

## **Unique Challenges for MEP Design Teams in the BIM Process**

The MEP design team faces many challenges during the BIM design process. There are challenges to integrate the MEP model into the construction and building operation phases. We will discuss the following topics:

- Understanding the importance of MEP systems space allocation in early design using BIMs.
- Spatial coordination requirements of MEP equipment and systems in BIMs.
- Schematic representations vs. fully modeled systems in BIMs.
- LOD 350
- Persistence of MEP meta-data beyond the design phase

We will discuss these topics along with showing images that will help to convey the message.

### **Understanding the importance of MEP systems space allocations in early design using BIMs:**

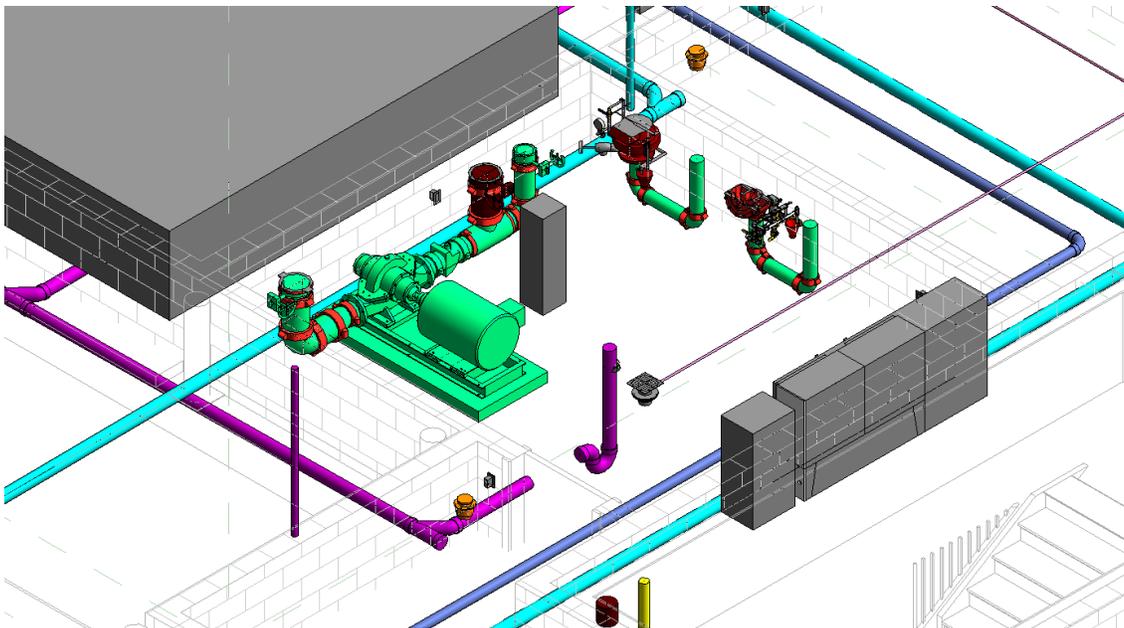
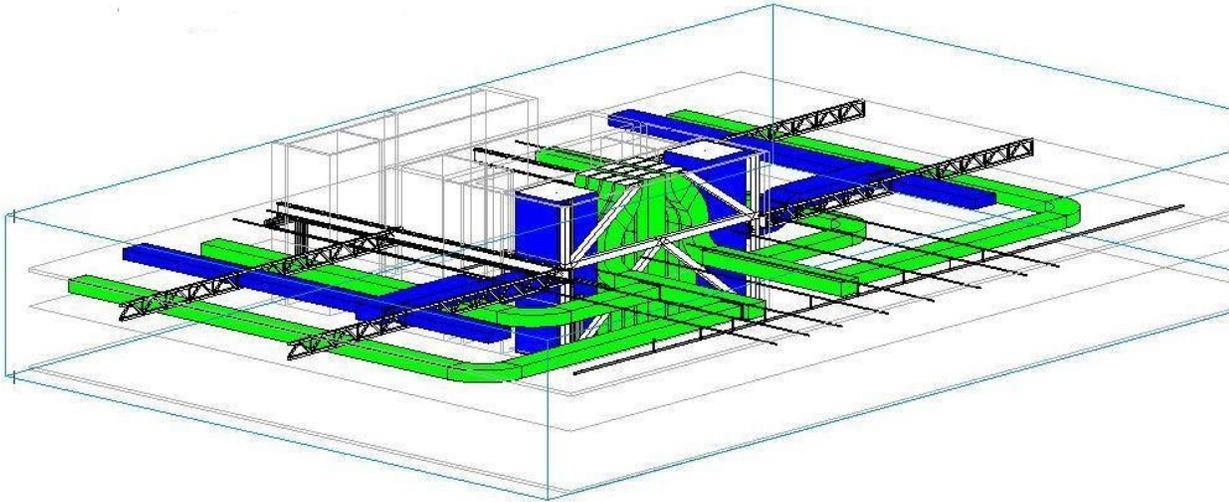
If the MEP engineers are given an accurate model from the architect early in the design process, they will be able to right-size the equipment. Most engineers will add 10%-25% onto their load calculations to ensure that the equipment will be able to cover any changes that occur during the design process. If the owner and architect can agree on things early in the design process, the engineer can use the equipment that will handle the load. The result of this will leave more space for the owner to use to make money because the mechanical and electrical rooms will be smaller. This extra space is now a source of revenue for the owner. This is an example of how the proper use of BIM will have benefits for everyone on the team, including the owner. A happy owner is more likely to use an engineering firm in the future if we are able to show that we helped increase their profits.

Another benefit to making decisions early in the design process is to make changes during the design phase instead of in the field. This can be a huge cost savings to the owner. For example, if changes were made in the design during construction that had an impact that added beam penetrations. If there are too many beam penetrations, the structural engineer would have to update the load calculations. The new calculations could call for more beams added to the project. This would cost money plus there may be more costs incurred because the design team may need to do more coordination work. Making these changes before construction can save money, time, and effort for the entire design team including the owner. This is becoming a cultural change in the design process during the construction industry today.

### **Spatial coordination requirements of MEP equipment and systems in BIMs:**

As we have discussed, unused space equates to more potential money for the owner. Therefore, the space above the ceiling is always going to be an area where every inch is fought over by the design teams. For the MEP team, the mechanical engineer usually the first to place equipment, ducts, and

pipes. Since the mechanical pieces are the largest of the MEP components, they need to be placed first. The other engineers will need to work around the mechanical engineer in most cases. One case where this is helpful would be to take ownership of a space during design. If the mechanical engineer can claim shaft space during design, the structural engineer can design around this.





### Schematic representations vs. fully modeled systems in BIMs:

Since the BIM models can become very large during the design process, engineers will make an effort to keep the models as small as possible. Not everything needs to be modeled. Just because you can model something doesn't mean you should model it. Sinks and toilets are not piped in the model. These were never piped in 2D CAD files, so there is no reason to start now. We can show this in a detail.

