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**The rewards
of inventive design**



Not-for-profit reaps rewards of inventive design

The new school and cultural center for the Alliance Française de Miami

By Aidan McConville

Design & Construction Team

Owner

Alliance Française de Miami,
Miami

Owner's representative

Europtima USA, Inc.,
Surfside, Fla.

General contractor

Mc Gowan Builders, Inc.,
Coral Gables, Fla.

Architect, interior designer

Hellmuth, Obata &
Kassabaum, Inc., Miami

Structural engineer

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

MEP engineer

SDM Consulting Engineers,
Coral Gables, Fla.

Civil engineer

EAC Consulting, Inc., Miami

A/V consultant

Technosystems, Inc.,
Hialeah, Fla.

Truss roof and metal decking fabricator

CMC Joist & Deck,
Summit, N.J.

Steel erector and sloped roof structure fabricator

NJ Boom & Erectors,
Henryville, Pa.

Mc Gowan Builders served Alliance Française de Miami as general contractor for construction of its new facility in

Miami, known as the Alliance Française Village. The facility is the new home for the not-for-profit organization, whose mission is to promote the French language and culture through



The bold blue, white, and red colors of the French flag are integral to the design of the atrium.

Mc Gowan Builders, Inc.



Wik Marketing Communications

The large event and exhibition space for the Alliance Française cultural and education center leverages open-web trusses and bottom-chord bracing to meet the strict hurricane demands in Miami.

the operation of a language school and other educational activities, encouragement of international travel, and cultural exchanges.

This renovation and revitalization project transformed a former printing facility and an adjacent property into a cultural and educational center that houses 14 classrooms; a reception area/lobby atrium; a library; a bookstore; a large multi-purpose and event space; offices; two meeting/break rooms; a catering kitchen; and a retail component with multiple tenants, including a sidewalk café, a travel agency, and a hair salon.

The project encompassed renovation and conversion of two pre-existing buildings — a 5,000-square-foot, one-story warehouse and a 6,000-square-foot, two-story industrial building; ground-up construction of a 5,000-square-foot addition; related site work; and utility connections. The facility features new and reinforced structural

support systems, a custom storefront, new MEPS systems, a hydraulic elevator, zinc casework, kitchen equipment, and an energy recovery HVAC system.

The project's logistical and technical challenges included coordination of labor teams, sub-contractors, and suppliers based outside of Florida, including in Pennsylvania and New Jersey; a fast-track schedule; limited site access; restrictive street and sidewalk closure permits and procedures; and coordination with government agencies, including the Miami-Dade County Department of Environmental Resources Management (DERM), the Florida Department of Transportation (FDOT), the Miami-Dade County Water and Sewer Department (MDWASD), and the City of Miami Building Department.

Mc Gowan Builders, along with the HOK design team, engineers, and the client, performed a value engineering analysis aimed at meeting the avail-

able construction budget. Through scope changes and system and material revisions and substitutions, the team reduced the initial construction cost by approximately \$1 million or 25 percent.

Architectural description

The project is located on Calle Ocho (8th Street) in Miami's "Little Havana." The street is currently undergoing accelerated growth and revitalization, as it links Little Havana to the adjacent developments near Brickell Avenue.

Tim Blair, vice president of architecture, and Yann Weymouth, director of design for architecture firm Hellmuth, Obata & Kassabaum, Inc.'s (HOK) Florida offices worked together to devise a design approach for this project. Blair described the architectural team's approach: "The design challenge was to economically rehabilitate two old industrial structures in order to accommodate new uses, including classrooms,

a library, a bookstore, a meeting hall, administrative offices, and a French café — all while creating an exciting, fresh image for the center. This has been accomplished by housing the entry between two bold towers, red and blue, transected by the strong diagonal slope of the new white metal roof. The entrance, reception, and sidewalk café are situated in the new addition. This design approach was employed to avoid the equipment, infrastructure, elevator, and stairs intersecting the floors of pre-existing structures. The new elevator and restrooms are housed in the towers. The iconic power of the towers and new roof echo the blue, white, and red of the flags flying in front of the entry ramp. The new café, serving the visitors and students, spills out onto the front porch — an inviting image reminiscent of a European streetscape.”

Structural work, foundations, walls, and roofing

The structural work encompassed installation of new steel trusses for the pitched roof and reinforcement of pre-existing concrete tie beams, tie columns, and column bases in the one-story building. Additional work for the new extension included shallow, concrete, and strip footing foundations; reinforced concrete and masonry walls; two, 40-foot-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 at the Miami-based structural engineering firm of Bliss & Nyitray, Inc., illustrated the condition of the pre-existing building: “The perimeter tie columns and tie beams in the one-story structure, erected in 1946, had

significantly deteriorated and needed to be reinforced. In addition, the original wood trusses supporting the roof were decayed and their design didn’t meet current building codes, so they had to be replaced.”

Bliss & Nyitray devised a procedure that reinforced the tie beams and columns, and designed a new structure to support the roof of the one-story building. The construction crews stripped the deteriorated concrete from the beams and columns, and excavated the floor slab and ground around the columns. The tradesmen then poured new, 2-foot-deep concrete column bases, flush with pre-existing masonry wall footings. Holes were drilled in both old columns and beams to accommodate 16-inch-long steel dowels. The dowels were installed in pre-existing concrete elements with Hilti HIT 500

From reusing the existing buildings to smart engineering to avoid custom systems, the new Alliance Française de Miami center will serve as a sophisticated and highly functional facility for years to come.

Adhesive Epoxy grout. Each column received 12 dowels. Once dowels were placed, the crews installed rebar cages for new columns and beams, and connected them to the extruding parts of the dowels. The crews completed construction of the new 24-inch x 8-inch tie beams and 12-inch square columns by pouring 4,000 pounds per square inch (psi) normal weight structural concrete around the rebar cages. The new concrete tie columns and tie beams comprise a complete structural support system for the building that now serves as an event and multi-use facility.

The redeveloped one-story building also features a new, large circular window installed in the northern gable wall and a new, 7-inch-thick reinforced concrete floor slab.

The roof support system above the one-story building includes open-web trusses and bottom-chord bracing, which are connected with 3/16-inch x 2-1/2-inch fillet welds. The trusses are welded to steel plates with headed stud anchors embedded into the tops

of new concrete columns. The chord bracing prevents buckling of the trusses due to wind uplift. This design was necessary to accommodate the 2004 Florida Building Code's 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 increased local structural requirements, Bliss & Nytray, which has extensive experience in hurricane-resistant design, was able to develop the truss and bracing system utilizing standard, pre-designed, and pre-fabricated elements manufactured by The New Columbia Joist Company, a subsidiary of Nicholas Bouras, Inc. Taking advantage of pre-designed structural elements allowed the team to significantly lower the construction cost and reduce the schedule by avoiding manufacture of a custom structural system for this part of the project.

NJ Boom & Erectors manufactured the structural steel system for the sloped roof above the addition and served as the steel erector for roof support systems in all buildings of the Alliance Française complex.

There were logistical challenges in erecting the structural steel. Access to the site was very limited and its small size prohibited storage of steel elements. To address this, Mc Gowan Builders closely controlled the timing of all steel deliveries. As the tractor trailers — traveling either from NJ Boom & Erector's plant in Pennsylvania or from Bouras'

plant in New Jersey — pulled in front of the site, the steel was immediately lifted by a 40-ton hydraulic boom and installed by the crews. In total, 50 tons of steel were erected, including 40 tons on the one-story building and 10 tons on the addition.

To make the situation even more challenging, the street closure permit was very restrictive. Because South West 8th Street is one of the busiest thoroughfares in Miami, the FDOT permitted a permanent closure of only one lane, under the condition that the project team perform patching and resurfacing on a portion of the street. The necessary closures of the second lane were permitted only for a very limited time and mostly at night, forcing the contractor to utilize an overtime schedule. Even this limited closure permit was further restricted on many occasions, for example to accommodate the Superbowl celebrations and the Calle Ocho Parade — one of the largest street festivals in the world — that took place directly in front of the construction site.

According to Terry Kolb, vice president of NJ Boom & Erectors, "Fabrication and installation of the structural steel for the addition required exact detailing procedures and high dimension accuracy due to the shape of the sloped roof and the wind-resistance requirements. The addition's structure comprises four W8 steel columns, bolted with A325-SC bolts; grade 50 structural wide-flange W14x30 beams and W14x27 bracing beams; and a 4,000-square-foot light-gauge galvanized steel roof deck. The addition's interior features a cantilevered, formed and poured on-site concrete mezzanine that overlooks the lobby atrium." NJ Boom & Erectors used TEKLA



Bliss & Nytray, Inc.

Mc Gowan Builders strengthened the existing columns by stripping the deteriorated concrete, doweling in new rebar, and integrating it into the new rebar cage.

Structures 13 software during the design, detailing, and fabrication process.

Recalled Kolb, "The on-site construction of the roof structure for the addition was complicated by its shape, tight dimension tolerances, and the necessary speed dictated by the lack of storage space. The erection crew and the crane operators developed procedures to lift the beams into position at the exact 30-degree angle at which they were to be installed, which allowed for installation immediately upon delivery of steel elements. The quality control of welding was very stringent."

The installation of steel took two weeks, including two days for delivery by trucks, seven days for the one-story building, and five days for the addition.

The total square footage of the new metal deck roofing on the Alliance Française complex is 10,000 square feet,

including 4,000 square feet above the addition and 6,000 square feet above the one-story structure. The roofing system features an interesting, custom-designed element — a structural steel gutter drain located at seam between the sloped roof of the addition and the pitched roof of the one-story building. Manufactured by NJ Boom & Erectors, the U-shaped internal drain is 35 feet long, 2 feet wide, and 1-foot deep. The drain was manufactured from grade 50 steel plates, prime painted at the plant, and finish-coated upon installation at the site.

The reinforced concrete and masonry exterior walls of both the addition and the pre-existing structures feature stucco finish. The two-story, high-impact storefront of the addition was custom manufactured of aluminum and glass.

Conclusion

The not-for-profit organization benefited greatly from the talents of the entire design and construction team. From reusing the existing buildings to smart engineering to avoid custom systems, the new Alliance Française de Miami center will serve as a sophisticated and highly functional facility for years to come. ▼

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