

Freisland Ditch Culvert Rehabilitation

CNA Consulting Engineers provided the design for rehabilitation of a liner plate arch culvert under I-35 near Hinckley, Minnesota. The culvert suffered from corrosion at the waterline and excessive deformation in the upper arch. Timber posts and beams had been installed by maintenance crews for temporary support. The rehabilitation included installing steel posts and spreaders, removal of the wood supports, pouring a concrete invert, shotcreting the upper arch, and removal of all the steel posts.



Invert concrete and arch rebar in place with winter snow shelter overhead

This was a pilot project to develop evaluation and repair methods for distressed liner plate structures. Sections were lined with four different combinations of dry and wet shotcrete and bar and fiber steel reinforcement. Various instruments were installed, including: strain and stress gauges, delamination gauges, and extensometers. After the repair, test loads were applied and the performance recorded.

Owner — Minnesota Department of Transportation

Completion Date —1996

Construction Cost — Entire Project \$250,000

CNA
Consulting
Engineers

2800 University Ave. SE, #102
Minneapolis, MN 55414
Ph: (612) 379-8805
Fax: (612) 379-8160
E-mail: bkn@cnaengineers.com