



Secondary Road Frost Boil Rehabilitation

MD of Provost Township Roads 364 and 384

Existing Township Roads 364 and 384 in the Municipal District of Provost experienced heavy rutting and potholes. Open bodies of water in the area are indicative of the high water table existing in the region resulting in soft subgrade conditions beneath the roadways.

These roads typically saw heavy vehicle loadings of 30 truck passes per day which exerted considerable pressure on an already soft and unstable subgrade. Frequent periods of increased precipitation worsened the conditions, making the roads effectively impassable at times.

The MD of Provost sought the help of Paradox Access Solutions in finding a sustainable method of rehabilitating these two important roadways. As the routes carried heavy oilfield traffic and served as interprovincial connectors, they were of significant importance in maintaining the commercial viability of the district.

FROM THE DISTRICT OFFICIALS:

"In the past two years the MD of Provost has used Tough Cell® (formerly PRS-Neoweb) in two separate projects, for the rehabilitation of two existing road structures of 250m and 400m respectively. These sections have now been in place for 2 years and are performing as required. Pot holes and rutting have been kept to a minimum, and the MD is very pleased with the project and the money invested. I have been pleased with the performance of both projects and recommend Paradox and the Tough Cell® product for consideration on future projects."

- W. Maclean, Director of Public Works, MD Provost #52

CASE STUDY



LOAD SUPPORT

PROJECT AT A GLANCE

APPLICATION:
Secondary road reconstruction

LOCATION
Alberta, Canada

DATE OF INSTALL:
July - August, 2014

CLIENT:
Municipal District of Provost



The Town and Municipal District of Provost is a busy hub with thriving agricultural, service, and oil & gas sectors, strategically located along a vital highway corridor linking Alberta and Saskatchewan.

CONSTRUCTION:
Paradox Access Solutions



The authorized Tough Cell® Master Distributor in North America, specializing in the supply and installation of high quality access solutions and services to customers in the pipeline, utility, municipal, general construction and oil & gas industries.

ENGINEERING DESIGN
Stratum Logics Inc.



Global geotechnical engineering design specialists exceptionally proficient in the deployment of cutting-edge geosynthetics for civil engineering across North America in all types of challenging soils and climates.

Tough Cell® Project Highlights

Secondary road frost-boil rehabilitation, Township Roads 384 and 364

THE CHALLENGE

Two well-utilized roads within the MD of Provost experienced repeated frost heave damage and significant rutting due to heavy traffic over subgrades softened by close proximity to open water and muskeg. Often rainy conditions further exacerbated the situation. On various occasions heavy rain created such poor conditions on the surrounding roads into the area that gravel trucks could not make their scheduled deliveries. Despite these challenges, the Paradox crew maintained their installation schedule.

THE SOLUTION

While the original design called for gravel infill, the MD elected to utilize readily available screenings derived from their local gravel pit instead, in which large rocks and other deleterious materials were found and removed. Alberta Transportation Designation 2 Class 40 aggregate was applied as the wearing course.

Total area: 800m x 8m

Product(s): 330-150-76-P-D;
800N Geotextile

Infill: locally available sand (screenings from local gravel pit)

Completion: Capped with 40mm crushed gravel

Site finishing: As construction occurred directly over the existing roadway the final elevation was 200mm higher than the original grade, which will significantly aid in keeping the traveled surface above water table. An extended shoulder design was applied to further assist in minimizing water infiltration into the subgrade soil.

THE BENEFITS

The MD of Provost can now rely on two safe and reliable roadways that resist rutting and will require little maintenance for the duration of their 15 year design life. Water infiltration to the surface layers has been minimized and pockets of standing water will no longer appear. Construction was completed without closure of Tp Rd 364, a significant benefit to the district as oilfield traffic continued without impediment.



Portion of existing roadway before restoration



Roadway conditions after heavy rain



(top) Installation of geotextile to ground
(bottom) Tough Cell® preparing to be stretched



Tough Cell® fully installed



Infilling of Tough Cell® geocells



Completed road after rehabilitation