



Pylon Underlay Tool
formZ tool plugin

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1 Introduction

With the Underlay Tool, setting up and managing your underlays in formZ's 3D modeling environment is easier than ever before. The Underlay Tool adds the following functionality to formZ's underlays:

Interactive placement and scaling

Interactively move and scale your underlay by clicking and dragging in the modeling window. Or enter the height or width you need the underlay to be, and Underlay Tool will scale the underlay to meet your specification.

Show in all views, or just the important one

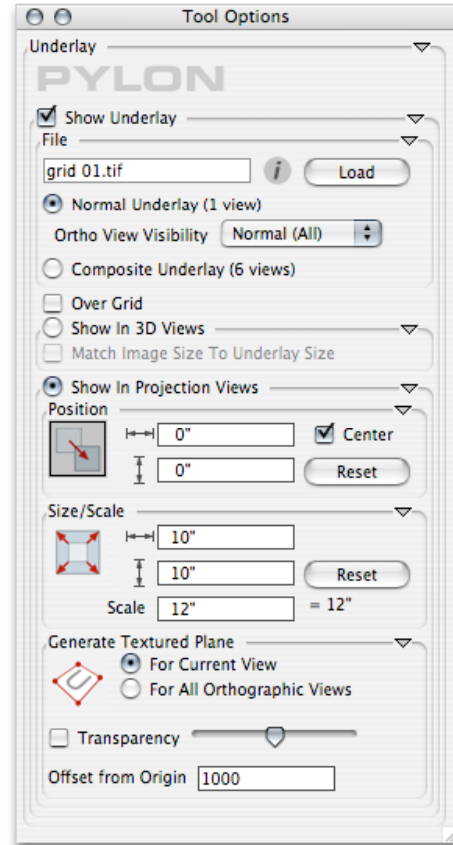
To reduce screen clutter, you can opt to display your underlay in only the orthographic view that is relevant to your model (Top, Front, etc.). Of course, you can also choose to display it in all views as well.

Composite Underlay Support

For situations where you need to trace precisely registered front, top, and side views of an existing product or structure, Underlay Tool introduces support for composite underlays. A composite underlay is composed of between two and six different orthographic views of the same subject, arranged on a grid. As you switch between orthographic views in the modeling window, Underlay Tool works in the background to automatically display the appropriate underlay section at the world origin.

Generate Matching Textured Planes

Need to use your underlay in interactive shaded mode? With one click, Underlay Tool creates textured geometry that precisely matches your underlay. A transparency parameter allows you to create dimmed underlays and transparent overlays in interactive shaded mode.



2 Getting started

2.1 Finding the Underlay 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 Underlay 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 Underlay

It is possible to set up a key shortcut for Underlay. In formZ, select *Help > Modeling Tools...* In the resulting dialog, double-click on the Underlay 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 Underlay Tool icon in the tools palette.

3 Using the Underlay Tool

To begin, select the Underlay Tool from the *Tools Palette* and inspect the *Tool Options* palette.

3.1 Loading an underlay

Show Underlay

Click on this checkbox to load an underlay. (The remaining tool options are disabled until an underlay has been chosen.)

Info



Click to inspect the underlay's file path.

Load

Click to load a different underlay file.

Tip

Where the underlay image itself contains a meaningful scale, **TIFF** and **PICT** (and to a lesser extent, BMP*) formats are recommended for use with Underlay Tool, because these formats store their DPI and dimensions internally. For instance, if you have a floor plan scan where 1/4" in your Photoshop file equals precisely 12" in real space, we recommend using TIFF or PICT, as you would will be able to specify 1/4" = 12" scale directly in formZ. However, if there is no meaningful scale to your image— a photograph, or a scan with an arbitrary scale— any image format will work.

*During testing, we found the display size of BMP images to be very slightly inaccurate, when compared to the size specified in Photoshop, so this format is not highly recommended.

Info

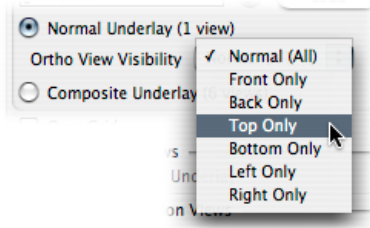
Currently, the maximum texture resolution supported by formZ is 4096 x 4096 pixels, so creating an image file larger than these dimensions will offer no benefit.

3.2 Using a Normal Underlay

Normal Underlay

This option is similar to formZ's conventional underlay placement. A 'Normal' underlay typically contains a single view of the subject from one angle. Underlays are always assigned on a per-window basis.

Ortho View Visibility



This pull-down menu determines which orthographic views the underlay will be visible in. The default, *Normal (All)*, represents formZ's standard behavior: the underlay is visible when any orthographic view is selected. If one of the named views is chosen instead, the underlay will be displayed only when that view is active, and hidden in all others.

The 'Ortho View Visibility' option only applies when the underlay is set to 'Visible in Projection Views.'

Note: When you manually turn off the 'Show Underlay' checkbox, this pull-down reverts to *Normal (All)*.

3.3 Using a Composite Underlay

For situations where you need to trace precisely registered front, top, and side views of an existing product or structure, Underlay Tool introduces support for composite underlays. A composite underlay is composed of between two and six different orthographic views of the same subject, arranged on a grid. As you switch between orthographic views in the modeling window, Underlay Tool works in the background to automatically display the appropriate underlay section at the world origin.

When in Composite Underlay mode, The scale and size fields refer to each of the component images, rather than the overall image size. Also, when in this mode, the Underlay Tool automatically handles positioning, so the 'Position' tool options are disabled.

Currently, the maximum texture resolution supported by formZ is 4096 x 4096 pixels. This means that when using a composite underlay, the maximum size of each component image is 1356 x 1356 pixels.

Creating a composite underlay in Photoshop

- Figure 1 shows the proper placement of each of the 6 views, or *component images*, within a composite underlay. If a particular view is not needed, simply leave it blank.
- The horizontal dimension of each component image ('x' in Figure 1) must be equal to the others. This dimension is called the *horizontal module*. Likewise, the *vertical module* ('y' in Figure 1) must also be the same for each component image. However, the horizontal and vertical modules may differ from one another. Figure 2 illustrates these rules through specific cases.

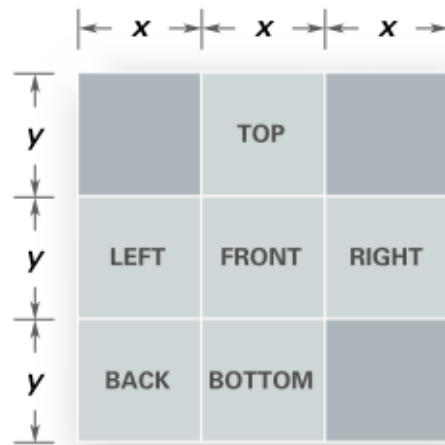


figure 1

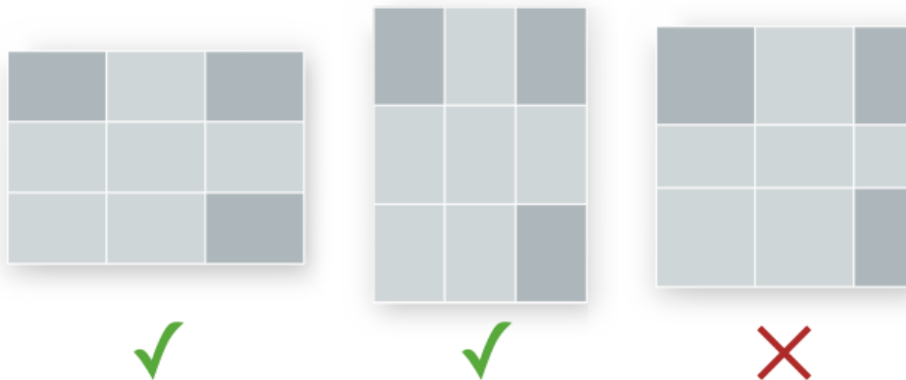


figure 2

- All views should be scaled alike, and important subject features should be aligned between views. For instance, in the left, front, and right views, the top and bottom of the subject should be aligned along the horizontal axis.

Composite Example Guides.jpg (See the *Underlay Examples* folder within your *Views and Navigation* plugin folder) illustrates how to use Photoshop's Guides to accomplish this task.

Composite Example.jpg is an example of a finished composite underlay (this file has been reduced in size from the original).

3.4 Basic Underlay Options

Over Grid

Match Image Size To Underlay Size

Show in 3D Views

Show In Projection Views

These options are equivalent to their native counterparts. See the section titled *Importing and placing underlays* in the formZ user manual for details.

3.5 Positioning the Underlay

Note: Positioning is disabled when the 'Composite Underlay' is selected.

The 'Allow Interactive Adjustments' checkbox will be disabled when you first select the tool, and will be disabled automatically after textured planes are created. Also, when initially enabled, none of the icon buttons will be selected. These features prevent you from accidentally moving or scaling the underlay.

Dynamic Move



Enable the checkbox 'Allow Interactive Adjustments.' Click on the Position icon, then again in the modeling window. Move the underlay to the desired position, then click again to confirm.

Numeric Position

These text fields indicate the underlay offset from the model origin. New values may be typed in directly.

Center

When enabled, the underlay offset is measured in terms of the center of the underlay; when disabled, to the upper-left hand corner.

Reset

Clicking on this button placed the underlay at the origin (0,0).

3.6 Sizing and scaling the Underlay

Dynamic Scale



Enable the checkbox 'Allow Interactive Adjustments.' Click on the Scale icon, then again in the modeling window. Moving the cursor to the left makes the underlay smaller, and to the right, larger. Click again to confirm the scale.

Initially clicking on the right edge of the underlay ensures that that edge will follow the cursor as it is moved.

Numeric Size

These text fields indicate the height and width of the underlay as displayed (as opposed to the height and width of the original image file). If a new value is typed in to either of these fields, the Underlay Tool will calculate and apply the appropriate scale to match.

Numeric Scale

This text field indicates the scale at which the underlay is currently displayed. Typing in a new value scales the underlay to that value.

Reset

Clicking on this button sets the scale to 1:1

3.7 Creating matching textured plane underlays

This function facilitates the creation of underlay and overlays that may be used in interactive shaded mode. Please note the following limitations: 1) The options in this section do not operate in real time, but are only set before a textured plane (or series of planes) is created. 2) This function works in formZ Plus, formZ RenderZone, and formZ RenderZone Radiosity, but not in the formZ - only version, as the latter does not support textured geometry.

For Current View / For All Orthographic Views

Determines whether a textured plane underlay will be created for the current view only, or for each orthographic view (Top, Front, etc.). The second option is more efficient when more than one view is needed, as a single surface style is created rather than six separate surface styles.

Transparency

Determines the transparency of the textured plane underlay. If the plane is used as an underlay, transparency can be used to mute the color values of the image by mixing it with the background color. Transparency can also be used to make an overlay, where the image appears over top of the geometry being modeled. See the 'Offset from Origin' parameter below.

Offset from Origin

The plane will be generated at the specified distance from the origin. If the value is positive, the plane will be placed on the far side of the origin with respect to the current view; if it is negative, the plane will be placed on the near side of the origin. For instance, if a front view is active, and the value is 1000", the plane will be placed at $y = 1000$ ". In the same case, if the value is -1000 ", the plane will be placed at $y = -1000$ ". Typically, positive values are used to create an underlay (the plane will lie behind the modeled objects), and negative values are used to create an overlay (the plane will lie between the viewpoint and objects). When creating an overlay, you will want to make the plane transparent (see 'Transparency,' above).

Create Plane



Click on this icon, then anywhere in the modeling window to generate the textured plane underlay(s). Ensure that the options above are set properly before creating the planes.

Note that 'Textures' must be enabled in the Interactive Shaded Display Options in order to see the textured plane image. Setting the pixel resolution to a high value (2048x2048 or 4096x4096) is recommended. The display of interactive shaded textures has been greatly improved in formZ 6.5. For best results, this version (or later) is recommended.

It is also recommended that 'Show Surfaces as Double Sided' (in menubar > Display) be turned off.

Tip

After a textured plane underlay has been created, it behaves like a normal formZ object. If you need to change the position or scale of your underlay later, it is recommended that you delete the associated textured plane underlay(s) then generate new ones. This is much easier than attempting to synchronize the wireframe underlay to the textured planes manually.

4 Preferences

Underlay Tool does not have a separate preferences tab or dialog, but the following tool options are considered preferences and are stored when you save your formZ preferences file:

Normal Underlay / Composite Underlay
Transparency (on/off)
Transparency Amount
Offset from Origin

Saving Preferences

Changes made to Underlay Tool's options 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 / limitations

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

- Underlay Tool operates exclusively in formZ's modeling environment, as there is currently no way for plugin developers to access the drafting environment.
- In formZ 6.1, when an existing file containing an underlay is opened, the scale parameter of an underlay file is not reported to Pylon Underlay Tool correctly unless formZ's native underlay dialog is opened first (*Window > Underlay...*). This problem was fixed with version 6.5. To work around this, upgrade to version 6.5, or make sure to open and dismiss formZ's native underlay dialog once before operating the Underlay Tool.

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