KEYSTONE® RETAINING WALL SYSTEMS
A CONTECH COMPANY

Retaining Excellence™

CASE STUDY

MetroLink Extension

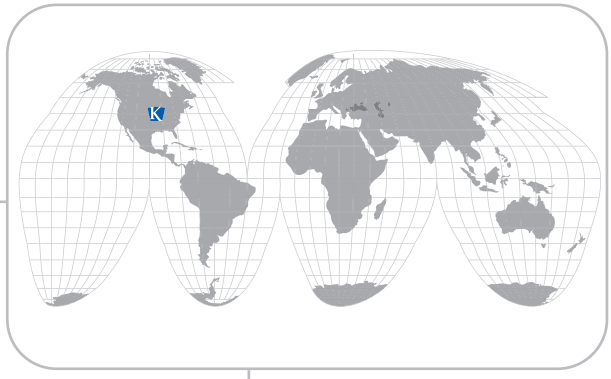
St. Louis, Missouri

The ambitious eight-mile extension of the St. Louis, Missouri MetroLink commuter rail system required massive earthmoving and extensive retention solutions. Keystone's superior strength, cost-competitiveness and speed of installation made them the right solution for this complex project.

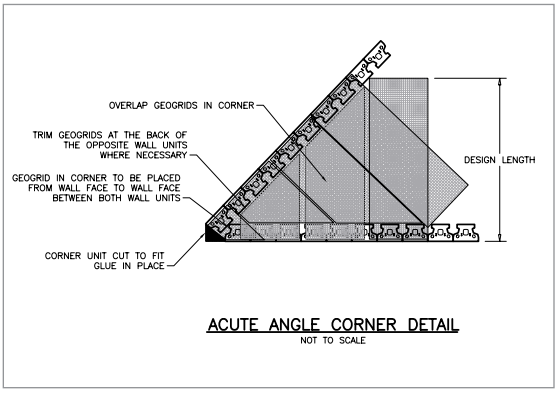
Project designers chose Keystone Compac Straight Face with a high-strength mix- manufactured by Kirchner Block & Brick, Inc. in Bridgeton, Missouri. The Keystone Compac units were manufactured to meet the Missouri DOT standards of 4000 psi and a maximum of five percent absorption.

Tom Zeisler, a Kirchner sales representative, was more than pleased with Keystone's steadily increasing role in the project. "The initial plans for the MetroLink project called for about 20,000 square feet of Keystone product," he said. "In the end, they installed about 60,000 square feet. The flexibility of the Keystone products was a great selling point. On this project, they kept finding more opportunities for the product."

According to Ed Austin, P.E., of Aspen Consultants, the wall engineer on the project, Keystone walls played a significant role in the construction of the commuter rail line. "I was involved with more than 20 separate walls along the project that used Keystone," Austin said. "SRWs lend themselves well to many different types of applications from small walls for pedestrian walkways to rail bed support. At bridge overpasses, three-foot diameter concrete piers support the bridge decking. Keystone Compac walls support the hillside soil mass."



Project:	*MetroLink*
Location:	*St. Louis, Missouri*
Keystone Supplier:	*Kirchner Block & Brick, Inc.* *Bridgeton, Missouri*
Owner/Developer:	*Bi-State Development Agency*
Product:	*Keystone Compac - Straight Face* *High-strength mix* *(4,000 psi - 5% max. absorption)*
Wall Area:	*60,000 sq. ft.*
Wall Contractor:	*Rosch Company, LLC* *Scott Rozier, Wade Schmidt*
Engineers:	*Aspen Consultants* *Ed Austin*



Tackling Tight Corners and Tough Conditions

The geometry of two walls in the MetroLink project necessitated the construction of acutely angled corners. Special consideration was taken at these acute corners because there is not enough space for standard wall reinforcement. In these instances, geogrids from opposing wall sides were overlapped, but not connected to both sides at one time. "My main concerns were from the contracting end- splitting the blocks correctly, bonding the blocks without too

Keystone Compac Tri-plane units were utilized to build this pedestrian walkway.

many small pieces and installing the geogrids," Austin said. "From an engineering standpoint it was difficult to determine the loads on the walls at the corners."

In addition to the challenge of building some uniquely designed walls, project wall installers faced difficult working conditions at several MetroLink job sites. "Our biggest problem was with tricky and often difficult working conditions," said Scott Rozier of Rosch Company, LLC. "There were several instances when my crews needed to work high off the ground, jammed underneath bridge decking or above active roadways. Although we always maintained safe working conditions, tough situations like that can take time and make tight deadlines even tighter."

High-Strength Mix Gaining Popularity

Tom Zeisler has seen a shift in the use of high strength mixes for municipal projects. "We've probably run 10 to 12 batches of high strength this year" he said. "High strength block allows for more conservative wall designs and adds protection against freeze and thaw conditions. Missouri and Illinois DOTs are using it more and more frequently." The Missouri DOT strength standard for SRW block is a minimum of 4000 psi. It must also absorb no more than five percent moisture by weight. High-strength mix contains more cement and moisture-repelling additives than regular mix. The strength of Kirchner's standard mix is 3000 psi with a maximum absorption of eight percent.

Flexibility Key to Success in Complex Project

Keystone's design flexibility was especially useful in the extensive St. Louis MetroLink expansion project. It was not only large and elaborate, its design requirements also changed over time.

Once completed, the eight-mile MetroLink expansion, boasted more than 60,000 square feet of Keystone. The total project cost was estimated at $700 million. Keystone's track record of municipal project success was central in securing the job, in the face of competing bids from other segmental retaining wall systems.

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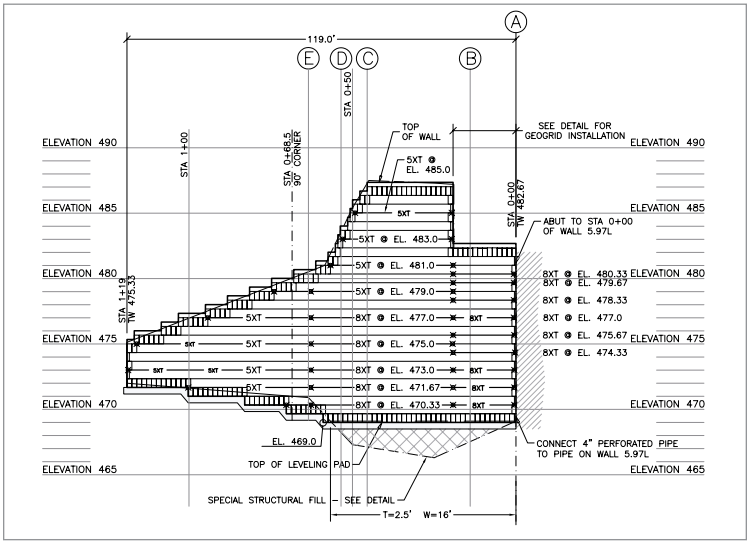

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