

# Green Renovation Bridges

## School with Nature Center

In 1995, the mayor of New Haven, Connecticut, John DeStefano, launched a citywide school construction program to renovate most of New Haven's schools. As part of that program, the Barnard School went through a \$43 million renovation in early 2005 and reopened in the fall of 2006 as the Barnard Environmental Studies Magnet School. The school's renovation was a U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) project.

This renovation included a pedestrian bridge over Ella T. Grasso Boulevard, a busy four-lane state route. The overpass connects the school to a new nature center located adjacent to West River Memorial Park. Dewberry-Goodkind Inc., who provided complete engineering services for the Barnard School project, wrote the specifications for the pedestrian bridge and defined its structural elements.

"We looked at a Continental Bridge right out of the box for this project," says Fran Kobylenski, project engineer for Dewberry-Goodkind Inc. "We had seen these bridges used on other projects and were quite impressed."

A Continental Gateway-style truss was chosen for the skywalk and was painted with epoxy primer and polyurethane topcoat. This two-coat paint system is often used on DOT bridges with exposed beams.

The fixed starting point for the first 55-foot bridge section is the school's ground floor, where it extends to a white concrete pillar set back from the boulevard. A second 28-foot span runs from the nature center to an adjacent pillar. The center section is 129 feet

long and has a minimum 17.5-foot clearance over the boulevard. Dewberry-Goodkind took special care when planning the bridge site.

The structure is laced through the trees, so Dewberry-Goodkind wanted to keep as many trees in place as possible and trim the others. According to Kobylenski, the overpass solves a significant safety problem for the neighborhood and Barnard School students.

"There are traffic signals at the intersection of Ella T. Grasso Boulevard and Derby Avenue, but because of the intersection layout and turning lane, even our engineers and contractors found it tough to safely cross the street before the bridge was up," explains Kobylenski. "You can imagine how difficult it would be for a teacher and a group of toddlers to cross."

### Expert Involvement

Roberta Washington Architects PC of New York City was the lead architectural firm for the Barnard School project. Their associate, David Thompson Architects (DTA) of New Haven, Connecticut, was responsible for the appearance of the bridge itself and the rehabilitation of the existing portion of the school building. David Thompson primarily drove the design of the skywalk bridge. Thompson's associate, Paul Laroque, worked in conjunction with Thompson and was responsible for some of the detailing and coordination. Design of the curtain wall detailing was a coordinated effort between DTA and Dewberry, with Continental providing feedback on what they could provide in the shop.

Since the bridge is situated over a very busy roadway, the decision was made to enclose the structure. It is an unconditioned space with penthouse louvers on the top and in the windows for ventilation.

“Our initial design involved aluminum cladding and windows to match the school and nature center,” says Larocque. “It ties the two structures together.”

DTA, in coordination with Dewberry, designed the special cladding connections and angle clips on the bridge were provided to attach the panels.

“Working with CONTECH was very good. They were on top of a lot of things,” comments Larocque. “This intersection and corridor are a major gateway into the city, and the bridge helps increase the gateway effect.”

### Bridge Installation—A Community Event

A. Prete Construction Inc. managed construction for the Barnard School renovation. Stamford Wrecking Company, the site contractor, was responsible primarily for the bridge construction. They installed the 138-ton structure in two phases. The first two shorter sections of the truss were installed in May 2006. The second phase began on the night of July 10, 2006. It was a community event, complete with bleachers for spectators. Traffic was shut down for four hours while the 129-foot middle span of the skywalk was rotated, lifted, lowered and placed slowly onto the pillars by two cranes.



“The trickiest part of this job is that the design engineer and architect wanted the window frames, paneling skin and roof installed on the 129-foot center span prior to erecting it,” states Greg Paquin, project executive and vice president of construction for Stamford Wrecking Company. “This approach offered cost savings to the project because the subcontractors installing the finishing building elements would not have to work at night and close traffic lanes.”

Prior to actually setting the center span, Stamford’s crew erected the 129-foot truss on false work along the side of the roadway. This

truss gave the finishing tradesmen a location to install the aluminum panels, windows and roof on the main span. There was concern that the truss could flex when it was moved, affecting the aluminum panels and other components. In addition, the bridge site was located among several oak trees marked for preservation. Because of these tight quarters, the only way to erect this section was to leapfrog it out three pick positions before finally lifting it onto the piers. During the design process, Dewberry considered several methods for lifting the bridge, and CONTECH engineers worked with Dewberry to design and place temporary connections on top of the structural framework.

“We had two cranes, 210 tons and 120 tons each, picked relatively close to the bearing locations, but from the top chord, and it went flawlessly,” states Paquin.

According to Mayor DeStefano, the bridge is a unique feature for a school construction project and has drawn a lot of interest from residents and visitors.

“In all of our school construction projects, we try to capitalize, through innovative design, on the surrounding environs,” DeStefano



says. “In this case, Barnard School benefits from its proximity to West River Memorial Park. Easy access to the Nature Center and the tidal wetlands of the park will serve as a valuable educational resource for the students as well as the neighborhood. The bridge

between the Barnard School and the nature center is a novel way to literally bring the classroom out to the park and enhance the school’s environmental studies theme.”

Barnard School is an interdistrict environmental studies school that serves grades K through 8. The eco-friendly school includes non-traditional landscaping that does not require mowing and a “green roof” that consists of a variety of plants surviving solely on rainwater. As an environmental magnet school, the curriculum is focused on the ways technology can improve efficiency while minimizing any environmental impact. ■ 103

## What Is LEED?

The Barnard School renovation was a U.S. Green Building Council LEED project. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.

LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environ-

mental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. There has been much focus on the LEED rating system for lighting, HVAC and construction waste management. But developers are finding expanding opportunities to incorporate more site development credits through the use of LEED-contributing bridge, drainage, earth stabilization and stormwater products. More information on LEED is available at [www.usgbc.org](http://www.usgbc.org).