

# MCASPHALT OIL/WATER SEPARATOR TANK

Location: Port of Hamilton, Ontario

Project Type: Tank



**DUROTERRA™**



## DUCTILE IRON PILE ADVANTAGES

- Rapid installation to depths over 20 meters
- Installations into temporary shoring by working at higher grades

## PROJECT DESCRIPTION

Construction consisted of a new oil/water separator tank located at Pier 24 in the Port of Hamilton. The 2.3 m by 5.3 m (7.5-ft by 17.4-ft) tank was designed to bear 4 meters (13 ft) below grade. Loads on the tank foundation were 311 kN (70 kips) SLS and 435 kN (98 kips) ULS.

## SOIL CONDITIONS

Ground conditions generally consisted of fill containing clay, silt, silty sand and slag underlain by peat. The fill and peat were underlain by a thick, very stiff silty clay and clayey silt layer followed by glacial till consisting of silty clay, silt and silty sand. Groundwater was approximately 5 meters below grade.

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## PROJECT CHALLENGES

Rapidly install the pile-supported below-grade tank in a congested port area without significant logistic issues or excavation requirements.

## DIP SOLUTION

Ductile Iron Piles were selected for foundation support for the tank because the piles could be installed from the existing grade following the excavation and placement of temporary shoring, avoiding the issues of completing the excavation around installed piles. A total of four Series 118/7.5 (118 mm diameter with 7.5 mm wall thickness) Ductile Iron Piles were designed for tank support. The piles were installed following the completion of the 4 meter deep excavation and temporary shoring provided by a 4.3 m by 7.5 m (14-ft by 25-ft) trench box with end plates.

The piles were installed to bear in the glacial till soils at depths of 18 to 19 meters (59 to 62 ft) below the footing bottom. Piles terminated after achieving a set criteria of less than 25 mm of movement in 50 seconds or more. Following cut-off, the piles were filled with grout and capped with a 350 mm (13.75-inch) square bearing plate 25 mm (1 inch) in thickness.

The four piles were installed in only one day allowing the contractor to form and pour the footing on the following day.



## PROJECT TEAM

**DIP Design/Build Partner:** GeoSolv Design/Build, Inc.

**Geotechnical Engineer:** AMEC / Oza Inspections Ltd.

**General Contractor:** Wm. Groves Ltd.

**Structural Engineer:** Exp