

## COMPANY

**WASA/Studio A**

## LOCATION

**New York, New York**

## SOFTWARE

**Autodesk® Revit®**

# Integrated excellence

## WASA/Studio A uses Autodesk Revit to support integrated design of a new medical facility in the Bronx

The collaborative capabilities of Revit software integrates all the disciplines and enables the design team, the contractor, and the client to exchange diverse ideas and approaches, which helps to simplify the way buildings are built.

—**Harry Spring, P.E., LEED AP**  
Senior Managing Partner  
WASA/Studio A

\*Autodesk Revit software is only available as part of the Autodesk Building Design Suite Premium and Ultimate Editions.



Image courtesy of WASA/Studio A.

### The project

WASA/Studio A is a fully integrated architectural design operation, specializing in architecture, engineering, preservation, interiors, and planning. Headquartered in New York City, WASA/Studio A is one of the oldest, continuously operating architecture and engineering firms in the United States. Throughout its 124-year history, the firm has constantly evolved to meet the demands of the marketplace, incorporating the highest standards of the profession and latest technology. In spring of 2008, WASA/Studio A demonstrated this commitment to technology by adopting Building Information Modeling (BIM) and completely transitioning the entire firm to the Autodesk® Revit® software platform. Immediately upon implementation, the firm used Revit software on its first BIM project: Bronx-Lebanon Hospital Center's new Life Recovery Center in New York City.

The 67,000 square-foot Life Recovery Center is a facility for the treatment of substance abuse and chemical dependency. The six-story building will house several outpatient programs specializing

in the treatment of people in substance abuse recovery. In addition to the outpatient programs, there will be three floors of residential programs for up to 100 residents. WASA/Studio A was responsible for the architectural, MEP, lighting, and interior designs.

### The challenge

"The building program was very dense and, on paper, seemed too much for the size of the building," explains Stan Fabiszak, WASA/Studio A project manager. "In addition, the building size was limited by zoning as well as the campus utilities input." Although it is located near several other Bronx-Lebanon facilities, the Life Recovery Center is a standalone building and requires its own mechanical plant. Furthermore, the project involved large amounts of specialty building systems and equipment. This complicated the above ceiling coordination as well as the 3D modeling effort to support that coordination.

# Tap into new revenue streams with expanded service offerings

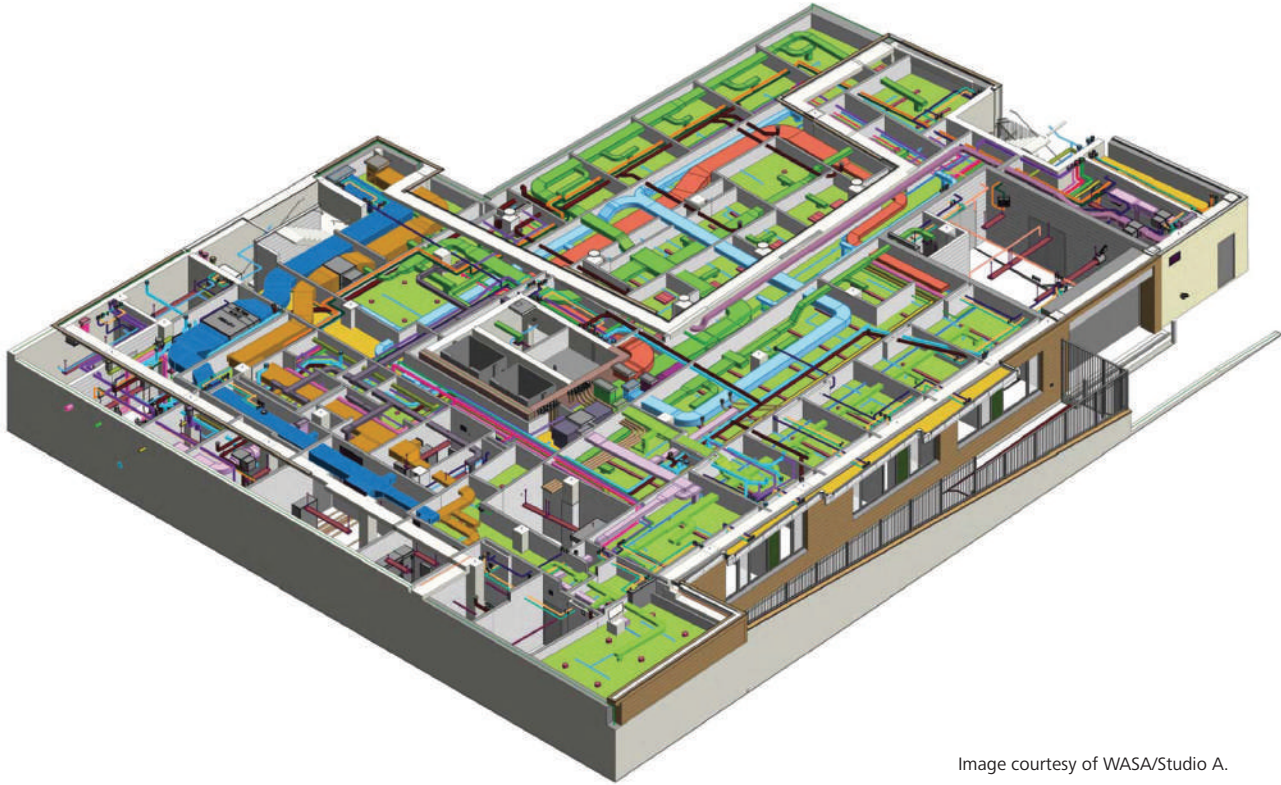


Image courtesy of WASA/Studio A.

## The solution

WASA/Studio A architects and engineers used Revit for their design and documentation, and to help coordinate the project—including the problematic above-ceiling congestion. Additionally, Revit Parametric Components helped the firm more quickly and accurately create library families of the project's specialty components. "Our reliance on the Revit 3D model-based design environment helped us fit all of our client's program requirements into the limited building space," says Harry Spring, WASA/Studio A senior managing partner and partner in charge of engineering. "The software's capabilities for information sharing and collaboration helped us deliver an extremely coordinated and highly accurate project faster."

## Integrate design disciplines

The firm uses BIM and its highly collaborative approach on all projects, with all the design disciplines and respective design partners working together from project onset. "The structural engineer's original design strategy was to use a standard steel frame and composite deck," says Jack Esterson, WASA/Studio A senior design partner in charge of architecture. "But when we added that structural system to our architectural Revit model and viewed a section of the building,

we knew right away it was not workable." Given the floor to floor height limitation of the building, there would not be enough space in the facility to meet the program requirements. As a result, the project team decided early on to change the structural design system to a more compact flat slab design that eliminated the need for bulky structural beams.

To maximize building space and optimize the program, the engineering design team had only 11 inches of clearance in the hung ceilings for systems. The Revit model was essential for fitting all the requisite duct work, sprinklers, drains, lighting, and so forth into that above-ceiling space. "We could not have delivered this project accurately using a 2D process," remarks Spring. "With help from the the 3D modeling environment and clash detection capabilities of Revit, we resolved all of the coordination issues before construction." For example, to alleviate the congestion in the ceilings the team wanted to minimize the amount of horizontal roof drain piping by adding additional vertical leader lines. The Revit integrated model helped the team to relocate those additional vertical lines through the building, visually avoiding interferences and leaving more space in the hung ceilings.

3D modeling was also vital for the routing and placement of piping for the building's fan coil units. The HVAC system includes perimeter fan coil units that sit on top of cantilevered structures. The piping for these units needed to penetrate through sleeves in a beam supporting those cantilevered floors. "Flat slab design is structurally very sensitive to drilling and penetrations," explains Esterson. "With Revit, we could carefully preposition and precisely document the exact risers positions to help properly locate the penetrations before the concrete was poured, thereby avoiding any need for drilling."

## Create specialty content

The Revit software includes pre-built parametric libraries of standard building products. However, projects often require the creation of engineered specialty components. "The first time I saw a demonstration of Revit, particularly its parametric modeling and library features, I knew it was the right design tool for our firm," recalls Spring. "The software proved itself right out of the gate on this Life Recovery Center project. Although we had to generate our own library families for most of the MEP components and equipment, the flexibility of the software's parametric capabilities made the process more efficient and it was easy for us to model the information content ourselves to perform for us as needed."

## Enable new services

By optimizing its use of Revit and creating models data-ready for use in construction and operations, WASA/Studio A is capitalizing on its expertise in facilities management requirements and expanding its services to encompass construction assistance and commissioning. “Our big goal is to change the way buildings are built—using our coordinated building models for design, construction, and commissioning,” says Spring. “Revit has enabled us to expand our offerings from just plain design services into construction and operations support services. We call this service Design and Construction Information Management (DaCIM). DaCIM broadens our business opportunities and helps us tap into potential new professional revenue sources.” As a building project transitions from design to construction to operations, WASA/Studio A transforms its integrated Revit project models to help meet new needs and requirements.

For example, on the Life Recovery Center project, the contractor hired WASA/Studio A to repurpose the Revit design model for construction and field coordination. Very early in the construction process, and working with the various MEP trades, the firm added fabrication and construction information proposed by the trades to create and maintain a virtual integrated as-built project model. WASA/Studio A used this model to support coordination and the production of the finalized shop drawings, ready for fabrication, for all the MEP subcontractors. Ultimately the firm plans to extend the Revit model to assist owners with Computer-Aided Facilities Management (CAFM) by enriching the model with the specific data needed for building operations and maintenance.

## Optimize energy savings

WASA/Studio A uses its integrated design approach to develop sustainable solutions for its building projects. The collaborative nature of Revit helps the firm’s designers to work together and pool their collective experience to achieve clients’ sustainability goals. The Life Recovery Center features a variety of sustainable design strategies, including a low-wattage lighting design that reduces air conditioning loads, chilled water variable air volume (VAV) system to reduce energy and water consumption, increased insulation values in the walls and windows, and an energy efficient building envelope.

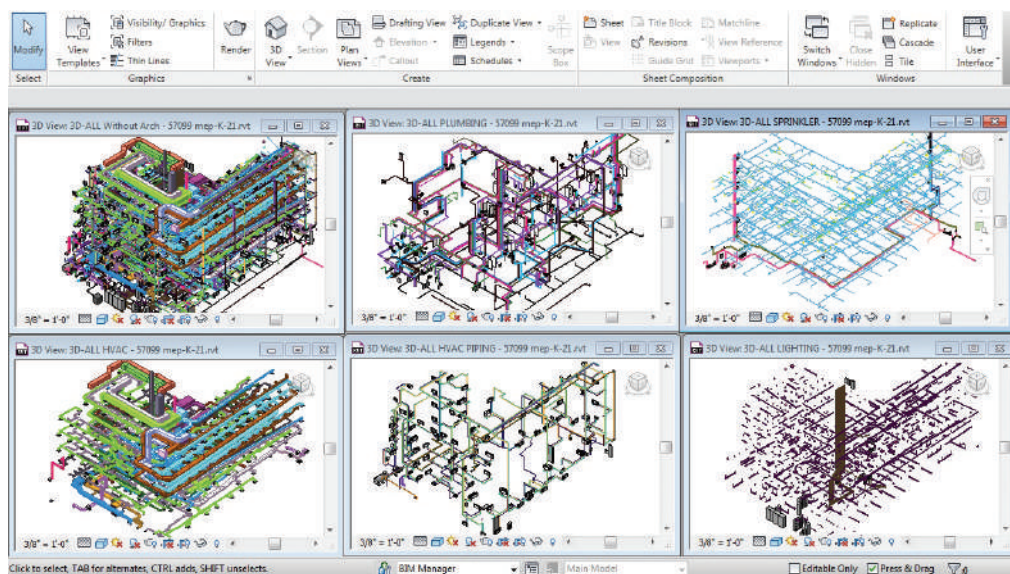


Image courtesy of WASA/Studio A.

“Traditionally, the architect and engineer work separately, with the architect progressing the building design to a certain point before involving the engineer. Often this is too late in the design cycle to fully accommodate the engineer’s feedback on strategies for energy savings,” says Fabiszak. “At WASA/Studio A, we have a team of architects and engineers in the same office who begin collaborating very early in the design process using a common Revit design model.”

In addition, the firm uses the Revit model and software to analyze and validate the energy performance of their building designs. For projects such as this, NYC requires that the building design be certified to meet the state’s energy conservation code for the building envelope, mechanical, and lighting energy consumption. To analyze the design, WASA/Studio A exported the Revit model to gbXML format (a standard format to transfer 3D building models to engineering analysis tools) and imported that file into Trane’s TRACE™ energy analysis software. Once the energy analysis was complete, the firm used gbXML to bring analysis calculations back into the Revit design model to support its continued design. “This roundtrip process populated the Revit model with all the information we need for our detailed MEP design—information such as supply airflow, heating and cooling loads, and U values for walls, floors, and roofs,” says Spring.

As Partner-in-Charge of design on the Bronx Lebanon project, I saw how Revit facilitated a better design process, which freed up our architects to spend less time on the ‘rote work’ and more time on coming up with creative solutions for our clients. It has also proved to be a powerful tool to visualize our design proposals during the design process internally and with our clients—so that all project stake holders better understand the proposed outcome. It has enhanced the entire process of design.

—**Jack Esterson, AIA**  
Senior Design Partner in Charge  
of Architecture  
WASA/Studio A

# Minimize project costs as well as energy consumption by approximately 40 percent

The firm also used the Revit software to perform a variety of calculations such as quantity material takeoffs and lighting intensity. "As a lighting designer, I am very impressed by how the Revit software enables us to perform a whole spectrum of lighting calculations, such as calculating the average estimated illumination for each space, and perform more accurate energy reviews of our lighting design to help certify the electrical power unit loads in watts per square foot."

## The result

The construction of the Life Recovery Center is nearing completion and Bronx-Lebanon's targeted opening is June of 2013—approximately three months ahead of schedule. "This was an especially impressive feat, considering it was our first BIM project and the first time we used Revit software," says Spring. "Above ground change orders for the project were less than one-tenth of one percent. And the analysis for energy consumption reduction demonstrated that we exceeded ASHRAE 90.1 minimum standards for energy consumption by approximately 40 percent."

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Since this project, WASA/Studio A has completed over 100 projects using Revit software, saving its clients project costs, time, and energy. The firm now uses Revit software exclusively for all of its projects. "Revit has finally helped us disprove the old adage about settling for just two of the three facets of a building project: fast, cheap, or good," says Spring. "With Revit software, we can deliver all three. Our BIM expertise provides our clients with more efficient, more accurate, and more cost effective project delivery."

Even in difficult market conditions, the firm is strategically positioned for success. "The collaborative capabilities of Revit software integrates all the disciplines and enables the design team, the contractor, and the client to exchange diverse ideas and approaches, which helps to simplify the way buildings are built," concludes Spring.

For more information, visit [www.autodesk.com/Revit](http://www.autodesk.com/Revit)

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