# AUTODESK UNIVERSITY

BES500087

# Using Revit as a Single Source of Truth for MEP Engineering and Install

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### Learning Objectives

- Discover a single workflow for projects that integrate design for permit and design for install
- Learn how to create a single Revit model that can efficiently accomplish engineers' and installers' design goals with reduced rework
- Discover opportunities for prefabrication and kitting using modeled Revit data
- Learn how to assess informational needs from all design parties to avoid bloated Revit models

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## Description

This class will demonstrate how using a Revit model as a single source of information for MEP (mechanical, electrical, and plumbing) engineering design, installation detailing, and fabrication data can reduce rework, increase accuracy of the model, and improve workflow efficiency of the entire design process. The class will be demonstrated from the point of view of electrical systems, but the lessons can be applied to other trades as well. Challenges this class will address include the following:
1) How to create Revit families that address the needs of all involved in the project (engineers, installers, owners, fabricators, other trades), and how to make them easy to understand and use.
2) How to maintain a balance of enough information to accomplish design goals but not add too much information that model performance is slowed or undue burden is placed on the designers.
3) How to identify opportunities for kitting and assemblies by using modeled data in Revit software. We'll also cover strategies for an iterative design workflow between engineers and installers.

## Speaker(s)

Cody Richardson is an Electrical Engineer employed at KLH Engineers. His focus has been working in construction in the retail market. Recently he has been focusing on more design for installation projects. In those projects he has been working directly with contractors, improving the workflow between engineer and contractors.

## Improve the handoff from engineers to contractors

Our goal is to reduce waste between contractors and engineers. Engineers are sitting on a lot of information after their work is done that contractors could use in their bid tabulation, install drawings, procurement, and other tasks. Likewise, because engineers aren't always concerned with installation level of detail, a lot of the work an engineer has completed must be redone by the contractor. How can we reduce this waste? Work together in the same Revit model, using it as a Single Source of Truth.

## Say it once, and say it right

To deal with the inevitable changes that happen in the lifetime of any project, keep information in a single place. If you ever need to change it, you only have to change it in one spot. Having multiple sources of information can lead to inconsistency and therefore confusion. Between engineers and contractors information is often replicated. Having a *single source of truth* (SSOT) between both parties can alleviate a lot of the confusion in the construction process.

Most projects will see some changes once the engineer is "done" with the design. If the contractor has gone through their own design, now two parties must react to these changes, independently. Two parties are performing the same task, sometimes coming up with different results. It's wasteful and can be avoided with a *single source of truth*.

## The single source of truth process in Revit

Use the project team to their strengths. We already have plenty of people in the industry that are experts in engineering or installation, so allow them to apply their knowledge. Get engineering and installation designers working together in the same Revit model, influencing each other's designs, and using the same Revit families to accomplish their goals.

Each decision an installation or engineering designer makes should immediately affect the other's work. It's a communication process. If the engineer needs to change the size of equipment based on their calculations, they can do so in the model and now the installer can react to that change and adjust the installation accessories around the equipment. It's an iterative process that can end with a better design than each party working in their own silo.

## Tips for using Revit as a single source of truth

- Assess informational needs from all parties before beginning work. Add too much information and you'll slow down the Revit model unnecessarily. Add too little and now you're going to other sources for that information, defeating the purpose of a SSOT.
- Use a single family for each object in the model. There is no reason to place one family for the engineer's needs and a different family representing the same equipment for the installer's needs.
- Put up-front time into establishing good model standards (view templates, worksets, families, model settings, etc) before commencing work. Separating permit information from install information is necessary in this process since it's all contained in the same model.
- Utilize good model managers for these types of projects. You'll want Revit savvy individuals establishing standards and alleviating issues between the different parties working in the model.
- Have members of the team that are capable of effectively creating Revit families for these processes. Out-of-the-box families from manufacturers or BIM libraries likely won't cut it when addressing the needs of both contractors and engineers.
- Be intentional about what you put in a family. The more complex the geometry and the more parametric the family is, the slower it will make the model. Only put in details and options that are necessary for your project.
- When making families, focus on limiting clicks for the designer. The more decisions you can hard code into the family, the better.

## Design is done, now what?

- Use the Revit model as your reference when searching for information about the project. It is the single source of truth!
- Export bills of materials for bid tabulations and procurement.
- Use Revit's spaces and schedules for kitting and planning on-site logistics.
- Identify opportunities for pre-construction assemblies and manufacturing using data from modeled families.
- Update the model with as-built information.
- Utilize the Revit model for asset management.
- Engage with those upstream and downstream of you in the construction process and determine how your data can alleviate their problems. Form partnerships and share the model with them!