

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 09 23.04 - Lighting Control Devices - Fluorescent Dimming.
- .2 Section 26 52 00 - Emergency Lighting.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI C82.1-04, Lamp Ballasts-Line Frequency Fluorescent Lamp Ballast.
 - .2 ANSI C82.4-02(R2007), Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps Multi Supply Type.
- .2 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)
 - .1 ANSI/IEEE C62.41-1991, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- .3 ASTM International Inc.
 - .1 ASTM F 1137-11E1, Standard Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
- .4 Canadian Standards Association (CSA International).
- .5 ICES-005-09, Radio Frequency Lighting Devices.
- .6 Underwriters' Laboratories of Canada (ULC)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide complete photometric data prepared by independent testing laboratory for luminaires where specified, for approval by Departmental Representative.
 - .3 Photometric data to include: VCP Table where applicable spacing criterion; 5 plane candlepower summary and lumen ratings.

- .3 Quality assurance submittals: provide following in accordance with Section 01 45 00 - Quality Control.
 - .1 Manufacturer's instructions: provide manufacturer's written installation instructions and special handling criteria, installation sequence and cleaning procedures.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .3 Packaging Waste Management: remove for reuse and return packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Divert unused metal materials from landfill to metal recycling facility.
- .5 Disposal and recycling of fluorescent lamps as per local regulations.
- .6 Disposal of old PCB filled ballasts.

1.5 LEED 2009 REQUIREMENTS

- .1 LEED Documentation:
 - .1 Submit Material Safety Data Sheets (MSDS) or product data sheets, for all site applied interior paints, coatings, adhesives, sealants, sealant primers, concrete curing compounds, etc. to ensure compliance with LEED Requirements for low emitting materials as per Section 01 35 21.

PART 2 - PRODUCTS

2.1 LAMPS

- .1 Refer to Luminaire Schedules on drawings.
 - .2 The lamp wattage, rated life, initial lumens, and mean lumens shall be as follows:
 - .1 32W T8 lamps: Rated Life: 40,000 hours; Initial Lumens: 3100; Mean Lumens 2915.
 - .3 LED Lamps: Rated Life: 50,000 hours; lumen output refer to Luminaire Schedules.
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- .3 The lamp colour and CRI index shall be as indicated on drawings.
- .4 Acceptable Manufacturers:
 - .1 General Electric.
 - .2 Osram/Sylvania.
 - .3 Philips.

2.2 BALLASTS

- .1 Fluorescent ballast: CBM and CSA certified, energy efficient type, IC electronic programmed rapid start design FB1.
 - .1 Rating: 120 V, 60 Hz, for use with 2-32 W, T8 lamps.
 - .2 RFI/EMI suppression circuit to: FCC (CFR47) Part 18, sub-part C, Class A and Part 15, sub-part B, Class B.
 - .3 Totally encased and designed for 40°C ambient temperature.
 - .4 Power factor: minimum 99% with 95% of rated lamp lumens.
 - .5 Crest factor: 1.6 maximum current, 1.0 maximum voltage.
 - .6 Harmonics: 10% maximum THD, including 49th for electronic discrete and hybrid ballasts.
 - .7 Operating frequency of electronic ballast; 21 khz minimum.
 - .8 Total Circuit Power: 60 Watts.
 - .9 Ballast Factor: 0.88.
 - .10 Sound rated: Class A.
 - .11 Mounting: integral with luminaire.
- .2 LED Driver.
 - .1 Rating: 347 V, 60 Hz.
 - .2 Designed for 40°C ambient temperature.
 - .3 Mounting: integral with luminaire.
 - .4 Colour temperature and colour rendering index (CRI): refer to Luminaire Schedule.

2.3 FINISHES

- .1 Light fixture finish and construction to meet ULC listings and CSA certifications related to intended installation.
- .2 Outdoor fixtures shall have durable UV and salt spray resistant finish in accordance with ASTM-B117 standard.

2.4 OPTICAL CONTROL DEVICES

- .1 As indicated on drawings.

2.5 LUMINAIRES

- .1 As indicated in Luminaire Schedule.

2.6 SURGE PROTECTION DEVICES

- .1 LED outdoor Area Luminaires shall be complete with surge protection devices.

2.7 LEED 2009 REQUIREMENTS

- .1 All site applied interior paints, coatings, adhesives, sealants, sealant primers, concrete curing compounds, etc. to comply with LEED Requirements for low emitting materials as per Section 01 35 21 - LEED 2009 Requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Locate and install luminaires as indicated.
- .2 Provide adequate support to suit ceiling system.

3.2 WIRING

- .1 Connect luminaires to lighting circuits.

3.3 LUMINAIRE SUPPORTS

- .1 For suspended ceiling installations support luminaires independently of ceiling.

3.4 LUMINAIRE ALIGNMENT

- .1 Align luminaires mounted in continuous rows to form straight uninterrupted line.
 - .2 Align luminaires mounted individually parallel or perpendicular to building grid lines.
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3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.