



CONSTRUCTION SPECIFICATION FOR INSTALLATION OF SECTIONAL STEEL HIGH MAST LIGHTING POLES

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630.01 SCOPE

This specification covers the requirements for the installation of sectional steel high mast lighting poles complete with raising and lowering equipment, including mechanical and electrical components.

630.02 REFERENCES

This specification refers to the following standards, specifications, or publications:

Ontario Provincial Standard Specifications, Material

OPSS 2471 Sectional Steel High Mast Lighting Poles
OPSS 2476 Raising and Lowering Equipment for High Mast Lighting Poles

CSA Standards

S6-14 Canadian Highway Bridge Design Code

630.04 DESIGN AND SUBMISSION REQUIREMENTS

630.04.01 Submission Requirements

630.04.01.01 Assembly of Sectional Steel High Mast Lighting Poles

Installation drawings, calculations, and procedures shall be submitted to the Contract Administrator at least 14 Days prior to the commencement of scheduled start of pole assembly for approval. An Engineer shall affix their seal and signature on the installation drawings, calculations, and procedures verifying that they are consistent with the Contract Documents and sound engineering practices.

These installation drawings, calculations, and procedures shall include all details of equipment to be used in jacking the sections together and lifting the assembled pole, including placing and securing it on the anchorage assembly.

630.04.01.02 Training Certificate

A certificate of training from the manufacturer of the high mast lighting raising and lowering equipment for each person who will be doing the installation work shall be submitted to the Contract Administrator. The certificates shall be submitted 14 Days prior to the commencement of the installation work, and the work shall not proceed until the certificates are accepted by the Contract Administrator. Training certificates that are 5 years old or more shall not be accepted.

The training certificate shall state that the manufacturer certifies that the individual has successfully completed training in the following areas:

- a) Assembly of the pole sections.
- b) Assembly of the raising and lowering equipment.
- c) Operation of the raising and lowering equipment.
- d) Installation of high mast poles and lighting equipment.
- e) Levelling of the luminaire ring assembly.
- f) Inspection of high mast poles and lighting equipment.
- g) Maintenance and repair techniques for sectional steel high mast lighting equipment.
- h) Safety procedures.

The training certificate shall be dated and signed by officers of the manufacturer and shall indicate the dates that the training was provided.

630.04.01.03 Inspection after Fabrication of Sectional Steel High Mast Lighting Pole Equipment

A Manufacturer's Certificate of Conformance shall be submitted to the Contract Administrator upon completion of the fabrication of the sectional steel high mast lighting pole equipment.

630.05 MATERIALS

630.05.01 Sectional Steel High Mast Lighting Poles

Sectional steel high mast lighting poles shall be according to OPSS 2471 and as specified in the Contract Documents.

630.05.02 Raising and Lowering Equipment

Raising and lowering equipment shall be according to OPSS 2476.

630.07 CONSTRUCTION

630.07.01 General

General requirements for electrical work shall be as specified in the Contract Documents.

630.07.01.01 Ordering Sectional Steel High Mast Lighting Poles and Raising and Lowering Equipment

Immediately following the award of the Contract, the high mast lighting poles and the raising and lowering equipment shall be ordered, as required for this Contract. All necessary measures shall be taken to ensure sectional steel high mast lighting poles and the raising and lowering equipment are 100% compatible and fully functional.

Verification of the delivery dates of the high mast lighting poles and the raising and lowering equipment shall be obtained from the suppliers and submitted to the Contract Administrator within 72 hours after the award of the Contract.

Timely and accurate communication shall be maintained with both the Owner and the suppliers regarding the delivery, schedules, and requirements for the high mast lighting poles and the raising and lowering equipment.

Delivery and off-loading of the sectional steel high mast lighting poles and the raising and lowering equipment shall be completed in a timely and efficient manner.

630.07.02 Sectional Steel High Mast Lighting Poles and Equipment

630.07.02.01 Assembly of Sectional Steel High Mast Lighting Poles

The lifting equipment used in contact with the pole sections shall be non-abrasive in nature.

Sectional steel high mast lighting poles shall be assembled so that all sections for individual poles are matched as fabricated. The completed sectional steel high mast lighting pole shall be according to the overall tolerances specified in the Contract Documents.

630.07.02.02 Raising and Lowering Equipment

The raising and lowering equipment and the mechanical and electrical components shall be installed according to the manufacturer's specifications and recommendations.

The raising and lowering equipment manufacturer shall be present during the equipment installation to ensure proper assembly procedures and commissioning.

630.07.02.03 Pole Installation

At least 14 Days prior to the start of pole installation, the Contract Administrator shall be informed, in writing, of the pending operation.

The anchorage setting templates shall be removed prior to installation of lighting poles.

The pole shall be installed plumb, with the base plate positioned and the door orientated as specified in the Contract Documents. The pole shall have adequate support during installation. The pole shall not be

considered self-supporting until all fasteners in the base are tightened by the turn-of-nut method according to CSA S6.

A 12 mm square, welded, 19 AWG galvanized steel metal mesh shall be placed around the outside circumference of the anchor bolt circle, between the pole base plate and the footing after pole installation is completed.

The orientation of the high mast lighting pole shall be as specified in the Contract Documents.

630.07.02.04 High Mast Lighting Equipment

High mast lighting equipment shall be installed as specified in the Contract Documents.

630.07.03 Quality Control

630.07.03.01 Pre-Installation Testing and Inspection

The pre-installation testing and inspection of the high mast lighting pole complete with raising and lowering equipment, including mechanical and electrical components, shall be according to manufacturer's specification and the Contract Documents.

Testing on the torque limiter shall be conducted on the internal drive raising and lowering equipment and on the portable power drill for the external drive raising and lowering equipment unit. The Contractor shall ensure that the torque limiter is set and functions according to the manufacturer's recommendations. The cord connecting the control to each raising and lowering motor or portable power drill shall be a minimum length of 13 m.

A Request to Proceed shall be submitted to the Contract Administrator after completion of the pre-installation testing and inspection.

The next operation after the completion of the pre-installation testing and inspection shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

630.07.03.02 Proof of Performance Testing and Inspection

The ring assembly, including luminaires, and the raising and lowering equipment shall be fully raised, latched, unlatched, and fully lowered a minimum of five times for each installed sectional steel high mast lighting pole. After each raising and lowering sequence, every piece of the raising and lowering equipment shall be inspected to ensure that all components are functioning properly and are not damaged. The cables inside the pole shall be inspected. Twisted cables shall be untwisted prior to each subsequent raising and lowering sequence.

The following shall be inspected:

- a) Winch gear and housing.
- b) Winch cable.
- c) Supporting cables.
- d) Power cable.
- e) Ring assembly.
- f) Latching system.

If problems or deficiencies occur during the testing, the test shall be stopped and the problem or deficiency corrected. Once the problem or deficiency has been corrected, the testing process of the pole and associated material shall be repeated in full.

Each ring assembly and supporting cable shall be inspected and adjusted to ensure that the ring is level.

A Request to Proceed shall be submitted to the Contract administrator after completion of the proof of performance testing and inspection.

The next operation after the proof of performance testing and inspection shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

630.07.03.02.01 Test and Inspection Report

The testing and inspection results shall be documented in a report and submitted to the Contract Administrator. The report shall include sufficient detail to demonstrate and confirm the following:

- a) All of the high mast equipment at each high mast pole was tested and inspected.
- b) The high mast lighting raising and lowering equipment is according to the Contract Documents.
- c) Each sectional steel high mast lighting pole has been installed plumb with the base plate positioned as specified in the Contract Documents.
- d) Each sectional steel high mast lighting pole and raising and lowering equipment passed the proof of performance testing and inspection.
- e) The torque limiter has been fully tested and verified to be fully functional according to the manufacturer's recommendations and the Contract Documents.
- f) The sectional steel high mast lighting pole jacking and installation procedures have been carried out according to the installation drawings, calculations, and procedures.
- g) At the end of the testing at each sectional steel high mast lighting pole, the ring assembly has been levelled, raised to the top of the pole, and fully and properly docked and latched to the head frame assembly at the top of the pole.

A Request to Proceed shall be submitted to the Contract Administrator after completion of the test and inspection report.

The next operation after the test and inspection report shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

630.07.04 Document Submission

The service manual for the high mast lighting equipment shall document in detail the installation and operation of the high mast lighting equipment and components. It shall include clear and detailed illustrations indicating layouts of controls, displays, schematic and wiring diagrams, and other information required to correctly operate a fully assembled and operational high mast lighting unit, as well as the maintenance and service aspects of individual components.

The service manual for the high mast lighting equipment shall include part numbers and settings and options of installation and operation. The manual shall provide sections that completely describe the theory of operation using block diagrams, wiring and schematic diagrams, diagnostic and repair procedures, assembly instructions and drawings, component layout drawings, and acceptable manufacturers and suppliers of miscellaneous component parts.

Each manual for the high mast lighting equipment shall detail all major assembling, adjusting, and aligning procedures and identify all acceptable tolerances or variances. Manuals shall also include:

- a) Detailed specifications of major components.

- b) Copies of the Working Drawings specified in OPSS 2471 and OPSS 2476 reduced to 8½ x 11" paper format.
- c) Component warranty certificates.
- d) Operating instructions.
- e) All other relevant documents or drawings.

630.07.05 Management of Excess Material

Management of excess material shall be according to the Contract Documents.

630.08 QUALITY ASSURANCE

The Owner may make random inspections of individual high mast lighting poles, visually check for proper assembly with related equipment, and witness the raising and lowering of the ring assembly.

630.09 MEASUREMENT FOR PAYMENT

630.09.01 Actual Measurement

**630.09.01.01 25 m Sectional Steel High Mast Lighting Poles and Equipment
 30 m Sectional Steel High Mast Lighting Poles and Equipment
 35 m Sectional Steel High Mast Lighting Poles and Equipment
 40 m Sectional Steel High Mast Lighting Poles and Equipment
 45 m Sectional Steel High Mast Lighting Poles and Equipment**

For measurement purposes, a count shall be made of the number of each size of sectional steel high mast lighting poles and equipment installed.

630.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clause under Actual Measurement.

630.10 BASIS OF PAYMENT

**630.10.01 25 m Sectional Steel High Mast Lighting Poles and Equipment - Item
 30 m Sectional Steel High Mast Lighting Poles and Equipment - Item
 35 m Sectional Steel High Mast Lighting Poles and Equipment - Item
 40 m Sectional Steel High Mast Lighting Poles and Equipment - Item
 45 m Sectional Steel High Mast Lighting Poles and Equipment - Item**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work.

Progress payments shall be based on the following percentages of the Contract price for milestones accepted by the Contract Administrator:

- a) 35% for delivery of all high mast lighting poles and equipment
- b) 5% for certificate of training
- c) 20% for installation of all high mast lighting poles and equipment
- d) 40% for the completed and accepted Test and Inspection Report.