

Case Study

application	Segmental Retaining Wall	job owner	Pacific Life Insurance Company
location	Orange County, CA	engineer	NMG Geotechnical, Canyon Consulting
product	Miragrid® 24XT & 10XT with SRS Verdura Wall	contractor	Soil Retention Systems, Snyder Langston

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

When it comes to land conforming, maximizing the quantity of useable land in hilly terrain, there is no place like Southern California. This was the case for Pacific Life Insurance Company when choosing to locate their Life Insurance Division of 1000 employees to a new location in Aliso Viejo. The location provides traffic free access to the 73 toll road in Orange County, a midpoint between Los Angeles and San Diego. The 9 story glass building adjacent to the Lennar Homes building is high exposure along the freeway. Given the site constraints, adequate parking could only be achieved with a 5 story parking structure. However, due to the site terrain, a 60 ft high grade separation exists between the nine story high-rise and the base of the parking structure. The grade separation line on the civil drawings was noted as 50 ft high MSE wall (SRW wall).

THE DESIGN

The general contractor Snyder Langston and the geotechnical engineer NMG Geotechnical were left to complete the design and selection of the SRW wall. The wall design challenges were:

- Wall geometry with curves as tight as 10 ft radius, drastic height changes along the wall length, and both 90 degree inside and outside corners (see wall photos).
- Critical structure with wall heights exceeding 40 ft with 2:1 slopes above in a seismic area.

- Portion of the wall facing the 73 toll road to be constructed as plantable wall to minimize visual impact.
- Design to accommodate pedestrian and vehicular bridge foundation on drilled piers.

The selection was the SRS Verdura system (ICC Report ER5515), a geogrid reinforced SRW with optional plantable face. Soil Retention Systems is a complete design—manufacturer-build contractor. The principal of SRS, Jan Erik Jansson says, “SRS has at its goal the perfection of SRW systems, producing the blocks that go into the system and installing the blocks to create grade-transitioning structures.” Since the 1980’s, SRS has provided plantable SRW walls to support the development of large residential and commercial properties in Southern California.

THE CONSTRUCTION

In the Verdura Wall construction, heavy earthmoving scrapers were used for wall backfill placement. The wall facing in the lower portion of the wall is the Verdura 60 block.



Above: Placing the Miragrid® 24XT & 10XT

Below:



Miragrid® Schedule 80 PVC pipe connection to Verdura 60 block

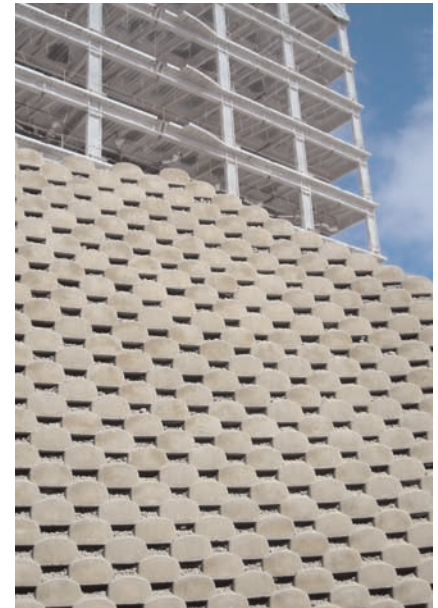
A high strength, heavy (132 pounds), 18-inch deep block. As each course of blocks is stacked, the lip of each block interlocks with the two blocks below it. This allows the heavy scrapers to run right up behind the wall facing. Imported select fill of friction angle 32 degrees was used in the wall construction. The fill was strategically stockpiled in front of and above the wall zone to increase scraper production. Miragrid® 24XT and 10XT high strength polyester geogrids were connected to the Verdura blocks using the continuous Schedule 80 PVC pipe connection (see connection photo). Using the higher strength Miragrid® maximized geogrid spacing to even 2 foot vertical increments. The Miragrid®, layers were overlapped directly on top of each other without soil cover in between in the areas of tight curves and corners. The total wall area of 15,000 SF was completed in 9 days when the schedule allowed 30 days.

Most of the wall is shaded by the 5 story parking structure and in order to inhibit vegetation growth a one foot wide gravel zone was placed

at the wall face. The sunny portion of the wall along the 73 toll road was constructed with earthen fill in the wall face to provide plant growth. Irrigation lines were installed in this area of the wall.

THE PERFORMANCE

The use of cast in place cantilever wall was considered “un-build-able” due to the grade separation heights in excess of 50 feet. The SRS Verdura Wall provided a cost effective grade transition between the office building and the parking garage. Even with the complicated wall geometry, the Verdura Wall was constructed well ahead of schedule. The heavy interlocking Verdura Block units allowed the use of heavy scrapers in the wall construction and the higher strength Miragrid® maximized the geogrid spacing to increase wall production time. The rapid completion of the Verdura Wall allowed the general contractor Snyder Langston to accelerate construction of the 5 story parking structure to parallel completion time with the 9 story office building.



SRS Verdura Wall in construction

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