

# Engineering

## Improving design quality and total project delivery with Building Information Modeling

Andrew Kozak



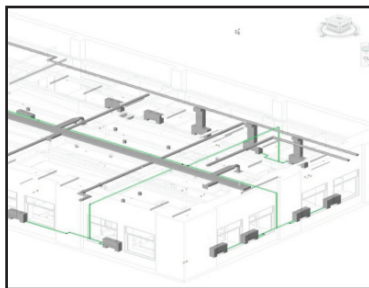
JFK&M Consulting Group

An accepted definition of Building Information Modeling (BIM) actually refers to BIM as a “process involving the generation and management of a digital representation of physical and functional characteristics of a facility. The resulting building information model becomes a shared knowledge resource to support decision-making about a facility from earliest conceptual stages, through design and construction, then through its operational life before its eventual demolition.” BIM is really a digital, three-dimensional model linked to a database of project information, in other words, a software tool. But this powerful tool provides the platform for collaboration throughout a building’s design, construction and future facility management.

The collaboration takes place among all design consultants from the beginning of a project so every aspect of the design can be coordinated whether it is architectural, structural,

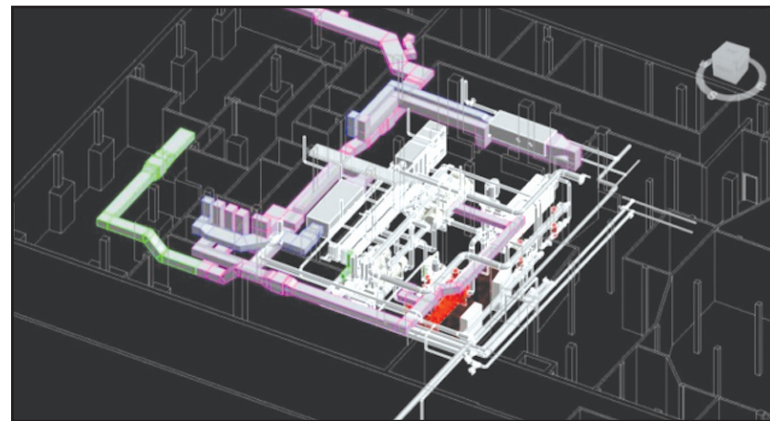
engineering, etc. Because the model is linked to a database, any change to one design is reflected throughout the model; thus, eliminating oversights and saving time changing design models and drawings. BIM can be employed on projects of any size and portions of projects. Large complex projects can involve many interconnected models. The 3-D depictions aid the owner and the entire team in visualizing the project which makes design decisions easier. It is easier to do complex design in BIM because you can document the complexity better in the drawings. Errors/clashes in design among the disciplines can be spotted and resolved easily. BIM can also be used to track LEED points. It will allow you to set up an attribute in a model; you can have models for daylighting and energy studies and also track LEED status during the design process in real time.

Moving beyond design, BIM models can facilitate materials purchasing, the bidding process, and the construction stage of the project. Fabricator models can interact with a design model to provide information for purchasing. Linking the contractor’s model to the design model can allow you to actually pre-build the project before actual construction and provide information for better staging and scheduling.



NYU Abu Dhabi regional office space

JFK&M understands the significance of quality design and completing a project efficiently. Therefore, we employ the use of BIM to manage the coordination of MEP/architectural design. JFK&M has used BIM on a number of different types of renovation and new construction projects. We provided New York University with comprehensive MEP/FP/IT engineering design services for the expansion of the administrative offices of three university departments, Stern School of Business, NYU Regional Campuses for international locations, and the History Department, located in the historic Silk Building. JFK&M used the BIM model to coordinate the new pipe and ductwork distribution with the large quantity of the existing mechanical, electrical and plumbing in the ceiling of this 1908 Italian-Renaissance-palazzo style building.



A major MEP upgrade in The Field Building, CUNY Baruch College

This model illustrates the NYU Abu Dhabi regional office space. The height restrictions and the existing piping in the 1908 building required us to use a dedicated air system for ventilation and vertical floor mounted fan coil units for cooling and heating. The model depicts the ceiling ductwork, air distribution system, existing steam lines, light fixtures, fan coil units, and the chilled water piping serving the fan coils.

Other projects where JFK&M is utilizing BIM include two healthcare clients and one major university client. One project is the new construction of a 176,000 s/f Ambulatory Surgery Building for a major healthcare institution; the second is a much smaller

project, the renovation of a laboratory in the Advanced Imaging Facility at CUNY College of Staten Island and the third example is a major MEP upgrade in The Field Building, CUNY Baruch College. These examples clearly show the level of detail of the models and it is easy to understand how BIM models improve the design quality and the delivery of the entire project.

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