



*+Montana Department of Transportation  
PO Box 201001  
Helena, MT 59620-1001*

## **Memorandum**

To: Distribution

From: Paul Ferry, P.E.  
Highways Engineer

Date: October 20, 2009

Subject: Concrete Barrier Installation

### **Background Information**

The old two-loop concrete barrier, which includes almost all concrete barrier found on Montana highways, has provided good service over the years. However, its pin and loop connection does not meet the requirements of NCHRP 350. In 2003 MDT sponsored the development of a new barrier connection that meets NCHRP 350 criteria. The layout and details for this barrier are found in Detailed Drawing 606-60.

FHWA allows transportation agencies to continue to utilize existing two-loop barriers until they complete their normal service life.

### **Definitions**

- New Construction projects: Horizontal and vertical alignment construction on new location. These projects must meet current MDT design standards.
- Reconstruction projects: This involves a major change to an existing highway within the same general right-of-way corridor and will typically include the addition of travel lanes, reconstruction of the existing horizontal and vertical alignment for more than 25% of the project length, and/or full-depth pavement reconstruction for more than 50% of the project length. These projects must meet current MDT design standards.
- Paving Projects: Paving projects focus primarily on the preservation and extension of the service life of existing facilities and on safety enhancements. Under the classification of paving projects, the types of improvements to existing highways include: resurfacing, pavement rehabilitation, joint repair, minor lane and shoulder widening, minor alterations to vertical grades and horizontal curves, bridge repair, and removal or protection of roadside obstacles. Work may include full-depth pavement reconstruction for up to 50% of the project length and may include horizontal and vertical alignment revisions for up to 25% of the project length.
- Maintenance projects: Typically, maintenance activities consist of those actions necessary to keep an existing highway facility in good condition. Maintenance activities include chip seals, fog seals, crack seals, repainting lane and edge

lines, repair or replacement of roadside and median hardware, removing accumulated debris from drainage inlets, repairing surface drainage features, mowing, and removing snow.

### **Installation**

We recommend the installation of 350-compliant barrier whenever possible. However, since it may be impractical due to funding constraints, the following guidance is provided for the installation and replacement of concrete barrier.

1. For all new construction and reconstruction projects install the NCHRP 350-compliant concrete barrier shown in detailed drawing 606-60. The length of barrier installation should meet current length of need warrants.
2. For paving projects, install the NCHRP 350 compliant approved concrete barrier if the existing barrier is in need of repair or must be moved in order to complete planned work. If the work can be accomplished without moving the existing barrier the two-loop barrier may remain in place so long as it has remaining service life.

Refer to the *Guidelines for the Nomination and Development of Pavement Projects* to determine if length of need and guardrail warrants need to be checked.

Anytime the NCHRP 350-compliant concrete barrier will be used either as a new installation or as a replacement, evaluate the need for tall-wall barrier (Detailed drawing 606-64). The use of tall-wall barrier should be discussed with the Environmental Services Bureau, since it may be considered an obstruction to wildlife passage in certain situations and may need consultation with the U.S. Fish and Wildlife Service.

### **Maintenance**

Maintenance of concrete barrier consists of replacement of segments that have been hit or replacement of worn out sections (barrier that has reached the end of its service life).

When replacing damaged rail, we recommend that NCHRP 350-compliant concrete barrier be used. However, the old concrete barrier can be used if the length to be replaced is 50 feet or less. The connection for new concrete barrier is compatible with the connections for the existing concrete barrier. Consequently, individual sections can be replaced when they are damaged instead of having to replace the entire run of barrier.

### **Miscellaneous Use**

**Temporary Barrier.** The decision to use new barrier as opposed to old style barrier (NCHRP 350 vs two-loop barrier) should be based on an evaluation of risk. The evaluation should involve an assessment of traffic volumes and characteristics, the length of time the barrier will be in place and the potential for crashes. If the project is on the NHS, FHWA approval to use two-loop barrier will be required. If the posted speed limit is 40 mph or greater, 350-compliant barrier shall be used.

**Rockfall Barrier.** Since the placement of rockfall barrier will entail either a new installation or the replacement of an existing installation, NCHRP 350-compliant concrete barrier should be used.

If you have questions concerning this, please contact me at 444-6244.

Pf.

Distribution:

Loran Frazier,	Chief Engineer
Jim Walther,	Preconstruction Engineer
Kevin Christensen,	Construction Engineer
Jon Swartz,	Maintenance Administrator
Kent Barnes,	Bridge Engineer
Matt Strizich,	Materials Engineer
Lesly Tribelhorn,	Highways Design Engineer
Damian Krings,	Road Design Engineer
Tim Conway,	Consultant Design Engineer
Duane Williams,	Traffic & Safety Engineer
Suzy Price,	Supervisor – Contract Plans Bureau
Jim Frank,	Glendive District Engineering Services Supervisor
Gary Neville,	Billings District Engineering Services Supervisor
Joe Olsen,	Butte District Engineering Services Supervisor
Shane Stack,	Missoula District Engineering Services Supervisor
Steve Prinzing,	Great Falls District Engineering Services Supervisor
John Cornell,	Road Plans Checker
Kevin Farry,	Road Plans Checker
Bryan Vieth	Consultant Design Section