BIM/Revit® and the Future of Pathway and Passive Fire Protection Design

Justin Pine, RCDD
Specified Technologies, Inc.
What is BIM?

- A digital representation of both the physical and functional characteristics of a building
- Provides a platform for effective collaboration between stakeholders over the buildings lifecycle.
In Non-Marketing Terms

• More than CAD:
  – intelligent 3D model-based process
  – database driven
  – equips architecture, designers, engineering, and construction professionals to be more efficient in projects
  – ability to track all changes within a single model
Includes all phases of Construction
Advantages of BIM

• Increased efficiency
  – Reduce Rework and Waste
  – Improve Productivity

• Collaboration
  – Reduce issues and omissions in documentation
  – Better Coordination of Trades
Building Without BIM

- Weekly Coordination Meetings are Critical
- Constantly checking FTP Sites, DropBox, or E-Mail Inboxes for Updated Plans
- Greater Administrative Burden to mitigate field encountered issues and setbacks
The Latest Version of the Plans?
Real-Time Collaboration

- On-Premises or Cloud Hosted Revit® Models via A360
  - Provides a central workplace for all stakeholders
- Geographically isolated teams can adapt to changes as they happen
  - Drawings are always in sync and current
No More Surprise Updates

• Revit® Alerts you of changes impacting your design.
  – In real-time or the next time you open the project
Reduce Rework and Change Orders

- Required products are a known quantity
  - Reduce or eliminate last minute additions or change orders
- Avoid rework or redundant design
  - Linked models share resources and design elements
Reduce Construction Waste

• Export model parameters to vendors directly
  – Eliminate field cutting studs and pathway
• On demand or on site material fabrication

Howick® LTD Stud Fabricator

2018 BICSI WINTER CONFERENCE & EXHIBITION
Orlando, FL | February 4-8
Implementation Without BIM

- Collisions happen when Teams Don’t Communicate!
- Partnering with other Trades Onsite is critical to avoid ➔
Avoid Colliding Services

• Clash Detection of building services
  – Better coordination of building trades
  – Avoid ceiling congestion and overlapping services while still in the design phase

2018 BICSI WINTER CONFERENCE & EXHIBITION
Orlando, FL | February 4-8
Services in a 3D Space

- Dimensioning and Spacing of Services are well defined
  - Able to prefabricate building services offsite
  - Reduces waste due to field fabrication
Streamlined Design

• Quickly draw out cabling plant
• Easily edit tray dimensions after the fact
• Provide detailed description of tray construction and contents
Configure & Deploy

• Create/Modify New or Existing Families
  – Save your common configurations for every project
  – Edit each Instance or Globally across a Model
Smart Objects

- Different Types of Objects
  - Face Based
  - Family Based
- Available directly from vendor’s website or object repositories such as BIMObject.com
Face Based Objects

- Similar to a wall sconce or poster
- Snap to any surface
  - Wall, Floor, table top, Etc.
Family Based Objects

- Based on assembly type (Wall, Floor, Ceiling, Etc.)
- Aware of and adapt to changes in underlying assembly
- Can Prevent improper usage
Object Design

• Typically simple in appearance.
  – The Bigger the Project, the Simpler the Object

<table>
<thead>
<tr>
<th>AREAS TO AVOID FOR OPTIMUM PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Mistake When Creating Families</strong></td>
</tr>
<tr>
<td>Lack of planning prior to family creation</td>
</tr>
<tr>
<td>Unnecessary parametric relationships</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Use of geometry instead of symbolic lines in plan views</td>
</tr>
<tr>
<td>High levels of geometric detail and underuse of visibility settings</td>
</tr>
<tr>
<td>Overuse of voids, formulas, and arrays</td>
</tr>
<tr>
<td>Use of too many nested families (families imported into other families)</td>
</tr>
<tr>
<td>Large families with many types that do not include type catalogs</td>
</tr>
<tr>
<td>Inadequate family testing</td>
</tr>
</tbody>
</table>
Impact of Design Complexity and Project Size on Family File Size

Schematic Design | Design Development | Construction Documentation | High Quality Rendering

File Size

Project Size

Small Residential

Large Commercial/Institutional
More Than Just Placeholders

• Contain detailed information about the product chosen
  – Ordering Information
  – Product & Safety Data Sheets
  – Manufacturer Contact Information
  – And More!
### One File, Multiple Configurations

<table>
<thead>
<tr>
<th>Type</th>
<th>Region</th>
<th>No. of Devices</th>
<th>Model No. (Device)</th>
<th>Model No. (Brackets)</th>
<th>Model No. (Accessory Bracket)</th>
<th>Model No. (Complete Kit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series 44 - 1 Device Floor Plate</td>
<td>Global</td>
<td>1</td>
<td>E2D44G2</td>
<td>EZP144F</td>
<td>EZP144FS2</td>
<td>EZP144FS2</td>
</tr>
<tr>
<td>Series 44 - 1 Bank Floor Grid</td>
<td>Global</td>
<td>4</td>
<td>E2D44B2</td>
<td>EZP444</td>
<td>EZP444/M8</td>
<td>EZP444/M8</td>
</tr>
<tr>
<td>Series 44 - 2 Bank Floor Grid</td>
<td>Global</td>
<td>8</td>
<td>E2D44B2</td>
<td>EZP444</td>
<td>EZP444/M8</td>
<td>EZP444/M8</td>
</tr>
<tr>
<td>Series 44 - 2 Bank Floor Grid - Side by Side</td>
<td>Global</td>
<td>16</td>
<td>E2D44B2</td>
<td>EZP444</td>
<td>EZP444/M8</td>
<td>EZP444/M8</td>
</tr>
<tr>
<td>Series 44 - 3 Bank Floor Grid - Side by Side</td>
<td>Global</td>
<td>12</td>
<td>E2D44B2</td>
<td>EZP444</td>
<td>EZP444/M8</td>
<td>EZP444/M8</td>
</tr>
<tr>
<td>Series 44 - 4 Bank Floor Grid - Side by Side</td>
<td>Global</td>
<td>16</td>
<td>E2D44B2</td>
<td>EZP444</td>
<td>EZP444/M8</td>
<td>EZP444/M8</td>
</tr>
<tr>
<td>Series 44 - 1 Device European Floor Plate</td>
<td>Europe</td>
<td>1</td>
<td>E2D44E1</td>
<td>EZG144</td>
<td>EZG144P4</td>
<td>EZG144P4</td>
</tr>
<tr>
<td>Series 44 - 1 Bank European Floor Grid</td>
<td>Europe</td>
<td>4</td>
<td>E2D44E1</td>
<td>EZG444</td>
<td>EZG444P4</td>
<td>EZG444P4</td>
</tr>
<tr>
<td>Series 44 - 2 Bank European Floor Grid - Side by Side</td>
<td>Europe</td>
<td>8</td>
<td>E2D44E1</td>
<td>EZG444</td>
<td>EZG444P4</td>
<td>EZG444P4</td>
</tr>
<tr>
<td>Series 44 - 1 Device Cast In Place (Concrete Floors Only)</td>
<td>Europe</td>
<td>1</td>
<td>E2P44MBE</td>
<td>E2P44MBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series 44 - 2 Devices Cast In Place (Concrete Floors Only)</td>
<td>Europe</td>
<td>2</td>
<td>E2P44MBE</td>
<td>E2P44MBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series 44 - 3 Devices Cast In Place (Concrete Floors Only)</td>
<td>Europe</td>
<td>3</td>
<td>E2P44MBE</td>
<td>E2P44MBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series 44 - 4 Devices Cast In Place (Concrete Floors Only)</td>
<td>Europe</td>
<td>4</td>
<td>E2P44MBE</td>
<td>E2P44MBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series 44 - 5 Devices Cast In Place (Concrete Floors Only)</td>
<td>Europe</td>
<td>5</td>
<td>E2P44MBE</td>
<td>E2P44MBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series 44 - 1 Device German Floor Plate</td>
<td>Germany</td>
<td>1</td>
<td>E2D44E1</td>
<td>EZG144</td>
<td>EZG144P4</td>
<td>EZG144P4</td>
</tr>
<tr>
<td>Series 44 - 1 Bank German Floor Grid</td>
<td>Germany</td>
<td>4</td>
<td>E2D44E1</td>
<td>EZG444</td>
<td>EZG444P4</td>
<td>EZG444P4</td>
</tr>
<tr>
<td>Series 44 - 2 Bank German Floor Grid - Side by Side</td>
<td>Germany</td>
<td>8</td>
<td>E2D44E1</td>
<td>EZG444</td>
<td>EZG444P4</td>
<td>EZG444P4</td>
</tr>
</tbody>
</table>
Third-Party Plugins

• Further enhance the suite of tools that Revit® comes with.
• Integrations with outside services/vendors
  – Design, Object Search/Selection, Production, Scheduling
FCM® – Firestop Clash Management

• Finds where services clash with barriers
• Searches for appropriate Firestop System
• Places firestop marker and product BIM Object
MWF® – Metal Wood Framer

- Finds all openings and penetrations through barriers
- Intelligently frames openings & assemblies
- Output framing information for Manufacturing
Working Together

- Firestop Clash Management
  - Finds and places firestop systems and products
- Metal Wood Framer
  - Frames walls, floors, ceilings and through openings with steel/wood studs
- Howick
  - Bend and cut steel framing members based on MWF® output on site from sheet steel
Virtual Tours

• Plugins like Enscape™ live render Revit® Models into a VR walkthrough
  – Works with HTC Vive or Oculus Rift
• Demo Video https://youtu.be/890zE2sbtWM