

A NOVEL APPROACH TO PAVEMENT DISTORTION HAGAR, ONTARIO, CANADA

Construction over Soft Soils

Problem

HWY #17 is a well traveled and important roadway in Northern Ontario. It connects two major communities, the City of North Bay to the City of Greater Sudbury. Traffic is constant on this paved 2 lane highway with intermittent passing lanes. Road maintenance is an ongoing occurrence with regular heavy truck traffic and cold icy winters playing havoc on pavements. One stretch of highway where differential settlements and asphalt cracking were evident at the pavement surface was of concern to the MTO. More than once this stretch of highway has been redone with the understanding that one day, a major reconstruction would have been required. The cause of the pavement distortion was due to the presence of pockets of clayey fill material integrated within a predominantly rock fill embankment and only a deep sub-excavation could have fixed the problem. This major reconstruction was approved when it was decided to widen the road.

Solution

The final solution was to excavate the fill embankment to about 2m below the existing top of the pavement to remove the majority of the clayey fill and to backfill the sub-excavation with angular blast rock and create a wider embankment. MTO also decided to cover the bottom of the sub-excavation with high strength geogrids to span any remaining pockets of clayey fill. Maccaferri's final proposal was to use a double layer of uniaxial ParaLink 200 geogrid placed in a biaxial configuration: one layer parallel to the roadway and the other placed perpendicular. In doing so the load distribution is equally transferred over the entire stretch of the excavated area. ParaLink 200 was recommended for this project because of its capability to resist to installation damage during backfilling even if sharp or large rocks are used. ParaLink 200 not only provides high ultimate tensile strength but has also low reduction factors that guarantee high performance in the long-term. ParaLink 200 was chosen as the best solution also because the rolls are 4.5 wide, and 200m long and the required overlaps were minimized. This allowed for a fast and easy installation whereby construction time was reduced along with lane restrictions.

Client: MINISTRY OF TRANSPORTATION ONTARIO

Designer / Consultant: MINISTRY OF TRANSPORTATION ONTARIO

Contractor: INTERPAVING LIMITED

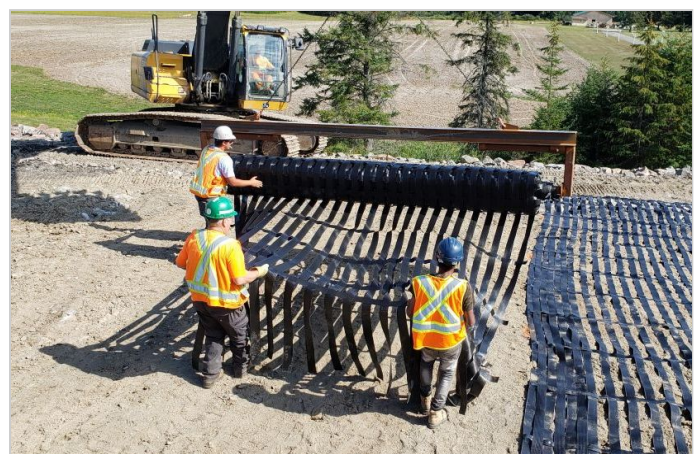
Products used (Qty.)

- ParaLink 15300 m²

Date of construction: 08/2019 - 09/2019



Graded Sub Grade



Unrolling of Parlink



Unrolling Paralink Parallel to Roadway



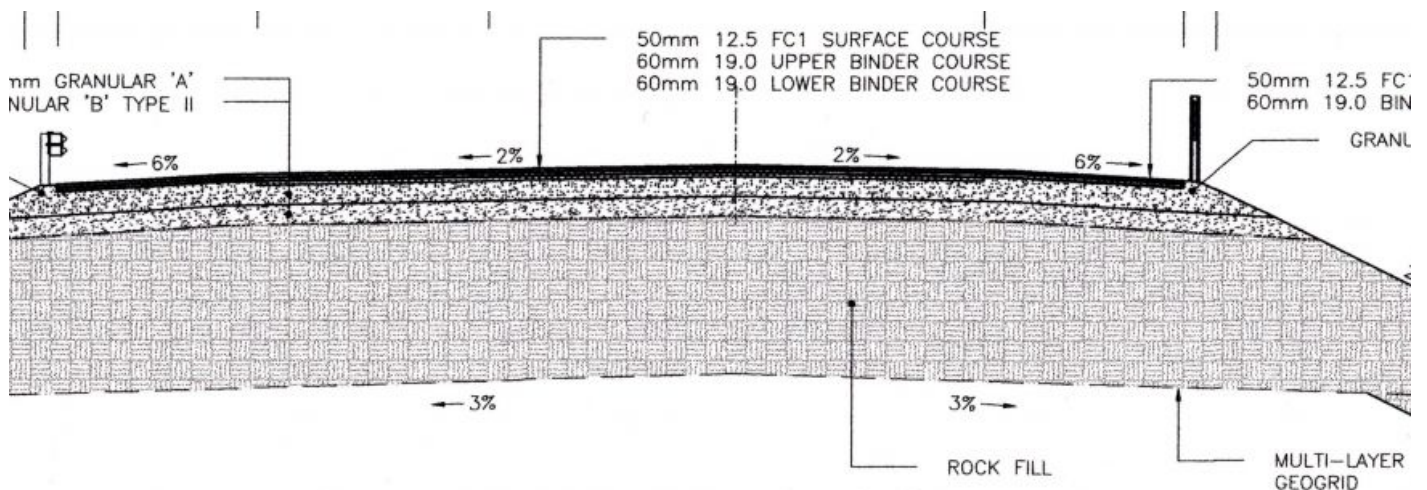
Biaxial Configuration of Geogrid Showing Overlaps



Backfill Operation using Large Angular Rocks



Geogrid Ready to Backfilled



NEW CONSTRUCTION

PDA #7 STA. 14+856 - 15+056, TWP. OF HAGAR
SECTION AA

Hwy #17 Cross Section

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