BUILDING BLOCKS IN YOUR BXP

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• BIM-M Initiative
• Masonry Modeling Limitations
• LOD for Masonry
• MUD
• BIM Masonry Guide
• Contractors/Downstream Use
Mission Statement

To **unify** the masonry industry and all supporting industries through the development and implementation of BIM for masonry software to facilitate smoother workflows and collaboration across all disciplines from owner, architect, engineer, manufacturer, mason, contractor, construction manager, and maintenance professionals.
- Coursing
- Graphics
- Properties
- Wythe Adjustments
- Bond Beams
- Reinforcing
- Special shapes
- Wall Ownership
- Clash detection
- Downstream use
COURSING/WYTHES
- Limits collaboration
- Wythes not represented
- Blocks not represented
- Graphics poor
STRUCTURAL INTERFACE
• Wythes cannot be independently adjusted for structure
• Requires duplicate modeling for veneer and backup walls
PROPERTIES

- Geared towards concrete, not masonry
- No actual dimensional representation of units
GRAPHICS

- Limited options
- Graphics do not represent actual coursing
- Hindrance to live section cuts
BXP:
What is your LOD?
LOD 300:
• Independent wythes so backup can adjust to structure
• ‘Smart’ wallpaper for coursing coordination - plan, section, elevation

LOD 350:
• Bond beams and vert. reinf. shown for intelligent clash detection
• Control joints break wall panels
• Structural usage tags more intelligent for clash and transfer to analytical programs

LOD 400:
• Individual units
• Cavity information
• Ties
• Joint reinf.
• Laps
• Grout sequence
BIM for Masonry LOD Examples
BIM-M Recommendations incorporated into BIMForum LOD Specification in 2014
• Very difficult to achieve our LOD recommendations with current REVIT tools
• Need ability to adjust height of separate wythes without duplicate modeling
• Need ‘Smart’ wallpaper for coursing collaboration
• **Better graphics** for section and plan views
• Ability to **easily define bond beam** locations within a wall
• Ability to insert **intelligent control joints**
• **Better structural usage tags** to flag walls for clash and to identify wythes that push downstream to analytical programs
• **INTELLIGENT data** that we can push downstream
• **Plug-ins** to get us to LOD 400
# Masonry Unit Database

## The MUD

### 8" x 8" x 16" SOLID HEADER CORNER

<table>
<thead>
<tr>
<th>Number</th>
<th>Dimensions</th>
<th>Unit Weight</th>
</tr>
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<tbody>
<tr>
<td>57</td>
<td>8&quot; x 8&quot; x 16&quot;</td>
<td>203 x 203 x 406</td>
</tr>
</tbody>
</table>

![Diagram of 8" x 8" x 16" SOLID HEADER CORNER]

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![Diagram of 8" x 8" x 16" SOLID HEADER CORNER]

## BN5

**SINGLE BULLNOSE HEADER EXTERNAL CORNER**

<table>
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<tr>
<th>Dimensions</th>
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<th>B</th>
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<td>Engineer</td>
<td>3-3/8&quot;</td>
<td>2-3/4&quot;</td>
</tr>
<tr>
<td>Queen</td>
<td>3&quot;</td>
<td>2-3/4&quot;</td>
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</table>

**Ordering Requirements**

- Brick size - (modular, engineer, queen)
- Type of Brick
### Catalog of specific units/materials

#### Step 2: Select products for evaluation

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<th>Product #</th>
<th>Body Composition</th>
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<th>Pre-Consumer RC</th>
<th>Recyclable</th>
<th>GREENGUARD IAQ@D</th>
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<td>Brk_CMU_4x4x16_Brik</td>
<td>Masonry Structural Walls</td>
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Material Supplier Database

- Unique designs into the hands of designers

Manufacturer A  CMU

Manufacturer B veneer  Accessories
• Tools for modeling masonry using current technology
• Based on Revit tools
• Examples of how other firms approach masonry
• **How-to Videos**
How To Guide for Advanced Modeling to Increase LOD

**Stone Accents in the Three-Dimensional Drawing Set**
- 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.

**Masonry Arches**
- Revit allows you to assign materials to geometry. In this family we have control within the project over the material, per family type.

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

**Rebar: Built-in Tools & Extensions**
- Built-in
  - Place individual bars
- Extension
  - Helps define wall
Model Practices

- For BIM-M Guide, utilized modeling techniques that push toward a three-dimensional drawing set.
- These included:
  - Detailing in three-dimensions
  - Utilizing live sections
  - Modeling as much of the project as possible
BXP:
Who owns the walls?

- Architect owns all walls – Structural Engineer uses underlay and detail lines for headers
- Architect and SE both own walls. Everything duplicate modeled, including openings
- Architect owns all walls – SE models bond beams and shear walls only for ‘smart clash’
- Independent wall model is created and shared by Architect and SE
Downstream use
- Contractor Input/Surveys
- Expanding Knowledge
- Creating Wish Lists
- Guide for Contractors
- Bridge to Downstream Programs
- Promote BIM!
Choose your LOD wisely – difficult with current tools to get beyond LOD 300
- Look to BIMForum LOD Specification for current masonry LOD recommendations
- Look for the Guide and Videos on BIM-M Website for Modeling Tips
- Decide who will own the walls
- Understand clash detection expectations
- Downstream Use - programs exist but not yet compatible with Revit models
- Look for MUD development and plug-ins
BIM-M Web site
www.BimforMasonry.org