



# INDIANA DEPARTMENT OF TRANSPORTATION

## *Driving Indiana's Economic Growth*

### Design Memorandum No. 13-09 Technical Advisory

April 12, 2013

**TO:** All Design, Operations, and District Personnel, and Consultants

**FROM:** /s/John Wright  
John Wright  
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Highway Design and Technical Support Division

**SUBJECT:** Small Structure Replacement, Guardrail Runout Length

**REVISES:** Supplemental Instructions to *Indiana Design Manual*  
Chapters 49 and 55

**EFFECTIVE:** Preliminary Field Check on or after June 1, 2013 and as noted

Project managers are encouraged to review small structure projects that fall outside the effective date to assess the benefit of incorporating these guidelines.

The replacement of small structures is considered a spot improvement in accordance with *Indiana Design Manual*, Chapter 55 Geometric Design of Existing Non-Freeway (3R). Project intent and a practical design approach suggest that a spot improvement project be as short as possible. The Department's position is to not automatically fix curves that do not meet current standards unless crash history or other circumstances, such as hidden drives, suggest otherwise. If the intent of the project is limited to replacing the small structure, i.e. the structure is not part of a larger project, and the crash history does not indicate a need for additional safety work, the project should address minimal pavement work and necessary guardrail. This philosophy can often only be accomplished through design exceptions. Design exceptions should not be construed as detrimental to a project's success, but rather as supporting rationale and documentation of engineering judgment.

The length of a small structure project is often dictated by the guardrail length of need, with Runout Length ( $L_R$ ) being one of several variables used to calculate the length of need. Until Chapter 303, Roadside Safety is published; it is acceptable to begin using the 2011 *Roadside Design Guide* (RDG) for  $L_R$  values in lieu of those shown in the *Indiana Design Manual*, Chapter 49, Roadside Safety immediately. The use of the 2011 RDG  $L_R$  values is not limited to small structure replacement projects and is acceptable for both 3R and 4R work. Designers should interpolate to obtain  $L_R$  from the table for design speeds not listed.

The offset from the traveled way to the face of guardrail is another variable in the length of need calculation. For a small structure replacement project, providing the required minimum usable shoulder and an additional guardrail offset may create a roadway or embankment section that is inconsistent with adjacent sections.

The following guidelines for lateral placement of guardrail are recommended for a small structure replacement project and utilize a 4-ft minimum guardrail offset from the edge of traveled way. The *RDG* recognizes that as long as the barrier is placed beyond the perceived shoulder, it will have minimal impact on driver speed or lane position.

Existing Paved Shoulder Width	Face of Guardrail Location	Comments
0 – 2 ft	4 ft from travel lane pavement	Obtain Design Exception for useable shoulder width as required.
3 – 4 ft	4 ft from travel lane pavement	Obtain Design Exception for useable shoulder width as required. If the existing useable shoulder on the approach roadway exceeds 4 ft, consideration should be given to a flared installation. If a flared installation is used, it is not necessary to pave beyond the 4-ft shoulder.
5 – 6 ft	6 ft from travel lane pavement	Obtain Design Exception for useable shoulder width as required. If the existing useable shoulder on the approach roadway exceeds 6 ft, consideration should be given to a flared installation. If a flared installation is used, it is not necessary to pave beyond the 6-ft shoulder.

The use of guardrail in conjunction with drainage structures should continue to be in accordance with *Indiana Design Manual* Section 49-3.04(01) and 55-5.03(02).