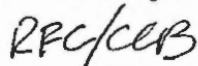


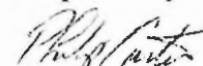
Reviewed by:



Robert F. Cauley, P.E.  
Materials and Research Engineer



Prepared by:



Philip Carter  
August 31, 1998

---

## RESEARCH UPDATE

---

U1998-7

### Insituform Pipe Lining Process

**Reference** Work Plan 91-R-9, U96-1, U96-26, U97-11

#### **Background**

Insituform is a system used to repair deteriorating pipelines without the need of excavation. The system uses a fiber felt liner which is impregnated with resins. The liner is fed into the pipe and sealed at the ends. The liner is then filled with water, pressing it onto the existing pipe. The water is heated, setting the adhesive, then cooled. The water is then drained, leaving a durable resurfaced interior. The advantage of this system is that roadways can remain open to traffic during installation. Three Insituform culvert liners were installed by the manufacturer, Insituform of New England, during the Fall of 1992 on the following structures:

- Interstate 89 MM 73.57, Town of Richmond- 1830 mm x 116 m corrugated metal pipe
- VT Route 22A MM 4.65, Town of Bridport- 1830 mm x 51m corrugated metal pipe
- VT Route 22A MM 0.23, Town of Addison- 1830 mm x 40 m corrugated metal pipe

In each case it was determined that excavation was an impractical approach given the lengthy detours required. Consequently, the use of Insituform was considered prudent.

#### **Inspection**

The culverts have been inspected yearly since installation of the product. The most recent inspection, on August 10, 1998, showed no change in the condition in the linings since the previous inspection in 1997. When the liner was installed in Bridport the culvert was collapsing, evidenced by a pronounced elliptical shape. It was hoped that the Insituform liner would add structural strength to the pipe and avoid the need for complete replacement. Measurements made at the axes of the ellipse have been identical each year, indicating that the liner has strengthened the pipe and prevented further collapse. Likewise, the Richmond and Addison linings had no signs of movement or deterioration. In addition, the low friction afforded by the lining has minimized build up of debris. All pipes were clean and had good flow.

#### **Follow Up**

The culverts will continue to be inspected yearly and update reports will follow.