

## SECTION 26 56 00 - EXTERIOR LIGHTING

### 1.- GENERAL:

#### 1. SUMMARY:

- A. This standard is intended to establish a basis of design for exterior site lighting such that the University may achieve a level of quality and consistency in the design and construction of their facilities.
- B. Related Sections:
  - 1. Section 01301 - Design Guidelines for Energy and Environment
  - 2. Section 01701 - Building Systems Identification and Labeling

#### 2. REFERENCED PUBLICATIONS:

- A. The documents or portions thereof listed in this section, shall be considered part of the requirements of this Standard (utilize latest Rhode Island adopted editions):
  - 1. International Energy Conservation Code (IECC)
  - 2. Illuminating Engineering Society of North America (IESNA) Handbook.

#### 3. SUBMITTALS:

- A. Submit the following for reference:
  - 1. Lighting Fixture cut sheets
  - 2. Lighting Control System: cut sheets, bill of materials, interconnection wiring diagrams.

#### 4. WARRANTY:

- A. Lighting controls, fixtures and ballasts: 1 year after date of acceptance or manufacturer's standard, whichever is greater.

#### 5. GENERAL DESIGN GUIDELINES:

- A. Lighting levels shall be in accordance with the guidelines outlined in the IESNA Handbook. Lighting levels for outdoor athletics sporting facilities shall also conform to NCAA lighting requirements. Light levels shall be closely coordinated with the University.
- B. Lighting calculations shall be developed to verify that the light levels meet the IESNA requirements and other requirements noted herein.
- C. Lighting design shall include review and verification of the following:
  - 1. Review of required Foot-candle illumination requirements
  - 2. Appropriate light source technology: LED versus metal halide, etc.
  - 3. User needs (Multiple lighting levels for athletics fields, etc.)

4. Controls and switching
- D. Exterior lighting fixtures and lamps shall be selected based on the following performance criteria unless specifically approved otherwise:
  1. Minimize light pollution via the use of cut-off style fixtures.
  2. High fixture efficiency.
  3. Qualify for local utility company rebates where applicable.
  4. Good to excellent color rendering and minimal color temperature variance.
  5. Durable, corrosion-resistant fixtures and very long life lamps.
  6. Minimal luminaire O&M costs.
  7. Minimize the number of different lamp types utilized and required to be stocked by Operations staff.
  8. Ready access for fixture lamp and ballast replacement.
- E. Poles to have a separate, unswitched 120 volt 20 amp convenience receptacle for events use.
- F. Avoid the use of step lights cast-in-place into stairs and retaining walls.
- G. The use of bollards and in-ground fixtures is not preferred; exercise care and consideration of the following criteria in the decision-making process to utilize or locate these types of fixtures;
  1. Sealing of the fixture and wiring chamber against water and moisture.
  2. Soil expansion/contraction due to seasonal freeze/thaw.
  3. Possibility of damage due to snow plowing
  4. Possibility of damage and vandalism due to pedestrians
6. EMERGENCY LIGHTING:
  - A. Where required by Code, provide exterior Emergency egress lighting to illuminate a minimum of 2 foot candles (maintained) along all exterior paths of egress leading to a public way.
  - B. Exterior Emergency egress lighting shall be powered by the Life Safety branch automatic transfer switch (ATS) in buildings where a standby generator is installed.
7. LAMP TYPES:
  - A. The following lamp types are utilized for exterior lighting:
    1. Metal halide – however, avoid their use on Emergency circuits.
    2. Light Emitting Diode (LED).
    3. Compact-fluorescent.
    4. Induction.

- B. Do not use low pressure sodium or mercury vapor lamps.

8. LAMP COLOR:

- A. Lamp color temperature shall be consistent to match existing area lighting, in the range of 3500K to 4,500 K color temperature.

9. SWITCHING AND LIGHTING CONTROLS:

- A. Site lighting and building exterior lighting shall be controlled via a central lighting control system.
- B. Lighting control system primary control is to be via photocell, with back-up astronomic time of day control, and incorporating automatic Daylight Savings time adjustment. Provide with manual On/Off override controls for each lighting zone.
- C. Contactors, where used with lighting controls, to be mechanically-held, electrically operated type.
- D. When so installed within a building, exterior lighting shall be controlled by the building master lighting control system.
- E. Locate lighting control stations and contactor cabinets in readily accessible, floor-level locations, such as in electrical closets: installation above suspended ceilings is not considered an accessible location.

10. FIXTURES:

- A. Lighting fixtures shall be commercially available, commercial-grade, standard models. Fixtures shall be UL-listed as an assembly and approved for use in the application to which they are specified.
- B. Custom designed/built fixtures shall not be used when standard models similar in appearance and performance are available. Where deemed essential by the Architect, limited use of custom fixtures shall be permitted provided they are designed, constructed and installed in conformance with the following criteria:
  - 1. The fixtures utilize standard lamps available from all manufacturers.
  - 2. The fixtures are readily serviceable for lamp and ballast replacement without major disassembly or removal of fixture. Lenses shall be well secured and readily replaceable.
  - 3. Custom fixtures shall be UL-listed assemblies approved for use in the application to which they are specified.

11. BALLASTS:

- A. Fluorescent ballasts shall be electronic, instant or rapid start, high power factor type ( $>0.9$  pf), low temperature rise, "Class P" indicating approved integral ballast protection, unless specifically indicated to the contrary.

- B. Provide identical ballasts within each fixture type unless otherwise noted.
  - C. For outdoor use and wherever ballasts are used outside of a heated environment, provide ballasts capable of lamp starting at any temperature down to 0°F.
  - D. Ballasts for HID lamps:
    - 1. Multi-tap, encased and potted, thermally protected, high power factor (90 percent or greater), constant wattage regulating.
    - 2. Include a fast-acting primary inline fuse built into the fixture assembly by the manufacturer.
2. - PRODUCTS:
- 2.1. LIGHTING CONTROLS:
- A. Tork
  - B. Paragon
3. - EXECUTION:
- 3.1. INSTALLATION:
- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals; install in proper relation with adjacent construction and with uniform appearance.
  - B. Restore or replace damaged components and finishes. Test for proper operation. Clean and protect work from damage.
  - C. Lighting fixtures shall be labeled with the manufacturer, model number and lamp type, in addition to the source panel, circuit number and voltage.
- 3.2. DOCUMENTATION –CLOSEOUT DATA:
- A. Include the following Operations & Maintenance information for building lighting systems:
    - 1. As-built drawings of the lighting and control system including locations of all lighting controllers,
    - 2. Recommended relamping program,
    - 3. Schedule for inspecting and recalibrating lighting controls,
    - 4. Complete narrative of how each lighting control system is supposed to operate, including its recommended settings.
- 3.3. SPARE PARTS:
- A. Provide spare lamps and ballasts in quantities equal to 5 percent of the amount used on the project, with no less than one of each type.

END OF SECTION