

Case Study

application Subgrade Stabilization
location Chino, CA
product Mirafi® RS380i

job owner
engineer
contractor
date of installation

Sares Regis Group
Southern California Geotechnical (SCG)
Oltmans Construction Company
April 2013

TenCate® develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

THE CHALLENGE

This project site was to be developed with four new commercial/industrial buildings ranging from 89,100± ft² to 789,084± ft² in size. The proposed buildings needed to be single story structures of tilt up concrete construction. All of the buildings, except for the building located in the southeast area of the subject site, included truck dock areas. The buildings were surrounded by asphaltic concrete and Portland cement concrete pavements. Fills ranging from 2 feet to approximately 30 feet were required in order to establish the planned subgrade elevations for the new development.

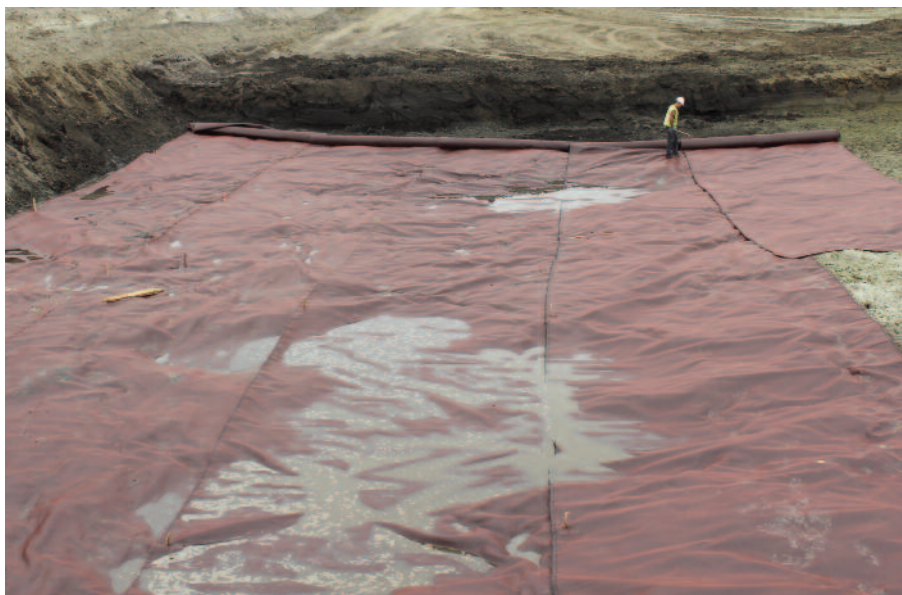
THE DESIGN

Remedial grading was recommended within the proposed building areas in order to remove the existing potentially compressible native soils. Over-excavation was also recommended within the former detention pond areas where new fills would be required. Based on conditions encountered at the boring locations, the existing soils within the proposed building areas were recommended to be over excavated to a depth of at least 3 feet below proposed building pad subgrade elevation and to a depth of at least 4 feet below existing grade, whichever was greater.

In the areas of the former detention basins, very moist to wet soils were anticipated to be encountered at the base of the recommended over-excavation. SCG provided preliminary recommendations in the soils report for subgrade stabilization. SCG recommended stabilization through placement of a highly permeable, high modulus geotextile fabric (TenCate Mirafi® RS380i*) and a minimum 18-inch thick layer of crushed stone (2 to 4 inch particle size).



Native alluvial & organic soils covered a large area of the project site



Mirafi® RS380i is laid out and overlapped prior to aggregate placement.

THE CONSTRUCTION

As anticipated, over saturated, unstable soils were encountered at the base of the over-excavation in the area of the former detention basin. The instability of the existing subgrade was visually characterized, by the SCG soils tech, as moderate to severe. The concrete debris which were generated during the demolition of the previous development, were crushed to a 2 to 8 inch particle size. These crushed particles were used in lieu of importing crushed rock for stabilization. Using the on-site concrete demo material was far more economical than importing crushed rock from a gravel pit. In areas of severe instability, SCG recommended placement of TenCate Mirafi® RS380i prior to placement of the crushed concrete material.

Mirafi® RS380i was placed on the surface of the very unstable over-saturated soils as identified by SCG. Approximately 18 to 24 inches of the crushed concrete was then placed over the geosynthetic. The crushed concrete was pushed out on to Mirafi® RS380i with a track mounted dozer. After placement of Mirafi® RS380i and crushed concrete was completed, fill soils were placed over the crushed concrete using Cat 837 scrapers. The stabilization layer was noted to be firm and unyielding beneath the weight of the grading equipment. The fill soils were compacted to at least 90% of the ASTM D1557 maximum dry density.

THE PERFORMANCE

The use of Mirafi® RS380i geosynthetic provided strength to the very poor subgrade conditions, allowing for a stable platform.

Mirafi® RS380i High Strength Geotextile Provides:

- Superior tensile strength for subgrade support
- Separation of the poor native soils from the aggregate base
- Filtration of the water from the pumping soils
- Lateral confinement of the stone section

*Patent Pending

- There was no damage during the placement and compaction of highly angular 2-8 inch crushed concrete.

The result is a completed firm stabilized platform for construction of the 4 commercial buildings & surrounding parking lots & loading docks.



Dump Truck dumps the large/angular crushed concrete onto Mirafi® RS380i.



Track Mounted Dozer spreads the crushed concrete over Mirafi® RS380i.

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