

PART I - GENERAL

- | | | | |
|--------------------------|----|---|---------------|
| <u>1.1 Related Work</u> | .1 | Electrical Pathway Lighting Systems: | Section 16500 |
| <u>1.2 Scope of Work</u> | .1 | Work under this section, in coordination with work under Section 16500, shall comprise the design and installation of complete operational park pathway lighting systems. | |
| | .2 | Coordinate work in this section with work in all other sections. | |

PART II -DESIGN CRITERIA FOR PARK PATHWAY LIGHTING

- | | | | |
|--------------------------------|----|--|--|
| <u>1. Photometric Criteria</u> | .1 | The electrical engineer shall provide the City of Mississauga representative and the contractor with pole layouts and associated lighting calculations. The lighting calculations are to be carried out using the computer programme Micro-Site-Lite and shall include the average horizontal illuminance on the pathway, the average horizontal illuminance for three metres on either side of the pathway, the glare, and the uniformity ratios including the average to minimum and the maximum to minimum. | |
| | .2 | The following parameters are to be specifically adhered to: <ul style="list-style-type: none"> i) The average horizontal and vertical illuminance on the pathway shall be 10 lux. ii) The average horizontal illuminance for three metres either side of the pathway shall be not less than 3.3 lux. iii) Uniformity ratio maximum to minimum shall not exceed 10:1. iv) Uniformity ratio average to minimum shall not exceed 4:1. v) Glare shall not exceed 40%. | |
| | .3 | The lighting calculations will be based on a light loss factor of 0.7 and a calculation grid of 3 metre intervals along the pathway and 0.8 metre intervals across the pathway. | |
| | .4 | The pole spacing shall meet the above criteria with the ideal spacing for each product line as follows:
Quality Lighting, Thematics fixture is thirty-two (32) metres. Moldcast, Module III fixture is thirty-two (32) metres.
General Electric Decashield is thirty-five (35) metres. | |
| | .5 | Luminaires with IESNA Type II cut-off distribution shall be primarily used on the pathways. | |
| <u>2. Electrical Criteria</u> | .1 | The number of poles per run shall be such that the voltage drop does not exceed three percent (3%) from the power supply to the end of the branch circuit, as per the Electrical Code. The following number of poles per branch run is provided as a design guideline only and should be verified by the Electrical Engineer for each park. | |
| | .2 | <u>For #4 AWG TWU Copper Wire:</u> <ul style="list-style-type: none"> i) Twenty (20) poles may be used for 30 metre spacing | |

-
- ii) Eighteen (18) poles may used for 31 to 35 metre spacing
 - .3 For #6 AWG TWU Copper Wire:
 - i) Fifteen (15) poles may be used for 30 to 32 metre spacing
 - ii) Fourteen (14) poles may used for 33 to 35 metre spacing
 - .4 It is assumed that the power supply is located within fifty (50) metres of the first light pole.
3. Submissions
- .1 The electrical engineer shall prepare and submit a "Load Letter" as required by Enersource for the application to connect the path light system to the utility's system. A copy of the load letter must be submitted to the City of Mississauga representative and the contractor.
 - .2 The engineer will prepare all drawings in a digital format as outlined in "Digital Requirements For Drawings". Digital files will be submitted to the City of Mississauga representative upon acceptance of the design and again, once the files have been revised to upon completion of the "As Constructed" field measurements.
 - .3 Upon inspection of the completed and tested light system the engineer is required to submit a letter to the City of Mississauga representative certifying that the installed path light system conforms to the design criteria and the design drawings.
4. Inspection
- .1 The pole locations must be confirmed by the electrical engineer and the City of Mississauga representative prior to the commencement of any work.
 - .2 The contractor is required to provide at least two working days notice to the electrical engineer and City of Mississauga representative prior to commencing each phase of the installation in order to arrange for an inspection.
 - .3 The electrical engineer must verify that all pole locations are staked out properly. Pole locations that deviate more than 0.5 metres in any direction from the original design location must be verified to ensure they continue to meet the photometric criteria.
 - .4 Where the lights have been designed or installed improperly, the lights will be relocated to the satisfaction of the City of Mississauga representative at the contractor's expense.
5. Construction Procedure
- .1 The entire installation is to proceed under the inspection and supervision of the electrical engineer, the City of Mississauga representative and the Facilities and Property Management - Energy Management inspector. Notice is required two working days prior to commencing of each phase installation. Upon completion of the following stages of construction, the contractor is to set up a site inspection to review the installation:
 - .1 Staking of handwell, power pedestal and pole locations

- .2 Trenching
- .3 Handwell, power pedestal, pole and luminaire installation
- .4 Cable laying and wiring
- .5 Sand backfill
- .6 Final backfill, 150mm wide yellow plastic 'Caution Tape' installation and restoration
- .7 Visual night inspection

6. Park Path Light
Criteria Summary

Light source	High Pressure Sodium
Energy Consumption	100 watts
Voltage	240 volts
Circuits	Power supply pedestal - luminaires with individual photocell
Photometry	a) IESNA Distribution: Type II cut-off recommended, Type III and V cut-off at the discretion of City of Mississauga b) Average Horizontal and Vertical illumination level (on pathway): 10 lux c) Average illumination level (3m on either side of pathway): 3.3 lux d) Maximum/Minimum Ratio: 10:1 e) Average/Minimum Ratio: 4:1 f) Disability Glare: 40%
Pole Spacing	As required to obtain photometric criteria
Cut off	Varies and depends on the particular site
Shielding	Site specific applications
Connections	Connection at luminaire shall be polarized and be of male and female plugs
Fusing	Fusing shall be provided at each pole hand hole. Fuses shall be 5 ampere 250V OTM type
Lens	Polycarbonate or Glass with
Shield	Polycarbonate
Pole Installation	Direct buried in a 250 mm dia. hole backfilled with screenings, and compacted to 98% Proctor density.
Pole Style/Type	Square steel pole, 100mm x 100mm x 3mm Length: 7.31m, hot dipped galvanized after fabrication, and powder coated.
Mounting height	6.1m
Mounting config.	Post top installation; to be mounted on a 60 mm outside dia..
Luminaire Style	Shoe box
Weight of Luminaire	Not to exceed 21 kg
Handhole Covers	Stainless steel tamper proof screws
Period of Warranty	One year from date of Preliminary Acceptance for all equipment.
Durability	20 year life expectancy
Colour	Brown, Pantone 297C
Finish method	a) Luminaire - pretreated, powder coated, aluminum b) Pole - Hot dipped galvanized after fabrication, and powder coated

Electrical Standards	IESNA, CSA and Electrical Safety Authority Specifications
Design Parameters	To be carried out on Micro-Site-Lite Light loss factor: 0.7
Calculation Grid:	3.0m intervals along pathway 0.8m intervals across the pathway

END OF SECTION 16010