

76

November 18, 2022 Letting

Notice to Bidders, Specifications and Proposal



**Contract No. 72246
SANGAMON County
Section D6 ITS 2023
Various Routes
District 6 Construction Funds**

Prepared by

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Checked by

(Printed by authority of the State of Illinois)



NOTICE TO BIDDERS

- 1. TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. November 18, 2022 prevailing time at which time the bids will be publicly opened from the iCX SecureVault.
- 2. DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 72246
SANGAMON County
Section D6 ITS 2023
Various Routes
District 6 Construction Funds**

Installation of CCTV cameras, conduit, handholes and fiber optic cable at various locations in Springfield and Chatham.

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

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

By Order of the
Illinois Department of Transportation

Omer Osman,
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:

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STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction, Adopted January 1, 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 Various Routes, Section D6 ITS 2023, Sangamon County, Contract No. 72246, and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

Various Routes
Section D6 ITS 2023
Sangamon County
Contract No. 72246

LOCATION OF PROJECT

The work in this section is located at following locations:

Chatham PTZ Cameras:

- N. Main (IL 4) @ E. Walnut St.

Springfield PTZ Cameras:

- I-55 @ Toronto Road
- Dirksen @ Peoria Road

Springfield Fiber Work:

- Iles Ave - (White Oaks Mall entrance to West White Oaks Drive)
- Veterans Parkway - (Wabash Ave. to I-72 North Ramp)
- Veterans Parkway - (Prairie Crossing to Panther Creek)
- Toronto Road – (Canadian Cross to Cottonwood Drive)
- Sangamon Ave – (I-55 to Camp Butler Road)
- N. Peoria Road (IL 4) – (Peoria Road to Dirksen Parkway)
- Browning Road – (Veterans Parkway to N. 5th St.)

Chatham Fiber Work:

- N. Main (IL 4) - (Mansion Road to E. Walnut St.)

DESCRIPTION OF PROJECT

The project consists of furnishing all equipment, labor, and material necessary to install conduit, handholes, fiber optic cable runs, CCTV cameras, and all other miscellaneous work required on the routes specified in Location of the Project special provision, in addition with providing District 6 with quantities and types of Ethernet switches, intersection monitors, and cobalt controllers listed in the plans.

TRAFFIC CONTROL PLAN

Effective: November 1, 1984

Revised: October 3, 2020

The following Traffic Control and Protection will apply to this project:

- 701001 This standard will be used where at all times all vehicles, equipment, workers, or their activities are more than 15' (4.5m) from the edge of pavement.
- 701006 This standard will be used where any vehicles, equipment, workers, or their activities will encroach in the area 15' (4.5m) to 24" (600mm) from the edge of pavement.
- 701101 This standard will be used on multi-lane traffic where any vehicles, equipment, workers, or their activities will encroach in the area 15' (4.5m) to 24" (600mm) from the edge of pavement.
- 701106 This standard will be used on multi-lane traffic where at all times all vehicles, equipment, workers, or their activities are more than 15' (4.5m) from the edge of pavement.
- 701201 This standard will be used on multi-lane traffic for all work activities within 24 inches to 15 ft. from the edge of pavement.
- 701502 This standard will be used for all activities on 2 lane / 2 way urban sections with bi-directional turn lanes requiring a lane closure.
- 701601 This standard will be used for all activities involving urban lane closures on multi-lane, 1 way or 2 way traffic with a nontraversable median.
- 701602 This standard will be used for all activities involving urban lane closures on multi-lane, 2 way traffic with a bi-directional left turn lane.
- 701701 This standard will be used for all work activities involving a multi-lane urban intersection.
- 701901 This standard describes all permissible traffic control devices that can be utilized with the above-mentioned traffic control standards.

Limitations of Construction: The Contractor shall coordinate the items of work in order to keep hazards and traffic inconveniences to a minimum, as specified below.

1. The Contractor shall contact the District Six Bureau of Operations, (217) 785-5306, at least 72 hours in advance of beginning work and three (3) weeks prior to implementing any traffic control.
2. During the construction of this section, at least one lane shall remain open to traffic at all times. No lane closures will be allowed without spotter protection.
3. The Contractor shall erect changeable message signs seven days in advance of implementing any traffic control and protection. The exact location of changeable message signs shall be confirmed by the Engineer and shall remain in place until all work requiring lane closures is complete.

STATUS OF UTILITIES TO BE ADJUSTED

The following utilities are involved in this project. The utility companies have provided the estimated dates.

Name & Address of Utility	Type	Location	Estimated Date of Relocation Completed
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NONE ANTICIPATED

The above represents the best information of the Department and is only included for the convenience of the bidder. The applicable provisions of Articles 105.07, 107.20, 107.31, and 108.02 of the Standard Specifications for Road and Bridge Construction shall apply.

The estimated utility relocation dates should be part of the progress schedule submitted by the Contractor. If any utility adjustments or relocations have not been completed by the above dates specified and when required by the Contractor's operations after these dates, the Contractor should notify the Engineer in writing. A request for an extension of time will be considered to the extent the Contractor's critical path schedule is affected.

UNDERGROUND FACILITIES

The Contractor's attention is directed to the possible presence of state-owned underground electrical cable within the limits of the proposed improvement. The Contractor shall request the Illinois Department of Transportation in Springfield (217-558-67168) to locate the underground facilities, providing a minimum of 72 hour notice. The Illinois Department of Transportation IS NOT a member of the Joint Utility Locating Information for Excavators (JULIE) System.

Any damage to the underground facilities, caused by the Contractor resulting from his or her failure to contact the Illinois Department of Transportation as specified above or from negligent operation, shall be repaired to the satisfaction of the Department at the Contractor's expense, including temporary repairs which may be required to keep the facility operational while material is being

obtained to make permanent repairs. Splicing of electric cable will not be allowed. Electric cable shall be replaced from pole to pole or controller.

SEEDING, MINOR AREAS

Effective July 1, 1990

Revised July 1, 1994

Seeding and fertilizing shall be done in accordance with Article 250 of the Standard Specifications, except for the following revisions: All areas disturbed by the work performed shall be seeded, fertilized, and mulched as directed by the Engineer. The seed mixture shall be applied at 110 kg/ha (100 pounds/acre). All seeds shall meet the mixture, purity, and noxious weed requirements of Article 1081.04 of the Standard Specifications and be approved by the Engineer. The Contractor shall provide the Engineer with the test results from the seed container and the chemical analysis of the fertilizer nutrients. The seed and fertilizer placed at all disturbed areas will not be measured for payment but will be considered incidental to this contract.

UNDERGROUND CONDUIT

Revised: March 22, 2018

This work shall consist of furnishing and installing a conduit of the type and size specified in accordance with Sections 810 and 1088.01(b) or 1088.01(c) of the Standard Specifications for Road and Bridge Construction, except as described herein.

PVC Conduits:

When it is necessary to connect PVC conduit to steel conduit, a heavy wall set screw connector with a PVC female adapter shall be installed and sealed by duct seal and plastic tape.

When conduits are installed in the excavation behind a curb, the conduit shall be installed below driveways and entrances at a depth which will prevent the conduit from protruding into the entrance pavement material.

Basis of Payment:

This work will be paid for at the contract unit price per FOOT for UNDERGROUND CONDUIT, of the size and type specified, which price shall be payment in full for furnishing and installing the complete conduit run, including all fittings.

HANDHOLE (SPECIAL)

Revised: March 22, 2018

This work shall be in accordance with Sections 814 and 1088 of the Standard Specifications, except as modified herein. This work shall consist of furnishing and installing a junction box constructed of polymer concrete.

The junction box shall conform to the following specifications:

Cover:

Material: Polymer Concrete
Nominal Dimensions: 11" W x 20" L"
Gasketed, Heavy Duty Lid with 2 Bolts
Design/Test Load: 22,500/33,750 lbs.
ANSI Tier: 22 Gasketed

Box:

Material: Polymer Concrete
Nominal Dimensions: 11" W x 20" L x 24" D
Open Bottom
Design/Test Load: 22,500/33,750 lbs.
ANSI Tier: 22

The junction box and cover shall be a composite concrete according to Article 1088.07 of the Standard Specifications.

Basis of Payment:

This work will be paid for at the contract unit price per EACH for HANDHOLE (SPECIAL) and shall be payment in full for all labor, materials, and equipment required to furnish and install the junction box described above.

MODIFY EXISTING CONTROLLER CABINET

Revised: March 22, 2018

This work shall consist of terminating, connecting, and testing newly installed fiber optic cable in existing controller cabinets as indicated in the plans.

Twelve of 24 fibers within the single-mode cable shall be terminated with fusion-type LC connectors. The connectors shall meet TIA/EIA 568B specifications and shall have an operating temperature range of -10°C (14°F) to 60°C (140°F). The connectors shall be free from defects in material and manufacture for six months.

Splice trays shall be provided for the separation and protection of individual fibers with buffer tubing and jacketing materials suitable for termination of the fiber with the fiber optic connectors. Stripped cable jackets shall be completely removed, and all protective gel shall be cleaned from the loose tubes as recommended by the cable supplier.

Fiber optic cables shall be terminated in the controller cabinets within wall-mountable interconnection enclosures. The interconnection enclosures shall seal out dust and moisture and shall be sized sufficiently to store any and all fiber, windings, and splice trays. The dimensions of the enclosures shall not exceed 9.25" x 8.5" x 3". The enclosures shall accept two modular connector panels which shall be configured to accept 12 terminated single-mode fibers. These 12 single-mode user connection adapters shall be configured to accept LC patch cables. The location of the distribution enclosure shall not restrict access to existing traffic signal systems components. The single-mode field cable shall be firmly secured to the enclosure with appropriate and applicable clamping devices. The single-mode fiber optic cable shall leave the enclosure through rubber grommets or similar devices to protect the cable against wear. Slack fiber shall be neatly trained around the bottom perimeter of the cabinet.

All installed fiber optic cable shall be tested at its nominal operating wavelength and in accordance with Article 801. Additionally, detailed and complete post-installation power meter and OTDR test documentation shall be provided electronically to the Engineer to the satisfaction of the Engineer. The test data should be formatted as an Excel spreadsheet and may be either emailed to the Engineer for inspection and acceptance or provided on a thumb drive.

Basis of Payment:

This work will be paid for at the contract unit price per EACH for MODIFY EXISTING CONTROLLER CABINET, which price shall be payment in full for installing the specified equipment and any incidental removal/replacement of existing equipment.

CAT 5 ETHERNET CABLE

Revised: March 22, 2018

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
- Unshielded 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, which shall be payment in full for all labor, equipment, and materials required to provide and install the cable described above.

CLOSED-CIRCUIT TELEVISION DOME CAMERA, IP BASED

Revised: March 22, 2018

Description:

This work shall consist of furnishing and installing closed-circuit television (CCTV) cameras, dome camera assemblies, camera brackets, and all other items required for installation and operation as indicated on the plan sheets.

Camera:

The CCTV camera shall be an Axis Model Q6074-E Dome Camera Assembly for integration into the existing District 6 ITS/ATMS network. The Contractor shall provide all materials required to install the proposed camera on the proposed pole or existing mast arm 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.

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. 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 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, IP 66 rated weatherproof connector located near the top for external interface.

CCTV Dome Camera 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 and 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 an aluminum construction with an 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 lbs. (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, CAT 5E cable. The cable shall be terminated using the IP66 rated RJ-45 connector on the camera end and a shielded RJ-45 connector in the cabinet. The Contractor shall test the cable after termination.

Cable will be paid for separately under the pay item CAT 5 ETHERNET CABLE.

Construction Requirements:

The Contractor shall prepare a shop drawing detailing the complete CCTV dome camera assembly and installation of all components to be supplied for the 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:

Payment will be made at the contract unit price per EACH for CLOSED-CIRCUIT TELEVISION DOME CAMERA, IP BASED, including all equipment, material, testing, documentation, and labor detailed in the contract documents for this bid item.

CLOSED CIRCUIT TELEVISION CABINET

Revised: December 9, 2021

Description:

This work consists of furnishing and installing a pole mounted equipment cabinet and peripheral equipment at locations indicated in the plans. The cabinet will be utilized to house critical electrical, optical, and communications equipment as defined in other contract pay items.

General:

The equipment cabinet shall conform to the details shown on the plan sheet. Equipment cabinets shall be mounted and anchored to the poles and structures at locations indicated in the plans. In addition, all mounting hardware and brackets required to install the equipment cabinet on the pole shall be stainless or galvanized steel and provided by the Contractor. The mounting height and pole diameters shall be as specified by the Engineer.

The cabinet shall be a NEMA 3R single door enclosure, constructed from 0.125" thick aluminum with nominal outside dimensions of 18" (H) x 14" (W) x 10" (D). The cabinet shall have a natural finish.

The cabinet shall be equipped with an appropriate exhaust fan, heater, and thermostat and shall be appropriately vented.

The cabinet shall be furnished with a slam lock neoprene door gasket, vent slots, continuous stainless-steel door hinge, and all stainless-steel hardware. The cabinet shall also have a Corbin #2 dead bolt lock or skeleton key. The key shall be removable in the lock position only. Two keys shall be supplied for each lock, and all equipment cabinet locks shall be keyed the same.

All cables shall be labeled utilizing marking tags.

The cabinet shall be equipped with a main power panel as shown on the cabinet plan detail sheet. The power panel shall include one 15A main breaker, power terminal blocks, and one six outlet power strip with integral surge protection. The power panel shall include a plexi-glass safety shield that covers the power panel.

Power Strip

The cabinet power strip shall have a minimum of six outlets and integral surge suppression that meets or exceeds the following minimum specifications:

- Let Through Voltage: <85 Volts
- Operating Voltage: 120VAC, 50/60H
- UL Suppressed Voltage Rating: 330V
- Energy Rating: 320J
- Peak Current NM/CM: 13k Amps NM, 13k Amps CM
- EMI/RFI Noise Filtration: >25-60Db

The power strip shall be wired directly to the power terminals in the cabinet.

Construction:

The Contractor shall prepare and submit shop drawings that detail all the components to be supplied, along with associated mounting hardware for the equipment cabinet. The shop drawings must be approved by the Engineer prior to installation of the completed cabinet in the field.

The Engineer reserves the right to inspect and/or factory test any completed cabinet assemblies prior to shipment of the material to the project site. Any deviations from these specifications that are identified during such testing shall be corrected prior to delivery of the assembly to the project site.

The AC power service to be ran to the equipment cabinet shall be terminated. In addition, the cabinet shall be connected to an adequate ground/bond following the Standard Specifications.

Lugs shall be installed at the end of each conductor suitable for connection to the barrier terminal blocks. The Contractor shall terminate 6 of the incoming fibers with LC connectors and carefully secure the cable in the cabinet to the satisfaction of the Engineer. The Contractor shall terminate the incoming CAT5E cable. The Contractor shall neatly wrap 4' of slack for the fiber optic and Ethernet cables inside the cabinet.

Basis of Payment:

This item shall be measured for payment for each pole mounted equipment cabinet in-place.

This work shall be paid for at the contract unit price per EACH for CLOSED CIRCUIT TELEVISION CABINET and shall include all equipment, material, and labor required to furnish and install the cabinet as described above.

FIBER OPTIC CABLE 24 FIBERS, SINGLE MODE

Revised: March 22, 2018

This work shall be in accordance with Sections 801, 864, 871, and 1076 of the Standard Specifications, except as modified herein.

Each cable shall be clearly labeled in each cabinet utilizing a durable computer-generated label. The label shall contain information regarding the locations to and from which the cable is installed. The Contractor shall provide numerical foot marking data at all handholes, vaults, cabinets, or enclosures to the Department.

Twelve of the fibers shall be terminated with LC connectors. All terminated fibers shall be clearly labeled pursuant to fiber color, termini locations, and buffer tubes.

Terminated fibers not being used shall be labeled "spare", and terminated fibers not attached to a distribution enclosure shall be capped and sealed after testing.

All ancillary components required to complete the fiber optic cable plant, including but not limited to, moisture and water sealants, cable caps, splice trays, weather-proof splice kits, boots, cable trays, splice enclosures, termination panels, etc., shall be supplied under this pay item and will not be paid for separately. These items shall be submitted to the Department for approval.

The fiber optic cable shall be clearly marked in each handhole, communication vault, or cabinet with a brightly colored (orange or yellow) weather resistant label securely attached to the cable.

The Contractor shall provide and install simultaneously one of the following means of locating each fiber optic cable installation, a stranded and insulated 12 AWG (EPR-TYPE RHW or THHN) tracer cable or locatable HDPE duct with an encased 18 AWG wire. The locatable wire shall be made continuous between fiber termination panels. There will be no additional compensation for this work.

Materials.

The single-mode fiber optic cable shall incorporate a loose buffer-tube design. The cable shall conform to the requirements of RUS 7 CFR1755.900 (PE-90) for a single, sheathed, and non-armored cable and shall be new, unused, and of current design and manufacture.

Experience Requirements.

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

The Contractor and their fiber optic installation personnel shall have a minimum of 3 years of experience in the installation of fiber optic cables, including splicing, terminating, and testing single mode fibers.

The Contractor and their fiber optic installation personnel shall have successfully and completely installed two outdoor fiber optic cable systems in conduit where the systems have been continuously and fully operational for at least two years. The Contractor shall submit the names, addresses, and telephone numbers of personnel who can be contacted regarding the installed fiber optic systems, along with photographs and other supporting documents pursuant to these installations. The Contractor shall plan to demonstrate one of these systems to Department's representatives and the Engineer.

Installers shall be familiar with the cable manufacturer's recommended procedures for installing the cable. This familiarity shall include knowledge of splicing procedures for and equipment being used on this project and knowledge of all hardware such as furcation kits and splice closures. The Contractor shall submit documented cabling, testing, splicing, furcation, and other installation procedures to the Engineer for purposes of inspection and acceptance of the Contractor's work.

Personnel involved in testing shall have been trained by the manufacturer of the fiber optic cable test equipment to be used. Proof of this training shall be submitted to the Engineer for approval. The Contractor shall also submit documentation of the testing procedures for approval by the Engineer.

Installation in Conduit.

The Contractor shall ensure that the maximum cable bending radius is not exceeded during any unreeling, pulling, or installation operation. Entry guide chutes shall be used to guide the cable into handhole conduit ports. Lubricating compound shall be used to minimize friction. Corner rollers (wheels), if used, shall not have effective radii greater than the maximum specified installation bending radius of the cable.

The pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. Fuse links and breaks can be used to ensure that the cable tensile strength is not exceeded. The pulling system shall have an audible alarm that sounds whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer upon request.

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

Splicing Requirements:

Splices shall be made at locations shown on the plans. Any other splices shall be permitted only with the approval of the Engineer. The Contractor shall submit a splicing plan to the Department for approval.

Operation and Maintenance Documentation:

After the fiber optic cable plant has been installed, two (2) complete sets of operation and maintenance documentation shall be provided. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices.
- Final copies of all approved test procedures.
- Complete performance data of the cable plant showing the losses at each terminal connector.
- Complete parts lists including names of vendors.
- Electronic Testing Files (OTDR traces, power meter data, etc.)

Testing Requirements:

Testing shall be in accordance with Article 801.13 except where modified by this special provision.

The Contractor shall submit detailed test procedures for approval by the Engineer. All continuous fiber runs shall be tested bi-directionally at both 1310 nm and 1550 nm with a power meter, optical source and OTDR. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

The Contractor shall provide the date, time, and location of any tests required by this specification to the Engineer at least 5 days before performing the test. Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers in each link for continuity and attenuation. The test procedure shall be as follows:

A certified technician utilizing an optical source/power meter and OTDR shall conduct the testing. The technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

At the completion of the test, the Contractor shall provide two copies of documentation of the test results to the Engineer. The test documentation shall be bound and shall include the following:

Cable & Fiber Identification:

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

Test Results:

Optical Source/Power Meter:

Total Attenuation (dB/km)

These results shall be provided in tabular form. The following shall be the criteria for the acceptance of the cable:

The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss. However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the proposed fiber and/or fusion splice and connector including that event point.

The total dB loss of the cable, less events, shall not exceed the manufacturer's production specifications as follows: 0.5 dB/km at both 1310 and 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair that cable run at the Contractor's expense, including both labor and materials. Elevated attenuation, due to exceeding the pulling tension during installation, shall require the replacement of the cable run at the Contractor's expense, including labor and materials.

The Contractor shall label the destination of each trunk cable onto the cable in each handhole and termination panel.

Slack Storage of Fiber Optic Cables:

A part of this pay item, slack fiber shall be supplied as necessary to allow splicing the fiber optic cables in a controlled environment, such as a splicing van or tent. After splicing has been completed, the slack fiber shall be stored underground in handholes and in the traffic controller cabinets.

Extra Cable:

Extra cable shall be left in each handhole and double handhole. Storage of additional extra cable in each handhole shall be coiled. These coils shall be bound at a minimum of three points around the coil perimeter and supported in their static storage position. The minimum of extra cable amounts shall be as follows unless stated differently on the plan sheets.

<u>Location:</u>	<u>Extra Cable length: feet</u>
Handhole	10.0 Feet
Double Handhole	50.0 Feet
Controller	6.0 Feet

Basis of Payment:

This work will be paid for at the contract unit price per FOOT for FIBER OPTIC CABLE 24 FIBERS, SINGLE MODE and shall be payment in full for all labor, equipment, and material required to provide, install, terminate, splice, and test the fiber optic cable as described above.

ETHERNET SWITCH

Revised: March 22, 2018

Description:

This work shall consist of providing a hardened Ethernet Switch, including the applicable power supply. Two 10km single-mode fiber optic modules shall be supplied with each Ethernet switch.

The Contractor shall furnish the following equipment (MATERIAL ONLY) and deliver it to the Department. There are no support requirements associated with this pay item.

The Ethernet Switch shall meet the following material specifications:

1. Overall switch station capacity and flexibility: Managed gigabit Ethernet switch with 7 10/100BaseT(X) ports and 3 10/100/1000BaseT(X), or 100/1000BaseSFP combo ports, with -40 to 75°C operating temperature. In addition, the switch shall include a SFP module with 1 1000BaseLX port with LC connector for 10 km transmission with -40 to 85°C operating temperature.
2. Cabling options: The switch shall be able to utilize a variety of connecting interfaces including 10/100Base(T)X, 10/100/1000Base(T)X, and 1000BaseSX/LX/LHX/ZX (LC connector).
3. Port configuration options: Port configurations shall be accessible via a standard web browser without requiring special vendor software. Port configuration changes shall be possible by personnel without special IT training. The configuration can be done via a console UI, telnet connection or command line interface. All T(X) ports shall provide cable autocross capability.

The Ethernet Switch shall be compatible with following network and software requirements:

1. Networking and Software: The Ethernet switches shall be IEEE802.3/802.3u/802.3ab/802.3z/802.3x/802.1D-2004/802.1w/802.1s/802.1Q/802.1p/802.1X/802.3ad compliant.

The switch shall support the following standards and software interfaces:

- a. Redundant fast/gigabit Ethernet ring capability
- b. IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- c. Supports IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- d. Supports QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
- e. Supports 802.3ad, LACP for optimum bandwidth utilization
- f. Supports TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- g. Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- h. SNMPv1/v2c/v3 for different levels of network management security
- i. Bandwidth management to prevent unpredictable network status
- j. Lock port for authorized MAC address access only
- k. Port mirroring for online debugging
- l. Automatic warning by exception through e-mail, relay output
- m. Digital inputs to integrate a sensor and alarm with an IP network
- n. Automatic recovery of connected device IP addresses
- o. Line-swap fast recovery

2. Port Trunking for Flexible Network Connection: Maximum of four trunk groups for all gigabit ports with maximum of 8 trunk ports for each trunk group shall be available. The user shall be able to either choose the type of the trunk group to be “Static” or “LACP.”
3. IP Addressing Approach Options: IP addresses shall be set over the network using BootP/DHCP. The user shall have the capability to disable BootP or DHCP network-based IP address changes. In addition, the switch shall support both a serial port and web page-based manual (static) addressing approach.
4. Ethernet Packet Transfer Accuracy and Capacity: The switch shall be capable of forwarding valid Ethernet frames using the store and forward method or equivalent method, and the address table shall have a maximum capacity of 8192 addresses.
5. Quality of Service Functions Enhance Determinism: The switches shall be able to read IEEE 802.1Q VLAN priority tags and support a minimum of a low, normal, medium, and high priority buffer. High priority messages shall be able to process before low priority messages. It also shall support QoS-IEEE 802.1p/1Q and TOS/DiffServ.
6. SNMP Traps: The switches shall support sending SNMP messages to maximum 2 SNMP “Trap” server, and the SNMP traps IP addresses shall be settable through a web browser interface.
7. Multicast Message Control for Filtering Multicast Traffic: The switches shall be able to support IEEE 802.1D-1998 GMRP (GARP Multicast Registration Protocol) and IGMP (Internet Group Management Protocol).
8. Port Access Control Enhances User Authentication: The switches shall support IEEE 802.1X and Static Port Lock for Port-Base Access Control.
9. Accessible IP Settings: It shall allow the user to add or remove “Legal” remote host IP addresses to prevent unauthorized access. Access to switch shall be controlled by IP address. That is, if a host’s IP address is in the accessible IP table, then the host shall be allowed access to the switch.
10. Additional network and software requirements shall be met:
 - a. IEEE 802.1X, HTTPS, and SSH to enhance network security
 - b. Bandwidth management prevents unpredictable network status
 - c. Port mirroring for online debugging
 - d. Automatic warning by exception through email and relay output
 - e. Digital inputs to integrate sensors and alarms with IP networks
 - f. Automatic recovery of connected device’s IP addresses
 - g. Line-swap fast recovery
 - h. Support EDS-SNMP OPC Server Pro
 - i. Software based IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
 - j. DHCP Option 82 for IP address assignment with different policies
 - k. Modbus/TCP / EtherNet/IP / PROFINET industrial Ethernet protocols supported
 - l. Supports LLDP (Link Layer Discovery Protocol)
 - m. Turbo Ring™ and Turbo Chain™ (< 20ms recovery time for fast Ethernet ports and < 50 ms recovery time for gigabit Ethernet ports at full load) and STP/RSTP (IEEE 802.1w/D)

The Ethernet Switch shall meet the following general installation requirements:

1. Mounting: The switch shall be DIN-Rail or wall mountable
2. Power supply: Low voltage ranges: 12/24/48 VDC (9.6-60 VDC). In addition, a provision shall be made so that the loss of a power supply may be user configurable to trigger hardware (i.e. relay contact), SNMP, e-mail, and web page alarms.

3. Environmental specifications: Temperature & humidity - The switch shall have operating temperature ranges of -10 to 60°C or -40 to 75°C. In addition, the switch shall be rated to withstand a maximum continuous operating humidity of 95% without condensation.
4. Electronical Noise Immunity: The switch will conform to the IEC61000-4-2 to 4-8 series of noise specifications as specified below:
 - IEC 61000-4-2 Electrostatic Discharge: Criterion A
 - IEC 61000-4-3 Radiated Noise Immunity: Criterion A
 - IEC 61000-4-4 Fast Transient (Burst) Withstand: Criterion A
 - IEC 61000-4-5 Surge Voltage: Criterion A
 - IEC 61000-4-6 Conducted Noise Interference: Criterion A
 - IEC 61000-4-8 Electromagnetic Field Withstand: Criterion A
 - IEC 61000-4-12
 - IEC 61000-4-29
5. Shock & Vibration: The operating shock rating shall conform to IEC60068-2-27 and withstand a 15 g, 11 ms duration and 18 shocks. In addition, the operating vibration spec shall conform to IEC60068-2-6 (Criterion 3) at 1 mm, 2 Hz - 13.2 Hz, 90 min.; 0.7g, 13.2 Hz - 100 Hz, 90 min.; 3.5 mm, 3 Hz - 9 Hz, 10 cycles, 1 octave/min.; 1g, 9 Hz - 150 Hz, 10 cycles, 1 octave/min.
6. Switch shall be compliant with IEC 62443-4-2.

The Ethernet switch shall meet the following hardware-based diagnostics and user interfaces requirements:

1. Alarm contact: The switch shall contain an alarm contact that can be configured via standard web browser to annunciate the drop out of either or both power supply inputs and/or to annunciate the active link status of any combination of ports. A Fault LED will be provided to indicate the status of the alarm contact.
2. LED Indications
3. Diagnostic display for internal switch status
4. Serial Port: The switch shall include a USB serial port that can be accessed by computers with hyper terminal or equivalent capability. The serial console connection manner shall require a short USB cable applied to connect the switch to a PC's USB port.

The Ethernet switch shall meet the following security requirements:

1. Port Disable: Unused ports shall be able to be disabled to prevent unauthorized access.
2. It shall support IEEE 802.1X and SSL to enhance network security.
3. Switch configuration password protection
4. https/SSL

The Ethernet switch shall have following communication redundancy:

1. The switch shall be able to detect and compensate for the failure of another switch, cable disruption, or hardware failure of one or more ports.
2. IEEE standards-based redundancy, including IEEE 802.1D/W spanning tree Turbo Ring: gigabit Ethernet redundant ring capability (Turbo Ring V2: recovery time <20ms for fast Ethernet ports; < 50 ms for Gigabit Ethernet ports). Ring coupling function to integrate different Turbo Ring for distributed application
3. Turbo Chain function for a multiple-ring architecture (recovery time <20ms for fast Ethernet ports; <50 ms for gigabit Ethernet ports)

The Ethernet switch shall be compatible with following software suite that assists with installation, operation, maintenance, and diagnostics of the existing network:

1. The switch must be compliant with a mass configuration tool:

- a. The tool must contain a security wizard for convenient setup of security-related parameters.
- b. The tool must allow for topology analysis to eliminate manual setting errors
- c. The tool must contain a configuration overview for efficient management
2. The switch shall be compliant with network management software (NMS).
 - a. The NMS must allow for auto-discovery of network devices and physical connections.
 - b. The NMS must allow for event playback for quick troubleshooting
 - c. The NMS must allow for color-coded VLAN/IGMP groups and other visualized network data.
 - d. The NMS must allow for a security view for the security status of network devices.
 - e. The NMS must support a mobile app for remote monitoring and notification.
3. The switch must be compliant with a stand-alone data collection tool to take network snapshots for quick troubleshooting.
 - a. The collection tool must allow for the ability to compare network and device data and then highlight the differences.

Construction:

The Contractor shall deliver the Ethernet switches, power supplies, and fiber optic modules to the District 6 Bureau of Operations, Traffic Signal Section, 650 North Lincoln Avenue – Bldg. E, Springfield, IL. It is the Contractor's responsibility to coordinate the delivery location and time with District 6 Operations.

Phone Numbers: 217-558-6695 (Bill Shaw)
 217-558-6716 (Dale Hebenstreit)

Basis of Payment:

This work will be paid for at the contract unit price per EACH for ETHERNET SWITCH, which price shall be payment in full for all labor, materials, and equipment required to provide the equipment specified above and deliver it to the Department.

COBALT CONTROLLER

Revised: March 22, 2018

Description:

This work shall consist of furnishing a shelf-mounted, two through sixteen-phase, fully-actuated, digital, solid-state traffic controller.

Controller:

The controller shall be an Econolite Cobalt C traffic controller for integration into the existing District 6 ITS/ATMS network and shall be fully compatible with the District's Centrac's ATMS. The Department will program the controllers.

Description:

The Contractor shall furnish the following equipment (MATERIAL ONLY) and deliver it to the Department: There are no support requirements associated with this pay item.

A shelf-mounted, two through sixteen phase, fully-actuated, digital, solid-state traffic controller. The controller shall be configurable to meet, as a minimum, all applicable sections of the NEMA

Standards Publications for TS2 and NTCIP 1202 and ATC standard 6.10. Where differences occur, these specifications shall govern. Controller versions shall be available to comply with NEMA TS2 Types 1 and 2. Type 2 versions of the controller shall be capable of operating as a Type 1 controller.

The controller shall require no more than 7" shelf depth. External dimensions shall not be larger than 8.5" x 15.2 1/4" x 6.375" (H x W x D).

The top and bottom of the chassis shall be made from extruded aluminum and include an integral handle on the back for easy transport. The sides shall be constructed of injection-molded polycarbonate. The model, serial number, and program information shall be displayed on the outside of the controller.

The electronics shall be modular in design and shall consist of vertical circuit boards. Horizontal circuit boards shall not be acceptable. In the interest of reliability, no sockets shall be used for any electronic device. All devices shall be directly soldered to the printed circuit board. Surface mount parts shall be used for the majority of the electronic components in the controller.

A built-in, high efficiency switching power supply shall generate the primary, +5VDC internal voltage, an isolated +24 VDC for internal and external use, VSTANDBY, LINESYNC, POWERUP, and POWERDOWN signals. All voltages shall be regulated. The 120 or 220VAC fuse shall be mounted on the front of the controller. Protection for the 24VDC supply shall be provided by a resettable electronic fuse. All printed circuit boards shall meet the requirements of the NEMA Standard plus the following requirements to enhance reliability. Both sides of the printed circuit board shall be covered with a solder mask material. The circuit reference designation for all components and the polarity of all polarized capacitors and two-leaded diodes shall be clearly marked adjacent to the component. Pin 1 for all integrated circuit packages shall be designated on all printed circuit boards. All printed circuit board assemblies shall be coated on both sides with a clear moisture-proof and fungus-proof sealant. Timing of the controller traffic application shall be derived from the AC power line.

To facilitate the transfer of user-programmed data from one controller to another, a Datakey receptacle for using a separate 2070-style, serial flash memory device shall be an available hardware option. In addition, two USB sockets and one SD card socket shall be provided for memory devices that can be used for data transfer. These data transfer devices shall be easily removable and directly accessible from the outside of the controller. The controller will not require this Datakey, USB memory thumb drive or SD card to be present for proper operation.

All controller software shall be stored in flash memory devices. The controller software shall be easily updated without the removal of any memory device from the controller. The use of removable PROMS or EPROMS from the controller shall not be acceptable. The controller shall include an option that allows updating software using a Windows based computer, a USB memory thumb drive, or an SD card.

The controller shall include an ATC engine board compliant to ATC standard 5.2b and proposed version 6.10. The engine board shall include a PowerPC 83XX family processor with QUICC engine.

The engine board shall have a minimum of the following memory:

- 128Mbytes of DDR2 DRAM memory used for application and OS program execution
- 64 Mbytes of FLASH memory used for storage of OS software and user applications

- 2MB of SRAM memory used for non-volatile parameter storage

The engine board shall provide the seven ATC serial ports, Ethernet, USB, and all other control signal required by ATC standard. The operating system shall be Linux 2.6.35 or later

Program values shall be entered through the keypad. Menu selections shall be entered by entering the numerical value of the desired option.

The front of the controller shall consist of a panel for the display, keyboard, and connectors for all necessary user connections. The display shall be a 7", TFT (Thin Film Transistor) LCD (Liquid Crystal Display) with high brightness. It shall be readable in direct sunlight. The display shall perform over the NEMA temperature range and shall have a resolution of 800 X 480. The luminous intensity shall be a minimum of 800 nits. The display shall not be affected by condensation or water drops.

Front-panel operator inputs shall be via clearly labeled elastomeric keypads. These shall include a 10-digit numeric keypad, Main and Sub keys, toggle keys, special function and enter keys, six function keys, status and help keys, and a large, four-direction cursor control key.

The front panel shall include a built-in speaker for enhanced controller audio feedback. The front panel shall include a tri-color status LED.

The controller shall have the capability of supporting Ethernet communications, using TCP/IP communications protocols. The controller shall provide four front-panel Ethernet ports. Two of the ports shall be connected to Ethernet switch ENET1, and the other two shall be connected to Ethernet switch ENET2.

The controller shall provide two USB 2.0 ports. USB ports shall be used for USB thumb drives to update software, upload or download configuration, or uploading logged data.

All non-optional interface connectors shall be accessible from the front of the controller in the NEMA Configured Controller models. Configurations shall be offered to accommodate different versions, as follows:

- NEMA TS2 Type 1
- NEMA TS2 Type 2
- NEMA TS1

The D connector shall be compatible with the Econolite Model ASC/2, ASC/2S, and ASC/3 D connectors.

To facilitate special applications, the controller shall have the capability of assignment of any input or output function to any input or output pin respectively on the interface connectors, with the exception of Flashing Monitor, Controller Voltage Monitor, AC+, AC-, Chassis Ground, 24VDC, Logic Ground, and TS2 Mode bits.

The controller shall, as a minimum, have the following communications ports:

- Port 1 SDLC for communications to other devices in the cabinet
- Port 2 serial port for systems communications
- Console serial port for local communications

An optional telemetry module shall utilize TDM/FSK data transmission at 1200 baud or 9600 baud over two pairs of wires. This module shall include the Econolite 25-pin D-sub connector.

All electronic modules, including the power supply, shall be easily removable from the controller using a screwdriver as the only tool. All power and signal connections to the circuit boards shall be via plug-in connectors.

A Datakey and receptacle shall be available for use as a database storage device (backup) or as a database transfer module. It shall be capable of storing a minimum 2MB of data. The Datakey shall be hot swappable, so it can be inserted and removed without powering down the controller. The Datakey shall be capable of storing the entire controller database and shall retain the information without use of a battery or capacitor backup. The controller shall not require this key to be present during normal operation. If the Datakey is present, the controller shall automatically backup the database to the Datakey 20 minutes following the last data change.

The controller shall provide support for one ATC-2070 Type communications slot that can be added, if needed, providing access to ATC communications ports

Construction:

The Contractor shall deliver the controllers to the District 6 Bureau of Operations, Traffic Signal Section, 650 North Lincoln Avenue – Bldg. E, Springfield, IL. It is the Contractor's responsibility to coordinate the delivery location and time with District 6 Operations.

Phone Numbers: 217-558-6695 (Bill Shaw)
 217-558-6716 (Dale Hebenstreit)

Basis of Payment:

This work will be paid for at the contract unit price per EACH for COBALT CONTROLLER, which price shall be payment in full for all labor, materials, and equipment required to provide the equipment specified above and deliver it to the Department.

MODIFY EXISTING SERVICE INSTALLATION

Revised: October 13, 2021

Description:

This work shall consist of installing a new CIRCUIT BREAKER, 1-POLE, 20 AMP, 120V SQUARE D QO BREAKER in the existing service disconnect cabinet as indicated in the plans.

Basis of Payment:

This work will be paid for at the contract unit price per EACH for MODIFY EXISTING SERVICE INSTALLATION, which price shall be payment in full. All materials required to complete this installation shall be incidental to this provision.

INTERSECTION MONITOR UNIT

Revised: October 18, 2021

This work shall be in accordance with Sections 857, 1074.03(b)(1) of the Standard Specifications, except as modified herein.

Description:

The Contractor shall furnish a malfunction management unit (MATERIAL ONLY) and deliver it to the Department. There are no support requirements associated with this pay item.

The malfunction management unit (MMU) shall meet the following material specifications:

The MMU shall be compatible for integration into the existing District 6 ITS/ATMS network and shall be fully compatible with the District's Centracs ATMS. The Department will program the MMUs.

1. Malfunction Management Unit (MMU). A MMU shall be shelf mountable, sixteen channels, and solid state with ethernet capability. The MMU shall be fully compliant with the requirements of NEMA TS-2 Standards as well as the NEMA TS-2 Flashing Yellow Arrow specifications.
2. Monitoring shall consist of all NEMA TS-2 requirements as well as Dual Indication, Field Check, External Watchdog, and Type Fault. The MMU shall provide the same fault coverage for the 4 section Flashing Yellow Arrow (FYA) approaches as it does for conventional protected left turn phases, including Conflict, Red Fail, Dual Indication, and both Minimum Yellow and Minimum Yellow plus Red Clearance Monitoring.
3. The MMU shall have an LCD display screen. This screen shall be separate from the full intersection channel status display.
4. These display functions shall be provided in addition to those required by NEMA TS-2 Standard. A PC shall not be required to display the following: Field Signal Voltages, the RMS Voltage and Frequency of the AC line, Field Check Status, Recurrent Pulse Status, Configuration, Event Logs, and Clock Set.
5. All NEMA standard configuration parameters shall be provided by a program card meeting the requirements of NEMA TS-2.
6. User programmed configuration enhanced settings shall be stored in an electronically erasable programmable read-only memory (EEPROM). This configuration shall be maintained without the use of a battery.

Construction:

The Contractor shall deliver the Intersection Monitor Unit/Malfunction Management Unit (MMU) to the District 6 Bureau of Operations, Traffic Signal Section, 650 North Lincoln Avenue – Bldg. E, Springfield, IL. It is the Contractor's responsibility to coordinate the delivery location and time with District 6 Operations.

Phone Numbers: 217-558-6695 (Bill Shaw)
 217-558-6716 (Dale Hebenstreit)

Basis of Payment:

This work will be paid for at the contract unit price per EACH for INTERSECTION MONITOR UNIT, which price shall be payment in full for all labor, materials, and equipment required to provide the equipment specified above and deliver it to the Department.

VIDEO VEHICLE DETECTION SYSTEM

Revised: March 4, 2019

This work shall consist of furnishing, installing, and placing into operation a video detection system that detects vehicles, bicycles, and motorcycles on a roadway by processing video images and that provides vehicle presence, traffic flow data, event alarms, and full-motion video for real-time traffic control and management systems. This equipment shall meet the NEMA environmental, power and surge ratings as set forth in NEMA TS1 and TS2 Specifications.

Hardware:

The video detection system shall be comprised of two major hardware components: a video sensor and a communications interface panel. An optional wired input/output card shall be available for certain cabinet types. The video detection system shall include a video sensor that integrates a high-definition (HD) camera with an embedded processor for analyzing the video and performing detection. The camera shall be a color CMOS imaging array. The camera shall have HD resolution of at least 720p (1280 x 720 pixels). The camera shall include a minimum 10X optical zoom. It shall be possible to zoom the lens as required to satisfy across-the-intersection detection objectives, including stop line and advance detection. It shall be possible to zoom the lens remotely from the TMC for temporary traffic surveillance operations or to inspect the cleanliness of the faceplate. The camera shall have direct real-time iris and shutter speed control by the integrated processor. The processor shall support H.264 video compression for streaming output.

Video Sensor Enclosure:

The camera and processor shall be housed in a sealed IP-67 enclosure. The faceplate of the enclosure shall be glass and shall have hydrophilic coating on the exterior surface to reduce debris accumulation and maintenance. The faceplate shall have a thermostatically controlled indium tin oxide (ITO) heater applied directly on the interior surface to keep the faceplate clear of condensation, snow, ice, and frost. An adjustable aluminum visor shall shield the faceplate from the sun and extraneous light sources. An integral aiming sight shall assist in aiming the camera for the detection objectives.

A removable rear cap and cable strain relief shall seal the power connection. The rear cap shall be tethered to the enclosure to avoid dropping the cap during installation. The rear cap shall be fastened to the body of the video sensor with a single, captive bolt. The rear cap and enclosure shall include gore breathers to equalize internal and external pressure while preventing moisture from entering the camera. The sensor shall be self-supporting on manufacturer's mounting brackets for easier fastening during installation. It shall be possible to rotate the field-of-view 360° without changing the angle of the visor.

Power and Communications:

Power and communications for the video sensor shall be carried over a single three-conductor cable. Termination of the three-conductor cable shall be inside the rear cap of the enclosure on a three-position, removable Phoenix terminal block. Each conductor shall be attached to the Phoenix plug via a screw connection. The video sensor shall operate normally over an input

voltage range of 89 to 265 VAC at 50 or 60 Hz. Power consumption shall be no more than 16 watts typical. No supplemental surge suppression shall be required outside the cabinet. All communications to the video sensor shall be broadband-over-power via the same three-conductor cable that powers the unit. Coaxial cable shall not be required.

Communications Interface Panel:

The video detection system shall include an interface panel in the traffic cabinet that manages communications between the video sensors, the traffic management center, a maintenance technician, and the traffic cabinet itself.

Video Sensor Connection:

The communications interface panel shall provide connection points for four video sensors. Each sensor connection shall be a 3-pole terminal block, which supplies power and broadband-over-power communications to the sensor. The broadband-over-power communications shall provide a throughput of 70 to 90 Mbps. The broadband-over-power connection shall support at least 1,000 feet of cabling to the video sensor. Each video sensor connection shall include a power switch. There shall be an LED for each video sensor to indicate the state of the power to the sensor and an LED for each video sensor to indicate the status of communications. Each video sensor connection shall contain a resettable fuse. Each video sensor connection shall provide high-energy transient protection.

Traffic Management Center (TMC) Communications:

An Ethernet port shall be provided to connect to a remote Traffic Management Center (TMC). The TMC connection shall support 10/100/1000 Mbps Ethernet communication. The communications interface panel shall proxy all network requests that arrive on the TMC connection to avoid unwanted network traffic from reaching the broadband-over-power network between the communications interface panel and the video sensors. All communications to the video detection system through the TMC connection shall be to a single IP address. The system shall be able to provide full HD quality video through its WAN port for use in streaming video back to the TMC or any remote location.

Local User Communications:

A wired Ethernet port shall be provided to connect the technician at the cabinet to the video detection system for setup and maintenance purposes. The maintenance port shall support 10/100/1000 Mbps Ethernet communication. All communications to the video detection system through the maintenance port shall be to a single IP address. The maintenance port shall support DHCP to automatically assign an IP address to the user's computer. An 802.11g Wi-Fi access point shall allow wireless connection to the video detection system at the cabinet for setup and maintenance purposes. All communications to the video detection system through the Wi-Fi access point shall be to a single IP Address. The Wi-Fi access point shall support DHCP to automatically assign an IP Address to the user's computer. The Wi-Fi access point shall include a dipole, omnidirectional antenna. A momentary pushbutton shall allow the user to turn the Wi-Fi access point on or off. The Wi-Fi access point shall turn itself off automatically after a period of inactivity from connected devices. An LED shall indicate when the Wi-Fi access point is enabled. The Wi-Fi access point shall operate simultaneously with the wired maintenance port and with the TMC connection. The Wi Fi access point shall require a password for connection by a user's computer. The default password shall be changeable.

Traffic Controller Connection:

The communications interface panel shall provide one (1) connection to communicate to the traffic controller through the cabinet. The traffic controller connection shall support a TS2 Type 1 compatible SDLC interface. The traffic controller connector shall be a 15-pin female metal shell D sub-miniature type connector to support a standard NEMA TS2 or TEES SDLC cable. The traffic controller connection shall support a protocol interface to SDLC-capable traffic controllers (NEMA or TEES). The traffic controller connection shall support the NEMA TS2 SDLC protocol to include up to 64 detector outputs and 32 inputs. The traffic controller connection shall be able to connect to a wired input/output card, which supports wired I/O in cabinets without a SDLC-capable controller. The wired I/O data communications link shall support at least 24 outputs and 16 inputs. It shall be possible to connect and use both SDLC communications and communication to the wired input/output card simultaneously.

USB Ports:

The communications interface panel shall include two USB 2.0 ports. If a communications interface panel fails to start and run due to a software or operating system failure, it shall be possible to reinstall all system and application software from a USB memory stick without necessitating removal of the communications interface panel from the cabinet. Video recording of up to two cameras simultaneously shall commence automatically when an appropriately configured USB memory stick is installed in either USB port.

Power:

The communications interface panel shall accept input voltage in the range of 89-265 VAC, 50/60 Hz power from the transient-protected side of the cabinet. The communications interface panel shall be protected by two slow blow fuses. Spares shall be attached to the panel.

Wired Input/Output Card:

The video detection system shall support an optional wired input/output card that communicates with the communications interface panel for real-time detection states and other I/O to the traffic controller. The card may reside in a standard detector rack or shelf-mount enclosure with power module. The optional wired input/output card shall comply with the form factor and electrical characteristics to plug directly into a NEMA type C or D detector rack. The card shall occupy two slots of the detector rack. The card shall provide four detector outputs on its rear-edge connector. A front connector shall provide communication to the communications interface panel. A front connector shall allow 16 inputs and 24 contact-closure detector outputs for wiring into the cabinet. A front panel LED for each of the 16 inputs and 24 outputs shall indicate the state of the input or output. The wired input/output card shall support optional expansion cards in other slots. Each expansion card shall support 4 outputs to the back edge of the card.

Management Software:

The video detection system shall include management software for configuration, monitoring, and data collection purposes. Management software shall be a Windows-based application and shall be compatible with Windows 10 operating systems (OS). The software shall communicate with the video detection system via Ethernet. The management software shall automatically determine all video sensors and communications interface panels available on the local network and populate a list of all devices. The management software shall provide a means to add video sensors and communications interface panels on routed networks by the communications panel's WAN IP address. The management software shall provide the user a means to name individual video sensors and communications interface panels. The management software shall provide a means for the user to zoom the camera optics while viewing a live video stream. The management software shall provide a means for the user to easily calibrate distances in the field of view so as to create a 3-dimensional mapping of the complete field of view.

The management software shall provide the user a means to create 4-sided detection zones in the field of view using either a still snapshot or live video. The management software will overlay an outline of each detection zone over the background image. It shall be possible for the user to place detection zones anywhere in the field of view for stop line detection and/or advance detection and for the user to set the desired color of both the “on” and “off” states of the overlay for individual detection zones. It shall be possible for the user to alter the size and shape of any previously created zone. The user should be able to click and drag any of the 4 sides of a zone and have the system automatically scale the length of the side consistent with the 3-dimensional field of view. It shall be possible for the user to move an entire zone without automatic rescaling.

The user shall be able to create a new zone by selecting an existing zone and duplicating it on either the left or right side or specifying a new zone behind (for advance) with a specific length and distance back from selected zone. It shall be possible for the user to easily rotate a zone by selecting any of its four corners and dragging to rotate it. It shall be possible to easily flip the zone direction 180 degrees from its current orientation. It shall be possible for the user to name each zone uniquely and to assign each zone to detect vehicles, to detect bicycles, or to detect both and to specify different outputs for each type.

It shall be possible for the user to specify the output of a zone as a presence, pulse, or snappy type output (presence during red and pulse during green signal phase state). The pulse output shall be usable for both approaching and receding traffic. The pulse output shall have a user programmable duration from 100 to 400 ms.

It shall be possible for a zone to have multiple output types (presence, pulse, snappy) on separate output channels. It shall be possible for the user to tie the presence outputs of multiple zones as well as signal phase state together with AND/OR Boolean logic. It shall be possible for the user to assign the same output to multiple zones, such that the output will be on if any of the zones are detecting a vehicle or bicycle. It shall be possible for the user to assign a single zone to more than one output, such that if a vehicle or bicycle is detected all the assigned outputs shall be turned on. The management software shall be capable of creating at least 99 detection zones per video sensor.

It shall be possible for the management software to retrieve all configuration parameters from video sensors or communications interface panels. It shall be possible for the user to save all the settings for a video sensor or a communications interface panel to a laptop file. The software shall provide a means to read or import all the settings from a previously saved configuration file for a video sensor or a communications interface panel. The management software shall be able to download a new version of the application software into a communications interface panel and its attached video sensors. The software shall provide a screen to monitor the operation of a video sensor. The monitoring screen shall include a live video stream from the video sensor with at least HD 1280 x 720-pixel resolution.

The screen shall show indications of detection in real time by changing the color of the detection zone. It shall be possible for the user to configure different indications for vehicle detections vs. bicycle detections when both are configured for the same zone. The monitoring screen shall include the following optional, configurable objects.

- It shall be possible for the user to size and position them anywhere on the screen and to change the color and size of text.
- An indication of when either a zone or an output is on or off, along with a user-configurable name for that indicator, applicable to any zone or output type.

- The current time in the video sensor.
- A user-configurable title or name.
- The version number of the video sensor software.configurable text as defined by the user.

Undo/Redo functions shall be available for operations during detection zone setup and programming. It shall be possible for the user to turn the overlay graphics on or off with a single setting.

The management software shall provide a screen to monitor the operation of the intersection with a quad-view video stream from the communications interface panel. The quad-view video stream shall have a resolution of at least HD 1280 x720 pixels, where each of the sensor videos comprising the quad-view shall be at least 640 x 360 pixels. It shall be possible for the user to configure the order that the sensor videos appear in the quad-view. The real-time quad-view video stream shall be capable of displaying the overlay graphics for all four sensors simultaneously. While monitoring the video of a single video sensor or of the quad-view, it shall be possible for the user to request a “snapshot” or single-frame image to save to a named file on a laptop. While monitoring the video of a single video sensor or of the quad-view, it shall be possible for the user to record a period of the video to save to a named file on a laptop.

System Functionality:

The video detection system shall detect the presence of vehicles in defined zones and turn on the assigned output when the vehicle is present in the zone. For detection zones placed at the stop line, the probability of not detecting the presence of a vehicle shall be 1% or less when aggregated over a 24-hour period when the video sensor is installed and configured properly. For detection zones placed at the stop line, the probability of falsely detecting a vehicle that is not present shall be 3% or less when aggregated over a 24-hour period when the video sensor is installed and configured properly. It shall be possible to place advance detector zones such that the farthest point of the zone is up to 600 feet from the video sensor. Advance detector zone placement shall include 2-3 car lengths of field-of-view beyond the farthest point of the zone. The video detection system shall be capable of detecting receding vehicles in day or night conditions when the video sensor is installed and configured properly. To ensure statistical significance for the above detection performance specifications, the data shall be collected over 24-hour time intervals (so as to avoid a single lighting condition) and will contain a minimum of one hundred vehicles per lane. The calculations of detection performance will not include turning movements where vehicles do not pass through the detectors, vehicle lane-change anomalies, or where they stop short or stop beyond the combined detection zones.

Failsafe Mode:

The video detection system shall provide three failsafe options during optical contrast loss. The default shall be maximum recall. The end-user may also choose to use minimum recall or fixed recall in which a user-defined number of seconds may be implemented to hold call during green. The video sensor shall continuously monitor the overall contrast in the video. If the overall contrast falls below a preset level (such as caused by dirty faceplate, severe glare, extreme fog, or temporary ice/snow on the faceplate), the sensor shall enable the chosen failsafe mode. When sufficient contrast is restored in the video, the sensor will exit the failsafe mode. The communications interface panel shall continuously monitor the connectivity status of the attached video sensors. If any video sensor goes offline due to either electrical failure or internal software failure, the communications interface panel shall enable the failsafe mode for that video sensor. If the video sensor comes back online, failsafe mode shall end.

Data Collection:

The video detection system shall automatically collect and store traffic flow data in non-volatile memory for later retrieval and analysis. No additional hardware or software shall be necessary. Data functionality shall include the following:

- Data shall be collected automatically for all zones created by the user once the learn period is complete and normal detection is active. No further setup shall be required.
- Vehicle counts per zone.
- Vehicle turning movements independent of zone.
- Vehicle average speeds.
- Vehicle lengths.
- Detection statistics with the on/off timestamps when zones were activated.
- Detection actuation statistics for whether a zone was triggered by a vehicle or a bicycle.

The management software shall be able to retrieve collected data over a specified period of time or for all currently stored data and save into a standard CSV file. The sensor hardware shall include up to 8GB of memory storage capacity for data collection. Options shall be provided for downloaded data in the form of a .csv file for Raw data, Binned data, Detections, and Zone Status as defined below:

- Raw Data – Includes time stamped zone statistics for vehicle or bike actuations and average speed as well as time stamped exiting vehicle statistics which include volume, turning movement direction, speed, and length for vehicles exiting each zone.
- Binned Data – Pre-binned data with bin time set by the user down to as little as 1 minute. Data shall include volume, occupancy, turning movement counts, and speed of vehicles for each zone.
- Detections – Date/time stamped data regarding vehicles exiting zones including type of object (vehicle or bike), speed, length, and direction of movement (through, left, right).
- Zone Status – Date/time stamped indications of whether a vehicle or bicycle actuated a zone and the average speed of all objects in the zone.

Data including counts, turning movements, speed, length, zone names, sensor status, and video snapshots shall be available to remote systems via remote communication to the system using an Applications Programming Interface (API). This API shall consist of a set of GET commands embedded in HTTP protocol. The resulting data returned shall be in JSON format.

Operations Log:

The communications interface panel and each video sensor shall maintain a time-stamped operations log of routine and special events in non-volatile memory for later retrieval and analysis.

Time Synchronization:

The video detection system and management software shall provide three methods to synchronize the time of day clocks in the communication interface panel and the video sensors, as follows:

- Manual time synchronization operation by the user, which sets the time to the current time on the laptop where the management software is running.
- A configuration setting to allow the communications interface panel to automatically obtain time from the NEMA TS2 protocol on the SDLC channel and broadcast it to the video sensors.

- A configuration setting to allow the communications interface panel to automatically obtain time from up to five Network Time Protocol (NTP) sources and broadcast it to the video sensors.

Video Streaming:

In addition to the ability to view video streams in the management software, it shall be possible to view video from individual sensors or to view the quad-view from the communications interface panel using a third-party video player application on a tablet, smartphone, or laptop computer. Video bitrate is user-definable between 100 Kbps-5000 Kbps. The default shall be 2048 Kbps. All bitrates shall provide 30 fps.

Installation and Setup:

The video detection system hardware shall be designed for flexible, fast, and easy installation and setup. It shall be possible to mount the video sensor on an intersection pole, mast arm, or luminaire arm. No special tools or extra equipment, other than a laptop for configuration, will be required. Once all hardware is installed, connected, and functional, it shall be possible to configure the video detection system for a typical 4-approach, 8-phase intersection in 15 minutes or less.

Warranty, Service and Support:

The manufacturer shall warrant the video detection system for a minimum of three years. An option for up to six years of warranty shall be available. Ongoing software support by the manufacturer will include software updates of the video sensor, communications interface panel, and management software. These updates will be provided free of charge during the warranty period. The manufacturer will maintain a program for technical support and software updates following the expiration of the warranty period. This program will be available to the contracting agency in the form of a separate agreement for continuing support. A quick-start guide, installation guide, application notes, and other materials shall be available from the manufacturer to assist in product installation and setup for various applications. In addition, training online or in person shall be available. Training shall be available to personnel of the contracting agency in application design, operation, setup, and maintenance of the video detection system. Manufacturer shall provide a tech support website, support email address, and a 1-800 number for technical support

Basis of Payment:

This work will be paid for at the contract unit price per EACH for VIDEO VEHICLE DETECTION SYSTEM, which price shall be payment in full for furnishing, installing, and placing into operation the equipment specified to the satisfaction of the Engineer.

CAMERA MOUNTING ASSEMBLY

This item shall consist of furnishing and installing a camera mounting assembly as shown on the plan details.

The item shall be an Astro bracket & pole mounting assembly and a camera mounting bracket. The camera mounting bracket shall be affixed to the pipe with stainless steel $\frac{3}{4}$ " banding.

Basis of Payment: This work will be paid for at the contract unit price per EACH for CAMERA MOUNTING ASSEMBLY, which price shall be payment in full for furnishing and installing the equipment specified and shown on the plans to the satisfaction of the Engineer.

COMPLETION DATE

All work on this contract shall be completed on or before March 1, **2024**. Should the Contractor fail to complete all work by March 1, 2024, the Contractor shall be liable in accordance with Article 108.09 of the Standard Specifications.

ATMS SOFTWARE SUPPORT

This pay item shall include a five year extension of the Econolite Centracs service agreement for IDOT District 6 Centracs System. This shall include 60 months of remote and/or on-site support for the ATMS software (Centracs) and associated network by the software vendor.

Basis of Payment: This work will be paid for at the contract unit price per LUMP SUM for ATMS SOFTWARE SUPPORT.

AUTOMATED FLAGGER ASSISTANCE DEVICES (BDE)

Effective: January 1, 2008

Description. This work shall consist of furnishing and operating automated flagger assistance devices (AFADs) as part of the work zone traffic control and protection for two-lane highways where two-way traffic is maintained over one lane of pavement. Use of these devices shall be at the option of the Contractor.

Equipment. AFADs shall be according to the FHWA memorandum, "MUTCD - Revised Interim Approval for the use of Automated Flagger Assistance Devices in Temporary Traffic Control Zones (IA-4R)", dated January 28, 2005. The devices shall be mounted on a trailer or a moveable cart and shall meet the requirements of NCHRP 350, Category 4.

The AFAD shall be the Stop/Slow type. This device uses remotely controlled "STOP" and "SLOW" signs to alternately control right-of-way.

Signs for the AFAD shall be according to Article 701.03 of the Standard Specifications and the MUTCD. The signs shall be 24 x 24 in. (600 x 600 mm) having an octagon shaped "STOP" sign on one side and a diamond shaped "SLOW" sign on the opposite side. The letters on the signs shall be 8 in. (200 mm) high. If the "STOP" sign has louvers, the full sign face shall be visible at a distance of 50 ft (15 m) and greater.

The signs shall be supplemented with one of the following types of lights.

- (a) Flashing Lights. When flashing lights are used, white or red flashing lights shall be mounted within the "STOP" sign face and white or yellow flashing lights within the "SLOW" sign face.
- (b) Stop and Warning Beacons. When beacons are used, a stop beacon shall be mounted 24 in. (600 mm) or less above the "STOP" sign face and a warning beacon mounted 24 in. (600 mm) or less above, below, or to the side of the "SLOW" sign face. As an option, a Type B warning light may be used in lieu of the warning beacon.

A "WAIT ON STOP" sign shall be placed on the right hand side of the roadway at a point where drivers are expected to stop. The sign shall be 24 x 30 in. (600 x 750 mm) with a black legend and border on a white background. The letters shall be at least 6 in. (150 mm) high.

This device may include a gate arm or mast arm that descends to a horizontal position when the "STOP" sign is displayed and rises to a vertical position when the "SLOW" sign is displayed. When included, the end of the arm shall reach at least to the center of the lane being controlled. The arm shall have alternating red and white retroreflective stripes, on both sides, sloping downward at 45 degrees toward the side on which traffic will pass. The stripes shall be 6 in. (150 mm) in width and at least 2 in. (50 mm) in height.

Flagging Requirements. Flaggers and flagging requirements shall be according to Article 701.13 of the Standard Specifications and the following.

AFADs shall be placed at each end of the traffic control, where a flagger is shown on the plans. The flaggers shall be able to view the face of the AFAD and approaching traffic during operation.

To stop traffic, the "STOP" sign shall be displayed, the corresponding lights/beacon shall flash, and when included, the gate arm shall descend to a horizontal position. To permit traffic to move, the "SLOW" sign shall be displayed, the corresponding lights/beacon shall flash, and when included, the gate arm shall rise to a vertical position.

If used at night, the AFAD location shall be illuminated according to Section 701 of the Standard Specifications.

When not in use, AFADs will be considered nonoperating equipment and shall be stored according to Article 701.11 of the Standard Specifications.

Basis of Payment. This work will not be paid for separately but shall be considered as included in the cost of the various traffic control items included in the contract.

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."

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 **3.00%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

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

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

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

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

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

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

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases and will be considered by the Department.

- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
- (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.
- (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.

b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.
- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
- (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.

- (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
- (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines the bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided it is otherwise eligible for award. If the Department determines the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification will also include a statement of reasons for the adverse determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period to cure the deficiency.
- (c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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

- (a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.

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

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

- (a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be emailed to the Department at DOT.DBE.UP@illinois.gov.
- (b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.
- (c) SUBCONTRACT. The Contractor must provide copies of DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.
- (d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:
- (1) The replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or
 - (2) The DBE is aware its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or
 - (3) The DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.
- (e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

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

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

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

which the DBE contractor was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

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

- (f) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.
- (g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.
- (h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

ILLINOIS WORKS APPRENTICESHIP INITIATIVE – STATE FUNDED CONTRACTS (BDE)

Effective: June 2, 2021

Revised: September 2, 2021

Illinois Works Jobs Program Act (30 ILCS 559/20-1 et seq.). For contracts having an awarded contract value of \$500,000 or more, the Contractor shall comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules. The goal of the Illinois Apprenticeship Works Initiative is that apprentices will perform either 10% of the total labor hours actually worked in each prevailing wage classification or 10% of the estimated labor hours in each prevailing wage classification, whichever is less. The Contractor may seek from the Department of Commerce and Economic Opportunity (DCEO) a waiver or reduction of this goal in certain circumstances pursuant to 30 ILCS 559/20-20(b). The Contractor shall ensure compliance during the term of the contract and will be required to report on and certify its compliance. An apprentice use plan, apprentice hours, and a compliance certification shall be submitted to the Engineer on forms provided by the Department and/or DCEO.

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) Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness) Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness) Other piling	23 lb/ft (34 kg/m) 32 lb/ft (48 kg/m) 37 lb/ft (55 kg/m) See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Welded Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail Steel Plate Beam Guardrail, Type A w/steel posts Steel Plate Beam Guardrail, Type B w/steel posts Steel Plate Beam Guardrail, Types A and B w/wood posts Steel Plate Beam Guardrail, Type 2 Steel Plate Beam Guardrail, Type 6 Traffic Barrier Terminal, Type 1 Special (Tangent) Traffic Barrier Terminal, Type 1 Special (Flared)	20 lb/ft (30 kg/m) 30 lb/ft (45 kg/m) 8 lb/ft (12 kg/m) 305 lb (140 kg) each 1260 lb (570 kg) each 730 lb (330 kg) each 410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms Traffic Signal Post Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 – 12 m) Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 – 16.5 m) Light Pole w/Mast Arm, 30 - 50 ft (9 – 15.2 m) Light Pole w/Mast Arm, 55 - 60 ft (16.5 – 18 m) Light Tower w/Luminaire Mount, 80 - 110 ft (24 – 33.5 m) Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 – 42.5 m) Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 – 48.5 m)	11 lb/ft (16 kg/m) 14 lb/ft (21 kg/m) 21 lb/ft (31 kg/m) 13 lb/ft (19 kg/m) 19 lb/ft (28 kg/m) 31 lb/ft (46 kg/m) 65 lb/ft (97 kg/m) 80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence) Steel Railing, Type SM Steel Railing, Type S-1 Steel Railing, Type T-1 Steel Bridge Rail	64 lb/ft (95 kg/m) 39 lb/ft (58 kg/m) 53 lb/ft (79 kg/m) 52 lb/ft (77 kg/m)
Frames and Grates Frame Lids and Grates	250 lb (115 kg) 150 lb (70 kg)

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

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

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

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

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017

Revised: April 1, 2019

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

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

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

SUBMISSION OF PAYROLL RECORDS (BDE)

Effective: April 1, 2021

Revised: November 1, 2022

FEDERAL AID CONTRACTS. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

“STATEMENTS AND PAYROLLS

The payroll records shall include the worker’s name, the worker’s address, the worker’s telephone number when available, the worker’s social security number, the worker’s classification or classifications, the worker’s gross and net wages paid in each pay period, the worker’s number of hours worked each day, and the worker’s starting and ending times of work each day. However, any Contractor or subcontractor who remits contributions to a fringe benefit fund that is not jointly maintained and jointly governed by one or more employers and one or more labor organization must additionally submit the worker’s hourly wage rate, the worker’s hourly overtime wage rate, the worker’s hourly fringe benefit rates, the name and address of each fringe benefit fund, the plan sponsor of each fringe benefit, if applicable, and the plan administrator of each fringe benefit, if applicable.

The Contractor and each subcontractor shall certify and submit payroll records to the Department each week from the start to the completion of their respective work, except that full

social security numbers shall not be included on weekly submittals. Instead, the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted. The submittals shall be made using LCPtracker Pro software. The software is web-based and can be accessed at <https://lcptracker.com/>. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate option ("No Work", "Suspended", or "Complete") selected."

STATE CONTRACTS. Revise Item 3 of Section IV of Check Sheet #5 of the Recurring Special Provisions to read:

- "3. Submission of Payroll Records. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month to the Illinois Department of Labor (IDOL) through the Illinois Prevailing Wage Portal in compliance with the State Prevailing Wage Act (820 ILCS 130). The portal can be found on the IDOL website at <https://www2.illinois.gov/idol/Laws-Rules/CONMED/Pages/Prevailing-Wage-Portal.aspx>. Payrolls shall be submitted in the format prescribed by the IDOL.

In addition to filing certified payroll(s) with the IDOL, the Contractor and each subcontractor shall certify and submit payroll records to the Department each week from the start to the completion of their respective work, except that full social security numbers shall not be included on weekly submittals. Instead, the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted. The submittals shall be made using LCPtracker Pro software. The software is web-based and can be accessed at <https://lcptracker.com/>. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate option ("No Work", "Suspended", or "Complete") selected."

VEHICLE AND EQUIPMENT WARNING LIGHTS (BDE)

Effective: November 1, 2021

Revised: November 1, 2022

Add the following paragraph after the first paragraph of Article 701.08 of the Standard Specifications:

"The Contractor shall equip all vehicles and equipment with high-intensity oscillating, rotating, or flashing, amber or amber-and-white, warning lights which are visible from all directions. In accordance with 625 ILCS 5/12-215, the lights may only be in operation while the vehicle or equipment is engaged in construction operations."

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."

REVISIONS TO THE ILLINOIS PREVAILING WAGE RATES

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at <http://www.state.il.us/agency/idol/> or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.