



■ Slope Stabilization



Reference Details:

**Client** Canadian National Railway, Gormley, ON, Canada

+++ **General**

**Contractor** Geo-Foundations Contractors Inc., Bolton, ON, Canada +++

**Consulting** Alston Associates, Markham, ON, Canada

**DSI Services** Supply of metallized DYWI® Drill Hollow Bars type R32N and components for bridge foundation remediation scheme.



**Use of DYWI® Drill Hollow Bars to upgrade centennial bridge foundation**

**Fairchild Creek Viaduct, Brantford, Ontario, Canada**

The CN (Canadian National) rail line near Brantford, Ontario, fords a valley with a creek at its base. The Fairchild Creek Viaduct is founded on groups of piers on spread foundations. The pier groups ascend the valley slopes on both sides of the creek. Creek bank erosion over the decades since the bridge was built had decreased the factor of safety of the pier foundations below acceptable limits. First constructed in the 1880's and later expanded in the 1910's, the footings near the base of the south slope were the focus of a slope-stabilizing scheme completed in 2001.

The remediation scheme included a soil nail array for augmentation of the global stability of the slope and a tension-piled and raked soil nailed ring beam. The new, self-supporting, anchored ring beam structure was built to encapsulate and permanently stabilize the subject group of

foundations.

Drilled micropiles formed a portion of the new reinforced concrete ring beam 's foundation, while multiple raked soil anchors were drilled 20 m deep into the slope to provide lateral resistance from strata beyond known slip-surface limits. Soil nailing of the south bank consisted of four rows of 15 m long nails on 1 m lateral spacing to treat over 220 m<sup>2</sup> of slope face. A coated multi-strand polyester geogrid was installed in tension over the ground surface and anchored to the soil nail heads before being treated with topsoil and hydro seeding.

Soil nails consisted of DYWI® Drill Hollow Bars type R32N, a fully threaded steel bar that can be drilled and grouted into loose or collapsing ground without drill casing. The drilling inclination for the project varied from 15° to 35°. Corrosion protection for soil nail components was provided by metallization, the first such application for soil nails in Ontario, Canada.