REINFORCED GRANULAR FOUNDATIONS
WINDSOR, ONTARIO, CANADA

Asphalt Pavement Reinforcement

Problem

The route selected for the Parkway is located within an area that was created by the deposition of materials during the retreat of the glaciers in the last Ice Age. These glacial till like deposits are typically 20 to 35m thick and consists primarily of silty clay and clayey silt materials. A thin surficial crust layer (typically 2m) of hard to stiff clay exists that is underlain by generally soft to firm soils. The new highway is sunk approximately 9-10m below the surrounding grades.

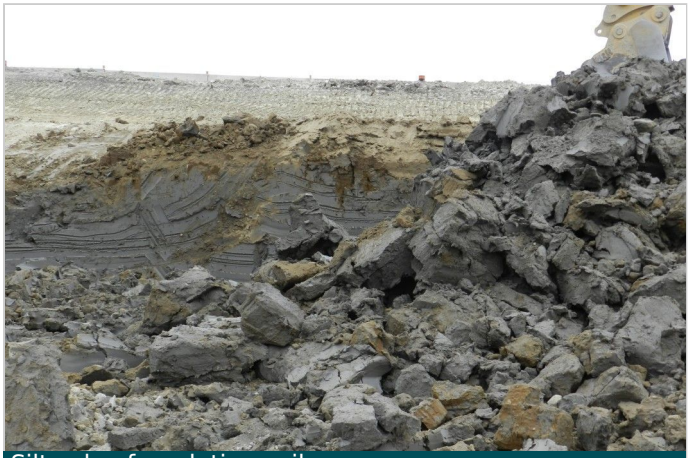
Solution

In order to reduce the loads applied to the soft foundation soils, the project geotechnical engineers recommended that a 1.5m thick layer of compacted crushed sand and gravel, reinforced with multiple layers of geogrid reinforcement (Reinforced Granular Mat—RGM) be designed and constructed under each of the abutment structures for the crossings. The loads associated with the bridge structures would be carried by piles that would be driven through the RGM after it was constructed.
Using woven polyester geogrids, Maccaferri used 3 layers of reinforcement at 0.5m vertical spacing. The strain within the layers of geogrid was limited to between 2-3%. With a very small width to length ratio, the loading was primarily transverse to the longitudinal axis of the granular foundation.Using woven polyester geogrids, Maccaferri used 3 layers of reinforcement at 0.5m vertical spacing. The strain within the layers of geogrid was limited to between 2-3%. With a very small width to length ratio, the loading was primarily transverse to the longitudinal axis of the granular foundations under the MSE walls, so mono-directional reinforcement oriented transversely across the granular pad was used.The tensile strength of the geogrid was determined based upon the load applied to the surface of the RGM, the depth of the reinforcement below the MSE structure and foundation soils at each site. MacGrid® WG5, WG6, and WG8 have been used to build numerous RGM structures.

Client: Parkway Infrastructure Constructors (PIC)
Designer / Consultant: Maccaferri Canada Ltd.
Contractor: Parkway Infrastructure Constructors
Products used (Qty.)
- MacGrid WG 11.2km

Date of construction: 04/2012 - 04/2012


Silty clay foundation soils


Silty clay foundation soils

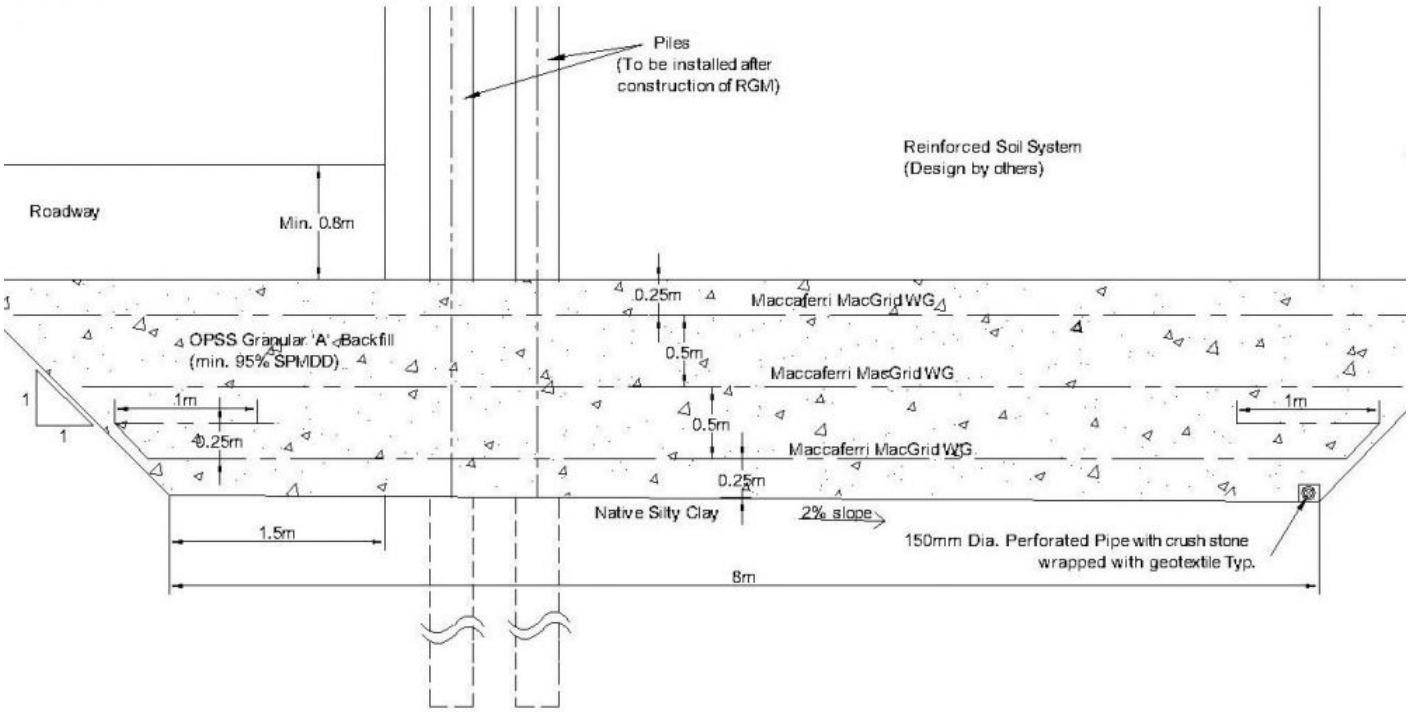
MACCAFERRI

Initial lift of granular fill

Installation of first layer of geogrid reinforcement

Three layers of geogrid reinforcement

Layout of pile locations



Typical Reinforced Granular Mat Section

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