

Chapter 29

Structural Supports for Signs, Luminaires, and Traffic Signals

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Chapter 29

Structural Supports for Signs, Luminaires, and Traffic Signals

29.1 General

The criteria for the structural design of all sign, signal, lighting, and ITS support structures must be in accordance with AASHTO's ***Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals***, as modified by the ***FDOT Structures Manual, Volume 3***. Include structural details in the Plans for all sign, signal and lighting structures. Use the ***Design Standards*** for sign, signal and lighting support structures unless site conditions or other considerations require a custom design.

When a custom support structure is required, or otherwise specifically designated in the contract documents, the EOR is responsible for the structural design including foundations and the review of the Shop Drawings. Details for supports attached to bridge structures must be coordinated with the bridge structural engineer and included in the plans. See ***Structures Design Guidelines***, Section 1.9 for details and restrictions related to making attachments to bridges.

The following sign and signal structure limits apply:

1. ***Design Standards, Index 11320***, Span Sign Structure span length: 220 feet
2. ***Index 11310***, Cantilever Sign Structure span length: 50 feet
3. ***Indexes 17743 and 17745***, Standard Mast Arm Assemblies span length: 78 feet
4. ***Index 17723 or Index 17725***, Steel or Concrete Strain Pole with Signal Cable span length: 250 feet

These limits were chosen based on past practice and practical experience. See the ***Instructions*** for the applicable ***Design Standards*** for additional information on sign and signal structures.

29.2 Sign Support Structures

Use the applicable **Design Standards** for the following sign support structures:

- **Index 11860** Single Column Ground Signs,
- **Index 11861** Single Column Cantilevered Ground Mounted Signs,
- **Index 11870** Single Post Bridge Mounted Sign Supports,
- **Index 11871** Single Post Median Barrier Mounted Sign Supports,
- **Index 11200** Multi-column Ground Signs,
- **Index 11310** Cantilever Overhead Sign Structures,
- **Index 11320** Span Overhead Sign Structures

Refer to the corresponding **FDOT Instructions for Design Standards (IDS)** for design information.

For **Design Standards, Index 11860**, Single Column Ground Signs, the contactor selects the appropriate pole size using the sign dimensions given in the plans and the four-step process given the standard.

Where the distance between the curb and the sidewalk restricts the use of **Design Standards, Index 11200; Design Standards, Index 11861** may be used.

The EOR is responsible for the design of all multi-column ground signs and overhead sign structures (including bridge mounted signs). This responsibility is for the entire sign structure, including the supports and foundations, as well as all details necessary to fabricate and erect the sign structures. The EOR is also responsible for the shop drawing review in accordance with **Chapter 28** when sign structure shop drawings are required by the Contract Documents.

FDOT assigns identification numbers to overhead sign structures. See the **Structures Detailing Manual, Chapter 2**, for instructions.

If a custom sign support structure is required, include a brief written justification with the 30% plans submittal.

Modification for Non-Conventional Projects:

Delete the sentence above and replace with the following:

If a custom design is required, include a brief written justification with the 90% component plans submittal.

Details for sign supports attached to bridge structures must be coordinated with the bridge structural engineer and included in the plans.

29.3 Lighting Support Structures

Use the applicable **Design Standards** for the following lighting support structures:

- **Index 17502** High Mast Light Poles,
- **Index 17515** Conventional Aluminum Light Poles.

Refer to the corresponding FDOT **IDS** for design information.

29.4 Traffic Signal Support Structures

Use the applicable **Design Standards** for the following traffic signal support structures:

- **Index 17723** Steel Strain Poles,
- **Index 17725** Concrete Strain Poles,
- **Index 17743** Traffic Signal Mast Arms.

Refer to the corresponding FDOT **IDS** for design information.

See **Chapter 7** of this Volume for determining which locations require mast arms.

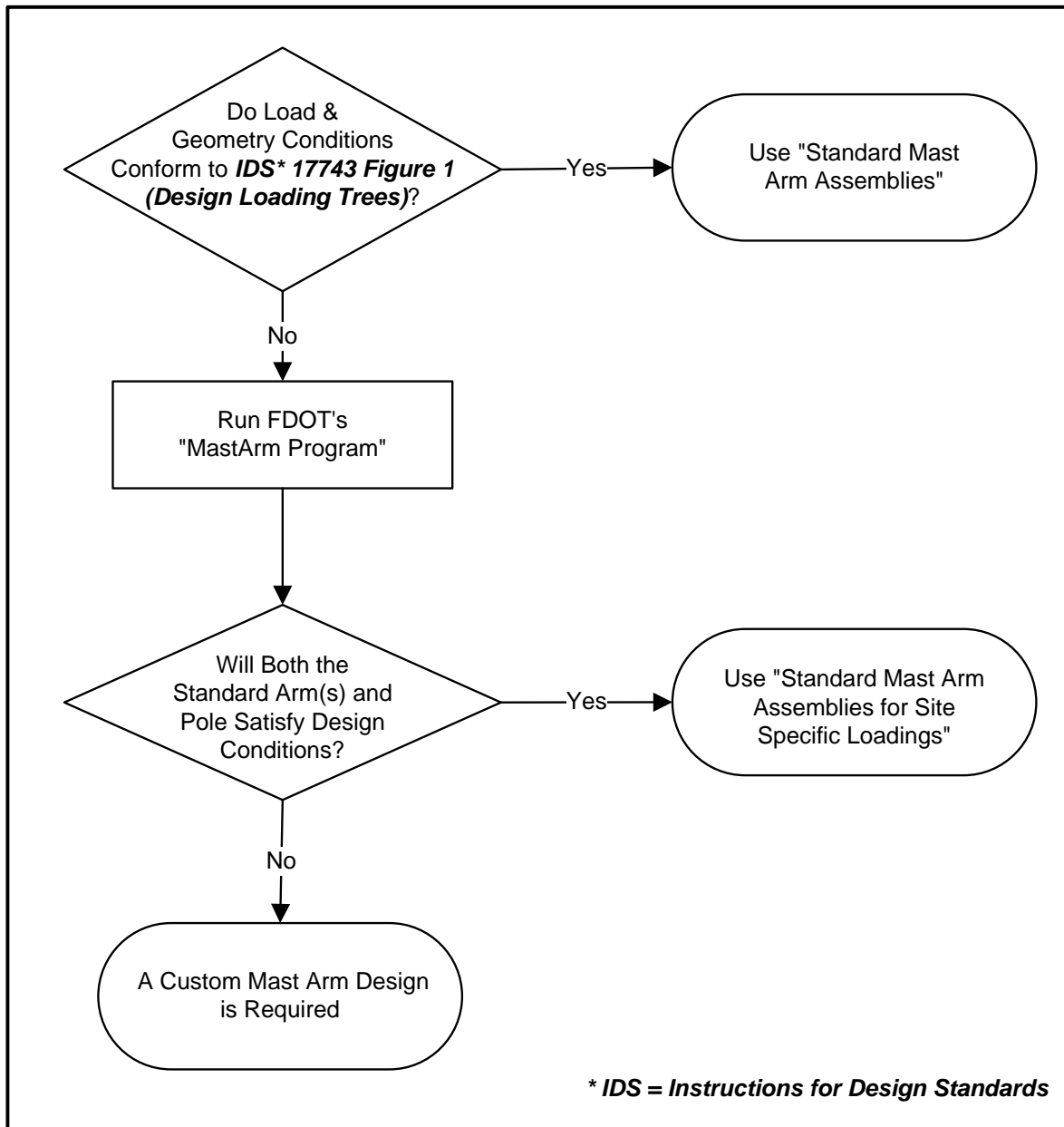
Design all structures assuming traffic signal assemblies have backplates in accordance with **Section 7.4**

Span wire systems have two strain pole options, rectangular prestressed concrete and round steel. Round steel poles are typically used on longer spans where prestressed concrete poles have exceeded their capacity.

For attaching Free-Swinging, Internally-Illuminated Street Sign Assemblies, see **Design Standards, Index 17748**.

Mast Arm Assemblies may be Standard Mast Arm Signal Structures, Standard Mast Arms for Site-Specific Loadings or Custom Designs. Use the Flowchart in **Figure 29.1** to determine which type of Mast Arm design is suitable for the particular application. See **Design Standards, Indexes 17743** and **17745**, and their **Instructions (IDS)**.

Figure 29.1 Flowchart for Designing and Detailing Mast Arm Assemblies



29.5 ITS Support Structures

Use the applicable **Design Standards** for the following ITS support structures:

- **Index 18111** Steel CCTV Poles,
- **Index 18113** Concrete CCTV Poles,
- **Indexes 11310** and **11320** Cantilever and Span Sign Supports to support Dynamic Message Signs (DMS). For additional DMS details, see **Design Standards, Index 18300** Dynamic Message Sign Walk-In.

Refer to the corresponding FDOT **IDS** for design information.

Refer to the **Structures Manual, Volume 3** for Dynamic Message Sign Structure design requirements.

29.6 Foundations

Unique site circumstances may require the foundation variables to be modified from the foundations shown in the **Design Standards**. If custom designs are required, the Geotechnical Engineer must provide the soil information to be used by the Structures Design Engineer during the design phase of the project.

The foundation design and drawings where special foundations are required are the responsibility of the Structures Engineer of Record (EOR). The Geotechnical Engineer must provide the EOR the following soils information (this information may be derived from the borings of other nearby structures or from roadway borings):

1. Soil Type
2. Effective Unit Weight of the Soil
3. Seasonal High Water Table Elevation
4. Effective Friction Angle of the Soil (if applicable)
5. Cohesion Value (if applicable)
6. Coefficient of Horizontal Subgrade Reaction
7. Factored Bearing Resistance (if applicable)

Include the above soils information in the plans. Additionally, Soil Boring Data Sheets must be included in the plans, except for strain poles. This will provide the Contractor with the conditions for which the foundations were designed as compared to actual on-site conditions and establish criteria for any future analysis of the foundations.

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