

General Recommendations for Importing an AutoCAD Drawings

If possible, open the drawings in AutoCAD and rename the Standard dimension style to something unique. In AutoCAD, use the DDIM command for renaming the style. This will prevent Rhino from ignoring the Standard style when importing multiple drawings with the default Standard style.

IMPORT the DWG in Rhino, instead of INSERT. Currently there is a bug with the INSERT command that incorrectly resets the insertion point of nested blocks in the DWG. Use IMPORT until SR1 for Rhino 4 is available.

You will need the Working_with_layouts_in_Rhino4.ZIP for the models that this tutorial refers. Unzip and place files in a working Rhino folder. You will be asked to import or insert them in the following exercise.

Importing the Models

 Begin a new Rhino model using the template *Large – Inches*. This is an architectural drawing using architectural units, where the base unit is 1 inch.

Open Template Fi	5			? ×
Look in	C Template Files	💌 😳 🎓 💷 💌		
My Rucant Documents Downlop Downlop My Documents My Computer My Network, Places	Q0.3dm Large Objects - Centimeters.3dm Large Objects - Feet.3dm Large Objects - Indrees.3dm Large Objects - Millions.3dm Large Objects - Millions.3dm Large Objects - Date Modified: 1/8 Small Objects - Date Modified: 1/8 Small Objects - Milliones.3dm Small Objects - Milliones.3dm Small Objects - Millioneters.3dm Small Objects - Millioneters.3dm	/2007 9:51 AM		Notes Use this template file for building objects the size of a truck or larger. Units: Feet Absolute tolerance: .01 ft.
	File name: Large Objects - I	nches.3dm	<u>O</u> pen	
	Files of type: Rhino 3D Model	s (*.3dm)	Cancel	
	Use this file when Rhino starts		No Template	



Import PLAN-LAYOUT.DWG and SECTION-LAYOUT.DWG. With the Top viewport active import these files with the default Import options.

Ч х 🛄	

3. Layout space is used to arrange the model for plotting. This placement is acceptable.

Setting up and Editing the Sheet Layout

 Type *LAYOUT* at the command prompt. For the first layout, use the default Windows printer, and 8.5x11 landscape orientation. Change the Initial Detail Count to 1. Pick the OK button.

💱 New Pag	ge Layout 🛛 🔀				
Name:	Page 1				
_ Select Pri	nter				
Printer:	🖨 HP LaserJet 8100 Series PCL 6 📃				
Size:	Letter				
	Portrait				
Custom					
Width:	11.0 inches				
Height:	8.5 inches				
Initial De	tail Count: 1				
	OK Cancel				

Note: The printers on the Printer list are Windows printers that were add to the Windows operating system from Start -> Printers and Faxes.



- 0 0 0 0 O D
- The sheet layout viewport Page 1 appears. 2.



3. Right-click over the Page 1 tab will bring up a menu. On this menu, you will find commands that manage the Page Layouts like Rename and Delete. You will also find the Layout Properties command for editing the layout settings Wodify Page Layout

		Name: Page 1 Select Printer
	Insert Delete Rename Move or Copy	Printer: HP LaserJet 8100 Series PCL 6 Size: Letter C Portrait Landscape Custom
	Combined Model Tab Tab Orientation Hide Tabs	 Width: 11.0 inches Height 8.5 inches
} Pagé	Layout Properties Print	OK Cancel

Right-Click Menu

Layout Properties command

×



Arranging the Layout

 Highlight the edge of the detail. Type *POINTSON* or press the F10 key. Control points will appear on the edge of the detail.





2. To resize the viewport, pick on the control point at one the corners. Press and drag it to a new location. The detail will resize. To move a detail you can use Windows drag or the Move command. Page 1



Drag the control to a new location.



This resizes the detail





ESC to turn off the Control Points. Pick on the edge of the detail to highlight. Press and drag and detail to a new location

 To set the scale to the detail, highlight the detail. Press F3 to open the *Properties...* command. In the Properties dialog, under the Object list, pick Detail.



- ¥___x
- 4. Type 1 at Inches on Page 1 and 48 at Inches in Detail. This will simplify to .021 and that is ok. Here we are telling Rhino to display 48 model units or 4' of model units for every 1 unit on the page. This is equivalent to 1=48 or ¼"=1'-0. There are 1'-0" of model units in every ¼" on the paper. This is another way of expressing the same 1=48 scale.
- 5. Last, resize the viewport with control points to show the entire plan.



- Note: By default, **F10** is set to the **POINTSON** command while F11 is set to the **POINTSOFF** command. To use this but make sure the paper is active (not the detail.) Highlight the edge of the detail. Press F10. Pick on the corner control points to activate and drag to new position, resizing the detail.
 - If panning is necessary, make the detail active by double clicking on it. The background in the detail will turn white and you will be able to pan and zoom the model.



Note: Panning and zooming are available until the detail is Lock in the Properties dialog.

Adding a Title Block and Notes

1. Start the *INSERT* command. Pick the File button:

🦤 Insert		<u>×</u>
<u>N</u> ame: LOGO		▼
Path:	initions We from this file	
Insertion point	Scale	Rotation
Prompt	Prompt	Prompt
⊻: 0.0	<u>×</u> : 1.0	Angl <u>e</u> : 0.0
<u>)</u>	<u>火</u> : 1.0	
<u>Z:</u> 0.0	<u>Z</u> ; 1.0	
External File	Insert as	
Embed	Block Instance Block Instance State State	
C Link and embed	O Group	
O Link	○ Indi⊻idual Objects	
	ОК	Cancel <u>H</u> elp



From the file dialog navigate to the tutorial files and select the file Letter Title 2. Block.DWG Use the defaults of prompt for rotation and scale of 1 and place the title on the sheet

				<u>? ×</u>
ayouts		💌 🖸 🗗 🖃 💌		
2211 Victor ma 552-02V vett 67-02V vett 67-02	infloor.dwg dm.dwg Duuc. - AutoCAD Drawing Modifed: 1/10/2007 2:22 PM 997 KB			Notes
File name:	letter title block.dwg	•	<u>O</u> pen	
Files of type:	AutoCAD drawing file (*.dwg)	•	Cancel	
	Elegants	leyouts 2211 Witter manifoor.dwg S521-02V vert dm.dwg Grotentid.dwg Wetter ditte Book dmg Grotentid.dwg Grotentid.dwg	Ieyouts Image: Control of the second sec	Isyouts Image: Control of the second sec

- Note: If File of Type is set to 3DM, pick DWG to insert the file Letter Title Block.DWG.
 - 3. The edge of the detail should be set to *No Print* under the *Print Width* in Properties. You can check this in Properties in the Print Width field.



4. Lock the detail to protect for accidental zooming. Highlight the detail, in Properties from the Detail list, check Lock.





5. Place the title block and arrange the detail on the title block.



6. Pick *Print* from the *File* menu or the *Print* button. The layout is ready to print. Here we are printing with the *Black and White* output color.



7. Print a test.



Adding Another Layout

1. Let us add a new layout that uses a D size or 36x24 sheet. Right click over the Layout 1 tab and from the menu, select Insert and Add Layout.



2. If you do not have a plotter that supports the larger sheet size, pick **Printer** as *None*.

😽 Nev	v Pag	e Layout
Na	me:	Page 2
Sele	ect Prin	iter
Pri	nter:	🚑 None 💌
Siz	e:	Custom
		O Portrait
Cus	tom	
Wi	dth:	36.0 inches 🗨
He	ight:	24.0 inches
Initi	al Deti	ail Count: 1
		OK Cancel

If you have a large format plotter as a **Design Jet**, pick the plotter and select the D size sheet.

New Pag	ge Layout	×
Name:	Page 2	
_ Select Pri	inter	1
Printer:	HP DesignJet 1055CM by HP	
Size:	Arch D - 24 x 36 in.	
	○ Portrait	
Custom		
Width:	36.0 inches 💌	
Height:	24.0 inches	
Initial De	atail Count: 1	
	OK Cancel	



3. Right click over the Layout 2 tab, and pick Insert and New Detail from the menu.



4. Pick two diagonal corners as shown below. Double-click to activate the viewport and zoom in on only the detail. Double click back on the sheet layout to de-activate the detail.

Page 2	
9x	
	8

5. Resize and scale the viewport to 1 paper unit per 48 model units or.021 paper unit over 1 model unit. For help see previous section Arranging the Layout for details.



6. Type the INSERT command. Pick the File button and browse to the tutorial folder and select *D Title Block.dwg*. Place it in the lower left corner of the sheet layout.

Page	2		
0.000			
		Fs	
(
y			
-			i.

Adding Additional Details

1. Right click over the Layout 2 tab, and pick Insert and New Detail from the menu.





2. Pick two diagonal corners as shown below. Double-click to activate the viewport and zoom in on only the detail. Double click back on the sheet layout to de-activate the detail. (this is important for the next step.)



3. Highlight the edge of the detail, and open *Properties* with *F3*. In the Properties dialog, under the **Object** list, pick **Detail**.

Properties		×
Object		-
Object		
Detail		
Name		
Layer	Default	-
Display Color	🗌 By Layer	-
Linetype	By Layer	-
Print Color	🔷 By Layer	-
Print Width	No Print	-
Render Mesh Settings		
Custom Mesh		
Settings	Adjust	
Isocurve Density		
Density		÷
Show surface isocurve	Visible	
	Match	
	Details	
	Object Object Detail Name Layer Display Color Linetype Print Color Print Width Render Mesh Settings Custom Mesh Settings Isocurve Density Density Show surface isocurve	Object Object Detail Name Layer Display Color By Layer Linetype By Layer Print Color Print Width No Print Render Mesh Settings Custom Mesh Settings Adjust Isoccurve Density Density Show surface isoccurve Visible Match



4. In the *Inches on Page* field type 1. In the *Inches in Models* field type 12. Dialog will simplify to .083 inches on page equals 1.0 inches on model. These are two different ways of saying the same thing.



- 5. Lock the detail in *Properties*. You cannot close or dock *Properties*. Docking will keep the dialog available for other details.
- 6. Make another detail. Hint: right click over the layout tab and pick New Detail.



- 7. Make the new detail active by double clicking on it. Using Properties, set the scale to 1 paper unit equals to 8 model units. This is equivalent to $\frac{3}{4}$ = 1'-0" or .125 paper units per 1 model unit.
- 8. Pan and resize as necessary. Then lock the detail with Properties.

Adding Dimensions to the Details

We now want to add dimensions and text that are appropriately sized for the $\frac{3}{4}"=1'-0"$ details. The text and dimensions that we add here will then be hidden in the smaller scale view of the plan. Let us see how this is done.



1. Make a layer called **DIMENSION-DETAIL**. Give it the Blue color and make it the current layer with the check mark in the current column.

Layers - All Layers]	X
🗅 🖪 🗙 🔺 🔺 🗸	≫ ?	
Name		•
Layer 02	🖓 🗗 🗖 🖉	
Layer 03	្ ៤ 🗖 🖓	_
Layer 04	្ 🖬 🗖 🖓	
Layer 05	្រាប	
FDN_WALL	្ 🖬 🗖 🖓	
TIT_BLK	្ 🖬 🗖 🖓	
FOOTING	្ 🖬 🗖 🕐	
DIMENSIONS	្ 🖬 🗖 🖓	
NODES	் 🗖 🖉 🕐	
BUILDING_LINES	្ ក 🔳 🔾	
0	ം പ∎ ്	
DEFPOINTS	💡 பி 🔳 🔿	
STEM-WALL	្ 🖬 🗖 🖓	
CONCRETE	ஒ பு □ ்	
REBAR	្ខ 🗗 🔳 🔾	
DIMENSION-DETAIL 🔗		_

2. From the *Dimension* menu, pick *Dimension Properties*.

⊢ Document Properties	Global dimension scale 1.0	
– Mesh – Units	Dimension at de	
- Page Units	Dimension style	
- Dimensions	Default	
Default		
dim48	New <u>Rename</u> <u>D</u> elete	
l dim12		
Grid	Dimension Style Name	×
- Notes		
- Summary	Name DIM16	
– Linetypes		
Web Browser	OK Ca	ancel
Rhino Options		
⊕ View	1 A	
Aliases		



 Pick in the left pane of the *Options* dialog. Pick the + to the left of the Dimensions category and pick on the new dimension style *dim16*. Change the dimension values as displayed in the dialog below. Do not forget to pick *Feet and Inches* as the Number format.

We calculated these numbers by factoring the plotted height of the item by the scale factor of the detail in which dimensions are going to be created.

For example, plotted text height of .125 or 1/8" is multiplied by 16 (16 model units per one plotted inch or $\frac{3}{4}"=1'$) which gives a text height for the dimension style of 2.

S Document Properties	<u> </u>
Document Properties Benino Render Mesh Units Page Units Dimensions Default dim48 dim12	Name - dim16 Eont - Arial - Arial Number format C Decimal C Fragtional C Fragtional C Fragtional Fragtional I'-1 1/4"
Gim lb	Angle precision: 1.00
 Notes Summary Linetypes Web Browser Rhino Options View Aliases Appearance Files General Mouse Keyboard Plug-ins Modeling Aids Context Menu Selection Menu RhinoScript Render Options RhinoMail Alerter 	Sizes Iext height: 20 Text gap: 05 Extension line extension: 10 Extension line effect 1.0 Dimension line egtension: 0.0 Centermark size: 1.0 Dimension arrows Length: 20 Arrow Leader arrows Length: 20 Arrow Ar
Alerter	C Horizontal to view Advanced OK Cancel Help

Before closing the *Dimension Properties* dialog, in the Dimension style list in the right pane pick the *dim16* dimension style to be current. Pick the *x* button in the upper right corner to close *Dimension Properties*.
 © Document Properties

Document Properties B. Rhino Render Mesh Units Page Units Dimensions Default dim18 dim16 Grid Notes Summary	1.0 Jename Delete
---	----------------------

×



5. Active the detail by double clicking in it. The background of the details will display as white when active.



6. Because the detail is locked, you cannot zoom in and modify the detail's display scale.



7. From the Dimension menu, pick Linear. Pick first on the left of the column footing, then pick on the right of the column footing, and finally pick above the column footing.





- 8. <u>Create a few more linear dimensions as suggested in the graphic below.</u>

9. Pan to compare the dimension text heights and arrow size. All the dimensions display and plot the same size here on the layout. That is because of the dimension style planning we did earlier.



Visibility Per Detail

Next, the dimension in the column footing detail should not be visible in the plan detail.



- 11010日のののので、10010人の 0 ۳_×
- Make the plan detail active by double clicking 1.

2. Type HideinDetail and select the dimensions that were created on the column footing in the last section. After selecting them, Enter to complete the command.



3. The dimensions will now only be visible in the column footing detail and not the plan.





Adding Text to the Details

1. Type Layer. Make three new layers called Notes-plan, Notes-section, Notes-detail. Make it Magenta and Current.

Layers - All Layers			×
D 🗅 🗙 🔺 🔻 🕇	ግ ነ	ծ ?	
Name			
Layer 05	Ŷ	പ് 🗆	C
FDN_WALL	<mark></mark> ₽	പ് 🗖	
TIT_BLK	Ç	പ് 🗖	
FOOTING		പ് 🗖	
DIMENSIONS	Ç	പ് 🗖	
NODES		പ് 🗖	
BUILDING_LINES		ப் 🗖	
0		பி	
DEFPOINTS		பி	
STEM-WALL	Q	ட் 🗖	<u> </u>
CONCRETE	V	бП	
REBAR	V	<u>ப</u> ் _	
DIMENSION-DETAIL	, V	<u> </u>	9
Notes-plan	× _		9
Notes-section	V R	<u>с</u>	<u> </u>
Notes-detail	V		┖╤╢
•			• //

2. The plan detail is set to a scale of 1 inch on the layout equals 48 units in the model. Plotted text heights will need to be scaled up by a factor of 48 to look correct. The section is set to a scale of 1 inch on the layout equals 12 units in the model. Plotted text heights will need to be scaled up by a factor of 12 to look correct. The column footing detail is set to a scale of 1 inch on the layout equals 16 units in the model. Plotted text heights will need to be scaled up by a factor of 12 to look correct. The column footing detail is set to a scale of 1 inch on the layout equals 16 units in the model. Plotted text heights will need to be scaled up by a factor of 16 to look correct.

.125" text height x 48 = 6 .125" text height x 12 = 1.5 .125" text height x 16 = 2 .25" text height x 48 = 12 .25" text height x 12 = 3

.25'' text height x 16 = 4

See the last sheet of this tutorial for more detailed text chart.

3. Make the Plan detail active. From the Dimension menu pick *Text Block*. Pick a location for the text to be created.



4. Type a text height of 6 and create sample text below.

😽 Create Text	×
Font	_
Arial	
☐ Bold ☐ Italic ✔ Always use this font	
Height: 6 inches Import File	
Text to create	
THIS TEXT IS 6" HIGH IN AND VIEWPORT HOWEVER IT WILL PLOT 1/8" HIGH ON THE LAYOUT	
OK Cancel Help	

5. Create a second piece of text. From the Dimension menu pick *Text Block*. Pick a location for the second text object to be created.



6. Type a text height of 12 and create sample text below.

😽 Create Text	×
Font	-
 ☐ Bold ☐ Italic ☑ Always use this font 	
Height 12 inches Import File	
Text to create	
THIS TEXT IS 12" HIGH IN AND VIEWPORT HOWEVER IT WILL PLOT 1/4" HIGH ON THE LAYOUT	
OK Cancel Help	11.





7. Make the Section detail active. Make the *Notes-section* layer current.

Layers - All Layers			×
0 % × 🔺 🔻 🤇	ዮ 2	≫ ?	
Name			
Layer 04	Ç	ර 🗖	0
Layer 05	Ç	° f □	
FDN_WALL	Ç	ර 🗖	
TIT_BLK	Ç	ර 🗖	0
FOOTING	Ç	ර 🗖	Ö
DIMENSIONS	Ç	ර 🗖	Ö
NODES	9	ර 🗖	Ö
BUILDING_LINES	Ç	ර 🗖	Ö
0	Ç	ර 🗖	Ö
DEFPOINTS	9	് 🗖	Ö
STEM-WALL	Ç	ර 🗖	Ö
CONCRETE	Ç	° ර 🗖	Ö
REBAR	Ç	ර 🗖	Ö
DIMENSION-DETAIL	Ç	ර 🗖	0
Notes-plan	Ç) ර 🗖	
Notes-section	Ø		
Notes-detail	<u>ק</u>	· ሐ 🗖	<u>o</u> r

8. From the Dimension menu, pick Text Block. Pick a location for the text to be created.

😽 Create Text	×
Font	
Arial	•
 ☐ Bold ☐ Italic ✓ Always use this font 	
Height 1.5 inches Import	File
Text to create	
THIS TEXT IS 1.5" HIGH IN AND VIEWPORT HOWEVER IT WILL PLOT 1/8" HIGH ON THE LAYOUT	
OK Cancel Help	

9. Type a text height of 1.5 and create sample text below.

10. From the Dimension menu, pick *Text Block*. Pick a location for the text to be created.



11. Type a text height of 3.0 and create sample text below.

😽 Create Text 🛛 🗙
Font
Arial
 ☐ Bold ☐ Italic ✓ Always use this font
Height: 3.0 inches Import File
Text to create
THIS TEXT IS 3" HIGH IN AND VIEWPORT HOWEVER IT WILL PLOT 1/4 [†] HIGH ON THE LAYOUT
OK Cancel Help

Your drawing will look like this:



12. Make the column footing detail active. Also, make the **Note-detail** layer current.





- 13. From the Dimension menu, pick *Text Block*. Pick a location for the text to be created.
- 14. Type a text height of 2 and create sample text below.

💸 Create Text	×
Font Arial	
 ☐ Bold ☐ Italic ✓ Always use this font 	
Height: 2.0 inches Import File	
THIS TEXT IS 2" HIGH IN AND VIEWPORT HOWEVER IT WILL PLOT 1/8 " HIGH ON THE LAYOUT	
OK Cancel Help	

15. From the Dimension menu, pick *Text Block*. Pick a location for the text to be created.



16. Type a text height of 4 and create sample text below.

😽 Create Text	×
Font	
Arial	•
☐ Bold ☐ Italic	
 Always use this font 	
Height: 4 inches	Import File
Text to create	
THIS TEXT IS 4" HIGH IN AND VIEWPORT HOWEVER IT WILL PLOT 1/4 [#] HIGH ON THE LAYOUT	
OK Cancel	Help

Your drawing will look like this: Page 2 - Detail (Top)



17. Now zoom out and compare the text heights. The larger text created at various heights will all plot at 1/4". The smaller text created at various heights will all plot at 1/8".



18. Last, hide the column detail text that is visible in the plan detail. Make the Plan



The text is now hidden in the plan detail







Adding Text to the Layout

1. Double click to make the layout active. Start the Layer command and make a new layer *Notes-Layout*. Set it to magenta and current.

Layers - All Layers			×
0 6 × 🔺 🔻 7	Þ	?	
Name			
FDN_WALL	۰ V	ና 🗖	C I
TIT_BLK	۰ V	ና 🗖	
FOOTING	۰ V	ና 🗖	
DIMENSIONS	۰ V	ና 🔳	
NODES	9 c	ና 🔳	
BUILDING_LINES	💡 c	ና 🔲	Ö
0	V c	ና 🔳	Ö
DEFPOINTS	💡 c	ና 🔳	Ö
STEM-WALL	۰ V	ና 🗖	Ö
CONCRETE	۰ V	£ 🔲	Ö
REBAR	۰ V	ና 🔳	Ö
DIMENSION-DETAIL	۰ V	ና 🔳	Ö
Notes-plan	۰ V	ና 🗖	Ö
Notes-section	۰ V	ና 🗖	O I
Notes-detail	۰ V	ና 🗖	0
Notes-Layout 🔗			
			_

19. From the Dimension menu, pick *Text Block*. Pick a location for the text to be created.



20. Type a text height of .25 and create sample text below.

💸 Create Text	×
Font Arial Bold Italic Always use this font	_
Height: 0.25 inches Import File	
FOUNDATION PLAN AND SECTIONS	
OK Cancel Help	1.

21. From the Dimension menu pick *Text Block*. Pick a location for the text to be created.



22. Type a text height of .125 and create sample text below.

💸 Create Text	×
Font	_
Arial	
 ☐ Bold ☐ Italic ✓ Always use this font 	
Height 0.125 inches Import File	
Text to create	
RHINO 4 LAYOUTS	
OK Cancel Help	

Your drawing will look like this:

	1			
FOUNDATION	Drawing No.	Date	RHINO 4 LAYOUTS	
PLAN AND	Layout No.	Drawn/Checked	Rov	Citid
PLAN AND SECTIONS	Layout No. Series No.	Drawn/Checked	Rov:	Chd Chd

Challenge: Add addition text objects to label the details content and scale.





Plotting

1. Right click over the Layout 2 tab and from the menu pick Print.





2. Print full size to you full size plotter.



If you do not have a full size plotter, scale to fit to a smaller sheet. Plot Extents, Scaled to Fit, and Landscape to you Windows printer.

