



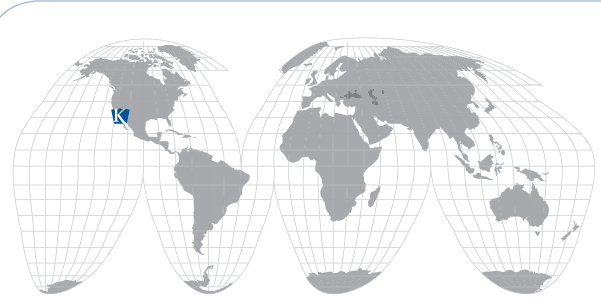
## Westview High School San Diego, California

As metropolitan areas grow and competition for valuable land increases, publicly owned building projects are often left with less desirable locations than residential and commercial ventures. In a San Diego suburb, two small, wooded canyons were the only space available for construction of the new \$75 million Westview High School.

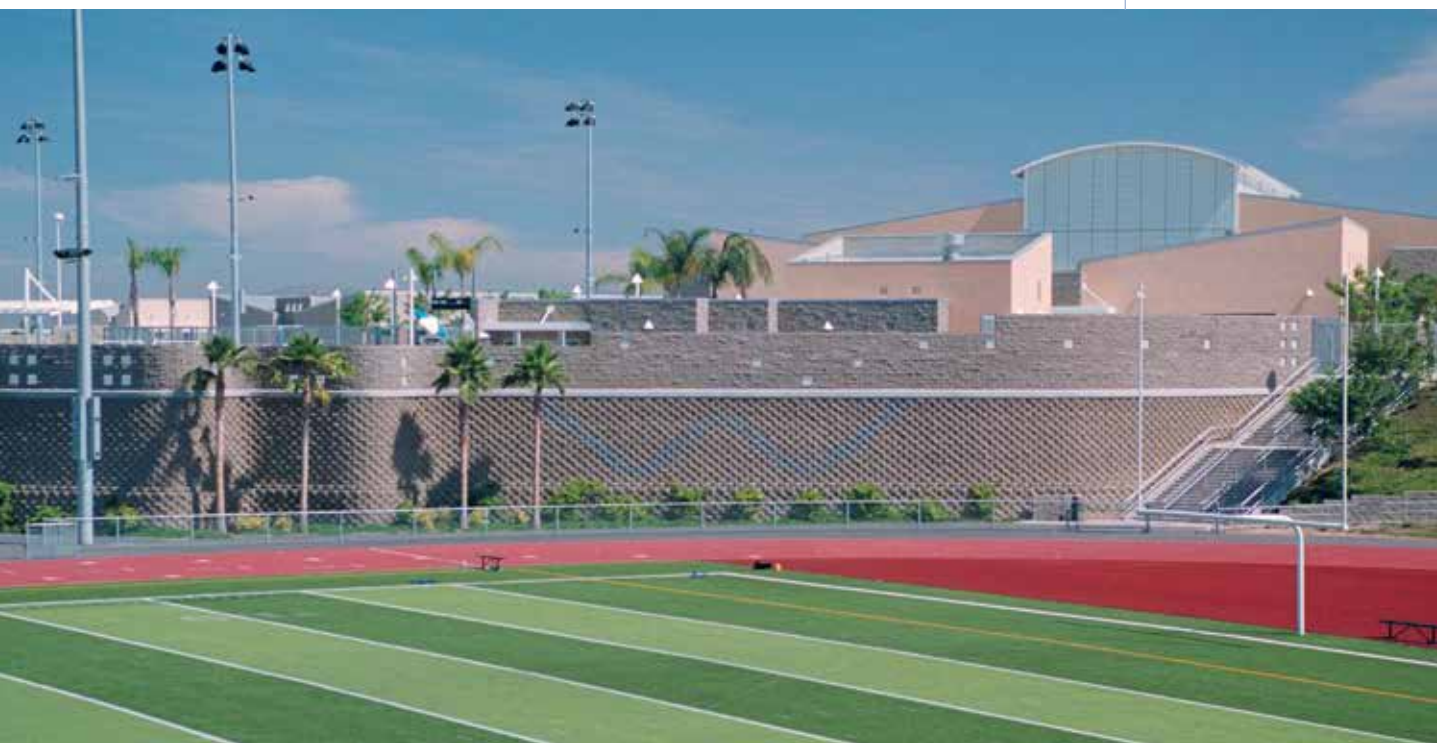
A solution was needed to turn this undeveloped and seemingly unusable land into a large school campus. That solution was a geogrid reinforced Keystone retaining wall.

RCP Block & Brick of San Diego supplied the Keystone product used in the retaining wall structure. Almost 20,000 square feet of Keystone units were used at the site – a combination of Keystone Standard, Compac, and Planter units – to deal with the substantial grade and soil retention issues. But before a Keystone unit was placed in this project, the excavation challenges at the site needed to be tackled.

The monumental task of excavating the site began with the cutting away, filling and grading of the two canyons until only a buildable site existed. Some of the most extensive cuts into the soil were approximately 60-70 feet deep and the fill area was 40-50 feet high.



<b>Project:</b>	<i>Poway Unified School Dist. Westview High School</i>
<b>Location:</b>	<i>San Diego, California</i>
<b>Keystone Product:</b>	<i>Keystone Standard Unit Keystone Compac Unit Standard Plantable Unit</i>
<b>Licensed Manufacturer:</b>	<i>RCP Block &amp; Brick</i>
<b>Total Wall Area:</b>	<i>20,000 sq.ft.</i>
<b>General Contractor:</b>	<i>Douglas E. Barnhart</i>
<b>Grading Contractor:</b>	<i>Sierra Pacific West, Inc.</i>
<b>Contractor/Installer:</b>	<i>Geogrid Retaining Wall Systems, Inc.</i>
<b>Civil Engineers:</b>	<i>Bemenent Dainwood &amp; Sturgeon</i>
<b>Architect:</b>	<i>NTD Architects</i>
<b>Wall Designer:</b>	<i>Landmark Engineering</i>



CASE STUDY



# CASE STUDY



footings using Sonotubes® in the fill area. Soil was compacted around the tubes as the crew added fill. There was also a 6-foot masonry fence parapet to be built on top of the segmental retaining wall. Construction design had to be coordinated so the footing for the fence was on top of the topmost retaining wall block and cantilevered back into the fill. This design meant the installation crew had to ensure that the geogrid was low enough to accommodate the footings.

The wall also features a distinctive “W” design, which was built using contrasting blue Keystone units. “The ‘W’ in the wall was a last minute thing,” Stevenson said. “The idea came up late into the design. They asked me for my opinion on how it could be accomplished, so I took a set of plans and colored in the appropriate blocks.” Keystone’s versatility and freedom in design made it easy to provide the blue “W” to boost school spirit.

For more information on Keystone Retaining Wall products and services, please visit [www.keystonewalls.com](http://www.keystonewalls.com) or call 800-747-8971.

Mike Stevenson of Geogrid Retaining Wall Systems, Inc. and his team consulted on the excavation in preparation for their work of installing the segmental retaining walls. The Keystone walls became the key to soil stability on this newly created building site.

“A huge challenge for the excavators was the significant soil concretions found as they cut away at the canyon walls,” Stevenson said. Concretions occur over time in the natural formation of soil due to the varying amounts of pressure exerted by the building and evolving topsoil.

“These concretions were cemented zones of soil that the excavators could not break even with the large D-9 dozers,” said Chad Sheridan of Sierra Pacific West, Inc., the project grading contractor. “These zones had to be cleared of the usable soils surrounding them and then moved to a central area to be handled by a 10,000 pound breaking machine. This broke them into pieces that could be handled by a 980 loader for placement into a crusher.” Sheridan said that the crusher then brought the size of the concretions to a usable form that met the required specifications for fill at the site.

After all of the appropriate excavation was complete, the school site was 30 feet above the site for the athletic field. “Because every acre of buildable land was needed to complete the campus, it was impossible to consider a slope for this condition,” said Stevenson. “A 2:1 slope with a 30-foot rise in elevation would mean the loss of 60 feet back and across the line where elevation began. Every inch of that valuable space was needed to build the athletic field,” he noted. All issues indicated one solution – a near vertical, Keystone segmental retaining wall. As the wall installation evolved, other challenges arose that called for creative measures. Because deep footings were required for the large light posts, it was necessary to build the

