

Adaptable by Design

In-house design-build format allows quick adjustments to meet new requirements, aesthetic changes, and challenges of a tight site

— Craig A. Shutt

Members of design-build teams often laud the ability to provide input early in the process that avoids later surprises or last-minute changes. When the entire team works in-house to start, all employed by one company, the closer communication can enhance the project outcome.

An example can be seen in the Surf Style retail store and parking structure built on the beach in Clearwater, Fla. The team handled last-minute design changes, ongoing aesthetic input from the owner and city, and the challenge of having to construct the facility entirely within the building's footprint. Even with these obstacles, the outmoded building on the site was demolished and the new one

was open for business in only eight months.

The project was built on a small parcel of land that contained a small retail store owned by the developer. He wanted to expand the retail space, add a restaurant and provide parking for his own customers and other beach-goers. That combination provided the best return on investment for the small footprint available.

"The store was the largest in the owner's chain, and he wanted to renew the facility and draw more of a crowd to the store," explains Jorge Arboleda, project architect for Finfrock in Orlando, Fla. The firm creates design-build projects, using precast concrete components manufactured in the company's manufacturing facility.

Value-Engineered Plan

The original plan was to construct the building from cast-in-place concrete, Arboleda explains, but the cost was higher than the owner anticipated. "We were called in to see if we could make it more efficient, and we found that precast concrete components could reduce costs. But it resulted in a totally different design."

It also produced a more efficient and attractive building, notes Stan Jones, vice president of construction at Finfrock. "A lot of times, designers don't fully understand the implications of putting several uses together one on top of another," he explains. In many instances, designers put parking above retail and drop columns through to the ground level, disrupting



The Surf Style retail store and parking structure built along the beach in Clearwater, Fla., features a total-precast concrete structural solution that resolved a number of key challenges for the project while providing a strong aesthetic and fast erection.

Photos courtesy of Finfrock Industries

the retail space. "That reduces leasable square footage and makes the space less attractive. If you're savvy about the capabilities of precast concrete, you can avoid that."

The in-house design-build team provided benefits through shared knowledge and quick communication, the men agree. "We all know the material well and its capabilities and limitations, so we know the design will be constructible and take full advantage of precast concrete's efficiencies," says Arboleda.

Jones agrees. "From a project-management perspective, design-build is different from bidding. Along with design-build subcontractors, we create a pure design-build team that works toward the same goal and looks at the big picture, not just as what's best for each function. That ultimately creates the most efficient design."

Design-build is becoming more commonplace, notes Jones. "We are seeing the design-build process become highly refined, with major subcontractor and supplier experts incorporated early in the development process to take advantage of their cost-saving knowledge. When we are the designer, contractor, and fabricator, owners can be assured of creative, economic, and practical input. They also receive, in the vast majority of cases, a company that is willing to assume the code risk and guarantee a lump-sum price, which reduces owner risk."

Frictions still exist between functions, as each person has his own expertise and ideas on ways to attack problems, Jones notes. "Especially when there's a compressed schedule, it puts pressure on everyone to work as quickly and efficiently as possible. That was definitely the case with this project, where time was of the essence to get the building open for business."

Total Precast Structure

The 175,000-square-foot facility consists of 34,500 square feet of retail, 6,000 square feet of restaurant and 134,500 square feet of parking. It features a total-precast concrete structural solution, including load-bearing architectural panels, double tees, columns, beams, and other components. It was built on a site of less than one acre and contains 4 1/2 levels of parking above the retail level, including a speed ramp, deceleration



The facility includes retail and a restaurant on the first floor, with parking above. Note the artwork, a requirement by the city, which fronts a setback that was also required by the city's Beach By Design guidelines.



A speed ramp provides quick access to the first level of parking. It was placed above the first-floor restaurant space.

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lane, and a variety of city-required setbacks.

The site abuts one of the most active portions of Clearwater Beach, and the construction took place during the busy winter tourist season and into the popular spring-break college schedules. "It was imperative that we maintain all construction activities within the building's footprint to ensure minimal disruption to pub-

lic areas," explains Dan Finrock, vice president of manufacturing. All of the building's elevations come within 5 feet of the property line, he notes.

The retail level was designed to be customer-friendly, with open spaces for clear sightlines and lots of merchandising racks and flexibility to change their configuration. Initially, the parking elevators were designed to open into the retail space, but they



The precast concrete structural system allowed for a nearly column-free retail space, providing flexibility for store layouts. A mezzanine was added to this space to add square footage and take advantage of the 25-foot height on this level.



The decision to add a FlowRider brand surfing machine was made after construction had begun, necessitating some quick adjustments. Observing the machine in its original home allowed designers to add some precautions to avoid moisture problems in the future.

were changed to open into a mall-like area adjacent to the store's interior entry. The city requested this change so users could still access the elevator when the store was closed. As it turned out, the store has proven so popular that it remains open 24 hours a day, 365 days a year.

Another change came with the addition of a mezzanine level during the design process to add more retail space. This was added once the 25-foot-tall first level made it apparent that the space could be added without causing clearance issues.

A more drastic change came with the decision during construction to change an aquarium feature planned for the retail level into a 1500-square-foot FlowRider brand surf attraction, which includes an inclined pool that allows customers to try out surfing equipment. The attraction required a separate mechanical room and some rapid, extensive adjustments to the design.

"We could handle the needed changes quickly and efficiently because all of the staff was in-house," says Jones. Only six weeks were

added to the schedule to adjust to the last-minute change. Adds Finrock, "The precast concrete already was being cast when the changes were made, so we immediately stopped casting until everything was priced out and set. Once manufacturing starts, you don't like to stop it, but we wanted to ensure we weren't wasting materials."

The delay provided a benefit, Arboleda notes. While the changes were discussed, the designers visited the building where the in-operation FlowRider unit was located and noted wear to the building. "The pump heats the pool to about 100°, which, combined with the high humidity and chlorides, created a very corrosive environment. Once we saw that, we knew we had to add corrosion protection."

After researching options, the designers used Supertherm water-resistant insulated coating from Superior Products to protect the interior from the high levels of moisture and heat, as well as implementing a UV-treatment chamber to disinfect the pool water in lieu of the traditional chlorine systems.

'Time was of the essence to get the building open for business.'

Only Four Columns

The retail levels benefited from the shift to precast concrete and the design changes that opened up, says Jones. "Our design allowed for only four column intrusions into the entire retail space. This was accomplished by using load-bearing wall panels that serve as shear walls along the exterior in conjunction with transfer beams that shift the load from the double tees to the shear walls. "This was about as minimal of an intrusion as could be provided, and it was critical for creating the open retail space that was desired."

"We couldn't use lite walls, as commonly would be done, because we wanted to eliminate columns from the first floor," adds Arboleda. The "horizontal lite walls" that were used prevented that by allowing the tees to span column to column. "The framing is pretty unique," says Jones. "But it works in combination with the various

types of ramping and uses required in the building.”

The speed ramp to the first level of parking proved challenging due to the tall height of the retail level and the city’s requirement that the slope be no greater than 12%, Arboleda notes. Likewise, internal park-on ramping could slope no more than 6%, which was challenging to provide in the small two-bay space. The ramps were placed side-by-side at the center, creating a double-helix-like design.

‘Our design allowed for only four column intrusions into the entire retail space.’

Special attention was paid to the concerns about creating parking levels over retail in a sandy, beach environment. It also exemplified the benefits to the owner in working with a design-build team, notes Jones. “If that building leaks, he’s coming to one place: us. There’s nowhere else to point fingers.”

The design team ensured that wouldn’t happen by using a water-resistant roofing membrane that comes with a 10-year warranty. In addition, it designed all connections to be accessed from underneath to avoid the possibility of grout wear that could lead to water penetration. “By incorporating stainless-steel connections and a special mix of concrete material, we could ensure the structure resists deterioration from water and chlorides,” says Finrock.

The parking levels were complicated further by the inclusion of cantilevered areas over the retail store’s entry. “As we were designing the space and trying to maximize parking, we realized that we had ‘free’ air space on upper levels that could add dimension to the building and more parking space,” says Jones. The beams were lengthened and cantilevered out 10 feet, creating an overhang while providing more space. “It wasn’t easy to design these structural members, but they gave us so much bang for the buck that they were worth it.”

The cantilever also helped enhance the building’s setbacks of 5 feet, which were required by city code every 100 feet to avoid a monolithic



A Neoguard brand waterproofing was applied directly to the precast concrete double tees above the retail space to ensure a leak-free retail area below. Connections were cast for access from below as well to provide additional protection.



Improved durability and increased erection speed was achieved by integrally casting the cornice into the wall panels.

appearance, Arboleda notes. These were provided on all sides, although one subsequently was covered with a large panel of artwork, which also was required. This setback, across the building’s entry area, was created by providing a load-bearing beam at the center of the span to transfer the exterior-wall loads around the gap and avoiding a column in that space.

City-Approved Look

The building’s aesthetics also had to meet the city’s “Beach By Design” requirements, which limited color choices and styles. “The zoning code is very strict, so it required a lot of back-and-forth between the city and

the owner and us to find the best aesthetic solution,” says Arboleda.

Adds Jones, “There definitely were a lot of discussions because the guidelines are not specific, so we needed to interpret them and fit them to what the owner wanted to do and get the city’s permission. He had definite ideas on what would be successful for the retail setting to attract patrons, but the city had a lot of say on what we could do. Our goal was to meet the guidelines and the owner’s goals while maintaining the budget and all the other parameters.”

That resulted in “constant feedback” on changes and how they would affect the look and whether they were



The tight site and busy area required the erection to be done almost entirely from within the building's footprint. Precast concrete components were shipped directly to the crane, where they were picked from the trucks to minimize disruptions. Photo courtesy of Aero Photo.

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acceptable to all concerned, Jones says. "Making adjustments by walking down the hall to talk it over makes it a lot faster and smoother to find solutions and get them incorporated. That's pretty powerful in ensuring that the result isn't suboptimized because of so many parameters."


The color scheme, for instance, was planned to reflect the company's logo colors of salmon and bright red, but the bright red proved too similar to a nearby hotel and was too distracting for such a large expanse, Arboleda says. Salmon and a cream color were applied as paint after erection, as decisions were still being made during construction. The panels were given a smooth trowel finish to allow the textured paint to adhere well.

Due to the tight and busy site, the structure was constructed with the

crane inside the footprint, walking it out the unfinished final side and closing the street for one week while it was finished. No on-site staging area was available, so components were delivered on a just-in-time basis and erected as needed.

The building was designed to meet all of FEMA's flood-zone standards, which require the structure to withstand 6 feet of standing water without incurring major damage. Additionally, the ground floor slab needed to resist a buoyancy uplift force of approximately 14 million pounds. This was accomplished by incorporating 12-inch-thick structural slabs tied to 50-foot-deep caisson foundations topped with concrete pile caps. A flood-resistant curtain-wall system and removable aluminum flood panels at doorways also were specified.

A final touch consisted of a wave wall constructed in front of the building. It features a 3-foot-tall concrete cap extending above grade, supported by vinyl sheet piles extending 20 feet below grade. The cap, which also provides a concrete seat wall with a precast capstone for the adjacent Beachwalk Promenade, takes the force of any storm surge.

The result of this close cooperation was a dynamic building that met the owners' needs while providing additional parking for the busy area. Best of all, the project came in on budget and three weeks earlier than the contracted delivery date. Demolition on the existing building began on Halloween, and the doors on the new facility opened in time to celebrate the 4th of July. 

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