INTRODUCTION

Comprehensive planning is key to every successful construction project, and smart use of technology can significantly improve the planning process. One useful technology application is Building Information Modeling (BIM). BIM is a multi-dimensional digital representation of the physical and functional characteristics of a facility, which allows you to form a reliable basis for decisions during a building’s construction and life cycle. A 3D representation of a building and its components allows the user to see spatial relationships and requirements prior to construction. It’s important to work with a General Contractor that effectively utilizes BIM. Below are six key uses of BIM to ensure successful project completion and to minimize costs.

1. Preconstruction

A preliminary BIM model used by a competent contractor during preconstruction can have dramatic impacts on the potential for success. The model, if developed correctly, can be used during this early phase for constructability reviews, quantity take-offs and estimating. During the bidding process, it serves as a tool to review major scope items with subcontractors to help reduce their contingencies and obtain accurate and comparable scopes. The chart to the right shows how a design becomes more difficult to change as you get further into a project – underscoring the value of BIM and proper planning.
2. Site Logistics Planning

Logistics planning is complex and crucial to a project’s success. Milender White offers guidance on logistics planning in its June 2016 White Paper – “Top 10 Factors for Logistics Planning”. An effective BIM model will improve logistics planning and support planning during each major phase of construction. Project site conditions, staging requirements, access, and occupancy will change significantly over the course of the project and can be analyzed through BIM, as you can see below.

3. Schedule

A 3D BIM model can be enhanced to incorporate time, creating a 4D model. Tying a well-planned CPM schedule into the model can help to perfect the sequencing and detail in Short-Interval-Schedules. Regardless of their level of sophistication, when subcontractors can see the 4-week schedule in 3D, they are generally much more successful at staying organized and effectively executing in the field.

In the photo above, you can see how BIM can be used during meetings with more effectiveness than written schedules.
4. Change Order Prevention

Owners hate hearing the dreadful words ‘change order’. Well, believe it or not, general contractors and subcontractors hate uttering them! At least we do. Stoppages or re-work in the field can impair the workflow, wreak havoc on manpower planning, and potentially damage relationships between owners, architects, contractors and vendors. BIM helps us to identify drawing conflicts, missing information, and coordination issues that may otherwise result in a change order. The example above revealed a precast concrete and steel column collision. The early discovery of the conflict not only ensured the precast and steel were fabricated correctly, but also allowed for the footing and grade beam to be relocated prior to excavation. This discovery alone saved one of our owners over $100,000 plus at least 4 weeks on the schedule.

5. Prefabrication

Prefabrication has a large impact on the schedule and can also improve the quality and safety of projects. Constructing the work off-site in a controlled environment yields a higher-quality product. It also means fewer man-hours on site where workers are subjected to adverse working conditions. For example, prefabricating ductwork can reduce the time workers spend on ladders. Prefabricating wood framing can reduce on-site waste and trip hazards, and the list goes on. BIM is an integral part of successfully prefabricating components and systems of buildings. The photo on the right shows Milender White’s own prefabrication facility for wood wall panels and other building components. Below is an example of the level of detail that goes into our projects, utilizing BIM, when we prefabricate wood wall panels.
Safety is listed last, but it is most certainly not the least important factor in successful projects. While BIM can be used to create a more coordinated, faster, cost-effective and higher-quality product – it also creates a safer project. A well planned design, performed on an organized site, with coordinated trades and minimal re-work is the best way to create a safe working environment and reduce risks. Effective use of BIM helps us all to get there.

The photo on the left shows how safety is improved by utilizing prefabricated framing from Milender White’s prefabrication facility and strict protocols at Milender White’s Kestrel multi-key project in Louisville, CO.
CONCLUSION

Technology is an important tool but only if used effectively. Milender White has been using BIM effectively at a high level for the past five years to maximize our understanding of the unique factors of each project and to complete construction on schedule and within budget. Ultimately, a General Contractor that has the experience and ability to effectively utilize a BIM model will make the entire team function at a higher level on all fronts.

MW employs BIM in all phases of project development, from preconstruction through operations and maintenance. We use advanced software applications to facilitate identification of each building system and components as a multi-dimensional object, and we collaborate with the design team to ensure that we have the best plan for every detail of the project, to identify conflicts and correct them prior to construction, reducing RFIs and minimizing costly field retrofits and potential change orders. Milender White would like the opportunity to discuss with you how to best utilize BIM on your next project.

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