Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

April 10, 2020

SUBJECT: FAI Route 90/94/290 (I-90/94/290)
Project NHPP-FB4M(631)
Section 2015-018R
Cook County
Contract No. 62A77
Item No. 170, April 24, 2020 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised the Schedule of Prices
2. Revised page ix of the Table of Contents to the Special Provisions
3. Revised pages 2, 50-52, 230, 323-328 & 350-355 of the Special Provisions
4. Added pages 624-625 to the Special Provisions
5. Revised sheets 5, 6, 9, 11, 12, 18, 19 & 30 of the Plans

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

Jack A. Elston, P.E.
Bureau Chief, Design and Environment

MTS

Revised 4/9/2020

SOILS INFORMATION

Soil boring logs and generalized soil profiles are shown in the Plans for SN 016-1823.

The reports below are available for inspection at IDOT District 1, 201 W. Center Court, Schaumburg, Illinois.

Structure Geotechnical Report
Circle Interchange Reconstruction
Retaining Wall 34 (Proposed SN 016-1823)
F.A.I. 90/94 (Kennedy Expressway)
IDOT D-91-227-13 / PTB 163-001
Cook County, Illinois
Prepared by Wang Engineering, Inc.
Original: April 19, 2019
Revised: November 1, 2019

Roadway Geotechnical Report
Jane Byrne Interchange Reconstruction
I-90/94 and Connecting Ramps
Section 2015-020B and 2014-15R&B-R
Cook County, Illinois
Prepared by Wang Engineering, Inc.
Original: October 28, 2019
Revised: January 28, 2020

Letter
Geotechnical Engineering Services
Accident Investigation Site Storage Tank
Jane Byrne Interchange Reconstruction
Prepared by Wang Engineering, Inc.
Dated October 21, 2019

Technical Memorandum
Date: March 31, 2020
Contract 62A77 – Sign Structure, Light Tower and CCTV Foundation Geotechnical Analyses
Jane Byrne Interchange Reconstruction
Wang Engineering, Inc.

Revised 4/9/2020

ENGINEER'S FIELD OFFICE TYPE A (SPECIAL)

Add the following to paragraph of Article 670.01 to read:

The location of the engineer's field office shall be located at 900 South Des Plaines Street, Chicago for the exclusive use of the Engineer or Authorized Representative. It is intended that Contract 62A76 ,I-90/94 Northbound Roosevelt Road to Lake Street, and Contract 62A77, I-90/94 Southbound Roosevelt Road to Lake Street share the same field office. Maintenance of the field office shall be a shared responsibility by each contractor. . All furnishings shall be clearly labeled by each contractor and be returned to each contractor at the end of the project.

Revise the fifth paragraph of Article 670.02 to read:

Solid waste disposal consisting of seven waste baskets and an outside trash container of sufficient size to accommodate a weekly provided pick-up service intreated by the contractor. A weekly cleaning service for the office, including lavatory, shall be provided.

Revise subparagraph (a) of Article 670.02 to read:

(a) Twenty-four desks, with minimum working surface 42 inch x 30 inch each and twelve non-folding chairs with upholstered seats and backs.

Revise subparagraph (d) of Article 670.02 to read:

(d) Eight free standing four-drawer legal size file cabinets with lock and an underwriters' laboratories insulated file device 350 degrees one hour rating.

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Revise subparagraph (e) of Article 670.02 to read:

(e) Twenty folding chairs with fabric top cushions and two conference tables with minimum top size of 44 inch x 96 inch.

Revise subparagraph (h) of Article 670.02 to read:

(h) Two electric desk type tape printing calculators.

Revise subparagraph (i)(2) of Article 670.02 to read:

(i)(1) Internet connection. A high speed service connection using cable broadband, or CDMA wireless technology. Additionally, a WIFI 5 wireless network shall be provided, which will allow connection by the Engineer and up to 20 staff throughout the building. Including but not limited to all labor, material and other work by the TELCOM company necessary to install the appropriate network in and into the building. However the consultant services room must have it's own independent network from state network or connections.

(i)(2) Telephones lines. One telephone line for the fax machine. All telephone lines shall include long distance service and all labor and materials necessary to install the phone lines at the locations directed by the Engineer. The TELCOM company shall configure ROLL/HUNT features as specified by the engineer.

Revise subparagraph (j) of Article 670.02 to read:

(j) Two plain paper network multi-function color printer/copier/scanner machines capable of reproducing prints up to 11 inch x 17 inch within automatic feed tray capable of sorting 30 sheets of paper. Letter size and 11 inch x 17 inch paper shall be provided. The contractor shall provide the multi-function machines with IT support for setup and maintenance.

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Revise subparagraph (k) of Article 670.02 to read:

(k) One plain paper fax machine including maintenance and supplies.

Revise subparagraph (m) of Article 670.02 to read:

(m) One electric water cooler dispenser including water service.

Add the following subparagraphs to Article 670.02:

(s) One 4 foot x 6 foot chalkboard or dry erase board.

(t) One 4 foot x 6 foot framed cork board.

Add the following to Article 670.07 Basis of Payment.

The building or buildings, fully equipped, will be paid for at the contract unit price per calendar month or fraction thereof for ENGINEER'S FIELD OFFICE, TYPE A (SPECIAL).

Revised 4/9/2020

Method of Measurement. Fence removal shall be measured for payment in feet of FENCE REMOVAL and measured along the top of the fence from center to center of end post, including the length occupied by gates.

Basis of Payment. This work will be paid for at the contract unit price per foot for FENCE REMOVAL, at the specified locations. Additionally, this price shall include all equipment, labor, and materials necessary to remove and dispose of the existing fence of all kinds, including but not limited to wrought iron, wood, steel aluminum, or chain link installations and their associated fence hardware, and appurtenances.

FIRE HYDRANTS TO BE REMOVED

Description. An existing CDWM water main fire hydrant is located immediately south of the Washington Boulevard bridge pier between SB I-90/94 and the Madison St. exit ramp. This work shall consist of preparing the location for the removal the fire hydrant by CDWM forces or contractors and the backfill and restoration of the area after CDWM has completed their work.

Materials. Required backfill and restoration materials shall meet relevant articles of the SSRBC. In addition, the contractor shall provide the following materials to the CDWM for removal of the fire hydrant and repair of the 12" water main at this location. All materials shall meet current (at the time of submittal) Chicago Department of Water Management (CDWM) Technical Specifications for Water Main Construction.

Materials	*Quantity*	*Units*
Pipe DI MJ – 12" Class 56	5	LF
Polywrap – 12"	5	LF
Sleeve Transition – 12"	2	EA
Gasket MJ LT – 12"	2	EA
Megalug MJ – 12"	2	EA

Prior to procurement of the water main repair materials, the contractor shall make submittals of manufacturer's cut-sheets, drawings, certifications, etc. for the materials to be provided to CDWM for review and approval. The material shall be delivered to the job site.

Construction. The work shall include various items, including protection of existing facilities, excavation, curb removal, pavement removal, excavation support, backfilling excavated material, curb installation, placing topsoil, seeding, and other required efforts. CDWM intends to have the contractor create an excavation to access the water main that will be approximately 5' x 7' and up to 5' in depth.

Method of Measurement. Fire hydrants to be removed will be measured for payment for each location required by CDWM.

Basis of Payment. This work will be paid for at the contract unit price per each for FIRE HYDRANTS TO BE REMOVED. The unit price shall include all equipment, labor and materials required to access the existing water main and restore the area after CDWM efforts have been completed and includes the proper disposal of any pipe and fittings left at the site from the CDWM hydrant removal work..

Revised 4/9/2020

CONCRETE FOUNDATION, TYPE E 30-INCH DIAMETER

Add the following to Article 878.03 of the Standard Specifications:

All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. (300 mm) at the threaded end.

Foundations shall provide two (2) 2-inch raceways. Unused raceways shall be stubbed and capped for future use.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

CLOSED CIRCUIT TELEVISION DOME CAMERA, HIGH DEFINITION
Effective: January 1, 2020

1. **Description**.

This item shall consist of furnishing an integrated High Definition Closed-Circuit Television (CCTV) Dome Camera Assembly as described herein and as indicated in the Plans.

2. **Materials.**

2.1 General. The HD (High Definition) CCTV Dome Color Camera shall be a rugged, non-pressurized, outdoor surveillance camera system with or without a dome bubble. The HD CCTV Camera shall be designed to perform over a wide range of environmental and lighting conditions and automatically switches from color daytime to monochrome nighttime operation. The high definition camera shall be either a Bosch Autodome IP starlight 7000 HD, a Siqura PD910, or an Axis Q6155-E in compliance with the requirements herein.

The camera shall use a standard Web browser interface for remote administration and configuration of camera parameters. The browser interface shall provide PTZ control including preset and pattern and on-screen display (OSD) for access to camera programming.

The camera shall be ONVIF compliant, Profiles S, and G.

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

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

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

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

Environmental	Requirement
IP Rating	IP 66
Weight (max.)	10 lbs
Overall Dimensions	10" dia. x 14"
Humidity	0 to 100%
Operating temperature	-40ºC to 55ºC
Mount	1 ½" NPT

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

2.3 Power. The CCTV Dome Camera shall be designed to operate from a 120v power source or Hi-PoE provided the proper Hi-PoE injector is utilized, (802.3bt Type 3: max 60 W). The appropriate power supply shall be included as a part of this item. The power requirements for the camera shall comply with the following:

Item	Requirement	
Port	RJ-45 for 100Base-TX; Auto MDI/MDI-X;	
Cabling Type	Cat5 cable or better for 100Base-TX	
Input Voltage	18 to 32 VAC; 22 to 27 VDC	
Input Power		
	24 VAC nominal	25 VA nominal (without heater and blower);
		75 VA nominal (with heater and blower)
	24 VDC nominal	0.7 A nominal (without heater and blower); 3 A nominal (with heater and blower)
	PoE	IEEE802.3af (without heater and blower)

2.4 Camera.

The camera shall provide a minimum of four simultaneous video streams, auto iris with 30X (minimum) optical, and 10X digital zoom. The CCTV Dome Camera shall incorporate

Item	Requirement
Sensor Type	1/2.8-inch CMOS sensor
Optical Zoom	30X (minimum)
Digital Zoom	12X
Maximum Resolution	2065 X 1553
Horizontal Angle of View	63° (wide) – 2.3° (tele)
Aspect Ratio	16:9
Light Sensitivity	Sensitivity in lux for 90% reflectance, f/1.6 (wide angle), 28 dB gain at 30 IRE (30% of signal level) with Sensitivity Boost OFF; 4X improvement to sensitivity with Sensitivity Boost ON
Color (33 ms)	0.65 lux
Color (250 ms)	0.07 lux
Mono (33 ms)	0.20 lux
Mono (250 ms)	0.015 lux
Day/Night Capabilities	Yes
IR Cut Filter	Yes
IR Trace	Curves 850 nm and 950 nm
Wide Dynamic Range	80dB
Iris Control	Auto iris with manual override
Backlight Compensation	Auto / Manual
Automatic Gain Control	Auto / Manual
Active Noise Filtering	Auto / Manual
Electronic Image Stabilization (EIS)	30X

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3.5 Video

Item	Requirement
Video Encoding	H.264. H.265, in High, Main, or Base profiles and MJPEG
Video Streams	Up to 4 simultaneous streams, the second stream is variable based on the setup of the primary stream
Frame Rate	Up to 30, 25, 15, 12.5, 10, 8.333, 7.5, 6, 5,3, 2.5, 2, 1 (depending upon coding, resolution, and stream configuration)
Minimum Available Resolutions	1920 x 1080 1280 x 720 720 x 480
Supported Protocols	TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP, IPv4, IPv6, SNMP v2c/v3, QoS, HTTP, HTTPS, LDAP (client), SSH, SSL, SMTP, FTP, and 802.1x (EAP)
Security Access	Password protected
Software Interface	Web browser view and setup

3.6 PTZ Mechanical

Item	Requirement
Pan Movement	360º continuous pan rotation
Pan Speed	Variable between 400 per second continuous pan to 5.0º per second
Vertical Tilt	Unobstructed tilt of +1º to –90º
Manual Control Speed	Pan speed of 0.1º to 80º per second; tilt operation shall range from 0.5º to 40º per second.
Automatic Preset Speed	Pan speed of 280º and a tilt speed of 160º per second
Presets	255 positions
Tours	2 tours
Preset Accuracy	± 0.2º
Proportional Pan/Tilt Speed	Speed decreases in proportion to the increasing depth of zoom
Motor	Continuous duty and variable speed, operating at 18 to 32 VAC, 24 VAC nominal
Window Blanking	16 blanked windows
Auto Flip	Rotates dome 180º at bottom of tilt travel
Power Consumption	Nominal 45 VA (without heater and blower running)
	Nominal 75 VA (with heater and blower running)

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The camera shall provide a freeze frame feature that freezes a camera image as a preprogrammed preset is called+, providing a live view once positioned. Selections for on/off shall be available through the embedded Web browser.

The camera shall provide image stabilization to compensate for vibration introduced into the camera.

The camera shall support IPv6 configurations in conjunction with IPv4.

4. Still Picture Capture.

The camera shall be capable of capturing a still image in JPEG format and automatically transferring this image to an FTP site. The resolution of the image shall be 1920 x 1080 pixels. The frequency of captures shall be user settable and shall as a minimum range from 1 picture every 30 seconds to 1 picture every five minutes.

5. Local Storage.

The camera shall have a SD/SDHC/SDXC memory card slot. The camera shall be provided with a 64GB SDXC memory card with a UHS Speed Class 1, minimum serial data transfer rate of 10MB/s. The camera shall be capable of continuous recording of video and audio, alarm/events/schedule recording. The stored video shall be remotely downloadable over the network the camera is connected to without any field intervention.

6. Testing.

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

7. Product Support.

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

8. Installation.

Thirty (30) days prior to the scheduled field installation of each CCTV camera, the Contractor shall deliver the camera to the Traffic Systems Center (TSC) for network configuration prior to installation by the Contractor. The camera shall be clearly identified as to which location it is to be installed for proper configuration. The camera's MAC address shall be clearly identified. After the camera is configured, the Contractor shall retrieve the camera from the TSC and install it.

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The Contractor shall install the CCTV camera in accordance with manufacturer's instructions. The camera firmware shall be the latest stable release available at the time of installation.

9. Documentation.

In addition to the initial submittal(s) prior to procurement, the Contractor shall provide installation and operation manuals, documentation of exact equipment model and serial numbers, software/firmware version numbers, in hardcopy and PDF formats on CDROM.

10. Measurement.

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

11. Basis of Payment.

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

ETHERNET MANAGE SWITCH
Effective: January 1, 2020

1. **Description**.

This item shall consist of furnishing a managed environmentally hardened Ethernet switch as described herein and as indicated in the Plans.

2. **Materials.**

For compatibility with the installed network infrastructure the Ethernet switch shall be a Cisco IE-4000-8GT8GP4G-E switch with PWR-IE170W- PC-AC power supply. Single Mode Fiber Small Form-Factor Plug (SFP) Modules shall be Cisco 1Gbps transceivers of the model for the distances involved.

8. Installation.

Thirty (30) days prior to the scheduled field installation of each Ethernet switch, Contractor shall deliver the Ethernet switch to the Traffic Systems Center (TSC) for configuration prior to installation by the Contractor. The switch shall be clearly identified as to which location it is to be installed for proper configuration. After the switch is configured, the Contractor shall retrieve the switch from the TSC and install it.

Revised 4/9/2020

CCTV CAMERA STRUCTURE

Description. This work shall consist of furnishing and installing a 100' steel CCTV camera structure complete with foundation and camera lowering device. The structure must be a galvanized steel structure with a concrete foundation. Specifications for the structure are detailed in the section herein.

Materials. Materials shall be as specified herein.

Camera Lowering System

The camera lowering system shall be designed to support and lower an Ethernet/IP closed circuit television camera, lens, housing, PTZ mechanism, cabling, connectors and other supporting field components without damage or causing degradation of camera operations.

The camera lowering system device and the pole are interdependent; and thus, must be considered a single unit or system. The lowering system shall consist of a pole and lowering device system with the mounting slot and bolt hole mirrored on 180 degrees of the pole top tenon. The system shall include the suspension contact unit, divided support arm, and a pole adapter for attachment to a pole top tenon, pole top junction box, conduit mount adapter and camera connection box. The divided support arm and receiver brackets shall be designed to self-align the contact unit with the pole center line during installation and ensure the contact unit cannot twist under high wind conditions. For maximum arm strength, round support arms are not acceptable.

The camera-lowering device shall withstand wind forces of 100 mph with a 30 percent gust factor using a 1.65 safety factor. The lowering device manufacturer, upon request, shall furnish independent laboratory testing documents certifying adherence to the stated wind force criteria utilizing, as a minimum effective projected area, the actual EPA or an EPA greater than that of the camera system to be attached.

The camera-lowering device to be furnished shall be the product of manufacturers with a minimum of 5 years of experience in the successful manufacturing of camera lowering systems. The lowering device provider shall be able to identify a minimum of 3 previous projects where the purposed system has been installed successfully for over a one-year period of time each.

The lowering device manufacturer shall furnish an authorized factory representative to oversee the installation contractor's assembly and testing of the first lowering system onto the pole assembly. The manufacturer shall furnish the applicable DOT engineer documentation certifying that the installation contractor has been instructed on the installation, operation and safety features of the lowering device for the particular project. The contractor shall be responsible for providing applicable maintenance personnel "on site" operational instructions.

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

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

The Lowering Device must be specifically equipped with electrical contacts connectors designed for an Ethernet (IP-CAT5e) video transmission along with PTZ control. The Contact Connectors shall be designed for extreme environmental outdoor use.

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

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

The Ethernet configuration contact connector shall include:

Each IP/Ethernet Male-Female connector shall include a total of (13) Specifically designed Male contacts sized a minimum of 0.09 inches while the female contacts shall be at least 0.09 inches I.D. at the contact area. Eight of the thirteen contacts shall be soldered to CAT5e Wire end terminated with an RJ45-Male connector. Five of the thirteen contacts shall be soldered to #18/1 UL lead wire and affixed with numbered tags, which may be used for additional camera requirements including but not limited to power, control, alarms or grounds.
All current carrying male pin and female socket/barrel contacts shall be Gold-plated per ASTM B-488 over Nickel plated CA 360 per QQ-N-290m. Each individual female barrel contact shall have a Nickel plated CA 360 sleeve which prevents foreign matter from entering the contact area as well as preclude the possibility of the leaves of the female contact from opening beyond allowable limits and ensure a snug fit around the respective male pins. There shall be at least one contact that is positioned in a manner which will allow it to make first and break last providing optimum grounding performance.

All soldering shall be per IPC J STD-001E. Each individual contact shall be rated for up to 600v and 7A but de-rated according to the wire used in the application. For optimum weatherproofing, each male shall be self-wiping with a shoulder at the base of each male contact so that it will recess into the female block, thereby giving a rain-tight seal to each individual contact when mated. Further, the wire leads from both the male and female rubber contact blocks shall be permanently and integrally molded in the synthetic rubber body. The facility manufacturing the electrical contact connector must comply with Mil Spec Q-9858 and Mil Spec I-45208.

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b) *Lowering Tool*

The camera-lowering device shall be operated by use of a portable lowering tool. The tool shall consist of a lightweight metal frame and winch assembly with factory spooled stainless steel aircraft cable, a quick release cable connector, an adjustable safety clutch and a variable speed industrial duty electric drill motor. This tool shall be compatible with accessing the support cable through the hand hole of the pole. The lowering tool shall attach/secure to the pole with one single bolt. The tool will support itself and the load during lowering/raising operations. The winch assembly shall include an automatic breaking system that provides a means to prevent freewheeling when loaded. The lowering tool shall be delivered to the applicable DOT engineer upon project completion. The lowering tool shall have a reduction gear to reduce the manual effort required to operate the lifting handle to raise and lower a capacity load. The lowering tool shall be provided with an adapter for operating the lowering device by a portable drill using a clutch mechanism. The lowering tool shall be equipped with a positive breaking mechanism to secure the cable reel during raising and lowering operations and prevent freewheeling. The manufacturer shall provide a variable speed, heavy-duty reversible drill motor, clutch and one lowering tool for every ten camera lowering device poles. The lowering tool shall be made of durable and corrosion resistant materials, powder coated steel, galvanized steel, heavy duty aluminum or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

c) *Camera Junction Box*

The camera junction box is essential for proving both a mounting location for the CCTV as well as an interface compartment for wire leads from the lowering device to the CCTV or applicable surge suppression module. The camera junction box shall be of two piece clamshell design with one removable hinge side and one latch side with single toggle bolt to facilitate easy access. The general shape of the box shall be cylindrical to minimize the effective projected area. The Camera Junction Box shall be cast aluminum with stabilizing weights on the outside of the box to increase room on the interior. The box shall be capable of having up to 40 pounds of stabilizing weights. The bottom of the Camera Junction Box shall be drilled and tapped with a 1-1/2" NPT/Female thread to accept industry standard dome housings and be able to be modified to accept a wide variety of other camera mountings. The junction box shall be gasketed to prevent water intrusion. The bottom of the box shall incorporate a screened and vented hole to allow airflow and reduce internal condensation.

d) *Materials*

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

All electrical and video Coaxial connections between the fixed and lowerable portion of the contact block shall be protected from exposure to the weather by both a gasket on the bottom side of the bell housing enclosure as well as the "O" ring shoulders at the base of each male contact pin to prevent degradation of the power/signal contacts.

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

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In the event the CCTV is a non-dome or otherwise not properly weight balanced and plumb, the Camera Manufacturer shall provide weights and /or counterweights as necessary to assure that the alignment of pins and connectors are proper for the camera support to be raised into position without binding.

The Contractor shall provide any applicable power/signal connectors and weatherproof interface couplers for attachment to the bare leads and RJ-45 Male in the pole top and/or camera junction boxes in a manner acceptable to the project engineer.

The Contractor shall provide appropriate length of applicable power/signal cable in one continuous run from the respective equipment cabinet to the pole top junction box of each lowering device pole. The Contractor is also responsible for providing a CAT5e cable from the CCTV unit to the CCTV cabinet for future use.

e) Camera Pole

Design shall be in accordance with the 2009 edition of AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals including all addendums. Minimum Loading requirements shall be based on an isotach wind velocity for the area of installation according to the current AASHTO isotach wind chart. Calculations and detailed drawings shall be submitted demonstrating compliance with the AASHTO specification.

The Fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required prior to bid opening to ensure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality pole structures.

All welding shall be in accordance with Sections 1 through 8 of the American Welding Society (AWS) D1.1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt-welded pole and arm splices shall be ultrasonically or radiographically inspected.

All materials and products shall be manufactured in the United States of America and comply with ASTM or AASHTO specifications. Mill certifications shall be supplied as proof of compliance with the specifications.

The pole shall be designed to support the specified camera and accessories. Close consideration must be given to the effective projected area of the complete lowering system and camera equipment to be mounted on the pole along with the weight when designing the pole to meet the specified deflection performance criteria. The pole top deflection shall not exceed one inch in a 30-mph (non-gust) wind. The calculations shall include a pole, base plate, and anchor bolt analysis. The pole calculations shall be analyzed at the pole base, at 5-ft. pole intervals/segments and at any other critical pole section. At each of these locations, the following information shall be given:

- The pole's diameter, thickness, section modulus, moment of inertia, and cross-sectional area.
- The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each pole segment.
- The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, and combined stress ratio (CSR).
- The pole's angular and linear deflection.

The pole shall be of multi-piece construction. All structures with pole shaft diameters of 26 inches or less shall be round; pole shaft diameters greater than 26 " may be round or multi-sided. The shaft shall have a constant linear taper of 0.14 in/ft, and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Longitudinal seam welds within 6 inches of complete penetration pole to base plate welds shall be complete penetration welds. The shaft shall be hot dip galvanized per the requirements of the contract documents. The interior diameter of the shaft regardless of pole height shall be at least 5 inches to accommodate lowering device requirements.

The hand hole opening for winch operation shall be reinforced with a minimum 2-inch wide hot rolled steel rim. The nominal outside dimension is 6 inches x 27 inches. The handhole shall have a tapped hole for mounting the portable winch thereto as shown on the drawings and include a cover. Unless otherwise noted on the plans, the bottom lip of the handhole shall be located on the shaft between 30"-33" from the baseplate.

The pole shall have a custom plate mounted tenon that allows the field modification of the arm/camera orientation up to 360 degrees. With this design the IDOT engineer can make slight orientation modifications to the camera mount to allow optimum viewing in case of future road development, change in terrain or a change in the viewing needs priority. The tenon shall have mounting holes and slot as required for the mounting of the camera-lowering system. The tenon shall be of dimensions necessary to facilitate camera lowering device component installation. Each lowering device slot shall be parallel to the pole centerline for mounting the lowering device. There shall be a mounting slot for each required camera lowering device. Unless otherwise noted, with a lowering device, the mounting slots shall be 180 degrees apart.

Top and bottom electrical cable guides shall be located within the pole aligned with each other. One cable guide-strain relief ring shall be positioned 2 inches below the winch operation handhole and the other shall be positioned 1 inch directly below the top of tenon. A parking stand ring shall be positioned no more than 2 inches below the top of the handhole on the inner portion of the handhole frame and located at 90, 180 and 270 degrees. Note Drawings for details.

Base plates shall conform to ASTM A36 or A572 Grade 50. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration butt weld with backup bar. Plates shall be hot dip galvanized per the requirements of the contract documents.

Anchor bolts shall conform to the requirements of ASTM F1554 Grade 55. The upper 12 inches of the bolts shall be hot dip galvanized per ASTM A153. Each anchor bolt shall be supplied with two hex nuts and two flat washers. The strength of the nuts shall equal or exceed the proof load of the bolts.

Revised 4/9/2020

Method 0f Measurement. CCTV camera structures shall be counted, each with foundation, lowering device and all appurtenances installed.

Basis of Payment. This item shall be paid at the contract unit each for CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, GALVANIZED STEEL, of the mounting height specified.

THERMAL MAGNETIC CIRCUIT BREAKER

Description. This work will consist of furnishing and installing a new thermal magnetic circuit breaker in an existing IDOT surveillance cabinet as described herein, as shown on the plans and as directed by the Engineer.

Construction Requirements. Furnishing and installing the thermal magnetic circuit breaker shall meet the requirements according to Division 800 of the Standard Specifications.

Materials. The thermal magnetic circuit breaker shall meet the requirements according to Section 1068.01(3) of the Standard Specifications.

Method of Measurement. Circuit breakers shall be counted as, each installed.

Basis of Payment. This item shall be paid at the contract unit price each for THERMAL MAGNETIC CIRCUIT BREAKER, of the type, voltage and amperage indicated.

Revised 4/9/2020

BRIDGE DECK GROOVING (LONGITUDINAL)

Revise Article 503.16(a)(3)b. to read as follows.

b. Saw Cut Grooving. The grooving operation shall not be started until after the expiration of the required curing or protection period and after correcting excessive variations by grinding or cutting has been completed.

The grooves shall be cut into the hardened concrete, parallel to the centerline of the roadway, using a mechanical saw device equipped with diamond blades that will leave grooves 1/8 in. wide and 3/16 in. ± 1/16 in. deep (3 mm wide and 5 mm ± 1.5 mm deep), with a uniform spacing of 3/4 in. ± 1/16 in. (20 mm ± 1.5 mm) centers. The grooving shall terminate 1.5 ft. from the faces of curbs or parapet. If the bridge has a variable width traffic lane, the grooving shall remain parallel to the centerline of the main roadway. Any staggering of the groove terminations to accommodate the variable width shall be within the shoulders. Grooves shall not be cut closer than 3 inches (75 mm) nor further than 6 inches (150 mm) from any construction joint running parallel to the grooving. In addition, grooves shall not be cut within 6 in. ± 1 in. (150 mm ± 25 mm) from deck drains and expansion joints.

The grooving machine shall contain diamond blades mounted on a multi-blade arbor on a self-propelled machine built for grooving hardened concrete surfaces. The grooving machine shall have a depth control device that detects variations in the deck surface and adjusts the cutting head height to maintain a specified depth of groove. The grooving machine shall have a guide device to control multi-pass alignment.

The removal of slurry shall be continuous throughout the grooving operations. The grooving equipment shall be equipped with vacuum slurry pickup equipment which shall continuously pick up water and sawing dust, and pump the slurry to a collection tank. The slurry shall be disposed of offsite according to Article 202.03.

Cleanup shall be continuous throughout the grooving operation. All grooved areas of the deck shall be flushed with water as soon as possible to remove any slurry material not collected by the vacuum pickup. Flushing shall be continued until all surfaces are clean.

Method of Measurement. This work shall be measured for payment according to Article 503.21(b) except no measurement will be made for any grooving of the shoulders to accommodate a variable width traffic lane.

Basis of Payment. This work will be paid for at the contract unit price per square yard (square meter) for BRIDGE DECK GROOVING (LONGITUDINAL).

Added 4/9/2020

RAISED REFLECTIVE PAVEMENT MARKER, REFLECTOR REMOVAL

Description. This work shall consist of completely removing and disposing of the existing reflector.

The Contractor shall take care not to damage the raised reflective pavement marking unit. All damaged units shall be removed and replaced at the Contractor's expense.

Method of Measurement. RAISED REFLECTIVE PAVEMENT MARKER, REFLECTOR REMOVAL shall be measured for payment on a per each unit removed basis.

Basis of Payment. RAISED REFLECTIVE PAVEMENT MARKER, REFLECTOR REMOVAL shall be paid for per each unit removed, which price shall include all equipment, labor, and materials necessary to remove the reflector.

Added 4/9/2020