nerej
CELEBRATING 55 YEARS

Improving construction with building information modeling

June 02, 2017 - Owners Developers & Managers

Advancements in design and construction technologies have revolutionized the design-build process, allowing for greater efficiency, accuracy, and cost savings than ever before. The increased value in building information modeling (BIM) is particularly noteworthy, as the technology can be implemented within every phase of a project – from conceptual, through final design, construction and on to operations. UA Builders Group, a national design-build firm headquartered in New York City, champions the use of BIM and its many applications, such as clash detection, quantity takeoff, scheduling and FM operations, among others. The firm offers an integrated project delivery approach complete with three-dimensional laser scanning, design development and construction services that include interior fit-outs, building infrastructure upgrades and ground-up construction, all of which incorporate BIM implementation and analysis.

Proper planning, coordination and execution are crucial to a project's success, and accounting for the unknown can prove challenging, especially in the customary design-build process. Traditionally, architects would design a space and provide two-dimensional construction drawings to the general contractor. The contractor then interpreted these drawings with the hope that there were no assumptions or inaccuracies. There is too much guesswork in this process, as some aspects of the project might appear a certain way in the architect's mind or in a two-dimensional design, but look markedly different when constructed.

BIM eliminates the guesswork by capturing an exact replica of the existing conditions of a space.

Benefits of the BIM Approach: BIM technology allows designers, engineers and architects to create fully detailed, three-dimensional computer models that, when implemented correctly, streamline the entire design-build process. The models created through BIM provide pricing information and add efficiency to site logistics and scheduling by helping with subcontractor coordination. They also detect major system clashes, allowing contractors to pre-emptively identify and avoid conflicts that would have otherwise delayed the schedule and been costly to fix. This is a significant contrast to the typical reactive style, where walls are built and plumbing is installed, leaving previously hidden problems to be discovered during construction, rather than before work has begun. By leveraging BIM, teams can identify problems, in a virtual setting, and resolve them before they become issues on site.

Additional benefits of BIM include:
• Increased usage of offsite fabrication (prefabrication);
•The ability to quickly share and update virtual models;

• Better appraisal of the “constructability” of a project;
• Leaner design creation; and
• An easier method of conducting a fly-through to help clients receive regulatory approvals or to sell commercial space.

BIM in the Field: For a real-world example of BIM in action, consider the process involved in surveying as-built conditions on existing building renovations. It is tremendously tedious and time-consuming. Surveyors may miss key structural components of the building, and views may be limited by physical obstructions. With BIM, architects and engineers have an accurate digital representation of actual existing conditions, with every component and system taken into account.

Building with BIM facilitates collaboration among the various trades by allowing project teams to highlight where parts of the building may wrongly intersect. For example, MEP coordination in BIM can resolve issues of duct placement and fire smoke dampers relative to the location of walls and mechanical shafts in corridors. As originally designed, an HVAC system may require extra work and materials needed for maintenance. BIM technology allows the engineer to reroute ductwork through the corridors, which achieves design intent and lessens future maintenance costs.

These models hold a tremendous amount of data, including ceiling heights, placement of beams, placement of columns and floor variances. The information can be accessed remotely and changes are updated in real time. If a new team takes over the project there will be little interruption, as everyone involved is working with the same model. Virtual model building removes much of the uncertainty that comes with construction by allowing for zero-cost simulations and analyses that avoid potential clashes, which would negatively impact schedules.

For example, designers can adjust the positioning of windows towards or away from the sun within the BIM model. Perhaps the first version of the building would have a side of the structure directly facing the afternoon sun – with this information the designers could tweak the angle of the building to compensate. Or for a smaller structure they could include tall trees in the design plans to provide some shading, in addition to slightly adjusting the building. These are the types of design flaws that are difficult to correct after construction, and in this example would require the application of tinted window films or other measures. BIM allows teams to “try out” different options without outlaying hard costs, until the optimal solution is found.

Tailored to the Client’s Needs UA Builders Group clients value workspaces that convey artistry, community support, social innovation and sustainability. The company uses BIM technology to create unique spaces that eliminate excessive construction debris, encourage resource efficiency and improve optimal air quality. Every element of a building’s materials and layout is considered, and the three-dimensional modeling provides an unparalleled level of insight and context into the look and feel of a project at its completion. BIM allows UA Builders Group to work hand-in-hand with clients to develop sustainable buildings that are also exceedingly efficient and create an environment that inspires creativity and innovation.