



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
TRAFFIC OPERATIONS DIVISION
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CLAY BRIGHT
COMMISSIONER

BILL LEE
GOVERNOR

TRAFFIC OPERATIONS MEMORANDUM NO. 2103

Traffic Signal Design Guidance

Effective February 11, 2022 Letting (December 1, 2021 Turn-in), the following traffic signal design guidance shall be included in traffic signal design projects unless otherwise approved in writing by the Traffic Operations Division.

For traffic signal head layouts (unless approved in advance by the Traffic Operations Division):

- The minimum distance from the stop line to 12-inch signal faces is 50 feet.
- The maximum distance from the stop line to 12-inch signal faces is 170 feet, unless a near-side supplemental 12-inch signal face is used.

For traffic signal mast arms:

- The mast arm length shall be designed using 5-foot increments (i.e. 40 feet, 45 feet, 50 feet, 55 feet, 60 feet, etc.).
- The minimum single mast arm length shall be 20 feet.
- The maximum single mast arm length shall be 90 feet.
- The maximum twin mast arm length shall be 70 feet.
- The maximum twin mast arm total length of both mast arms shall not exceed 120 feet.
- All mast arms shall include a damper plate per TDOT Special Provision SP700SIG (see attachment). In addition, no items shall be located within the last seven feet of the mast arm such as traffic signals, signs, cameras, and detectors. For street name signs, allow a minimum seven feet from the edge of street name sign to the end of the mast arm.
- Mast arms less than 60 feet shall require a 3-foot diameter foundation. Mast arms 60 feet or longer shall require a 4-foot diameter foundation.
- The minimum angle between twin mast arms is 90 degrees with the mast arms located at the same pole elevation. Twin mast arm angles less than 90 degrees require one of the mast arms to be located above the other mast arm on the pole.

For minimum spacing of traffic signal poles within the same area:

- Between two proposed signal poles:
4.0 x foundation diameter (e.g. 16 feet center-to-center, assuming one or both foundations is a 4-foot diameter foundation).
- Between one proposed signal pole near an abandoned signal pole foundation remaining in the ground and the existing foundation is at ground level:
1.5 x foundation diameter (e.g. 6 feet center-to-center, assuming the proposed foundation is a 4-foot diameter foundation).
- Between one proposed signal pole near an abandoned signal pole foundation remaining in the ground and the void above the existing foundation filled with self-consolidating material:
1.5 x foundation diameter (e.g. 6 feet center-to-center, assuming the proposed foundation is a 4-foot diameter foundation).
- Between one proposed signal pole near an abandoned signal pole foundation remaining in the ground and the void above the existing foundation filled with unclassified material:
3.0 x foundation diameter (e.g. 12 feet center-to-center, assuming the proposed foundation is a 4-foot diameter foundation).

The following TDOT Traffic Signal 730 Special Provisions shall be used in traffic signal design plans where traffic signals are located within these local agency jurisdictions:

- 730C (City of Chattanooga)
- 730CLEV (City of Cleveland/Bradley County)
- 730FA (City of Farragut)
- 730FR (City of Franklin)
- 730JC (City of Johnson City)
- 730K (City of Knoxville)
- 730M (City of Memphis/Shelby County)
- 730MTOWN (City of Morristown)
- 730R (City of Murfreesboro)
- 730N (Metro Nashville/Davidson County)
- 730PF (City of Pigeon Forge)
- 730SV (City of Sevierville)


Phillip Freeze (Oct 3, 2021 20:58 CDT)

P. Brad Freeze, PE
Director
Traffic Operations Division

BF:SKB
10/4/2021
Attachment

SPECIAL PROVISION

REGARDING

HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS

Scope

These design requirements shall apply to **713**-Highway Signing, **714**-Roadway and Structure Lighting, and **730**-Traffic Signals of the current Standard Specifications.

Description

The design of the supports for overhead sign bridges and butterfly configurations, high mast lighting, luminaires, CCTV camera poles, and traffic signal strain poles and mast arm structures shall be in accordance with the American Association of Highway and Transportation Officials (AASHTO) LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st edition, with addenda.

General Conditions

All overhead sign bridges and butterfly sign structures, traffic signal strain poles and mast arm structures and high mast light poles 90-feet or greater in height, shall be designed using the Fatigue Category 1 provisions found in the subject specifications except that, design for galloping-induced fatigue and truck-induced gust fatigue, are excluded. Fatigue designs are not required for luminaire poles less than 55-feet in height, span-wire poles, or roadside sign poles.

In lieu of designing for galloping-induced fatigue in mast arm pole assemblies, a 60-inch by 16-inch by 0.125 gauge aluminum or galvanized steel panel shall be installed horizontally near the end of the mast arm with the long axis of the panel collinear with the long axis of the mast. The panel shall be mounted at such a height as to provide a least a 6-inch clearance from the top of the signal assembly or sign blank located on the mast arm within the length of the anti-galloping panel. The panel and attachment hardware shall be shown on the shop drawings, and is considered an item included in the price bid for the mast arm assembly.

Additionally, all mast arm connections to the support pole shall be accomplished using a wrap-around ring stiffener assembly.

The design coordination instructions are as follows:

- a. The Basic Wind Speed shall be 120 mph for Extreme 1 Limit State.
- b. The Design Life shall be 50 years resulting in a 1,700 year Recurrence Interval.