

**Box Culvert Guard Rail (2005-2)**  
**State Technical Representative**  
**William Williams, P.E., Project Manager**

**Project Objective:**

Develop a guard rail design for typical box culverts that will meet TL-3 requirements of NCHRP Report 350. This design will also simplify contractor installation through the use of an epoxy adhesive anchor system to anchor the post anchor bolts to the concrete box culvert.

**Work Performed to Date:**

Performed two detailed post designs using the Hilti RE 500 Epoxy anchoring system. Designs were submitted to panel members for review on September 19, 2006. Two designs using two different post sizes were performed and submitted. The W6x9 design is recommended for guard rail installations constructed over shallow box culvert. The W8x21 design is recommended when greater post strength is required.

**Results of Work Performed**

Both designs incorporate the use of Hilti RE 500 Adhesive Epoxy Anchoring System. Post strengths were evaluated and post baseplates and anchors were developed for each post size.

**Work Remaining to be Completed.**

Full-scale pendulum testing of a single design is planned for one of the designs developed for this project to validate the analytical results. After review of the testing results and approval of the post strength performance, full-scale crash testing using a pick up truck is planned.