



***Pylon Live Section Tool***  
*formZ tool plugin*

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# 1 Introduction

With Live Section, creating sections and cut-away views is easy. With Live Section, you can interactively preview sections through complex assemblies or buildings, then section the entire structure (or, if you prefer, only the selected geometry) with a single mouse click.

## Interactive Placement

Live Section allows you to create sections from the view you'll be using them from-- plan, elevation, or any arbitrary viewing angle. The sectioning plane is always perpendicular to your viewpoint. In Target mode, the sectioning plane is placed so it passes through any object clicked on. In Move mode, clicking and dragging in the modeling window moves the sectioning plane towards or away from your position.

## Preview modes

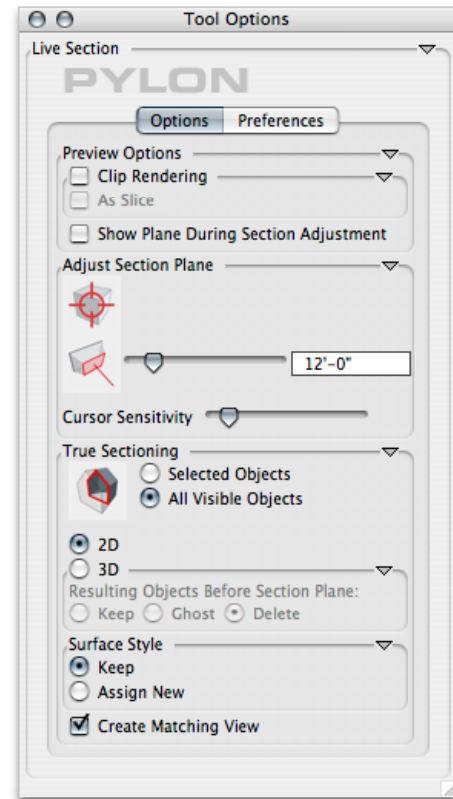
Several preview modes provide feedback while you position the sectioning plane.

## True Sections

Section your entire project, or just a part of it, with a single click. Sections are automatically placed in groups or joined into a single entity (your choice), and given meaningful names (e.g., "2D Section Top"). With 3D sections, you can opt to delete (or keep or ghost) resulting sectioned objects that are between the viewpoint and the sectioning plane, allowing you to effortlessly create cutaway views. Live Section will even section symbols!

## Unstoppable

If Live Section encounters 'incompletely formed' objects, or objects that are inappropriate for the specified section type, it will simply skip them and continue sectioning everything that can be sectioned. When finished, Live Section will notify you if troublesome objects



were found, and ask if you'd like to ignore them, automatically select them, or tag the objects' names so you can deal with them later. The automatic-selection option makes it easy to fix your objects afterward using formZ's Object Doctor--- just click on the Object Doctor tool and all the troublesome objects are inspected, one at a time.

## 2 Getting Started

### 2.1 Finding the Live Section Tool

After installing the Views + Navigation Collection, a new group of tools will be added to your tool palette, called *Views + Navigation*. You'll find the Live Section Tool in this new group. (If you want, you can move your new tools to another location by selecting *Palettes > Customize Tools*.)

### 2.2 Setting up a key shortcut for Live Section

It is possible to set up a key shortcut for Live Section. In formZ, select *Help > Modeling Tools...* In the resulting dialog, double-click on the Live Section Tool icon and create a new key shortcut.

### 2.3 Using the Help System

This manual can be launched from formZ by shift-clicking on the Live Section Tool icon in the tools palette.

## 3 Using Live Section

Sections 3.1 and 3.2 below detail how to prepare for a section. After positioning the sectioning plane. Section 3.3 treats the topic of section renderings and section 3.4, how to create true geometric sections. To begin, select the 'Live Section' tool and inspect the *Tool Options* palette.

### 3.1 Selecting a preview mode

Live Section Tool provides several modes for previewing your section:

#### Clip Rendering

When this checkbox is enabled, everything lying between the sectioning plane and your viewpoint is omitted, or 'clipped'. As the section plane is repositioned using the tools detailed in the next section, the sectioned rendering will be updated in real time. (Live Section is manipulating the 'clip hither' parameter found in formZ's view options.)

#### As Slice

When enabled, the preview will display a 'slice' of the model where it intersects with the section plane. (Live Section is manipulating both the 'clip hither' and 'clip yon' parameters.) The thickness of this slice can be changed in *Preferences*.

#### Show Plane During Section Adjustment

When this checkbox is enabled, a plane representing the section is drawn during repositioning (see the *Position* tool option, below) . Unlike the Clip Rendering preview option, this plane is visible in all windows.

In the sectioning window or frame, this option is best used with Interactive Shaded mode. If Transparencies are enabled (Display > Display Options... > Interactive Shaded), the plane will display as 50% transparent; if not, it will be opaque.

In orthographic views, wireframe mode is often the best choice, as the plane can be seen as a single line passing through the model.

**Tip** When using the 'Show Plane' option, you can inspect the section plane from several angles by opening additional windows or frames.

### 3.2 Adjusting the section plane position

Two tool options are provided for positioning the sectioning plane:

#### Target



Click on the icon, then on any object in the modeling window. The section plane will be positioned so that it passes through the center of the chosen object. Note that you can still click on and target objects even when they are not visible (due to the 'Clip Rendering' preview).

#### Position



Click on the icon, then again in the modeling window. Moving the cursor up will move the section plane further away from your position; moving it down will move the section plane closer. When you are satisfied with the position of the plane, click again to confirm. (You may opt for horizontal cursor movement instead. See *Preferences*).

You may also adjust distance by moving the slider or by typing a value directly into the text box, which indicates the distance from the eye point to the section plane.

#### Cursor Sensitivity

This slider controls how far the section plane is moved per a given mouse movement. Position the slider to the left for fine adjustment, and to the right for coarse adjustment.

**Tip** A good method for positioning the sectioning plane:

1. Using the *Target* mode, select an object in the general vicinity where you want to create the section
2. Turn on one of the preview modes described above.
3. Use the *Position* mode to fine-tune the section.

### 3.3 Creating rendered sections

After you have positioned the section plane, you can make a rendering in any of formZ's rendering modes. RenderZone renders are great for 'cutaway' views, while Hidden Line renderings are useful for making sections that can be pasted into formZ's drafting environment.

#### How to place a rendered Hidden Line section into a formZ drafting project

1. Render the section in Hidden Line Mode.
2. Switch to a drafting project (or create a new one).
3. Select *Edit > Paste From Modeling...* In the resulting dialog, select your hidden line rendering from the list, and enable 'Each 3D Segment As A Single Line' and 'Remove Duplicate And Overlapping Lines'. In most cases, you will want to enable 'Join All Segments' as well.

#### How to import a section into Illustrator

1. Follow steps 1 – 3 above.
2. With the draft window active, select *File > Export Image > Illustrator*.

#### Tip

'Cleaner' sections can often be obtained by creating a true 2D or 3D section (see section 3.4), then copying and pasting the true section into the drafting environment.

### 3.4 Creating true geometric sections

After you have positioned the sectioning plane, you can create a true geometric section of all (or part of) your model. First, set the sectioning options (below) as desired, then click on the True Section Button, then click anywhere in the modeling window. New, sectioned objects will be created and assigned meaningful names.

#### **Selected Objects / All Visible**

Determines whether all visible objects in the file, or only currently selected objects, will be sectioned.

#### **2D / 3D**

Determines if a 2D or a 3D section will be created.

#### **Resulting Objects Before Section Plane**

Determines whether resulting sections lying between the section plane and the viewpoint are kept, ghosted, or deleted. This option is useful when creating cut-away views. It applies to 3D sections only.

#### **Surface Style**

Controls whether the cut faces of the 2D or 3D section are assigned the same surface style of the original cut object(s) (**keep**), or the style currently selected in the surface styles palette (**assign new**).

#### **Create Matching View**

Upon sectioning, the current view will be given a meaningful name and saved to the views palette. This option is useful when one needs to return to the same spot later for further rendering passes, or to generate additional sections with the same orientation but different position.

#### **True Section**



To create a section, click on the Section icon, then anywhere in the modeling window. All selected geometry will be sectioned, including symbol instances, if this option is selected in Live Section Preferences.

**Tip**

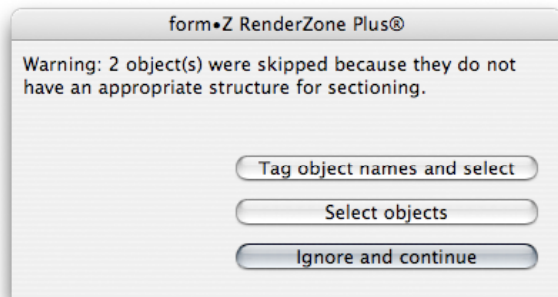
After creating a 2D section, you can paste it into formZ's drafting environment. This will generally produce a cleaner result than pasting from a Hidden Line rendering.

### 3.5 Finding and Fixing Un-sectionable Objects with the Section Diagnostic

If Live Section encounters 'incompletely formed' objects, or objects that are inappropriate for the specified section type, it will simply skip them and continue sectioning everything that can be sectioned. When finished, Live Section will notify you if un-sectionable objects were found, and provide three options to assist you. This warning is only displayed when un-sectionable objects are encountered.

#### Ignore and continue

The default option is to ignore the un-sectionable objects and continue working. This option simply dismisses the warning dialog. Choose this option if you know that the offending objects are not necessary for the section (because you have previously run a section with the 'Select Objects' option and have determined that the offending objects are not critical).



#### Select Objects

Clicking on this button will select all un-sectionable objects and dismiss the warning dialog. [Note: this option is disabled if 'Status of Objects' is set to 'Delete.'] A suggested recovery workflow follows:

1. Visually inspect the highlighted objects to determine if they have are relevant to your section. Some objects, such as open wires (which can never be sectioned), can be safely ignored.

2. If some skipped objects are important, click on formZ's Object Doctor Tool. In Tool Options, click on the 'All' Button within each tab, and enable 'Preview' under the 'Action' parameter. Finally, with the objects still selected, click anywhere in the modeling window.
3. The objects will be loaded into the Object Doctor one at a time, where you can inspect them in greater detail. Some problems, such as non-planar surfaces, can be corrected from within the object doctor. See the formZ reference manual for more details.

### **Tag object names and select**

Clicking on this button will select all un-sectionable objects, append each object name with the tag "[\*]" and dismiss the warning dialog. This option makes it impossible to loose track of the un-sectionable objects. In the future, you can select them all again by selecting Edit > Select By.... Under the 'Attributes' tab, enable the 'Name' checkbox, select 'Contains' from the pull-down menu, and type 'un-sectionable' into the text box.

Notes: The tag objects option is disabled if 'Status of Objects' is set to 'Delete.' Also, if an object's name is longer than 27 characters, the tag cannot be appended.

### **False-Positives**

Live Section's diagnostic system attempts to find each and every case where an object may cause sectioning problems. Occasionally, this sensitivity may result in a false-positive, where an object very near the sectioning plane, but not actually intersecting with it, will be identified as un-sectionable. If this happens, simply dismiss the dialog. You can turn off the diagnostic warning if you wish.

### **Turning off the Section Diagnostic**

You may disable the diagnostic warning dialog in the preferences tab if you would prefer that Live Section not inform you of these cases (as in versions 1.1 and below).

### **A table of typical sectioning problems and solutions**

<b>Object Type / Description</b>	<b>Affects Section Type</b>	<b>Solutions</b>
Open Wire	2D and 3D	• Section not meaningful. Close wire or ignore.
Double-sided surface	2D and 3D	• Make single-sided with formZ's Make One Sided/Two Sided tool.
Solid with non-planar face(s)	3D	• Triangulate Object / Face with formZ's Triangulate Tool. • Edit or recreate object if face should be planar.

## 4 Preferences

### Operand Status

Functions identically to 'Status of Objects' found elsewhere in formZ.

### Section Symbols

When enabled, copies of any symbols are exploded and sectioned. The original symbol instances are not changed. When disabled, symbols are skipped. (Disable this feature if the exploded symbols are resulting in an excess of unnecessary objects.)

### Join Resulting Objects

When enabled, all resulting section objects are joined into a single object. (If necessary, you may separate them later with formZ's 'Separate' tool.) When disabled, all resulting section objects are placed into a single group.

### Prompt For Section Name

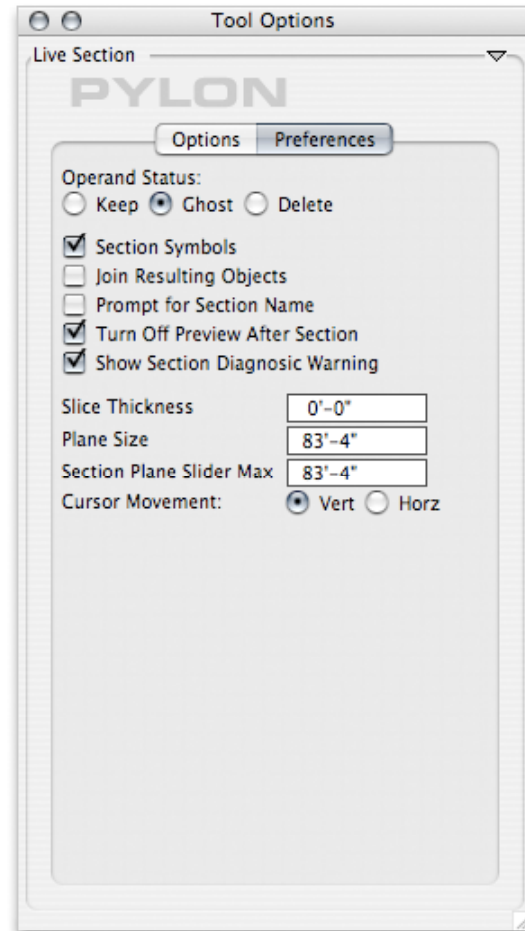
When enabled, you are alerted to name the section if it is successfully created. This name will be given to both the group/joined object and the automatically saved view (if applicable). When disabled, resulting entities will be automatically assigned a meaningful name.

### Turn Off Preview After Section

Determines whether view clipping is turned off automatically after a section is made.

### Show Warnings

Enables/Disables warnings as described in section 3.5.



### **Slice Thickness**

Determines the thickness of the preview slice described in section 3.1.

### **Section Planes Slider Max**

Determines the maximum value of the Position slider found in 'Options'.

### **Cursor Movement**

- Vert: Vertical cursor movement is used to position the section plane while in Position mode.
- Horz: Horizontal cursor movement is used to position the section plane while in Position mode.

### **Saving Preferences**

Changes made to Live Section Preferences are by default only retained for the duration of your modeling session. As with all other tools, if you want to save your preferences for subsequent modeling sessions, go to formZ's general preference dialog (*formZ > Preferences... System > General*) and save a new preference set (or save over your old one). All Live Section preferences, as well as the options found under the 'True Sectioning' heading in 'Options', will be saved.

formZ tech support strongly recommends that users edit and save their preferences only at the beginning of the modeling session.

## **5 Obtaining version information**

Click on the Pylon Logo in *Tool Options* for version information and credits.

## **6 Known issues**

The following minor issues are due to bugs or limitations in the formZ Application Programming Interface (API). They will be corrected when ADS resolves the underlying problems.

- None

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rev. 1.2.0.0