




Arizona Department of Transportation

ROADWAY ENGINEERING GROUP

MEMORANDUM

To: Roadway Design Personnel
ADOT and Consultants

Date: June 25, 2002

From: John L. Louis 
Assistant State Engineer
Roadway Engineering Group

Subject: Guard Rail-to-Bridge Rail Transitions

The attached Procedure for Determination of Transition Treatment (June 2002) is to be utilized as guidance to evaluate and treat existing guard rail-to-bridge rail transitions in conjunction with pavement preservation project safety considerations, bridge rail replacement projects, or other minor projects that may involve transitions. Thank you for your attention to this item.

JLL/THO

C:

Roadway Engineering Group

Bridge Group

Statewide Project Management Group

Valley Freeway Group

Districts (10)

Traffic Group

Construction Group

Regional Traffic Engineers (4)

Materials Group

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ROADWAY ENGINEERING GROUP

JUNE , 2002
Amended 8/8/02

GUARD RAIL-to-BRIDGE RAIL TRANSITIONS


Procedure for Determination of Transition Treatment for Guard Rail-to-Bridge Rail Retrofits in Conjunction with Pavement Preservation Project Safety Treatments, Bridge Rail Replacements, or Other Special Minor Projects Involving Transitions

Background: When evaluating existing guard rail-to-bridge rail transitions, the designer is often faced with a difficult decision regarding what transition treatment is appropriate for a given location. Many existing bridge railings are grandfathered in as approved to remain in place if they meet AASHTO structural and geometric requirements. Guard rail-to-bridge rail transitions that meet NCHRP 230 requirements are approved to be left in place. The dilemma comes when the bridge rail or bridge dado meets strength requirements but the transition does not.

It makes little practical or economic sense to say that a guard rail-to-bridge rail transition not meeting 230 must be brought up to 350 when a grandfathered bridge rail may remain. To bring a transition to 350 compliance would likely require the bridge rail/bridge dado to be upgraded to the same 350 criteria. This is because there is a lack of crashworthy transition systems meeting 350 requirements that can also be retrofitted to a compliant bridge rail. In order to adequately attach a transition to a bridge, the dado must be structurally adequate.

Therefore it is appropriate to set forth a procedure whereby Roadway Design and Bridge Design personnel review the existing conditions and achieve a consensus on the most appropriate treatment for each particular location.

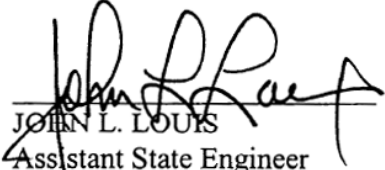
Procedure:

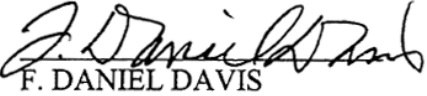
1. Obtain all as-built information regarding the bridge rail, guard rail-to-bridge rail transition, and the approach guard rail.
2. Obtain and review all other project related information that may be pertinent.
3. Obtain and review 230 compliant C-Stds. C-10.80, C-10.30, C-10.31, or C-10.32 as applicable. These can be found on the Roadway Design Web Site within the Construction Standard History from the year 1999. <http://www.dot.state.az.us/ROADS/Rdwyeng/updates/CD-oldStandards/index.html> 
4. Evaluate bridge rails and transitions to determine if they presently meet structural and geometric requirements.
5. If the bridge rail meets strength and geometric requirements and the transition meets 230, no retrofit is required.

6. If the bridge rail/bridge dado do not meet strength and geometric requirements, bridge design and roadway design will coordinate their designs to provide a 230 minimum transition with a possible 350 transition being considered depending upon the bridge rail/bridge dado treatment.
7. When a transition does not meet 230, consider what improvements could be made to achieve what would represent 230. If a 230 transition can be achieved with relatively minor reconstruction, then it can be considered. A guard rail transition system will be considered to meet 230 requirements if it has reduced post spacing for the last 6 posts prior to the concrete barrier connection and has a rub rail attached when there is no curb and gutter. Therefore, as an example, if all that needs to be done to substantially meet 230 is to add a rub rail, or move the rub rail terminus behind the end post, that may be considered appropriate.
8. The roadway designer and bridge designer will review and come to a consensus on the final treatment to be implemented whenever a guard rail-to-bridge rail transition does not meet 230 requirements. This will assure that the system is thoroughly evaluated. That decision will be documented in the project file. In the unanticipated instance of a "no-build" consensus, the factors justifying the determination shall be documented and written concurrence of the Roadway and Bridge Assistant State Engineers is required.

Other Factors which may be considered:

1. Project budget.
2. Accident history at bridge transition.
3. Future projects or work planned at the location.

 6-25-02
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