



## GEO-FOUNDATIONS Contractors Inc.

### Blind Slough Dam



Date: 2005  
Technology: Rock Anchors

In 2005 Geo-Foundations spent 9 months at BC Hydro's Blind Slough Dam drilling and installing over 3,600 dowels rock anchors. The major component of this rehabilitation and seismic retrofit project was the construction of 71 large, deep, rock anchors.

The rock anchors – passive, fully grouted elements with no free stressing length – vary in depth from 16 metres to 35 metres deep. Their tendons consist of bundled (3 bars per rock anchor) 63.5mm diameter, 550MPa yield stress, individually encapsulated (in grout-filled corrugated sheathing) solid bars. Their 279mm diameter holes were all drilled from the dam's top deck using a 50mm diameter pilot hole arrangement with alignment confirmation through the use of a BoreTrak MK2 down-hole surveying system.

All of the rock anchor drilling and installation work had to be staged in restricted fashion in order to accommodate local traffic across the dam's narrow deck. Special lifting procedures – involving 2 cranes and a telescopic forklift – were required to ensure that bending of the rock anchor tendons during installation was kept to an acceptable minimum. Splicing of the individual 63.5mm diameter bars – necessary because the anchors' length was universally longer than the longest mill length of bar – had to be organized in a manner that avoided any two couplers being closer than 1.5 metres apart from one another. A strict inspection procedure was followed to check the bars' encapsulation for pitting or "holidays" one last time during hoisting into the hole. With the elevation of the rock being so highly varied across the site, on top of the several other procedural restrictions was the added aspect of having to wait until rock was encountered at each hole before determining the overall rock anchor length, as this dimension was predicated on the as-found top of rock elevation.



*Delivery of 19-metre long triple-bar rock anchor segments*

Drilling by Geo-Foundations at this site totaled over 8200 lineal metres, with more than 3600 lineal metres consumed by drilling and re-drilling of the 279mm diameter rock anchor holes. Drilled holes ranged from plumb

to 10° off horizontal, and were located everywhere across the site including indoors inside the Tainter House, on the downstream face of the piers, on the spillway aprons and on the abutment wall faces. Five different drill rigs were used to construct all of the dowel and rock anchor holes.



*Hoisting of triple-bar rock anchor segment using 3 independent hoists*



*Heat-shrink sleeve being installed over a single-bar field splice*