

Haskell Architects and Engineers, P.A.

Customer Success Story

Autodesk® Revit® MEP  
Autodesk® Navisworks® Manage

Revit MEP for BIM definitely improved design quality and helped us solidify our relationship with the client. We look forward to using Revit MEP and other Autodesk BIM solutions on our future projects. Ultimately, we intend to fully integrate BIM into our practice.

—Aryak Goswami  
Mechanical Engineer  
Haskell Architects and Engineers, P.A.

# High-precision design.

With help from BIM, Haskell Architects and Engineers P.A. greatly improves coordination on a complex medical facility design.



Rebar and conduit installation. Image courtesy of Haskell Architects and Engineers PA.

## Project Summary

Haskell Architects and Engineers, P.A. recently completed design on the Scripps Proton Therapy Center, an innovative, \$225-million facility in San Diego County, California. When complete in early 2013, the 102,000-square-foot center will have the capacity to treat approximately 2,400 cancer patients per year. The company's engineers—including John Fortenberry, the lead mechanical engineer for the project—worked closely with The Haskell Company, a leading design-build contractor based in Florida; as well as Scripps Health and Advanced Particle Therapy. To improve collaboration and coordination among the geographically dispersed team members, Haskell Architects and Engineers, P.A. relied upon Autodesk® Revit® MEP software for Building Information Modeling (BIM) and Autodesk® Navisworks® Manage software. "Greatly improved coordination is the most important benefit of using BIM on complex design-build projects," says Frank Mangin, President of Haskell Architects and Engineers, P.A. "On a project of this complexity, choosing BIM with Revit MEP was an easy decision to make given our past successes using it for multi-disciplinary coordination."

## The Challenge

At the rear of the facility is a 90-ton cyclotron capable of creating a beam of accelerated protons that can target deeply buried tumors. To prevent unwanted radiation exposure, the team placed the cyclotron and associated equipment into a large concrete "bunker" with walls as thick as 16 feet. The adjoining, steel-framed clinical facility includes treatment rooms, diagnostic tools, exam rooms, and offices. "The building really consists of two very different structures," says Mangin.

Coordination between the two structures was challenging. For example, much of the building's piping and electrical conduit has to pass through the bunker wall, necessitating careful planning. "All pipes had to follow a Z-shaped path through the wall," says Mangin. "A misplaced pipe or conduit would be potentially catastrophic—and very expensive." Because each structure behaves very differently during a seismic event, the team also had to ensure that the crisscrossing mechanical, electrical, and plumbing (MEP) systems could accommodate different rates of movement.

# With help from Autodesk BIM solutions, the team met precise tolerances—as little as one-thousandth of an inch.

## The Solution

Revit MEP software proved helpful in overcoming these and other design challenges. For example, the main mechanical room is on the patient side of the facility. “We had to run piping underground, through thick concrete walls, and have it emerge in very specific locations in the bunker area,” says Aryak Goswami, a mechanical engineer at Haskell Architects and Engineers, P.A. “BIM helped us visualize how to place the pipes and conduit with a high degree of precision. That is critical on complex buildings.”

Another challenge was coordination with the proton beam manufacturer. “Their equipment is custom-built, with very precise tolerances—as little as one thousandth of an inch,” says Goswami. “Revit’s 3D modeling and visualization helped us meet those tolerances and keep up with any changes that occurred during design—saving considerable coordination time.”

Once the digital model was complete, the design team walked through it virtually with the client and other stakeholders using Navisworks Manage. “We showed them what the completed facility would look like, checked for conflicts, and gathered feedback that helped improve the design,” says Goswami. “That’s where we got the most benefit from the software.”

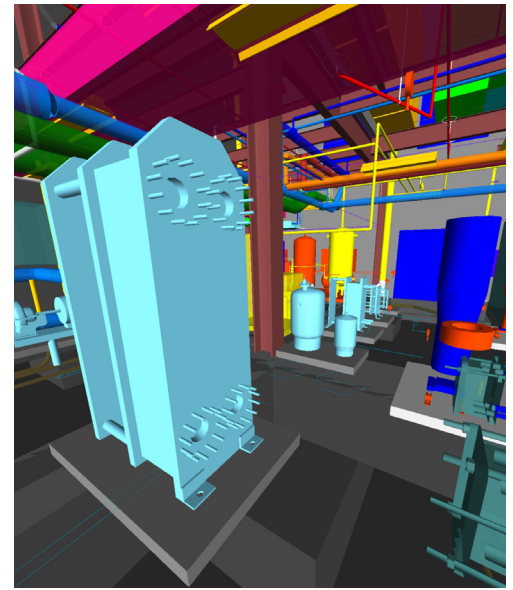
During construction, Navisworks proved valuable in completing the facility’s concrete wall, which required a sequence of pours. “The builder compared printouts of the 3D model with the pipes and conduits that were actually installed, verifying their accuracy before each pour,” says Mangin. This process helped the builder catch a missing pipe and make a correction in time to avoid significant—and very costly—consequences.

At one point, the model helped avert a potential catastrophe when it was determined that the proposed location of underground electrical conduit would pose a risk to the cyclotron during transportation onsite, as well as to the building. Using information from the model, the team illustrated the risks associated with the mistake and helped the subcontractor make the hard decision to relocate the conduit. “Those risks would not have been obvious without BIM,” says Goswami.

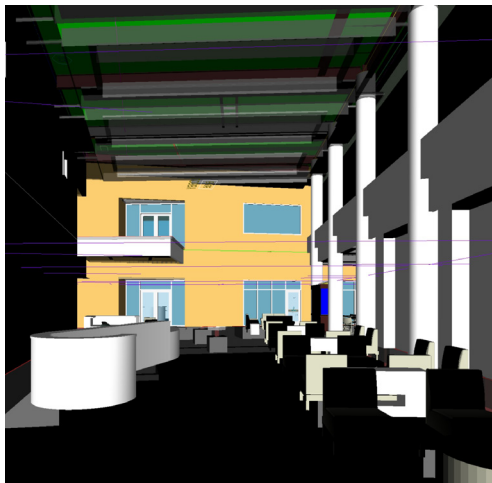
## The Result

Construction on the facility is scheduled for completion in early 2013. “BIM and Revit MEP definitely improved design quality and helped us solidify our relationship with the client and work more efficiently,” says Goswami. As a result, the project developer, Advanced Particle Therapy, awarded Haskell Architects and Engineers P.A. a contract for the design of a new proton therapy facility in Maryland. “We look forward to using Revit MEP and Navisworks Manage on our future projects. Ultimately, we intend to fully integrate BIM into our practice.”

For more information, visit [www.autodesk.com/BIM](http://www.autodesk.com/BIM), [www.autodesk.com/revitmep](http://www.autodesk.com/revitmep), and [www.autodesk.com/navisworks](http://www.autodesk.com/navisworks).



Heat exchanger. Image courtesy of Haskell Architects and Engineers PA.



Scripps Proton Therapy Center lobby. Image courtesy of Haskell Architects and Engineers PA.

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—Frank Mangin  
President  
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