

VIEWPORT CREATION FOR 3D MODELS

Vectorworks Tutorial by [Andy Broomell](#) © 2020.
Green text indicates advanced or supplementary notes.


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OVERVIEW

- A **viewport** is an object which displays a portion of your drawing within a window, sort of like a live picture.
- When you've modeled an object in 3D, you can create multiple viewports of that object, each looking at a particular view, instead of drafting each view individually in 2D.
- When you change your model, viewports "see" the changes.
- Views looking directly at a side (Top, Front, Left, etc.) are called **orthographic views**. In these views, things that are perpendicular to the viewer are measurable.
- Just as with 2D drafting, **scale** will be important when creating orthographic views of a 3D model, allowing a view to be measured.
 - Perspective views have no measurable scale, so perspective should only be utilized for renderings and auxiliary views.
"Drafting" views should never be in perspective.
- This tutorial will guide you through the process of creating a drafting plate from a simple 3D model.
- When drafting interior sets, see page 8 for Section Viewports.

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CREATING A SHEET LAYER

- Viewports are typically placed on **Sheet Layers**  (which are where sheets are laid out for printing, the equivalent of LayOut).
- To create a new Sheet Layer from scratch, go to the third tab of the Navigation Palette, right click in a blank area, and choose New. Enter a number and name (such as **3 / Elevations**). Check the “Edit Properties After Creation” checkbox. Click OK.
- In the next pop-up, click **Page Setup**, then click **Printer Setup**. This is where you choose the **paper size** for your sheet, and the settings depend on the printer driver settings on your computer. Typically set the printer to “Adobe PDF” or “Format for Any Printer”. For page size, drafting plates are often 24x36” (ARCH D), or 11x17”. You may have to set up a custom page size for your printer/computer. It’s best for margins to be set to 0. Click OK to exit the Printer Setup pop-up.
- Back in the **Page Setup** pop-up, make sure the Pages and Printable Area settings are correct and match what you determined in the Printer Setup. Click OK until you’re back in the drawing area.
- Note that you can also create a new Sheet Layer *during* the process of creating a viewport.

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CREATING A VIEWPORT

- To create a viewport of a 3D object, first make sure the classes and layers are set to the **visibility** you want. Then go to the **view** you want to see in the viewport (such as Front) and set the **render mode** (these aspects can also be changed later).
 - A good render mode for views based on 3D models is “**Hidden Line**” which is similar to Wireframe but doesn’t display edges that are obscured by the 3D object itself. (**Dashed Hidden Line** is also an option depending on what you’re drafting).
 - Note that in the **Hidden Line Render Options**, there is a setting for “Smoothing Angle”. This parameter reduces facet lines on curved surfaces, so increase the angle if there are “too many” edge lines being displayed. Often 15-30° is appropriate.
- Once everything looks correct, go to **View > Create Viewport** (note shortcut) to create a viewport based on your current view.
 - If you want to create a **cropped** viewport, first draw a 2D shape (typically a rectangle) then select “Create Viewport” with the shape selected. (Shape may need to be set to Screen Plane).
 - Viewports with **no crop** automatically expand/contract to display everything modeled on the visible Design Layers.

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CREATE VIEWPORT DIALOGUE BOX

- In the “Create Viewport” dialogue box, give the viewport a Name and Drawing Title (they can match). This can also be done later.
 - Viewport names are useful when viewing the list of all viewports in the 4th tab of the Navigation Palette.
 - The Drawing Title will auto-fill into the Drawing Label object.

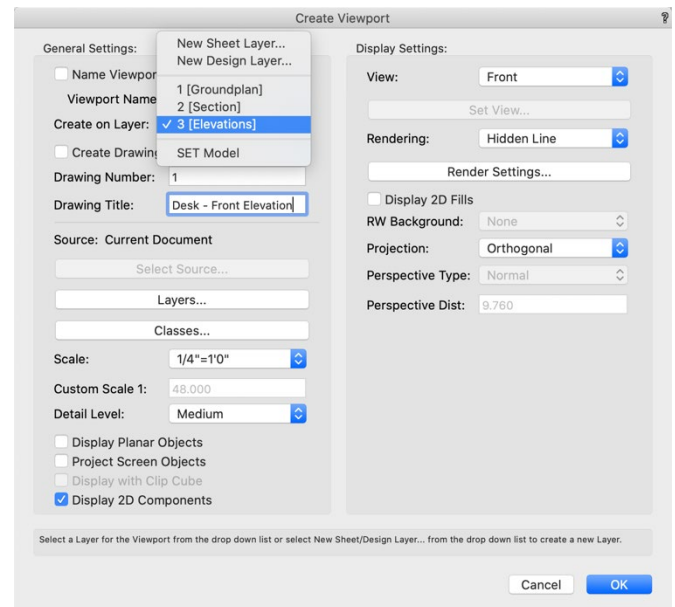
- Under “**Create on Layer**” select the desired Sheet Layer destination.

- This is where you can also create one from scratch by selecting “New Sheet Layer”.

- The **scale** will default to your Design Layer preview scale (likely $\frac{1}{4}'' = 1'-0''$). You can choose a different scale if you want.

- Remember to always build your objects at real-life scale and let Viewports scale them down for printing.

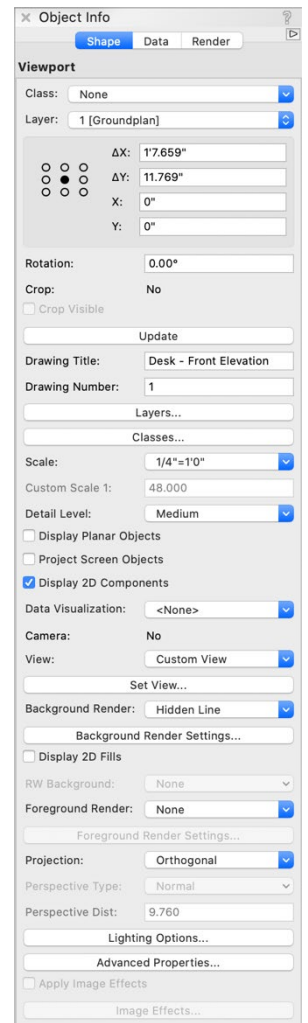
- The rest of the options default to the view and visibility settings that were present when you ran the Create Viewport command.
- **Click OK.** You will be taken to the new viewport on the Sheet Layer.



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VIEWPORT PARAMETERS

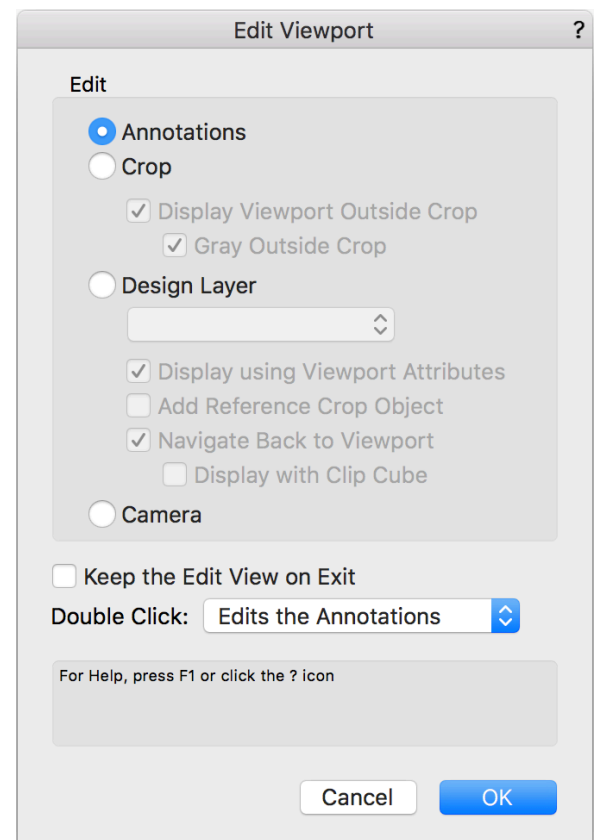
- All of the viewport settings can be changed in the OIP once it's created. Note in particular that “**Background Render**” is simply the general render setting for the viewport. For now leave that set to Hidden Line or Dashed Hidden Line.
 - The “Background Render Settings” button allows you to adjust the render mode options for that viewport. Each viewport stores its own render settings, independent from the options set in the “Current Render Mode” dropdown (used on Design Layers).
- Remember that each Viewport has its own class and layer visibility independent from the Navigation Palette. To change what's seen in a viewport, select it and click on either the **Classes** or **Layers** button in the OIP.
- Note that the OIP also has “View” and “Scale” parameters which can be changed at any time.
- For measurable drafted views, make sure “Projection” is set to either “2D Plan” or “Orthogonal”.



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ADDING ANNOTATIONS


- To add annotations to a viewport, double click it, or right click and choose **Annotations**. Annotations include dimensions, notes about materials, drawing labels, etc.
- Each Viewport has its own Annotations overlay. These annotations exist only in their respective Viewport; they don't show up in your Design Layers. Objects within Annotations are automatically at the same scale as the Viewport.
- Sheet Layers, Viewports, and Annotations never get **referenced** in to other files. You can only reference Design Layers.
- Right clicking a Viewport will also give you options to edit its Crop, Navigate to included Design Layers, or edit the Camera view (for perspective renderings).
- In the Edit window you can also set the default action when double-clicking viewports.




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CREATING ADDITIONAL VIEWPORTS



- If you want additional viewports of the same object, you can go back to the Design Layer and repeat all the steps listed previously, **or** you can **duplicate** your first viewport (Option+drag or Ctrl+drag), then change the “View” to another view.
 - Remember that you may want to rename the new Viewport at the bottom of the OIP.
 - Duplicating a viewport also duplicates any objects within the Annotations of the first viewport, along with the viewport’s Crop.
- Just as in hand drafting, it is imperative that each view is lined up horizontally / vertically with its neighboring views.
- Use the Drawing Label tool (Dims/Notes toolset) to add a label below each viewport. Give each a number / letter and a name as needed.

 **Wall A - Elevation**
Scale: 1/4" = 1'-0"

- **Section Viewports** are used whenever you need to slice through a 3D model, or when other geometry is obscuring the view you're trying to create.
- There are numerous ways to create Section Viewports. One way is to first draw a line indicating the cut plane with the **Section-Elevation Marker**  tool (found in the Dims/Notes toolset).
- With the **Section Line** object selected, click the “**Create Section Viewport**” button in the OIP and choose a destination Sheet Layer.
- Click the “**Advanced Section Properties**” button to further define the extents of the viewport, including “Extents Beyond Cut Plane.” You can also choose a class for the attributes of sectioned objects.
- Section Viewports default to Hidden Line mode which is a good starting point for elevations.
- When you click OK, it creates the viewport and takes you to the Sheet Layer.
- Modifying the Section Line back on the Design Layer will alter the connected Section Viewport accordingly.
- Use the Reference Marker tool (Dims/Notes toolset) to add elevation labels in your groundplan.

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UPDATING VIEWPORTS

- Only Wireframe viewports automatically update when changes are made to the model.
- Viewports with other render modes will display a red hatched outline  when out of date, and require you to select the viewport and click the **Update** button in the OIP.
 - There is a setting  that can be added to the Quick Preferences toolbar which can turn the display of these red hatches on and off.
- If multiple Viewports need to be updated, you can select them and choose “**Update Selected Viewports**” under the View menu, or you can simply choose “**Update All Viewports**”.
 - This may take a while depending on the complexity of your model and other factors.
- The Publish dialogue box, and various other export functions, have a checkbox to automatically update all out-of-date viewports prior to saving, though this can also add a lot of time to the exporting process. The alternative is to keep this unchecked and manually make sure viewports are up-to-date before exporting.

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PUBLISHING A PDF

- To save your Sheet Layer(s) to a PDF, go to **File > Publish** (or if exporting a single Sheet Layer, you can use File > Export PDF).
- In the left-hand column are exportable items. Select the ones you want, then click the right arrow to move them to the right-hand side.
 - Typically Sheet Layers are exported, not Saved Views.
- When ready, click **Publish** and choose where to save your PDF.
 - Always add dates to saved PDF filenames.
 - For example:
 - WOD-ShopDrawings-9-17-18.pdf
 - VMA_7_AudiencePlatforms_081219.pdf
 - When saving any type of file on a computer, it's best to only use letters, numbers, hyphens, and underscores. Avoid spaces, periods, slashes, and special characters.

