Culvert-Slip-Liner Repair Method

Jerry Thompson
District Operations Engineer
Vincennes District
INDOT
CULVERT REPLACEMENT AND SLIP-LINING REPAIR METHOD

By:

Jerry E. Thompson, P.E.
Vincennes District Operations Engineer
Indiana Department of Transportation

Maintenance Session.................................3:15-4:30 P.M.

Session Goal:
To provide the latest information of interest to city, county and state maintenance personnel regarding culvert replacement and the slip-lining repair method.

This presentation is a joint effort on the part of myself, Mr. Rusty Fowler, P.E., Operations Field Engineer and Mr. Richard Thomas, P.E., also an Operations Field Engineer in the Vincennes District Operations Department of the Indiana Department of Transportation.

My portion will include welcoming comments, an introduction of Mr. Fowler and Mr. Thomas, a discussion period and conclude with closing comments, all to be accomplished in approximately 30 minutes.

I have re-arranged the order to allow the Culvert Replacement portion presented by Mr. Fowler to go first, followed by the Slip-Lining Repair Method presented by Mr. Thomas.

This next 30 minutes will hopefully provide you with some useful information that will help you with your decision making process, and provide some understanding of what INDOT has gone through to get where we are today.
Before I introduce the Engineers who will get into the specifics of culvert replacement and repair, I would like to provide a brief explanation of the decision making process utilized by INDOT.

New roads and bridges are constructed by contractors through a bid letting process. The project is constructed in accordance with the plans, prepared by either INDOT design engineers or a consultant, the Standard Specifications, and any special provisions contained in the proposal or contract. The plans contain Standard Drawings along with drawings unique to the project itself. These Standard Drawings, or Standards, are prepared to accomplish a number of goals. These are to save the designer time by not requiring each little part of the project to be individually designed, to provide uniformity for all bidders, and to assure standardization between projects.

These standards also allow the contractor to select the type of culvert, or slip-liner, usually among various types of material, permitted to be used for each individual culvert. In most cases, choices are available. In some cases, the choices are limited due to special conditions for that culvert. INDOT is striving to accomplish a goal with this selection process, and that is to allow various materials to be used, which promotes competition among producers, while striving to assure the culvert used is cost-effective. Obviously we could allow the bottom-line cheapest, which may not last, and we also could require a material that is so over-designed the extra cost could not be justified. We want our cake and eat it too!

So how do we do that? INDOT currently has a committee, named the Pipe Service Life Committee, of which I happen to be a member. The task before this committee is to make recommendations regarding pipe to those responsible for preparing the Standards, the Specifications, and design manuals, used by the designers. This committee currently has many studies underway, all in various stages. We are striving to find, and to select, the best and most modern materials and methods INDOT can use to provide safe long lasting roads. Again, we want as close to perfection as we can get. The process is never-ending as the industry and bright designers are coming up with new and improved ideas every day.
About two (2) years ago, the Standards were revised, based on, in part, input from the pipe committee. These new Standards placed emphasis on the service life of the pipe, while taking into consideration the functionality of the roadway and various field conditions. This process resulted in two (2) service life categories: 75 years for Interstates and Arterials, and 50 years for Collectors and Local Roads. Obviously, these standards have set their sights on the long-term. We, as an agency have decided we believe it is worthwhile, on newly constructed projects, to put something in the ground that is going to last well into the future. The result of all this is to thicken the gage when the pipe is placed under a high-class road, especially if the site has been found to have abrasive conditions or have higher than normal acid level readings. However, in accordance with these standards, a normal driveway pipe may be acceptable at only 16 gage.

Some of the requirements in these INDOT standards may be more conservative than you think necessary for your county or town, especially in locations where the culvert can be easily replaced.

As our first topic today is about culvert replacement, field conditions should help you decide what should be considered when selecting the type of pipe to be used.

Without further delay, let’s have Rusty give you his thoughts on the entire subject of replacement (not just about the pipe itself), then we’ll hear from Richard on what-to-do-when-closing-the-road-and-digging-up-a-deep-pipe-gives-you-the-willies.

INTRODUCE RUSTY FOWLER
Thank you Rusty

Next we have Richard Thomas, who will provide you with a portion of his considerable knowledge about the slip-lining process. The first slip-lining work, by the way, was pioneered in the Vincennes District of INDOT just over ten (10) years ago with Richard as the engineer in charge of that effort. Richard has made presentations at previous Purdue Road Schools, covering the topic much more in depth.

RICHARD

Thank you Richard

The Pipe Service Life Committee I referred to earlier is also in the process of reviewing and updating the Standards and Specifications for Slip-Liners. The process is not complete, so going into details would not be helpful at this time. We are looking at all the new materials and fabrication styles available and hope to complete our recommendation in the not-too-distant future.

If you are interested in this process, please get in contact with one of the vendors supplying this product and give it a try, I think you will find it to be relatively easy, especially considering the alternative!

If you would like additional information or want to discuss it further with either of my Field Engineers, please feel free to contact Rusty or Richard at your convenience.

Are there any additional questions for either Mr. Thomas or Mr. Fowler or myself?

Thank You for making this, The 86th Annual Purdue Road School a success.

END