

## SECTION 26 50 00 – LIGHTING

### PART 1 - GENERAL

#### 1.1 SCOPE

- A. Provide complete interior systems, including fixtures, standards, hangers, supports, fittings, lamps, wiring, connections and controls, as indicated in the Contract Documents. Types of interior fixtures in this section include LED drivers.

#### 1.2 SUBMITTALS

- A. Submit shop drawings as described in Section 260100. Lighting fixture shop drawings shall include photometric data for each fixture utilizing the specified lens/louver type, lamp(s) and ballast(s). All lighting fixture types shall be submitted in a single complete brochure which shall be in the form of a soft cover binder with each fixture separated by an identified index tab. Information on each fixture shall include:
  - 1. Manufacturer and Catalog Number.
  - 2. Dimensioned Construction Drawing(s).
  - 3. Standard Catalog "Cut" Sheet.
  - 4. Photometrics.
  - 5. Lens/Louver Type.
  - 6. Lamp Type.
  - 7. Maintenance Data

#### 1.3 QUALITY ASSURANCE

- A. Lighting fixtures shall be standard products of manufacturers regularly engaged in the manufacture of the specific type lighting fixtures specified and shall be the manufacturer's latest standard design that complies with specification requirements. Firms installing the fixtures shall have a minimum of five (5) years of successful installation experience on projects with interior lighting work similar to the requirements of this project.
- B. Codes and Standards
  - 1. NEC:
    - a) Shall comply with Articles 220, 410 and 510 as applicable to installation and construction.
  - 2. NEMA:
    - a) Shall comply with Standard Publication Nos. LE 1 and LE 2 as applicable to lighting equipment.
  - 3. UL:
    - a) All interior lighting fixtures and components shall be UL listed and

labeled.

- b) Comply with all applicable UL standards including UL 486A and B.
4. All work shall comply with applicable local code requirements of the authority having jurisdiction.
- C. Verify the availability of all fixtures proposed to be used in the execution of the work prior to submitting for approval. The discontinuance of production of any fixture after such approval has been granted shall not relieve the Contractor from furnishing an approved fixture of comparable quality and design at no additional cost.
- D. Lighting fixtures shall be as specified in the "Luminaire Schedule." Fixture types, characteristics, photometrics, finishes, etc., correspond to the first manufacturer, and associated catalog number, listed in the "Luminaire Schedule." Provide a sample fixture from the factory for any products not listed as acceptable for approval. The Owner's Representative reserves the right to disapprove any fixture type submitted which is not equal in quality, appearance or performance to the fixture specified.
- E. All luminaires shall meet the Total Luminaire Efficiency (TLE) requirements of the New York State Energy Conservation Construction Code.

## **PART 2 - PRODUCTS**

### **2.1 LAMPS**

### **2.2 DRIVERS:**

- A. LED Drivers
- 1. Ten-year operational life while operating with a case temperature range of 0 degrees C to 62 degrees C and 90 percent non-condensing relative humidity.
  - 2. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
  - 3. Electrolytic capacitors to operate at least 20 degrees C below the capacitor's maximum temperature rating when the driver is under fully-loaded conditions and case temperature is 62 degrees C.
  - 4. Maximum inrush current of 2 amperes for 120V and 277 V drivers.
  - 5. Withstand up to a 4,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.
  - 6. Manufactured in a facility that employ ESD reduction practices in compliance with ANSI/ESD S20.20.

7. Inaudible in a 27 dBA ambient.
  8. No visible change in light output with a variation of +/- 10 percent line voltage input.
  9. Total Harmonic Distortion less than 20 percent and meet ANSI C82.11 maximum allowable THD requirements
  10. Drivers to track evenly across
    - a) Multiple fixtures.
    - b) All light levels.
  11. Stand by power is <1.0Watts when using digital EcoSystem controls.
  12. Compatibility of driver and LED light engine must be tested and ensured by driver manufacturer.
- B. Luminaire Schedule:
1. Luminaire schedule is found on the drawings.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION:**

- A. Examine areas and conditions, under which lighting fixtures are to be installed, and substrate for supporting lighting fixtures. Notify Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

#### **3.2 COORDINATION**

- A. Refer to respective reflected ceiling plan for each area. Reflected ceiling plans indicate proper light fixture location only. Coordinate the proper arrangement with all other ceiling mounted devices. Contract Documents indicate light fixture characteristics (type), quality, quantity, etc. Verify with the ceiling supplier design of actual ceiling installed in each area and coordinate compatible fixture flange.
- B. General
  1. Install interior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's 'Standard of Installation', NEMA standards, and with recognized industry practices.
  2. Provide fixtures and/or fixture outlet boxes with hangers to properly support fixture weight. Submit design of hangers, method of fastening, other than indicated or specified herein, for review by Engineer.

3. Make installation such that the fixture is free of finger marks, flaws, scratches, dents or other imperfections.

C. Arrangement

1. Align edges of fixtures with walls or other building elements. Where indicated by dimensions or indicated on Drawings, maintain indicated arrangement.
2. For wall to wall installed light fixtures, field measure length required after completion of the wall construction and prior to ordering the light fixtures. Fabricate in largest lengths allowable.

D. Recessed Mounting

1. Verify ceiling construction and material prior to ordering light fixtures.
2. Provide plaster frames for plaster ceilings and flanged frames for drywall ceiling.
3. Provide necessary mounting hardware and accessories to adapt fixture to ceiling construction.
4. Provide gaskets, trims, flanges, etc. as required to prevent light leaks around trim.
5. Where installing 'lay-in' type fixtures, provide galvanized supports to the building structure, independent of the ceiling system, at all four corners of the fixture.
6. Each support shall be capable of supporting 100 pounds and each wire shall be a minimum of #12 AWG mild steel.
7. Provide saddle hangers or tie bars attached to runners or between crossbars of ceiling systems as a safety measure.
8. Provide mounting splines or other positive means of maintaining alignment and rigidity.
9. Use a minimum of two supports independent of the ceiling for each point source type fixture.

E. Stem Mounting

1. Use self-aligning hangers in canopies for hanging fixtures true to vertical.
2. Do not deface ceiling or walls.
3. Locate hangers at intersections of joints or at centers of blocks in rooms with patterned type ceiling materials such as acoustic tile.
4. Use hangers capable of supporting four times fixture weight.

5. Align continuous rows of fixtures maintaining fixtures level without rotation about the longitudinal axis.
  6. Rigidly support outlet box independent of ceiling system from building structure.
  7. Where obstructions prevent direct support of outlet, provide offset or trapeze hangers of outlet box.
  8. Stem shall be supported directly from building structure on centers as called for by the manufacturer.
  9. There shall be a minimum of two stems per individual four foot light fixture, and three stems per individual eight foot light fixture for steel fixtures.
  10. Extruded aluminum fixtures shall have hangers as called for by the manufacturer.
- F. Surface Ceiling Mounting
1. Mount surface fixtures tight to surface without distorting surface.
  2. Space fixtures in continuous rows to correspond to ceiling joint intersections.
  3. Continuous row fixtures may be fed by a single outlet where fixtures contain approved wireways and suitable wiring is used.
  4. Provide hangers for each fixture, each rated to support four times the fixture weight.
  5. Provide offset or trapeze hangers where required.
  6. Supports shall be provided on a maximum of 4 foot centers with a minimum of two hangers per individual four foot light fixture and three hangers per individual eight foot light fixture.
  7. Hangers shall be supported from the building structure and independently from ceiling system or other building services.
  8. Fasten fixtures securely to structural supports.

### **3.3 DELIVERY, STORAGE, AND HANDLING**

- A. Lighting fixtures and equipment shall be delivered with UL and manufacturer's labels intact and legible in factory fabricated containers.

- B. Fixtures and accessories shall be stored in protected dry locations in their original unbroken package or container. Fixtures shall be protected from dust and dampness both before and after installation. Fixtures shall be protected from paint and cleaning solvents during all phases of construction.
- C. Handle interior lighting fixtures carefully to prevent damage, breaking, and scoring of finishes. Do not install damaged fixtures or components; replace with new.

**3.4 SEQUENCING AND SCHEDULING:**

- A. Coordinate with other work including ceiling type, wires/cables, electrical boxes, fittings, and raceways, to properly interface installation of interior lighting fixtures with other trades.

**3.5 FINAL CLEANING**

- A. Prior to acceptance, damp clean diffusers, glassware, trim, reflectors, lamps, louvers, lens and similar objects of all fixtures. Remove all dirt, corrosion, foreign material, finger marks, blemishes. Replace all burned out lamps and failed components.

**END OF SECTION**