

32

Letting August 5, 2022

Notice to Bidders, Specifications and Proposal



**Contract No. 76P66
MADISON County
Section 60-1,9SG-1
Route FAI 270, FAP 310
Project HSIP-DXAF(431)
District 8 Construction Funds**

Prepared by

Checked by

F

(Printed by authority of the State of Illinois)



- 1. TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. August 5, 2022 at which time the bids will be publicly opened from the iCX SecureVault.
- 2. DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 76P66
MADISON County
Section 60-1,9SG-1
Project HSIP-DXAF(431)
Route FAI 270, FAP 310
District 8 Construction Funds**

Installation of dynamic message signs on I-270 at the Chain of Rocks Canal Bridge and on IL 255 north of I-270.

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

(b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.
- 4. AWARD CRITERIA AND REJECTION OF BIDS.** This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to re-advertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2022

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

No ERRATA this year.

SUPPLEMENTAL SPECIFICATIONS

Std. Spec. Sec.

Page No.

No Supplemental Specifications this year.

RECURRING SPECIAL PROVISIONS

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

<u>CHECK SHEET #</u>		<u>PAGE NO.</u>
1	X Additional State Requirements for Federal-Aid Construction Contracts	1
2	X Subletting of Contracts (Federal-Aid Contracts)	4
3	X EEO	5
4	Specific EEO Responsibilities Non Federal-Aid Contracts	15
5	Required Provisions - State Contracts	20
6	Asbestos Bearing Pad Removal	26
7	Asbestos Waterproofing Membrane and Asbestos HMA Surface Removal	27
8	Temporary Stream Crossings and In-Stream Work Pads	28
9	Construction Layout Stakes	29
10	Use of Geotextile Fabric for Railroad Crossing	32
11	Subsealing of Concrete Pavements	34
12	Hot-Mix Asphalt Surface Correction	38
13	Pavement and Shoulder Resurfacing	40
14	Patching with Hot-Mix Asphalt Overlay Removal	41
15	Polymer Concrete	43
16	PVC Pipeliner	45
17	Bicycle Racks	46
18	Temporary Portable Bridge Traffic Signals	48
19	Nighttime Inspection of Roadway Lighting	50
20	English Substitution of Metric Bolts	51
21	Calcium Chloride Accelerator for Portland Cement Concrete	52
22	Quality Control of Concrete Mixtures at the Plant	53
23	X Quality Control/Quality Assurance of Concrete Mixtures	61
24	Digital Terrain Modeling for Earthwork Calculations	77
25	Preventive Maintenance – Bituminous Surface Treatment (A-1)	79
26	Temporary Raised Pavement Markers	85
27	Restoring Bridge Approach Pavements Using High-Density Foam	86
28	Portland Cement Concrete Inlay or Overlay	89
29	Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	93
30	Longitudinal Joint and Crack Patching	96
31	Concrete Mix Design – Department Provided	98
32	Station Numbers in Pavements or Overlays	99

TABLE OF CONTENTS

LOCATION OF PROJECT	1
DESCRIPTION OF PROJECT	1
SUBMITTAL OF EEO/LABOR DOCUMENTATION	2
PEAK HOUR RESTRICTIONS	4
TRAFFIC CONTROL PLAN	4
COOPERATION BETWEEN CONTRACTORS.....	5
TRAFFIC CONTROL AND PROTECTION STANDARD 701401 (SPECIAL)	5
ROAD CLOSURE FOR OVERHEAD SIGN TRUSS INSTALLATION.....	6
MOBILE BARRIER TRAILER	7
STATUS OF UTILITIES TO BE ADJUSTED	8
TEST EQUIPMENT.....	8
SYSTEM IMPLEMENTATION, EQUIPMENT INTEGRATION AND SUPPORT	8
TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN	9
CONDUIT ATTACHED TO STRUCTURE, 4" DIA., PVC TYPE C	33
DRILL EXISTING HANDHOLE	34
REMOVE EXISTING ITS EQUIPMENT.....	35
CAT 5 ETHERNET CABLE.....	36
CLOSED CIRCUIT TELEVISION SYSTEM.....	36
FIBER OPTIC ETHERNET DROP AND REPEAT SWITCH	41
FUSION SPLICING OF FIBER OPTIC CABLES	44
TERMINATION OF FIBER OPTIC CABLES WITH FUSION SPLICED ST CONNECTORS	46
FIBER OPTIC SPLICE - LATERAL	47
FIBER OPTIC UTILITY MARKER.....	48
BLENDED FINELY DIVIDED MINERALS (BDE).....	50
COMPENSABLE DELAY COSTS (BDE).....	50
CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE).....	54
DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)	56
PORTLAND CEMENT CONCRETE – HAUL TIME (BDE).....	64
SPEED DISPLAY TRAILER (BDE).....	65
STEEL COST ADJUSTMENT (BDE).....	66
SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)	68
SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)	69
TRAFFIC SPOTTERS (BDE).....	69
WEEKLY DBE TRUCKING REPORTS (BDE).....	71
WORK ZONE TRAFFIC CONTROL DEVICES (BDE)	71

FAI ROUTE 270/FAP ROUTE 310 (I-270/IL 255)
PROJECT HSIP-DXAF (431)
SECTION 60-1, 9SG-1
MADISON COUNTY
CONTACT NO. 76P66

WORKING DAYS (BDE) 73

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted January 1, 2022, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of FAI Route 270/FAP Route 310 (I-270/IL 255), Project HSIP-DXAF (431), Section 60-1, 9SG-1, Madison County, Contact No. 76P66, and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

FAI Route 270/FAP Route 310 (I-270/IL 255)
Project HSIP-DXAF (431)
Section 60-1, 9SG-1
Madison County
Contact No. 76P66

LOCATION OF PROJECT

The project is located on Interstate 270 at mile post 1.8 and at IL Route 255 at mile post 1.0 in District 8's Madison County, Illinois.

DESCRIPTION OF PROJECT

The dynamic message signs, located in the plans, include but is not limited to the following

- dynamic message signs, fiber optic communications and ethernet networks, electrical work, and guardrail.
- All peripheral equipment placement shall be as directed by the contract or as issued by the Department's representative.

SUBMITTAL OF EEO/LABOR DOCUMENTATION

Effective: April 2016

This work shall be done in accordance with Check Sheets No. 1, 3, and 5 of the IDOT Supplemental Specifications and Recurring Special Provisions and the "Weekly DBE Trucking Reports (BDE)" Special Provision, except as here-in modified.

PAYROLL AND STATEMENT OF COMPLIANCE:

Certified payroll (FORM SBE 48 OR AN APPROVED FACSIMILE) and the Statement of Compliance (FORM SBE 348) shall be submitted by two methods:

1. By Mail (United States Postal Service): The ORIGINAL of the certified payroll and the Statement of Compliance for the Prime Contractor and each Subcontractor shall be submitted by mail to the Regional Engineer for District 8.
2. Electronically: Scan both the ORIGINAL of the certified payroll and the Statement of Compliance to the same PDF file, and email to the District at the email address designated by the District EEO Officer.

SBE 48 and SBE 348 forms shall be submitted weekly and will be considered late if received after midnight seven (7) business days after the payroll ending date.

WEEKLY DBE TRUCKING REPORT:

The Weekly DBE Trucking Report (FORM SBE 723) shall be submitted electronically. Scan the form to a PDF file, and email to the District at the email address designated by the District EEO Officer.

SBE 723 forms shall be submitted weekly and will be considered late if received after midnight ten (10) business days following the reporting period.

MONTHLY LABOR SUMMARY & MONTHLY CONTRACT ACTIVITY REPORTS:

The Monthly Labor Summary Report (MLSR) shall be submitted by one of two methods:

1. For contractors having IDOT contracts valued in the aggregate at \$250,000 or less, the report may be typed or clearly handwritten using Form D8 PI0148. Submit the ORIGINAL report by mail to the Regional Engineer for District Eight. Contractors also have the option of using the method #2 outlined below.
2. For contractors having IDOT contracts valued in the aggregate at more than \$250,000, the report must be submitted in a specific "Fixed Length Comma Delimited ASCII Text File Format". This file shall be submitted by e-mail using specific file formatting criteria provided by the District EEO Officer. Contractors must submit a sample text file to District 8 for review at least fourteen (14) days prior to the start of construction.

The Monthly Contract Activity Report (MCAR) may be typed or clearly handwritten using Form D8 PI0149.

The Monthly Labor Summary Report and the Monthly Contract Activity Report shall be submitted concurrently. If the method of transmittal is method #1 above, then both the MLSR and the MCAR shall be mailed together in the same envelope. If the method of transmittal is method #2 above, then the MCAR shall be scanned to a .pdf file and attached to the email containing the MLSR .txt file.

The MLSR and MCAR must be submitted for each consecutive month, for the duration of the project, and will be considered late if received after midnight ten (10) calendar days following the reporting period.

REQUEST FOR APPROVAL OF SUBCONTRACTOR:

The ORIGINAL and one copy of the Request for Approval of Subcontractor (FORM BC 260A) shall be submitted to the District at the IDOT Preconstruction Conference.

SUBSTANCE ABUSE PREVENTION PROGRAM CERTIFICATION:

The ORIGINAL and one copy of the Substance Abuse Prevention Program Certification (FORM BC 261) shall be submitted to the District at the IDOT Preconstruction Conference.

The Contractor is required to follow submittal procedures as provided by the EEO Officer at the preconstruction conference and to follow all revisions to those procedures as issued thereafter.

If a report is rejected, it is the Contractor's responsibility to make required adjustments and/or corrections and resubmit the report. Reports not submitted and accepted within the established timeframes will be considered late.

Disclosure of this information is necessary to accomplish the statutory purpose as outlined under 23CFR part 230 and 41CFR part 60.4 and the Illinois Human Rights Act. Disclosure of this information is REQUIRED. **Failure to comply with this special provision may result in the withholding of payments to the Contractor and/or cancellation, termination, or suspension of the contract in whole or part.**

This Special Provision must be included in each subcontract agreement.

ALL HARD COPY FORMS TO BE SUBMITTED TO:

Region 5 Engineer
Illinois Department of Transportation
ATTN: EEO/LABOR OFFICE
1102 Eastport Plaza Drive
Collinsville, IL 62234-6198

Compliance with this special provision shall be included in the cost of the contract, and no additional compensation will be allowed for any costs incurred.

PEAK HOUR RESTRICTIONS

The Contractor shall have two lanes open to traffic during peak hours in both the westbound and eastbound directions along I-270 at all times. The Contractor shall not be permitted to conduct any type of operation that would impede the flow of traffic during peak hours. The Contractor shall be permitted to have lane closures through the weekends, without peak hour restrictions, except for those holiday weekends specified in Article 107.09.

The Contractor shall be permitted to set up traffic control during off peak hours and Fridays as defined below.

Peak hours are defined as:

5:00 A.M. to 9:00 P.M. Monday through Friday

Should the Contractor fail to have two lanes open to traffic during the defined peak hours, the Contractor shall be liable and shall pay to the Department \$1500, not as a penalty but as liquidated damages, for every 15-minute interval or portion thereof that the flow of traffic is impeded by the Contractor's operations. The Department will deduct these liquidated damages from any monies due or to become due to the Contractor from the Department.

TRAFFIC CONTROL PLAN

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

Contractor shall perform this work in accordance with Art. 701.15, conform to the requirements of Art. 701.15(h). of the Standard Specifications, in accordance with the Work Zone Traffic Control Devices special provision, and follow the requirements of Category 4 for Traffic Control Devices. Work zone traffic control devices and any combinations of devices shall meet crashworthiness standards for their respective categories. The Contractor shall provide a truck-mounted/trailer mounted attenuators (TMA), which shall be used in accordance with Traffic Control and Protection, Standard 701401 (Special)". The TMA shall be at a location as shown on the plans.

Special attention is called to Articles 107.09 and 107.14 of the "Standard Specifications for Road and Bridge Construction" and the following highway standards relating to traffic control:

701101	701106	701400	701401	701402	701406
701411	701428	701446	701456	701901	

In addition, the following special provision(s) will also govern traffic control for this project:

- Peak Hour Restrictions
- Cooperation Between Contractors

Traffic Control and Protection (Special)
Traffic Control and Protection, Standard 701401 (Special)
Road Closure for Overhead Sign Truss Installation
Speed Display Trailer
Traffic Spotters
Work Zone Traffic Control Devices
Mobile Barrier Trailer

COOPERATION BETWEEN CONTRACTORS

The Contractor for this contract is advised that other projects within or adjacent to the limits of this contract section may be under construction during construction operations for this contract. The Contractor for this section shall cooperate with the Contractor for:

FAI 270 (I-270)
Section 60B-1
Madison County
Contract 76J90
Replacement of SN 060-0035

in accordance with Article 105.08 of the Standard Specifications and shall schedule their work in order to minimize conflicts between contracts.

TRAFFIC CONTROL AND PROTECTION STANDARD 701401 (SPECIAL)

Description: This work shall be done in accordance with the applicable portions of Section 700 of the Standard Specifications and highway standard 701401. Standard 701401 shall be modified to utilize the MOBILE BARRIER TRAILER as shown in the plans. Two truck/trailer mounted attenuators shall be required as shown in the plans. The Resident Engineer shall determine the exact locations to place the MOBILE BARRIER TRAILER and the truck/trailer mounted attenuators for the traffic control standard. Additional barricades and signs may be required in addition to those shown in the plans.

This item shall include all traffic control required for work regarding DMS construction on I-270 at locations shown on the traffic control plans.

Basis of Payment: This work will be paid for at the contract unit price per EACH for TRAFFIC CONTROL AND PROTECTION, STANDARD 701401 (SPECIAL).

ROAD CLOSURE FOR OVERHEAD SIGN TRUSS INSTALLATION

The road shall be closed in one direction during the installation of the overhead sign truss under the following conditions:

- a.) The Engineer shall be notified a minimum of ten (10) working days in advance of any proposed road closure or lane restriction. This time is required to coordinate closure operations with police forces and issue the necessary press release.
- b.) Road closures for the purpose of installing the new overhead sign truss structure and or the dynamic message sign shall be scheduled between the hours of 9:00 p.m. to 5:00 a.m.
- c.) Any and all road closures and lane restrictions shall be removed and/or rescheduled if adverse weather such as rain, snow, or fog is present.
- d.) All labor, equipment, and materials required to perform the short term work shall be present prior to closing the lanes.
- e.) Road closures on any road shall be limited to a maximum of 15 minutes and shall be coordinated with the Illinois State police by the Contractor and through District 8's Bureau of Traffic's Jeff Abel, phone (618) 346-3283. Seventy-two (72) hour advance notice is required.
- f.) After the 15-minute closure, "all" lanes shall be immediately reopened to traffic for a minimum clearing period of 30 minutes or longer before resuming normal construction activities as directed by the Engineer.
- g.) Delays to the Contractor caused by complying with these requirements will be considered incidental to the item for Traffic Control and Protection (Special), and no additional compensation will be allowed.

Basis of Payment: Conformance for road closure for overhead sign truss installation will not be paid for as a separate item but will be included in the cost of the contract unit price per LUMP SUM for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

MOBILE BARRIER TRAILER

This work shall consist of furnishing all material, labor, tools, transport, and equipment necessary to transport a MOBILE BARRIER TRAILER from the address noted below and maintain the mobile barrier trailer in satisfactory condition on the work site or other location approved by the Resident Engineer. This device will provide positive barrier protection for traffic control when used in conjunction with the standard traffic control setups to protect workers and their work areas. This unit is to be used for the duration of this contract. A semitruck will be supplied by the Contractor to pull this trailer (tractor with dual drive axles on at least 60 inches of swing clearance is recommended) and will remain the property of the Contractor. Upon completion of the project, the mobile barrier trailer will be checked for acceptance, (damage - not by motorist, working condition, lights, etc.) and once accepted it will be transported back to the following state yard where it was picked up:

Mitchell Storage Facility @ intersection of IL Route 111 & Poag Road, north of Pontoon Beach, IL 62040.

The State's contacts for pickup and acceptance upon project completion will be Jeff Abel, (618)346-3283/Cell (618)444-2524, or Chad Sanders, (618)346-3264/Cell (618)550-9411.

Materials: This unit is the property of the Illinois Department of Transportation and shall be maintained and insured by the Contractor while in his or her use for all perils, including theft and except for motorist damage. All damage to the unit, except motorist damage, shall be reimbursed by the Contractor. Any damage shall be directly reported as soon as possible to Jeff Abel or Chad Sanders.

Construction Requirements: This unit is to be picked up at the above noted address, transported to the jobsite, and used in conjunction with proposed traffic control standards for the duration of this project. This unit will provide enhanced protection of workers by reducing safety concerns. This unit is to be maintained, serviced, and stored, as necessary, per the State's and manufacturer's recommendations. Storage, transport, and security will be the responsibility of the Contractor. This unit will be the sole responsibility of the Contractor until the unit is accepted back by the State at the end of this contract. This unit will be for the Contractor's use and will be transferred back to the State of Illinois after project completion.

The direction of the barrier may be reversed on the trailer to provide traffic control as specified in the plans. Three days prior to performing the reversal, the Contractor shall inform Jeff Abel or Chad Sanders. The barrier may be reversed twice at a maximum throughout this project. The Contractor shall choose a suitable smooth, paved location to safely reverse the direction of the barrier and shall confirm the site with Chad Sanders prior to performing the reversal.

Method of Measurement: The Lump Sum payment will be divided as follows:

- One-fourth payment of item at 25% project completion.
- One-fourth payment of item at 50% project completion.
- One-fourth payment of item at 75% project completion.
- One-fourth payment and final payment at completion, acceptance, and delivery.

Basis of Payment: The furnishing of materials, labor, tools, transportation, and storage in connection with use of this MOBILE BARRIER TRAILER will not be paid for separately but shall be considered as included in the contract lump sum price.

This work will be paid for at the contract unit price per LUMP SUM for MOBILE BARRIER TRAILER.

STATUS OF UTILITIES TO BE ADJUSTED

NO UTILITIES TO BE ADJUSTED

The above represents the best information of the Department and is only included for the convenience of the bidder. The applicable provisions of Sections 102 and 103 and Articles 105.07 and 107.20 of the Standard Specifications for Road and Bridge Construction shall apply.

If any utility adjustment or removal has not been completed when required by the Contractor's operation, the Contractor should notify the Engineer in writing. A request for an extension of time will be considered to the extent the Contractor's operations were affected.

TEST EQUIPMENT

The Contractor shall provide all of their own testing instruments, as required, to service the facilities of the Department.

The Contractor shall use the established procedures as defined by the manufacturer or standard practice to determine the integrity of equipment. The Department shall be provided with the testing procedures used upon request.

All required test equipment shall be included in the contract, and no additional compensation will be allowed.

SYSTEM IMPLEMENTATION, EQUIPMENT INTEGRATION AND SUPPORT

The Contractor shall install the ITS components at the locations indicated on the plans.

All ITS components shall be subject to a 30-day burn-in period. During the "burn-in" period, all components shall perform continuously, without any interruption of operation, for a period of thirty days. In the event that there are operational problems during the burn-in period, the burn-in period shall reset back to day one.

The Department will program the ITS components and integrate them into the existing ITS system.

The Contractor shall be responsible for installing the proposed ITS components in accordance with the plans, specifications, and manufacturer's recommended practices.

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

TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN

Description:

This work consists of providing a truss mounted dynamic message sign (TMDMS) at the location shown on the plans and as directed by the Engineer. Truss mounted dynamic message sign assembly includes the TMDMS enclosure, communication cables, conduits, and associated mounting hardware and software as described in these special provisions and as shown on the contract plans. It also includes operational TMDMS software that remotely provides access to the functionality and performance specified herein.

TMDMS Manufacturer Qualifications

The TMDMS manufacturer shall submit references as specified below. Reference data shall include the current name and address of the 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 TMDMS manufacturer shall submit at least two references, preferably from other state departments of transportation, that are successfully operating a highway LED full matrix TMDMS 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 TMDMS systems submitted shall be full-matrix and able to display at least 3 lines of 18 characters per line, 18" characters, and have walk-in access housings.

References

The TMDMS 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.

Materials

General

The TMDMS shall be a full matrix FULL COLOR LED display (32,000 distinct colors using red, green, and blue LEDs) in a walk-in weatherproof cabinet. The TMDMS shall provide approaching motorists with a clear readable message in all normally encountered weather and lighting

conditions. The TMDMS shall be capable of displaying messages with three lines with twenty-one characters per line at an eighteen-inch character height.

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

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

The sign shall be designed and constructed so as to present a clean and neat appearance.

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

The TMDMS 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.

Environmental Requirements

The TMDMS shall withstand the following environmental conditions for 24 hours or more with no functional or performance degradation, permanent deformation, or other damages:

- Temperature: -40 to +140°F (-40 to 60°C)
- Humidity: 0 to 100 %
- Wind: To at least 90 mph with a 30% gust factor
- Ice: Front face ice load of 4 pounds per square foot

All field equipment enclosures shall be designed to withstand the effects of sand, dust, and hose-directed water. All connections shall be watertight.

Functional Requirements

The TMDMS shall be capable of accepting command and displaying messages and returning status as required by the current version (v2) National Transportation Communications for ITS

Protocol (NTCIP) Specifications applicable for TMDMS and as specified in these special provisions. The TMDMS shall communicate without error for all of the applicable NTCIP standards and be compliant with all applicable NTCIP standards for TMDMS. The TMDMS shall support all mandatory objects of all mandatory conformance groups of NTCIP for TMDMS.

The TMDMS 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. The matrix of a standard character shall consist of 35 pixels over 5 columns and 7 rows. Each TMDMS shall be minimum 54-pixel high x 250 pixel wide (Pixel Pitch Range from 20mm to 35mm), full matrix, and capable of displaying three lines of text using a standard 5 wide x 7 high font size. 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 sign 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.

For message creation, the TMDMS field controller and TMDMS control software shall support the storage and use of a minimum of three (3) alphanumeric character font files comprising the ASCII character set and including 8 directional arrows. Software shall provide the ability to create and maintain message libraries containing up to 255 messages.

The sign shall be able to reproduce standard MUTCD colors per 23 CFR 655. These colors include:

- Black (no pixels on)
- White
- Blue
- Brown
- Green
- Light Blue
- Orange
- Purple
- Red
- Yellow
- Fluorescence Pink
- Fluorescence Yellow-Green

Software

The Contractor shall supply three licenses of remote control and sensing software used to control and interrogate the signs. This software shall provide inter-operability with all other signs supplied under this contract and shall be designed to run on a workstation under Windows 10 and Windows Server 2016, either remotely using the communications link connected to the TMDMS or locally from a laptop computer connected to the sign controller communications port. The software shall display the message to be downloaded to operators exactly as it will appear on the destination TMDMS and shall provide verification back to the operators that the actual message has been visibly displayed on the destination TMDMS on an individual pixel basis.

The software shall include functionality for message scheduling (based on date and time), message priority queuing, and DMS diagnostics.

The software shall be capable of sending multiple messages to multiple signs based on a user programmable time schedule. Communications shall be by cellular wireless service. The cellular modem and service will be paid for under a separate pay item.

TMDMS control software shall support the creation of user ID's and passwords for up to 25 potential system users. User creation, as well as individual user access rights, shall be assignable only by a System Administrator.

Before a system operator can use the TMDMS control software, the software shall request a user name and user password. If the correct user name and password are not provided, access to the software shall be declined.

An 8-bit identification code shall be assignable to each controller via switches located inside the controller enclosure. The software shall control a network of at least 250 variable message signs.

The software shall have the following functionality:

Display Control:	<ul style="list-style-type: none"> • View, group, and monitor DMS in real time • Controls any NTCIP-compliant DMS (Any DMS configuration, portable NTCIP message displays) • Powerful list view or map view • Pre-schedule event scenarios • Scheduled status polling of DMS
Messaging:	<ul style="list-style-type: none"> • Full suite of message and graphic tools • Message changing depending on time and date • Adjust message duration and priority • Time based scheduled DMS polling
Communications:	<ul style="list-style-type: none"> • Run nearly unlimited signs at once from traffic management centers with client-server architecture • Supports ethernet and serial (COM Port) connections • Supports modem pools

Diagnostics:	<ul style="list-style-type: none"> • Log events and alert TMC staff via email • Locate pixel failures instantly with an in-software visual representation test • View status, errors, and problem codes of all DMS subsystems • Verify and troubleshoot at the pixel level
Security:	<ul style="list-style-type: none"> • Real-time verification of "on" pixels • Username/password restricted access to functional areas • Built-in security levels for easy setup • Prohibited words list

In the event that the software is not capable of operating on a laptop that is connected directly to the DMS sign, the Contractor shall provide ten additional licenses of software that can be used in the field to manage the DMS and perform sign diagnostics.

The vendor shall furnish updated copies of all software during the warranty period at no charge to the Department.

Software Documentation

Full documentation for all software and associated protocols shall be supplied to the Department on a CD-ROM. The Department reserves the right to provide this documentation to other parties who may be contracted to provide overall integration or maintenance of this item.

Performance Requirements

TMDMS messages shall be clearly visible and legible from in-vehicle viewing distances between 150 and 1100 feet. While using an 18” character height, the TMDMS shall be capable of simultaneously displaying up to 18 characters in each of three lines with spaces between characters and using 5 horizontal X 7 vertical (or larger) pixel matrices.

The TMDMS controller shall be capable of storing a minimum of 32 three-line full width messages. The controller shall be capable of downloading a minimum of 8 additional messages and commands from the communications interface.

The sign shall provide a RS-232 communications interface in the sign control cabinet suitable for wireless, PSTN, cellular, and fiber optic communications with the sign controller. Additionally, an RS-232 serial port and ethernet port shall be provided in the control cabinet for full sign operation by means of a laptop computer. Each serial port shall support data rates of 19.2 kbps, 14.4 kbps, 9600 bps, 4800 bps, 2400 bps, and 1200 bps.

Optical Requirements

All mandatory NTCIP sign functions shall be available, and message effects shall be visible from the ground-mounted sign control cabinet.

The viewing angle of each discrete LED-formed pixel shall be a minimum cone of 30 degrees around a line normal to the TMDMS viewing surface. The intensity of each pixel shall not decrease more than 30% over the twenty-year life of the sign.

If pulse-width modulation is used for intensity control, the sign drive electronics shall use a refresh or repetition rate of 100 Hz or greater.

The TMDMS walk-in cabinet shall mount three or more light sensors, one angled in a northerly direction away from nearby lighting, scaled for 100 lux and two normal to the sign face, pointing in opposite directions, scaled for 100,000 lux. Each sensor shall have an adjustable aiming angle. The TMDMS shall be capable of automatic dimming.

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:

- “Interstate Shields”
- “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.

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.

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.

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 degrees
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 LED,
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. Intercomponent 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.

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.

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.

Two conduits shall connect the controller cabinet with the walk-in sign display; one for power and one for communications, unless communications between the two is by optical fiber.

The TMDMS manufacturer shall provide two earth ground lugs that are electrically bonded to the TMDMS housing. Lugs shall be installed near the lower left and lower right corners of the TMDMS housing's rear wall. The TMDMS installation contractor shall provide the balance of materials and services needed to properly earth ground the TMDMS to all four ground rods at each site.

The sign shall be equipped with surge suppression circuitry for AC power conductors and external RS-232 data lines to protect them from electrical spikes and transients. The presence of power transients or electromagnetic fields, including those created by any components of the system, shall have no deleterious effect on the performance of the system.

The system shall not conduct or radiate signals which will adversely affect other electrical or electronic equipment including, but not limited to, other control systems, data processing equipment, audio, radio, and industrial equipment.

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 report the error condition to the DMS remote monitoring software.

DMS Power Supplies

TMDMS shall be provided with redundant DC power supplies. These shall be rated for a minimum of 50% spare capacity over that required to light every pixel on a line to full intensity and shall automatically pick up the load if one unit fails while sending an error indication to the TMDMS controller. All electrical components operating on more than 24 V shall be UL listed.

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 or a laptop computer onsite at local control box location automatically.

Display Modules

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 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 candelas 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 candelas @ 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.

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

TMDMS pixels shall be constructed with discrete LEDs manufactured by the Toshiba Corporation or Agilent Technologies (formerly known as Hewlett-Packard). Substitutes will not be accepted. Discrete LEDs shall conform to the following specifications:

- LED's shall be non-tinted, non-diffused, high-intensity, solid-state lamps that utilize AllnGAP OR InGaN semiconductor technology.
- LED lenses shall be fabricated from UV light resistant epoxy.
- The LED lens diameter shall be 0.2 inches (5 mm).
- Red LEDs shall be AllnGAP with a peak wavelength of 626 nm.
- Green LEDs shall be InGaN with a peak wavelength of 525 nm.
- Blue LEDs shall be InGaN with a peak wavelength of 475 nm.
- LEDs shall be obtained from a one-bin luminous intensity sort.
- LEDs shall have a minimum half-power viewing angle of 15°.
- LED package style shall be through-hole flush-mount. LEDs with standoffs and surface mount LEDs will not be accepted.
- All LEDs used in all TMDMS provided for this contract shall be from the same manufacturer and have the same part number.

The sign shall have a minimum intensity of 12,400 cd/m².

All LED display modules, as well as the LED pixel boards and driver circuit boards, shall be identical and interchangeable throughout the TMDMS. LED arrays shall not share a circuit board with the display drive electronics but shall be easily connected and disconnected from the driver board using plugs, sockets, and simple hand tools while excluding soldering operations.

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. It also shall allow the DMS Client software or laptop computer on site at local control box location to 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.

LED intensity shall be automatically adjusted to match ambient lighting conditions. This automatic control shall be provided with an override operated through the TMDMS controller communications channel.

Front face panels shall provide a high-contrast background for the TMDMS display matrix. The aluminum portion of each panel shall be painted black and shall contain a circular or square opening for each LED pixel. Openings shall be large enough to not block any portion of the LED-viewing angle.

The front panel shall be heated to prevent fogging and condensation. A minimum eight watt-per-foot, self-regulating, heat tape shall be provided along the bottom of the message area between the glazing and the display modules. The TMDMS controller shall control the heat tape. All heat tape terminal blocks shall be covered for safety.

Structural Requirements

Walk-in TMDMS Display Cabinet

The TMDMS display cabinet shall allow replacement of any display component from the walkway within the sign, excluding the sign display cover. The removal of any display module shall not reduce the structural integrity of the walk-in cabinet.

The maximum weight of the TMDMS display and walk-in enclosure shall not exceed 4000 lb and shall conform to the structural loading capabilities of the sign structure. Dimensions of the TMDMS walk-in enclosure shall not exceed 31' long by 9' high by 3' wide (nominal dimensions).

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, and 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.

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, 1/4" 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.

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.

Inside the sign housing, all 120 VAC service lines shall be independently protected by a thermal magnetic 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.

The bottom panel of the housing shall have a minimum of four drain holes, with replaceable drain filter plug inserts.

A three-point lockable aluminum access door shall be provided at the end of the housing as shown in the plans to enable easy access to the walk-in housing. This access door shall be 6'-8" X 2'-0" minimum. The door shall have 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, dead bolt, center-case lock with a zinc finish. There shall be a handle on both the inside and the outside of the door. 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 pad lockable. Included in the door assembly shall be a device to hold the door open at 90 degrees.

For moving and installation purposes, multiple steel lifting eyebolts shall be attached to the top of the TMDMS housing. Eyebolts shall attach directly to the TMDMS housing structural frame and shall be installed at the TMDMS factory. All eyebolt-mounting points shall be sealed to prevent water from entering the TMDMS housing. Lifting eyebolts, as well as the housing frame, shall be designed so that the TMDMS can be shipped and handled without damage or undue stress being applied to the housing prior to or during TMDMS installation on its support structure.

The sign housing shall have a continuous 18-inch-wide walkway extending the full length of the sign. The walkway shall be made of 1/8-inch, diamond tread, 6061-T6 or 3003-H22 aluminum. All edges of the walkway grating shall be finished to eliminate sharp edges or protrusions. The walkway shall be capable of supporting a total load of 1000 lb. within any 10-ft section of the walkway.

The sign housing shall be a minimum of 30 inches wide to allow adequate room inside the sign housing for maintenance personnel. There shall be 18 inches of clear area between all equipment along the entire length of the sign housing from the 18-inch walkway and upwards 6 feet.

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.

All welding shall be by an inert gas process in accordance with the American Welding Society (AWS) Standards, ANSI/AWS D1.2-97. The LED TMDMS manufacturer's welders and welding procedures shall be certified by an ANSI/AWS certified welding inspector to the 1997 ANSI/AWS D1.2-97 Structural Welding Code for Aluminum.

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 ventilation system shall be a positive-pressure, filtered, forced-air system which cools both the display modules and the sign housing interior. The sign housing shall have at least two exhaust ports. Each exhaust port shall be filtered and protected by an aluminum hood assembly.

The ventilation system shall have a minimum of two fans. Air shall be drawn into the sign housing through hoods near the top of the housing, and then filtered before reaching the fan units. There shall be one aluminum hood assembly and one inlet filter for each fan.

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.

All duct work that impedes access to any sign components shall be easily removable, without tools, for servicing of these components. Ductwork shall be 0.040 inch minimum thick aluminum and shall be designed for minimal pressure drops throughout the system.

Multiple temperature sensors shall activate the ventilation system. There shall be a minimum of one sensor located near the middle of the sign at the top of the display area. There shall be an additional temperature sensor located to accurately measure the ambient temperature outside the sign housing. The temperature sensors shall have an accuracy of +/- 3°F. or better and a range from -40 to +155°F or greater.

The temperatures from the sensors shall be continuously measured and monitored by the sign controller. A temperature reading greater than a user selectable critical temperature shall cause the sign to go to blank, and the TMDMS controller shall report this error message to the central controller.

The ventilation system shall be equipped with a manual override timer to provide ventilation for service personnel. The timer will have a maximum on time of 1 hour.

The LED modules and electronic equipment shall be protected by a fail-safe, back-up fan control system in the event of an electronic fan control failure or shutdown of the sign controller.

The sign housing shall be furnished with a minimum of four florescent lights equipped with cold weather ballasts. 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 and shall include a timer to turn off the lights after a specified time period.

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 a 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.

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.

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

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

Sign Controller

The sign controller shall include a minimum of two (2) serial communications I/O ports; one (1) RS-232, one (1) RS-485, and one (1) Ethernet port.

The sign controller shall be programmed to receive NTCIP-compliant sign control commands from the central controller (DMS client software) 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, 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.

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 shutdown 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.

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.

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 and 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.

The sign controller shall report errors and failures, including but not limited to:

- 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.

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, 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 photocell circuits in the sign and convert the measured light intensity into the desired pixel brightness. The photo circuit readings shall be correlated with a brightness table in the sign controller. The brightness table shall have a minimum of 255 brightness levels. Automatic adjustment of the LED driving waveform duty cycle shall occur in small enough increments so that brightness of the sign changes smoothly, with no perceivable brightness change between adjacent levels. The brightness 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 requested from the DMS client software, existing ATMS software, or laptop computer. A list of defective pixels shall then be transmitted to the DMS client software, existing ATMS software, or laptop computer and logged into the log file. The log file shall list 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, existing ATMS software, or laptop computer, each pixel in the sign shall be read and its current state for the current displayed message. The actual message that is visibly displayed on the sign on an individual pixel basis in a WYSIWYG format shall be returned to the DMS client software and existing ATMS software to show either on a laptop computer or the controller itself.

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, 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, 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, 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.

Flashing Beacons

The TMDMS shall be equipped with two 12" diameter yellow flashing beacons that can be programmed to operate through the sign controller and remote access software. The beacons shall be located at the top of the sign on each end and shall flash alternately. The beacons shall be equipped with tunnel visors to maximize visibility.

Construction Requirements

Sign construction and installation shall be coordinated with the Engineer. TMDMS shall be transported and erected in a manner recommended by the manufacturer, providing a minimum clearance of 17.5 ft. above the pavement and a horizontal appearance to motorists once fully installed as shown on the Plans.

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.

Any special or proprietary cables shall be provided by the DMS manufacturer to the installation contractor.

Testing

The Contractor shall certify in writing to the Engineer that each TMDMS installation is fully compliant with the NTCIP standards named in the materials section of this special provision. All mandatory objects and the optional objects mentioned above under materials shall be certified for each sign and provided to the Department. In addition, following installation, the Contractor shall perform a site test of each sign demonstrating the functionality and performance required in the materials section of this special provision to the Engineer. The Contractor shall give the Engineer a minimum of two weeks notice before performing the site test.

Testing Requirements

The Department has the right to require performance testing of materials and equipment not previously tested and approved. If technical data is 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 can be substituted in its place with 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

The TMDMS manufacturer shall be responsible for conducting demonstration tests on all units at a TMDMS'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 TMDMS 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 TMDMS 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 TMDMS manufacturer's facility. The Department may elect to perform and/or witness this test. The specifics of this factory acceptance test shall be proposed by the TMDMS manufacturer to the Department for approval.
- Stand-Alone Tests: The TMDMS 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 either 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

After the installation of the TMDMS system is completed and the successful completion of the system test, the TMDMS 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 management software.

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 TMDMS vendor with a letter of approval stating the first day of the 90 days test period.

Maintenance Services

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

The installation contractor shall correct all failures in the TMDMS 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 TMDMS manufacturer; 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.

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 of the 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 the 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's 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 and/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 TMDMS 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 including instructions for performing a backup of all software and message libraries.
2. 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.
3. The TMDMS manufacturer's NTCIP MIB (Management Information Base) shall be provided to the Department.
4. Warranty information.
5. 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 TMDMS 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.

As-Built Documentation

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

- TMDMS 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 TMDMS 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 TMDMS to the sign truss; complete with dimensions and sizes, and
- Wiring schematics.

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

The TMDMS 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, and the routing of all conductors (pairs) in the communications system.

Four (4) copies of each As-Built installation shall be delivered to the Department with one complete copy to be placed in the equipment cabinet at each TMDMS location. Drawings left in the TMDMS shall be attached to the door with stainless steel fasteners and protected from weather with a waterproof enclosure.

Warranty

The Contractor shall warranty all materials and workmanship including labor for a period of two years after the completion and acceptance of the installation, unless other warranty requirements prevail. Any parts or equipment found to be defective and/or determined to be a failure in design, those materials and workmanship during the warranty period shall be replaced free of charge. The warranty period shall begin when the Contractor completes all construction obligations related to this item and when the components for this item have been accepted which shall be documented as the final completion date in the construction status report. This warranty shall include repair and/or replacement of all failed components via a factory authorized depot repair service. All items sent to the depot for repair shall be returned within two weeks of the date of receipt at the facility. The depot location shall be in the United States. Repairs shall not require more than two weeks from date of receipt, and the provider of the warranty shall be responsible for all return shipping costs. The depot maintainer designated for each component shall be authorized by the original manufacturer to supply this service. A warranty certificate shall be supplied for each component from the designated depot repair site indicating the start and end dates of the warranty. The certificate shall be supplied at the conclusion of the system acceptance test and shall be for a minimum of two years after that point. The certificate shall name the Department as the recipient of the service. Company contact information and warranty dates should be clearly shown on the warranty certificate. The Department shall have the right to transfer this service to other private parties who may be contracted to perform overall maintenance of the facility.

Method of Measurement

Truss mounted changeable message sign shall be measured for payment each per TMDMS complete, in place, tested to assure all functionality and performance required above, and accepted by the Engineer.

Basis of Payment

This work will be paid for at the contract unit price per EACH for TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN.

CONDUIT ATTACHED TO STRUCTURE, 4" DIA., FIBERGLASS BULLET RESISTANT, MULTI-DUCT

This work shall consist of furnishing and installing four (4) inch (nominally) conduit, fittings, and accessories as part of the conduit attached to structure as according to the applicable portions of Section 811 of the Standard Specifications.

Conduit shall:

1. Meet or exceed Schedule 40 PVC mechanical performance requirements,
2. Have inner duct with four (4) inside diameter ducts (1.263" diameter, each, for Opti-com, 1.19" diameter, each, for Carlon, or approved equivalent for others and
3. Typically, be UL listed for communication cable and fiber optic cable.

Each inner duct shall be of a different color. The color shall be consistent throughout the system so that the white inner duct is always matched with white, blue with blue, etc. A pull rope shall be installed in each inner duct.

The conduit shall comply with current corresponding NEMA standards. Coding for the current corresponding NEMA standards shall be stamped on all conduit. Expansion joint shall be installed every 100 feet for all exposed conduit.

When there is an abrupt change in conduit alignment due to bridge abutments and its associated equipment, pier cap equipment, beam stiffeners, and bridge scuppers, associated flexible multi-duct conduit shall be used. This associated flexible multi-duct conduit shall be included in the contract unit price of this pay item.

This work shall be paid at the contract unit price per FOOT for CONDUIT ATTACHED TO STRUCTURE, 4" DIA., FIBERGLASS BULLET RESISTANT, MULTI-DUCT.

DRILL EXISTING HANDHOLE

This work shall consist of drilling a hole in an existing handhole structure for the installation of new conduit(s). This work shall be performed in accordance with Section 801 of the Standard Specifications.

The size of the hole must be as close as possible to the size of the proposed conduit. Conduit openings must be fitted with the appropriate conduit fittings, nuts, and accessories. The type and orientation of the conduit must be as shown in the plans.

Field cut openings shall be uniform and smooth. All burrs and rough edges shall be filed smooth prior to the installation of the conduit(s) into the handhole. Any gaps around the conduit penetration shall be sealed against moisture or animal entry.

Cleaning the existing handhole (if required) shall be included in this item and shall be done as directed by the Engineer.

The Contractor shall furnish all labor, tools, equipment, and other incidentals necessary to drill holes in heavy duty handholes. This work will be measured for payment per each hole that is drilled in an existing handhole.

This work will be paid for at the contract unit price per EACH for DRILL EXISTING HANDHOLE.

REMOVE EXISTING ITS EQUIPMENT

This work shall consist of removing, protecting, and transporting CCTV equipment and pole structure to an IDOT yard as indicated on the plans. The concrete foundation shall be removed and transported to an IDOT approved salvage yard.

Before starting work, the Contractor shall submit a CCTV removal plan to the Engineer for acceptance detailing the proposed methods of CATV removal and the amount, location(s), and type(s) of equipment to be used. The Traffic Systems Center (TSC) Engineer will test the CATV prior to removal. The Contractor shall be responsible for the CATV and pole structure equipment until they are transferred to the State.

It shall be the Contractor's responsibility to contact the TSC Engineer a minimum of 7 working days prior to the CATV removal. The Contractor shall coordinate their work fully with the TSC Engineer, both as to the work required and the timing of the removal of the CATV. No additional compensation will be granted under this or any other item for extra work caused by failure to comply with this requirement.

The CATV on the existing structure shall remain operational until it is in conflict with construction operations or as determined by the Engineer. The new structure shall be erected and prepared for the relocation of the existing CATV prior to removing the CATV from the existing structure to minimize the operational downtime of the CATV.

Removal Inspection

Prior to any work being performed by the Contractor, the Contractor shall (in the presence of the Engineer and the TSC Engineer) conduct an inspection of the CATV and pole structure, making note of any parts which are found broken, missing, defective, or malfunctioning.

The TSC Engineer will test the sign as deemed necessary. Any problems will be noted and/or repaired prior to transfer of maintenance. The Contractor shall assume full responsibility for the DMS, sign structure, cabinet and cabinet equipment during removal, transportation, storage, and installation. Any damage shall be repaired to the satisfaction of the Engineer at no additional cost to the State.

This inspection shall be submitted in writing to the Engineer for record. Without such a record, any damage to the DMS, sign structure, cabinet, cabinet equipment, hardware, and/or cables shall be repaired by the Contractor to the full satisfaction of the Engineer at no additional cost to the Department

The Contractor shall only be allowed to take one DMS out of service at a time. After a DMS has been removed, the Contractor shall have seven (7) calendar days to install the replacement DMS. The replacement will only be considered complete when the DMS is operational and can be controlled from the IDOT Traffic Operations Center.

This work will be measured for payment per each for the removal of CCTV , pole structure and foundation, and all ancillary items, thereto.

Basis of Payment: This work will be paid for at the contract unit price per EACH for REMOVE EXISTING ITS EQUIPMENT.

CAT 5 ETHERNET CABLE

This work shall be in accordance with Sections 873, 1076, and 1088 of the Standard Specifications, except as modified herein.

This work shall consist of furnishing and installing an outdoor rated CAT5E cable in conduits, handholes, and poles.

The cable shall be rated for outdoor use and conform to the following specifications:

- Outdoor CMX rated jacket (climate/oil resistant jacket)
- UV resistant outer jacket material (PVC-UV, UV Stabilized)
- Outer jacket ripcord
- Designed For outdoor above- ground or conduit duct applications
- Cat5E rated to 350MHz (great for 10/100 or even 1000mbps gigabit Ethernet)
- Meets TIA/EIA 568b.2 standard
- Shielded twist pair
- 4 pairs, 8 conductors
- 24AWG, solid core copper
- UL 444 ANSI TIA/EIA-568.2 ISO/IEC 11801
- RoHS compliant
- Water blocking gel

Basis of Payment: This work will be paid for at the contract unit price per FOOT for CAT 5 ETHERNET CABLE.

CLOSED CIRCUIT TELEVISION SYSTEM

Description. This work shall consist of furnishing and installing an integrated closed-circuit television (CCTV) dome camera assembly, camera bracket, and all other items required for installation and operation. This assembly shall contain all components identified in the materials section and shall be configured as indicated on the plan sheets.

Materials.

The CCTV camera shall be an Axis Model Q6075-E Dome Camera Assembly for integration into the existing District 8 ITS system.

The Contractor shall provide all materials required to install the proposed camera on the proposed sign structure camera mast as shown on the plan sheets.

The Contractor shall submit catalog cut sheets to the Department for all items (mounting brackets, hardware, etc.) that will be utilized for review prior to commencing work.

The Department will program the cameras prior to installation.

The camera shall meet or exceed the following specifications:

CAMERA

VIDEO:	60 Hz (NTSC), 50 Hz (PAL)
IMAGE SENSOR:	1/2.8" progressive scan CMOS
LENS:	4.44–142.6 mm, F1.6–4.41 Horizontal angle of view: 62.8°–2.23° Vertical angle of view: 36.8°–1.3° Autofocus, auto-iris
DAY AND NIGHT:	Automatically removable infrared-cut filter
MINIMUM ILLUMINATION:	Color: 0.3 lux at 30 IRE F1.6 B/W: 0.03 lux at 30 IRE F1.6 Color: 0.5 lux at 50 IRE F1.6 B/W: 0.04 lux at 50 IRE F1.6
SHUTTER TIME: NTSC:	1/33000 s to 1/3 s with 50 Hz 1/33000 s to 1/4 s with 60 Hz
PAN/TILT/ZOOM:	Pan: 360° endless, 0.05° - 450°/s Tilt: 220°, 0.05°-450°/s 32x optical zoom and 12x digital zoom, total 384x zoom E-flip, 256 preset positions, tour recording, guard tour, control queue, on-screen directional indicator, set new pan 0°, adjustable zoom speed

VIDEO

VIDEO COMPRESSION:	H.264 (MPEG-4 Part 10/AVC), motion JPEG
RESOLUTIONS:	HDTV 1080p 1920x1080 to 320x180 HDTV 720p 1280x720 to 320x180
FRAME RATE (H.264):	Up to 60/50 fps (60/50 Hz) in HDTV 720p Up to 30/25 fps (60/50 Hz) in HDTV 1080p
VIDEO STREAMING:	Multiple, individually configurable streams in H.264 and motion JPEG, Axis' Zipstream technology, controllable frame rate and bandwidth, VBR/MBR H.264
IMAGE SETTING:	Manual shutter time, compression, color, brightness, sharpness, white balance, exposure control, exposure zones, fine tuning of behavior at low light, rotation: 0°, 180°, text and image overlay,

32 individual 3D privacy masks, image freeze on PTZ, automatic defog, backlight compensation
Wide Dynamic Range (WDR): Up to 120 dB depending on scene, highlight compensation

NETWORK

SECURITY: Password protection, IP address filtering, HTTPS encryption, IEEE 802.1Xa network access control, digest authentication, user access log, centralized certificate management

PROTOCOLS: IPv4/v6, HTTP, HTTPS, SSL/TLSa, QoS Layer 3 DiffServ, FTP, CIFS/SMB, SMTP, Bonjour, UPnP, SNMP v1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, RTSP, RTP, SFTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS, SSH, NTPCIP

SYSTEM INTEGRATION

APPLICATION PROGRAM INTERFACE: Open API for software integration, including VAPIX® and AXIS camera application platform; specifications at www.axis.com, AXIS video hosting system (AVHS) with one-click connection, ONVIF Profile S, specification at www.onvif.org

ANALYTICS: Video motion detection, autotracking, active gatekeeper basic analytics (not to be compared with third-party analytics): object removed, enter/exit detector, fence detector, object counter, highlight compensation, support for AXIS camera application platform enabling installation of third-party application, see www.axis.com/acap

EVENT TRIGGERS: Detectors: live stream accessed, video motion detection, shock detection, object removed, enter/exit detector, fence detector, object counter; hardware: fan, network, temperature, casing open, PTZ: autotracking, error, moving, ready, preset reached; storage: disruption, recording; system: system ready; time: recurrence, use schedule; input signal: manual trigger, virtual input

EVENT ACTIONS: Day/night mode, overlay text, video recording to edge storage, pre- and post-alarm video buffering, send SNMP trap
PTZ: PTZ preset, start/stop guard tour
File upload via FTP, SFTP, HTTP, HTTPS network share and email; notification via email, HTTP, HTTPS and TCP

DATA STREAMING Event data

BUILT IN INSTALLATION AIDS Pixel Counter

GENERAL

CASING:	IP66-, NEMA 4X- and IK10-rated metal casing (aluminum), polycarbonate (PC) clear dome, sunshield (PC/ASA)
SUSTAINABILITY:	PVC free
MEMORY:	512 MB RAM, 128 MB Flash
POWER CAMERA:	Axis High PoE midspan 1–port: 100–240 V AC, max 74 W Camera consumption: typical 16 W, max 60 W
CONNECTORS:	RJ45 10BASE-T/100BASE-TX PoE, RJ45 push-pull connector (IP66) included
EDGE STORAGE:	Support for SD/SDHC/SDXC card Support for recording to dedicated network-attached storage (NAS); for SD card and NAS recommendations see www.axis.com
OPERATING CONDITIONS:	With 30 W midspan: -20 °C to 50 °C (-4 °F to 122 °F) With 60 W midspan: -50 °C to 50 °C (-58 °F to 122 °F) Maximum temperature (intermittent): 60 °C (140 °F) Arctic temperature control: start-up as low as -40 °C (-40 °F) Humidity 10–100% RH (condensing)
APPROVALS:	EMC: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 55024, FCC Part 15 Subpart B Class A, ICES-003 Class A, VCCI Class A, RCM AS/NZS CISPR 22 Class A, KCC KN32 Class A, KN35 Safety: IEC/EN/UL 60950-1, IEC/EN/UL 60950-22 Environment: EN 50121-4, IEC 62236-4, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60721-4-3, NEMA 250 Type 4X, IEC 60068-2-30, IEC 60068-2-60, IEC 60068-2-78, IEC/EN 60529 IP66, NEMA TS-2-2003 v02.06, Subsection 2.2.7, 2.2.8, 2.2.9; IEC 62262 IK10, ISO 4892-2 Midspan: EN 60950-1, GS, UL, cUL, CE, FCC, VCCI, CB, KCC, UL-AR
WEIGHT:	3.7 kg (8.2 lb.)
INCLUDED ACCESSORIES:	Axis High PoE 60 W midspan 1-port, RJ45 push-pull connector (IP66), sunshield, installation guide, windows decoder 1-user license
VIDEO MANAGEMENT SOFTWARE:	AXIS camera companion, AXIS camera station, video management software from Axis' Application Development Partners available on www.axis.com/techsup/software

WARRANTY: Axis 3-year warranty and AXIS extended warranty option

Environmental Enclosure/Housing

The environmental enclosure shall be designed to physically protect the integrated camera from the outdoor environment and moisture via a sealed enclosure. If the option exists in the standard product line of the manufacturer, the assembly shall be supplied with an integral sun shield. The enclosure shall be fully water and weather resistant with a NEMA 4 rating or better.

The camera dome shall be constructed of distortion free acrylic or approved equivalent material that must not degrade from environmental conditions. The environmental housing shall include a camera-mounting bracket. In addition, the environmental housing shall include a heater, blower, and power surge protector. An integral fitting compatible with a standard 1-1/2 in (38.1 mm) NPT pipe, suitable for outdoor pendant mounting shall also be provided.

The enclosure shall be equipped with a heater controlled by a thermostat. The heater shall turn on when the temperature within the enclosure falls below 40° F (4.4°C). The heater shall turn off when the temperature exceeds 60°F (15.6°C). The heater will minimize internal fogging of the dome faceplate when the assembly is operated in cold weather.

In addition, a fan shall be provided as part of the enclosure. The fan will provide airflow to ensure effective heating and to minimize condensation.

The enclosure shall be equipped with a hermetically sealed, weatherproof connector, located near the top for external interface with power, video, and control feeds.

CCTV Camera System Mounting Supports

The Contractor shall furnish and install an Axis Pole Mount Bracket T91L61 (Part Number 5801-721) for camera installation on traffic signal mast arms, CCTV camera poles, and stainless steel banding as required.

Mounting supports shall be configured as shown on the camera support detail plans and as approved by the Engineer. Mount shall be of aluminum construction with enamel or polyester powder coat finish. Braces, supports, and hardware shall be stainless steel. Wind load rating shall be designed for sustained gusts up to 90 mph (145 km/hr) with a 30% gust factor. Load rating shall be designed to support up to 75 lb (334 N). For roof or structural post/light pole mounting, mount shall have the ability to swivel inward for servicing. The mounting flange shall use standard 1-1/2 inch (38.1 mm) NPT pipe thread.

Connecting Cables

The Contractor shall furnish and install outdoor rated, shielded CAT5E cable at the locations shown on the plan sheets. The cable shall be terminated using the terminal block inside the camera bracket, the IDC connector and pre-formed IP66 rated RJ-45 connector on the camera end, and a shielded RJ-45 connector in the cabinet. The Contractor shall test the cable prior and after termination.

Cable will not be paid for separately but shall be included in the cost of this pay item.

Construction Requirements.

General

The Contractor shall prepare a shop drawing detailing the complete CCTV dome camera assembly and the installation of all components to be supplied for approval of the Engineer. Particular emphasis shall be given to the cabling and the interconnection of all of the components.

The Contractor shall install the CCTV dome camera assembly at the locations indicated in the plans. The CCTV dome camera assembly shall be mounted on a pole, wall, or other structure.

Testing

The Contractor shall test each installed CCTV dome camera assembly. The test shall be conducted from the field cabinet using the standard communication protocol and a laptop computer. The Contractor shall verify that the camera can be fully exercised and moved through the entire limits of Pan, Tilt, Zoom, Focus and Iris adjustments using both the manual control and presets. The Contractor shall maintain a log of all testing and the results. A representative of the Contractor and a representative of the Engineer shall sign the log as witnessing the results. Records of all tests shall be submitted to the Engineer prior to accepting the installation.

Method of Measurement. The closed-circuit television dome camera bid item will be measured for payment by the actual number of CCTV dome camera assemblies furnished, installed, tested, and accepted.

Basis of Payment. This work will be paid for at the contract unit price per EACH for CLOSED CIRCUIT TELEVISION DOME CAMERA.

FIBER OPTIC ETHERNET DROP AND REPEAT SWITCH

The Contractor shall furnish a fiber optic drop and repeat switch complete with the accessories specified below and install it inside the proposed traffic signal cabinet.

The fiber optic drop and repeat switch shall meet or exceed the following minimum specifications:

Approved Models: Antaira (Aaxeon) Technologies Model LNX-0702C-SFP-T (7-Port (5-port 10/100T + 2 10/100/1000T SFP ports industrial Ethernet switch, wide operating temperature) or approved equal.

Features:	<ul style="list-style-type: none"> • 5-Port 10/100TX + 2-Port 10/100/1000T/Mini-GBIC Combo • Store-and-Forward Switching Architecture • 10Gbps Back-Plane (Switching Fabric) • 1 Mbits Memory Buffer • 8K MAC Address Table • Wide-Range Redundant Power Design • Power Polarity Reserve Protect • Provides EFT Protection 3000 VDC for Power Line • Supports 6000 VDC Ethernet ESD Protection • IP30 Rugged Aluminum Case Design • 5-Year Warranty
Standard:	<ul style="list-style-type: none"> • IEEE 802.3 10BaseT Ethernet • IEEE 802.3u 100BaseTX Fast Ethernet • IEEE 802.z Gigabit Fiber • IEEE 802.3x Flow Control and Back-Pressure
Protocol:	<ul style="list-style-type: none"> • CSMA/CD
Switch Architecture:	<ul style="list-style-type: none"> • Back-Plane (Switching Fabric): 10Gbps
Transfer Rate:	<ul style="list-style-type: none"> • 14,880pps for Ethernet Port • 148,800pps for Fast Ethernet Port • 1,488,000pps for Gigabit Fiber Ethernet Port
MAC Address:	<ul style="list-style-type: none"> • 8K MAC Address Table
Memory Buffer:	<ul style="list-style-type: none"> • 7,926 pps (default)
LED:	<ul style="list-style-type: none"> • Unit: Power 1, Power 2, Fault • 10/100 TX: Link/Activity, Full Duplex/Collision • Gigabit Copper: Link/Activity, Speed • SFP: Link/Activity
Connector:	<ul style="list-style-type: none"> • 10/100T: 5 x RJ-45 • 100/1000T: 2 x 100/1000 SFP Sockets
Network Cable:	<ul style="list-style-type: none"> • 10BaseT: 2-pair UTP/STP Cat. 3, 4, 5 cable EIA/TIA-568 100-ohm (100m) • 100BaseTX: 2-pair UTP/STP Cat. 5 cable EIA/TIA-568 100-ohm (100m)
Power Supply:	<ul style="list-style-type: none"> • DC 12 ~ 48V, Redundant Power with Polarity Reverse Protect Function and Removable Terminal Block

Power Consumption:	<ul style="list-style-type: none"> • 6 Watts
Reverse Polarity Protection:	<ul style="list-style-type: none"> • Present
Overload Current Protection:	<ul style="list-style-type: none"> • Present
Mechanical:	<ul style="list-style-type: none"> • Casing: IP30 Metal Case • Dimension (W x H x D): 30 x 99 x 142 mm • Installation: DIN-Rail/Wall Mountable
Weight:	<ul style="list-style-type: none"> • Unit Weight: 1.3 lbs. • Shipping Weight: 1.7 lbs.
Operation Temperature:	<ul style="list-style-type: none"> • Wide Operating Temperature: -40° C to 75° C (-40° F to 176° F)
Operation Humidity:	<ul style="list-style-type: none"> • 5% to 95% (Non-condensing)
Storage Temperature:	<ul style="list-style-type: none"> • -40° C to 85° C
EMI:	<ul style="list-style-type: none"> • FCC Class A • CE EN6100-4-2/EN6100-4-3/EN6100-4-4/EN6100-4-5/EN6100-4-6 • /EN6100-4-8/EN6100-4-11/EN6100-4-12/EN6100-6-2/EN6100-6-4
Stability Testing:	<ul style="list-style-type: none"> • Shock: IEC60068-2-27 • Free Fall: IEC60068-2-32 • Vibration: IEC60068-2-6
Warranty:	<ul style="list-style-type: none"> • 5-Year Warranty

The following items shall also be included with each switch:

- SFP Fiber Optic Module – Qty. 2 (Aaxeon SFP-S20-T, 1.25Gbps Ethernet SFP Transceiver, Single Mode 10KM / LC / 1310nm, -40°C~85°C)
- Fiber Optic Patch Cable – Qty. 2 (single mode fiber, 1 meter length, duplex, LC/ST connectors)

Basis of Payment: This work will be paid for at the contract unit price per EACH for FIBER OPTIC ETHERNET DROP AND REPEAT SWITCH.

FUSION SPLICING OF FIBER OPTIC CABLES

Description. The Contractor will splice optical fibers from different cable sheaths and protect them with a splice closure at the locations shown on the plans. Fiber splicing consists of in-line fusion splices for all fibers described in the cable plan at the particular location.

Two types of splices are identified. A mainline splice includes selected fibers from each cable run as shown in the plan sheets. In a lateral splice, the buffer tubes in the mainline cable are dressed out, and those fibers identified on the plans are accessed in and spliced to lateral cables.

Materials.

Splice Closures:

Splice closures shall be designed for use under the most severe conditions such as moisture, vibration, impact, cable stress, and flex temperature extremes as demonstrated by successfully passing the factory test procedures and minimum specifications listed below:

Physical Requirements:

The closures shall provide ingress for up to four cables in a butt configuration.

The closure shall prevent the intrusion of water without the use of encapsulates.

The closure shall be capable of accommodating splice organizer trays that accept mechanical or fusion splices. The splice closure shall have provisions for storing fiber splices in an orderly manner, mountings for splice organizer assemblies, and space for excess or un-spliced fiber. Splice organizers shall be re-enterable. The splice case shall be UL rated.

Closure re-entry and subsequent reassembly shall not require specialized tools or equipment. Further, these operations shall not require the use of additional parts.

The splice closure shall have provisions for controlling the bend radius of individual fibers to a minimum of 1.5 in (38 mm).

Factory Testing of Splice Closures:

Compression Test: The closure shall not deform more than 10% in its largest cross-sectional dimension when subjected to a uniformly distributed load of 1335 N at a temperature of 0°F and 100°F (-18°C and 38°C). The test shall be performed after stabilizing at the required temperature for a minimum of two hours. It shall consist of placing an assembled closure between two flat parallel surfaces with the longest closure dimension parallel to the surfaces. The weight shall be placed on the upper surface for a minimum of 15 minutes. The measurement shall then be taken with weight in place.

Impact Test: The assembled closure shall be capable of withstanding an impact of 28 N-M at temperatures of 0°F and 100°F (-18°C and 38°C). The test shall be performed after stabilizing the closure at the required temperature for a minimum of 2 hours. The test fixture shall consist of

20 lb (9 kg) cylindrical steel impacting head with a 2 in (5 cm) spherical radius at the point where it contacts the closure. It shall be dropped from a height of 12 in (30 cm). The closure shall not exhibit any cracks or fractures to the housing that would preclude it from passing the water immersion test. There shall be no permanent deformation to the original diameter or characteristic vertical dimension by more than 5%.

Cable Gripping and Sealing Testing: The cable gripping and sealing hardware shall not cause an increase in fiber attenuation in excess of 0.05 dB/fiber @ 1550 nm when attached to the cables and the closure assembly. The test shall consist of measurements from six fibers, one from each buffer tube or channel, or randomly selected in the case of a single fiber bundle. The measurements shall be taken from the test fibers before and after assembly to determine the effects of the cable gripping and sealing hardware on the optical transmission of the fibers.

Vibration Test: The splice organizers shall securely hold the fiber splices and store the excess fiber. The fiber splice organizers and splice retaining hardware shall be tested per EIA Standard FOTP-II, Test Condition I. The individual fibers shall not show an increase in attenuation in excess of 0.1 dB/fiber.

Water Immersion Test: The closure shall be capable of preventing a 10 ft (3 m) water head from intruding into the splice compartment for a period of 7 days. Testing of the splice closure is to be accomplished by the placing of the closure into a pressure vessel and filling the vessel with tap water to cover the closure. Apply continuous pressure to the vessel to maintain a hydrostatic head equivalent to 10 ft (3 m) on the closure and cable. This process shall be continued for 30 days. Remove the closure and open to check for the presence of water. Any intrusion of water in the compartment containing the splices constitutes a failure.

Certification: It is the responsibility of the Contractor to ensure that either the manufacturer or an independent testing laboratory has performed all of the above tests and that the appropriate documentation has been submitted to the Department. Manufacturer certification is required for the model(s) of closure supplied. It is not necessary to subject each supplied closure to the actual tests described herein.

Construction Requirements.

The closure shall be installed according to the manufacturer's recommended guidelines. For all splices, the cables shall be fusion spliced.

The Contractor shall prepare the cables and fibers in accordance with the closure and cable manufacturers' installation practices. A copy of these practices shall be provided to the Engineer 21 days prior to splicing operations.

Using a fusion splicer, the Contractor shall optimize the alignment of the fibers and fuse them together. The Contractor shall recoat the fused fibers and install mechanical protection over them.

Upon completing all splicing operations for a cable span, the Contractor shall measure the mean bi-directional loss at each splice using an optical time domain reflectometer. This loss shall not exceed 0.1 dB.

The Contractor shall measure the end-to-end attenuation of each fiber optic link, from connector to connector, using an optical power meter and source. This loss shall be measured from both

directions and shall not exceed 0.5 dB per installed kilometer of single mode cable. Measurements shall be made at both 1300 and 1550 nm for single mode cable. For multimode cable, power meter measurements shall be made at 850 and 1300 nm. The end-to-end attenuation shall not exceed 3.8 dB/installed kilometers at 850nm or 1.8 dB per installed kilometer at 1300nm for multimode fibers.

As directed by the Engineer, the Contractor, at no additional cost to the Department, shall replace any cable splice not satisfying the required objectives.

The Contractor shall secure the splice closure to the side of the splice facility using cable support brackets. All cables shall be properly dressed and secured to rails or racks within the handhole or traffic signal cabinet. No cables or enclosures will be permitted to lie on the floor of the splice facility. Cables that are spliced inside a building will be secured to the equipment racks or walls as appropriate and indicated on the plans.

Basis of Payment. This work will not be paid for separately but shall be included in the bid price for the fiber optic cable pay items.

TERMINATION OF FIBER OPTIC CABLES WITH FUSION SPLICED ST CONNECTORS

Description. The Contractor shall terminate a single mode fiber by fusion splicing a factory-formed ST connector (from a pre-formed fiber optic pigtail) onto a field fiber at the locations shown on the plans.

Materials. The Contractor shall be responsible for ensuring that the pre-formed pigtail fiber is compatible with the field fiber that it will be fusion splice to.

The splice shall be protected with a protection sleeve/enclosure that will secure both cables and prevent cable movement.

The fiber optic patch cords shall meet or exceed the following specifications:

- High-quality 125um fiber optics
- 900um tight buffer construction
- Aramid yarn individually protected
- Duplex construction
- Stress relief boots color coded (Tx/Rx)
- ST connectors with high-grade zirconia ferrule
- Insertion loss < 0.2 dB @ 1310 / 1550 nm
- Return loss < -58 dB @ 1310 / 1550 nm
- Compliant with ANSI/TIA/EIA 568-B.3
- TIA/EIA-604, FOCIS-2

The Contractor shall submit a shop drawing of all proposed components to the Engineer for approval prior to commencing construction.

Construction Requirements.

The Contractor shall prepare the cables and fibers in accordance with the cable manufacturers' installation practices. A copy of these practices shall be provided to the Engineer 21 days prior to splicing operations.

Using a fusion splicer, the Contractor shall optimize the alignment of the fibers and fuse them together. The Contractor shall recoat the fused fibers and install mechanical protection over them.

Upon completing all splicing operations for a cable span, the Contractor shall measure the mean bi-directional loss at each connector using an optical time domain reflectometer. This loss shall not exceed the loss of the fusion splice (0.1 dB) plus the loss of the connector (typically 0.75 dB).

As directed by the Engineer, the Contractor, at no additional cost to the Department, shall replace any cable splice and/or connector not satisfying the required objectives.

Basis of Payment: This work will not be paid for separately but shall be included in the bid price for the fiber optic cable pay items.

FIBER OPTIC SPLICE - LATERAL

The Contractor shall perform the following items:

- The Contractor shall install fiber optic cable from the proposed fiber optic cable located on I-270 EB near the existing IDOT communications vault for the existing CCTV as shown on the plan sheets.
- The fiber optic cable will be paid for separately under the pay item for FIBER OPTIC CABLE IN CONDUIT, 72 COND. SM. F.O.
- The Contractor shall laterally splice twelve single-mode fibers (six single mode fibers in each direction) from the proposed fiber optic cable into the existing backbone fiber inside the existing communications vault.
- The Contractor shall terminate twelve fibers with ST connectors inside the proposed DMS controller cabinet.
- The Contractor shall furnish and install a weatherproof splice kit inside the existing handhole and all other items required for fiber optic cable splicing and termination.
- The Contractor shall submit shop drawings for all items for approval prior to ordering any materials.
- The Contractor shall verify all field conditions prior to bidding. There will be no additional compensation for this work.

Method of Measurement: This work will be paid for per each per intersection (includes all splicing and termination as described above).

Basis of Payment: This work will be paid for at the contract unit price per EACH for FIBER OPTIC SPLICE-LATERAL.

FIBER OPTIC UTILITY MARKER

Marking of the fiber optic in-ground conduit runs will be done to prevent future damage to the fiber backbone. The markers will be placed every 300 feet along the fiber run and at other important junctions, turns, or other areas as specified by the Field Engineer.

The markers shall adhere to the following minimum specifications:

- The marker shall be a cylindrical marker mounted on a 3.5" O.D. post.
- The marker shall be comprised of polymer materials which are resistant to impact, ultraviolet light, ozone, or hydrocarbon damage. The post and marker shall remain impact resistant in temperatures of -20 degrees to 140 degrees F.
- The marker shall incorporate a cylindrical tube construction. It shall be capable of permanent or temporary installation on a 3.5" O.D. tube and shall utilize an anchor barb below ground level to prevent rotation and removal. The marker shall have an outside diameter of 3.82 inches. The nominal wall thickness shall be 0.13 inches, and the overall length shall be 18 inches.
- The marker shall be colored red on top of orange. Red shall be from the top to halfway down the marker (9 inches) and then orange the remaining 9 inches. The marker shall be pigmented throughout its entire cross section and shall incorporate UV resistant materials to prevent fading or cracking in outdoor environments.

The marker graphics shall include the following:

- On the red portion of the marker in the vertical direction, it shall say "Buried Cables" above the symbol for "no digging". It shall have the same verbiage on the opposite side (180 degrees away). Ninety degrees (90°) from this, on both sides, shall be the verbiage "Danger", also in the vertical direction.
- The orange portion of the marker, in the horizontal direction and on two sides of the marker, shall incorporate the IDOT logo and the words, "Illinois Department of Transportation". Directly below this it shall say, "Intelligent Transportation System". Below this, it shall say, "Before digging, trenching, or pushing pipe in this vicinity, call 618-346-3233. Failure to comply will result in Legal Action." Directly below this, a horizontal line and then "MARKER ID NUMBER" with a blank space for the marker ID number to be inserted in the field. The Contractor shall be responsible for adding the MARKER ID NUMBER based on the following template:

557007.84.01F

Where:

5570 = Interstate Designation
07.84 = Milepost number to nearest hundredth of mile
01 = Marker number
F = Fiber Marker

Directly below this again include the symbol for “no digging” and the words “Buried Cable”. All graphics shall consist of a solvent-based ink that is abrasive and UV resistant.

- The marker shall exhibit good workmanship and shall be free of burns, discoloration, and other objectionable marks or defects which affect appearance or serviceability.
- The marker shall have a minimum tensile strength of 2700 pounds per square inch as measured by ASTM D638 (specimen Type I with separation rate of two inches per minute). The marker tensile strength shall not deviate more than 10 percent from the standard room temperature result when tested at both 140 degrees and -20 degrees F after a minimum of two hours conditioning at the respective temperature.
- The marker shall be a six-foot post with an 18” marker attached and installed to a two foot burial depth. It shall be capable of withstanding at least one vehicle impact at 35 mph. The marker shall return upright within 15 degrees of vertical position within a maximum of 30 seconds from the time of impact. The warning legend shall be retained on the marker after each impact.

GPS coordinates for every line marker placed will be measured. The coordinates shall be measured in geographic decimal degrees and recorded in a table provided to IDOT in both electronic and hard copy format. GPS coordinate data collection shall continue to fiber termination points at controller cabinets and to the TMC, so all conduit and fiber runs are clearly identified. The conduit, fiber markers, and controller cabinets shall be located with an accuracy level of eighteen (18) inches. The fiber optic utility markers, conduit, and controller cabinets shall be distinguishable in the GPS locator device as they are collected, so they are clearly identified in the table provided to the Department.

This work shall be paid for at the contract unit price per EACH for FIBER OPTIC UTILITY MARKER.

BLENDED FINELY DIVIDED MINERALS (BDE)

Effective: April 1, 2021

Revise the second paragraph of Article 1010.01 of the Standard Specifications to read:

“Different sources or types of finely divided minerals shall not be mixed or used alternately in the same item of construction, except as a blended finely divided mineral product according to Article 1010.06.”

Add the following article to Section 1010 of the Standard Specifications:

“1010.06 Blended Finely Divided Minerals. Blended finely divided minerals shall be the product resulting from the blending or intergrinding of two or three finely divided minerals. Blended finely divided minerals shall be according to ASTM C 1697, except as follows.

- (a) Blending shall be accomplished by mechanically or pneumatically intermixing the constituent finely divided minerals into a uniform mixture that is then discharged into a silo for storage or tanker for transportation.
- (b) The blended finely divided mineral product will be classified according to its predominant constituent or the manufacturer’s designation and shall meet the chemical requirements of its classification. The other finely divided mineral constituent(s) will not be required to conform to their individual standards.”

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017

Revised: April 1, 2019

Revise Article 107.40(b) of the Standard Specifications to read:

“(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows.

- (1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.
- (2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.

- (3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days.”

Revise Article 107.40(c) of the Standard Specifications to read:

“(c) Payment. Payment for Minor, Major, and Reduced Rate of Production Delays will be made as follows.

- (1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

- (2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the Contractor’s yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

- (3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven calendar days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Payment for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be determined according to Article 109.13.”

Revise Article 108.04(b) of the Standard Specifications to read:

“(b) No working day will be charged under the following conditions.

- (1) When adverse weather prevents work on the controlling item.
- (2) When job conditions due to recent weather prevent work on the controlling item.
- (3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.

- (4) When delays caused by utility or railroad adjustments prevent work on the controlling item.
- (5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.
- (6) When any condition over which the Contractor has no control prevents work on the controlling item.”

Revise Article 109.09(f) of the Standard Specifications to read:

“(f) **Basis of Payment.** After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

The above Basis of Payment is an essential element of the contract and the claim cost recovery of the Contractor shall be so limited.”

Add the following to Section 109 of the Standard Specifications.

“**109.13 Payment for Contract Delay.** Compensation for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be allowed when such costs result from a delay meeting the criteria in the following table.

Contract Type	Cause of Delay	Length of Delay
Working Days	Article 108.04(b)(3) or Article 108.04(b)(4)	No working days have been charged for two consecutive weeks.
Completion Date	Article 108.08(b)(1) or Article 108.08(b)(7)	The Contractor has been granted a minimum two week extension of contract time, according to Article 108.08.

Payment for each of the various costs will be according to the following.

- (a) **Escalated Material and/or Labor Costs.** When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.
- (b) **Extended Project Overhead.** For the duration of the delay, payment for extended project overhead will be paid as follows.

- (1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

Original Contract Amount	Supervisory and Administrative Personnel
Up to \$5,000,000	One Project Superintendent
Over \$ 5,000,000 - up to \$25,000,000	One Project Manager, One Project Superintendent or Engineer, and One Clerk
Over \$25,000,000 - up to \$50,000,000	One Project Manager, One Project Superintendent, One Engineer, and One Clerk
Over \$50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

- (2) Home Office and Unabsorbed Overhead. Payment for home office and unabsorbed overhead will be calculated as 8 percent of the total delay cost.

- (c) Extended Traffic Control. Traffic control required for an extended period of time due to the delay will be paid for according to Article 109.04.

When an extended traffic control adjustment is paid under this provision, an adjusted unit price as provided for in Article 701.20(a) for increase or decrease in the value of work by more than ten percent will not be paid.

Upon payment for a contract delay under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this provision."

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010

Revised: November 1, 2014

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term “equipment” refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted using the phased in approach shown below. Equipment that is of a model year older than the year given for that equipment’s respective horsepower range shall be retrofitted:

Effective Dates	Horsepower Range	Model Year
June 1, 2010 ^{1/}	600-749	2002
	750 and up	2006
June 1, 2011 ^{2/}	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 ^{2/}	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

- 1/ Effective dates apply to Contractor diesel powered off-road equipment assigned to the contract.
- 2/ Effective dates apply to Contractor and subcontractor diesel powered off-road equipment assigned to the contract.

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

- a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (<http://www.epa.gov/cleandiesel/verification/verif-list.htm>), or verified by the California Air Resources Board (CARB) (<http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>); or
- b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be \$1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected. Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000

Revised: March 2, 2019

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

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

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

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

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

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

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates, in the absence of unlawful discrimination and in an arena of fair and open competition, DBE companies can be expected to perform **6.00%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

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

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

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement and failure of the bidder to comply will render the bid not responsive.

The bidder shall submit a DBE Utilization Plan (form SBE 2026), and a DBE Participation Statement (form SBE 2025) for each DBE company proposed for the performance of work to achieve the contract goal, with the bid. If the Utilization Plan indicates the contract goal will not be met, documentation of good faith efforts shall also be submitted. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor is selected over a DBE for work on the contract. The required forms and documentation must be submitted as a single .pdf file using the "Integrated Contractor Exchange (iCX)" application within the Department's "EBids System".

The Department will not accept a Utilization Plan if it does not meet the bidding procedures set forth herein and the bid will be declared not responsive. In the event the bid is declared not responsive, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty and may deny authorization to bid the project if re-advertised for bids.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan is approved. All information submitted by the bidder must be complete, accurate and adequately document enough DBE participation has been obtained or document the good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will

be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. This means the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts the bidder has made. Mere *pro forma* efforts, in other words efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases and will be considered by the Department.
- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
 - (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.
 - (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
 - (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.
 - b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract

DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
 - (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
 - (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
 - (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines the bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided it is otherwise eligible for award. If the Department determines the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification will also include a statement of reasons for the adverse determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period to cure the deficiency.
- (c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the

goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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

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

- (2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.
- (3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a DBE regular dealer or DBE manufacturer.

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

- (a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be emailed to the Department at DOT.DB.E.UP@illinois.gov.
- (b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.
- (c) SUBCONTRACT. The Contractor must provide copies of DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.
- (d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute

work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

- (1) The replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or
- (2) The DBE is aware its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or
- (3) The DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

- (e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

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

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

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

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

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

- (f) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request

an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.

- (g) **ENFORCEMENT.** The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.
- (h) **RECONSIDERATION.** Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of “Good Faith Effort Procedures” of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

PORTLAND CEMENT CONCRETE – HAUL TIME (BDE)

Effective: July 1, 2020

Revise Article 1020.11(a)(7) of the Standard Specifications to read:

“(7) Haul Time. Haul time shall begin when the delivery ticket is stamped. The delivery ticket shall be stamped no later than five minutes after the addition of the mixing water to the cement, or after the addition of the cement to the aggregate when the combined aggregates contain free moisture in excess of two percent by weight (mass). If more than one batch is required for charging a truck using a stationary mixer, the time of haul shall start with mixing of the first batch. Haul time shall end when the truck is emptied for incorporation of the concrete into the work. The maximum haul time shall be as follows.

Concrete Temperature at Point of Discharge, °F (°C)	Maximum Haul Time ^{1/} (minutes)	
	Truck Mixer or Truck Agitator	Nonagitator Truck
50 - 64 (10 - 17.5)	90	45
> 64 (> 17.5) - without retarder	60	30
> 64 (> 17.5) - with retarder	90	45

1/ To encourage start-up testing for mix adjustments at the plant, the first two trucks will be allowed an additional 15 minutes haul time whenever such testing is performed.

For a mixture which is not mixed on the jobsite, a delivery ticket shall be required for each load. The following information shall be recorded on each delivery ticket: (1) ticket number; (2) name of producer and plant location; (3) contract number; (4) name of Contractor; (5) stamped date and time batched; (6) truck number; (7) quantity batched; (8) amount of admixture(s) in the batch; (9) amount of water in the batch; and (10) Department mix design number.

For concrete mixed in jobsite stationary mixers, the above delivery ticket may be waived, but a method of verifying the haul time shall be established to the satisfaction of the Engineer.”

SPEED DISPLAY TRAILER (BDE)

Effective: April 2, 2014

Revised: January 1, 2022

Revise the last 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 COST ADJUSTMENT (BDE)

Effective: April 2, 2004

Revised: January 1, 2022

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract. Failure to indicate “Yes” for any item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

- Metal Piling (excluding temporary sheet piling)
- Structural Steel
- Reinforcing Steel

Other steel materials such as dowel bars, tie bars, welded 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
Welded 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)

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

“109.14 Subcontractor and Disadvantaged Business Enterprise Payment Reporting.
 The Contractor shall report all payments made to the following parties:

- (a) first tier subcontractors;
- (b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;
- (c) material suppliers or trucking firms that are part of the Contractor’s submitted DBE utilization plan.

The report shall be made through the Department’s on-line subcontractor payment reporting system within 21 days of making the payment.”

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017
 Revised: April 1, 2019

Replace the second paragraph of Article 109.12 of the Standard Specifications with the following:

“This mobilization payment shall be made at least seven days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor’s work.

Value of Subcontract Reported on Form BC 260A	Mobilization Percentage
Less than \$10,000	25%
\$10,000 to less than \$20,000	20%
\$20,000 to less than \$40,000	18%
\$40,000 to less than \$60,000	16%
\$60,000 to less than \$80,000	14%
\$80,000 to less than \$100,000	12%
\$100,000 to less than \$250,000	10%
\$250,000 to less than \$500,000	9%
\$500,000 to \$750,000	8%
Over \$750,000	7%”

TRAFFIC SPOTTERS (BDE)

Effective: January 1, 2019

Revise Article 701.13 of the Standard Specifications to read:

“701.13 Flaggers and Spotters. Flaggers shall be certified by an agency approved by the Department. While on the job site, each flagger shall have in his/her possession a current driver’s license and a current flagger certification I.D. card. For non-drivers, the Illinois Identification Card issued by the Secretary of State will meet the requirement for a current driver’s license. This certification requirement may be waived by the Engineer for emergency situations that arise due to actions beyond the Contractor’s control where flagging is needed to maintain safe traffic control on a temporary basis. Spotters are defined as certified flaggers that provide support to workers by monitoring traffic.

Flaggers and spotters shall be stationed to the satisfaction of the Engineer and be equipped with a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Flaggers shall be equipped with a stop/slow traffic control sign. Spotters shall be equipped with a loud warning device. The warning sound shall be identifiable by workers so they can take evasive action when necessary. Other types of garments

may be substituted for the vest as long as the garments have a manufacturer's tag identifying them as meeting the ANSI Class 2 requirement. The longitudinal placement of the flagger may be increased up to 100 ft (30 m) from that shown on the plans to improve the visibility of the flagger. Flaggers shall not encroach on the open lane of traffic unless traffic has been stopped. Spotters shall not encroach on the open lane of traffic, nor interact with or control the flow of traffic.

For nighttime flagging, flaggers shall be illuminated by an overhead light source providing a minimum vertical illuminance of 10 fc (108 lux) measured 1 ft (300 mm) out from the flagger's chest. The bottom of any luminaire shall be a minimum of 10 ft (3 m) above the pavement. Luminaire(s) shall be shielded to minimize glare to approaching traffic and trespass light to adjoining properties. Nighttime flaggers shall be equipped with fluorescent orange or fluorescent orange and fluorescent yellow/green apparel meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 3 garments.

Flaggers and spotters shall be provided per the traffic control plan and as follows.

- (a) Two-Lane Highways. Two flaggers will be required for each separate operation where two-way traffic is maintained over one lane of pavement. Work operations controlled by flaggers shall be no more than 1 mile (1600 m) in length. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies.

The Engineer will determine when a side road or entrance shall be closed to traffic. A flagger will be required at each side road or entrance remaining open to traffic within the operation where two-way traffic is maintained on one lane of pavement. The flagger shall be positioned as shown on the plans or as directed by the Engineer.

- (b) Multi-Lane Highways. At all times where traffic is restricted to less than the normal number of lanes on a multilane pavement with a posted speed limit greater than 40 mph and the workers are present, but not separated from the traffic by physical barriers, a flagger or spotter shall be furnished as shown on the plans. Flaggers shall warn and direct traffic. Spotters shall monitor traffic conditions and warn workers of errant approaching vehicles or other hazardous conditions as they occur. One flagger will be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic. One spotter will be required for each separate activity with workers near the edge of the open lane or with their backs facing traffic.

Flaggers will not be required when no work is being performed, unless there is a lane closure on two-lane, two-way pavement."

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

Revised: November 1, 2021

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

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

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

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: March 2, 2020

Add the following to Article 701.03 of the Standard Specifications:

“(q) Temporary Sign Supports1106.02”

Revise the third paragraph of Article 701.14 of the Standard Specifications to read:

“For temporary sign supports, the Contractor shall provide a FHWA eligibility letter for each device used on the contract. The letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support per the manufacturer’s specifications.”

Revise the first paragraph of Article 701.15 of the Standard Specifications to read:

“701.15 Traffic Control Devices. For devices that must meet crashworthiness standards, the Contractor shall provide a manufacturer’s self-certification or a FHWA eligibility letter for each Category 1 device and a FHWA eligibility letter for each Category 2 and Category 3 device used on the contract. The self-certification or letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device.”

Revise the first six paragraphs of Article 1106.02 of the Standard Specifications to read:

“1106.02 Devices. Work zone traffic control devices and combinations of devices shall meet crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, plastic drums, and delineators, with no attachments (e.g. lights). Category 1 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 1 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include vertical panels with lights, barricades, temporary sign supports, and Category 1 devices with attachments (e.g. drums with lights). Category 2 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 2 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1 or 2. Category 3 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 3 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2029. Category 3 devices shall be crash tested for Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. It is preferable for Category 4 devices manufactured after December 31, 2019 to be MASH-16 compliant; however, there are currently no crash tested devices in this category, so it remains exempt from the NCHRP 350 or MASH compliance requirement.

For each type of device, when no more than one MASH-16 compliant is available, an NCHRP 350 or MASH-2009 compliant device may be used, even if manufactured after December 31, 2019.”

Revise Articles 1106.02(g), 1106.02(k), and 1106.02(l) to read:

“(g) Truck Mounted/Trailer Mounted Attenuators. The attenuator shall be approved for use at Test Level 3. Test Level 2 may be used for normal posted speeds less than or equal to 45 mph.

(k) Temporary Water Filled Barrier. The water filled barrier shall be a lightweight plastic shell designed to accept water ballast and be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings.

(l) Movable Traffic Barrier. The movable traffic barrier shall be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings. The barrier shall be capable of being moved on and off the roadway on a daily basis.”

WORKING DAYS (BDE)

Effective: January 1, 2002

The Contractor shall complete the work within **35** working days.

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor

performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection

for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#).

The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each

classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a

separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice

performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one

and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of

Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of

Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

Contract Provision - Cargo Preference Requirements

In accordance with Title 46 CFR § 381.7 (b), the contractor agrees—

“(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.”

Provisions (1) and (2) apply to materials or equipment that are acquired solely for the project. The two provisions do not apply to goods or materials that come into inventories independent of the project, such as shipments of Portland cement, asphalt cement, or aggregates, when industry suppliers and contractors use these materials to replenish existing inventories.

