

The Port Mann Main No. 2 project is a 148-meter-long micro-tunnel under the Mary Hill Bypass in Coquitlam, British Columbia, just east of Vancouver.

The project was designed for Metro Vancouver as a pipe-in-a-pipe. Michels used an Akkerman SL 74 micro-tunnel boring machine (MTBM) to build a 16mm thick, 1790mm diameter casing pipe during tunnelling operations. The casing pipe was manufactured by Permalok with threaded 50mm grout ports and 6100mm lengths.

Cover over the tunnel crown varied from as little as 2 meters when passing under a drainage ditch to 13 meters when crossing the Mary Hill Bypass itself.

The MTBM was launched from a 13m long by 7m wide by 7.5m deep sheet pile excavation with a 600mm base slab poured via tremie method. Water levels in the area were 1.5 m below surface elevation, which required a wellpoint system to relieve pressure from the base slab and assist with the launch/retrieval of the MTBM.

Ground conditions were challenging, consisting mainly of silty sand with gravel seams. When combined with the water levels, this ground type required exact balancing of the face and slurry pressure to prevent ground movement. At several points throughout the drive, wood debris was evident in the separations pit spoil pile, suggesting that the MTBM mined through wooden piles. While these obstructions slowed the mining progress, the MTBM was able to chew through and process the wood without significant delay.

The 148-meter drive was completed in just 10 days from launch to hole-through with a maximum advance rate of 24.3 meters in a 10-hour shift.