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Risk Management of Building Information Modeling (BIM)

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For those unfamiliar, BIM is a powerful, digital 3D modeling tool used to plan, design, engineer, collaborate and develop construction information for a given project. BIM can provide and optimize architecture, structural, construction, process, MEP (Mechanical, Electrical, Plumbing) and civil design efforts prior to construction to minimize defects. BIM can also be used for project scheduling, tracking, costing and project maintenance tasks. Some common BIM packages include Navisworks, AutoCAD MEP, Revit, Autodesk BIM 360, Vectorworks and SmartPlant3D etc.

It's safe to say that Building Information Modeling, or BIM, is a great tool when used correctly. It is equally important to note that BIM, when used ***incorrectly***,

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can be a leading contributor to engineering and construction defects and delays. A typical defect in a BIM model is the erroneous locating of structural steel and piping in the same location causing a “clash” between the two elements. Some fundamental ways to mitigate BIM error risk are discussed below.

BIM Construction Defects

BIM errors have been found centric to numerous construction and engineering standard of care defects which in turn cause construction delays, increased project schedules and COST. In many cases, a false sense of security arises from the fact that a BIM is being used with a given project, where assumptions regarding the completeness and accuracy of the BIM are skewed.

While said BIM issues and defects are fairly common, it is reassuring to know that there are fundamental risk management methods which can significantly mitigate BIM risk, as discussed below:

BIM Project Management: Strong management of the BIM process provides the governance needed for success in any engineering and construction project. Make this first priority! Good leadership will quickly understand ***the project BIM is a key aspect of the project*** and will ensure the items discussed below are prioritized.

Training BIM Users: BIM training for designers and engineers should be considered ***paramount*** for any project as BIM errors can quickly propagate through the model, compounding defects and impact. BIM training should include classroom/book training as well as real world project experience for BIM designers and engineers.

BIM Model Expert Review: It is paramount that a review and analysis of the BIM model be performed by bona-fide expert(s) to ensure the project team thoroughly ***understands the BIM and project***. This is especially important if BIM models are passed or “handed-off” between parties in the course of a project. This passage may be between differing design firms or owners, bidders and constructors etc. An

improper handoff of the BIM can be the “**Achilles Heel**” of a project!

Communication Between Project Team(s)

Information sharing is key on any project, ***and especially important regarding BIM***. This results from the sheer magnitude and complexity of BIM models which may contain millions of elements, components and systems. The more information sharing between project groups, the better.

As an example, piping changes in the BIM made by a mechanical or Mechanical – Electrical – Plumbing (MEP) engineer should be ***clearly communicated*** to the broader project team such as project management, civil, structural, electrical and process designers etc. This is important as these various project designers can review changes impacting his/her area of responsibility relevant to the project. Resulting BIM issues can then be resolved collectively, avoiding unknown model errors which quickly lead to compounding defects, delays and costs. Unknown BIM errors are the “**Archenemy**” of any project.

Management of Change (MOC) for BIM

Management of Change (MOC) is an important concept regarding engineering, construction and operation of commercial and industrial facilities. Good, and I stress “**Good**,” engineers, project managers and facility operators know this from real world experience. MOC is a systematic method used to manage change, such as organizational, design, engineering, and personnel changes. In the instance of BIM on a construction project, MOC protocols regarding BIM changes are necessary so changes can be processed appropriately and “**Managed**”. The first part of the MOC process is to *know that you need an MOC process*, and to implement and manage the MOC process using a qualified MOC resource.

Summary

In review of many BIM issues and construction defects and construction claims, it is clear that the use of BIM risk management protocols can significantly reduce engineering and construction defects on relevant projects. **Don't be in the dark on project BIM!**

