



THE STANDARD

FALL / WINTER 2010

BAKER
CONCRETE CONSTRUCTION



University of Texas, MD Anderson Cancer Center Mid-Campus Building 1

The University of Texas, MD Anderson

Cancer Center Mid-Campus

Building 1 (MDACC) is comprised of three different structures incorporated into one project. Located in Houston's Medical Center, those three structures stretch to 26 stories, 21 stories, and 5 stories respectively. Once completed, it will house office staff, IT systems, records and archives. This project highlights the value and efficiency of the design/build process, where Baker worked closely with the general contractor, Vaughn Construction, and the architecture/engineering firms, Watkins, Hamilton Ross (WHR), and Haynes Whaley & Associates.

CONCRETE EXPERTISE

The University of Texas, M.D. Anderson Cancer Center Mid-Campus Building 1 (MDACC) project is a shining icon of the strength of American cancer treatment. Consistently ranked one of the best cancer treatment centers in the country, the MDACC will soon house the administrative staff and systems for this world class healthcare facility.

Utilizing Technology

Baker is proud to have taken a role in this technologically advanced project. Appropriately for this project, Baker implemented the IntelliRock™ system that provides real-time monitoring and logging of concrete maturity (strength), temperatures, and temperature gradients.

“Using the IntelliRock™ system allowed the wrecking crew to gain half a day on almost every pour, which is significant when there are three pours per floor and 26 floors. Baker brought the project in three weeks ahead of our original schedule even after an additional floor was added to our scope,” said Garret Benson, Baker Project Manager.

The IntelliRock™ system served two main functions on the project. The first is the more traditional function that consists of monitoring the temperature of concrete over a period of time. The second function is to measure the strength of concrete based on a calculated curve that is determined for a specific concrete mix design.

Mat Foundation

The first function was used within the construction of the mat foundation to help better understand the temperature dynamic within the mass of concrete after it was placed. With massive concrete structures such as this, the concrete cures at different rates throughout the mass. The concrete in the center will get to a much higher temperature, resulting in a higher strength gain, while the concrete at the edges will reach a much lower temperature due to the cooler ground or air coming in contact with the concrete. This variance in temperature may result in detrimental “thermal cracks” within the concrete mass.

To prevent this from occurring, IntelliRock™ sensors were placed at various depths at predetermined locations throughout the mat. The temperature variance from the middle of the mat to both the bottom 3” and top 3” of the mat could not differ by more than 40 degrees Fahrenheit. The pour occurred in December and the air temperature at the conclusion of the pour was at 34 degrees while the center of

the mass of concrete was reaching temperatures close to 130-140 degrees. The slab had to be wet-cured, so thermal blankets had to be utilized over the 60,000+ square feet of mat surface to ensure the concrete temperature at the surface of the mat did not get below the 40 degree variance. IntelliRock™ sensors were recorded twice a day for 30 days to evaluate the temperature dynamic in the mat. Blankets had to be moved during this time to allow for the vertical construction elements and the sensors had to be closely monitored while the blankets were removed.

Horizontal Decks

The second function was utilized within the construction of the horizontal decks. The IntelliRock™ system doesn't measure strength itself, but measures the Temperature (by) Time of the concrete. These two variables are the two main components of the formula that determine the strength of concrete.

In general terms, concrete strength is a function of temperature over a period of time. This relationship creates a unique temperature-time curve for each individual concrete mix design. By running a sample batch of each mix design, creating test cylinders in which IntelliRock™ sensors monitor the temp versus the time relationship, and breaking these cylinders at set times throughout the curing process, a specific curve can be established for that mix design. On a deck that requires the strength of the concrete to be 5,000 psi and requires 75 percent maturity of the concrete before stripping can occur, sensors will be placed throughout the critical components of the deck that can be recorded throughout the day to determine when the deck is ready for formwork to be removed. It reduces the wait time for information to come back from testing labs and the additional time required if breaks come back below the strength requirements. Using this technology on the MDACC eliminated weeks from the schedule.

Time and again, Baker proves that it has the ability to complete the work safely, timely, and with great quality. ◀

Baker Placed Mat Pour

On December 19, Baker placed a total of 17,500 cubic yards (cy) for the MDACC foundation that was completed in less than 24 hours at a rate of 730 cy per hour.

It is second only to the Venetian Hotel in Las Vegas, Nevada as the largest mat pour placed in the United States. ◀

