

In Reply Refer To: HSSD-10/B-161

Mr. Pratip Lahiri, P.E.
Specifications and Standards Section, POD 23
New York State Department of Transportation
50 Wolf Road
Albany, NY 12232

Dear Mr. Lahiri:

Thank you for your letter requesting the Federal Highway Administration's (FHWA) acceptance of a four strand cable median barrier as a Test Level 3 device for use on the National Highway System (NHS). The median barrier is a modification of your previously accepted generic three strand cable system. You requested that we find this barrier acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

The FHWA guidance on crash testing of roadside safety hardware is contained in a memorandum dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features."

Testing

Generic low-tension 3-cable barriers have been tested with various cable heights and spacing. The New York State Department of Transportation cable median design has the top cable at 28 inches above grade with the cables spaced 6 inches apart. The Federal Outdoor Impact Laboratory recently conducted physical testing and computer simulations of cable median barrier designs. These indicated a need for the bottom cable to be significantly lower than most designs currently in use. Your modification is in conformance with the recommendations of that research. Those recommendations indicated a need for the cable median barrier to have four cables, spaced 6 inches apart vertically, and mounted on alternating sides of the post with the lowest cable on the downhill side.

You acknowledged various limitations on the use of cable barrier systems. Once struck, the entire run is effectively compromised until the damage is repaired and the system retensioned. Winter repairs are often deferred until spring due to the inability to drive replacement posts in the frozen ground.

Cable tension under varying temperature conditions, and spacing between anchorages are detailed on the drawings.

Old installations used a 1 cubic yard anchor block that sometimes moved after several impacts. You doubled the block size and added a check of the anchor block orientation to your impact repair procedure to ensure that anchor blocks do not rotate enough that a cable end is released from its anchor angle slot.

Findings

Your request to add a fourth cable to your median barrier system includes a separate anchor connection for the added cable. This connection is identical to the connections for the other three cables and can be expected to perform in a similar manner. Because the addition of a fourth cable will serve to improve the performance of your median barrier system, with little potential for any adverse consequences, the system described above and detailed in the enclosed drawings is acceptable for use on the NHS as a test level 3 device.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- This acceptance is limited to the crashworthiness characteristics of the device(s).
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being installed is significantly different from the accepted version, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- It is expected that the hardware furnished will have essentially the same mechanical properties, and geometry as that submitted for acceptance, and that it will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number B-161 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

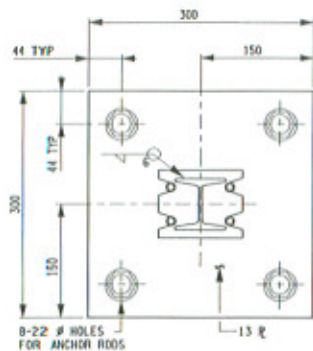
Sincerely yours,



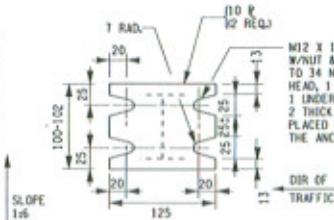
George E. Rice, Jr.
Acting Director, Office of Safety Design
Office of Safety

3 Enclosures

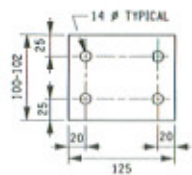
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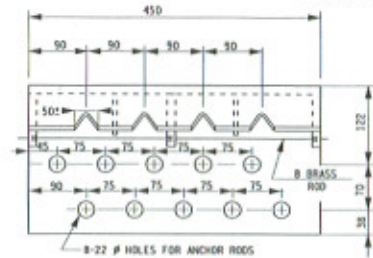
ANCHOR POST BASE DETAIL
PLAN VIEW



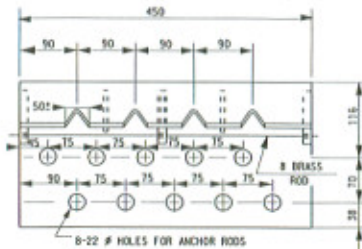
SLIP IMPACT BASE
KEEPER PLATE NOT SHOWN



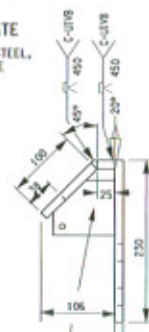
KEEPER PLATE
28 GA. GALV. STEEL,
PAINTED ORANGE



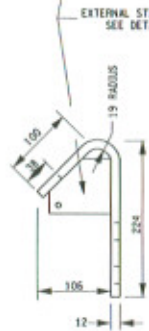
WELDED PLATE



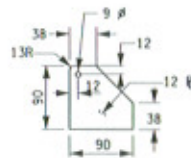
BENT PLATE



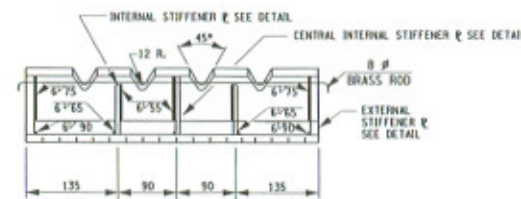
EXTERNAL AND CENTRAL STIFFENER R



ANCHOR ANGLE DETAILS



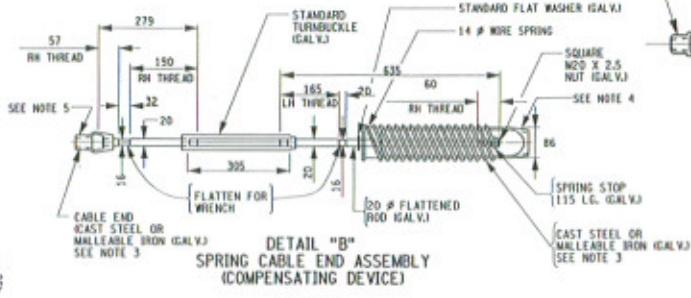
INTERNAL STIFFENER R



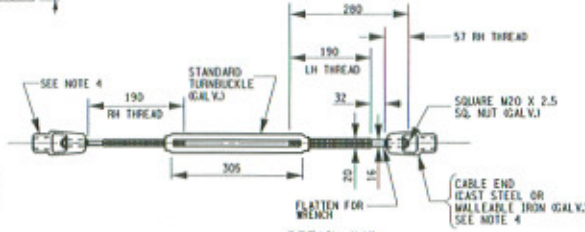
INTERNAL STIFFENER R SEE DETAIL
CENTRAL INTERNAL STIFFENER R SEE DETAIL
EXTERNAL STIFFENER R SEE DETAIL

WASHER SERIES	A		B		C	
	INSIDE DIA. (mm)	OUTSIDE DIA. (mm)	INSIDE DIA. (mm)	OUTSIDE DIA. (mm)	THICKNESS (mm)	THICKNESS (mm)
20	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
	REGULAR WIDE	22.32	21.80	50.00	49.38	4.60
12	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
	NARROW	13.57	13.30	25.40	24.90	2.00

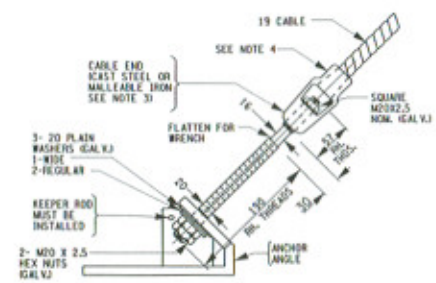
WASHER TABLE AND DETAIL



DETAIL "B"
SPRING CABLE END ASSEMBLY
(COMPENSATING DEVICE)
SEE NOTE 7



DETAIL "A"
STEEL TURNBUCKLE CABLE END ASSEMBLY
SEE NOTE 7

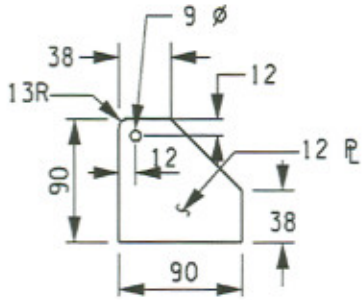


CABLE END ASSEMBLY TO
ANCHOR ANGLE DETAIL

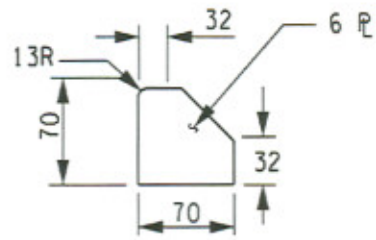
GENERAL NOTES ON SHEET 1 OF 3

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

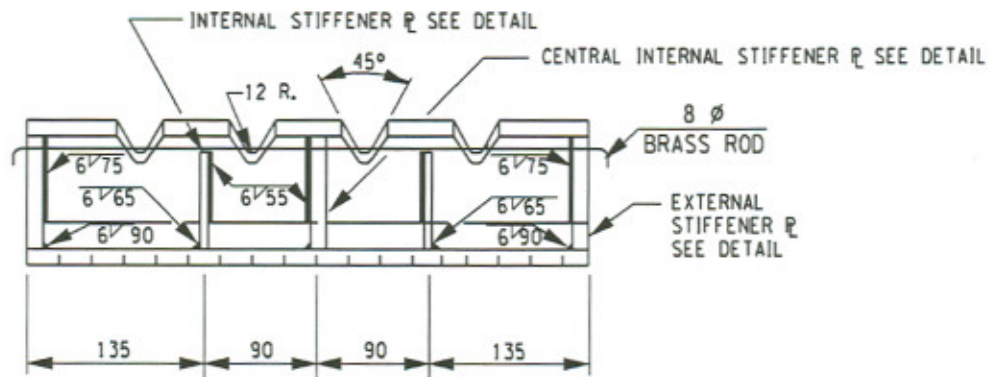
STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION	
METRIC STANDARD SHEET	
CABLE MEDIAN BARRIER	
SHEET 2 OF 3	
APPROVED	ISSUED UNDER EB EFFECTIVE
DEPUTY CHIEF ENGINEER DESIGN	M606-53



EXTERNAL AND CENTRAL STIFFENER \square



INTERNAL STIFFENER \square



NOTE: ALTERNATE METHODS OF
FABRICATING ANCHOR ANGLES
SHALL BE SUBMITTED FOR APPROVAL.