

Robins & Morton
Carolinas Healthcare System

Customer Success Story

Autodesk® Revit® Architecture
Autodesk® Navisworks® Manage

Because of the BIM coordination effort on the front end of this project, there has been virtually no rework and the schedule was reduced by an estimated 30 percent.

—Brad Lucas
Senior Project Manager
Carolinas Healthcare System

Faster, better, less expensive.

Robins & Morton uses Autodesk BIM solutions to deliver a new hospital ahead of schedule and under budget.



The Carolinas Medical Center–Lincoln Replacement Hospital. Image courtesy of Robins & Morton. Photo by Joel Lassiter/Lassiter Photography.

The Firm

Robins & Morton provides general construction, construction management, program management, preconstruction, and design-build services. The company's major divisions—Healthcare, Commercial, Special Projects, Concrete & Industrial, and Government Services—operate from six offices throughout the southeastern United States. In 2009 and 2010, the firm was ranked top health care contractor in the United States by Modern Healthcare magazine. Since its founding in 1946, the firm has completed over 1000 health care projects.

For the past four years, Robins & Morton has relied on Building Information Modeling (BIM) for close collaboration with building owners, designers, and subcontractors. The firm has successfully constructed over 35 projects using Autodesk BIM solutions.

The Challenge

Robins & Morton was the general contractor for the new 101-bed Carolinas Medical Center–Lincoln Replacement Hospital located in Lincolnton, North Carolina. The \$54-million facility includes four operating rooms and two patient floors, a maternity center, a critical care unit, an on-site laboratory, a pharmacy, radiology, imaging, and physical therapy services.

"The construction of medical facilities makes coordination of the above-ceiling trades more challenging than conventional construction. There are more building systems; the systems are more complex; and the components are larger," says Chris Lawson, mechanical, electrical, and plumbing (MEP) coordinator for Robins & Morton. "To minimize field rework on a project like this, we knew we had to use BIM for collaboration and coordination." But the building design was developed using 2D CAD software.

The Solution

Members of an integrated project team—including Robins & Morton, hospital owner Carolinas Healthcare System, the architect, the engineers, and the major subcontractors—contributed their expertise to the project from the beginning of schematic design. To enable BIM-based preconstruction coordination, Robins & Morton used Autodesk® Revit® Architecture software to create an architectural design model for the project and required all its subcontractors to provide 3D trade models. The firm then combined these models using Autodesk® Navisworks® Manage software for collaboration, clash detection, and coordination.

Autodesk®

Autodesk BIM solutions helped reduce the project schedule by 30 percent.

Enable Design-Assist

Robins & Morton also used Autodesk BIM solutions for visualization and usability studies. The firm used Revit Architecture software to develop models of the five major types of patient rooms and all of the operating rooms, as well as to create design visualizations of these spaces. Robins & Morton imported those models into Navisworks software to give the project team and hospital representatives virtual tours of the rooms.

"Instead of spending materials, time, and money to create physical mockups of the rooms, we created virtual mockups of the rooms," says Lawson. The extended project team met with the owner, hospital administrators, nurses, and doctors to make sure the spaces met their needs and expectations. "Using Navisworks software and design visualizations, everyone could easily visualize the rooms and make more informed, real-time design decisions," says Lawson. "As a result of this effort, there were no changes requested by the owner once the rooms were constructed."

Reduce Rework

As preconstruction continued, Robins & Morton used Navisworks software to aggregate the major trade fabrication models for multidiscipline clash detection and field coordination. "As each floor was coordinated, the trade contractors' models were downloaded to their fabrication shops, fabricated, and delivered to the site," says Lawson.

This reliance on digital design-to-fabrication workflows is fundamental to Robins & Morton's sustainable construction practices. "Reducing rework means reducing the waste of energy and materials during fabrication and construction."

Plan for the Future

When the construction was completed, the project team updated and delivered Navisworks models to Carolinas Healthcare System. "The project is designed for a future vertical expansion, so delivering as-built data is critical to the owner," says Lawson.

Robins & Morton also worked with the owner to integrate the Navisworks models into their space management software. In addition, the firm helped Carolinas Healthcare System develop BIM guidelines for all its future projects, based on the precedents set during this project.

The Results

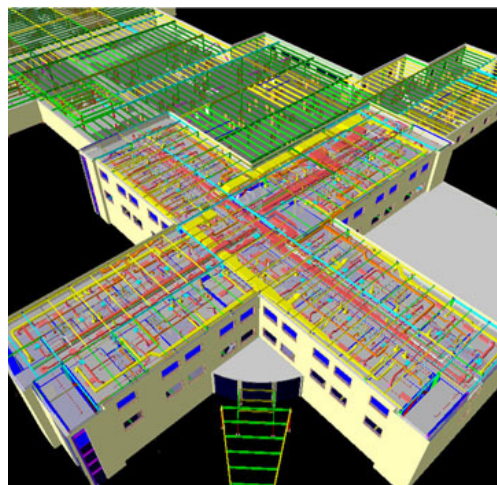
The new hospital opened in the fall of 2010. In February 2011, the project received an Associated Builders and Contractors (ABC) Excellence in Construction award. The project came in under budget, ahead of schedule, and required no change order requests. The use of BIM helped the integrated project team build the facility faster, more economically, and more efficiently than expected.

"Quality always increases when you are not tearing things out and redoing them," says Brad Lucas, senior project manager for Carolinas Healthcare System. "Because of the BIM coordination effort on the front end of this project, there has been virtually no rework and the schedule was reduced by an estimated 30 percent."

For more information about Autodesk BIM solutions, visit www.autodesk.com/BIM.



Autodesk Navisworks model being used at the construction site. Image courtesy of Robins & Morton.



Hospital building systems coordinated with Autodesk Navisworks. Image courtesy of Robins & Morton.

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—Chris Lawson
MEP Coordinator
Robins & Morton



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