Presenters

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Integrus Architecture

- Integrus focuses on K-12, Higher Education, Civic, and Justice Design
- Integrus Architecture was an early adopter of BIM, having worked in Revit since 2006.
- Integrus offers Architectural, Structural, and Interior Design Services.

Tyee Middle School | Bellevue School District
122,500 SF
Standard Practice VS. the Three-Dimensional Drawing Set

- What are Integrus standard practices for creating common masonry elements?
- How does Integrus use the model to create drawings?
- What would it mean if the industry did not rely on two-dimensional drawings?
Standard Practice VS. the Three-Dimensional Drawing Set

For the BIM-M exercise, we utilized modeling techniques that push the boundaries of normal practice further toward a three-dimensional drawing set.

These included:
- Detailing in three dimensions
- Utilizing live sections
- Modeling as much of the project as possible

Model Practices
Why Build Exclusively From Models?

- Design/Build vs Design/Bid/Build
- Abbreviated Drawing Sets
  - No Detailing
  - No Wall Sections
- Up to 50% savings in man hours / profit
- Building Industry evolving toward this practice.

Enhanced Detailing

In order to detail in three dimensions, we utilized “detail views”
Enhanced Detailing

These views are live snapshots of the three-dimensional model.

Three-dimensional plan detail view with wall selected

Three-dimensional view
With the same wall selected

We take the three-dimensional view and overlay two-dimensional information and graphics on it.

Three-dimensional plan detail view with two-dimensional elements overlaid

Three-dimensional elements are in red and two-dimensional elements are in grey
Because the view is three-dimensional, changes in the model occur in real time.

Enhanced Detailing

Three-dimensional plan detail view with two-dimensional elements overlaid.

Three-dimensional elements have shifted causing a visual alert.

Live Sections

- Revit is a three-dimensional parametric modeling software.
- The section tool allows you to investigate issues and coordinate at any time during the modeling process.
Live Sections

- Building sections are live and change as you continue to work on your model.
- At this scale the section does not benefit from detail element enhancements.

Live Building Section

Live Sections

- Wall sections tend to be a larger scale and consist of both model and detail elements.
- Changes to the model will change the live wall section view.

Live Wall Section
A majority of a wall section will be generated with model elements, as shown highlighted in orange.

• At larger scales, like a wall section, detail elements are added to enhance the view.
• The detail elements in this view are highlighted in orange.
Live Elevations
• We found ways to utilize model elements for all required stone accents.
• Through the use of sweeps we were able to model stone sills, lintels, and quoining.
Modeling Stone Accents

Three-dimensional quoining throughout model.

Building Information Modeling for Masonry

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Reinforcement

• Moving from 2D to 3D

Current Disadvantages of Two-Dimensional Reinforcement

• No embedded information
• No clash
• No scheduling
• No tagging
• Everything fits
• No warnings as things move
Current Advantages of Three-Dimensional Reinforcement

- Coordination is improved
- Accurate schedules
- Tagging
- Correctly warns you when items move

Three-dimensionally reinforced wall
Hybrid Elements

- Model the three-dimensional elements
- Created a three-dimensional family
  - Less memory
  - No embedded information

Using the bold beam tool

Wall Section

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BIM-M
Building Information Modeling for Masonry
“OneModel” and Multiple Models

- Break up components by discipline
- Effectively use filters and work sets to manage the correct pieces
Building Custom Families

- Build your own families to depict whatever you need
- Examples: Stepped footings, Lintels over doors, etc.

Exporting to Analytical Programs

- Getting better, but still not there structurally
- Autodesk has been adding a lot of options for other types on analysis in Revit, i.e. energy modeling
Additional Resources

• How is masonry represented in the future of BIM
  • Pre-made content
  • Custom Masonry Tools

Coming! – How-to Videos

• Hosted on the BIM-M website (possibly YouTube format)
• Will cover content from the guide and give examples, tips, and tricks for how to do things in Revit with Masonry
Questions?