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BIM — What Is It and Is It Right for My Company?

Introduction

Building Information Modeling, or BIM, is becoming a standard requirement in project specifications. BIM is a three-dimensional design and construction model for coordinating trades and providing information about the equipment and systems in the model. BIM can be very complicated or it can be reasonably simple. BIM requirements are often defined in the bid or contract documents and are rarely the same for every customer or project.

While BIM presents an additional cost to any project, it can also provide real benefits. Once a company invests in the people and software required to provide 3D drawings for a project, it must look at the whole project and its delivery methods to see the total value in BIM.

If you decide to invest in this technology, you need to understand how it can save money for you as a mechanical contractor.

Making the Investment Pay Off

To reap the greatest benefit from BIM technology, you must look at how to integrate the available software products with your company's fabrication equipment and your piping and sheetmetal installation methods. There are many programs on the market that will fit the needs of various companies. Many models are being drawn in Revit, which for the mechanical contractor may not have sufficient libraries of piping and sheetmetal components that would help us with fabrication designs. There are some additional third-party software programs that can be used to convert a Revit model into a spec-driven, trade-specific model that can be changed and coordinated with all the other trades to allow you to make fabrication drawings from your 3D model.

When you use these third-party programs, you can design a specified piping model with all of the actual dimensions of the pipe, fittings and valves as well as hangers for your system. You can also coordinate and run the model with other software programs to do clash detection with the other trades.

Taking the Lead Early

It is generally a good idea for the mechanical contractor to take the lead on the 3D coordination effort, since the mechanical generally has the largest equipment and services above the ceilings and in mechanical rooms.

The BIM coordination starts early in the construction process, many months before the trades are onsite, in most cases. The team must decide where the coordination will start as it coincides with the project schedule. Equipment decisions must be made and drawings must be based on the

final purchased items. Once you have areas that are fully coordinated, having sign-off from the other trades is important so that you can use these drawings for prefabrication of hangers, pipe and sheetmetal for the coordinated areas.

To get the greatest efficiency from these efforts, the use of a robotic total station laser or other similar products for locating all of your hangers and equipment corners will save you a lot of time and money. In most cases, it can keep your crews from working off of lifts or ladders while locating all of your hangers from the floor or roof above and using inserts when applicable. Installing your projects in this manner can save a lot of time and reduce unsafe practices of drilling overhead from ladders or manlifts. With BIM and preplanning, seismic cables and inserts can also be included on your drawings which will save you from doing this at a later time.

Using the 3D model for coordination to prefab as much as possible adds to the quality and speed of construction, and yields a better final product. The model will also reduce the jobsite manpower and weather-related slowdowns. Performing the majority of this work in a shop environment with heat, ventilation and fabrication equipment before it is needed on the job will keep you from getting covered up by other trades.

The coordinated model will also help you evaluate such elements as prefabricating building risers, pump skids, coil connection modules, steam pressure-reducing modules and ductwork assemblies.

Using your coordinated model to make your prefab assemblies, you will see the most benefit from this technology.

Getting Started

If this technology is new to you, begin by reading *Achieving Spatial Coordination through BIM—A Guide for Specialty Contractors* by David E Quigley. This publication, developed jointly by MCAA, NECA and SMACNA, is available through MCAA.

Once you have made the decision to build your projects this way, you will need to get all of your project personnel on the same page. Project management, estimating, purchasing, pipe designers, fab shop managers, foremen and tradesmen all need to be brought together to understand how the technology will be implemented for your company.

Finding the right software and setting up your piping and sheetmetal standards for BIM is the first step. Training your designers to draw using the methods you use in the field and working with your installers will help minimize mistakes when fabricating from the drawings.

Getting this to work is a collaborative effort within the company, and its success depends on all parties' input. When this effort comes together and is successful, the entire company will benefit. Seeing how this technology improves field installation and keeps your job on schedule improves morale and customer satisfaction. It will take an investment in time and dollars to get the full benefit from this technology.

So if one of your next projects requires BIM coordination and you can implement it to the level of shop fabrication and hanger layout, you will see that although BIM adds costs to the front end of the project, it cuts costs in the field and in overall construction.

Conclusion

To be competitive in large projects, most companies will have to embrace BIM technology. If they want to be profitable on these projects, they will need to take it to the level of fabrication. Companies will have to decide to invest in this technology based on the type of projects that they pursue.

