
REINFORCED CONCRETE BOX STRUCTURES AND THREE-SIDED STRUCTURES

Reference: [LPA & State Shop Drawing & Falsework Review Procedures](#)

The agency has multiple locations with information on the topics of reinforced concrete box structures and reinforced three-sided structures. The intent of this memo is to provide a few points of clarification and reminders for designers related to these structure types.

Material and Design Requirements

The material and design requirements for reinforced concrete box structures and reinforced concrete three-sided structures are specified in *Indiana Standard Specifications* sections 714 and 723 respectively. Notes related to materials or design data should not be included on the contract plans. If exceptions to the *Standard Specifications* are being proposed on a project-specific basis, a unique special provision should be included in the contract. If complete structures or portions such as wingwalls are fully detailed on the plans and will not be the responsibility of the Contractor, design data notes should be included on the plans for those elements.

Shop Drawing Review and Load Rating

The [LPA & State Shop Drawing & Falsework Review Procedures](#) document located on the INDOT Construction Information webpage defines the shop drawing review procedures for precast concrete 3-sided structures and box culverts. The Engineer of Record (EOR) should submit a New Design request in the Load Rating Request Applications (LRRRA) upon receipt of the shop drawings and calculations from the Project Engineer/Construction Project Manager/Project Supervisor (PEMS). The EOR should then begin their review concurrently with the Department's load rating process. Structures sizes and cover limits which trigger a load rating can be found in the referenced shop drawing review document.

The requirements for working drawings and calculations are given in 105.02, 714.04(c), and 723.04(c) of the *Standard Specifications*. The shop drawings should clearly illustrate concrete dimensions, reinforcing requirements including bar size, spacing, and clear cover, reinforcing bar lap lengths, and all other details that will become part of the permanent structure. Insufficient or unclear details should result in the rejection of the shop drawings.

The EOR should review the shop drawings and calculations for conformance with the contract plans and specifications. The design of reinforced concrete box structures and reinforced concrete three-sided structures in accordance with the *Standard Specifications* is the sole responsibility of the Contractor and will not require a comprehensive review by the EOR. The Department's load rating is based on the information provided on the shop drawings and is not intended to serve as a review of the Contractor's design. Any unique details or non-typical design elements may be cause for the EOR or Department to request additional information or hand calculations from the Contractor, in accordance with 105.02. Examples of unique details may include connecting elements and their associate design capacity, joints not shown on the contract plans, or specific construction sequences that could result in locked-in forces.