

High-Performance Low-Carbon Concrete Infrastructure Throughout the City of Syracuse



Aesthetic Concept:

For the past 40 years, our recycled glass, including wine bottles, jars, and containers, have been sent to our landfills due to high contamination and the lack of an end market, creating a massive environmental and cost problem for recyclers. At the same time, concrete producers are struggling to find an alternative to the dwindling supply of fly ash and slag as the industry faces a significant push to decarbonize.

At KLA W Industries, we process this waste glass into a high-performance glass SCM, providing improved resistivity while lowering concrete's embodied carbon.

In 2024, Riccelli-Northern led the deployment of high-performance, low-carbon concrete leveraging glass SCMs in a curb, sidewalk, and street overhaul in the City of Syracuse. The initiative is one of the first public-private partnerships to deliver next-generation concrete with significant embodied carbon reduction in the Central New York Region.



Figure 1: Receiving waste glass, processing it in Binghamton, and creating an SCM.

Structural Design:

The project's defining feature was the use of glass, initially destined for landfills, as a high-performance SCM to replace 20% of cement content. Glass SCMs have been gaining attention nationwide as one of the most effective ways to decarbonize concrete utilizing existing regulations and operating practices.

As the first project with glass SCMs in the CNY market, field testing was a core focus of the project and was carried out by Riccelli-Northern. Jason Uhlinger led mix integration, optimizing Riccelli-Northern's Class D to achieve excellent air results and improved workability.

The technical success of the project will serve as the foundation for bringing new materials to the industry in CNY in 2025 and 2026 in upcoming NYSDOT projects targeting improved resistivity.



Figure 2: Chet Gates, Nick Jobin, Jon Wagner, and Ray Mendez from Michael McConnell Concrete.

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Innovative Use of Materials:

The push for low-embodied carbon concrete has primarily focused on architectural, university, and specialty projects. Riccelli-Northern has changed the paradigm by bringing an American-made SCM that leverages the millions of tons of waste glass produced every year to municipal concrete projects. Targeting traditional concrete is a defining aspect of this project, as it is the vast majority of concrete produced and where practical low-embodied carbon solutions are most impactful.

The partnership with the City was spearheaded by Mark LaLomia, who worked alongside Ryan from Michael McConnell Concrete and Jacob from KLA W Industries to bring the project to fruition. The project featured sidewalk upgrades on North McBride Street, Hickory Street, and Union Ave on the Northside of Syracuse. Riccelli-Northern has become a leader in sustainable concrete, devoting in-house resources to developing their use of new materials and making these innovations in the circular economy accessible to local residents, contractors, and municipalities.



Figure 3: Batching and field testing at Riccelli-Northern Monday morning as the project commenced.

Quality of the Installation:

Ryan and the crew from Michael McConnell Concrete performed the concrete installation. As the first users of glass SCMs in CNY, they displayed remarkable expertise in adapting to cutting-edge materials gaining traction in the industry. They have become prominent supporters of glass SCMs and are a pivotal group developing next-generation concrete.

The project gained significant media attention, including coverage by the City of Syracuse, The Central New York Business Journal, and YahooTech. Local news channels, including CNY Central, covered the completion of the project and noted the unified focus on material innovations between the City, McConnell Concrete, and Riccelli-Northern.

The project's location on the Northside of Syracuse demonstrates the concrete sector's time, effort, and commitment to improving the local industry and providing American-made materials sourced from our own backyard. The work during this project by Riccelli-Northern, Michael McConnell Concrete, and the City of Syracuse exemplifies how focusing on performance and innovations can advance the industry one street at a time.



Figure 4: The Crew from McConnell Concrete at the corner of N McBride and E Willow Street.