

# CASE STUDY

## PILOT TUBE METHOD | GUIDED PIPE RAMMING


**Project Name:**

The Port Mann/Hwy. 1 Improvement Project


**Prime Contractor:**

Kamloops Augering & Boring Ltd.  
(The Tunneling Company)


**Location:**

Langley, BC, Canada


**Owner:**

The Ministry of Transportation & Infrastructure


**Ground Conditions:**

Water, sand, gravel, wood and boulders


**Akkerman Equipment:**

GBM 240A Jacking Frame & Guidance System, 42 & 120-in. Weld-On Reaming Heads


**Pipe:**

120-in. Steel Casing, 20-ft. length


**Total Length/Longest:**

585-lf./266-lf.

### PROJECT OVERVIEW

The Port Mann/ Highway 1 Improvement Project (PMH1) was executed as a design-build project. Its purpose was to mitigate traffic congestion, improve safety for vehicles and pedestrians, improve environmental habitat, and re-implement public transit in greater Vancouver.

The scope of work involved replacing the Port Mann Bridge with a 10-lane bridge, widening Highway 1, and upgrading the interchanges.

Part of the PMHI was the Latimer Creek and Leoran Brook Salmon Habitat Enhancement Culverts project to improve fish passage between habitats.

Three culverts were to be installed from the median of the highway, alongside Latimar Creek. Native Coho Salmon and Cutthroat Trout had been unable to swim through the existing culverts for several decades. The new culverts would mimic a natural extension of the creek.

### THE CHALLENGES

- Project timing to ensure that native Coho Salmon and Cutthroat Trout had migrated before construction
- Potential for risk of settlement as culverts crossed two lanes of traffic and on/off ramps
- Installation of the culverts by open-cut methods was not a feasible because of the 20-ft. depths and environmental impacts
- Strict line and grade tolerances - 0.54 - 2.42%
- Varied subsurface variables

### THE SOLUTION

The subcontractor approached the project using their Akkerman Guided Boring Machine system as a means of achieving absolute accuracy. The contractor used their auger boring machine to install

the first stage reaming head, then their SCCI S150 horizontal pipe driving unit was the last tool in the sequence to advance the 120-in. steel casing pipe.

### OUTCOME

- Simple, efficient and cost effective solution to large diameter, on grade tunneling in unconsolidated ground
- Boulders were enveloped for removal
- All tolerance met with success
- This contractor's first instance of combining hybrid methods of guided auger boring and horizontal pile driving unit

