINCOLNWOOD TOWN CENTER	CO LINCOLNWOOD	T-1A	ON
2314	TS	20396	IL 31 @ KANE ST	KA WEST DUNDEE	T-1A	ON

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2315	TS	20400	BARRINGTON RD @ ST ALEXIUS HOFFMAN MEDICAL	CO HOFFMAN ESTATES	T-1A	ON
2316	TS	20402	IL 58 GOLF RD @ HOFFMAN ESTATES S C	CO HOFFMAN ESTATES	T-1A	ON
2317	TS	20405	US 45 DES PLAINES RIVER RD @ US 45 IL 21 MILWAUKEE	CO PROSPECT HTS	T-1A	ON
2318	TS	20426	IL 22 @ BUFFALO GROVE FIRE HOUSE	LA BUFFALO GROVE	T-1A	ON
2319	TS	20435	IL 50 CICERO AVE @ 24TH ST	CO CICERO	T-1A	ON
2320	TS	20480	PALATINE RD @ ROSELLE RD	CO INVERNESS	T-1A	ON
2321	TS	20485	IL 131 GREEN BAY RD @ CRESCENT AVE	LA WAUKEGAN	T-1A	ON
2322	TS	20490	US 6 159TH ST @ 108TH AVE	CO ORLAND PARK	T-1A	ON
2323	TS	20491	US 6 159TH ST @ RAVINIA	CO ORLAND PARK	T-1A	ON
2324	TS	20492	US 6 159TH ST @ 104TH AVE	CO ORLAND PARK	T-1A	ON
2325	TS	20495	IL 50 CICERO AVE @ 120TH ST	CO ALSIP	T-1A	ON
2326	TS	20525	IL 171 ARCHER AVE @ BULLDOG DR 57TH ST	CO SUMMIT	T-1A	ON
2327	TS	20530	IL 60 @ SAUNDERS RD FIELD DR	LA LAKE FOREST	T-1A	ON
2328	TS	20535	US 12 @ DEERPATH RD PHEASANT RIDGE DR	LA LAKE ZURICH	T-1A	ON
2329	TS	20555	WAUKEGAN RD @ NILES CIVIC CENTER PLAZA	CO NILES	T-1A	ON
2330	TS	20560	US 6 WOLF RD @	CO	T-1A	ON

			167TH ST	ORLAND PARK		
2331	TS	20561	IL 7 IL 53 @	WI	T-1A	ON
			CATON FARM RD	CREST HILL		
2332	TS	20590	US 14 NORTHWEST HWY @	CO	T-1A	ON
			FIRST BANK	PALATINE		
2333	TS	20595	US 12 @	LA	T-1A	ON
			OLD MCHENRY RD	HAINESVILLE		
2334	TS	20600	US 6 @	WI	T-1A	ON
			BRANDON RD	ROCKDALE		
2335	TS	20605	I 290 IKE WEST RAMP ENT @	CO	T-1A	ON
			BIESTERFIELD RD	ELK GROVE		
2336	TS	20610	I 290 IKE EAST RAMP EXT @	CO	T-1A	ON
			BIESTERFIELD RD	ELK GROVE		
2337	TS	20615	BRAINARD AVE @	CO	T-1A	ON
			HEGEWISCH METRA PARK LOT			
2338	TS	20620	IL 59 @	DU	T-1A	ON
			NEW YORK AVE AURORA AVE	AURORA		
2339	TS	20625	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			I 355 N S TLWY E RAMP	DOWNERS GROVE		
2340	TS	20630	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			I 355 N S TLWY W RAMP	DOWNERS GROVE		
2341	TS	20631	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			NICOLL WAY	GLEN ELLYN		
2342	TS	20632	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			PARK BLVD	GLEN ELLYN		
2343	TS	20634	IL 38 ROOSEVELT RD @	DU	T-1A	ON
			LAMBERT RD	GLEN ELLYN		
2344	TS	20635	IL 59 @	DU	T-1A	ON
			FOX VALLEY CSC N ENT	AURORA		
2345	TS	20660	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			EAST LOOP DR	WHEATON		
2346	TS	20901	IL 137 SHERIDAN RD @	LA	T-1A	ON
			IL 173 21ST ST	ZION		

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2347	TS	20906	31ST ST @ IL 137 SHERIDAN RD	LA ZION	T-1A	ON
2348	TS	20908	IL 137 SHERIDAN RD @ 34TH ST	LA ZION	T-1A	ON
2349	TS	20910	US 34 OGDEN AVE @ FOX RIVER COMMONS SC ENT	DU AURORA	T-1A	ON
2350	TS	20935	TOUHY AVE @ VILLAGE CROSSING SC ENT C	CO NILES	T-1A	ON
2351	TS	20945	US 45 96TH AVE @ 179TH ST	CO TINLEY PARK	T-1A	ON
2352	TS	20955	US 6 IL 83 TORRENCE AVE @ 166TH ST FIELDCREST DR	CO LANSING	T-1A	ON
2353	TS	20965	127TH ST @ KOSTNER AVE	CO ALSIP	T-1A	ON
2354	TS	20967	IL 126 @ MEADOW AVE	WI PLAINFIELD	T-1A	ON
2355	TS	20968	US 30 @ NEW VAN DYKE RD	WI PLAINFIELD	T-1A	ON
2356	TS	20969	IL 126 @ DRAUDEN RD STEINER RD	WI PLAINFIELD	T-1A	ON
2357	TS	20970	IL 126 @ WALLIN DR	WI PLAINFIELD	T-1A	ON
2358	TS	20971	IL 126 @ NEW VAN DYKE RD	WI PLAINFIELD	T-1A	ON
2359	TS	20972	US 30 @ 135TH ST	WI PLAINFIELD	T-1A	ON
2360	TS	20976	US 30 LINCOLN WAY @ 119TH ST	WI PLAINFIELD	T-1A	ON
2361	TS	20979	US 30 @ 127TH ST		T-1A	ON
2362	TS	20986	TORRENCE AVE @ JOE ORR RD	CO LYNWOOD	T-1A	ON
2363	TS	20995	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON

			RIVERWALK DR COLUMBUS PKWY	BUFFALO GROVE		
2364	TS	21000	IL 132 GRAND AVE @ GURNEE MILLS CIRCLE WEST MENARD ENT	LA GURNEE	T-1A	ON
2365	TS	21010	IL 137 BOB THOMPSON OHIO @ IL 137 BUCKLEY RD	LA NORTH CHICAGO	T-1A	ON
2366	TS	21015	IL 50 CICERO AVE @ 105TH ST	CO OAK LAWN	T-1A	ON
2367	TS	21020	US 6 MAPLE ST @ BRIGGS ST FERNWOOD AVE	WI JOLIET	T-1A	ON
2368	TS	21030	22ND ST @ MACARTHUR DR COSTCO ENT	DU OAKBROOK	T-1A	ON
2369	TS	21035	22ND ST @ PARKVIEW DR	DU OAKBROOK	T-1A	ON
2370	TS	21070	US 45 @ EVERGREEN DR	LA VERNON HILLS	T-1A	ON
2371	TS	21085	IL 137 SHERIDAN RD @ 22ND ST MLK KING DR		T-1A	ON
2372	TS	21090	GLENWOOD DYER RD @ STONY ISLAND AVE	CO LYNWOOD	T-1A	ON
2373	TS	21100	IL 83 OLD MCHENRY RD @ LEXINGTON DR	CO WHEELING	T-1A	ON
2374	TS	21110	IL 132 GRAND AVE @ GURNEE MILLS CIRCLE EAST TRI STATE	LA GURNEE	T-1A	ON
2375	TS	21115	IL 132 GRAND AVE @ GRAND HUNT SC SAMS CLUB	LA GURNEE	T-1A	ON
2376	TS	21117	IL 132 GRAND AVE @ ALMOND RD HUTCHINS RD	LA GURNEE	T-1A	ON
2377	TS	21118	IL 132 GRAND AVE @ ROLLINS RD OAKWOOD DR	LA GURNEE	T-1A	ON
2378	TS	21119	IL 132 GRAND AVE @ STONEBROOK DR	LA GURNEE	T-1A	ON

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2379	TS	21120	US 41 @ STEARNS SCHOOL RD	LA GURNEE	T-1A	ON
2380	TS	21125	IL 58 GOLF RD @ GOLF GLEN SHOPPING CTR	CO NILES	T-1A	ON
2381	TS	21130	BARRINGTON RD @ OLD CHURCH RD	CO STREAMWOOD	T-1A	ON
2382	TS	21134	US 30 LINCOLN HWY @ RETAIL DR VANCINA	WI NEW LENOX	T-1A	ON
2383	TS	21135	US 30 LINCOLN HWY @ SCHOOL HOUSE RD SCHMUHL RD	WI NEW LENOX	T-1A	ON
2384	TS	21139	IL 59 @ WESTRIDGE CT ENT MEIJER VANTAGE	DU AURORA	T-1A	ON
2385	TS	21145	ELMHURST RD @ GREENLEAF	CO ELK GROVE	T-1A	ON
2386	TS	21150	ELMHURST RD @ PRATT AVE	CO ELK GROVE	T-1A	ON
2387	TS	21175	31ST ST @ MAYFAIR	CO WESTCHESTER	T-1A	ON
2388	TS	21181	IL 22 HALF DAY RD @ MAIN ST PRAIRIE RD W JCT	CO		
2389	TS	21185	IL 83 TORRENCE AVE @ GLENWOOD LANSING RD	CO LANSING	T-1A	ON
2390	TS	21190	IL 59 @ KELSEY RD	LA TOWER LAKES	T-1A	ON
2391	TS	21195	IL 132 GRAND AVE @ BELLE PLAINE ST	LA GURNEE	T-1A	ON
2392	TS	21200	IL 68 DUNDEE RD @ HUNTINGTON LANE LAKE BLVD	CO WHEELING	T-1A	ON
2393	TS	21210	LAKE COOK RD @ ELA RD	CO BARRINGTON	T-1A	ON
2394	TS	21215	IL 22 @ ARBORETUM WAY	LA BUFFALO GROVE	T-1A	ON

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2395	TS	21220	111TH ST @ AUSTIN	CO	T-1A	ON
				CHICAGO RIDGE		
2396	TS	21235	IL 58 GOLF RD @ BASSWOOD	CO	T-1A	ON
				SCHAUMBURG		
2397	TS	21237	IL 58 GOLF RD @ WILKENING RD	CO	T-1A	ON
				SCHAUMBURG		
2398	TS	21239	IL 176 @ HALIGUS RD MT THABOR RD	MC	T-1A	ON
				CRYSTAL LAKE		
2399	TS	21240	IL 47 @ IL 176 SOUTH	MC	T-1A	ON
				LAKEWOOD		
2400	TS	21241	IL 47 @ IL 176 NORTH	MC	T-1A	ON
				LAKEWOOD		
2401	TS	21250	IL 38 ROOSEVELT RD @ BLANCHARD ST	DU	T-1A	ON
				WHEATON		
2402	TS	21255	IL 38 ROOSEVELT RD @ MAIN ST (GLEN ELLYN)	DU	T-1A	ON
				GLEN ELLYN		
2403	TS	21260	US 45 @ INNOVATION WAY	LA	T-1A	ON
				MUNDELEIN		
2404	TS	21275	WILLOW RD @ KRAFT FOOD THREE LAKES DR	CO	T-1A	ON
				NORTHBROOK		
2405	TS	21280	BARRINGTON RD @ BUTTITTA LAURIE LN	CO	T-1A	ON
				HANOVER PARK		
2406	TS	21285	BARRINGTON RD @ RAMBLEWOOD	CO	T-1A	ON
				HANOVER PARK		
2407	TS	21295	US 12 @ MILLER RD	LA	T-1A	ON
				LAKE ZURICH		
2408	TS	21320	IL 72 HIGGINS RD @ SPRING MILL ROAD	CO	T-1A	ON
				HOFFMAN ESTATES		
2409	TS	21322	IL 72 HIGGINS RD @ GRAND CANYON PKWY	CO	T-1A	ON
				HOFFMAN ESTATES		
2410	TS	21325	IL 43 HARLEM AVE @ OAK PARK AVE	CO	T-1A	ON
				TINLEY PARK		
2411	TS	21340	IL 83 TORRENCE AVE @	CO	T-1A	ON

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			176TH ST	LANSING		
2412	TS	21350	IL 59 @	LA	T-1A	ON
			CUBA RD	CUBA		
2413	TS	21355	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			BRIARWOOD	MT PROSPECT		
2414	TS	21370	IL 58 GOLF RD @	CO	T-1A	ON
			KNOLLWOOD	HOFFMAN ESTATES		
2415	TS	21375	IL 58 GOLF RD @	CO	T-1A	ON
			HARMON BLVD	HOFFMAN ESTATES		
2416	TS	21390	US 30 @	KE	T-1A	ON
			WOLF CROSSING RD	OSWEGO		
2417	TS	21392	US 30 LINCOLN HWY @	WI	T-1A	ON
			EOLA RD HEGGS RD	AURORA		
2418	TS	21393	US 30 @	WI	T-1A	ON
			111TH ST	PLAINFIELD		
2419	TS	21395	IL 64 NORTH AVE @	DU	T-1A	ON
			PRESIDENT ST FIRESIDE DR	CAROL STREAM		
2420	TS	21405	US 45 IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			TOWER PKWY	LINCOLNSHIRE		
2421	TS	21409	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			AMERICAN HOTEL DR	VERNON HILLS		
2422	TS	21410	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			CORPORATE WOODS PKWY	VERNON HILLS		
2423	TS	21411	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			WOODLAND DR	LINCOLNSHIRE		
2424	TS	21412	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			JAMESTOWN RD PORT CLINTON RD	VERNON HILLS		
2425	TS	21420	US 45 LAKE AVE @		T-1A	ON
			DUNBAR RD UNIVERSITY DR			
2426	TS	21435	IL 53 @	WI	T-1A	ON
			MANHATTAN RD	ELWOOD		
2427	TS	21437	IL 53 @	WI	T-1A	ON

			EAST ACCESS RD WALTER STRAWN DR	ELWOOD		
2428	TS	21439	IL 53 @ HOFF RD		T-1A	ON
2429	TS	21450	IL 19 IRVING PARK RD @ OLD SALEM	CO HANOVER PARK	T-1A	ON
2430	TS	21460	US 14 DIVISION ST @ AIRPORT RD MCGUIRE RD	MC HARVARD	T-1A	ON
2431	TS	21463	US 14 @ IL 23	MC HARVARD	T-1A	ON
2432	TS	21470	US 14 @ KISHWAUKEE VALLEY RD	MC WOODSTOCK	T-1A	ON
2433	TS	21473	IL 171 ARCHER AVE @ 131ST ST	CO LEMONT	T-1A	ON
2434	TS	21490	IL 21 MILWAUKEE AVE @ LAKE ST	LA LIBERTYVILLE	T-1A	ON
2435	TS	21505	IL 53 @ SHEEHAN AVE	DU GLEN ELLYN	T-1A	ON
2436	TS	21510	I 90 TLWY SOUTH RAMP @ IL 59	CO HOFFMAN ESTATES	T-1A	ON
2437	TS	21516	IL 43 HARLEM AVE @ BENTON RD	WI WILL COUNTY	T-1A	ON
2438	TS	21520	IL 7 143RD ST @ IL 7 WOLF RD	CO ORLAND PARK	T-1A	ON
2439	TS	21522	IL 7 143RD ST @ 108TH ST	CO ORLAND PARK	T-1A	ON
2440	TS	21523	143RD ST @ WILL COOK RD	CO ORLAND PARK	T-1A	ON
2441	TS	21525	IL 22 @ OLD MCHENRY RD	LA LONG GROVE	T-1A	ON
2442	TS	21535	I 90 @ IL 59 NORTH RAMP POPLAR CREEK	CO HOFFMAN ESTATES	T-1A	ON
2443	TS	21537	IL 59 @	CO	T-1A	ON

			POPLAR CREEK ENT	HOFFMAN ESTATES		
2444	TS	21543	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			IL 120 NORTH RAMP	GURNEE		
2445	TS	21544	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			IL 120 SOUTH RAMP	GURNEE		
2446	TS	21545	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			GAGES LAKE RD	GURNEE		
2447	TS	21547	IL 21 MILWAUKEE AVE @	LA	T-1A	ON
			I 94 TLWY EXIT RAMP	GURNEE		
2448	TS	21553	IL 72 HIGGINS RD @	CO	T-1A	ON
			PRAIRIE STONE PKWY	HOFFMAN ESTATES		
2449	TS	21555	IL 72 HIGGINS RD @	CO	T-1A	ON
			SEARS E ENT TRILLIUM BLVD	HOFFMAN ESTATES		
2450	TS	21557	IL 72 HIGGINS RD @	CO	T-1A	ON
			SEARS W ENT	HOFFMAN ESTATES		
2451	TS	21560	IL 72 HIGGINS RD @	CO	T-1A	ON
			OLD SUTTON RD THEATER ENT	HOFFMAN ESTATES		
2452	TS	21565	US 45 LAGRANGE RD 96TH AVE @	WI	T-1A	ON
			LA PORTE RD	FRANKFORT		
2453	TS	21570	IL 53 CHICAGO ST @	WI	T-1A	ON
			MILLS RD	JOLIET		
2454	TS	21590	JOLIET RD @	WI	T-1A	ON
			INTERNATIONAL PKWY	BOLINGBROOK		
2455	TS	21595	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			NEWPORT DR	ROLLING MEADOWS		
2456	TS	21600	PFINGSTEN RD @	CO	T-1A	ON
			GLENLAKE DR GLENBROOK HOSP	GLENVIEW		
2457	TS	21605	US 30 LINCOLN HWY @	CO	T-1A	ON
			ELLIS ST	FORD HTS		
2458	TS	21625	IL 134 @		T-1A	ON
			HART RD			
2459	TS	21630	IL 31 @	KA	T-1A	ON

			BONCOSKY RD	WEST DUNDEE		
2460	TS	21635	IL 59 @	LA	T-1A	ON
			PETITE LAKE RD	LAKE VILLA		
2461	TS	21637	IL 83 @	LA	T-1A	ON
			PETITE LAKE RD	LAKE VILLA		
2462	TS	21640	IL 62 ALGONQUIN RD @	MC	T-1A	ON
			SANDBLOOM RD COUNTRYSIDE DR	ALGONQUIN		
2463	TS	21650	IL 50 CICERO AVE @	CO	T-1A	ON
			71ST ST WAL MART	BEDFORD PARK		
2464	TS	21655	US 45 @	LA	T-1A	ON
			GAGES LAKE RD	GURNEE		
2465	TS	21660	US 45 @	LA		
			IL 137	MUNDELEIN		
2466	TS	21662	IL 137 @		T-1A	ON
			CASEY MIDLOTHIAN RD			
2467	TS	21663	US 45 @	LA	T-1A	ON
			CASEY RD	GRAYSLAKE		
2468	TS	21695	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			BAXTER ENT NORMAN RD	NORTH CHICAGO		
2469	TS	21700	US 34 OGDEN AVE @	DU	T-1A	ON
			CHELSEA AVE US POST OFFICE	LISLE		
2470	TS	21709	IL 19 IRVING PARK RD @	CO	T-1A	ON
			IL 390 TLWY E FRONTAGE	SCHAUMBURG		
2471	TS	21710	IL 19 IRVING PARK RD @	CO	T-1A	ON
			IL 390 TLWY W FRONTAGE	HOFFMAN ESTATES		
2472	TS	21715	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			ABBOTT LABS GATE 4	NORTH CHICAGO		
2473	TS	21717	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			ATKINSON AVE	NORTH CHICAGO		
2474	TS	21745	IL 64 MAIN ST @	KA	T-1A	ON
			38TH ST CHARLESTOWN MALL EAST ENT	ST CHARLES		

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2475	TS	21746	IL 64 NORTH AVE @ CHARLESTOWN CTR W DR	KA ST CHARLES	T-1A	ON
2476	TS	21747	IL 64 MAIN ST @ FOXFIELD COMMONS LAKESIDE DR	KA ST CHARLES	T-1A	ON
2477	TS	21768	IL 72 @ SLEEPY HOLLOW RD CARRINGTON DR	KA SLEEPY HOLLOW	T-1A	ON
2478	TS	21775	MONTROSE AVE @ NEENAH	CO HARWOOD HTS	T-1A	ON
2479	TS	21795	WESTERN AVE @ JOE ORR RD COUNTRY CLUB DR	CO OLYMPIA FIELDS	T-1A	ON
2480	TS	21805	PALATINE RD @ CHAMBERS DR JEWEL OSCO	CO HOFFMAN ESTATES	T-1A	ON
2481	TS	21815	US 14 @ JANDUS RD LAKE JULIAN LN	MC CARY	T-1A	ON
2482	TS	21820	I 80 NORTH RAMP @ IL 53 CHICAGO AVE	WI JOLIET	T-1A	ON
2483	TS	21825	US 6 US 52 MCDONOUGH ST @ IL 53 CHICAGO ST	WI JOLIET	T-1A	ON
2484	TS	21830	US 34 OGDEN AVE @ DOWNERS PLAZA KMART	DU DOWNERS GROVE	T-1A	ON
2485	TS	21845	MAIN ST LAKE COOK RD @ DUNDEE AVE	CO BARRINGTON	T-1A	ON
2486	TS	21850	IL 64 NORTH AVE @ WALMART ENT HILLSIDE	CO NORTHLAKE	T-1A	ON
2487	TS	21855	IL 43 WAUKEGAN RD @ OVERLOOK DR KRAFT FOOD ENT	CO GLENVIEW	T-1A	ON
2488	TS	21861	IL 59 @ ROYAL WORTHINGTON DR	WI NAPERVILLE	T-1A	ON
2489	TS	21862	IL 59 @ 127TH ST	WI PLAINFIELD	T-1A	ON
2490	TS	21864	IL 59 @	WI	T-1A	ON

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			135TH ST	PLAINFIELD		
2491	TS	21870	IL 56 BUTTERFIELD RD @	DU	T-1A	ON
			MAXANT DR WASTE MANAGEMENT TECH	LOMBARD		
2492	TS	21880	US 6 CHANNAHON RD @	WI	T-1A	ON
			TERMINAL CT JOHNS MANVILLE ENT	JOLIET		
2493	TS	21881	US 6 CHANNAHON RD @	WI	T-1A	ON
			CATERPILLAR E DR	JOLIET		
2494	TS	21882	US 6 @	WI	T-1A	ON
			HOLLYWOOD BLVD EMPRESS CASINO ENT	JOLIET		
2495	TS	21883	US 6 @	WI	T-1A	ON
			MCCLINTOCK RD	CHANNAHON		
2496	TS	21885	US 45 @	LA	T-1A	ON
			ARBOR VISTA LN	GRAYSLAKE		
2497	TS	21890	BIESTERFIELD RD @	CO	T-1A	ON
			BEISNER	ELK GROVE		
2498	TS	21893	IL 59 @	WI	T-1A	ON
			CANTORE DR	NAPERVILLE		
2499	TS	21895	IL 59 @	WI	T-1A	ON
			95TH ST	NAPERVILLE		
2500	TS	21897	IL 59 @	WI	T-1A	ON
			LACROSSE LN	NAPERVILLE		
2501	TS	21900	US 6 CHANNAHON RD @	WI	T-1A	ON
			BUSCH PKWY	JOLIET		
2502	TS	21910	US 20 LAKE ST @	DU	T-1A	ON
			IL 390 RAMP D	HANOVER PARK		
2503	TS	21920	US 6 159TH ST @	CO	T-1A	ON
			JEWEL ORLAND TOWN CTR	ORLAND PARK		
2504	TS	21925	I 80 NORTH RAMP @	WI	T-1A	ON
			HOUBOLT AVE	JOLIET		
2505	TS	21926	I 80 SOUTH RAMP @	WI	T-1A	ON
			HOUBOLT AVE	JOLIET		

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2506	TS	21930	AURORA RD @ WESTRIDGE CT NAPER WEST PLAZA	DU NAPERVILLE	T-1A	ON
2507	TS	21935	IL 31 @ PRAIRIE ST	KA ST CHARLES	T-1A	ON
2508	TS	21940	IL 120 BELVIDERE RD @ GILMER RD	LA VOLO	T-1A	ON
2509	TS	21942	IL 120 BELVIDERE RD @ FISH LAKE RD	LA VOLO	T-1A	ON
2510	TS	21955	IL 72 HIGGINS RD @ NATIONAL PKWY	CO SCHAUMBURG	T-1A	ON
2511	TS	21965	IL 22 @ STEVENSON HS ENT PALAZZO DR	LA LINCOLNSHIRE	T-1A	ON
2512	TS	21968	US 20 @ PROSPECT ST	MC MARENGO	T-1A	ON
2513	TS	21969	IL 120 BELVIDERE RD @ MILL RD	LA GRAYSLAKE	T-1A	ON
2514	TS	21970	US 20 @ IL 23	MC MARENGO	T-1A	ON
2515	TS	21971	IL 23 @ IL 176	MC MARENGO	T-1A	ON
2516	TS	21972	I 90 TLWY @ US 20	KA HAMPSHIRE	T-1A	ON
2517	TS	21973	IL 23 @ CORAL PLEASANT GROVE	MC MARENGO	T-1A	ON
2518	TS	21975	US 45 @ TOWNLIN SQUARE SC	LA MUNDELEIN	T-1A	ON
2519	TS	21990	IL 83 @ LAKE ST	LA GRAYSLAKE	T-1A	ON
2520	TS	21991	IL 83 @ HOME DEPOT MILLSIDE	LA ROUND LAKE BEACH	T-1A	ON
2521	TS	21992	IL 83 @ HOOK DR OLD ROLLINS RD	LA ROUND LAKE BEACH	T-1A	ON

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2522	TS	21996	IL 25 5TH AVE @ COUNTRY CLUB RD	KA ST CHARLES	T-1A	ON
2523	TS	21997	IL 25 5TH AVE @ RED GATE RD	KA ST CHARLES	T-1A	ON
2524	TS	22015	IL 60 @ FISH LAKE RD	LA VOLO	T-1A	ON
2525	TS	22025	US 20 LAKE ST @ RODENBURG RD	DU ROSELLE	T-1A	ON
2526	TS	22035	75TH ST @ WILLOW SPRINGS RD	CO WILLOW SPRINGS	T-1A	ON
2527	TS	22040	IL 59 @ ROBERTS RD	LA TOWER LAKES	T-1A	ON
2528	TS	22041	IL 59 @ INDIAN TRAIL	LA TOWER LAKES	T-1A	ON
2529	TS	22050	IL 21 EXECUTIVE WAY @ MARKETPLACE N ENT	LA VERNON HILLS	T-1A	ON
2530	TS	22055	IL 43 HARLEM AVE @ ST FRANCES RD	WI FRANKFORT	T-1A	ON
2531	TS	22060	US 45 LAGRANGE RD @ 171ST ST	CO ORLAND HILLS	T-1A	ON
2532	TS	22065	22ND ST CERMAK RD @ 14TH ST	CO NORTH RIVERSIDE	T-1A	ON
2533	TS	22095	104TH AVE @ 123RD ST MCCARTHY RD	CO PALOS PARK	T-1A	ON
2534	TS	22100	IL 120 @ LILY LAKE RD	MC LAKEMOOR	T-1A	ON
2535	TS	22102	IL 120 BELVIDERE RD @ DARRELL RD	LA LAKEMOOR	T-1A	ON
2536	TS	22104	IL 120 @ COMMERCIAL ENT	LA LAKEMOOR	T-1A	ON
2537	TS	22110	IL 59 @ INGALTON AVE ARBOR LN	DU WEST CHICAGO	T-1A	ON
2538	TS	22115	IL 59 @	DU	T-1A	ON

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			DIVERSEY PKWY	WEST CHICAGO		
2539	TS	22125	IL 59 @	DU	T-1A	ON
			SCHICK RD	BARTLETT		
2540	TS	22130	IL 59 @	LA	T-1A	ON
			DEVLIN RD	FOX LAKE		
2541	TS	22135	IL 53 ROHLWING RD @	DU	T-1A	ON
			SIDNEY AVE	LOMBARD		
2542	TS	22150	DEVON AVE @	CO	T-1A	ON
			GREENWOOD AVE	PARK RIDGE		
2543	TS	22155	IL 31 @	MC	T-1A	ON
			JAMES RAKOW RD	CRYSTAL LAKE		
2544	TS	22156	IL 31 @	MC	T-1A	ON
			VIRGINIA	LAKE IN THE HILLS		
2545	TS	22157	IL 31 @	MC	T-1A	ON
			KLASEN RD	ALGONQUIN		
2546	TS	22165	25TH AVE @	CO	T-1A	ON
			ARMITAGE	MELROSE PARK		
2547	TS	22180	I 55 @	WI	T-1A	ON
			US 52 JEFFERSON ST EAST	SHOREWOOD		
2548	TS	22185	I 55 @	WI	T-1A	ON
			US 52 JEFFERSON ST WEST	SHOREWOOD		
2549	TS	22191	I 55 EAST FRONTAGE RD @	WI	T-1A	ON
			US 52 JEFFERSON ST	SHOREWOOD		
2550	TS	22205	GILMER @	LA	T-1A	ON
			MIDLOTHIAN	HAWTHORN WOODS		
2551	TS	22215	US 12 20 45 LAGRANGE RD @	CO	T-1A	ON
			58TH ST	COUNTRYSIDE		
2552	TS	22220	US 14 @	MC	T-1A	ON
			CARY ALGONQUIN RD	CARY		
2553	TS	22225	IL 58 GOLF RD @	CO	T-1A	ON
			ROHRSEN RD	HOFFMAN ESTATES		
2554	TS	22230	IL 62 ALGONQUIN RD @	CO	T-1A	ON
			WILLOW CREEK WILLOWMERE	SOUTH BARRINGTON		

2555	TS	22240	IL 62 ALGONQUIN RD @ PENNY RD	CO HOFFMAN ESTATES	T-1A	ON
2556	TS	22242	COUNTY LINE RD @ HAEGERS BEND RD	MC ALGONQUIN	T-1A	ON
2557	TS	22245	IL 62 CHICAGO ST @ COUNTY LINE COMPTON LAKE COOK RD	MC ALGONQUIN	T-1A	ON
2558	TS	22250	IL 120 BELVIDERE RD @ FAIRFIELD RD	LA GRANT TOWNSHIP	T-1A	ON
2559	TS	22255	IL 120 BELVIDERE RD @ WILSON RD	LA GRANT TOWNSHIP	T-1A	ON
2560	TS	22259	191ST @ OAK PARK AVE	CO TINLEY PARK	T-1A	ON
2561	TS	22263	IL 43 HARLEM AVE @ 191ST ST	CO TINLEY PARK	T-1A	ON
2562	TS	22305	IL 72 @ VILLAGE QUARTER RD	KA WEST DUNDEE	T-1A	ON
2563	TS	75111	IL 7 @ I 355 TLWY WEST RAMP	WI LOCKPORT	T-1A	ON
2564	TS	75112	IL 7 @ IL 355 TLWY EAST RAMP	WI	T-1A	ON

PLANNED T-1A LOCATIONS

1	TS	15	I 55 STEV SW OFF RAMP @ IL 43 HARLEM AVE	CO SUMMIT	T-1A	OFF
2	TS	30	I 57 W RAMP @ IL 83 147TH ST	CO POSEN	T-1A	OFF
3	TS	31	I 57 E RAMP @ IL 83 SIBLEY BLVD 147TH ST	CO POSEN	T-1A	OFF
4	TS	215	US 6 159TH ST @ CRAWFORD AVE PULASKI RD	CO MARKHAM	T-1A	OFF
5	TS	220	US 6 159TH ST @ DIXIE HWY	CO MARKHAM	T-1A	OFF

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6	TS	245	US 6 159TH ST @ KEDZIE AVE	CO MARKHAM	T-1A	OFF
7	TS	325	US 6 159TH ST @ LARAMIE AVE	CO OAK FOREST	T-1A	OFF
8	TS	450	US 12 20 95TH ST @ 78TH AVE	CO HICKORY HILLS	T-1A	OFF
9	TS	452	US 30 LINCOLN HWY @ GOUGAR RD		T-1A	OFF
10	TS	485	US 12 20 95TH ST @ KEDZIE AVE		T-1A	OFF
11	TS	525	US 12 20 95TH ST @ ROBERTS RD	CO HICKORY HILLS	T-1A	OFF
12	TS	950	US 12 RAND RD @ OLD RAND RD NORTH RAVINIA TERRACE	LA LAKE ZURICH	T-1A	OFF
13	TS	1130	US 12 45 LEE ST @ OAKTON ST	CO DESPLAINES	T-1A	OFF
14	TS	1155	US 12 IL 53 RAND RD @ IL 53 IL 68 DUNDEE RD	CO PALATINE	T-1A	OFF
15	TS	1157	IL 68 DUNDEE RD @ LYNDA DR ACCESS DR	CO PALATINE	T-1A	OFF
16	TS	1160	US 12 IL 53 RAND RD @ OLD HICKS RD COACH RD	CO PALATINE	T-1A	OFF
17	TS	1230	US 14 CALDWELL AVE @ HOWARD ST	CO NILES	T-1A	OFF
18	TS	1245	US 14 NORTHWEST HWY @ LAKE COOK RD	CO BARRINGTON	T-1A	OFF
19	TS	1480	US 34 OGDEN AVE @ WOLF RD	CO WESTERN SPRINGS	T-1A	OFF
20	TS	1715	US 45 IL 21 MILWAUKEE AVE @ IL 68 DUNDEE	CO WHEELING	T-1A	OFF
21	TS	1815	IL 1 HALSTED ST @ 163RD	CO HARVEY	T-1A	OFF

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22	TS	1820	IL 1 HALSTED ST @ 167TH	CO HARVEY	T-1A	OFF
23	TS	1825	IL 1 HALSTED ST @ 171ST	CO EAST HAZEL CREST	T-1A	OFF
24	TS	1900	IL 7 SOUTHWEST HWY @ 111TH ST	CO WORTH	T-1A	OFF
25	TS	1987	IL 19 IRVING PARK RD @ TAFT OHARE CARGO ACCESS RD	CO SCHILLER PARK	T-1A	OFF
26	TS	1989	IL 19 IRVING PARK RD @ SOUTH ACCESS RD	DU BENSENVILLE	T-1A	OFF
27	TS	1990	IL 21 MILWAUKEE AVE @ IL 43 HARLEM AVE	CO NILES	T-1A	OFF
28	TS	2020	IL 21 MILWAUKEE AVE @ HOWARD ST	CO NILES	T-1A	OFF
29	TS	2060	IL 21 MILWAUKEE AVE @ GOLF MILL CENTER DR	CO NILES	T-1A	OFF
30	TS	2095	IL 43 HARLEM AVE @ IL 64 NORTH AVE	CO OAK PARK	T-1A	OFF
31	TS	2105	IL 43 HARLEM AVE @ IL 83 119TH ST COLLEGE DR	CO PALOS HEIGHTS	T-1A	OFF
32	TS	2140	IL 43 HARLEM AVE @ 57TH ST	CO SUMMIT	T-1A	OFF
33	TS	2215	IL 43 HARLEM AVE @ 115TH ST	CO WORTH	T-1A	OFF
34	TS	2220	IL 43 HARLEM AVE @ 123RD ST	CO PALOS HEIGHTS	T-1A	OFF
35	TS	2227	IL 43 HARLEM AVE @ ISHNALA DR	CO PALOS HEIGHTS	T-1A	OFF
36	TS	2230	IL 43 HARLEM AVE @ 131ST ST	CO PALOS HEIGHTS	T-1A	OFF
37	TS	2260	IL 43 HARLEM AVE @ ARCHER AVE 55TH ST	CO SUMMIT	T-1A	OFF
38	TS	2270	IL 43 HARLEM AVE @	CO	T-1A	OFF

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			AUGUSTA BLVD	OAK PARK		
39	TS	2290	IL 43 HARLEM AVE @ CHICAGO AVE	CO OAK PARK	T-1A	OFF
40	TS	2295	IL 43 HARLEM AVE @ DIVISON ST	CO OARK PARK	T-1A	OFF
41	TS	2315	IL 43 HARLEM AVE @ GARFIELD HARRISON	CO FOREST PARK	T-1A	OFF
42	TS	2330	IL 43 HARLEM AVE @ HOWARD	CO NILES	T-1A	OFF
43	TS	2350	IL 43 HARLEM AVE @ JACKSON BLVD	CO FOREST PARK	T-1A	OFF
44	TS	2360	IL 43 HARLEM AVE @ LAKE ST	CO FOREST PARK	T-1A	OFF
45	TS	2370	IL 43 HARLEM AVE @ MADISON ST	CO FOREST PARK	T-1A	OFF
46	TS	2380	IL 43 HARLEM AVE @ NORTH BLVD CENTRAL	CO OAK PARK	T-1A	OFF
47	TS	2385	IL 43 HARLEM AVE @ ONTARIO	CO OAK PARK	T-1A	OFF
48	TS	2390	IL 43 HARLEM AVE @ RANDOLPH	CO FOREST PARK	T-1A	OFF
49	TS	2400	IL 38 ROOSEVELT RD @ HARLEM AVE	CO FOREST PARK	T-1A	OFF
50	TS	2415	IL 43 HARLEM AVE @ WASHINGTON BLVD	CO OAK PARK	T-1A	OFF
51	TS	2515	IL 50 CICERO AVE @ 113TH ST STATE BANK OF ALSIP	CO ALSIP	T-1A	OFF
52	TS	2520	IL 50 CICERO AVE @ 115TH ST	CO ALSIP	T-1A	OFF
53	TS	2555	IL 50 CICERO AVE @ 122ND ST	CO ALSIP	T-1A	OFF
54	TS	2660	IL 53 IL 68 DUNDEE RD @ WEST FRONTAGE RD	CO ARLINGTON HEIGHTS	T-1A	OFF

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55	TS	2685	IL 53 IL 68 DUNDEE RD @ BALDWIN	CO PALATINE	T-1A	OFF
56	TS	2810	IL 58 GOLF RD @ MEACHAM RD	CO SCHAUMBURG	T-1A	OFF
57	TS	2930	IL 62 ALGONQUIN RD @ ARBOR DR	CO ROLLING MEADOWS	T-1A	OFF
58	TS	2966	IL 62 ALGONQUIN RD @ TONNE RD	CO ARLINGTON HEIGHTS	T-1A	OFF
59	TS	3030	IL 64 NORTH AVE @ AUSTIN BLVD	CO OAK PARK	T-1A	OFF
60	TS	3055	IL 64 NORTH AVE @ NARRAGANSETT AVE ENDER	CO OAK PARK	T-1A	OFF
61	TS	3060	IL 64 NORTH AVE @ NATOMA AVE COLUMBIAN	CO OAK PARK	T-1A	OFF
62	TS	3070	IL 64 NORTH AVE @ OAK PARK AVE	CO OAK PARK	T-1A	OFF
63	TS	3080	IL 64 NORTH AVE @ RIDGELAND AVE MOBILE	CO OAK PARK	T-1A	OFF
64	TS	3105	IL 68 DUNDEE RD @ BARRINGTON RD	CO BARRINGTON	T-1A	OFF
65	TS	3120	IL 68 DUNDEE RD @ HICKS RD	CO PALATINE	T-1A	OFF
66	TS	3170	IL 68 DUNDEE RD @ SANDERS RD	CO NORTHBROOK	T-1A	OFF
67	TS	3180	IL 68 DUNDEE RD @ SHERMER RD	CO NORTHBROOK	T-1A	OFF
68	TS	3200	IL 68 DUNDEE RD @ WOLF RD	CO WHEELING	T-1A	OFF
69	TS	3240	IL 72 HIGGINS RD @ OAKTON ST WEST	CO ELK GROVE	T-1A	OFF
70	TS	3275	IL 72 HIGGINS RD @ IL 72 IL 83 OAKTON EAST	CO ELK GROVE	T-1A	OFF
71	TS	3285	IL 72 HIGGINS RD @	CO	T-1A	OFF

			ARLINGTON HEIGHTS RD	ELK GROVE		
72	TS	3370	IL 83 IL 171 S CAL SAG SOUTH @ 111TH ST	CO LEMONT	T-1A	OFF
73	TS	3475	IL 83 SIBLEY BLVD 147TH ST @ MICHIGAN CITY RD LINCOLN	CO DOLTON	T-1A	OFF
74	TS	3573	WILLOW SPRINGS RD @ GERMAN CHURCH RD	CO WILLOW SPRINGS	T-1A	OFF
75	TS	3635	IL 171 1ST AVE @ 13TH ST MADDEN MEDICAL CE	CO BROADVIEW	T-1A	OFF
76	TS	3640	IL 171 1ST AVE @ MADISON ST	CO MAYWOOD	T-1A	OFF
77	TS	3645	IL 171 1ST AVE @ MAYBROOK SQUARE	CO MAYWOOD	T-1A	OFF
78	TS	3650	IL 171 1ST AVE @ ROOSEVELT RD	CO FOREST PARK	T-1A	OFF
79	TS	3656	IL 171 1ST AVE @ WARREN	CO MAYWOOD	T-1A	OFF
80	TS	3665	IL 171 1ST AVE @ VAN BUREN ST COM ED ENT	CO MAYWOOD	T-1A	OFF
81	TS	3670	IL 171 1ST AVE @ WASHINGTON	CO MAYWOOD	T-1A	OFF
82	TS	3700	22ND ST CERMAK RD @ 17TH AVE	CO BROADVIEW	T-1A	OFF
83	TS	3735	26TH ST @ DESPLAINES AVE	CO NORTH RIVERSIDE	T-1A	OFF
84	TS	3810	47TH ST @ JOLIET RD	CO LYONS	T-1A	OFF
85	TS	3815	47TH ST @ LAWNDALE	CO LYONS	T-1A	OFF
86	TS	3850	55TH ST @ JOLIET RD	CO MCCOOK	T-1A	OFF
87	TS	3910	87TH ST @ KEDZIE AVE	CO EVERGREEN PARK	T-1A	OFF

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88	TS	3955	111TH ST @ ROBERTS RD	CO PALOS HEIGHTS	T-1A	OFF
89	TS	4015	127TH ST @ BISHOP	CO CALUMET CITY	T-1A	OFF
90	TS	4095	183RD ST @ CRAWFORD AVE PULASKI RD	CO HAZEL CREST	T-1A	OFF
91	TS	4110	183RD ST @ RIEGAL RD	CO HOMEWOOD	T-1A	OFF
92	TS	4140	ASHLAND AVE @ VERMONT	CO CALUMET PARK	T-1A	OFF
93	TS	4150	BALLARD RD @ GREENWOOD	CO NILES	T-1A	OFF
94	TS	4640	IL 31 @ MAIN ST (IN BATAVIA)	KA BATAVIA	T-1A	OFF
95	TS	4690	US 14 NORTHWEST HWY @ WESTERN AVE OLD NW HWY AERIAL IND	LA BARRINGTON	T-1A	OFF
96	TS	4695	US 14 NORTHWEST HWY @ EASTERN AVE HILLSIDE AVE		T-1A	OFF
97	TS	4700	US 14 NORTHWEST HWY @ HART RD		T-1A	OFF
98	TS	4875	CHURCH ST @ MCCORMICK BLVD	CO SKOKIE	T-1A	OFF
99	TS	4907	CRAWFORD PULASKI @ 178TH CAMBRIDGE	CO COUNTRY CLUB HILLS	T-1A	OFF
100	TS	4935	CRAWFORD AVE @ FLOSSMOOR	CO FLOSSMOOR	T-1A	OFF
101	TS	5000	ROOSEVELT RD @ DESPLAINES AVE	CO FOREST PARK	T-1A	OFF
102	TS	5105	FLOSSMOOR RD @ WESTERN	CO FLOSSMOOR	T-1A	OFF
103	TS	5210	GRAND AVE @ MT PROSPECT	CO FRANKLIN PARK	T-1A	OFF

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104	TS	5211	GRAND AVE @ NORTHWEST AVE	CO NORTHLAKE	T-1A	OFF
105	TS	5295	HICKS RD @ CUNNINGHAM	CO PALATINE	T-1A	OFF
106	TS	5315	HICKS RD @ CARPENTER	CO PALATINE	T-1A	OFF
107	TS	5440	LAWRENCE AVE @ FORSTER	CO SCHILLER PARK	T-1A	OFF
108	TS	5500	MONTROSE AVE @ NARRAGANSETT AVE	CO HARWOOD HEIGHTS	T-1A	OFF
109	TS	5555	US 34 OGDEN AVE @ 31ST ST	CO CICERO	T-1A	OFF
110	TS	5565	US 34 OGDEN AVE @ AUSTIN BLVD	CO BERWYN	T-1A	OFF
111	TS	5595	US 34 OGDEN AVE @ RIDGELAND 34TH	CO BERWYN	T-1A	OFF
112	TS	5645	PALATINE RD @ ELA RD	CO BARRINGTON	T-1A	OFF
113	TS	5655	PFINGSTEN RD @ WILLOW RD	CO GLENVIEW	T-1A	OFF
114	TS	5720	ROOSEVELT RD @ 5TH	CO MAYWOOD	T-1A	OFF
115	TS	5820	TORRENCE @ DOLTON STATE RD	CO CALUMET CITY	T-1A	OFF
116	TS	5915	WILLOW RD @ GREENWOOD AVE	CO NORTHBROOK	T-1A	OFF
117	TS	5920	WILLOW RD @ LANDWEHR RD	CO GLENVIEW	T-1A	OFF
118	TS	6030	US 20 LAKE ST @ GARY AVE	DU ROSELLE	T-1A	OFF
119	TS	6550	US 41 @ IL 132 GRAND AVE	LA GURNEE	T-1A	OFF
120	TS	6845	IL 59 @	LA	T-1A	OFF

			IL 173	ANTIOCH		
121	TS	6950	IL 83 + FLASHERS BEFORE & AFTER RXR @	LA	T-1A	OFF
			IL 173	ANTIOCH		
122	TS	6985	IL 83 @	LA	T-1A	OFF
			BUFFALO GROVE SC HIGHPOINT RD	BUFFALO GROVE		
123	TS	7015	IL 131 GREEN BAY RD @	LA	T-1A	OFF
			IL 137 BUCKLEY	NORTH CHICAGO		
124	TS	7350	WEBER RD @	WI	T-1A	OFF
			NORMANTOWN RD	ROMEOVILLE		
125	TS	7352	I 55 @	WI	T-1A	OFF
			WEBER RD SOUTH RAMP	ROMEOVILLE		
126	TS	7354	I 55 @	WI	T-1A	OFF
			WEBER RD NORTH RAMP	ROMEOVILLE		
127	TS	7395	US 30 LINCOLN HWY @		T-1A	OFF
			I 80 EAST RAMP OLD HICKORY RD			
128	TS	7400	I 80 @	WI	T-1A	OFF
			US 30 LINCOLN HWY	NEW LENOX		
129	TS	7440	US 30 LINCOLN HWY @	WI	T-1A	OFF
			NELSON RD	NEW LENOX		
130	TS	7455	US 30 LINCOLN HWY MAPLE ST @	WI	T-1A	OFF
			VINE ST EAST SOUTH JUNCTION	NEW LENOX		
131	TS	7465	US 30 LINCOLN HWY MAPLE ST @		T-1A	OFF
			VINE ST WEST NORTH JUNCTION			
132	TS	7503	IL 1 DIXIE HWY @	WI	T-1A	OFF
			CHURCH RD	BEECHER		
133	TS	7544	I 57 EAST RAMP @	WI	T-1A	OFF
			STUENKEL RD	UNIVERSITY PARK		
134	TS	7575	IL 53 @	WI	T-1A	OFF
			NORMANTOWN RD DEVONWOOD DR	ROMEOVILLE		
135	TS	7580	IL 53 @	WI	T-1A	OFF
			KANKAKEE RIVER WILMINGTON PEOTONE R	WILMINGTON		
136	TS	7581	IL 53 @	WI	T-1A	OFF

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			NORTH RIVER RD	WILMINGTON		
137	TS	7582	IL 53 @	WI	T-1A	OFF
			SOUTH ARSENAL RD	WILMINGTON		
138	TS	7590	IL 59 @	WI	T-1A	OFF
			BLACK RD	SHOREWOOD		
139	TS	7820	IL 131 GREEN BAY RD @	LA	T-1A	OFF
			IL 120 BELVIDERE RD	WAUKEGAN		
140	TS	8795	IL 137 SHERIDAN RD @	LA	T-1A	OFF
			9TH ST	WINTHROP HARBOR		
141	TS	9375	IL 131 GREEN BAY RD @	LA	T-1A	OFF
			14TH ST	NORTH CHICAGO		
142	TS	9390	IL 131 GREEN BAY RD @	LA	T-1A	OFF
			SARATOGA ST	NORTH CHICAGO		
143	TS	9885	IL 83 MCHENRY RD @	LA	T-1A	OFF
			PAULINE AVE TOWN PLACE PK	BUFFALO GROVE		
144	TS	10635	US 6 159TH ST @	CO	T-1A	OFF
			CENTRAL PARK AVE	MARKHAM		
145	TS	10640	US 6 159TH ST @	CO	T-1A	OFF
			RICHMOND	MARKHAM		
146	TS	11080	55TH ST @	CO	T-1A	OFF
			ELECTRO MOTIVE DRIVE	MCCOOK		
147	TS	11285	BARRINGTON RD @	CO	T-1A	OFF
			PALATINE RD	BARRINGTON		
148	TS	11310	IL 72 HIGGINS RD OAKTON ST @	CO	T-1A	OFF
			IL 83 BUSSE RD	ELK GROVE		
149	TS	11481	IL 31 @	KA	T-1A	OFF
			LOVEDALE LN	NORTH AURORA		
150	TS	11692	IL 68 DUNDEE RD @	CO	T-1A	OFF
			COMMUNITY BLVD	MORTON GROVE		
151	TS	11760	US 12 20 95TH ST @	CO	T-1A	OFF
			76TH AVE	HICKORY HILLS		
152	TS	11853	KEDZIE AVE @		T-1A	OFF
			94TH ST			

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153	TS	12025	LAWRENCE AVE @ 25TH AVE RUBY	CO	T-1A	OFF	SCHILLER PARK
154	TS	12045	IL 19 IRVING PARK RD @ YORK RD	DU	T-1A	OFF	BENSENVILLE
155	TS	12145	IL 137 SHERIDAN RD @ 7TH MAIN ST IN WINTHROP HAR	LA	T-1A	OFF	WINTHROP HARBOR
156	TS	12155	IL 53 IL 68 DUNDEE RD @ IL 53 WEST RAMP	CO	T-1A	OFF	ARLINGTON HEIGHTS
157	TS	12175	US 12 RAND RD @ WINSLOWE DR PARK PL	CO	T-1A	OFF	PALATINE
158	TS	12535	ARLINGTON HEIGHTS RD @ WHITE OAK	CO	T-1A	OFF	ARLINGTON HEIGHTS
159	TS	12550	ARLINGTON HEIGHTS RD @ SIGWALT	CO	T-1A	OFF	ARLINGTON HEIGHTS
160	TS	12560	ARLINGTON HEIGHTS RD @ MINER ST	CO	T-1A	OFF	ARLINGTON HEIGHTS
161	TS	12565	ARLINGTON HEIGHTS RD @ EUCLID AVE	CO	T-1A	OFF	ARLINGTON HEIGHTS
162	TS	12585	ARLINGTON HEIGHTS RD @ LILLIAN	CO	T-1A	OFF	ARLINGTON HEIGHTS
163	TS	12590	ARLINGTON HEIGHTS RD @ PALATINE RD	CO	T-1A	OFF	ARLINGTON HEIGHTS
164	TS	13000	US 12 45 LEE ST @ ALGONQUIN RD	CO	T-1A	OFF	DESPLAINES
165	TS	13055	US 12 45 GRACELAND JEFFERSON US 14 MINOR ST	CO	T-1A	OFF	DESPLAINES
166	TS	13210	IL 31 STATE @ HIGHLAND		T-1A	OFF	
167	TS	13220	IL 31 STATE @ LAWRENCE AVE KIMBALL ST		T-1A	OFF	
168	TS	13286	IL 58 SUMMIT @ WAVERLY DR	CO	T-1A	OFF	ELGIN
169	TS	14345	US 45 LAKE @	LA	T-1A	OFF	

			DIVISION	MUNDELEIN		
170	TS	14493	22ND ST @ SPRING RD	DU OAKBROOK	T-1A	OFF
171	TS	14494	22ND ST @ MCDONALD DRIVE	DU OAKBROOK	T-1A	OFF
172	TS	14755	IL 62 ALGONQUIN RD @ COMMUNICATIONS DR VILLAGE TREE	CO SCHAUMBURG	T-1A	OFF
173	TS	14765	IL 62 ALGONQUIN RD @ THOREAU DR THORNTREE LN	CO SCHAUMBURG	T-1A	OFF
174	TS	14780	IL 62 ALGONQUIN RD @ MEACHAM RD	CO SCHAUMBURG	T-1A	OFF
175	TS	15025	IL 131 GREEN BAY RD @ SUNSET AVE	LA WAUKEGAN	T-1A	OFF
176	TS	15050	SHERIDAN RD @ GRAND AVE	LA WAUKEGAN	T-1A	OFF
177	TS	15060	IL 137 SHERIDAN RD @ GREENWOOD AVE	LA WAUKEGAN	T-1A	OFF
178	TS	20425	IL 22 @ BUFFALO GROVE RD	LA BUFFALO GROVE	T-1A	OFF
179	TS	20575	US 20 LAKE ST @ WALNUT AVE	CO HANOVER PARK	T-1A	OFF
180	TS	20902	23RD ST @ IL 137 SHERIDAN RD	LA ZION	T-1A	OFF
181	TS	20903	27TH ST @ IL 137 SHERIDAN RD	LA ZION	T-1A	OFF
182	TS	20904	29TH ST @ IL 137 SHERIDAN RD	LA ZION	T-1A	OFF
183	TS	20905	25TH ST SHILOH BLVD @ IL 137 SHERIDAN RD	LA ZION	T-1A	OFF
184	TS	20907	33RD ST @ IL 137 SHERIDAN RD	LA ZION	T-1A	OFF
185	TS	21290	IL 58 GOLF RD @	CO	T-1A	OFF

			NATIONAL PKWY	SCHAUMBURG		
186	TS	21465	IL 59 @	WI	T-1A	OFF
			103RD ST	NAPERVILLE		
187	TS	21475	IL 171 ARCHER AVE @	CO	T-1A	OFF
			BELL RD	LEMONT		
188	TS	21515	IL 43 HARLEM AVE @	CO	T-1A	OFF
			VOLLMER RD	MOKENA		
189	TS	21550	IL 68 DUNDEE RD @	CO	T-1A	OFF
			BARRINGTON MIDDLE SCHOOL	BARRINGTON		
190	TS	21805	PALATINE RD @	CO	T-1A	OFF
			CHAMBERS DR JEWEL OSCO	HOFFMAN ESTATES		
191	TS	21860	IL 59 @	WI	T-1A	OFF
			111TH ST	NAPERVILLE		
192	TS	21863	IL 59 @	WI	T-1A	OFF
			119TH ST	PLAINFIELD		
193	TS	21993	IL 83 @	LA	T-1A	OFF
			SHOREWOOD DR	ROUND LAKE BEACH		
194	TS	22010	IL 120 BELVIDERE RD @	LA	T-1A	OFF
			IL 60	VOLO		
195	TS	22120	17TH AVE @	CO	T-1A	OFF
			19TH ST	BROADVIEW		
196	TS	22121	17TH AVE @	CO	T-1A	OFF
			23RD ST	NORTH RIVERSIDE		
197	TS	22235	ARLINGTON HEIGHTS RD @	CO	T-1A	OFF
			BENNETT RD	ARLINGTON HEIGHTS		

TRAFFIC SIGNALS - EQUIPMENT PAY CODE T-1B LOCATIONS

1	TS	78	US 12 20 45 MANNHEIM RD @	CO	T-1B	ON
			GLADYS	BELLWOOD		
2	TS	221	IL 72 @	KA	T-1B	ON
			STATE GETZELMAN	HAMPSHIRE		
3	TS	2690	IL 56 BUTTERFIELD RD @	CO	T-1B	ON
			WASHINGTON BLVD	BELLWOOD		

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4	TS	3320	IL 72 HIGGINS RD @ PATTON DR	CO ROSEMONT	T-1B	ON
5	TS	4040	135TH ST @ CENTRAL AVE	CO CRESTWOOD	T-1B	ON
6	TS	5127	IL 394 EAST RAMP @ GLENWOOD DYER RD	CO LYNWOOD	T-1B	ON
7	TS	5128	IL 394 WEST RAMP @ GLENWOOD DYER RD	CO LYNWOOD	T-1B	ON
8	TS	6366	IL 59 @ SMITH RD	DU WAYNE	T-1B	ON
9	TS	6690	US 45 @ ROLLINS RD	LA GRAYSLAKE	T-1B	ON
10	TS	6925	IL 60 IL 83 @ MIDLOTHIAN	LA MUNDELEIN	T-1B	ON
11	TS	6943	IL 120 BELVIDERE RD @ ATKINSON RD	LA GRAYSLAKE	T-1B	ON
12	TS	6980	IL 83 IVANHOE RD @ IL 137 ANTIOCH RD	LA GRAYSLAKE	T-1B	ON
13	TS	7133	IL 173 @ KILBOURNE RD	LA WADSWORTH	T-1B	ON
14	TS	7313	IL 31 @ RINGWOOD RD	MC RINGWOOD	T-1B	ON
15	TS	7388	NEW LENOX @ BRIGGS ST	WI JOLIET	T-1B	ON
16	TS	7393	I 80 RAMPS SOUTH @ BRIGGS ST	WI JOLIET	T-1B	ON
17	TS	7583	IL 126 @ ESSINGTON RD	WI PLAINFIELD	T-1B	ON
18	TS	7618	IL 394 @ RIGHTON RD	WI CRETE	T-1B	ON
19	TS	8770	111TH ST @ OKETO AVE	CO WORTH	T-1B	ON
20	TS	9715	ARSENAL RD @	WI	T-1B	ON

			EXXON MOBIL GATE 5	CHANNAHON		
21	TS	11140	I 55 SB EXT RAMP @ IL 113	WI	T-1B	ON
22	TS	11980	IL 25 @ GRANT ST	KA	T-1B	ON
23	TS	11723	183RD ST @ CENTRAL RD	CO	T-1B	ON
24	TS	15085	IL 47 @ COUNTRY CLUB RD	MC	T-1B	ON
25	TS	20333	IL 53 @ SPRING AVE	DU	T-1B	ON
26	TS	20974	US 30 LINCOLN HWY @ US 30 143RD ST	WI	T-1B	ON
27	TS	21500	IL 83 GLENWOOD DYER RD @ BURNHAM AVE	CO	T-1B	ON
28	TS	21962	US 20 @ BIG TIMBER	KA	T-1B	ON
29	TS	22052	IL 21 MILWAUKEE AVE @ CDW WAY MARKETPLACE S ENT	LA	T-1B	ON
				VERNON HILLS		

PLANNED T-1B LOCATIONS

1	TS	3972	119TH ST @ PAGE ST		T-1B	OFF
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TRAFFIC SIGNALS - EQUIPMENT PAY CODE T-2A LOCATIONS

1	TS	FL28	US 12 LEE ST NB @ PARK PL JEFFERSON	CO	T-2A	ON
2	TS	FL149	US 45 @ STEGER RD	WI	T-2A	ON
3	TS	FL170	IL 31 @ MOOSEHART HENRY WILSON	KA	T-2A	ON
4	TS	FL490	107TH ST @ KEAN	CO	T-2A	ON
				PALOS HILLS		

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5	TS	FL566	123RD ST MCCARTHY @ 86TH AVE	CO PALOS PARK	T-2A	ON
6	TS	FL825	IL 23 @ KISHWAUKEE VALLEY RD	MC MARENGO	T-2A	ON
7	TS	FL830	IL 47 @ IL 173	MC HEBRON	T-2A	ON
8	TS	FL835	IL 47 @ CHARLES	MC WOODSTOCK	T-2A	ON
9	TS	FL840	IL 120 @ CHARLES	MC MCHENRY	T-2A	ON
10	TS	FL851	IL 173 @ ALDEN	MC ALDEN	T-2A	ON
11	TS	FL890	US 45 @ MANHATTAN MONEE RD	WI MONEE	T-2A	ON
12	TS	FL895	US 45 US 52 MAIN ST @ WILMINGTON PEOTONE RD	WI PEOTONE	T-2A	ON
13	TS	FL913	IL 50 CICERO AVE @ PEOTONE RD	WI PEOTONE	T-2A	ON
14	TS	FL925	GOVERNORS HWY @ UNIVERSITY	WI UNIVERSITY PARK	T-2A	ON
15	TS	FL930	MANHATTAN MONEE RD @ CEDAR RD	WI MANHATTAN	T-2A	ON
16	TS	FL1085	IL 129 @ COAL CITY RD	WI COAL CITY	T-2A	ON
17	TS	FL1210	US 41 @ DEERFIELD WEST PARK (BETWEEN)	LA HIGHLAND PARK	T-2A	ON
18	TS	FL1306	IL 137 BUCKLEY RD @ IL 137 BOBBY THOMPSON OHIO	LA NORTH CHICAGO	T-2A	ON
19	TS	FL2515	US 45 @ US 52 JOLIET RD	WI PEOTONE	T-2A	ON
20	TS	FL11950	US 52 IL 53 CHICAGO @ PATTERSON NB	WI JOLIET	T-2A	ON

PLANNED T-2A LOCATIONS

1	TS	FL18	US 6 SOUTHWEST HWY @ GOUGAR RD	WI	T-2A	OFF
2	TS	FL210	IL 47 @ MAIN ST (IN KANEVILLE)	KA	T-2A	OFF
3	TS	FL228	IL 47 @ PLATO RD WB	KA	T-2A	OFF

TRAFFIC SIGNALS - EQUIPMENT PAY CODE T-2B LOCATIONS

1	TS	FL21	US 12 LEE ST SB @ PARK PL JEFFERSON	CO	T-2B	ON
2	TS	FL22	132ND ST @ KEDZIE AVE	CO	T-2B	ON
3	TS	FL100	IL 31 NB @ HALF MILE TRAIL	MC	T-2B	ON
4	TS	FL101	IL 31 SB @ HALF MILE TRAIL	MC	T-2B	ON
5	TS	FL105	IL 31 NB @ EDGEWOOD RD	MC	T-2B	ON
6	TS	FL106	IL 31 SB @ EDGEWOOD RD	MC	T-2B	ON
7	TS	FL110	IL 31 NB @ AMES	MC	T-2B	ON
8	TS	FL111	IL 31 SB @ AMES	MC	T-2B	ON
9	TS	FL114	IL 53 @ MISSISSIPPI AVE EB RIGHT	WI	T-2B	ON
10	TS	FL115	IL 53 @ MISSISSIPPI AVE EB LEFT	WI	T-2B	ON
11	TS	FL116	IL 53 @ MISSISSIPPI AVE WB RIGHT	WI	T-2B	ON
12	TS	FL117	IL 53 NB RIGHT @ MISSISSIPPI AVE	WI	T-2B	ON

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13	TS	FL118	IL 53 NB LEFT @ MISSISSIPPI AVE	WI ELWOOD	T-2B	ON
14	TS	FL119	IL 53 SB RIGHT @ MISSISSIPPI AVE	WI ELWOOD	T-2B	ON
15	TS	FL120	IL 53 SB LEFT @ MISSISSIPPI AVE	WI ELWOOD	T-2B	ON
16	TS	FL140	US 20 EB @ REINKING RD	KA PINGREE GROVE	T-2B	ON
17	TS	FL145	US 45 NB @ STEGER RD	WI FRANKFORT	T-2B	ON
18	TS	FL146	US 45 SB @ STEGER RD	WI FRANKFORT	T-2B	ON
19	TS	FL150	US 20 @ MARSHALL (WEST OF)	KA PINGREE GROVE	T-2B	ON
20	TS	FL151	US 20 WEST @ MARSHALL	KA PINGREE GROVE	T-2B	ON
21	TS	FL156	183RD ST @ WOLF RD NB	WI ORLAND PARK	T-2B	ON
22	TS	FL157	183RD ST @ WOLF RD SB	WI ORLAND PARK	T-2B	ON
23	TS	FL158	WOLF RD @ 151ST ST	CO ORLAND PARK	T-2B	ON
24	TS	FL160	US 20 WB @ REINKING RD	KA PINGREE GROVE	T-2B	ON
25	TS	FL191	IL 47 @ IL 64 EB	KA LILY LAKE	T-2B	ON
26	TS	FL192	IL 38 EB @ ANDERSON RD	KA ELBURN	T-2B	ON
27	TS	FL194	IL 38 WB @ ANDERSON RD	KA ELBURN	T-2B	ON
28	TS	FL195	I 80 I 94 EB RIGHT @ TORRENCE AVE	CO LANSING	T-2B	ON
29	TS	FL196	I 80 I 94 EB LEFT @	CO	T-2B	ON

			TORRENCE AVE	LANSING		
30	TS	FL197	I 80 I 94 WB RIGHT @ TORRENCE AVE	CO	T-2B	ON
31	TS	FL198	I 80 I 94 WB LEFT @ TORRENCE AVE	CO	T-2B	ON
32	TS	FL211	IL 47 @ MAIN KANEVILLE	KA	T-2B	ON
33	TS	FL212	IL 47 @ MAIN KANEVILLE	KA	T-2B	ON
34	TS	FL226	IL 72 @ BRIER HILL RD EB	KA	T-2B	ON
35	TS	FL227	IL 72 @ BRIER HILL RD WB	KA	T-2B	ON
36	TS	FL330	US 14 NORTHWEST HWY @ IL 68 DUNDEE RD	CO	T-2B	ON
37	TS	FL332	US 14 NORTHWEST HWY EB RIGHT @ METRA CHICAGO NORTHWESTERN RR	CO	T-2B	ON
38	TS	FL333	US 14 NORTHWEST HWY WB LEFT @ METRA CHICAGO NORTHWESTERN RR	CO	T-2B	ON
39	TS	FL334	US 14 NORTHWEST HWY WB RIGHT @ METRA CHICAGO NORTHWESTERN RR	CO	T-2B	ON
40	TS	FL480	87TH ST @ SOUTHWEST HWY COLUMBUS	CO	T-2B	ON
41	TS	FL587	IL 83 @ 91ST ST EB	DU	T-2B	ON
42	TS	FL590	PALATINE RD EB FRONTAGE @ WHEELING RD (EAST OF)	CO	T-2B	ON
43	TS	FL591	PALATINE RD WB FRONTAGE @ WOLF RD (WEST OF)	CO	T-2B	ON
44	TS	FL635	IL 59 @ JOLIET RD	DU	T-2B	ON
				WEST CHICAGO		

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45	TS	FL640	IL 59 @ INGALTON	DU WEST CHICAGO	T-2B	ON
46	TS	FL660	US 12 IL 59 SB RIGHT SIDE @ IL 134	LA FOX LAKE	T-2B	ON
47	TS	FL661	US 12 IL 59 SB LEFT SIDE @ IL 134	LA FOX LAKE	T-2B	ON
48	TS	FL701	IL 53 @ ROBERT PARKER COFFIN RD EB	LA LONG GROVE	T-2B	ON
49	TS	FL715	IL 59 @ MONAVILLE	LA LAKE VILLA	T-2B	ON
50	TS	FL716	IL 59 @ MONAVILLE SOUTH	LA LAKE VILLA	T-2B	ON
51	TS	FL727	IL 60 WB @ LAKE FOREST ACADEMY	LA LAKE FOREST	T-2B	ON
52	TS	FL740	IL 120 @ ALMOND LAKE	LA GRAYSLAKE	T-2B	ON
53	TS	FL741	IL 120 WB @ ALMOND LAKE	LA GRAYSLAKE	T-2B	ON
54	TS	FL748	IL 120 WB SOUTH @ BACON RD	LA GRAYSLAKE	T-2B	ON
55	TS	FL749	IL 120 WB @ BACON RD	LA GRAYSLAKE	T-2B	ON
56	TS	FL752	IL 23 STATE RD NB @ RIVER RD	MC MARENGO	T-2B	ON
57	TS	FL753	IL 23 STATE RD SB @ RIVER RD	MC MARENGO	T-2B	ON
58	TS	FL755	IL 176 WB @ MILLSTREAM RD DUNHAM RD	MC UNION	T-2B	ON
59	TS	FL756	IL 176 EB @ MILLSTREAM RD DUNHAM RD	MC UNION	T-2B	ON
60	TS	FL757	IL 176 @ MILLSTREAM RD DUNHAM RD NB	MC UNION	T-2B	ON
61	TS	FL758	IL 176 @	MC	T-2B	ON

			MILLSTREAM RD DUNHAM RD SB	UNION		
62	TS	FL760	IL 23 STATE RD @ RIVER RD EB	MC MARENGO	T-2B	ON
63	TS	FL761	IL 23 STATE RD @ RIVER RD WB	MC MARENGO	T-2B	ON
64	TS	FL762	IL 72 EB @ RANDALL RD	KA DUNDEE	T-2B	ON
65	TS	FL763	IL 72 WB @ RANDALL RD	KA WEST DUNDEE	T-2B	ON
66	TS	FL764	US 12 NB @ SUNSET	MC FOX LAKE	T-2B	ON
67	TS	FL766	US 14 SE @ CUBA RD	LA BARRINGTON HILLS	T-2B	ON
68	TS	FL767	US 14 NW @ CUBA RD	LA BARRINGTON HILLS	T-2B	ON
69	TS	FL768	US 14 @ CUBA RD EB	LA BARRINGTON HILLS	T-2B	ON
70	TS	FL769	US 14 @ CUBA RD WB	LA BARRINGTON HILLS	T-2B	ON
71	TS	FL822	IL 173 @ GREENWOOD RD NB RIGHT SIDE	MC HEBRON	T-2B	ON
72	TS	FL824	IL 173 EB @ KEYSTONE RD	MC RICHMOND	T-2B	ON
73	TS	FL826	IL 173 WB @ KEYSTONE RD	MC RICHMOND	T-2B	ON
74	TS	FL827	IL 23 NB @ KISHWAUKEE VALLEY RD	MC MARENGO	T-2B	ON
75	TS	FL828	IL 173 @ GREENWOOD RD NB LEFT SIDE	MC HEBRON	T-2B	ON
76	TS	FL829	IL 23 SB @ KISHWAUKEE VALLEY RD	MC MARENGO	T-2B	ON
77	TS	FL836	IL 47 SB @ OBRIEN	MC HEBRON	T-2B	ON

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78	TS	FL837	IL 47 NB @ OBRIEN	MC HEBRON	T-2B	ON
79	TS	FL852	IL 173 @ ALDEN EASTBOUND	MC ALDEN	T-2B	ON
80	TS	FL853	IL 173 @ ALDEN WESTBOUND	MC ALDEN	T-2B	ON
81	TS	FL856	IL 173 WB @ CONVERSE RD (WEST OF)	MC FOX LAKE	T-2B	ON
82	TS	FL857	IL 38 EB @ ST CHARLES BOYS SCHOOL	KA ST CHARLES	T-2B	ON
83	TS	FL865	I 80 WB RIGHT SIDE @ WATER ST	WI JOLIET	T-2B	ON
84	TS	FL866	I 80 WB LEFT SIDE @ WATER ST	WI JOLIET	T-2B	ON
85	TS	FL900	US 52 STATE ST @ NORTH ST WB	WI MANHATTAN	T-2B	ON
86	TS	FL901	US 52 STATE ST SB @ NORTH ST	WI MANHATTAN	T-2B	ON
87	TS	FL902	US 52 STATE ST NB @ NORTH ST	WI MANHATTAN	T-2B	ON
88	TS	FL967	US 12 @ OLD RAND RD SB	LA LAKE ZURICH	T-2B	ON
89	TS	FL1029	IL 126 WB RIGHT EAST OF RR @ IL 59 (EAST OF)	WI PLAINFIELD	T-2B	ON
90	TS	FL1030	IL 126 WB RIGHT WEST OF RR @ IL 59 (EAST OF)	WI PLAINFIELD	T-2B	ON
91	TS	FL1034	IL 126 @ ESSINGTON RD WB	WI PLAINFIELD	T-2B	ON
92	TS	FL1036	IL 59 NB @ DAYFIELD DR	WI PLAINFIELD	T-2B	ON
93	TS	FL1037	IL 59 SB @ DAYFIELD DR	WI PLAINFIELD	T-2B	ON
94	TS	FL1086	IL 129 NB & SB FLASHERS @	WI	T-2B	ON

			STRIP MINE RD	WILMINGTON		
95	TS	FL1087	IL 129 @	WI	T-2B	ON
			STRIP MINE RD EB & WB FLASHERS	WILMINGTON		
96	TS	FL1088	IL 129 ADV YELLOW FLASHER NB @	WI	T-2B	ON
			STRIP MINE RD	WILMINGTON		
97	TS	FL1089	IL 129 ADV YELLOW FLASHER SB @	WI	T-2B	ON
			STRIP MINE RD	WILMINGTON		
98	TS	FL1091	IL 394 SB LEFT @	WI	T-2B	ON
			RIGHTON RD	CRETE		
99	TS	FL1092	IL 394 SB RIGHT @	WI	T-2B	ON
			RIGHTON RD	CRETE		
100	TS	FL1093	IL 394 NB LEFT @	WI	T-2B	ON
			RIGHTON RD	CRETE		
101	TS	FL1094	IL 394 NB RIGHT @	WI	T-2B	ON
			RIGHTON RD	CRETE		
102	TS	FL1096	IL 394 @	WI	T-2B	ON
			BURRVILLE RD NB LEFT	CRETE		
103	TS	FL1097	IL 394 @	WI	T-2B	ON
			BURRVILLE RD NB RIGHT	CRETE		
104	TS	FL1098	IL 394 @	WI	T-2B	ON
			BURRVILLE RD SB LEFT	CRETE		
105	TS	FL1099	IL 394 @	WI	T-2B	ON
			BURRVILLE RD SB RIGHT	CRETE		
106	TS	FL1107	I 90 SE HARLEM OFF RAMP LEFT SIDE @	CO	T-2B	ON
			W HIGGINS RD N OCTAVIA	CHICAGO		
107	TS	FL1108	I 90 SE HARLEM OFF RAMP RIGHT SIDE @	CO	T-2B	ON
			W HIGGINS RD N OCTAVIA	CHICAGO		
108	TS	FL1115	IL 59 S NELTOR BLVD NB @	DU	T-2B	ON
			GARYS MILL RD	WEST CHICAGO		
109	TS	FL1116	IL 59 S NELTOR BLVD SB @	DU	T-2B	ON
			GARYS MILL RD	WEST CHICAGO		
110	TS	FL1117	IL 38 ROOSEVELT RD @	DU	T-2B	ON

			GARYS MILL RD NB	WEST CHICAGO		
111	TS	FL1118	IL 38 ROOSEVELT RD @	DU	T-2B	ON
			GARYS MILL RD SB	WINFIELD		
112	TS	FL1123	IL 83 CAL SAG RD @	CO	T-2B	ON
			RIDGELAND NB	PALOS HEIGHTS		
113	TS	FL1125	I 80 EB RIGHT SIDE @	WI	T-2B	ON
			WHEELER (BEFORE)	JOLIET		
114	TS	FL1126	I 80 EB LEFT SIDE @	WI	T-2B	ON
			WHEELER (BEFORE)	JOLIET		
115	TS	FL1127	I 80 EB RIGHT SIDE @	WI	T-2B	ON
			WHEELER (AFTER)	JOLIET		
116	TS	FL1128	I 80 EB LEFT SIDE @	WI	T-2B	ON
			WHEELER (AFTER)	JOLIET		
117	TS	FL1131	IL 53 NB @	WI	T-2B	ON
			MANHATTAN RD RIGHT SIDE	ELWOOD		
118	TS	FL1132	IL 53 NB @	WI	T-2B	ON
			MANHATTAN RD LEFT SIDE	ELWOOD		
119	TS	FL1133	IL 53 SB @	WI	T-2B	ON
			MANHATTAN RD RIGHT SIDE	ELWOOD		
120	TS	FL1134	IL 53 SB @	WI	T-2B	ON
			MANHATTAN RD LEFT SIDE	ELWOOD		
121	TS	FL1136	IL 53 NB @	WI	T-2B	ON
			NORTH RIVER RD	WILMINGTON		
122	TS	FL1137	IL 53 SB @	WI	T-2B	ON
			NORTH RIVER RD	WILMINGTON		
123	TS	FL1138	IL 53 BALTIMORE RD NB @	WI	T-2B	ON
			216TH AVE	WILMINGTON		
124	TS	FL1139	IL 53 BALTIMORE RD SB @	WI	T-2B	ON
			216TH AVE	WILMINGTON		
125	TS	FL1140	US 12 20 45 MANNHEIM RD @	CO	T-2B	ON
			CANTERBURY WATERFORD	WESTCHESTER		
126	TS	FL1141	GRAND AVE EB NEAR RIGHT @	CO	T-2B	ON
			ELMWOOD PARK RR CROSSING	ELMWOOD PARK		

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127	TS	FL1142	GRAND AVE EB FAR RIGHT @ ELMWOOD PARK RR CROSSING	CO ELMWOOD PARK	T-2B	ON
128	TS	FL1143	GRAND AVE WB NEAR RIGHT @ ELMWOOD PARK RR CROSSING	CO ELMWOOD PARK	T-2B	ON
129	TS	FL1144	GRAND AVE WB FAR RIGHT @ ELMWOOD PARK RR CROSSING	CO ELMWOOD PARK	T-2B	ON
130	TS	FL1150	US 14 EB @ BERRY RD	LA BARRINGTON	T-2B	ON
131	TS	FL1151	IL 59 SB NEAR @ LAKE COOK RD	CO BARRINGTON	T-2B	ON
132	TS	FL1152	IL 59 SB FAR @ LAKE COOK RD	CO BARRINGTON	T-2B	ON
133	TS	FL1153	IL 59 @ LAKE COOK RD WB NEAR	CO BARRINGTON	T-2B	ON
134	TS	FL1154	IL 59 @ LAKE COOK RD WB FAR	CO BARRINGTON	T-2B	ON
135	TS	FL1155	IL 59 NB FAR @ JAMES ST CN RR	LA BARRINGTON	T-2B	ON
136	TS	FL1156	IL 59 SB NEAR @ JAMES ST CN RR	LA BARRINGTON	T-2B	ON
137	TS	FL1157	IL 59 SB FAR @ JAMES ST CN RR	LA BARRINGTON	T-2B	ON
138	TS	FL1158	IL 59 NB NEAR @ JAMES ST CN RR	LA BARRINGTON	T-2B	ON
139	TS	FL1165	IL 83 NB LEFT @ RED OAK LN	DU WOOD DALE	T-2B	ON
140	TS	FL1166	IL 83 NB RIGHT @ RED OAK LN	DU WOOD DALE	T-2B	ON
141	TS	FL1193	US 12 @ IL 59 OFF RAMP	LA WAUCONDA	T-2B	ON
142	TS	FL1211	US 41 @ DEERFIELD WEST PARK	LA HIGHLAND PARK	T-2B	ON
143	TS	FL1212	US 41 @	LA	T-2B	ON

			WEST PARK NB	HIGHLAND PARK		
144	TS	FL1222	LAGRANGE RD NB @ WEEPING WILLOW RD	CO HODGKINS	T-2B	ON
145	TS	FL1223	LAGRANGE RD SB @ WEEPING WILLOW RD	CO HODGKINS	T-2B	ON
146	TS	FL1251	IL 43 WAUKEGAN RD @ VOLTZ RD	CO NORTHBROOK	T-2B	ON
147	TS	FL1297	WOLF RD NB @ CAMP MCDONALD RD	CO PROSPECT HEIGHTS	T-2B	ON
148	TS	FL1298	OAKTON ST EB @ BUSSE HWY	CO ELK GROVE	T-2B	ON
149	TS	FL1308	US 20 LAKE ST WB @ GARDEN	DU ROSELLE	T-2B	ON
150	TS	FL1309	US 20 LAKE ST EB @ GARDEN	DU ADDISON	T-2B	ON
151	TS	FL1310	IL 19 IRVING PARK RD WB @ BLOOMINGDALE RD	DU ITASCA	T-2B	ON
152	TS	FL1320	US 20 LAKE ST @ BLUFF CITY LOVEL WB	CO ELGIN	T-2B	ON
153	TS	FL1321	US 20 LAKE ST @ BARRINGTON RD	CO HANOVER PARK	T-2B	ON
154	TS	FL1471	US 34 WB OGDEN AVE @ JOLIET RD (WEST OF)	CO LYONS	T-2B	ON
155	TS	FL1472	US 34 EB OGDEN AVE @ LELAND	CO LYONS	T-2B	ON
156	TS	FL1825	IL 1 HALSTED @ 171ST NB	CO EAST HAZEL CREST	T-2B	ON
157	TS	FL1945	IL 19 IRVING PARK RD @ DESPLAINES RIVER RD SB	CO DESPLAINES	T-2B	ON
158	TS	FL2113	IL 60 @ WILSON SB	LA VOLO	T-2B	ON
159	TS	FL2116	IL 173 EB @ TIFFANI	LA ANTIOCH	T-2B	ON

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160	TS	FL2117	IL 173 WB @ TIFFANI	LA ANTIOCH	T-2B	ON
161	TS	FL2121	IL 173 @ LINDEN LANE	LA ANTIOCH	T-2B	ON
162	TS	FL2122	IL 173 WB @ GRIMM RD	LA ANTIOCH	T-2B	ON
163	TS	FL2123	IL 173 EB @ GRIMM RD	LA ANTIOCH	T-2B	ON
164	TS	FL2690	IL 56 BUTTERFIELD @ WASHINGTON BLVD	CO BELLWOOD	T-2B	ON
165	TS	FL2760	IL 58 GOLF RD WB @ GANNON DR	CO HOFFMAN ESTATES	T-2B	ON
166	TS	FL2761	IL 58 GOLF RD EB @ GANNON DR	CO HOFFMAN ESTATES	T-2B	ON
167	TS	FL3150	IL 62 ALGONQUIN RD WB @ BATEMAN	CO BARRINGTON HILLS	T-2B	ON
168	TS	FL3151	IL 62 ALGONQUIN RD EB @ BATEMAN	CO BARRINGTON HILLS	T-2B	ON
169	TS	FL3152	IL 62 ALGONQUIN RD @ BATEMAN SB	CO BARRINGTON HILLS	T-2B	ON
170	TS	FL3153	IL 62 ALGONQUIN RD @ BATEMAN NB	CO BARRINGTON HILLS	T-2B	ON
171	TS	FL3154	IL 62 ALGONQUIN RD @ OLD SUTTON RD NB	CO BARRINGTON HILLS	T-2B	ON
172	TS	FL3155	IL 62 ALGONQUIN RD @ OLD SUTTON RD SB	CO BARRINGTON HILLS	T-2B	ON
173	TS	FL3156	IL 62 ALGONQUIN RD @ OLD SUTTON RD EB	CO BARRINGTON HILLS	T-2B	ON
174	TS	FL3157	IL 62 ALGONQUIN RD @ OLD SUTTON RD WB	CO BARRINGTON HILLS	T-2B	ON
175	TS	FL3160	IL 68 DUNDEE RD WB @ OLD SUTTON	CO BARRINGTON HILLS	T-2B	ON
176	TS	FL3161	IL 68 DUNDEE RD EB @	CO	T-2B	ON

			OLD SUTTON	BARRINGTON HILLS		
177	TS	FL3162	IL 68 DUNDEE RD @	CO	T-2B	ON
			OLD SUTTON SB	BARRINGTON HILLS		
178	TS	FL3163	IL 68 DUNDEE RD @	CO	T-2B	ON
			OLD SUTTON NB	BARRINGTON HILLS		
179	TS	FL3168	IL 68 DUNDEE RD @	CO	T-2B	ON
			STERLING AVE	PALATINE		
180	TS	FL3200	IL 58 SUMMIT DR @	CO	T-2B	ON
			SHADY OAKS DR EB	ELGIN		
181	TS	FL3202	IL 58 SUMMIT DR @	CO	T-2B	ON
			SHADY OAKS DR WB	ELGIN		
182	TS	FL3325	IL 72 HIGGINS RD WB @	CO	T-2B	ON
			GANNON DR	HOFFMAN ESTATES		
183	TS	FL3326	IL 72 HIGGINS RD EB @	CO	T-2B	ON
			GANNON DR	HOFFMAN ESTATES		
184	TS	FL3540	95TH ST SW @	CO	T-2B	ON
			IL 171 ARCHER AVE	WILLOW SPRINGS		
185	TS	FL3542	95TH ST NE @	CO	T-2B	ON
			IL 171 ARCHER AVE	WILLOW SPRINGS		
186	TS	FL3544	IL 171 ARCHER AVE NE @	CO	T-2B	ON
			95TH ST	WILLOW SPRINGS		
187	TS	FL3546	IL 171 ARCHER AVE SW @	CO	T-2B	ON
			95TH ST	WILLOW SPRINGS		
188	TS	FL3555	IL 171 ARCHER AVE EB LEFT @	CO	T-2B	ON
			55TH ST	SUMMIT		
189	TS	FL3556	IL 171 ARCHER AVE EB RIGHT @	CO	T-2B	ON
			55TH ST	SUMMIT		
190	TS	FL3575	IL 171 ARCHER AVE NB LEFT @	CO	T-2B	ON
			44TH ST	LYONS		
191	TS	FL3576	IL 171 ARCHER AVE NB RIGHT @	CO	T-2B	ON
			44TH ST	LYONS		
192	TS	FL3577	IL 171 ARCHER NB FAR LEFT @	CO	T-2B	ON
			44TH ST (SOLAR AMBER)	LYONS		

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193	TS	FL3578	IL 171 NB FAR RIGHT @ 44TH ST (SOLAR AMBER)	CO LYONS	T-2B	ON
194	TS	FL3936	CRAWFORD PULASKI @ 123RD ST NB	CO ALSIP	T-2B	ON
195	TS	FL4034	135TH ST EB @ RIDGELAND (WEST OF)	CO PALOS HEIGHTS	T-2B	ON
196	TS	FL4036	135TH ST WB @ RIDGELAND (WEST OF)	CO PALOS HEIGHTS	T-2B	ON
197	TS	FL4660	IL 59 NB @ WEST BARTLETT RD	CO BARTLETT	T-2B	ON
198	TS	FL4662	IL 59 SB @ WEST BARTLETT RD	CO BARTLETT	T-2B	ON
199	TS	FL5240	FRANCISCO AVE @ BROADWAY ST	CO ROBBINS	T-2B	ON
200	TS	FL5322	ILLINOIS RD @ HIBBARD RD NB	CO WILMETTE	T-2B	ON
201	TS	FL5324	ILLINOIS RD @ HIBBARD RD SB	CO WILMETTE	T-2B	ON
202	TS	FL5326	ILLINOIS RD WB @ HIBBARD RD	CO WILMETTE	T-2B	ON
203	TS	FL5328	ILLINOIS RD EB @ HIBBARD RD	CO WILMETTE	T-2B	ON
204	TS	FL5930	WILLOW RD EB @ OLD WILLOW RD (WEST OF)	CO NORTHBROOK	T-2B	ON
205	TS	FL6021	US 52 WB @ COUNTY LINE RD	WI SHOREWOOD	T-2B	ON
206	TS	FL6023	US 52 EB @ COUNTY LINE RD	WI SHOREWOOD	T-2B	ON
207	TS	FL6051	US 34 OGDEN AVE EB @ FRONTENAC	DU AURORA	T-2B	ON
208	TS	FL6151	IL 19 IRVING PARK RD SB FAR RIGHT @ IL 53 ROHLWING RD	DU ITASCA	T-2B	ON

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209	TS	FL6152	IL 19 IRVING PARK RD @ IL 53 ROHLWING RD SB NEAR LEFT	DU ITASCA	T-2B	ON
210	TS	FL6153	IL 19 IRVING PARK RD @ IL 53 ROHLWING RD NB FAR RIGHT	DU ITASCA	T-2B	ON
211	TS	FL6154	IL 19 IRVING PARK RD @ IL 53 ROHLWING RD NB NEAR LEFT	DU ITASCA	T-2B	ON
212	TS	FL6916	IL 176 EB @ HAWLEY WEST	LA HAWTHORN WOODS	T-2B	ON
213	TS	FL6917	IL 176 WB @ HAWLEY WEST	LA HAWTHORN WOODS	T-2B	ON
214	TS	FL6921	IL 60 IL 83 NB @ DIAMOND LAKE RD S OF RR	LA MUNDELEIN	T-2B	ON
215	TS	FL6922	IL 60 IL 83 NB @ DIAMOND LAKE RD N OF RR	LA MUNDELEIN	T-2B	ON
216	TS	FL6923	IL 60 IL 83 SB @ DIAMOND LAKE RD N OF RR	LA MUNDELEIN	T-2B	ON
217	TS	FL6924	IL 60 IL 83 SB @ DIAMOND LAKE RD S OF RR	LA MUNDELEIN	T-2B	ON
218	TS	FL7249	US 14 EB @ HARTLAND RD HUGHES RD	MC WOODSTOCK	T-2B	ON
219	TS	FL7250	US 14 WB @ HARTLAND RD HUGHES RD	MC WOODSTOCK	T-2B	ON
220	TS	FL7252	US 14 @ HARTLAND RD HUGHES RD NB	MC WOODSTOCK	T-2B	ON
221	TS	FL7254	US 14 @ HARTLAND RD HUGHES RD SB	MC WOODSTOCK	T-2B	ON
222	TS	FL7292	IL 176 WB @ BAYVIEW BEACH RD	MC CRYSTAL LAKE	T-2B	ON
223	TS	FL7293	IL 176 EB @ BAYVIEW BEACH RD	MC CRYSTAL LAKE	T-2B	ON
224	TS	FL7506	IL 1 DIXIE HWY NB @ COUNTY LINE RD	WI BEECHER	T-2B	ON
225	TS	FL7507	IL 1 DIXIE HWY SB @	WI	T-2B	ON

			COUNTY LINE RD	BEECHER		
226	TS	FL7508	IL 1 DIXIE HWY @	WI	T-2B	ON
			COUNTY LINE RD EB	BEECHER		
227	TS	FL7509	IL 1 DIXIE HWY @	WI	T-2B	ON
			COUNTY LINE RD WB	BEECHER		
228	TS	FL8853	IL 59 @	DU	T-2B	ON
			HAWTHORN LN SB	WEST CHICAGO		
229	TS	FL9126	135TH WB ROMEO RD @	WI	T-2B	ON
			NEW AVE (WEST OF)	ROMEOVILLE		
230	TS	FL9670	IL 83 NB ELMHURST RD @	CO	T-2B	ON
			LINCOLN	MT PROSPECT		
231	TS	FL9671	IL 83 SB ELMHUURST RD @	CO	T-2B	ON
			LINCOLN	MT PROSPECT		
232	TS	FL10698	IL 72 @	KA	T-2B	ON
			BIG TIMBER EB	RUTLAND		
233	TS	FL10699	IL 72 @	KA	T-2B	ON
			BIG TIMBER WB	RUTLAND		
234	TS	FL11245	US 12 45 LEE ST @	CO	T-2B	ON
			US 12 45 MANNHEIM RD WB	DESPLAINES		
235	TS	FL11246	US 12 45 LEE ST @	CO	T-2B	ON
			US 12 45 MANNHEIM RD NB	DESPLAINES		
236	TS	FL11715	WESTERN @	CO	T-2B	ON
			SAUK TRAIL WB	PARK FOREST		
237	TS	FL11720	IL 50 CICERO AVE @	CO	T-2B	ON
			175TH ST	COUNTRY CLUB HILLS		
238	TS	FL11725	DIXIE HWY @	CO	T-2B	ON
			FLOSSMOOR RD CAMBRIDGE	FLOSSMOOR		
239	TS	FL11744	IL 394 @	CO	T-2B	ON
			SAUK TRAIL SB RT	SAUK VILLAGE		
240	TS	FL11745	IL 394 @	CO	T-2B	ON
			SAUK TRAIL SB LT	SAUK VILLAGE		
241	TS	FL11751	US 6 WB 159TH ST @	CO	T-2B	ON
			PARK AVE RIGHT	HARVEY		

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242	TS	FL11760	US 12 20 95TH ST @ I 294 SB OFF RAMP TO WB 95TH LEFT	CO	T-2B	ON	BRIDGEVIEW
243	TS	FL11761	US 12 20 95TH ST @ I 294 SB OFF RAMP TO WB 95TH RIGHT	CO	T-2B	ON	BRIDGEVIEW
244	TS	FL11765	US 12 20 95TH ST @ 88TH AVE EB	CO	T-2B	ON	HICKORY HILLS
245	TS	FL11770	SOUTHWEST HWY NE @ RIDGELAND	CO	T-2B	ON	CHICAGO RIDGE
246	TS	FL11795	US 12 EB 95TH ST @ MARIANOS WEST OF RR TRACKS	CO	T-2B	ON	EVERGREEN PARK
247	TS	FL11796	US 12 EB 95TH ST @ MARIANOS EAST OF RR TRACKS	CO	T-2B	ON	EVERGREEN PARK
248	TS	FL11797	WB US 12 95TH ST @ MARIANOS EAST OF RR TRACKS	CO	T-2B	ON	EVERGREEN PARK
249	TS	FL11798	WB US 12 95TH ST @ MARIANOS WEST OF RR TRACKS	CO	T-2B	ON	EVERGREEN PARK
250	TS	FL11870	IL 72 TOUHY AVE @ IL 72 CUT OFF	CO	T-2B	ON	DESPLAINES
251	TS	FL11880	IL 176 @ ROBERTS RD	MC	T-2B	ON	ISLAND LAKE
252	TS	FL11894	IL 176 EB @ DEAN ST	MC	T-2B	ON	LAKEWOOD
253	TS	FL11896	IL 176 WB @ DEAN ST	MC	T-2B	ON	LAKEWOOD
254	TS	FL11945	US 12 @ STATE PARK RD EAST	LA	T-2B	ON	FOX LAKE
255	TS	FL11948	US 12 @ SOLON NB	MC	T-2B	ON	RICHMOND
256	TS	FL11949	US 12 @ SOLON SB	MC	T-2B	ON	RICHMOND
257	TS	FL11952	US 52 IL 53 CHICAGO @ I 80 EB RAMP	WI	T-2B	ON	JOLIET

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258	TS	FL11953	US 52 IL 53 CHICAGO @ PATTERSON SB	WI JOLIET	T-2B	ON
259	TS	FL11955	IL 53 NB @ SCHWEITZER RD	WI JOLIET	T-2B	ON
260	TS	FL11956	IL 53 SB @ SCHWEITZER RD	WI JOLIET	T-2B	ON
261	TS	FL11957	IL 53 @ SCHWEITZER RD EB	WI JOLIET	T-2B	ON
262	TS	FL11958	IL 53 @ SCHWEITZER RD WB	WI JOLIET	T-2B	ON
263	TS	FL12015	IL 56 BUTTERFIELD RD @ TAFT AVE EB	CO HILLSIDE	T-2B	ON
264	TS	FL12315	IL 83 @ WASHINGTON ST SB	LA GRAYSLAKE	T-2B	ON
265	TS	FL15100	IL 19 IRVING PARK RD WB (BEFORE RR) @ WOOD DALE RD (EAST OF)	DU WOOD DALE	T-2B	ON
266	TS	FL15101	IL 19 IRVING PARK RD WB (AFTER RR) @ WOOD DALE RD (EAST OF)	DU WOOD DALE	T-2B	ON
267	TS	FL20445	127TH ST @ WIRETON RD NB	CO BLUE ISLAND	T-2B	ON
268	TS	FL20600	US 6 @ BRANDON RD WB	WI ROCKDALE	T-2B	ON
269	TS	FL21476	IL 171 ARCHER AVE @ 131ST NB LEFT	CO LEMONT	T-2B	ON
270	TS	FL21477	IL 171 ARCHER AVE @ 131ST NB RIGHT	CO LEMONT	T-2B	ON
271	TS	FL21478	IL 171 ARCHER AVE @ 131ST SB LEFT	CO LEMONT	T-2B	ON
272	TS	FL21479	IL 171 ARCHER AVE @ 131ST SB RIGHT	CO LEMONT	T-2B	ON
273	TS	FL21976	IL 23 NB @ CORAL PLEASANT GROVE	MC MARENGO	T-2B	ON

274	TS	FL21977	IL 23 SB @ CORAL PLEASANT GROVE	MC MARENGO	T-2B	ON
275	TS	FL21982	US 20 NB RIGHT @ HARMONY RD	MC HARMONY	T-2B	ON
276	TS	FL21983	US 20 SB RIGHT @ HARMONY RD	MC HARMONY	T-2B	ON
277	TS	FL22101	IL 120 EB WEST BELVIDERE RD @ SULLIVAN LAKE BLVD	LA LAKEMOOR	T-2B	ON
278	TS	FL22103	IL 120 WB WEST BELVIDERE RD @ SULLIVAN LAKE BLVD	LA LAKEMOOR	T-2B	ON

PLANNED T-2B LOCATIONS

1	TS	FL6625	IL 176 WB @ US 45	LA MUNDELEIN	T-2B	OFF
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TRAFFIC SIGNAL RAILROAD INTERCONNECT LOCATIONS – PATROLED TWICE PER MONTH

1	TS	310	US 6 159TH ST 162ND @ VINCENNES AVE VAN DRUNEN	CO SOUTH HOLLAND	T-1A	ON
2	TS	438	US 12 20 95TH ST @ MUSEUM DR 50TH COURT	CO OAK LAWN	PROPOSED	
3	TS	793	IL 25 BROADWAY @ SULLIVAN RD	KA AURORA	T-1A	ON
4	TS	814	IL 25 BROADWAY @ ILLINOIS	KA AURORA	T-1A	ON
5	TS	833	IL 31 @ WATKINS US 30 NORTH RAMP	KA MONTGOMERY	T-1A	ON
6	TS	835	IL 31 @ WEBSTER ST AUCUTT RD	KA MONTGOMERY	T-1A	ON
7	TS	862	US 30 @ DUGAN RD	KA SUGAR GROVE	T-1A	ON

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8	TS	1084	IL 113 MAIN ST @ IL 129 WASHINGTON ST & IL 53	WI BRAIDWOOD	T-1A	ON
9	TS	1105	US 12 45 MANNHEIM RD @ ARMITAGE AVE	CO MELROSE PARK	T-1A	ON
10	TS	1135	US 12 45 MANNHEIM RD @ TOUHY AVE	CO DESPLAINES	T-1A	ON
11	TS	1170	US 14 NORTHWEST HWY @ US 14 BALDWIN RD @ COLFAX	CO PALATINE	T-1A	ON
12	TS	1225	US 14 NORTHWEST HWY @ HICKS RD SOUTH JCT	CO PALATINE	T-1A	ON
13	TS	1236	US 14 @ ALGONQUIN RD	MC FOX RIVER GROVE	T-1A	ON
14	TS	1237	US 14 @ LINCOLN AVE	MC FOX RIVER GROVE	T-1A	ON
15	TS	1238	US 14 @ FOXMOOR RD	MC FOX RIVER GROVE	T-1A	ON
16	TS	1255	US 14 NORTHWEST HWY PROSPECT AVE @ MT PROSPECT RD	CO MT PROSPECT	T-1A	ON
17	TS	1290	US 14 NORTHWEST HWY @ ROHLWING RD	CO PALATINE	T-1A	ON
18	TS	1310	US 14 NORTHWEST HWY @ WILKE RD	CO ARLINGTON HEIGHTS	T-1A	ON
19	TS	1575	US 41 SKOKIE BLVD @ OAKTON ST	CO SKOKIE	T-1A	ON
20	TS	1577	US 41 SKOKIE BLVD @ SEARLE PKWY	CO SKOKIE	T-1A	ON
21	TS	1910	IL 7 SOUTHWEST HWY @ 135TH ST	CO ORLAND PARK	T-1A	ON
22	TS	2125	IL 43 HARLEM AVE @ 26TH ST	CO NORTH RIVERSIDE	T-1A	ON

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23	TS	2160	IL 43 HARLEM AVE @ 65TH ST	CO SUMMIT	T-1A	ON
24	TS	2485	IL 50 CICERO AVE @ 94TH ST	CO OAK LAWN	T-1A	ON
25	TS	2620	IL 50 CICERO AVE @ SOUTHWEST HWY	CO OAK LAWN	T-1A	ON
26	TS	2897	IL 59 NEW SUTTON RD @ PENNY RD	CO SOUTH BARRINGTON	T-1A	ON
27	TS	3280	BUSSE HWY @ OAKTON ST DEE RD	CO PARK RIDGE	T-1A	ON
28	TS	3605	IL 171 1ST AVE @ CERMAK CUT OFF	CO NORTH RIVERSIDE	T-1A	ON
29	TS	3630	IL 171 1ST AVE @ LAKE ST	CO MAYWOOD	T-1A	ON
30	TS	3740	26TH ST @ EAST END AVE	CO CHICAGO HEIGHTS	T-1A	ON
31	TS	3920	CRAWFORD AVE PULASKI RD @ SOUTHWEST HWY COLUMBUS 87TH	CO	T-1A	ON
32	TS	3970	119TH ST @ VINCENNES RD	CO BLUE ISLAND	T-1A	ON
33	TS	4220	BRAINARD AVE @ BURNHAM	CO BURNHAM	T-1A	ON
34	TS	4695	US 14 NORTHWEST HWY @ EASTERN AVE HILLSIDE AVE	CO BARRINGTON	T-1A	ON
35	TS	5335	HOWARD ST @ LEHIGH AVE	CO NILES	T-1A	ON
36	TS	5350	INDIANA @ 138TH	CO RIVERDALE	T-1A	ON
37	TS	5450	LEHIGH AVE @ OAKTON	CO MORTON GROVE	T-1A	ON

38	TS	5455	LEHIGH AVE @ TOUHY AVE	CO NILES	T-1A	ON
39	TS	5670	COLFAX AVE @ QUENTIN RD	CO PALATINE	T-1A	ON
40	TS	5945	WOLF RD @ CAMP MCDONALD RD	CO MT PROSPECT	T-1A	ON
41	TS	6165	IL 19 IRVING PARK RD @ WALNUT AVE	DU ITASCA	T-1A	ON
42	TS	6405	IL 64 NORTH AVE @ ADDISON RD	DU VILLA PARK	T-1A	ON
43	TS	6530	US 14 NORTHWEST HWY @ KELSEY PLUM TREE RD	LA BARRINGTON HILLS	T-1A	ON
44	TS	6555	US 41 SKOKIE HWY @ IL 137 BUCKLEY	LA NORTH CHICAGO	T-1A	ON
45	TS	6565	US 41 SKOKIE HWY @ 22ND ST MLK KING DR	LA NORTH CHICAGO	T-1A	ON
46	TS	6575	US 41 @ OLD ELM RD	LA LAKE FOREST	T-1A	ON
47	TS	6585	US 41 @ WESTLEIGH RD	LA LAKE FOREST	T-1A	ON
48	TS	6625	US 45 LAKE @ IL 176 MAPLE	LA MUNDELEIN	T-1A	ON
49	TS	6655	US 45 @ DEERPATH RD	LA VERNON HILLS	T-1A	ON
50	TS	6718	IL 21 MILWAUKEE AVE @ N HOLLISTER CUNEO PROP S ENT	LA VERNON HILLS	T-1A	ON
51	TS	6735	IL 22 @ IL 43	LA BANNOCKBURN	T-1A	ON
52	TS	6830	IL 43 WAUKEGAN RD @	LA	T-1A	ON

			FOSTER AVE	LAKE BLUFF		
53	TS	6865	IL 60 TOWNE LINE RD @ BUTTERFIELD RD	LA	T-1A	ON
54	TS	6940	IL 83 @ IL 120 BELVIDERE RD	LA	T-1A	ON
55	TS	6970	IL 83 @ GRASS LAKE RD	LA	T-1A	ON
56	TS	6980	IL 83 IVANHOE RD @ IL 137 ANTIOCH RD	LA	T-1B	ON
57	TS	7090	IL 134 @ FAIRFIELD RD	LA	T-1A	ON
58	TS	7175	IL 137 BUCKLEY RD @ RAY ST	LA	T-1A	ON
59	TS	7223	US 12 @ WILMOT RD JOHNSBURG RD	MC	T-1A	ON
60	TS	7245	US 14 @ CARY RD WEST MAIN ST	MC	T-1A	ON
61	TS	7260	US 14 @ THREE OAKS RD	MC	T-1A	ON
62	TS	7330	IL 47 @ MAIN ST (IN HUNTLEY)	MC	T-1A	ON
63	TS	7435	US 30 LINCOLN HWY MAPLE ST @ CEDAR RD	WI	T-1A	ON
64	TS	7516	IL 171 STATE ST @ DIVISION ST	WI	T-1A	ON
65	TS	7517	IL 171 STATE ST @ IL 7 9TH ST	WI	T-1A	ON
66	TS	7518	IL 171 STATE ST @ 2ND ST	WI	T-1A	ON
67	TS	7519	IL 171 STATE ST @	WI	T-1A	ON

			10TH ST	LOCKPORT		
68	TS	7549	IL 171 STATE ST @	WI	T-1A	ON
			13TH METRA STATION	LOCKPORT		
69	TS	7645	IL 43 HARLEM AVE @	CO	T-1A	ON
			GRAND FULLERTON	ELMWOOD PARK		
70	TS	7947	IL 43 HARLEM AVE @	CO	T-1A	ON
			34TH ST STANLEY BURLINGTON	RIVERSIDE		
71	TS	9035	IL 19 IRVING PARK RD @	DU	T-1A	ON
			ROSELLE RD	ROSELLE		
72	TS	9040	IL 19 IRVING PARK RD @	DU	T-1A	ON
			PARK ST	ROSELLE		
73	TS	9125	NEW AVE @	WI	T-1A	ON
			135TH ST ROMEO RD	ROMEOVILLE		
74	TS	9235	BUSSE HWY @	CO	T-1A	ON
			GREENWOOD AVE	PARK RIDGE		
75	TS	9690	US 14 NORTHWEST HWY @	CO	T-1A	ON
			CENTRAL RD	MT PROSPECT		
76	TS	10670	IL 43 WAUKEGAN RD @	LA	T-1A	ON
			EVERETT RD	LAKE FOREST		
77	TS	10750	IL 7 SOUTHWEST HWY @	CO	T-1A	ON
			DUFFY	HOMETOWN		
78	TS	10975	BELMONT AVE PACIFIC AVE @	CO	T-1A	ON
			ROSE ST 25TH AVE	FRANKLIN PARK		
79	TS	11060	73RD @	CO	T-1A	ON
			GRAND AVE	ELMWOOD PARK		
80	TS	11141	IL 53 BALTIMORE RD @	WI	T-1A	ON
			STRIPMINE RD	WILMINGTON		
81	TS	11142	IL 53 @	WI	T-1A	ON
			COAL CITY RD	WILMINGTON		
82	TS	11355	MARGARET ST @	CO	T-1A	ON

			WILLIAMS ST	THORNTON		
83	TS	11360	WILLIAMS ST @	CO	T-1A	ON
			ELEANOR ST	THORNTON		
84	TS	11800	CERMAK RD 22ND ST @	CO	T-1A	ON
			1ST AVE CUT OFF	NORTH RIVERSIDE		
85	TS	11915	IL 120 ELM ST @	MC	T-1A	ON
			CRYSTAL LAKE AVE	MCHENRY		
86	TS	11945	US 12 @	LA	T-1A	ON
			STATE PARK RD EAST ST	FOX LAKE		
87	TS	11975	IL 25 RIVER RD @	KA	T-1A	ON
			IL 56 STATE ST	NORTH AURORA		
88	TS	11978	IL 25 BROADWAY @	KA	T-1A	ON
			INDIAN TRAIL	AURORA		
89	TS	12330	US 45 @	LA	T-1A	ON
			WINCHESTER RD	LIBERTYVILLE		
90	TS	12555	US 14 NORTHWEST HWY @	CO	T-1A	ON
			ARLINGTON HTS RD	ARLINGTON HEIGHTS		
91	TS	12660	US 14 NORTHWEST HWY DAVIS @	CO	T-1A	ON
			EUCLID AVE	ARLINGTON HEIGHTS		
92	TS	12665	US 14 NORTHWEST HWY @	CO	T-1A	ON
			MCKINLEY ARTHUR DAVIS	ARLINGTON HEIGHTS		
93	TS	12670	US 14 NORTHWEST HWY @	CO	T-1A	ON
			KENSINGTON RD DOUGLAS	ARLINGTON HEIGHTS		
94	TS	12675	US 14 NORTHWEST HWY @	CO	T-1A	ON
			EVERGREEN	ARLINGTON HEIGHTS		
95	TS	12680	US 14 NORTHWEST HWY @	CO	T-1A	ON
			DUNTON AVE	ARLINGTON HEIGHTS		
96	TS	12685	US 14 NORTHWEST HWY @	CO	T-1A	ON
			VAIL AVE	ARLINGTON HEIGHTS		
97	TS	12690	US 14 NORTHWEST HWY @	CO	T-1A	ON

			WALNUT AVE RIDGE AVE	ARLINGTON HEIGHTS		
98	TS	12770	IL 50 CICERO AVE @ 22ND ST CERMAK RD	CO CICERO	T-1A	ON
99	TS	12775	22ND ST CERMAK RD @ 49TH AVE	CO CICERO	T-1A	ON
100	TS	12780	22ND ST CERMAK RD @ 50TH AVE	CO CICERO	T-1A	ON
101	TS	12785	22ND ST CERMAK RD @ LARAMIE AVE	CO CICERO	T-1A	ON
102	TS	12790	22ND ST CERMAK RD @ 54TH AVE	CO CICERO	T-1A	ON
103	TS	12795	IL 50 CICERO AVE @ 16TH ST	CO CICERO	T-1A	ON
104	TS	13035	US 12 45 LEE ST @ US 14 MINER ST ELLENWOOD ST	CO DESPLAINES	T-1A	ON
105	TS	13040	US 14 MINER ST @ PEARSON ST	CO DESPLAINES	T-1A	ON
106	TS	13065	US 12 45 MANNHEIM RD @ PROSPECT AVE	CO DESPLAINES	T-1A	ON
107	TS	13075	US 14 MINER ST @ DESPLAINES RIVER RD	CO DESPLAINES	T-1A	ON
108	TS	13215	IL 31 STATE @ CHICAGO	KA ELGIN	T-1A	ON
109	TS	13225	IL 31 STATE @ WING	KA ELGIN	T-1A	ON
110	TS	13845	GREEN BAY RD @ KENILWORTH AVE PARK DR	CO KENILWORTH	T-1A	ON
111	TS	13905	US 12 20 45 LAGRANGE RD @ BURLINGTON AVE HILLGROVE	CO LAGRANGE	T-1A	ON
112	TS	14013	IL 21 MILWAUKEE AVE @	LA	T-1A	ON

			S ARTAIUS PKWY CUNEO N ENT	LIBERTYVILLE		
113	TS	14183	5TH AVE @	CO	T-1A	ON
			MAIN ST CHARLES	MAYWOOD		
114	TS	14290	IL 58 DEMPSTER ST @	CO	T-1A	ON
			LEHIGH AVE	MORTON GROVE		
115	TS	14725	PALATINE RD @	CO	T-1A	ON
			PLUM GROVE RD	PALATINE		
116	TS	15100	IL 19 IRVING PK RD @	DU	T-1A	ON
			WOOD DALE RD	WOOD DALE		
117	TS	11980	IL 25 @	KA	T-1B	ON
			GRANT ST	NORTH AURORA		
118	TS	20615	BRAINARD AVE @	CO	T-1A	ON
			HEGEWISCH METRA PARK LOT	BURNHAM		
119	TS	20979	US 30 @	WI	T-1A	ON
			127TH ST	PLAINFIELD		
120	TS	21085	IL 137 SHERIDAN RD @	LA	T-1A	ON
			22ND ST MLK KING DR	NORTH CHICAGO		
121	TS	21181	IL 22 HALF DAY RD @	LA	T-1A	ON
			MAIN ST PRARIE RD W JCT	PRAIRIE VIEW		
122	TS	21420	US 45 LAKE AVE @	LA	T-1A	ON
			DUNBAR RD UNIVERSITY DR	MUNDELEIN		
123	TS	21439	IL 53 @	WI	T-1A	ON
			HOFF RD	ELWOOD		
124	TS	21625	IL 134 @	LA	T-1A	ON
			HART RD	ROUND LAKE		
125	TS	21662	IL 137 @	LA	T-1A	ON
			CASEY RD MIDLOTHIAN RD	LIBERTYVILLE		
126	TS	452	US 30 LINCOLN HWY @	WI	T-1A	OFF
			GOUGAR RD	NEW LENOX		
127	TS	485	US 12 20 95TH ST @	CO	T-1A	OFF

			KEDZIE AVE	EVERGREEN PARK		
128	TS	1915	IL 7 SOUTHWEST HWY @ 143RD ST UNION AVE	CO	T-1A	OFF
129	TS	4700	US 14 NORTHWEST HWY @ HART RD	LA	T-1A	OFF
130	TS	7395	US 30 LINCOLN HWY @ I 80 EAST RAMP OLD HICKORY RD	WI	T-1A	OFF
131	TS	7465	US 30 LINCOLN HWY MAPLE ST @ VINE ST WEST NORTH JUNCTION	WI	T-1A	OFF
132	TS	9630	US 14 NORTHWEST HWY @ IL 83 ELMHURST RD MAIN ST	CO	T-1A	OFF
133	TS	9640	US 14 NORTHWEST HWY @ EMERSON ST	CO	T-1A	OFF
134	TS	11853	KEDZIE AVE @ 94TH AVE	CO	T-1A	OFF
135	TS	13055	US 12 45 GRACELAND JEFFERSON @ US 14 MINER ST	CO	T-1A	OFF
136	TS	13210	IL 31 STATE @ HIGHLAND	KA	T-1A	OFF
137	TS	13220	IL 31 STATE @ LAWRENCE AVE KIMBALL ST	KA	T-1A	OFF

SPECIAL LOCATIONS - VSL

1	V	HQ	IDOT HQ BLDG & TOWER @ 201 W CENTER CT - SCHAUMBURG	CO	V-1	ON
2	V	FIB	IDOT FIBER AND FIBER CABINETS @ DISTRICT 1 LOCATIONS	VA	V-1	ON
3	V	CIE1	SPECIAL FIBER CABINET @ I 80 @ IL 355	WI	V-1	ON
4	V	FOS	SPECIAL TOWER LOCATION @	CO	V-1	ON

			FOSTER TOWER			
5	V	TOLL	ILLINOIS TOLLWAY AUTHORITY @ ADMIN OFFICE & VARIOUS PLAZAS	VA	V-1	ON
6	V	UIC	UNIVERSITY OF ILLINOIS @ CIRCLE CAMPUS - CHICAGO	DU	V-1	ON
7	V	ISP	IL STATE POLICE DIST CHICAGO - ISP 3 @ 9511 W HARRISON ST - DESPLAINES	CO	V-1	ON
8	V	JRTC	ILLINOIS THOMPSON CENTER @ 100 W RANDOLPH ST CHICAGO	CO	V-1	ON
9	V	EMC	EMC DISPATCH CENTER @ TO BE DETERMINED	VA	V-1	ON

SOLAR SPEED SIGNS - SSS

1	V	1317	I 55 STEV NE @ I 294 TLWY NB EXT	CO	V-1	ON
2	V	1717	I 55 STEV NE @ ARSENAL RD EXT	WI	V-1	ON
3	V	5367	I 90 94 RYAN NB @ CERMAK RD EXT	CO	V-1	ON
4	V	9073	I 290 IKE EB @ NORTH AVE EXT	DU	V-1	ON
5	V	10058	IL 53 NB @ PALATINE RD EB EXT	CO	V-1	ON
6	V	10120	I 290 IL 53 NB A @ LAKE COOK EB EXT	CO	V-1	ON
7	V	10125	I 290 IL 53 NB B @ LAKE COOK WB EXT	CO	V-1	ON
8	V	15028	I 80 EB @ I 57 NB EXT	CO	V-1	ON
9	V	20058	IL 38 WB @ BRUSH HILL DR EXT	DU	V-1	ON
10	V	20087	I 94 EDENS SB @ IL 58 WB EXT	CO	V-1	ON

HIGHWAY ADVISORY RADIO - HAR

1	V	I190	I 190 IB @ I 294	CO	V-1	ON
2	V	I294	I 294 @ I 55 IB	CO	V-1	ON
3	V	IL394	IL 394 IB @ 186 ST	CO	V-1	ON
4	V	290A	I 290 IB @ ASHLAND AVE	CO	V-1	ON
5	V	290E	I 290 OB @ WESTCHESTER	DU	V-1	ON
6	V	290T	I 290 IB @ THORNDALE AVE	DU	V-1	ON
7	V	290W	I 290 @ WELLS ST	CO	V-1	ON
8	V	80E	I 80 EB @ LINCOLN OASIS	WI	V-1	ON
9	V	80W	I 80 WB @ COLUMBIA AVE JARNECKE	WI	V-1	ON
10	V	EDENS	I 94 IB @ TOWER RD	LA	V-1	ON
11	V	KENN	I 90 IB @ NAGEL AVE	CO	V-1	ON
12	V	RYAN	I 90 94 IB @ 159TH ST	CO	V-1	ON

RAMP ACCESS CONTROL (RACS)

1	V	C5	IL 38 RACS CAM C5 @ I 88 (EAST OF)	DU	V-1	ON
2	V	C6	IL 38 RACS CAM C6 @ I 88 (EAST OF)	DU	V-1	ON
3	V	C7	IL 38 RACS CAM C7 @	DU	V-1	ON

			I 294 (SOUTH OF)			
4	V	C8	IL 38 RACS CAM C8 @ HILLSIDE TOWER	DU	V-1	ON
5	V	G1	IL 38 RACS GATE G1 @ I 88 (EAST OF)	DU	V-1	ON
6	V	G2	IL 38 RACS GATE G2 @ I 88 (EAST OF)	DU	V-1	ON
7	V	G3	IL 38 RACS GATE G3 @ I 88 (EAST OF)	DU	V-1	ON
8	V	G4	IL 38 RACS GATE G4 @ I 88 (EAST OF)	DU	V-1	ON
9	V	G5	IL 38 RACS GATE G5 @ I 88 (EAST OF)	DU	V-1	ON
10	V	G6	IL 38 RACS GATE G6 @ I 88 (EAST OF)	DU	V-1	ON
11	V	G7	IL 38 RACS GATE G7 @ I 88 (EAST OF)	DU	V-1	ON
12	V	G8	IL 38 RACS GATE G8 @ I 88 (EAST OF)	DU	V-1	ON
13	V	G9	IL 38 RACS GATE G9 @ I 88 (EAST OF)	DU	V-1	ON
14	V	G10	IL 38 RACS GATE G10 @ I 88 (EAST OF)	DU	V-1	ON
15	V	R4	IL 38 RACS MESSAGE SIGN R4 @ I 88 (EAST OF)	DU	V-1	ON
16	V	V1	IL 38 RACS CHEVRON V1 @ I 88 (EAST OF)	DU	V-1	ON
17	V	V2	IL 38 RACS CHEVRON V2 @ I 88 (EAST OF)	DU	V-1	ON
18	V	V3	IL 38 RACS CHEVRON V3 @ I 88 (EAST OF)	DU	V-1	ON
19	V	V4	IL 38 RACS CHEVRON V4 @ I 88 (EAST OF)	DU	V-1	ON

20	V	V5	IL 38 RACS CHEVRON V5 @ I 88 (EAST OF)	DU	V-1	ON
21	V	V6	IL 38 RACS CHEVRON V6 @ I 88 (EAST OF)	DU	V-1	ON
22	V	HRB	HILLSIDE RACS BLDG @ IL 38 12100 W ROOSEVELT RD	DU	V-1	ON

PLANNED RACS - 8 LOCATIONS

1	V	AS1	IL 38 RACS AUX SIGN A1 I 88 (WEST OF)	DU	V-1	OFF
2	V	AS2	IL 38 RACS AUX SIGN AS2 I 88 (WEST OF)	DU	V-1	OFF
3	V	C1	IL 38 RACS CAM C1 YORK RD (WEST OF)	DU	V-1	OFF
4	V	C2	IL 38 RACS CAM C2 YORK RD (EAST OF)	DU	V-1	OFF
5	V	C3	IL 38 RACS CAM C3 YORK RD (EAST OF)	DU	V-1	OFF
6	V	C4	IL 38 RACS CAM C4 I 88 (EAST OF)	DU	V-1	OFF
7	V	R1	IL 38 RACS MESSAGE SIGN R1 YORK RD (WEST OF)	DU	V-1	OFF
8	V	R3	IL 38 RACS MESSAGE SIGN R3 I 88 (WEST OF)	DU	V-1	OFF

MATTESON UNDERPASS FLOOD WARNING SYSTEM - MFW

1	V	214V	MATTESON VIADUCT 214 GOVERNORS HWY & 214 ST	CO	V-1	ON
2	V	219V	MATTESON VIADUCT 219 GOVERNORS HWY & 219 ST	CO	V-1	ON

JOLIET MOVEABLE BRIDGES -JMB

1	V	BRAN	JOLIET MOVEABLE BRIDGE BRANDON ST	WI	V-1	ON
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2	V	RUBY	JOLIET MOVEABLE BRIDGE RUBY ST	WI	V-1	ON
3	V	JBO	JOLIET BRIDGE OFFICE 105 BRIDGE ST	WI	V-1	ON

PLANNED JOLIET MOVEABLE BRIDGES - JMB

1	V	CASS	JOLIET MOVEABLE BRIDGE CASS ST	WI	V-1	OFF
2	V	JACK	JOLIET MOVEABLE BRIDGE JACKSON ST	WI	V-1	OFF
3	V	JEFF	JOLIET MOVEABLE BRIDGE JEFFERSON ST	WI	V-1	OFF
4	V	MCDN	JOLIET MOVEABLE BRIDGE MCDONOUGH ST	WI	V-1	OFF

IDOT DISTRICT 1 MAINTENANCE YARDS - MYD

1	V	55Y	I 55 YARD @ 151 E SOUTH FRONTAGE RD	WI BOLINGBROOK	V-1	ON
2	V	57Y	I 57 YARD @ 16010 S CRAWFORD AVE	CO MARKHAM	V-1	ON
3	V	ALSY	ALSIP YARD @ 11801 S RIDGELAND AVE	CO ALSIP	V-1	ON
4	V	ARLY	ARLINGTON YARD @ 210 E NOYSE	CO ARLINGTON HTS	V-1	ON
5	V	BBY	BIRDS BRIDGE YARD @ I 55 & US 6 (22608 S FRONTAGE RD)	WI CHANNAHON	V-1	ON
6	V	BFY	BISHOP FORD YARD @ 16915 VAN DAM RD	CO SOUTH HOLLAND	V-1	ON
7	V	DRY	DAN RYAN YARD @ 6543 S WENTWORTH AVE	CO CHICAGO	V-1	ON
8	V	EDY	EDENS YARD @ 2 HAPP RD	CO NORTHFIELD	V-1	ON
9	V	GRAY	GRAYSLAKE YARD @ 219 N BARON BLVD	LA GRAYSLAKE	V-1	ON

10	V	GURY	GURNEE YARD @ 3516 W WASHINGTON ST	LA GURNEE	V-1	ON
11	V	HARY	HARVEY YARD @ 16738 S LATHROP AVE	CO HARVEY	V-1	ON
12	V	HILY	HILLSIDE YARD/BS @ EAST AVE & MAY ST	CO HILLSIDE	V-1	ON
13	V	IKEY	EISENHOWER YARD @ 5201 W FLOURNOY ST	CO CHICAGO	V-1	ON
14	V	JOLY	JOLIET YARD @ CATON FARM RD & IL 53	WI JOLIET	V-1	ON
15	V	KENY	KENNEDY YARD @ 5027 N CENTRAL AVE	CO CHICAGO	V-1	ON
16	V	LANY	LANDSCAPE YARD @ 1260 W AUGUSTA BLVD	CO CHICAGO	V-1	ON
17	V	NAPY	NAPERVILLE YARD @ 28 W 731 OGDEN AVE	DU NAPERVILLE	V-1	ON
18	V	NBY	NORTHBROOK YARD @ 1916 TECHNY RD	CO NORTHBROOK	V-1	ON
19	V	NLY	NEW LENOX YARD @ I 80 & US 30	WI NEW LENOX	V-1	ON
20	V	NSY	NORTHSIDE YARD @ 4051 N HARLEM AVE	CO CHICAGO	V-1	ON
21	V	OAKY	OAKBROOK YARD @ 17 W 125 BUTTERFIELD RD	DU OAKBROOK	V-1	ON
22	V	RODY	RODENBURG YARD LTG/COM-C @ 1480 RODENBURG RD	CO SCHAUMBURG	V-1	ON
23	V	STCY	ST CHARLES YARD @ 38 W 027 IL 38	KA ST. CHARLES	V-1	ON
24	V	STY	STEVENSON YARD @ JOLIET RD & 1ST AVE	CO MCCOOK	V-1	ON
25	V	WDY	WOODSTOCK YARD LTG @ 11916 CATALPA LANE	MC WOODSTOCK	V-1	ON

IDOT DISTRICT 1 WEIGH STATIONS - IWS

1	V	12WS	WEIGH STATION @ US 12 & BURLINGTON RD	MC RICHMOND	V-1	ON
2	V	14WS	WEIGH STATION @ US 14 & CROWLEY RD	MC HARVARD	V-1	ON
3	V	30WS	WEIGH STATION @ US 30 E OF TORRENCE	CO CHICAGO HEIGHTS	V-1	ON
4	V	83WS	WEIGH STATION @ IL 83 & ST CHARLES	DU ELMHURST	V-1	ON
5	V	41IBWS	WEIGH STATION @ US 41 IB	LA ROSECRANS	V-1	ON
6	V	41OBWS	WEIGH STATION @ US 41 OB	LA WADSWORTH	V-1	ON
7	V	55IBWS	WEIGH STATION @ I 55 IB W OF IL 53	WI BOLINGBROOK	V-1	ON
8	V	55OBWS	WEIGH STATION @ I 55 OB W OF IL 53	WI BOLINGBROOK	V-1	ON
9	V	57IBWS	WEIGH STATION @ I 57 IB N OF US 52	WI PEOTONE	V-1	ON
10	V	57OBWS	WEIGH STATION @ I 57 OB N OF US 52	WI PEOTONE	V-1	ON
11	V	80IBWS	WEIGH STATION @ I 80 IB E OF TOWNLINE T	WI FRANKFORT	V-1	ON
12	V	80OBWS	WEIGH STATION @ I 80 OB E OF TOWNLINE FRANKFORT	WI FRANKFORT	V-1	ON

IDOT DISTRICT 1 VARIOUS FACILITIES - FAC

1	V	ACS	ADDISON AVE COLD STORAGE @ US 12 20 MANNHEIM RD (UNDER)	CO ADDISON	V-1	ON
2	V	BBO	BIESTERFIELD BRIDGE OFFICE @ 1101 BIESTERFIELD RD	CO ELK GROVE	V-1	ON
3	V	DRO	DAN RYAN FIELD OFFICE	CO	V-1	ON

			DESPLAINES @ TAYLOR	CHICAGO		
4	V	ESS	ELGIN SIGN SHOP @ 595 S STATE ST	KA ELGIN	V-1	ON
5	V	ETP	ETP 3501 NORMAL AVE	CO CHICAGO	V-1	ON
6	V	FRB	FORMER RAMP BUILDING B I 90 94 KENN 1035 GRAND AVE	CO CHICAGO	V-1	ON
7	V	HRB	HILLSIDE RAMP BUILDING 12100 W ROOSEVELT RD	DU YORK TWNSP	V-1	ON
8	V	LZSS	LAKE ZURICH SIGN SHOP 700 S ELA RD	LA LAKE ZURICH	V-1	ON
9	V	MAT	DISTRICT 1 MATERIAL LAB 205 W. CENTER CT	CO SCHAUMBURG	V-1	ON
10	V	MSY	MONEE STORAGE IL 50 & US 6	WI MONEE	V-1	ON
11	V	NLSS	NEW LENOX SIGN SHOP I 80 & US 30	WI NEW LENOX	V-1	ON
12	V	NSSS	NORTH SIDE SIGN SHOP @ 7151 FOREST PRESERVE DR	CO CHICAGO	V-1	ON
13	V	SPS	SHALES PKWY STORAGE @ 525 SHALES PKWY	CO ELGIN	V-1	ON
14	V	SSSS	SOUTH SIDE SIGN SHOP @ 15940 PULASKI RD	CO CHICAGO	V-1	ON
15	V	57IBRA	PRAIRIEVIEW REST AREA @ I 57 IB @ PEOTONE	WI PEOTONE	V-1	ON
16	V	57OBRA	PRAIRIEVIEW REST AREA @ I 57 OB @ PEOTONE	WI PEOTONE	V-1	ON

REVISIONS TO THE ILLINOIS PREVAILING WAGE RATES

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at <http://www.state.il.us/agency/idol/> or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.