

## Chris Cooper

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**To:** Dallas Hammit; Steve Boschen; Todd A. Emery; Jesse Gutierrez; Brent Cain; James Windsor; Scott Beck; Annette Riley; David Eberhart; Maysa Hanna; Julie Kliewer; Steve Beasley; Michael DenBleyker; Paul O'Brien; Lonnie Hendrix; Madhu Reddy; Raul Amavisca; Audra Merrick; Lynn Johnson; Alvin Stump; Roderick F. Lane; Bill Harmon; Paul Patane; Randy Everett

**Cc:** Gregory Byres; Reed Henry; Joseph M. Phillips

**Subject:** Treatment of Existing Barrier Memo

**SENT ON BEHALF OF GREG BYRES, STATE ROADWAY ENGINEER**

**TO ALL ADOT AND CONSULTANT DESIGN PERSONNEL**

**RE: TREATMENT OF EXISTING BARRIER**

All permanent concrete barrier and guardrail components included on ADOT construction projects advertised after December 31, 2017 must be Manual for Assessing Safety Hardware (MASH) compliant. Revised standard drawings, specifications and barrier summary sheets should be available this summer. Meanwhile, please follow the attached guidance to determine treatment of existing barrier on all projects advertising after this calendar year.

Contact Chris Cooper, Roadway Support Manager at 602-712-8365 if you have any questions regarding this memorandum. Please distribute to all ADOT and consultant designers in your Group, Section or District. This memorandum will also be available from the following link on our Roadway Design website:

<https://www.azdot.gov/business/engineering-and-construction/roadway-engineering/roadway-standards-and-guidelines/roadway-design-memos>

**MEMORANDUM**

TO: All ADOT Design Personnel and Consultants

*GDB* FROM: Greg Byres, Assistant State Engineer, Roadway Engineering Group

CC: Dallas Hammit, State Engineer

DATE: May 3, 2017

RE: Existing Roadway Barrier Assessment

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An assessment of existing roadway barriers should be part of any major pavement preservation, spot improvement, widening, or reconstruction project. All existing barrier features lacking National Cooperative Highway Research Program Report 350 (NCHRP 350) compliance should be replaced with Manual for Assessing Safety Hardware (MASH) compliant features. Existing NCHRP 350 compliant barrier not otherwise impacted by project work may remain in-place.

Depending on specific conditions, a run of barrier with some non-compliant features may be either partially or completely replaced. Project team members from roadway, construction, and maintenance will determine extent of replacement based on condition and quantity of compliant features. For example, a project team may choose to replace only the non-compliant end terminals on a long run of otherwise NCHRP 350 compliant guardrail in good condition.

For both partially and fully replaced barrier, length of need should be re-evaluated per current ADOT Roadway Design Guidelines using future AADT and design or posted speed as appropriate.

Existing guardrail shall be replaced if the rail height (measured from roadway surface to top of rail) will be less than 26.5" at project completion. Rail height should be determined for each run from the average of field measurements for that run.

When converting an existing run of guardrail from 8" to 12" blockouts, the new posts should be set back 4" from existing post locations whenever practical in order to maintain shoulder width.

Roadway and bridge project team members should reach consensus on appropriate treatment for guard rail-to-bridge rail transitions not meeting NCHRP 350 compliance. Treatment may depend on such factors as bridge barrier condition, project budget, accident history, future project plans, speed, and AADT. Justification for any decision

short of MASH compliance shall be documented in the project file.

This memorandum supersedes the August 7, 2001 Memorandum "Guard Rail Minimum Height after Overlay Pavement Preservation Projects" and the June 25, 2002 Memorandum "Guard Rail-to-Bridge Rail Transitions".

A partial list of existing ADOT safety hardware which may remain in-place is attached. For further assistance, please contact Chris Cooper, Roadway Support Manager at 602-712-8365.

#### Attachment

- C: Roadway Engineering Group
  - Maintenance Group
  - Project Management Group
  - Construction & Materials Group
  - Contracts & Specifications
  - Districts
  - Bridge Group
  - Traffic Engineering Group
  - State Engineer's Office
  - Local Public Agency Section
  - Regional Traffic Engineers
  - Engineering Consultants Section
  - Transportation Systems Management and Operations
  - Federal Highway Administration

**EXISTING UNDISTURBED ADOT SAFETY HARDWARE  
ALLOWED TO REMAIN IN PLACE**

**BARRIER:**

W-beam guardrail with wood or steel post, 8" minimum depth wood or composite blockouts and 26.5" minimum rail height matching 2012 Std Dwgs C-10.01 through C-10.05.

Thrie-beam guardrail with wood or steel posts, 8" minimum depth wood or composite blockouts and 26.5" minimum rail height matching 2012 Std Dwg C-10.20.

Concrete median barrier with 29" minimum height matching 2012 Std Dwgs C-10.40 or C-10.41.

Concrete half barrier with 29" minimum height and backfill or support as shown in applicable drawing. See 2012 Std Dwgs C-10.50 through C-10.55, SD 1.01 or SD 1.02.

High tension cable barrier systems listed on APL.

**END TERMINALS:**

BEST, ET, FLEAT, SKT, SRT, or XLITE with layouts as shown in Roadway Engineering website <http://www.azdot.gov/business/engineering-and-construction/roadway-engineering/roadway-design-standards-and-guidelines/guardrail-barrier-and-transition-design-information> .

W-beam end anchor matching 2012 Std Dwg C-10.08 on divided road, downstream end.

**TRANSITIONS:**

Thrie-beam transition matching 2012 Std Dwgs C-10.30 or SD 1.03 plus concrete barrier transition matching 2012 Std Dwg C-10.70 through C-10.73, SD 1.01 or SD 1.02.

W-beam transition bolted to barrier on divided road, downstream end.

**MISCELLANEOUS FEATURES**

Missing Guardrail Posts - Nested W-beam with 26.5" minimum rail height and 18.75' maximum span matching 2012 Std Dwg C-10.06.

Concrete Box Culvert Guardrail – Full length posts or bolted anchors matching 2012 Std Dwg C-10.07.

Concrete barrier transitions matching 2012 Std Dwg C-10.74 through C-10.76.