



Project Summary

Texas Department of Transportation

0-6143: Standards for Mounting Traffic Control Signs and Devices on Concrete Traffic Barrier (CTB) in Construction Work Zones

Background

Portable concrete traffic barriers (PCTBs) are commonly used in work zones or in temporary median barrier applications. PCTBs separate and direct vehicle movement and protect workers. Signs are often necessary wherever PCTBs are used, especially where driver visibility is optimal. It might be desirable to place signs in the shoulder of the left hand lane between the PCTB and the roadway. Signs placed in the shoulder of roadways are often supported by skids weighted down with sand bags. Often, there is not enough shoulder width for these skid-type sign supports. One solution is to mount the sign supports directly on the PCTB.

What the Researchers Did

The goal of this research project was to develop a sign support mount connection that could be incorporated into the Texas Department of Transportation (TxDOT) standard specifications for sign supports used in construction zones. Due to the large inventory of Type 2 PCTBs, this barrier type was selected to support the sign mounting device for this project. After full-scale pendulum testing of several different sign support mounting concepts and the review of the crash performance of each, one concept was selected for full-scale crash testing in accordance with the American Association of State Highways and Transportation Officials' (AASHTO) *Manual for Assessing Safety Hardware (MASH)*.

What They Found

The sign support assembly selected for full-scale crash testing consisted of a 48-inch × 48-inch × 5/8-inch thick plywood sign panel, sign support post, and sign support connection anchored to the top of a TxDOT Type 2 PCTB. The sign support connection was anchored to the top of the PCTB centered over a joint of two adjoining 30-ft sections of PCTB. The sign support connection consisted of a structural steel tube shape welded to a 3-inch diameter schedule 40 steel collar. The sign post consisted of a 2 1/2-inch diameter Schedule 80 pipe that fit inside the 3-inch diameter steel collar that was welded to the steel tube connection. A 1/2 inch diameter Grade 5 hex head bolt was used to connect the sign post to the sign support connection.

Research Performed by:

Texas Transportation Institute (TTI),
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Research Supervisor:

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Figure 1 shows the sign support assembly anchored to the top of the TxDOT Type 2 PCTB. The sign support connection was anchored atop the PCTB using four 3/4-inch diameter high strength rods that were anchored to the barrier using a Hilti HY 150 Adhesive Anchoring System. These rods were located along the centerline of the steel tube connection and widely spaced along the length of the steel tube. This connection was designed for use with the TxDOT grid slot connection typically connecting the Type 2 barrier. In addition to the grid slot connections in the barrier, three barrier joints in the installation were reinforced with anchored steel strap connection plates located at the base of the barrier. These anchored steel strap connection plates were used to stiffen the joined connections in the immediate area of the sign support. They were installed at the barrier connection joint at the location of the sign support and at two barrier joints adjacent to the sign support. Figure 2 shows the impact angle of the test vehicle with respect to the sign support assembly mounted on top of the barrier.

What This Means

The sign support assembly anchored atop the TxDOT Type 2 barrier tested for this project performed acceptably for *MASH* test 3-11. TTI researchers recommend the implementation of the sign support assembly anchored to the TxDOT Type 2 PCTB in conjunction with the steel strap connections to the three barrier joints as tested for this project and described herein. This recommendation is based on the successful crash performance of this design with respect to *MASH* criteria. For additional information, please refer to the final test report prepared for this project.



Figure 1: Sign Support Assembly Anchored to the Top of the TxDOT Type 2 PCTB.



Figure 2: Impact Angle of Test Vehicle with the Sign Support Assembly.

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