

ENGINEERING DIRECTIVE

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CHIEF ENGINEER

Mast Arm and Foundation Details **Standard Drawings**

General

Effective immediately, the following *Mast Arm and Foundation Details Standard Drawings*, dated February 24, 2011, shall be used on projects that include mast arm traffic signal structures, as specified herein:

- Title Sheet
- Light, Medium and Short Span Load Diagrams
- Heavy Load Diagrams
- Details
- Cored Pier Foundations

These standard drawings supersede the following drawings, dated January 2, 1985:

- Type I Mast Arm Spread Foundations
- 20' – 25' and 30' – 35' – Type II Mast Arm Spread Foundations
- 35' – Type II Mast Arm Cored Pier Foundations

The *Mast Arm and Foundation Details Standard Drawings* have been developed in accordance with the 2001 AASHTO Standard Drawings for Structural Supports for Highway Signs, Luminaires and Traffic Signals. These standard drawings will allow MassDOT design engineers to design and select appropriate mast arm structures and foundations during the design process.

Guidelines for Use

For new design projects and active design projects that have not been submitted for review at the 75% design stage as of March 1, 2011, the *Mast Arm and Foundation Details Standard Drawings* shall be used on all projects that include mast arm traffic signal structures.

For active design projects that have progressed beyond the 75% design submission as of March 1, 2011, the *Mast Arm and Foundation Details Standard Drawings* may be used on projects that include mast arm traffic signal structures, at the discretion of the project proponent.

In all cases, any costs associated with using the *Mast Arm and Foundation Details Standard Drawings* shall be borne solely by the project proponent (the entity responsible for funding the design phase services.)

Additional Design Guidance

Mast arm structures provide flexibility for the installation of video detection and surveillance cameras, emergency pre-emption detectors, signal heads, etc., and are the preferred support structures for traffic signals for MassDOT projects. Therefore, for any proposed use of support structures other than standard mast arms, such as dual mast arms, mast arms longer than 45 feet and strain poles, the design engineer shall provide written justification to MassDOT for the use of the proposed structure.

For approved Strain Pole installations, designs shall conform to the following Standard Drawings:

- Span Wire Assembly with Tether Wire, dated January 2, 1985
- Span Wire Assembly Foundation Details, dated January 2, 1985
- Span Wire Assembly Foundation Charts, dated January 26, 1988

For intersections where the Average Daily Traffic is greater than 40,000 vehicles and the percentage of trucks (classified as WB-50 or greater) is greater than 10%, the *Mast Arm and Foundation Details Standard Drawings* **SHALL NOT APPLY**. Mast arm structures and foundations in these locations shall be designed with a 50-year design life, using Fatigue Category No. 1.

Design engineers shall use a mast arm wind design speed of 130 MPH for all locations.

Design engineers shall use a mast arm foundation wind design speed of 110 MPH for all locations, except for locations in Barnstable, Berkshire, Bristol, Dukes, Nantucket and Plymouth Counties where the mast arm foundation wind design speed shall be 130 MPH.

There may be circumstances that warrant the use of spread footings or coring into rock. For these occasions the design engineer is responsible for designing the spread footing or the rock socket connection details into ledge for MassDOT review and approval.

Availability

The *Mast Arm and Foundation Details Standard Drawings* are available as TIF files on the MassDOT website at <http://www.massdot.state.ma.us/Highway/>. For a direct link to the *Mast Arm and Foundation Details Standard Drawings*, click here: [Mast Arm Drawings](#).