Special Specification 6394
Smart Photocontrol

Texas Department of Transportation

1. DESCRIPTION

Furnish, install, and make fully operational a Smart Photocontrol at designated locations in accordance with the details shown on the plans and as detailed in accordance with this specification. Provide a locking type photocontrol for outdoor lighting.

2. MATERIALS

Furnish new materials conforming to the details shown on the plans which conform to the ANSI C136.10 standards and part 15 of FCC rules.

2.1. **Submittals.** Before fabrication, manufacturer must submit the following materials for approval.
- Manufacturer's published catalog data sheets for the photocontrols.
- Shop Drawings- Submit detailed drawings and documentation of photocontrols. It must include a minimum of wiring diagrams and full catalog sheets.

2.2. **Legs and Gasket.** Provide legs and gasket with the following features.
- All three legs should be brass.
- Gasket should be neoprene or similar.
- Gasket must withstand a minimum 90°C at 95% humidity.

2.3. **Sensors.** Provide sensors with the following features.
- Silicon sealed. Cadmium sulfide cells are not acceptable.
- Horizontal orientation facing the same direction as NORTH arrow and photocontrol window.

2.4. **Window and LEDs.** Provide photocontrol window and LEDs with the following features.
- Window made of UV stable and UV blocking acrylic polymer.
- Contain red and green LEDs located to the left and right of the center of the window.

2.5. **Surge Protection.** Surge protection to be provided in the form of Metal Oxide Varistor (MOV) with the following features.
- MOV should be rated for a minimum of 320 Joules (8x20 microseconds.)
- Node should be rated for a maximum of 6500 Amp surge.

2.6. **Warranty.** The manufacturer will replace failed smart photocontrols, when non-operable due to defect in material or workmanship, within 3 years of installation with a smart photocontrol that meets all specifications, delivered to the project location.

2.7. **Performance Requirements.** Each photocontrol must conform to the following requirements.
- Capable of remote turn off or on.
- Capable of assignment of groups to be controlled over the network as a single unit.
- Communicate with neighbor controls and gateway devices via 2.4 Gigahertz radio signals within a mash network.
- Communications range of 1000 ft. line of sight.
- Communications between controls must require a direct line of sight view.

- Should control all luminaires on which it is installed.
- Should be a locking type photocontrol as per ANSI C136.10.
- Should require a 7-pin receptacle for luminaire.
- Should communicate with other controls and gateway devices via radio signal.
- At least one-hour collection resolution for data within each control.
- Encrypted data from individual controls via radio signals.
- Provide troubleshooting information over the network.
- Should have a rated line voltage of 480 Volts AC at 60 Hertz.
- Should have a maximum load rating of 1800VA/1000 Watts.
- Should operate all HID, halogen, incandescent, LED, solid state, fluorescent, and relay loads.
- Should consume a maximum of 5.4 Watts.
- Should turn ON in 1.5 ± 0.5 ft. candles.
- Should turn OFF at 1.5 times the level it turns ON.
- Should fail ON as per definitions in ANSI C136.10.
- Should have a 2.5-5 second delay before turning ON.
- Should have a 2.5-5 second delay before turning OFF.
- Should operate in -40°F to 185°F (-40°C to 85°C) ambient temperatures.
- Should withstand an Interface Temperature of 90°C where Interface Temperature is defined in ANSI C136.10.

2.8. **Networking**

- Photocontrols must be capable of remote turn off and turn on.
- Photocontrols must be capable of assignment to groups which can be controlled over the network as a single unit.
- Photocontrols within an installation must communicate with neighbor controls and gateway devices via 2.4 Gigahertz radio signals within a mesh network.
- Photocontrols must have a communications range of 1000 ft. line of sight.
- Communications between controls should require a direct line of sight view.
- Data for each control within an installation should have at least a one-hour collection resolution.
- Data sent from individual controls via radio signals should be encrypted.
- Photocontrols should provide troubleshooting information over the network.
  a.) All troubleshooting reports should include the MAC number of the associated photocontrol.
  b.) Fixture malfunctions should be reported.
  c.) Cycling fixtures should be reported.
  d.) Day burning fixtures should be reported.
  e.) Uncommunicative photocontrols should be reported.
  f.) Power details for fixtures should be reported.
  9. Photocontrol must operate as a standard standalone photocontrol if networking fails.

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans in accordance with the manufacturers' requirements and the requirements of this Item.

The photocontrol must be installed and connected as directed by the manufacturer.

The photocontrol is a locking type control and should require no additional field wiring.

The complete product specification should be available from the manufacturer.

4.   MEASUREMENT

This Item will be measured as each Smart Photocontrol installed.

5.   PAYMENT

The work performed and materials furnished, in accordance with this Item and measured as provided under "Measurement," will be paid for at the unit price bid for "Smart Photocontrol."

This price is full compensation for furnishing, installing, testing, and integrating a Smart Photocontrol and includes all equipment, labor, tools, and incidentals necessary for a complete and operational system.