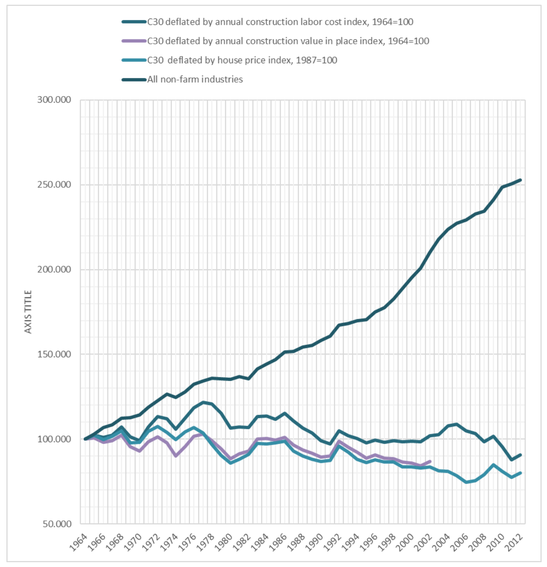
Workflow for Modeling Prefabricated Building Assemblies in Autodesk Revit

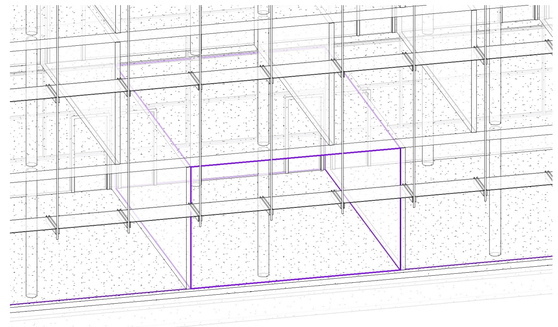
Index of Construction Labor Productivity, 1964-2012



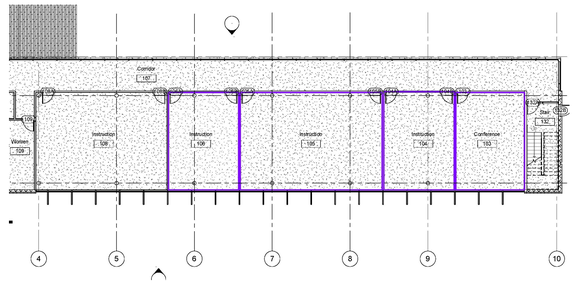
Source: Census Bureau, BLS

In 2008, by request of the National Institute of Standards and Technology (NIST), the National Research Council (NRC) put together a committee of experts to advise a plan that would advance the "competitiveness and productivity of U.S. construction industry in the next 20 years." Two of those recommendations included the widespread deployment of building information modeling (BIM) and greater use of prefabrication, preassembly, modularization, and off-site fabrication techniques. Case studies overwhelming report faster project delivery, improved quality, and safer working conditions. However, current data indicates that labor productivity has still been significantly lacking, perhaps showing that investment and research in this area has been slow to develop. Barriers include lack of cooperation among teams, late design changes, and other coordination issues. This project addresses these barriers as a practical problem presented by two case studies and provides a flexible solution to both design issues with a plugin to the collaboration tool, Autodesk Revit©. The result is a tool that can detect opportunities to parse projects into instanced modules for more consistent design application, encouraging standardization in building components and an environment where implementing prefabrication techniques become more feasible.

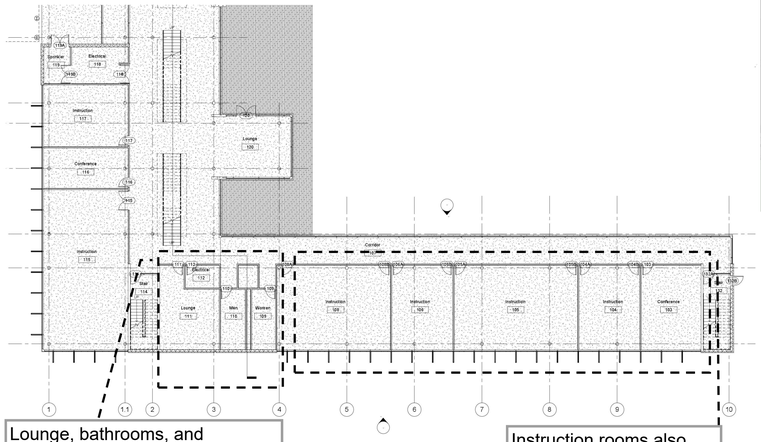
Keywords: Modular Construction, Revit, BIM, Prefabrication



Instanced conceptual mass of instruction rooms to be replicated throughout corridor.

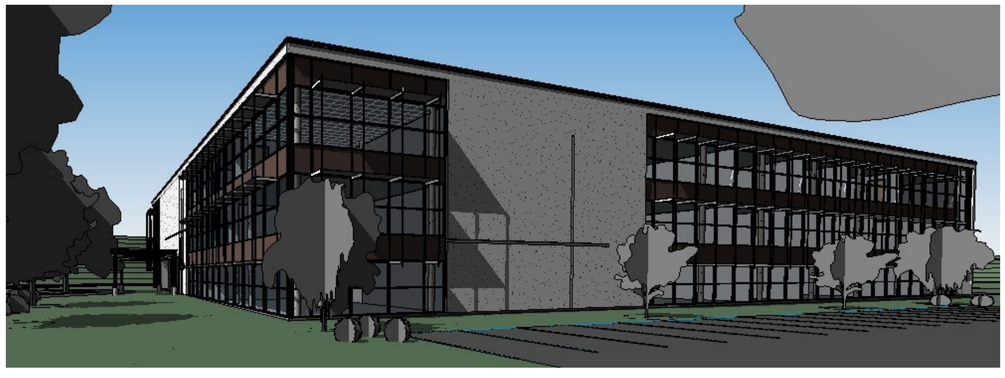


Instantly selects similar selects rooms based on user inserted criteria. In this case: room ID and square footage. Possible criteria include wall type, hosted elements, graphic setting, etc.



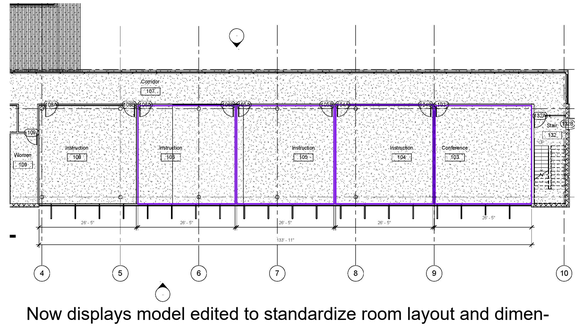
Lounge, bathrooms, and electrical room repeat on all 3 floors and provides opportunity to create assembly of each.

Instruction rooms also provide opportunity for modulation



The project used to demonstrate the Revit © plugin is a sample elementary school provided by the Autodesk community.

- **Revit 2017 was used as base program**
- **Revit API was used to host plugin**
- **Iron Python was used to compile code**



Now displays model edited to standardize room layout and dimensions for modulation. Rooms are also instanced; any element hosted to the original room will be copied to others.

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