Model-Based Earned Value Tracking

CJ Best, McKinstry Co, LLC

Gary Mashburn, McKinstry Co, LLC

for Keeping Projects on Budget and Schedule

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McKinstry
For The Life Of Your Building

About the speakers

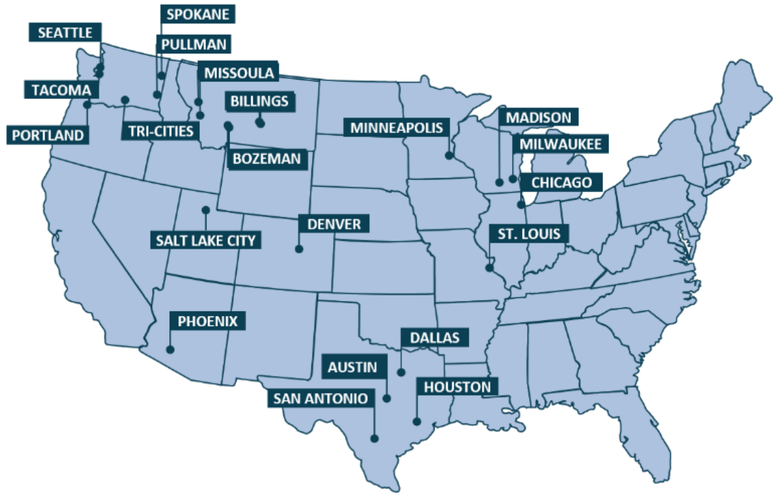
CJ Best, Director of Manufacturing

CJ currently serves as McKinstry's Director of Manufacturing. He oversees operations of the detailing and fabrication teams across the Pacific Northwest. CJ's leadership experience and technical acumen allows him to leverage Building Information Modeling software to increase the percentage of value-added activities throughout McKinstry's manufacturing team. Over 6 years of experience in the MEP industry.

Gary Mashburn, Project Director

Gary currently serves as a Project Director in McKinstry's Portland, Oregon office. Gary is responsible for overall project oversight, reviewing budgets, schedules and logistics plans, interfacing with project team members, providing milestone updates, and supporting the construction team. Over 25 years of experience in the construction industry.

About McKinstry



- Founded in 1960
- National leader in designing, constructing, operating and managing high-performing facilities.
- 2,100+ employees, including 165+ licensed PEs
- Partnership mentality focused on customer successes
- Single point of accountability for the life of your building

McKinstry
For The Life Of Your Building

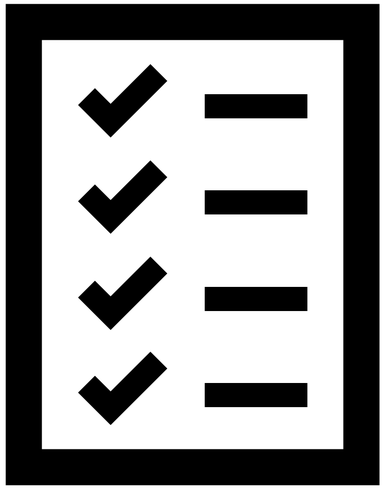
50+ Years
Experience

21
Office Locations

Seattle
Headquarters

Learning Objectives

1. Using assemble to track installation progress
2. Sort and filter data by installation status and activity id to see quantities installed
3. Benefits of tracking earned value through a 3d model instead of 2d solutions
4. Utilize BIM meta data for construction management



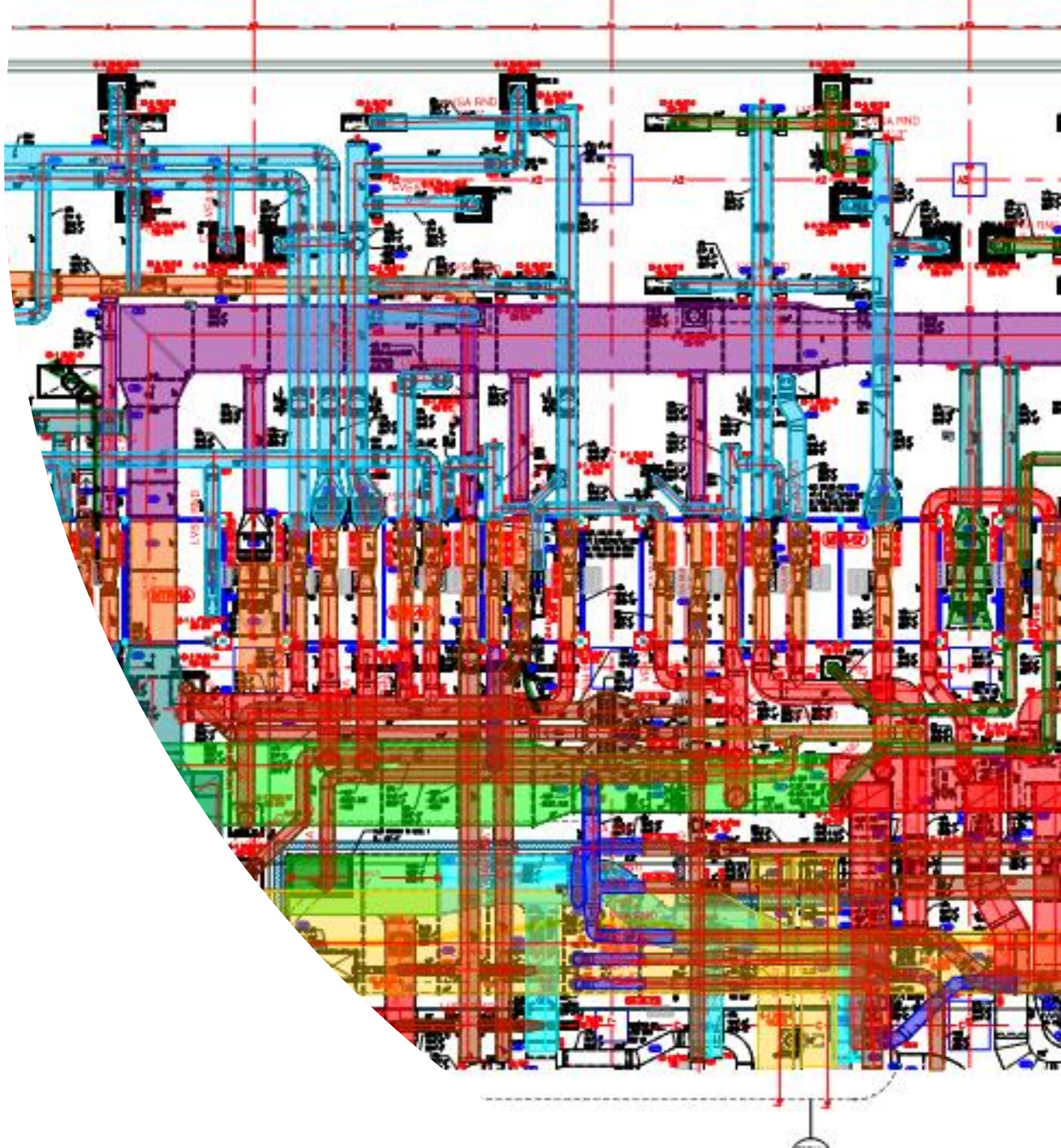
Agenda

- 2D Method
- 3D Assemble Workflow
- Overall Benefits

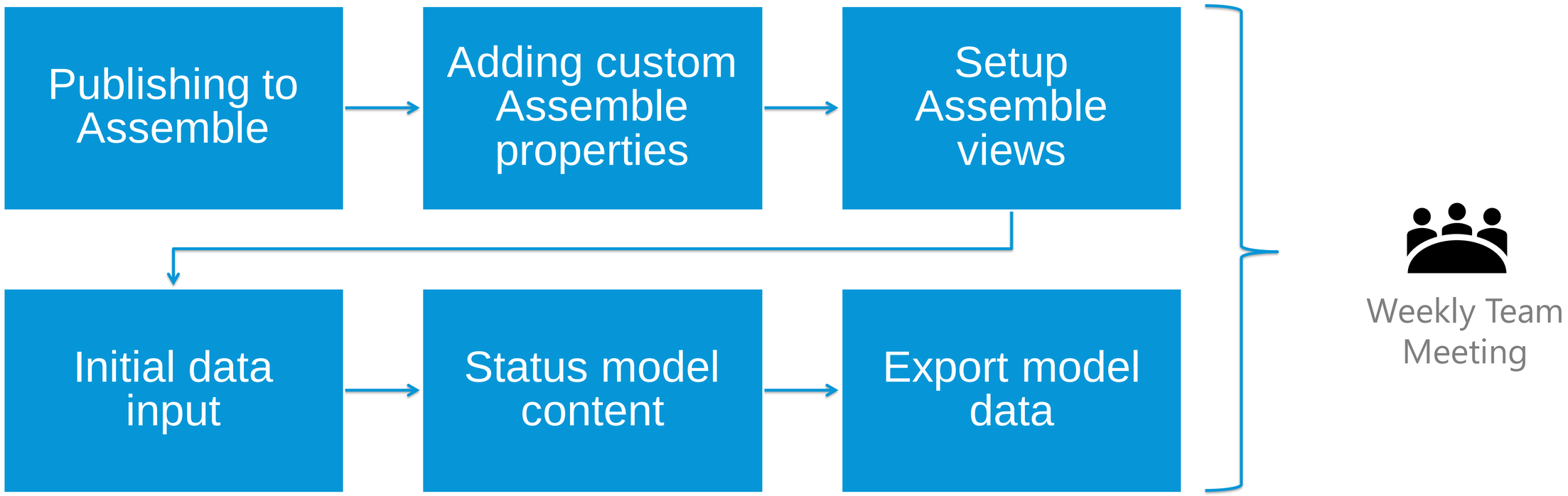
2D Earned Value Process

- Time consuming
- Inaccurate
- Challenging on complex buildings
- Unable to compare to budget

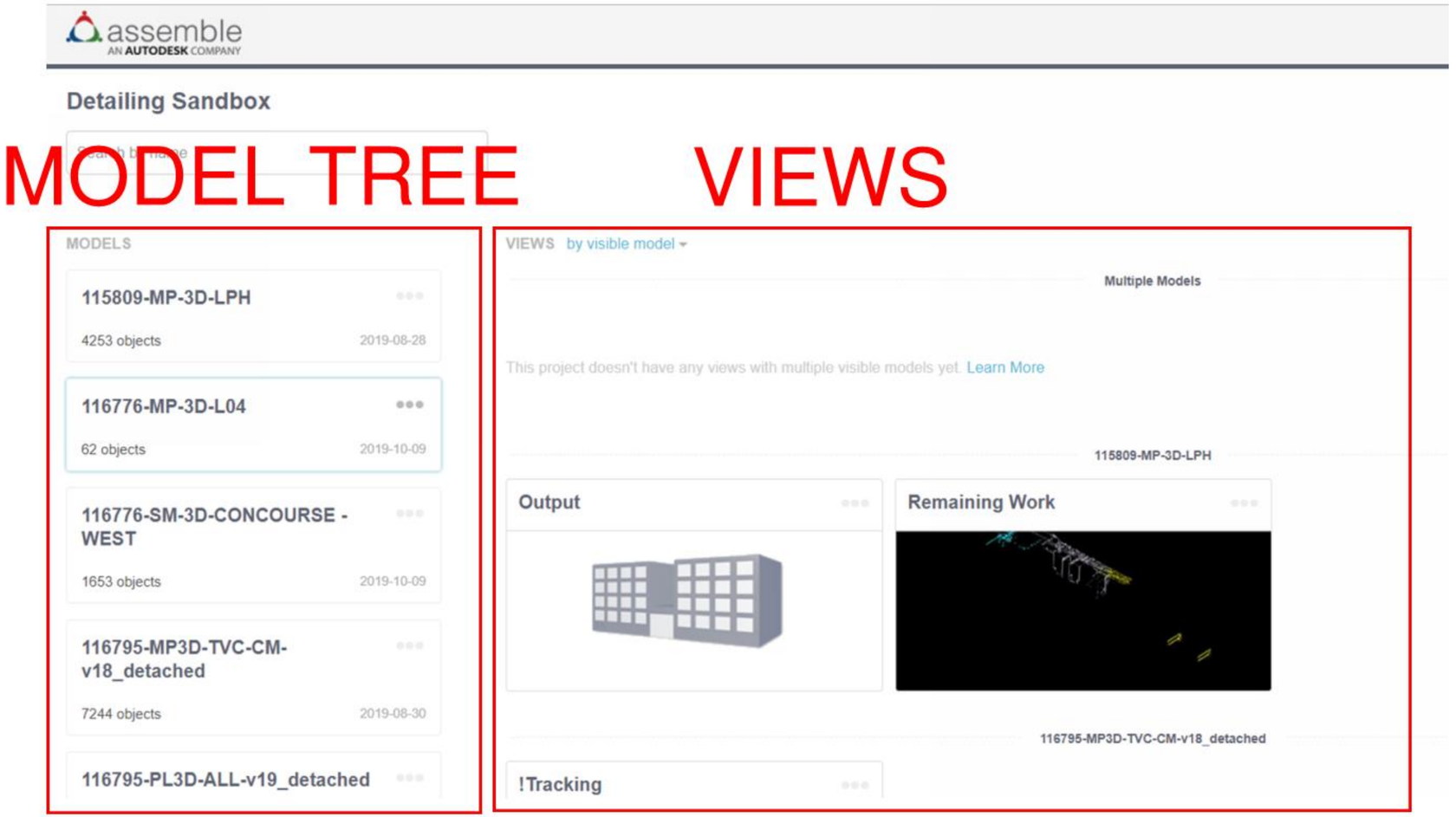
$$\text{Productivity } EV = \frac{\left(\frac{Lbs.Installed}{Total\ Lbs.}\right) * \text{Budget Hours}}{\text{Actual Hours}}$$



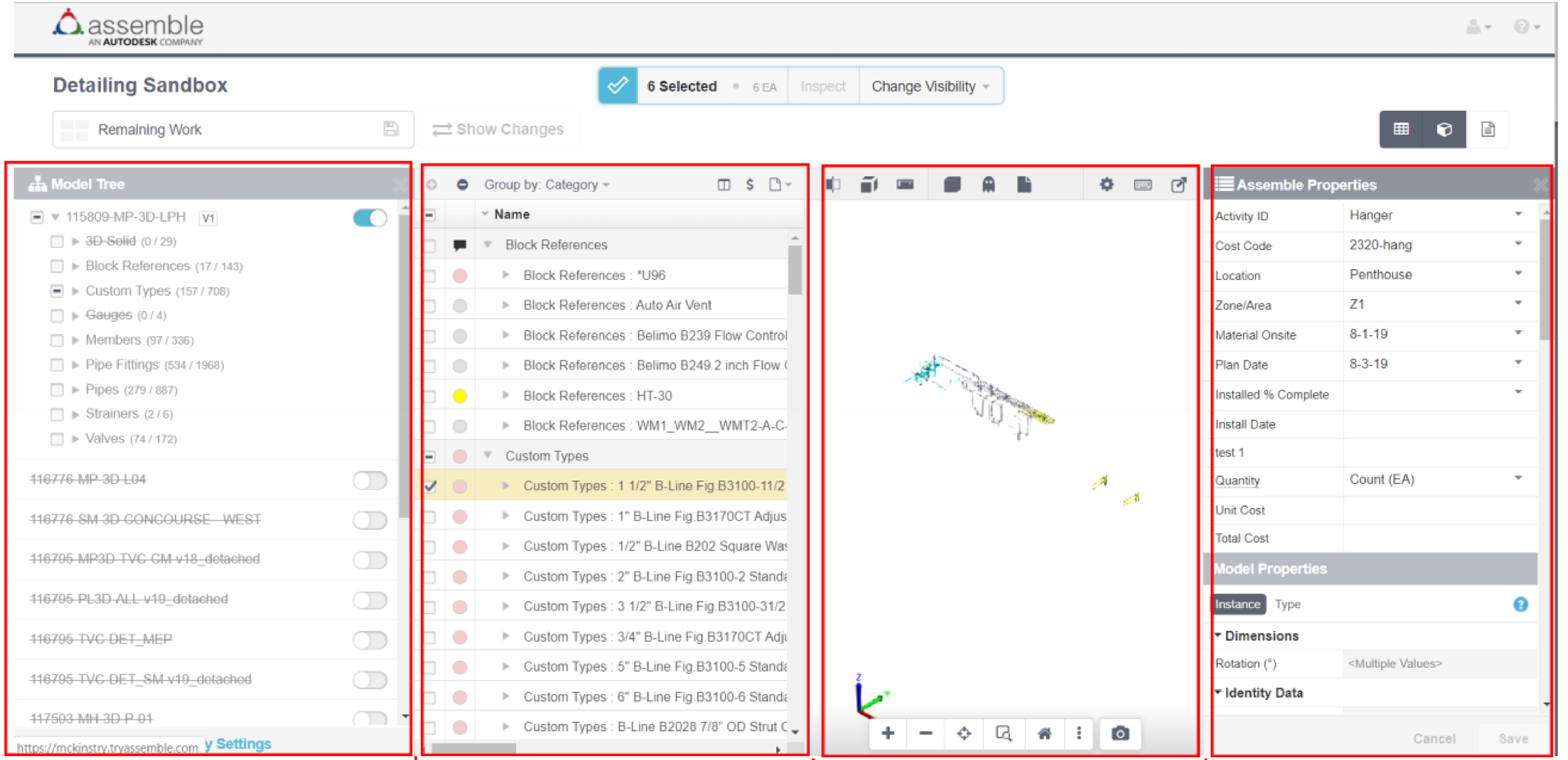
Assemble Workflow



Assemble User Interface

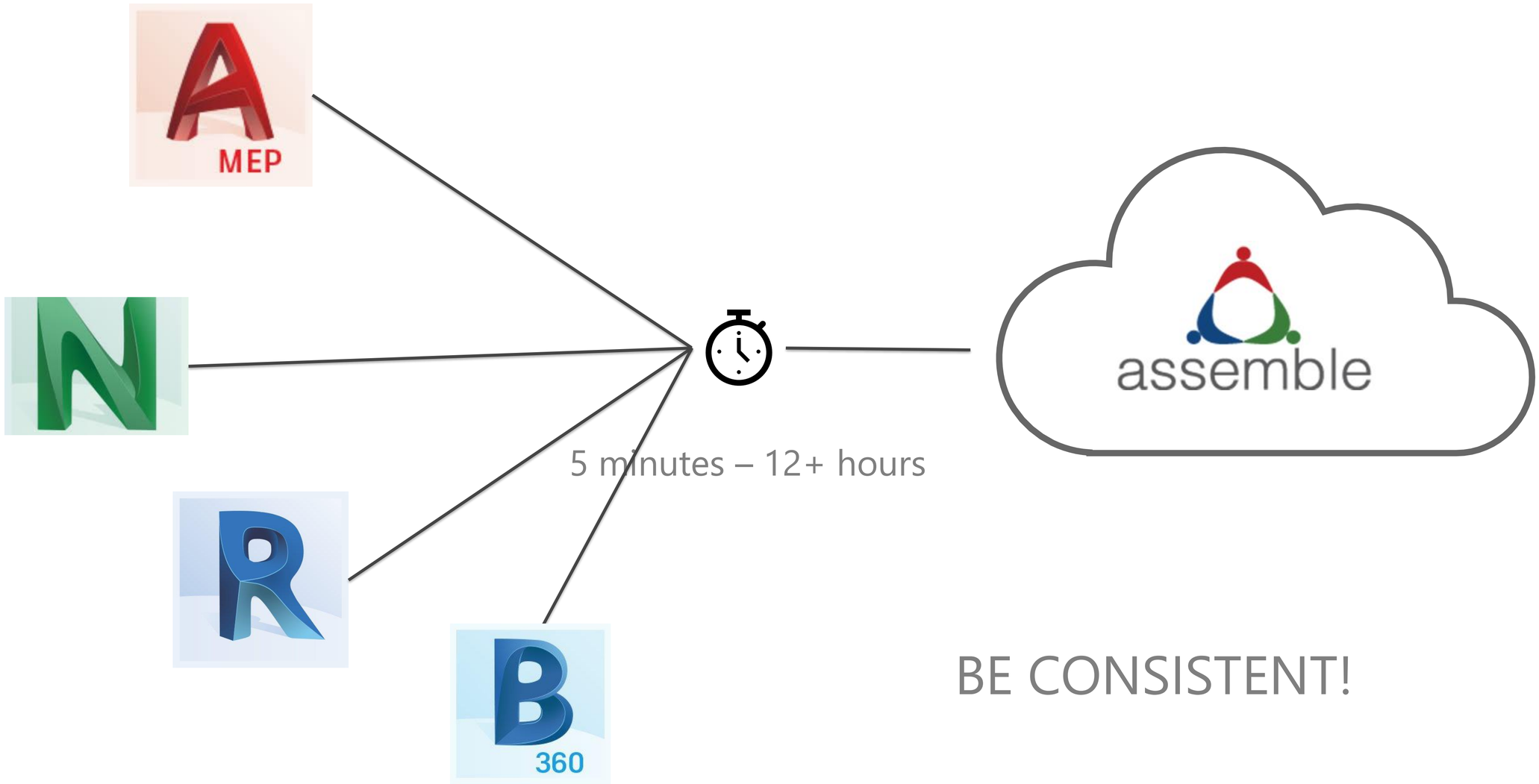


Assemble User Interface



MODEL TREE | INVENTORY | 3D VIEW | PROPERTIES

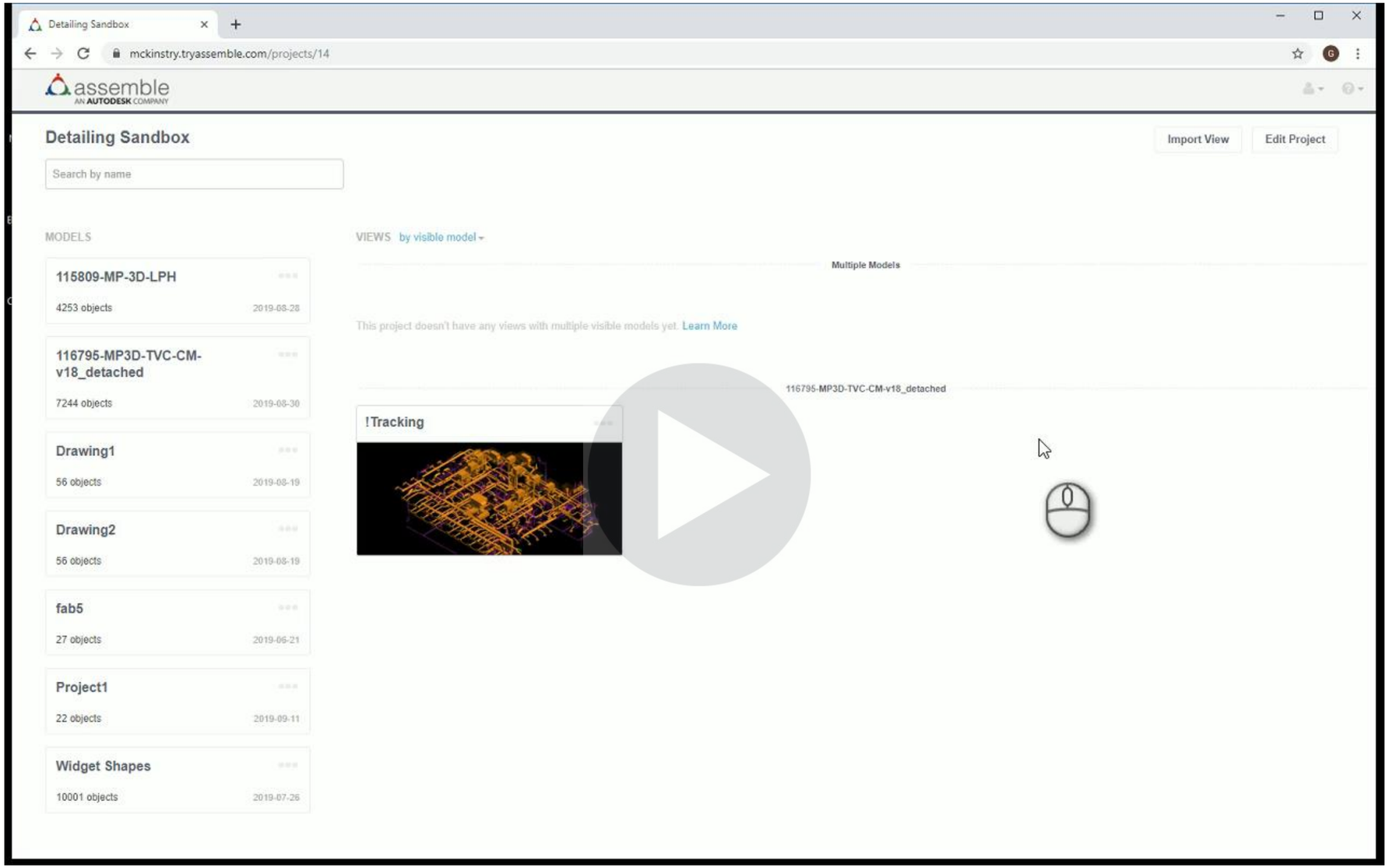
Publishing to Assemble



BE CONSISTENT!

PRO TIP: If you are using Fabrication parts, ensure you've installed the Object Enabler before publishing.

Adding Custom Assemble Properties



Some Custom Assemble Properties McKinstry uses

Dates

- Plan [to install] date
- Material onsite
- Inspection complete
- Insulation start date

Key for EV

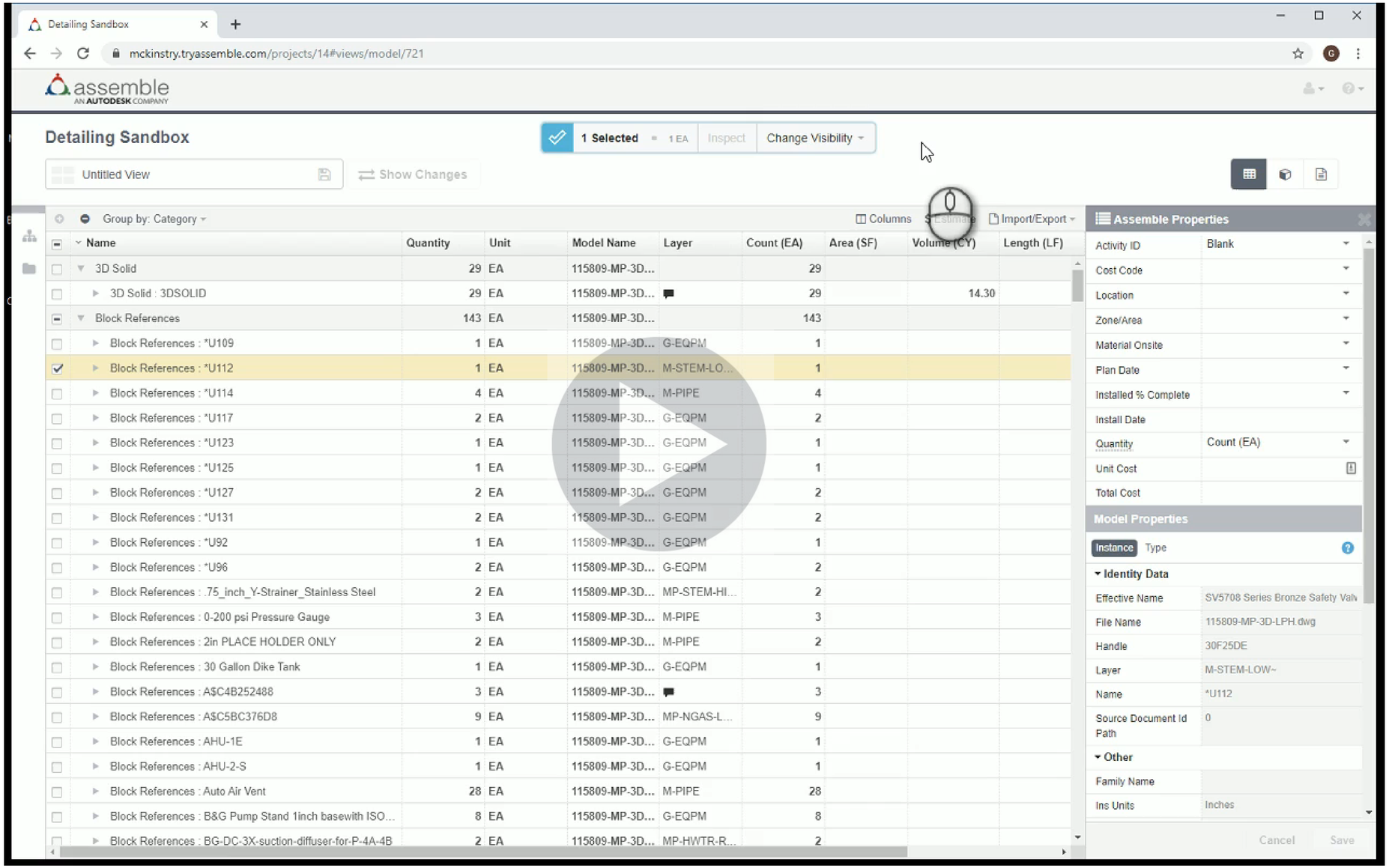
% Complete

- Detailing
- Submittal
- DWG Review
- Layout
- Install

Other

- Issues/comments

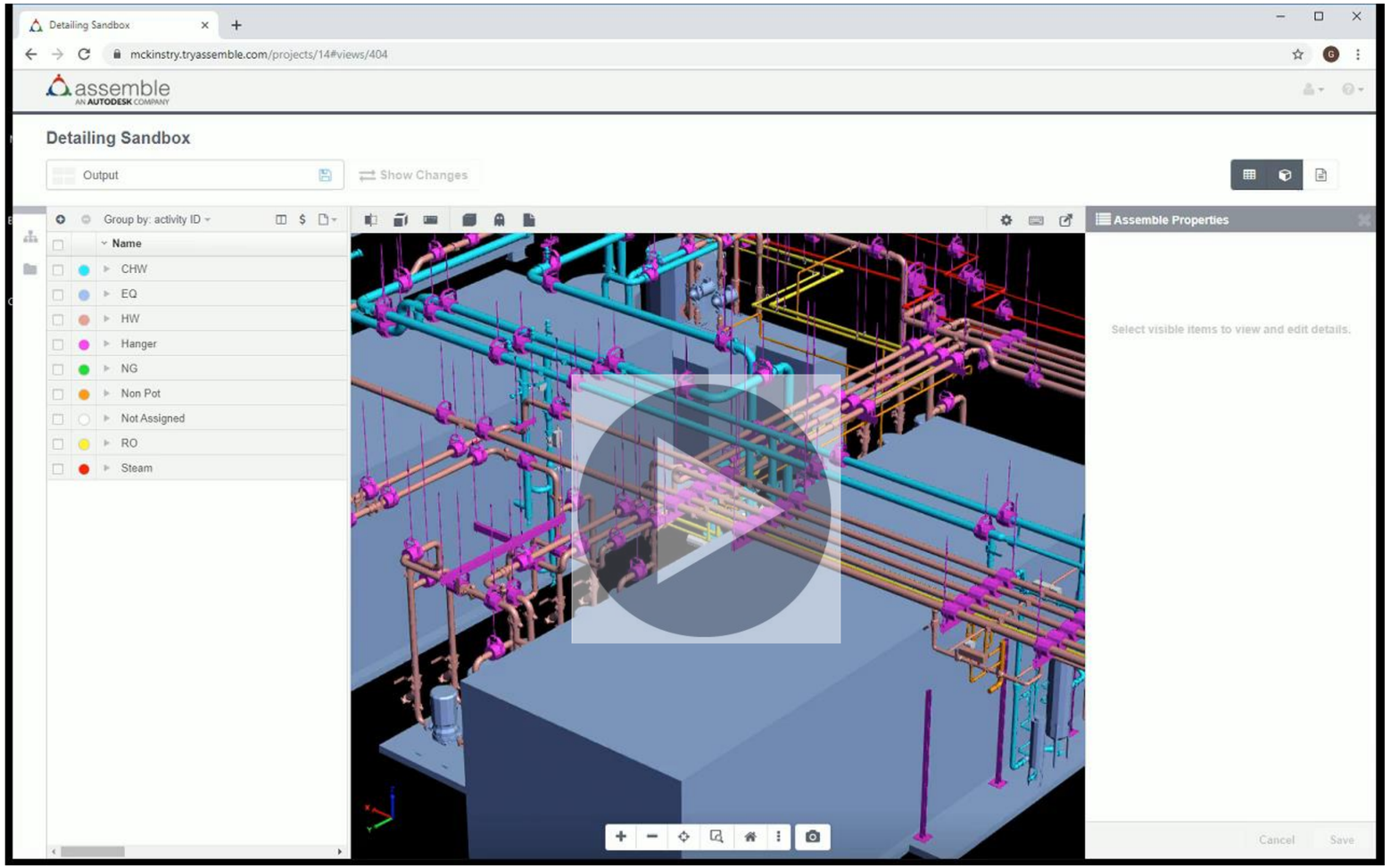
Setting up Assemble Views



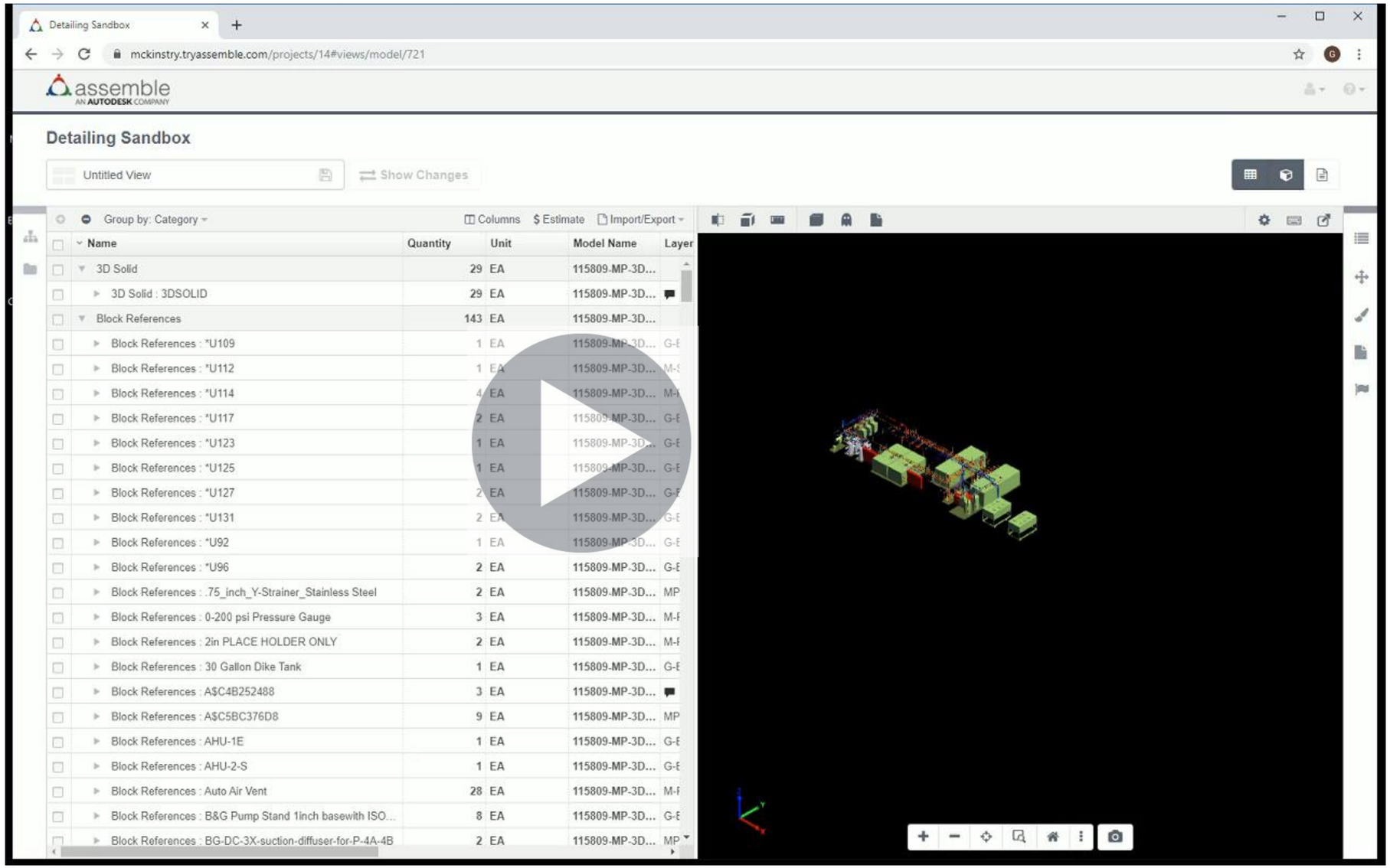
Loading up Assemble Properties

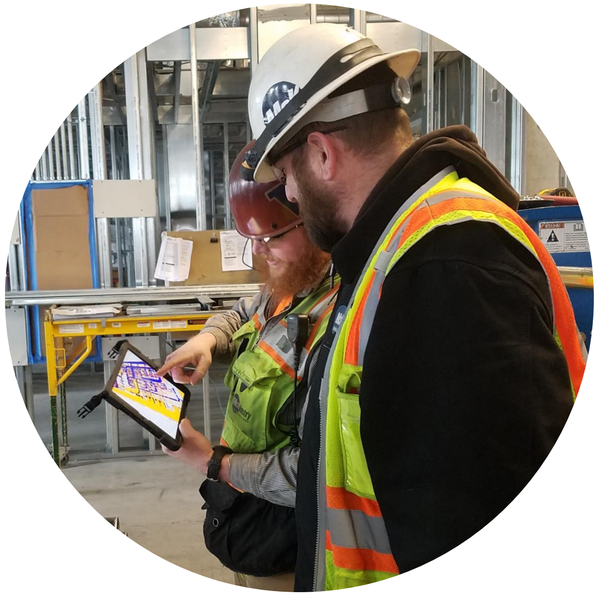
Assemble Properties that are filled out at the beginning of a McKinstry project.

- Cost Code
- Activity ID
- Zone
- Location



Creating Views - Remaining Work View





Status Model Content

Methods for updating model content:

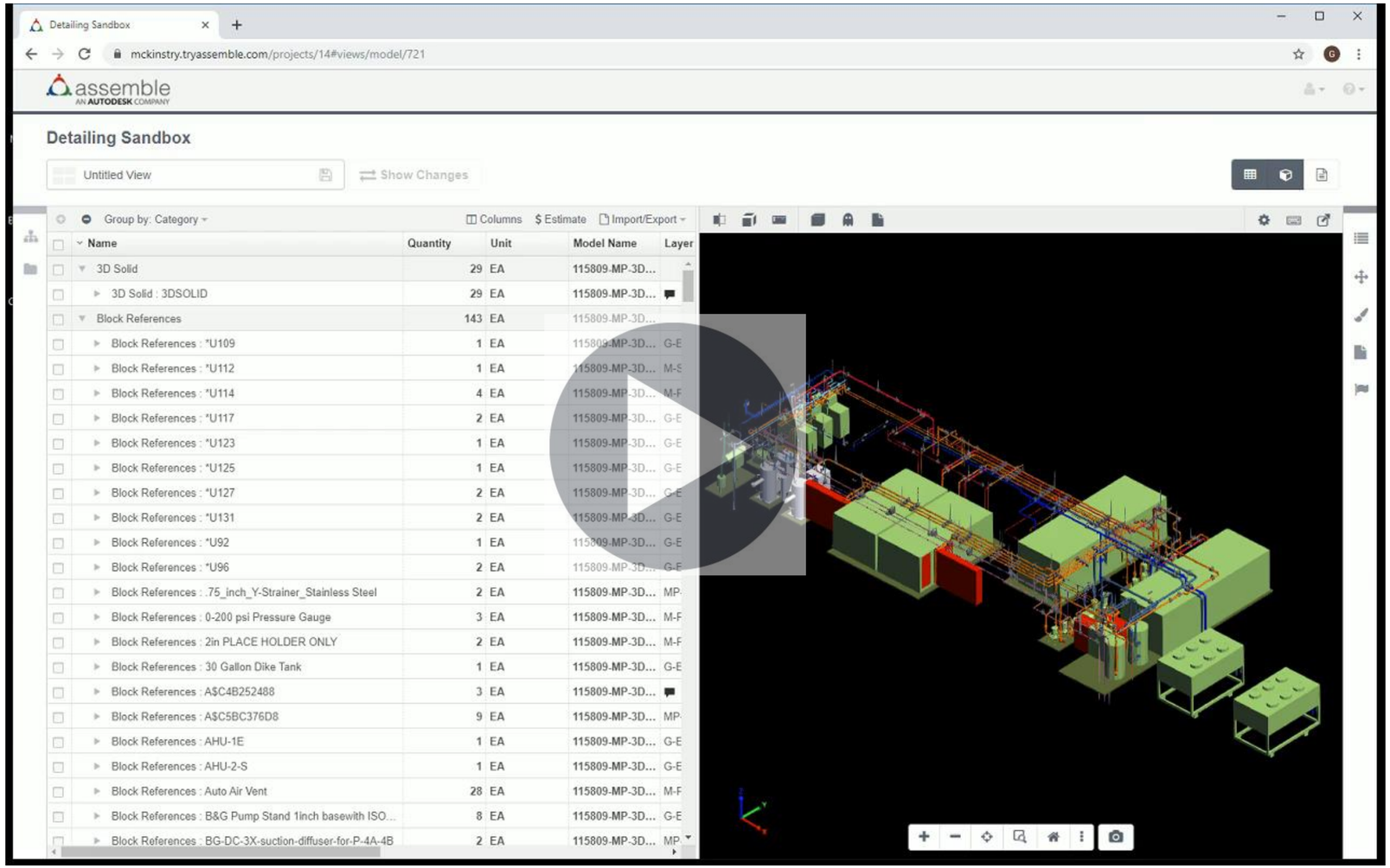
- Field leads can update via tablet or phone
- Prints can be highlighted and model statused by others
- Site walks can verify claimed quantities to maintain accuracy

Updating Model Content on iOS

Data Export Process

- Open in the view you created
- Export to excel

Color	Category Name	Item	Model Name	Source ID	Quantity	Unit
	Air Terminals				231.00	EA
	Custom Types				91.00	EA
	Duct Accessories				117.00	EA
	Duct Fittings				363.00	EA
	Ducts				2,186.72	LF
	Electrical Equipment				1.00	EA
	Flex Ducts				886.13	LF
	Mechanical Equipment				66.00	EA
	Pipe Fittings				260.00	EA
	Pipe Flex				8.00	EA
	Pipes				1,074.75	LF
	Plumbing Fixtures				12.00	EA
	Pumps				2.00	EA

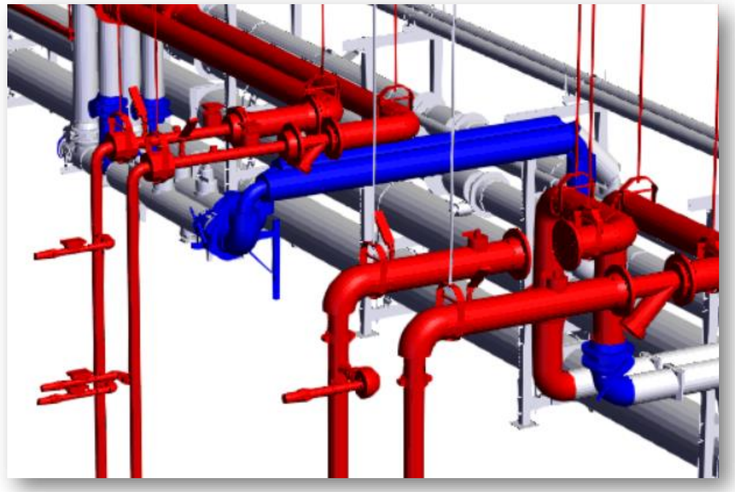


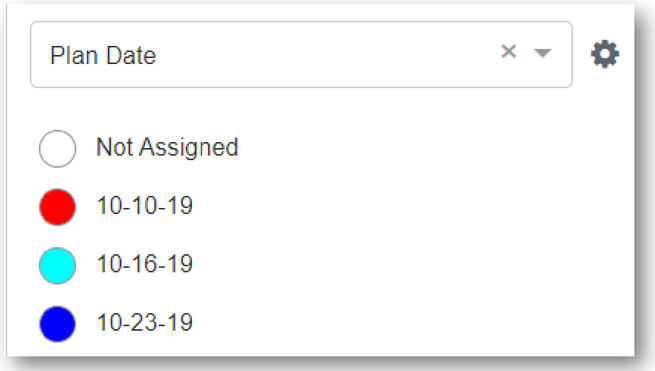
PRO TIP: Change all of the text to black on the excel export to see the data

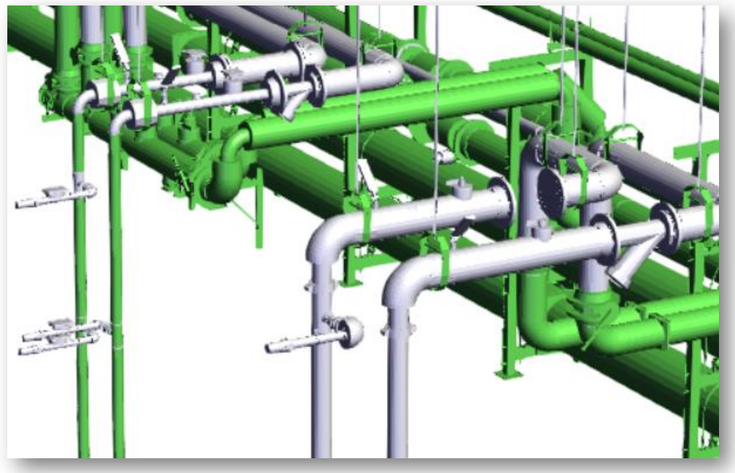
Benefits

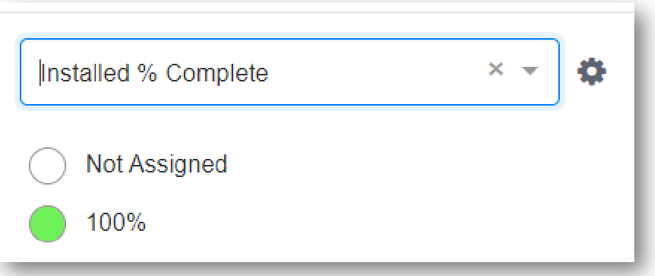
Help facilitate weekly team meeting

- Plan vs Actual complete
- Remaining work
- Pressure testing status
- Inspection status
- QC issues





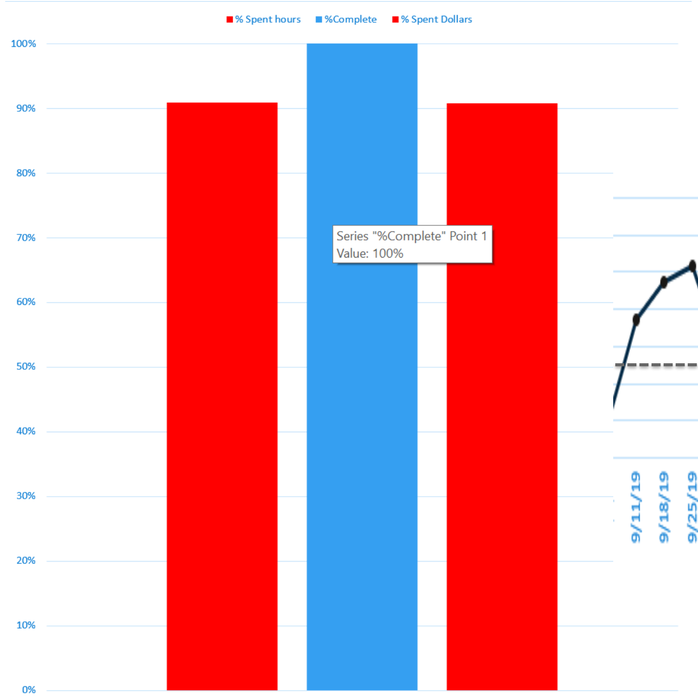




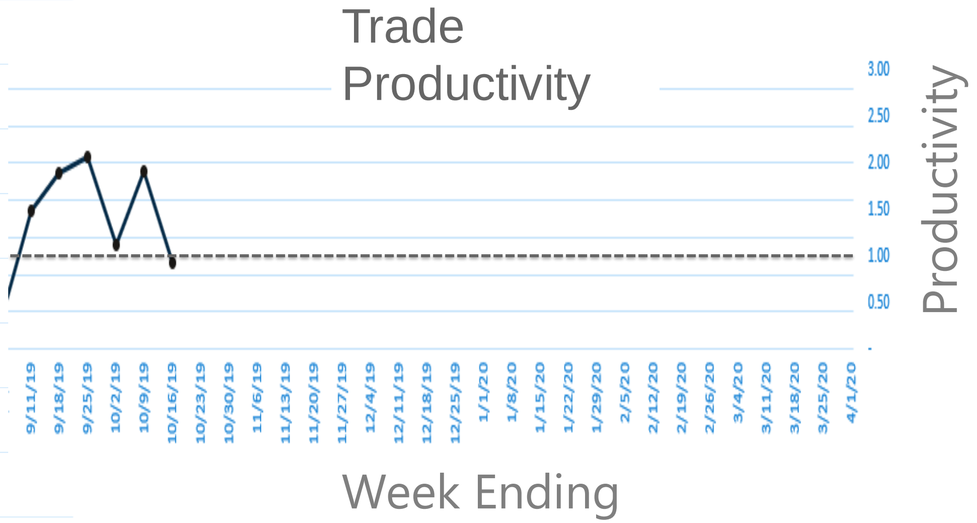
Benefits

Project Tracking

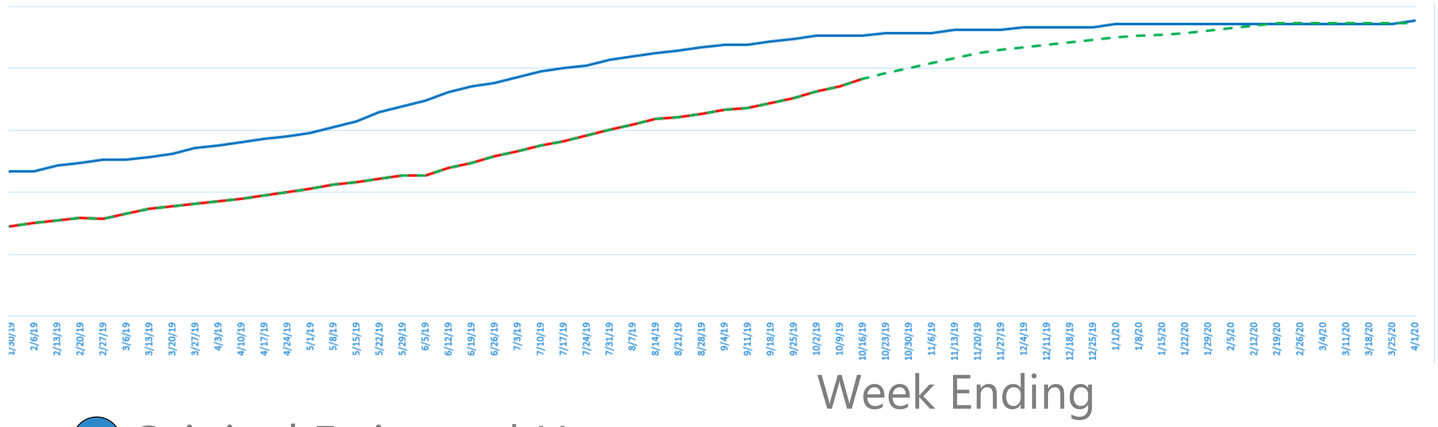
- Speed and accuracy of quantities
- Weekly productivity by trade
- Man hour plan
- Financial tracking – “middle finger” graph



“Middle Finger” Graph



Man hour plan



$$EV = \frac{\left(\frac{Lbs.\,Installed}{Total\ Lbs.}\right) * \text{Budget Hours}}{\text{Actual Hours}}$$

Benefits

- Project Team Collaboration
  - Minimal technical skills required to navigate the model
  - 3D environment fosters discussion between staff and field
  - Updates to Assemble properties is real-time, so everyone can stay on the same plan

Recap of what we discussed

Using Assemble to Track Installation Progress

- Publishing models and project setup
- Weekly update process

Sort and filter data by installation status and activity id to see quantities installed

- Setting up views
- Excel data export

Benefits of tracking earned value through a 3D model instead of 2D solutions

- Increased accuracy
- Enhanced speed

Utilize BIM meta data for construction management

- Hosting weekly team meetings
- Breaking silos between staff and field

What’s Next?

1. Connect Assemble to hours for work to be performed
2. Identify “at risk” work

Questions?

Reminder - Take the class survey in the app!

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