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BACK PREVIOUS NEXT

Pulling Off No Small Miracle

By: Steven Ferry

An unusual $95 million renovation project completed mid-July 2005 has transformed a 400,000 square foot sports and entertainment arena, Houston's Compaq Center and home to the Houston Rockets, into the new 600,000 square foot state-of-the-art-facility for world-renowned Lakewood Church. The old Houston landmark that used to host events such as the NBA and WNBA finals, and concerts by such as Elvis Presley, the Rolling Stones and U2 is now hosting inspiring sermons by pastor Joel Osteen to 16,000 congregants at a time from an impressive new stage flanked by screens and waterfalls, overlooked by a choir loft for 250. A five-story broadcast production studio has been added for broadcasts to an audience of seven million.

Irvine Team, the Houston-based firm that bills itself as the nation's leading design and construction strategy company, certainly demonstrated those talents when it managed a team of 50 contractors and consultants in a 30-month design and construction timeline that involved 1.5 million man-hours.

Lorrie Foreman, vice president at Irvine Team, was the senior project manager who integrated all the elements and pushed the project through to completion on time and on budget. She explains that the company achieves this kind of success by bringing in the best subs for the job: in this case, the likes of Wacky World Studios, a Florida-based company that has worked on the ET ride at Universal Studios, the Rainforest Café and Busch Gardens in Tampa, to do the artwork in the children's area; four-time Emmy Award winner, Rene Lagler, to handle the new stage; and seven-time Emmy Award–winning cinematographer, Bill Klages, to oversee lighting design. And then letting them excel in their own area of expertise. The subs Irvine Team brought in to handle the interior walls and ceilings were Marek Brothers Systems with corporate offices in Houston, and Clunn Acoustics, based in Cypress, Texas. Foreman describes some of the challenges: "The 35-foot wide corridors around the arena were originally open so you could see the bottom of the arena seats and the air slots beneath people's feet where they'd place their Cokes. When they spilled them, it would go through the air slots and you'd look up from the lobby and see all those stains dating back three decades. These stains just would not come out. That area now has a three-tiered ceiling that is a combination of drywall bulkheads and an acoustical ceiling treatment in between to block out any ornery kids in the lobby from the message being preached in the sanctuary, and vice versa. We carried out some high-tech experiments in which I would stand in the lobby while the director of media would sit in the sanctuary. I would yell and he would say, 'I could hear every word you said, Lorrie!' until we had it just right."

"We had some pretty tricky construction because of the heights and trying to deal with existing conditions. An arena is just a huge box with seats in it and without much structure to it at all. The construction standards and safety codes in the 1970s were different, and with the age of the building, the structure itself was a tricky proposition. The lobby floor was an elevated slab of hollow core planks. Yet we needed equipment to reach 80 feet into the ceiling corners. The

structural engineer said, 'You are not bringing that lift in here on this floor!' It was a real challenge! So we used an articulating arm with a bucket, which meant a lot of up and down due to weight and space constrictions on the buckets. We had to beef up the superstructure using 10 x 10 tube steel, 40 feet long, bringing it all in and installing it by hand—much like the pyramids. We hung our stud structure on those tubes.

"Not only did we have a lot of unforeseen problems that had to be solved, but we also had to keep to the schedule. And that was made more challenging about the time we started construction, as Lakewood Church experienced rapid growth and national prominence as Joel Osteen began traveling around the nation and speaking to sell-out crowds in different arenas around the country. These gave them ideas as to what was possible, thereby elevating expectations for their home sanctuary. So, we went from a $57 million to a $75 million dollar project for the construction phase while only adding one week to the schedule. There was a conscious decision to make this into a showplace instead of just converting an arena as simply as one could. A lot of that burden fell to both Marek and Clunn.

"We had up to 450 people working on the site each day (for about three months, 550 people), with everybody in the spirit of trying to get this project completed on time. Nobody was taking breaks, or just walking from one point to another. Unlike other projects, every single worker had a real determined urgency to do what he was doing. It was a real dream from a supervisor's point of view, although there were many sleepless nights! This building sits on a prominent thoroughfare that cuts through the middle of Houston. So, there's plenty of opportunity for the people who worked on the project to drive past with their families and say, 'I did that!' Everyone had a lot of pride of ownership—it wasn't just somebody else's church; there was a real vision here."

A Brilliant Net Result

Jared Wood of Houston-based architectural firm, Studio Red, had to come up with a solution for the ceiling in the sanctuary that would transform it from an arena to a place of worship. As he explains it, "A typical church might have a hard or lay-in ceiling, but this one was so huge and we had to work with the existing structure, so it couldn't support the normal ceilings. We didn't have much of a solution at first, other than hanging little bits and pieces of ceiling and playing with their arrangement in certain areas. It wasn't exciting, and we needed something exciting.

"Then I went to Las Vegas on business and saw [a show] at the Cirque du Soleil theatre. The small net ceiling they had built with metal mesh wadded up and thrown on top to simulate clouds set me to thinking about something transparent and lighting it. We looked at the idea but there was too much weight and expense involved.

"The final inspiration came shortly afterward, when I was at a party at which the hosts had netting strung up above the stage and were projecting onto it with lasers. So we took fish nets and hung them between all of the catwalks. Then we lit it so that you could change the mood of the room with LED lights. We tried a number of different mock-ups to try and get the distance between strings at the right width for the lights to work correctly. We tried different colored nets, too, trying three or four mockups before we came up with the final idea.

"We had to do all these calculations in the beginning for egress and the way this building was designed, it's not about the number of exits, it's about how long it takes smoke to build up in the room. That was another reason not to put in a ceiling that would block that build-up of smoke and why the netting was a good idea.

"We demo'd everything that was under the bowl and built classroom spaces for 1,500 children, which required new openings for exiting out of that level that then opened up the question of blocking sound between classrooms and the sanctuary above. So, we built a separation ceiling below the bowl to separate the classrooms from the sanctuary. Then we built mezzanines above the classrooms and below the bowl for mechanical and electrical and so on.

"We did build a new five-story building next to the old arena that required the tying of the new into the old, which was another big challenge—getting the expansion joints in the walls to work and all of that. We built a tall, pre-cast concrete wall in between the two that served as a feature wall for their logo. And then we added some columns along the façade to break it up and make it look less arena-like."

Making It Sound Right
Gordon Clunn of Clunn Acoustical Systems, another key contractor, tells his side of the story: "We installed 400,000 square feet of acoustical ceilings in the high lobbies throughout the facility, acoustical wall panels in the sanctuary, and Decoustics Cilencio ceilings and acoustical fabric-covered wall panels in the recording studios. We also fitted wood diffusers for sound deflection that help capture sound perfectly. We've done a lot of acoustical work and the design on these studios is the best I have ever seen. The acoustics involved in making a former sport arena into a sanctuary was a job in itself! By working off the catwalks, we were able to hang 15,000 square feet of black acoustical lapidary banners with a plastic, perforated wrap around them to absorb sound 110 feet up. The placement of the acoustical wall panels handled the classic arena echo-chamber into effect.

"The challenges otherwise were accessing the high ceilings and the short amount of time to create what we had to do. It was made possible because we had the architect on-site all the time who could make decisions on the spot. We did encounter problems with the existing facility, once we got underneath all the stuff that was there: structural problems, elevation problems, problems placing the EIFS, and clearance problems with existing ductwork, mechanical and electrical, that either had to be re-routed or ceilings that had to be lowered, or decisions that had to be made that would allow us to keep rolling. Without the project being well thought out and the team players all coming together, it would not have happened. We had a strong leadership team from the architectural end as well as the general contractor, and they met with each other daily to monitor the progress and handle any problems. The problems were tough, but we made our deadlines, and that was it!"

GC: "Marek Is #1"
"One of the biggest challenges we had early in the job" recalls Mike Holland, division president of Houston-based Marek Brothers, "was designing and building an isolation ceiling beneath the ceiling bowl, suspended from the structure, to isolate the classroom below from the sound of the bowl and also from all the chill-water piping and the other systems that would feed the bowl. The ceiling not only had to isolate the bowl from the lower level sound-wise, but structurally it had to support everything that was in the classroom level. We used 12-inch structural metal stud joints and plywood with a couple of layers of [drywall] and insulation on top.

"We consulted with the project's architect and structural engineer, and our light-gauge framing structural engineer to work out how to design structural members that would span from the feeding trusses that went up. A lot of the problem was with airflow: We had to run the framing members a certain way so as not to interrupt the airflow that went from the mechanical systems up between the risers, because much of our framing was very close to the risers. If we had it wrong, it would block the flow of air that would be fed up through the risers. So there were lots of mechanical issues related to that, and it was a massive job to get that done."

Foreman's take on that aspect of the job is this; "Marek Brothers was very engaged in the problem solving as we went along to help us stay within budget. We came up with some really tricky details and we'd uncover items as we went along in the arena—areas that just didn't align, areas where you thought there would be structure to attach to and there weren't. We also had to decide on that acoustical barrier ceiling that we put in the lobby and between those classrooms and the sanctuary so the decibel ratings wouldn't drive the kids crazy and they could hear the teachers. Marek installed an acoustical drywall system that went in between the seats and the classrooms below that were built in the locker room area.

"It was tricky getting it in there because we couldn't hang from the structure above, and we had to build our own structure. We were snaking ceilings in between new and existing utilities—I mean, it was a real challenge! We did a lot of investigation ahead of time, but you know how that goes, it's never enough. That is why it was good to have collaboration with Marek Brothers and their problem solving, because it was not your normal ceiling-and-wall contract."

"Another challenge," Holland continues, "was the fact that the drawings were constantly in a state of flux. We not only had to figure out what we were building, but incorporate the changes as we went on a project that increased dramatically while the date never changed.

"The sound and isolation and structural ceiling were the big challenge. The rest was how much work can you push through a pinhole. I mean, how much can you get done in a short period of time? It was a huge job: We used 2.4 million square feet of gypsum board, 33,000 square feet of cement board, more than 1.7 million linear feet of studs and track, 1,300 tubes of sand caulking, 3,200 boxes of joint compound, and 520,000 square feet of bat insulation. But as any contractor knows, you like to have a normal workflow, starting in one area and working your way around.

"At one point, it just reached critical mass, we were working everywhere, which makes it hard to maintain any level of productivity. Usually you can't work like that without moving the end date, without sacrificing quality or productivity, because you can't continue to up the pace without having that kind of problem. And somehow we were able to do it right and within the time frame and have people feel good about it! Usually what happens is, you do a job like that and everybody is not speaking at the end. We had 150 men out there and lots of quality supervision. We were really proud not only to have completed it and to have helped them make what was a very aggressive goal, but with the owner liking it, the contractor liking it, the architect liking it and them still having a high opinion of us, too!

"Tellepsen [Builders, LP] signed us up early on a GMP basis, instead of completing the drawings and calling four or five guys and bidding the job out, and we actually gave them money back at the end, which was good for them, considering the risk. Normally on a high-speed job, you're lucky to control your own cost. We were able to price what we had, price the change orders, complete it on schedule and actually save them money, which in my mind was really a testimony to the partnering process that we used, working together up front. And it was a tribute to our field. I mean we had some fabulous guys out there, a foreman and the lead guys, they did a wonderful job! We couldn't have done it without them. We're blessed to have a very talented work force that made a very difficult process look amazingly easy."

Robert Scardino, of Tellepsen Builders, a family-owned, Houston-based general contractor that has been serving the greater Houston area close to a century, was the GC on the project. His comments, now that the work is done?

"Marek Brothers are number one as far as I am concerned, the leaders of the pack in terms of getting the job done and setting the pace. It was a massive drywall job! We actually returned money to the owners—the amount is probably a first in the industry! I've been in the business 30 years, and this job rejuvenated me! [More than $75 million] worth of work in 15 months is a lot to do in a short time, but it was a lot of fun."

And no small miracle.

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BACK PREVIOUS NEXT