



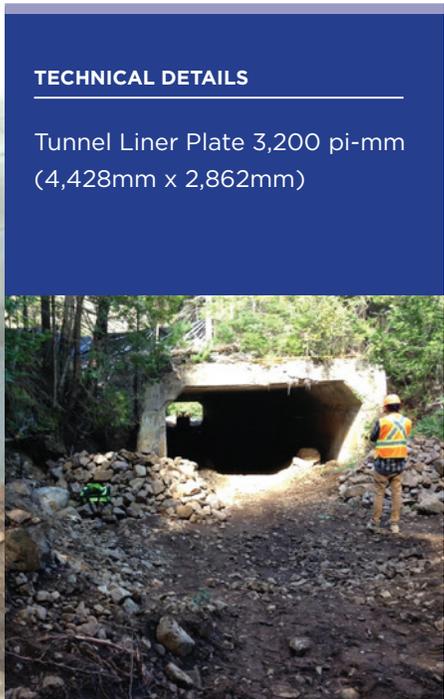
Shamrock Lake Concrete Culvert Rehabilitation using Tunnel Liner Plate

OWNER	Northwestern Region MTO
DESIGNER	Hatch Mott MacDonald
CONTRACTOR	KA Vanderzwagg
LOCATION	Hwy 11 East McKirdy, ON

Located on Highway 11 in East McKirdy, Ontario a 108 year old cast-in-place (CIP) concrete box culvert located 9 metres beneath the highway was failing. A solution was required to rehabilitate the structure and maintain vehicular access along this busy stretch of highway.

Application:

The Northwestern Region Ministry of Transportation required rehabilitation of a failing CIP concrete box culvert located 9 metres beneath a section of Highway 11 in a ravine.



TECHNICAL DETAILS

Tunnel Liner Plate 3,200 pi-mm
(4,428mm x 2,862mm)

The Challenge:

One of the primary challenges faced on this project was the requirement to build a structure around a 1,000mm diameter bypass pipe to be routed inside the existing structure to transport water during construction and keep the job site dry. The support system for the pipe running along its length needed to be factored into the installation phase.

The failing box culvert was located 9 metres below the highway down a ravine. Access to the job site was limited with only a trail on the west side leading down to the structure. Additional infrastructure to access the job site was not planned. Finally, due to the remote location and restricted site access the owner required an extended service life and corrosion resistant product.

The Solution:

The original solution to rehabilitate the concrete box culvert was a push/pull installation using Multi-Plate. After consideration of the bypass pipe requirement, the contractor proposed an alternative design developed by Armtec using Tunnel Liner Plate. A 4,428mm diameter x 2,862mm long pipe arch structure was constructed using Strata-CAT polymer coated sections of 3,200pi-mm Tunnel Liner Plate. The Strata-CAT polymer coating extended the structure's service life up to 100 years.

The use of Tunnel Liner Plate allowed the contractor to install the bypass pipe and build the structure around it. Other structural plate products would have led to a more time consuming and labour intensive installation since assembly would have needed to work around the pipe and its support system. With Tunnel Liner, plates were assembled into continuous rings advancing the tunnel in 500mm sections.

One hundred and eight Tunnel Liner Plate rings were used in total.

The Tunnel Liner plates were delivered to site on relatively small pallets that could be moved close to the mouth of the structure. This reduced the distance materials needed to be carried speeding up installation. The alternative Multi-Plate which was originally proposed would have required assembly on the side of the road and 'rolling' or hoisting down to the structure.

Rehabilitation of the CIP concrete box culvert was successfully completed in October 2016. Armtec's Tunnel Liner Plate provided a cost-effective and practical solution to this challenging rehabilitation.

Find out how Tunnel Liner Plate can be used on your next project.

Contact us today!



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