Chapter 29

Structural Supports for Signs, Luminaires, and Traffic Signals

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29.1 General

Design sign, signal, lighting, and ITS support structures in accordance with the ***AASHTO LRFD 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 to be included in the plans, the EOR is responsible for the structural design, the foundation design, and the review of 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 11310 and 11320***, Cantilever and Span Sign Structure Truss Depth: 9.5 feet
4. ***Indexes 17743 and 17745***, Standard Mast Arm Assemblies span length: 78 feet
5. ***Index 17723*** or ***Index 17725***, Steel or Concrete Strain Pole with Signal Cable span length: 250 feet

These limits are based on past practice, inspection requirements, 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.

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

The EOR is responsible for the following:

- Design of multi-column ground signs and overhead sign structures (including bridge mounted signs),
- Design of the supports and foundations, as well as all details necessary to fabricate and erect the sign structures.
- Review of shop drawings in accordance with ***Chapter 28***.

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.

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*** Standard Mast Arm Assemblies,
- ***Index 17745*** Mast Arm Assemblies.

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***.

See ***Design Standards, Indexes 17743*** and ***17745,*** and their ***Instructions (IDS)***.

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.