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Main Roadway Retrofit in Historic New York Village

by Maureen Murray, Precise Communications

Above: Chautauqua Avenue in the Village of Lakewood, New York was redesigned by landscape architecture firm Barton & Loguidice. The 13,500-square-foot green infrastructure project included a new water management system centered around the addition of permeable pavers.

The Village of Lakewood, New York is located at the southern end of Chautauqua Lake and offers the tranquil charm of a lakeside village with a public beach, park, playground, boat launch, and the hustle and bustle of downtown boutiques, Amish crafts, artisan dining, antiques, and wine shops.

With a need for pedestrian accessibility, safety, and keeping Chautauqua Lake clean, the village initiated the Chautauqua Avenue – Green Street project, a 13,500-square-foot green infrastructure retrofit of three main intersections and pedestrian areas.

The project was designed by Barton & Loguidice (B & L), a multidisciplinary engineering firm, and features green infrastructure practices that reduce stormwater runoff and pollutants from entering Chautauqua Lake. The use of Belgard® Aqualine permeable pavers were key to the water management aspects, as they provide significant environmental benefits while complementing the aesthetic charm of the Lakewood Village center. The project demonstrates the successful use of concrete pavers in high-load applications with special design features that improve the system's performance.

Considerations about the nearby lake required stormwater management and environmentally sound practices and materials, so stormwater tree trenches, flexible porous pavement, and planted landscape areas were also installed. The streetscape also features interpretive educational panels about the green practices in the greater watershed area. For the permeable paver portion of the project, the paving manufacturer's national support team provided design and construction input to the B & L Landscape Architect.

Contracted for construction with Kingsview Enterprises and RMS Services of WNY, Inc., the project specs involved replacing asphalt pavement with permeable pavers in three main intersections as well as the curb areas. B & L called for a unique design using the Aqualine four-and-a-half-inch-by-nine-inch

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Top, Left: Interlocking pavers situated at each intersection feature double-running bond patterns along the crosswalks to delineate them from the 90-degree herringbone patterns of the main areas.

Bottom, Left: 4.5" by 9" Belgard® Aqualine permeable pavers in colors Amaretto, Bella, Sable, and Silex were used throughout the street. These interlocking pavers have a smooth surface that consists of joints filled with ASTM No. 89 over a one-inch ASTM No. 8 bedding layer on a six-inch choker course confined by geocell for additional stiffening. A 16-inch sub-base of larger aggregates function as a reservoir, and an elevated underdrain allows water to infiltrate the ground while excess water can flow into the existing stormwater system.

Right: Tree trenches are surrounded by flexible pavement to help manage stormwater for the village. Aqualine pavers, similar to the paving in the street, were placed along the walkways.

permeable pavers in colors of Amaretto, Bella, Sable, and Silex. This product line is produced by Oldcastle APG, a CRH Company with manufacturing facilities nationwide.

B & L's Nicole Cleary, PLA explained, "This paver system provides a beautiful streetscape while also caring for the lake water, creating an environmentally and aesthetically friendly final product for the village."

Cleary noted that maintaining access for local business owners in the village was important to the community and to the success of the project.

"We tried to minimize disruption and kept sidewalks open even when roads and the intersection were closed for periods of time," she said. "Signs let people know that businesses were open during the summer and, because of tourist season, we had to build in pedestrian access."

Permeable pavers take water down to stone courses which filter it and gradually lead into the groundwater. That runoff is then captured, treated, slowed, and cooled prior to entering Chautauqua Lake. Underdrains in the permeable pavement intersections are connected to the existing storm sewer system to collect excess water from very large rain events. Tree wells are surrounded with flexible porous pavement that also captures rainwater and provides filtering benefits.

Surface infiltration tests show that the permeable pavement system is working very efficiently. The hardscape manufacturer has been involved with the project from the design phase through post-construction and has shared surface infiltration monitoring results with the entire project team to show the effectiveness of the water management.

The pavers add to the aesthetic charm of the village while improving the water quality and helping manage stormwater events. Cleary said communication and education within the community are essential to a project that impacts main intersections and businesses.

The result of this project provides a beautiful streetscape while caring for the local environment, creating an environmentally and aesthetically friendly final product for the community. The project was a 2022 Hardscape North America Award Winner.