

Skanska.

Customer Success Story

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We wanted to be as unique and innovative in the way we build as the project we were working on. For that reason, we knew we wanted to use BIM, and we knew we wanted to use Autodesk software.

—Will Senner
Assistant Project Manager
Skanska

Higher learning. Big Benefits.

Skanska uses Building Information Modeling and integrated project delivery on several massive projects.



Image courtesy of Skanska.

Project Summary

It's one of life's great truisms: there can be no greater compliment to one's work than to be asked to do more of it. Since the company's founding nearly 125 years ago, Stockholm, Sweden-based Skanska has grown from a company producing ornamental concrete angels for churches into one of the largest and most well-respected project development and construction companies in the world.

Approximately eight years ago, Skanska had the foresight to create a virtual design and construction group (VDC), a team of individuals who would ensure the company's project management, design, and construction practices remained at the forefront of the industry. That dedication has since been exemplified in a series of projects for North Carolina State University (NCSU)—an institution that has repeatedly turned to Skanska for ever more complex projects—beginning with a biotechnology center and culminating with the impressive new James B. Hunt Jr. Library. The Skanska VDC team was also at the forefront of the recent US\$400 million extension of the Good Samaritan Hospital in Puyallup, Washington. The Skanska team made extensive use of Autodesk® software to facilitate Building Information Modeling (BIM) and integrated project delivery (IPD) processes on all projects.

The Challenge

"Skanska has been working on various parts of the NCSU Centennial Campus in Raleigh for most of the past decade," says Will Senner, assistant project manager at Skanska. "It seems like every time we finish an NCSU project, they ask us to do another one. After finishing Engineering Building 3, we rolled right into the Hunt Library."

In addition to the usual pressures of creating a complex, high-profile, "signature" project, Senner and his Skanska team knew the Hunt Library would be just the second building on the entire NCSU campus to have no brick used in its construction. And that wasn't all: "The Hunt Library is unique in its use of a number of advanced systems," says Senner. "Our curtain wall system, for instance, is fully customized. Our mechanical systems use chill beams, as well as radiant heating and cooling, which are unusual in the southeast part of the United States. We also have a fully automatic book delivery system—a 50-foot pit of high-density storage housing approximately two million volumes. People can browse for and order their books using their iPads or other electronic devices, and robotic arms go and get it for them."

Autodesk®

“The building is truly unlike anything surrounding it. Everybody is paying a lot of attention to it, so quality is critical. We wanted to challenge ourselves to be as unique and innovative in the way we build as the project we were working on. For that reason, we knew we wanted to use BIM, and we knew we wanted to use Autodesk software.”

The Solution

With those intentions in mind, the Skanska team began building on the experiences and workflow gleaned by the VDC group on the Good Samaritan Hospital project, which was completed in 2010.

“Good Samaritan was just a massive extension,” says Greg Smith, regional director of virtual design and construction at Skanska. “It involved a new patient care tower, a new central utility plant, a new parking garage, and lots of other site work. The project took four years to complete, and from the beginning, we were determined to use BIM. It wasn’t just the Autodesk® tools that we wanted to implement, it was the entire collaborative process that they helped facilitate. It was really an IPD project even though there was no formal contract to that effect, just an agreement. We’ve never regretted it.”

“We simply could not have accomplished the Good Samaritan project without BIM and Autodesk software,” says Mark Howell, senior vice president at Skanska. “The combination of a deeply complex project and a fast-track schedule made them vital to our success.”

The intense schedule of the Good Samaritan project required that construction begin before the architectural designs were completed, a situation that would recur on the Hunt Library project. While the aggressive schedule is right up Skanska’s alley, it did present certain challenges in the management of their supply chain. This was why BIM, with its intelligent model-based process, was such a critical requirement for the team. The insight BIM provides in helping companies to create and manage building and infrastructure projects faster, more economically, and with less environmental impact was just what the Skanska team needed.

“We used Autodesk Revit Architecture and Autodesk Quantity Takeoff software to verify our

material quantities,” says Senner. “We were also doing integrations into Autodesk Navisworks software for supply chain management, especially for our curtain wall system. All of the curtain wall panels are unique and were fabricated offsite, and need to be put together on the building almost like a jigsaw puzzle. We made sure that each panel was barcoded, which was scanned when the panel was fabricated, shipped, received, and installed. That information was all linked into our Autodesk Navisworks model, so we were able to keep track of more than 800 absolutely unique panels. We’ve used similar material tracking processes on our doorframes and many other aspects of the project, including key mechanical equipment. Navisworks has been hugely beneficial, helping us keep track of where we are, what we’ve checked from a quality standpoint, and where we’re going next.”

The Result

Just as the collaboration enabled by BIM and IPD on the Good Samaritan Hospital project reaped benefits for Skanska in terms of efficiency, so did the use of Autodesk software result in tangible benefits for the Hunt Library project.

“BIM and Autodesk software technology really bring the extended team together to work as an integrated unit,” says Smith. “The visualization of each project means every stakeholder can see what the designer is talking about. What’s more, the technology then enables fast changes to the digital model. When we put together an RFI [request for information], we were able to use Autodesk Revit to determine and show how things should work. That goes a long way toward easing communications, improving collaboration, and ultimately speeding up even a really complex project.”

Senner is quick to agree, saying: “Our goal was not just to be different for the sake of being different. We were thinking about the big risks on the project, those issues that threatened our schedule and quality the most. When we first considered procuring the curtain wall, bidders told us a complete installation would take at least two years. We wanted to do it in 13 months. They said we were nuts, but that only made us more determined. Luckily, we had BIM and Autodesk on our side, and we installed the curtain wall on schedule.”



Image courtesy of Skanska.

More recently, Skanska has been digging still deeper into the benefits of BIM. Together with an NCSU graduate student preparing a thesis based on a cost benefit analysis and return on investment study of Skanska’s use of innovative technologies, the company is still more excited by recent discoveries in the research. Broken down into study areas including Mobile Field Technologies, such as iPads and other tablets, Skanska’s Mobile Electronic Field Station, and general BIM processes, the study has determined a return on investment of more than 10 percent for the owner, and well over 400 percent for the overall project. In terms of the implementation of technology as a whole, the owners enjoy a 35 percent return, and the project a staggering 900 percent. It would be difficult to imagine better numbers than those.

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