Model-Based Earned Value Tracking

CJ Best, McKinstry Co, LLC
Gary Mashburn, McKinstry Co, LLC

for Keeping Projects on Budget and Schedule
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
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

1. 2D Method
2. 3D Assemble Workflow
3. Overall Benefits
2D Earned Value Process

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

Productivity $EV = \frac{(Lbs. \text{ Installed})}{(Total \text{ Lbs.})} \times \frac{\text{Budget Hours}}{\text{Actual Hours}}$
Assemble Workflow

Publishing to Assemble → Adding custom Assemble properties → Setup Assemble views

Initial data input → Status model content → Export model data

Weekly Team Meeting
Assemble User Interface

MODEL TREE

VIEWS
Assemble User Interface

MODEL TREE | INVENTORY | 3D VIEW | PROPERTIES
Publishing to Assemble

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

BE CONSISTENT!
Adding Custom Assemble Properties
Some Custom Assemble Properties McKinstry uses

<table>
<thead>
<tr>
<th>Dates</th>
<th>% Complete</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Plan [to install] date</td>
<td>• Detailing</td>
<td>• Issues/comments</td>
</tr>
<tr>
<td>• Material onsite</td>
<td>• Submittal</td>
<td></td>
</tr>
<tr>
<td>• Inspection complete</td>
<td>• DWG Review</td>
<td></td>
</tr>
<tr>
<td>• Insulation start date</td>
<td>• Layout</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Install</td>
<td></td>
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Key for EV
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

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

\[ EV = \left( \frac{Lbs. \text{ Installed}}{Total \ Lbs.} \right) \times \text{Budget Hours} \]

\[ \frac{\text{Actual Hours}}{\text{Original Estimated Hours}} \]
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

<table>
<thead>
<tr>
<th>Using Assemble to Track Installation Progress</th>
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<tbody>
<tr>
<td>Publishing models and project setup</td>
</tr>
<tr>
<td>Weekly update process</td>
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</tbody>
</table>

| 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!