



# NOVANT COSTSWOLD MEDICAL BUILDING

Permeable Paver System Provides Cost-Effective Stormwater Solution

## LOCATION:

Charlotte, North Carolina

## PRODUCTS:

Aqualine™ 80mm (4.5" x 9")

## COLORS:

Fossil

## INSTALLED AREA:

44,000 sq. ft.

## INSTALLER:

Unit Paving

## OWNER:

MPV Properties

## ENGINEER:

GeoScience Group



## Background

A new office building was needed to support a variety of medical services in the expansive Novant Cotswold Medical District in Charlotte, NC. The congested site was located on a high traffic street and bordered by both commercial properties and a residential neighborhood.

## The Challenge

The project site was limited for space, and the design required compliance with stringent stormwater quality and storage regulations

with sensitivity to the neighboring residential and commercial entities. According to Kevin Caldwell, President of project designer GeoScience Group, the property layout did not have the space needed for a typical underground detention system. They initially looked at a subsurface sand filter and vault system, but there was little elevation difference between the parking surface and the outfall. The vault detention system could not go very deep and would therefore not only require a larger footprint but would also increase the heights of the retaining walls surrounding the parking lot, incurring increased costs.

## The Solution

Caldwell found the best option was to use a Permeable Interlocking Concrete Pavement (PICP) system, although the developer was not familiar with PICP and was concerned about structural capacity. "After providing a number of examples of similar projects where permeable pavers had been used, we moved ahead with the Belgard® team, relying on their design and engineering knowledge of PICP systems. Overall, we saved the developer over \$200,000 by using a permeable paver system."

Paul Cureton, P.E. of Belgard's commercial

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engineering team provided a permeable paver concept demonstrating how the system would meet the project requirements for managing both stormwater quality and peak flow release rates. "Eliminating the cost of underground systems and the associated collection and conveyance system of inlets and pipes are a huge driver for using PICP systems," he said.

Belgard Aqualine™ pavers in 80mm thickness were selected for their look and the ability to handle heavy vehicular loads. The paver system includes graduated layers of aggregate that temporarily store stormwater that infiltrates through the joints of the pavers. The void space between the individual rocks and the thickness of the stone layer is the key to providing sufficient storage, slowing and protecting the downstream properties from increased peak flows. Water is also filtered of pollutants as it percolates through the aggregates.

"Post-development release rates and predevelopment have to equal out—the peak flows can't be increased," said Caldwell. "PICP systems' release rates may even be even less than predevelopment rates, with some soil infiltration."

The paver system's ability to filter the rainwater also eliminated the need for the expensive sand filter and piping that would have been required with a traditional underground detention system. "There is no need for additional water

treatment with PICP," said Caldwell. "A bonus of the paver system is a nicer look, with a more upscale aesthetic that holds up very well to harsh conditions."

## The Result

PICP provided a more attractive parking lot that saved the developer significantly over a detention system in time, labor and material costs. The pavers were mechanically laid in a herringbone pattern using a PaverMax machine. Installation contractor Unit Paving reported that the PaverMax worked very well with Belgard's Aqualine pavers. "I also like the color consistency of Aqualine," said Scott Michaud, owner of Unit Paving. "We also had great support from Belgard's engineering team. This was our first mechanically installed parking lot in the Charlotte area, which not only saved time, it saved strain on the crew."

The project was completed in the allotted three weeks. Michaud also reports that even though all roof water from the building is discharged into the permeable parking lot, there is little to no runoff onto the neighboring properties. Unit Paving also set up a water infiltration demonstration at the site and invited area developers, municipal officials, landscape architects and engineers to see the permeable paver system in action.

**We also had five inches of rain and passed the infiltration tests with flying colors—there was nothing leaving the discharge pipe. This is the first permeable paver parking lot in the area, and the developer is thrilled. He plans to use PICP for all future developed properties and parking lots.**

*Kevin Caldwell  
President of Project Designer  
GeoScience Group*

### 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.

