



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

400 Seventh St., S.W.
Washington, D.C. 20590

November 8, 2000

Refer to: HSA-1\HSA-CC68

Dean L. Sicking, Ph.D., P.E.
Director, Midwest Roadside Safety Facility
University of Nebraska - Lincoln
P.O. Box 880601
Lincoln, NE 68588-0601

Dear Dr. Sicking:

On June 6, Dr. Ronald K. Faller submitted a request to Mr. Dwight A. Horne, the Director of the former Office of Highway Safety Infrastructure, for acceptance of a Thrie-beam bullnose guardrail system (bullnose attenuator) that was developed and tested at the Midwest Roadside Safety Facility (MwRSF) in cooperation with the Midwest States Regional Pooled-Fund Program. Included with this request were copies of the Phase I, II, and III final reports and video tapes of the nine tests that were conducted.

In reviewing this material, members of my staff noted that in addition to the design that was actually tested, you were also requesting acceptance for two variations of the tested version for use in wider medians. After several informal discussions, you agreed to modify the alternative layouts, recommending two asymmetrical designs that were essentially similar to the tested version in the curved nose area. On October 26, Mr. Richard Powers received the final dimensioned drawings for the alternative designs. Enclosure 1 contains details of the final symmetrical design. Basically, this design consists of five slotted Thrie-beam rails, one with a 1580-mm radius, two with a 10400-mm radius, and two straight rail sections. Posts numbered 1 and 2 on each side are BCT-type posts with one hole at ground level set in foundation tubes, and posts numbered 3 through 8 are standard CRT posts. All posts except the first use non-standard offset blocks as shown in Enclosure 1. Two 6 x 25 5/8" diameter steel cables are set behind the top two corrugations in the curved nose section of the attenuator. Enclosures 2 and 3 show the two designs intended for use in wider medians/gore areas. The first layout has a flare along the opposing traffic side only, the second, on both sides. I am assuming that detailed plans and specifications for the bullnose attenuator can be obtained directly from you at the MwRSF.

The design of the Thrie-beam bullnose was modified several times during the development and testing of the system. Only Report 350 tests 3-32 and 3-38 were conducted on the final design. Tests 3-30, 3-31, and 3-33 were run on earlier versions of the design. After analyzing the probable effects the design changes might have had on the earlier tests, you concluded that the changes made to stiffen the side of the bullnose would not likely change the results of the end-on tests. You also concluded that redirection tests 3-36, 3-37 and 3-39 need not be run since Thrie-beam guardrail itself has been shown to be capable of containing and redirecting the test vehicles. We concur with your assessments.

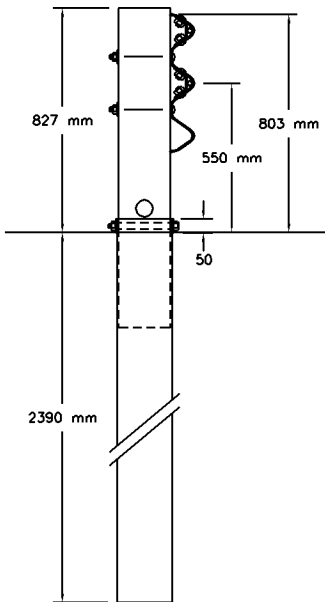
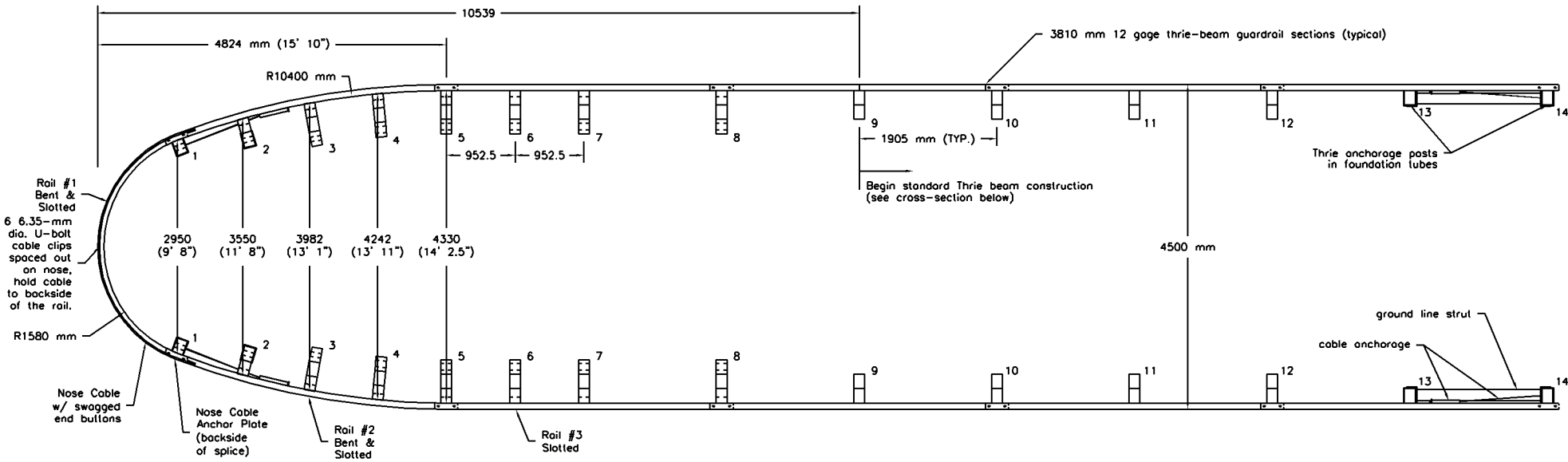
Based on the information you provided, the tested Thrie-beam bullnose design and the two alternative layouts shown in Enclosure 1 may be considered NCHRP Report 350 designs at test level 3 (TL-3) and used on the National Highway System when such use is specified by the appropriate highway authority. As noted in the "Recommendations" section of your Phase III report, the leading edge of the bullnose attenuator should be located a minimum distance of 19 meters in advance of any shielded hazard and any transition to a bridge rail should not begin sooner than post number 9. Additionally, the flare rates on the side of approaching traffic should not exceed the recommendations for barrier flare rates contained in the AASHTO Roadside Design Guide without additional testing. The bullnose attenuator must also be installed on essentially flat ground unless testing indicates that its performance will not be adversely affected by non-level terrain.

Sincerely yours,

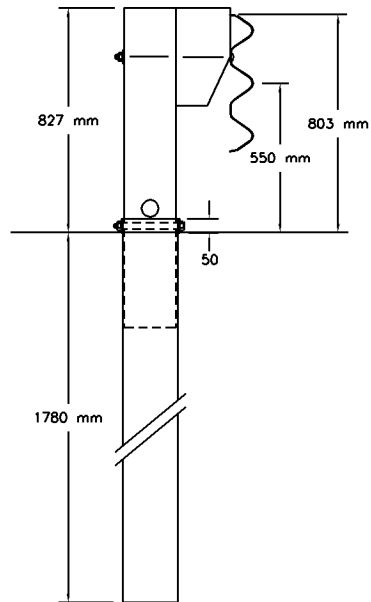
Frederick G. Wright, Jr.
Program Manager, Safety

3 Enclosures

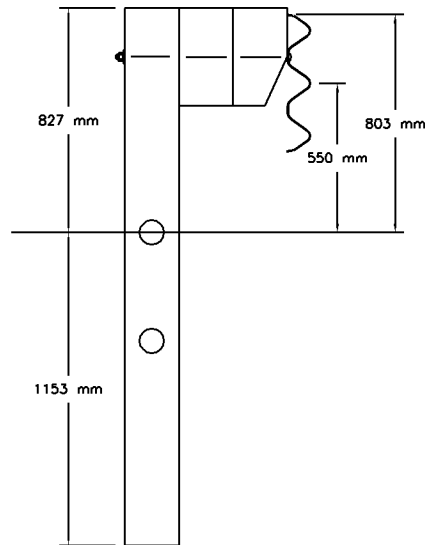
Bullnose 350 Test Layout



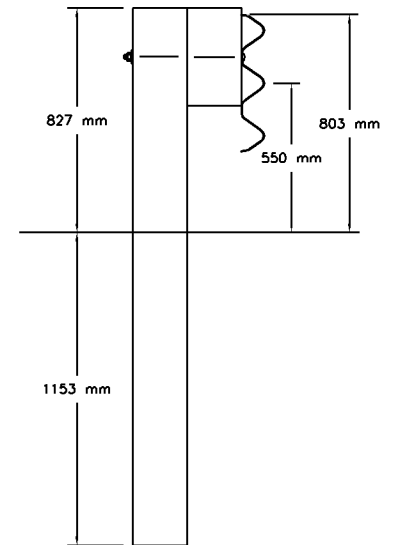
Thrie Beam BCT Post
w/ 2440mm
Foundation Tube
Post 1



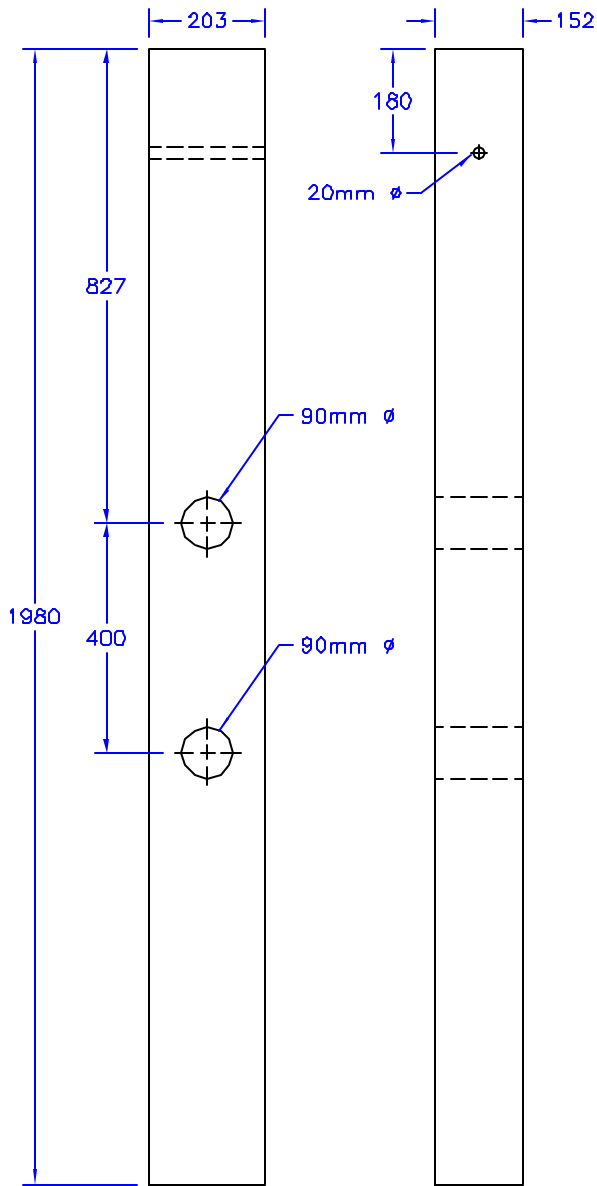
Thrie Beam BCT Post
w/ 1830mm Foundation Tube
& 360mm Tapered Block
Post 2



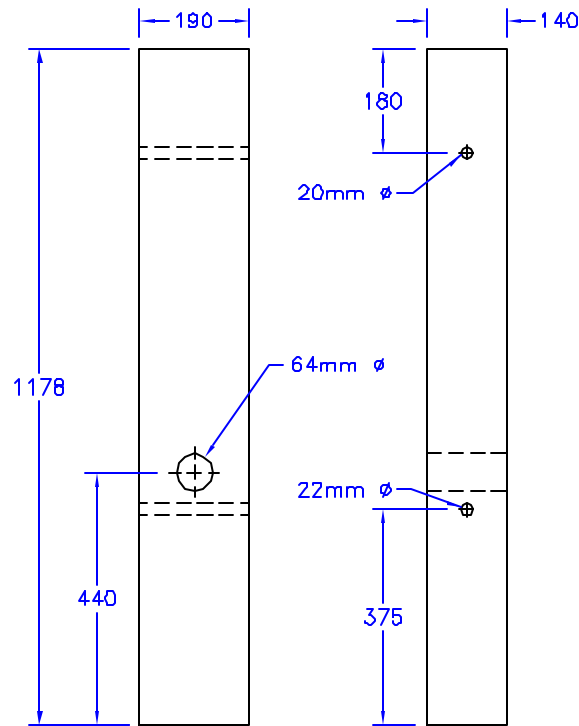
Thrie Beam CRT Post
1980mm long
w/ 360mm Block &
360mm Tapered Block
Posts 3,4,5,6,7,8



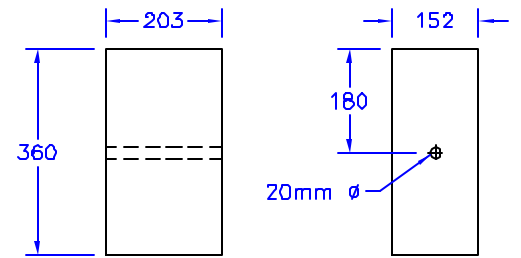
Thrie Beam Post
1980mm long
w/ 360mm Block
Posts 9,10,11,12



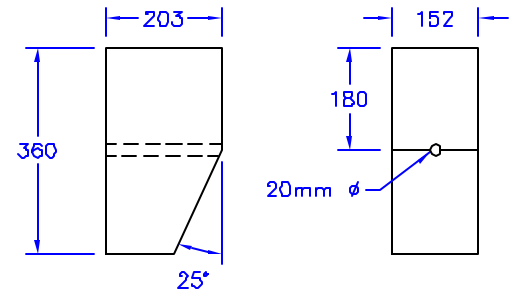
Thrie Beam CRT Posts




Thrie Beam Anchor Posts

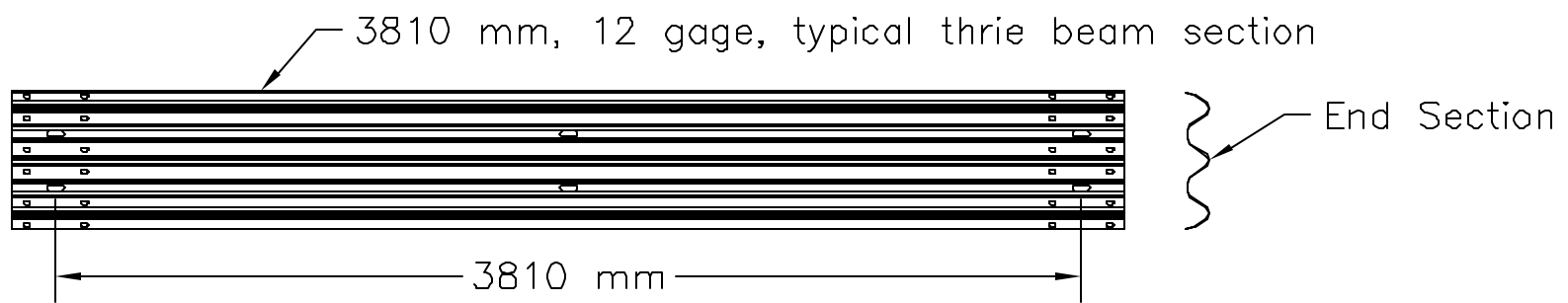
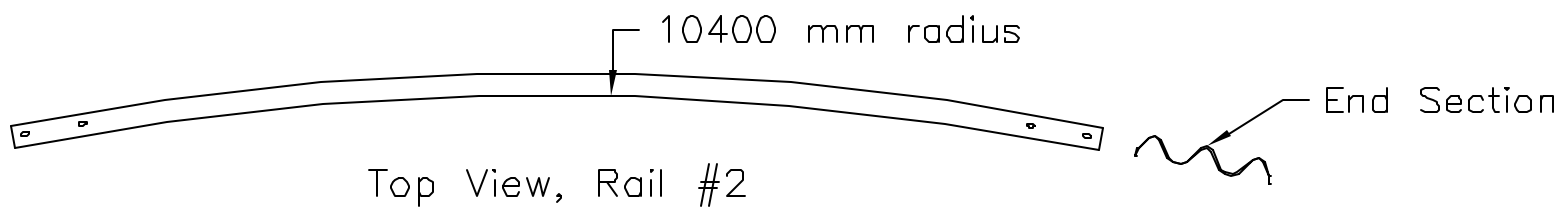
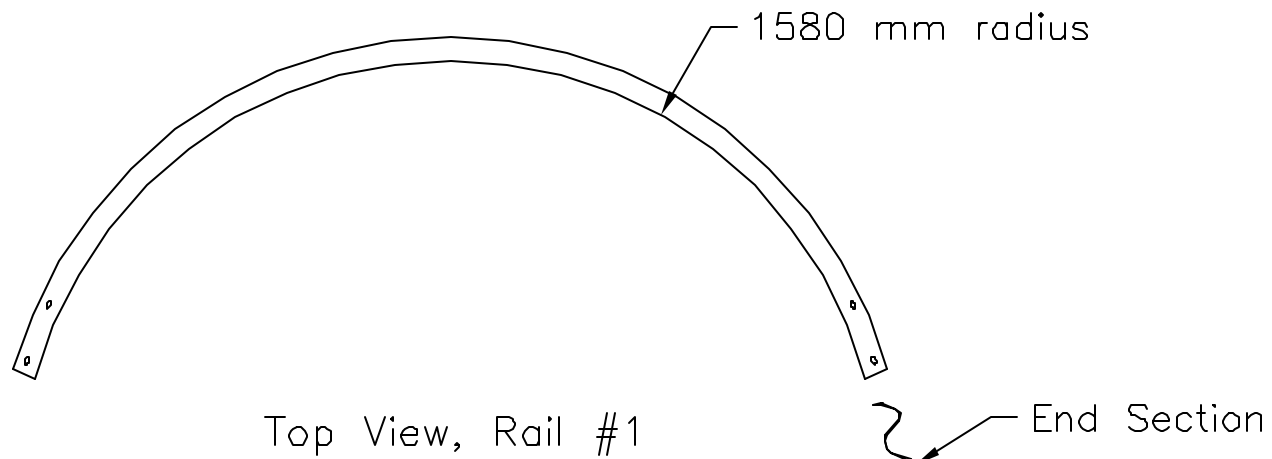


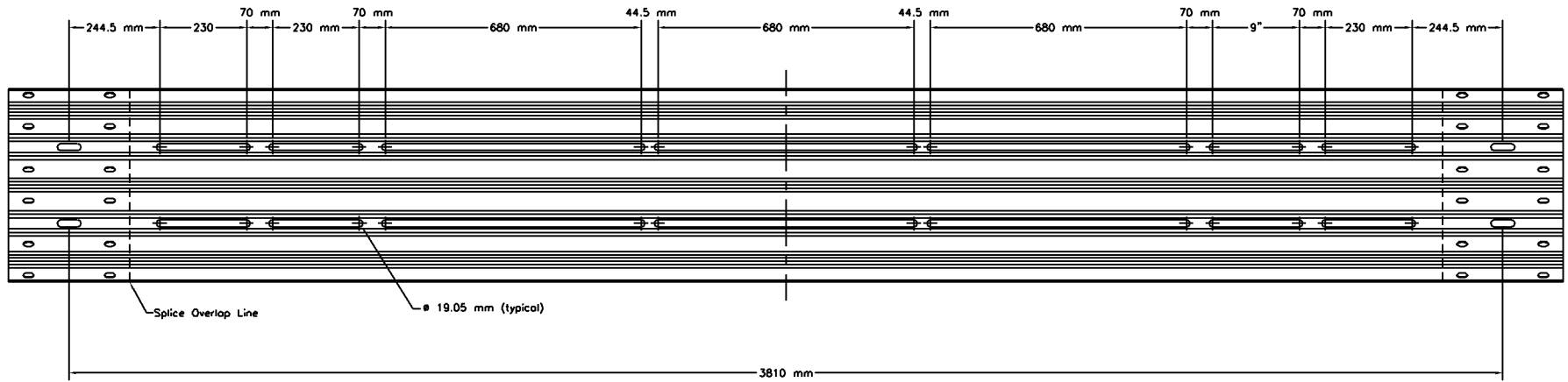
Standard Block



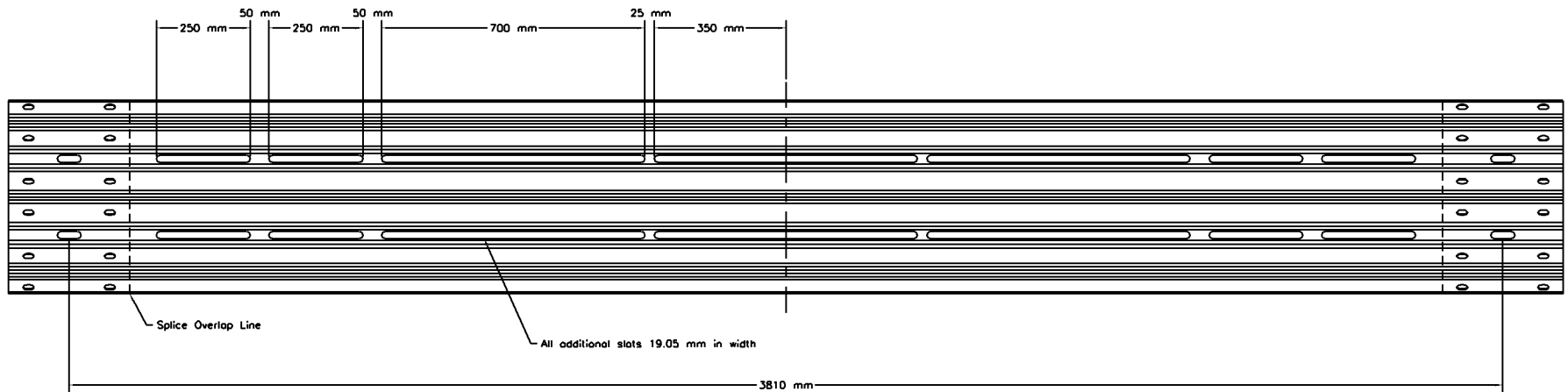
Tapered Block

 MwRSF <i>University of Nebraska C.E. Department</i>	
Missouri Bull-Nose	
DATE: 7/16/99	
SCALE: none	
DR'N: EAK	bnposts8

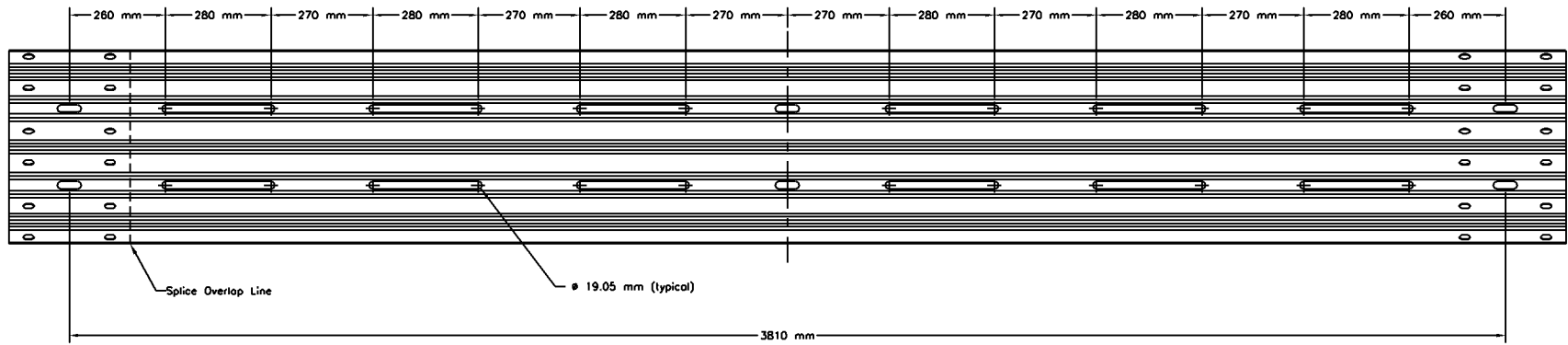




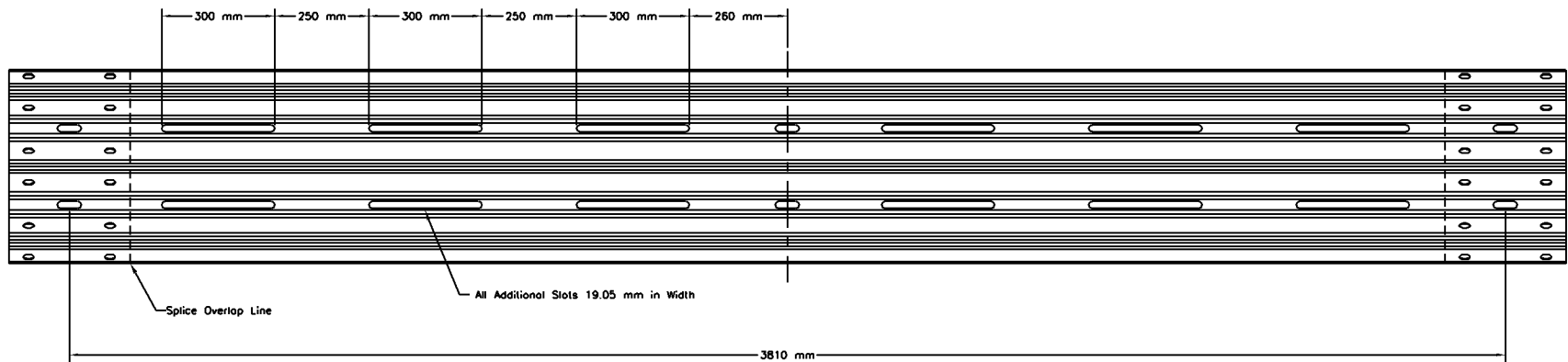
Rail Section 1 ("Nose" Section)



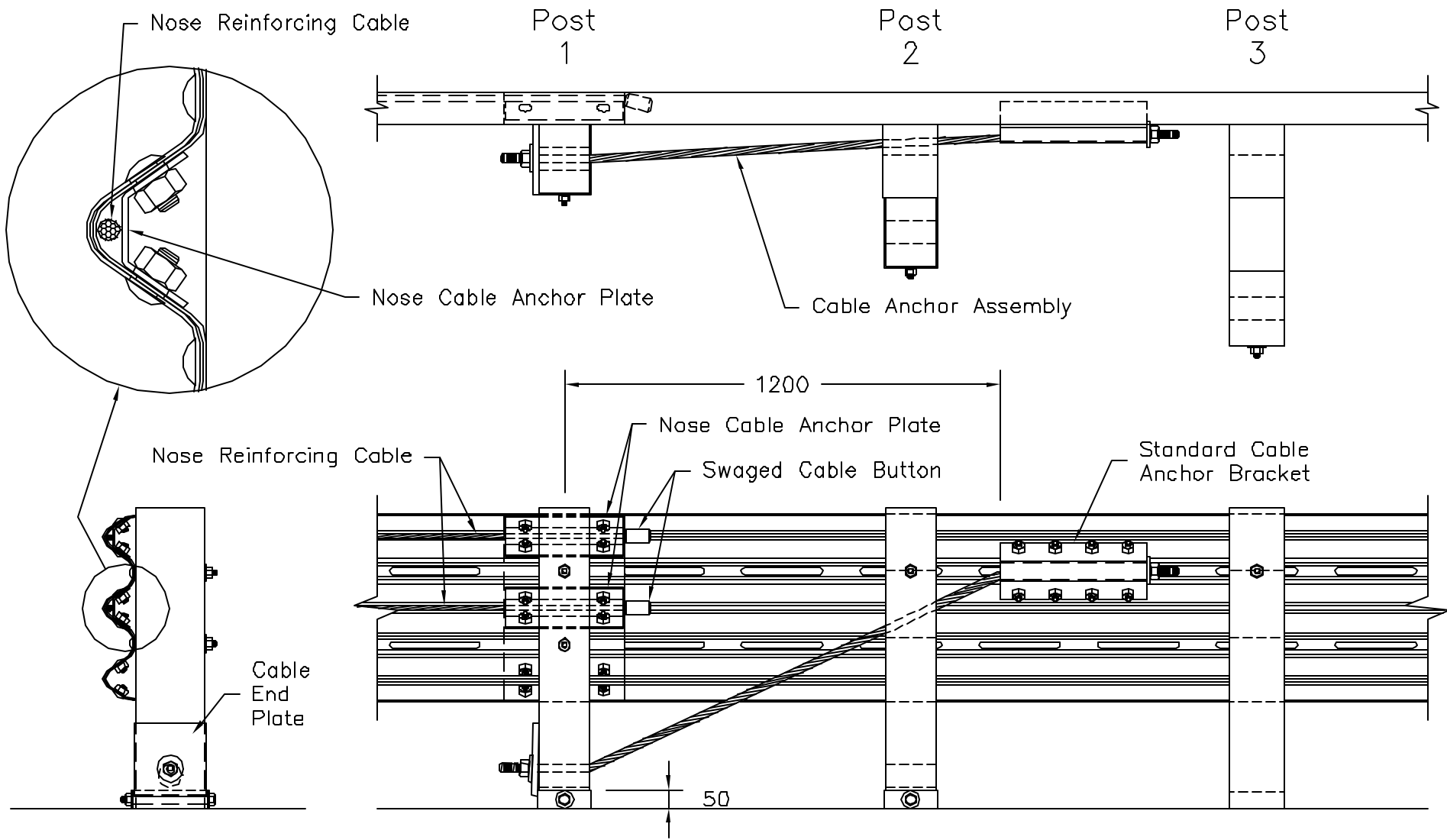
Rail Section 1 ("Nose" Section)



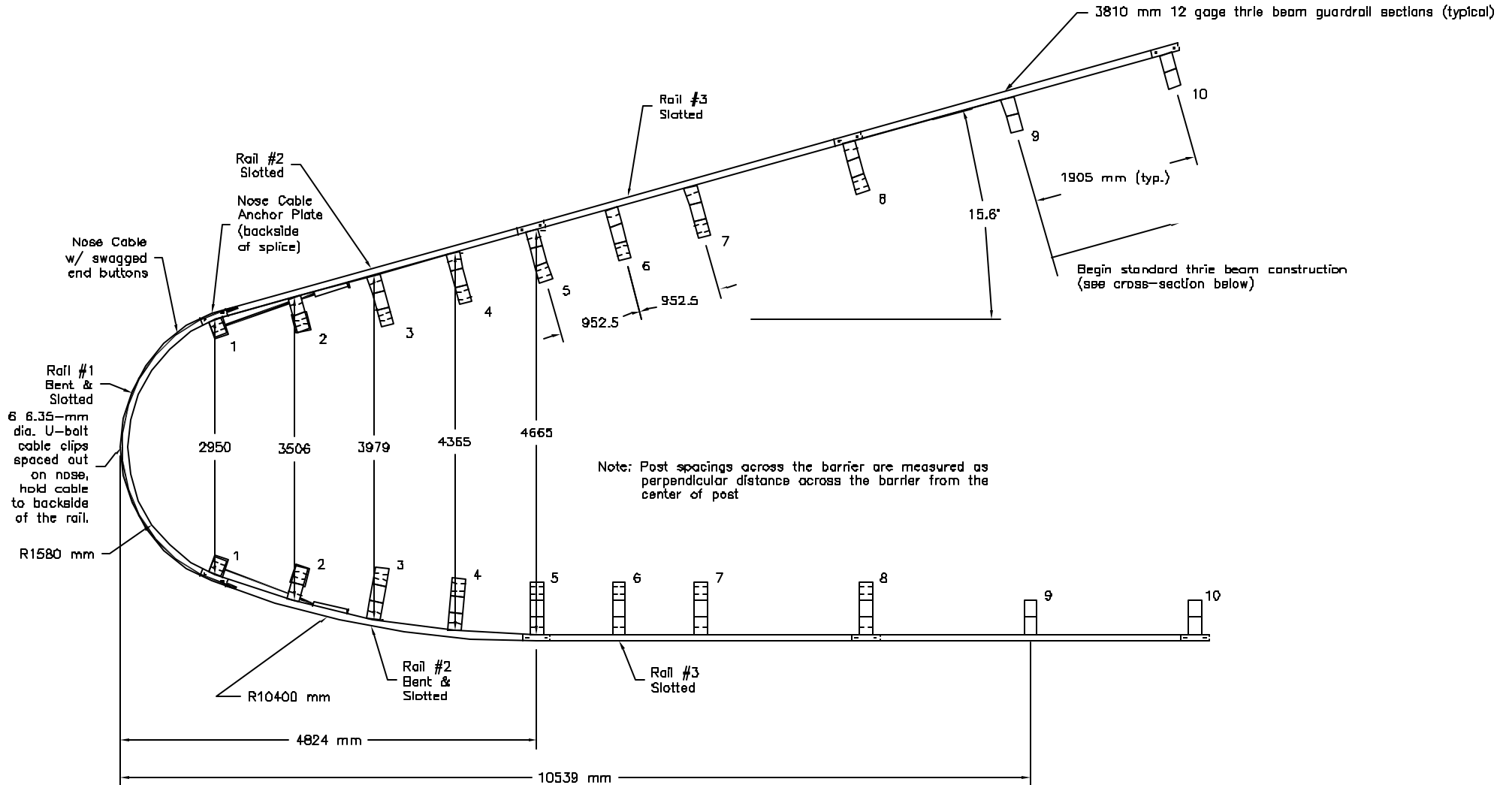
Rail Section 3



Rail Section 3



Widened Bullnose Design No. 1



Widened Bullnose Design No. 2

