



THE STANDARD

SPRING | SUMMER 2011

BAKER
CONCRETE CONSTRUCTION



From the President

Dan Baker, President | C.E.O.

Like all industries, construction requires continuous improvement as technological advancements improve our methods, our management, our safety and our quality. We've been working hard to stay on top of these advancements, and in this issue we're highlighting some of our methods for offering our customers the quality they deserve.

One of those improvements is in our Lean management approach. David MacNeel explains on page 3, how we got there and how we are capitalizing on total efficiency.

We were fortunate enough to be featured recently in a safety video sponsored by Sperian, where we were filmed working on the Miami Airport Link project. You can read about this, and also a unique accomplishment at the project on pages 5 and 6.

Finally, we're proud to take part in new coal technology at the John W. Turk, Jr. Power Plant in Fulton, Arkansas. Read about the 600 megawatt coal combustion technology on page 7.

We're working to continue to push the concrete construction industry forward at Baker. I welcome your feedback. <

BAKER'S LEAN CONSTRUCTION JOURNEY

David MacNeel, Operations Manager, LEED AP

In 2005, an initiative began at Baker to explore the buzz that was growing around the topic of Lean Construction. After a lengthy study of the available literature we decided to pilot the system on a single project in early 2007.

In response, the project leadership team at Baker and the project group for Titan Reinforcing thoroughly studied the principles and processes that form the Lean Construction method. The book *The Toyota Way* by Jeffrey Liker was an integral part of that initial study period, and the teams scrutinized Lean methodologies over the course of the next year.

MORE THAN A BOOK CLUB

Once the Baker and Titan teams were familiar with the methodologies in the book, they turned to applying those Lean principles to concrete construction. And as it turned out, efficiently building Toyota vehicles is not all that different from efficiently placing concrete. In both cases, a key to efficiency is found in increasing the reliability of hand-offs: from carpentry to rodbuster to place/finish crews.

To help meet the team's goal of increasing reliability on the project, Baker implemented The Last Planner® System (LPS), which was developed by Greg Howell and Glen Ballard of the Lean Construction Institute. The various phases of LPS include Milestone Planning, Pull Planning, Weekly Work Planning, Daily Huddles, and Percent Plan Complete after the plan has been carried out.

Milestone Planning is a view from 30,000 feet, where historical data is applied to the large phases of the project; for Baker it is typically the foundations and superstructure, but can be broken into more detail as required.

Pull Planning is an in-depth look at the various resource requirements and hand-offs that have to happen to complete the work. Craft foremen are typically engaged in the planning during the Pull Planning phase.

LEAN IN ACTION

Once the project is reviewed and a schedule is created with input from the field, the weekly planning begins. In the Weekly Work Planning (WWP) sessions the project team looks at several items including a Six-Week Look-Ahead schedule to ensure all necessary resources and information will be available when it comes time to do the work. Foremen and superintendents then prepare very detailed (day-by-day) plans in a collaborative effort for the upcoming work week. The WWP meeting has two other important elements: Constraint Analysis and Workable Backlog. Constraint Analysis looks at anything that could derail the plan – missing information, material not on-site yet, equipment availability, etc. – and assigns a co-worker to remove the constraint by a specific date. Workable Backlog is any work that is ready to be performed, but is not on the weekly plan because it is not critical path. This would be 'Plan B' in the event the main plan gets halted. The other reason teams and individual foremen keep a Workable Backlog is because they oftentimes find themselves completing their originally planned work early and needing somewhere to go to keep the crews busy and productive.

Baker has implemented a form of its Lean process on over 20 projects since 2007 including the Great American Tower located in Cincinnati (photo top right). The projects have resided primarily in the midwest and mid-atlantic regions of the country, but have also been applied to projects in Florida and Alabama. ◀



Great American Tower, Cincinnati



UK Patient Tower
Lexington, Kentucky

One of the first Baker projects to utilize Lean Construction, Baker used the Last Planner System® to coordinate multiple forming, reinforcing, and placing crews. As evidence of the impact of Lean, the project team commented there was only one reinforcing steel delivery that didn't go directly from the delivery truck to the deck.



Thyssen-Krupp Steel Mill
Calvert, Alabama

Baker used the Lean principles on a 100,000 cubic yard foundation package that was nearly identical to another similar foundation package that was underway. Lean helped the team complete the "twin" project nearly three months faster than its predecessor.



Miami International Airport

Miami International Airport (MIA) is the main airport serving the Miami, Florida Metropolitan area and serves as the major gateway between the United States and Latin America.

The multi-billion dollar North Terminal Program for the MIA included a major expansion to the existing terminal configuration. Over a ten year period (2001 to 2011), Baker was given the opportunity to work on major terminal expansions at Terminal A, B, C, and D.

In addition, Baker worked on the MIA Mover, a light-rail system, and the Miami Intermodal Center (MIC).

*Photo by
Selso Garcia
Corgan Associates*

MIAMI AIRPORT LINK

Relieving the stresses of roadway congestion, Miami's new Airport Link (previously named Orange Line) will connect a variety of high profile venues throughout the city of Miami, Florida. The 2.4 mile rail extension connects the city's existing Earlington Heights station to the Miami Intermodal Center.

Baker was tasked with handling the total concrete package that included: foundations, sheeting, excavation, forming, reinforcing and placing 107 pile caps, all mass concrete, 111 bridge piers, 99 Pier caps, 129 u-beams, Superstructure deck, and the installation of fiberglass.

Unique Accomplishment

Last fall, Baker placed a 130-foot precast beam over the Miami Metro-Rail tracks.

The 277,000 pound precast beam was picked up by two very large cranes, a 230-ton crawler crane on the west side and a 300-ton hydraulic crane on the east side.

Then on the east end the beam was passed from the 300-ton hydraulic crane to a different 230-ton crawler crane, with only a 2-foot crane radius overlap, while midway over the Miami Metro-Rail elevated tracks.

The 5-hour shut-down of the Metro-Rail was coordinated by the Odebrecht-Tower Community lead team.

Baker provided the riggers, the engineered plan and confirmed that the setup was correct and things went according to plan.

This was a successful accomplishment with no surprises or delays to the train service.

Michael Hernandez, Baker's Project Executive, stated of the entire project, "We had a great team effort to accomplish a challenging project with exacting quality control standards spread out over several miles. We worked safely with over 240,000 man-hours on this project with zero recordable injuries." ◀



277,000 pound Precast Beam



LIVING INCIDENT AND INJURY FREE



Sperian Safety Videos

“If the safety slips, we cannot go back.” Those words of advice came from Baker’s Grant Johnson (photo left) during a live video taping at the Miami Airport Link (previously named the Orange Line) project in March. The Sperian Protection company, now owned by Honeywell, wanted to produce a number of short videos that demonstrated safety in the workplace. Sperian chose Baker for their construction video.

“We were glad they picked us,” said Mike Schneider, Senior V.P., and Chief People Officer at Baker. “It’s a testament to our IIF program, and our safety in general. And in the end, we were prominently featured in three videos that Sperian is distributing through the internet and highlighting in their communication efforts.”

Once Sperian and Baker agreed on a plan, a video crew from London, England arrived at the Miami Airport Link job site to begin taping. The taping included shots of the morning stretch and flex, pier construction, grinding concrete, job trailer activity, and a late-night deck pour.

The final videos were released in April, and they’ve made stars out of three of our co-workers: Grant Johnson, David Brownstein, and Fausto Guzman—all from the Miami office.

“Our guys did a great job,” said Schneider. “We’re proud of their efforts, their safety consciousness, and abilities on-camera.”

To see the videos, log on to YouTube and visit the Sperian Global page. There you will find the video series entitled “Making Safety Personal,” and the three videos involving Baker.

For more information, or for an electronic copy of the videos, please contact Baker at communications@bakerconcrete.com with Sperian Video in the subject line. ◀

A large-scale construction site for a power plant. The foreground is dominated by a dense grid of vertical and horizontal steel rebar, prepared for concrete pouring. In the middle ground, several workers in safety gear are visible, some standing on a yellow structure and others on a complex network of scaffolding. The background shows more of the construction site under a clear sky, with some industrial structures and power lines visible in the distance.

NEW COAL TECHNOLOGY

A new generation power plant is under construction in southern Arkansas, and the technology inside represents some of the newest developments in the clean coal industry.

The John W. Turk, Jr. Power Plant will be one of the cleanest and most efficient coal-fueled plants, and one of the first of its kind in operation in the United States. The 600-megawatt plant will use an advanced “ultra-supercritical” coal combustion technology, requiring less coal to produce the same amount of power. In addition, the plant uses low-sulfur coal and state-of-the-art emission control technologies, and will allow for the retrofit of carbon dioxide controls. All these technologies will enable the plant to meet emission limits that are among the most stringent required for a pulverized coal unit.

Seventy-three percent of the Turk Plant is owned by Southwestern Electric Power Company, a unit of American Electric Power and will serve customers in Arkansas, Louisiana and Texas. Shaw, the Engineering, Procurement and Construction Contractor for the project, selected Baker for the concrete scope on multiple areas of the project.

The most challenging building, the Rotary Car Dumper, has 81-foot deep foundations that required moving approximately 150,000 cubic yards of dirt and rock. The work also required Baker to install some 20 well points pumping water 24/7 in order to maintain low water levels and facilitate excavation.

Under high summer temperatures common in Eastern Arkansas, Baker built 3.5-foot thick walls while hand-placing more than 943,000 pounds of reinforcing steel. Work also called for installing a waterproof membrane on all exposed concrete and backfilling the excavation.

Another scope of the project, the Reclaim Tunnel, had its own unique set of challenges, including a peculiar structural shape, recessed roof and over 103,000 pounds of embedded items. Baker built more than 76 pieces of precast sections—weighing as much as 75,000 pounds—and installed them atop the Reclaim Tunnel after completion.

Construction has created approximately 1,400 jobs, and the \$1.7 billion facility is expected to be completed in late 2012. ◀

EQUAL OPPORTUNITY EMPLOYER



MOODY GARDENS RAINFOREST

Moody Gardens is an entertainment complex in Galveston, Texas. It features three main pyramid attractions: an Aquarium; a Discovery Pyramid; and the Rainforest Pyramid that contains tropical animals and plants.

The Rainforest Pyramid recently underwent a \$25 million enhancement that included the integration of an elevated platform throughout the Rainforest exhibit. Baker contracted with Gilbane Building Group to build six concrete trees varying in height throughout the rainforest with one tree buttress that contained the HVAC for cooling the upper areas of the rainforest.

Concrete Trees

The Symons-made forms consisted of three separate form sections. The base or “trunk” section was made up of two 6-foot sections and three 2-foot sections. This helped with

the variance of size throughout the pyramid, and gave the column the tree trunk appearance. Next came the “transition section” where the trunk forked into the four branches. Each “tree” was poured in two lifts, the first lift (trunk section), then the second lift (transition piece and the branches.)

The rebar detailer used the formwork design drawings to confirm rebar bends for the branches. The forms were steel and required the use of a mini crane to assemble. In order to allow the mini crane movement throughout the pyramid and minimize damage to plants in the rainforest, it was designed to fold up and fit through a standard man door. Baker also was charged with the suspended concrete slab elevated walkway. This post tensioned slab was 10-inches thick and 4000psi. ◀