

Billy Bishop Toronto City Airport Pedestrian Tunnel Boring Machines

Tunnel Boring Machines

The Toronto Port Authority is building a pedestrian tunnel under the Western Gap to Billy Bishop Toronto City Airport that will allow travellers to reach the airport in less than six minutes.

Over the tunnel's construction, the latest in tunnel and construction technology has been used. Two purpose-built, Canadian-made tunnel boring machines bore the seven interlocking "tunnel drifts," forming the unique arched crown design of the main tunnel. Three of the tunnel drifts were built to include new City Of Toronto sanitary and water mains, which has helped save Toronto taxpayers an estimated \$10 million in duplicated construction efforts. Excavation of the tunnel by these boring machines was completed in October 2013.



What is a tunnel boring machine?

A tunnel boring machine (TBM) is a circular machine used to excavate soil and rock when constructing tunnels.

Key Facts

- The pedestrian walkway is the only tunnel in the Toronto area built using drift tunnels as a canopy for the main structure.
- Two Canadian-made TBMs dubbed Chip and Dale will be used to create the drift tunnels
- The TBMs were built specifically for the project at Billy Bishop
- The TBMs were built by Technicore, a leading tunnelling company based in Newmarket, Ontario
- The TBMs are 6.5 feet (2 metres) in diameter and 36 feet (11 metres) long
- Each TBM weighs 198,416 pounds (90 tonnes)
- The TBMs are made of steel, hydraulic cylinders and pumps, electric motors and have carbide cutters
- One TBM excavates 39.3 to 49.2 feet (12 to 15 metres) per work day
- The TBMs that will be used for the pedestrian walkway project can bore through soft ground, shale and limestone
- The cutter at the TBMs' head turns at a variable speed