



Walmart Retaining Wall

Tyler, Texas

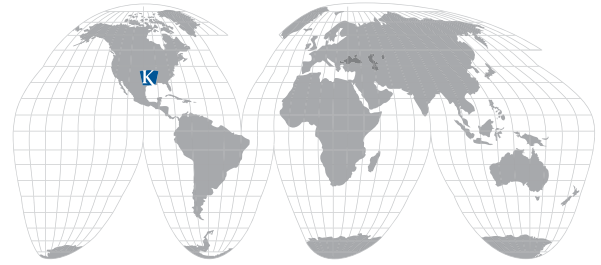
In a state that prides itself on doing everything bigger than anywhere else, it stands to reason that Keystone would be the choice to build the tallest segmental retaining wall in Texas.

Planners for a Walmart in Tyler, Texas were faced with a serious dilemma. They required a way to turn a large, hillside property into the standard Walmart store design. In order to create enough space for semi-trailer access to the back-of-store loading dock, a long wall, over 40 feet tall at its peak, would need to be constructed.

Keystone the Best Choice for Tough Jobs

"The civil engineers had originally planned for a concrete wall," said Aaron McMillan of product supplier, Jewell Concrete Products. "But after considering the cost and complexity of building a concrete wall on this scale, the efficiencies of the Keystone system made us the choice from the beginning. The result was the biggest segmental wall ever built in Texas."

Construction of the wall went smoothly, even though the sandiness of the area soils precluded the use of any wheeled vehicles in construction. *"Apart from the sandy conditions, we had no real problems during this job,"* said Roland Helmenstein of Kellystone, project wall contractor. *"I just worked from the design plans supplied by Keystone. They took into account all the extra requirements necessary for Walmart projects so I didn't even have to think about it."*



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| Project: | Walmart Retaining Wall |
| Location: | Tyler, Texas |
| Keystone Product: | Keystone Compac II |
| Licensed Manufacturer: | Jewell Concrete Products Waco, Texas |
| Total Wall Area: | 11,500 square feet |
| Wall Contractor/Installer: | Kellystone Austin, Texas |
| Engineer: | Keystone Engineering Minneapolis, MN |



CASE STUDY



CASE STUDY



Keystone In-House Engineering Advantage

Slope stability is a complicated analysis that depends on site geometry, construction methods, tested soil parameters and the potential influence of groundwater.

According to the Keystone Staff Engineer, the sandy soil conditions, in combination with Walmart's specifications, required some additional design considerations for this tall wall. "For SRWs, Walmart requires a global factor of safety that is greater than 1.5. The minimum NCMA and AASHTO standard is only 1.3," he said. "The major difference in building a wall with these more-stringent standards is the use of substantially greater amounts of geogrid. The design called for granular backfill to be hauled in from off site. And a drainage system was also required to address groundwater levels threatening the base of the wall."

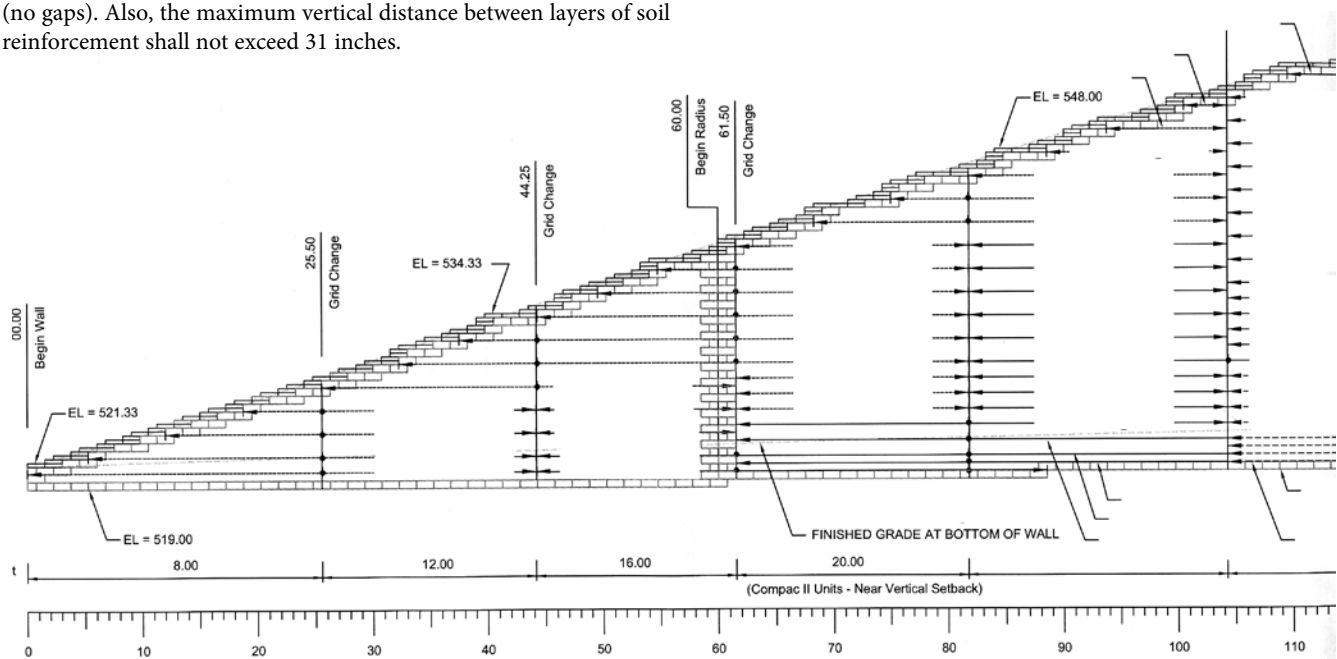
Walmart has standardized specifications for the construction of all of its facilities that, in some cases, exceed the standards established by the NCMA Design Manual for Segmental Retaining Walls. On this project, one very pertinent specification was the minimum factor of safety on geogrid pullout. The standard required by Walmart necessitated considerably longer lengths of geogrid. The figure used by Walmart is that minimum geogrid length shall be 70 percent of wall height and geogrid coverage at each layer shall be 100 percent (no gaps). Also, the maximum vertical distance between layers of soil reinforcement shall not exceed 31 inches.

Keystone provides its licensee network with a full-service, in-house engineering department. With seven staff engineers and four structural wall specialists, Keystone offers the full spectrum of engineering services from product consultation and troubleshooting to complete wall engineering.

The wall, built of Keystone Compac II units is approximately 320 feet in length and over 40 feet tall at its highest point. It required 11,500 square feet of Keystone product to complete.

This project called for a product that was stable enough to handle poor soil conditions while also being cost-effective. Because of the Keystone Compac's outstanding product integrity and ease of installation, and the design capabilities of Keystone's engineering department, the project wall contractor was able to concentrate solely on following the provided plans without needing to think about special design considerations.

For more information on Keystone Compac II or other innovative Keystone products, please call 800-747-8971 or visit our website at www.keystonewalls.com.



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