CASE STUDY
MICROTUNNELING | SLURRY MICROTUNNELING

Project Name:
Campbell River Raw Water Intake Upgrade

Prime/Sub Contractors:
Aecon Infrastructure/Frontier-Kemper Constructors JV

Location:
Elk Falls Provincial Park, British Columbia

Owner:
BC Hydro & City of Campbell River

Ground Conditions:
Clay and sand

Akkerman Equipment:
SL60C MTBM

Pipe:
1,524-mm - 61-in ID Permalok® Casing

Total Length/Longest:
380-lf / 380-lf

PROJECT OVERVIEW

BC Hydro's John Hart Generating Station has been supplying water for electrical power operation since 1947.

To provide safer, efficient and more reliable service, BC Hydro embarked on the construction of a new underground hydro power generation facility slated for completion in 2018. The change required the City of Campbell River to devise an independent means for sourcing its drinking water.

The resulting project, the Campbell River Water Supply Upgrade, required an $18.3m investment from BC Hydro and $10m from the City to construct and operate an independent water conveyance system and build a new water treatment facility and pump station alongside John Hart Lake on BC Hydro's property.

THE CHALLENGES

- MTBM underwater retrieval
- Pre-existing underground structures
- Flowable materials at lake interface subjecting pipe to uplift
- Possible flooding of shaft and tunnel
- Preservation of the ecological integrity of the lake

THE SOLUTION

In order to begin microtunneling into John Hart Lake, a 9m diameter, 15.2m deep caisson intake structure was built to house the microtunneling jacking shaft and was modified for microtunneling use with a shaft seal to prevent lake water and ground intrusion, a concrete reaction block to bear jacking thrust loads. Frontier-Kemper Constructors, Inc. (F/K) viewed the lake interface and noticed two points of high risk. F/K employed Fraser Burrard Diving Limited to survey the interface and remove foreign material, one being a large tree stump with extensive rooting system.

Shallow cover and a large amount of flowable material was a concern, seeing as the pipe would be subject to uplift when disconnected from the MTBM. The diving crew added concrete blocks with straps to weigh down the section of pipe behind the MTBM to prevent flotation. To prevent the tunnel and shaft from flooding a double bulkhead was built into the end pipe section closest to the MTBM. An in-pipe bulkhead was welded in place at 1.2m in the first pipe joint.

To ensure the ecological integrity of the lake was preserved, a floating debris boom was installed in the lake just beyond the construction region to inhibit potential contaminants during construction.

OUTCOME

After conducting a pressure test on the bulkhead to ensure no leaks were present the hydraulic jacks were given a test run. The MTBM was successfully released and retrieved from the lake surface without incident.

Aecon Infrastructure completed the intake connection with a 484-ft. fused joint 63-in. HDPE pipeline which was floated and submerged into the lake and attached to the microtunnel, angled downward towards the intake screen.

source: NASTT - Y-Dig

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