



*Florida Department of Transportation*

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SECRETARY

June 12, 2015

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: State Specifications Office  
Section **700**  
Proposed Specification: **7000100 Highway Signing.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Matt Dewitt of the State Traffic Engineering and Operations Office to update the language for current Department and industry practice.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to SP965DS or [daniel.scheer@dot.state.fl.us](mailto:daniel.scheer@dot.state.fl.us).

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Daniel Scheer, P.E.  
State Specifications Engineer

DS/dt

Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

**HIGHWAY SIGNING.****(REV ~~4-27296-11-15~~)**

ARTICLE 700-1 is deleted and the following substituted:

**700-1 General Requirements.**

**700-1.1 Description:** Furnish and erect roadway signs at the locations, ~~shown in the Plans~~ and in accordance with the details, shown in the Plans.

The Department designates ground traffic signs as signs erected on the shoulders, slopes, or medians, but not extending over the traveled roadway, and may further classify these signs as single post or multi-column.

The Department designates signs erected partially or completely over the traveled roadway or mounted on bridges as overhead traffic signs, and may further classify these signs as overhead cantilever or span traffic signs.

Meet the requirements of Section 603.

SUBARTICLE 700-3.2.1.1 is deleted and the following substituted:

**700-3.2.1.1 General:** Signs ~~shall~~ must not exceed 9 feet in length, or be larger than 18.0 square feet in area, ~~or and must not~~ weighing more than 144 pounds ~~are not listed on the APL, and must be submitted to the Engineer for approval.~~ Provide an ~~UL-listed~~ internally illuminated sign assembly ~~or equivalent~~ listed to the requirements of UL48. Light emitting diode (LED) retrofit kits must be listed on the APL.

SUBARTICLE 700-3.2.1.2 is deleted and the following substituted:

**700-3.2.1.2 Housing:** Ensure that the sign housing is constructed of continuous 5052 or 6063-T5 aluminum. All housing, corners, and door seams must be continuously welded. ~~All corners must be welded.~~ All exterior surfaces of the assembly must be powder-coat painted in accordance with Military Standard MIL-PRF-24712A or AAMA-2603-02. Finish must meet the requirements of ASTM D3359, ASTM D3363, and ASTM D522. Sign housings with any interior airspace must consist of a box type enclosure and separate hinged door assembly. The sign housing must include provisions to prevent water from entering the sign housing. Drain holes in the sign larger than 0.125 inch must be covered by a screen.

Signs must have removable sign faces. The sign assembly must have one face unless specified otherwise in the Plans. The sign face must be secured by a method that holds the sign face securely in place. Slide-in grooves are allowed to secure the sign face if the sign is edge lit.

The sign face must be a translucent lens constructed of 0.125 inch thick high impact strength polycarbonate or acrylic meeting UL48. Letters must be as detailed in the Contract Documents. Background must be translucent retroreflective sheeting coated with a transparent, pressure-sensitive adhesive film. Color must meet the criteria as detailed in Sections 994. Retroreflective sheeting must meet the requirements of Section 994, and be listed on the APL.

If a door opens upward, it shall have a bracket on each side to secure the door in the open position during maintenance. Doors shall be permanently and continuously sealed with a foam gasket listed to UL157 to prevent the entry of water into the sign housing. Each door must be secured from opening by a minimum of two stainless steel rotary action draw latches ~~with an additional latch for every six feet of sign length.~~

The sign assembly must be designed and constructed to withstand 150 mph wind loads meeting the requirements of the Department's Structures Manual.

SUBARTICLE 700-3.2.2.1 is deleted and the following substituted:

**700-3.2.2.1 General:** Ensure highlighted signs meet the design and functional requirements specified in this Section and Section 2A of the MUTCD. Use ~~light emitting diodes (LED)s~~ to highlight ~~as the~~ sign's shape, color, or message.

Stop, Do Not Enter, Yield, and Wrong Way signs that are highlighted with LEDs must use red LEDs. All other signs must use LEDs which resemble the color of the sign background color.

SUBARTICLE 700-3.2.5 is deleted and the following substituted:

**700-3.2.5 Electrical Requirements:** Electrical wiring must meet NEC requirements for the light source provided. All wiring must be copper wire. All internal electrical wiring must be tight and secure. Ensure the sign includes an accessible electrical power service entrance compartment (internal or external) for connection of field wiring. External compartments must be weather-tight. All power supplies and ballasts must be Federal Communications Commission (FCC) approved.

Ensure ~~battery electrical~~ connections are protected against corrosion. All signs must have provisions for an integrated photocell.

SUBARTICLE 700-3.2.7 is deleted and the following substituted:

**700-3.2.7 Submittal Requirements for Acceptance of Internally Illuminated Signs:**

~~700-3.2.7.1 General: Free swinging, internally illuminated signs and clamp on cantilever arms mounted on the upright poles of mast arm assemblies or monotube signal structures may be accepted either by certification or by shop drawing submittal and approval as stipulated in this Section.~~

~~700-3.2.7.2 Acceptance of Signs by Certification: Provide evidence eCertification that signs has been reviewed, approved and is listed on the APL meets the requirements of this Section.~~

~~700-3.2.7.3 Acceptance of Signs by Shop Drawing Approval: Submit shop drawings for internally illuminated signs larger than 18.0 square feet in area or weighing more than 144 pounds. Signs submitted for acceptance by shop drawing approval must be manufactured by a vendor with an approved internally illuminated sign listed on the APL.~~

~~700-3.2.7.4 Acceptance of Clamp-On Cantilever Arms: For and clamp-on cantilever arms supporting signs less than 18 square feet in area or weighing less than 144 pounds, certify to the Engineer that the arm provided meets the criteria in this Section.~~

SUBARTICLE 700-4.1 is deleted and the following substituted:

**700-4.1 Sign Types General:** Dynamic Message Signs (DMS) must meet the requirements of NEMA TS4-2005. DMS are classified by the type of sign display and the type of mechanical construction. Provide monochrome, tri-color, or full-color signs as shown in the Contract. Use only equipment and components that meet the requirements of these minimum specifications and are listed on the APL. DMS LED retrofit kits must be listed on the APL.

SUBARTICLE 700-4.2.7 is deleted and the following substituted:

**700-4.2.7 Sign Housing Photosensors:** Ensure the sign meets the requirements of NEMA TS 4-2005, Section 8.8. Ensure that the sensors provide accurate ambient light condition information to the sign controller for automatic light intensity adjustment. Ensure that the automatic adjustment of the LED driving waveform duty cycle occurs in small enough increments that the sign's brightness changes smoothly, with no perceivable brightness change between adjacent levels. Ensure that stray headlights shining on the photoelectric sensor at night do not cause LED brightness changes.

Ensure that the brightness and color of each pixel is uniform over the sign's entire face within a 30 degree viewing angle in all lighting conditions.

SUBARTICLE 700-4.10 is deleted and the following substituted:

**700-4.10 TMC Communication Specification for all DMS:** Ensure that the sign controller is addressable by the TMC through the Ethernet communications network using software that complies with the NTCIP 1101 base standard (formerly the NEMA TS 3.2-1996 Standard), including all amendments as published at the time of contract letting, the NTCIP Simple Transportation Management Framework, and conforms to Compliance Level 1. Ensure that the software implements all mandatory objects in the supplemental requirement ~~SR-781-3-700-4.1.1~~, Dynamic Message Sign NTCIP Requirements, as published on the Department's State Traffic Engineering and Operations Office web site at the time of contract letting. Ensure that the sign complies with the NTCIP 1102v01.15, 2101v01.19, 2103v02.07, 2201v01.15, 2202v01.05, and 2301v02.19 Standards. Ensure that the sign complies with NTCIP 1103v02.17, Section 3.

Ensure that the controller's internal time clock can be configured to synchronize to a time server using the network time protocol (NTP). NTP synchronization frequency must be user-configurable and permit polling intervals from once per minute to once per week in one-minute increments. The controller must allow the user to define the NTP server by internet protocol (IP) address.

Provide communications line circuits that are point-to-point or multipoint, and that provide full duplex asynchronous data transmissions at the rate shown in the contract documents or directed by the Engineer.

Assign each sign controller a unique address.

SUBARTICLE 700-4.21 is deleted and the following substituted:

**700-4.21 Operational Testing:** After the system testing is successfully completed; conduct one continuous 72 hour, full-operating test prior to conducting the 630 day acceptance test. The Engineer will approve the type of tests to be conducted. Include in the tests all control, monitoring, and communications functions of the field equipment by the master equipment.

SUBARTICLE 700-4.22 is deleted and the following substituted:

**700-4.22 Acceptance Testing:** Conduct a 630 day acceptance test after the successful completion of the approved 72 hour operational test. During the 630 day test period, limit downtime due to mechanical, electrical, or other malfunctions to a maximum total of five calendar days. If the equipment fails to operate for a total of five or more calendar days, testing will be restarted. The Engineer may select to pause and extend the 630 day test period by the number of days lost by failure and repair time in lieu of restarting the full 630 day test. The Engineer will furnish the Contractor with a letter of approval and completion stating the first and last day of the 630 day test period.

**HIGHWAY SIGNING.****(REV 6-11-15)**

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**700-1 General Requirements.**

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**700-3.2.1.1 General:** Signs must not exceed 9 feet in length or be larger than 18.0 square feet in area, and must not weigh more than 144 pounds. Provide an internally illuminated sign assembly listed to the requirements of UL48. Light emitting diode (LED) retrofit kits must be listed on the APL.

SUBARTICLE 700-3.2.1.2 is deleted and the following substituted:

**700-3.2.1.2 Housing:** Ensure that the sign housing is constructed of continuous 5052 or 6063-T5 aluminum. All housing, corners, and door seams must be continuously welded. All exterior surfaces of the assembly must be powder-coat painted in accordance with Military Standard MIL-PRF-24712A or AAMA-2603-02. Finish must meet the requirements of ASTM D3359, ASTM D3363, and ASTM D522. Sign housings with any interior airspace must consist of a box type enclosure and separate hinged door assembly. The sign housing must include provisions to prevent water from entering the sign housing. Drain holes in the sign larger than 0.125 inch must be covered by a screen.

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The sign face must be a translucent lens constructed of 0.125 inch thick high impact strength polycarbonate or acrylic meeting UL48. Letters must be as detailed in the Contract Documents. Background must be translucent retroreflective sheeting coated with a transparent, pressure-sensitive adhesive film. Color must meet the criteria as detailed in Sections 994. Retroreflective sheeting must meet the requirements of Section 994, and be listed on the APL.

If a door opens upward, it shall have a bracket on each side to secure the door in the open position during maintenance. Doors shall be permanently and continuously sealed with a foam gasket listed to UL157 to prevent the entry of water into the sign housing. Each door must be secured from opening by a minimum of two stainless steel rotary action draw latches.

The sign assembly must be designed and constructed to withstand 150 mph wind loads meeting the requirements of the Department's Structures Manual.

SUBARTICLE 700-3.2.2.1 is deleted and the following substituted:

**700-3.2.2.1 General:** Ensure highlighted signs meet the design and functional requirements specified in this Section and Section 2A of the MUTCD. Use LEDs to highlight the sign's shape, color, or message.

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**700-3.2.5 Electrical Requirements:** Electrical wiring must meet NEC requirements for the light source provided. All wiring must be copper wire. All internal electrical wiring must be tight and secure. Ensure the sign includes an accessible electrical power service entrance compartment (internal or external) for connection of field wiring. External compartments must be weather-tight. All power supplies and ballasts must be Federal Communications Commission (FCC) approved.

Ensure electrical connections are protected against corrosion. All signs must have provisions for an integrated photocell.

SUBARTICLE 700-3.2.7 is deleted and the following substituted:

**700-3.2.7 Acceptance of Internally Illuminated Signs:** Certify that signs and clamp-on cantilever arms provided meet the criteria in this Section.

SUBARTICLE 700-4.1 is deleted and the following substituted:

**700-4.1 General:** Dynamic Message Signs (DMS) must meet the requirements of NEMA TS4-2005. DMS are classified by the type of sign display and the type of mechanical construction. Provide monochrome, tri-color, or full-color signs as shown in the Contract. Use only equipment and components that meet the requirements of these minimum specifications and are listed on the APL. DMS LED retrofit kits must be listed on the APL.

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**700-4.2.7 Sign Housing Photosensors:** Ensure the sign meets the requirements of NEMA TS 4-2005, Section 8.8. Ensure that the sensors provide accurate ambient light condition information to the sign controller for automatic light intensity adjustment. Ensure that the automatic adjustment of the LED driving waveform duty cycle occurs in small enough increments that the sign's brightness changes smoothly, with no perceivable brightness change between adjacent levels. Ensure that stray headlights shining on the photoelectric sensor at night do not cause LED brightness changes.

Ensure that the brightness and color of each pixel is uniform over the sign's entire face within a 30 degree viewing angle in all lighting conditions.

SUBARTICLE 700-4.10 is deleted and the following substituted:

**700-4.10 TMC Communication Specification for all DMS:** Ensure that the sign controller is addressable by the TMC through the Ethernet communications network using software that complies with the NTCIP 1101 base standard (formerly the NEMA TS 3.2-1996 Standard), including all amendments as published at the time of contract letting, the NTCIP Simple Transportation Management Framework, and conforms to Compliance Level 1. Ensure that the software implements all mandatory objects in the supplemental requirement SR-700-4.1.1, Dynamic Message Sign NTCIP Requirements, as published on the Department's State Traffic Engineering and Operations Office web site at the time of contract letting. Ensure that the sign complies with the NTCIP 1102v01.15, 2101v01.19, 2103v02.07, 2201v01.15, 2202v01.05, and 2301v02.19 Standards. Ensure that the sign complies with NTCIP 1103v02.17, Section 3.

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Provide communications line circuits that are point-to-point or multipoint, and that provide full duplex asynchronous data transmissions at the rate shown in the contract documents or directed by the Engineer.

Assign each sign controller a unique address.

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**700-4.21 Operational Testing:** After the system testing is successfully completed; conduct one continuous 72 hour, full-operating test prior to conducting the 30 day acceptance test. The Engineer will approve the type of tests to be conducted. Include in the tests all control, monitoring, and communications functions of the field equipment by the master equipment.

SUBARTICLE 700-4.22 is deleted and the following substituted:

**700-4.22 Acceptance Testing:** Conduct a 30 day acceptance test after the successful completion of the approved 72 hour operational test. During the 30 day test period, limit downtime due to mechanical, electrical, or other malfunctions to a maximum total of five calendar days. If the equipment fails to operate for a total of five or more calendar days, testing will be restarted. The Engineer may select to pause and extend the 30 day test period by the number of days lost by failure and repair time in lieu of restarting the full 30 day test. The Engineer will furnish the Contractor with a letter of approval and completion stating the first and last day of the 30 day test period.