Project Title: Development of a T-Intersection/Curved Guardrail System
Phase I: TL-2 Complaint System
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Project Objective

Develop a short radius guardrail design that meets NCHRP Report 350 TL-2 crash test criteria and that can be installed on the intersection of a primary roadway and another roadway.

Work Performed to Date

Per the proposal plan, a literature review was conducted of short radius designs that were crash tested. The focus was on designs that were tested to NCHRP TL-2 or similar conditions since there is no design that was successfully tested under NCHRP Report 350 TL-3. One particular series of crash tests are those conducted by Southwest Research Institute for Yuma County, AZ. Table 1 below summaries these tests for a 5400 lb pick-truck.

Table 1. Summary of Yuma County test results.

Test No.	Test Vehicle	Impact Specification	System Configuration	Test Results
YC-1	5400 lb pickup	45.0 mph @ 1.4 degrees to the roadway -centerline of test vehicle aligned with bridge rail	- 12 gauge w-beam -8 ft radius curved section with an 18 ft straight section along primary roadway -12.5 ft straight section along secondary roadway -2 independent posts behind the curved section	vehicle redirected with no signs of instability, accelerometer data was within NCHRP 230 limits **-Test Passed**
YC-3	5400 lb pickup	44.8 mph into the curved section @ 19.7 degrees to the roadway	same configuration as YC-1	the anchoring system failed, allowing the system to release **-Test Failed**
YC-4	5400 lb pickup	44.9 mph into the curved section @ 20.1 degrees to the roadway	same configuration as previous with an additional 12.5 ft of guardrail length along the secondary roadway	**-Test Passed**

YC-7	5400 lb pickup	45.2 mph into transition section @ 20.7 degrees to the roadway	same configuration as YC-4	no observed wheel snag or pocketing, accelerometer data fell within limits outlined in NCHRP 230 **-Test Passed**

Some states have a standard drawing for a short radius guardrail based on the original Yuma County design, for example the Louisiana Department of Transportation and Development (LDOTD) has a standard plan of the T-Intersection (GR-200) that is based on the Yuma County original design. Figure 1 below shows two configurations of such design.

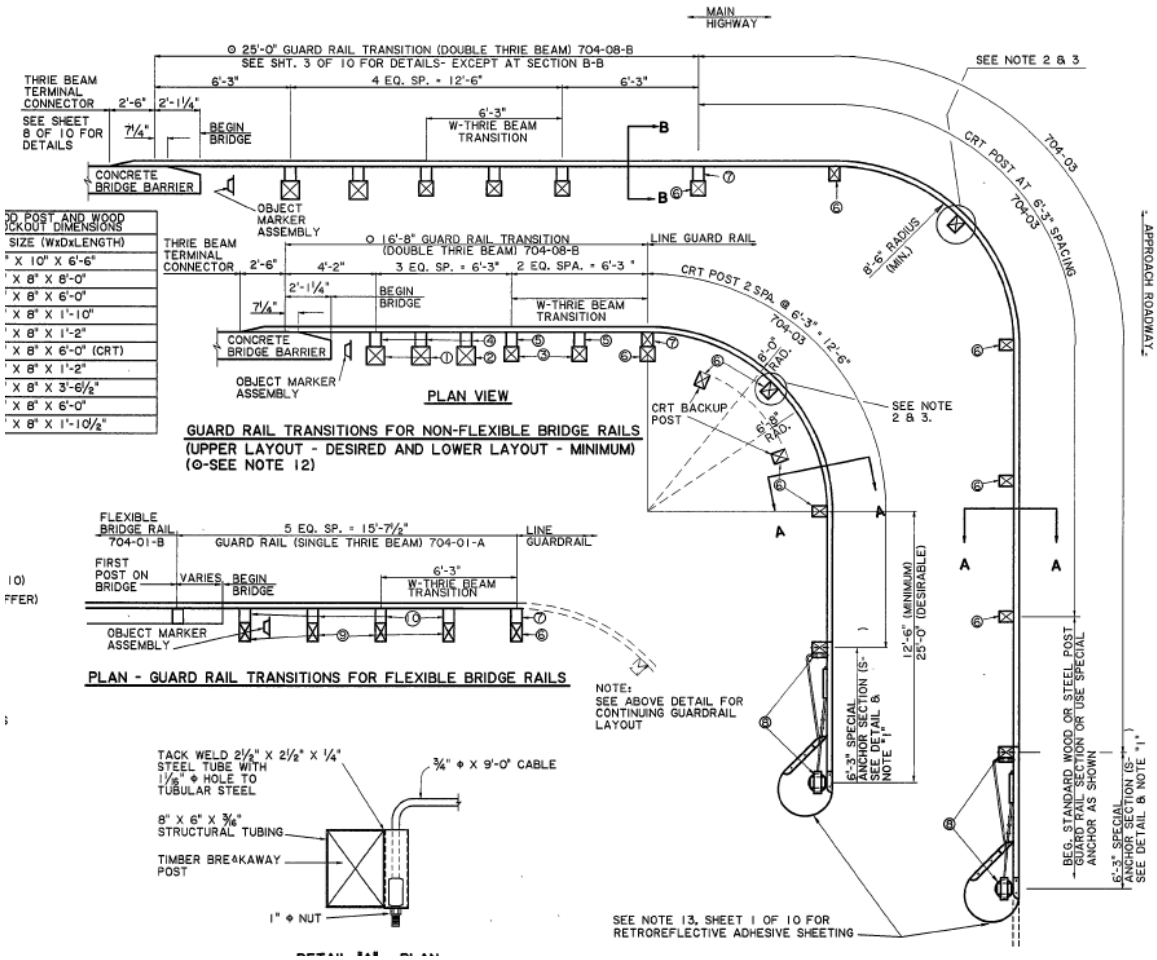

Figure 1 LDOTD T-Intersection design (GR-200)

The Yuma county design is shown in figure 2 below.

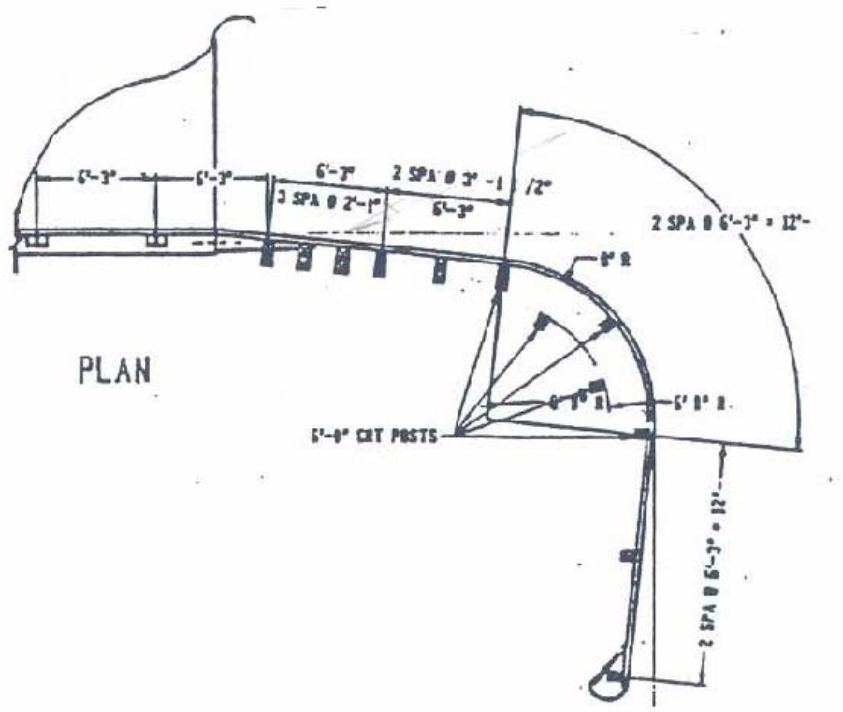

Figure 2 Yuma County short radius system.

Both systems have CRT backup posts as energy absorption features. However, two CRT post may not be the key design feature for such system since their total fracture energy may not be significant to the kinetic energy of the vehicle.

Results of Work Performed

No results are available at the end of this reporting period.

Work Remaining to be Completed

The next step is finish the engineering review and submit a summary outlining the conclusion of Task 1. Tasks 2 (computer simulation) and 3 (crash testing) are contingent upon the results of Task 1 and the recommendation of the pooled fund technical representative.