

March 8, 2002

HSA-10/B45B

Mr. Rich Peter
Chief, Roadside Safety Technology Branch
Division of Materials Engineering and
Testing Services
5900 Folsom Boulevard
Sacramento, California 95819-0128

Dear Mr. Peter:

In your January 10 letter to Mr. Richard Powers of my staff, you requested the Federal Highway Administration's formal acceptance of a single-slope bridge rail designated as the Type 732S as an National Cooperative Highway Research Program (NCHRP) Report 350 test level 4 (TL-4) design. To support this request, you included a copy of the test report and a videotape of the two tests you conducted.

The 732S design is essentially identical in shape on its traffic face to the concrete single-slope design originally designated the Type 70 barrier (and later renamed the Type 732) and accepted by Mr. Dwight A. Horne's letter to you dated March 6, 1998. It is 810-mm tall and its smooth face slopes away from traffic at 9.1 degrees from vertical. It is fabricated from 15-mm thick steel plate in 2.5-m long segments with steel diaphragms and gusset plates on the backside. The diaphragms are spaced on 900-mm centers and each was bolted to a 25-mm thick simulated bridge deck with four M 22 diameter A354 steel bolts for the crash tests. This particular deck design was used to determine if the barrier connections would likely cause damage to the deck of the specific bridge for which the steel rail was designed. The bolt size was selected to allow the bolts to fail before damage to the deck occurred. However, none of the bolts failed in the single unit truck test. Therefore, the 4-bolt connection could be adopted for use on other types of decks if the design is structurally equivalent to the tested connection. Specific barrier details are shown in the enclosure.

NCHRP tests 4-11 and 4-12 (Caltrans tests 571 and 572) were successfully completed. In the first test, the pickup truck impacted the bridge rail at 25 degrees and 98.2 km/h. Occupant impact velocity was 4.6 m/s and the ridedown acceleration was 5.7 g's. Maximum vehicle roll was reported to be 41 degrees. There was no significant damage to the barrier. In the second test, an 8111-kg single unit truck hit the barrier at 15 degrees and 82.6 km/h. This vehicle was contained and redirected upright, but reached a 47.2-degree roll angle during the crash. Although there was some minor gouging of the steel barrier, there was no significant damage to the bridge rail.

I concur with our California Division Office's preliminary finding that the 732S bridge rail meets NCHRP Report 350 evaluation criteria for a TL-4 bridge rail and that it may be used on the National Highway System when selected by the contracting authority. I also understand that this design is non-proprietary and that anyone wishing further

information may contact you directly at (916) 227-7257 or via e-mail at rich_peter@dot.ca.gov.

Sincerely yours,

(original signed by Janet A. Coleman)

for

Michael L. Halladay

Acting Program Manager, Safety

Enclosure

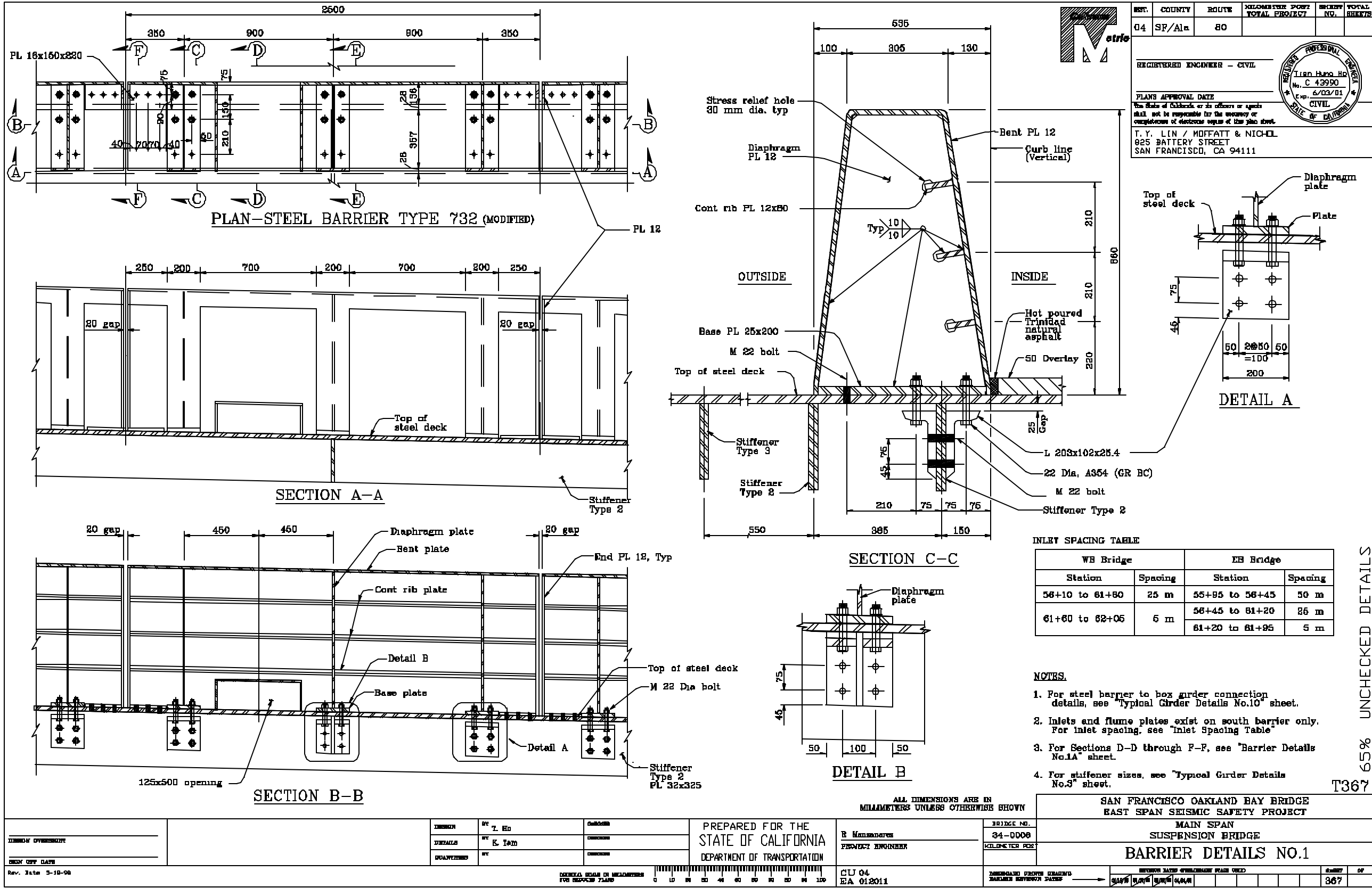


Figure 7-8 – As built drawing for the Type 732S



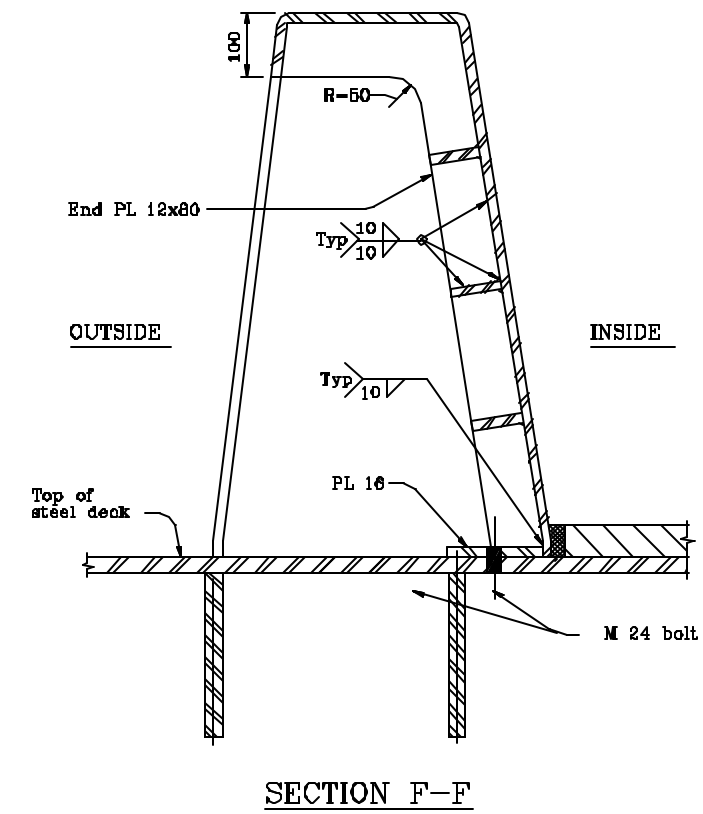
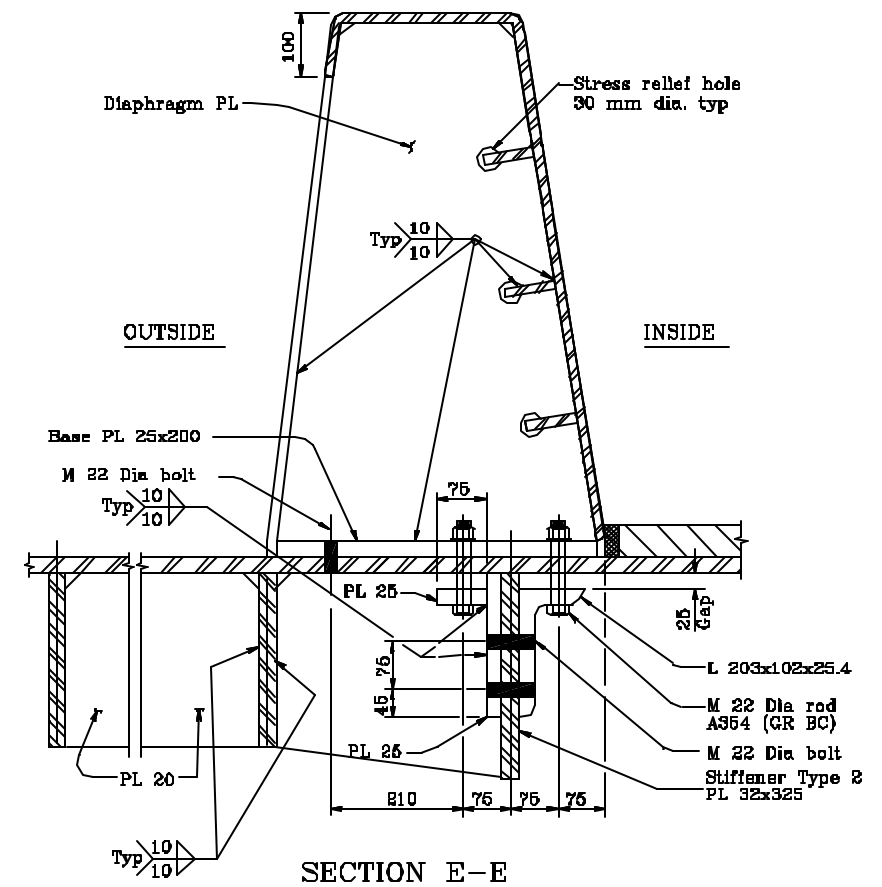
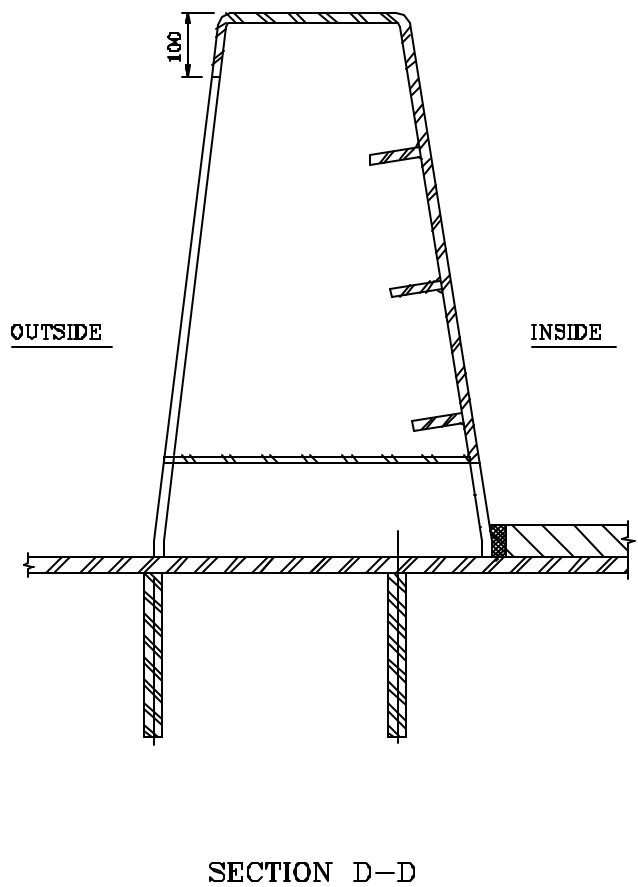
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
D4	SF/Ala	80			

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of information shown on this plan sheet.

T. Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111



- NOTES.
1. For steel barrier to box girder connection details, see "Typical Girder Details No 9" sheet.
 2. Inlets and flume plates exist on south barrier only. For inlet spacing, see "Inlet Spacing Table".
 3. For typical Barrier dimensions, see "Barrier Details No.1" sheet.
 4. For stiffener sizes, see "Typical Girder Details No.3" sheet.

65% UNCHECKED DETAILS

T367A

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN		SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT	
PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		BRIDGE NO. 34-0008	
PROJECT ENGINEER: R. Mansanarez		BARRIER DETAILS NO.1A	
PROJECT NO. CU 04 EA 012011		SHEET NO. 367A	

Figure 7-9 – As built cross section and attachment detail for the Type 732S