

**SECTION 16530**  
**LED SITE/SECURITY LIGHTING**

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Contractor shall provide all lighting luminaires, mounting brackets, photo controls, time clock, conduit, wire, etc., to form a Site/Security Lighting System. System shall be installed to minimize light trespass to and from the site to the levels indicated on the NYC Green Schools Guide Credit S6.1R - Light Pollution Reduction and IESNA RP-33-99-Table 1, with the "post curfew" recommendations for maximum trespass illuminance levels. The site/security lighting shall be installed in accordance with the Contract Drawings and Specifications. The lighting system shall be completely operational, aimed, tested, and free from fault.

**1.02 SUPPLEMENTAL SUBMITTALS**

- A. Submittal Package

Submit the Shop Drawings, Product Data, samples, candlepower distribution curves, Isofootcandle distribution curves for the indicated mounting heights and quality control submittals specified below at the same time as a package.

- B. Shop Drawings

For mounting brackets that have welded assembly, show details of luminaires and welded assembly and manufacturer's certification of galvanizing after completed assembly.

- C. Product Data

Catalog sheets, description of Luminaires, specifications and installation instructions.

1. For each luminaire, include data indicating the effective projected area, details of attaching luminaries, accessories, and other equipment.

- D. Samples: One of each product if different from Company or catalog number specified - when requested by Authority.

- E. Manufacturer's specification sheets showing IESNA cutoff data and classification, shielding accessories, Candlepower and Isofootcandle Distribution Curves for each luminaire type if different from the Manufacturer/catalog number specified.
- F. Certificate of compliance with the Quality Assurance requirements.
- G. Warranty
- H. Spare parts

### 1.03 QUALITY ASSURANCE

- A. Company Field Advisor

Secure the services of a Company Field Advisor for a minimum of eight- (8) working hours for the following:

1. Determine and recommend final luminaire aiming points.
2. Render advice and witness completion of luminaire aiming at night.

### 1.04 SPARE PARTS

- A. Screwdrivers

Provide one (1) screwdriver suitable for each type of vandal resistant screw installed on a luminaires.

- B. Spare parts lenses, vandal shields, Drivers, LED luminaire and photocontrols

1. The Contractor shall provide extra parts as follows:
  - a. For Floodlights: The contractor shall provide (1) one spare exact replacement polycarbonate "Vandal Shield Lens" along with its required mounting stainless steel screws and hardware for each 10 luminaries installed. A minimum of one "Vandal Shield Lens" for each type (not Wattage) of Floodlight required.
  - c. For Floodlights: The contractor shall provide (1) one spare exact replacement glass lens

along with for each 10 luminaires installed. A minimum of one lens for each type (not Wattage) of Floodlight required.

d. For All Luminaires:

- 1) Photocontrol: The Contractor shall provide one (1) photocontrol for each 10 luminaires type requiring this control. A minimum of one (1) photocontrol is required.
2. The spare parts shall be delivered to the Custodian of the School Building with an itemized list and a receipt taken, certifying that these spare parts have been delivered securely packed and received in acceptable condition. The receipt shall be given to the Authority's Representative.

#### **1.05 WARRANTY**

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace luminaires or components of luminaires and lamps that fail in materials or workmanship; corrode; or fade, stain, or chalk due to effects of weather or solar radiation within one year of Substantial completion.

### **PART 2 - PRODUCTS**

#### **2.01 GENERAL**

- A. The following requirements shall apply to all luminaires that are provided by the Contractor. Wherever luminaires are specified by Catalog Numbers or Catalog Numbers are noted on the Drawings or in the Specifications for a specific type of luminaire, that luminaire shall be modified to meet the requirements listed below for all luminaires.

B. Manufacturers

The following luminaire manufacturers, listed, will be approved provided all applicable paragraphs of the Specifications including required modifications are conformed with.

Cooper Lighting  
Holophane

Hubble Lighting  
Magniflood  
Juno Lighting Group  
Philips Lighting

## 2.02 LED ENGINE

- A. The Correlated Color Temperature (CCT) of LED modules shall be 3500K and shall be consistent through the entire outdoor project. Color Rendering Index (CRI) shall be minimum 70 for all outdoor lighting.
- B. The performance of LED luminaires shall be tested according to the IESNA standards LM-79 "Electrical and Photometric Measurements of Solid-State Lighting Products" and LM-80 "Measuring Lumen Maintenance of LED Light Sources." Reports shall be available upon request.
- C. LED luminaires shall have a minimum 50,000 life with the minimum 70% lumen maintenance.
- D. Electrical circuitry for weather exposed luminaires shall have integral surge protector rated for a minimum of 20KA and 10KV.
- E. Drivers shall be suitable for 0-10V dimming control and have greater than .9 power factor and less than 20% Total Harmonic Distortion.
- F. Optics
  - 1. Unless otherwise noted on The Contract Drawings, optics shall be Dark Sky Compliant with NEMA Type II, Type III, Type IV or Type V (VS).
  - 2. Weather exposed optical elements shall be shatter resistant, UV resistant and field replaceable.

## 2.03 HIGH-LEVEL WALLPACKS: Not Used

## 2.04 LOW-LEVEL WALLPACKS: Not Used

## 2.05 UNDER-CANOPY LUMINAIRES: Not Used

## 2.06 FLAG POLE LIGHTING: Not Used

## 2.07 ROOF-MOUNTED SECURITY LIGHTING

- A. The luminaires shall be Full Cut-Off Dark Sky compliant and shall have optional visors and shields to prevent light trespass.
- B. Coordinate mounting details and provide mounting hardware for proper and secure installation of the luminaires.
- C. Finish: Dark bronze thermoset acrylic enamel or powder coat.
- D. Miscellaneous
  - 1. UL listing and label for wet locations.
  - 2. Stainless steel hardware.
  - 3. Heat and aging-resistant gaskets to seal and cushion lenses and refractors in luminaire doors.
  - 4. Luminaire Identification: A 2" high weather-resistant, reflective number label shall be affixed to each luminaire denoting the wattage.

E. Bracket Arms

Provide mounting brackets for mounting of luminaires to parapets, roofs, rails, overhangs, etc. Brackets shall be field measured prior to fabrication to assure custom fit. Brackets shall be fabricated of ASTM A36 steel, and hot dip galvanized after complete fabrication/welding. The parapet and fence-type mounting brackets shall be designed to allow the mounting of an aim able floodlight that extends over the edge of the building wall. The bracket arm pivot for maintenance and relamping.

- 1. The basic mounting bracket, the MF-2116, consists of an upper and lower pivot assembly, and a right angle pipe arm constructed from schedule 40 steel pipe. The lower half of the assembly has a 1/2" welded stop pin which positions the arm to the required height when the assembly is bolted to the parapet wall. The upper half of the assembly serves to secure the arm to the wall and insure the smooth rotation of the arm. The stainless steel bolt used to position the location of the arm goes through the upper half of the pivot assembly.
- 2. The pipe arm has a 3/4" threaded fitting welded into the horizontal portion of the arm. Seal-tite flexible conduit is attached to the fitting and

extends to a 4"x4"x3" cast aluminum electrical splice box (see drawing detail). The SO-WA cord supplied with the luminaire is fed through the bracket arm, through the 3/4" fitting, through the seal-tight, and into the electrical box. The use of weather-resistant SO-WA cord insures that no sharp edges or moisture will endanger the electrical connection of the luminaire.

3. The parapet and fence brackets are customized to the dimensions of each individual installation. Contractors are required to submit detailed dimensions and pictures of each installation site. A Dimension fill-in sheets is available from the factory.
4. The brackets shall be hot dipped galvanized after fabrication. Stainless steel fishplates may be required for installations, which require added stability (as required by field conditions). All holes into the parapet shall be core drilled, impact drilling is not acceptable.
5. It is the installing contractor's responsibility to adapt to field conditions. A bracket drawing complete with dimensions and method of attachment must be submitted and approved by the project engineer. If epoxy shields are to be used they must be inserted a minimum of 6" in to the parapet. If the parapet is hollow within the 6" depth epoxy shields are not acceptable.
6. Attachment of brackets to parapet walls with epoxy shields must be approved by the SCA in writing. If the bracket is attached to the wall in 8 places 3/8-16 stainless steel threaded rod is acceptable if the bracket is attached in only 4 places 1/2-13 stainless steel rod is required.

## **2.08 LIGHTING CONTROLS**

### **A. Time Switch**

1. Provide Time switches where indicated on Drawings. Generally, time switches shall be three pole, single throw or single pole, double throw. Provide alternative configurations as required by specific loads.

2. When two circuits are to be controlled, the switch shall be a two pole, single throw. Switch contacts shall be rated 40 amperes per pole at 277 volts. The time switch shall be 24-hour type.
3. The clock motor shall be a self-starting synchronous motor rated for 120 volts, 60 Hz. AC
4. Spring driven reserve shall be provided with sufficient capacity to operate time switch contacts at least 16 hours after power failure. On restoration of power, spring driven reserve shall be automatically rewound.
5. Switch shall be Tork 7120L for the lighting contactor's coil control, Tork 7300L for three pole or 7200L for two pole, or the equal by Sangamo, Intermatic Register Company, LD&C, or the Paragon Electric Co.

B. Photocontrols

1. Provide photoelectric controls wired in parallel with the time switches and lighting contactor coil.
  - a. Photocells shall be standard EEI-NEMA twistlock type solid state, poly-voltage type to operate on line voltages from 110 volts to 277 volts, 60Hz. Photocell shall be provided with silicon diode sensor. Cadmium sulfide type is not acceptable.
  - b. Photocells shall be as manufactured by Fisher Pierce or equal.
2. Provide EEI-NEMA - twistlock receptacle mounted in heavy duty 4"x4"x3" deep cast aluminum [with  $\frac{3}{4}$ " pipe knockouts and external mounting ears] box for mounting of photocontrol.
3. A master photocontrol wired in parallel with the approved time clock to the starter coil of a magnetic contactor is required. Photocontrols shall not be used on individual luminaires unless absolutely necessary.

**PART 3 - EXECUTION**

**3.01 GENERAL**

- A. The Contractor shall be responsible for the safe and proper support of each luminaire. The Contractor shall provide all items of equipment (hangers, rods, inserts, boxes, brackets, yokes, channels, frames, etc.) required to adequately and safely support each luminaire in a manner acceptable to the Authority.
- B. Contractor shall provide underground pull boxes, concrete reinforced flush to top of grade. Cover shall be cast iron, gasketed, with the word "Electrical" embossed on the top cover plate. Cable and conduit openings entering and leaving this pull box shall be sealed.
- C. The Contractor shall examine the Drawings and familiarize himself with location and conditions under which each type of luminaire is to be installed, so that details of construction will best suit mounting conditions and/or obstructions at the job.
- D. The Contractor is required to protect luminaires from damage during installation of same and up to time of acceptance by the Authority and any broken luminaires, glassware, plastics, lamps, etc., shall be replaced by the Contractor.

**3.02 LUMINAIRE INSTALLATION**

- A. The Contractor shall be responsible for the proper mounting and support of all luminaires.
- B. A suitable cast metal roughing box shall be provided by the Contractor for each luminaire provided. The box shall receive all branch circuit conduit and wiring. Each luminaire shall connect to the roughing box in an approved manner using sealtile conduit, maximum length 12".

**3.03 LUMINAIRE WORK IN EXISTING CONSTRUCTION**

- A. Canopies on Surface Mounted Outlet Boxes
  - 1. Where luminaires are mounted upon surface-mounted outlet boxes with surface mounted conduit, the Contractor shall provide a fixture canopy sufficiently deep to permit exposed conduits to pass through. Canopy shall have proper openings cut by fixture manufacturer through which conduits



may pass. Submit sample of canopy for approval before installation. Luminaires shall not be mounted to outlet boxes alone.

B. Adapters

Where new luminaires are mounted on existing outlet boxes and mounting holes are not in proper position, suitable adapter or extension collars shall be provided.

C. Removed Luminaires

1. Where the Drawings or Specifications call for the Contractor to remove an existing luminaire, the Contractor shall also install a suitable blank faceplate on the exposed outlet box.
2. If the outlet box is to be used in the extension of branch circuit wiring, this Contractor shall provide a suitable extension collar that may be required to receive conduit.

**3.04 MOUNTING HEIGHT OF LUMINAIRES: Not Used**

**3.05 WIRING AND CONNECTIONS**

- A. Each luminaire shall be completely wired in an approved manner in accordance with requirements of the Electrical Code of the City of New York.
- B. Install branch circuit grounding conductor from the grounding terminal bar in the panelboard to each exterior luminaire.

**3.06 AIMING**

- A. After installation and prior to final acceptance, security lighting shall be adjusted under the supervision of the Authority's Representative and the Engineer to provide the intent of the Contract Drawings. Aiming shall be performed at night to verify light levels. Light levels shall conform to NYC Green Schools Guide Credit S6.1R and IESNA RP-33-99-Table 1, with the "post curfew" recommendations for maximum trespass illuminance levels.
- B. Where an aiming diagram is provided with the Contract Drawings, the Contractor shall provide the services of a licensed land surveyor to "stake out" the aiming points.

Contractor shall also provide the necessary staff and metering to coordinate the aiming and provide as-built drawings on achieved lighting levels at each point.

**3.07 CLEANING**

- A. All luminaires shall be cleaned prior to final acceptance to remove construction dirt, dust, finger prints, etc. inside and out.

**END OF SECTION**

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data	_____	_____
Shop Drawings	_____	_____
Samples	_____	_____
Certificate of Compliance with QA requirements	_____	_____
Warranty	_____	_____
Spare parts	_____	_____

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