



GATEWAY VILLAGE

Murfreesboro Project is Gateway to City's Stormwater Management Approach

LOCATION:

Murfreesboro, Tennessee

PRODUCTS:

Aqua-Bric® Type 4 & Mega-Bergerac®

COLORS:

Napoli

INSTALLED AREA:

92,000 sq. ft.

CONTRACTOR:

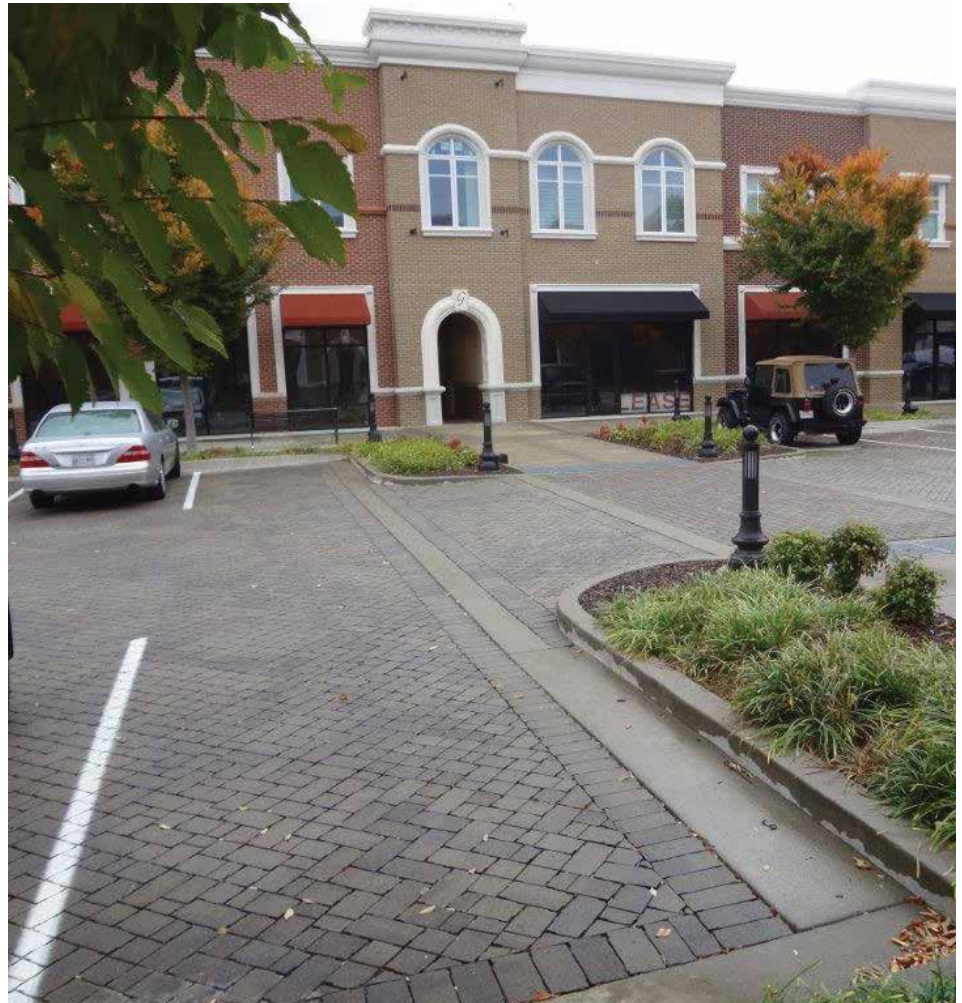
Parsley Brothers

ENGINEER:

Matt Taylor, SEC Inc.

ARCHITECT:

Ragan Smith Associates
Alan Thompson, RLA



Background

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 Challenge

The project was LEED certified 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. Overall, as a community under development, Gateway Village had both environmental, durability and aesthetic considerations.

GATEWAY VILLAGE**The Solution**

Belgard® Interlocking Concrete Permeable Pavement (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 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
Vice President of SEC, Inc.*

The Result

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 as it was designed."

With its completion, Gateway Village became the first PICP project to be completed 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 Commercial®

Belgard Commercial, part of Oldcastle® APG, offers a complete collection of paver and wall products for plazas, terraces, parking areas, roadways, rooftops and retaining walls. Available in a range of styles, premium Belgard Commercial products have been found in the nation's finest developments and award-winning commercial and retail properties since 1995.

Oldcastle APG is part of CRH's Building Products division. As the largest building materials company in North America, CRH provides a single-source solution for commercial construction projects with a full portfolio that also includes structural masonry, masonry veneers, dry mix products, hardscape jointing sands and sealants, stormwater management systems, concrete infrastructure, architectural glass, lawn & garden products, and composite decking.

