

French Framing

BY PETER WILK

Besides the South Miami-Dade Cultural Arts Center, another new cultural facility in Miami that employs steel framing, albeit on a smaller scale, is the new home for the Alliance Française de Miami, a not-for-profit organization whose mission it is to promote French language and culture.

The project, constructed by McGowan Builders and designed by HOK, encompassed the renovation and conversion of two preexisting buildings—a 5,000-sq.-ft one-story warehouse and a 6,000-sq.-ft two-story industrial building—and ground-up construction of a 5,000-sq.-ft addition. The new facility houses 14 classrooms, a reception area/lobby atrium, a library, a bookstore, a large multi-purpose space, offices, two meeting rooms, a catering kitchen, and a retail component with six tenants, including a French café and a travel agency.

The structural work involved installation of new steel trusses for the pitched roof and reinforcement of preexisting concrete tie beams, tie columns, and column bases in the one-story building; and erection of structural elements for the new extension, including shallow-footing strip concrete foundations, new reinforced concrete and masonry walls, two new 40-ft high towers (one of which houses an elevator shaft), and structural steel support for the sloped roof above the addition.

Paul Zilio, senior vice president and partner with the project's structural engineer, Bliss & Nyitray, Inc., described the condition of the original wood trusses supporting the roof of the preexisting one-story structure, erected in 1946, as decayed and outdated in terms of current building codes, thus making replacement necessary. So, the engineering team devised a procedure that reinforced the tie beams and columns and designed a new roof support system featuring open-web trusses and bottom chord-bracing, which are connected with $\frac{3}{16}$ -in. \times 2½-in. fillet welds. The trusses are welded to steel plates, which feature headed stud anchors embedded into the tops of new concrete columns below, and the chord bracing prevents buckling of the trusses due to wind uplift. This design was necessary to accommodate the Florida Building Code's (2004 edition) specific requirements for the Miami-Dade and Broward counties, which are located in a high-velocity hurricane zone; all buildings in Miami-Dade are required to withstand a three-second gust of 146-mph wind.

Despite these increased local structural requirements, Bliss & Nyitray, which has extensive experience in hurricane-

resistant design, was able to develop the truss and bracing system, using standard, pre-designed, and prefabricated elements. Doing so allowed the team to significantly lower the construction cost



by avoiding manufacture of a custom structural system for this part of the project. In total, 50 tons of steel, including 40 tons in the one-story building and 10 tons in the addition, were used for the project. The total area of the new galvanized metal deck roofing for the complex is 10,000 sq. ft, including 4,000 sq. ft above the addition and 6,000 sq. ft above the one-story structure.

The roofing system also features an interesting custom-designed element: a structural steel gutter drain located at the seam between the sloped roof of the addition and the pitched roof of the one-story building. The U-shaped internal drain—35 ft long, 2 ft wide, and 1 ft deep—was manufactured from Grade 50 steel plates, prime-painted at the fab shop, and finish-coated upon installation at the site. The sturdy design of the drain prevents leaks into the building below.

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Architect

Hellmuth, Obata and Kassabaum, Inc., Miami

Structural Engineer

Bliss & Nyitray, Inc., Coral Gables, Fla.

General Contractor

Mc Gowan Builders, Inc., Coral Gables



The erection team developed procedures to lift the beams of one of the roof sections into position at the exact 30° angle at which they were to be installed, allowing for immediate installation upon material delivery to the site.