REINFORCED EARTH®
SUSTAINABLE TECHNOLOGY
NEWS
July 2012

Interchange A30-A730

The extension of highway 30 as a southern bypass in the Montérégie area comes more than a decade after the last portion was built in 1996. This extension is expected to reduce traffic and transit time in the island of Montreal. It will also help link the regional highways into a more efficient network. In addition, due to the population expansion on the south shore, the existing main routes can no longer meet the traffic demands, the extension of the highway will help re-route a huge amount of the traffic and thus making the travel easier and faster in the region.

One of the main interchanges on this extension in Saint-Constant, Québec is the interchange A30/A730. It is part of the eastern portion of the extension of the highway and one of many TerraClass MSE walls projects designed and supplied by Reinforced Earth Company Ltd. for this portion.

This Interchange links the towns of Delson, Sainte-Catherine, Saint-Constant and the Kahnawake Mohawk reserve to Châteauguay and Léry to the west and to Honoré-Mercier Bridge to the north. With this project, part of the old highway 30 became highway 730 linking the new portion to route 132. As part of the eastern portion, this interchange is one of the several bridges linking Montreal to New York State via highway 30 then highway 15, therefore playing a major economic role in the region liking the markets of Quebec, Ontario and the northeastern States.

What's Inside

Interchange A30-A730

continued from page 1

The owner of the project is "Transports Québec", for this reason the project was designed and built to meet MTQ's specifications.

The area of the walls was 1904m2 with Fractured Fin and raised architectural finish portion of the panels.

An architectural detail was requested by MTQ so that the raised portion of the abutment could be carried throughout the length of the adjoining walls. Reinforced Earth Company Ltd. then designed a raised rectangular portion in the center of the panels within the wall.

The design produced a wall that would not show a continuous strip but rather an alternating pattern. It was requested by the Owner that the new design should be a visible improvement to one continuous strip and therefore was designed as such.

On November 19, 2010 the eastern portion of highway 30 was officially open to traffic.

Owner: Transports Québec

Contractor: Constructions Bricon Ltée

Project Size: 1904 m^2

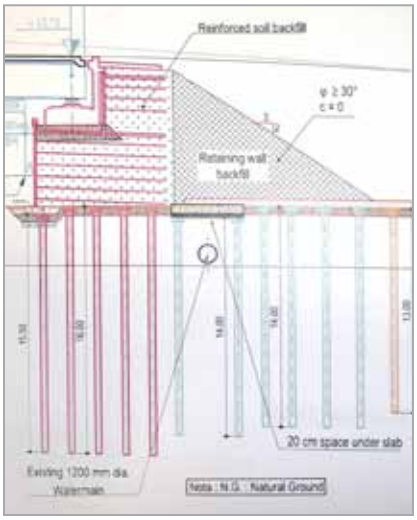
Architectural: Raised Fractured Fin

Aranguez Bridge – Trinidad and Tobago

Reinforced Earth Company Ltd. Canada (RECO) and Vinci Construction Grand Projets were proud to design and construct the Aranguez Bridge Interchange on behalf of the Government of Trinidad and Tobago. This was RECO's second project in Trinidad and Tobago.

This project required RECO to design the two tiered true abutment walls that supported the Aranguez Bridge over the Churchill Roosevelt highway. Due to the seismic activity in the area RECO's Mechanically Stabilized Earth walls were the ideal choice due to their proven track record under previous major earthquakes. This abutment design is the first of it's kind to be used in Trinidad and Tobago.

The new bridge is a 54m single span composite deck with two associated ramps. The bridge now has four lanes, two lanes in each direction.



Before the abutments embankments were constructed ground improvements to the foundation soil were needed.

This was accomplished by drilling 768 flight auger piles each 400mm diameter. To construct the composite deck which consists of 250 tons of steel and 260m^3 of concrete, Vinci used a Self Propelled Modular Transport – multi-axle transport of COMETTO type. The transport was able to move the pre-assembled steel structure from the North abutment where it was assembled to the other side of the Churchill Roosevelt Highway.

This operation was done at night with minimal disturbance to the traffic flow. The introduction of this technology was also a first in the Caribbean region.

Owner: Government of Trinidad and Tobago

Contractor: Vinci Construction Grand Projects

Project Size: 910m2 of TerraClass Walls

Architectural: Smooth Grey Finish

RIVER and FROST Embedment

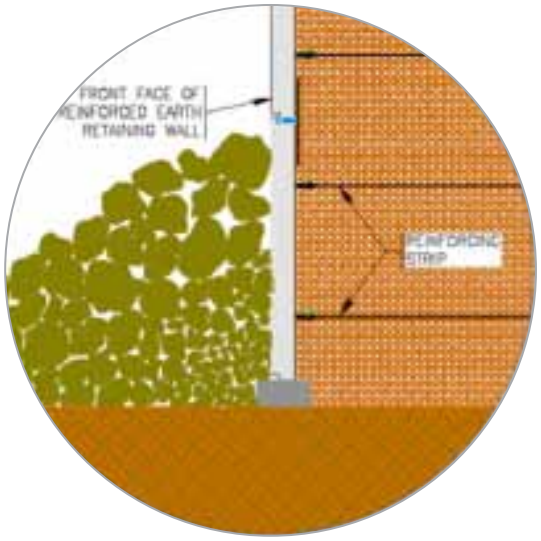
Embedment of MSE River Walls

Nowhere is the need for embedment of an MSE wall more important than with walls that have their toes submerged in a river or other body of water. In this case it is standard to provide increased scour protection by increasing the depth of embedment and also to use coarse rock material commonly referred to as Rip-Rap. For these walls it is necessary for a hydraulic or geotechnical engineer specialized in scour protection to specify both the depth of embedment and the size and grading of the Rip-Rap. There was a recorded case, many years ago, where a heavy flood removed the Rip-Rap that was undersized for an extreme flood and the stream flow continued to remove the soil under the wall and behind the facing panels. The end result was the loss of the wall and the bridge on top of it. As unfortunate as this accident was it was an important lesson. It must be understood that many MSE walls have been successfully used along rives for several decades proved the scour protection is properly designed.

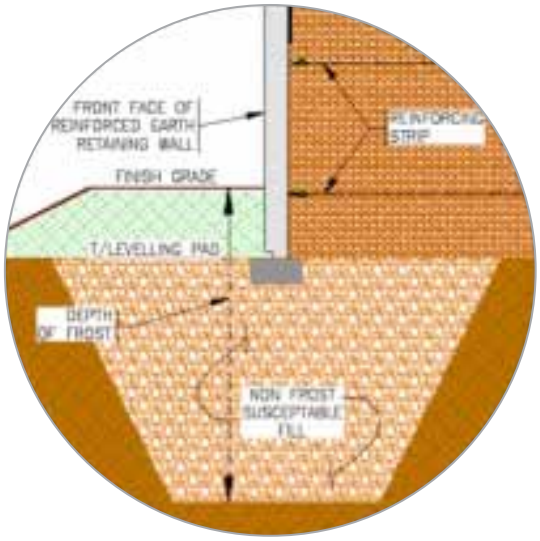
Should MSE Walls be Embedded Below the Frost Depth?

Many engineers unfamiliar with MSE walls make the assumption that these walls must be founded below the prevailing depth of frost. This is simply not necessary and results in an unnecessary expense when it is enforced as a project specification. The practice of not embedding MSE walls for frost has existed for 40 years and the authors are not aware of a single case of MSE wall distress due to frost heave. The reason for this is likely a combination of the flexibility of the facing to accommodate any minor heave without distress, and the absence of a large concrete footing for ice lenses to adfreeze to.

At some geographic locations there may exist a foundation soil for an MSE wall with a particular nasty reputation as very frost sensitive. In this case added insurance against frost movements can be achieved by what is commonly referred to as a "frost trench". A example geometry of this can be seen in figure 1. The basic concept is to replace the frost-susceptible foundation soil with a non-frost susceptible soil, typically a clean granular material for the prevailing frost depth but only in the zone under the leveling pad and immediately behind it. This will often introduce a trench that collects ground water but since the fill in this trench is granular there will be negligible expansion upon freezing.



RIP RAP Protection in Water



Optional Frost Trench Detail

Reinforced Earth Company Ltd.

1550 Enterprise Road
Suite 229
Mississauga, Ontario, Canada
L4W 4P4
Tel. 1.800.263.7097
Fax. 905.564.2609

REINFORCED EARTH®
SUSTAINABLE TECHNOLOGY

www.reinforcedearth.ca

- Antigonish NS (902) 735-3900
- Edmonton AB (780) 453-8983
- Montreal QC (450) 646-4266
- Toronto ON (905) 564-0896
- Vancouver BC (604) 714-0766