

CASE STUDY

Canal de l'Aqueduc

Québec, Canada

HISTORY

Built in 1853, the Canal de l'Aqueduc on the island of Montreal in Québec, Canada, is an open-air aqueduct. The canal serves as part of the drinking water supply for the city of Montreal.

Lined with wetlands, a bicycle path, and a park, the canal runs approximately 8100 meters in length and varies between 30 and 50 meters in width.

PROBLEM

As with most canals and wetlands, erosion is often a problem and retaining walls need to be built to keep the water in place and protect the surrounding areas from runoff and flooding. At Canal de l'Aqueduc, the retaining wall would also support the new highway that was being built along the canal.

Soft soils and shallow soil depths at the site made driving sheet pile for the retaining wall difficult and unstable. Because of these and other issues, the design team from WSP opted for a toe pin wall system in order to obtain maximum stability.

SOLUTION

JV KPH-Turcot/WSP/ETPO reached out to Skyline Steel Canada for their engineering expertise in steel retaining walls. As shallow soils over the rock layer did not permit driving the sheet piling deep enough to develop toe support, Skyline Steel proposed various solutions to toe pin and anchor the sheet piling wall into the bedrock and stabilize the wall.



The optimal solution consisted of using AZ 36-700N and AZ 46-700N sheet pile sections with casings welded to the AZ sheet pile for driving to bedrock. Drilling rigs were then utilized to drill into the bedrock through the casings and steel toe pins were inserted into the casing and ultimately, the rock. Grout was injected into the casings and rock layer to solidify the system. The coated sheet piles were used to resist corrosion, pin the sheets to the rock layer, and minimize the gaps between the steel sheet pile and the bedrock.

A tie back system was designed to further stabilize the wall. The sheets were anchored near the top to limit wall deflection and prevent settling on the future highway.

PROJECT PARTNERS

Owner

KPH Turcot – Québec, Canada

General Contractor

ETPO GÉODEX – Québec, Canada

Consultants

WSP – Québec, Canada

PRODUCTS

Sheet Piles: AZ 36-700N (550 nt) and AZ 46-700N (700 nt)

PROJECT TIMELINE

Spring 2018 through June 2019