

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.
- .2 Section 26 05 00 – Common Work Results – Electrical.

1.2 REFERENCES

- .1 Unless otherwise indicated, all the works must be done in accordance with the latest edition of the Quebec Construction Code (QCC).
- .2 Furthermore, works must be carried out in accordance with any other code or standard having jurisdiction, as per the latest edition, including, but not limited to:
 - .1 American National Standards Institute (ANSI).
 - .1 ANSI C82.1, Electric Lamp Ballasts-Line Frequency Fluorescent Lamp Ballast.
 - .2 ANSI C82.4, Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps.
 - .2 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE).
 - .1 ANSI/IEEE C62.41, Surge Voltages in Low-Voltage AC Power Circuits.
 - .3 American Society for Testing and Materials (ASTM).
 - .1 ASTM F1137, Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
 - .4 Canadian Standards Association (CSA) / CSA International.
 - .1 CSA C22.2 No. 74, Equipment for Use with Electric Discharge Lamps.
 - .5 United States of America, Federal Communications Commission (FCC).
 - .1 FCC (CFR47), EM and RF Interference Suppression.

1.3 SUBMITTALS

- .1 Shop drawings:

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- .1 Submit shop drawings in accordance with Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.
- .2 Product data:
 - .1 N/A.
- .3 Samples:
 - .1 Provide documents and samples as requested on the plans.
 - .2 Install one (1) sample fixture, same model as indicated on plans, in mock-up ceiling. Install samples on site for approval by Engineer prior to commencing work.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 21 00 00/26 00 00 – Specific Conditions – Mechanical/Electrical.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure empty containers are sealed and properly stored out of reach of children for disposal.
- .4 Dispose of fluorescent lamps.
- .5 In the case of renovation works, dispose of old PCB filled ballasts.
- .6 Remove and separate for recycling packaging materials and dispose of in appropriate onsite bins in accordance with Waste Management Plan.
- .7 Remove all packaging materials from the site and divert to appropriate recycling facilities.

1.5 GENERAL

- .1 Supply and install all fluorescent tubes and bulbs for each type of lighting as indicated on plans.

PART 2 - PRODUCTS

2.1 LAMPES/DEVICES

- .1 Fluorescent lamps with the following features:
 - .1 T-8;
 - .2 32 Watt (4 ft.), 17 Watt (2 ft.);
 - .3 Initial lumens as indicated on plans;
 - .4 CRI 86;
 - .5 Colour temperature as indicated on plans;
 - .6 24,000 hour lamp life for 2 and 3 ft. lamps;
 - .7 60,000 hour lamp life for 4 ft. lamps;
 - .8 Approved manufacturer: GE, OSRAM/SYLVANIA;
 - .9 Lamps must come from the same manufacturer.
- .2 LED devices with the following features:
 - .1 Lumens as indicated;
 - .2 50,000 hour additional lamp life;
 - .3 5 year minimum manufacturer warranty;
 - .4 Colour temperature 3,500 K interior;
 - .5 Colour temperature of 4,100 K exterior;
 - .6 Model: as indicated on plans.

2.2 BALLASTS

- .1 Electronic type ballast for fluorescent lamps, CBM and CSA certified: energy efficient type.
 - .1 Nominal voltage and start-up: As indicated on plans;

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- .2 Totally encased and designed for 40 degrees Celsius ambient temperature;
- .3 Ambient temperature: ballast must start lamps up to a minimum ambient temperature of 10 °C;
- .4 Power factor: minimum 90% with 95% of rated lamp lumens;
- .5 Sound rated: Class A;
- .6 Mounting: Integral with luminaire;
- .7 Harmonics: 10% maximum THD;
- .8 Electromagnetic emissions: electromagnetic emissions must not exceed Class A, as defined by FCC, part 18, 15C, for interference (EMI) and radio frequencies (RFI);
- .9 Protection against transient fluctuations: ballast must withstand transient voltage fluctuations and electrical noise, as described in ANSI C62.41 and IEEE 587, with and without lamps on the secondary circuit;
- .10 Thermal protection: ballast must have thermal protection, as defined in CSA C22.2 no. 74-1969, article 1.6.7.3 or comply with the technical information letter (T.I.L.) no. 37 of July 25, 1988;
- .11 Supply voltage: ballast must withstand input voltage variation of $\pm 10\%$ without damaging ballast;
- .12 Harmonic distortion: total harmonic distortion (THD) is defined as the sum of the second to the twentieth harmonic. This should not increase as ballast ages and must not exceed 10%;
- .13 Acceptable products: GE or OSRAM/SYLVANIA, or approved equivalent.

2.3 LENSES

- .1 Unless otherwise indicated, all fluorescent lighting is fitted with pure acrylic lenses.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Locate and install luminaires as indicated on plans.

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- .2 Suspended lighting is the responsibility of the electrical Contractor. For suspending surface fluorescent lighting from suspended tile ceilings, the Contractor shall provide, in its bid, a specially designed metal bar to be placed above the suspension to screw in the lighting with wood screws of the appropriate length.
- .3 In mechanical rooms, suspension chains are used for suspended lighting; the exact placement will be determined on site.
- .4 Lighting that replaces existing mercury vapour lighting must be installed with an oversized ring, gauge 16GA, painted according to the client's choice and large enough to conceal the existing opening. Shop drawings must be submitted to Engineer, as requested in specifications.

END OF SECTION