



**SPECIAL PROVISIONS
FOR
TRAFFIC SIGNALIZATION**

**Johnson County
IM-080-6(488)242--13-52**

**Effective Date
September 20, 2022**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150896.01 GENERAL

Article 2525.03 and Section 4189 of the Standards Specifications are modified by these specifications.

2525.03 UNDERGROUND.

A. Underground.

1. Handhole.

e. Conduit. Add the following:

- 4)** Cap unused conduits with duct plugs.

3. Wiring and Cable.

a. Revise to the following:

Where practical, follow color codes and ensure cables are properly labeled at the controller with durable labels, or other appropriate methods, attached to the cables. Label home runs for signal and video cables as follows: northeast corner is blue, southeast corner is orange, southwest corner is yellow, and northwest corner is green. Other Coralville cable and color codes are as follows:

- Left turn signals = 1 tape
- Through signals = 2 tapes
- Right turn signals = 3 tapes

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| <p><u>Color Code</u> NB = Red SB = Green EB = Blue WB = Black or Yellow</p> <p><u>Tape Code</u> Left Turn = 1 tape Through = 2 tapes Right Turn = 3 tapes</p> | <p><u>5 Conductor Cables</u> Green ball = green Yellow ball = orange Red ball = red Common = White Spare = Black</p> | <p><u>7 Conductor Cables</u> Green ball = green Yellow ball = orange Red ball = red Green arrow = blue Yellow arrow = black Common = white and white/black</p> |
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- i. Add the following:
 - 9) Fiber to be furnished and installed by the City of Coralville Engineering Department.
- j. Add the following:
 - 7) Fiber testing shall be completed by the City of Coralville Engineering Department.
- k. Add the following:
 - Pull Tape: Pull tape shall be provided as a flat polyester pull-tape with a minimum pulling strength of 1250 pounds with permanent sequential footage markings.
- m. **(ADD) Ethernet Communications.**
 - 1) Ethernet cables shall be managed in a neat and organized fashion to reduce strain on components and reduce risk of damage to cables.
 - 2) Cat5E/Cat6/Cat6a Patch cables shall be color-coded NB red, SB green, EB blue, WB yellow for detection. Purple shall be used for general equipment connections.
 - 3) All cables shall have preprinted labels on both ends identify the port.
 - 4) City of Coralville Engineering will provide port scheme for installed equipment.

4. Footings.

b. Foundation

4) Anchor Bolts.

- e) (Add) Cabinet footing shall have 3/4 inch by 8 inch eye bolt poured into footing under the location of BBS piggyback cabinet. Two nuts and a washer to be installed on threaded shank to prevent pull out. Eye bolt will be used to secure future portable generator (City provided) with cable lock.

C. Communications.

2. Fiber Optic Hub Cabinet. Revise to the following:

Provide and install EX75964-0VTU 24 port switch manufactured by EtherWAN, installed on rack mount. The City of Coralville Engineering Department will provide fiber terminal enclosure with SC connectors. Coordinate with City of Coralville Engineering Department for fiber optic cable connections and integration with traffic signal cabinet IP components.

4189.01 UNDERGROUND.

A. Handhole.

1. General.

- a. **Cable Hooks:** (Revise to the following) Provide four galvanized steel cable hooks with a minimum diameter of 3/8 inch and minimum length of 5 inches for traffic signal handholes but do not provide/include cable hooks for fiber optic cable handholes.
- b. **Granular Base:** (Revise to the following) Granular base to consist of 1/2 inch or larger pea gravel and extend 12 inches deep and extend 6 inches beyond the walls of the handholes.

B. Conduit.

3. Plastic Conduit and Fittings.**a. HDPE.**

- 1) (Revise to the following) Comply with ASTM F 2160 (conduit) and ASTM D 3350 (HDPE material), SDR 11

C. Wiring and Cable.**4. Ethernet Cable.** Revise to the following:

Category 5E (Cat5E), Category 6 (Cat6), and Category 6A (Cat6A) Cable: Provide outdoor use rated direct burial, sun and weather resistant cable. Cable used for video detection shall be as recommended by Iteris.

- a. (Add) Ethernet cable for PTZ camera: Shall also include water blocking layer and drain wire.

5. Fiber Optic Cable and Accessories.

- s. **Splices / Splice Enclosure** (Revise to the following) Provide Commscope FOSC 450-B6-6-24-1-B3V splice enclosure for intersection locations. Cit of Coralville Engineering to conduct splicing between trunk fiber and branch fiber. Coordinate with City of Coralville Engineering Department for fiber optic cable splicing and integration with traffic signal cabinet IP components.

4189.02 DETECTION.**B. Pedestrian Push Button Detectors.****1. Assembly.** Revise to the following:

The City of Coralville uses round Polara BullDog push buttons when non-APS push buttons are specified on the plans. Body color shall be black.

4. Signs. Revise to the following:

Furnish R10-3e signs with directional arrows as shown on the plans complying with MUTCD.

C. Video Detection Camera System.**1. Video Detection System and Processors.** Revise to the following:

The City of Coralville uses the Iteris Vantage Next and Vector video and radar detection system, processors, and cameras unless otherwise specified on the plans. Provide a sliding 1U high 19 inch rack mount with minimum 17 inch LCD monitor with an operating temperature range of 32°F to 122°F.

- f. (add) Radar / cameras shall connect via RJ45 weathertight bulkhead connector
- g. (add) Detection shall be set up in a way to have adequate stop bar detection and advanced detection to utilize Iteris Automated Signal Performance Measures as recommended by Iteris
- h. (add) All mast arms over 50 feet in length with video/radar detection shall be equipped with a pneumatic mast arm dampener to reduce vertical motion and vibration

E. Off-Ramp Queue Detection System (Add).

1. The queue detection system sensors, logic devices, and surge protectors shall be various models manufactured by Wavetronix, Inc. and shall be compatible with Iowa DOT existing Traffic Operations Bureau equipment. Devices shall include or be equivalent to Matrix sensor, Click 200 surge device, Click 512 vehicle alert device, Click 202 Power, etc. See plans for additional information with regards to equipment model information.

4189.03 COMMUNICATIONS.

A. Traffic Monitoring System. Revise to the following:

11. (Add) The City of Coralville uses the Axis Q-6315-LE PTZ cameras unless otherwise specified on the plans.

B. Fiber Optic Hub Cabinet. Revise to the following:

Provide and install rack mounted Ethernet Switch within proposed traffic signal cabinets. The City of Coralville uses the EX75964-0VTU 24 port switch manufactured by EtherWAN. The City of Coralville Engineering Department will provide fiber fiber terminal enclosure with SC connectors. Coordinate with City of Coralville Engineering Department for fiber optic cable connections and integration with traffic signal cabinet IP components.

D. (ADD) Ethernet Communications.

1. Ethernet cable for cabinet components: Shall be Cat5E/Cat6/Cat6a shielded with factory molded snagless connectors.
2. Two Horizontal 19 inch 1u cable management panels shall be used to reduce strain of ethernet connections entering rack mount components.

4189.04 CABINET AND CONTROLLER.

A. NEMA Controller, Cabinet, and Auxiliary Equipment.

1. **Controller.** Revise to the following:

- h. **(Add)** The City of Coralville Siemens m60 Series ATC controllers. Loaded with latest version of NTCIP with ATC communication module.

2. **Cabinet.** Add the following:

- d. (REPLACE) Police door with Normal/Flash, Auto/Hand and removeable manual phase advance push button.
- i. Add the following:
 - 4) Signal field outputs shall be individually equipped with midget style fuse and pluggable surge arrestor.
- k. (Add) The City of Coralville uses Eagle Smart P – EL712DQ traffic cabinets with 18 inch riser.
- l. (Add) The cabinet shall contain two ventilating fans controlled by a thermostat and suitable dust filters for the capacity of the ventilating system. The filters shall be of the dry type and easily removed and replaced and be of standard dimensions commercially available.
- m. (Add) Provide a piggy back cabinet for the battery backup system.
- n. (Add) External surge protection to the communications cables is required. The communications cable surge protector shall meet the following requirements:
 - 1) The unit must be a two-staged protector intended for use on data or communications pairs.
 - 2) The peak surge current for the unit shall be 10,000 amperes.
- o. (Add) Assure the detector card rack will accommodate necessary slots required for video detection system as well as GPS based emergency vehicle pre-emption equipment detector card rack slots. City of Coralville uses GTT Opticom GPS emergency vehicle pre-emption, Model 3100.
- p. (Add) Cabinet shall have two bolt on lifting ears
- q. (Add) Cabinet shall have greater than 12U of 19 inch rack space with rear door access.
- r. (Add) Provide one 19 inch pull out document drawer
- s. (Add) 19 inch 1U Power strip with eight individually controlled outlets via ethernet and eight individual DC inputs

- t. The filters shall be of the dry type and easily removed and replaced and be of standard dimensions commercially available.
 - u. (Add) Cabinet shall contain a supplemental preemption panel providing green phase outputs, AC+,AC- and ground terminals to integrate directly with GTT Opticom emergency vehicle pre-emption AUX panel.
 - v. (Add) All device power cables shall have pre-printed labels at plug end to identify the device it powers.
 - w. (Add) Three sets traffic cabinet prints on paper and pdf file shall be submitted to the City
3. **Auxiliary Equipment.** Add the following:
City of Coralville uses EDI SmartMonitor malfunction management unit with IP, Model MMU2-16LE-IP.
- B. Uninterruptible Power Supply Battery Backup System.** Add the following:
- 5. The City of Coralville uses Alpha Technologies battery backup system with an Ethernet interface for remote monitoring, Model FXM HP 1100 UPS Model w/ Universal Auto Transfer Switch (UATS).
 - 6. Batteries shall be provided with 5 year performance warranty and heater mats.
 - 7. The following Alpha modules shall be installed: Alpha RMBS, Alpha UTAS, Alpha UGTS and Alpha UATS bypass switch.
 - 8. 'On-Battery' blue indicator light, mounted on street side of cabinet.
 - 9. Locking generator access door with L5-30 F1 plug.
- C. Emergency Vehicle Preemption System.** Revise to the following:
The City of Coralville uses Opticom GPS System Intersection Equipment, Model 3100 GPS Radio Unit, manufactured by Global Traffic Technologies. GPS radio unit mounting bracket shall be painted to match the traffic signal pole. GPS radio unit cable shall be per manufacturer's recommendations. The EVP GPS Radio Unit to be mounted above the traffic monitor camera if both are specified to be installed on the same traffic signal pole vertical upright. Contractor shall furnish and install all equipment and materials to provide a fully functional emergency vehicle preemption system.

4189.05 POLES, HEADS, AND SIGNS.

A. Vehicle Traffic Signal Head Assembly.

- 1. **Housing.**
 - a. Revise to the following:
Individual signal sections made of durable polycarbonate manufactured by Eagle. Color shall be black and integral to the materials composition.
 - e. Add:
All signal heads shall have temperature and humidity controlled heated tunnel visor for the red indication.
- 7. **Mounting Hardware.**
 - a. Revise to the following:
1 1/2 inch aluminum pipe and fittings, natural aluminum finish for galvanized poles or match pole color when poles are painted. Secure vertical upright mounted heads to pole by drilling and tapped with stainless steel bolts affixed to bracket flange. Banding will not be permitted for vertical upright mounted heads. Secure mast arm mounted heads to mast arm with a minimum 5/8 inch wide stainless steel banding material.

- c. Add the following:
All traffic signal heads shall be side mounted when installed on a vertical pole. Post top mounting is not allowed. Factor side mounting and minimum mounting height requirements when determining pedestal pole shaft lengths.
- d. Add the following:
Vertical and Pedestal pole Mounting: Secure to pole by drilling and tapped with stainless steel bolts affixed to bracket flange. Banding will not be permitted. 1 1/2 inch aluminum pipe and fittings, natural aluminum finish for galvanized poles or match pole color.
- e. Add the following:
Mast arm Mounting: Rigid mounted signs and heads shall be mounted to mast arm with Pelco Astro-Brac Galaxy Series clamps.

8. **LED Modules.** Revise to the following:
The City of Coralville uses LED modules manufactured by Dialight, Inc. The LED modules shall comply with current ITE standards. LED modules shall be provided with a 15 year performance warranty. See plan sheets for model numbers.

B. Pedestrian Traffic Signal Head Assembly.

- 1. **Housing.**
 - a. Revise to the following:
Made of a durable polycarbonate. Color shall be black and integral to the materials composition.
- 2. **Visor.**
 - a. Revise to the following:
Egg crate type visor attached to the housing door.
- 3. **LED Modules.** Add the following:
 - d. LED modules shall be provided with a 15 year performance warranty.
 - e. Pedestrian traffic signal head shall be one combined 16 inch LED light with "Walk" / "Flashing Don't Walk" / on left and count down on right side.

C. Traffic Signal Poles and Mast Arms.

- 1. **General.** Add the following:
 - j. **Pole Finish:** The signal supports to include poles, mast arms and luminaire arms, pedestal poles, push button poles/posts, and all bases shall be finish coated with smooth powder coat, color matching Lumec Black, over galvanizing. Prior to the application of the powder coat, the surfaces shall be prepared by removing rolled-in mill scale, impurities, and non-metallic foreign materials. After assembly, all weld flux shall be mechanically removed. Iron or steel surfaces shall then be degreased by immersion in an agitated 4.5% to 6% concentrated caustic solution elevated to a temperature ranging from 150°F to 180°F. The product shall then be pickled by immersion in a heated sulfuric acid solution of 6% to 13 % concentration, controlling the temperature at 150°F. The product shall then be rinsed clean of any residual effects of the caustic or acid solutions by immersion in a circulating fresh water bath. The product shall then be immersed in a concentrated zinc ammonium chloride flux solution heated to 130°F. The solution's acidity content shall be maintained between 4.5 to 5.0 pH. The product shall be air dried prior to zinc coating. Next, the product shall be hot-dip galvanized to the requirements of either ASTM A 123 or ASTM A 153 by immersion in a molten bath of prime western grade zinc maintained between 810°F to 850°F. Maximum aluminum content of the bath shall be 0.01% and the flux ash shall be skimmed from the bath surface prior to immersion and extraction. Galvanized exterior surfaces visually exposed shall be coated with a Urethane or Triglycidyl Isocyanurate (TGIC) Polyester Powder to a minimum dry film thickness (DFT) of 2.0 mils. The surfaces shall be mechanically etched by brush

blasting and the zinc coated substrate shall be preheated to 450°F for a minimum of 1 hour in a gas-fired convection oven. Finally, the coating shall be electrostatically applied and cured by elevating the zinc-coated substrate temperature to a minimum of 400°F in a gas-fired convection oven. To prevent damage during delivery, small poles shall be wrapped in 0.188 inch thick ultraviolet-inhibiting, plastic-backed foam and larger poles shall be cradled in a 1.0 inch rubberized foam base. If the painted surface of any equipment piece is damaged in shipping or installation, such equipment shall be retouched or repaired in a manner satisfactory to the Engineer.

- k. All mast arms over 50 feet in length with video/radar detection shall be equipped with a pneumatic mast arm dampener to reduce vertical motion and vibration.

D. Traffic Signal Pedestal Poles.

- 1. **Materials.** Add the following:
 - d. The City of Coralville uses Pelco Products for traffic signal pedestal poles and bases.

E. Traffic Signs

- 1. Replace with: Sheet aluminum and retroreflective sheeting shall comply with Section 4186 and sheeting type shall be HIP (High Intensity Prismatic)
- 2. Replace with: Use Pelco Astro-Brac Galaxy Series clamps for sign brackets

F. Add: Pedestrian Push Button Post.

- 1. **Post:** Schedule 40 4 inch in diameter aluminum pipe. Natural aluminum finish for galvanized poles or powder coated finish to match signal pole color
- 2. **Cap:** Waterproof aluminum top cap for 4 inch in diameter pipe same finish as pole.
- 3. **Anchor Bolts:** 4 5/8 diameter anchors installed per manufacture spec to comply with AASHTO MASH Breakaway.
- 4. **Base:** Cast aluminum AASHTO MASH Breakaway compliant with cable pole tether. Same finish as pole
- 5. Pedestrian Push buttons and signs shall be mounted on Polara Pedestrian Push button/Sign frame with appropriate adapter to center frame on post.
- 6. The City of Coralville uses Pelco Products for pedestrian push button posts and bases.