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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 “Illinois Manual on Uniform Traffic Control Devices for Streets and Highways,” and the “Manual of Test Procedures for Materials” in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of FAI Route 57 (I-57), Section D9 ITS SIGNING 2017-1, Williamson and Jefferson Counties, Contract No. 78337, and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

LOCATION OF PROJECT

This project is located near Mile Marker 88.6 on southbound FAI Route 57 (I-57) in Jefferson County and near Mile Marker 56.6 on northbound FAI Route 57 (I-57) in Williamson County, Illinois.

DESCRIPTION OF PROJECT

The proposed project consists of the construction of two Truss Mounted LED Dynamic Message Signs and Closed Circuit Television cameras along I-57. The proposed work includes installing the DMS boards, cameras, and trusses. Construction also includes construction layout, temporary erosion control, traffic control and protection, guardrail, seeding, and various other items required to complete the planned improvements.

WORKING DAYS

The Contractor will be allowed 3 months from the notice to proceed to acquire the ITS equipment and fabrication of the trusses. From that point on, the Contractor shall complete the work within 60 working days.

TRAFFIC CONTROL PLAN

Effective: 1985

Revised: 2/17/99

Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction, the guidelines contained in the National Manual of Uniform Traffic Control Devices for Streets and Highways, the Supplemental Specifications, these Special Provisions and any special details and highway standards contained herein and in the plans.

Special attention is called to Articles 107.09 and 107.14 and Section 701 of the Standard Specifications for Road and Bridge Construction and the following traffic control related (1) Highway Standards; (2) Supplemental Specifications and Recurring Special Provisions; (3) other Special Provisions; (4) Plan Details which are included in this contract:

1. Highway Standards:
701101, 701400, 701401, 701406, 701428, 701901
2. Supplemental Specifications and Recurring Special Provisions:
Work Zone Public Information Signs
3. Special Provisions:
Equipment Parking and Storage

Traffic control standards shall be applied as directed by the Engineer. Suggested applications for each standard are as follows:

701101 This standard should be used for work which is performed within 15', but not closer than 2' to the edge of the traffic lane of I-57.

701400 This standard should be used for work which requires a lane closure on I-57.

701401 This standard should be used for work which requires off peak lane closures. Off peak lane closures at Mt. Vernon, Illinois will be allowed from 9:00 pm to 6:00 am. The Contractor shall complete as much work as possible utilizing Standard 701101. The passing lane or driving lane may be closed at the Marion, Illinois location but two lanes must remain open at all times.

701406 This standard should be used for work which encroaches on the lane adjacent to a shoulder or on the shoulder within 2' of the edge of pavement on I-57 for day operations only. The Contractor shall complete as much work as possible utilizing Standard 701101. The passing lane or driving lane may be closed at the Marion, Illinois location but two lanes must remain open at all times

701428 This standard should be used for setup and removal of lane closures on I-57.

701901 This standard includes the traffic control device details.

During the entire construction period, the existing roads shall be kept open to traffic as follows:

- (a) In accordance with the applicable portions of the Standard Specifications.
- (b) The Contractor shall schedule and conduct his operations so as to insure the least obstruction to traffic, create a minimum of confusion to the public, and to conform to Article 107.09 of the Standard Specifications.
- (c) Access to all public roads and private entrances shall be maintained during all stages of the work unless otherwise shown.
- (d) Cones, drums or barricades shall be placed on the closed lane, not the open lane.
- (e) I-57 shall be kept open to two lanes of traffic to the greatest extent possible except when setting trusses when all lanes will be temporarily closed at night only.

If at any time the signs are in place but not applicable, they should be turned from the view of the motorists or covered as directed by the Engineer.

The cost of furnishing, erecting, maintaining, relocating and removing the required temporary signs shall be included in the contract.

UTILITIES

Effective 1984

Revised 1/2/97

Add the following after the first paragraph of Article 105.07 of the Standard Specifications:

Underground utilities have been plotted from available surveys and records and, therefore, their locations must be considered approximate only. There also may be utilities for which the locations are unknown. Verification of locations of underground utilities, shown or not shown, will be the responsibility of the Contractor. Utility companies that have facilities within the project limits which will require adjustment are shown on the Status of Utilities to be Adjusted in the plans.

Additional utility information may be obtained by calling the "Joint Utility Location Information for Excavators" phone number, 800-892-0123.

Add the following after the first paragraph of Article 107.31 of the Standard Specifications:

The Contractor is advised that this project includes areas of highway illumination and/or signalized intersections. These areas have underground cable or conduit throughout which is to remain in service. Before driving any posts or beginning any excavation operations, the Contractor shall locate, uncover by hand and relocate any wiring which conflicts with the proposed work. Any cable or conduit which is damaged as a result of the Contractor's operations shall be replaced by him at his expense. Replacement material and methods shall meet or exceed the original specifications for the wiring. Splicing will not be permitted.

Status of JULIE Member Utilities in the Area (I 57)

Name and Address of Utility	Type	Locations	Estimated Date Adjustment Completed
AmerenUE	Power	Jefferson County DMS Location	–
Southeastern Illinois Electric Coop 585 Highway 142 South Eldorado, IL 62930	Power	Williamson County DMS Location	–

The above represents the best information the Department has available and is only included for the convenience of the bidder. The applicable provisions of Section 102 and Articles 105.07, 107.20, 107.37, 107.39, 107.40, and 108.02 of the applicable edition of the Standard Specifications for Road and Bridge Construction shall apply.

TEMPORARY CLOSURE OF ALL LANES

In order to erect the sign trusses, the interstate must be closed to traffic. To minimize disruptions to traffic, temporary full road closures for truss erection operations are required to be performed at night only. The Contractor shall submit a plan to the Engineer for his approval in which the proposed means and methods for the removal and erection and the traffic control are thoroughly detailed.

The Contractor may employ the use of “rolling” roadway closures. These rolling closures shall consist of the pacing of traffic by the Illinois State Police to allow a window during which the Contractor may complete the above specified work without the interference of traffic on the interstate.

All entrance ramps to the interstate that would conflict with the rolling closure shall be temporarily closed prior to the beginning of each rolling closure until the line of traffic being paced on the interstate has passed the point of temporary closure.

The Contractor will be permitted to temporarily close all lanes to traffic on I-57 provided the following traffic control requirements are met:

1. Work will be permitted Monday through Thursday from 12:01 am to 5:00 am only, limited to periods less than 15 minutes, with a 1 hour interval or per the Engineer’s directive before a subsequent closure. Failure to comply with the maximum closure period shall be subject to Article 105.03 of the Standard Specifications, Traffic Control Deficiency Deduction.
2. A minimum of two (2) officers of the Illinois State Police will be required to provide assistance in pacing traffic on the interstate in Jefferson County, a minimum of three (3) officers will be required in Williamson County. The Illinois State Police shall also be used in the establishment of the temporary ramp closures within the zone of the rolling closures.
3. The Contractor will be allowed a maximum of four nights of closures.

The Contractor shall be required to contact the following offices two (2) weeks prior to the implementation of a rolling closure:

Illinois Department of Transportation
P.O. Box 100
Carbondale, IL 62903
(618) 549-2171

Illinois State Police, District 13
1391 S. Washington Street
Du Quion, IL 62832
(618) 542-2171

This item shall be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL), which will include the cost of any additional traffic control devices as required by the engineer in the completion of the work. The cost for the provision of the Illinois State Police Assistance shall be paid in accordance with Article 109.05 with no other compensation nor remuneration being made to complete this item of work.

Nighttime work zone lighting will be paid for at the contract lump sum price for NIGHTTIME WORK ZONE LIGHTING.

GRADING AND SHAPING FORESLOPES

Description: This work shall consist of grading and shaping foreslopes to the lines and dimensions shown on the plans, in an aesthetically pleasing manner as determined by the engineer. Topsoil shall be furnished and placed by the Contractor as needed to construct the fill areas to the variable depths as shown on the plans. This shall also cover grading and shaping any backslope areas to the lines and dimensions shown on the plans. Minimal excavation will be required for this work.

The Contractor will be required to provide approximately 400 cubic yards of topsoil for this work. This includes both locations. More or less topsoil may be required to match existing field conditions at each new truss location.

Topsoil provided by the Contractor shall meet the requirements of Section 211. Soil excavated for the footings may be used if the Engineer determines it is suitable and meets topsoil requirements found in Section 211.

Basis of Payment: Payment for this work shall be at the contract price per square yard for GRADING AND SHAPING FORESLOPES.

COOPERATION BETWEEN CONTRACTORS

The Contractor is to be aware that resurfacing projects (Contract: 78416 and 78440) may be in progress at the Jefferson County location concurrently with this work. The Contractor shall coordinate his/her work with the other Contractors to minimize any possible conflicts. The Contractor shall also notify the Engineer five (5) working days in advance of any work that may affect other adjacent contracts. In the event of any conflicts, the work on contracts 78416 and 78440 will take precedence over this contract.

TRAFFIC COUNTER - TIRTL

This work consists of furnishing and installing foundation, aggregate, weed barrier, structural components and traffic counter system components at the location shown on the plans, as directed by the Engineer, and as herein specified.

Generally, the traffic counter system is installed on break-away wide flange beam steel sign supports and foundations. For this project, the traffic counter components under this contract will be installed by IDOT forces from the Office of Planning and Programming Data Management Lab. The installed components will complete the Traffic Counter system as herein specified. All hardware, bolts, pipes and conduits necessary to install the components will be provided by IDOT.

The components to be furnished under this item are as follows:

- Data Collection System w/cables
- Wireless Modem
- Dual Band Cellular/PCS Antenna
- Cabinets
- Solar Panels
- Solar Charge Regulators
- Batteries
- Antenna and Modem Cables

Components to be furnished under this item shall conform to the following manufacturer's specification or approved equivalent:

COMPONENT

TIRTL ver. 3 Traffic Counter with Cellular Antenna and cable, and external modem cable.	Control Specialists, Inc.
TIRTL Cabinets w/ir lenses	Control Specialists, Inc.
External Battery Cabinet BBA1M w/#2 Police Lock	Ameresco
Sierra Wireless LS 300 EVDO Rev. A VZW	Brightstar U. S., Inc.
SunSaver Solar Controller SS-10L-12V	Morningstar Corp.
Lifeline GPL-U1T 12 Volt 33 AH absorbed electrolyte battery	Concord Battery
Lifeline GPL-24T 12 Volt 80 AH absorbed electrolyte battery	Concord Battery

The number of components necessary to complete each installation is shown on the plans. The components shall be delivered to the site and stored at a location directed by the Engineer. The counters, modem and cables shall be sent to the Data Management Lab to be tested and configured by IDOT personnel.

The wide flange beam break-away sign supports and foundation will be paid for separately and included for payment as STRUCTURAL STEEL SIGN SUPPORT – BREAKAWAY and as CONCRETE FOUNDATIONS as specified in Sections 727 and 734 of the Standard Specifications.

A 4" thick concrete pad shall be placed in the median area between the asphalt shoulders (if the counter system is not located at a turnaround) and from the edge of the asphalt shoulders to the location of the concrete foundation (20'-0" wide each foundation) as directed by the Engineer. The finished grade of the concrete pad must be no higher than the edge of shoulder elevation and shall follow the existing side slopes. This work shall be included in the cost of CONCRETE FOUNDATIONS which price shall include all labor, excavation, material and equipment necessary, and no additional compensation will be allowed.

Full manufacturer's specifications of the components to be furnished under this item shall be approved in writing prior to ordering of components. Warranty information shall be provided to the Engineer at the time of delivery of components.

Contact Information for the Office of Planning and Programming Data Management Lab is Mr. Ramon Taylor, 126 E. Ash Street, Springfield, IL, Phone 217 782-2065.

Furnishing of the components necessary to complete the traffic counter system will be paid for at the contract unit price each for TRAFFIC COUNTER and shall include all components necessary to complete each installation as herein specified.

TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN

GENERAL REQUIREMENTS

Equipment to be furnished at the dynamic message sign (DMS) field site shown in the plans shall include, but not be limited to the following:

CONTROLLER CABINET TYPE III, SPECIAL housed LED DMS controller, all necessary electronics and communications hardware for a fully functional LED DMS, all necessary power cables, data cables and pull rope between the sign and LED DMS controller, and required LED DMS mounting hardware.

The sign shall be designed for a minimum life of 20 years.

The DMS shall be compatible with the Department's existing Gigabit Ethernet over single-mode fiber network. It shall communicate without error for all of the applicable National Transportation for Intelligent Transportation System Protocol (NTCIP) standards for DMS and, thus, be compliant with all applicable NTCIP standards for DMS. The DMS shall be compatible with the Department's existing Advanced Traffic Management System (ATMS) software and shall support all mandatory objects of all mandatory conformance groups of NTCIP for DMS. All costs associated with compatibility testing and coordination will not be paid for separate, and shall be included in the cost of the DMS.

LED DYNAMIC MESSAGE SIGN (DMS)

The LED DMS shall enable the display of text, consisting of a string of alphanumeric and other characters. Each character shall be formed by a matrix of luminous pixels. A standard character shall consist of 35 pixels over 5 columns and 7 rows. Each LED DMS shall be minimum 27 pixel high x 125 pixel wide, full matrix and capable of displaying three lines of text using a standard 5 wide x 7 high font size. Each line shall be capable of displaying a minimum of 10 alphanumeric characters with 2 blank pixels spacing between each 5 x 7 character for maximum readability and a minimum of 14 alphanumeric characters with only one blank pixel between each character. All display elements and modules shall be solid state. No mechanical or electromechanical elements or shutters shall be used.

All characters, symbols, and digits shall be 18" nominal character size and shall be clearly visible and legible at a distance of 1100' within a minimum 30 degree cone of vision centered around the optical axis of the pixel.

The signs shall be capable of displaying the following:

- A static message
- A flashing message
- Alternating messages, either flashing or static

The changing from one message to another shall be instantaneous.

All field equipment shall remain fully functional over an ambient temperature range of -40° F to +149°F with relative humidity of up to 95%. All field equipment enclosures shall be designed to withstand the effects of sand, dust, and hose-directed water. All connections shall be watertight.

The size of the sign, along with other dimensions and configuration details of the sign covered by this specification, can be seen in Table 1.2 below:

TABLE 1.2: SPECIFIC SIGN DIMENSIONS / REQUIREMENTS	
Sign type:	Walk-in Access
Matrix type:	Full
Nominal character height:	18.0 inches
No. lines:	3
LED manufacturer/part number (if applicable):	Agilent(Avado) HLMP-EL30-STKDD or Agilent(Avado) HLMP-EL33
LED color/wavelength:	Amber / 592 nm
LED viewing angle:	30°
LED pixel brightness:	40 Cd @ 25mA
Display (H x W): Display Module (H x W):	27 x 125 minimum (full matrix) 7 x 5
Power Service:	120/240 +12/-23 VAC, 60 Hz, single phase; 40 amps/leg (2 legs required)
Power consumption range:	3 – 18 Amps (@120VAC)
Maximum Width:	30 feet, 8 inches
Maximum Height:	8 feet, 6 inches
Maximum Depth:	37 inches
Approximate weight range:	4000 – 5200 lbs
Sign Controller Location:	Ground-mounted

SUBMITTALS

The intent of this section is to summarize all the submittals required in the specifications. If a submittal is inadvertently omitted from this summary, but is included in another section of the specification, the DMS Manufacturer is still required to submit the information.

Submittal Description	Time Requirements	Department's Action
Experience	Include in Proposal	Review/Score
References	Include in Proposal	Review/Score
Factory Acceptance Test (FAT) procedures	After award and 60 days before test	Review/Approve or Reject
Factory Acceptance Test dates	After award and 30 days before test	Determine if a Rep. will attend
Factory Acceptance Test results	14 days after FAT	Review/Approve or Reject
Stand Alone Test (SAT) procedures	After award and 60 days before test	Review/Approve or Reject
Stand-Alone Test dates	After sign is installed	Determine if a Rep. will attend
Stand-Alone Test results	14 days after SAT	Review/Approve or Reject
System Test Procedures	After award and 60 days before test	Review/Approve or Reject
System Test dates	7 days before test	Determine if a Rep. will attend
System Test results	14 days after system test	Review/Approve or Reject
90 day test procedures	After award and 60 days before test	Review/Approve or Reject
NTCIP Testing	Prepare to have done for Short-listed Manufacturers	Perform test and score results
Shop Drawing Submittals	Within 15 days of award of contract	Review/Accept or Reject within 15 days of receipt
Sign Truss Details	Within 15 days of award of contract	Review/Accept or Reject within 15 days of receipt
Operator's Manuals	After installation and before final payment	Keep for future reference
Software Manuals	After installation and before final payment	Keep for future reference
Maintenance Manuals	After installation and before final payment	Keep for future reference
As-Builts	After installation and before final payment	Keep for future reference
DMS Weight (if over 5000 lbs) and size (if over spec amounts)	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt

DMS Housing Fascia	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of version of NTCIP Standards, compliance, etc.	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 1101	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 1201	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 1203	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 2001	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 2101	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 2102	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 2104	Within 15 days of award, part of Shop Drawing submittal	Review/Accept or Reject within 15 days of receipt
Declaration of compliance of NTCIP 2201	Within 15 days of award	Review/Accept or Reject within 15 days of receipt
Agenda for training session	30 days before training	Review and comment
Certification, Warranty and/or Guarantee	Upon final acceptance, or sooner	Keep on file

The DMS Manufacturer shall also submit any additional documentation not previously described, but required by specification and necessary to fully describe the DMS and associated equipment including complete technical information, photographs, instruction manuals, security provisions, etc.

The DMS Manufacturer will be required to complete the sign mounting bracket structural details and the sign mounting bracket structural calculations. The miscellaneous members and hardware shall be furnished by the DMS Manufacturer.

QUALIFICATIONS FOR THE DMS MANUFACTURER

The DMS Manufacturer shall submit the references as specified below. Reference data shall include current name and address of organization, and the current name and telephone number of an individual from the organization who can be contacted to verify system operation, as well as date of system installation.

EXPERIENCE REQUIREMENTS

The DMS Manufacturer shall submit at least two references, preferably from other state departments of transportation, that are successfully operating a highway LED full matrix DMS system, supplied by this manufacturer under the current corporate name, which otherwise meets this specification, for a period of no less than two years. The LED DMS systems submitted shall be full-matrix and able to display at least 3 lines of 25 characters per line, 18" characters and have walk-in access housings.

REFERENCES

The DMS Manufacturer shall submit three references, preferably from other state departments of transportation, that are successfully operating a multi-unit, multi-lane state or interstate highway, permanently-mounted, overhead dynamic message sign system supplied by this manufacturer under the current corporate name, for a period of no less than five years.

ISO 9001:2000 REQUIREMENTS

The company that designs and manufactures the LED DMS shall be currently ISO 9001:2000 certified as of the bid date for this project. The scope of this company's ISO 9001:2000 certification shall be for the manufacturing of Dynamic Message Sign Systems. The facility where this company actually designs and manufactures the LED DMS parts shall be ISO 9001:2000 certified. This company, this scope and the address of this facility shall all be listed on the ISO 9001:2000 certificate. This ISO 9001:2000 certificate shall be provided with the bid. The name, phone number and address of both the Authorized ISO 9001:2000 Registrar that certified this company and the Authorized ISO 9001:2000 Accreditation Body that accredited this Registrar shall be provided with the bid. ISO 9002 and ISO 9003 certifications are not adequate and do not meet this requirement. The Department will evaluate the company's submittals for quality assurance and determine if the quality control/quality assurance requirements are met.

MATERIAL REQUIREMENTS GENERAL

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.

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 commonalty. The equipment shall be designed for ease of maintenance. All component parts shall be readily accessible for inspection and maintenance. Test points shall be provided for checking essential voltages.

The sign shall be designed for a minimum life of 20 years.

The sign shall be designed and constructed so as to present a clean and neat appearance. Poor workmanship shall be cause for rejection of the sign.

All cables shall be securely clamped/tied in the sign housing. No adhesive attachments will be allowed.

The 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 DMS hardware, along with the sign controller hardware, software and firmware, shall support all DMS functionality described throughout the remaining specification sections.

The DMS assembly shall be listed by an accredited 3rd party testing organization for conformance to Underwriters Laboratories (UL) standards 48 (Standard for Electric Signs) and 1433 (Control Centers for Changing Message Signs). Proof of this conformance shall be provided with submittal materials.

ELECTRONIC MATERIALS AND COMPONENTS

All electronic components, except printed circuit boards, shall be commercially available, easily accessible, replaceable and individually removable using conventional electronics repair methods. All electronic assemblies shall meet or exceed IPC 610A workmanship standards.

PRINTED CIRCUIT BOARDS

Each pixel shall have a device attached to the printed circuit board (PCB) to hold and protect the LEDs. These devices shall:

1. Hold the LEDs perpendicular to the display modules within 0.5 degree,
2. Prevent the LEDs from being crushed or bent during handling,
3. Protect the LEDs from damage when the display module is laid on the front surface (the side that the LED lamps are located),
4. Not put any stress on the LEDs due to differentials of expansion and contraction between the device and the LEDs over the herein specified temperature range,
5. Not become loose or fall off during handling or due to vibrations,
6. Not block airflow over the leads of the LEDs,
7. Securely hold each LED while allowing a gap between the device and a minimum of 95% of the body of each LED for airflow,
8. Not block the light output of the LEDs at the required viewing angle,
9. Be black in color to maximize contrast.

The LEDs shall be protected from the outside environmental conditions, including moisture, snow, ice, wind, dust, dirt and UV rays.

Printed Circuit Board (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 minimum thickness 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 Printed Circuit Boards (PCBs), except for the power supply PCBs, UPS PCBs, modem PCBs and sign controller PCBs, shall be completely conformal coated with a silicone resin conformal coat.

All PCBs shall be finished with a solder mask and a component identifier silk screen.

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, aluminum or brass. All materials used in construction shall be resistant to fungus growth and moisture deterioration. Dissimilar metals shall be separated by an inert dielectric material without compromising any intended electrical grounding functions.

CAPACITORS

The DC and AC voltage ratings as well as the dissipation factor of a capacitor shall exceed the worst case design parameters of the circuitry by 50%.

A capacitor which can be damaged by shock or vibration shall be supported mechanically by a clamp or fastener.

Capacitor encasements shall be resistant to cracking, peeling and discoloration.

RESISTORS

Any resistor shall not be operated in excess of 50% of its power rating.

SEMICONDUCTOR DEVICES

All transistors, integrated circuits, and diodes shall be a standard type listed by EIA and clearly identifiable.

CONNECTORS

All PCB edge connectors and cable connectors, except for those found in the power supply, UPS, modem and sign controller, shall be base plated with nickel and finished with 30 micro-inches of gold.

MECHANICAL COMPONENTS

All external screws, nuts, and locking washers shall be stainless steel. No self-tapping external 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. Dissimilar metals shall be separated by an inert dielectric material.

DMS HOUSING

GENERAL CONSTRUCTION

The sign shall be designed and constructed so as to present a clean and neat appearance. Poor quality work shall be cause for rejection of the sign. The equipment within the sign housing shall be protected from moisture, dust, dirt and corrosion. The sign shall be constructed of aluminum alloy 3003-H14, 5052-H32, or an approved equal which shall not be less than 1/8 inch thick. Framing structural members shall be made of aluminum alloy 6061-T6, 6063-T5, or approved equal. Seams shall be continuously welded by an inert gas process. The sign shall be designed for a minimum life of 20 years.

The sign enclosures shall be capable of withstanding wind loadings of 120 mph without permanent deformation.

The performance of the signs 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 ambient magnetic 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.

WALK-IN HOUSING

Walk-in housing dimension shall not exceed 8'6" tall, 30'-8" wide, and 37" deep. The total weight added to the sign structure shall be no greater than 5200 pounds.

The walk-in housing dimensions and total weight shall be as shown in this specification or in the plans. The walk-in housing shall protect all internal components from rain, ice, dust, and corrosion in accordance with NEMA enclosure Type 3R standards as described in NEMA Standards Publication 2501997, Enclosures for Electrical Equipment (1000 Volts Maximum).

The sign housing shall be engineered and P.E. certified to 2001 AASHTO and NCHRP Report 411 specifications for AASHTO basic wind speeds. The sign housing shall also be engineered and P.E. certified to withstand group loading combinations as outlined in 2001 AASHTO including: sign weight, repair personnel and equipment, ice and wind loads, and shall also meet strength requirements for truck-induced gusts as specified in NCHRP Report 412. The sign housing shall be engineered to withstand snow loading (40 PSF) for applicable geographical regions.

Inside the sign housing, all 120 VAC service lines shall be independently protected by a thermomagnetic circuit breaker at the housing entry point. All 120 VAC wiring shall be located in conduit, pull boxes, raceways or control cabinets. No 120 VAC wiring shall be exposed to the inside or outside of the sign housing. The sign housing shall not be considered as a raceway or control cabinet.

EXTERIOR HOUSING PANEL

The exterior housing, door and end panels shall be 3003-H14, 5052-H32 or approved equal aluminum alloy sheet, 1/8 inch minimum thickness.

The number of seams in the top housing panel shall be kept to a minimum. All seams in the top housing panel shall be continuously welded.

All exterior seams and joints shall be continuously welded by an inert gas process.

The exterior housing panel material shall be stitch welded to the internal structural members to form a unitized structure.

INTERIOR STRUCTURE

The interior structural members shall be 6061-T6, 6063-T5, or approved equal aluminum alloy with 3/16 inch minimum wall thickness.

MOUNTING

The housing shall be designed to accommodate mounting on the rear vertical plane only.

The angular alignment of the sign housing shall be designed to optimize the viewing angle based on the sign location and lane configuration as shown in the plans.

HOUSING FACE

The internal structural members shall be extruded aluminum and shall accommodate both display module mounting and air distribution. They shall retain the display modules in a manner to facilitate easy and rapid removal of each display module without disturbing adjacent display modules.

The external fascia panels shall be extruded aluminum and shall be designed to keep heat conduction to a minimum between the exterior surfaces and the interior components. They shall incorporate provisions for retaining and sealing the modular lens panels and have a closed cell resilient gasket. They shall be finished with a matte black, KYNAR 500, or approved equal, and be removable from within the main sign housing. The external fascia perimeter panels shall be a minimum of 12" wide. The external fascia panels shall be thermally isolated from the rest of the sign housing. There shall be a minimum amount of metal contact between the external fascia panels and the rest of the sign housing.

The lens panel assembly shall be modular in design, interchangeable without misalignment of the lens panel and the LED pixels and removable from within the main sign housing.

The lens panel aluminum mask shall be 0.040" minimum thickness and panel interiors contain 0.236-inch-polycarbonate sheeting. It shall be perforated to provide an aperture for each pixel on the display modules. Each aperture shall be as small as possible, without blocking the LED light output at the required viewing angle.

The lens panel clear glazing shall be 90% UV opaque, non-breakable, polycarbonate GE LEXAN XL, ¼" minimum thickness and clear in color shall be laminated to the inside surface of the lens panel aluminum mask using an acrylic foam tape joining system, 3M Scotch VHB, or approved equal, to form the lens panel assembly.

SURFACE FINISH

The face shall be finished with a matte black, factory applied PVDF resin. All other exterior and all interior surfaces shall be a natural aluminum mill finish. No painted surfaces will be allowed.

ACCESSIBILITY

A three-point lockable aluminum access door shall be provided at each end of the housing as shown in the plans to enable easy access to the walk-in housing. This shall make it possible for a single maintenance person to easily access the display modules.

This access door shall be 2032 mm X 610 mm (6'-8" X 2'-0") minimum. The door shall be fitted with a handle operated locking mechanism, closed cell neoprene gasket and a stainless steel hinge.

The locking mechanism shall be a heavy-duty, industrial-strength, three-point, deadbolt, center-case lock with a zinc finish. There shall be a handle on both the inside and the outside of the door. These handles shall be heavy-duty, industrial-strength with a zinc finish on the inside handle and a chrome-plated finish on the outside handle. The outside handle shall be padlockable.

Included in the door assembly shall be a device to hold the door open at 90 degrees

INTERNAL WALKWAY

The sign housing shall have a continuous 455 mm (18-inch) wide walkway extending the full length of the sign. The walkway shall be made of 3 mm (1/8 inch) diamond tread 6061-J6 or 3003-H22 aluminum. All edges of the walkway grating must be finished to eliminate sharp edges or protrusions.

The sign housing shall be a minimum of 863 mm (2' 10") wide to allow adequate room inside the sign housing for maintenance personnel. There shall be 455 mm (18 inches) of clear area between all equipment along the entire length of the sign housing from the 455 mm (18-inch) walkway up to 1829 mm (6 feet) above the 455 mm (18-inch) walkway.

VENTILATION SYSTEM

The ventilation system shall be sufficiently cool both the display modules and the sign housing interior.

The sign housing shall have a minimum of two (2) exhaust ports. Each exhaust port shall be filtered and protected by an aluminum screened louver assembly, or other conformable method. The exhaust filters shall be sized for the required air volume.

The ventilation system shall have a minimum of two (2) blowers and shall exchange the DMS air volume to sufficiently cool the interior of the sign.

The filters shall be 1" thick, permanent, reusable, filters. These filters shall be easily removable from within the sign housing without the use of tools. Each sign shall include a complete set of replacement filters.

The internal housing temperature shall be automatically verified on command from the DMS Client software and existing IDOT ATMS software. Any over temperature condition shall cause an error message to be sent to the DMS Client software and existing IDOT ATMS software when the sign controller is polled.

The ventilation system shall be designed to keep the internal DMS air temperature from exceeding +140° F, even when the outdoor ambient temperature is as high as +115° F.

The ventilation system shall be activated by temperature sensors.

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 an error message shall be sent to the DMS Client software and existing ATMS software automatically. The DMS Client software, existing ATMS software and personnel on site with laptop computer at local control box position shall have the ability to read all temperature measurements from the sign controller. When the sign reaches a temperature of 130° F, it shall cut the LED intensity to half of its normal brightness to keep the sign from reaching the critical temperature and shutting down.

The temperature sensors shall have an accuracy of +/-3° F and a range from -40° F to +150° F.

The ventilation system shall be equipped with a manual override timer to provide ventilation for service personnel. The timer shall have a maximum "on" time of two (2) hours.

INTERNAL LIGHTING AND ELECTRICAL OUTLETS

The sign housing shall be furnished with four 100 watt incandescent lights with heavy duty fixtures. The lamps shall be spaced evenly above the walkway and shall be fitted with protective guards. The light switch shall be located near the door.

The sign housing shall be equipped with two 15 amp 120V (+/- 10%) grounded GFCI protected duplex electrical receptacles to accommodate inspection and maintenance requirements. One of these receptacles shall be located at each end of the sign housing. Additionally, the sign housing shall be equipped with sufficient and readily available power source in order to accommodate a fiber optic modem and all other necessary communications equipment required to transmit data from the sign to nearest controller cabinet with fiber optic communications for the backbone. The sign housing and display panel shall be designed to minimize any visible internal light from the outside of the DMS when the internal DMS lighting is on during nighttime maintenance activities.

ANTI-CONDENSATION/DEFOG/DEFROST

An effective, field-proven defogging and anti-condensation system shall be incorporated into the overall functionality of the sign. The face shall be heated to prevent fogging, frost and condensation.

A humidity sensor shall be provided and monitored by the sign controller from zero percent to 100 percent relative humidity in 1 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 heater 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.

BASE BOARD HEATERS

Baseboard heaters shall be included in the sign housing. These heaters shall be capable of remote start up in anticipation of winter field service.

LAPTOP SHELF

The interior of the sign shall include a fold-down shelf for a laptop computer.

DISPLAY MODULES

GENERAL

Display modules consisting of nominal 18" high characters shall be assembled to form the specified full matrix message configuration. These circuit boards shall be designed and constructed to allow a single service technician to troubleshoot, isolate, remove, and replace these boards with minimal impact to the overall operation of the sign.

All LED boards shall be fully interchangeable and not require any address switches or adjustment when interchanged or placed in service. Module addressing, where required, shall be accomplished in the connector. The DMS Manufacturer shall document all LED testing for color so that replacement LED boards shall match existing amber color.

Pixel status and diagnostics shall include string failure, pixel failure and failed pixel location (line, module, row and column numbers). Replacement of a complete display module shall be possible using only simple hand tools. Interconnection of modules shall be through connectors only. All connectors shall be keyed to preclude improper hookups.

The display modules shall be approximately $\frac{3}{4}$ " behind the lens panel assembly.

LED AND PIXEL CHARACTERISTICS

Each pixel shall be a maximum of 1-3/8" in diameter. The LEDs in each pixel shall be clustered to maximize long range visibility. The average light intensity of the LEDs in each pixel shall be 3 candela minimum. All pixels in the sign shall have equal color and on-axis intensity. All pixels shall have a minimum on-axis intensity of 40 candela @ 20 mA forward current, with an overbright capability of 60 cd.

All pixels in all signs in this project, including the spare parts, shall have equal color and on-axis intensity. The pixel strings shall be powered from a regulated DC power source and the LED current shall be maintained at the LED manufacturer's specified nominal operating current to maximize life of the pixel. The failure of an LED in one string within a pixel shall not affect the operation of any other string or pixel. Pixel power drawn from the DC supplies shall not exceed 1.5 W per pixel, including the driving circuitry.

The LEDs shall be individually mounted directly to a printed circuit board and shall be easily replaceable and individually removable using conventional electronics repair methods.

DISPLAY MODULE CHARACTERISTICS

All display modules shall be mechanically, electrically, and optically interchangeable within the sign. Each display module shall contain a connector for power and a connector for controls and data.

The display module contains the control and memory elements and provides the signals to switch the LED pixels. All LED boards and driver boards shall be fully interchangeable and shall not require any manual addressing switches or adjustment when interchanged or placed in service. The driver board shall contain the solid state electronics necessary to control pixel data and read pixel status. A diagnostic indicator shall be included on each daughter board to provide visual indication of the operational status of the LED module. LED drive circuitry supports a minimum refresh rate of 100 frames per second and is able to support 255 intensity levels.

These pixels shall be arranged uniformly, capable of displaying an 18" dot matrix character. All LEDs shall be individually and directly mounted to the LED circuit board to form the LED board. The LED board shall also hold the supporting control electronics and have an extruded aluminum frame. The display modules shall be mounted to the display face in a manner that facilitates easy and rapid removal of each display module without disturbing adjacent display modules. Replacement of a complete display module shall be possible without the use of any tools.

Failure of any LED in the pixel shall not affect the ability to control any other pixel and remaining LEDs in that pixel.

All LEDs shall be mounted so that their mechanical axis is normal $\pm 1.00^\circ$ to the face of the sign to ensure brightness uniformity over the face of the sign. The sign manufacturer shall propose a method, acceptable to the Engineer, to test the LEDs in the display modules to ensure they meet these criteria.

There shall be a power distribution system that connects each display module to all power supplies and minimizes the voltage drop over the face of the sign.

The LEDs shall be protected from the outside environmental conditions, including, but not limited to, moisture, snow, ice, wind, dust, dirt, and UV rays.

Pixel brightness shall be controlled by pulse width modulation of the DC current with an adjustable duty cycle of 2.0% to 99.9% in 0.5% or finer increments. The operational status of the LEDs in each pixel shall be tested and then transmitted to the DMS Client software, existing ATMS software, or laptop computer on site at local control box location. The pixel status test shall distinguish the difference between full-out, and fully stuck on pixels. A list of defective pixels shall be provided, listing x coordinate (from left hand edge of sign), y coordinate (measured down from the top of the sign) and the failure type (stuck on or stuck off) for each defective pixel. Pixels shall be arranged as such so that coordinate (1,1) is in the upper left corner and coordinate (125,27) is in the lower right corner.

The state of the LEDs (full on, or off) in each pixel of the sign shall be read by the sign controller when it is polled or when a message is downloaded from the DMS Client software, existing ATMS software, or laptop computer on site at local control box location, and shall allow the DMS Client software or laptop computer on site at local control box location show the actual message that is visibly displayed on the sign in a WYSIWYG format, including any full-out or fully stuck on pixels.

All printed circuit boards, except the LED circuit board, shall be conformal coated. The LED board shall be conformal coated except at the pixels. All printed circuit boards, including the LED circuit board, shall have a solder mask and a component identifier silk screen. The display modules shall be assembled in a full matrix configuration.

CHARACTERS DISPLAYED

The sign shall be capable of displaying ASCII characters 32 through 126 and the following characters at any location in the message line:

“A” thru “Z”- All upper case letters.

“0” thru “9”- All decimal digits.

Space (i.e., ASCII code 0x20).

Punctuation marks shown in brackets [. , ! ? - ‘ ’ “ ” / ()]

Special characters shown in brackets [# & * + < >]

3 pixel wide dash

The display modules shall be rectangular, and shall have an identical vertical and horizontal pitch between pixels. The pitch shall be no greater than $2\frac{3}{4}$ ”.

The separation between the last column of one display module and the first column of the next shall be equal to the horizontal distance between the columns of a single display module.

The characters shall be legible under all light conditions at a distance of 1100' within a 30° degree cone of vision centered around the optical axis of the pixel.

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 to the point where the pixels bloom, especially in low ambient light level conditions, as determined by the Department ITS Engineer, or those acting in his/her behalf.

The brightness and color of each pixel shall be uniform over the entire face of the sign within the fifteen degree cone of vision from 1100' to 200' 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 MATRIX

The DMS shall be a full-matrix configuration. A matrix with a minimum of 27 x 125 pixels must be supplied. The operator shall be able to display normal (5 x 7), compressed (4 X 7), expanded (6 X 7) or double stroke (7 X 7) character fonts. Font access privileges shall be assigned by the system supervisor.

LED DC POWER

Power to the LED display shall be provided by industrial-grade switching power supplies manufactured by Lambda (model number LZS1000) or a pre-approved equivalent. The power supplies shall have an efficiency of 75%. The voltage to the LED modules and associated electronics shall not exceed 25 VDC. The power supplies shall be redundant. The power supplies shall be paralleled in a Diode-OR configuration such that one supply may completely fail and the sign will still be supplied with enough power to run 50% of all pixels at 100% duty cycle at 149° F. Functioning supplies must current share to within 10%. The combined effect of line (95 to 135 VAC) and load (10% to 100%) on the power supplies be 80% greater at 120 VAC 50% to 100% of maximum load. The power supplies shall have a power factor of 0.95 or greater at 120 VAC from 50% to 100% of maximum load.

The power supplies shall be continuously monitored for proper operation by the sign controller. If the voltage drops below its nominal operating value, an error message shall be generated and transmitted to the DMS Client software, existing ATMS software, or laptop computer on site at local control box location automatically.

PHOTOELECTRIC SENSOR DEVICES

The sign shall incorporate a means of changing the brightness level provided by the LEDs automatically in response to ambient lighting conditions as detected by photo-electric sensors, and remotely in response to commands received from the central computer system. The photo-electric sensors shall be positioned to sense in three (3) directions. A minimum of sixteen (16) settings shall be used to control the brightness level. The lowest settings shall be for night use. The highest settings shall be for over bright control. The middle settings shall be for normal day time use allowing for variable light levels. Photo-electric sensors shall be provided integral to the DMS. These devices shall direct the sign controller unit to modify the intensity of the light produced by the pixel elements. The mounting devices for the photo-electric sensors shall allow full adjustment of the sensor orientation. The photo-electric sensors shall be located such that they are easily accessible for maintenance.

ENVIRONMENTAL BEHAVIOR

The signs shall be capable of operating without any decrease in performance over an ambient temperature range of -40° F to +149° F with a relative humidity of up to 95%.

MAIN POWER SUPPLY AND ENERGY DISTRIBUTION

The sign and its controller shall be designed for use on the following:

Power line Voltage – 120/240 VAC Nominal, single-phase power, 40 amperes per leg – the system shall operate within a voltage range of 95VAC to 135VAC.

Frequency – 60Hz +/- 3Hz

Under normal operation, the drop in voltage between no load and full load of the sign and its controller shall not exceed 10% of the nominal voltage. The system shall be protected by transient suppression devices including, MOVs, RIS and spark gap arrestor.

The system shall report any power failures to the main controller when system power returns.

Power protection shall be provided by a thermal magnetic circuit breaker associated with a 5 mA ground fault circuit interruption (GFI) device. A GFI device shall protect all service outlets.

The sign shall have a 40 A two-pole (common trip) main, 120/240 VAC, single phase, four wire load center with 20 circuit capability. Each circuit in the sign shall be powered from a separate circuit breaker. The power cables shall be as required by the NEC for acceptable voltage drop to supply AC power to the sign. The power required for sign operation shall not exceed 7000 watts for the sign housing to include fans, heaters, sign controller, communication equipment and all pixels illuminated at 100% brightness.

SURGE PROTECTION

The system power shall be protected by two (2) stages of transient voltage suppression devices including MOVs and spark gap arrestor. 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 dialup 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 both stages 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 both stages of surge protection are tripped. Communication lines shall be protected by two (2) stages of transient voltage suppression devices including MOVs and spark gap arrestor. 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 dialup 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 both stages 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 both stages of surge protection are tripped.

UNINTERRUPTIBLE POWER SUPPLY (UPS)

A UPS shall be provided to allow the sign controller to notify the DMS Client software or existing ATMS software (if available) when an improper power condition at the DMS persists for longer than a user selectable "short power loss time".

The UPS shall meet the following minimum specifications:

1. Line Transient Protection: Passes ANSI/IEEE C.62.41/C.62.45 Cat A&B
2. Safety Compliance: Satisfies US / CSA En50091-1 regulations.
3. Capacity: Must be able to operate controller & modem for 10 minutes
4. Voltage Nominal: 120VAC
5. Voltage Range: 92-135 VAC
6. Transfer time: <150 ms typical
7. Battery: Sealed, maintenance-free lead acid
8. Battery recharge time: 2-8 hours; must be temperature-compensated
9. Over current protection:
 - a. UPS automatic shutdown if overload exceeds 110% of nominal for 3 minutes.
 - b. Communications:
 - c. RS-232 Interface (monitor, control and calibrate), DB-9 connection
10. Front panel display indicators: Fault, Test, Low Battery, On Battery, On Line
11. Operating temperature range: -37°C to +74°C

(NOTE: The UPS shall be mounted and operated in a manner to meet the temperature range requirements of the DMS as outlined in Section 2.5 (-40°C to 74°C (-40°F to 165°F) with a relative humidity of up to 100% condensing).

SIGN CONTROLLER UNIT (SCU)

The sign controller shall include a minimum of two 2 serial communications I/O ports; one (1) RS-232, one (1) RS-485; one (1) Ethernet port and one (1) fiber optic communications port (or fully tested compatible serial to fiber device).

The sign controller shall be programmed to receive NTCIP-compliant sign control commands from the central controller (DMS client software or existing ATMS) or laptop computer, transmit NTCIP-compliant responses as requested to the central controller (DMS client software or existing ATMS) or laptop computer, monitor sign and message status and control sign operation and message displays.

The controller will have power-up and auto-restart capabilities with a programmable default message (including a blank message) when recovering from a power off condition. A hardware watch dog circuit will be utilized to provide automatic reset to the controller and the modem. The DMS client software and existing ATMS software (if applicable) shall be capable of remotely commanding a controller and modem reset.

The sign controller shall be capable of being controlled from the Departments existing DMS control software, Skyline NTCIP Version 1.15, existing ATMS developed by the Delcan Corporation or the laptop computer. The DMS and sign controller functionality must be in compliance with all mandatory NTCIP objects for DMS. All integration necessary with the Delcan Corporation software for complete NTCIP compliance and functionality as described within this document shall be included in the cost of this contract.

GENERAL

The sign controller shall be programmed to receive sign control commands from the master controller, transmit responses as requested to the master controller and control sign operation and message displays.

The sign controller shall be able to receive and send messages and data via IEEE 802.3 (Ethernet), fiber optic modem, and cellular CDPD, CDMA or GSM/GPRS. Transmission speed shall be a minimum of 9.6 kbps. A test pattern shall be provided in the DMS controller.

The sign controller shall be designed for fail-safe prevention of improper information display in the case of a system malfunction. Failure of any sign shall not affect operation of any other sign in the system. The sign controller shall consist, but not be limited to, the following:

Local control panel status indicators, including:

1. power on/off
2. communication status with the electronics in the walk-in housing
3. sign display power supply status
4. controller address
5. Power supply module
6. Central processor module
7. Input/output circuits

The sign controller shall have power-up and auto-restart capabilities with automatic sign blanking when recovering from a power-off condition. A watch-dog circuit shall be utilized to provide automatic shut down of the sign in the event of power or sign controller failure.

Connections from the controller shall be accomplished via industry standard, keyed type connectors with a retaining mechanism.

DISPLAY SYSTEM HARDWARE

The sign controller shall communicate with the display modules via the system interface circuit consisting of data bus drivers and line address decoders. Communication and control lines between the sign controller and the system interface circuits shall be surge protected.

GROUND MOUNTED CABINET

A weatherproof roadside cabinet shall be furnished and installed at each dynamic message sign location. The cabinet shall be designed to meet all applicable requirements of Section 1074 of the Standard Specifications, except as modified herein. The cabinet shall utilize EIA-standard 19-inch racks and be designed with front and rear lockable access doors. The cabinet doors shall include permanent, fixed position non-corrosive handles. The cabinet shall be sized to accommodate the TMDMS Sign Controller and communications equipment, including fiber optic transceivers, fiber terminations and distribution, environmental filters and control equipment. All equipment shall be side-panel or rack mounted. Final design of the cabinet including sizing and equipment layout shall be done by the Contractor. Shop drawings for the cabinet and equipment layout shall be submitted to the Department for review and acceptance before any fabrication is started.

The following shall be mounted inside the ground mounted cabinet housing:

1. Sign controller
2. Fiber optic modem/Ethernet to fiber modem
3. IEEE 802.11b wireless access point for remote communication to sign controller from ground4. elevation
4. Display system interface circuits
5. Display modules
6. Power supplies
7. Local/remote control switch and LED indicator
8. RS-232 (or Ethernet) plug-in connection for the laptop computer
9. S-232 cable (or CAT 5 Ethernet cable) a minimum of 4' long to connect the laptop computer to the sign controller
10. Uninterruptible power supply
11. A foldout and or hinged aluminum work surface to fully support a portable computer or technician's tool case shall be installed at an ergonomically correct height for a technician 5 feet 10 inches tall. The foldout surface shall be mounted inside the front access door and shall be flat and sturdy when folded out with a portable computer placed on the surface. The foldout surface shall be secured with appropriate hardware against the inside of the front access door when not in use.
12. Communication equipment and transient voltage surge suppressors (TVSS)

LAPTOP COMPUTER

The TMDMS manufacturer shall furnish a laptop computer to operate the TMDMS either at the Department District 9 Facilities or remotely at the controller. The laptop shall include the following:

- A. 4th Gen Intel Core i5 processor (minimum 2.5GHz base freq, 3MB cache)
- B. DDR3L-1600 2x8GB system memory
- C. 750GB (min) SSD hard drive with 1GB (min) DRAM cache memory
- D. 15.6 inch screen
- E. Intel HD 4600 graphics (internal)
- F. DVD-RW/Blu-Ray burner drive (internal) with burning software
- G. IEEE 802.11ac WLAN plus Bluetooth
- H. Webcam (built-in)
- I. HDMI video output port
- J. Video output port capable of providing connection to a 15 pin video peripheral either through a 15 pin port or adapter
- K. USB 3.0 port
- L. Memory card reader
- M. Wireless Mouse
- N. Windows 7 Enterprise 64-bit OS
- O. 2 year extended warranty (parts and labor)

This work will not be paid for separately, but shall be included in the contract bid price for TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN.

SIGN CONTROLLER COMMUNICATION INTERFACE

The sign controller shall be able to communicate with the DMS Client software, existing ATMS software, or laptop computer on site at local control box location using event-driven operation. Upon any status changes initiated either remotely or locally to the DMS controller, controller shall automatically update the DMS Client software and existing ATMS software. It shall be possible for a maintenance technician to connect a laptop computer to the remote control port, either from ground level outside the sign at the local control box, or from within the sign's walk-in housing, and carry out all operations that could be carried out by the central computer. Connection of a laptop without disconnecting the sign controller shall be accomplished with additional control ports. The sign and sign controller shall also be capable of remote communication access via IEEE 802.11b from existing Department laptops for remote control, programming and diagnostics. The sign manufacturer shall test and ensure compatibility with the existing IEEE 802.11b communications cards installed in two Department laptops. The sign manufacturer shall set up and configure appropriate security measures for all IEEE 802.11b hardware provided to ensure a secure network.

The DMS Manufacturer shall provide all required modems. The DMS equipment shall be able to support connection to Department's nearest single-mode fiber optic communications backbone controller cabinet location for remote control, programming and diagnostics by way of Ethernet over fiber optic cable.

For Ethernet operations, each controller shall be assigned a unique controller ID, a 4 bit IP Network Address determined by working with the Department to ensure the address is consistent with the established IP system. The IP address shall also be used to ensure that SNMP Trap messages are able to identify the originating sign.

SIGN CONTROLLER FUNCTIONS

The sign controller shall be controlled from the DMS client software, existing ATMS software or the laptop computer, which shall specify the appropriate display. The sign controller and its software shall perform the following functions:

1. Display a message, including:
2. Static messages
3. Flashing messages
4. Alternating messages
5. Double brush stroke messages for maximum legibility
6. Full-Matrix type displays

It shall be possible to separately vary the flashing and alternating frequency. The flashing frequency shall vary between one-half and five seconds in one tenth second increments. The alternating frequency shall vary between one-half and five seconds in one-tenth second increments.

It shall be possible to flash any character or set of characters in a static or alternating message. In the case of alternating message, the flashing period shall be a submultiple of the alternating on time it is associated with.

Report errors and failures, including:

- Data transmission error
- Receipt of invalid data
- Communications failure recovery
- AC power failure
- Power recovery
- Pixel status
- Fan status
- Temperature status
- Power Supply status

The sign controller shall issue an SNMP trap under the following conditions:

Power Supply Failure – when the AC power supply at a DMS has failed.

Power Restoration - whenever it detects restoration of AC power at the sign controller.

Temperature Limit – Whenever internal DMS temperature initially exceeds a programmed safety limit. A new trap will not be issued until the temperature once again falls below the safety limit and then exceeds it.

Door Open – Whenever the door of the DMS housing or the door of the controller cabinet is opened.

Message and status monitoring:

The sign controller shall transmit a return message to the DMS client software and existing ATMS software whenever it receives a valid request for status. The return message shall contain the following:

- Address of the sign controller
- Actual message that is visibly displayed on the sign on an individual pixel basis
- Current sign illumination level
- Error and failure reports
- Temperature readings
- Power supply operational status
- Origin of display message transmission (laptop, manual, central, etc)
- Beacon status (for possible future enhancement)
- Uninterruptible power supply status

The sign controller shall blank any message displayed in the event of power or sign controller failure. Also, in the event of power failure the sign controller shall immediately access the modems and notify the master controller of AC failure.

The sign shall normally display single stroke (5 X 7) characters, compressed (4 X 7), expanded (6 X 7) or double-stroke (7 X 7) character fonts. Each font shall be fully customizable, and modifications to a font may be downloaded to the sign controller from the DMS client software and existing ATMS software or laptop computer at any time without any software or hardware modifications. The sign shall be capable of displaying a different font and character spacing on each line.

The sign controller shall monitor the photo cell circuits in the sign and convert the measured light intensity into the desired pixel brightness. The photo circuit readings shall be correlated with a brightness table in the sign controller. The brightness table shall have a minimum of 255 brightness levels. Automatic adjustment of the LED driving waveform duty cycle shall occur in small enough increments so that brightness of the sign changes smoothly, with no perceivable brightness change between adjacent levels. The brightness levels shall be adjustable from the DMS client software.

The operational status of each pixel in the sign shall be automatically tested once a day and tested when a pixel test is required from the DMS client software and existing ATMS software or laptop computer. A list of defective pixels shall then be transmitted to the DMS client software and existing ATMS software or laptop computer and logged into the log file, listing pixel status, module number, column number and pixel number. This pixel status test shall distinguish the difference between full out 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 a message is downloaded from the DMS client software and existing ATMS software or laptop computer, each pixel in the sign shall be read and its current state for the current displayed message, and shall be returned to the DMS client software and existing ATMS software to show either on a laptop computer or the controller itself, the actual message that is visibly displayed on the sign on an individual pixel basis in a WYSIWYG format.

The operational status of the fans shall have the ability to be automatically tested once a day and tested on command from the DMS client software and existing ATMS software or laptop computer. Any failure shall cause an error message to be sent to the DMS client software, existing ATMS software or laptop computer when the sign controller is polled by the DMS client software, existing ATMS software or laptop computer.

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 an error message shall be sent to the DMS client software and existing ATMS software or laptop computer when the sign controller is polled by the DMS client software, existing ATMS software or laptop computer. This user selectable critical temperature shall be capable of being changed by the DMS client software, existing ATMS software (if available) or laptop computer. The DMS client software and existing ATMS software (if available) and laptop computers shall have the ability to read all temperature measurements from the sign controller. When the sign reaches an internal temperature of 130° F, it shall cut the LED intensity to half of its normal brightness to keep the sign from reaching the critical temperature and shutting down.

When the display time of a message has expired, the controller shall set the sign to neutral. A sign is considered to be neutral when the sign is blank.

In the event of a communications failure with the DMS client software or existing ATMS software, the sign controller shall set the sign to neutral after a user-defined number of minutes (1 to 60) unless communications have been restored within this period. This function shall apply only when the sign controller is in the Master Control mode.

All LED module power supplies shall be continuously monitored by the sign controller. A low voltage reading shall cause an error message to be sent to the DMS client software, existing ATMS software or laptop computer when the sign controller is polled by the DMS client software, existing ATMS software or laptop computer.

There shall be no perceivable flicker or ghosting of the pixels during sign erasure and writing periods.

Message additions, deletions and changes in the sign controller shall be made from either the DMS client software, existing ATMS software or the laptop computer.

In the event of an AC power loss, all non-volatile memory shall be retained for a minimum of 30 days. AC power failure shall cause the sign controller to notify the DMS client software and existing ATMS software and display an error message on the DMS client software and existing ATMS software CRT. For cellular operation, the sign controller shall immediately access the modem to notify the DMS client software and existing ATMS of the AC power failure.

Failure of any sign shall not affect the operation of any other sign in the system.

The sign controller internal time clock shall ensure that a message is taken down at the correct time, even in the event of communications loss.

The sign controller shall maintain its internal clock during power outages of less than 4 hours and display the proper message when power is restored.

The sign controller shall be able to put a self-updating time, temperature and/or date display on the sign.

MODES OF OPERATION

The mode of operation shall determine which level of control governs the DMS message selection. These two modes can change be an automatic function of the DMS system and controller. The two modes of operation shall be:

Master- the DMS Master Controller (the DMS client software or existing IDOT ATMS software) determines the appropriate message or test pattern.

Local - the sign controller keypad or laptop computer is used to determine the appropriate message or test pattern.

SAFETY OF OPERATION

All DMS Equipment shall meet all of the requirements in Section 3.2.4 "Power Interruption" of the National Electrical Manufacturers Association (NEMA) Standard TSI for Traffic Control Systems.

All DMS Equipment shall meet all of the requirements in Section 2.1.6 "Transients, Power Service" of NEMA Standard TS1.

In the event of a communications failure with the DMS client software or existing IDOT ATMS software, the sign controller shall set the sign to neutral after a defined number of minutes, unless communications have been restored within this period (whatever the remaining display time).

The function described above shall apply only when the sign controller is in the Master Controller Mode.

DESCRIPTION OF THE VARIOUS COMMANDS

As a minimum, the following commands shall be available at the sign controller:

1. Display command from the DMS client software and existing ATMS (Master Control Mode).
2. Display command from the laptop computer (Local Control Mode).
3. Sign Status request - This command shall provide a report concerning the:
 - a. Sign appearance (lit, blank or neutral)
 - b. Status of pixel, fan, temperature and power supply
 - c. Mode of the displayed message (local/master)
 - d. Status of the photoelectric sensors
 - e. Light output level (minimum of 255 user defined levels)
 - f. Sign number, location, or ID
4. Pixel status request - This command shall provide a current indication of the status of all the pixels.
5. Light output switching command (minimum of 255 user defined levels)
6. "Blank sign" command
7. Sign off command (set to neutral state)
8. Echo command - This command shall provide a report concerning the message currently displayed by the controller (pixels on, display parameters, remaining display time, font used, character spacing).
9. Any commands/functions detailed elsewhere in this specification.

SIGN TO SIGN CONTROLLER CABINET INTERCONNECTION

Cables and pull rope between the sign and CONTROLLER CABINET TYPE III, SPECIAL shall be provided for operation of the sign. These cables shall terminate using CHAMP IDC type connectors. Power and signal cables shall be in separate conduits.

DMS REPLACEMENT PART ALLOWANCE

A total allowance of \$10,000 shall be included in the material cost of replacement parts for the DMS on this contract. The Contractor shall submit a list of recommended replacement parts with associated unit costs and quantity within 90 days after award.

The Contractor shall allow in the contract bid the allocated allowance amount as described above, and said amount shall be included under this Special Provision. The amount stated above is for material only. No other related costs associated with the purchase, delivery, and other related overhead costs shall be included in the above amount. The material and overhead costs associated with this item shall be included in the pay item TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN.

TECHNICAL ASSISTANCE

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

1. Sign to structure installation
2. Controller cabinet installation
3. Sign housing to ground control cabinet cable termination
4. Initial sign turn on and stand alone test

The initial powering up of the sign(s) shall not be executed without the permission of the DMS manufacturer's technical representative.

Special or proprietary cables shall be provided by the DMS Manufacturer to the installation Contractor.

TESTING REQUIREMENTS

The Department has the right to require performance testing of materials and equipment not previously tested and approved. If technical data are not considered adequate for approval, samples may be requested for testing.

The DMS Manufacturer shall provide five (5) copies of all factory acceptance tests, stand-alone, system test and 90 day test procedures and data forms for the Department's approval at least 60 calendar 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 Department's approval prior to submission of equipment for tests.

The DMS Manufacturer shall perform the factory acceptance tests, stand-alone and system test. The DMS Manufacturer 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 (1) copy of the data forms shall be sent to the Department within 14 days of the test's conclusion.

The Department reserves the right to have a representative to witness 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 Department. Rejected equipment may be offered again for a retest, provided that all non-compliances have been corrected and retested by the DMS Manufacturer and evidence thereof submitted to the Department.

Each of the tests on all or one type of equipment must be completed within five (5) working days of each other. Any delays in performing all these tests may result in the DMS Manufacturer paying the additional costs of providing the Department's representatives for the additional testing time.

Final inspection and acceptance of equipment shall be made after installation at the designated location as shown on the installation plans.

The DMS Manufacturer shall be responsible for providing the test fixtures and test instruments for all the tests.

The Stand-Alone and System Tests are separate tests, however, they may be performed by the DMS Manufacturer during the same visit.

Consequences of Test Failures: If any unit fails to pass its 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 test failure, a report shall be prepared and delivered to the Department 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 Department may direct that design and construction modifications be made to all units at no additional cost or extension of the contract period.

FACTORY ACCEPTANCE TESTS (FAT)

The DMS Manufacturer shall be responsible for conducting demonstration tests on all units at a DMS's Manufacturer's facility. These tests shall be performed on each unit supplied. The Department shall be notified a minimum of 30 calendar days before the start of tests. At a minimum, all equipment shall have passed the following individual tests:

EXAMINATION OF PRODUCT

Each DMS unit shall be examined carefully to verify that the materials, design, construction, markings and quality of work comply with the requirements of these project specifications.

CONTINUITY TESTS

The wiring shall be checked to determine conformance with the requirements of the appropriate paragraphs in these project specifications.

OPERATIONAL TEST

Each DMS unit 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 these project specifications.

NTCIP TEST

A NTCIP test shall be performed at the DMS Manufacturer's facility. The Department may elect to perform and/or witness this test. The specifics of this FAT shall be proposed by the DMS Manufacturer to the Department for approval. The Department encourages the DMS Manufacturer to use the testing methods as described herein, but understands your company may not have the license to test the described software.

STAND-ALONE TESTS

The DMS Manufacturer 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 contract documents.

Approved data forms shall be completed and turned over to the Department as the basis for review and rejection or acceptance. At least 30 working days notice shall be given prior to all tests to permit the Department to observe each test.

SYSTEM TESTS

The DMS provided shall be compatible with the Department's existing Advanced Traffic Management System (ATMS) software. The DMS Manufacturer shall provide the latest version of Skyline Products NTCIP DMS Client and Server software. The Department currently uses Skyline Products NTCIP DMS Version 1.15.00. The DMS shall also be compatible with the latest version of Skyline Products NTCIP DMS Client and Server software. All costs associated with compatibility testing and coordination with the Department's existing ATMS vendor, Delcan Corporation and existing DMS vendor's client/server software, Skyline Products, will not be paid for separate and shall be included in the cost of the DMS.

The DMS Manufacturer shall conduct approved DMS system tests on the field equipment with the DMS manufacturer's software and the Department's existing Advanced Traffic Management System software and equipment for comparison. The Department shall be notified a minimum of seven (7) calendar days before the start of tests. The tests shall, as a minimum, exercise all remote control functions and display the return status codes from the controller and all standard mandatory NTCIP functions for a minimum of 72 hours. Approved data forms for both the DMS manufacturer's software and Department's existing ATMS software shall be completed and turned over to the Department as the basis for review and for rejection or acceptance.

72 HOURS AND 90 DAYS TEST

After the installation of the DMS system is completed and the successful completion of the System Test, the DMS system shall be subjected to one continuous 72-hour full operating test prior to a 90 day test period. The test shall consist primarily of exercising all control, monitor and communications functions of the field equipment by the central equipment.

The 90 days 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 days test period, downtime, due to mechanical, electrical and/or other malfunctions, shall not exceed five (5) working days. The Engineer may extend the 90 days 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 days test period.

NTCIP STANDARDS TESTING

The Department and DMS Manufacturer shall test the DMS system for NTCIP compliance using Intelligent Devices Inc. (IDI) Device Tester. Any differences in the interpretation of the newly developed NTCIP Standards shall be decided by the NTCIP Joint Standards Committee.

The DMS manufacturer shall be responsible for ensuring that the DMS equipment complies with the NTCIP Standards as specified herein. The NTCIP field testing will be completed no later than 30 calendar days after the installation of the DMS.

NTCIP REQUIREMENTS

A. Definitions

The following terms shall apply within the scope of this specification:

DMS – A Dynamic Message Sign, includes the sign display, controller, cabinet, and other associated field equipment.

FSORS – Full Standardized Object Range Support.

Full Standardized object Range Support – Support for, and proper implementation of all valid values of an object as defined within the object's OBJECT_TYPE macro in the NTCIP standard; this is defined in two distinct sub-requirements. (1) If ACCESS of the object is read-write, a Management System shall be able to set the object to any valid value as defined by SYNTAX and DESCRIPTION fields (except that the value of 'other' need not be supported when such a value is defined) and the indicated functionality shall be provided. (2) The value indicated by the object (e.g. in response to a get), regardless of the access shall reflect the current conditions per the rules specified in the object's

DESCRIPTION.

Management System – A computer system used to control an NTCIP component. This includes any laptop software used for field control as well as the central software.

NTCIP Component – A DMS or management system.

NTCIP System – A management plus the various ASCs and DMSs controlled by the management system.

Response Time – The time to prepare and begin transmission of a complete response containing the requested application layer information. This is measured as the time from receipt of the closing flag of the request to the transmission of the opening flag of the response when the device has immediate access to transmit.

B. References.

Each DMS component shall support the most recent version of these standards, including all Recommended or Approved Amendments, currently in effect. The most recent versions of these standards and known Amendments are shown below. In many cases, the standards are more widely known by its original NEMA assigned number; in these cases the NEMA number is also identified. The content of the NEMA standard is identical to the NTCIP standard. It is the ultimate responsibility of the Manufacturer to monitor NTCIP actives to discover any recent documents.

NTCIP Standards

NTCIP 1101-NTCIP 1101:1997
(NEMA TS 3.2-1996) Simple Transportation Management Framework Amendment #1 Dated
November 2, 1998

NTCIP 1201-NTCIP 1201:1997
(NEMA TS 3.4-1996) Global Object Definitions Amendment #1 Dated
November 2, 1998

NTCIP 1203-NTCIP 1203:1997
(NEMA TS 3.6-1997)
Object Definitions for Dynamic Message Signs

NTCIP 2001-NTCIP 2001: 2000
(NEMA TS-3.3) Class B Profile Amendment #1
Dated Unknown

NTCIP 2101-NTCIP 2101: 2000
(NEMA TS 3.PMP232-2000)
Subnet Profile for PMPP over RS-232

NTCIP 2102-NTCIP 2102V01.03: (Draft)
Point-to Point Protocol using RS 232 Subnet work Profile
NTCIP 2104 NTCIP 2104 v01.10
National Transportation Communications for ITS Protocol Ethernet Subnet work Profile

NTCIP 2201-NTCIP 2201 Transportation Profile

NTCIP 2301-NTCIP 2301: 2000
(NEMA TS 3.STMF) Application Profile

C. General Requirements

1. Subnet Level

Each serial port on each NTCIP Component shall support NTCIP 2102 over a dial-up connection with an external modem with data rates of 28.8 kbps, 19.2 kbps, 14.4 kbps, 9600 bps, 2400bps, 1200 bps, 600 bps and 300bps. The NTCIP Component shall be capable to make outgoing and receive incoming calls as necessary and support the following modem command sets:

- Hayes AT – Command Set
- MNP5
- MNP10
- V.42bis

Each serial port on each NTCIP Component shall support NTCIP 2102 over a null-modem connection with data rates of 19.2 kbps, 14.4 kbps, 9600 bps, 4800 bps, 2400 bps, 1200 bps, 600 bps and 300 bps.

Each serial port on each NTCIP Component shall support NTCIP 2101 with data rates of 9600 bps, 4800 bps, 2400 bps, 1200 bps, 600 bps and 300 bps.

NTCIP Components may support additional Subnet Profiles at the Manufacturer's option. At any one time, only one Subnet Profile shall be active on a given serial port of the NTCIP Component.

The NTCIP Component shall be configurable to allow the field technician to activate the desired Subnet Profile and shall provide a visual indication of the currently selected Subnet Profile.

2. Transport Level

Each NTCIP Component shall comply with NTCIP 2201. The transport layer shall be a NULL layer. NTCIP Components may support additional Transportation Profiles at the Manufacturer's option. Response datagram's shall use the same Transport Profile used in the request. Each NTCIP Component shall support receipt of datagram's conforming to any of the identified Transport Profiles at any time.

3. Application Level

Each NTCIP Component shall comply with NTCIP 1101 and shall meet the requirements for conformance Level 1.

Each NTCIP Component shall support STMP traps.

An NTCIP Component may support additional Application Profiles at the Manufacturer's option. Responses shall use the same Application Profile used by the request. Each NTCIP Component shall support the receipt of the Application data packets at any time allowed by the subject standards.

4. Information Level

Each NTCIP Component shall provide full Standardized Object Range Support of all objects required by this specification unless otherwise indicated below. The maximum response time for any object shall be 200 milliseconds.

The DMS shall support all mandatory objects of all Conformance Groups as defined in NTCIP 1201 and NTCIP 1203. The section below, Modified Object Ranges for Mandatory Objects, indicated the modified object requirements of these mandatory objects.

Modified Object Ranges for Mandatory Objects

Object: Module Table Entry

Reference: NTCIP 1201 Clause 2.2.3

Requirement: Shall contain at least one row with module Type equal to 3 (software). The module make shall specify the name of the Manufacturer, the module model shall specify the Manufacturer" name of the component and the model version shall indicate the model version number of the component

Object: Max Group Address

Reference: NTCIP 1201 Clause 2.7.1

Requirement: Shall be at least 1

Object: Community Name Address

Reference: NTCIP 1201 Clause 2.8.2

Requirement: Shall be at least 3

Object: dms Num Permanent Msg

Reference: NTCIP 1203 Clause 2.6.1.1.1.1

Requirement: Shall be at least 1*

Object: dms changeable Msg

Reference: NTCIP 1203 Clause 2.6.1.1.1.3

Requirement: Shall be at least 21

Object: dms Free Changeable Memory

Reference: NTCIP 1203 Clause 2.6.1.1.1.4

Requirement: Shall be at least 20 when no message is stored

Object: dms Message Multi String

Reference: NTCIP 1203 Clause 2.6.1.1.1.8.3

Requirement: The DMS shall support any valid MULTI string containing any subset of those MULTI tags listed in the Required Multi Tags section.

Object: dms Control Mode

Reference: NTCIP 1203 Clause 2.7.1.1.1.1

Requirement: The DMS shall support any valid MULTI string containing any subset of those MULTI tags listed in the Required Multi Tags section.

* The Permanent Messages shall display the content shown below in Content of Permanent Messages.

Content of Permanent Messages

1 - Permanent Message #1 shall blank the display (ie. consist of an empty MULTI string). It shall have a run-time priority of one (1),

Required Multi Tags

Code: f1, Feature: field 1 – time (12hr)

Code: f2, Feature: field 2 – time (24hr)

Code: f8, Feature: field 8 - day of month

Code: f9, Feature: field 9 - month

Code: f10, Feature: field 10 – 2 digit year

Code: f11, Feature: field 11 – 4 digit year

Code: fl (and/fl), Feature: flashing text on a line by line basis with flash rates controllable in 0.1 second increments

Code: fo, Feature: font

Code: jl2, Feature: justification – line- left

Code: jl3, Feature: justification – line-center

Code: jl4, Feature: justification – line-right

Code: jl5, Feature: justification – line-full

Code: jp2, Feature: justification – page - top

Code: jp3, Feature: justification – page -middle

Code: jp4, Feature: justification – page -bottom

Code: mv, Feature: moving text

Code: nl, Feature: new line

Code: np, Feature: new page, up to 2 instances in a message (ie., up to 3 pages/frames in a message counting first page)

Code: pt, Feature: page times controllable in 0.1 second increments

The NTCIP Component shall also implement all mandatory objects of the following optional conformance groups.

(a) Time Management, as defined in NTCIP 1201

(b) Time base Event Schedule, as defined in NTCIP 1201.

The following list indicates the modified object requirements of the conformance group.

Modified Object Ranges for the Time base Event Schedule Conformance Group

Object: max time base schedule entries
Reference: NTCIP 1201 clause 2.4.3.1
Project Requirements: Shall be at least 28

Object: max day plans
Reference: NTCIP 1201 clause 2.4.4.1
Project Requirements: Shall be at least 20

Object: max day plan events
Reference: NTCIP 1201 clause 2.4.4.2
Project Requirements: Shall be at least 10

(c) Report, as defined in NTCIP 1201.

(d) PMPP

(e) The following list indicates the modified object requirements for this conformance group.

Modified Object Ranges for the Report Conformance Group

Object: max event log configs
Reference: NTCIP 1201 Clause 2.5.1
Project Requirement: Shall be at least 50

Object: Event configuration Mode
Reference: NTCIP 1201 Clause 2.4.3.1
Requirement: The NTCIP Component shall support the following event configuration: on change greater than value smaller than value.

Object: Max event log size
Reference: NTCIP 1201 Clause 2.5.3
Requirement: Shall be at least 200

Object: Max event classes
Reference: NTCIP 1201 Clause 2.5.5
Requirement: Shall be at least 7

(f) Font Configuration, as defined in the NTCIP 1203.

The following list indicated the modified object requirements for this conformance group.

Modified Object Ranges for the Font Configuration Conformance Group

Object: num Fonts
Reference: NTCIP 1203 Clause 2.4.1.1.1.1
Requirement: Shall be at least 8

Object: max Font Characters
Reference: NTCIP 1203 Clause 2.4.1.1.1.3
Requirement: Shall be at least 255

Upon delivery, the first three font sets shall be configured in accordance with ASCII character set for the following characters:

- “A” thru “Z” – in both upper and lower cases
- “0” thru “9” – all decimal digits
- A blank or space
- Eight (8) directional arrows
- Punctuation marks, such as . , ! ? - ‘ ”
- Other characters, such as # & * / () [] < >

(g) DMS configuration, as defined in NTCIP 1203

(h) Multi Configuration, as defined in the NTCIP 1203.

The following list indicates the modified object requirements for this conformance group.

Modified Object Ranges for the MULTI Configuration Conformance Group

Object: default Background color
Reference: NTCIP 1203 Clause 2.5.1.1.1.1
Requirement: The DMS shall support the following background colors: black
Object: default foreground color
Reference: NTCIP 1203 Clause 2.5.1.1.1.2
Requirement: The DMS shall support the following foreground colors: Amber

Object: Default flash on
Reference: NTCIP 1203 Clause 2.5.1.1.1.3
Requirement: The DMS shall support the full range of these objects.

Object: Default flash off
Reference: NTCIP 1203 Clause 2.5.1.1.1.4
Requirement: The DMS shall support the full range of these objects.

Object: default justification line

Reference: NTCIP 1203 Clause 2.5.1.1.1.6

Requirement: The DMS shall support the following forms of line justification:

- left
- center
- right

Object: default justification page

Reference: NTCIP 1203 Clause 2.5.1.1.1.7

Requirement: The DMS shall support the following forms of page justification:

- top
- middle
- bottom

Object: default page on time

Reference: NTCIP 1203 Clause 2.5.1.1.1.8

Requirement: The DMS shall support the full range of these objects with step sizes no larger than 0.5 seconds

Object: default page off time

Reference: NTCIP 1203 Clause 2.5.1.1.1.9

Requirement: The DMS shall support the full range of these objects with step sizes no larger than 0.5 seconds

Object: default character set

Reference: NTCIP 1203 Clause 2.5.1.1.1.10

Requirement: The DMS shall support the following character sets: eight bit

(i) Multi Error Configuration, as defined in NTCIP 1203

(j) Illumination/Brightness Control, as defined in NTCIP 1203.

The following list indicates the modified object requirements for the conformance group.

Modified Object Ranges for Illumination/Brightness Control Conformance Group

Object: dms illum control

Reference: NTCIP 1203 Clause 2.8.1.1.1.1

Requirement: The DMS shall support the following illumination control modes:

- photocell
- timer
- manual

Object: Dms illum num bright levels

Reference: NTCIP 1203 Clause 2.8.1.1.1.4

Requirement: Shall be at least 16

(k) Scheduling as defined in the NTCIP 1203. The following text indicates the modified object requirements for this conformance group.

Modified Object Ranges for Scheduling Conformance Group

Object: num action table entries
Reference: NTCIP 1203 Clause 2.9.1.1.1.1
Requirement: Shall be at least 200

- (l) Sign Status, as defined in NTCIP 1203
- (m) Status Error, as defined in NTCIP 1203
- (n) Pixel Error Status, as defined in NTCIP 1203
- (o) Power Status, as defined in the NTCIP 1203

The NTCIP Component shall also implement the following optional objects:

Object: global set ID parameter
Reference: NTCIP 1201 Clause 2.2.1
Requirement: FSORS

Object: event config log OID
Reference: NTCIP 1201 Clause 2.5.4.7
Requirement: FSORS

Object: event config action
Reference: NTCIP 1201 Clause 2.5.4.8
Requirement: FSORS

Object: event class description
Reference: NTCIP 1201 Clause 2.5.6.4
Requirement: FSORS

Object: default flash on
Reference: NTCIP 1203 Clause 2.5.1.1.1.3
Requirement: The DMS shall support the full range of these objects with step size no larger than 0.5 seconds

Object: default flash off
Reference: NTCIP 1203 Clause 2.5.1.1.1.4
Requirement: The DMS shall support the full range of these objects with step size no larger than 0.5 seconds.

Object: dms SW reset
Reference: NTCIP 1203 Clause 2.7.1.1.1.2
Requirement: FSORS

Object: dms message time remaining
Reference: NTCIP 1203 Clause 2.7.1.1.1.4
Requirement: FSORS

Object: dms short power recovery message
Reference: NTCIP 1203 Clause 2.7.1.1.1.8
Requirement: FSORS

Object: dms long power recovery message
Reference: NTCIP 1203 Clause 2.7.1.1.1.9
Requirement: FSORS

Object: dms short power loss time
Reference: NTCIP 1203 Clause 2.7.1.1.1.10
Requirement: FSORS

Object: dms reset message
Reference: NTCIP 1203 Clause 2.7.1.1.1.11
Requirement: FSORS

Object: dms communication loss message
Reference: NTCIP 1203 Clause 2.7.1.1.1.12
Requirement: FSORS

Object: dms time comm. loss
Reference: NTCIP 1203 Clause 2.7.1.1.1.13
Requirement: FSORS

Object: dms end duration message
Reference: NTCIP 1203 Clause 2.7.1.1.1.15
Requirement: FSORS

Object: dms memory mgmt
Reference: NTCIP 1203 Clause 2.7.1.1.1.16
Requirement: The DMS shall support the following Memory Management Modes:
 clear changeable messages
 clear volatile messages

Object: dms multi other error description
Reference: NTCIP 1203 Clause 2.7.1.1.1.20

Requirement: If the vendor implements any vendor-specific MULTI tags, the DMS shall provide meaningful error messages with in the object whenever one of these tags generates an error.

Object: dms illume light output status
Reference: NTCIP 1203 Clause 2.8.1.1.1.9
Requirement: FSORS

Object: watchdog failure count
Reference: NTCIP 1203 Clause 2.11.1.1.1.5
Requirement: FSORS

Object: dms stat door open
Reference: NTCIP 1203 Clause 2.11.1.1.1.6
Requirement: FSORS

Object: fan failure
Reference: NTCIP 1203 Clause 2.11.1.1.1.8
Requirement: FSORS

Object: fan test activation
Reference: NTCIP 1203 Clause 2.11.1.1.1.9
Requirement: FSORS

Object: temp min ctrl cabinet
Reference: NTCIP 1203 Clause 2.11.4.1.1.1
Requirement: FSORS

Object: temp max ctrl cabinet
Reference: NTCIP 1203 Clause 2.11.4.1.1.2
Requirement: FSORS

Object: temp min sign housing
Reference: NTCIP 1203 Clause 2.11.4.1.1.5
Requirement: FSORS

Object: temp max sign housing
Reference: NTCIP 1203 Clause 2.11.4.1.1.6
Requirement: FSORS

MAINTENANCE SERVICES

The installation Contractor shall provide complete maintenance services for the entire DMS assembly until the final acceptance. All labor, travel, replacement parts and associated costs necessary to maintain the DMS assembly shall be included in the contract at no additional cost to the Department.

The installation Contractor shall correct all failures in the DMS assembly within 48 hours of notification from the Department until final acceptance. A failure of a sign installation shall be defined as the inability of the sign to function as per these specifications. A failure shall also be defined as the sign becoming unreadable or illegible as determined by the Department.

FINAL SYSTEM ACCEPTANCE

Final system acceptance will be defined as when all work and materials provided have been furnished and completely installed by the DMS Manufacturer, and all parts of the work have been approved and accepted by the Department and the Dynamic Message Sign System has been operated continuously and successfully for 90 calendar days with no more than 5 calendar days downtime due to mechanical, electrical and/or other malfunctions, as specified herein.

The warranty period, as specified in herein, will begin upon final acceptance.

AS-BUILT DOCUMENTATION

The DMS Manufacturer shall provide to the Department the following documentation of the complete installed equipment prior to final payment. 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 Department:

The DMS Manufacturer shall prepare and submit the following detailed drawings for each sign:

- the DMS character set as detailed herein,
- all non-catalog or custom-made components,
- sign housing assembly details, including the component location details and a layout of all the display elements, complete with dimensions,
- sign housing structural details, including member details, support mechanism details required for installation of the DMS onto the sign truss, welding details, and miscellaneous hardware details; complete with dimensions and sizes,
- sign mounting bracket structural details, including miscellaneous members and hardware required to attach the DMS to the sign truss; complete with dimensions and sizes, and
- wiring schematics.

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. One (1) copy of the manual shall be provided and kept in the sign cabinet. An additional ten (10) copies of the manual shall be submitted to the Department for each model of equipment. An additional copy of the manual shall be submitted to the Department on CD for each model of equipment. The manual shall include the following information:

1. A general description of the equipment including all information necessary to describe the basic use or function of the system components. This shall include a general block diagram presentation of the equipment. Where auxiliary equipment is required, tabular charts shall be included, listing such equipment. These charts shall include the nomenclature physical and electrical characteristics and functions of the auxiliary equipment unless such information is contained elsewhere in an associated manual. In the latter case, a reference shall be made to the location of the information pertaining to the auxiliary equipment.

2. The theory of operation of the system components in a clear, concise manner supported by simplified schematics, logic, data flow diagrams, one-function diagrams, etc. Timing and waveform diagrams and voltage levels shall be shown as required. A logical development shall be used starting with a system block level and proceeding to a circuit analysis. Circuit analysis shall be detailed whenever circuits are not normally found in standard textbooks. The application of new theoretical concepts shall be fully described. Where the design allows operation in a number of different modes, an operational description of each mode shall be included.

3. In simple, clear language, the routine of operation, from necessary preparations for placing the equipment into operation, to securing the equipment after operation. This section shall contain appropriate illustrations, with the sequence of operations presented in tabular form wherever feasible. This section shall also contain a list of applicable test instruments, aids and tools required in the performance of necessary measurements and technique of each system component. In addition, set-up test, and calibration procedures shall be described.

4. 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 should be limited to allow their use in close proximity of the equipment, in the classroom, etc., part reference symbols, test voltages, waveforms, and other aids to understanding of the circuit's function shall be included on the diagrams. Test voltages, waveforms, and other aids to understanding of the circuit's function may be shown on both the simplified schematics and other drawings (as required in the above sections) on theory of operation, or maintenance or on the schematic diagrams required for this section. The overall scope of information shall not be less, however, than that stated for the schematic diagrams.

SOFTWARE MANUALS

The DMS Manufacturer shall provide manuals and data for the computer software system and components thereof. One (1) copy of the manual shall be provided and kept in the sign cabinet. Ten (10) additional copies of the manual shall be submitted to the Department for each version of software. One (1) copy of the manual shall be provided on CD. As software is upgraded, updated versions of the manual shall be provided. This submittal shall include the following:

1. Software user's manuals shall be supplied. Include instructions for performing a backup of all software and message libraries.
2. Manufacturer's documentation (including schematics) for all plug in circuit cards used in the microcomputer chassis.
3. Computer program logic in flowchart form.
4. Narrative descriptions of programs and input/output formats.
5. Two (2) copies of source programs, for master and sign controller software, shall be provided on CD-ROM. The Department shall have the right to duplicate the sign controller software as needed for use in controlling signs under its' jurisdiction.
6. The DMS Manufacturer's NTCIP MIB (Management Information Base) shall be provided to the Department.
7. Warranty information.
8. Preventive maintenance and maintenance information.

MAINTENANCE MANUALS

A manual containing a general description and detailed maintenance instructions shall be provided for each different type or model of equipment. One (1) copy of the manual shall be provided and kept in the sign cabinet. An additional ten (10) copies of the manual shall be submitted to the Department for each model of equipment. One (1) copy of the manual shall be provided on CD. The manual shall include the following information:

1. 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. Specifications, including tolerances, for all electrical, mechanical, and other applicable measurement, adjustments, or both, shall be listed. The DMS Manufacturer shall provide the Department with a sample preventive maintenance schedule.
2. Data necessary for isolation and repair of failures or malfunctions, assuming the maintenance technicians to be capable of analytical reasoning using the information provided above. 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.
3. Detailed instructions shall be given only where failure to follow special procedures would result in damage to the equipment, improper operation, or danger to operating or maintenance personnel.
4. 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 of all assemblies, subassemblies, and replacement parts of units. The tabular arrangement shall be in alphanumeric 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, e.g., appropriate grouping, shall be provided for the purpose of identifying major components, assemblies, etc.

FINAL DOCUMENTATION OF ALL HARDWARE AND SOFTWARE

Final documentation shall reflect all field changes and software modifications and shall be provided before final payment is made.

The DMS Manufacturer shall coordinate and take the lead on this effort with the installation Contractor.

This documentation 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 code and function, the routing of all conductors (pairs) in the communications system.

Four (4) copies of each As-Built installation shall be delivered to the Department. Copies shall go to:

1. Resident Construction Engineer
2. Maintenance supervisor
3. ITS Engineer
4. One will be left in the DMS

Drawings left in the DMS shall be attached to the door with stainless steel fasteners and protected from weather with a waterproof enclosure.

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, seminars and other related technical procedures. Training shall be limited to a maximum of ten (10) people and shall be provided at a time and location approved by the Department. The training shall include, but not be limited to, the following:

1. "Hands-on" operation of all sign control hardware
2. Explanation of all system commands, their function and usage
3. Insertion of data
4. Required preventative maintenance procedures
5. Servicing procedures
6. System "troubleshooting" or problem identification procedures

A minimum of eight (8) hours of instruction shall be provided for the operational and maintenance procedures for the system.

The DMS Manufacturer shall submit an agenda for the training and one complete set of training material (manual and schematic) along with the qualification of proposed instructors to the Department for approval at least 30 calendar days before the training is to begin. The Department will review material and approve or request changes.

The DMS Manufacturer shall record the entire training on DVD and shall provide DVD's to the Department for later use.

The training session(s) shall be conducted at a facility provided by the Department, after the completion of all system integration tests. The schedule of the training sessions shall be established by the DMS Manufacturer with the approval of the Department.

WARRANTY

The equipment and parts furnished for the dynamic message sign system shall be new, of the latest model, fabricated under high quality standards.

Equipment and parts furnished for the dynamic message sign system shall be warranted by the manufacturer to be free from defects in assembly or fabrication and materials for a minimum of two (2) years 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 and/or determined to be a failure in design, materials and workmanship during the warranty period shall be replaced free of charge.

The Department shall be furnished with a certification stating that the equipment, parts, and material are covered by a warranty. Company contact information and warranty dates should be clearly shown.

All manufacturer's warranties and guarantees for the dynamic message sign system shall be transferred to the Department on the date of final acceptance.

Replacement parts covered in the section shall be shipped within one week of the Department notifying the DMS Manufacturer of a failed part or operational problem.

BASIS OF PAYMENT

The work performed and materials furnished in accordance with this Item and measured will be paid for at the contract unit price each for TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN. This price shall be full compensation for furnishing, placing and testing all materials and equipment, and for all tools, labor, equipment, hardware, operational software package(s), supplies, support, personnel training, shop drawing and documentation necessary to complete the work.

ELECTRIC SERVICE INSTALLATION

The Contractor shall install the Electrical Service at the locations indicated on the plans and as directed by the Engineer and the Electrical Utilities standards for installation. Contractor shall refer to Ameren Inc. SECTION 600 OVERHEAD SERVICES, METER POLE INSTALLATIONS CUSTOMER-OWNED SECONDARY METERING UNDERGROUND DISTRIBUTION INSTALLATION 100 OR 200 AMPERE, SINGLE PHASE LOCATED IN SECTION 600 ON PAGES 600-7 AND 600-8. All associated costs from the utility Contractor shall be billed as a direct expense to IDOT for the utility work required to provide a 480V service drop at Jefferson County and 240V service drop at Williamson County.

This work shall be in accordance with Section 804 and 1086 of the Standard Specifications except as modified herein.

The service installation shall include furnishing and installing Rigid Galvanized Steel (RGS) conduit, disconnect switches, and all associated appurtenances including a meter base approved by the utility company. The service disconnects and meter base shall be mounted on a Contractor provided and installed 25'(above grade) with a minimum of 6' below grade, ANSI Class 5(minimum) new power pole. Each power pole shall include but is not limited to the following equipment. 2"RGS conduit with gasketed connections, Weather head, NEMA 4X electrical disconnect prior to the meter socket(at Jefferson County location only), meter socket, NEMA 4X electrical disconnect after the meter socket, 8'x 1/2" ground rod, NEC compliant ground wire and all associated connecting hardware such as secondary wire clevises, box and conduit mounting hardware.

Galvanized steel conduit shall be used from the weatherhead connection on the pole to the disconnect, or meter equipment. The use of PVC conduit will be allowed after the RGS conduit has transitioned to below grade downstream of the secondary disconnect mounted below the meter housing. In the event that the utility company will not allow rigid conduit to be installed, the Contractor shall install an aluminum or galvanized steel conduit.

A rain tight hub assembly (Myers type) shall be used in conjunction with conduit from the top of the disconnect or meter housing.

All service disconnect switches shall be a stainless steel, weatherproof NEMA 4X enclosure that meets the following specifications:

100-Ampere (250 V) Minimum Fused Disconnect Switch: Unless indicated otherwise on the plan sheets, the fused disconnect switch shall be single-throw, three-wire (two poles, two fuses, and solid neutral). The switch shall provide for locking the blades in either the "On" or "Off" position with one or two padlocks and for locking the cover in the closed position. The disconnect switch and fuse rating shall be rated at the voltage and amperage required to comply with utility company and equipment requirements. All fuses shall be provided with the disconnect installation.

100-Ampere (480 V) Minimum Fused Disconnect Switch (typical of 2 at Jefferson County):
Unless indicated otherwise on the plan sheets, the fused disconnect switch shall be single-throw, three-wire (two poles, two fuses, and solid neutral). The switch shall provide for locking the blades in either the "On" or "Off" position with one or two padlocks and for locking the cover in the closed position. The disconnect switch and fuse rating shall be rated at the voltage and amperage required to comply with utility company and equipment requirements. All fuses shall be provided with the disconnect installation.

The service disconnect(s) and meter housing assemblies shall be installed at a maximum height of 84" to a minimum height of 36", unless otherwise required by the utility company standards in section 600 of the electric service manual.

The Department will furnish all padlocks.

Basis of Payment: This work shall be paid for at the contract unit price each for ELECTRIC SERVICE INSTALLATION which price shall be payment in full for all labor, equipment, and materials required to provide and install the electrical service installation described above, complete. Utility company charges shall be billed as a direct expense for utility service installation work.

CLOSED CIRCUIT TELEVISION CABINET

The proposed cabinet for camera interface shall be mounted to new poles as shown in the plans in a manner that is acceptable to the Engineer.

The cabinet shall be an enclosure of weatherproof, stainless steel of adequate size per the required equipment at the respective location shown in the plans.

In general, the cabinet shall contain the following equipment: data cable surge arrestor (DITEK DTK-MRJPOE), or equivalent equipment, capable of handling High PoE power of 60W.

The proposed cabinet shall vent to provide air flow.

This work shall be paid for at the contract unit price for at the contract unit cost EACH for CLOSED CIRCUIT TELEVISION CABINET and no additional compensation will be allowed.

CLOSED CIRCUIT TELEVISION CAMERA

This work shall consist of the installation of an integrated Closed-Circuit Television (CCTV) Dome Camera Assembly and CAT 6 Ethernet cable at the locations shown in the plans. The Contractor shall be responsible for installing the CCTV cameras in accordance with the plans, specifications, and manufacturers recommended practices.

In order to maintain compatibility with existing network cameras, the camera provided in this contract shall be the AXIS Dome Network Camera, Model No. Q6042-E PTZ or the preapproved equivalent.

Where it is shown in the plans that a camera shall be mounted 6 inches below the top of the pole, the Contractor shall supply the necessary mounting hardware, per the approval of the Engineer, for mounting the camera on mast arm poles and shall be considered as included in this pay item.

The Contractor shall ensure that a clear viewing path is accessible in each direction. The mast pole shall not inhibit the view.

The Contractor will program the cameras.

Ethernet Cable - The Contractor shall supply and install an outdoor-rated CAT 6 Ethernet Cable that is per the manufacturer's specifications. The Ethernet cable shall be installed from the camera interface cabinet to the camera location. The Ethernet cable will not be paid for separately but considered included in associated pay items.

CELLULAR MODEM

This work shall consist of providing and installing a Cellular Modem and remote antenna at the following locations:

I-57 southbound at milepost 88.63 (STA. 431+90 approximately) in Jefferson County at the proposed TMDMS Sign Cabinet.

I-57 northbound at milepost 56.56 (STA. 293+10 approximately) in Williamson County at the proposed TMDMS Sign Cabinet.

The Cellular modem shall be Sierra Wireless Airlink GX440 series or the pre-approved equivalent.

The proposed Cellular Modems shall accept cellular Ethernet interface direct from the CISCO network switch (IE-3000-8TC).

The mounting height and positioning of the antenna shall be per the approval of the engineer.

Contractor shall complete a Cellular site survey and confirm 4G-LTE coverage at the DMS cabinet locations with the cellular provider prior to ordering materials. Contractor shall inform the Engineer of any discrepancies that may inhibit data transfer between the Control Center and the DMS/CCTV systems.

This work shall be paid for at the contract unit cost EACH for CELLULAR MODEM and shall include all labor, VPN programming, IP network programming, hardware, RF antenna, electrical connections and any other material necessary for the complete working installation and communication of all components. No additional compensation will be allowed.

ELECTRICAL SERVICE CONNECTION

Description

The work for this item includes the coordination with the installation of new low voltage service connection installed within Contractor provided PVC conduit at the following locations as shown on the plans.

I-57 southbound at milepost 88.63 (STA. 431+90 approximately) in Jefferson County at the proposed TMDMS Sign Cabinet. Utility provider, AmerenUE.

I-57 northbound at milepost 56.56 (STA. 293+10 approximately) in Williamson County at the proposed TMDMS Sign Cabinet. Utility provider, Southeastern Electric Coop.

At the Jefferson County DMS sign location, the Contractor will be responsible for providing a trench connection (minimum 30" deep x minimum 12" wide x 1,400' length), backfill, environmental control and restoration following the installation of electrical infrastructure including a Contractor provided and installed 15kVA pad mounted transformer(480:120/240V) trenching and backfilling for respective electrical service. At the Williamson County DMS sign location, the Contractor will be responsible for providing a trench connection (minimum 30" deep x minimum 12" wide x 450' length), backfill, environmental control and restoration following the installation of electrical infrastructure trenching and backfilling for respective electrical service. The respective utility providers will be responsible for providing and installing medium voltage electrical cable, junction boxes (as required), transformers and transformer platforms on existing power poles located as shown on plans.

Contractor will be required to provide perimeter erosion barrier along the trench if trench will remain open for more than one (1) working day. Trench shall be backfilled with the excavated material within the same working day that respective utility providers have completed the installation of electrical cable. Contractor shall compact the trench fill with a hand compactor or method approved by the respective utility providers. Contractor will be responsible for the restoration of work areas. Salt tolerant seed Type 2a shall be used in open areas and salt tolerant sod shall be used in all mowed areas. Seeding will not be permitted at any time when the ground is frozen, wet, or in an untellable condition. Location to be seeded will be determined by the engineer.

100-Ampere (250 V)(Jefferson and Williamson County) Minimum Fused Disconnect Switch:
Unless indicated otherwise on the plan sheets, the fused disconnect switch shall be single-throw, three-wire (two poles, two fuses, and solid neutral). The switch shall provide for locking the blades in either the "On" or "Off" position with one or two padlocks and for locking the cover in the closed position. The disconnect switch and fuse rating shall be rated at the voltage and amperage required to comply with utility company and equipment requirements. All fuses shall be provided with the disconnect installation.

100-Ampere (480 V) Minimum Fused Disconnect Switch (Jefferson County): Unless indicated otherwise on the plan sheets, the fused disconnect switch shall be single-throw, three-wire (two poles, two fuses, and solid neutral). The switch shall provide for locking the blades in either the "On" or "Off" position with one or two padlocks and for locking the cover in the closed position. The disconnect switch and fuse rating shall be rated at the voltage and amperage required to comply with utility company and equipment requirements. All fuses shall be provided with the disconnect installation. Contractor shall install "H" frame disconnect mount comprised of two vertical Unistrut type legs(supported by concrete) within 5' of the pad mounted 15kVA transformer and two horizontal unistrut sections centered at 48" above grade to mount the 480V disconnect upstream of the pad mounted transformer and 240V disconnect downstream between the 15kVA transformer and the DMS cabinet.

Basis of Payment

Work for this item should be paid for the Lump Sum for ELECTRICAL SERVICE CONNECTION. Work shall include perimeter erosion trenching, coordinating with the respective utility providers and backfilling the excavated area.

NETWORK CONFIGURATION

Description

This work shall consist of installing, configuring and provisioning a fully operational Ethernet Local Area Network (LAN) at remote Dynamic Message Sign(DMS) sites, which shall provide cellular backhaul network communication to all field devices from the Illinois Department of Transportation District 9 office. Work at the District 9 office shall consist of network router and VPN (Virtual Private Network) programming to allow the field devices to communicate via cellular network. Field devices include DMS controllers, Uninterruptable Power Supply (UPS) units, Network Electronics, Cellular Modems and (PTZ) cameras or other specified Intelligent Transportation System (ITS) field device as shown on the plans.

Construction

Contractor shall include configuring Ethernet switches, and DMS controllers, assigning IP addresses to field devices based on Department IT staff input/standards, troubleshooting and submitting documentation to Department IT staff. A new 4G LTE Cellular Modem shall serve as the Local Area Network (LAN) communication backhaul for both the Jefferson County and Williamson County projects through the existing District 9 Traffic Operations Center. This work shall also require coordination with each manufacturer of field end devices, converters, and networking equipment to ensure successful digital video transmissions, serial-over-copper, serial-over-fiber, and serial-over-Ethernet communications between the WAN and field devices. Coordination with the DMS provider is required to determine specific central software requirements for the communications including communication channels, static IP addresses, VPN tunneling, port forwarding, and TCP/IP ports. The Contractor shall setup a meeting between the Contractor, Department IT staff, Department stakeholders, and the Engineer to coordinate programming requirements for the final network prior to final turnover.

The Contractor shall develop a written test plan and submit it to the Engineer for approval. The test plan shall be revised to the satisfaction of the Engineer prior to approval. The testing plan shall include systematic procedures with anticipated results that demonstrate that the communication network and all of its subsystems are fully operational. Approved testing procedures will be performed in the presence of the Department and Contractor representatives. The testing plan shall include forms listing itemized functional checks of the system with signature placeholders for Department and Contractor representatives.

The test plan will verify the network performance over the extent of this project. The Contractor shall emulate traffic operations over the network by interfacing a laptop computer with the Cisco Ethernet Switch at the Jefferson County and Williamson County TMDMS sign locations. From these locations, the Contractor will control and exchange data with all DMS controllers, CCTV cameras and DMS signs. The computer shall also monitor the UPS components and all other alarms.

After satisfactory completion of this work, the existing master controllers shall be returned to the Department as directed by the Engineer.

Basis of Payment

The work shall be paid for at the contract unit price per lump sum for NETWORK CONFIGURATION, which price shall be payment in full for all communication network configuration and coordination necessary to deliver an Ethernet network that provides successful communications between all field devices and the communication backhaul to the District 9 Office.

OUTDOOR RATED NETWORK CABLE

Description

This work shall consist of furnishing an outdoor-rated 24 AWG, 4-pair data cable. Each cable link that is routed to an external device outside of the area serving ITS cabinet shall be protected by a lightning protection device on the switch side of the link cable for equipment protection.

Materials

Shielded polyolefin cable with four 24 AWG twisted pair conductors.

Jacket Material: PE
Conductor Material: Bare Copper
Drain Wire Material: Tinned Copper
Insulation Material: Polyolefin
Separator Material: Polyolefin
Shield (Tape) Material: Aluminum/Poly

Cable shall meet the following electrical criteria:

ANSI/TIA Category: 6
Maximum dc Resistance Unbalance: 5 percent
Maximum dc Resistance: 9.38 ohms/100 m
Mutual Capacitance: 6.0 nF/100 m @ 1 kHz
Nominal Velocity of Propagation (NVP): 62 percent
Maximum Operating Frequency: 250 MHz
Transmission Standards: ANSI/TIA-568-C.2, CENELEC EN 50288-6-1, ISO/IEC 11801 Class E

Cable shall have an operating temperature from -40 degrees Fahrenheit to 160 degrees Fahrenheit, with an insulation temperature from 32 degrees Fahrenheit to 140 degrees Fahrenheit.

Cable shall be type F/UTP (unshielded) with 4 pairs.

Conductor gauge shall be 24 AWG and of solid type. 8 conductors shall be provided.

Maximum pull tension of cable shall be 11 kg.

Nominal cable diameter over jacket shall be no greater than 8.255 millimeters.

RJ-45 grounded lightning protection device shall be a RJ-45 to RJ-45 module style grounded to the nearest ground bar or rod. The device shall be capable of passing 60W of PoE power and shall draw no power from the supplied PoE(passive). Contractor shall install a No. 6 grounding jumper from the lightning protection device to the nearest ground bar or rod.

Basis of Payment

This work will be paid for at the contract unit price per FOOT for OUTDOOR RATED NETWORK CABLE which price shall include all equipment, labor, Ethernet extenders, and materials necessary to complete this work as specified including mounting hardware and terminating connectors.

ROAD WEATHER INFORMATION STATION COMPLETE

The Contractor shall furnish and install a Roadway Weather Information System (RWIS) to monitor weather conditions at the I-64/IL 37 interchange. The Roadway Weather Information System (RWIS) shall be installed in the median of I-64 on the west side of IL 37. The RWIS shall be a Vaisala RWS200 or approved equivalent. The system shall be specifically designed for monitoring and displaying pavement surface conditions, pavement temperature, freeze point temperature, chemical percent concentration, roadway grip/friction coefficient, subsurface temperature and atmospheric conditions from the I-64/IL 37 interchange. The system shall support both passive in-pavement sensors and non-intrusive sensors installed at the RWIS site to monitor roadway surface status conditions including dry, wet, frost, chemical wet, and snow/ice warning. Atmospheric/meteorological conditions monitored may include any of the following; air temperature, relative humidity, dew point, precipitation classification, visibility, barometric pressure, solar radiation, water level, snow depth, or wind/speed direction. The information from the RWIS station shall be collected by, archived, and displayed on the proposed RWIS Statewide Cloud based Graphical User Interface. The RWIS Cloud Display system shall be used in IDOT Traffic, ITS and Winter maintenance operations. The system shall include all hardware, software, and licenses to operate as follows:

- In-pavement roadway sensors shall measure roadway pavement surface temperature, freeze point temperature, chemical concentration, surface conditions, and communicate these signals to the Remote Processing Unit (RPU).
- Non-intrusive surface sensors shall measure roadway pavement surface temperature, surface conditions, grip conditions and communicate these signals to the RPU.
- Atmospheric sensors shall measure their respective weather parameters and communicate the signals from each to the RPU.
- The RPU shall utilize a Linux based operating system, and be capable of multi-tasking operations to optimize data acquisition from all connected devices. The RPU shall process and temporarily store the output from the pavement sensors and atmospheric sensors.
- The RWIS server shall poll each RPU on a scheduled basis via communications telemetry as specified in the project plans. The RPU shall respond to the poll and transfer all of its data to the RWIS server.
- All data transfers between the RWIS server and RPUs shall be compliant with the most current Federal standard NTCIP ESS (Level 3) protocols.
- The RWIS user display and data collection systems shall be available in a RWIS Cloud based architecture as well as a 3rd party, standalone server application of which will include all sensor data in a browser-based data display format.

Remote Processing Unit (RPU):

The Contractor shall supply and install a tower mounted RPU electronics package with enclosure on a concrete foundation at the location shown in the project plans. The Contractor shall install 110VAC service to the RPU power disconnects. Power for the RWIS station will be available at the DMS controller cabinet. The RPU shall operate in a range of 100-130 VAC at 50-60 Hz and shall use not more than approximately 50 watts of continuous power (excluding options). The 30-foot (10 meter) RPU tower shall be constructed of aircraft grade aluminum and fold over at the 10-foot level for ease of servicing atmospheric sensors. The tower shall be constructed to withstand winds of up to 90 mph.

The RPU hardware and software supplied for the project should meet the following technical specifications. Sensor locations on the RWIS tower shall adhere to the current FHWA ESS/RWIS Siting guidelines. Single combination sensors shall not be allowed and do not comply with current Federal ESS/RWIS Guidelines.

RPU software shall utilize a Linux based operating system, and be capable of multi-tasking operations to optimize data acquisition from all connected devices. The RPU shall gather data from all connected sensors and remote pavement sensors, and process, store and transmit this data to the RWIS server upon a polled request. Each RPU shall be capable of collecting data from the following sensors:

- 1 to 8 Passive surface sensors that are “hardwired”
- 1 to 8 Subsurface sensors that are “hardwired”
- 1 to 8 Temperature Data probe sensors
- 1 Air temperature/relative humidity sensor
- 1 “Hardwired” mechanical wind speed/direction sensor or 1 heated ultrasonic wind speed/direction sensor
- 1 Weather identifier and visibility sensor or 1 optical weather identifier
- 1 Precipitation occurrence sensor (Y/N)
- 1 Barometric pressure sensor
- 1 Solar radiation sensor
- 1 Water level sensor
- 1 Ultrasonic snow depth sensor
- 2 Non-intrusive pavement temperature sensors
- 2 Non-intrusive pavement condition sensors
- 1 to 3 transportation gas monitors capable of detecting Carbon Monoxide (CO); Nitrogen Dioxide (NO₂); Ozone (O₃); Sulfur Dioxide (SO₂); Volatile Organic Compounds (VOC); and Particulate Matter (PM₁₀ and PM_{2.5}).
- 1 to 2 Remote traffic microwave sensor (RTMS)

RPU communication with the server shall utilize the most current published Federal Standard NTCIP-ESS Level 3 protocol, with compliant manufacturer-specific objects. The RWIS Cloud based data collection and display solution shall poll the RPU via the cellular modem provided for the Jefferson DMS installation. The RPU shall incorporate “watch-dog” circuitry, monitor its own operation, and reset itself if the RPU software enters an indeterminate state. The RPU shall also have the capability to be reset by a “user administrator” from the server.

The RPU design shall be an 8-slot card cage with ISA back plane utilizing a ZF86 PC-on-a-Chip. Memory shall be a flash drive card with 64 MB of flash memory and 32 MB of RAM memory. Analog inputs shall include 20 differential and 11 single-ended channels, with some dedicated to individual sensors. There shall be a total of 10 serial ports available selectable to either EIA-232 or RS-422/485, half or full duplex. These serial ports are for system maintenance and device interfaces, using baud rates selectable from 300 to 115.2 Kbps. For maximum reliability, the design shall utilize extensive lightning protection for all channels and serial ports including auto-reset circuit breakers for power, Transorbs, and gas discharge tubes. All RPU electronics shall provide stable operation over a temperature range of -40°C to 70°C (-40°F to 160°F) and 0-90% RH non-condensing.

The RPU shall use commercial electric power. There is a commercial power source available at the I-64/IL 37 interchange. It shall be the Contractor's responsibility to arrange for electric service to the RPU.

The RPU shall be enclosed inside a NEMA 4 lockable aluminum enclosure that is resistant to damage by weather and vandals. It shall be mounted on a freestanding, non-climbable, corrosion resistant, aluminum tower. The 30-foot tower is to be equipped with a lockable fold-over device to facilitate servicing the atmospheric sensors. RPU software configuration shall be performed by PC computer with a browser connected to the RPU Ethernet port.

The existing statewide RWIS server shall poll the RPU on a scheduled basis via digital wireless communications telemetry. The RPU shall respond to the poll and transfer all of its data to the RWIS server and display the data to the customer's web site. The existing RWIS server system stores the RWIS data and video images in a standard SQL Server data base for access by IDOT users with the appropriate credentials on any computer connected to the Internet running the Internet Explorer web browser.

Embedded Road Sensor:

The Contractor shall supply and install an embedded road sensor. The sensor supplied shall be a single solid-state electronic device that is installed in the roadway pavement. Exact sensor placement shall be as determined by the Project Engineer with guidance from the equipment supplier. The sensor shall be a Vaisala DRS511 or approved equivalent.

The sensor shall be constructed of materials that have thermal characteristics similar to common pavement materials. The top of the sensor shall approximate the roadway pavement color and texture. It shall be installed with epoxy sealer so the top is flush with the surrounding roadway surface. The sensor shall be thermally passive, providing stable operation over a temperature range from -40°C to 80°C (-40°F to 176°F). Weather conditions, traffic, or ice control chemicals shall not degrade its performance. The sensor shall be supplied with 46 m (150 ft), 91 m (300 ft), or 152.4 m (500 ft) of attached molded cable, that is waterproofed and sealed as an integral part of the assembly. Each sensor shall be capable of operating at extended cable lengths up to 1,524 m (5,000 ft) from the RPU by splicing to direct burial sensor extension cable. The sensor shall electronically sample the following pavement parameters:

- Surface temperature at the sensor head.
- Dry pavement condition.
- Wet pavement condition above 0°C (32°F).
- Pavement status information.

In addition, the pavement sensors shall supply data for the RWIS to determine the following pavement surface conditions when sufficient water is present on the pavement, and atmospheric data from precipitation, RH, and air temperature sensors is available:

- Water on the pavement at or below 0°C (32°F).
- Snowy or icy pavement at or below 0°C (32°F).
- Freezing point temperature of the water/ice-control-chemical solution present on the surface of the pavement sensor for selected ice-control-chemicals.
- Depth of the water/ice-control-chemical solution present on the surface of the pavement sensor up to a depth of 12 mm (0.5 inches).
- Percentage of ice particles present in the water/ice-control-chemical solution resident on the surface of the pavement sensor.

After bid opening and prior to contract execution, the successful Contractor shall supply actual field test documentation that substantiates pavement sensor performance.

Subsurface Temperature Probe:

The Contractor shall supply and install the subsurface temperature probe(s) in the roadway near a surface sensor at a depth of 17 inches. The probe shall be a Vaisala DTS12G or approved equivalent. The probe shall measure the ground temperature below the roadway pavement surface. The temperature-sensing element of the probe shall operate over a temperature range of -40°C to 80°C (-40°F to 176°F). The sensor shall come with a limited lifetime warranty.

The probe shall be supplied with attached cable, which is waterproofed and sealed as an integral part of the assembly. Each sensor shall be capable of operating at extended cable lengths up to 1524 m (5000 ft) from the RPU by splicing to direct burial sensor extension cable.

Non-Intrusive Pavement Condition Sensor:

The Contractor shall supply and install one (1) Vaisala DSC111 (or approved equivalent) non-intrusive pavement condition sensor. The sensor shall be laser based and utilize spectroscopy to provide outputs for pavement condition (dry, moist, wet, slush, icy, snow/frost), ice (0-2mm)/water (0-2mm)/snow layer (0-10mm) thickness with a resolution of 0.01mm, and grip coefficient (0.01 to 1.0) with a resolution of 0.01. Single non-intrusive sensors containing and reporting both pavement condition and pavement temperature instrumentation shall not be permitted. The pavement condition sensor will offer an optional visibility measurement with a range of 10-2.000m with a resolution of 1m and accuracy (fog and snowfall) of $\pm 20\%$. The operating temperature range is -40°C to 60°C (-40°F to 140°F). The measuring range from the sensor to the pavement monitoring location is 8-15m. The elevation angle is 30° to 85°. Sensing area is 20 cm at 10 m. The Project Engineer shall determine exact sensor placement with guidance from the equipment supplier.

Non-Intrusive Pavement Temperature Sensor:

The Contractor shall supply and install from one (1) Vaisala DST111 (or approved equivalent) non-intrusive pavement temperature sensor. The sensor shall measure surface temperature via emitted infrared radiation. It shall provide outputs for pavement temperature in the range of -40 to +60 °C with a resolution of 0.1 °C. The operating temperature range is -40°C to 60°C (-40°F to 140°F). The measuring range from the sensor to the pavement monitoring location is 2-15m. The elevation angle is 30° to 85°. Sensing area is 80 cm at 10 m. The Project Engineer shall determine exact sensor placement with guidance from the equipment supplier.

Present Weather Detector and Visibility Sensor:

The Contractor shall supply and install a Vaisala PW12 (or approved equivalent) present weather / visibility sensor approximately 8 feet above ground on the RWIS tower structure. This sensor shall function as a precipitation classifier, a precipitation rate meter, and a close range visibility sensor. The sensor shall be able to differentiate between rain, snow, mixed rain/snow, and drizzle as well as to measure actual precipitation rates as water equivalent.

The sensor shall have a precipitation intensity range of 0.00 to 99.99mm/h. It shall measure precipitation amount from 0.00 to 99.99 mm. It shall measure new snow amount from 0.00 to 999 mm water equivalent. The Sensor visibility range shall extend from 10m to 2,000 m (32 to 6,500 ft.). Sensor shall report 39 different codes supported from WMO 4680 (SYNOP) and NWS code tables.

Sensor housing shall be all weather and ice-proof with optional heated optics to prevent ice, dew or frost buildup. Normal operating temperature range shall be from -40°C to 60°C (-40°F to 140°F). Factory and/or Site acceptance testing shall be supplied and conducted by the vendor to demonstrate water equivalency range and accuracy.

Air Temperature/Relative Humidity Sensor:

The Contractor shall supply and install the Vaisala HMP155E or approved equal. The Air Temperature/Relative Humidity Sensor shall have an air temperature-sensing element that operates over the temperature range of -80°C to 60°C (-112°F to 140°F). The relative humidity sensing element shall be of the HUMICAP®180R(C) type and have a measuring range of 0 to 100% RH. System dew point temperature shall be calculated by the RPU from the air temperature and relative humidity. Both atmospheric sensing elements shall be mounted on the RWIS tower at the standard meteorological height of approximately 2 m (6 ft) above ground level in a solar/wind-radiation shield.

Mechanical Wind Speed/Direction Sensor:

The Contractor shall supply and install a Vaisala WA 15 (or approved equal) wind speed/direction sensor at the standard meteorological height of approximately 10 m (30 ft) above ground level, at the top of the RWIS tower structure. The wind speed/direction sensor shall have an operating range of 0.5 to 60 m/s (1 to 134 mph). The sensor operating azimuth is 360° mechanical and 355° electrical. The temperature operating range shall be -40°C to 55°C (-40°F to 131°F).

RWIS Device Control

The RWIS RPU hardware and software system, as proposed herein, provides the agency ITS device control functionality. The RWIS package, as specified, includes the software logic and hardware to control a roadside ITS device. Device control logic shall be present local on the RWIS RPU and will be capable of being configured during system commissioning. A maximum of up to three conditional parameters are possible for device control.

The RWIS site shall contain the specific sensor required to detect the desired weather or roadway condition. Upon the RPU detecting a defined weather condition or roadway grip condition, the system will be able to provide a dry contact relay closure to any roadside device such as LED sign, beacon, for on and off control functionality. The system will require a hardwire connection between the RWIS RPU and the roadside ITS device.

National Weather Service Integration:

As an option and tool to the Department, the Contractor shall provide access to the local National Weather Service (NWS) forecasts. Local, zone based NWS forecasts shall be provided within or imbedded as part of the RWIS Cloud data collection and display system.

Installation and Construction Details:

The Contractor shall install the RWIS in accordance with the RWIS vendor's recommendations, plans and Standard Specifications and all federal, state and local codes and requirements. The Contractor will be responsible for providing all traffic control/safety work zones for the installation of the roadway sensors in accordance with the IDOT traffic control requirements. The Contractor shall be responsible for any modifications needed to the electrical plans to connect the RWIS to the power source.

Quality Assurance:

Vendor shall submit a copy of their corporate ISO certification and quality program to ensure that the entire proposed RWIS system is manufactured, bench tested separately and together as a system prior to installation and inspected after installation.

RWIS System Commissioning:

After completion of the RWIS system equipment installation, the system vendor shall provide an on-site field engineer to start-up and test the entire system. This engineer will make all final sensor connections to the RPU, perform all final system checks, sensor alignments, software setup, and software configuration to provide a fully operational RWIS system.

RWIS Equipment Warranty:

The equipment vendor shall provide a limited, on-site warranty covering all equipment for a 12-month period from the RWIS commissioning date.

Selection of RWIS Vendor:

The Contractor shall provide a detailed description (technical cut sheets) of the RWIS to be supplied by the Contractor and the experience of the vendor/manufacturer in supplying such RWIS to other like agencies. The Contractor shall also provide written justification of the selection process used by the Contractor in the selection of a RWIS vendor/manufacturer. Such justification shall assure that the IDOT receives a state of the art RWIS from a responsible vendor/manufacturer that is compatible with RWIS system specifications. The Contractor must have at least 10 successful RWIS system installations in North America that have been operating in excess of 5 years. As part of the equipment approval process, the Contractor shall provide the names of at least ten (10) agencies, with names, telephone numbers and contact person to verify said RWIS installations were successful.

Training:

The Contractor shall provide examples of training materials and plans used previously, and describe their plans for providing training within District 9. At a minimum, training plans shall include the following components and curriculum:

The Contractor training course will explain both the functionality of the RWIS Cloud software together with a full explanation of all the information which can be viewed. The course shall provide the opportunity to gain hands on practice in opening, interrogating and configuring tabular, graphical and cartographical views for actual, forecast and archived data using the display software.

Training shall also cover pavement surface meteorology and various related scenarios. In the scenarios, the delegates will get a chance to practice interpreting sensor and forecast information provided within the RWIS system and from other sources, and monitoring and making Maintenance and Traffic Operation decisions based on that information.

Minimum Course requirements and further details:

The course shall last a full day, with a maximum of 12 delegates. The training shall be conducted at the District 9 Office.

The course shall require at least one computer between 3 trainees with internet access, and individual usernames and passwords for the RWIS Cloud display will need to be set up prior to the training event. This will provide the delegates with plenty of opportunity for hands on practice during the course. The District will provide digital projector, screen and/or flip chart.

Hand outs and/or manuals shall be provided by the Contractor for each attendee. The Contractor shall furnish copies of these materials on a CD which will explain how to access all of the information shown during the course in a simple easy to follow format, and also upon completion, certificates will be provided.

Training Schedule Structure:

- System architecture
- A full explanation of the sensor readings found on the weather stations
 - Atmospheric sensors
 - Pavement sensors including chemical factors, freezing points and grip where applicable
- Factors influencing dew, frost and ice formation on the pavement surface
- Factors influencing the heat balance at the pavement surface
- Traffic management impacts
- RWIS Cloud display software
 - The main map view – status layer interpretation and configuration
 - Accessing, configuring and interpreting the station summary view
 - Configuring and interpreting observational and forecast graphs
 - Accessing and interpreting any text forecasts
 - Setting and configuring station alerts
- Winter Scenarios
 - The data displayed by the RWIS system
 - Viewing and interpreting the important information relevant to that specific scenario
 - Decision making based on the meteorology and information from the RWIS system

RWIS System Acceptance Testing:

Factory Acceptance Testing (FAT):

The Contractor shall supply copies of the FAT testing for the RWIS equipment package. The FAT documentation shall encompass and document the provisions of manufacturer's calibration & certification specifications for the RWIS equipment supplied. Confirmation of conformance to the project specification shall be enforced as part of the FAT documentation..

Site Acceptance Testing (SAT) (CSAT):

The Contractor shall provide on-site testing that insures each individual device operates independently and in an integrated fashion. This includes verification of data integration from the RWIS site to the existing ILDOT Scan Web/RoadDSS Navigator Cloud Graphical User interface.

Final System Acceptance Testing:

Testing that insures the RWIS provides data to the RWIS Cloud Display, which meets all the contract requirements.

Chain Link Fence:

A 6' tall chain link fence shall be installed around the RWIS. The area enclosed shall be 10' X 10' with a 4' wide gate. The gate shall be located such that the 30-foot (10 meter) RPU tower can be lowered through the gate opening.

Method of Measurement

ROAD WEATHER INFORMATION SYSTEM, COMPLETE shall be included in the lump sum item, complete, in place, tested to assure all functionality and performance required above, and accepted by the Engineer. The CHAIN LINK FENCE shall be measured according to Article 664.12.

Basis of Payment

Payment will be made at the lump sum price for ROAD WEATHER INFORMATION SYSTEM, COMPLETE which shall include the electric service installation, all equipment, material, documentation, testing and labor detailed in the contract documents for this bid item. The CHAIN LINK FENCE and CHAIN LINK GATES shall be paid for according to Article 664.13.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)

Effective: September 1, 2000

Revised: July 2, 2016

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract that the Contractor signs with a subContractor.

The Contractor, subrecipient, or subContractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (a) Withholding progress payments;
- (b) Assessing sanctions;
- (c) Liquidated damages; and/or
- (d) Disqualifying the Contractor from future bidding as non-responsible.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined that the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform 3.00% of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

- (a) The bidder documents that enough DBE participation has been obtained to meet the goal or,
- (b) The bidder documents that a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217) 785-4611, or by visiting the Department's website at:
<http://www.idot.illinois.gov/doing-business/certifications/disadvantaged-business-enterprise-certification/il-ucp-directory/index>.

BIDDING PROCEDURES. Compliance with this Special Provision is required prior to the award of the contract and the failure of the low bidder to comply will render the bid not responsive.

In order to assure the timely award of the contract, the low bidder shall submit:

- (a) The bidder shall submit a DBE Utilization Plan on completed Department forms SBE 2025 and 2026.
 - (1) The final Utilization Plan must be submitted within five calendar days after the date of the letting in accordance with subsection (a)(2) of Bidding Procedures herein.
 - (2) To meet the five day requirement, the bidder may send the Utilization Plan electronically by scanning and sending to **DOT.DBE.UP@illinois.gov** or faxing to (217) 785-1524. The subject line must include the bid Item Number and the Letting date. The Utilization Plan should be sent as one .pdf file, rather than multiple files and emails for the same Item Number. It is the responsibility of the bidder to obtain confirmation of email or fax delivery.

Alternatively, the Utilization Plan may be sent by certified mail or delivery service within the five calendar day period. If a question arises concerning the mailing date of a Utilization Plan, the mailing date will be established by the U.S. Postal Service postmark on the certified mail receipt from the U.S. Postal Service or the receipt issued by a delivery service when the Utilization Plan is received by the Department. It is the responsibility of the bidder to ensure the postmark or receipt date is affixed within the five days if the bidder intends to rely upon mailing or delivery to satisfy the submission day requirement. The Utilization Plan is to be submitted to:

Illinois Department of Transportation
Bureau of Small Business Enterprises
Contract Compliance Section
2300 South Dirksen Parkway, Room 319
Springfield, Illinois 62764

The Department will not accept a Utilization Plan if it does not meet the five day submittal requirement and the bid will be declared not responsive. In the event the bid is declared not responsive due to a failure to submit a Utilization Plan or failure to comply with the bidding procedures set forth herein, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty, and may deny authorization to bid the project if re-advertised for bids. The Department reserves the right to invite any other bidder to submit a Utilization Plan at any time for award consideration.

- (b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number, and telefax number of a responsible official of the bidder designated for purposes of notification of Utilization Plan approval or disapproval under the procedures of this Special Provision.
- (c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and scanned or faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:
 - (1) The names and addresses of DBE firms that will participate in the contract;
 - (2) A description, including pay item numbers, of the work each DBE will perform;
 - (3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price, and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;

- (4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subContractors whose participation is submitted to meet the contract goal;
- (5) If the bidder is a joint venture comprised of DBE companies and non-DBE companies, the Utilization Plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,
- (6) If the contract goal is not met, evidence of good faith efforts; the documentation of good faith efforts must include copies of each DBE and non-DBE subContractor quote submitted to the bidder when a non-DBE subContractor is selected over a DBE for work on the contract.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan submitted by the apparent successful bidder is approved. All information submitted by the bidder must be complete, accurate and adequately document that enough DBE participation has been obtained or document that good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. The Utilization Plan will not be approved by the Department if the Utilization Plan does not document sufficient DBE participation to meet the contract goal unless the apparent successful bidder documented in the Utilization Plan that it made a good faith effort to meet the goal. This means that the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts that the bidder has made. Mere *pro forma* efforts, in other words, efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases, and will be considered by the Department.
 - (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.

- (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.
- (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subContractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subContractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.
 - b. A bidder using good business judgment would consider a number of factors in negotiating with subContractors, including DBE subContractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with subsection (c)(6) of the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subContractor quote submitted to the bidder when a non-DBE subContractor was selected over a DBE for work on the contract.
- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
- (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
- (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.

- (8) Effectively using the services of available minority/women community organizations; minority/women Contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines that the apparent successful bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided that it is otherwise eligible for award. If the Department determines that the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification shall include a statement of reasons for the determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period in order to cure the deficiency.
- (c) The bidder may request administrative reconsideration of a determination adverse to the bidder within the five working days after the receipt of the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217) 785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The determination shall become final if a request is not made and delivered. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for consideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR Part 26.55, the provisions of which govern over the summary contained herein.

- (a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.
- (c) DBE as a subContractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subContractor from the prime Contractor or its affiliates. Work that a DBE subContractor in turn subcontracts to a non-DBE does not count toward the DBE goal.
- (d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:
 - (1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 - (2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission is receives as a result of the lease arrangement.
- (e) DBE as a material supplier:
 - (1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
 - (2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.
 - (3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a DBE regular dealer or DBE manufacturer.

CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the DBE Participation Commitment Statement.

- (a) **NO AMENDMENT.** No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217) 785-4611. Telefax number (217) 785-1524.
- (b) **CHANGES TO WORK.** Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subContractor, not previously involved in the project, then a Request for Approval of SubContractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, then a new Request for Approval of SubContractor shall not be required. However, the Contractor must document efforts to assure that the existing DBE subContractor is capable of performing the additional work and has agreed in writing to the change.
- (c) **SUBCONTRACT.** The Contractor must provide DBE subcontracts to IDOT upon request. SubContractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.
- (d) **ALTERNATIVE WORK METHODS.** In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

- (1) That the replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award;
or
 - (2) That the DBE is aware that its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or
 - (3) That the DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.
- (e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subContractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

As stated above, the Contractor shall not terminate or replace a DBE subContractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subContractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subContractor, the Contractor shall give notice in writing to the DBE subContractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

- (1) The listed DBE subContractor fails or refuses to execute a written contract;
- (2) The listed DBE subContractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subContractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime Contractor;

- (3) The listed DBE subContractor fails or refuses to meet the prime Contractor's reasonable, nondiscriminatory bond requirements;
- (4) The listed DBE subContractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- (5) The listed DBE subContractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law.
- (6) You have determined that the listed DBE subContractor is not a responsible Contractor;
- (7) The listed DBE subContractor voluntarily withdraws from the projects and provides to you written notice of its withdrawal;
- (8) The listed DBE is ineligible to receive DBE credit for the type of work required;
- (9) A DBE owner dies or becomes disabled with the result that the listed DBE 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 prime Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime Contractor can self-perform the work for which the DBE Contractor was engaged or so that the prime Contractor can substitute another DBE or non-DBE Contractor after contract award.

When a DBE is terminated, or fails to complete its work on the Contract for any reason the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established Contract goal. The good faith efforts shall be documented by the Contractor. If the Department requests documentation under this provision, the Contractor shall submit the documentation within seven days, which may be extended for an additional seven days if necessary at the request of the Contractor. The Department shall provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

- (f) PAYMENT RECORDS. The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than thirty calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes that the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.
- (g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.
- (h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor 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.

PROGRESS PAYMENTS (BDE)

Effective: November 2, 2013

Revise Article 109.07(a) of the Standard Specifications to read:

“(a) Progress Payments. At least once each month, the Engineer will make a written estimate of the quantity of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than \$1000.00 will be approved for payment other than the final payment.

Progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics’ Lien Act, 770 ILCS 60/23(c).

If a Contractor or subContractor has defaulted on a loan issued under the Department’s Disadvantaged Business Revolving Loan Program (20 ILCS 2705/2705-610), progress payments may be reduced pursuant to the terms of that loan agreement. In such cases, the amount of the estimate related to the work performed by the Contractor or subContractor, in default of the loan agreement, will be offset, in whole or in part, and vouchered by the Department to the Working Capital Revolving Fund or designated escrow account. Payment for the work shall be considered as issued and received by the Contractor or subContractor on the date of the offset voucher. Further, the amount of the offset voucher shall be a credit against the Department’s obligation to pay the Contractor, the Contractor’s obligation to pay the subContractor, and the Contractor’s or subContractor’s total loan indebtedness to the Department. The offset shall continue until such time as the entire loan indebtedness is satisfied. The Department will notify the Contractor and Fund Control Agent in a timely manner of such offset. The Contractor or subContractor shall not be entitled to additional payment in consideration of the offset.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved.”

SPEED DISPLAY TRAILER (BDE)

Effective: April 2, 2014

Revised: January 1, 2017

Revise the third paragraph of Article 701.11 of the Standard Specifications to read:

“When not being utilized to inform and direct traffic, sign trailers, speed display trailers, arrow boards, and portable changeable message boards shall be treated as nonoperating equipment.”

Add the following to Article 701.15 of the Standard Specifications:

“(m) Speed Display Trailer. A speed display trailer is used to enhance safety of the traveling public and workers in work zones by alerting drivers of their speed, thus deterring them from driving above the posted work zone speed limit.”

Add the following to Article 701.20 of the Standard Specifications:

“(k) When speed display trailers are shown on the Standard, this work will not be paid for separately but shall be considered as included in the cost of the Standard.

For all other speed display trailers, this work will be paid for at the contract unit price per calendar month or fraction thereof for each trailer as SPEED DISPLAY TRAILER.”

Add the following to Article 1106.02 of the Standard Specifications:

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

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

The speed indicator display shall face approaching traffic and shall have a sign legend of “YOUR SPEED” immediately above or below the speed display. The sign letters shall be between 5 and 8 in. (125 and 200 mm) in height. The digital speed display shall show two digits (00 to 99) in mph. The color of the changeable message legend shall be a yellow legend on a black background. The minimum height of the numerals shall be 18 in. (450 mm), and the nominal legibility distance shall be at least 750 ft (250 m).

The speed indicator display shall be equipped with a violation alert that flashes the displayed detected speed when the work zone posted speed limit is exceeded. The speed indicator shall have a maximum speed cutoff. On roadway facilities with a normal posted speed limit greater than or equal to 45 mph, the detected speeds of vehicles traveling more than 25 mph over the work zone speed limit shall not be displayed. On facilities with normal posted speed limit of less than 45 mph, the detected speeds of vehicles traveling more than 15 mph over the work zone speeds limit shall not be displayed. On any roadway facility if detected speeds are less than 25 mph, they shall not be displayed. The display shall include automatic dimming for nighttime operation.

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

STEEL PLATE BEAM GUARDRAIL (BDE)

Effective: January 1, 2017

Revise Article 630.02 of the Standard Specifications to read:

“**630.02 Materials.** Materials shall be according to the following.

Item	Article/Section
(a) Steel Plate Beam Guardrail	1006.25
(b) Wood Posts and Wood Block	1007.01, 1007.02, 1007.06
(c) Steel Posts, Blockouts, Restraints and Wire Rope for Guardrail	1006.23
(d) Preservative Treatment	1007.12
(e) Reinforcement Bars	1006.10
(f) Plastic Blockouts (Note 1)	
(g) Chemical Adhesive Resin System	1027.01
(h) Controlled Low-Strength Material (CLSM)	1019

Note 1. Plastic blockouts may be used in lieu of wood blockouts for steel plate beam guardrail. The plastic blockouts shall be the minimum dimensions shown on the plans and shall be on the Department’s qualified product list.”

Revise Article 630.05 of the Standard Specifications to read:

“**630.05 Posts.** Posts shall be as follows.

- (a) Wood Posts. Wood posts and blocks shall be treated. The posts and blocks shall be cut to the proper dimensions before treatment. No cutting of the posts or blocks will be permitted after treatment. Posts shall be erected according to Article 634.05.
- (b) Steel Posts. Steel posts may be driven by hand or mechanical methods provided they are protected by a suitable driving cap and the earth around the posts compacted, if necessary, after driving. When steel posts are driven to incorrect alignment or grade, they shall be removed and set according to Article 634.05.

When it is necessary to shorten the posts in the field, the lower portion shall be cut off in a manner to provide a smooth cut with minimum damage to the galvanizing. Cut areas shall be repaired according to the requirements of AASHTO M 36.”

Revise Article 630.06 of the Standard Specifications to read:

“**630.06 Shoulder Stabilization at Guardrail.** Shoulder stabilization shall be constructed at the locations of steel plate beam guardrail installation according to the details shown on the plans. On new construction projects, the material used in the shoulder stabilization shall be the same as that used in the adjacent paved shoulder. On shoulder resurfacing projects, the material used in the shoulder stabilization shall be the same as that used for the shoulder resurfacing.

When portland cement concrete is used, shoulder stabilization shall be constructed according to the applicable portions of Section 483. The shoulder stabilization shall be constructed simultaneously with the adjacent portland cement concrete shoulder. Guardrail posts shall be driven through leaveouts or holes cored in the completed shoulder stabilization. The void around each post shall be backfilled with earth or aggregate and capped with hot-mix asphalt (HMA) or CLSM.

When HMA is used, shoulder stabilization shall be constructed according to the applicable portions of Section 482. On new construction, the shoulder stabilization shall be constructed simultaneously with the HMA shoulder. On shoulder resurfacing projects, the portion of the shoulder stabilization below the surface of the existing paved shoulder shall be placed and compacted separately. The guardrail posts shall be driven through holes cored in the completed shoulder stabilization. The void around each post shall be backfilled with earth or aggregate and capped with HMA or CLSM.

When driving guardrail posts through existing shoulders, shoulder stabilization, or other paved areas, the posts shall be driven through cored holes. The void around each post shall be backfilled with earth or aggregate and capped with HMA or CLSM.”

Revise Article 630.08 of the Standard Specifications to read:

“630.08 Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for NON-BLOCKED STEEL PLATE BEAM GUARDRAIL; STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT (1.83 M) POSTS; STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT (2.74 M) POSTS; STEEL PLATE BEAM GUARDRAIL, TYPE B, 6 FOOT (1.83 M) POSTS; STEEL PLATE BEAM GUARDRAIL, TYPE B, 9 FOOT (2.74 M) POSTS; or STEEL PLATE BEAM GUARDRAIL, TYPE D, 6 FOOT (1.83 M) POSTS.

When end sections are specified, they will not be paid for as a separate item, but shall be considered as included in the unit price for steel plate beam guardrail.

Steel plate beam guardrail mounted on existing culverts will be paid for at the contract unit price per foot (meter) for STRONG POST GUARDRAIL ATTACHED TO CULVERT or WEAK POST GUARDRAIL ATTACHED TO CULVERT, of the case specified.

Portland cement concrete shoulder stabilization at guardrail will be paid for according to Article 483.10.

HMA shoulder stabilization at guardrail will be paid for according to Article 482.08.

Excavation in rock will be paid for according to Article 502.13.

Steel plate beam guardrail incorporating long-span spacing will be paid for at the contract unit price per foot (meter) for LONG-SPAN GUARDRAIL OVER CULVERT, 12 FT 6 IN (3.8 M) SPAN; LONG-SPAN GUARDRAIL OVER CULVERT, 18 FT 9 IN (5.7 M) SPAN; or LONG-SPAN GUARDRAIL OVER CULVERT, 25 FT (7.6 M) SPAN.

Steel plate beam guardrail incorporating treated timber at the back side of the post will be paid for at the contract unit price per foot (meter) for BACK SIDE PROTECTION OF GUARDRAIL.”

TRAFFIC BARRIER TERMINAL, TYPE 1 SPECIAL (BDE)

Effective: January 1, 2017

Revise Article 631.04 of the Standard Specifications to read:

“631.04 Traffic Barrier Terminal, Type 1 Special (Tangent) and Traffic Barrier Terminal, Type 1 Special (Flared). These terminals shall meet the testing criteria contained in either NCHRP Report 350 or MASH. In addition to meeting the criteria in one or both of these references, the terminals shall be on the Department’s qualified product list.

The terminal shall be installed according to the manufacturer’s specifications. The beginning length of need point of the terminal shall be placed within 12 ft 6 in (3.8 m) of the length of need point shown on the plans.

The terminal shall be delineated with a terminal marker direct applied. No other guardrail delineation shall be attached to the terminal section.”

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

Revised: April 2, 2015

The Contractor shall submit a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subContractors (i.e. not owned by the Contractor or subContractors) that are used for DBE goal credit.

The report shall be submitted to the Engineer on Department form “SBE 723” within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

VETERAN BUSINESS PROGRAM

Effective: November 6, 2014

STATE OBLIGATION. This special provision will be used by the Department to satisfy the requirements of the Illinois Procurement Code, 30 ILCS 500/45-57. It is the goal of the State to promote and encourage the continued economic development of small businesses owned and controlled by qualified veterans and that qualified Service-Disabled Veteran-Owned Small Businesses (SDVOSB) and Veteran-Owned Small Businesses (VOSB) participate in the State's procurement process as both prime Contractors and subContractors.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific Veteran Small Business participation goal of **0.00%** based on the availability of CMS certified veteran-owned and service-disabled veteran-owned small business (VOSB/SDVOSB) vendors to perform or provide the anticipated services and/or supplies required by this contract.

The Veteran Small Business participation goal is applicable to all bids. In addition to the other award criteria established for this contract, the Department will award this contract to a Vendor that meets the goal or makes good faith efforts to meet the goal. This goal is also applicable to change orders and allowances within the scope of work provided by the certified VOSB/SDVOSB vendor. If Vendor is a CMS certified VOSB/SDVOSB vendor, the entire goal is met and no subcontracting with a CMS certified VOSB/SDVOSB vendor is required; however, Vendor must submit a Utilization Plan indicating that the goal will be met by self-performance.

VETERAN SMALL BUSINESS CERTIFIED VENDOR LOCATOR REFERENCES. Vendors may consult CMS' Veteran Small Business Vendor Directory at www.sell2.illinois.gov/cms/business as well as the directories of other certifying agencies, but firms must be certified with CMS as VOSB/SDVOSB vendors at the time of bid/offer (see Title 44 Illinois Administrative Code Sec. 20.530).

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement. The failure of the bidder to comply with this special provision will render the bid nonresponsive or not responsible.

At the time of the bid, Vendor, or Vendor's proposed subContractor, must be certified with CMS as a VOSB or SDVOSB.

Following are guidelines for Vendor's completion of the Utilization Plan.

- (a) The bidder shall submit a Veteran Business Program (VBP) Utilization Plan. The format for the VBP Utilization Plan is included in this special provision.
- (b) Vendor should include any additional information that will add clarity to Vendor's proposed utilization of certified Veteran Small Business vendors to meet the targeted goal. The Utilization Plan must demonstrate that Vendor has either:
 - (1) met the entire contract goal;
 - (2) made good faith efforts towards meeting the entire goal; or
 - (3) made good faith efforts towards meeting a portion of the goal. Any submission of good faith efforts by Vendor shall be considered as a request for a full or partial waiver.
- (c) If the bidder is a joint venture comprised of Veteran Business Enterprises (VBE) companies and non-VBE companies, the plan must also include:
 - (1) A clear identification of the portion of work to be performed by the VOSB/SDVOSB partner(s); and
 - (2) An agreement between a vendor and a certified VOSB/SDVOSB vendor in which a certified VOSB/SDVOSB vendor promises not to provide subcontracting or pricing quotations to other vendors is prohibited. The Department may request additional information to demonstrate compliance. Vendor agrees to cooperate promptly with the Department in submitting to interviews, allowing entry to places of business, providing further documentation, and to soliciting the cooperation of a proposed certified VOSB/SDVOSB vendor. Failure to cooperate by Vendor and certified VOSB/SDVOSB vendor may render the bidder nonresponsive or not responsible. The contract will not be awarded to Vendor unless Vendor's Utilization Plan is approved.

GOOD FAITH EFFORT PROCEDURES. Vendor must submit a Utilization Plans and Letters of Intent that meet or exceed the published goal. If Vendor cannot meet the stated goal, Vendor must document and explain within the Utilization Plan the good faith efforts it undertook to meet the goal. Utilization Plans are due at the time of bid. Vendors may not be permitted to correct goal deficiencies after bid due dates. The Department will consider the quality, quantity, and intensity of Vendor's efforts but if the Department determines that a Vendor did not demonstrate good faith efforts towards meeting the goal on the bid, the bid may be deemed nonresponsive or not responsible.

The Utilization Plan contains a checklist of actions that the Department will consider as evidence of Vendor's good faith efforts to meet the goal. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases.

- (a) In evaluating Vendor's good faith efforts, the Department may consider whether the ability of other bidders to meet the contract goal suggests that good faith efforts could have resulted in Vendor meeting the goal.

- (b) If the Department determines that Vendor has made good faith efforts to meet the goal, the Department may award the contract provided that Vendor is otherwise eligible for award.
- (c) If the Department determines that good faith efforts have not been met, the bidder may be determined to be nonresponsive or not responsible.

CALCULATING CERTIFIED VOSB/SDVOSB VENDOR PARTICIPATION. The Utilization Plan documents work anticipated to be performed by all certified VOSB/SDVOSB vendors 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 the VOSB/SDVOSB vendors. Applicable guidelines for counting payments attributable to contract goals are listed below:

- (a) A Vendor shall count towards the goal only expenditures to firms that perform a commercially useful function in the work of the contract.
 - (1) A firm is considered to perform a commercially useful function when it is responsible for execution of a distinct element of the work of a contract and carries out its responsibilities by actually performing, managing, and supervising the work involved. The certified VOSB/SDVOSB vendor must also be responsible, with respect to materials or supplies used on the contract, for negotiating price, determining quality and quantity, ordering the materials or supplies, and installing the materials (where applicable) and paying for the material or supplies. To determine whether a firm is performing a commercially useful function, the Department shall evaluate the amount of work subcontracted, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the credit claimed for its performance of the work, industry practices, and other relevant factors.
 - (2) A certified VOSB/SDVOSB vendor does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction or contract through which funds are passed through in order to obtain certified VOSB/SDVOSB vendor participation. In determining whether a certified VOSB/SDVOSB vendor is such an extra participant, the Department shall examine similar transactions, particularly those in which certified VOSB/SDVOSB vendors do not participate, and industry practices.
- (b) The value of the work actually performed or goods/equipment provided by the certified VOSB/SDVOSB vendor shall be counted towards the goal. The entire amount of that portion of the contract that is performed by the certified VOSB/SDVOSB vendor, including supplies purchased or equipment leased by the certified VOSB/SDVOSB vendor shall be counted, except supplies purchased and equipment rented from the Prime Vendor submitting this bid.
- (c) A vendor shall count the portion of the total dollar value of the Veteran Small Business contract equal to the distinct, clearly defined portion of the work of the contract that the certified VOSB/SDVOSB vendor performs toward the goal. A vendor shall also count the dollar value of work subcontracted to other certified VOSB/SDVOSB vendor. Work performed by the non-certified VOSB/SDVOSB party shall not be counted toward the goal. Work that a certified VOSB/SDVOSB vendor subcontracts to a non-certified VOSB/SDVOSB vendor will not count towards the goal.

- (d) A Vendor shall count toward the goal 100% of its expenditures for materials and supplies required under the contract and obtained from a certified VOSB/SDVOSB vendor manufacturer, regular dealer, or supplier. A Vendor shall count toward the goal the following expenditures to certified VOSB/SDVOSB vendors that are not manufacturers, regular dealers, or suppliers.
- (1) The fees or commissions charged for providing a bona fide service, such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials or supplies required for performance of the contract, provided that the fee or commission is determined by the Department to be reasonable and not excessive as compared with fees customarily allowed for similar services.
 - (2) The fees charged for delivery of materials and supplies required by the contract (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is not also the manufacturer or a supplier of the materials and supplies being procured, provided that the fee is determined by the Department to be reasonable and not excessive as compared with fees customarily allowed for similar services. The certified VOSB/SDVOSB vendor's trucking firm must be responsible for the management and supervision of the entire trucking operation for which it is responsible on the contract, and must itself own and operate at least one fully licensed, insured and operational truck used on the contract.
 - (3) The fees or commissions charged for providing any bonds or insurance specifically required for the performance of the contract, provided that the fee or commission is determined by the Department to be reasonable and not excessive as compared with fees customarily allowed for similar services.
- (e) Certified VOSB/SDVOSB vendors who are performing on contract as second tier subContractors may be counted in meeting the established Veteran Small Business goal for this contract as long as the Prime Vendor can provide documentation indicating the utilization of these vendors.
- (f) A Vendor shall not count towards the goal expenditures that are not direct, necessary and related to the work of the contract. Only the amount of services or goods that are directly attributable to the performance of the contract shall be counted. Ineligible expenditures include general office overhead or other Vendor support activities.

CONTRACT COMPLIANCE. Compliance with this section is an essential part of the contract. The following administrative procedures and remedies govern Vendor's compliance with the contractual obligations established by the Utilization Plan. After approval of the Plan and award of the contract, the Utilization Plan becomes part of the contract. If Vendor did not succeed in obtaining certified VOSB/SDVOSB vendor participation to achieve the goal and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of certified VOSB/SDVOSB vendor work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the contract goal. Vendors are encouraged to seek VOSB/SDVOSB firms during the course of performing the contract.

- (a) NO AMENDMENT. The Utilization Plan may not be amended after contract execution without the Department's prior written approval.
- (b) CHANGES TO WORK. Vendor may not make changes to its contractual certified VOSB/SDVOSB vendor commitments or substitute certified VOSB/SDVOSB vendors without the prior written approval of the Department. Unauthorized changes or substitutions, including performing the work designated for a certified VOSB/SDVOSB vendor with Vendor's own forces, shall be a violation of the utilization plan and a breach of the contract, and shall be cause to terminate the contract, and/or seek other contract remedies or sanctions. The facts supporting the request for changes must not have been known nor reasonably should have been known by the parties prior to entering into the subcontract. Vendor must negotiate with the certified VOSB/SDVOSB vendor to resolve the problem. Where there has been a mistake or disagreement about the scope of work or goods/equipment, provided the certified VOSB/SDVOSB vendor can be substituted only where agreement cannot be reached for a reasonable price or schedule for the correct scope of work, goods or equipment.

Substitutions of a certified VOSB/SDVOSB vendor may be permitted under the following circumstances and possibly others on a case-by-case basis:

- (1) Unavailability after receipt of reasonable notice to proceed;
- (2) Failure of performance;
- (3) Financial incapacity;
- (4) Refusal by the certified VOSB/SDVOSB vendor to honor the bid or proposal price or scope;
- (5) Material mistake of fact or law about the elements of the scope of work of a solicitation where a reasonable price cannot be agreed;
- (6) Failure of the certified VOSB/SDVOSB vendor to meet insurance, licensing or bonding requirements;
- (7) The certified VOSB/SDVOSB vendor's withdrawal of its bid or offer; or
- (8) Decertification of the certified VOSB/SDVOSB vendor.

If it becomes necessary to substitute a certified VOSB/SDVOSB vendor or otherwise change the Utilization Plan, Vendor must notify the Department in writing of the request to substitute a certified VOSB/SDVOSB vendor or otherwise change the Utilization Plan. The request must state specific reasons for the substitution or change. The Department will approve or deny a request for substitution or other change in the Utilization Plan within five business days of receipt of the request.

Where Vendor has established the basis for the substitution to the Department's satisfaction, it must make good faith efforts to meet the contract goal by substituting a certified VOSB/SDVOSB vendor. Documentation of a replacement certified VOSB/SDVOSB vendor, or of good faith efforts to replace the certified VOSB/SDVOSB vendor, must meet the requirements of the initial Utilization Plan. If the goal cannot be reached and good faith efforts have been made, Vendor may substitute with a non-certified VOSB/SDVOSB vendor or Vendor may perform the work.

When adding a VOSB/SDVOSB, a new certified VOSB/SDVOSB vendor agreement should be executed and submitted to the Department with the appropriate subContractor approval forms prior to the subContractor's performance of work on the project.

Vendor shall maintain a record of all relevant data with respect to the utilization of certified VOSB/SDVOSB vendors. Full access to these records shall be granted by Vendor upon 48 hours written demand by the Department to any duly authorized representative thereof, or to any municipal, state or federal authorities. The Department shall have the right to obtain from Vendor any additional data reasonably related or necessary to verify any representations by Vendor. After the performance of the final item of work or delivery of material by the certified VOSB/SDVOSB vendor and final payment to the certified VOSB/SDVOSB vendor by Vendor, but not later than 15 calendar days after such payment, Vendor shall submit a statement confirming the final payment and the total payments made to the certified VOSB/SDVOSB vendor under the contract.

The Department will periodically review Vendor's compliance with these provisions and the terms of its contract. Without limitation, Vendor's failure to comply with these provisions or its contractual commitments as contained in the Utilization Plan, failure to cooperate in providing information regarding its compliance with these provisions or its Utilization Plan, or provision of false or misleading information or statements concerning compliance, certification status or eligibility of the certified VOSB/SDVOSB vendor, good faith efforts or any other material fact or representation shall constitute a material breach of this contract and entitle the Department to declare a default, terminate the contract, or exercise those remedies provided for in the contract or at law or in equity.

The Department reserves the right to withhold payment to Vendor to enforce these provisions and Vendor's contractual commitments. Final payment shall not be made pursuant to the contract until Vendor submits sufficient documentation demonstrating compliance with its Utilization Plan.

****RETURN WITH BID****

VETERAN BUSINESS PROGRAM (VBP) UTILIZATION PLAN

The VBP Utilization Plan includes the Letters of Intent and Good Faith Efforts.

(Vendor)_____ submits the following Utilization Plan as part of our bid or offer in accordance with the requirements of the (VBP). We understand that all subContractors must be certified with the CMS Veteran Small Business Program at the time of submission of all bids. We understand that compliance with this section is an essential part of this contract and that the Utilization Plan will become a part of the contract, if awarded.

Vendor submits the following statement:

- ___ Vendor is a certified VOSB/SDVOSB and plans to fully meet the goal through self-performance.
- ___ Vendor has identified certified VOSB/SDVOSB subContractor(s) to fully meet the established goal and submits the attached completed Letter(s) of Intent; or
- ___ Vendor has made good faith efforts towards meeting the entire goal, or a portion of the goal, and hereby requests a waiver (complete checklist below).

****RETURN WITH BID****

Vendor's person responsible for compliance:

Name: Title:
Telephone: Email

DEMONSTRATION OF GOOD FAITH EFFORTS TO ACHIEVE GOAL AND REQUEST FOR WAIVER

If the Veteran Small Business participation goal was not achieved, the Good Faith Efforts Procedures and Guidelines outlined in Contract Compliance will be used to evaluate submitted utilization plans. Vendors providing Good Faith Effort documentation and request for waiver must complete and submit the Good Faith Effort Contact Log with the bid or offer. Failure to submit Good Faith Effort documentation in its entirety shall render Vendor's bid nonresponsive or not responsible and cause it to be rejected or render Vendor ineligible for contract award. Insufficient Good Faith Effort documentation may render the bidder nonresponsive or not responsible.

Below is a checklist of actions that will be used to evaluate a Vendor's Demonstration of Good Faith Efforts and Request for Waiver. Please check the actions which you completed. If any of the following actions are not completed, please attach a detailed written explanation indicating why such action was not completed. If any other efforts were made to obtain Veteran Small Business participation in addition to the items listed below, attach a detailed description of such efforts.

- _____ Utilize the Sell2Illinois website: www2.illinois.gov/cms/business to identify certified VOSB/SDVOSB vendors within the respective commodity/service codes denoted above and at a minimum email all listed vendors and solicit quotes from all vendors who express an interest via follow-up emails or telephone calls.
- _____ Solicit through all reasonable and available means (e.g., attendance at a vendor conference, advertising and/or written notices) the interest of certified VOSB/SDVOSB vendors that have the capability to perform the work of the contract. Vendor must solicit this interest within sufficient time to allow the certified VOSB/SDVOSB vendors to respond to the solicitation. Vendor must determine with certainty if the certified VOSB/SDVOSB vendors are interested by taking appropriate steps to follow up initial solicitations and encourage them to submit a bid or proposal. Vendor must provide interested certified VOSB/SDVOSB vendors with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding promptly to the solicitation.
- _____ Select portions of the work to be performed by certified VOSB/SDVOSB vendors in order to increase the likelihood that the goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate certified VOSB/SDVOSB vendor participation, even when Vendor might otherwise prefer to perform these work items with its own forces.
- _____ Make a portion of the work available to certified VOSB/SDVOSB vendors and selecting those portions of the work or material needs consistent with their availability, so as to facilitate certified VOSB/SDVOSB vendor participation.

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- _____ Negotiate in good faith with interested certified VOSB/SDVOSB vendors. Evidence of such negotiation must include the names, addresses, email addresses, and telephone numbers of certified VOSB/SDVOSB vendors 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 certified VOSB/SDVOSB vendors to perform the work. A Vendor using good business judgment may consider a number of factors in negotiating with certified VOSB/SDVOSB vendors and may take a firm's price and capabilities into consideration. The fact that there may be some additional costs involved in finding and using certified VOSB/SDVOSB vendors may not be in itself sufficient reason for a Vendor's failure to meet the goal, as long as such costs are reasonable. Vendors are not required to accept higher quotes from certified VOSB/SDVOSB vendors if the price difference is excessive or unreasonable.

- _____ Thoroughly investigate the capabilities of certified VOSB/SDVOSB vendors and not reject them as unqualified without documented reasons.

- _____ Make efforts to assist interested certified VOSB/SDVOSB vendors in obtaining lines of credit or insurance as required by the State.

- _____ Make efforts to assist interested certified VOSB/SDVOSB vendors in obtaining necessary equipment, supplies, materials, or related assistance or services.

****RETURN WITH BID****

GOOD FAITH EFFORTS CONTACT LOG

Use this Log to document all contacts and responses (telephone, e-mail, fax, etc.) regarding the solicitation of certified VOSB/SDVOSB vendors within the specific scope of work selected. It is not necessary to show contacts with certified VOSB/SDVOSB vendors who are identified on the Letter(s) of Intent. Keep and submit copies of all emails sent and received from prospective vendors. Include a copy of the commodity list or scope of work you solicited prospective vendors to perform. Duplicate this log as necessary; do not limit your contacts to the number of spaces shown.

Name of Certified Veteran Small Business Vendor	Date	Method of Contact	Scope of Work Solicited	Reason Agreement Was Not Reached

****RETURN WITH BID****

LETTER OF INTENT (LOI)

BETWEEN PRIME VENDOR AND CERTIFIED VETERAN SMALL BUSINESS VENDOR

Instructions: The Bidder is required to submit a separate, signed LOI from each identified certified VOSB/SDVOSB vendor (hereinafter "certified vendors"). **LOIs must be submitted with the Bid and must be signed by both parties.** The Prime Bidder shall not prohibit or otherwise limit certified vendor(s) from providing bids or quotes to other potential bidders. Each LOI shall include the dollar amount, percentage, and scope of work to be performed by each identified certified vendor. All LOI's shall be subject to Department approval.

Any changes involving or affecting the identified certified vendor(s) may not be permitted without written approval of the Department.

Contract Number:

Name of Vendor:

Name of Contact Person:

Address:

City, State and Zip:

Telephone: Fax: Email:

Name of Certified Veteran Small Business Vendor: Name of Contact Person:

Address:

City, State and Zip:

Telephone: Fax: Email:

Proposed % of Contract to be performed by the certified vendor firm: _____%

Proposed dollar amount of Contract to be performed by the certified vendor: \$_____

Description of work to be performed by the certified vendor firm:

Vendor and the Certified vendor above hereby agree that upon the execution of a contract for the above-named project between Bidder and the State of Illinois, the certified vendor will perform the scope of work for the percentage as indicated above.

Bidder (Company Name or D/B/A):

Certified Vendor (Company Name or D/B/A):

Signature:

Signature:

Printed Name:

Printed Name:

Title:

Title:

Date:

Date:

STEEL COST ADJUSTMENT (BDE) (RETURN FORM WITH BID)

Effective: April 2, 2004

Revised: July 1, 2015

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 on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form or failure to indicate contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. 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)	23 lb/ft (34 kg/m)
Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness)	32 lb/ft (48 kg/m)
Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness)	37 lb/ft (55 kg/m)
Other piling	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	20 lb/ft (30 kg/m)
Steel Plate Beam Guardrail, Type B w/steel posts	30 lb/ft (45 kg/m)
Steel Plate Beam Guardrail, Types A and B w/wood posts	8 lb/ft (12 kg/m)
Steel Plate Beam Guardrail, Type 2	305 lb (140 kg) each
Steel Plate Beam Guardrail, Type 6	1260 lb (570 kg) each
Traffic Barrier Terminal, Type 1 Special (Tangent)	730 lb (330 kg) each
Traffic Barrier Terminal, Type 1 Special (Flared)	410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms	
Traffic Signal Post	11 lb/ft (16 kg/m)
Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 - 12 m)	14 lb/ft (21 kg/m)
Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 - 16.5 m)	21 lb/ft (31 kg/m)
Light Pole w/Mast Arm, 30 - 50 ft (9 - 15.2 m)	13 lb/ft (19 kg/m)
Light Pole w/Mast Arm, 55 - 60 ft (16.5 - 18 m)	19 lb/ft (28 kg/m)
Light Tower w/Luminaire Mount, 80 - 110 ft (24 - 33.5 m)	31 lb/ft (46 kg/m)
Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 - 42.5 m)	65 lb/ft (97 kg/m)
Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 - 48.5 m)	80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence)	
Steel Railing, Type SM	64 lb/ft (95 kg/m)
Steel Railing, Type S-1	39 lb/ft (58 kg/m)
Steel Railing, Type T-1	53 lb/ft (79 kg/m)
Steel Bridge Rail	52 lb/ft (77 kg/m)
Frames and Grates	
Frame	250 lb (115 kg)
Lids and Grates	150 lb (70 kg)

Return With Bid

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**OPTION FOR
STEEL COST ADJUSTMENT**

The bidder shall submit this completed form with his/her bid. Failure to submit the form or properly complete contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment. After award, this form, when submitted shall become part of the contract.

Contract No.: _____

Company Name: _____

Contractor's Option:

Is your company opting to include this special provision as part of the contract plans for the following items of work?

- | | | |
|--|-----|--------------------------|
| Metal Piling | Yes | <input type="checkbox"/> |
| Structural Steel | Yes | <input type="checkbox"/> |
| Reinforcing Steel | Yes | <input type="checkbox"/> |
| Dowel Bars, Tie Bars and Mesh Reinforcement | Yes | <input type="checkbox"/> |
| Guardrail | Yes | <input type="checkbox"/> |
| Steel Traffic Signal and Light Poles, Towers and Mast Arms | Yes | <input type="checkbox"/> |
| Metal Railings (excluding wire fence) | Yes | <input type="checkbox"/> |
| Frames and Grates | Yes | <input type="checkbox"/> |

Signature: _____ **Date:** _____

STORM WATER POLLUTION PREVENTION PLAN



Storm Water Pollution Prevention Plan



Route FAI 57	Marked Route I-57	Section D9 ITS Signing 2017-1
Project Number	County Williamson & Jefferson	Contract Number 78337

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issues by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name Jeffrey Keirn	Title Regional Engineer	Agency IDOT Region 5 - District 9
Signature <i>Jeffrey 2 Keirn</i>	Date 11/3/16	

I. Site Description

- A. Provide a description of the project location (include latitude and longitude):
 This project is located near Mile Marker 88.6 on SB FAI 57 in Jefferson Co. and near Mile Marker 56.6 on NB FAI 57 in Williamson Co.
- B. Provide a description of the construction activity which is subject of this plan:
 The proposed project consists of the construction of two Truss Mounted LED Dynamic Message Signs and Closed Circuit Television cameras along I-57. The proposed work includes installing the DMS boards, cameras, and trusses. Construction also includes construction layout, temporary erosion control, traffic control and protection, guardrail, seeding, and various other items required to complete the planned improvements.
- C. Provide the estimated duration of this project:
 60 days
- D. The total area of the construction site is estimated to be 1.25 acres.
 The total area of the site estimated to be disturbed by excavation, grading or other activities is 1.25 acres.
- E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:
 0.3
- F. List all soils found within project boundaries. Include map unit name, slope information and erosivity:
 Bluford Silt Loam (1.5-4%) Slight erosivity
- G. Provide an aerial extent of wetland acreage at the site:
 N/A
- H. Provide a description of potentially erosive areas associated with this project:

None

- I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g. steepness of slopes, length of scopes, etc.):

Soil will be disturbed during construction. Perimeter erosion control barrier will be used.

- J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent off site sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) and locations where storm water is discharged to surface water including wetlands.

- K. Identify who owns the drainage system (municipality or agency) this project will drain into:

Municipality, Agency (IDOT District 9)

- L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located.

ILR400721, ILR400493

- M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. The location of the receiving waters can be found on the erosion and sediment control plans:

Big Muddy River and Crab Orchard Creek

- N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes, highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc.

None

- O. The following sensitive environmental resources are associated with this project, and may have the potential to be impacted by the proposed development:

- Floodplain
- Wetland Riparian
- Threatened and Endangered Species
- Historic Preservation
- 303(d) Listed receiving waters for suspended solids, turbidity, or siltation
- Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity, or siltation
- Applicable Federal, Tribal, State or Local Programs
- Other

1. 303(d) Listed receiving waters (fill out this section if checked above):

- a. The name(s) of the listed water body, and identification of all pollutants causing impairment:

- b. Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

- c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

- d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

2. TMDL (fill out this section if checked above)

- a. The name(s) of the listed water body:

b. Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

c. If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet the allocation:

P. The following pollutants of concern will be associated with this construction project:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Soil Sediment | <input checked="" type="checkbox"/> Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids) |
| <input checked="" type="checkbox"/> Concrete | <input checked="" type="checkbox"/> Antifreeze / Coolants |
| <input checked="" type="checkbox"/> Concrete Truck waste | <input checked="" type="checkbox"/> Waste water from cleaning construction equipment |
| <input checked="" type="checkbox"/> Concrete Curing Compounds | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Solid waste Debris | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Paints | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Solvents | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Fertilizers / Pesticides | <input type="checkbox"/> Other (specify) _____ |

II. Controls

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in I.C. above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

- A. **Erosion and Sediment Controls:** At a minimum, controls must be coordinated, installed, and maintained to:
1. Minimize the amount of soil exposed during construction activity;
 2. Minimize the disturbance of steep slopes;
 3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
 4. Minimize soil compaction and, unless infeasible, preserve topsoil.
- B. **Stabilization Practices:** Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II(B)(1) and II(B)(2), stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.
1. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
 2. On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Preservation of Mature Vegetation | <input checked="" type="checkbox"/> Erosion Control Blanket / Mulching |
| <input type="checkbox"/> Vegetated Buffer Strips | <input type="checkbox"/> Sodding |
| <input type="checkbox"/> Protection of Trees | <input type="checkbox"/> Geotextiles |

- | | |
|--|--|
| <input type="checkbox"/> Temporary Erosion Control Seeding | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Temporary Turf (Seeding, Class 7) | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Temporary Mulching | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Permanent Seeding | <input type="checkbox"/> Other (specify) _____ |

Describe how the stabilization practices listed above will be utilized during construction:

Vegatative cover should meet specifications for percent coverage.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Permanent seeding will remain in place.

C. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

The following stabilization practices will be used for this project:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Perimeter Erosion Barrier | <input type="checkbox"/> Rock Outlet Protection |
| <input type="checkbox"/> Temporary Ditch Check | <input type="checkbox"/> Riprap |
| <input type="checkbox"/> Storm Drain Inlet Protection | <input type="checkbox"/> Gabions |
| <input type="checkbox"/> Sediment Trap | <input type="checkbox"/> Slope Mattress |
| <input type="checkbox"/> Temporary Pipe Slope Drain | <input type="checkbox"/> Retaining Walls |
| <input type="checkbox"/> Temporary Sediment Basin | <input type="checkbox"/> Slope Walls |
| <input type="checkbox"/> Temporary Stream Crossing | <input type="checkbox"/> Concrete Revetment Mats |
| <input type="checkbox"/> Stabilized Construction Exits | <input type="checkbox"/> Level Spreaders |
| <input type="checkbox"/> Turf Reinforcement Mats | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Permanent Check Dams | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Permanent Sediment Basin | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Aggregate Ditch | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Paved Ditch | <input type="checkbox"/> Other (specify) _____ |

Describe how the structural practices listed above will be utilized during construction:

Perimeter Erosion Barrier will be used during construction to prevent erosion.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

D. **Treatment Chemicals**

Will polymer flocculents or treatment chemicals be utilized on this project: Yes No

If yes above, identify where and how polymer flocculents or treatment chemicals will be utilized on this project.

E. **Permanent Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

The practices selected for implementation were determined on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design & Environment Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

N/A

- F. **Approved State or Local Laws:** The management practices, controls, and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Illinois Urban Manual. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

N/A

- G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342a.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
 - Approximate duration of the project, including each stage of the project
 - Rainy season, dry season, and winter shutdown dates
 - Temporary stabilization measures to be employed by contract phases
 - Mobilization time frame
 - Mass clearing and grubbing/roadside clearing dates
 - Deployment of Erosion Control Practices
 - Deployment of Sediment Control Practices (including stabilized construction entrances/exits)
 - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
 - Paving, saw-cutting, and any other pavement related operations
 - Major planned stockpiling operations
 - Time frame for other significant long-term operations or activities that may plan non-storm water discharges such as dewatering, grinding, etc.
 - Permanent stabilization activities for each area of the project
2. The Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:

- Vehicle Entrances and Exits - Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
- Material delivery, Storage, and Use - Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
- Stockpile Management - Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal - Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control - Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.).
- Concrete Residuals and Washout Wastes - Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management - Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Cleaning and Maintenance - Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering Activities - Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer Flocculants and Treatment Chemicals - Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

III. Maintenance

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

All erosion control devices will be maintained in accordance with Article 280.05 of the Standard Specifications for Road and Bridge Construction.

IV. Inspections

Qualified personnel shall inspect disturbed areas of the construction site which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report (BC 2259). Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by e-mail at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

The Incidence of Non-Compliance shall be mailed to the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Compliance Assurance Section
1021 North Grand East
Post Office Box 19276
Springfield, Illinois 62794-9276

Additional Inspections Required:

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V. Failure to Comply

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.



Contractor Certification Statement



Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.G of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractors/subcontractor completing this form.

Route FAI 57	Marked Route I-57	Section D9 ITS Signing 2017-1
Project Number	County Williamson & Jefferson	Contract Number 78337

This certification statement is a part of SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

- Contractor
- Sub-Contractor

Print Name	Signature
Title	Date
Name of Firm	Telephone
Street Address	City/State/Zip

Items which the Contractor/subcontractor will be responsible for as required in Section II.G. of SWPPP:

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.