



BELGARD PARTNERS WITH THE CITY OF ATLANTA FOR THE LARGEST PERMEABLE PAVEMENT RETROFIT PROJECT IN NORTH AMERICA

Installation Includes Almost Six Miles of Permeable Pavement in Urban Roadways



PRODUCT: Permeable Interlocking Concrete Pavement: Aqualine™ 9" L-Stone 80 mm thickness

LOCATION: Atlanta, Georgia

COLOR: Georgia Blend

INSTALLERS: Four Seasons Landscape Management

DESIGN FIRM: Gresham, Smith and Partners

DESIGN/BUILD FIRM: Amec Foster Wheeler

GENERAL CONTRACTOR: Southeastern Site Development, Inc.

About Belgard® Commercial Hardscapes
Belgard Commercial is part of the Oldcastle Architectural Group, the largest concrete products manufacturer in North America. With over 180 locations and a company culture characterized by a commitment to customer satisfaction, Oldcastle adheres to a level of service and consistency that no other supplier can match. Our combination of local market presence and national capabilities allows us to meet and exceed the demanding needs of an ever-changing industry.

In 2015-16, the Atlanta, Georgia, Department of Watershed Management partnered with Belgard Hardscapes to install over six miles of permeable interlocking concrete pavement (PICP). The largest permeable paver retrofit project in North America, the installation includes almost six miles of streetscape across neighborhoods near Turner Field, home of the Atlanta Braves. Phase I of the project started during the spring of 2015 and will conclude in late 2016.

The Issue

As cities across the world grow, they give rise to more concrete, paved parking lots and miles of asphalt roads. During a large

rain event in urban areas, these impervious surfaces cause runoff, which empties directly into drain systems that struggle to perform as infrastructure demand increases. In Atlanta, heavy rains repeatedly caused flooding problems in the neighborhoods of Summerhill, Peoplestown and Mechanicsville—areas adjacent to the huge parking lots at Turner Field and directly centered where Interstates 20, 75 and 85 convene. The shared singular draining system combined with these impervious areas contributed to regular flooding. In 2012, a particularly fierce storm sent runoff and raw sewage into people's homes and backyards, causing the city to take action.

The Solution

Atlanta's Department of Watershed Management started working on the Southeast Atlanta Green Infrastructure Initiative, which sought to develop a holistic approach to managing stormwater runoff and reduce flooding while promoting sustainability and enhancing community amenities. A key aspect of green infrastructure is that it provides an alternative to traditional pipe replacement by incorporating elements designed to mimic nature to more effectively manage urban stormwater and reduce flooding, erosion and sewer overflows. One of the immediate projects undertaken by the Department of Watershed Management was the decision to



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install approximately six miles of permeable pavers in the Peoplestown, Mechanicsville and Summerville communities.

Permeable Interlocking concrete pavement systems consists of concrete pavers with joint openings filled with permeable aggregate that allows stormwater to flow into layers of crushed stone that support the pavement while providing water storage and runoff control. As the rainwater sinks through the four feet of aggregate under the pavement, the rocks act as a filtration system to clean oils and chemicals from the street above. Geomembrane dams and the aggregate detain the water and slowly release it into the existing stormwater sewer system. Since the water does not run directly to the curb gutter, flooding is significantly deterred during heavy rain.

After funding for the \$16 million project was secured, the team leaders chose Belgard's Aqualine™ L-Stone permeable paver—in the appropriate color of Georgia Blend. Economically sound and surpassing all EPA stormwater requirements, Aqualine is designed to withstand vehicular travel in high-traffic areas. The pavement also delivers results in both cost-effectiveness and long-term durability in harsh climates, particularly those with extreme freeze/thaw cycles.

Installation of the pavement was a three-step process. First, the asphalt was removed. Second, the street was excavated and filled with stone along with a terraced dam system that detains the water and eventually carries it to the proper drainage area. Finally, the individual pavers are put into place on top of the stone and installed 12 square feet at a time using a machine. The unique "L-shape" of the stone allows for minimal waste during installation and provides optimal interlock for vehicular traffic.

The Belgard team worked closely with Amec Foster Wheeler to help plan the design build portion of the project. Using in-depth product knowledge and experience gained on past projects, Amec Foster Wheeler was able to better navigate challenges that occurred during installation such as unexpected utility cuts. In addition, Belgard worked with the City of Atlanta to develop a Permeable Interlocking Concrete Pavement Operations and Maintenance Guide. The document provides in-depth details on short- and long-term

maintenance ranging from replacing pavers to winter inspection. The guide will ensure that the city saves time and money, and maximizes its investment for years to come.

The Results

Atlanta has adopted one of the most far-reaching post-development stormwater management ordinances in the nation, laying the groundwork for a robust green infrastructure program both for private development and the city's capital improvement projects. Under the ordinance, new and redevelopment sites are required to treat the first inch of stormwater runoff with green infrastructure, such as bioretention (rain gardens) and permeable pavement. Over 2,000 construction projects that incorporate green infrastructure have been permitted in Atlanta since 2013, which equates to the removal of approximately 350 million gallons of polluted runoff from local streams and combined sewer systems each year.

As of June 2016, Belgard's new PICP system is providing over two million gallons of storage capacity giving residents extra flood protection during heavy rain events. The city's plan is to reach seven million upon project completion.

In June 2016, the Metropolitan North Georgia Water Planning District awarded Watershed Management with a STREAM Award for its Post-Development Stormwater Management Ordinance in a celebration held at the Loudermilk Conference Center. The STREAM Awards recognize the outstanding sustainability achievements of Metro water utilities and local governments.

Permeable interlocking concrete pavement systems continue to become an extremely popular choice for streetscapes and parking lots for municipalities and in the private sector. One of the biggest drivers for this technology is not just flood prevention, but also the Environmental Protection Agency's Clean Water Act requiring builders to address their water quality impacts from stormwater runoff as well as neighborhood and street flooding. "A PICP system is the best of both worlds," stated Aaron Faubli, Belgard Hardscapes Sales Manager. "You're not just getting a pavement, you're getting a pavement and a stormwater management system all in one."

Permeable Interlocking Concrete Pavement (PICP)

Stormwater runoff from impervious surfaces like traditional streets, parking lots and sidewalks is a major contributor to flooding of adjacent low lying areas, in addition to surface water impairment and erosion along existing drainage courses. Permeable pavement is one of the solutions being utilized for both hydrologic and water quality improvement. Belgard's Permeable Interlocking Concrete Pavement (PICP) system is fundamentally a large-scale detention reservoir with a drivable surface course. The open-graded base and subbase aggregates have approximately 32% and 40% open space respectively, providing for temporary water storage. Being the same aggregates used for railway tracks, they are more than capable of supporting vehicular loads. Use of PICP on various plaza and boulevard applications can add to the aesthetic look of a project, eliminate the need for traditional stormwater conveyance works, improve stormwater runoff quality and prevent downstream flooding and erosion.

