



Parkdale Creek Stream Crossing, BC

OWNER**CONTRACTOR****LOCATION**

Westhills Land Corporation

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Parkdale Connector Langford, BC

The Westhills lands encompass 209 hectares of rolling sloped lands, knolls, and rocky outcroppings, and are located in the City of Langford, British Columbia. At Westhills, sustainability equates to environmental stewardship—it is the result of a careful assessment of every decision and action they take that relates to the land, water and air.

Parkdale Creek is an environmentally sensitive fish-bearing stream that meanders through the heart of the Westhills subdivision. In order to join the two halves of the neighborhood, Westhills Land Corporation required a structure that would span the creek in an aesthetic and environmentally friendly way.



During the preliminary design stage, Westhills considered both a traditional bridge option and an arch structure. Their review determined that a 12,000mm span x 5,948mm rise Bridge-Plate arch structure would provide cost savings and fit into their vision of environmental stewardship.

The upstream end of the structure required a specially skewed end in order to stay within the allowed construction disturbance zone, and to prevent encroachment into the stream. Skewed ends are normally avoided in arch designs as they leave a large unbalanced load unsupported due to the interruption of the soil arch in a two-dimensional view. To provide the required support, Armtec designed a special cast-in-place concrete collar for the skewed end that could support the unbalanced load. This special concrete collar end had a custom reinforcement design and was 1,000mm wide and 750mm deep. In comparison, a standard concrete collar was used on the downstream end and was only 440mm wide and 600mm deep.

The custom skew collar transferred significantly larger loads than the footings would under a balanced load condition. To economize the design, the owner's geotechnical engineer proposed a footing that transitioned into a deeper section at the skewed collar.

Westhills Land Corporation also incorporated a green wall system that required geogrid reinforcement.



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Originally designed with a competitive product, Armtec proposed an equivalent Mirafi 5XT uniaxial geogrid for the retaining wall reinforcement instead, and worked with the wall supplier to determine the connection strengths were adequate. Westhills proceeded with ordering the Mirafi 5XT geogrid based on the results of a competitive bid.

In order to remain on schedule, the assembly crew preassembled complete rings of the arch in a staging area while the skew collar and footing designs were completed. The result was an assembly that only required eight days.

Backfill of the arch was controlled by the green MSE wall construction progress and was completed over a period of 38 days.

The finished structure held true to the Westhills Land Corporation's land stewardship ideals, and now provides a wildlife corridor in an ecologically sensitive manner. Armtec is proud to have been part of this design effort and looks forward to replicating this success in the future.

"It was a pleasure dealing with Armtec in this complex project. Through the entire delivery process, from tender, design, installation and final approvals, all Armtec staff were extremely professional and always willing to assist. The end results for Westhills was a cost effective solution that respected the key environmental sensitivities of Parkdale Creek. Many thanks to the Armtec team!"

Matthew Pike, Development Engineer Westhills Land Corp.



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