

SECTION 700 ROADWAY SIGNS

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish and erect roadway signs at the locations and in accordance with the details shown in the Plans unless otherwise referenced herein. These include roadway static sign assemblies, Internally Illuminated Street Name Signs, Electronic Display Sign assemblies, and Sign Beacon assemblies.

- B. Related Sections
 - 1. Section 630 (Conduit)
 - 2. Section 635 (Pull, Splice, and Junction Boxes)
 - 3. FDOT Specification Section 620 (Grounding and Lightning Protection)
 - 4. FDOT Specification Section 646 (Aluminum Poles, Pedestals, And Posts)
 - 5. FDOT Specification Section 676 (Controller Cabinets)
 - 6. FDOT Specification Section 700 (Highway Signing)

- C. Method of Measurement
 - 1. General:
 - a. Unless otherwise specified herein, a completed assembly includes all materials, equipment, and labor necessary for a complete, functional and accepted installation.
 - b. The cost of furnishing and installing the required installation decals is considered incidental and is included in the unit prices for the signs or assemblies.
 - c. The cost for documenting and returning removed sign panels and assemblies to the Traffic Signals and Signs Division's Yard is considered incidental and is included in the unit prices for removal.
 - 2. Roadway Static Sign Assembly (ground-mounted).
 - a. Single/Multi Post Sign Assembly items: A completed assembly includes the support structure and all the sign panels required to be mounted on the support structure. The Contract unit price per assembly for ground mounted signs (single post and multi-post), furnished and installed, includes furnishing and installing the sign panels, support structure, foundation, hardware, appurtenances, and labor required for a complete and accepted installation.
 - b. Single/Multi Post Sign Assembly Relocation/Removal items: Relocation of sign assembly consists of removing the existing sign assembly and installing the assembly on a new foundation at the location shown in the Plans. When the Plans call for existing ground-mounted signs to be relocated or removed, after removing the sign panel(s) from the assembly, remove support(s) and footing(s). Restore the area of the sign assembly removal or relocation to the condition of the adjacent area at no additional cost.
 - c. Sign Panel Pay Items:

- 1) Pay items for adding/removing sign panel are used only when adding/removing a panel to/from an existing support structure that will remain in place. Adding sign panel requires the use of new attachment hardware. For new single post and multi-column signs, all panels on a new assembly are included in the payment for the assembly. No additional payment will be made for adding/removing panels on single/multi post sign assembly where the entire assembly has been relocated or removed.
- 2) Relocation of sign panels includes new attachment hardware for mounting the relocated signs onto existing support structures as indicated on the Plans.
3. Internally Illuminated Street Name Sign (IISNS).
 - a. Contract unit price per each for IISNS, furnished and installed, will include furnishing the sign panels, housing, hardware, electrical connection, photocontrol, and labor necessary for a complete and accepted installation.
 - b. Includes all hardware necessary to complete the attachment to the mast arm structure as required by the Contract Documents.
4. Electronic Display Sign Assembly (EDS).
 - a. EDS refers to a general category of electronically enhanced signs that includes electronic speed feedback signs and blank-out signs.
 - b. The Contract unit price per assembly for EDS, furnished and installed, includes the sign panels, electronic display, housing, cabinet, controller, speed detector, hardware, electrical connection, wiring, appurtenances, and labor necessary for a complete, functional, and accepted installation as required by the Contract Documents. When the EDS is ground mounted, the Contract unit price includes the sign support structure, conduit, pull box, grounding, and foundation. When the EDS is mounted on span wire or mast arm, the Contract Unit Price includes the hardware necessary to complete the attachment to the support structure; the span wire or mast arm structure will be paid separately.
 - c. In addition:
 - 1) For AC powered assembly does not include the cost of the Electrical Power Service Assembly.
 - 2) For solar powered assembly, price includes solar panels and all components for a complete and functional solar powered installation.
5. Sign Beacon Assembly.
 - a. The Contract unit price per assembly for sign beacon assembly includes the beacons, sign panels, cabinet, electronics, wiring, all necessary appurtenances, and labor necessary for a complete, functional, and accepted installation as required by the Contract Documents. When the sign beacon assembly is ground mounted, the Contract unit price includes the sign support structure, conduit, pull box, grounding, and foundation. When the sign beacon is mounted on span wire or mast arm, the Contract Unit Price includes the hardware necessary to complete the attachment to the support structure; the span wire or mast arm structure will be paid separately.
 - b. In addition:
 - 1) For AC powered beacon assembly, does not include the cost of the Electrical Power Service Assembly.
 - 2) For solar powered beacon assembly, price includes solar panels and all components for a complete and functional solar powered installation.

- 3) For beacon assembly intended for use with school zone signing, price includes equipment approved by the Department for centralized remote calendar programming of days and times of operation.
- 4) For vehicle-activated sign beacon assembly, price includes vehicle detection system listed on the FDOT APL and the TSSQPL.
- 5) For pedestrian-activated sign beacon assembly, price includes a pedestrian detector listed on the FDOT APL and the TSSQPL.
- 6) For warning beacons assembly operated from a wired input received from traffic signal cabinet to temporarily actuate beacons ahead of a change in signal phase, single cable and conduit from the signal cabinet to the sign beacon will be paid separately under the applicable pay items and Specifications in the Contract Documents.

D. Basis of Payment

1. Price and Payment will be full compensation for all work specified in this Specification Section that have awarded Contract Unit Prices under the following items:

Pay Item	Description	Unit
700-1-11B	Single Post Sign, F&I Ground Mount, Up To 12 SF	AS
700-1-12C	Single Post Sign, F&I Ground Mount, 12-20 SF	AS
700-1-50	Single Post Sign, Relocate	AS
700-1-60	Single Post Sign, Remove	AS
700-2-12	Multi- Post Sign, F&I Ground Mount, 12-20 SF	AS
700-2-50	Multi- Post Sign, Ground Mount, Relocate	AS
700-2-60	Multi- Post Sign, Remove	AS
700-3-101	Sign Panel, F&I Ground Mount, Up To 12 SF	EA
700-3-102	Sign Panel, F&I Ground Mount, 12-20 SF	EA
700-3-201	Sign Panel, F&I Overhead Mount, Up To 12 SF	EA
700-3-202	Sign Panel, F&I Overhead Mount, 12-20 SF	EA
700-3-203	Sign Panel, F&I Overhead Mount, 21-30 SF	EA
700-3-204	Sign Panel, F&I Overhead Mount, 31-50 SF	EA
700-3-501	Sign Panel, Relocate, Up To 12 SF	EA
700-3-502	Sign Panel, Relocate, 12-20 SF	EA
700-3-503	Sign Panel, Relocate, 21-30 SF	EA
700-3-601	Sign Panel, Remove, Up To 12 SF	EA
700-3-602	Sign Panel, Remove, 12-20 SF	EA
700-5-21	Internally Illuminated Sign, F&I Overhead Mount, Up To 12 SF	EA
700-5-60	Internally Illuminated Sign, Remove	EA
700-11-139	Electronic Display Sign, F&I Ground Mount- AC Powered, Speed Feedback Sign	AS

Pay Item	Description	Unit
700-11-239	Electronic Display Sign, F&I Ground Mount- Solar Power, Speed Feedback	AS
700-11-391	Electronic Display Sign, F&I Overhead Mount- AC Powered, Blank Out Sign, Up To 12 SF	AS
700-12-11	Sign Beacon, F&I Ground Mount- AC Powered, One Beacon	AS
700-12-12	Sign Beacon, F&I Ground Mount- AC Powered, Two Beacons	AS
700-12-21	Sign Beacon, F&I Ground Mount- Solar Powered, One Beacon	AS

1.02 REFERENCES

- A. Miami-Dade County Traffic Signals and Signs Division’s Qualified Product List (TSSQPL)
- B. FDOT Approved Product List (APL)
- C. Miami-Dade County’s Public Works Manual, Standard Road Detail Sheets R18.1
- D. American Society for Testing and Materials (ASTM)
- E. FHWA Manual on Uniform Traffic Control Devices (MUTCD)
- F. National Electrical Code, NFPA 70 (NEC)

1.03 DELIVERY STORAGE AND HANDLING

- A. Storage, Handling and Labeling:
 - 1. Storage and handling:
 - a. If signs are stored prior to installation, store them in accordance with the manufacturer’s recommendations. Properly package signs to protect them during storage, shipment and handling to prevent damage to the sign face and panel.
 - 2. Installation Decals:
 - a. In addition to the information required in FDOT Specification Section 994, all permanent roadway signs (new, repaired or relocated) must be labeled on the back lower right-hand corner with the date of installation, repair or relocation punched out. The decal must not be placed over any existing installation decal.
 - b. Decals must be manufactured from Type II (ASTM D4956) sheeting with black legend and yellow reflectorized background. The decal must show information that includes the date of installation, repair, or relocation; the name “Miami-Dade County, Florida”; the relevant Florida Statutes and associated fine for sign tampering and the telephone number for reporting damaged or missing signs.
 - c. Make the labels unobtrusive, but legible enough to be easily read by an observer on the ground when the sign is in its final position. Apply the label in a manner that is at least as durable as the sign face.

1.04 ACCEPTANCE OF SIGNS

- A. Sign Inspection:

1. Submit certification that the sign assembly meets the material and installation requirements of the Contract Documents and the approved Shop Drawings. Engineer will inspect the signs at the final construction inspection. Repair and replace signs deemed unacceptable by Engineer at no expense to the Department.

B. Certification of Conformance:

1. Provide a Certificate of Conformance with a notarized Affidavit specifying the alloy and domestic source origin of aluminum signs.
2. Provide a certification that all signs, materials, and installation are in strict accordance with the requirements of this Specification Section.

1.05 SYSTEM DESCRIPTION

A. Design Requirements

1. Engineer of Record must ensure that the proposed sign assemblies and foundation are designed to withstand all applicable loads and meet performance requirements.
2. Electronic Display Signs
 - a. Electronic Speed Feedback Signs (ESFS).
 - 1) Plans must include a schedule listing the programming parameters for the ESFS including Speed Limit, Violation Alert Speed, "SLOW DOWN" Speed, High Speed Cutoff Function (Blank Display), High Speed Cutout Speed, and Minimum Display Speed.
 - 2) ESFS in a school zone may only operate while the speed limit is in effect in the zone. Otherwise the display must be blank.
 - b. Blank-Out Signs (BOS).
 - 1) Plans must include operational details pertaining to all display phases and blank-out phases.
 - 2) Plan details must depict exact mounting location in relation to other traffic signal components and signs on the Mast Arm.

B. Performance Requirements

1. The sign assembly for IISNS, Sign Beacon Assembly, and EDS must be designed and constructed to meet the requirements of FDOT's Structures Manual using a Design Wind Speed of 150 mph.
2. Manufacturer must provide engineering certification that the assembly's major components along with the recommended attachments for mounting on a 4.5" outer diameter pole (Sign Beacon and EDS Assembly) and other support structures (Mast Arms and Span Wire), meet the load requirements of Section 3 of AASHTO LTS-6 as modified by FDOT Structures Manual Volume 3 using a Basic Wind Speed (V) of 150 mph in the determination of the design wind pressure.

1.06 WARRANTY

A. Special Warranty

1. Flashing Beacons and EDS Assemblies: Ensure all EDS, IISNS, and flashing beacon systems have a manufacturer's warranty covering defects in assembly, fabrication, and materials for a minimum of five years from the date of final acceptance. Ensure

the manufacturer will furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the Department within 30 calendar days of notification. In addition, ESFS must include a manufacturer's warranty of ten (10) years on the LEDs, comprising the display segments, from the date of final acceptance.

2. Outbound shipping costs for warranty replacements parts must be paid for by the manufacturer. All control software and firmware updates must be available to the County at no additional charge, during the warranty period.
3. Manufacturer must also provide technical telephone support at no extra charge to the County including replacement components for in-warranty repairs when provided in exchange for the part being replaced.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General:

1. Meet the material and equipment requirements of this Specification Section and any additional requirement stipulated in the Contract Documents.
2. Meet the Sign Fabrication requirements of FDOT Specification Section 700 (Highway Signing).
3. Meet the Storage, Handling and Labeling requirements of FDOT Specification Section 700 (Highway Signing).

B. Concrete:

1. Use concrete meeting the requirements of FDOT Specification Section 346.
2. Obtain concrete from a plant that is listed on the FDOT's Production Facility Listing.

C. Sign Panels.

1. All sign panels must be aluminum unless otherwise shown in the Plans.
2. Sheets and plates for sign panels must meet the requirements of ASTM B209, Aluminum Association Alloy 6061-T6, 5154-H38 or 5052-H38. Sign panels for single column ground mounted signs must utilize aluminum plate with a minimum thickness of 0.08 inches. All other sign panels must utilize aluminum plate with a minimum thickness of 0.125 inches. All panels shall have rounded corners.

D. Retroreflective Sign Sheeting.

1. Meet the retroreflective sign sheeting requirements of FDOT Section 700 (Highway Signing).

E. Roadway Static Sign Assembly (ground-mounted).

1. Mounting Hardware and Posts for Static Signs Only:
 - a. Unless otherwise specified in the Plans, for static roadway sign assemblies use steel sign post, base post, anchor plate, retainer spacer strap, hardware and

appurtenances meeting Standard Road Detail Sheets R18.1 of the Miami-Dade County's Public Works Manual.

b. Sign Post:

- 1) Sign post must be provided with a galvanized 30 inch base post, retainer strap, galvanized anchor plate and all the miscellaneous hardware needed for installation as required by Standard Road Detail Sheets R18.1 of the Miami-Dade County's Public Works Manual.
- 2) Sign and base post must be rolled from rail steel meeting the properties established in ASTM A499. Minimum weight of each post prior to drilling must be three pounds per foot (± 5 percent) with profile dimensions as specified in Standard Road Detail Sheets R18.1 of the Miami-Dade County's Public Works Manual. Post must be galvanized pursuant to ASTM A123 as the last step after fabrication and hole punching has been completed.
- 3) The galvanized steel post must be furnished in appropriate lengths to provide a minimum 7 ft. ground clearance to the bottom of the lowest sign unless otherwise shown in the Contract Documents or Standard Road Detail Sheets R18.1.
- 4) The finished post must be machine straightened and have a smooth uniform finish free from defects affecting strength, durability or appearance.
- 5) Bolt holes having a diameter of $7 / 16$ of an inch must be punched at one inch centers along the post's center line beginning one inch from the top of the post and continued down the length of the post.

c. Anchor Plate:

- 1) Anchor plate must be 6 inch x 12 inch x 0.120 inch steel, hot dip galvanized per ASTM A123. The anchor plate must have two $7 / 16$ inch diameter holes for attaching to base post with sign/base post assembly hardware.

d. Hardware:

- 1) Nuts, bolts, and washers for attaching signs must be 2024-T4 aluminum. Hex-head bolts must be $5 / 16$ inch – 18 UNC x $2 - 1 / 2$ inch with hexagon nuts and flat washers.
- 2) Hardware for attaching sign post to the base post and anchor plates must be Hex-head integral flange bolt, nut and lockwasher. Bolts must be $5 / 16$ inch – UNC x $1 - 3 / 4$ inch meeting ASTM A354, Grade BD (Grade 8). Nuts must be ASTM A563, Grade DH. Lock washer must be heavy duty external type. Finish must be cadmium plated per ASTM A165-80, Type OS, except using clear chromate.
- 3) Retainer-Spacer Strap must be AISI 1020 Steel and be $17 1 / 8$ inch x one inch x $0 - 3 / 8$ inch thick with a $0 - 3 / 8$ inch offset, galvanized per ASTM A123.

F. Internally Illuminated Street Name Sign.

1. Use Internally Illuminated Street Name Sign and mounting hardware that meet the requirements of FDOT Specification Section 700 (Highway Signing) and this Specification.
2. Use Internally Illuminated Street Name Sign and mounting hardware that are listed on the FDOT's APL and the Department's TSSQPL.

G. Electronic Display Sign Assembly.

1. Meet the requirements of FDOT Specification Section 700 (Highway Signing) and this Specification.
2. Use Electronic Display Sign and mounting hardware that meet the requirements of this Specification and are listed on the FDOT's APL and the Department's TSSQPL.
3. Unless otherwise shown in the Plans and approved by Engineer, the ESFS, its components, and sign panels must be U-bolt mounted on a Miami-Dade County TSSQPL approved 4-1/2 inches outer diameter (4 inch nominal) threaded aluminum pedestal pole and square aluminum break away base with a reinforcing collar assembly meeting the requirements of FDOT Specification Section 646. Attachment hardware must meet or exceed the requirements of the Florida Department of Transportation (FDOT) Standard Plans, Index No. 700-010.

H. Sign Beacon Assembly:

1. Meet the requirements of FDOT Specification Section 700 (Highway Signing) and this Specification.
2. Use Sign Beacon assembly and mounting hardware that meet the requirements of this Specification and are listed on the FDOT's APL and the Department's TSSQPL.
 - a. Beacon assemblies intended for use with school zone signing must include a remote means approved by the Department for centralized remote calendar scheduling program days and times of operation.
 - b. Vehicle activated beacons must utilize a vehicle detection system listed on the FDOT APL and the TSSQPL.
 - c. Pedestrian activated beacons must utilize a pedestrian detector listed on the FDOT APL and the TSSQPL.
3. Unless otherwise shown in the Plans and approved by Engineer, the Beacon Assembly, its components, and sign panels must be U-bolt mounted on a Miami-Dade County TSSQPL approved 4-1/2 inches outer diameter (4 inch nominal) threaded aluminum pedestal pole and square aluminum break away base with a reinforcing collar assembly meeting the requirements of FDOT Specification Section 646. Attachment hardware must meet or exceed the requirements of the Florida Department of Transportation (FDOT) Standard Plans, Index No. 700-010.

PART 3 EXECUTION

3.01 INSTALLATION

A. General.

1. Meet all requirements of FDOT Specification Section 620 (Grounding and Lightning Protection) and the National Electrical Code.
2. Perform and document utility clearances.

B. Roadway Static Sign Assembly (ground-mounted).

1. Install pursuant to Standard Road Detail Sheets R18.1 of the Miami-Dade County's Public Works Manual and the Contract Documents.

C. Internally Illuminated Street Name Sign.

1. Install pursuant to FDOT Specification Section 700, the Contract Documents, and the wiring, mounting and installation requirements of the Miami-Dade County TSS Division's "Typical Wiring and Installation Details Internally Illuminated Street Name Signs (IISNS)".
- D. Electronic Display Sign Assembly.
1. Install pursuant to FDOT Specification Section 700 and the Contract Documents.
 2. For ground mounted EDS Assembly.
 - a. Construct foundation and install support structure in accordance with FDOT Section 646, this Specification Section, Standard Plans, Index 700-120, and the Contract Documents.
 - b. Set anchor bolts 90 degrees apart with a bolt circle diameter of 13 inches. Adjust anchor bolts to a plumb line and hold rigidly in position to prevent displacement while pouring concrete.
 - c. Meet the requirements of FDOT Specification Section 620 and the NEC.
- E. Sign Beacon Assembly.
1. Install pursuant to FDOT Specification Section 700 and the Contract Documents.
 2. For ground mounted Sign Beacon Assembly.
 - a. Construct foundation and install support structure in accordance with FDOT Section 646, this Specification Section, Standard Plans, Index 700-120, and the Contract Documents. Bolt circle radius must be thirteen inches.
 - b. Set anchor bolts 90 degrees apart with a bolt circle diameter of 13 inches. Adjust anchor bolts to a plumb line and hold rigidly in position to prevent displacement while pouring concrete.
 - c. Meet the requirements of FDOT Specification Section 620 and the NEC.

3.02 REMOVAL

- A. Deliver sign panels, sign assemblies, EDS, IISNS and all sign equipment removed pursuant to these specifications a to the Department of Transportation and Public Works, Traffic Signals and Signs Division's Yard at 7100 NW 36th Street, Miami, FL 33166.
- B. Document delivery and coordinate with the TSS Division's warehouse manager prior to offloading the material.

3.03 RESTORATION

- A. Restore all areas impacted by the Work.
- B. Restore any areas impacted by the installation of a crosswalk enhancement assembly to original condition unless otherwise shown in the Plans. Install crosswalk enhancement assembly in accordance with the Americans with Disabilities Act Standards for Transportation Facilities.

END OF SECTION 700