TENCATE Mirafi®

SOIL REINFORCEMENT

Case Study

application	MSE Retaining Wall	job owner	Caltrans
location	Santa Rosa, CA	engineer	Anchor Wall Systems/Albus Keefe Engs
product	Miragrid® XT	contractor	Ghilotti Construction
		date of installation	August 2010

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

Caltrans began the overdue widening of Highway 101 north of San Francisco to accommodate the heavy influx of North Bay commuters who commute each day out to Santa Rosa, 40 miles north of downtown, in the heart of the famous northern California wine country. MSE Retaining Walls were needed to support final roadway widening alignments and achieve grade separations in the highway median for temporary travel lanes. For the permanent walls, the project specifications listed the conventional Caltrans MSE Retaining Walls labeled as Earth Retaining Structures, which utilize large precast concrete panels connected to steel reinforcing elements placed in the soil. However, the recent Caltrans preapproved Anchor Landmark MSE Retaining Wall was listed in the Caltrans MSE wall bid list. This allowed the contractors to bid the Anchor Landmark Wall with Miragrid® XT geogrid soil reinforcement. There was no specification provided at bid time for the temporary walls.

THE DESIGN

The contractor, Ghilotti Construction selected Anchor Landmark Wall as a significant cost savings to the project. The design used masonry concrete blocks which are cast more efficiently than precast concrete panels, and Miragrid® XT geogrids, which are high strength yet noncorrosive as compared to steel reinforcements. The design is a typical SRW wall design incorporating a mechanical connection lock bar device to connect the geogrid to the masonry block. Only Miragrid® XT geogrid may be used in the Anchor Landmark Wall MSE Retaining Wall.

For the temporary walls, the contractor selected TenCate Temporary MSE Wirewalls. TenCate teamed with a local engineer to provide the complete design and wall plans for Caltrans review and approval. The design was Miragrid® XT geogrid soil reinforcement with welded wire baskets and filter fabric at the wall face.

THE CONSTRUCTION

Anchor Landmark block units were installed on a concrete leveling pad in accordance with the Caltrans plans. Miragrid® XT geogrid was available in 12 foot wide rolls and was unrolled and cut to the required reinforcement lengths shown on the wall design plans. The geogrid leading edge was set inside the prefabricated slot in the top of the Anchor wall block units. A fiberglass lock bar included in the Anchor Landmark Wall system was set over the Miragrid® XT geogrid and rotated to lock the geogrid in place. The geogrid was placed on the soil backfill in full length panels. No cutting or splicing in the roll direction was allowed. The geogrid panels were placed adjacent to one another without overlaps along the wall length. The Caltrans structural wall backfill was placed and compacted over the geogrid following Caltrans specifications for MSE wall construction.

The Temporary MSE Wirewalls were constructed in the highway median to safely and quickly raise the grade without diverting traffic from existing highway lanes. “This allows us to build an inexpensive wall that holds back the soil,” said Kevin Kruizenga, the project manager for Ghilotti Construction. “We can work in a tight area and it is a quarter the cost of a concrete retaining wall.” In construction, the welded wire baskets were set along the wall alignment.

TenCate temporary MSE wirewall system along Highway 101.

Native soil backfill is placed in temporary wirewall.

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Setting the Anchor Landmark Wall Block unit and Miragrid® geogrid reinforcement.

TenCate Miragrid® XT geogrid was placed on the soil backfill from the front face of the wire basket into the reinforcement zone. TenCate Mirafi® filter fabric was placed inside the wire basket to retain the soil backfill. The filter fabric offers UV resistance for a 3 yr temporary service life. The contractor was able to use onsite soil for the temporary MSE walls, offering additional savings to the project.

Miragrid® XT geogrid for both Caltrans MSE Retaining Walls and the welded wire baskets and filter fabric were supplied by TenCate local distributor, Stevenson Supply.

THE PERFORMANCE

The use of MSE Retaining Walls offered significant savings on a major Caltrans highway widening project. Miragrid® XT geogrid was installed in the 27,000 SF Anchor Landmark MSE Wall. Miragrid® XT geogrid is the only preapproved high strength polyester geogrid acceptable for permanent Caltrans MSE Retaining Walls using the Anchor Landmark MSE Wall. For temporary walls, TenCate teamed with a local engineer to provide the complete wall design and construction drawings for 40,000 SF of Temporary MSE Wirewalls. Miragrid® XT geogrid and Mirafi® filter fabric were used in the wall construction with welded wire baskets. The contractor was able to complete this challenging project of widening a narrow stretch of freeway through northern California without disrupting traffic flow and keeping within budget and time schedule.

Partial completion of the Caltrans approved Anchor Landmark Wall with Miragrid® geogrid.

Installing MSE wall backfill over Miragrid® geogrid.

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