6 BIM FAILURES

Plus 3 ways Basepin helps you avoid your own catastrophes

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The design is complete, contracts are written, the project team is assembled and ready to build. Optimism is at its peak!

To meet the owner’s performance requirements and complete the project on time within the budget, construction field crews will need spatially coordinated installation drawings.

The use of BIM for spatial coordination is a vital link in the construction project supply chain, where the building is created in the virtual world and software is used to find and resolve cross-system conflicts that would otherwise impact the construction team. When the BIM link fails it allows undiscovered design conflicts to shutdown field work, which leads to delays, dissention, disputes, added costs and claims.

The following Basepin experiences help us understand and take action to prevent 6 common causes for BIM failures.
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Non-Participating Team Members

BIM spatial coordination depends on modeling all building systems. Clash analysis cannot see problems where 3D elements are missing so when one or more participants fail to provide 3D content it impacts the entire team.

When starting a new state police crime lab project one subcontractor decides to save money by not modeling their piping systems. As required by the BIM Execution Plan they sign coordination documents noted with “sub did not participate”. Their crews arrive in the field with pre-fabricated systems to start installing but are put on hold by the GC. Their strategy to move if they block other trades is rejected by the GC and they are required to wait until others finish and then to fit their systems into available space. The GC and other subs proceeded to install without conflicts. The non-participating sub absorbed field modification costs exceeding 4 times the money saved by not doing 3D modeling.

Piping content was not provided by the subcontractor resulting in hundreds of un-discovered clashes with other systems.
Lack of BIM Content

BIM spatial coordination depends on modeling all building systems accurately in terms of size, location, and orientation. When systems are modeled conceptually instead of as real-world content it impacts the entire project.

The MEP design model provided at 100% CD lacked piping insulation. The mechanical contractor modeled pipe with insulation which increased vertical spatial requirements by 14”. To avoid conflicts in tight corridors piping systems were forced below the ceiling. Ceilings were lowered to accommodate mechanical but adequate space was not available for electrical conduits. This exposed a non-buildable design. On the first level electrical feeders were moved to below grade incurring added costs and delays. The problem persisted on upper levels which caused additional disputes and claims. The design team and GC were unable to negotiate solutions which led to the owner terminating the GC and forcing the bonding company take over the project. The project is headed toward litigation.

Pipe insulation was lacking in the design model. Adding it to the federated model added 14” of vertical spatial requirements for mechanical pipe revealing a non-buildable design. The project went to litigation.
Creating a “perfect” model does not guarantee a good BIM result if parts of the model are inaccurate.

A media center shell and core steel model used for tenant improvement design had parallel flange roof beams. The beams sloped upward to the peak allowing room for MEPF systems to be installed above the ceiling. The BIM coordination team completed a clash free federated model ahead of construction. Demolition of the ceilings revealed an actual condition of horizontal bottom flanges. The BIM team created an as-built structural model that revealed MEPF clashes throughout the entire upper level. This required added clash coordination and field modifications to the steel structure. The GC and subs submitted change orders for delays and added work that were paid by the owner.
Clash reports cannot help the team if they are ignored.

The shoring model for a mixed use commercial project reported clashes between tie-backs and the city sanitary sewer system. The GC superintendent signed off with “the field will expose and verify sewer pipe locations”. To save time and cost the exploration was not completed and tie-back drilling went through the sewer. Grout was pumped into the city main where it hardened and blocked flow deep below city streets. Significant costs and delays were incurred by the GC to replace the city main.
Late Arriving BIM Content

Time critical information such as approved submittals is needed to produce accurate models. When design decisions or approvals are delayed the BIM team may have to proceed with shop drawings using preliminary information. In this case it is prudent to document these facts should related problems ensue during construction.

A high-rise courthouse had 18 floors with exposed concrete decks heated with in-slab pex piping. Each deck had a kiosk directory bolted to the slab. Locations for the kiosks were not approved until after the decks were poured. Drilled in anchors placed by field crews penetrated pex piping on nearly every floor. The decks were saw cut to expose and repair heating pipe and then re-poured. The GC and subs submitted change orders for delays and added work that were paid by the owner.
BIM Solutions Not Transferred to Field Drawings

Once the BIM team has created the “perfect” model their work is not done. They must use the model to develop fully coordinated field installation drawings. If a disconnect happens at this point the money spent on BIM is wasted and field crews are left to discover the conflicts. It becomes everyone for themselves and traditional change order systems are wielded to recover costs. If the owner paid for a well written BIM Execution Plan, then the construction team is responsible to make it right. If the BEP doesn’t exist or is poorly written all parties are exposed to risk and potential disputes and claims.

The sprinkler contractor modeled and coordinated a 3 story science building 100% clash free. The shop fabricated pipe and they began field installation. Within a couple of days, their superintendent approached the GC claiming “other trades are hitting 40% of my pipe!” Investigation showed that jobsite crews were working with non-coordinated permit set drawings. An interview with the modeler revealed that there was no internal communication between BIM and the field group. When asked why they had gone to the expense of 3D modeling they answered “it was a contractual requirement”. The sprinkler model was produced as required by contract but clash free routing was not used to update the field construction drawings. The sub bore all costs for field modifications.
BIM technology is a great advantage when used effectively.
Here are 3 ways that Basepin Solutions can create BIM success:
Enable the BIM Team to Create a Collaborative Culture
By bringing project participants into one central system, ideas and solutions are shared, and all participants bring valuable knowledge and expertise to the benefit of all.

Basepin’s approach is simple yet powerful.

3 Cultures 1 Team

Basepin methodology and technology empowers owners, designers and contractors to become the project team. Coming together contractually and technologically helps the team focus on collaboration and success. Basepin project teams work within an integrated Building Information Management System designed to manage shared digital information and participant workflow.
Use BIM to Support Jobsite Claim Resolution

With the use of BIM geometric space is reserved for each trade system installation as agreed upon through a signature Superplot process. Project participants are protected against any contractors whom deviate from the agreed upon space, or do not participate fully, resulting in a BIM Failure.

Basepin keeps everyone on track.

Rules and Tools

Collaborate with the owner, architect and contractor to develop project centric agreements that clearly spell out the roles, responsibilities, and deliverables for all participants of the BIM coordination team. Replace traditional inefficient paper based change management systems with BIM friendly rules such as AIA E203 G201 Digital Data and G202 BIM protocols.
Drive BIM Success Outcomes
BIM is a powerful tool with the potential to revolutionize how buildings are built. When things do not go as expected we can learn and make changes to future projects. Basepin’s approach is to look at all factors and continually improve the process. These are the core principles that have been implemented on the most successful projects:

Basepin is retooling the industry.

Use BIM tools to verify that the design can be built spatially prior to procurement of construction contracts. Doing BIM while building will not get rid of all impacts to the schedule and may still increase costs since contract sums have been set.

Various solutions can be used to support this goal such as:
• production of a fully coordinated design model
• design team assist support from BIM capable MEPF contractors
• blended design team of plan and spec consultants and design-build contractors
Let us know how we can help meet your requirements!

Contact us to discuss your project needs or get a quote.

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