STEEL GETS A+

at University Athletic Facilities

THE MISSION STATEMENT FOR 150-YEAR-OLD POLYTECHNIC UNIVERSITY is to "produce and support the leaders of tomorrow...provide excellence in research and education in engineering, computing, science and related fields for the New York region and the world." While this formidable commitment to quality and excellence obviously guides the school's academic pursuits, recently it held true for one of its other endeavors: building a $36 million addition at its Brooklyn campus. And when "testing" materials for the job, structural steel was the one that received the highest grade.

The university's new 89,000-square-foot Jacobs Academic and Athletic Facility at 329 Jay St. in Brooklyn addition, combines seven floors of academic space above 26,000 square feet of athletic space at street level, the highlight of which is a 26-ft.-high gymnasium with an NCAA regulation basketball court. One of the chief reasons steel was selected is because of this spatial configuration. Since the athletic facilities were required to be located on the first floor of the building "steel trusses were the only solution that allowed for a clear span above the building's gymnasium," explained Mathys Levy, chairman of Weidlinger Associates Consulting Engineers, the project's New York City-based structural engineer.

"Over the gymnasium, four steel trusses provide an 85-ft. clear span for the space while supporting a 4,200-sq.-ft. elevated courtyard and seven stories of L-shaped academic space above," he noted, adding that a 13-ft.-high mechanical space above the trusses is supported as well. The truss support system is so large that it extends from the third floor to the fourth floor. Each of the four trusses is a typical bolted-up beam truss made out of A-572 steel. Because of their height and weight — each 15-ft.-high truss weighs between 12-tons and 14-tons fully assembled — they were put together in the field, but not in the manner you would expect.

Temporary Columns Enable Assembly in Place

In order to install the A-572 steel trusses, each had to be assembled in place. First, temporary columns were installed to support the bottom chord sections. The floor was framed next, followed by installation of the top chord and the diagonals. Everything was then bolted in and the temporary columns were removed.

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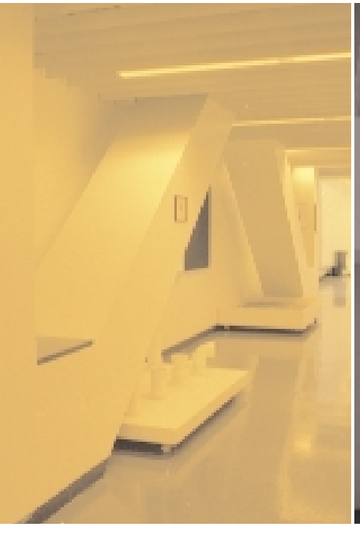

According to Charles Weir, president of Weir Welding Co., Inc., the project's Carlstadt, N.J.-based fabricator, it was difficult to install the trusses not only because of their size and weight, but because of site constraints as well. "Logistics were difficult because the new structure was bounded by three other buildings, one each to the north, east and west," Weir explained. "The only open side was to the south, which is where the new facility linked to the existing Rogers Hall,
a seven-story, 150,000-sq.-ft. structure."

In order to install the trusses, a Manitowic 888 crane with a 140-ft. boom and 140-ft. jib was used. "The trusses were put together one piece at a time as part of the building," noted Gerald Maher, president of Glasmar Steel Erectors, Inc., the project's Rockville Centre, N.Y.-based steel erector, "because there was no room on the site to assemble them. If there had been room on the ground, we would have assembled them there and hoisted them in place, albeit in halves because of their weight."

Tubular Steel In addition to using trusses for spanning the gymnasium, the designer used steel trusses to support the lobby curtain wall as well. The lobby wall is framed of 40-ft.-long vertical strong back trusses fabricated of 2-inch-by-8-inch steel tubes, with 2-inch round tubes welded to the back of each tube by means of four-inch-by-four-inch plate steel stand-offs. The curtain wall is made up of glass glazing and one-eighth-inch aluminum panels supported with the help of mullions attached to the front of the steel tubes so the curtain wall could be stacked 40-ft. high. Lateral loading was resisted by means of a crisscrossing turnbuckle-and-cable system connecting the curtain wall's ten vertical trusses.

The building also features an elegant ornamental metal and terrazzo stair connecting the lobby to the lower level. It is constructed with a stainless steel handrail supported by a tempered glass balustrade directly connected to the steel stringers.

Structural steel was also used to create a new skybox opening for the existing Jacobs building. The skybox on the existing building projected into the new gymnasium, requiring that the earlier building be shored up. The building is one of three structures by which the new facility is bounded.

Completed in July 2002, Polytechnic students were welcomed back that September to a new facility aptly designed for the world's future engineers and designers. ■ ■

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POLYTECHNIC PROJECT

Structural Engineer	**Weidlinger Associates Consulting Engineers, NYC**
Construction Manager	**J.A. Jones Construction Group, NYC**
Fabricator	**Weir Welding Co. Inc., Carlstadt, NJ**
Erector	**Glasmar Steel Erectors Inc., Rockville Centre, NY**