Dunham Associates, Inc.

Customer Success Story

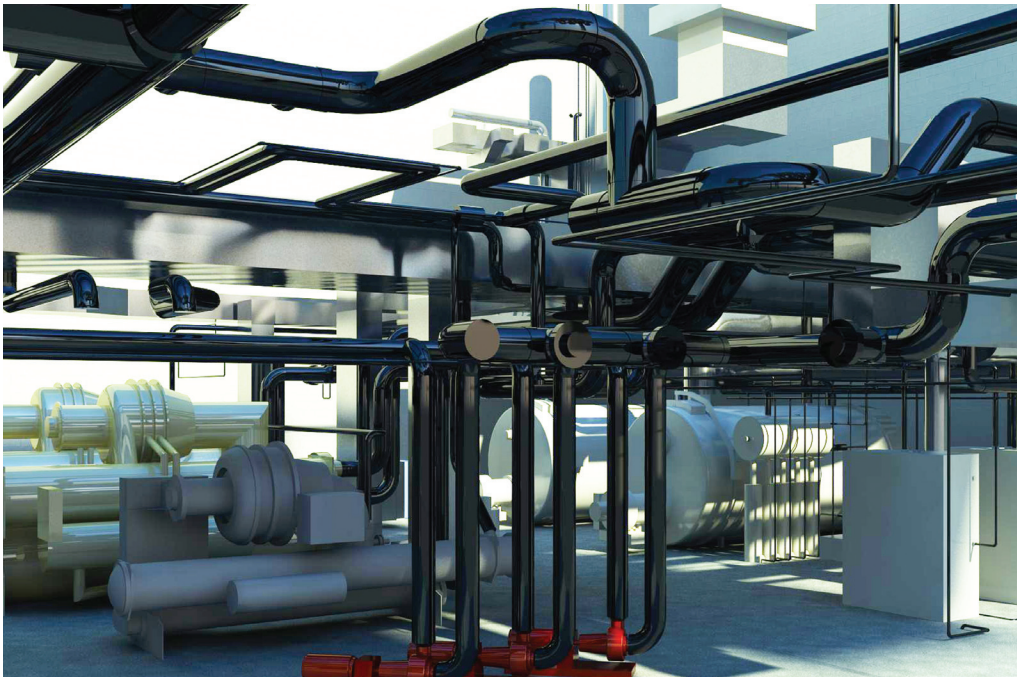
Autodesk® Revit® MEP

Autodesk Revit MEP software enables us to leverage building information modeling for various analyses and facilitates a new way of doing things—resulting in progressive design workflows and high-performance designs.

—Jay Rohkohl, PE, LEED AP
Executive Vice President
Dunham Associates

Impact building performance.

Dunham Associates turns to BIM with Autodesk® Revit® MEP software for complex building systems design.



Maple Grove Hospital, Mechanical Equipment. Courtesy of Dunham Associates.

The Firm

Founded in 1960, Minnesota-based Dunham Associates is a mechanical and electrical consulting firm, providing engineering services to its clients across the country in aviation, commercial, education, health care, hospitality, and retail sectors. With 50 LEED-accredited professionals on staff, the firm offers extensive knowledge and experience in the sustainable design of all types of facilities.

Dunham adopted building information modeling (BIM) with Autodesk Revit MEP software in 2007 to coordinate its mechanical and electrical designs, to enhance project collaboration with its architectural and structural partners, and to streamline its workflows. To date, the firm has used Revit MEP to complete five projects through design and documentation and has more than 30 mechanical, electrical, and plumbing engineers using the software.

The Challenge

One of Dunham's first BIM projects was the Maple Grove Hospital, a new 96-bed hospital located in Maple Grove, Minnesota. Dunham wanted a means to design and document the mechanical and electrical systems for the hospital, as well as all of the equipment and associated piping from the building to the equipment yard. The plans for the 300,000-square-foot facility included an emergency department, an imaging department, inpatient and outpatient surgical services, an ICU, a birthing unit, a rehab gym, as well as patient rooms, three medical/surgical wings, and one floor of shell space set aside for future inpatient rooms. The top floor of this five-level facility is a mechanical penthouse. The hospital also required a large equipment yard for electrical transformers, emergency generators, and other equipment. Like most hospital projects, the building systems of the facility were extremely complex and had to provide both flexibility and expandability for future changes and additions.

Autodesk®

Using Autodesk Revit MEP with BIM, Dunham was able to work holistically, linking mechanical, electrical, and plumbing systems with the building model.

The Solution

Revit MEP helped Dunham meet these requirements. "The software's 3D modeling environment helped our engineers visualize the design and fit all the piping, ductwork, and equipment into tight spaces," says Steve Gentilini, executive vice president for Dunham. "The BIM approach was critical for incorporating high-performance engineering strategies that maximize energy savings and ensure the comfort of those who will ultimately use this facility."

Support Project Coordination

With help from Revit MEP, Dunham coordinated its design by linking the plumbing, electrical, and HVAC models, and also by utilizing models from the architect using Autodesk® Revit® Architecture software and the structural engineer using Autodesk® Revit® Structure software. "Through this collaborative BIM process, we were able to identify and resolve interferences and other issues early in the design phase—before they impacted construction costs and schedules," says Gentilini.

Perform Energy Calculations

Using the architect's design model as a basis for performing its energy calculations, Dunham engineers extracted space and room information from the architect's model within the Revit MEP environment and then imported that information via green building extensible markup (gbXML) into a third-party software for load calculations. Airflow and load calculations for each room were posted back to the Revit MEP model as room attributes to begin equipment and ductwork sizing. This streamlined the load analysis process, and helped Dunham optimize the building systems for maximum performance and efficiency.

Enhance Documentation

"We used Revit MEP to not only guide our system design, but to also create exceptional documentation," says Gentilini. Beyond the traditional drawings, Dunham used the software to automatically create 3D isometric drawings and shaded images of highly congested areas, which were incorporated into construction documents—to more clearly communicate the engineering design to the system installation contractors and the owner.

Impact Building Performance

The best mechanical and electrical system designs work together with the building architecture, rather than being applied to it," says Jay Rohkohl, executive vice president. "BIM helps us understand how our systems fit within the building. Its holistic approach toward design enables the mechanical, electrical, and plumbing team to be involved from the beginning of the process and helps us impact early design decisions such as orientation, massing, and fenestration—features that have a huge impact on the building's mechanical and electrical systems design and ultimately its performance."

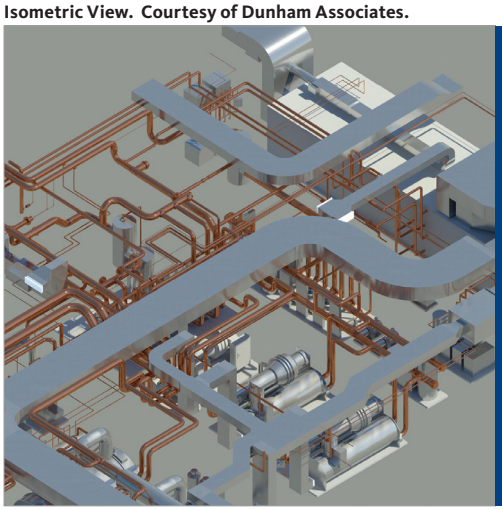
The Result

"Our firm is committed to the principles of sustainable design, which means we cannot just keep doing things the same way. We need to do new things in new ways: energy analysis, computational fluid dynamics for thermal displacement ventilation, and so on," says Rohkohl. "Revit MEP software enables us to leverage the Revit design model for various analyses, and facilitates a new way of doing things—resulting in progressive design workflows and high-performance designs."

Maple Grove Hospital. Architect: BWBR Architects. Mechanical/Electrical Engineers: Dunham Associates.

To learn more about Autodesk Revit MEP, visit **www.autodesk.com/revitmep.**

Maple Grove Hospital, Chiller/Boiler Room, Isometric View. Courtesy of Dunham Associates.



> The BIM approach was critical for incorporating high-performance engineering strategies that maximize energy savings and ensure the comfort of those who will ultimately use this facility.
>
> —Steve Gentilini
> Executive Vice President
> Dunham Associates

Autodesk®