

Incorporating Engineering into Autodesk® Revit® Structure: Project Procedures

Desirée Mackey, PE
Structural Engineer, Martin/Martin

Class summary

This class demonstrates how to use custom families that incorporate structural calculations within a project environment. In addition, this class shares some project procedures and tools that will enhance the capabilities of Autodesk Revit Structure software for engineers, such as working schedules, calculated values, and conditional formatting. By integrating engineering into custom families and project procedures, a structural engineer can make use of more features of Revit to aid in the engineering design process. This class covers several custom families and procedures and how to incorporate various methods, through conditional formatting and visibility settings, to notify the engineer if any of the components are overstressed or otherwise “not working.” In the companion class, "SE1591 Incorporating Engineering into Autodesk® Revit® Structure: Advanced Families," the custom families are discussed and demonstrated within the Family Editor.

Key learning objectives

At the end of this class, you will have learned about how to:

- Incorporate engineering into Revit Structure
- Describe custom families that incorporate structural engineering calculations
- Use working schedules and conditional formatting to enhance the capabilities of Revit Structure
- Use custom families in the project environment to enhance the capabilities of Revit Structure

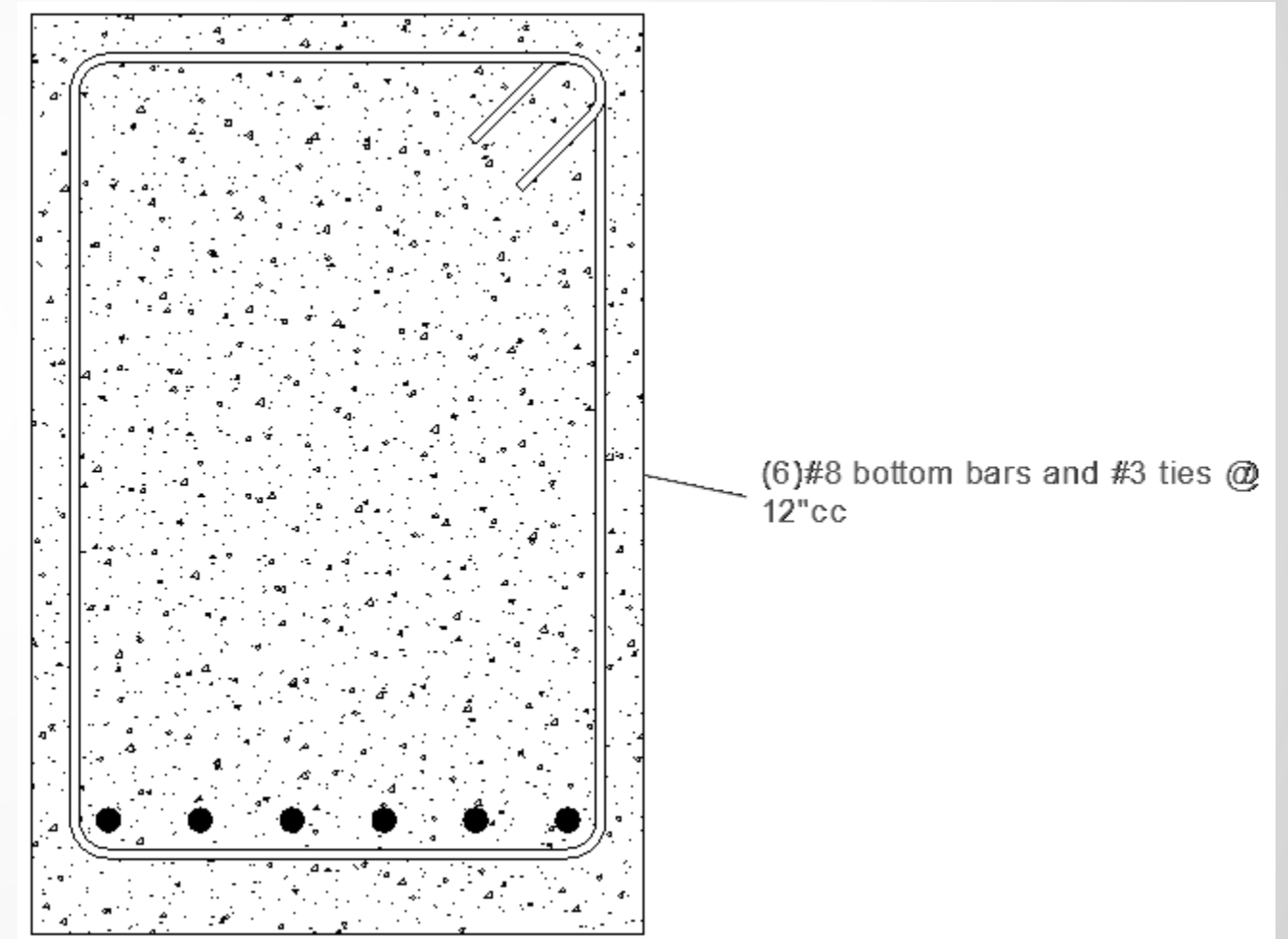
Introduction

- Families that Perform Calculations
 - Reinforced concrete beam detail item
 - Shear wall adaptive component
- Families that Design Themselves
 - Pad footing
 - Structural steel column
 - Concrete double tee (time permitting)
- **Project Procedures and Workflows**
 - Top of footing elevation tag
 - Slender column model element
 - Markup symbol (time permitting)

Families that Perform Calculations

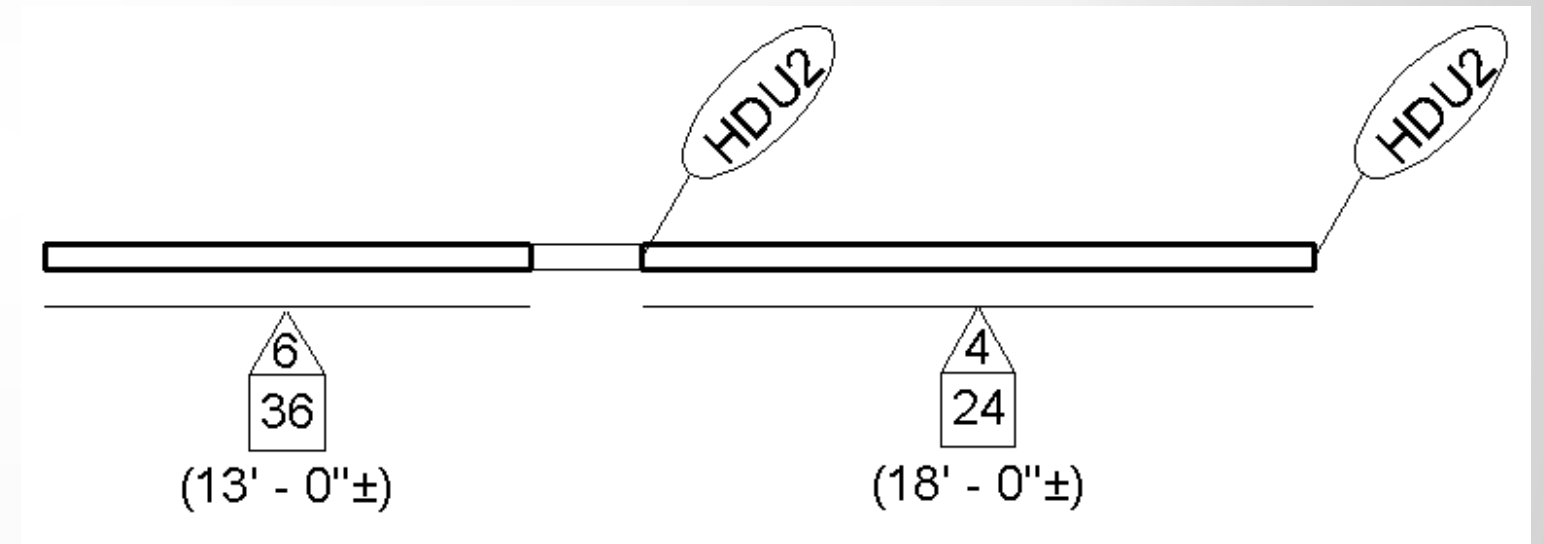
Reinforced Concrete Detail Item

- 2D detail item
- Calculates flexural beam capacity
- Code checks alerting user of violations
- Custom tag



Shear Wall Adaptive Component

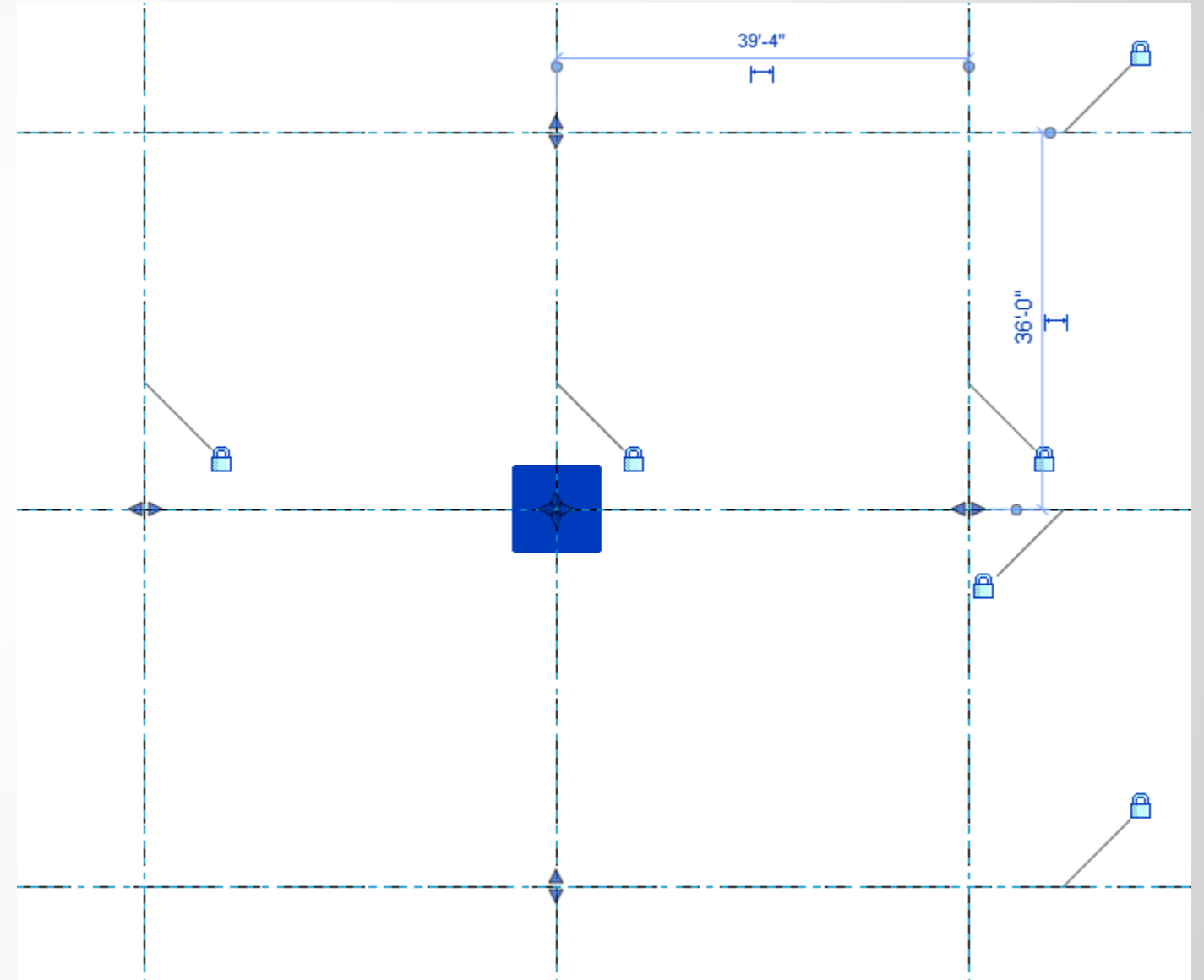
- Adaptive component
- Calculates shear wall nailing, hold downs and anchor bolt spacing
- Custom tags
- All can be scheduled
- Graphic options within project



Families that Design Themselves

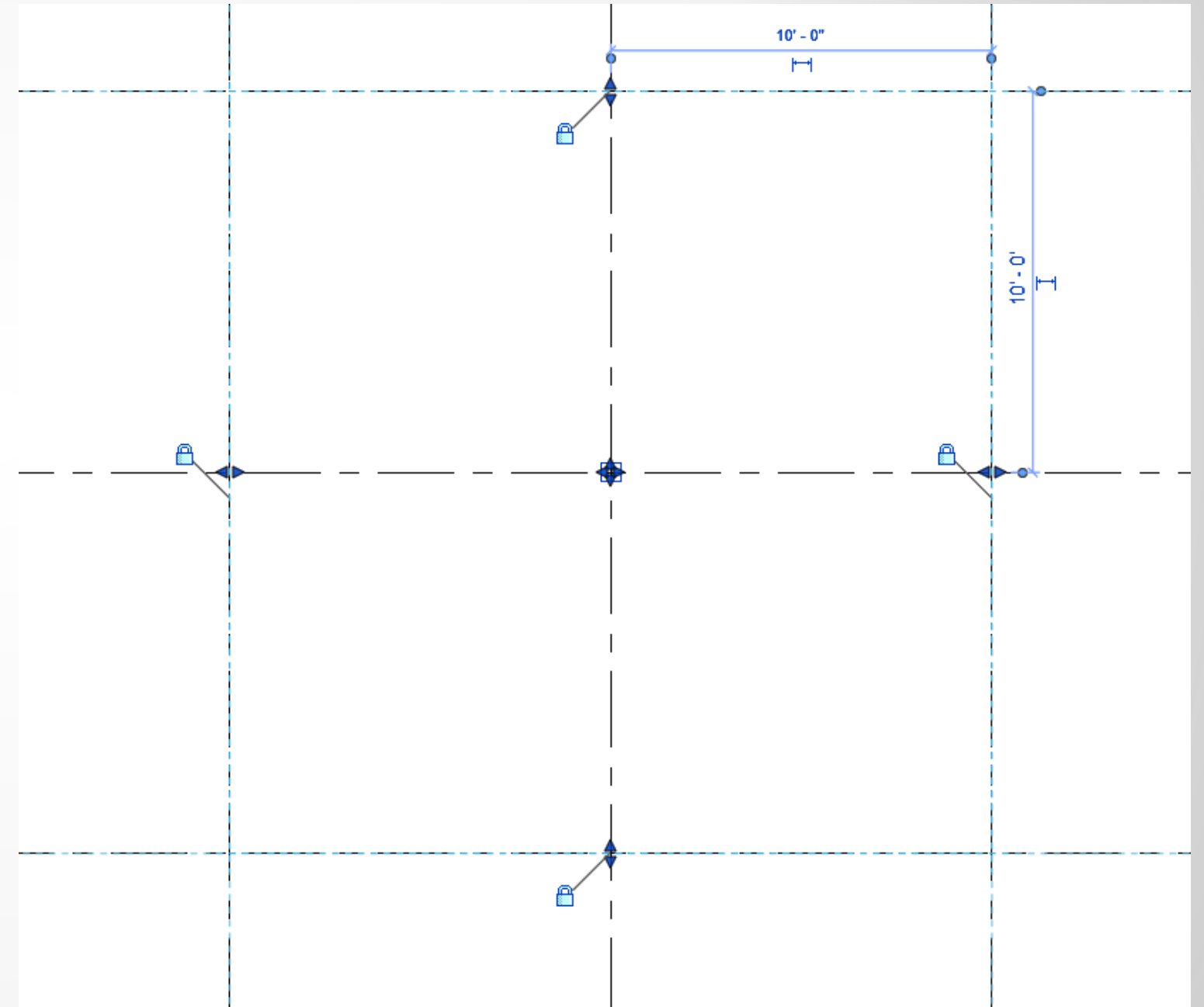
Pad Footing

- User inputs loads only
- Reference planes for tributary area
- Updates instance-based geometry in real time
- Instance-based text parameter for tag



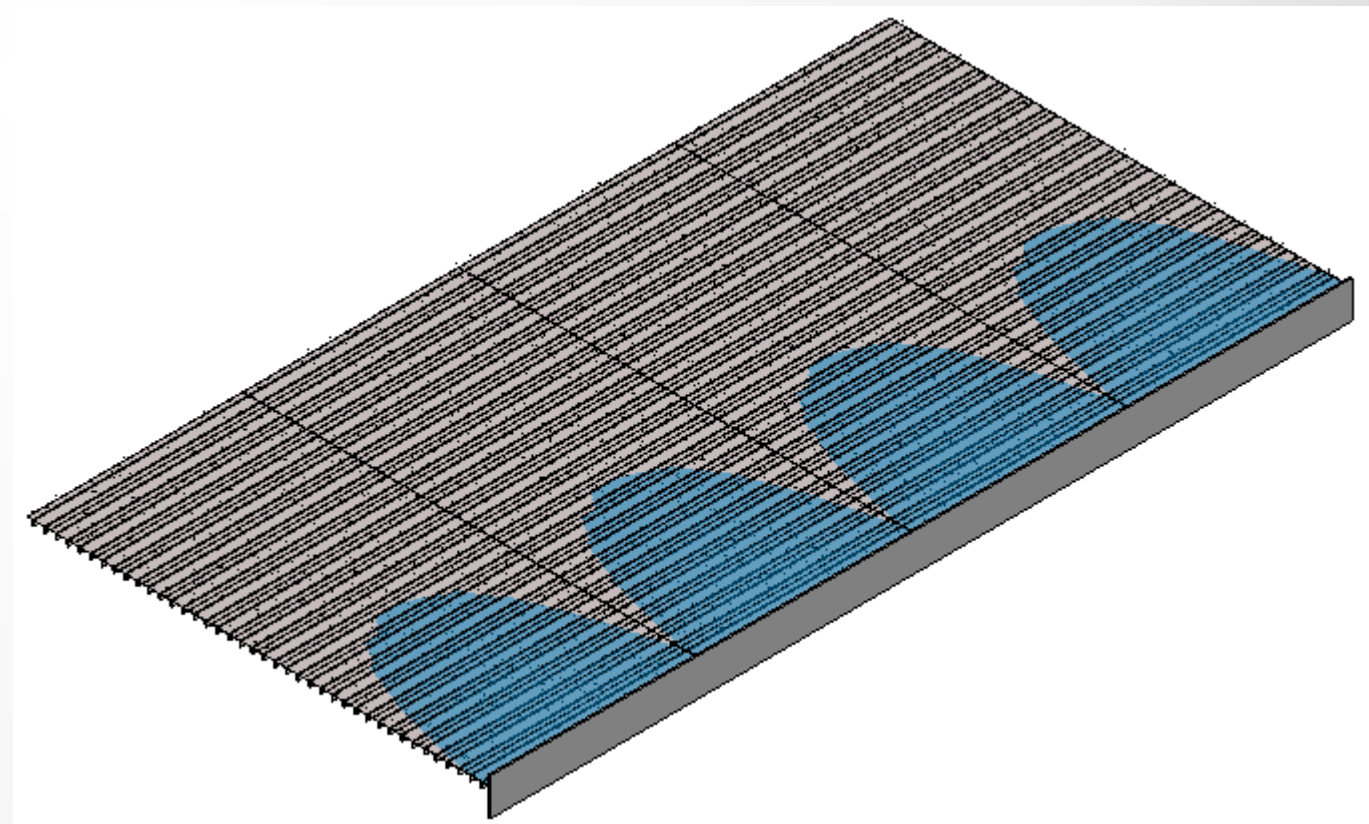
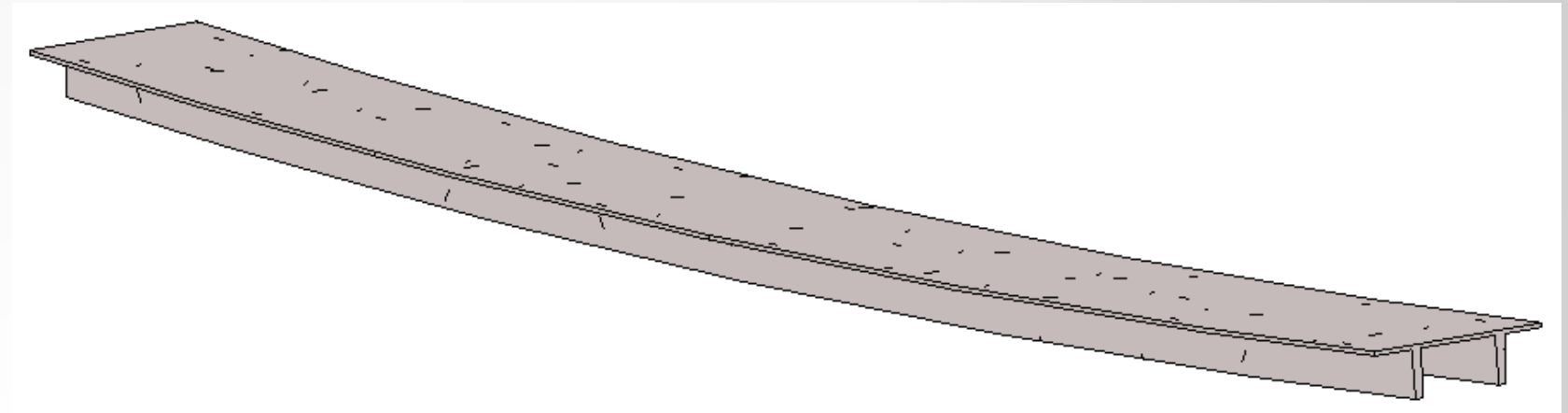
Structural Steel Column

- User inputs loads only
- Extracts info required from project
- Reference planes for tributary area
- Updates instance-based geometry in real time
- Instance-based tag



Concrete Double Tee

- User inputs water level only
- Calculates deflection based on water level
- Edits geometry to show deflected shape
- Can be scheduled
- Adaptive component for water



Project Procedures and Workflows

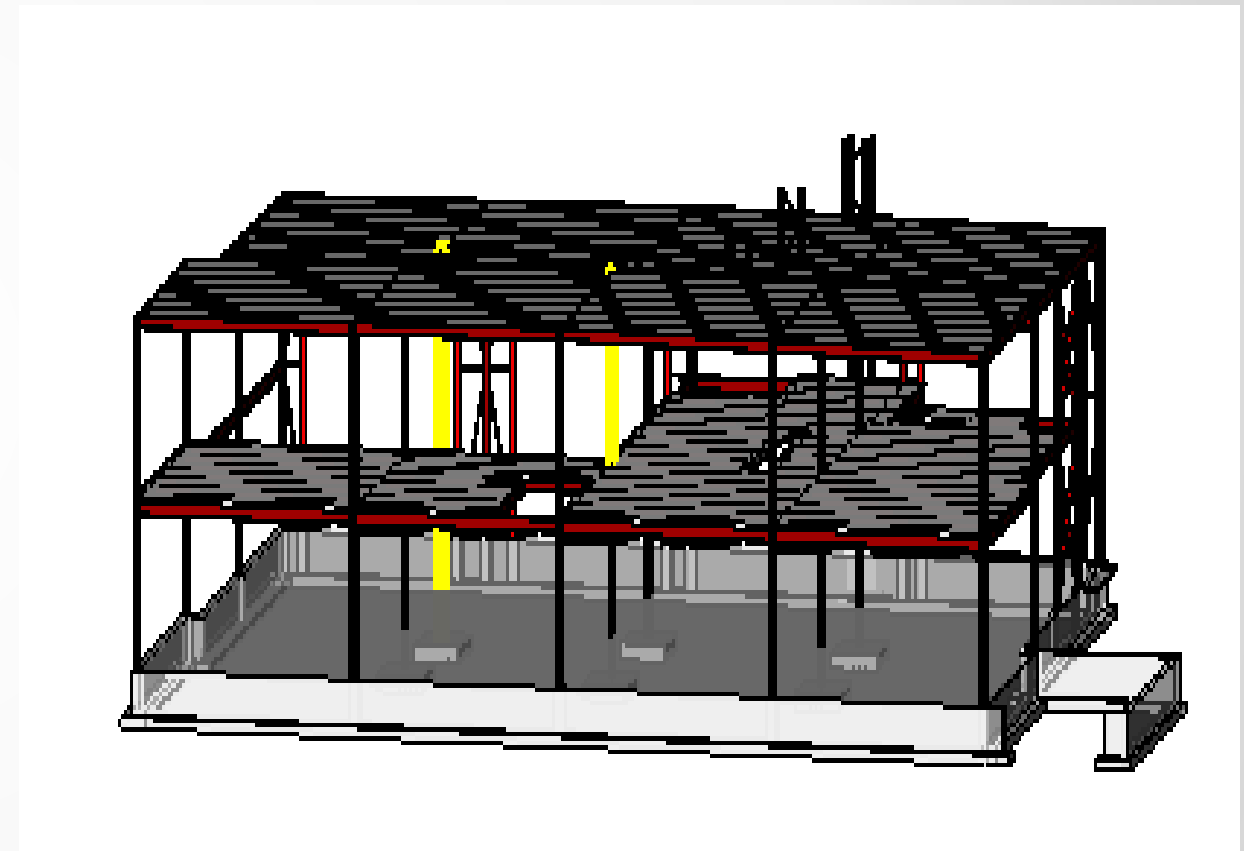
Top of Footing Elevation Tag

- Parameters added to out-of-the-box families
- Custom tag
- Calculated values
- Conditional formatting
- QA schedule

	F	G	
otto	TO Ftg Calc	TO Ftg Elevation	
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	87' - 0"	87' - 0"	0' - 0"
	91' - 0"	91' - 0"	0' - 0"
	91' - 0"	91' - 0"	0' - 0"
	93' - 6"	87' - 0"	6' - 0"
	93' - 6"	93' - 6"	0' - 0"

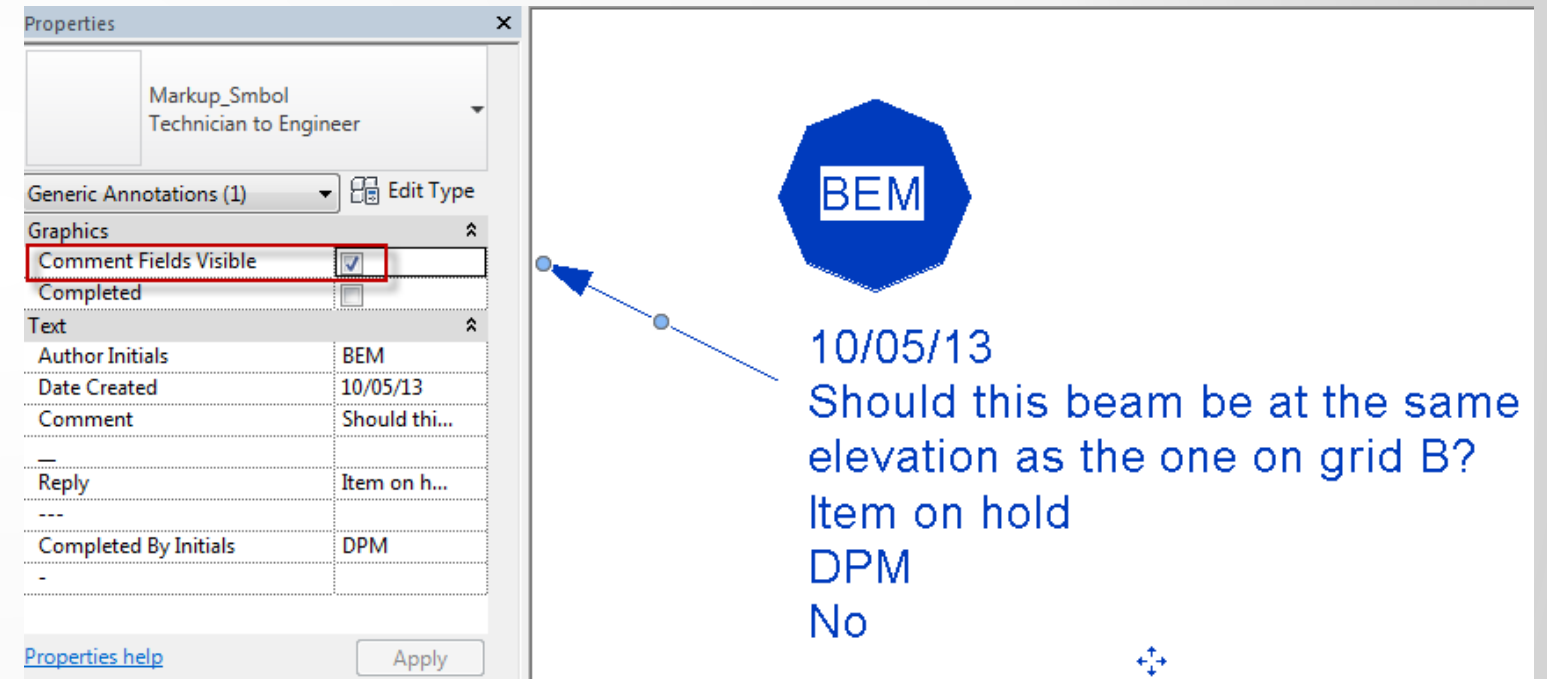
Slender Column

- Modified out-of-the-box family
- Calculates axial compressive capacity and slenderness ratio
- View filters, custom formatting
- Conditional formatting in schedule



Markup Symbol

- Internal communication tool
- Different types
- Text fields
- Schedule



The image shows a software interface for creating a markup symbol. On the left is a 'Properties' dialog box, and on the right is a preview of the symbol in use.

Properties Dialog Box:

- Markup_Smbol
Technician to Engineer
- Generic Annotations (1) Edit Type
- Graphics
 - Comment Fields Visible
 - Completed
- Text
 - Author Initials BEM
 - Date Created 10/05/13
 - Comment Should thi...
 - Reply Item on h...
 - Completed By Initials DPM
- Buttons: Properties help, Apply

Symbol Preview:

- A blue octagonal symbol with 'BEM' inside.
- Text below the symbol: 10/05/13
Should this beam be at the same elevation as the one on grid B?
Item on hold
DPM
No
- A blue arrow points from the 'Comment Fields Visible' checkbox to the text area.

Questions?



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Email: dmackey@martinmartin.com

Blog: bdmackeyconsulting.com/blog

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