1. GENERAL

1.01 SECTION INCLUDES

.1 Pole mounted, wall mounted, and canopy mounted solid state, light emitting diode (LED) source exterior luminaires.

1.02 RELATED REQUIREMENTS

.1 Division 04 – Masonry: brick grinding requirements for wall mounted luminaires.

.2 Section 26 09 23 – Lighting Control Devices: photocells, astronomical timers.

.3 Section 26 09 26 – Lighting Control Panelboards.

.4 Section 26 09 43.19 – Wireless Network Lighting Controls.

.5 Section 26 56 13 – Lighting Poles and Standards.

1.03 REFERENCES

.1 CSA Group:

.1 CSA C22.1:21, Canadian Electrical Code, Part 1 (25th Edition), Safety Standard for Electrical Installations.

.2 Ontario Electrical Safety Code (28th edition/2021).

.3 CSA C22.2 No. 9.0 – General Requirements for Luminaires.

.4 CSA C22.2 No. 250.0 – Luminaires (Bi-National Standard, with UL 1598).

.5 CAN/CSA-C22.2 No. 250.13 – Light Emitting Diode (LED) equipment for lighting applications.

.2 DesignLights Consortium (DLC):

.1 Solid-State Lighting Technical Requirements v5.1, or latest edition.

.2 Where the specifications do not explicitly call for DLC qualified LED luminaires, the technical criteria provided in the DLC Technical Requirements provide the basis of the requirements for this section of the Specification.

.3 Illuminating Engineering Society (IES):

.1 IES HB-10-11 – The Lighting Handbook, 10th Edition.

.2 IES LM-79-08 – Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products.

.3 IES LM-80-08 – IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.

.4 IES TM-21-11 – IES Technical Memorandum on Projecting Long Term Lumen Maintenance of LED Light Sources.

.4 National Electrical Manufacturer's Association (NEMA):

.1 SSL-1-10 – Electronic Drivers for LED Devices, Arrays, or Systems.

.2 WD 6 - Wiring Devices - Dimensional Requirements.

.5 Underwriters Laboratories Inc. (UL):

.1 ANSI/UL 1449, (4th Edition), Standard for Safety, Surge Protective Devices.

1.04 ACTION SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00.

.2 Manufacturer reports: Provide a point-by-point photometric analysis of the site, in accordance with the procedures laid out in IES RP-8-18, for review by the Consultant. Include point-by-point calculation zones along the property line. The designer shall lay out a grid of points on the pavement at a maximum spacing of one-third the light fixture mounting height, commencing within one-half the grid spacing from the perimeter boundary.

.3 Product specification sheets or other documentation that includes the designed parameters as detailed in this specification. These parameters include (but are not limited to):

.1 Luminaire cut sheets.

.1 Highlight all parameters of the complete luminaire part number, including lumen package, correlated colour temperature, IES distribution type, and driver information.

.2 Highlight the input watts of the luminaire and the B-U-G rating.

.3 Cut sheet to document L70 lumen maintenance data, in hours, when extrapolated for the worse case operating temperature.

.4 [Lighting Manufacturer's photometric analysis when requested by the Consultant during submittal review.]

1.05 INFORMATIONAL SUBMITTALS

.1 Instructions for installation and maintenance.

1.06 CLOSEOUT SUBMITTALS

.1 Section 01 78 00: Submittals for project closeout.

.2 The Contractor shall be responsible for obtaining from the supplying lighting manufacturers, for each luminaire, a recommended maintenance manual including:

.1 Vendor and local representative's contact information.

.2 Tools required.

.3 Maintenance instructions.

.4 Types of cleaners to be used.

.5 Replacement parts identification lists.

.6 Equipment product data (high-quality reproducible copies).

.3 Complete warranty information including manufacturer's warranty conditions, including driver, luminaire, and accessories.

.4 Light level measurements demonstrating the installation is consistent with the photometric analysis.

1.07 QUALITY ASSURANCE

.1 Luminaires tested to IES LM-79.

.2 Design Qualification Testing performed by a National Voluntary Laboratory Accreditation Program (NVLAP) testing facility. Such testing may be performed by the manufacturer, or an independent testing lab hired by the manufacturer on new luminaire designs, and when a major design change has been implemented on an existing design. A major design change is defined as a design change (electrical or physical) which changes any of the performance characteristics of the luminaire, results in a different circuit configuration for the power supply, or changes the layout of the individual LED's in the module.

.3 Products certified by a recognized testing agency accredited by the Standards Council of Canada, and bearing a certification mark from that agency. Certification shall include wet location rating.

1.08 WARRANTY

.1 Manufacturer Warranty against loss of performance and defects in materials and workmanship for the luminaires for a period of 5 years after acceptance of the luminaires. Warranty to cover all components comprising the luminaire.

.2 [Manufacturer to confirm that the addition of third party bird spikes will not compromise luminaire warranty.]

2. PRODUCTS

2.01 MANUFACTURERS

.1 As noted on Lighting Fixture Schedule.

2.02 OUTDOOR LED LUMINAIRES, GENERAL

.1 Maximum nominal luminaire input wattage as specified for each luminaire type as indicated on the Luminaire schedule.

.2 Luminaires designed for ease of component replacement and end-of-life disassembly.

.3 Input Voltage:

.1 As indicated on Luminaire schedule.

.2 Driver to be compatible with system voltage without use of a step-down transformer. If the manufacturer's standard product offering cannot achieve this, clearly indicate on the shop drawings and clearly indicate location of transformer.

.4 Surge Protection

.1 UL 1449 recognized surge protective device that is wired in front of the driver(s) and protects the luminaire to a minimum Category C Low (per ANSI/IEEE C62.41.2).

.5 Power Factor and Total Harmonic Distortion

.1 Power factor of greater than or equal to 0.9.

.2 THD of less than or equal to 20 per cent.

.6 0-10 V dimming, or as indicated on drawings.

.7 Driver rated for minimum 50 000 hours.

.8 Gasket: neoprene seal between refractor and housing.

.9 Light Distributions:

.1 Fixtures available with IES distribution types I, II, III, IV, V, and other distributions, as noted.

.2 Pole mounted luminaire shall have an available option for low-profile house-side shield.

.10 Self-locking latches of stainless steel and aluminum.

.11 Factory wired including integral driver, terminated at terminal block.

.12 Luminaires with cast aluminum weatherproof housing.

.13 Ingress protection: sealed against moisture and environmental contaminants to IP65 rating or better for both light engines/optics and overall luminaire.

.14 Finishes

.1 Housing and heat sink finished in polyester powder coat paint, minimum 2.5 mil nominal thickness.

.2 Standard finish colours to include black, bronze, grey, white, dark platinum, and graphite metallic.

.3 RAL and custom colour matches to be available as indicated on the luminaire schedule.

2.03 OUTDOOR POLE/ARM MOUNTED AREA AND ROADWAY LED LUMINAIRES

.1 Pole mounted luminaires suitable for the EPA rating of the pole.

.2 Pole finish colour to match that of luminaire.

.3 Source: Light Emitting Diode (LED).

.1 Zonal Lumen Density:

.1 100 per cent between 0 degrees and 90 degrees from nadir.

.2 Less than or equal to 10 per cent between 80 degrees and 90 degrees from nadir.

.2 Minimum luminaire efficacy: 105 lumens per watt.

.3 Correlated Colour Temperature (CCT): 3000 K.

.4 Colour Rendition Index (CRI): 70 CRI minimum.

.5 Minimum L70 lumen maintenance to occur at 50 000 hours in accordance with LM-80 testing data and TM-21 extrapolation. LM-80 testing is to utilize 10 000 hour testing data.

2.04 OUTDOOR WALL MOUNTED AREA LED LUMINAIRES

.1 Source: Light Emitting Diode (LED).

.1 Zonal Lumen Density:

.1 100 per cent between 0 degrees and 90 degrees from nadir.

.2 Less than or equal to 10 per cent between 80 degrees and 90 degrees from nadir.

.2 Minimum luminaire efficacy: 105 lumens per watt.

.3 Correlated Colour Temperature (CCT): 3000 K.

.4 Colour Rendition Index (CRI): 70 CRI minimum.

.5 Minimum L70 lumen maintenance to occur at 50 000 hours in accordance with LM-80 testing data and TM-21 extrapolation. LM-80 testing is to utilize 10 000 hour testing data.

2.05 FIXTURE MOUNTED CONTROLS PROVISION

.1 Provide NEMA 7-pin receptacle on all pole mounted luminaires, complete with shorting cap.

.1 Shorting Cap, Locking-Type Mounting: 3-prong locking-type plug connector. It is used with luminaries with a photocontrol receptacle to complete circuit when a photocontrol is not required.

.2 Basis of design: Intermatic K4500 series.

2.06 [BIRD SPIKES]

.1 Stainless steel bird spikes that fasten to luminaires with adhesive or ties.

.2 Manufacturers:

.1 Luminaire manufacturer's standard bird spikes.

.2 Bird-X.

3. EXECUTION

3.01 EXAMINATION

.1 [Perform a site review of existing poles with manufacturer's paint chip to confirm suitability of new luminaire paint finish on existing poles.]

3.02 INSTALLATION

.1 Install lighting equipment, including but not limited to luminaires, controls, auxiliary devices and the integration of same in strict conformance with all manufacturers' recommendations and instructions the securing of which shall be the responsibility of the Contractor.

.2 Luminaires shall be integrated with controls in accordance with respective luminaire manufacturers' and controls manufacturers' recommendations and instructions and to provide a complete, trouble-free operation without compromising safety, code, and UL/CSA/NOM requirements.

.3 Contractor shall be responsible for sealing all outdoor luminaires for wet locations (i.e. all knock-outs, all pipe and wire entrances, etc.) as is standard industry practice to prevent water from entering luminaires.

.4 All luminaires shall be installed plumb and true and level as viewed from all directions unless specifically identified otherwise in the Luminaire Schedule. Luminaires shall remain plumb and true without continual adjustment or visibly obvious means beyond what is shown on luminaire submittal drawings.

.5 Luminaire finishes which are disturbed in any way during construction shall be touched up or refinished in a manner satisfactory to the Consultant.

.6 Whenever a luminaire or its hanger canopy is installed directly to a surface mounted junction box, a finishing ring painted to match the ceiling, shall be used to conceal the junction box.

.7 All accessories shall be properly installed and adjusted by Contractor in accordance with specification and installation instructions. Any spare items shall be clearly labeled (indicate type of accessory and associated luminaire types).

.8 Install luminaires on poles in accordance with Section 26 56 13.

.9 For wall mounted luminaires:

.1 Provide a smooth grinding of brick, including type such as split face, to ensure a flush contact between luminaire and wall in accordance with Division 04 requirements.

.2 Provide a silicone seal around the luminaire.

.10 Connect luminaire to lighting circuit.

.11 [Provide field installed bird spikes on all luminaires.]

.1 Fasten to luminaire with adhesive, or ties to maintain manufacturer's warranty on luminaire.

.2 Fastening by screws or nails: not permitted.

3.03 SITE TESTS AND INSPECTIONS

.1 Perform lighting system commissioning in accordance with Section 26 08 50.

.2 Perform light meter testing at night and report values to the Consultant.

3.04 ADJUSTING

.1 As required, all adjustable luminaires shall be aimed, focused, locked, etc., by the Contractor under the observation of the Consultant. As aiming and adjusting is completed, locking setscrews and bolts and nuts shall be tightened securely by the Contractor.

.2 All ladders, scaffolds, lifts, etc. required for aiming and adjusting luminaires shall be furnished by the Contractor.

.3 Where possible, units shall be focused during the normal working day. However, where daylight interferes with seeing lighting effects, aiming shall be accomplished at night.

3.05 CLEANING

.1 All luminaires and accessories shall be thoroughly cleaned after being installed. All fingerprints, dirt, tar, smudges, drywall mud and dust, etc. shall be removed by the Contractor from the luminaire bodies, reflectors, trims, and lens or louvers prior to final acceptance. All reflectors shall be free of paint other than factory-applied, if any. All reflectors, cones and lenses shall be cleaned only according to manufacturers' instructions.

End of Section