

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 09 23.02 - Lighting Control Devices - Photoelectric.

### **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; five (5) plane candlepower summary and lumen ratings.
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- .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 MEASUREMENT FOR PAYMENT**

- .1 No separate measurement for payment shall be made for items under this section. Include costs incidental in the Lump Sum Amount of work on the Combined Price Form.

### **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.
  - .2 LED Lamps: Rated Life: 50,000 hours; lumen output refer to Luminaire Schedules.
- .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: 120 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.

## **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 individually parallel or perpendicular to building grid lines.

### **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.