

CASE STUDY

GUIDED BORING | GUIDED PIPE RAMMING



<p>Project Name: The Port Mann/Highway 1 Improvement Project (PMH1)</p> <p>Prime/Sub Contractors: Kamloops Augering & Boring Ltd (The Tunneling Co.)</p> <p>Location: Langley, British Columbia</p> <p>Owner: The Ministry of Transportation and Infrastructure</p>	<p>Ground Conditions: Sand, gravel, clay, wood, and boulders</p> <p>Akkerman Equipment: GBM 240A / Pipe Ramming</p> <p>Pipe: 120 in Steel Casing</p> <p>Total Length/Longest: 585 Lf / 266 Lf</p>
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PROJECT OVERVIEW

The expansion of the Port Mann Bridge to a 10-lane structure, widening Highway 1, and upgrading the interchanges were made to reduce the area's traffic congestion and improve air quality in the Vancouver area. This involved the installation of three large-diameter drainage culverts under Highway 1, which benefited the Latimer Creek and Leoran Brook Salmon Habitat Enhancement Culverts project and satisfied one of the Port Mann/Highway 1 Improvement (PMH1) goals, to protect and improve fish passage between habitats.

THE CHALLENGES

- High traffic area
- Time sensitive
- Potential flooding
- Obstructing underground objects
- Strict line and grade tolerances

THE SOLUTION

The production began once the native Coho salmon and Cutthroat trout migrated to the ocean to ensure they were not present during operation.

The first two culverts were installed from the median of the highway, one facing north and one facing south, crossing two lanes of traffic and on/off ramps. The third culvert was just west of the first site. Seeing as open-cut methods were not feasible due to the required depth of 5-6m with strict line and grade tolerances, Kamloops suggested the use of the three-pass innovation, involving the combination of an Akkerman 240A Pilot Tube Machine, auger-bore rig and horizontal pile driving. The 240A GBM jacking frame was mounted on the auger boring rig track, the guidance system initiated and established the

drive's line and grade. The casing is able to follow the auger-bore rig and install the final product pipe. A SCCI S150 HPD was used as the last tool rather than an auger-bore rig product pipe installation.

Two drivers were initiated from the shaft installed in the highway's median to drive north and the other south. As the GBM jacking frame drove the pilot tubes to meet tolerance 1,067mm weld-on reaming head was welded on the last length of the pilot tube to increase the diameter. As sections of the pilot tubes, casings and augers were advanced, they were removed simultaneously from the reception area. Spoils were reversed to the launch shaft for dirt bucket removal. Once completed the crew turned all the equipment around to begin the second 52m drive. The third shaft was initiated from the final shaft, just west of the initial shaft, which extended 81m.

OUTCOME

Guided Boring provided accuracy to meet line and grade tolerances.

Guided pipe ramming proved to be simple cost effective solution.

Cobble and boulders were enveloped in casing during ramming process.

The City of Langley is looking forward to the return of the Coho salmon and Cutthroat trout to Latimer Creek and Leoran Brook.



source: Trenchless World



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