

BIM in Building Projects

James B. Hunt Library

Raleigh, North Carolina, United States



"I'm very impressed with how the Hunt Library team has utilized technology to improve the overall construction process, and I look forward to applying these lessons learned to challenges on other projects."

Steve Stouthamer
General Manager, Skanska USA Building



Designed to advance collaborative research and interactive learning, the James B. Hunt Jr. Library, at the heart of North Carolina State's Centennial Campus, will incorporate leading-edge technology to a degree achieved by only a handful of libraries in the country.

James B. Hunt Library	
Size	250,000sf (23,000m ²)
Client	North Carolina State University
Contract value	USD 88 million (EUR 67 million)
Completion date	Fall 2012
LEED® certification	Targeting LEED Silver
Architect	Snohetta

When completed in 2012, the facility will feature an automatic book delivery system, in which a robotic arm will retrieve books from a climate-controlled underground storage vault where over 2 million volumes will be stored in bins. Underground storage will allow more room in open public spaces for perceptive pixel displays and touch screen displays.

With such a unique, innovative building, the Skanska team wanted to take an "all in" approach to BIM and technology, leveraging new tools as much as possible to mitigate risks in construction, beginning in preconstruction and continuing all the way to hand over.

One particularly significant challenge in the design of the library was the custom unitized curtainwall system, which comprised over 800 unique panels, each of which had to be installed in a precise location and perform at the highest level. In order to manage this critical path activity, Skanska developed a supply

chain management protocol that involved barcoding each curtainwall unit and tracking its status from fabrication through installation. This information was linked to the team's BIM model, allowing for easy visualization of the real time supply chain information and giving the team the ability to more accurately sequence work based on updated production rate. This innovative approach helped the team complete the curtainwall installation in just 13 months from award – a large improvement from the 24 months originally requested by bidders.

Another critical aspect of the way the team is building the library revolves around the use of Mobile Electronic Resource Stations (MERS) on the jobsite. While Skanska personnel has the benefit of iPads and tablet PC's for updated, marked-up plans at their fingertips in the field, the subcontractors on site would have to either rely on their own set of plans or walk the 15 min-

utes back to Skanska's trailer to view marked-up drawings. With the MERS, subcontractors are able to view all the RFIs (request for information) as well as the BIM model, which provides huge benefits in visualizing the work they are preparing to install. The MERS also has the coordinated mechanical, electrical and plumbing models, allowing subs to quickly understand how their installations need to fit together in congested locations.

In order to truly learn from the various technology implementations on this project, the Skanska team applied for and received an innovation grant from Skanska USA Building, which paid for a graduate-level research project on a detailed cost benefit and return on investment analysis. The study showed not only an overall return on investment of over 30 percent to the owner in project cost savings, but also provides recommendations for technology implementations on future Skanska projects.