

SECTION 16530 – EXTERIOR LUMINAIRES

GENERAL

1.1 SECTION INCLUDES

- A. Exterior luminaires and accessories.
- B. Lighting poles.
- C. Concrete foundations bases for lighting poles.
- D. Exterior lighting control panel.

1.2 WORK PROVIDED UNDER OTHER DIVISIONS

- A. The General Contractor shall provide the following work associated with exterior lighting:
  - 1. Trenching excavation and backfill

1.3 RELATED SECTIONS

- A. Section 03300 – Concrete.
- B. Section 16111 - Conduit.
- C. Section 16510 - Interior Luminaires.

1.4 REFERENCES

- A. ANSI C82.4 - Ballasts for High-Intensity-Discharge and Low-Pressure Sodium lamps (Multiple-Supply Type).
- B. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.
- C. ANSI/NFPA 70 - National Electrical Code.

1.5 SYSTEM DESCRIPTION

- A. Included in the scope of work are pole-mounted, building-mounted, and deck-mounted area lights.
- B. Concrete and steel reinforcing for foundation bases for exterior lighting plans shall be as specified in Section 03300.

1.6 STREET LIGHTING

- A. New street lighting being provided under this Contract shall include the following:
  - 1. Luminaires leased from *The Central Maine Power Company* under the Municipal Street Lighting Lease Agreement.
  - 2. Lighting poles, bracket arms, and decorative base covers to be provided by the Contractor.
  - 3. Lighting foundation bases to be provided by the Contractor.
  - 4. Wiring and underground conduit to be provided by the Contractor.
- B. The Contractor shall make all necessary arrangements with *CMP* to have leased luminaires installed and connected by *CMP*.

1.7 SUBMITTALS

- A. Submit under provisions of Section 16010.
- B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product Data: Provide dimensions, ratings, and performance data.

1.8 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 16010.
- B. Accurately record actual locations of each luminaire.

1.9 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 16010.
- B. Maintenance Data: Include instructions for maintaining luminaires.

1.10 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PRODUCTS

2.1 LUMINAIRES

- A. Furnish products as specified in schedule on Drawings.

2.2 BALLASTS

- A. High Intensity Discharge (HID) Ballast:
1. Description: ANSI C82.4, metal halide and high-pressure sodium lamp ballasts.
  2. Provide ballast suitable for lamp specified.
  3. Voltage: Provide 480-volt ballasts for pole lights and 277-volt ballasts for building mounted and deck mounted lights.

2.3 LAMPS

- A. Provide lamp type specified for luminaire.

2.4 POLES

- A. Description: Round tapered steel, or round tapered aluminum as indicated in the Lighting Fixture Schedule.
- B. Finish: Painted with polyester powder coat paint. Finish color: Black.
- C. Height: As indicated in the Lighting Fixture Schedule.
- D. Accessories:
1. Ground Lug.
  2. Wire Hand Hold at base.
- E. Loading Capacity Ratings:
1. Steady Wind: 90 miles per hour minimum.
  2. Gust Factor: 1.3

2.5 LIGHTING CONTROL PANELS

- A. Sequence of Operation: The Lighting Control Panel shall include a separate channel for exterior lighting that is controlled by a photocell and by the integral time switch to turn the exterior lighting circuit on at dusk and off at dawn or at a pre-set time.
- B. Manufacturer:
1. *Watt Stopper*
  2. *Lighting Control & Design*
  3. *Leviton*
  4. Substitutions: None Permitted.
- C. *Watt Stopper* model numbers are listed below to establish configuration and type of materials. Equal materials by *LCD* will be accepted.
- D. Description: The Receiving Building lighting control panel shall be *Watt Stopper* model HINCP2424y-277 and shall provide four (4) automatic control channels for operating contactors controlling exterior lighting. The Terminal Building lighting control panel shall be *Watt Stopper* model HINCP 1212Y-277 and shall provide a single automatic control channel for operating contactors controlling exterior lighting. Each channel shall be individually configurable. Each

channel shall include an LED light status indicator to provide channel status and a separate ON/OFF switch for manual channel control. The Control Panel shall consist of the following:

1. Tub: Empty NEMA 1 enclosure.
2. Cover: Surface with captive screws in a hinged, lockable configuration.
3. Interior: Metal back plate and barrier for separation of high voltage (class 1) and low voltage (class 2) wiring. Intelligence board with eight (8) channels of control provided regardless of interior size. Interiors shall be provided with up to 16 DIN rail mounted contactor poles.
4. Contactors: DIN rail mounted, four-pole, normally closed, electrically held with coil voltage to match panel control power voltage. Contactors shall be compatible with all lighting, ballast, and HID loads and be rated for 20-Amp tungsten up to 277V and rated for 30A ballast and general use up to 600V. Provide 20% spare contactor poles.
5. Auxiliary Power: 350mA at 24VDC and 350mA at 24VAC for operating system devices.
6. Time Clock: The system time clock shall be *Watt Stopper* model SC-100 CP and shall provide time-based control with eight-year time backup, non-volatile memory program storage, automatic daylight savings adjustment, selectable 12/24-hour time formats and selectable date formats. All clock programming shall be accessible from the clock front display/keypad. The time clock shall provide for the following:
  - a. Control of eight control channels with status and manual ON/OFF control of each channel from the front display and keypad.
  - b. Control of eight individual override inputs that can be used to connect external devices such as photocells, switches and daylighting controllers. Each of these inputs shall be capable of being configured to operate as a photocell, as an ON/Auto switch, as a maintained ON/OFF switch, or as a momentary ON/OFF switch.
  - c. Scheduling of any combination of days of the week and/or 3 holiday types with the capacity for temporary and/or repeating schedules that are adjustable from 5 minutes to 10 hours.
  - d. Assignment of 32 perpetual holidays to any one of three holiday day schedules and continuing for 1 to 120 days. Holiday dates shall be specific day/month/year, or perpetual dates including day/month/years or day of the week in a given month every year or self-calculating Easter Sunday.
  - e. Astronomic control capability for calculating sunrise and sunset based on time, latitude, and time zones. All scheduled astronomic/time operations shall be interlocked so loads are not turned on when astronomic off time are earlier than scheduled on times or astronomic on times are later than scheduled off times. Each schedule shall have an independent astronomic offset of  $\pm 120$  minutes.

## 2.6 EXTERIOR PHOTOCCELL

- A. Manufacturer:
  1. *Watt Stopper*
  2. *Lighting Control & Design*
  3. *Leviton*
  4. Substitutions: Or Approved Equal.
- B. Photocell shall be *Watt Stopper* model EM-24A2 and shall include a footcandle range of 1-15 and an 8-second time delay. The photocell shall mount on the exterior or roof of a building with its

light level window facing the northern sky. The photocell shall provide an ON signal when the ambient light level drops below a user-defined dark set point, and an OFF signal when the ambient light level rises above a user-defined light set point.

1. Contacts: One set of normally open, isolated relay contacts that are rated for one Amp at 30 VAC/VDC
2. Set point: adjustable ON/OFF dark set point.

## EXECUTION

### 3.1 EXAMINATION

- A. Examine each luminaire to determine suitability of ballast voltage and for lamps specified.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturers' instructions.
- B. Install lighting fixtures and poles at locations indicated on plans.
- C. Install poles plumb.
- D. Install lamps in each luminaire.
- E. Bond luminaires and metal poles to branch circuit equipment grounding conductor.

### 3.3 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection. Inspect for improper connections and operation.

### 3.4 CLEANING

- A. Clean electrical parts to remove conductive and deleterious materials.
- B. Remove dirt and debris from enclosure.
- C. Clean photometric control surfaces as recommended by manufacturer.
- D. Clean finishes and touch up damage.

3.5 EXTERIOR LIGHTING CONTROL PANEL INSTALLATION

- A. Provide all equipment and cabling for a complete installed operating system.
- B. Cabling shall be installed concealed and shall be supported from the building structure.
- C. All cables shall be installed in a neat and workman-like manner. Cables shall be installed parallel and perpendicular to building elements.
- D. Install Lighting Control Panel with top of panel at 60" AFF.
  - 1. Test Reports: Upon completion and testing of the installed system, test report shall be submitted showing satisfactory system operation, certified by a factory authorized representative.
  - 2. Systems installed under this Section shall be demonstrated to the Owner and Resident. Demonstrations are in addition to necessary testing and training sessions. Notify all parties at least 7 days prior to the scheduled demonstration. Schedule demonstrations in cooperation with and at times convenient to all parties and so as to not disturb ongoing activities.
  - 3. Systems shall be tested prior to the demonstrations and each system shall be fully operational and tested prior to arranging the Acceptance Demonstration. Final payments will be withheld until a satisfactory demonstration is provided for all systems indicated or requested.
  - 4. If the demonstration is not totally complete, performing all functions, features and connections or interfaces with other systems, or if there is a failure during the demonstration, additional demonstrations shall be arranged. Provide and pay for all costs, labor and expenses incurred for all attendees for each additional demonstration required for acceptance and demonstration of complete system operation.
  - 5. Demonstrations shall be scheduled in ample time to complete all activities prior to final acceptance and Owner occupancy. Demonstrations shall take place at least 30 days prior to the scheduled project completion date and 30 days prior to Owner's use and occupancy.

\*\*\*END OF SECTION\*\*\*