

New Jersey Department of Transportation
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Baseline Document Change Announcement

ANNOUNCEMENT: BDC17MR-02

DATE: July 18, 2017

SUBJECT: Revisions to the 2015 Roadway Design Manual, Section 8, Guide Rail and Median Barriers

REFERENCE: Barrier Curb, Guide Rail and Bridge Attachment Details
- **Revisions to CD-607 through CD-609, BCD-507-8 and BCD-507-9 of the Standard Construction Details 2016, Roadway and Bridge**

BDC17D-02

Midwest Guardrail System (MGS)

- **Revision to Subsections/Subparts 607.04, 609.03.01, 609.03.03, 609.04, 913.01.02 & 913.01.03 and addition of new Subparts 609.03.07, 609.03.08 & 609.03.09 to the 2007 Standard Specifications for Road and Bridge Construction.**

BDC17S-07

Section 8, Guide Rail and Median Barriers of the 2015 Roadway Design Manual has been completely Revised.

NJDOT certifies that all changes are in conformance to the following:

- Update to AASHTO Roadside Design Guide (RDG), 4th Edition 2011
- MASH implementation for guide rail and concrete barrier curb
- MASH crash tested 31" high Midwest Guide Rail System (MGS)

The AASHTO/FHWA Joint Implementation Agreement for the AASHTO Manual for Assessing Safety Hardware (MASH) as of 12/22/2015 states that only guide rail and cast-in-place concrete barrier curb using the new edition of MASH will be allowed on the NHS for new permanent installations and full replacements after the project letting date of December 31, 2017. The letting date is the receipt and opening of bids - "Activity 5040 Receive bids".

Section 8 has been revised as a result of new guide rail crash testing conducted in accordance to the Manual for Assessing Safety Hardware (MASH) and to incorporate changes from the 2011 AASHTO Roadside Design Guide. The revised Section 8 shall replace the current Section 8.

The current guide rail system is being revised to the MASH crash tested 31” high Midwest Guide Rail System (MGS) to improve its crash performance for the higher center of gravity vehicles. A higher concrete barrier curb (42” F Shape Barrier Curb) is also being implemented to include guidelines for this TL-5 barrier.

In addition to minor rewording throughout Section 8, a summary of major revisions are as follows:

Section 8, Guide Rail and Median Barriers

- Title of Section revised from Guide Rail Design and Median Barriers to Guide Rail and Median Barriers.
- All references to Roadside Design Guide, AASHTO 2006 revised to Roadside Design Guide, AASHTO 2011.

Subsection 8.2.3 Clear Zone

- Definition of clear zone has been revised.

Subsection 8.3.1.A Without Curb or Raised Berm in Front of Guide Rail

- 31 inch mounting height from ground to top of rail has been added.
- Table 8-3 moved to Subsection 8.3.1.C

Subsection 8.3.1.B Curb or Raised Berm in Front of Guide Rail

- 31 inch mounting height from gutterline to top of rail has been added.

Subsection 8.3.1.B.4 Rub Rail

- Existing Subsection deleted. Rub rail is no longer required when guide rail is at the curblines.

Subsection 8.3.1.B.E On Bridges

- When using a Type “A” bridge guide rail attachment, direction provided on when to install a TL-2 or TL-3 approach guide rail transition.

Subsection 8.3.2.A Flared Guide Rail Terminals

- Minimum distance between beam guide rail attachment to bridges and a flared guide rail terminal added.

Subsection 8.3.2.B Tangent Guide Rail Terminals

Minimum distance between beam guide rail attachment to bridges and a tangent guide rail terminal added

Subsection 8.3.2.C Beam Guide Rail Anchorage

- Need for a clear area behind the anchorage added.

Subsection 8.3.2.D Telescoping Guide Rail End Terminals

- Existing Subsection moved to new Subsection 8.4.5 Median Barrier End Treatments.

Subsection 8.3.2.E Controlled Release Terminal (CRT)

- Subsection numbering revised to 8.3.2.D
- Guidance on providing vertical guide rail transition from 27 1/4 inch to 31 inch added.

Subsection 8.3.2.F Buried Guide Rail Terminal

- Subsection numbering revised to 8.3.2.E
- Height of guide rail revised to 31 inches.

Subsection 8.3.2.F Existing Slotted Rail Terminals (SRT), Breakaway Cable Terminals (BCT), and Eccentric Loader Terminals (ELT)

- ET-Plus added to list of end treatments that should be replaced

Subsection 8.3.5 Nonvegetative Surface Under Guide Rail

- Porous Nonvegetative surfaces are recommended as designer's first choice when designing Nonvegetative surfaces
- Requirement added that if Nonvegetative Surface, Hot Mix Asphalt (HMA) is used a "leave out" must be provided.

Subsection 8.3.6 Sidewalks

- New subsection. A "Leave Out" is required where guide rail is to be installed in a sidewalk.

Subsection 8.3.7 Underground Structures

- New Subsection. Subsection provides information on adding additional blockouts, deleting guide rail posts and mounting guide rail on sidewalk to avoid underground structures (inlets, pipes, fiber optic lines, etc.)

Subsection 8.3.8 Guide Rail Details

- Renumbered. Was previously Subsection 8.3.5

Subsection 8.3.9 General Comments

- Previously Subsection 8.3.6
- Construction tolerance for the height of guide rail added.
- Provides information on height of new guide rail (31 inches) and when existing 27 1/4 inch high guide rail should be replaced.

Subsection 8.4.2 Median Barrier Type

- Previously Subsection 8.4.1.C
- Provides information on when existing 27 1/4 high dual faced beam guide rail should be replaced with 31 high dual faced beam guide rail. Provides direction on where to use 42 inch high concrete barrier curb.

Subsection 8.4.2.D End Treatments

- Moved to new Subsection 8.4.5 and renamed Median Barrier End Treatments.

Subsection 8.4.3 Median Barrier Location

- Previously 8.4.2.E

Subsection 8.4.5 Median Barrier End Treatments

- Previously Subsection 8.4.2.D

Subsection 8.4.5.B Telescoping Guide Rail End Terminal (TGRET)

- Requires designer to check the Department's MASH Qualified Products List for approved TGRET's. Also requires designer to check with manufacturer to determine where point of redirection occurs. Breakmaster and CAT will no longer be installed.

Section 8 Figures

- All Figures have been moved to the end of Section 8.

In addition to minor drafting changes to the Figures the following revision were made:

Figure 8-B1 Clear Zone Examples

- Existing example at bottom of page moved to new Figure 8-B2.

Figure 8-B2 Clear Zone Examples

- New Figure, one example moved from 8-B and new example added showing method for determining clear zone adjacent to speed change lane.

Figure 8-C Horizontal Curve Adjustments for Clear Zone

- Radii and several correction factors in Table revised to conform to AASHTO 2011 Roadside Design Guide.

Figure 8-E Approach Length of Need on Embankment (Fill) Slope

- Table 2 revised. Minimum functional Length changed to Minimum Length and values in the Table have been revised.

Figure 8-F Grading Treatment at Flared and Tangent Terminals

- Grading revised to conform to AASHTO 2011 Roadside Design Guide.

Figure 8-H Guide Rail Treatment for Critical Embankment Slopes

- Distance to PVI in Section A-A revised from center of post to back of post.

Figure 8-I2 Beam Guide Rail Anchorage Clear Area

- New Figure. A clear area 37.5 ft x 10 ft. minimum is required behind an end anchorage.

Figure 8-J Telescoping Guide Rail End Terminal in Median

- New figure replaced existing Figure 8-J. Figure illustrates guide rail treatment around median piers.

Figure 8-K Overlapping Median Guide Rail with Concrete Pad for Maintenance Vehicle U-Turn

- New figure replaces existing Figure 8-K. Figure illustrates treatment for accommodating U-turns for maintenance vehicles at bridge piers where there is continuous dual faced beam guide rail.

Figure 8-L Dual Faced Median Guide Rail Treatments

- New figure replaces existing Figure 8-L, Figure illustrates treatments of dual faced beam guide rail to shield piers in the median.

Figure 8-N Beam Guide Rail Treatment for Approach End Buried in Slope

- Rail height revised from 27 ¼ inches to 31 inches.

Figure 8-O2 Bridge Attachment Minimum Length of Guide Rail

- New figure. Length of Approach Guide Rail Transition and minimum length of guide rail for both TL-2 and TL-3 conditions are shown.

Figure 8-P1 Example of a Controlled Release Terminal at Driveway located within Length of Need

- Radii in table revised and 2 ft. distance from PVI to center of post revised to back of post .

Figure 8-P2 Bridge Attachment Minimum Length of Guide Rail for CRT

- New figure. Length of Approach Guide Rail Transition and minimum length to a CRT is shwn.

Figure 8-S Guide Rail Treatment Examples for Limited Gore Areas

- Revised table. Detail showing sand barrel array in gore area deleted. 31'-6" length for the Telescoping Guide Rail Terminal deleted.

Figure 8-W Median Guide Rail Placement

- 2 ft distance from center of post revised to back of post.

The following Roadway Design Manual have been revised and replaced:

- Table of Contents
- Section 8 Guide Rail and Median Barriers

The revision must be read in conjunction with the referenced BDCs for the corresponding change to the Standard Specifications for Roadway and Bridge Construction and the Standard Construction Details.

Implementation Code S (SPECIAL)

These BDC changes must be implemented in all Department projects that have a project letting date after December 31, 2017. The letting date is the receipt and opening of bids - "Activity 5040 Receive bids". This will allow designers to make necessary plan, specifications, and estimate/proposal changes without requiring the need for an addenda or postponement of advertisement or receipt of bids.

Recommended By:

Approved By:



Paul F. Schneider
Director
Capital Program Support



Eli D. Lambert III, P.E.
Assistant Commissioner
Capital Program Management

Attachment: Table of contents and "Section 8 Guide Rail and Median Barriers" of the 2015 *Roadway Design Manual*.