



AQUABRIC TYPE 4 & MEGA-BERGERAC GATEWAY VILLAGE - MURFREESBORO, TN

Murfreesboro Project is Gateway to City's Stormwater Management Approach

PROJECT:

Parking Lot for Mixed-Use Development - Murfreesboro, TN

PRODUCTS:

AquaBric Type 4 & Mega-Bergerac

INSTALLATION SIZE:

92,000 Sq Ft

MANUFACTURED BY:

Adams an Oldcastle® APG Company

INSTALLATION METHOD:

Mechanical and Manual (circles)

CONTRACTOR:

Parsley Brothers

ENGINEER:

Matt Taylor, SEC Inc.

ARCHITECT:

Ragan Smith Associates
Alan Thompson, RLA



Murfreesboro, Tennessee, is one of the fastest growing cities in the country thanks to strong city planning that includes good schools and plentiful employment, so it's no surprise that the local municipality would take a progressive approach to stormwater management.

This consideration for stormwater management was key in the development of Gateway Village, a mixed-use project with 62 residential units and 61,500 square feet of office/retail space spread over three buildings that vary in size from two stories to four stories.

The project was a LEED certified project and needed to attain specific

environmental objectives as well as meet the local municipality's stormwater requirements for water quality, streambank protection, detention volume and flood management.

As a mixed-use project with a subsurface garage, residential, office and retail space, the site needed to be able to receive a variety of vehicles, including an estimated 2,000 passenger vehicles each day. It also needed to receive garbage trucks on a normal cycle as well as other single unit or van type delivery vehicles on a daily basis. Additionally, two to three times each week a WB-50 type vehicle, or 18-wheel tractor trailer, is likely to make deliveries.

PICP Benefits Bridge Environmental, Performance and Aesthetic Needs

As a community under development, Gateway Village had both environmental and durability considerations. Belgard® Interlocking Concrete Permeable Pavers (PICP) helped the project meet certain environmental certification objectives as well as mandates set by the local municipality for water quality, streambank protection and flood management. SEC, Inc engineering chose PICP because of its ability to achieve multiple goals.

"Belgard permeable pavers helped achieve LEED certification and meet local stormwater mandates, and it also set the ambiance for the center," said

MURFREESBORO PROJECT IS GATEWAY TO CITY'S STORMWATER MANAGEMENT APPROACH

Matt Taylor, vice president of SEC, Inc. engineering, which cites Gateway as its first of many experiences with PICP.

"We did a lot of research on permeable interlocking concrete pavers as a pervious pavement solution for the Gateway project, because we previously had only seen porous asphalt and pervious concrete. Both of those present issues with performance and aesthetics and create long-term maintenance demands for our clients," Taylor said. "Now PICP is an option we look at for almost every project."

SEC, Inc considered an underground detention with a proprietary water quality unit, but the systems are large, expensive and require maintenance. With PICP, the pavers and subgrade aggregates naturally clean the water. For Gateway, the subgrade is a mixture of bedrock and silty clay, and the substructure to the permeable pavers provided adequate storage volume to meet detention volume requirements and allow natural infiltration to mimic the pre-development conditions.

Underdrains were utilized on the project to aid in draining away runoff from

buildings on the "uphill" side as well as from the most downstream fill slope. No other storm drainage exists on the project except for some culverts at the rear of the project where pedestrian ways cross existing drainage swales.

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*Matt Taylor
VP of SEC, Inc.*

Post-Development Testing Proves PICP Benefits

The 1-100 year storms were accounted for in this design, and the only water that runs off the pavement is if a portion of the paver system is clogged on the surface. A study by Middle Tennessee State University verified these findings.

Working with a grant from the City of Murfreesboro, the Concrete Industry Management program at Middle Tennessee State University studied water quality and quantity using an ISCO sampler situated at the site for two years.

"In that period of time there were 41 inches of rain – or 2.3 million gallons of water – and we found that there was no water discharge at the discharge outlet located at the back of the site," said Dr. Heather Brown of Middle Tennessee State University. "All of the water from the rooftops and parking surface was infiltrated back into the soil and replenished into the groundwater aquifer system. The system is working at it was designed."

With its completion, Gateway Village became the first PICP project to be done in the city of Murfreesboro and it has become a model for the city's consideration of storm water management for new construction.

"The use of PICP, underground water storage and a hardscape surface allowed us to increase our yield of leasable space and reduce our long-term maintenance costs," said property owner Joe Swanson of Swanson Companies. "The benefits extend to our tenants, too, who enjoy the convenience of abundant and attractive parking areas for their employees, shoppers and diners."



About Belgard®

Belgard, part of Oldcastle APG, offers a complete collection of paver and wall products for outdoor living spaces, walkways, driveways, parking areas and retaining walls. Available in a range of styles, premium Belgard products have been found in America's finest homes and award-winning commercial and retail properties since 1995. For more information, visit Belgard.com or call 1-877-Belgard (235-4273). Oldcastle APG is part of CRH's Building Products division. CRH is a leading global diversified building materials group, employing c.85,000 people at c.3,600 operating locations in 32 countries worldwide. CRH is the largest building materials company in North America and the second largest worldwide.