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Quantum Industrial Solutions
quality • integrity • safety

Geotechnical Grouting with Polyurethanes

Client	**BC MOTI**
Project location	**Northern BC**
Contractor	**Quantum Industrial Solutions Inc.**
Product Used	**NCFI TerraThane 24-042 & Genyk B1028**

Problem

When the Ministry of Transport in British Columbia was conducting asset integrity inspections when they ran into a problem with their culverts. The culvert joints experienced severe soil loss due to inflow and infiltration (I&I). In order to curb the erosion and possible loss of the culvert and highway above, they had to address their compromised culverts and re-establish the support soil bearing capacity.

The 2 Large Diameter galvanized culverts measured approximately 100 long, and were 4-8ft below grade on average. The infiltration had been happening for some time, having an average of 12" of erosion that settled on the culvert floor. The culverts had to be dammed off one at a time and bypass pumping in place to minimize standing water, and the silt removed prior to injections.

Solution

The solution was to use NCFI 24-042 and Genyk B-1028 geotechnical polyurethanes to stabilize the soils, fill the voids, and seal the joints against future I&I. Quantum Industrial Solutions approached the project by drilling 2 rows of holes, separated by 4 ft, with injection intervals at every 5 ft. The injections were made with 3 man teams, 1 crew member managing the truck, and 2 crew members injecting simultaneously from within the culvert. The simultaneous injection approach helped to maximize the spread of the polyurethane and to ensure the voids were filled, joints were sealed, and soil contact was re-established with the culvert.

Results

Over the course of two days, Quantum Industrial would stabilize 200 ft of the 2 culverts. They worked the culvert injecting 100 ft to one culvert on one day and 100ft to the second culvert on the second day. They would inject approximately 100-200 lbs of polyurethane per injection location, with up to 2,000 lbs injected in a single day. The project took place over 3 days with the entirety of the culvert being stabilized against future erosion and settlement without any disturbance to the traffic on roadway above.