SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		*New York State Department of Transportation* **ENGINEERING INSTRUCTION**	**EI** **14-019**

Title: **HIGH MAST LIGHTING**

Target Audience:

- ☐ Manufacturers (18)
- ☐ Local Govt. (31)
- ☐ Agencies (32)
- ☐ Surveyors (33)
- ☐ Consultants (34)
- ☐ Contractors (39)
- ☐ _____( )

Approved: _____ 9/17/14

Richard Lee, PE
Deputy Chief Engineer (Design)

Date

ADMINISTRATIVE INFORMATION:

- Effective Date: This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of May 7, 2015
- Superseded Issuances: None
- Cost Impact: None anticipated
- Disposition of Issued Materials: Standard Specifications

PURPOSE: The purpose of this EI is to update the current Standard Specifications for High Mast Lighting to use the 2009 AASHTO Standard Specifications, for Structural Supports for Highway Signs, Luminaires and Traffic Signals with interims.

TECHNICAL INFORMATION:

- The AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals were revised in 2001 to include fatigue design. By citing the specific year of this document, Manufacturers will know to design High Mast Lighting Poles with Fatigue Importance Category I.
- Any implied option to allow the use of weathering steel for high-mast poles is being eliminated.
- ASTM Specifications for the pole have been added.

IMPLEMENTATION:

- Main Office Design Quality Assurance Bureau will insert a copy of the Revisions to Standard Specifications beginning with projects submitted for the letting of May 7, 2015.

TRANSMITTED MATERIALS: Metric and USC Standard Specification revisions are attached.

BACKGROUND: The existing Standard Specifications cite the AASHTO Standard Specifications, for Structural Supports for Highway Signs, Luminaires and Traffic Signals without reference to edition. Manufacturers had to assume which edition to follow.

Weathering Steel is no longer allowed for High Mast Lighting.

CONTACT: Direct questions regarding this issuance to Loretta Montgomery of the Office of Design at (518) 485-9674 or via e-mail at Loretta.Montgomery@dot.ny.gov.

Add the following to the (Metric) Standard Specifications of May 4, 2006 -

Replace *670-3.02 Shop Drawings* with:

"670-3.02 Shop Drawings. The Contractor shall submit five copies of the Manufacturer's Shop Drawings to the Engineer for approval. High Mast Lighting drawings will be approved by DCES. These drawings shall cover the following items and be submitted at least ten working days prior to ordering the light standards, breakaway transformer bases, arms, precast concrete foundations and high mast poles, head assemblies and lowering devices. The shop drawings shall be neatly drawn and clearly legible.

For luminaires and photoelectric controls, catalog cuts may be submitted to the Engineer."

723-02 HIGH MAST POLE, HEAD FRAME ASSEMBLY WITH LUMINAIRE RING AND LOWERING DEVICE

Replace *General, Poles, and Anchor bolts, nuts, and washers* with:

General. The steel pole, head frame assembly, luminaire ring and lowering system shall be designed to meet or exceed the *AASHTO Standard Specifications, for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, 2009 with interims, with a Fatigue Importance Category of I. The design wind loading shall be chosen to be consistent with the location of the structure and the height factor. See §723-01 *Aluminum Light Standards and Arms*. The Contractor shall obtain verification of all necessary weights and effective projected areas as required in the contract documents.

Poles. The pole shall meet the requirements of one of the following specifications:

ASTM A53M,	Welded and Seamless Steel Pipe, Grade B, Type E or S
ASTM A500M,	Welded and Seamless Steel Pipe, Grade B (Rounds Only)
ASTM 252,	Welded and Seamless Pipe, Grade 2 or 3, provided that the chemical certifications meet the requirements for ASTM A53M, Grade B Type E or S.

The high mast steel pole shall be capable of supporting the combined weight and projected area of both the lowering system and number of luminaires with built-in ballast as shown on the contract documents.

The high mast pole shall consist of sections of tapered steel tubes, a round cross section, which telescopes into each other with an overlap of 1.5 diameters. Steel used in fabricating the shaft shall have a minimum yield strength of 345 MPa after all fabricating operations have been completed.

The base of the pole shall have an adequate size hand hole complete with a weatherproof cover and lock. A plate shall be welded opposite the hand hole for mounting the lowering system winch (unless externally mounted on the portable power drive), circuit breakers and other hardware. The hand hole area shall have a 1.8 meter reinforcing sleeve. The hand hole and plate shall be designed to accommodate the required High Mast Head

Frame and Lowering Assembly.

The high mast pole shall be galvanized after fabrication in accordance with §719-01 Coating and Repair Methods, Type1.

Anchor Base. The anchor base shall be fabricated of steel meeting or exceeding the yield strength of ASTM A-36M. The anchor base shall telescope the butt end of the pole and be welded on the inside bottom and outside top.

Anchor bolts, nuts, and washers. Anchor bolts and nuts. The top of the anchor bolts shall have a minimum 230 mm of thread. Nuts, washers and a minimum of 300 mm of the top of anchor bolts shall be hot-dipped galvanized in accordance with the requirements of 719-01 *Galvanized Coating and Repair Method, Type II*. Each bolt shall be furnished with two (2) heavy duty, galvanized, hex nuts with a strength equal to or exceeding the proof load of the bolts. Washers shall be plain hardened washers. The Contractor may wish to install pre-assembled anchor bolt cages, subject to approval by the Engineer, in lieu of the design shown in the contract documents.

The pole manufacturer shall design the anchor bolts and nuts in accordance with AASHTO *Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, 2009 with interims, with a Fatigue Importance Category of I."

Replace *BASIS OF ACCEPTANCE* in its entirety with:

"BASIS OF APPROVAL. If the Contractor proposes to use a shape of pole and/or appurtenances different from that indicated in the contract documents, written approval of the change in shape must be received from the Engineer prior to fabrication of the poles and/or appurtenances. The differences shall be highlighted on the shop drawings submitted to the Office of Structures for approval. Where the pole and/or appurtenances to be used are not as indicated in the contract documents, the manufacturer shall certify, in writing that the pole and/or appurtenances supplied meet or exceed the capacity of the pole and/or appurtenances indicated in the contract documents.

BASIS OF ACCEPTANCE. Acceptance of the steel poles and appurtenances will be based on the delivery, by the Contractor to the Engineer, of a manufacturer's certification, signed by a Professional Engineer, of compliance with the specification requirements and the details of the poles and their appurtenances as indicated in the contract documents. The Contractor shall submit to the Engineer five copies of the shop drawings, approved by DCES, that were used to fabricate the poles and appurtenances."

Add the following to the (US Customary) Standard Specifications of May 1, 2008 -

Replace *670-3.02 Shop Drawings* with:

"670-3.02 Shop Drawings. The Contractor shall submit five copies of the Manufacturer's Shop Drawings to the Engineer for approval. High Mast Lighting drawings will be approved by DCES. These drawings shall cover the following items and be submitted at least ten working days prior to ordering the light standards, breakaway transformer bases, arms, precast concrete foundations and high mast poles, head assemblies and lowering devices. The shop drawings shall be neatly drawn and clearly legible.

For luminaires and photoelectric controls, catalog cuts may be submitted to the Engineer."

723-02 HIGH MAST POLE, HEAD FRAME ASSEMBLY WITH LUMINAIRE RING AND LOWERING DEVICE

Replace *General, Poles, and Anchor bolts, nuts, and washers* with:

General. The steel pole, head frame assembly, luminaire ring and lowering system shall be designed to meet or exceed the *AASHTO Standard Specifications, for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, 2009 with interims, with a Fatigue Importance Category of I. The design wind loading shall be chosen to be consistent with the location of the structure and the height factor. See §723-01 *Aluminum Light Standards and Arms*. The Contractor shall obtain verification of all necessary weights and effective projected areas as required in the contract documents.

Poles. The pole shall meet the requirements of one of the following specifications:

ASTM A53,	Welded and Seamless Steel Pipe, Grade B, Type E or S
ASTM A500,	Welded and Seamless Steel Pipe, Grade B (Rounds Only)
ASTM 252,	Welded and Seamless Pipe, Grade 2 or 3, provided that the chemical certifications meet the requirements for ASTM A53, Grade B Type E or S.

The high mast steel pole shall be capable of supporting the combined weight and projected area of both the lowering system and number of luminaires with built-in ballast as shown on the contract documents.

The high mast pole shall consist of sections of tapered steel tubes, a round cross section, which telescopes into each other with an overlap of 1.5 diameters. Steel used in fabricating the shaft shall have a minimum yield strength of 50,000 psi after all fabricating operations have been completed.

The base of the pole shall have an adequate size hand hole complete with a weatherproof cover and lock. A plate shall be welded opposite the hand hole for mounting the lowering system winch (unless externally mounted on the portable power drive), circuit breakers and other hardware. The hand hole area shall have a 6 feet reinforcing sleeve. The hand hole and plate shall be designed to accommodate the required High Mast Head Frame and Lowering Assembly.

The high mast pole shall be galvanized after fabrication in accordance with §719-01 Coating and Repair Methods, Type1.

Anchor Base. The anchor base shall be fabricated of steel meeting or exceeding the yield strength of ASTM A-36M. The anchor base shall telescope the butt end of the pole and be welded on the inside bottom and outside top.

Anchor bolts, nuts, and washers. Anchor bolts and nuts shall be ASTM F1554 Grade 36 or 55. The top of the anchor bolts shall have a minimum 9 inches of thread. Nuts, washers and a minimum of 12

inches of the top of anchor bolts shall be hot-dipped galvanized in accordance with the requirements of 719-01 *Galvanized Coating and Repair Method, Type II*. Each bolt shall be furnished with two (2) heavy duty, galvanized, hex nuts with a strength equal to or exceeding the proof load of the bolts. Washers shall be plain hardened washers. The Contractor may wish to install pre-assembled anchor bolt cages, subject to approval by the Engineer, in lieu of the design shown in the contract documents.

The pole manufacturer shall design the anchor bolts and nuts in accordance with AASHTO *Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, 2009 with interims, with a Fatigue Importance Category of I."

Replace *BASIS OF ACCEPTANCE* in its entirety with:

"BASIS OF APPROVAL. If the Contractor proposes to use a shape of pole and/or appurtenances different from that indicated in the contract documents, written approval of the change in shape must be received from the Engineer prior to fabrication of the poles and/or appurtenances. The differences shall be highlighted on the shop drawings submitted to the Office of Structures for approval. Where the pole and/or appurtenances to be used are not as indicated in the contract documents, the manufacturer shall certify, in writing that the pole and/or appurtenances supplied meet or exceed the capacity of the pole and/or appurtenances indicated in the contract documents.

BASIS OF ACCEPTANCE. Acceptance of the steel poles and appurtenances will be based on the delivery, by the Contractor to the Engineer, of a manufacturer's certification, signed by a Professional Engineer, of compliance with the specification requirements and the details of the poles and their appurtenances as indicated in the contract documents. The Contractor shall submit to the Engineer five copies of the shop drawings, approved by DCES, that were used to fabricate the poles and appurtenances."