



U.S. Department
of Transportation
**Federal Highway
Administration**

Montana Division

December 2, 2011

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In Reply Refer To:
HDA-MT

Dwane Kailey
Acting Administrator
Highways and Engineering Division
Montana Department of Transportation
P.O. Box 201001
Helena, MT 59620-1001

Dear Mr. Kailey:

Subject: NCHRP Report 350 Hardware Compliance – Concrete Barrier

The purpose of this letter is to reiterate the current policy regarding the use of 2-loop concrete barriers on Federal-aid highway projects. The enclosure with this letter details the reasoning for this policy.

All existing 2-loop concrete barriers, including tall concrete barriers, which must be moved for any reason during construction, must be replaced with approved 350-compliant barriers. This means that any physical movement whatsoever of non 350-compliant barriers requires placement of a new barrier due to the fact that the old barrier cannot be reset. The salvaged 2-loop barrier may not be used as a traffic barrier on Federal-aid highway projects for neither temporary nor permanent installations. Please revise the MDT Guidelines for Nomination and Development of Pavement Projects as necessary to reflect this policy.

If you have any questions please don't hesitate to contact Ms. Marcee Allen, Safety/Traffic/Design Engineer, at 406-441-3909.

Sincerely,

Kevin McLaury, P.E.
Division Administrator

Enclosure: Attachment A

cc: Kevin Christensen, Construction Bureau Chief, MDT
Paul Jagoda, Construction Engineer, MDT
Paul Ferry, Design Engineer, MDT

3 pin - Corrosion

Attachment A

Requirements for use of crashworthy concrete barrier on federal-aid projects

On August 28, 1998 the Federal Highway Administration concurred in the proposed AASHTO-FHWA Agreement on the NCHRP Report 350 Implementation that was prepared by the AASHTO 350 Task Force. In this document the task force recommended that the October 1, 1998 deadline for the use of NCHRP Report 350-tested roadside hardware on the National Highway System (NHS) be extended for selected hardware categories. A summary table showing extended implementation dates for several categories of roadside appurtenances is attached. According to the table longitudinal barrier must be NCHRP-350 compliant in all new installations beginning October 1, 1998. On 3R projects new installations must be 350 compliant; however, the replacement of existing hardware meeting NCHRP 230 is not required. Note 3 of the summary applies to 3R projects and states: "The general rule is that all permanent safety features on new construction and 3R projects should meet current criteria unless a design exception is obtained. The intention here, and in Note 2, is to continue this rule. However, features that meet the acceptance requirements recommend in NCHRP Report 230, at the discretion of the responsible transportation agency, may remain in place. The preferred treatment of features that must be moved, reconstructed, or extended because of a changed roadway grade, width, or other condition or must be rebuilt because of crash damage is to bring them to current criteria. Nevertheless, a transportation agency, at its discretion, may retain or extend "in-kind" an existing feature meeting the acceptance requirements in NCHRP Report 230." Also, Note 13 of the summary states: "A barrier will be considered crashworthy if (a) it has been crash tested and met the acceptance requirements proposed in either NCHRP Reports 230 or 350 or (b) it is a barrier with one of the five joints listed as "Tested and Operational Connections" starting on page 9-3 of the 1996 AASHTO Roadside Design Guide or (c) if an Engineering Study of in-service performance demonstrates the barrier will provide the performance requirements of the site where it is to be used."

The Montana Department of Transportation received approval from FHWA in August 2003 for two new 350-compliant concrete barrier designs: one with one pin and a triple loop connection and one with a double steel plate connection. Since that time, MDT has been using the 350-compliant on new and reconstruction projects. The existing 2-loop barrier installed prior to 2003 is typically not replaced on 3R projects in the state. A review of the old 2-loop concrete barrier design has revealed that it was never tested for compliance with NCHRP Report 230 and that it would not meet the requirements of today's NCHRP 350 or MASH crash test criteria. The older two-loop and pin connection is not satisfactory for the following reasons:

1. For a pin and loop connection to appropriately serve as load transfer it must have double shear characteristics as well as connection 'loops' that are fully developed into the barrier section
2. Woven wire rope is not recommended due to: (a) damaged ropes or 'kinks' that can occur during barrier section transport and storage; (b) deterioration of ropes. Damage to the wire rope will significantly reduce the strength of the connection.