

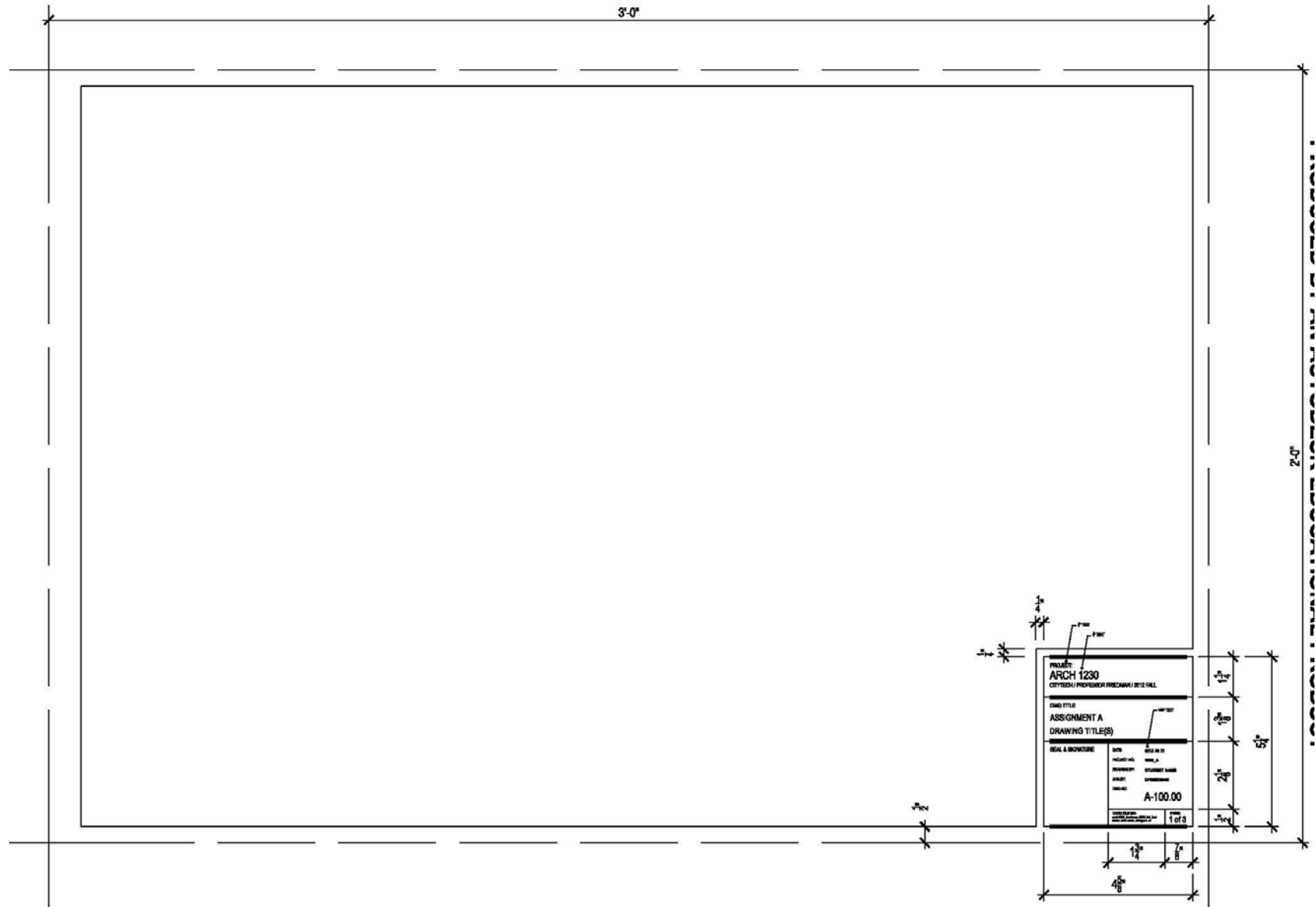
Class #2 Lab:
Basic CAD Skills & Standards

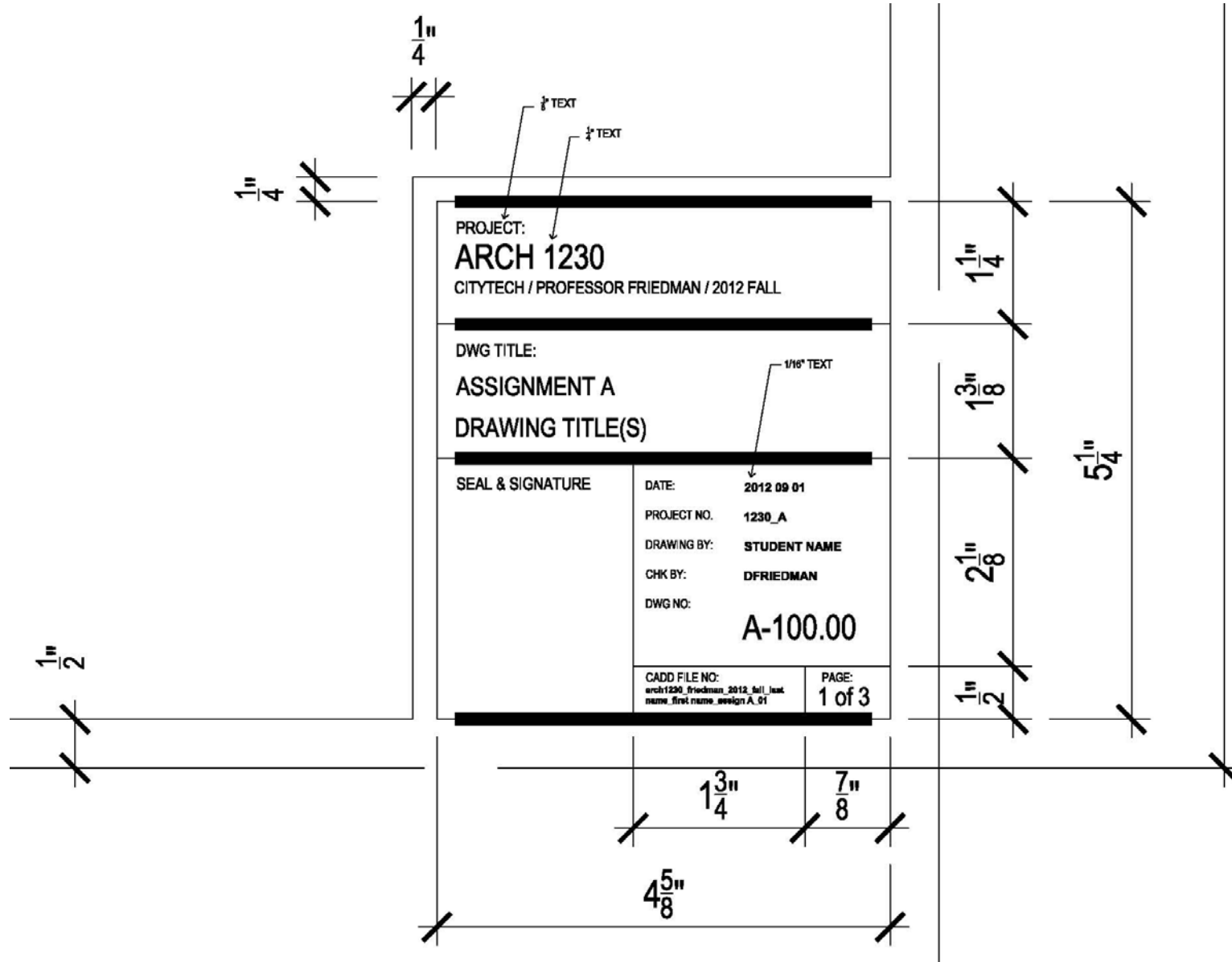
1230- Building Tech II
NYC College of Technology
Professor: Daniel Friedman AIA LEED AP
Fall 2012

Basic AutoCAD Interface

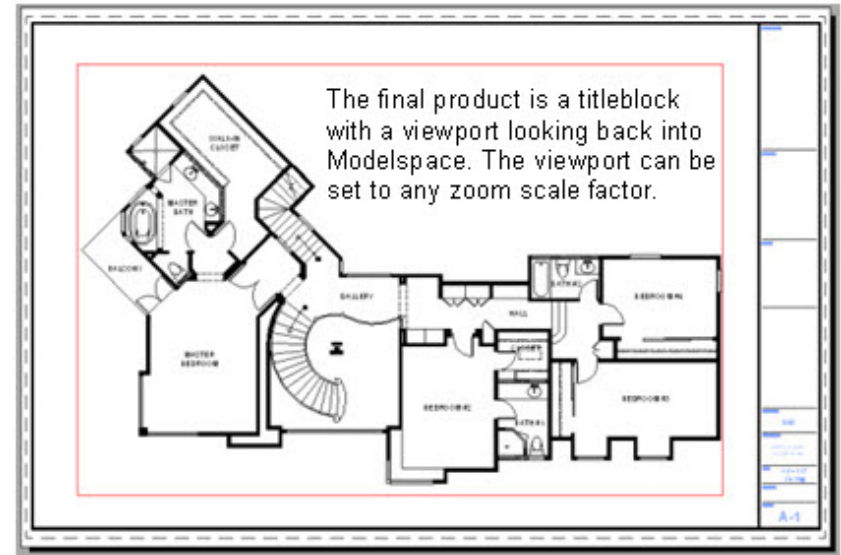
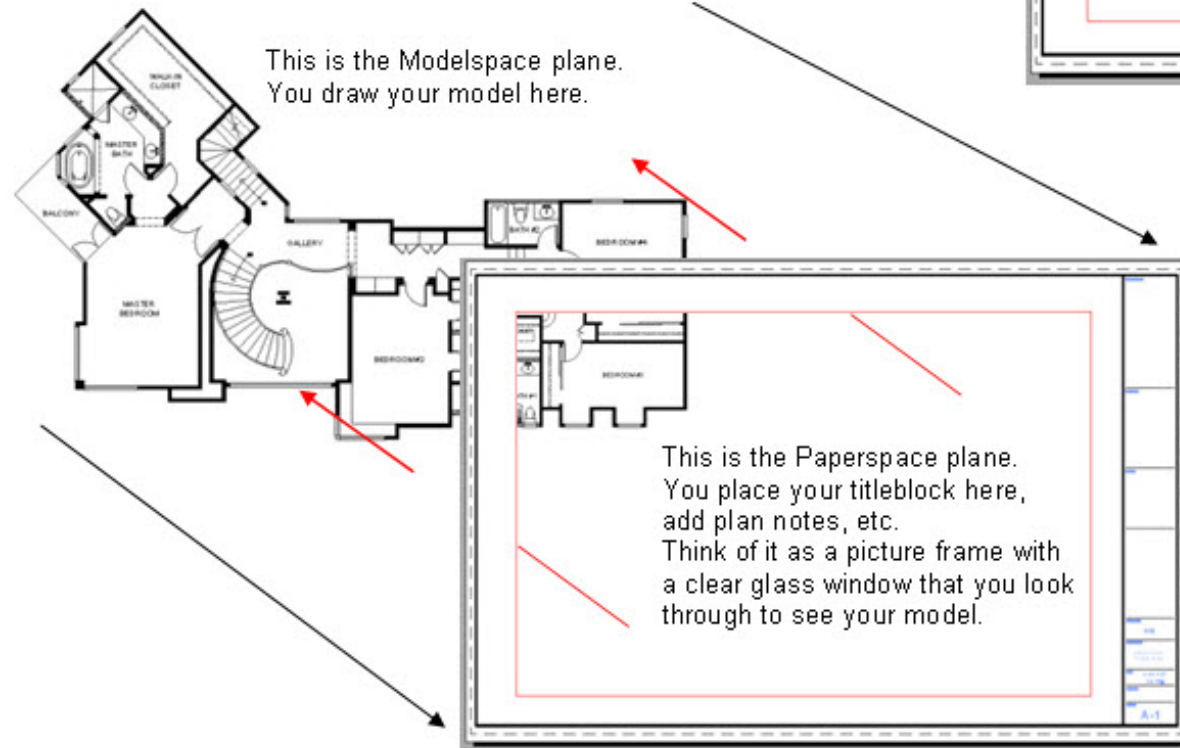
AutoCAD Skills

AutoCAD Standards

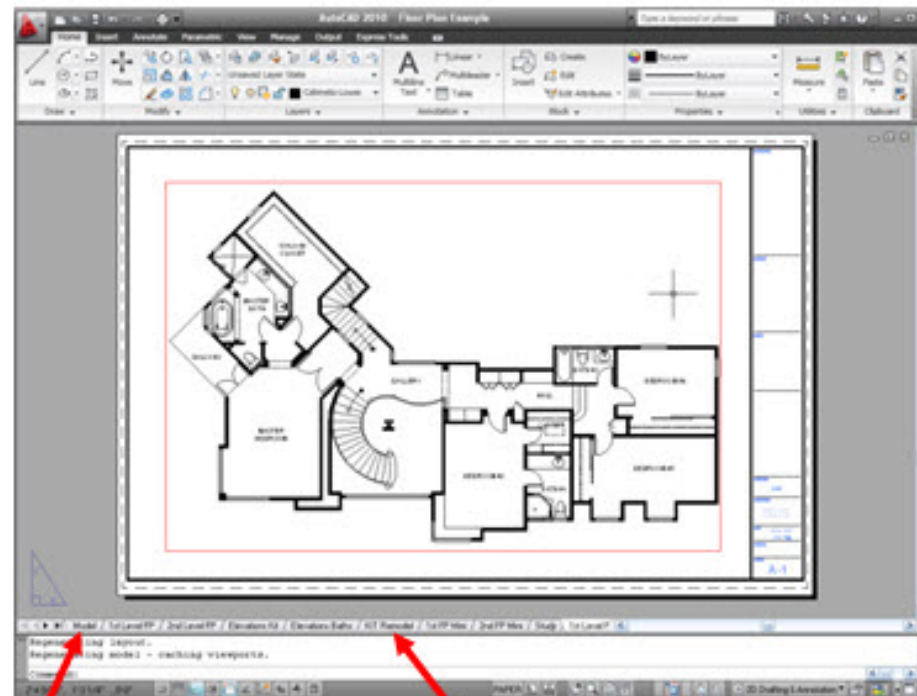




Paperspace/ Layouts



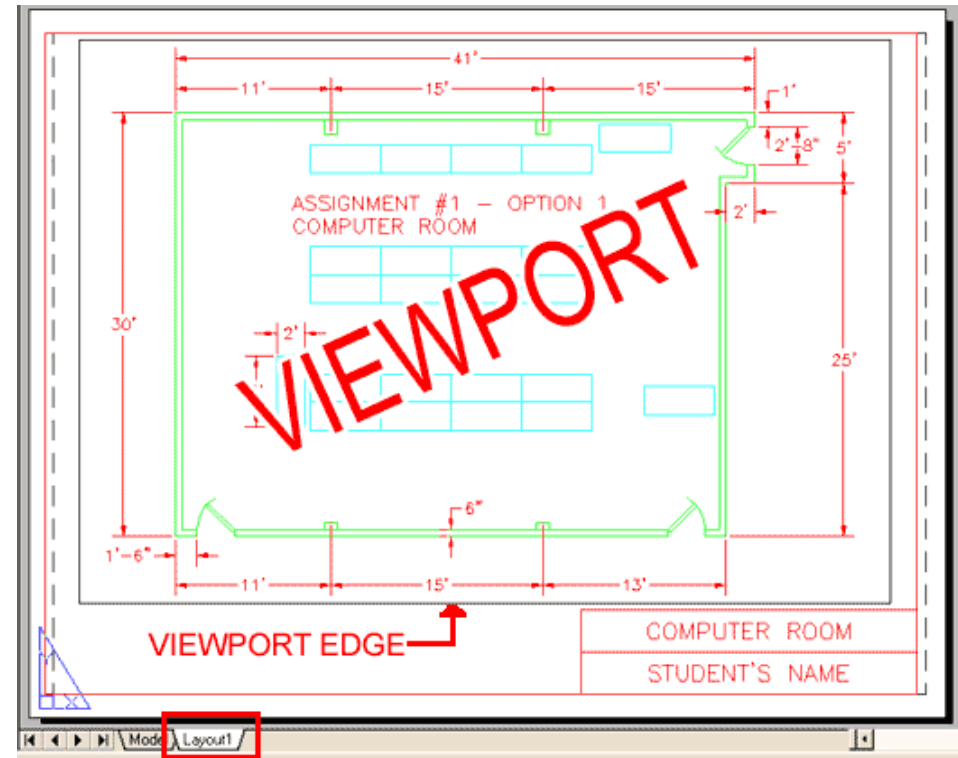
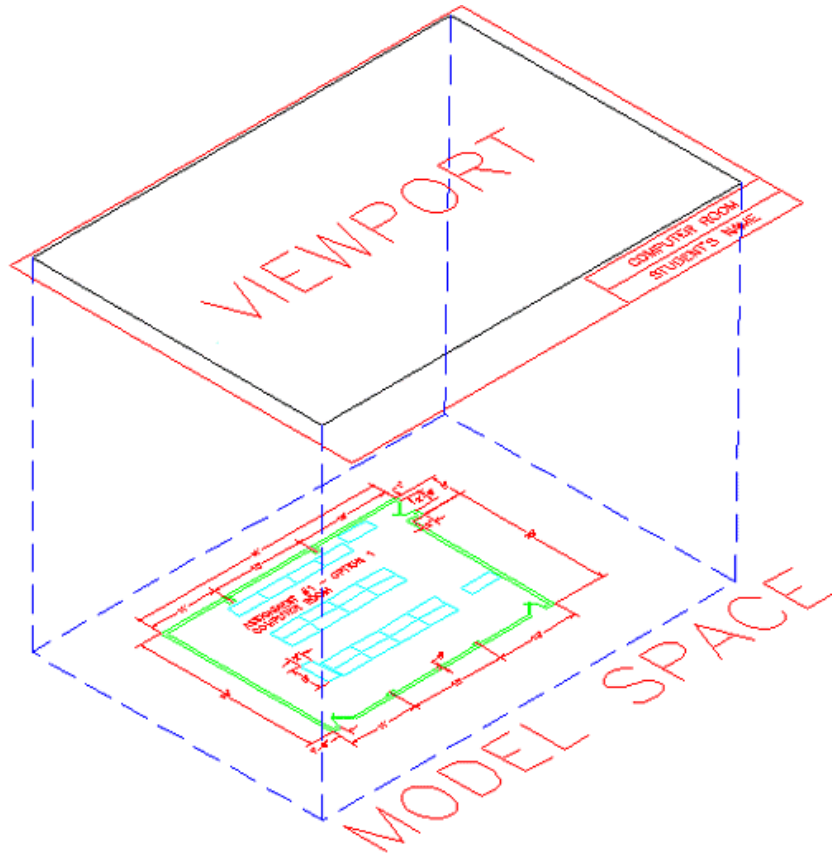
Paperspace



The Modelspace tab, pick here to turn off the display of Paperspace and return to Modelspace.

Paperspace Layout tabs, pick any one of these tabs to display that Layout.

Paperspace



Paperspace



- When drawing by hand you use an architectural scale to draw a reduced drawing at a measurable size (like 1/8" = 1'-0").
- When drawing in AutoCAD you draw at real world size (full scale) and AutoCAD will reduce it to the appropriate scale.

Paper Space versus Model Space

AutoCAD has two different areas that you will use to create scaled drawings.

Model Space

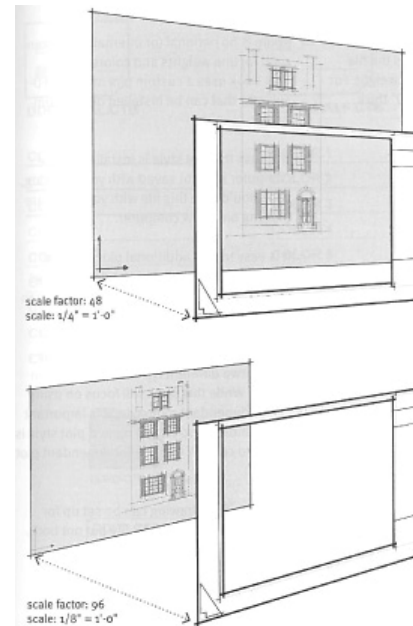
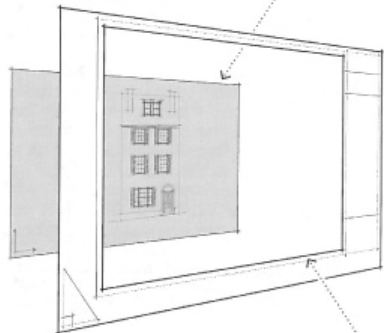
- **MODEL SPACE** (or the Model tab) is the place in AutoCAD where we draft 95 percent of our lines.
- While in Model Space, you draft at true world scale. True world scale means if you are drafting a room that is 30'-6" wide by 20'-0" deep in Model Space you will draft your lines 30'-6" wide by 20'-0" deep.

Paper Space / Layout View

- The **LAYOUT VIEW** (Layout1, Layout2, and Layout3 tabs) is the place in AutoCAD where you set up the sheets you are going to print or plot.
- Anything that you draft in your Layout View will print the same size as you drafted it. Therefore, if you add 1/8" tall text to your layout view, this text will measure 1/8" tall on your printed sheet.

Viewport

- The opening (or window) you see in the Layout View is called a **VIEWPORT**. Viewports allow you to see through your Layout View to the project you drafted in Model Space.



AutoCAD Scale Factors

The Scale Factor concept is unique to AutoCAD. In this diagram, the Scale Factor represents the distance between Model Space and the Layout View. If you move Model Space farther back, then the drawing in your Layout View will get smaller. If you move Model Space closer, then the drawing in your Layout View will get larger.

- For a drawing/viewport to be scaled 1/4" = 1'-0", the scale factor is **48**.
- For a drawing/viewport to be scaled 1/8" = 1'-0", the scale factor is **96**.
- As you increase the scale factor, you are increasing the distance between Model Space and Layout View which decreases the printed size of your drawing.

The following is a list of drawing scales and their AutoCAD scale factors:

Drawing Scale	Scale Factor
3" = 1'-0"	4
1-1/2" = 1'-0"	8
1" = 1'-0"	12
3/4" = 1'-0"	16
1/2" = 1'-0"	24
3/8" = 1'-0"	32
1/4" = 1'-0"	48
3/16" = 1'-0"	64
1/8" = 1'-0"	96
3/32" = 1'-0"	128
1/16" = 1'-0"	192
1/32" = 1'-0"	384

Paperspace

To change the paper size, go to the **Page Setup Manager**.
Found by Right Clicking on the Layout Tab.

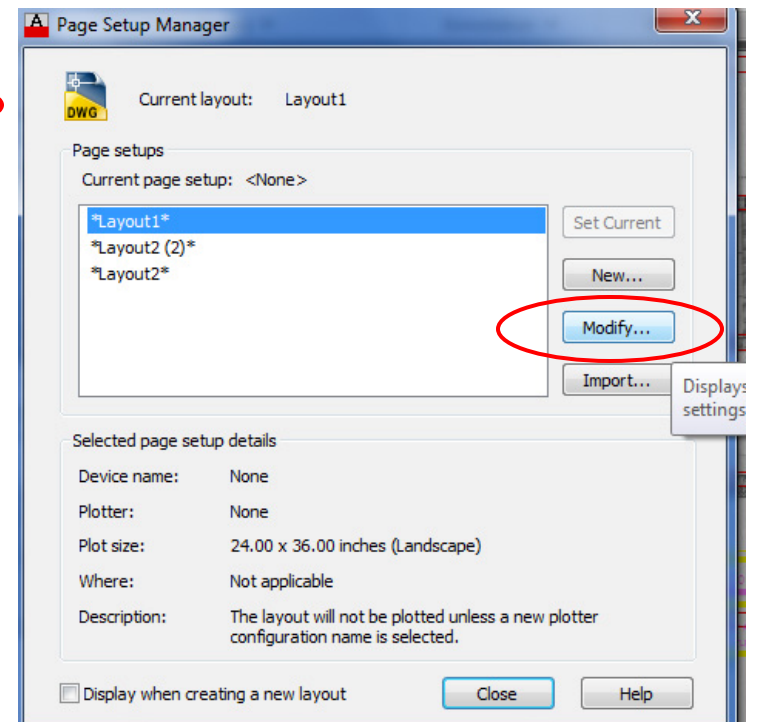
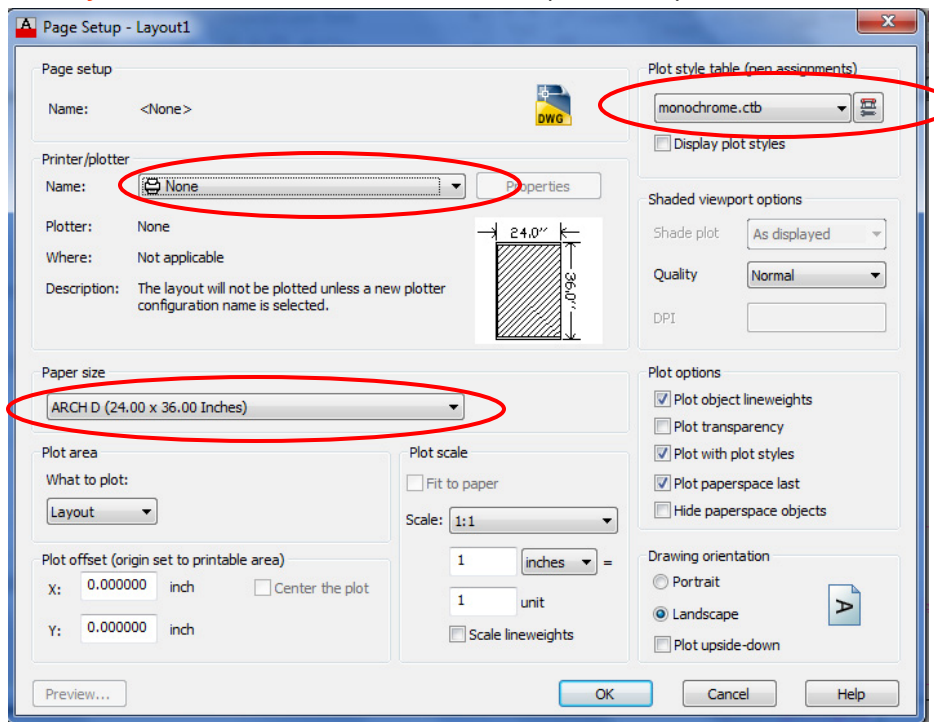
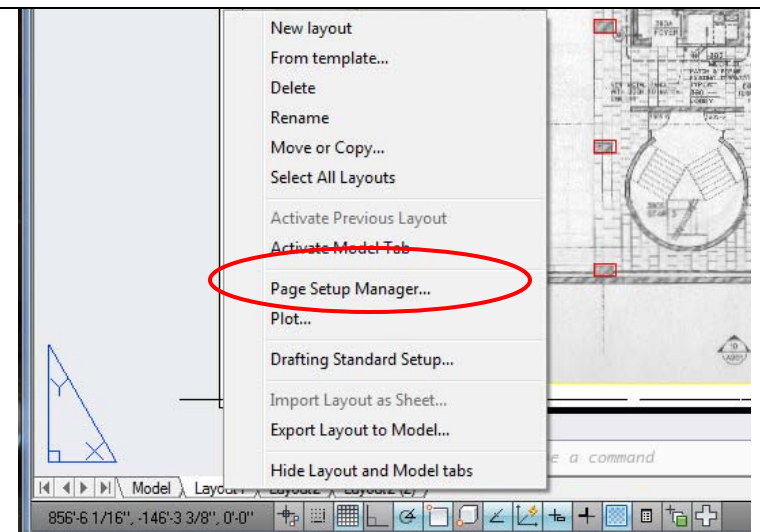
-In the Page Setup Manager, we are going to **Modify** the Page.

-In Page Setup, **change the Printer** to a large scale plotter (or **Adobe PDF**)

Change the **Paper Size** to **ARCH D (24" x 36")**.

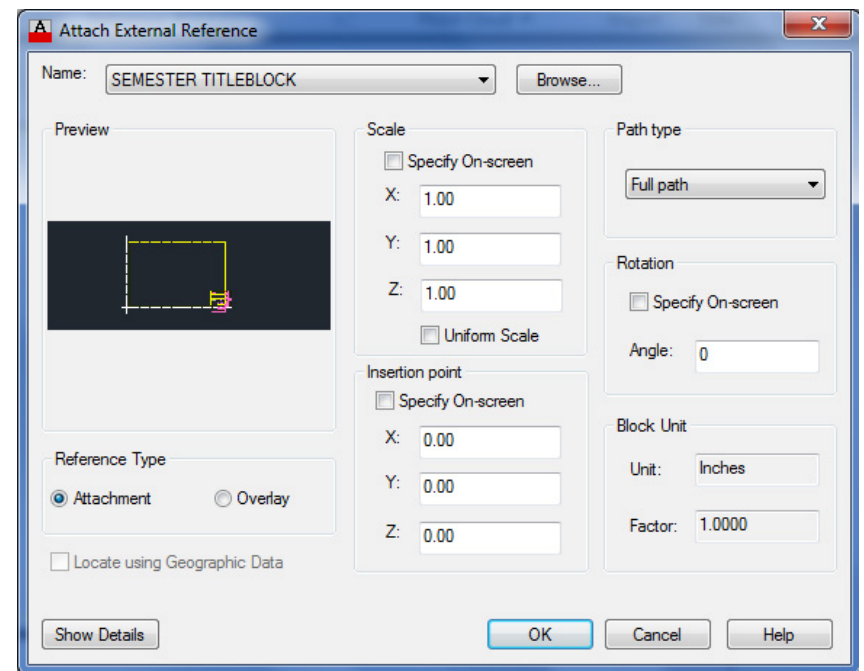
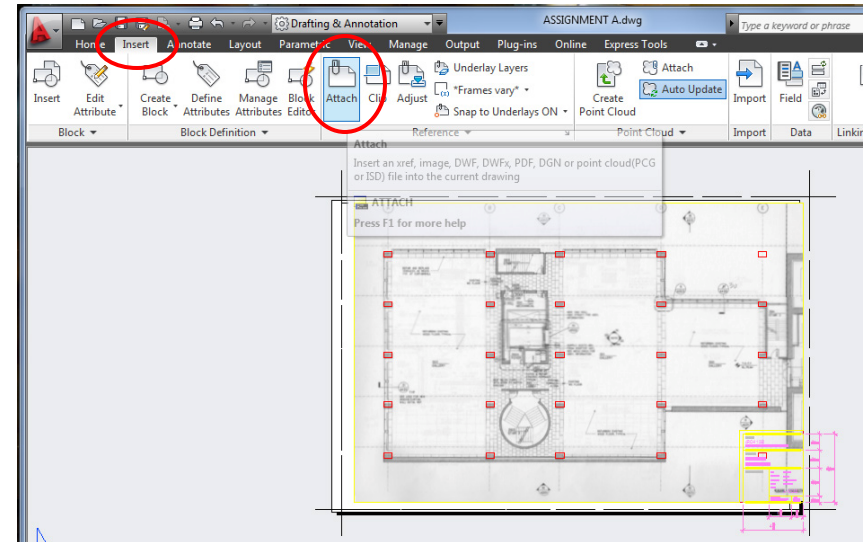
Plot Area should be **Layout**.

Set **Plot Style table---** to **Monochrome** (for now)



Attach the Titleblock (and other External References)

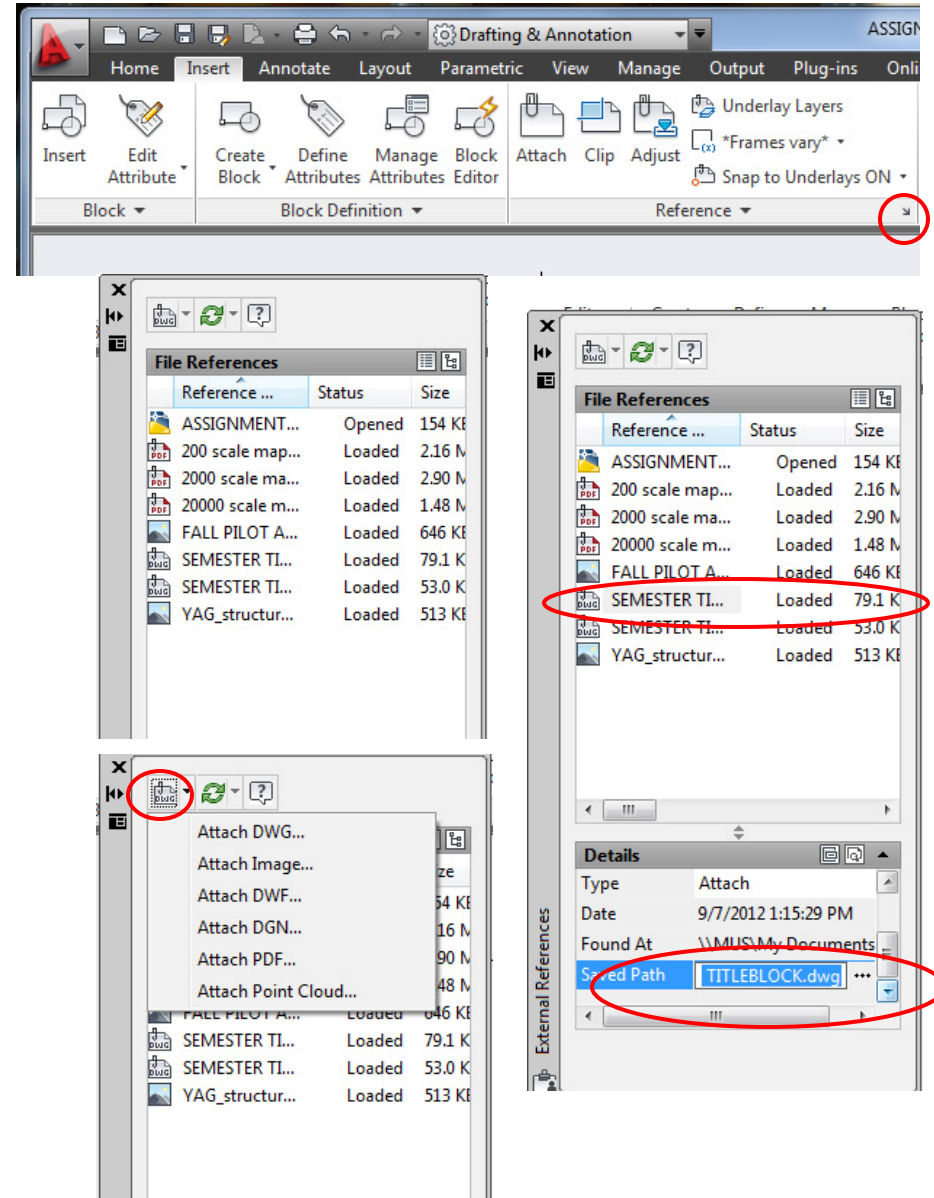
1. Insert Tab--- Reference Panel--- **Attach Drawing**
2. Find the Titleblock file and click Open.
3. "Attach External Reference" window:
Make sure that **Scale is set to 1.0, 1.0, 1.0**
Insertion Point should be 0,0,0.
4. The titleblock should then fit perfectly onto the page.



Re-attaching an External Reference

If your titleblock or image (that has been referenced from another file) is missing, then follow this process...

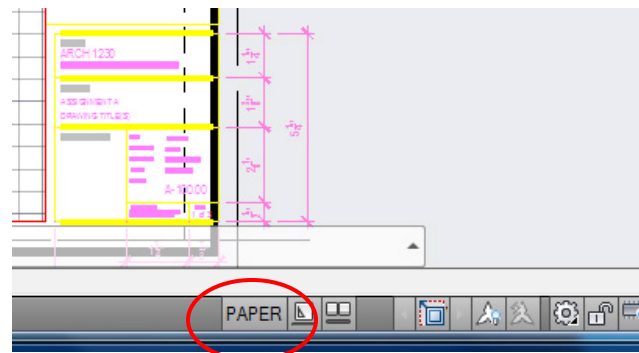
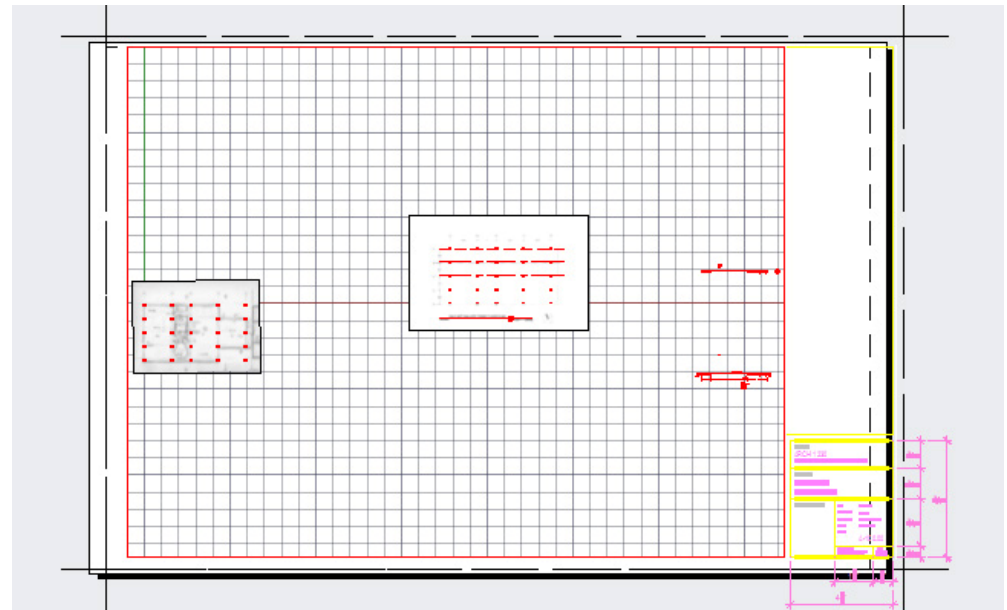
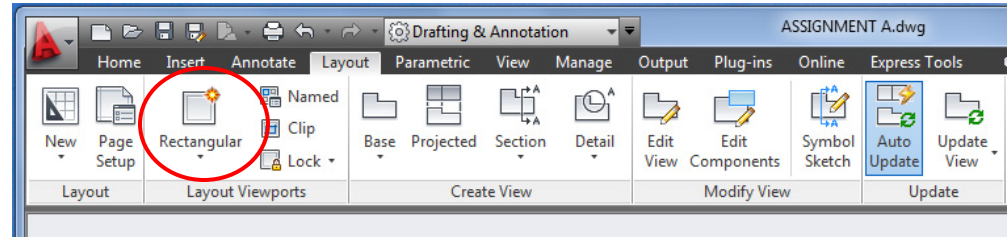
1. Go to the Insert Tab--- Reference Panel
2. Click on the little arrow in the lower right corner (or type in **XREF** (or **EXTERNAL REFERENCE**))
3. This opens up the External References panel with a **list of all attached files** (images and dwgs). You can **reload the attached files here**, you can also **attach files using this panel** by clicking the attach button in the upper left corner.
4. If a file has lost its connection, you can **re-locate the path** by clicking on the file and **under Found/ Saved Path**, you can **re-link the file**.



Add a Viewport

AutoCAD usually starts up with a viewport in each layout tab. If it doesn't, then follow these steps...

1. Go to the Ribbon--- Layout Tab--- Layout Viewports panel--- Rectangular Viewport
2. Draw a Rectangle viewport on the page.
3. Select the Viewport border and adjust the blue grips to re-size it.
4. To zoom/ pan around the viewport, double click inside (or click on the Model/ Paper button on the bottom of the screen to switch between Paperspace and Modelspace. Zoom/ Pan around the screen as needed until the view shows in the window.
5. Double-click outside the viewport (or click the Model button at the bottom of the screen to switch back to Paperspace.

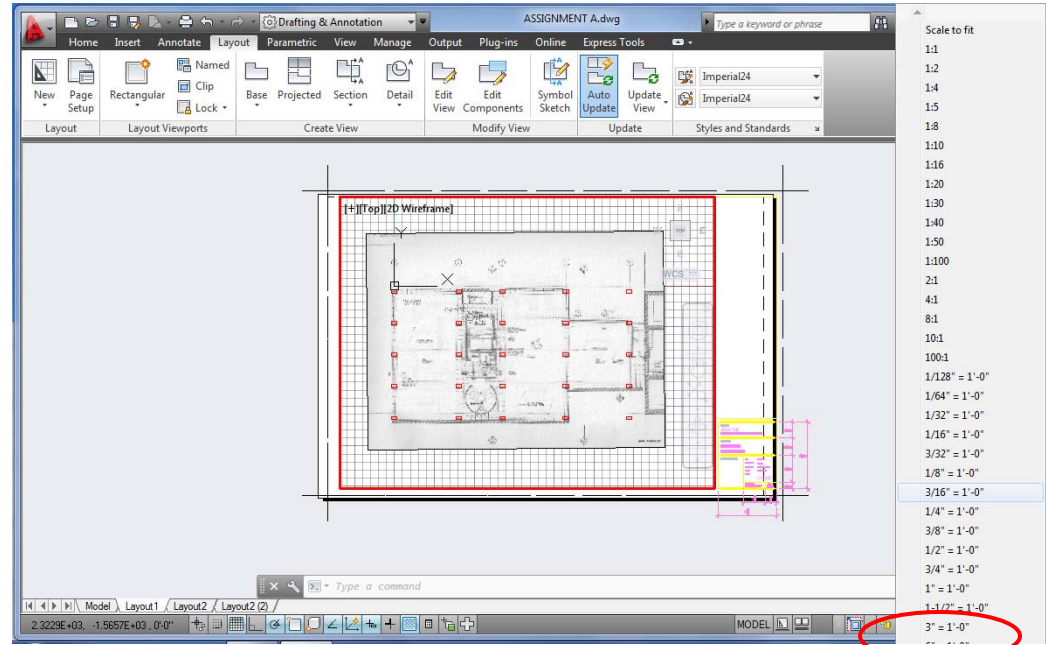


Change the Viewport Scale

1. Select the **Viewport**, or click inside the viewport window to select it.
2. Click on the **Scale** button in the lower right corner.
3. Change the scale as needed to ensure accuracy.

Note: If you zoom in the viewport, it will change the scale.

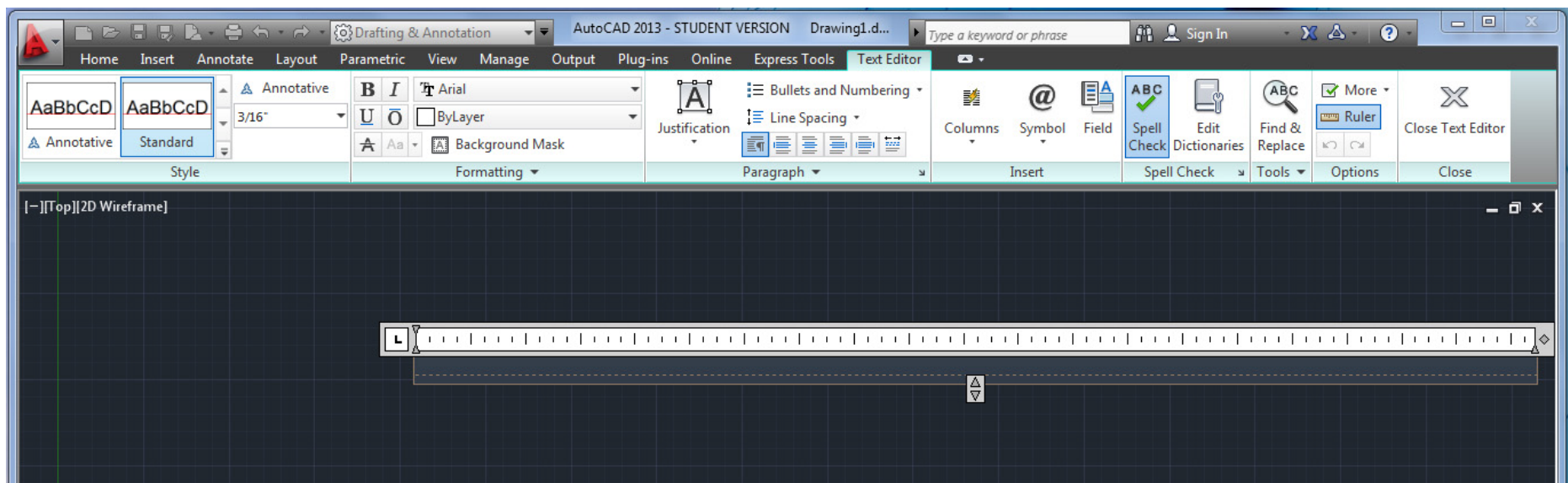
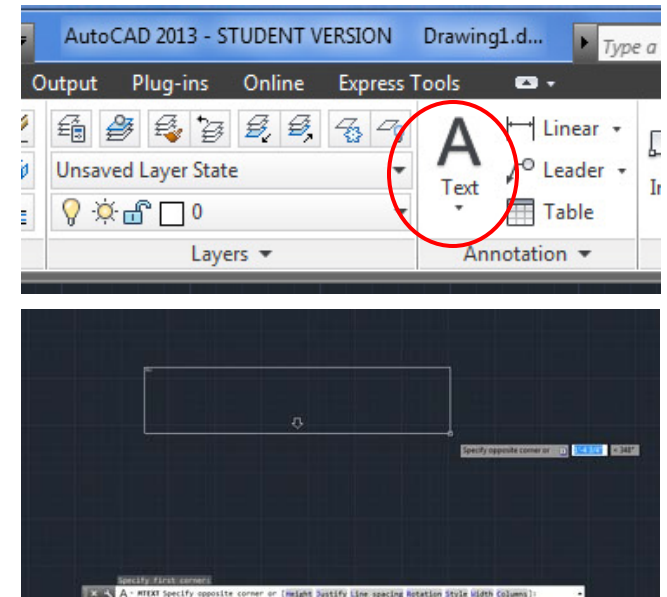
Note: Remember to check the viewport scale afterwards before printing to make sure it's accurate!



Text Command

-Type MTEXT or use the Text button found on the Ribbon--- Home Tab--- Annotation Panel--- Multi-line Text

- Specify a rectangle where you want the text to go.
- Choose a standard font (Arial).
- The text size has to be scaled. [See Chart on next page]



Text Command

-The text size has to be scaled depending on what scale your final print will be.

Drawing Scale	Code	Scale Factor	LT Scale	Standard Drawing Text	Drawing Title Text
				3/32" Text	1/8" Text
1"=1" (Full Scale)]	1	1.0	0.5	3/32"	1/8"
1/32" = 1'-0"	3	384	192	36"	48"
1/16"	6	192	96	18"	24"
1/8"	8	96	48	9"	12"
1/4"	4	48	24	4 1/2"	6"
1/2"	2	24	12	2 1/4"	3"
3/4"	E	16	8	1 1/2"	2"
1"	D	12	6	1 1/8"	1 1/2"
1-1/2"	C	8	4	3/4"	1"
3"	B	4	2	3/8"	1/2"
6"	A	2	1	3/16"	1/4"
3/64" = 1'-0"	M	256	128	24"	32"
3/32"	H	128	64	12"	16"
3/16"	G	64	32	6"	8"
3/8"	F	32	16	3"	4"
1/10" = 1'-0"	N	120	60	11 1/4"	15"
1/20"	P	240	120	22 1/2"	30"
1/30"	Q	360	180	33 3/4"	45"
1/40"	R	480	240	45"	60"
1/50"	S	600	300	56 1/4"	75"
1/100"	T	1200	600	112 1/2"	150"
1/200"	U	2400	1200	225"	300"

Dimension Command

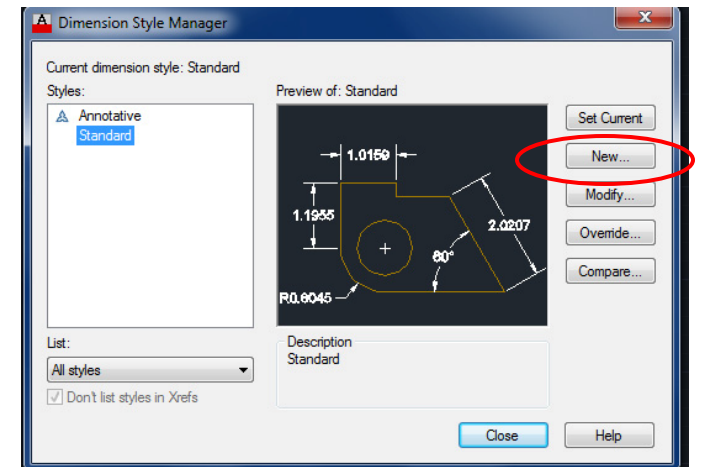
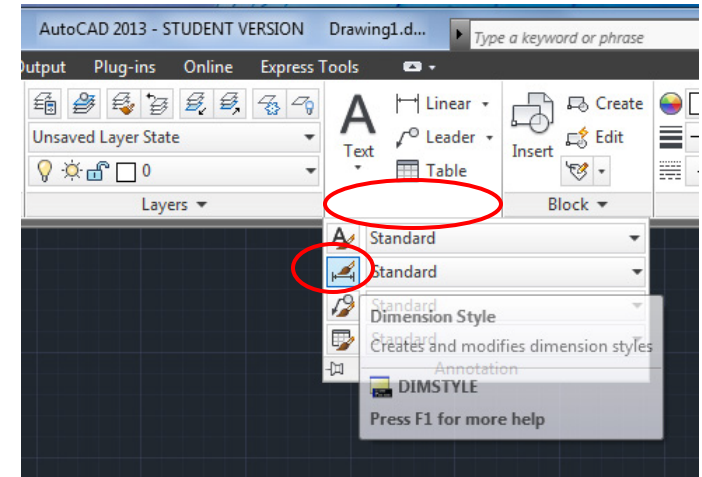
-Dimensions are easy to use but they **must be set-up first!**

Type DIMSTYLE or use the Text button found on the Ribbon--- Home Tab--- Annotation Panel---(Down arrow at bottom of panel to expand panel--- Dimension Style button.

-Dimension Style Manager– Click New (or Modify).

-2 main settings to adjust here:

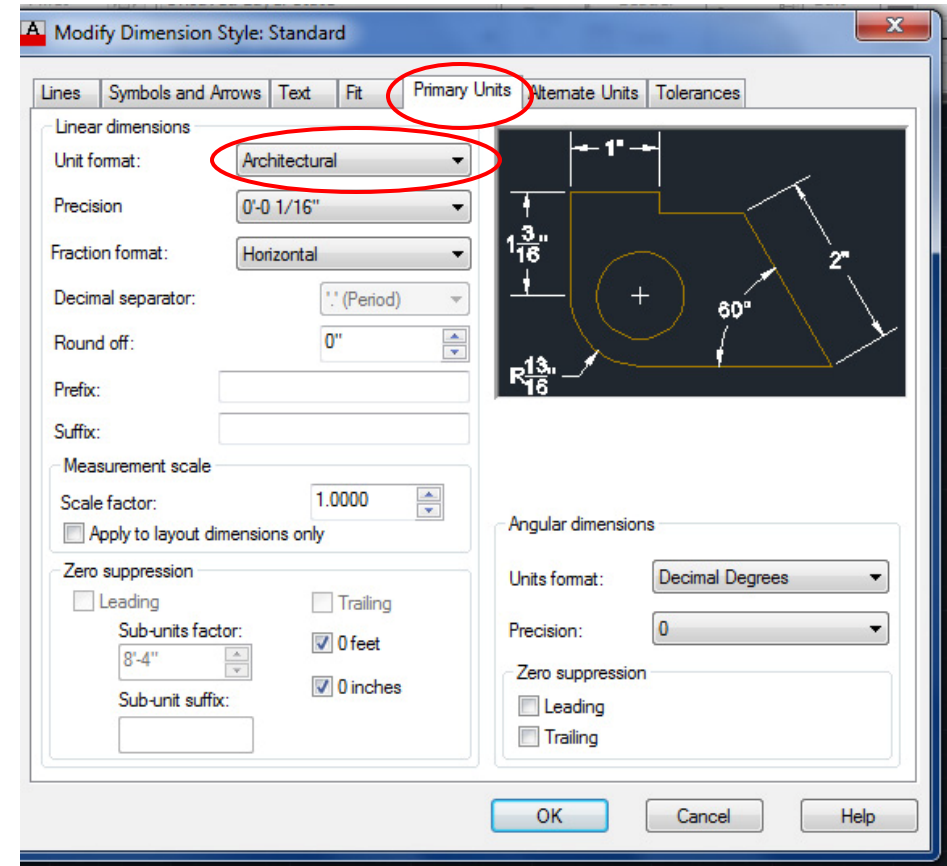
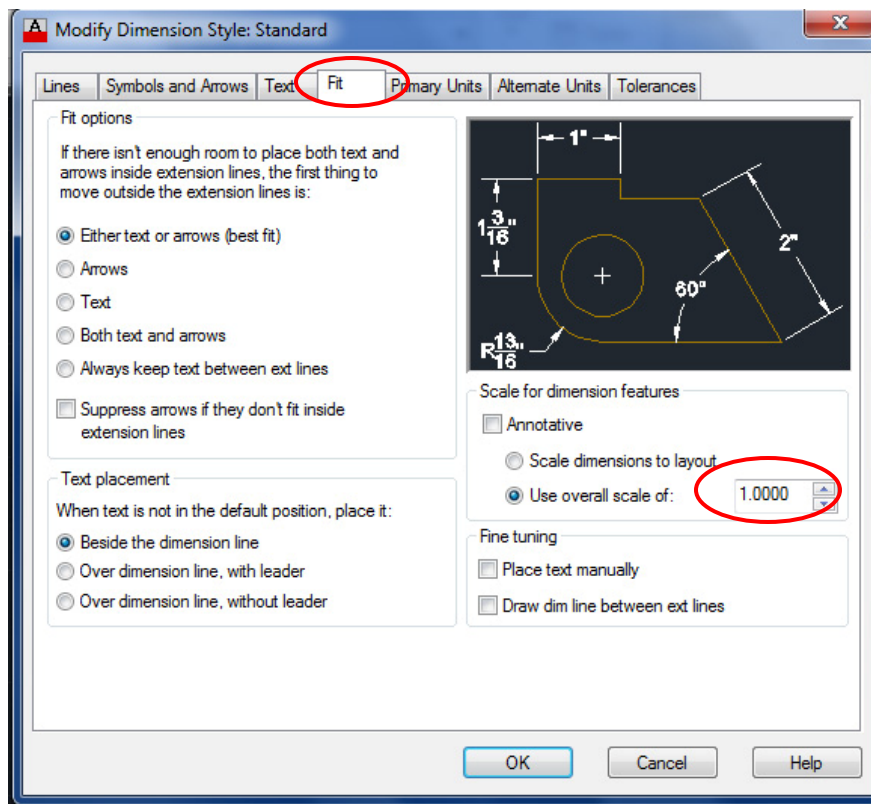
1. Primary Units--- Change Unit Format to Architectural (Ft/ inches)
2. Fit --- Scale for Dimension features--- Use Overall Scale of:
[Use Chart]



Dimension Command

-2 main settings to adjust here:

1. Primary Units--- Change Unit Format to Architectural (Ft/ inches)
2. Fit --- Scale for Dimension features--- Use Overall Scale of:
[Use Chart on next page]



Dimension Command

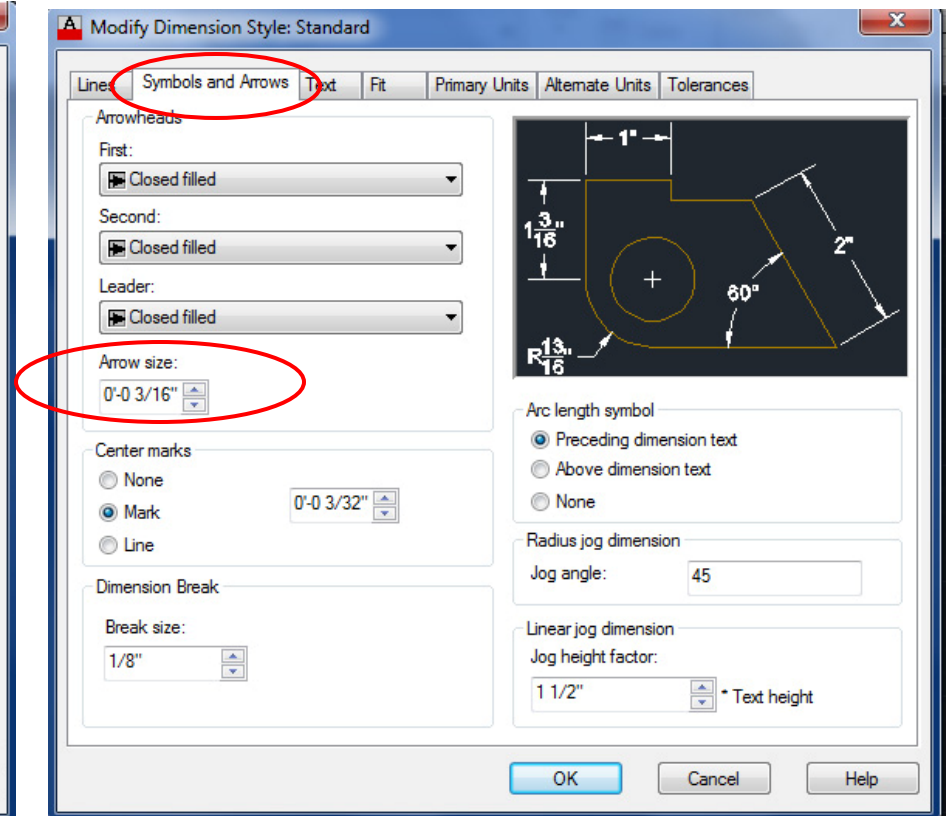
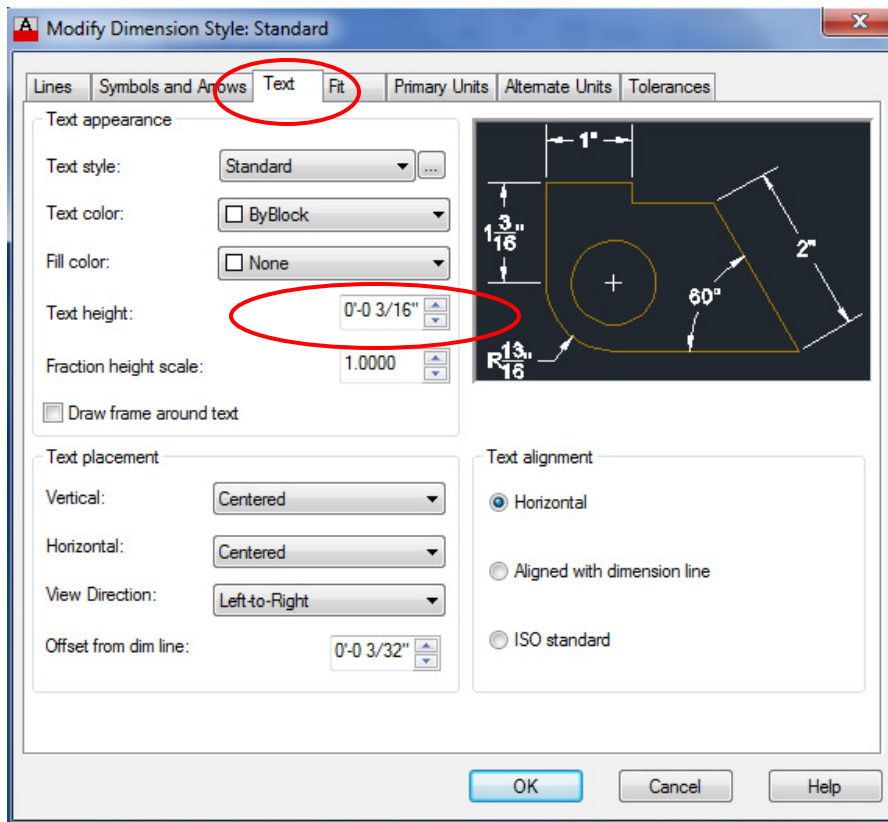
-The dimension size has to be scaled depending on what scale your final print will be.

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1"=1" (Full Scale)]	1	1.0	0.5	3/32"	1/8"
1/32" = 1'-0"	3	384	192	36"	48"
1/16"	6	192	96	18"	24"
1/8"	8	96	48	9"	12"
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1/2"	2	24	12	2 1/4"	3"
3/4"	E	16	8	1 1/2"	2"
1"	D	12	6	1 1/8"	1 1/2"
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3"	B	4	2	3/8"	1/2"
6"	A	2	1	3/16"	1/4"
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1/100"	T	1200	600	112 1/2"	150"
1/200"	U	2400	1200	225"	300"

Dimension Command

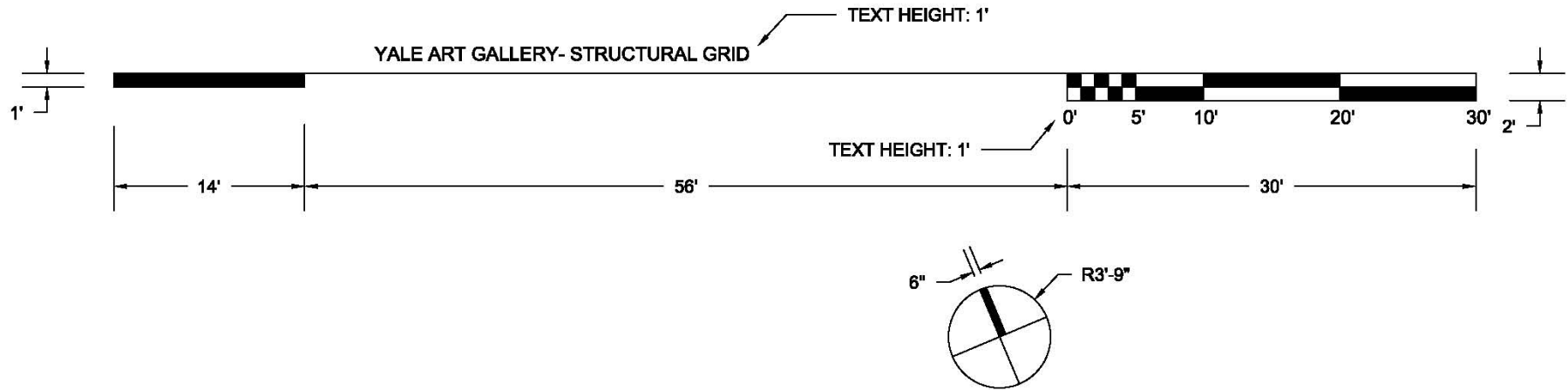
-2 more settings that may improve the aesthetics of your dimensions.

1. The text height--- change to 3/32"
2. The arrow size--- change to 3/32"



Labels and North Arrows

-Use these dimensions to create your Labels and North Arrows for your
Grid Plan and Floor Plan



Labels and North Arrows

-Use these dimensions to create your Labels and North Arrows for your

Site Maps

(If you inserted the images into your drawing at a scale of 1.0.

If not, then use the labels from the last page.)

