

3D Dimensions - A Tutorial

To achieve 3-dimensional dimensions in VectorWorks, I have found the following method. Start with the shape that you want to dimension. Shown in Fig. 1, I have created an arbitrary shape of a tapered box with a tapered cylinder on the top.

Once you have your shape, determine the number of dimension planes that you will need. For each dimension plane, you will need to add a new layer to your document. (These layers can be added at any time, of course.)

In Fig. 2, you can see the four dimension planes that we'll be using for this tutorial, shown as red shaded polygons.

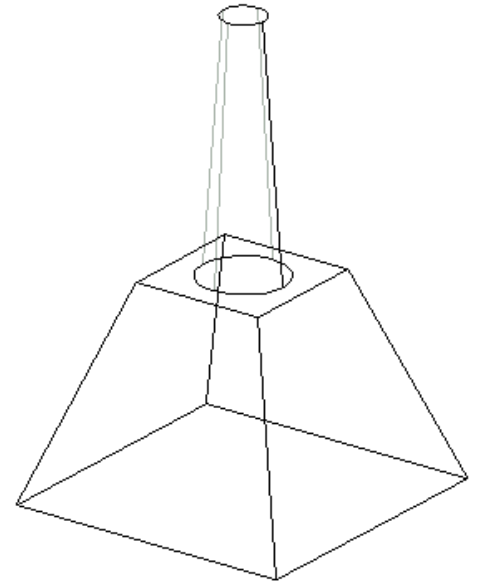


Fig. 1: The shape to be dimensioned

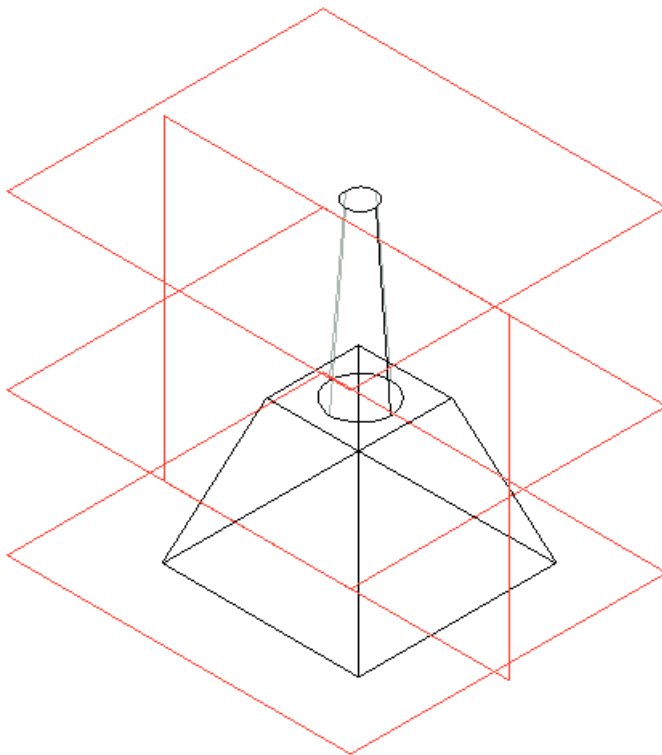


Fig. 2: The four dimension planes: (1) the base, (2) the top of the tapered box, (3) the top of the tapered cylinder, and (4) the vertical plane bisecting the object.

Once the planes have been determined, and the necessary layers have been created, we can now proceed with creating the dimensions themselves.

Moving to the layer for the base dimensions, create a layer link of the layer that the object is on. Once created, unlock the layer link. (Note: Don't move it. It makes this process much easier if the layer link is properly aligned with the original layer.)

Place the layer for the base dimensions in Top or Top/Plan view. Now, draw your dimensions,

just as you would for any standard dimensions, as shown in Fig. 3.

Once the dimensions are drawn, select the layer link, and, using the Object Info palette, move it to the next dimension layer.

Now, before moving on to create the next set of dimensions, there is one more thing that can be added to this layer. Place several 3D Loci at various points around the dimensions. As these dimensions will be brought back into the main layer as Layer Links with 2D objects projected, you want to place some 3D objects to act as 'handles' (you cannot grab a 2D object in a layer link), and 3D loci work very well in this capacity. In Fig. 3, the locations of the 3D loci are circled in red.

Figs. 4, 5, and 6 show the dimensioning* of each of the subsequent layers. Note that all of them are in Top view, except Fig. 6 which has been switched to Front view.

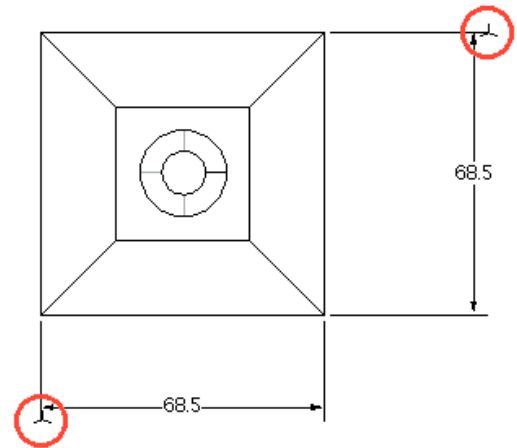


Fig. 3: The base, dimensioned, with 3D loci circled in red

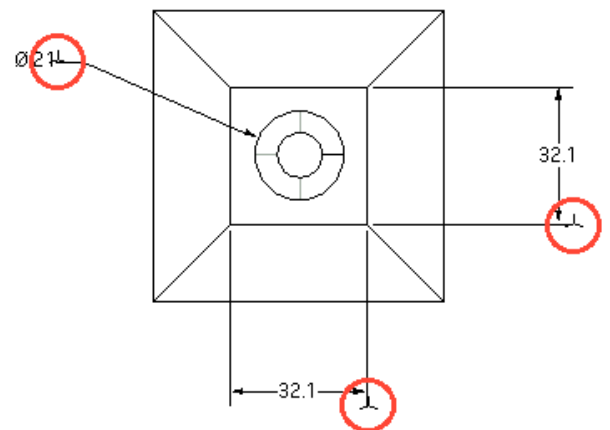


Fig. 4: The top of the tapered box, dimensioned, with 3D loci circled in red

Fig. 5: The top of the tapered cylinder, dimensioned, with 3D loci circled in red

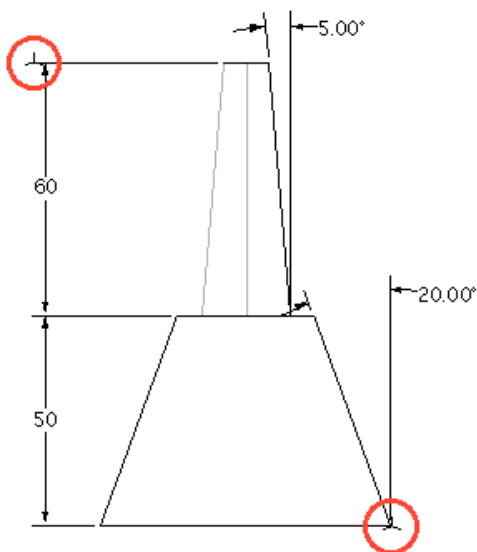
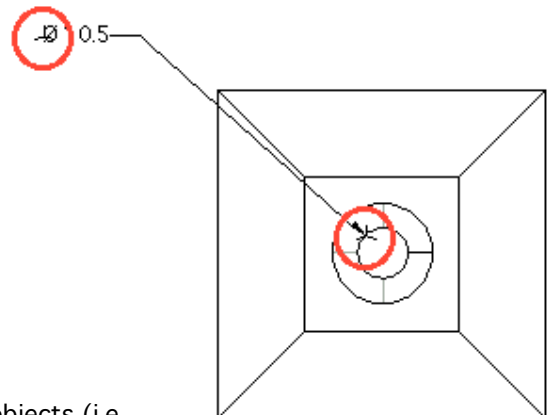


Fig. 6: The vertical plane, dimensioned, with 3D loci circled in red

* The diameter and angle dimensions shown were achieved using extra objects (i.e. circles and lines, respectively) to base the dimensions on as these tools don't recognize these features on 3D objects.

Now that all of the dimensions have been drawn, it's just a matter of bringing them back onto the layer with the original object. First step toward doing this is to delete the layer link of the original object that we've been using to create our dimensions.

Next, on the layer of the original object, create layer links of all of the dimension layers. Make sure that the Project 2D Objects check box is checked each time you create a layer link (Fig. 7).

When all of the dimensions have been linked in, you'll see a pile of dimensions on the ground plane of the object's layer, as shown in Fig. 8.

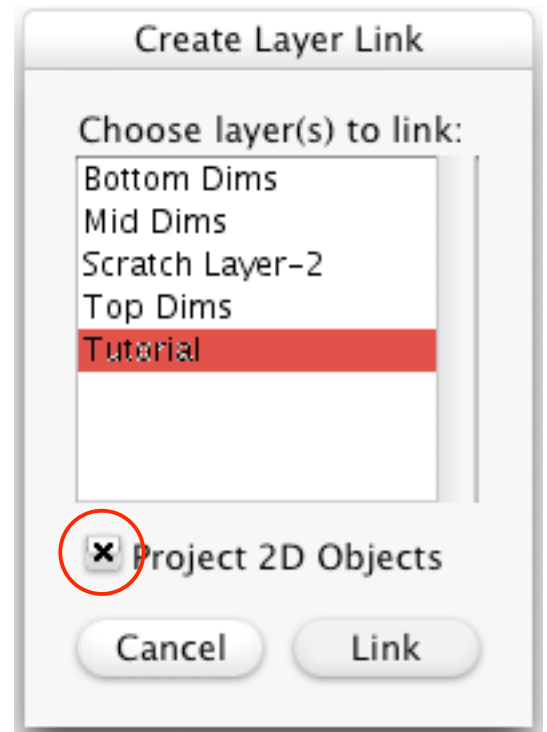


Fig. 7: The Layer Link dialog box

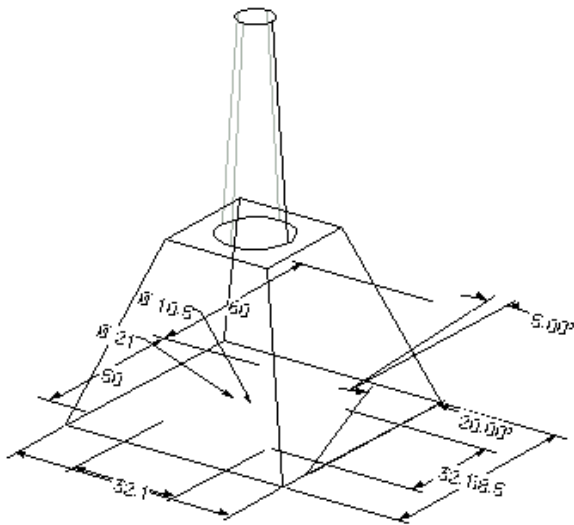


Fig. 8: The object with all the dimensions linked in but not yet placed.

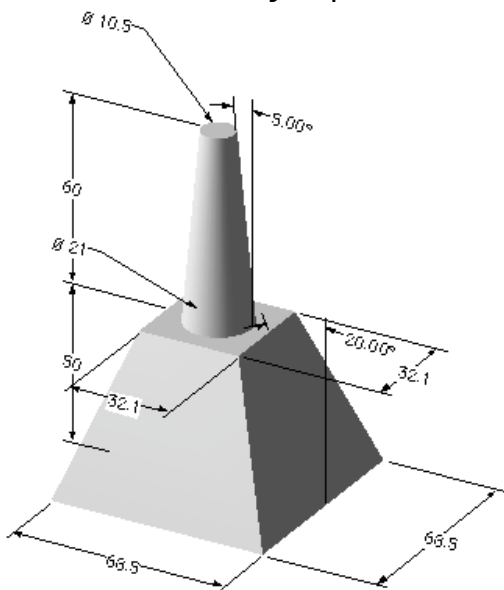


Fig. 9: The object, rendered, with all the dimensions linked in and placed.

Now we'll unlock all of the layer links, and start to position them. For the horizontal dimensions, it is simply a matter of changing their Z position, because they were created already aligned to the object. For the vertical dimensions, they must first be rotated up to a vertical position, then positioned, either by dragging, using the 3D locus handles that we created, or using the move or nudge commands.

This leaves us with the final result, as shown in Fig. 9.

Questions? Comments?

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