

**CULVERT HEADWALLS
OTTAWA, ONTARIO, CANADA**

Weirs, Culverts and Transverse Structures

Problem

The culvert and the road above it were to be upgraded to current roadway standards. This meant a widening of the roadway platform and using materials that satisfied a 75 year design life. The problem with this scenario was that the site is underlain by very sensitive soft Leda Clays and the City required that all the upgrades remain within the existing municipal Right-of-Way.

The nature of the Leda Clay soils meant that any new headwall structures must be designed so that there was no increase in the net loading on the foundation soils. This ruled out the use of a conventional vertical headwall structure.

Unfortunately for the City of Ottawa and the Contractor, Dalcon Enterprises Ltd., the supplier of the culvert promised that a welded wire wall could be built without properly understanding the nature of the in-situ soils. After the road had been completely excavated to install the new culvert, the supplier then informed the City and the Contractor that they could not deliver a design that satisfied all of the design criteria.

With Sarsfield Road closed due to the culvert excavation and a fixed opening date to allow for school buses to transport students back to school, the City's Design Consultant, Dillon Consulting, decided to contact Maccaferri in order to solve this challenging problem.

Solution

Working with Dillon Consulting and Houle Chevrier Engineering, Maccaferri determined that in order to avoid overloading the foundation soil and to widen the roadway platform, a steep, reinforced slope would be required. In order to satisfy the 75 year design life, a Maccaferri Terrawall System was proposed. It was determined that two reinforced slopes constructed at each end of the new culvert at 65° from the horizontal would provide sufficient space at the top of the structure in order to accommodate two 3.25m traffic lanes and shoulders. The downstream (west) headwall was approximately 4.5m in height. The upstream structure was approximately 5.2m high. The upstream and downstream structures were each approximately 20m long. Once the culvert was in place, it took less than one week to construct and backfill both reinforced slopes.

Client: City of Ottawa

Designer / Consultant: Maccaferri Canada / Inspec-Sol Engineering

Contractor: Dalcon Enterprises Ltd.

Products used (Qty.)

- Terrawall 164m²

Date of construction: 08/2007 - 09/2007



Headwall Structure



Units in place, ready for next lift

