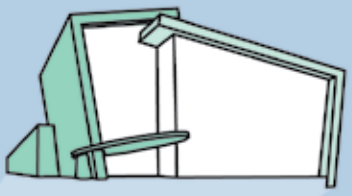
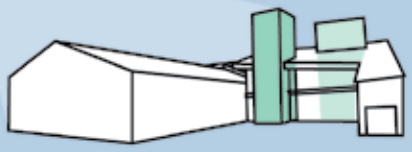


Florida Confidential

BY GENE MARTIN, WALT PRIMER, AND GEOFF WEISENBERGER

AISC's "Team Florida" provides some insight on just what's happening steel-wise in the land of alligators, oranges, and theme parks.



FROM A CONSTRUCTION STANDPOINT— well, from several other standpoints as well—Florida is unique compared to most northern states.

Changes in the business environment—affected by the financial world, current political tone, increasing price of gasoline, slumping housing market, value of the U.S. dollar, material prices, and availability of material and trained labor—seem to be magnified and responded to quickly in the Florida market. Rapid changes in material preferences for projects are driven by the dynamic balance between the cost and availability of materials.

The impact of these changes is also significant on a national level, considering the sheer size of the Florida construction market, which is about 10% of the total U.S. market. Florida is currently the second largest state for construction, representing 8.5% of all non-residential (single-family) construction; the largest state is Texas with 11.7%.

The widely reported downturn in the housing market has certainly impacted apartment and condo construction in Florida. For example, in 2005 apartment and condo construction accounted for 32% of the state's overall construction volume. Today that figure looms at 7%. Miami alone saw a 50% decline in multi-family housing construction in 2007. This trend is affecting the downstream commercial, retail, and office markets as well.

The good news, at least in Florida, is the market share for structural steel. As an industry, we have made great strides in increasing the visibility and market share for steel. In 2005 Florida's market share for steel was at 22% and had increased to 36% by the end of 2007. This number slipped to 29% for the first half of 2008 but remains well ahead of the 2005 numbers.

The growth in the steel market share over the past few years is increasingly important, as we have seen a drop in overall construction square footage in Florida by 24% between the first half of 2007 and the first half of this year. This drop is square footage in Florida is greater than the total construction volume of at least 22 of the other states. The percentage rate of drop in Florida is exceeding the national downturn of 15%. Indications are that housing, commercial, and manufacturing projects will see a decline, while institutional, public works, and electrical utilities will experience an increase. The projected $2 billion shortfall in Florida's state budget will likely affect state projects as well.

A Healthy Opportunity

Compared to the rest of the nation, Florida's construction market has a higher percentage of warehouse, parking, and hotel construction but a lower percentage of manufacturing, school, and, surprisingly, hospital and health-care projects. Nationally, health-care is about 6% of non-residential construction; in Florida it averages about 4%. But this could indicate a strong health-care push in the near future, as baby boomers continue to retire to the Sunshine State. In fact, the fastest growing industries in Florida right now are health services and education, with most of the growth attributable to the former. However, this is expected to shift to the business sector over the next few years.

The bottom line is that when it comes to any type of facility, the construction community in Florida is using structural steel more

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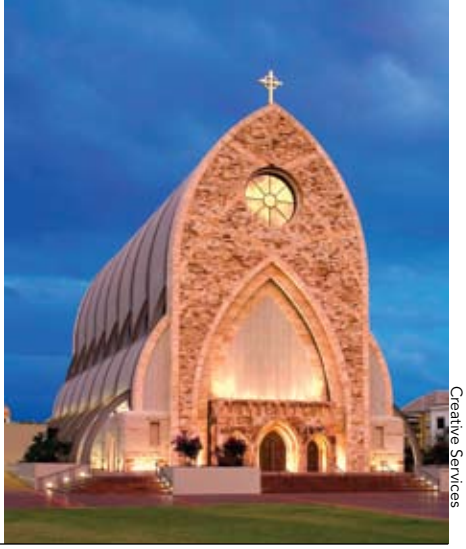


Creative Services

Far right: Latitude One is the largest structural steel office building in Miami.

Right: Ave Maria Oratory is the centerpiece of the town and university of the same name, in southwestern Florida.

often than in the past. But, fabricators still have some concerns about Florida's future market. The media's constant stream of bad news about the housing and construction markets seems to be a self-fulfilling prophecy that is hindering even viable projects from moving forward.

In general, our opinion is that the market has slowed a bit but is by no means dying. As Kurt Langsenkamp, with AISC Member Steel Fabricators in Ft. Lauderdale, puts it, "There still is plenty of work to bid, and architects and engineers are still busy, although not working the frenzied pace they were in 2005–2007."

(Sun)shining Examples

In a shift from the "numbers" approach, perhaps the best way to illustrate the steadily growing success of steel in the Sunshine State is by highlighting some of the significant projects taking place there. On the office side of things, Miami recently added a high-rise with the opening of the 24-story Latitude One project. At 455,000 sq. ft and using 4,300 tons of structural steel, it's the largest structural steel office building in the city. For this project, steel framing followed a migration pattern from north to south thanks to construction manager Suffolk Construction Company's experience and concurrent success with this project type in the northeast. (For more on the Latitude One project, see "Changing Attitudes," July 2007 or at **www.modernsteel.com**.) And on the steel skyscraper horizon in Miami are the 600 Brickell high-rise and retail development and the Metropolitan Miami complex's Met II, consisting of a 46-story office and 31-story hotel tower.

On the other side of the state, just east of Naples in the town of Ave Maria, steel recently made another statement, this one in the form of an elegant curved-steel system for a new iconic church. The Ave Maria Oratory, which won a 2008 AISC IDEAS^2 Award, stands 120 ft tall and consists of 1,270 tons of fabricated structural steel, more than 70% of which had to be rolled to various radiuses prior to the start of fabrication. The framing system in this project is a beautiful illustration of the harmony of function and artistic expression, as the lattice pattern of the steel is fully exposed in the nave. (For more on Ave Maria Oratory, see "Center of Attention," July 2008 or at **www.modernsteel.com**.)

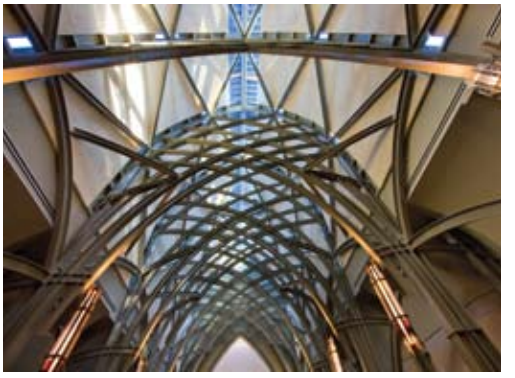
Up the coast in Tampa, work has begun on a medical office building for the University of South Florida, which includes 467 tons of structural steel. Major steelwork was erected in just six weeks, and the building is expected to open within the next few months.

Back to Miami, steel forms the unusual geometry of an under-construction arts facility. Designed by Miami firm Arquitectonica, the South Miami-Dade Cultural Arts Center will feature a 1,000-seat theater and related performing-arts-related spaces, plus an adjacent activities building. The main Theater Building structure is a combination of structural steel framing in the public areas and load-bearing masonry walls and composite concrete-encased steel columns in the stage and back-of-house areas.

In addition, the eastern coast of the state can boast another notch in the steel parking belt with a seven-story parking garage at the Seminole Hard Rock Hotel and Casino in Hollywood, held up by 4,000 tons of steel framing. The framing decision was based on the project being designed and completed in 11 months using steel versus the estimated typical 26-month time frame that would have come with a concrete package.

Like predicting the weather, predicting the construction market is by no means an exact science. But all of these projects, and others, paint a favorable picture of the structural steel market in Florida. This varied and increasingly widespread use of structural steel framing across the state is at least one indicator that the steel market in Florida—even in the face of the "hurricane" of the current housing and economic slumps—should remain sunny. **MSC**

Gene Martin is AISC's southeast regional engineer and Walt Primer is AISC's Florida Initiative area marketing representative. Contact either of them to find out more about AISC's efforts to promote structural steel in the state of Florida: martin@aisc.org and primer@aisc.org.



NY Focus

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Flying Over

BY WILLIAM R. O'DONNELL, P.E.

One recent major steel project in Florida puts exposed steel on prominent display to more than 8 million people per year. This figure reflects the number of people that travel through the South Terminal Expansion of the Miami International Airport, a five-story, 800,000-sq.-ft structure linking Concourse H to the new Concourse J. The expansion provides an additional 14 gates and houses the airport's international terminal.

The upper passenger level of the terminal accommodates immigration and customs processing as well as international baggage pick-up, and features an 850-ft by 165-ft long-span open area with ceiling heights of 35 ft. In the customs and immigration area, tri-chord, 8-ft-deep, arched trusses span 120 ft. These arches emanate from each side of a 60-ft-wide central spine; the spine itself spans 165 ft from end to end.

Photos by Steven Brooke Studios

The terminal's structural system uses a steel frame, concrete shear walls, and composite steel moment frames that act as the wind-resisting system. A composite slab of lightweight concrete, reinforced with welded wire fabric cast on steel deck, is supported by steel beams and girders, which in turn are supported by steel columns. Headed studs are welded to the beams and girders to allow the concrete slab to function as a compression flange for the beams. The slab thickness was set to 6¼ in., so the required fire rating was achieved without spraying the underside of the deck. However, the beams and columns are coated with sprayed-on cementitious fireproofing.

Two expansion joints divide the terminal. The three sections move independently, mitigating excessive stress buildup due to thermal movement. Utilizing double rows of columns at these expansion joints would have disrupted the design pattern of slender columns, so girders were located to one side of each joint. These girders sit atop a sliding connection, which consists of Teflon bearing pads mounted to a bracket off the column to the other side of the joint.

Lateral stability of the upper-level long-span roofs under wind loading is provided by moment frames in each direction. The use of moment frames mitigates the need to run diagonal bracing between floors and provides flexibility for architectural layouts.

Modern airports require clear, open spaces and natural light. Generous areas of upper-level glazing flood the South Terminal's public areas below with natural light via an abundance of perimeter glazing, and the upper roof appears to float above the building's main roof. Moment frames stiffen the tall roof and minimize unnecessary view obstructions. Light is brought further into the building through strategically placed floor openings. A 65-ft-tall wall of glass runs the entire length of the terminal and exposes the third-level circulation corridor, complete with people movers, to the public. As with all the glazed surfaces, missile impact-resistant glass was used to protect from increasingly frequent tropical storms. MSC

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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 3/16-in. × 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. MSC

Peter Wilk is the president and founder of Wilk Marketing Communications, a New York-based publicity and advertising firm specializing in the construction industry. He can be reached at peter@wilkmarketing.com.

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Structural Engineer
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General Contractor
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Photos: Wilk Marketing Communications

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.

Right: More than 70% of Ave Maria Oratory's steel had to be rolled prior to fabrication.

Below, right: The South Miami-Dade Cultural Arts Center's unique structural geometry continues the long history of innovative, modern design in the Miami area.