

SECTION 26 50 00 - LIGHTING**PART 1 GENERAL****1.01 DESCRIPTION**

- A. Provide all lighting outlets indicated on the Drawings with a fixture of the type designated and appropriate for the location. Outlet symbols on the Drawings without a type designation shall have a fixture the same as those used in similar or like locations.
- B. Provide lamps or LED modules for all fixtures.
- C. Coordinate installation of fixtures with the ceiling installation and all other trades to provide a total system that is neat and of orderly appearance.

1.02 QUALITY ASSURANCE

- A. Fixtures shall conform to the following specifications.
- B. Manufacturers specified are indicative of the general type and performance desired and are not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equivalent light distribution and brightness characteristics, and of equal finish and quality will be acceptable if approved by the Architect prior to the bid. Digital IES files shall be provided as part of Submittal and Substitution Request processes upon request in order to properly evaluate proposed fixtures.
- C. Equality shall be determined by comparisons of performance, construction, installation ease, maintenance, and appearance.
- D. All light fixtures shall be UL listed and labeled.

1.03 SUBMITTAL AND RECORD DOCUMENTATION

- A. Submit product data describing fixtures, lamps, LED modules, ballasts, drivers, and emergency lighting units. Arrange product data for fixtures in order of fixture designation.
- B. Include data on features and accessories and the following information.
 - 1. Outline drawings of fixtures indicating dimensions and principle features.
 - 2. Electrical ratings and photometric data with specified lamps/LED modules and certified results of laboratory tests, including digital IES files.
 - 3. Data on batteries and chargers of emergency lighting units.
- C. Submit shop drawings from manufacturers detailing nonstandard fixtures and indicating dimensions, weights, methods of field assembly, components, features, and accessories.

PART 2 PRODUCTS**2.01 LED FIXTURES**

- A. General:
 - 1. LED lighting fixtures shall be in accordance with IES, NFPA, UL, as shown on the Drawings and as in these Specifications.
 - 2. LED drivers shall include the following features unless otherwise indicated:
 - a. Power factor: > 0.9 nominal
 - b. Input Voltage: 120V – 277V, 60 Hz
 - c. Total Harmonic Distortion: < 20%
 - d. Temperature Rating: 0 deg C – 40 deg C
 - e. Integral short circuit, open circuit, and overload protection.
 - 3. LED modules shall include the following features unless otherwise indicated.

- a. Comply with IES LM-79 and LM-80 requirements.
 - b. Minimum 80 CRI and color temperature 3500 deg K (interior) and 4000 deg K (exterior) unless otherwise specified in Lighting Fixture Schedule/List.
 - c. Minimum Rated Life: 70,000 hours per IES L70, unless otherwise specified in Lighting Fixture Schedule/List.
 - d. Light output initial lumens as specified in Lighting Fixture Schedule/List.
 - e. LED modules shall be field replaceable and contain quick-disconnects.
4. LED lighting fixtures shall have available digital IES files from a NVLAP accredited testing laboratory in accordance with IESNA LM-79, which specifies the entire luminaire as the source, resulting in an efficiency of 100%. Lighting fixtures that do not have these test results available will not be accepted.

2.02 RECESSED FIXTURES

- A. In insulated ceilings, recessed fixtures to be equipped with "IC" rated housing or with a field fabricated fireproof box (metal, sheet rock, etc.), complying fully with all clearance requirements.
- B. Recessed troffers shall be as follows, unless specified otherwise:
 1. Diffusers shall be pattern 12 extruded clear acrylic plastic, 0.125" overall thickness, unless otherwise specified in the fixture schedule by catalog number or remarks. Door shall be securely closed by use of enclosed cams.
 2. Finish shall be white baked enamel, unless otherwise specified with a minimum average reflectance of 85% on all exposed and light reflecting surfaces.
 3. Housing shall be 22-gauge minimum.

2.03 TRACK LIGHTING SYSTEMS

- A. Conform to UL 1574.
- B. Provide components, including track, fittings, and fixtures, from same manufacturer and as recommended by manufacturer for intended use.

2.04 OUTDOOR FIXTURES

- A. Outdoor fixtures shall be weatherproof, heavy duty types designed for efficient light utilization, adequate dissipation of lamp and ballast/driver heat and safe cleaning and relamping. Ballasts/drivers shall be incorporated within the luminaire housings unless otherwise noted. Luminaires shall be sealed unless charcoal filters are provided. Lenses shall be heat and impact resistant, tempered glass. Lens gasket shall be heat and weather resistant. Materials shall be rustproof. Latches and fittings shall be nonferrous metal or stainless steel.

2.05 POLES AND STANDARDS

- A. Lighting standards, assemblies, and pole bases shall be designed and constructed to withstand a steady wind velocity of 100 miles per hour without permanent distortion or displacement. Where unusual soil or base installation conditions occur, the Contractor shall provide adequate reinforcement under the guidance of the Architect to assure the specified strength for 100-mile-per-hour wind. Generally poles/bases shall be suitable for installation in earth having an allowable bearing of 1800 pounds per square foot.

2.06 FIXTURES

- A. See Drawings for Lighting Fixture List/Schedule.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Lamps of the proper type, wattage, and voltage rating shall be delivered to the project in the original cartons and installed in the fixtures just prior to the completion of the project. Provide lamp type as recommended by the fixture manufacturer.
- B. Fixtures shall be left clean at the time of acceptance of the work with every lamp or LED module in operation. If fixtures are deemed dirty by the Architect at completion of the project, the Contractor shall clean them.
- C. Fixtures shall be carefully aligned, leveled in straight lines, and located as shown on the Architectural reflected ceiling plan. The final decision as to adequacy of support and alignment shall be made by the Architect. The fixtures shall be supported and fastened to the ceiling system. The lighting plans are to be used for fixture types and connection information only, not exact locations.
- D. Verify all ceiling conditions and provide all lighting fixtures complete with factory furnished stems, balls, aligners, and canopies as required for a complete installation.
- E. Recessed troffers installed in suspended T-bar ceiling shall be independently supported on two opposite corners by #12 gauge steel wire attached to structure, per UBC Standard #47-18.
- F. Surface mounted light fixtures shall be securely fastened to the building surface via factory-created holes in the fixtures. Attachment of fixture merely to recessed outlet box is not sufficient.
- G. Where two switches are shown dedicated to an office, room, or area, provide two-level lighting.
- H. Lighting fixtures in any single enclosed room shall be connected using a common (one) circuit, except in cases where the loading requires a second circuit.
- I. Accessories such as straps, mounting plates, nipples, or brackets shall be provided for proper installation.
- J. Standards shall be plumb with arms aligned and square. Arms shall be perpendicular to the parking axis unless specifically shown otherwise.
- K. Standards shall be in line such that sighting along straight lines of standards will show no standard out of line with the others. The Contractor is cautioned that some curbs or roadway edges may not be straight and, therefore, should not be used for alignment.
- L. The Contractor shall erect the luminaires and pole assemblies complete on locations called out on the Drawings.
- M. The poles shall be installed with leveling nuts (galvanized). The space between the bottom of the pole base flange and the top of the footing shall be grouted to present a finished appearance with a 1/2" drain hole.

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