ITEM 680.59XXYY01 - MONOTUBE STRUCTURE FOR TRAFFIC SIGNAL INSTALLATION, X.X m MOUNTING HEIGHT, YY m SPAN

To:		*New York State Department of Transportation* **ENGINEERING BULLETIN**	**EB 05-DFT**
		Expires one year after issue unless replaced sooner	

Title: **INTERIM DESIGN GUIDANCE FOR MAST ARM TRAFFIC SIGNAL POLES**

Distribution		Approved:
☒ Manufacturers (18) ☒ Local Govt. (31) ☒ Agencies (32)	❑ Surveyors (33) ☒ Consultants (34) ☒ Contractors (39) ❑ _____( )	_____ Date

ADMINISTRATIVE INFORMATION:

- Effective Date: This Engineering Bulletin (EB) is effective immediately.
- Superseded Issuances: None
- Disposition of Issued Materials: This EB will expire within a year or when the future official design guidance is issued, whichever takes place first.

PURPOSE: The purpose of this issuance is to set a temporary limit of 18 meters for the mast arm length of any newly erected cantilever signal poles. The policy is in effect until the official design guidance is issued before this EB expires.

TECHNICAL INFORMATION:

- Designers will remain responsible for the layout of the mast arm pole geometry, i.e. the pole height, mast arm length, mounting height, and number of signals and signs. Designers should limit the mast arm length for traffic signals to 18 m.

- In the few instances where cantilever signal poles with arm length greater than 18 m become necessary, the designer should consider the following alternative designs:
  - Span wire system.
  - Two separate cantilever poles with shorter arm length.
  - Single bridge structure - two separate poles with a monotube (Region 1 spec attached).
  - Relocation of utility or ROW acquisition to minimize the arm length.

IMPLEMENTATION:

- The following standard specification contract pay items will be temporarily disapproved where the YY is greater than 18.

  680.62XXYY Traffic Signal Pole -- Mast Arm

ITEM 680.59XXYY01 - MONOTUBE STRUCTURE FOR TRAFFIC SIGNAL INSTALLATION, X.X m MOUNTING HEIGHT, YY m SPAN

680.63XXYY Traffic Signal Pole – Dual Mast Arm
680.64XXYY Traffic Signal Pole -- Mast Arm with Lighting Arm
680.65XXYY Traffic Signal Pole – Dual Mast Arm with Lighting Arm
XX = Mast arm mounting height in meters and tenths of a meter
YY = Mast arm length in whole meters

TRANSMITTED MATERIALS: None

BACKGROUND: The Department installed number of mast arm signal poles in the past 15 years. The following is a summary of the signal poles that appeared in Contracts throughout the Regions between 1990 and 2005. The numbers may not be all inclusive, since some of the poles were installed under Requirements Contracts and are not accounted for.

Mast Arm Length (m)	# of Poles installed	%
1 < L < 10	185	38%
10 < L < 15	244	50%
15 < L < 18	56	11%
L > 18	7	1%
Total (1990-2005)	492	100%

Based on the above data, 99% of the existing arm lengths are 18 m and below. Although fatigue condition always exists throughout the mast arm service period, there is no recorded fatigue failure. We noticed that the number of newly erected mast-arm poles with extensive arm length (longer than 18 m) is ever increasing. As some national studies indicate, the longer the arm length is, the bigger the pole and arm diameter, and higher the probability for fatigue failure. This issuance of EB is to prevent esthetically displeasing installations and to reduce the probability of structural failure due to fatigue. This effort is in line with the Department's commitment to context sensitive design.

The Department is in process of adopting the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2001 edition. It is expected that by introducing the fatigue design, the new AASHTO standard will yield bigger arm and pole sizes for the same pole geometry and loading. It will also put a limitation on the mast arm length from practical and CSS point of views. Until the Department issues the official guidance based on 2001 standard, any mast arm pole length greater than 18 m is discouraged.

VENDOR: Pole manufacturers should continue submitting shop drawings to the Department EIC for approval prior to pole installation. For poles that have been ordered, vendors may contact the Department for an exemption from the policy set forth by this EB.

CONTACT: For additional information regarding this issuance, please contact Pratip Lahiri at

plahiri@dot.state.ny.us or Sam Zhou at szhou@dot.state.ny.us of the Design Quality Assurance Bureau at (518) 457-6467.

ITEM 680.59XXYY01 - MONOTUBE STRUCTURE FOR TRAFFIC SIGNAL INSTALLATION, X.X m MOUNTING HEIGHT, YY m SPAN

TO: See attached list.

FROM: Pratip Lahiri, Specfications and Standards section, DQAB, POD 23

SUBJECT: **Request for Review – EB to limit length of mast arm**

DATE: November 2, 2005

A copy of a draft Engineering Bulletin issuing temporary design guidance to place a limit on the length of mast arm for traffic signal poles is attached. Also attached is a Regional specification for a monotube structure.

This is a request to review the proposed Official Issuance and provide any comments by November 18, 2005. Concurrence to the issuance would be assumed otherwise.

You may send your comments by e-mail to plahiri@dot.state.ny.us

You may also send your comments by mail to:

Pratip Lahiri
DQAB, POD 23
NYSDOT
50 Wolf Rd
Albany, NY 12232

Should you have any questions, feel free to call me at (518) 457-4092.

ITEM 680.59XXYY01 - MONOTUBE STRUCTURE FOR TRAFFIC SIGNAL INSTALLATION, X.X m MOUNTING HEIGHT, YY m SPAN

DESCRIPTION

The work shall consist of designing, furnishing, and installing a monotube structure to support a traffic signal. A monotube structure consists of two vertical shafts and an approximately horizontal tube spanning between the two shafts.

The monotube structure shall meet all the requirements of Section 680 - Traffic Signals except as noted herein.

MATERIALS

The monotube structure shall be designed in accordance with the 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. Wind pressures shall be computed as per Appendix C of the AASHTO Standards. Wind speeds shall be considered as per Section 724-03, Wind Loads.

The monotube structure shall be made of the materials specified in Section 724-03, Poles and Arms. The horizontal member shall be continuously tapered from the center to the end, the bigger dimension being at the center.

Each of the two poles shall be equipped with a reinforced hand hole located 90° clockwise, top view, from the axis of the monotube and a 4 NPS cabinet coupling (as described under Section 724-03, Design Criteria) located 180° clockwise from the axis of the monotube. The diameter of the wiring hole must be at least 75 mm. A suitable 4 NPS plug shall be installed on the coupling.

Reinforced hand holes shall be provided every 10 m on the tube, placed on the side away from traffic; weep holes shall be included near the connections of the tube and the shafts.

CONSTRUCTION DETAILS

A single line sketch defining the geometry of the installation (mounting height and span) and the types and locations of the loads shall be provided with the Contract Documents. The Contractor shall provide to the Engineer, for approval, shop drawings and stress computations stamped by a Professional Engineer licensed to practice in New York State, as required by Section 680-3.01.

METHOD OF MEASUREMENT

Monotube structures for traffic signals will be measured as the number of monotube structures satisfactorily installed.

ITEM 680.59XXYY01 - MONOTUBE STRUCTURE FOR TRAFFIC SIGNAL INSTALLATION, X.X m MOUNTING HEIGHT, YY m SPAN

BASIS OF PAYMENT

The unit price bid for each monotube structure shall include the cost of all labor, equipment, and materials (including, but not limited to, grounding systems, anchor bolts, pole caps) necessary to satisfactorily complete the installation.

Payment will be made under:

Item No.	Item Description	Pay Unit
680.59XXYY01	Monotube Structure for Traffic Signal Installation, X.X m Mounting Height, YY m Span	Each