



Transportation Research Division



Technical Report 07-3

*Utilizing Snap-Tite Slip Line Pipe
as a Direct Burial Cross Pipe*

Second Interim Report, January, 2009

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Introduction

The Maine Department of Transportation uses reinforced concrete, polymer coated corrugated metal, corrugated aluminum or corrugated polyethylene for highway cross pipes. Design life for cross pipe is 50 plus years. Repair of failed cross pipes involves excavation and replacement resulting in high costs and traffic congestion. A cost effective solution to repair failed cross pipes is to slip line the pipe. MaineDOT policy allows the use of solid wall and profile wall high density polyethylene pipe for slip line applications. Snap-Tite is one of the solid wall liners often used.

Snap-Tite Pipe is a smooth bore pipe that comes in a variety of lengths and diameters. The pipe is lightweight and has a unique joint that snaps together to form a tight bond and water tight seal.

The Department has been slip lining corroded corrugated metal cross pipes for a number of years using Snap-Tite Pipes. This repair can only be employed when the existing pipe is large enough for the slip line pipe, the replacement pipe is large enough to handle the water flow, the ends of the metal pipe have not been lifted by frost, and the position of the existing pipe is sufficient for drainage.

A cross pipe on the Smyrna Road in Oakfield and another on the Pond Road in Benedicta were not suitable for slip lining and had to be replaced. It was decided to use Snap-Tite Slip Line Pipe as a direct burial cross pipe at these locations because of the cost as compared to the conventional materials used.

Construction

For Construction information, please refer to the Construction and First Interim Report dated October, 2007.

Evaluation

The two Snap-Tite Pipe locations in Oakfield and Benedicta were evaluated on October 8, 2008.

Oakfield – Smyrna Road Location

The cross pipe at this location was replaced with two 54 foot by 32 inch Snap-Tite pipes in 2005. Each pipe consists of three 18 foot sections. The top of each pipe is approximately 54 inches below the roadway surface.

An evaluation of this section was not completed in 2007.

Approximately three years after installation, these pipes remain in very good condition. The 4 to 5 inch elevation drop at the center of the pipe identified in the 2006 visual evaluation has not changed. No appreciable deformation is visible in either pipe (Photo 1). Neither pipe appears to have moved and

banking material at both the inlet and outlet ends remains in place (Photo 2). Roadway settlement, where the pipes cross under the road continues to be approximately 1 to 1.5 inches.



Photo 1: Left Pipe - From Inlet End



Photo 2: Inlet End of Pipes

Benedicta – Pond Road Location

Two Snap-Tite pipes were installed at this location to replace the two existing metal corrugated pipes. Both the main pipe and the overflow pipe are approximately 35 to 40 feet in length. The overflow pipe is approximately 1 foot higher than the main pipe (Photo 3).

After one year of service, the two pipes at this location are performing very well. Minimal deformation was observed in each pipe, believed to be caused by the weight of the backfill. Pipe joints were found to be intact, with no separation. Banking at both the inlet and outlet ends of the pipes remains in place, with no washouts visible (Photo 4).

The roadway has settled approximately 1 inch where the pipes cross under the road.



Photo 3: Main (left) and Overflow Pipe



Photo 4: Banking at Outlet End of Pipes

Summary

Overall, the four pipes installed at these locations are performing well. Very little deformation of the pipe was noted at either location. Joints are intact, with no visible separation.

Approximately 1 inch of settlement has occurred at the pavement surface and banking at each end of the pipes is intact, with no visible washouts. These conditions are considered to be an indication of successful installation procedures.

A visual inspection will be completed in 2009 at both locations with the Third Interim Report to follow.

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