MICROPILES ANCHORS AND GROUTING LTD

WEST TRANSIT WAY CPR OVERPASS BRIDGE BAYVIEW STATION – GROUND IMPROVEMENT SEGMENT 1

PROPERTY: OLRT CONSTRUCTORS
GENERAL CONTRACTOR: ELLIS DON, SNC LAVALIN, DRAGADOS CANADA JOINT VENTURE
SCOPE OF WORK: LOW PRESSURE GROUTING SOIL STABILIZATION

INTRODUCTION

The city of Ottawa begins a new cycle of modernization. The Capital City needs to adapt its old transit infrastructures to new growing and expansion necessities. The new Confederation Line of the Ottawa Light Rail Train plan is to extend from Tunney's Pasture station in the west to Blair Road at Highway 174 in the east (Blair station), a distance of 12.5 km including a 2.5 km tunnel running under Queen Street in the central business district. The line will connect the existing Bus Rapid Transitway at Tunney's Pasture Station in the west and Blair Road in the east, and to the O-Train Trillium Line at Bayview Station, which will be a major transfer point with the north-south Trillium Line to south Ottawa.

This Job Report is about a soil stabilization using grout beneath the two abutments of the CPR Overpass Bridge in Bayview Station between the elevations 50.00 and 54.00.

SCOPE OF WORK

The ground treatment in the east and west abutments at Bayview Station was completed between September and November 2016. This process mainly treated the waste layer of silty sand with gravel, embedded between the fill and till. The ground improvement consisted of permeation grouting which improved the soil's frictional angle and cohesion. This in turn provided greater densification, higher soil strength and improved lateral support for the nearby foundations.

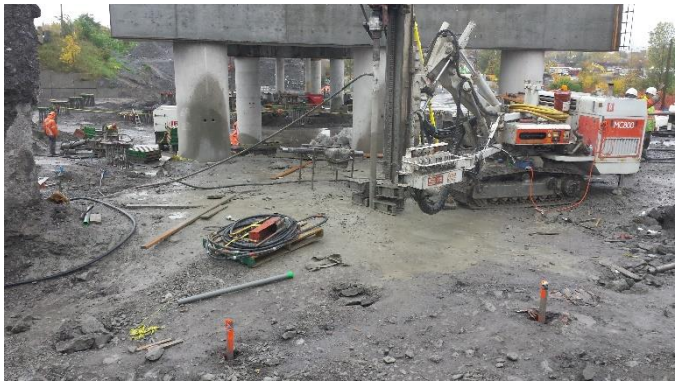

Figure 1. Injection operations

The permeation grouting consisted of primary and secondary injections. The primary injection was installed in a grid of 3 by 3 meters which determined the thickness and extends of the waste layer.

The primary injection was performed by inserting grout and sand by gravity and low pressure.
The grouting operation consisted of lowering the drilling rods and casing to the desired depth and injecting grout through the rods. The rods as well as the casing were then retracted in 50 cm sections and a grout volume injected in limits up to:

- Volume of grout: 1000kg / ml
- Rejection pressure of 4 bar (60 psi).

A secondary injection system was installed with flow and pressure control, in a grid of 3 by 3 m. This secondary grid was offset halfway from the primary grid. The secondary injection, consisted of "tubes with non-return valves", using cement and water mixtures in proportion to 1:1 ratio, controlling the flow rate, volume, injection and rejection pressure, which reached up to 10 Bar (150 psi).

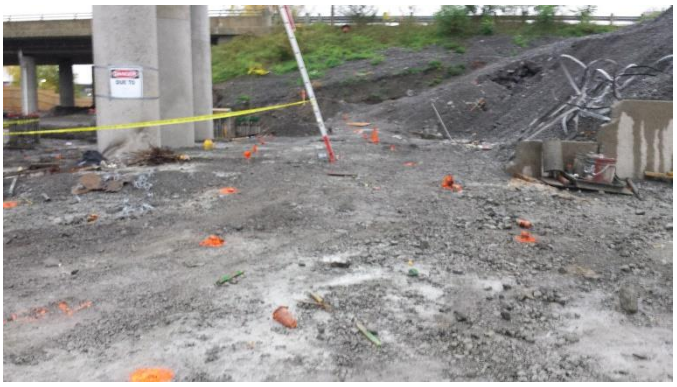

Figure 2. Secondary injection system grid installed.

The granular waste layer was consolidated as demonstrated by the east and west abutment SPT results.