

## **SECTION 265100 - INTERIOR LIGHTING**

### **PART 1 - GENERAL**

#### **1.01 GENERAL PROVISIONS**

- A. This sections is a Division 26 Basic Electrical Materials and Methods section and is part of each Division 26 section making reference to electrical connections for equipment specified herein.

#### **1.02 LUMINAIRE IDENTIFICATION**

- A. Provide a luminaire for each luminaire designation and location shown on the drawings. Outlets for which luminaires are not indicated shall be provided with a unit specified for similar areas. The contractors shall verify with the Architect all luminaires in question.
- B. Luminaire designation is indicated by a letter and number combination adjacent to each designated outlet, a symbol or by a note for areas where the luminaires are alike.
  - 1. Contractor shall be responsible for installing the correct luminaire at each outlet or designated location with the proper orientation.
  - 2. Contractor shall coordinate luminaire installation and all clearances needed with the work of other Divisions.

#### **1.03 UL LABEL**

- A. Luminaires shall be UL listed and labeled with UL listed wiring. Wiring shall be suitable for the luminaire temperature listing.

### **PART 2 - PRODUCTS**

#### **2.01 LUMINAIRE SCHEDULE**

- A. All luminaires shall be of the design and quality described in the schedule shown on the drawings.

#### **2.02 DIFFUSERS**

- A. Plastic lenses, diffusers or shields specified shall be 100% virgin acrylic, plexiglass or polycarbonate in sizes and shapes to properly fit the luminaire.

#### **2.03 BALLASTS**

- A. All fluorescent luminaires shall have high power factor, energy conserving solid state ballasts. Each ballast shall be provided with integral thermal protection. All ballasts shall have an "A" sound rating, and UL, CBM and Electrical Testing Laboratories certification. Ballasts shall have less than 20% total harmonic distortion. Ballasts shall be programmed rapid start, except where otherwise indicated. All

ballasts shall be rated for use at 120 or 277 volts, 60 Hertz as scheduled. Ballasts shall be made by Advance Transformer, Universal Lighting Technologies, or approved equal.

- B. Ballasts for luminaires utilizing double-ended lamps shall have integral ballast disconnect means.
- C. All ballasts for metal halide luminaires shall be high power factor, pulse start type, of voltage specified and shall meet current ANSI specifications, with the exception that ballasts for all mogul base horizontally mounted metal halide lamps be injection start type.
- D. All ballasts for high pressure sodium luminaires shall be high power factor, constant wattage auto-transformer type, of voltage specified, and shall meet current ANSI specifications.
- E. All ballasts for outdoor use shall be low temperature type (-20 degrees F).

## **2.04 LAMPS**

- A. All lamps shall meet Federal TCLP Standards for maximum mercury content.
- B. Fluorescent lamps shall be nominally 32 watt T8, 3500 K, minimum CRI-80, unless otherwise noted in Luminaire Schedule.
- C. High intensity discharge lamps shall be of the type and rating required for each luminaire. Furnish color corrected type lamps where indicated.
- D. Incandescent lamps shall be inside frosted, reflector type, or as otherwise noted. Lamps shall be the rating specified in the Luminaire Schedule, or as required to suit each luminaire.
- E. All lamps shall be manufactured by General Electric, Osram-Sylvania, North American Phillips, or approved equal.

## **2.05 LED LUMINAIRES**

- A. The manufacturer offering this item shall have been in business for a minimum of five years and shall have successfully produced at least 1000 (one thousand) identical or similar models to that being tendered.
- B. Luminaire shall be mercury-free, lead-free, and RoHS compliant.
- C. Luminaire shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
- D. Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.
- E. White LED shall meet chromaticity standards set by ANSI C78.377. Light output of the LED system shall be measured using the absolute photometry method following IES LM-79 and IES LM-80 requirements and guidelines.

- F. Driver shall have a minimum rated life of 50,000 hours.
- G. Color temperature shall be 3500K, unless otherwise noted on the Luminaire Schedule.
- H. The manufacturer of the Luminaire shall utilize LEDs with proven quality. LED drivers to be compatible with LEDs. Driver and LEDs shall be furnished from a single manufacturer to ensure compatibility.
- I. Luminaire Color Rendering Index (CRI) shall be a minimum of 70 for exterior fixtures, and a minimum of 80 for interior fixtures, unless otherwise noted on the Luminaire Schedule.
- J. LED fixture shall be thermally designed as to not exceed the maximum junction temperature of the LED for the ambient temperature of the location the fixture is to be installed. Rated case temperature shall be suitable for operation in the ambient temperatures typically found for the intended installation. Exterior luminaires to operate in ambient temperatures of -20°F to 122°F (-29°C to 50°C).
- K. LED driver shall have a minimum power factor (pf) of 0.9 and a maximum crest factor (cf) of 1.5 at full input power and across specified voltage range.
- L. Luminaire shall operate normally for input voltage fluctuations of plus or minus 10 percent and shall have a maximum Total Harmonic Distortion (THD) of 20% at full input power and across specified voltage range.
- M. Electrical components of the LED lighting fixture (LED light engine/board array and driver(s)) shall be of modular construction so that each component is individually replaceable in the field for maintenance and repair purposes. Wiring connecting these components shall utilize polarized quick-disconnects.
- N. All connections to luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
- O. Fuse Protections: All luminaires shall have built-in fuse protection. All power supply outputs shall be either fuse protected or be Polymeric Positive Temperature Coefficient (PTC)-protected as per Class 2 UL listing. All luminaires shall be provided with knockouts for conduit connections.
- P. The LED lighting fixture shall carry a limited 5-year warranty minimum for LED light engine/board array, and driver.
- Q. LED driver shall be compatible with dimming controls where dimming is indicated on the plans. Dimmable drivers shall use Dimming Constant Current (DCC) or Pulse Width Modulation (PWM) operation.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Contractor shall verify the construction of the spaces where luminaires are to be installed and furnish the necessary supports, frames, clamps, hangers, etc., for a complete installation.
  - 1. Luminaires in suspended ceiling shall be supported directly by the ceiling support system.
  - 2. Provide a minimum of two grid clamps for each luminaire, one at each end of the luminaire, unless otherwise required.
  - 3. Provide any baffles and/or gaskets needed to prevent light leaks around fixtures.
- B. Recessed luminaires shall be designed to fit the make and type of ceiling to be installed, and shall include plaster frames where installed in plaster ceilings, mounting yokes where required for support from ceiling construction, and independent support from structural members where the weight of luminaires would cause deformation of the ceiling.
  - 1. Recessed luminaires shall be removable from below to allow access to an outlet box in the ceiling, as required by the National Electrical Code.
- C. Industrial or strip luminaires, unless indicated otherwise, shall be chain suspended and equipped with a prewired "SJ" cord and 120-volt grounded type plug. Fixtures shall be supported from a Day-Brite 5900 series or Ideal 360-7300 series Hydee fixture hanger, complete with 120-volt grounded receptacle, "S" hooks and cord grips. Hangers shall be mounted to a 4-inch round outlet box and be the type that permits 360 degree adjustment of the fixtures.
- D. Branch circuit conduits for luminaires in suspended ceilings shall be supported from the structural ceiling with a 1/2-inch flexible metallic conduit connection to the luminaire.
- E. Suspended luminaires installed in continuous rows shall be provided with splice plates and installed in such a manner that they present a straight line appearance from beginning to end. Continuous rows longer than 16-feet shall be mounted on steel channel which shall be suspended from the structural ceiling from aligner hangers.

### **3.02 CLEAN-UP**

- A. All luminaires shall be thoroughly cleaned to remove all construction dust, paint, cement, etc. This shall include all light reflecting surfaces, frames and lenses. Any luminaires or parts of luminaires damaged by the construction work shall be replaced. All lamps shall be new and any lamps installed in luminaires for use during construction shall be replaced.

### **3.03 SUBMITTALS**

- A. Submit shop drawings and manufacturers descriptive data for each luminaire. Information shall include specific identification of items to be furnished when more than one item is shown on the submittal.

**END OF SECTION 265100**