



**SPECIAL PROVISIONS  
FOR  
TRAFFIC SIGNALIZATION**

**Johnson County  
NHSX-001-5(120)--3H-52**

**Effective Date  
November 19, 2019**

**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.**

**4189.01 UNDERGROUND**

**A. Handhole.**

**1. General.**

- a. Cable Hooks:** (REPLACE) Provide four galvanized steel cable hooks with a minimum diameter of 3/8 inch and a minimum length of 5 inches. Provide with Type I handholes only.
- 3. Composite Handhole and Cover:** (REPLACE) Composed of mortar consisting of sand, gravel, and polyester resin reinforced by a woven glass fiber mat or of resin mortar and fiberglass. Provide a skid resistant surface on the cover. Provide two 3/8-16 UNC stainless steel hex head bolts with washers. The handholes shall have ANSI Tier 22 ratings and the covers shall have ANSI Tier 15 ratings. Covers shall be two-piece for Type III and Type IV handholes.

**B. Conduit.**

**3. Plastic Conduit and Fittings.**

**b. HDPE.**

- 1)** (REPLACE) Comply with ASTM F 2160 (conduit) and ASTM D 3350 (HDPE material), SDR 11.
- 5)** (ADD) Conduit couplers for HDPE to HDPE connections shall be double-e-loc couplers.
- 6)** (ADD) HDPE duct plugs shall be blank expandable duct plugs with elastomeric gaskets and rope loops.

**C. Wiring and Cable:**

- 4. Communications Cable:** (REPLACE) Fiber optic cable as included in the plans, or as approved by the Engineer.

5. **(REPLACE) Category 5E (Cat5E), Category 6 (Cat6), and Category 6A (Cat6A) Cable:** Provide outdoor use rated cable as included in the plans, or as approved by the Engineer.
7. **(ADD) Pull Tape:** Flat polyester pull-tape with a minimum pulling strength of 1250 pounds and permanent sequential footage markings.

**4189.02 DETECTION.**

**B. Pedestrian Push Button Detectors.**

2. **Accessible Pedestrian Signals (APS) Push Button Stations.**
  - i. (ADD) Polara iNavigator Push Button Stations with 9 inch by 15 inch front plate adapters and 9 inch by 15 inch R10-3e faceplates with braille. Button covers shall be black in color.
3. **Solid State Pedestrian Push Buttons (non-APS).**
  - e. (ADD) Polara BullDog push buttons. Body color shall be black.
4. **Signs.** (REPLACE) Furnish R10-3e signs complying with MUTCD and with directional arrows as shown on the plans.

**C. Video Detection Camera System.**

3. **(ADD) Equipment.** Iteris Vantage Next video detection system, processors, and cameras.

**E. (ADD) Radar Detection System.**

1. **Equipment:** Wavetronix radar detection system.

**4189.04 CABINET AND CONTROLLER.**

**A. NEMA Controller, Cabinet, and Auxiliary Equipment:**

1. **Controller.**
  - h. (ADD) Siemens m60 Series ATC controller
2. **Cabinet.**
  - j. (ADD) The cabinet shall contain strong mounting shelves to accommodate the mounting of the controller and all auxiliary equipment. The mounting shelves shall permit the controller and all auxiliary equipment to be withdrawn from the cabinet for inspection or maintenance without breaking any electrical connections or interrupting operation of the controller.
  - k. (ADD) The cabinet shall contain two thermostatically controlled duct fan units with a minimum rating of 100 CFM in free air shall be installed in the cabinet to provide forced air ventilation through the cabinet. The fan unit shall be mounted to the inside top of the cabinet and shall be easily removed and replaced without having to dismantle any part of the cabinet or exhaust duct system. The thermostat controlling the fans shall be manually adjustable to turn on between 90°F and 150°F with a differential of not more than 10°F between automatic turn-on and turn-off. The fans shall intake air through filtered vents located near the bottom of the cabinet or cabinet door and exhaust it through a weather-proof, screened duct located near the top of the cabinet. Fiberglass type dry filters shall be used to cover the air intakes into the cabinet. These filters shall be easily removed and replaced and be of standard dimensions commercially available. The filters shall be provided with positive retainment on all sides to prevent warpage and entry of foreign matter around the edges.
  - l. Provide a piggy back cabinet for the battery backup system.

**B. Uninterruptible Power Supply Battery Backup System:**

5. (ADD) Alpha Technologies battery backup system with an ethernet interface for remote monitoring.

**4189.05 POLES, HEADS, AND SIGNS.****A. Vehicle Traffic Signal Head Assembly.****1. Housing.**

- a. (REPLACE) Individual signal sections made of a durable polycarbonate. Color shall be black and integral to the materials composition.

**7. Mounting Hardware.**

- c. (ADD) 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.

8. **LED Modules:** (REPLACE) Comply with current ITE standards. LED modules shall be provided with a 15 year performance warranty.

**B. Pedestrian Traffic Signal Head Assembly.****1. Housing.**

- a. (REPLACE) Made of a durable polycarbonate. Color shall be black and integral to the materials composition.
- b. (REPLACE) Self-contained unit capable of separate mounting or inclusion in a signal face containing two signal sections rigidly and securely fastened together.

**3. LED Module.**

- c. (ADD) LED modules shall be provided with a 15 year performance warranty.

**C. Traffic Signal Poles and Mast Arms.****1. General:**

- c. (REPLACE) Use continuously tapered, round, steel poles of the anchor base type. Fabricate poles of low carbon (maximum carbon 0.30%) steel of U.S. standard gauge.
- f. (ADD) Luminaire mounting height shall be 30 feet unless otherwise specified.

**E. Pedestrian Push Button Post:**

1. **Material:** (REPLACE) Use Frey Manufacturing Corporation Crosswalk Pedestals that comply with the details shown in the plans. Materials shall be painted black, per manufacturer's recommendations, when installed in the Downtown area.

**2525.03 CONSTRUCTION.****A. Underground.****1. Handhole.**

- b. **Excavation:** (REPLACE) Excavate as necessary to accommodate the handhole and granular base. The Contractor is responsible for incidental sidewalk removal and replacement necessary to complete the signal construction. Whenever excavation is made across parkways, gravel driveways, sodded areas or other surfaces, the sod, topsoil, crushed stone and gravel shall be replaced or restored as nearly as possible to its original condition and the whole area involved shall be left in a neat and presentable condition.

Concrete sidewalk pavements, base courses, bituminous surfaces and other disturbed surfaces shall be replaced with new materials and the cost shall be incidental to the work. All waste material and debris shall be disposed of at a sanitary landfill, or other site approved by the Engineer, at the Contractor's expense.

**e. Conduit.**

4) (ADD) Cap unused conduits with duct plugs.

f. **Cable Hooks:** (REPLACE) Install cable hooks centered between the knockouts and the top of the handhole for Type I handholes only.

**2. Conduit.**

**a. General.**

1) (REPLACE) Place conduit to a minimum depth of 30 inches and a maximum depth of 48 inches below the gutterline. When conduit is placed behind the curb, place to a minimum depth of 30 inches and a maximum depth of 48 inches below top of curb.

5) (REPLACE) Install duct plugs in conduit ends. When duct plugs are not practical, pack conduit ends with conduit sealing compound.

6)(ADD) Install pull tape in each conduit segment and secure to duct plugs at each end.

**b. Trenched Installation.**

3) (ADD) The Contractor is responsible for incidental sidewalk removal and replacement necessary to complete the signal construction. Whenever excavation is made across parkways, gravel driveways, sodded areas or other surfaces, the sod, topsoil, crushed stone and gravel shall be replaced or restored as nearly as possible to its original condition and the whole area involved shall be left in a neat and presentable condition. Concrete sidewalk pavements, base courses, bituminous surfaces and other surfaces shall be replaced with new materials and the cost shall be incidental to the work.

**3. Wiring and Cable.**

a. (REPLACE) 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 Iowa City cable and color codes are as follows:

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

<u>4 Conductor Cables</u>	<u>7 Conductor Cables</u>	<u>9 Conductor Cables – Pedestrian Signals</u>
Green ball = green	Green ball = green	Main street walk = green
Yellow ball = black	Yellow ball = orange	Main street don't walk = red
Red ball = red	Red ball = red	Side street walk = green/black
Common = white	Green arrow = blue	Side street don't walk = red/black
	Yellow arrow = black	Common = white
	Common = white and white/black	Main street push button = orange
		Side street push button = black
		Common = white/black
		Common = blue

**4. Footings.**

a. **Excavation:** (ADD) The Contractor is responsible for incidental sidewalk removal and replacement necessary to complete the signal construction. Whenever excavation is made across parkways, gravel driveways, sodded areas or other surfaces, the sod, topsoil, crushed stone and gravel shall be replaced or restored as nearly as possible to its original condition and the whole area involved shall be left in a neat and presentable condition. Concrete sidewalk pavements, base courses, bituminous surfaces and other surfaces shall be replaced with new materials and the cost shall be incidental to the work.

- d. **(ADD) Removal:** Where shown on the plans, the Contractor shall remove the top of the existing mast arm footings, anchor bolts, and conduits to 36 inches below the existing top of curb or edge of pavement elevation. Waste materials shall be removed from the site and disposed in accordance with local regulations. Backfilling for the removal shall be performed according to Section 2552. The upper 6 inches of the removal area, if outside the proposed pavement, shall be backfilled with topsoil.

**B. Detection.**

4. **(ADD) Radar Detection System:** Install according to the manufacturer's recommendations and as specified in the contract documents

**E. Poles, Heads, and Signs.**

**1. Vehicle and Pedestrian Traffic Signal Heads.**

- e. (ADD) Pole mounted signal heads and pedestrian push buttons are shown on the plans and schematic drawings in schematic form only. Pole mounted signal heads are generally intended to be mounted on the face of pole with respect to oncoming traffic. Modifications to this are required when the view of the pole mounted signal indication is blocked. Pedestrian push buttons shall be located on the pole face so the arrow on the R10-3e sign directs pedestrians to the appropriate crosswalk.

The location of signal heads in which the view of the indications is blocked or partially blocked by utility poles, trees, other signal heads or any physical obstructions shall be adjusted to a location approved by the Engineer. Standard heights and locations shown on the plans are typical for unobstructed locations. Signal heads installed without approval of the Engineer, which in the opinion of the Engineer are obstructed, shall be relocated at the Contractor's expense. Holes in the poles due to this signal relocation shall be plugged in a manner acceptable to the Engineer.