ICF coastal condo's lesson: Why would you ever build with anything else?

By Carole McMichael

Photography courtesy of IntegraSpec GulfSouth

To most people, the name "Grand Caribbean," would bring to mind the lure of the tropics: gently rolling waves, moonlit nights and the relaxing pace of resort living. To architect David Lindsey, owner of IntegraSpec GulfSouth and builder of the Grand Caribbean, it is so much more.

A designer of cast-in-place concrete buildings for the last 25 years, Lindsey got involved with insulating concrete forms (ICFs) about seven years ago. He worked with a structural engineer who started telling him about the system. It sounded fascinating; but as he was used to things not being as good as they sound, he was very skeptical. After a year of being dragged to job after job, he began to work as a consultant.

Then he found IntegraSpec (www.integraspec.com) and concluded that a builder could do anything with the ICFs that he had done with cast-in-place. At that point, he bought distributor rights. He started out doing commercial buildings, but had just as much interest in residential, and by number, his company now does more residential. The Grand Caribbean is the first six-story building he has done with ICFs.

"We chose ICFs because we are in a hurricane area," Lindsey said, "and need the central strength of concrete. We have had a lot of trouble with water infiltration in buildings in this area, but not in this condo, so the owners feel safe. Another reason for using ICFs is the problem of killing sound from one unit to next. The one thing the owners all talk about is how quiet the units are. A third reason is energy efficiency. The owners are happy that their power bills are so low."

The Grand Caribbean offers 27,000 square feet per floor for five floors and 10,000 square feet for the sixth floor. The units, which average about 900 square feet, are a convenient size to serve the large rental market in Orange Beach, Ala. There are one- and two-bedroom units and large tower units. Those on the top level have fifth floor entry with a sixth floor loft. Most of the units were sold before erection began.

The Grand Caribbean captures the turn-of-the century Victorian look that is still very appealing in the housing market, but Lindsey chose it because he was determined to prove the flexibility of the product by showing builders that they can combine delicate looking architectural detailing in the formwork itself. All exterior columns and exterior beams were done with ICFs; in fact, almost everything on the exterior was done with ICFs.

The teaching trade

"The real reason ICF building for residential hasn't been so popular," Lindsey said, "is that most builders feel safe doing what they know; and they just don't know enough about construction with concrete. Once we educate people, usually their first reaction is 'why would you build anything but ICF houses?' But we haven't educated people. Once we reach a point in time where we are building 25 percent of the homes from ICFs, it is going to escalate to 75 percent over night because everyone will know somebody who lives in one and they will know how happy they are and all that doubt and fear of doing something new and unknown will go away.

"When I got into this business, I got into ICF installation because I knew we would be going through an education process. I've given up my architectural practice to focus just on training installers, distributing materials and showing people that this is something they need to be doing.

"The biggest challenge on the Grand Caribbean was that building a six-story multiunit project like this is not like building other residential projects. We had a tight time frame, and teaching the crew was difficult because we were actually developing the system as we were figuring out how to build a building this size out of ICFs. I was on the job everyday — teaching and learning myself. We were fortunate to work with Coastal Builders' Larry Jacobsen as contractor."

The crew, which had varied concrete experience, was not trained in ICF construction. The majority were 25 years or younger, which turned out to be an advantage because they were open-minded about how things were done. According to Lindsey, they have really picked up on ICFs. They see learning this system as a potential career opportunity. By working on a concentrated project like this, they can grow faster than they would in another trade.

"Training is offered as part of my distributorship," Lindsey said. "We teach people all the way from organizing projects ahead of time to where the materials are, how they are handled, how different pours are set up, what works most effectively to set up pours and schedules to do that. A lot of that training has to be done in the field.

"We are doing installation now because I don't have enough trained crews available. I won't sell to people who are not trained. I want building with IntegraSpec to be a good experience. I make an evaluation with an individual to see how difficult this will be for him. I want him to know what obstacles might come up. Most training is done by me personally,

and we will send our trained people to work with them. If there are one or two on the crew without experience, the job could take a long time. With four or five experienced crew members, a 2,500-square-foot single-story home could be raised in five to seven days."

The Grand Caribbean

Preplanning took a couple of months. Lindsey's current projects incorporate what was learned during the building process on the condo into creating a complete set of shop drawings. Everything an ICF installer needs to know is included, as well as the phasing of the project. The drawings show what the schedule is, the time frame, what materials are involved, how the walls are laid out, and how they are moved and put into place.

Builders in Orange Beach have to consider the water table and potential for tidal flooding. A lot of beach construction is done on pilings; however, tidal surging was not an issue for the condo, which was built on an 18-inch-by-12-foot-wide shallow spread footing. The footing was part of the floor of the parking garage, which, because it was built beneath the building, raised the habitable part of the condo above the flood plain and met code.

The structural engineer designed the superstructure, determining the different configurations on spacing the rebar. The ground floor walls, which carried a bigger load, had horizontal rebar placed every 12 inches on center and vertical rebar, every 8 inches on center, using number 5 rebar. As the walls on the higher floors carried less of a load, the rebar spacing got lighter. There were places where different configurations required different spacing. The 12-inch core wall under the tower (a 17-inch-wide finished wall) was the base foundation wall of the 80-foot tower, so there were double rows of horizontals and verticals.

Using the IntegraSpec flat wall system, Lindsey built one floor at a time, completely without an overhead crane. Because the materials are lightweight, all moving of material could be done with a forklift, a less expensive option.

The garage had an 11-foot wall; all other floors had 10-foot walls. What is unusual about the garage is that Lindsey used the demising walls (walls between the units) above the garage to create 40-foot-long beams to span the garage from outside wall to outside wall.

Typical of the ICF systems, everything is built in place and poured in place. There is not a great deal of work for other trades at this stage, but the plumber and electrician placed a sleeve in the ICFs before pouring. They did some external vibration and some internal with a pencil vibrator. On this project, Lindsey used a 3,000 psi pea gravel mix because it consolidates and fills the wall best. On some jobs, he uses a higher psi mix.

Before the walls inside are finished, electrical and plumbing work is done by cutting a 2.5-inch trench in the ICF polystyrene foam with a chain saw, and putting in conduit for the wiring and PVC pipe. The bar joist in the ceiling can be used as well.

The condo is more than 400 feet long, so building for each floor was done in phases, doing a quarter of the floor at a time. The crew would strip the metal bracing the next day after the pour and start building the next phase.

"We used different sized pump trucks for the pours," Lindsey said. "The taller we went up, the larger the truck we had to use. By the time we reached the top, we were using a 53-meter boom with a hose off of that. Pouring the tower was the most difficult part because I was having to pull the hose and couldn't quite reach. Now we have a 58-meter boom available — and there are detachable booms. One of the advantages of the pumper truck is that we only pay when the pumper is onsite. A crane is there all the time, so you pay all the time.

"We learned early on that blowouts were always installation problems, not product

problems. I made up a list entitled "What to do if you want to have a blowout." At the end, I wrote, 'If you don't want one, don't do these things.' After that, we had no more blowouts.

"The floor system used a steel bar joist in a metal pan. A slab was poured over the metal pan and into the wall from below, so each unit is completely encapsulated. The bar joist allowed us to have wide spans without having to have any shoring under the floor system. As soon as it was poured, the metal stud framers were able to go in and start putting in interior walls. And then the whole process was repeated.

"Prior to installing sheet rock ceiling, we put in a 6-inch fiberglass batt. Sheet rock was installed directly over the polystyrene on the ICF. The exterior finish is applied directly to the outside polystyrene surface, which has inserts 8 inches on center that allow you to attach whatever finish you want. The demising walls of the units were built to the shape of the roof. We embedded z-purlin, a common steel framework in the shape of a 'z.' You can attach a standing seam metal roof to the purlin."

To market, to market

"We don't use high pressure to sell builders or clients on ICFs," Lindsey said. "Our attitude is ICFs are not going away in a few years, and we are in it for the long haul. If people are not ready now, they could be in a couple of years, and we want them to know whom to call. Normally when we do one project, the builder is ready to do another, so we get a lot of repeat business. We have developed systems that maximize the material. IntegraSpec is a panel system rather than a block, with no top or bottom, so any cut we make can go back into the wall. We have very little waste. Also, owners and buyers become our sales people because they spread the word about how great their ICF house is, how quiet and inexpensive. It is kind of a grass roots marketing plan."

This article appears in the November 2004 issue of Concrete Homes.