

SECTION 16515 - INTERIOR LIGHTING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes interior lighting fixtures, lamps, ballasts, and accessories.

1.03 DEFINITIONS

- A. Fixture: A complete lighting unit. Fixtures include lamps and parts required to distribute light, position and protect lamps, and connect lamps to power supply.
- B. Average Life: The time after which 50 percent fails and 50 percent survives under normal conditions.

1.04 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data describing fixtures, lamps, and ballasts. Arrange Product Data for fixtures in order of fixture designation. Include data on features and accessories and the following:
 - 1. Outline drawings indicating dimensions and principal features of fixtures.

1.05 QUALITY ASSURANCE

- A. Electrical Component Standard: Provide components that comply with NFPA 70 and that are listed and labeled by UL where available.
- B. Listing and Labeling: Provide fixtures, emergency lighting units, and accessory components specified in this Section that are listed and labeled for their indicated use and installation conditions on Project.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- C. Coordinate fixtures, mounting hardware, and trim with ceiling system and other items, including work of other trades, required to be mounted on ceiling or in ceiling space.
- D. All fixtures shall use fluorescent bulbs, compact fluorescent bulbs or LED bulbs. Incandescent bulbs are not permitted.

1.06 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, fixtures that may be incorporated into the Work include, but are not limited to, the products specified in each Interior Lighting

Fixture Schedule at end of this Section.

- B. Products: Subject to compliance with requirements, provide one of the products specified in each Interior Lighting Fixture Schedule at end of this Section.

2.02 FIXTURES AND FIXTURE COMPONENTS, GENERAL

- A. Metal Parts: Free from burrs, sharp corners, and edges.
- B. Sheet Metal Components: Steel, except as indicated. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.
- D. Reflecting Surfaces: Minimum reflectance as follows, except as otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
- E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or water white, annealed crystal glass, except as otherwise indicated.
 - 1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - 2. Lens Thickness: 0.125 inch (3 mm) minimum; except where greater thickness is indicated.
- F. Fluorescent Fixtures: Conform to UL 1570.
- G. Fluorescent Ballasts: Electronic integrated circuit, solid-state, full-light-output, energy-efficient type compatible with lamps and lamp combinations to which connected.
 - 1. Certification by Electrical Testing Laboratory (ETL).
 - 2. Labeling by Certified Ballast Manufacturers Association (CBM).
 - 3. Type: Class P, high power factor, except as otherwise indicated.
 - 4. Sound Rating: "A" rating, except as otherwise indicated.
 - 5. Voltage: Match connected circuits.
 - 6. Lamp Flicker: Less than 5 percent.
 - 7. Minimum Power Factor: 90 percent.
 - 8. Total Harmonic Distortion (THD) of Ballast Current: Less than 20 percent.
 - 9. Total Harmonic Distortion (THD) of Ballast Current: Less than 10 percent.
 - 10. Conform to FCC Regulations Part 15, Subpart J for electromagnetic interference.
 - 11. Conform to IEEE C62.41, Category A, for resistance to voltage surges for normal and common modes.
 - 12. Multilamp Ballasts: Use 2, 3, or 4 lamp ballasts for multilamp fixtures where possible.
 - 13. Lamp-ballast connection method does not reduce normal rated life of lamps.

2.03 LAMPS

- A. Comply with ANSI C78 series that is applicable to each type of lamp.
- B. Fluorescent Color Temperature and Minimum Color-Rendering Index (CRI): 4100 K and 85 CRI, except as otherwise indicated.
- C. Noncompact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid start circuits.

2.04 FINISHES

- A. Manufacturer's standard, except as otherwise indicated, applied over corrosion-resistant treatment or primer, free of streaks, runs, holidays, stains, blisters, and similar defects.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Set units plumb, square, and level with ceiling and walls, and secure according to manufacturer's written instructions and approved Shop Drawings. Support fixtures according to requirements of Division 16 Section "Basic Electrical Materials and Methods."
- B. Lamping: Where specific lamp designations are not indicated, lamp units according to manufacturer's instructions.

3.02 CONNECTIONS

- A. Ground lighting units. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.03 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replaced damaged fixtures and components.
- B. Tests: Verify normal operation of each fixture after fixtures have been installed and circuits have been energized with normal power source.
- C. Replace or repair malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.
- D. Replace fixtures that show evidence of corrosion during Project warranty period.

3.04 ADJUSTING AND CLEANING

- A. Clean fixtures after installation. Use methods and materials recommended by manufacturer.
- B. Adjust aimable fixtures to provide required light intensities.

3.05 INTERIOR LIGHTING FIXTURE SCHEDULE

- A. Fixture Type: See drawing.

END OF SECTION 16515