

Case Study

application Soil Stabilization
location Irvine, CA - Marriott Springhill Suites
product Mirafi® BXG11 & BXG12 Geogrids

job owner Marriott Hotels
engineer Krazan & Associates
contractor Lusardi Construction Co.

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

Soil stabilization, control of differential settlement and seismic liquefaction resistance were required in order to support the 4-story wood frame Marriott Springhill Suites being constructed at the corner of Finch and MacCarther Blvd in Irvine, California. The project site is located on cultivated agricultural land consisting of colluvium over alluvium with a shallow ground water table. Geosynthetics made of polyester fibers were used to carry the static building load on spread footings, reduce settlement and provide resistance to liquefaction in a seismic event.

THE DESIGN

Mirafi® BXG11 and BXG12 biaxial strength geogrids were used to provide soil stabilization under the building footprint and extending 10 feet beyond. First, the design called for removing the upper 7 feet of native silty sand and clay soil. A stabilized geogrid reinforced platform was designed using the native soil blended with imported sandy gravel, placed and compacted with 5 layers of Mirafi® BXG biaxial geogrid. Using the stronger Mirafi® BXG12 biaxial geogrid in the bottom layer to obtain stabilization of the subgrade allowed the use of the lighter strength Mirafi® BXG11 biaxial geogrid in the upper layers. Mirafi® BXG geogrids are composed of woven polyester fibers in a PVC coating. The polyester provides high strength at low strain, unlike polypropylene based biaxial geogrids making Mirafi® BXG polyester biaxial geogrids ideal for supporting long term static building loads.

THE CONSTRUCTION

In order to create a stable platform at the start of construction, the contractor placed sacrificial stone on the soft, exposed, overexcavated soil. An alternative solution was to place one layer of Mirafi® HP570 high strength, woven geotextile on the soft subgrade with less stone to stabilize

the subgrade for construction, as done in the case study for the Geothermal Plant constructed in Brawley, California. The bottom geogrid lift was constructed using Mirafi® BXG12 biaxial geogrid. The first 8-inch compacted lift of the blended soil mix was placed using scrapers and dozers to spread the material.



Mirafi® BXG geogrid is cost effective, lightweight and easy to install.



Five layers of Mirafi® BXG geogrid were installed to create a stabilized geogrid reinforced platform.

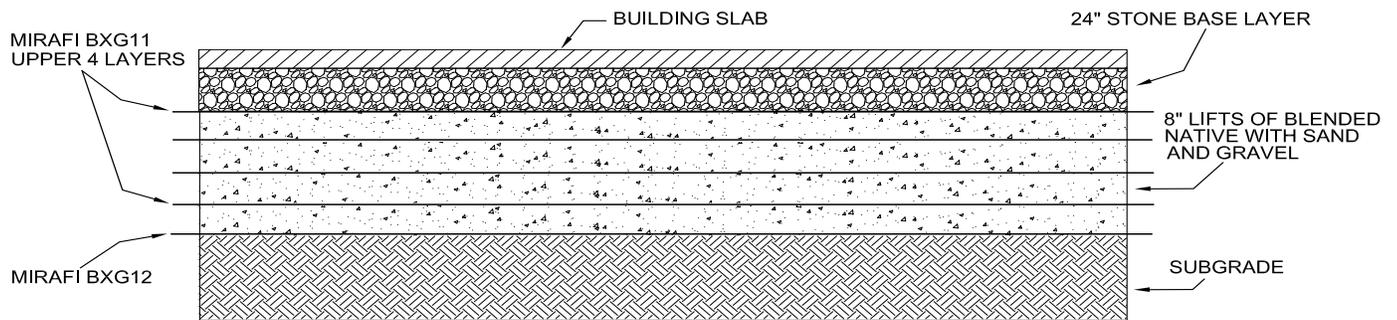
Large rubber tire scrapers were operated directly on the Mirafi® BXG geogrid. The PVC coating on the Mirafi® BXG geogrid gives it superior resistance to construction damage. The contractor completed the geogrid reinforced platform by placing 4 additional layers of Mirafi® BXG11 biaxial geogrid between 8-inch compacted fill lifts. An upper 2 foot stone base layer was placed above the geogrid reinforced platform to provide an unobstructed zone to install utilities. This was not the case in the construction of the Marriott Town Place Suites in El Centro, California where Mirafi® BXG biaxial geogrids were spliced at utility cut locations.

THE PERFORMANCE

A 4-story hotel was constructed on soft subgrade using the economy of geosynthetics made of polyester fibers. The design did not require costly piles or stone columns to support the building. The design used the native soil blended with sandy gravel and the friction provided by Mirafi® BXG biaxial geogrids to provide soil stabilization, limit differential settlement and resist seismic liquefaction.



Mirafi® BXG Series geogrids, manufactured from polyester yarns, are ideal for supporting long-term static building loads.



DETAIL FOR
SUBGRADE STABILIZATION
NOT TO SCALE

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