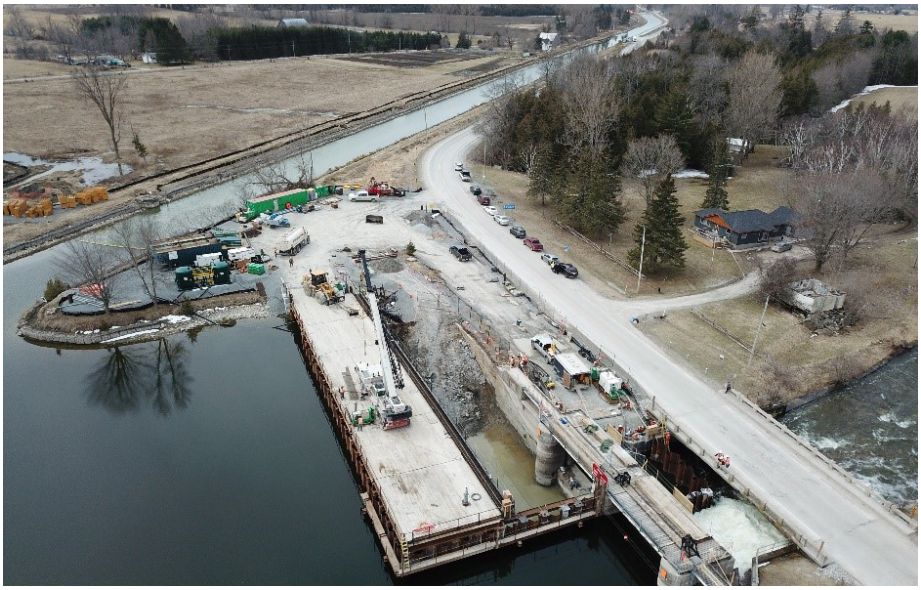
Talbot Dam Rehabilitation

Piling

Hamilton, ON

Project snapshot

- Part of the $615M Trent-Severn Waterway Improvement project
- Original Structure built in 1905
- Detailed design, supply and installation of the Cofferdam & Trestle



General Contractor
Public Works and Government Services Canada

Consultant
Isherwood

SB Canada Personnel
Jeff Thomson

Period of Work
October 2019 - December 2019

Project Description

The Talbot Dam project is a full replacement of an existing 100+ year old dam located on the Trent-Severn Waterway near Gamebridge, Ontario. The project was completed in three phases over a two-year period.

SB Canada led the design development of a year-round temporary access trestle, cofferdam and water control system to facilitate staged removal of a two-sluiceway water control dam. This included design of an intermediate middle pier and custom stop log handling system in the temporary condition. SB Canada designed and managed the dewatering system 24/7 throughout the demolition and reconstruction phases of the permanent structure.

Construction Sequence

Phase I: SB Canada installed an 8.2m wide X 49.7m long trestle plus an access ramp. The trestle was used as working platform for the installation of the 59.1m long upstream cofferdam that connected to the middle pier of the dam, installation of a 20.1 cut-off sheet pile wall on the south side of the upstream cofferdam and installation of a 14m combi-wall downstream cofferdam that connected to the existing middle pier of the dam as well. This phase allowed the dewatering system to be in place for the demolition and reconstruction of the south sluice and facilitated the construction of the concrete base slab of the new sluice.

Phase II: SB Canada continued with installation of an additional section of the trestle that measured 8.3m wide X 49.7 long. Utilizing the trestle SB Canada was able to install a 19.6m long temporary pier to allow the demolition and reconstruction of the middle pier while positioning the stop logs to control the flow through the south sluice. This phase also included installation of a 9.5m cut-off sheet pile wall on the north side of the upstream cofferdam and installation of a 8.3m combi-wall downstream cofferdam allowing the cofferdam to be sealed. This phase allowed the dewatering system to be in place during the reconstruction of the north sluice of the dam.

Phase III: SB Canada re-installed the Phase I cofferdam, including the connection to the middle pier using C-frames installed around it to avoid any drilling into the new concrete of the dam. During this phase the removal of the temporary pier; re-configuration and maintenance of the dewatering systems and removal of the cofferdam and trestle was completed.

Innovative Solutions

A challenging part of this project was being able to build the cofferdams and still maintain access once construction flipped to the other side. SB Canada designed an innovative solution utilizing the cofferdam piles as part of the base for the trestle. This solution allowed for the water to flow freely through the other sections of the dam that were not being worked on.

The second challenge was sealing the cofferdam against the existing dam structure and at the interface of the riverbed. On the upstream side of the Phase I cofferdam there was a pre-existing concrete overpour at the bottom of the pier below the silt level that impeded proper connection of the sheet pile wall to

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the concrete, creating a path for the water to enter the cofferdam. This was identified during Phase II once excavation was completed at the bottom and the concrete pier was exposed. The solution was to increase the pumping capacity of the dewatering system.

Techniques Utilized

Piles for the combi-wall were driven to top of the bedrock using a vibratory hammer. A 3.0m rock socket was drilled using L23 VTL system with a BHD40 and BRC75, reverse circulation and DTH. Interlock was welded to HSS 610mm steel pipe piles to allow the connection to the sheet piles. The seal of the cofferdam was improved with the installation of poly sheets and sandbags on the outside of the cofferdam, water-swelling elastic sealant on the interlocks and hydraulic cement.