



## Case Study: University of Oklahoma Memorial Stadium; Norman, Oklahoma



**Flintco, Inc. is adding 8,000 seats and 27 suites to the University of Oklahoma Memorial Stadium as a part of a \$52 million, 18-month project. At a cost of less than \$5,000, the IntelliRock concrete strength measurement system has saved Flintco \$309,000 in man-hour costs.**

### **Project Background**

In January 2002, a \$52 million project was awarded to Flintco Inc. to add 8,000 seats and 27 skyboxes to the 75,000-seat stadium. The project consumed about 18,000 cubic yards of concrete, and was scheduled for completion by the first home football game on August 30, 2003. Flintco would incur heavy penalties per seat and per skybox – as much as \$2.5 million per game – if the new stadium facilities were to be unavailable in time. Project superintendent, Rick Cole was looking for innovative means and methods to keep the project on schedule.

The IntelliRock concrete strength and quality control system came to the attention of Tom Heffernan, Flintco Director of Field Operations, because of its use on the highly publicized I-40 Bridge reconstruction project in Oklahoma



Flintco began using the IntelliRock system on the stadium project during July 2002. Cole placed IntelliRock sensors in each of the horizontal beams, cross members and cast-in-place floor sections. During the project, a variety of people from concrete superintendents, to labor and carpenter foremen, and Quality Control managers would periodically take in-situ readings to estimate the concrete's strength.

In warm weather, the IntelliRock system indicated that 75% strength was often achieved in as little as two and one half to three days. This information allowed Cole to cycle the limited number of specialty forms and re-shore faster, often in half the time expected based on traditional cylinder testing called for by the original project specification.

The advantages of this approach were significant: faster forms cycling would shave weeks off the construction schedule – up to four days per placement, save man-hours, and lower form rental costs.

In cold weather, concrete gains strength more slowly, and the IntelliRock system would allow Cole to monitor a structure's temperature to know how much heat was necessary to apply in order to accelerate its strength gain.

The IntelliRock system provided a more accurate estimate of the actual structure's strength than did cylinder specimens, ensuring that forms were not stripped or the structure loaded prematurely.

Cole found the IntelliRock system easy to implement and use. "I've had experience using thermocouple devices to measure temperature on another project. The IntelliRock system is much more advanced than a thermocouple device. It was also simple for my people to use, at times I have utilized carpenter and labor foreman to download strength data. The beneficial aspects of the system extend beyond the obvious critical path advantages, into the realm of quality control and quality assurance. It provides a new perspective for driving project concrete operations. The IntelliRock system has changed the way we will approach concrete intensive jobs, and I will continue to use IntelliRock on future projects."

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