Florida Department of Transportation

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ROADWAY DESIGN BULLETIN 12-05

STRUCTURES DESIGN BULLETIN 12-03

DATE: March 2, 2012

TO: District Directors of Production, District Directors of Operations, District Design Engineers, District Structures Engineers, District Construction Engineers, and District Traffic Operations Engineers

FROM: David C. O'Hagan, P.E., State Roadway Design Engineer
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COPIES: Tom Byron, Duane Brautigam, David Sadler, Tim Lattner, Charles Boyd, Mark Wilson, Chris Richter (FHWA), Jeffrey Ger (FHWA)

SUBJECT: Median Traffic Railing Mounted Signs

Currently the Plans Preparation Manual - Section 7.2.1 provides guidance that, "All signs not bridge or barrier wall mounted and installed within the clear recovery zone must be breakaway or protected by an approved barrier." Design Index 11870 provides details for mounting signs to bridge rails but there are no details or guidance in the PPM or Design Standards for signs that are mounted on Type K or median traffic barrier/rails. The Structures Office is currently working on a rigid design for median barrier wall mounted signs which includes the following design requirements:

1. Sign post shall be ASTM A53 Grade B, 3" NPS (minimum) Schedule 40 steel pipe.
2. Base plate shall be ASTM A36 or ASTM A709 Grade 36, ¾" thick (minimum), 1 ¼" thick (maximum) steel plate. Width of base plate shall be 8" for use with ***Design Standards Indexes 420*** and ***425*** (placed back to back), ***Index 421*** and ***Index 410*** full wall median barrier. Width of base plate shall be 7" for use with ***Design Standards Index 410*** half wall median barriers (placed back to back).
3. Design for the wind loads specified in PPM ***Section 7.2.2***.
4. Attach the post to the base plate using a full penetration weld.

5. Provide 45 degree beveled edges at both ends of the base plate.
6. Hot-dip galvanize the sign support and base after fabrication in accordance with ***Specification Section 962***.
7. Use a minimum of four - ¾" diameter adhesive bonded anchor bolts embedded a minimum of 12" into the top of the traffic railing to attach the sign support to the railing. Use ASTM F1554 Grade 36 headless anchor bolts threaded full length, ASTM A563 or A194 self locking hex nuts and ASTM F436 flat washers hot-dip galvanized in accordance with ***Specification Section 962***. Design the adhesive bonded anchor bolts in accordance with ***Structures Design Guidelines*** Section 1.6. Position the anchor bolts to clear reinforcing steel within the traffic railing. A staggered anchor bolt arrangement is recommended.
8. Design the sign attachment to the post per ***Design Standards Index 11860***.
9. Locate the bottom of the sign panel a minimum of 7' above the surface of the adjacent travel way.
10. Do not design the sign support for vehicular impact loads.
11. Do not use aluminum for the post and base plate.
12. Do not use a saddle-type base plate that fits over the top of the traffic railing.
13. Do not use a frangible or slip base to attach the sign support to the traffic railing.
14. Do not use a sleeve type connection between the sign support and the base plate.

Until such time as details and Design Standards are posted, the interim policy is to attach all median barrier signs using a rigid connection. Median barrier mounted signs should be limited only to those signs that are **critical to safety** (i.e. No U Turns, Warning Signs for Lane Control or Lane Reduction, etc.) **not enforcement** (i.e. Speed Limit Signs).

BACKGROUND

These criteria are intended to improve crashworthiness of median traffic railings and the miscellaneous attachments that are made to them while still meeting minimum standards for roadway signing.

Steel is the required material for median traffic railing mounted sign supports because it is more ductile than aluminum and thus is less likely to break completely away when impacted by an errant vehicle.

Likewise, the use of a rigid connection to attach a sign support to a traffic railing reduces the potential for the support and sign to break off and become a hazard to other vehicles when impacted by an errant vehicle.

DESIGN IMPLEMENTATION

These requirements also apply to back-to-back outside shoulder traffic railings that are located so close together that the required setback distances cannot be provided for both railings. See also the requirements stated in **PPM *Table 7.1.2.1***.

Although primarily intended for permanent installations, these design criteria can also be used for designing median traffic railing mounted temporary signs and supports for Temporary Traffic Control. They can also be used for temporary signs and supports mounted to outside shoulder traffic railings where there is insufficient room to accommodate the use of ***Design Standards Index 11870***.

These requirements are effective immediately on all projects in Phase I or Phase II design development (less than 60% complete). These requirements may be implemented immediately on all projects either in Phase III, Phase IV at the discretion of the District (i.e. designs which are required before the release of the Design Standard shall use the design requirements above and shall be signed and sealed by a Professional Engineer registered by the Florida Board of Professional Engineers).

CONSTRUCTION IMPLEMENTATION

Work zone signs are critical to safety and will be allowed if designed in accordance with the above requirements and shall be signed and sealed by a Professional Engineer registered by the Florida Board of Professional Engineers.

CONTACT

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