16530 EXTERIOR LIGHTING

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SPECIFIER:
CSI MasterFormat 2004 number: 26 56 00

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PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide all labor, materials, equipment and services necessary to complete the lighting fixture installation work, and as indicated on the drawings, and as specified herein.

B. All materials shall be listed and labeled by an OSHA approved Nationally Recognized Testing Laboratory (NRTL).

1.2 RELATED SECTIONS:

1. 16112 - Raceways and Conduits.
2. 16120 - Wire and Cable.

1.3 SYSTEM DESCRIPTION

A. Wet location fixtures shall bear an NRTL label appropriate for that type of application.

1.4 SUBMITTALS

A. Shop drawings include but not be limited to:

1. Manufacturer's dimensioned scale drawings showing in complete detail the fabrication of all luminaires including finished, metal thickness, fabrication methods, support method, ballasts, sockets type of shielding, reflectors, provisions for relamping and all other information to show compliance with the Contract Documents.
2. Submit shop drawings and samples as requested of luminaires for approval before fabrication. Luminaire details may vary slightly from those shown on drawings provided the changes do not adversely affect size of installation, durability of luminaire, luminaire performance or appearance. Submitted samples may be subjected to photometric testing at an independent testing laboratory, refer to Section 01330, “Submittals”.

B. Certified photometric data for exterior lighting fixtures and a point by point illumination plan for entire site at same scale as Construction Documents

C. Wind load certification, by a Florida registered structural engineer, for exterior lighting poles.

D. Upon request, a sample of each fixture proposed for every use and specified unit shall be submitted to the A/E for review.

1.5 QUALITY ASSURANCE

A. Materials, equipment and appurtenances as well as workmanship provided under this section shall conform to the highest commercial standard and as specified and as indicated on drawings. Luminaire parts and components not specifically identified or indicated shall be fabricated from materials most appropriate for their use or function and as such resistant to corrosion, thermal, and mechanical stresses encountered in the normal application and functioning of the luminaires.

B. All cast parts, including die-cast members shall be of uniform quality, free from blow holes, pores, hard spots, shrinkage defects, cracks or other imperfections that affect strength and appearance, or are indicative of inferior metals or alloys. Exterior surfaces, which do not otherwise receive a finishing coating, shall be machined, sanded or similarly treated areas, such as extruded metal parts. All such finished castings: given a minimum of one coat of baked-on clear methacrylate lacquer unless a painted finish is specified.

C. Comply with Florida Building Code (FBC).

D. Luminaries and components shall be built under provisions of the N.E.C.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Exterior mounted lighting fixtures shall be vandal-proof types by Kenall Mfg. Co. or accepted equivalent.

2.2 EQUIPMENT

A. Exterior Lighting Fixtures:

1. Exterior fixtures shall be vandal-proof.
2. Provide required exterior lighting fixtures and components with NEMA LE2 lighting systems noise ratings.
3. Exterior lighting fixtures shall be furnished as indicated on drawings and fixture schedule. Fixtures shall be complete with necessary wiring, lamps, reflectors, glassware, and mounting accessories.
4. Components of the same type, size, rating, functional characteristic, and make of similar exterior lighting fixtures shall be interchangeable.
5. Fixture bases shall be metal and fastened to mounting locations with metal components.
6. Exterior fixtures shall be of aluminum or plastic construction.

B. Lamps:

1. Provide lamps for exterior lighting fixtures. Lamps shall be as indicated on the lighting fixture schedule.
2. High pressure sodium lamps are not acceptable.
3. Metal halide lamps shall comply with the following:

    a. Wattage ratings as shown on fixture schedule.

b. Lamp base shall be mogul base.

4. LED:

a. Shall be Reduction of Hazardous Substance (RoHS) compliant, and shall comply with FCC 47 CFR Part 15, IES LM-79 & 80.
b. Minimum CRI of 80 with a color temperature of 3500º K.
c. Minimum rated life of 50,000 hours at 25ºC ambient temperature.
d. LED driver shall have a THD of <20% and a power factor of 0.95 or higher with integral short circuit, open circuit and overload protection.
e. LED driver and LED module shall be accessible and replaceable from below.

C. Ballasts: High power factor, individually fused, regulator type. Ballasts shall be listed by an OSHA approved NRTL. Voltage shall be as shown on fixture schedule.

D. Lighting Poles: Comply with FPL standards and specifications and the following:

1. Luminaries, pole, base, and sub-base of exterior lighting shall be capable of withstanding wind velocity pressures determined by American Society of Civil Engineers (ASCE) 7. Supplier shall provide Shop Drawings and calculations, signed and sealed by a Florida registered engineer, as proof of compliance with this requirement.

a. Use a map wind speed of 185 mph, risk category "III".

2. Poles shall be of material, shape, finish, and height as indicated on the drawings. Provide a reinforced handhold and grounding lug on poles.
3. Metal pole base, where indicated, shall be welded to pole and furnished complete with cover and anchorage hardware. Pole and luminaire finish shall be as indicated on the drawings and as accepted by the A/E.
4. Provide anchor bolts at least 1/2" diameter by 12 inches long with 2 inch bends, complete with nuts, washers, and shims. Anchor bolts shall be hot-dipped galvanized steel. Number of anchor bolts required shall be determined by lighting pole manufacturer.

E. OUTDOOR PHOTOELECTRIC SWITCHES

1. Description: Solid state, with dry contacts to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.
2. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range.
3. Time Delay: 15-second minimum, to prevent false operation.
4. Surge Protection: Metal-oxide varistor, complying with IEEE C62.41.1, IEEE C62.41.2, and IEEE 62.45 for category A1 locations.
5. Mounting: Twist lock complying with IEEE C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.

PART 3 EXECUTION

3.1 INSPECTION

A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 INSTALLATION

A. Exterior Lighting Fixtures: Exterior lighting fixtures shall be installed according to manufacturer's instructions and according to details as shown on electrical drawings. Fixtures in student areas shall not be mounted below 7'-6" above the floor.

B. Lighting Poles:

1. Lighting poles shall be installed according to manufacturer's instructions and according to details shown on electrical drawings. Adjust poles to be set plumb and make final adjustments as required.
2. Build concrete bases for lighting poles to the most stringent requirements as indicated on the drawings or submittal based on wind velocity pressures. Bases shall be complete with reinforcing anchor bolts, ground rod and conduit entry.
3. Exterior light poles shall be solidly grounded to the conduit or to the circuit ground conductor in the case of nonmetallic conduit and to a local ground rod installed at the fixture base.
4. Provide weatherproof fuse holders in each ungrounded conductor within at each lighting pole base. Splices between circuit feed conductors and fixture conductors shall be made using molded waterproof connectors equivalent to Buss "Tron" type.
5. Luminaries shall be oriented and aimed to provide the illumination patterns desired. Adjust fixtures, reflectors or lamps as required to obtain desired results.

3.3 Exterior lighting shall be controlled using a combination of photocell control with the programmable timed lighting control system.

END OF SECTION