

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)
 - .1 ANSI/IEEE C62.41-02, Recommended Practices for Surge Voltages in Low-Voltage AC Power Circuits.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM F1137-11e1, Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
- .3 United States of America, Federal Communications Commission (FCC)
 - .1 FCC (CFR47) EM and RF Interference Suppression.

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 Submit shop drawings in accordance with Section 26 05 00 Common Work Results – Electrical.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with the Waste Reduction Work plan.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

Part 2 Products

2.1 EQUIPMENT

- .1 Provide complete shop drawing to satisfy identified characteristics. Provide photometric point-by-point calculation for the complete area for Normal and Emergency conditions. The quantity of the fixtures is not to be adjusted. Results are to be presented on a full-scale drawing. The area to indicate average, maximum and minimum lux, average to minimum and lighting power density W/ft². Light fixtures and controls must be approved by Engineer. All equivalency decisions made by Engineer will be final. The burden of proof of equivalent products both in terms of performance and quality shall be on the contractor.
- .2 Provide complete lighting system including all required controls (dual technology occupancy sensors), power packs, wiring, boxes and mounting accessories.

2.2 LED LIGHTING/FIXTURES

- .1 Provide light fixtures as identified in lighting fixture schedule c/w all required accessories
- .2 Performance Testing:
 - .1 Fixture to be tested in accordance with IESNA LM-80-08 and LM-79-08 for LED performance for delivered lumens and system efficacy.
 - .2 Fixtures to have a life expectancy in the range of 50,000 hours at 70% lumen maintenance rating.
 - .3 Optics designed for LED technology through the use of reflectors, lenses or diffuser or any combination for optical efficiency.
- .3 Thermal Management:
 - .1 Fixture to be designed to allow for the dissipation of heat away from the fixture and solid state components using heat sinks and/or reflective materials or design components.
 - .2 Thermally protected. In locations with direct contact with insulation, fixture or housing to be IC rated for application.
- .4 Color Quality:
 - .1 LED color temperature to remain relatively stable over its life.
 - .2 Interior light fixtures to have a minimum CRI of 80.
 - .3 LED color consistency to be provided by binning (sorting) for proper color mixing.
 - .4 Color temperature for indoor fixtures to be 3000K and 4000K as noted.
- .5 Electrical:
 - .1 Fixtures to be compatible for control through dimming and energy controls for extended maintenance life and reduced energy use.
 - .2 LED lightbars to be mounted on mounting bars or plates with quick disconnect for ease of replacement.
 - .3 CSA approved.
 - .4 Driver to be 350mA for extended LED life and rated 0-10V for dimming or controls application.

2.3 EMERGENCY LIGHTING

- .1 Emergency lighting equipment: to CSA C22.2 No.141.
- .2 Supply voltage: 120 V, AC.
- .3 Output voltage: 24 V DC.
- .4 Operating time: 30 minutes.
- .5 Battery: sealed, maintenance free.
- .6 Charger: solid state, multi-rate, voltage/current regulated, inverse temperature compensated, short circuit protected with regulated output of plus or minus 0.01 V for plus or minus 10% input variations.

- .7 Solid state transfer circuit.
- .8 Low voltage disconnect: solid state, modular, operates at 80% battery output voltage.
- .9 Signal lights: solid state, for 'AC Power ON'.
- .10 Lamp heads: integral on unit and remote, 345 degrees horizontal and 180 degrees vertical adjustment. Lamp type: LED, 12 W.
- .11 Cabinet: suitable for direct or shelf mounting to wall and c/w knockouts for conduit. Removable or hinged front panel for easy access to batteries.
- .12 Finish: white.
- .13 Auxiliary equipment:
 - .1 Ammeter.
 - .2 Voltmeter.
 - .3 Test switch.
 - .4 Time delay relay.
 - .5 Battery disconnect device.
 - .6 AC input and DC output terminal blocks inside cabinet.
 - .7 Cord and single twist-lock plug connection for AC.
 - .8 RFI suppressors.

2.4 WIRING OF REMOTE HEADS

- .1 In accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.
- .2 In accordance with Section 26 05 21 - Wires and Cables (0-1000 V), sized in accordance with manufacturer's recommendations

Part 3 EXECUTION

3.1 INSTALLATION

- .1 Install lighting fixtures in accordance with the manufacturer's specific instructions and details on the drawings, when shown.
- .2 Supply plaster frames, trim rings and backboxes to other trades as the work requires.
- .3 Coordinate with mechanical subcontractor to avoid conflicts between luminaries, supports and fittings and mechanical equipment and installations.
- .4 Support all fixtures installed on or in suspended acoustic tile ceilings, if applicable, independently of ceiling by means of chain hangers.
- .5 Support suspended fixtures in areas without ceilings directly from building structure. Provide all required accessories.
- .6 Coordinate exact fixtures location and mounting height on site. Provide mock-up installation for approval.
- .7 Refer to Section 26 05 00 for additional seismic supports and cross bracing requirements.
- .8 Align individual fixtures parallel or perpendicular to building lines.
- .9 Coordinate outlet locations for suspended fixtures to clear door swings.

3.2 TESTING AND COMMISSIONING

- .1 Carry out Testing and Commissioning in accordance with Commissioning specifications.

3.3 WIRING

- .1 Reuse existing lighting circuits.
- .2 Provide new wiring and conduit.

END OF SECTION