

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

INTER-DEPARTMENT CORRESPONDENCE

DATE: January 1, 2016


FROM: Meg B. Pirkle, P.E., Chief Engineer

TO: Divisions of Engineering, Operations, Field Districts, Construction and P3/Program Delivery

SUBJECT: **Roadside Safety Hardware (Implementation of MASH)**

In 1993, *NCHRP Report 350* was adopted by FHWA and GDOT as the standard for safety performance of guardrail and other roadside safety hardware. In 2009, the *AASHTO Manual on Assessing Safety Hardware (MASH)* was published to incorporate changes in vehicle fleet characteristics that occurred over the previous two decades. The MASH updated and replaced NCHRP Report 350, revising testing standards to include heavier and higher center-of-gravity pickup trucks and SUVs, increasing the impact angle for most small cars, and generally more stringent performance standards.

In May 2010, FHWA sent a memorandum to all states with updated guidance for new installations of guardrail on the National Highway System (NHS). Specifically, the minimum installation height recommended under NCHRP Report 350 was revised from 27 to 27 $\frac{3}{4}$ inches. Also, the recommended height under MASH was stated as 31 inches, which includes a construction tolerance of plus or minus 1 inch. The memorandum also stated that:

- Highway safety hardware accepted prior to MASH using Report 350 may remain in place;
- Safety hardware accepted using Report 350 does not require retesting under MASH; and
- Any new safety hardware not previously evaluated shall utilize MASH evaluation and testing techniques.

Furthermore, the memorandum advised that State transportation agencies implement the revised NCHRP Report 350 minimum installation height of 27 $\frac{3}{4}$ inches, and requested they consider adopting the 31-inch height. Accordingly, on July 1, 2012, GDOT adopted the 31-inch W-beam guardrail height as the standard for new installations on state routes and roadways on the NHS in Georgia.

On November 12, 2015 FHWA issued another memorandum stating the following:

In an effort to encourage installation of MASH crash tested devices, after December 31, 2015, FHWA will not accept requests for Federal-aid eligibility determinations for any modification based on previous crash testing performed using NCHRP 350 criteria. All modifications to an NCHRP 350-tested device will require testing under MASH in order to receive a Federal-aid reimbursement eligibility letter from FHWA. Going forward, modifications to NCHRP 350-tested devices that have, in the past, been based on engineering analysis, finite element modeling, or through other analysis will no longer receive FHWA eligibility letters.

On December 22, 2015, AASHTO published a news release recommending a schedule for implementing MASH requirements for new and replacement installations of roadside safety hardware on the NHS. These recommendations have been adopted by the Department and incorporated into the attached GDOT document, *Implementation of AASHTO-MASH Criteria for Roadside Safety Hardware*.

This letter and the attachment will be posted on the R.O.A.D.S. webpage under the category "Policy Announcements", and Chapters 5 and 11 of the *GDOT Design Policy Manual* will be updated accordingly. If you have any questions contact Brent Story, Office of Design Policy & Support at (404) 631-1978.

MBP:HP:BAS
Attachment

Georgia Department of Transportation

Implementation of AASHTO-MASH criteria for Roadside Safety Hardware

The implementation dates below apply to the installation of roadside safety hardware on state routes and roadways on the National Highway System in Georgia. All references to the AASHTO *Manual on Assessing Safety Hardware* (MASH) refer to the latest edition unless otherwise noted.

January 1, 2016: 31-inch height W-beam guardrail and either NCHRP 350 or MASH accepted end-treatments on GDOT QPL shall be installed as outlined below:

1. **New construction, widening and/or reconstruction:** For new permanent installations and full replacements.
2. **Resurfacing, Restoration, Rehabilitation (3R) and Pavement Reconstruction:** Where the existing guardrail height is less than 27 ¾ inches.
3. **Preventative Maintenance (PM) activities:** Where the existing guardrail height is less than 27 ¾ inches. PM activities will either address needed upgrades during the course of work or identify and schedule the needed upgrades with one of the following:
 - a. Future scheduled 3R project,
 - b. Future scheduled pavement reconstruction work,
 - c. Future standalone guardrail project,
 - d. Future programmed roadway project, or
 - e. District Maintenance Contract.
4. **Repairs:**
 - a. The repair of more than 25 ft (> 25 ft) of damaged W-beam guardrail where the height is less than 27 ¾ inches shall be replaced at 31-inch height.
 - b. If an existing end-treatment is connected to >25 ft of damaged W-beam guardrail that is less than 27 ¾ inches in height, then the end-treatment shall be replaced at 31-inch height along with the W-beam guardrail.
 - c. The repair of 25 ft or less (≤ 25 ft) of W-beam guardrail may match existing guardrail height. This (25 ft) represents two 12 ½-ft W-beam panels or one 25-ft W-beam panel.
 - d. Damaged end-treatments shall be replaced with NCHRP 350 or MASH accepted products according to the manufacturers installation manual.
 - e. A decision to replace a whole run of guardrail during a repair will be the discretion of the Department's engineer in the field.

References:

- [GDOT Design Policy Manual](#) Chapter 11 for examples of 3R and Pavement Reconstruction projects, and PM activities.
- [GDOT Construction Standards](#) guardrail and end treatments, 4380 – 4391.

June 30, 2018: All new permanent installations and full replacements of W-beam end-treatments shall meet MASH testing standards.

December 31, 2018: All new permanent installations and full replacements of cable barrier, cable barrier terminals, and crash cushions shall meet MASH testing standards.

December 31, 2019:

1. All new permanent installations and full replacements of bridge rail, transitions, longitudinal barrier (including portable barriers installed permanently), all other terminals, sign supports, and all other breakaway hardware shall meet MASH testing standards.
2. Temporary work zone devices, including portable barriers, manufactured after December 31, 2019, must have been successfully tested under MASH requirements. Such devices manufactured on or before this date, and successfully tested under either NCHRP Report 350 or the 2009 edition of MASH, may continue to be used throughout their normal service lives.

NOTE: If the Department determines that a reasonable number of MASH accepted products are available between January 1, 2016, and any of the implementation dates listed above, then these implementation dates may be revised to earlier dates and notice provided.