RECO NEWS
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The Reinforced Earth Company

Tree covered islands greet visitors to Alberta Children's Hospital

The new Alberta Children's Hospital, recently completed in North West Calgary Alberta, required a new road access to accommodate the increased traffic to the new facility. The new interchange, designed by Stantec Consulting Ltd. Calgary office, was constructed near the Trans Canada Highway (16th Ave) and Shagganappi Trail to provide easy entrance to the hospital that serves southern Alberta, southeastern British Columbia and southwestern Saskatchewan.

The project was subsequently tendered in July of 2005, and a construction contract was awarded to Volker Stevin Contracting Ltd. Reinforced Earth Company Ltd. (RECo) was awarded a contract for engineering design and material supply for the Mechanically Stabilized Embankment (MSE) components.

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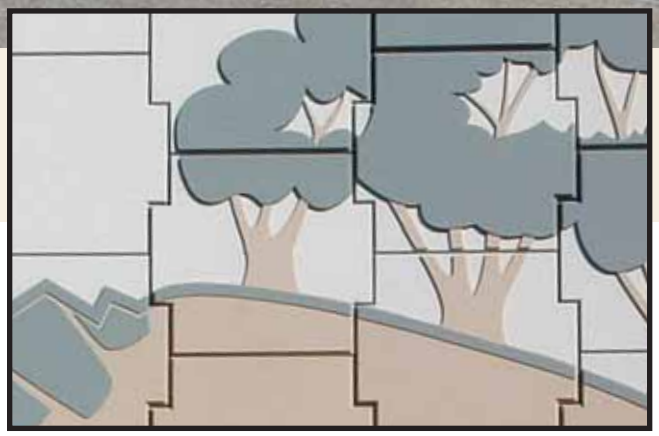
What's inside



Tree covered islands greet visitors to Alberta Children's Hospital

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Project scheduling was very important to the success of this project. The new interchange was required to be open by August 31, 2006 to match the completion of construction and opening of the hospital. For this reason, construction of the walls would need to take place in part during the winter season – during which temperatures regularly drop below freezing and occasionally to -30°C (-22°F). Accordingly, the walls were designed for winter construction with a drain rock backfill material for the reinforced earth volume. This backfill material had a maximum size of 40mm (1-1/2") and a minimum size of 20mm (3/4"). This material could be compacted in all temperatures and would permit uninterrupted wall construction throughout the winter.

The design of the intersection incorporated three RECo structures. On the south side of 16th avenue a 4.85m (16ft) high - 44.9m (150ft) long false abutment wall supports the bridge embankment which transitions into a 151m (495ft) long wing wall supporting West Campus Boulevard as it comes off the bridge to the south. On the north side of 16th avenue a long curving hillside wall supports an adjacent residential area and provide space for an interchange ramp in the area salvaged from the hillside. Together these three structures have an exposed facing area of 2,261 m^2 (24,335 ft^2)

The walls feature RECo's TerraClass panels detailed with an architectural mural showing bushy trees growing along a rocky edged island repeated at intervals along the wall. This mural motif was developed by Stantec's Architectural Landscape division and reflects the City of Calgary's progressive policy of allowing a fixed percentage of project cost on public project's for architectural/artistic details. RECo customized the motif and developed a working design consisting of 25 unique architectural panels with raised relief features. Once construction of the walls was completed, three different coloured concrete sealers were applied to the surfaces to complete the desired effect. For years to come, both patients and visitors will enjoy a warm welcome to the distinguished new Alberta Children's Hospital.

RECo has developed an expertise in architectural finishes allowing the owner the opportunity to select a custom theme. RECo will develop the desired finish or murals into a working design. While customizing the desired finish RECo takes advantage of the repeating components of the artwork to reduce cost and increase the production efficiency. Form liners are used to create varying degrees of relief on individual panels to create the desired image. Detailing may be further enhanced with the use of various surface treatments and other enhancement techniques like stains, sandblasting and exposed aggregate. Casting architectural features into the concrete panels, is a cost effective long-term low maintenance enhancement for municipal infrastructure.

Blondo Street Noisewall, Omaha, Nebraska

Under a contract from the Nebraska Department of Roads (NDOR), Hawkins Construction Company, Omaha was awarded the contract to construct a noisewall along I-680 near Blondo Street west of downtown Omaha. A cooperative, innovative redesign of the foundations and precast posts offered unique benefits to Hawkins in terms of material costs and an improved construction schedule.

An alternative design developed by RECo for a similar noisewall project had been previously reviewed and accepted for use by NDOR. This facilitated a quick start for RECo and Hawkins to employ the alternative design on the Blondo Street project. RECo prepared the final design drawings and assembled a material supply package that included precast posts to be mechanically connected to a poured-in-place drilled shaft foundation and the precast noise panels, cast with double-sided Ashlar Stone architectural finish.

Since the RECo design provided for a mechanical connection of the precast post to the surface of the drilled shaft foundations, over 800 lineal feet (243m) of costly precast post that is normally embedded below the surface was eliminated. Following the contract award, RECo Engineers conducted an in-depth analysis of the foundation soils and were able to justify a substantial reduction of the size of the drilled shafts - from 42" (1070mm) diameter to 30" (762mm) diameter, while still providing all required safety factors in accordance with the AASHTO requirements. An added benefit to Hawkins, the foundations could be installed ahead of the precast post installation, thereby allowing for on-site work to begin earlier, independent of the precast posts.

The key design feature focused on the mechanical connection of the precast posts to the drilled shafts. Two corrugated metal canisters are pre-located in the empty shaft to form the lower half of the structural connection. Anchor bars extend from the bottom of each post and are aligned with and inside the two embedded canisters. The post is then temporarily supported allowing for flexibility to make adjustments in terms of roadway offset, post spacing and post alignment. Once all adjustments are complete, the embedded canisters are filled with high-strength grout through the use of a grout pump.

The Blondo Street Noisewall encompasses 19,192 ft^2 (1782m^2) of facing area consisting of 272 individual precast units manufactured by American Concrete Products, Inc., Omaha, subcontractor to RECo. Specially-designed precasting formwork, architectural formliners, and fabrication drawings were supplied to American by RECo. Once installed, the individual stones of the architectural concrete texture were stained in contrasting colors providing for an aesthetically pleasing wall simulating natural stone.

The advantages of lap joints in RECo wall design

Precast concrete facing panels are the most common of facing elements used in MSE wall construction along highways. RECo's concrete panels employ a lap joint on all horizontal and vertical joints, whereby panel-to-panel contact is avoided and flexibility of the facing is assured.

This flexibility is maintained by specially fabricated elastomeric bearing pads that support the panel above while preventing contact between the two panels. This detail allows the panels to be adjusted horizontally during installation as well as move vertically in the event of differential settlement or seismic occurrence. The joint dimensions allow some panel rotation thereby allowing a wall to follow the profile of different settlements.

In addition to flexibility, the panel joints are an important part of the wall system. Lap joints provide an indirect flow path for water in the event that the primary drainage system is inadequate for the event.

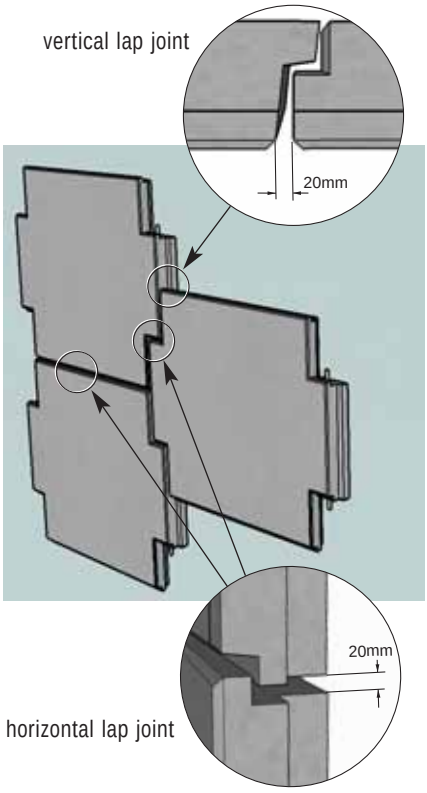
Lap joints also shield the filter fabric on the fill side of the joint from direct exposure to degrading UV rays. The lap joint also provides protection of the fabric from damage by vandals and animals.

A nominal joint width of 20mm (3/4") has been used by RECo for over 30 years. This joint dimension has become an industry standard recognized in numerous state and country codes.

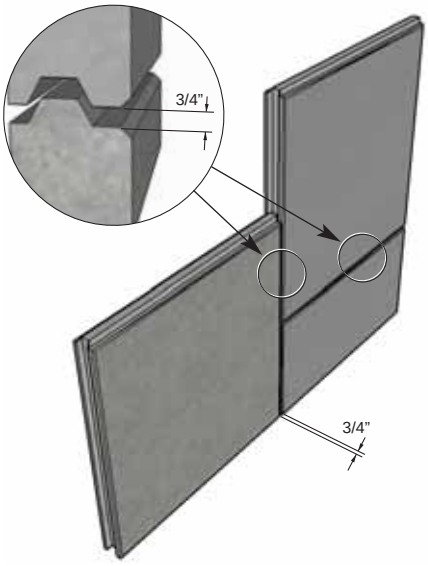
Lap joints are a sophisticated precast panel feature with many advantages. RECo strongly recommends that Owners, Engineers and Contractors specify 20mm (3/4") lap joints for their MSE wall projects.

"If you don't spec it - you won't get it."

Reinforced Earth Lap Joint System



Retained Earth Lap Joint System



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