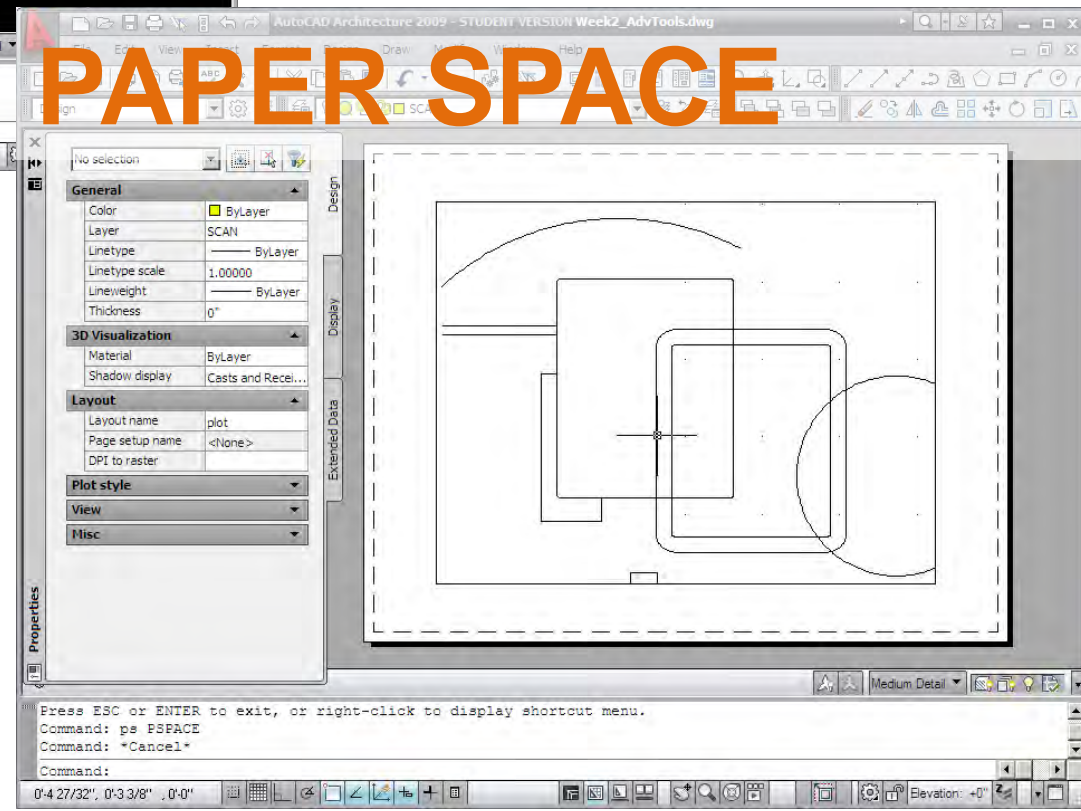


Thus far, we've been working on drawing in a single view. This view is called **Model Space**.

Everything drawn here is at 1:1 (full) scale.

To set up multiple views of a drawing and specify the *scale* of those views we'll begin to work with **Viewports** in **Paper Space**.

We'll also do all *annotation* of drawings in Paper Space.

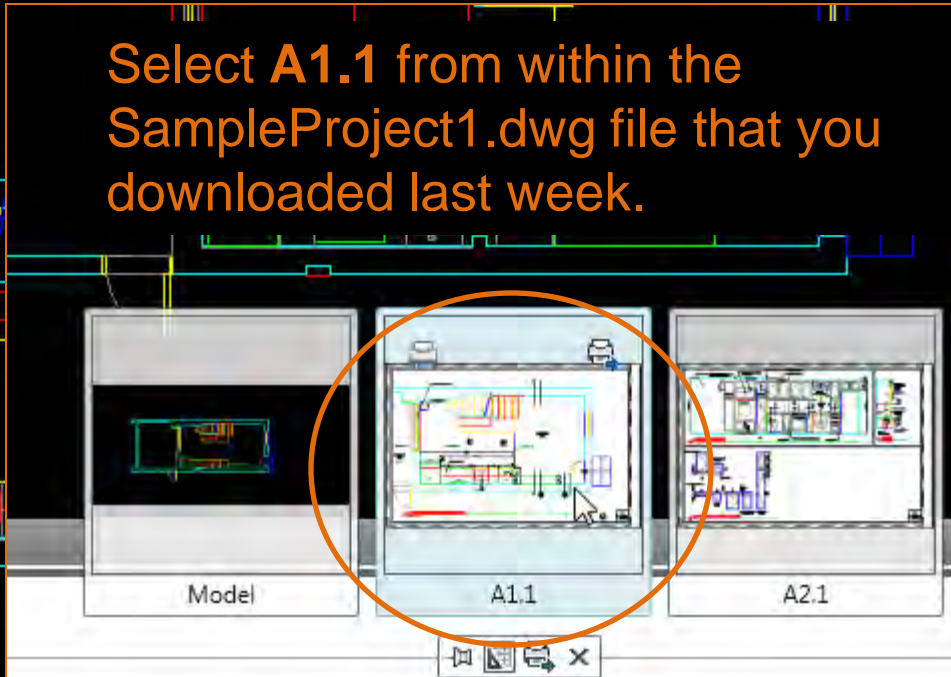
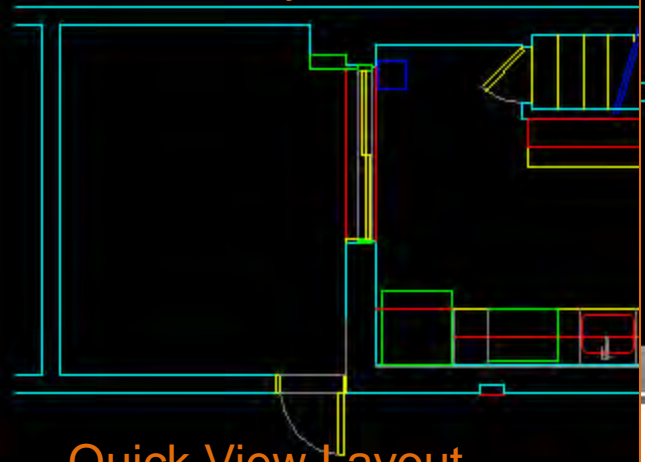


MODEL SPACE

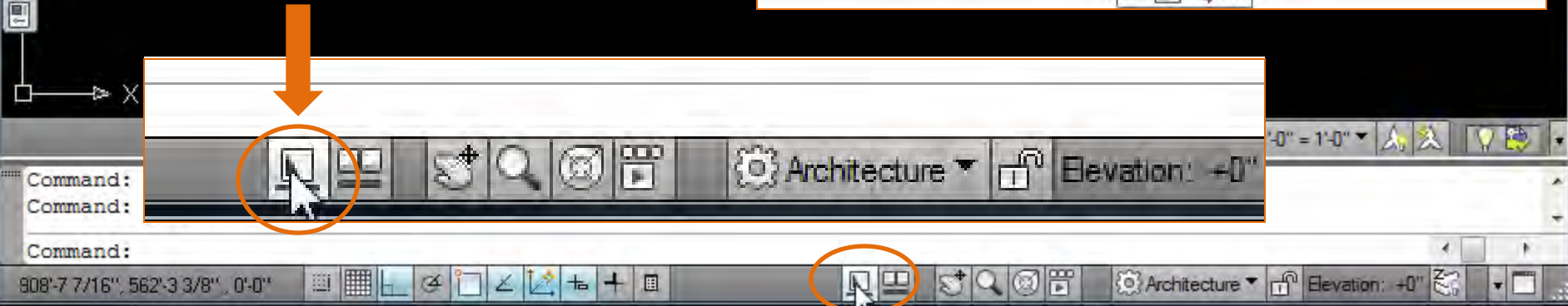


To switch between Model Space and Paper Space, use the **Quick View Layout** button in the **Status Bar** at the bottom of your screen.

Select **A1.1** from within the SampleProject1.dwg file that you downloaded last week.



Quick View Layout

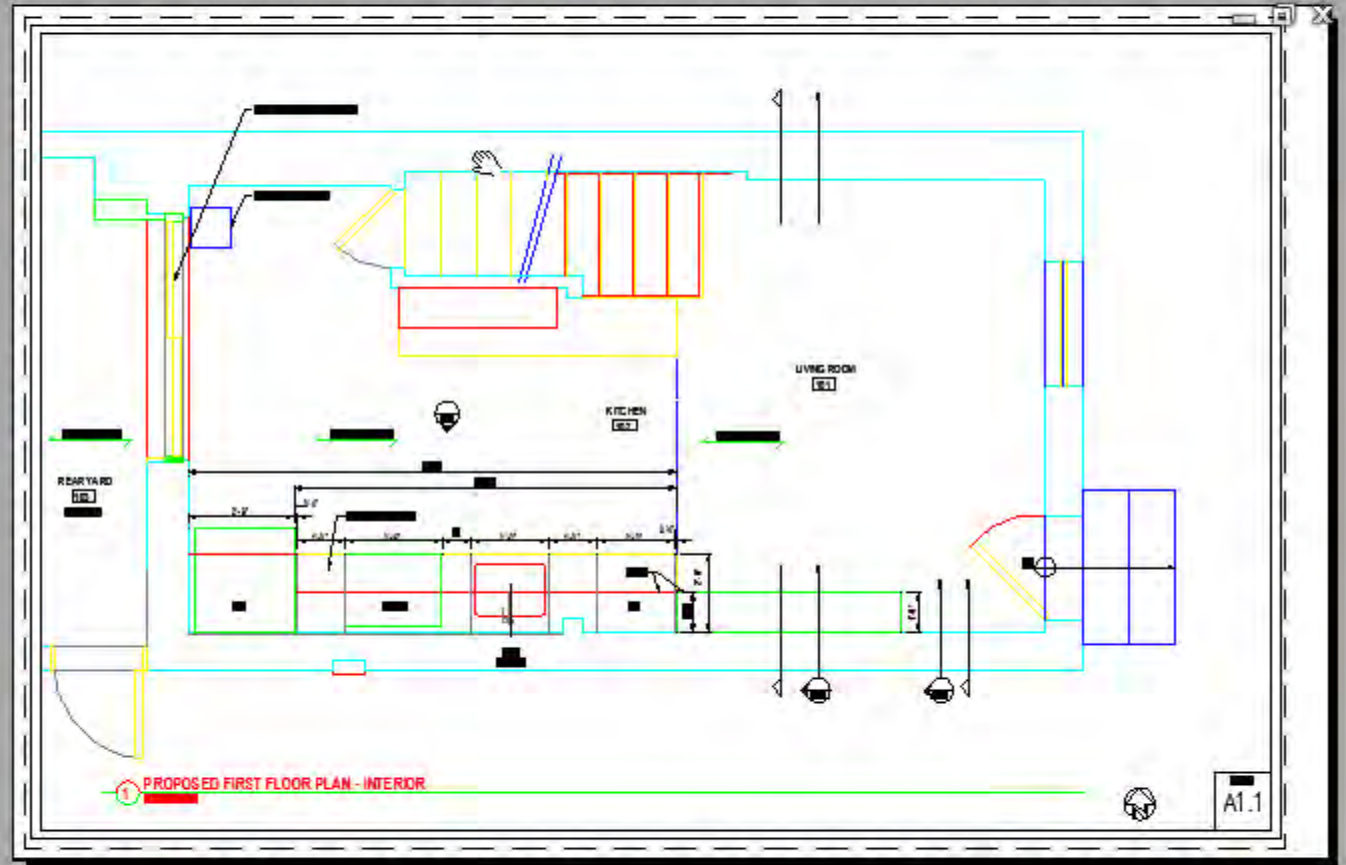


PAPER SPACE



You should see a layout of a drawing. The white area designates the size of paper that has been set up for this drawing.

Use your mouse scroll wheel to zoom in and out.

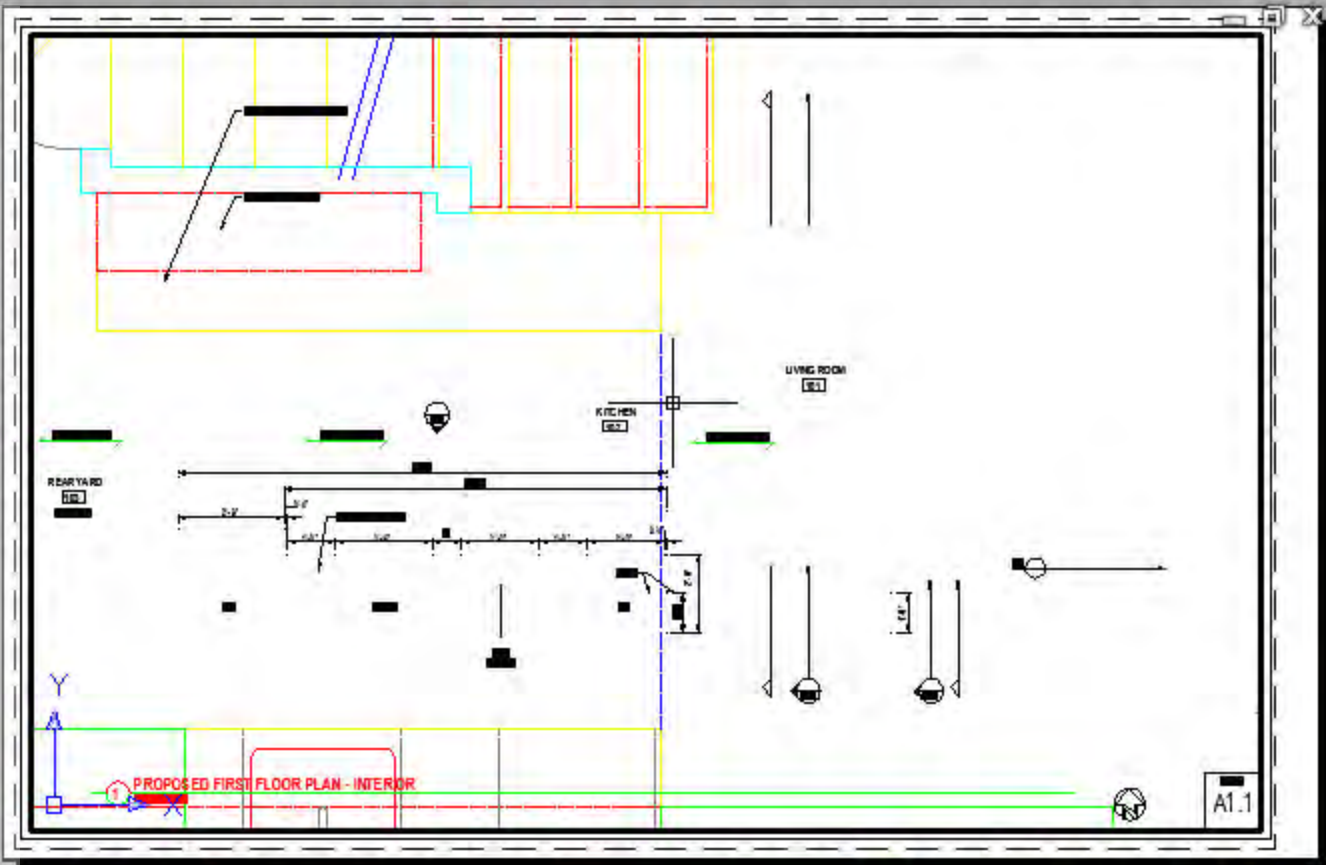


Command: p PAN
Press ESC or ENTER to exit, or right-click to display shortcut menu.

Press pick button and drag to pan.

PAPER SPACE

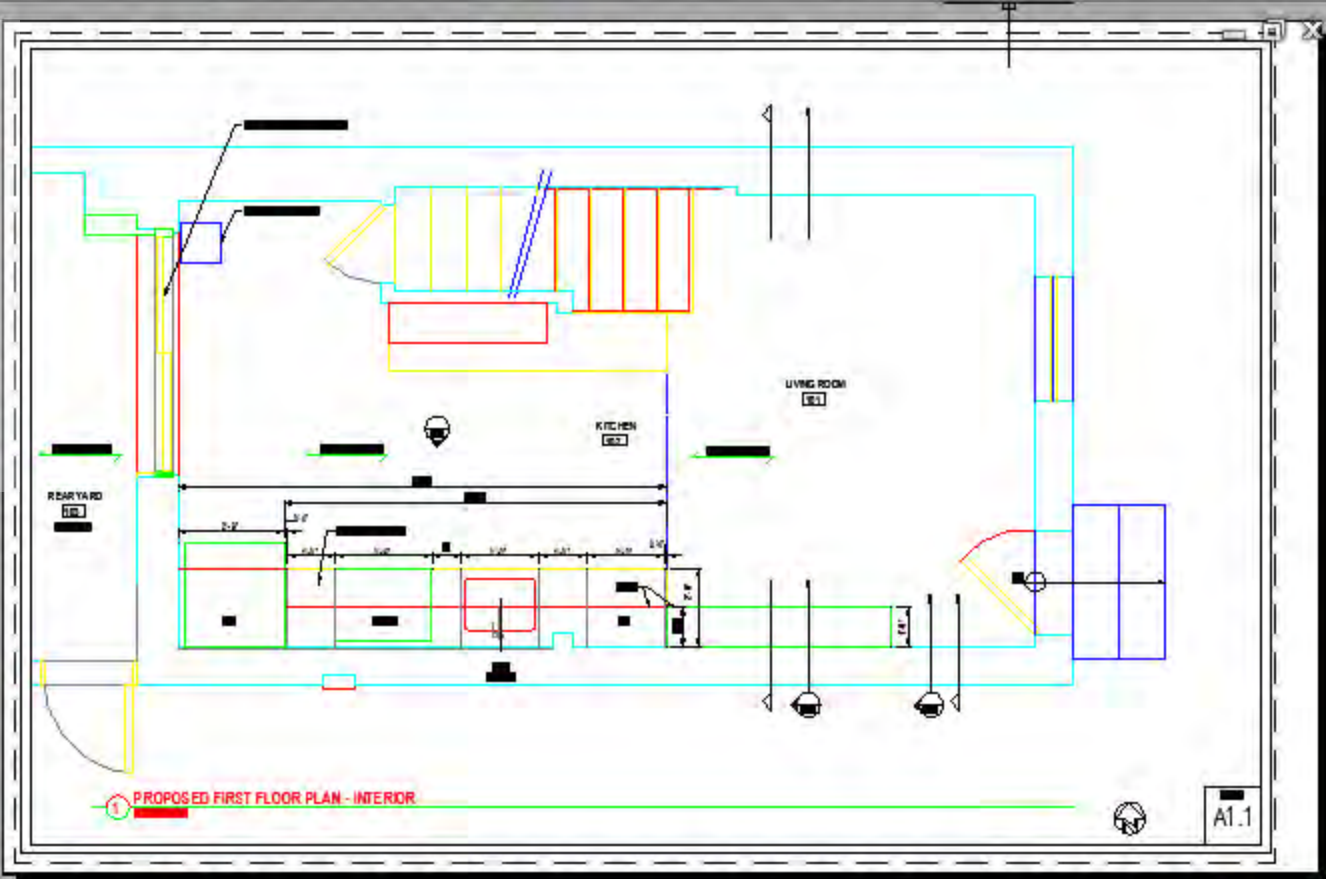
Type **MS**, **Spacebar** to access *model space* (the drawing area boundary will be highlighted). You are now accessing the original drawing model area *through* the space of the paper. Try zooming in and out with your mouse – notice the difference.



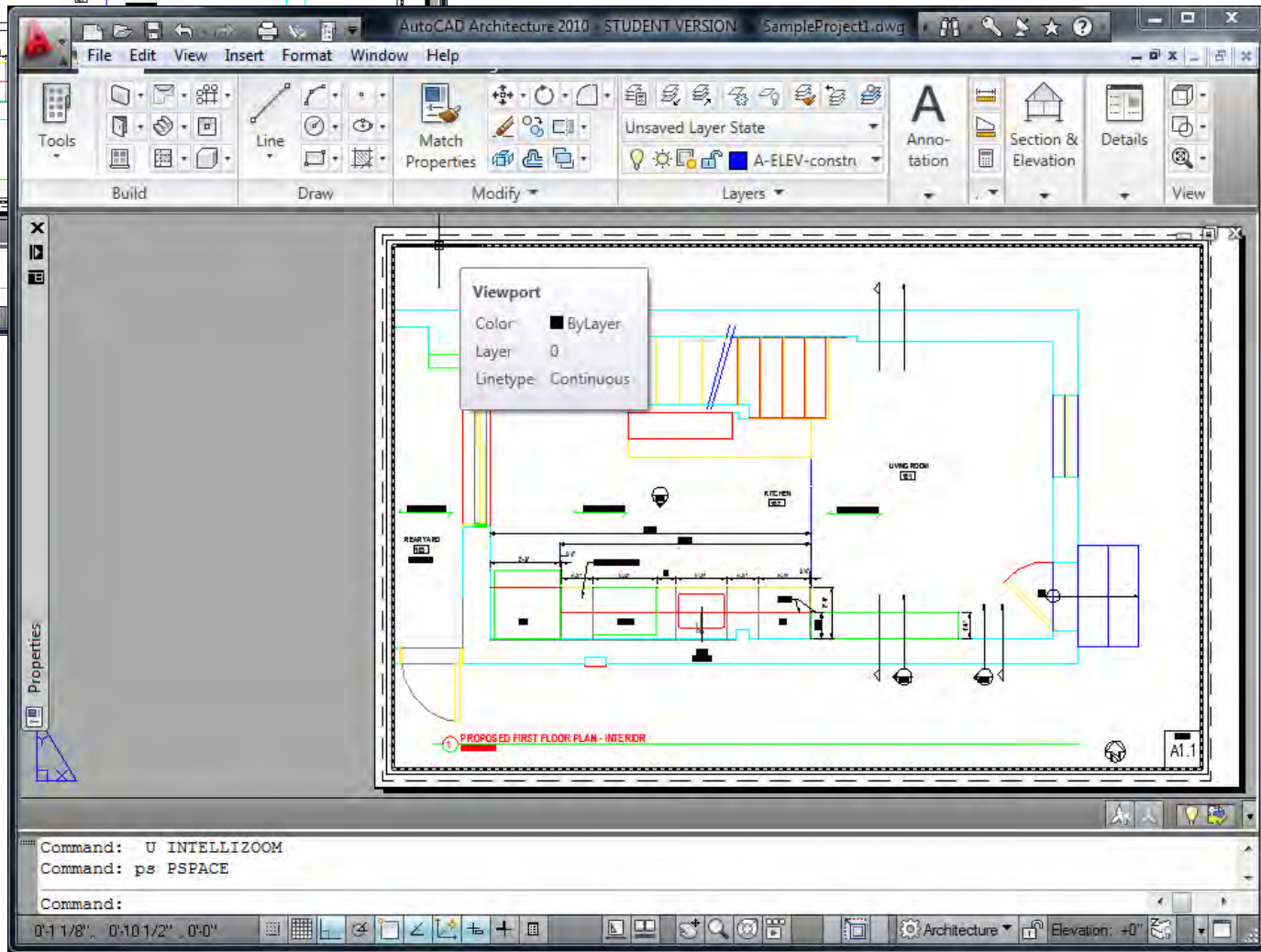
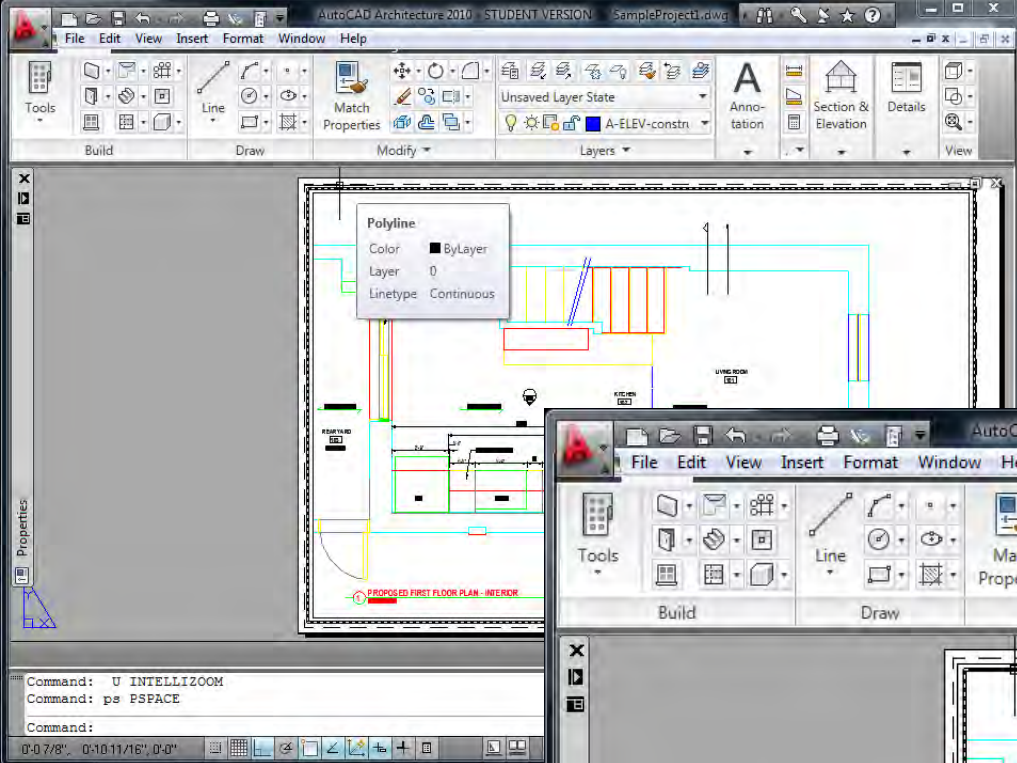
Command: ms
MSPACE
Command:

PAPER SPACE

Type **U**, **Spacebar** to undo changes, then **Esc** to exit the command. Type **PS**, **Spacebar** to return to paperspace.

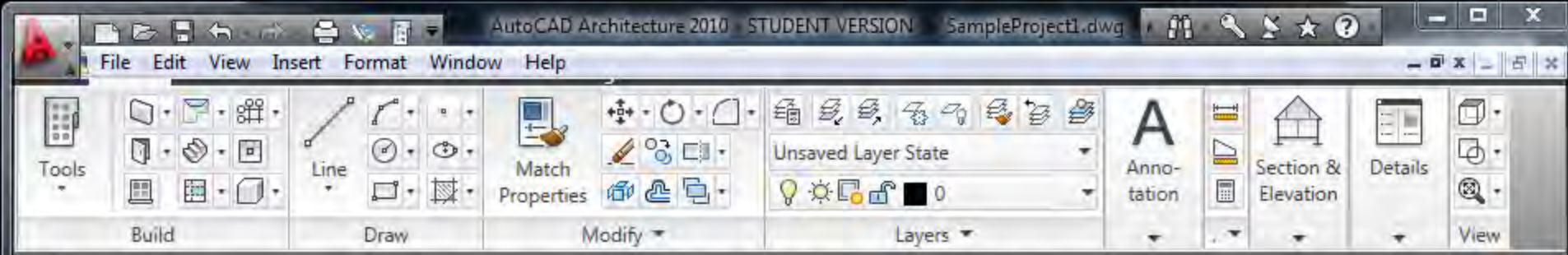


Command: U INTELLIZOOM
Command: ps PSPACE
Command:



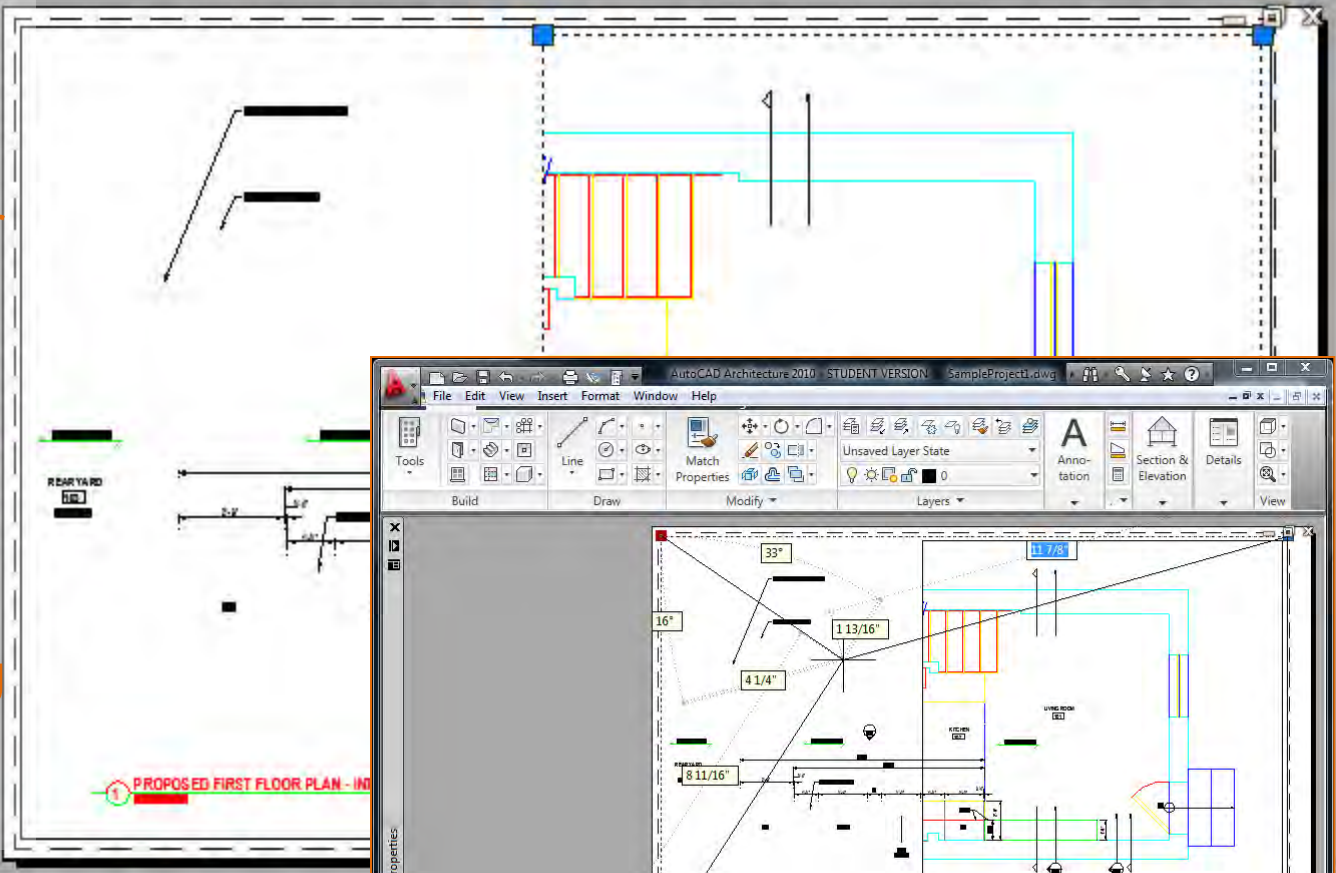
Hover your cursor over the two rectangles at the boundary of the page: one is a **Viewport** and one is a **Polyline**.

Click once to select the **Viewport**.



Try resizing the boundary of the **viewport** simply by dragging one corner of it. Notice that it behaves differently from other shapes.

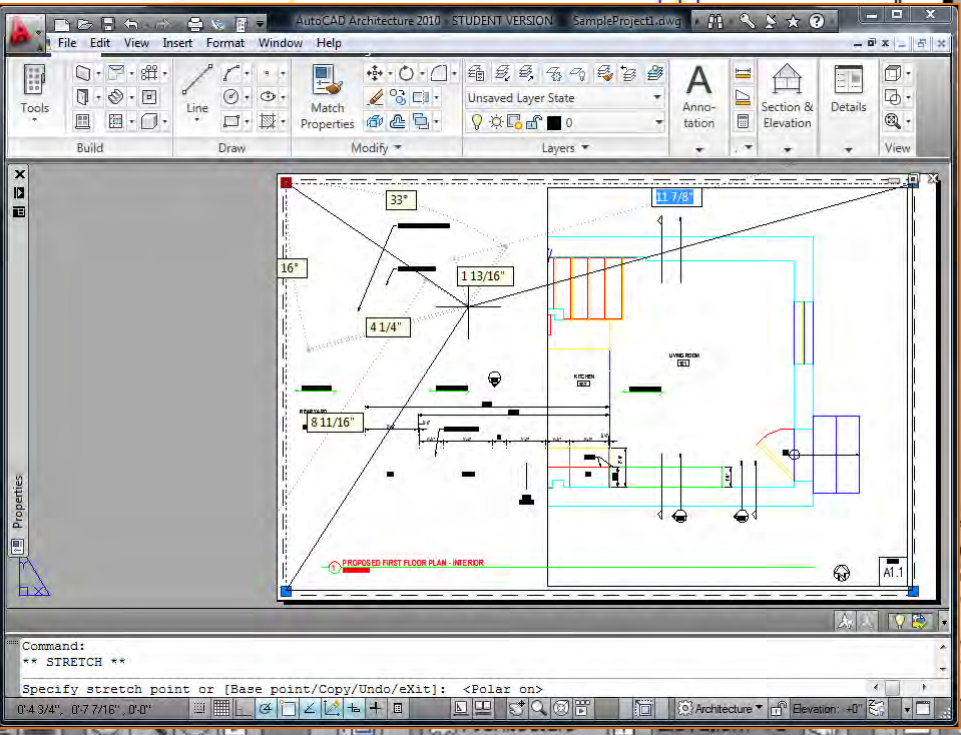
Compare this action to the behavior of polylines by resizing the other rectangle on the page.



Properties

Command: **** STRETCH ****
Specify stretch point or [Base point/Copy/Undo/eXit]:

Command:



0'-6 13/16", 0'-0 1/4", 0'-0"

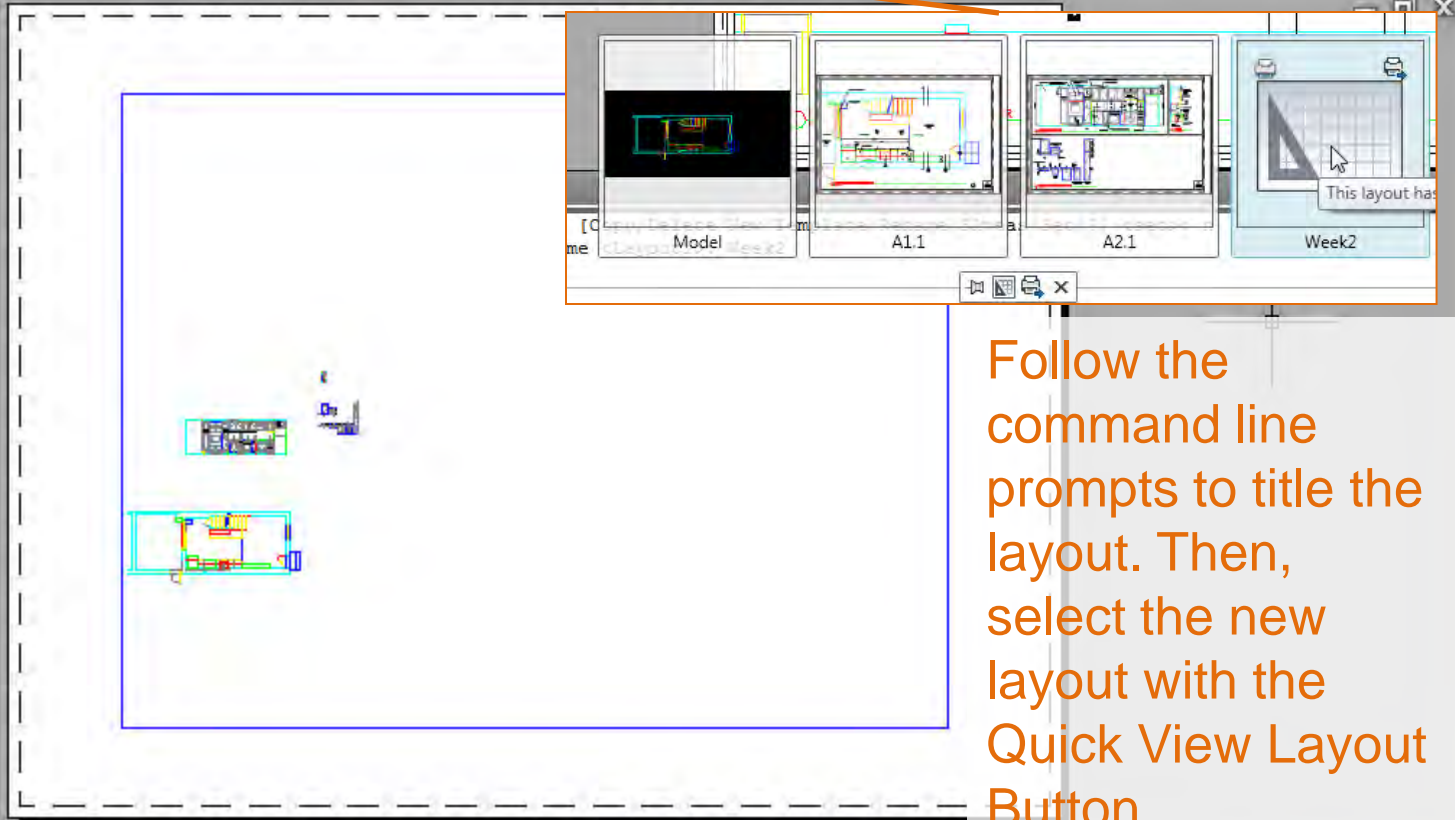
0'-4 3/4", 0'-7 7/16", 0'-0"

```
Command: *Cancel*  
Command: layout  
Enter layout option [Copy/Delete/New/Template/Rename/SAveas/Set/?] <set>: n  
Enter new Layout name <Layout1>: Week2
```

1'-2 15/16", 0'-0", 0'-0"

To create a new Layout, type **layout**, **Spacebar**.

Type **N** for a new layout (note you can type **C** to copy an existing layout).

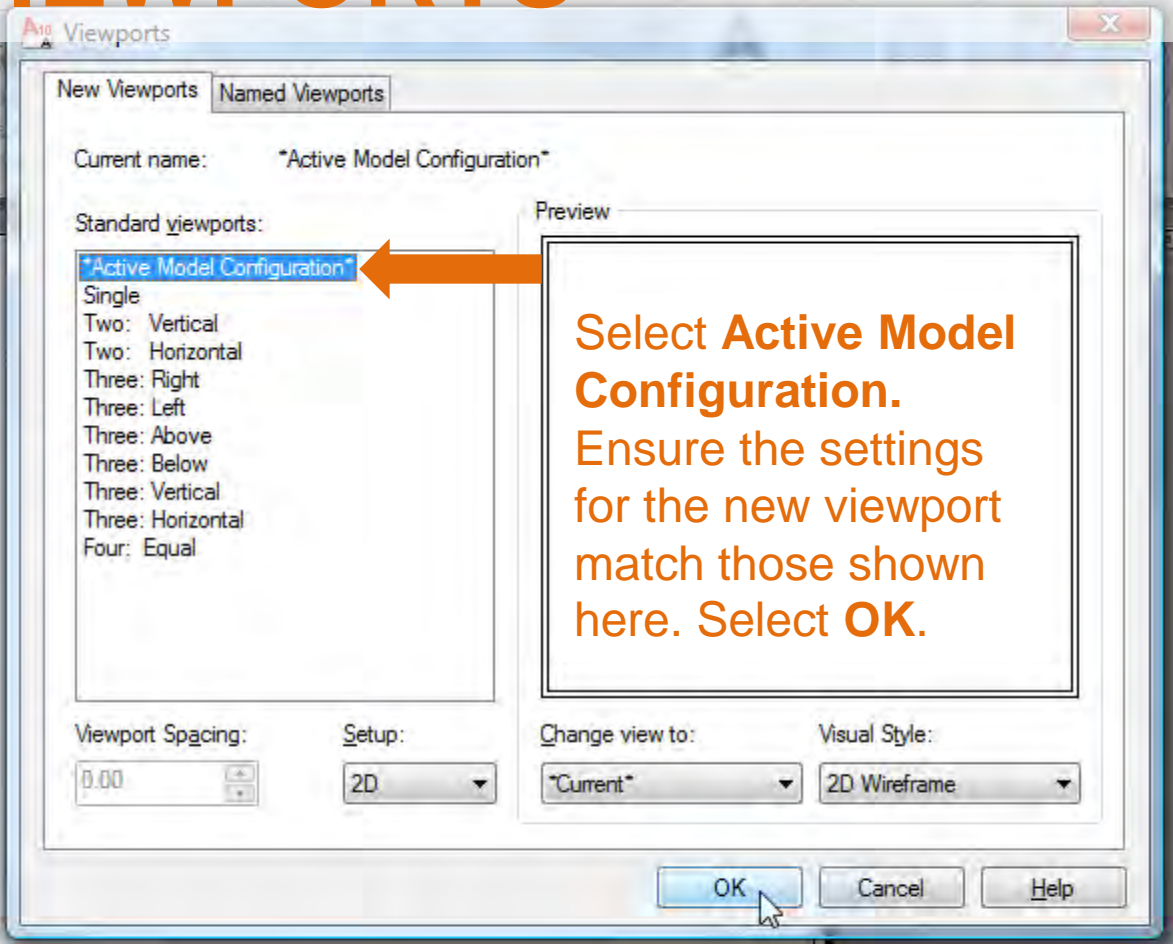


Follow the command line prompts to title the layout. Then, select the new layout with the Quick View Layout Button.

```
Regenerating model - caching viewports.  
*Cancel*  
Command: *Cancel*  
Command:
```

1'-1 1/16", 0'-5 1/16", 0'-0"

CREATING VIEWPORTS



Erase the existing boundary (E, Spacebar) and type **Vports** to create a new viewport (boundary) for your drawing.

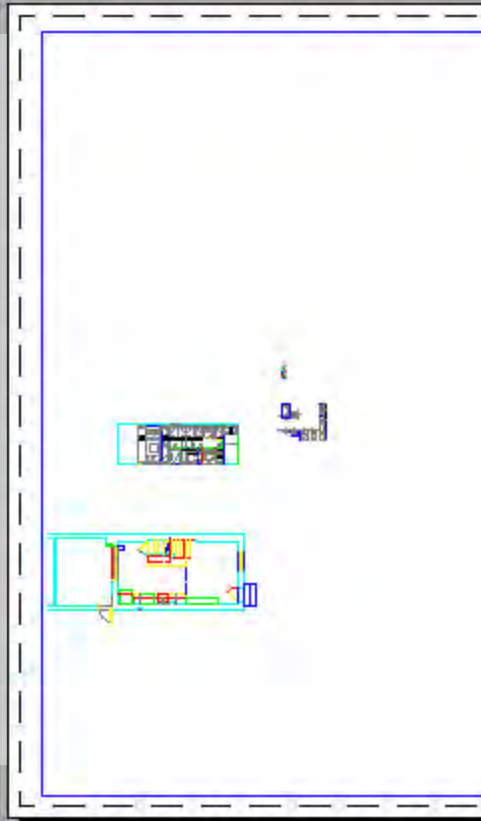
Select **Active Model Configuration**. Ensure the settings for the new viewport match those shown here. Select **OK**.

Command: Specify opposite corner:
Command: e ERASE 1 found
Command: vports

0'-3 15/16", 0'-7", 0'-0"



After making the selections from the previous slide, draw a bounding box on the page – this is the viewport.

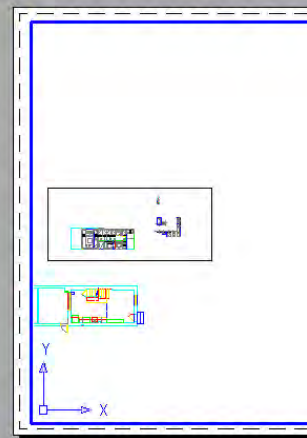


Specify first corner or [Fit] <Fit>:
Specify opposite corner: Regenerating layout.
Regenerating model.

Command:

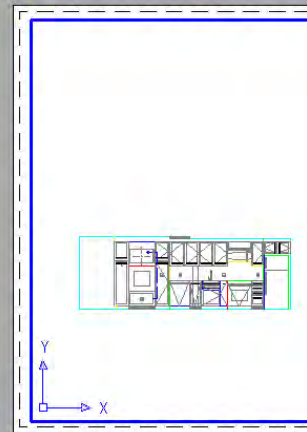
0'-10 9/16", 0'-0 1/8", 0'-0"

Type **MS** to access model space and type **Z, Spacebar, E, Spacebar** to zoom extents (use this command when you've lost your drawing!)



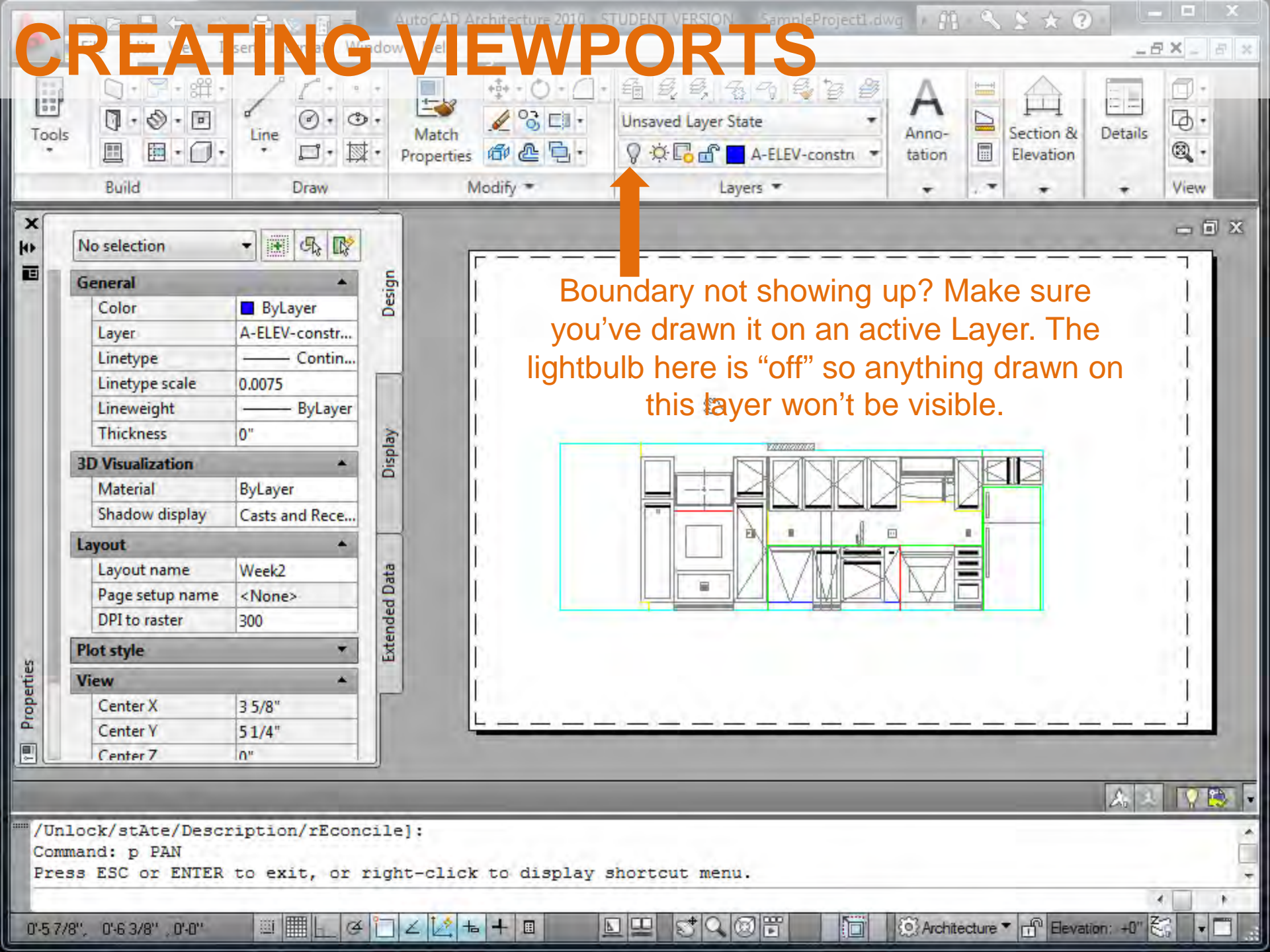
Command: z ZOOM
Specify corner of window, enter a scale factor (nX or nXP), or

Type **Z, Spacebar, W, Spacebar** and use **P** to pan around the drawing and center it on the page.



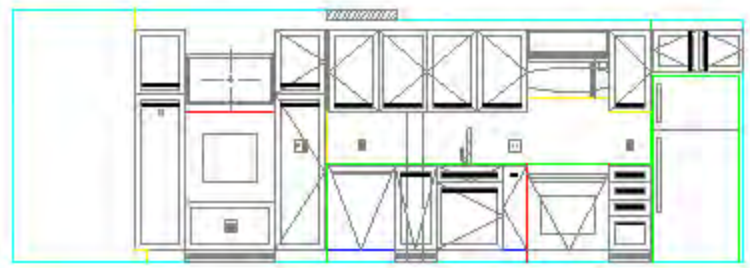
Specify corner of window, enter a scale factor (nX or nXP), or
[All/Center/Dynamic/Extents/Previous/Scale/Window/Object] <Extents>
Specify first corner: Specify opposite corner:

Command:
97'-9 7/8", 60'-10 3/4", 0'-0"



CREATING VIEWPORTS

Boundary not showing up? Make sure you've drawn it on an active Layer. The lightbulb here is "off" so anything drawn on this layer won't be visible.



Properties

Design

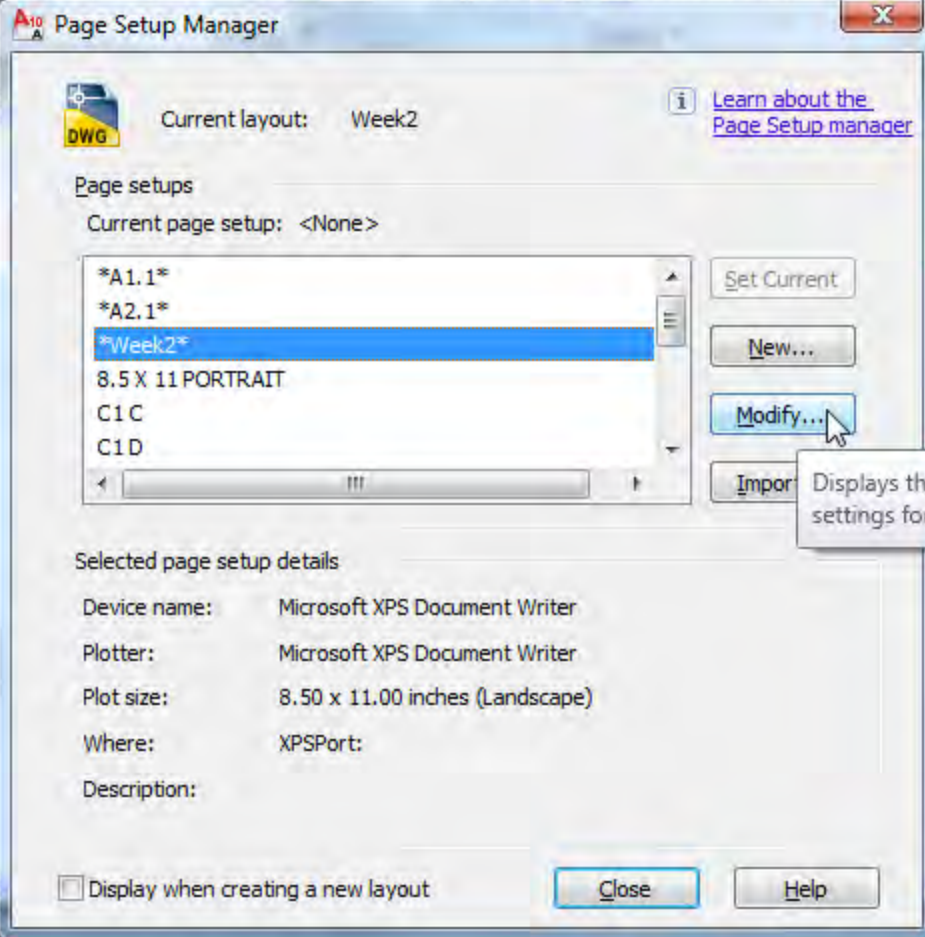
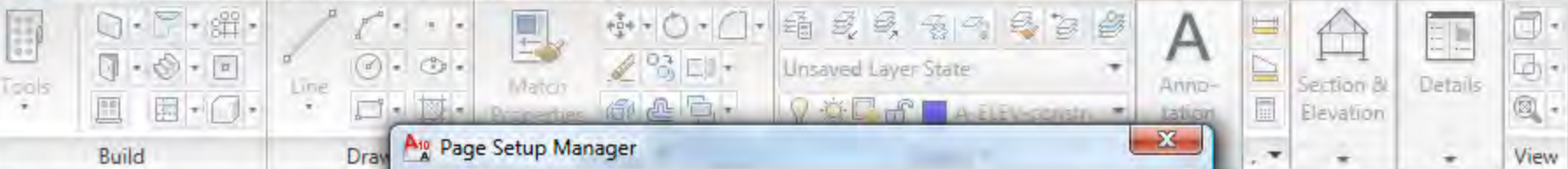
Display

Extended Data

No selection	
General	
Color	ByLayer
Layer	A-ELEV-constr...
Linetype	Contin...
Linetype scale	0.0075
Lineweight	ByLayer
Thickness	0"
3D Visualization	
Material	ByLayer
Shadow display	Casts and Rece...
Layout	
Layout name	Week2
Page setup name	<None>
DPI to raster	300
Plot style	
View	
Center X	3 5/8"
Center Y	5 1/4"
Center Z	0"

```
Command: p PAN  
Press ESC or ENTER to exit, or right-click to display shortcut menu.
```

Home Insert Annotate Render View Manage



Displays the Page Setup dialog box, in which you can edit settings for the selected page setup.

Type
pagesetup,
Spacebar.

Select the
new layout
you've
created to
modify its
page setup.

Command:
Command: _qsave
Command: pagesetup

Page Setup - Week2

Page setup
Name: <None>

Printer/plotter
Name: **Adobe PDF** Properties

Plotter: Adobe PDF Converter - Windows System Driver - b...
Where: Documents*.pdf
Description:

Paper size
11 x 17

Plot area
What to plot: Layout

Plot offset (origin set to printable area)
X: 0.000000 inch Center the plot
Y: 0.000000 inch

Plot scale
 Fit to paper
Scale: Custom
1 inches = 1 unit

Plot style table (pen assignments)
None
 Display plot styles

Shaded view plot options
Shade plot: As displayed
Quality: Normal
DPI: 300

Plot options
 Plot object lineweights
 Plot with plot styles
 Plot paper objects
 Hide paper objects

Drawing orientation
 Portrait
 Landscape
 Plot upside-down

Preview... OK Cancel Help

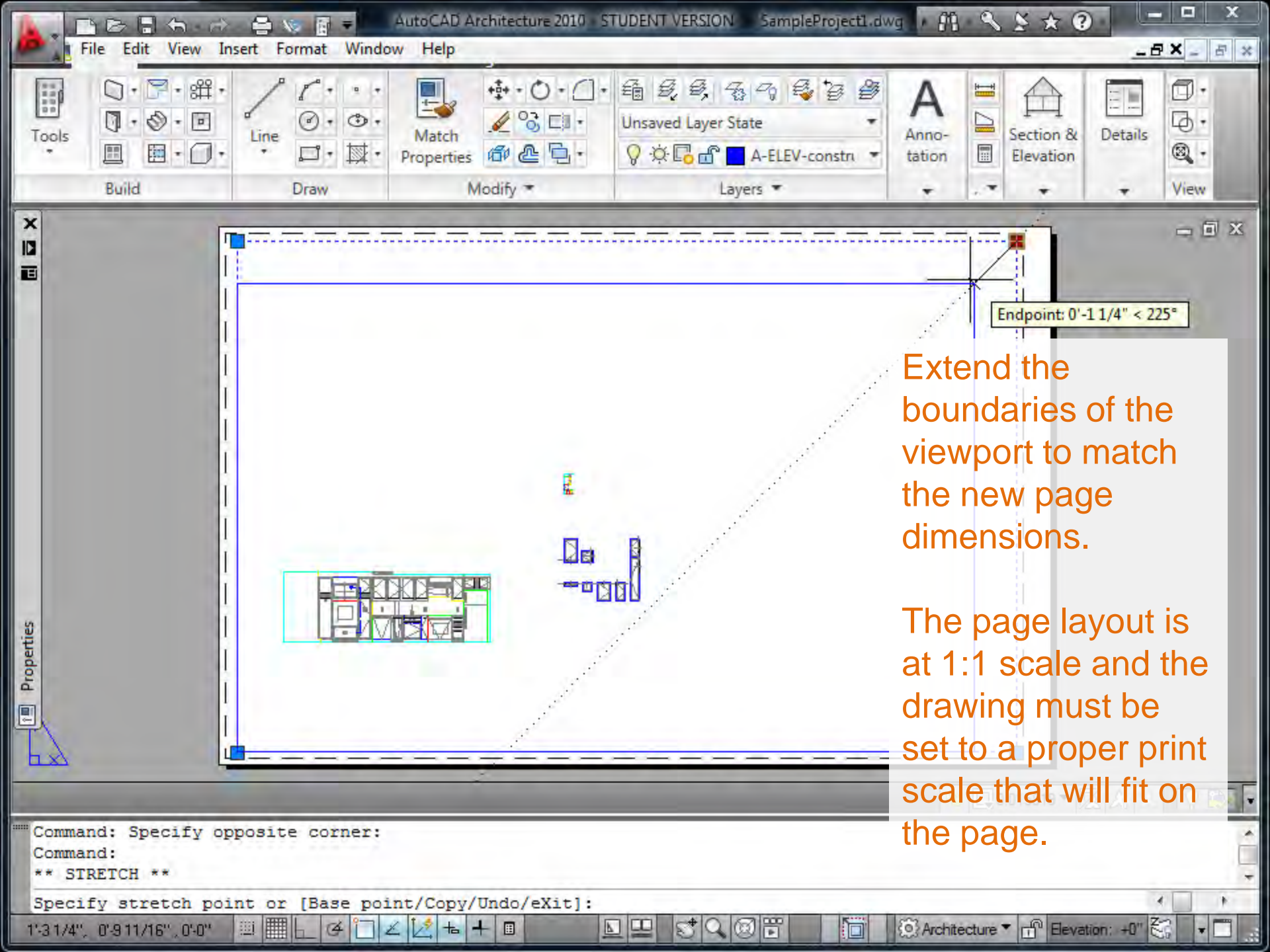
Select Printer and Paper Size

Note that if you've successfully installed a PDF generator, it will appear in your printer/plotter options. You can also select "None" and set up a printer later.

DO NOT select Plot Scale Here!

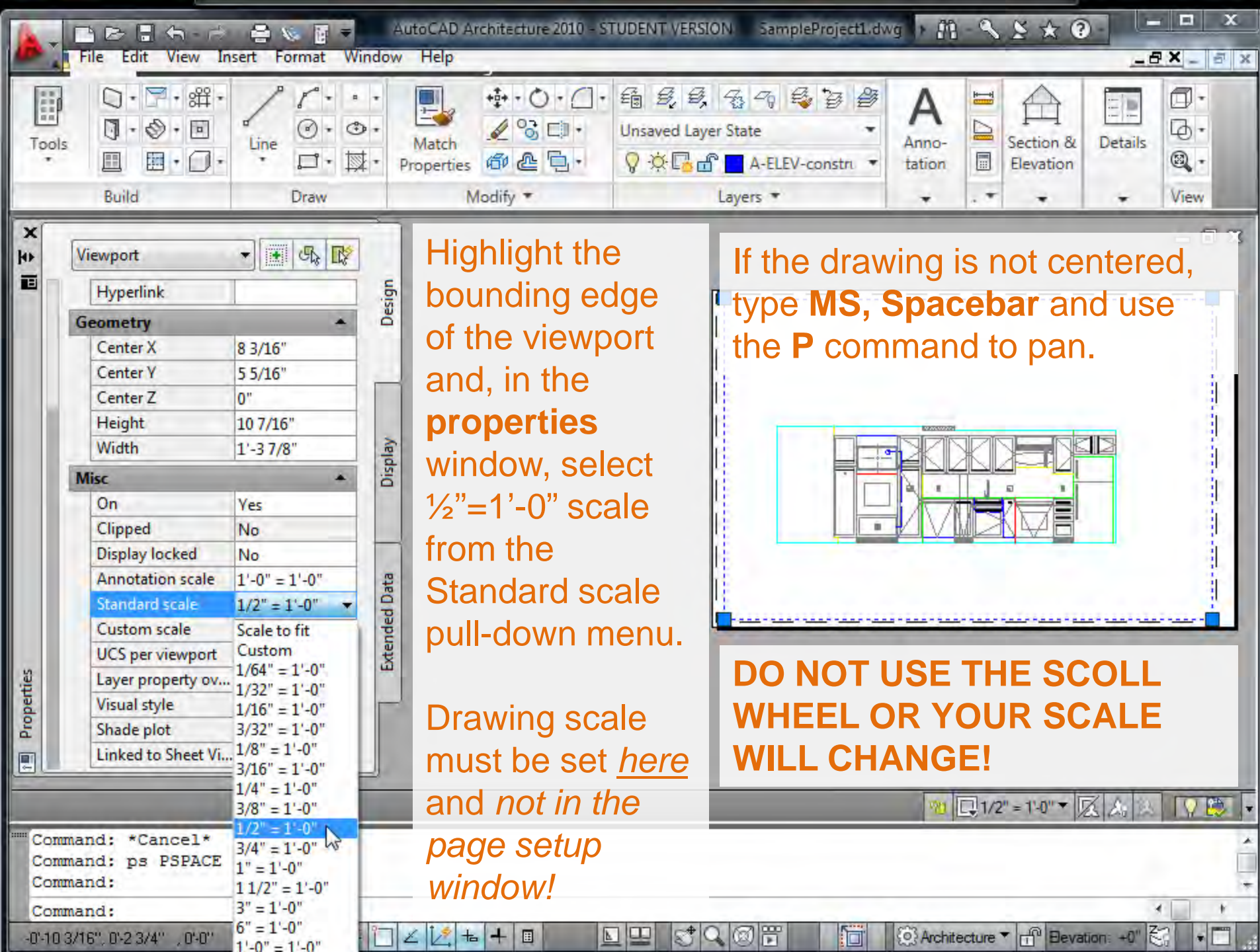
Select Drawing Orientation

Press ESC or
Command: u PAGESETUP
Command: pagesetup



Extend the boundaries of the viewport to match the new page dimensions.

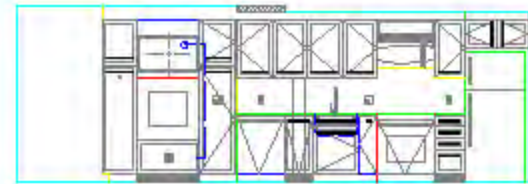
The page layout is at 1:1 scale and the drawing must be set to a proper print scale that will fit on the page.



Highlight the bounding edge of the viewport and, in the **properties** window, select $\frac{1}{2}''=1'-0''$ scale from the **Standard scale** pull-down menu.

Drawing scale must be set here and not in the page setup window!

If the drawing is not centered, type **MS, Spacebar** and use the **P** command to pan.



DO NOT USE THE SCROLL WHEEL OR YOUR SCALE WILL CHANGE!

PROPERTIES

Properties

No selection

General

Color	ByLayer
Layer	Guides
Linetype	ByLayer
Linetype scale	1.00000
Lineweight	ByLayer
Thickness	0"

3D Visualization

Material	ByLayer
Shadow display	Casts and Recei...

Layout

Layout name	PLAN
Page setup name	<None>
DPI to raster	300

Plot style

View

Misc

```
Command: p PAN
Press ESC or ENTER to exit, or right-click to
Command: ps PSPACE
Command:
```

0'-4 21/32", 0'-8 3/32", 0'-0"

Properties

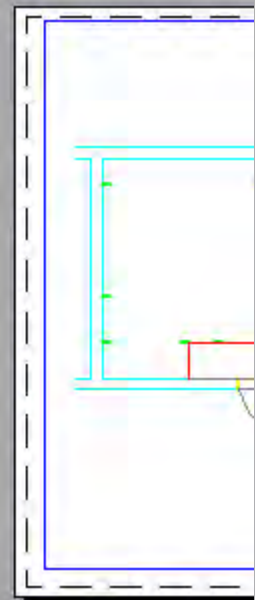
No selection

Has your Properties window disappeared? Type properties into the command line.

Is your Properties window in the way? Resize it or tuck it out of view when it's not in use. It can be docked on either side of the drawing, too.

```
Command: p PAN
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Command: ps PSPACE
Command:
```

0'-4 25/32", 0'-5 3/32", 0'-0"



Tools

Build Draw Modify Layers Annotation Section & Elevation Details View

Line Match Properties

Unsaved Layer State A-ELEV-constructi

No selection

Design

General

Color ByLayer

Layer A-ELEV-constr...

Linetype Contin...

Linetype scale 0.0075

Lineweight ByLayer

Thickness 0"

3D Visualization

Material ByLayer

Shadow display Casts and Rece...

Plot style

View

Center X 925'-1 1/4"

Center Y 569'-10 15/16"

Center Z 0"

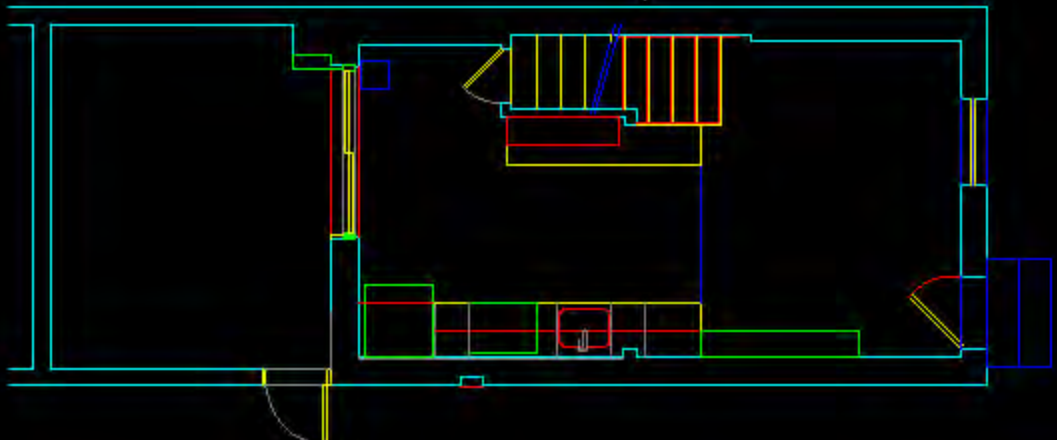
Height 31'

Width 69'

Misc

Properties

Return to model space by selecting *model* from the Quick View Layout button.



Model A1.1 A2.1 Week2

Quick View Layout button

Command: *Cancel*

Command: p PAN

Press ESC or ENTER to exit, or right-click to display shortcut menu.

Command:

Page Setup - Week2

Page setup
Name: <None>

Printer/plotter
Name: Adobe PDF
Plotter: Adobe PDF Converter - Windows System Driver - b...
Where: Documents*.pdf
Description:

Paper size
Tabloid

Plot area
What to plot:
Window
Display
Extents
Layout
Window
Window <

Plot scale
Fit to paper
Scale: Custom
1 inches =
1 unit
Scale lineweights

Plot style table (pen assignments)
LKM.ctb (missing)
Display plot styles

Shaded viewport options
Shade plot as displayed
Quality Normal
DPI 300

Plot options
Plot with plot styles
Plot with lineweights
Hide plot area
Plot area

Drawing orientation
Portrait
Landscape
Plot upside-down

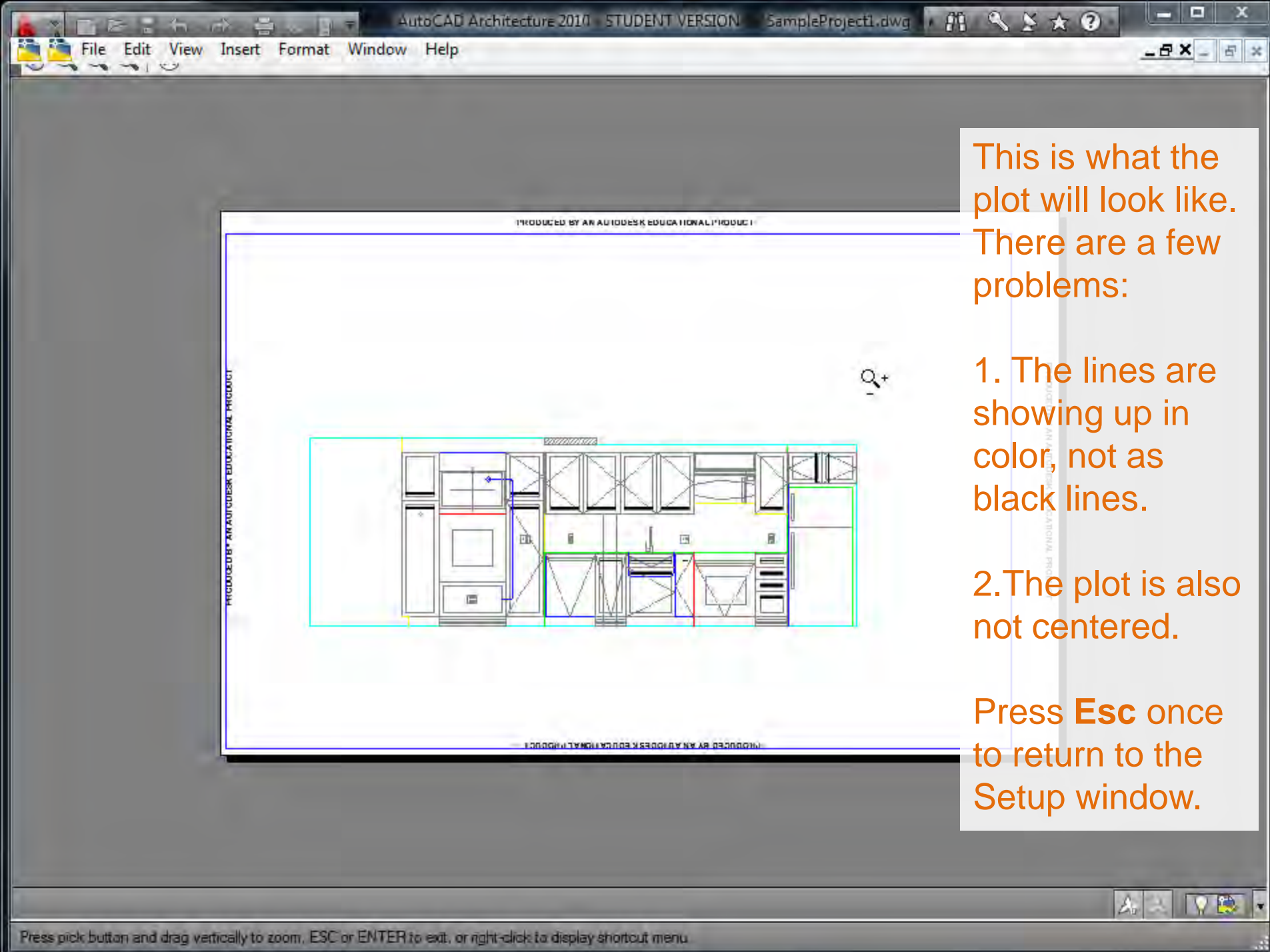
Preview... OK Cancel Help

Return to the new layout in paperspace and type **pagesetup** to preview the plot.

Select **“Window”** in Plot Area. You’ll be prompted to draw a window around the drawing area (or press the Window button).

Then, select **Preview**.

Resuming PAGE...
Specify first corner: Specify opposite corner:
Specify window for printing
Specify first corner: Specify opposite corner:



This is what the plot will look like. There are a few problems:

1. The lines are showing up in color, not as black lines.

2. The plot is also not centered.

Press **Esc** once to return to the Setup window.

Page Setup - Week2

Page setup
Name: <None>

Printer/plotter
Name: Adobe PDF
Plotter: Adobe PDF Converter - Windows System Driver - b...
Where: Documents*.pdf
Description:

Paper size
Tabloid

Plot area
What to plot: Window
Window <

Plot offset (origin set to printable area)
X: 0.426589 inch
Y: 0.164853 inch

Plot scale
Fit to paper:
Scale: Custom
1 inches = 1 unit

Plot style table (pen assignments)
LKM.ctb (missing)
 Display plot styles

Shaded viewport options
Shade plot: As displayed
Quality: Normal
DPI: 300

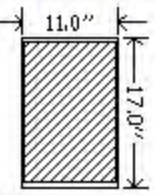
Plot options
 Plot object lines
 Plot with plot styles
 Plot paperspace objects
 Hide paperspace objects

Drawing orientation
 Portrait
 Landscape

Center the plot

Preview...

Cancel Help




Select "Center to Plot" for an improved layout.

Preview again to test out this change.


Automatically calculates the X and Y offset values to center the plot on the paper. This option is not available when Plot Area is set to Layout.

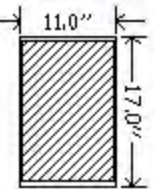
Specify first
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Press ESC or ENTER to exit, or right-click to display shortcut menu.

Page Setup - Week2

Page setup
 Name: 

Printer/plotter
 Name:

Plot style table (pen assignments)
 LKM.ctb (missing) 
 None
 LKM.ctb (missing)
 AIA Color LWT by Object.ctb
 AIA LWT by Object.ctb
 AIA Standard Color.ctb
AIA Standard.ctb
 AIA(256) Scale 48.ctb
 AIA(256) Scale 96.ctb
 D A CH (monochrome) Scale 1-100.ctb
 D A CH (monochrome) Scale 1-200.ctb
 D A CH (monochrome) Scale 1-50.ctb
 D A CH (monochrome) Scale 1-500.ctb
 New...

Properties 

Paper size
 Tabloid

Plot area
 What to plot:

Plot scale
 Fit to paper
 Scale: Custom
 1 inches = 1 unit
 Scale lineweights

Plot offset (origin set to printable area)
 X:
 Y:

OK Cancel Help

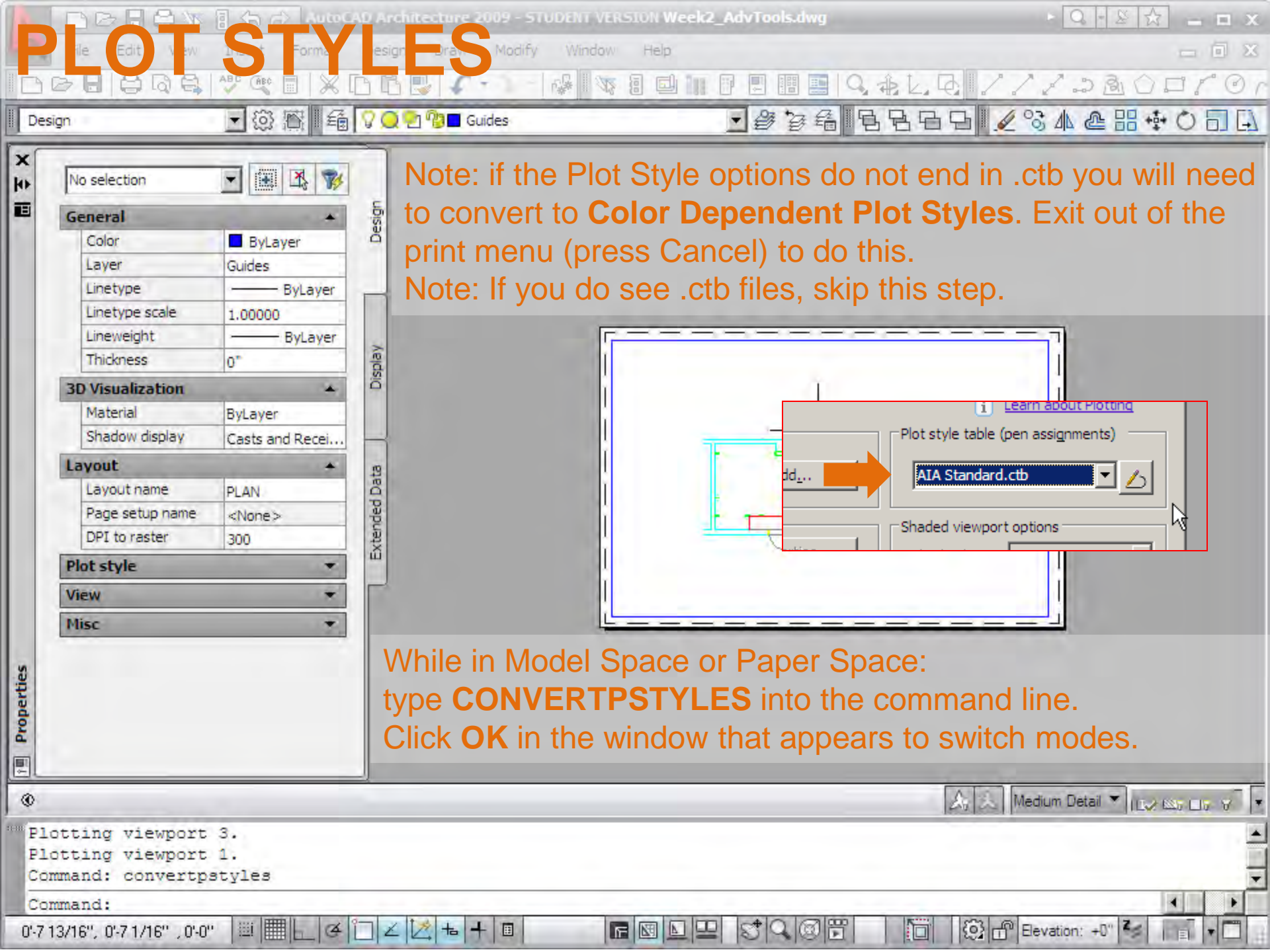
To ensure the lines print in black in the proper line weights, and not in color as arbitrary line weights, we must set up plot styles.

Notice that this file says the assigned plot style table is missing (LKM.ctb).

If a file is missing, line weights will not plot properly.

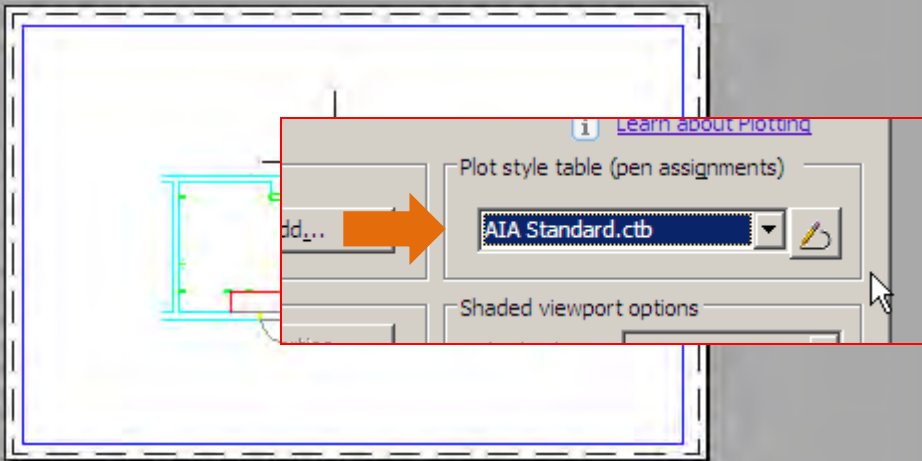
Select **AIA Standard.ctb** and then select the **Edit** button.

Press ESC or ENTER to exit, or right-click to display shortcut menu.
 Press ESC or ENTER to exit, or right-click to display shortcut menu.



PLOT STYLES

Note: if the Plot Style options do not end in .ctb you will need to convert to **Color Dependent Plot Styles**. Exit out of the print menu (press Cancel) to do this.
Note: If you do see .ctb files, skip this step.



While in Model Space or Paper Space:
type **CONVERTPSTYLES** into the command line.
Click **OK** in the window that appears to switch modes.

Plotting viewport 3.
Plotting viewport 1.
Command: convertpstyles
Command:

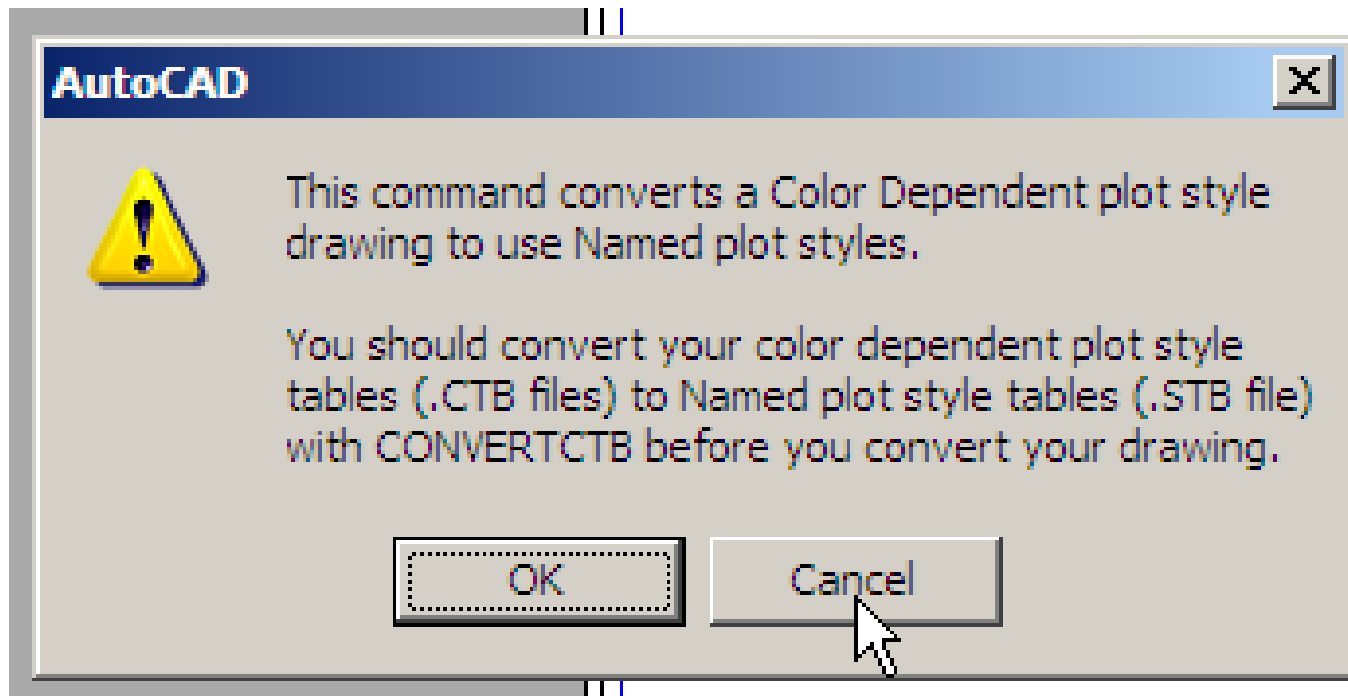
Medium Detail

0'-7 13/16", 0'-7 1/16", 0'-0" Elevation: +0"

If you skipped the last step, you may skip this step as well.

If you completed the last step and this screen appears, select **Cancel**.

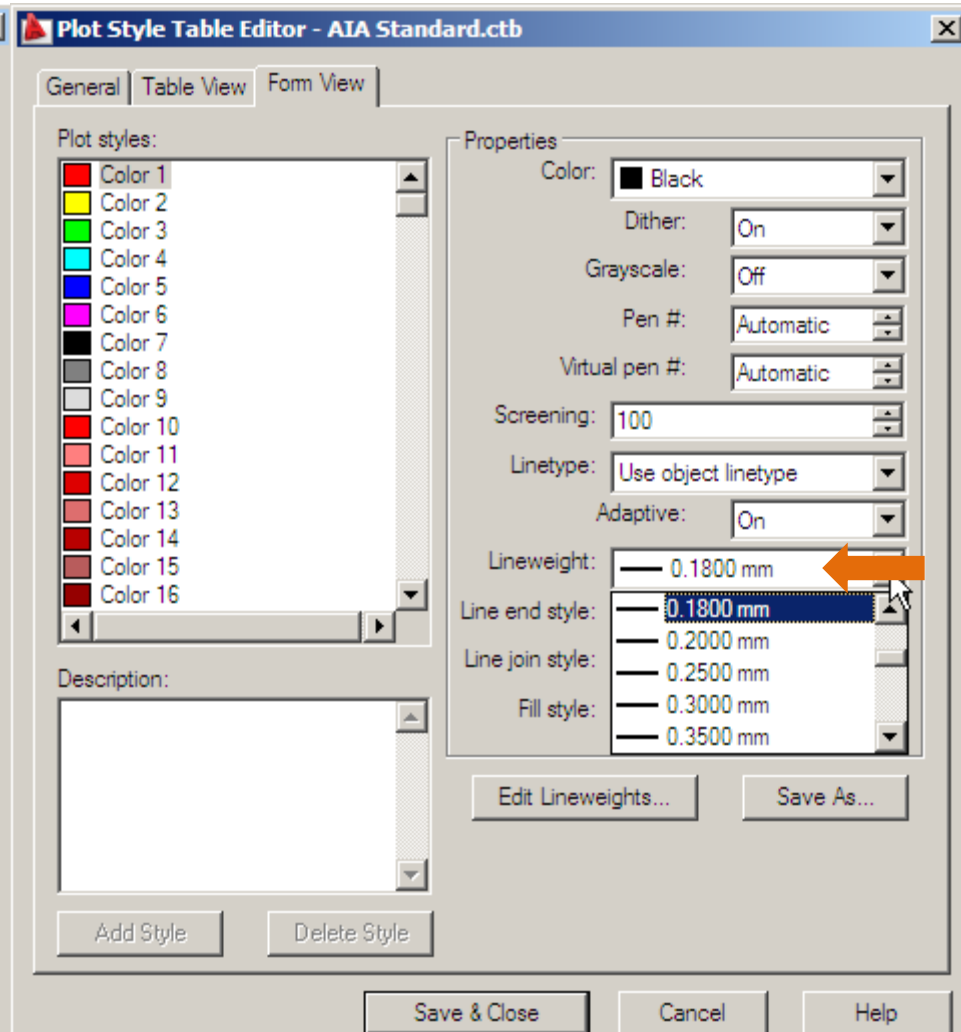
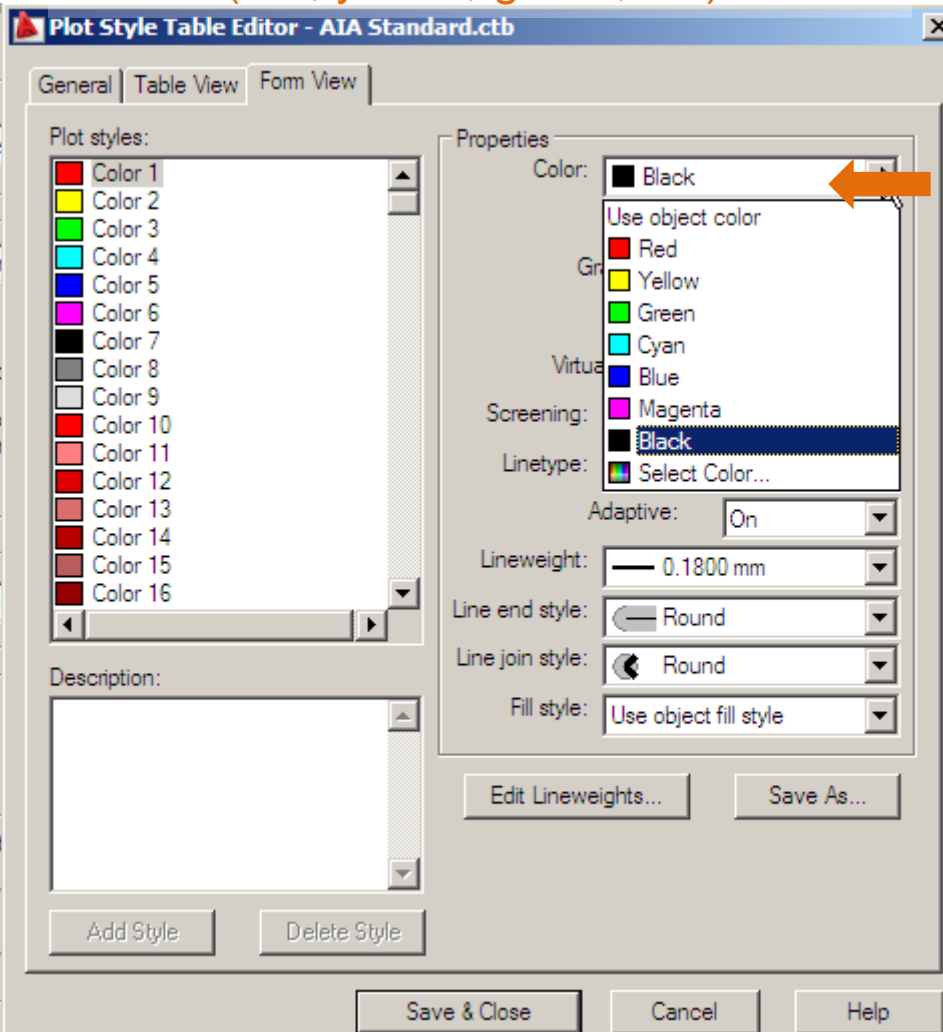
If it does not appear,
proceed with converting Named plot styles to Color Dependent plot styles.



PLOT STYLES

By selecting Black as the Color option, you are telling the printer to print a line in Black rather than in its “object color” (red, yellow, green, etc).

The lineweight setting will translate a color that’s been set in Layers into a specified line thickness.



Plot Style Table Editor - LKM.ctb

General Table View Form View

Name	Color 1	Color 2	Color 3	Color 4	Color 5
Description					
Color	Black	Black	Black	Black	Black
Enable dithering	On	On	On	On	On
Convert to grayscale	Off	Off	Off	Off	Off
Use assigned pen #	Automatic	Automatic	Automatic	Automatic	Automatic

Save As

ACA 2010 > enu > Plot Styles

Organize Views New Folder

Name	Date modified	Type
AIA Color LWT by Object		
AIA LWT by Object		
AIA Standard		
AIA Standard Color		
AIA(256) Scale 48		
AIA(256) Scale 96		
D A CH (monochrome) Scale 1-50		
D A CH (monochrome) Scale 1-100		
D A CH (monochrome) Scale 1-200		
D A CH (monochrome) Scale 1-500		

File name: LKM

Save as type: Color-Dependent Style Table Files (*.ctb)

Save Cancel

Save As...

Cancel Help

Properties

Press
Press
Press

Plot Style Table Editor - LKM.ctb

General Table View Form View

Name	Color 1	Color 2	Color 3	Color 4	Color 5
Description					
Color	Black	Black	Black	Black	Black
Enable dithering	On	On	On	On	On
Convert to grayscale	Off	Off	Off	Off	Off
Use assigned pen #	Automatic	Automatic	Automatic	Automatic	Automatic
Virtual pen #	Automatic	Automatic	Automatic	Automatic	Automatic
Screening	100	100	100	100	100
Linetype	Use object linetype	Use object linetype	Use object linetype	Use object linetype	Use object linetype
Adaptive adjustment	On	On	On	On	On
Lineweight	0.0900 mm	0.1500 mm	0.3500 mm	0.4500 mm	0.0500 mm
Line End Style	Round	Round	Round	Round	Round
Line Join style	Round	Round	Round	Round	Round
Fill Style	Use object fill style	Use object fill style	Use object fill style	Use object fill style	Use object fill style

Buttons: Edit Lineweights..., Save As..., Save & Close, Cancel, Help



Make the changes noted here to get started with a plot style. You can make adjustments in the future, based on how the printers and plotters handle your line weights.

Press ESC or ENTER to exit, or right-click to display shortcut menu.
 Press ESC or ENTER to exit, or right-click to display shortcut menu.

Plot Style Table Editor - LKM.ctb

General Table View Form View

Name	Color 5	Color 6	Color 7	Color 8	Color 9
Description					
Color	Black	Black	Black	Black	Black
Enable dithering	On	On	On	On	On
Convert to grayscale	Off	Off	Off	Off	Off
Use assigned pen #	Automatic	Automatic	Automatic	Automatic	Automatic
Virtual pen #	Automatic	Automatic	Automatic	Automatic	Automatic
Screening	100	100	100	50	100
Linetype	Use object linetype	Use object linetype	Use object linetype	Use object linetype	Use object linetype
Adaptive adjustment	On	On	On	On	On
Lineweight	0.0500 mm	0.0000 mm	0.0900 mm	0.0900 mm	2.0000 mm
Line End Style	Round	Round	Round	Round	Round
Line Join style	Round	Round	Round	Round	Round
Fill Style	Use object fill style	Use object fill style	Use object fill style	Use object fill style	Use object fill style

Note that Color 8 is also changed to 50 for its screening – this means that it will print at 50% blackness, or gray. This may not work on all plotters.

When finished, select Save & Close.

Edit Lineweights...

Save As...

Save & Close

Cancel

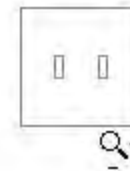
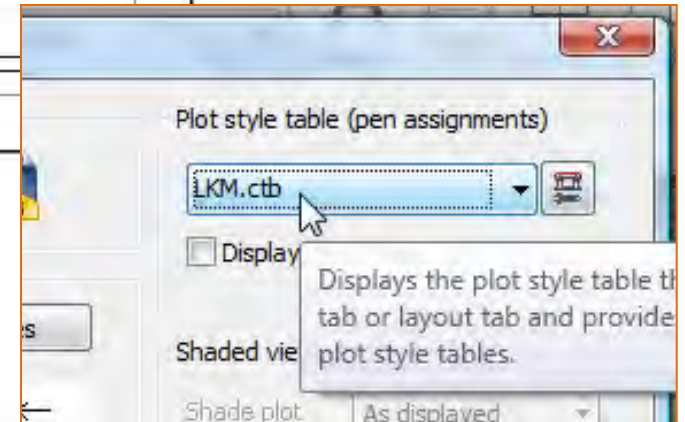
Help

OK

Cancel

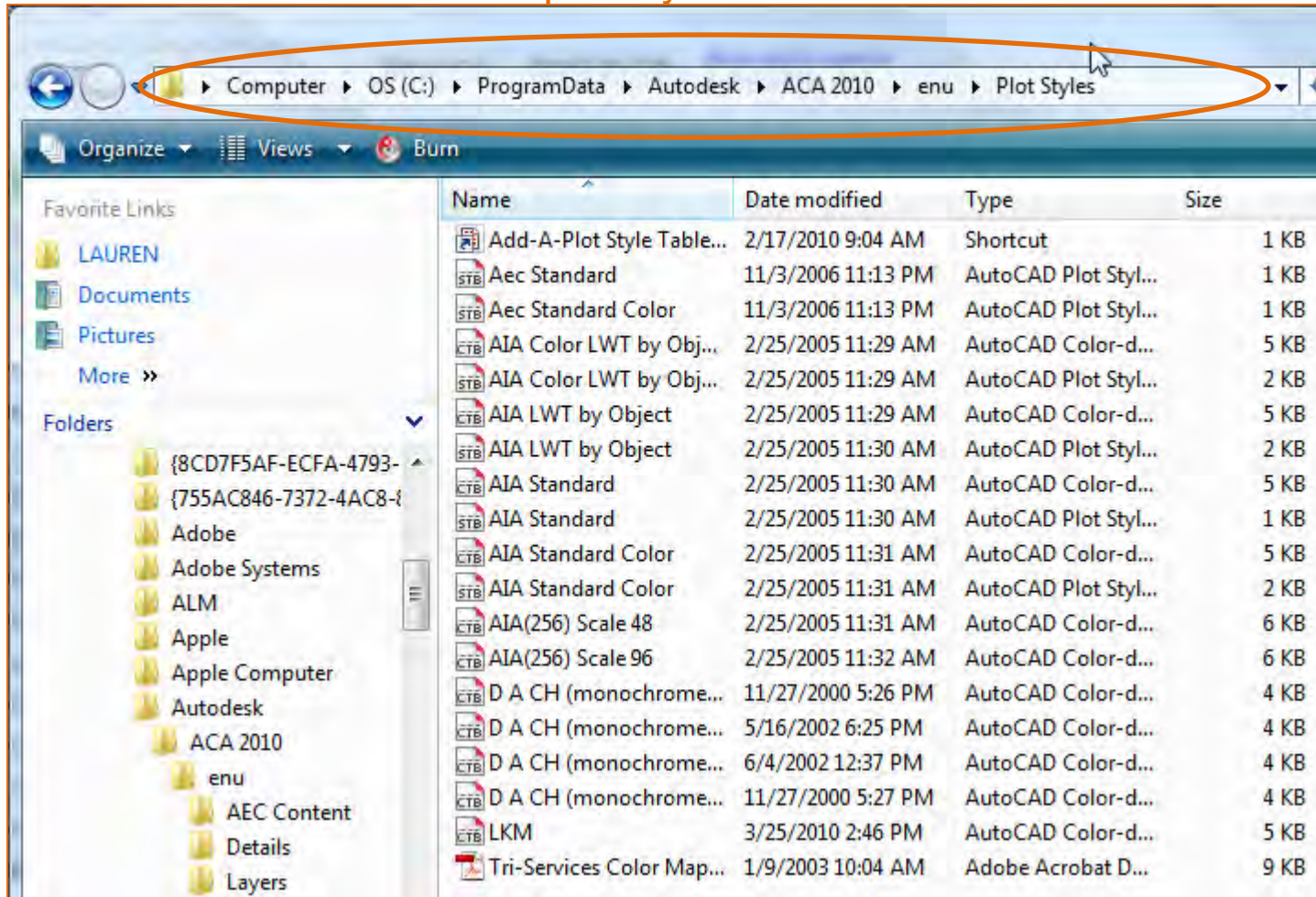
Help

Once you return to the setup window, select the new plot style you created from the pulldown menu, then select Preview to view the changes. Note that all lines now appear as black or gray.



PLOT STYLE LOCATION

Where is this plot style file located? **Only on your computer.** If you plot from another computer, you must remember to *bring a copy of your plot style file along with your drawing file.* Here's where the plot styles are located:



Or, type **stylesmanager** into the command line. It's good practice to keep a copy of the **.ctb** file on the flash drive you used for moving files to lab computers for plotting. Be sure to place this file in the appropriate Autodesk folder on the computer you're plotting from.

PLOT & PRINT

Plot - Week2

Learn about Plotting

Page setup

Name: <None> Add...

Printer/plotter

Name: Adobe PDF Properties...

Plotter: Adobe PDF Converter - Windows System Driver - by Au...

Where: Documents*.pdf

Description:

Plot to file

Paper size: Tabloid

Number of copies: 1

Plot area

What to plot: Window Window<

Plot scale

Fit to paper

Scale: Custom

1 inches =

1 unit

Scale lineweights

Plot offset (origin set to printable area)

X: 0,426589 inch Center the plot

Y: 0,164853 inch

Preview... Apply to Layout OK Cancel Help

Type **plot** or press **Ctrl + P** to access the print window. It is similar to the page setup window, but from this window you may print / plot your files.

Select the **More Options** arrow to expand the window.



Plot - Week2 Learn about Plotting

Page setup

Name: <None> Add...

Printer/plotter

Name: Adobe PDF Properties...

Plotter: Adobe PDF Converter - Windows System Driver - by Au...

Where: Documents\3.pdf
Description:
 Plot to file

Paper size

Tabloid Number of copies: 1

Plot area

What to plot:
Window Window <

Plot offset (origin set to printable area)

X: 0.426589 inch Center the plot
Y: 0.164853 inch

Plot scale

Fit to paper
Scale: Custom 1 inches = 1 unit
 Scale lineweights

Plot style table (pen assignments)

LKM.ctb

Shaded viewport options

Shade plot: As displayed
Quality: Normal
DPI: 300

Plot options

Plot in background
 Plot object lineweights
 Plot with plot styles
 Plot paperspace last
 Hide paperspace objects
 Plot stamp on
 Save changes to layout

Drawing orientation

Portrait
 Landscape
 Plot upside_down

Preview... Apply to Layout OK Cancel Help

Always double-check all of your settings and Preview prior to plotting.

You may install the studio plotter drivers directly onto your own laptop, and connect your laptop directly to the plotter for faster plotting (instead of plotting over the network).

HP Designjet 500

<http://h20000.www2.hp.com/bizsupport/TechSupport/DriverDownload.jsp?lang=en&cc=us&prodNameId=377952&taskId=135&prodTypeId=18972&prodSeriesId=25301&lang=en&cc=us>

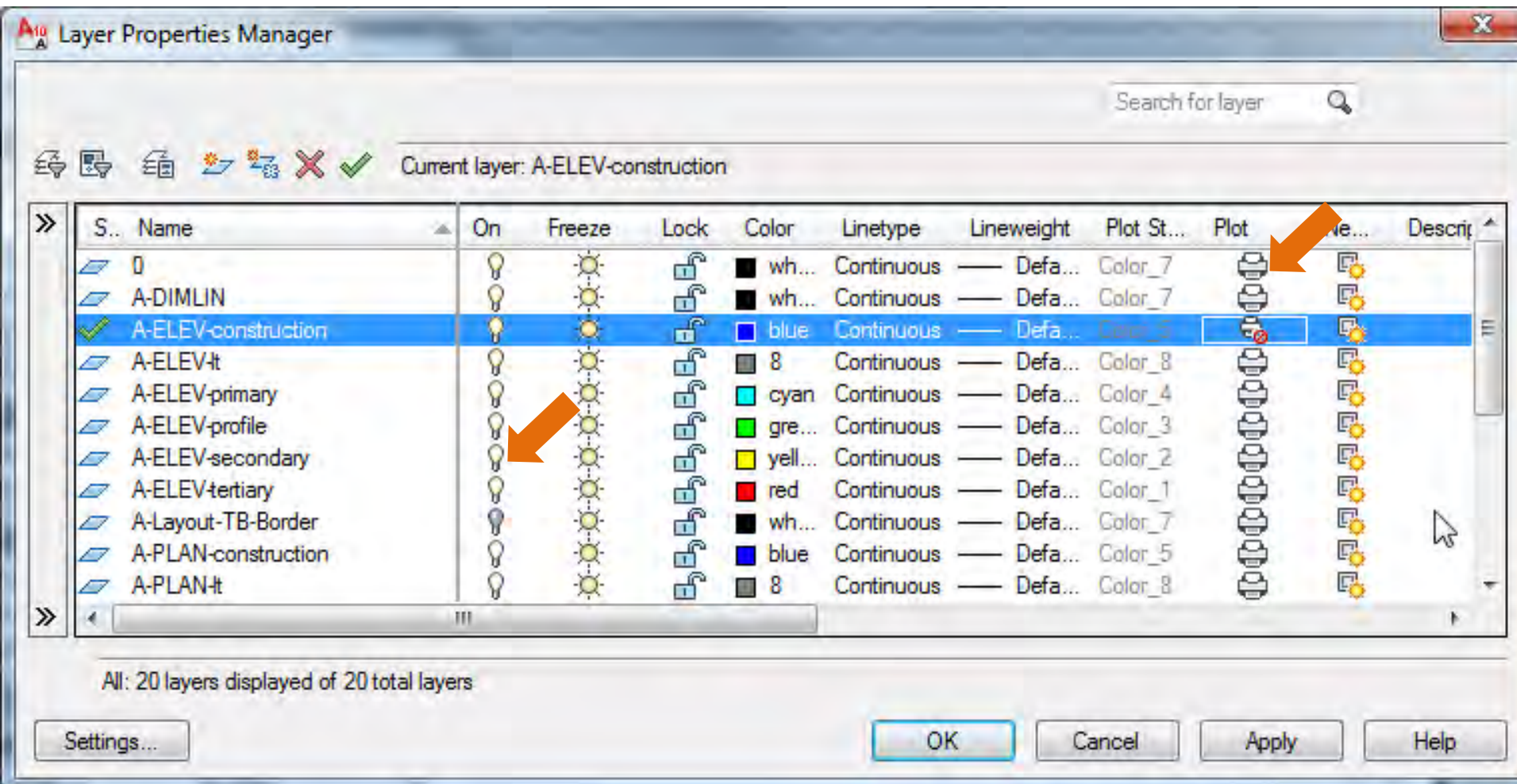
HP Designjet 800

<http://h20000.www2.hp.com/bizsupport/TechSupport/DriverDownload.jsp?prodNameId=377955&lang=en&cc=us&taskId=135&prodTypeId=18972&prodSeriesId=25302>

These links are also available directly from the course website.

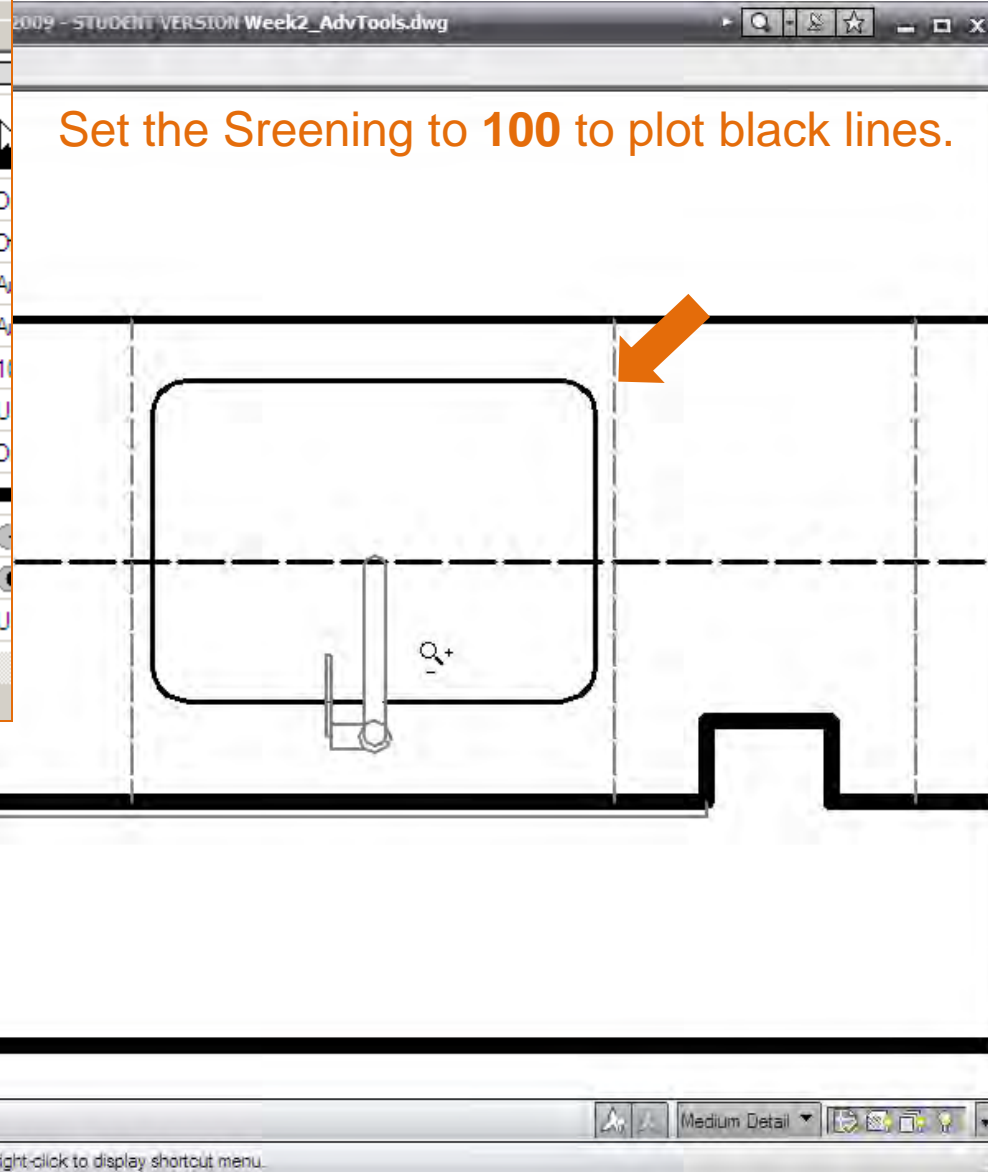
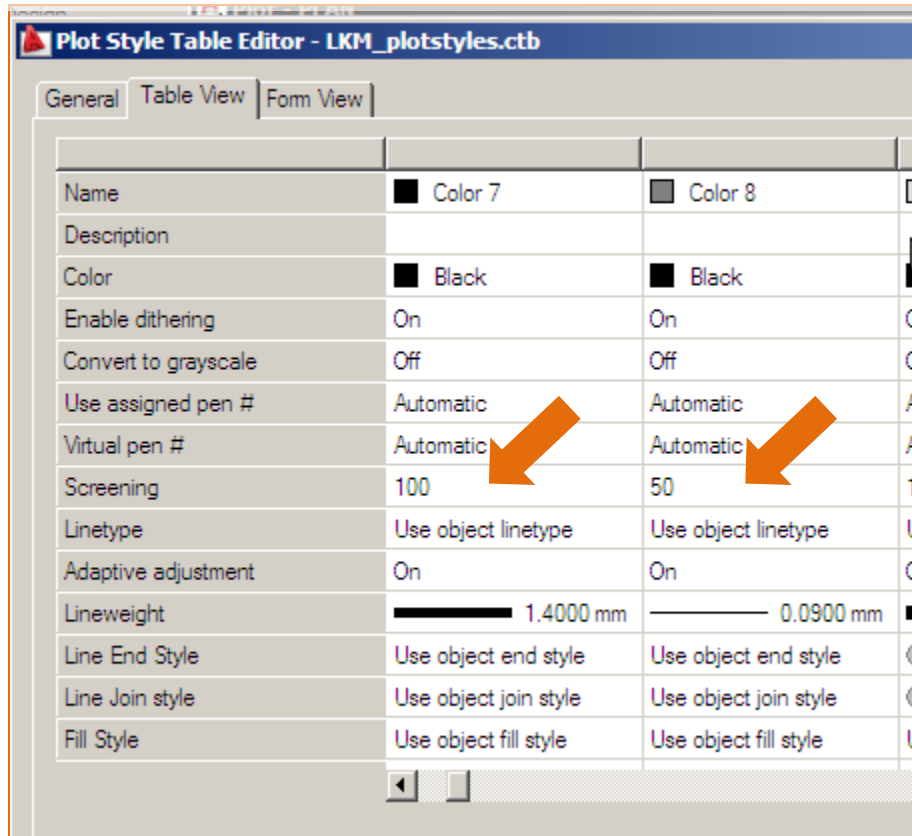
OTHER TIPS

If, in the preview mode, some objects do not show up, return to the Layer menu to adjust their settings – ensure the printer icon does not have a slash thru it and that the lightbulb for the layer is turned on.



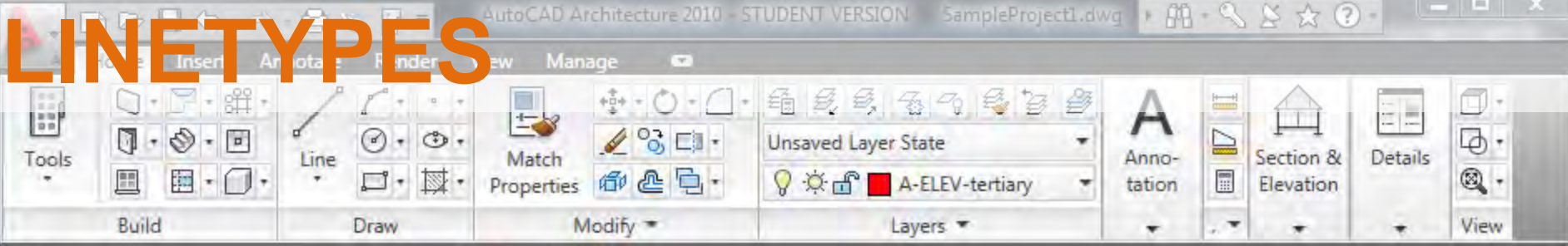
OTHER TIPS

If you find that some lines are plotting in shades of gray (or preview as gray) return to the plot style editor window to double-check the **Screening** selection for the line color.



Set the Screening to **100** to plot black lines.

LINETYPES



Properties

Line

Design

Display

Extended Data

General

Color	ByLayer
Layer	A-ELEV-tertiary
Linetype	- - Dash...
Linetype scale	ByLayer
Plot style	ByBlock
Lineweight	CENTE...
Hyperlink	Contin...
Thickness	DASHE...

3D Visualization

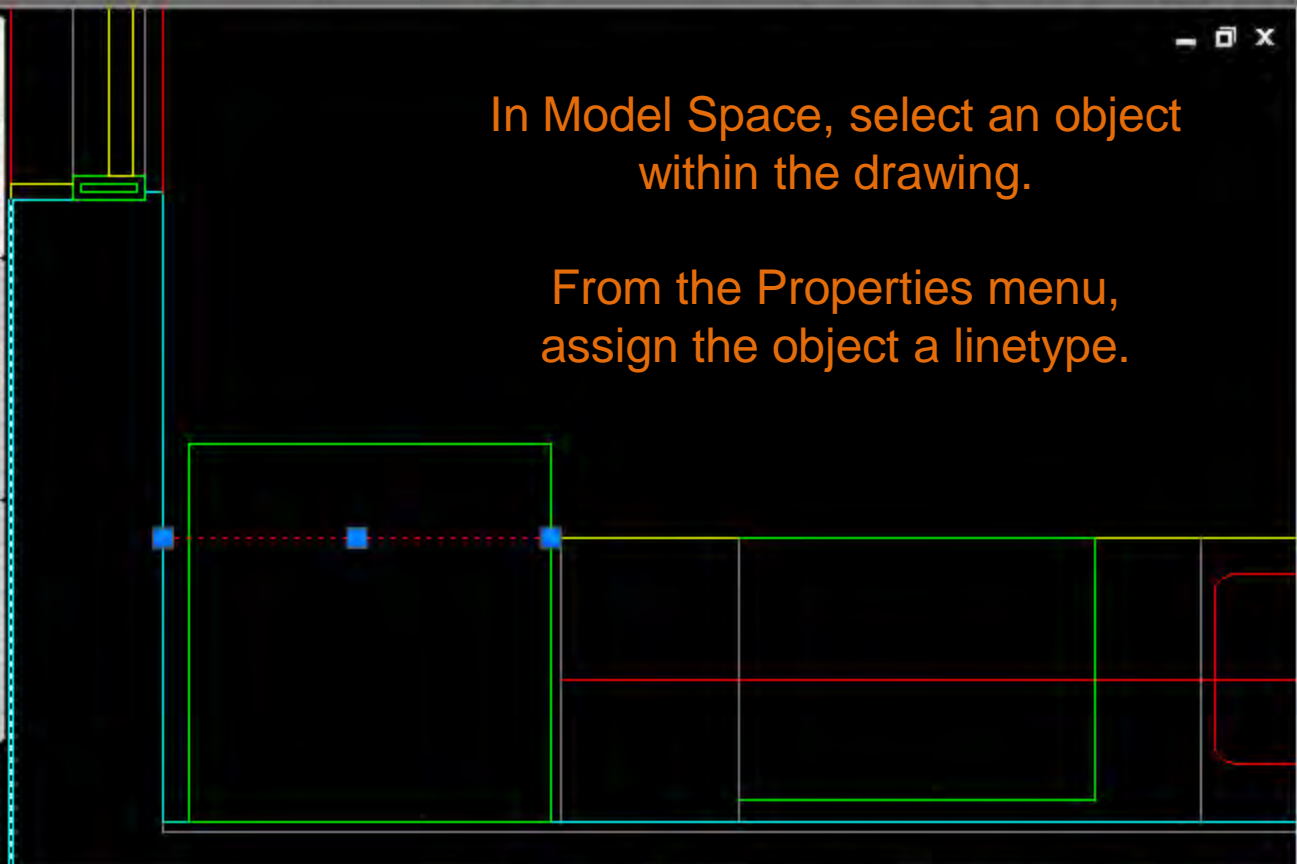
Material	ByLayer
----------	---------

Geometry

Start X	931'-5 3/4"
Start Y	566'-9 3/8"
Start Z	0"
End X	928'-9"
End Y	566'-9 3/8"
End Z	0"
Delta X	-2'-8 3/4"

In Model Space, select an object within the drawing.

From the Properties menu, assign the object a linetype.



Cancel

Command: *Cancel*

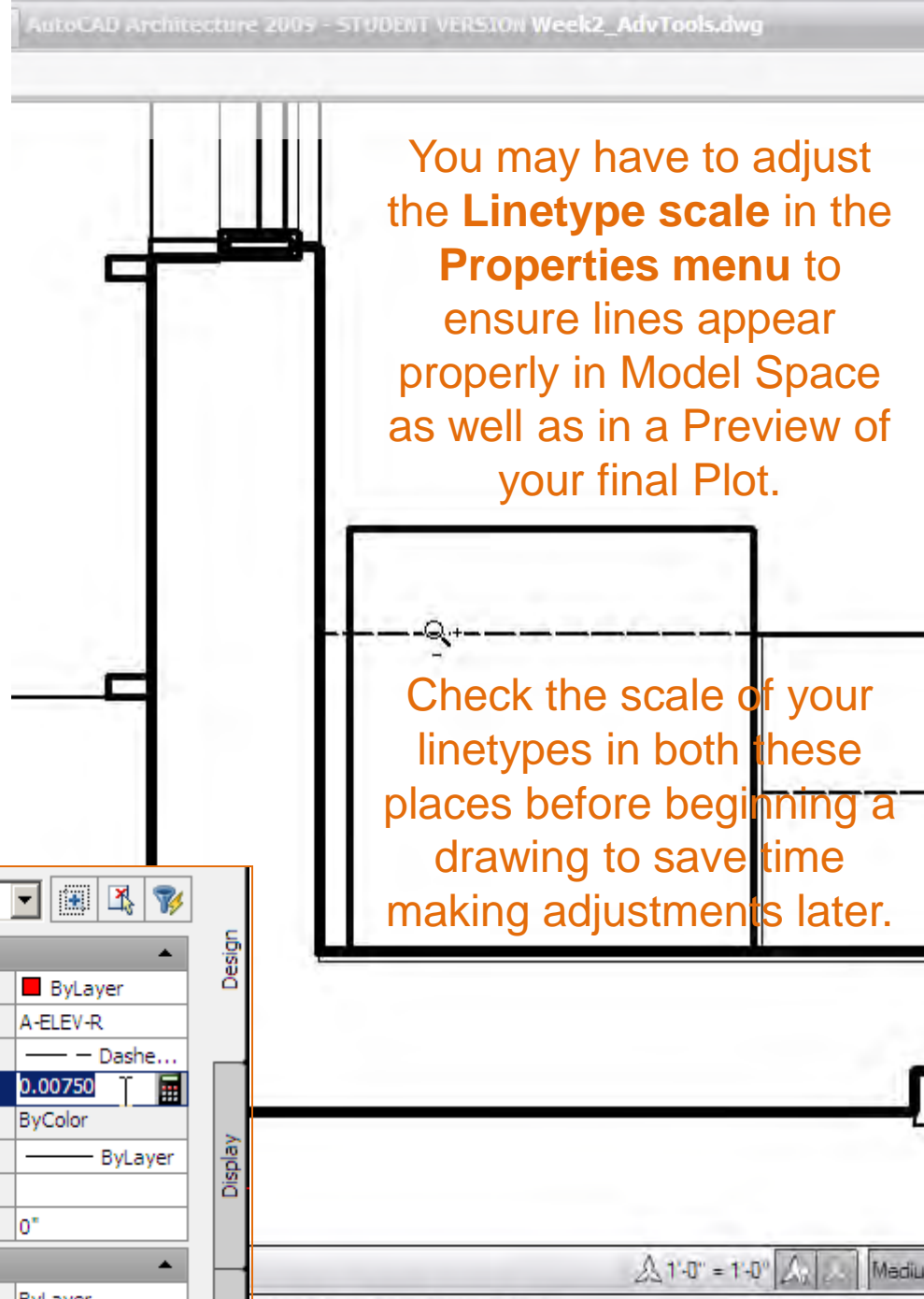
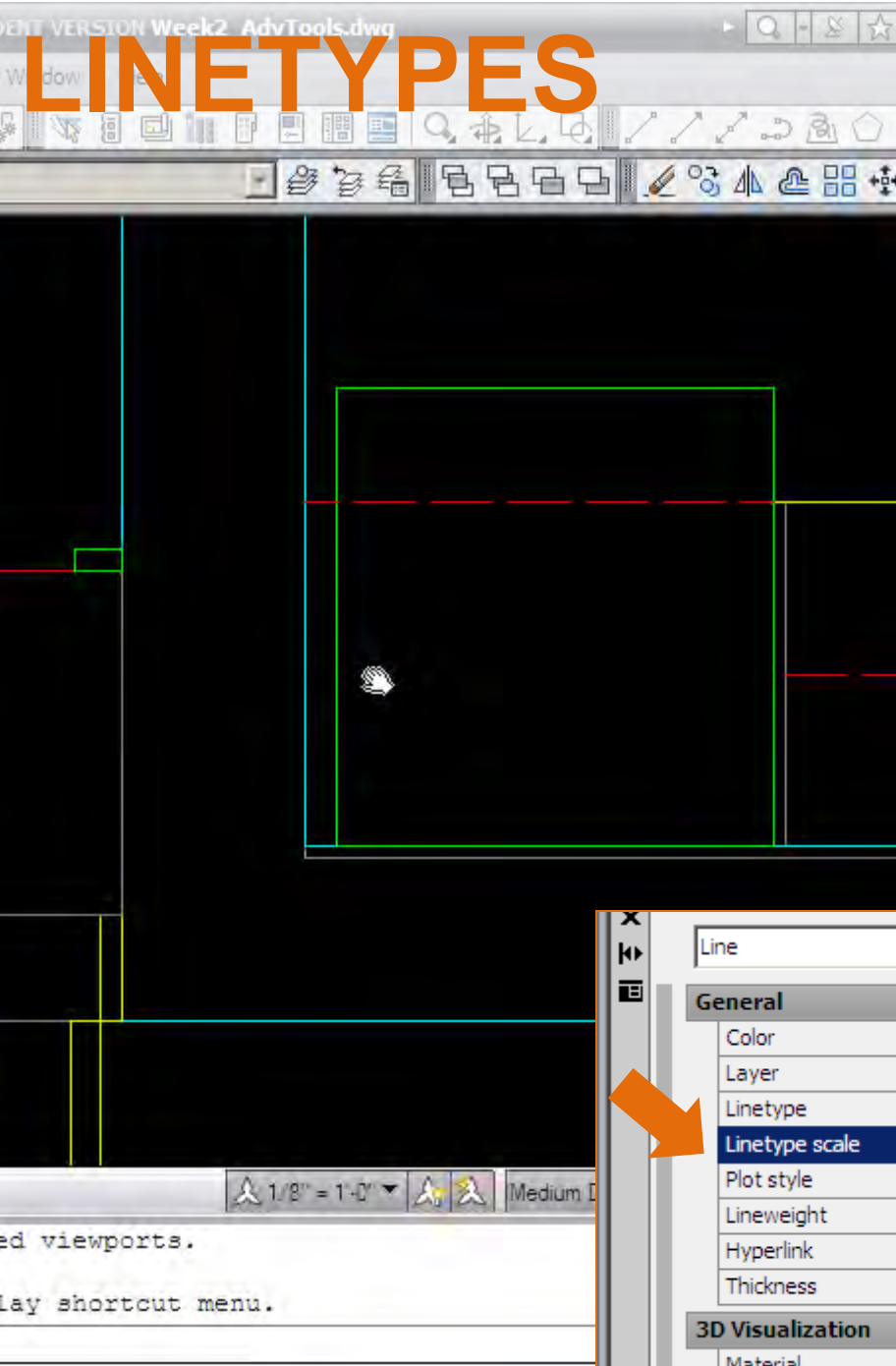
Command:

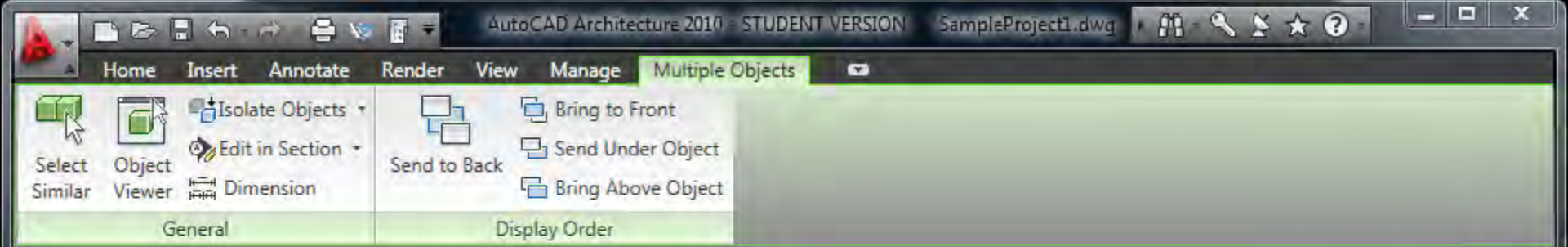
Command:

927'-8 3/8", 568'-2 3/4", 0'-0"

Architecture

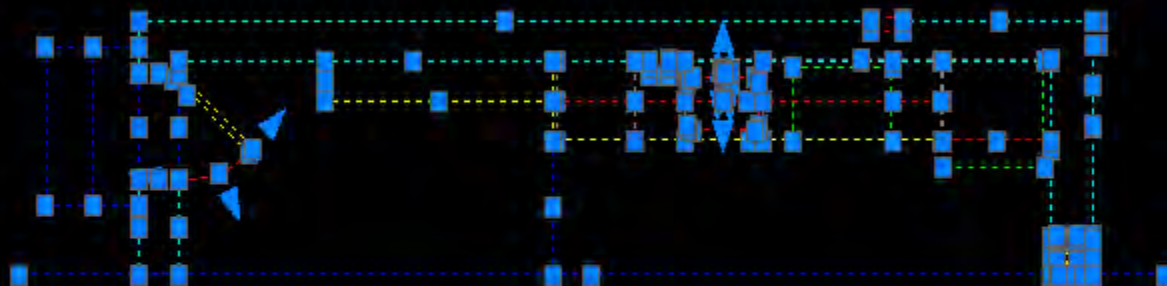
Elevation: +0"





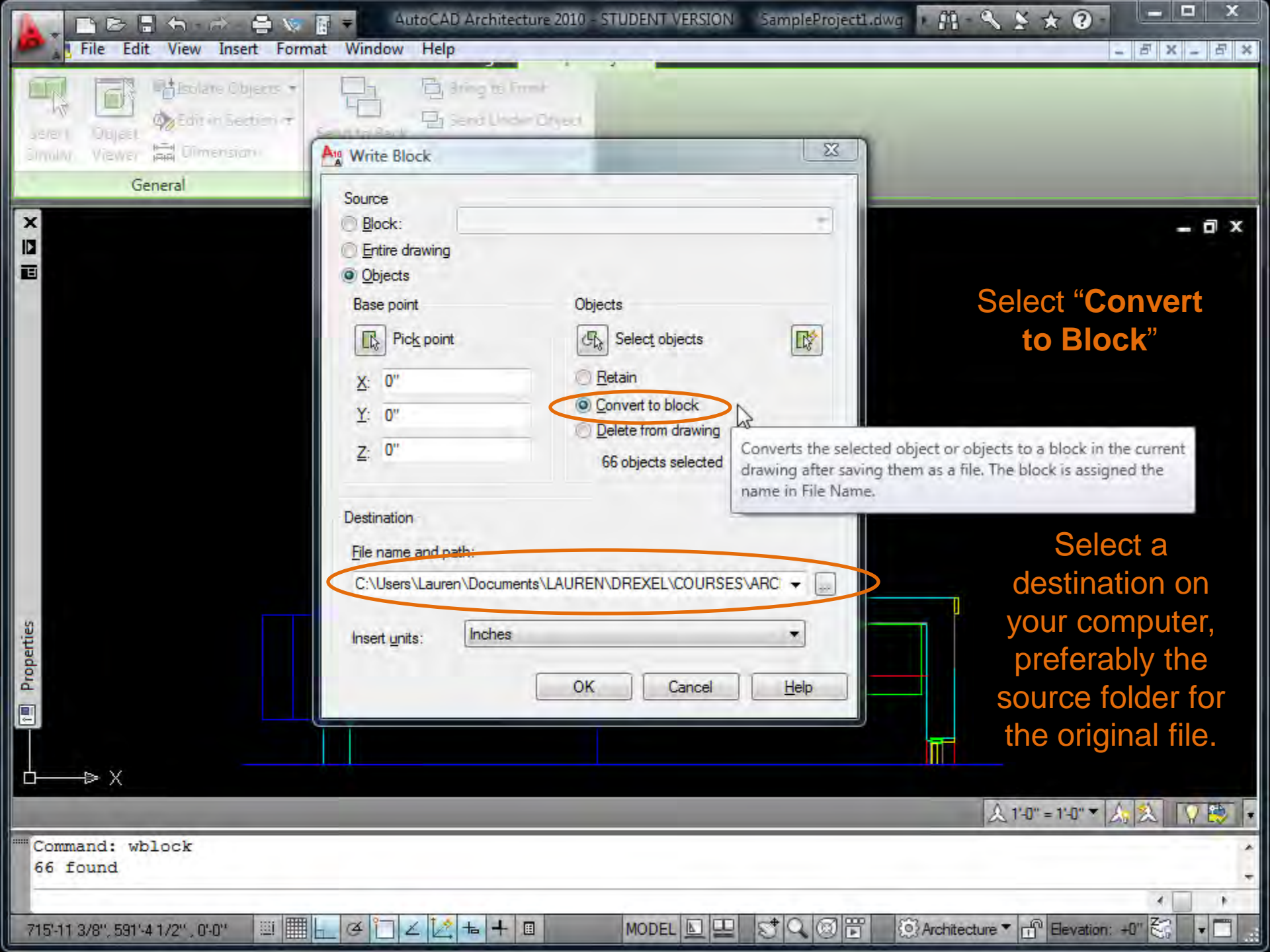
A drawing may be turned into a **wblock** for use as an underlay or for other purposes. The elements in the block will act like a *group*.

Type **wblock**, Spacebar.



Properties

Command: *Cancel*
Command: Specify opposite corner:
Command: wblock
715'-11 3/8", 591'-4 1/2", 0'-0"
MODEL
Architecture
Elevation: +0"



Select "Convert to Block"

Converts the selected object or objects to a block in the current drawing after saving them as a file. The block is assigned the name in File Name.

Select a destination on your computer, preferably the source folder for the original file.

Command: wblock
66 found

715'-11 3/8", 591'-4 1/2", 0'-0"

MODEL

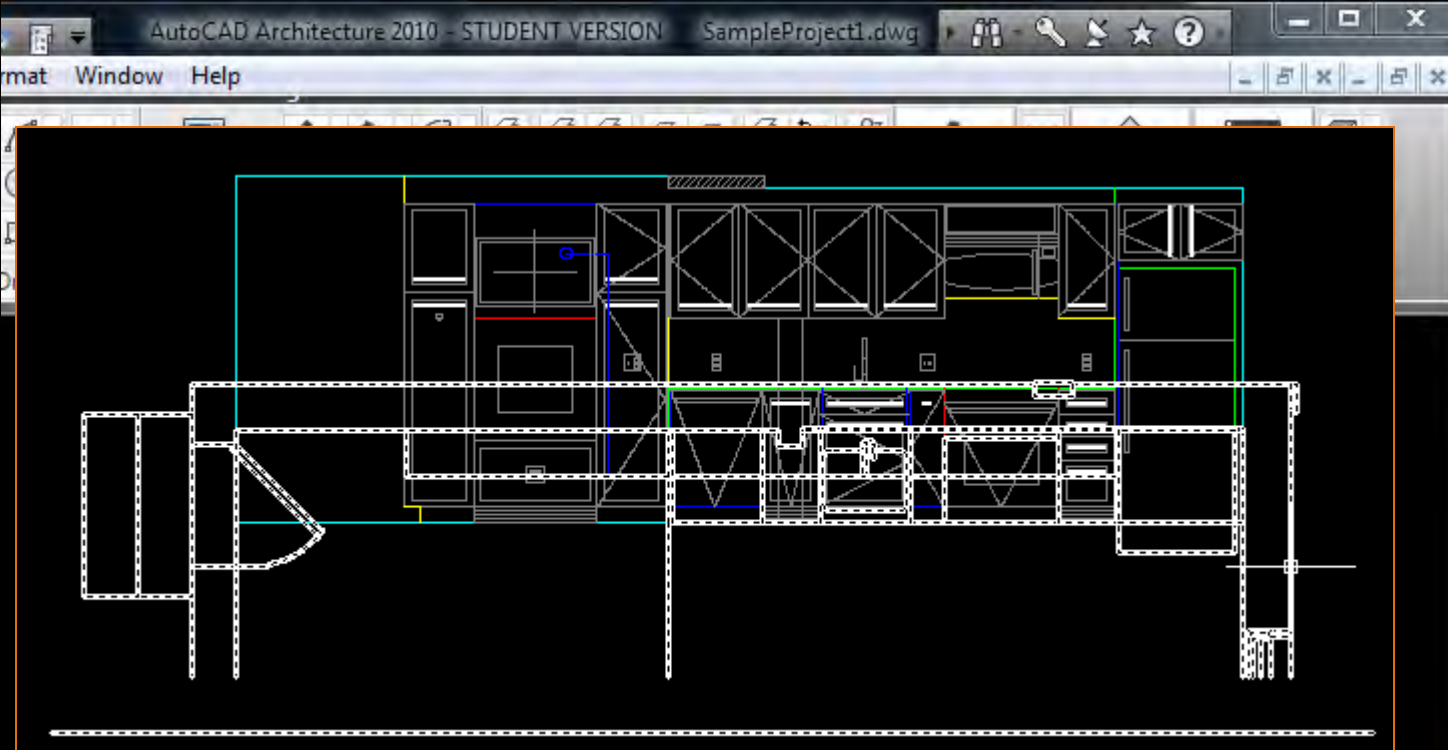
Architecture

Elevation: +0'

For better visibility, all lines can be set to a single color.

Note that this block may be placed on top of other elements without affecting them and can be easily selected as a unit.

Blocks may be turned back into lines using the **Explode** command.



<use first point as displacement>: *Cancel*

Command:

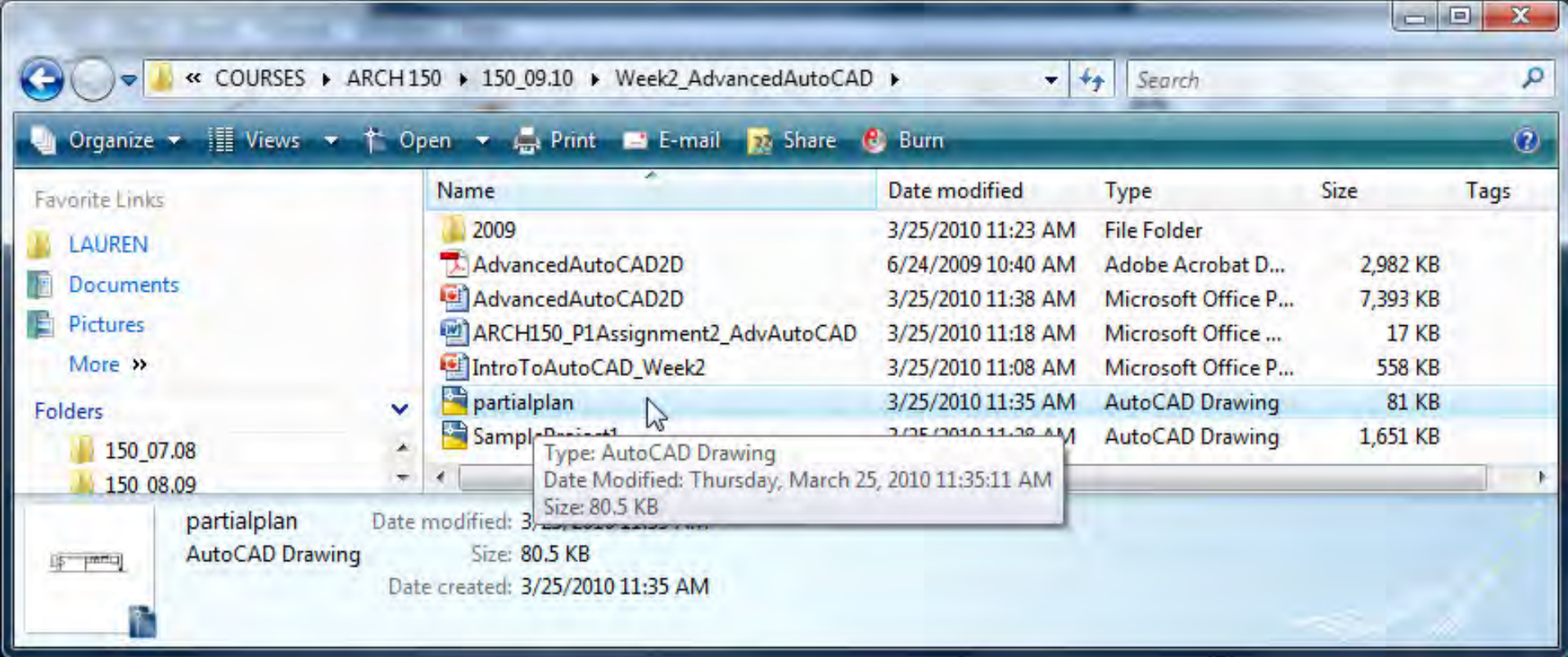
Command:

714'-8 3/4", 601'-4 1/16", 0'-0"

MODEL

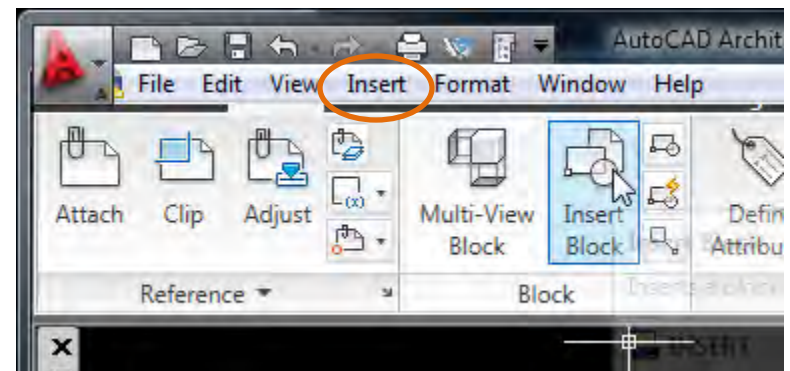
Architecture

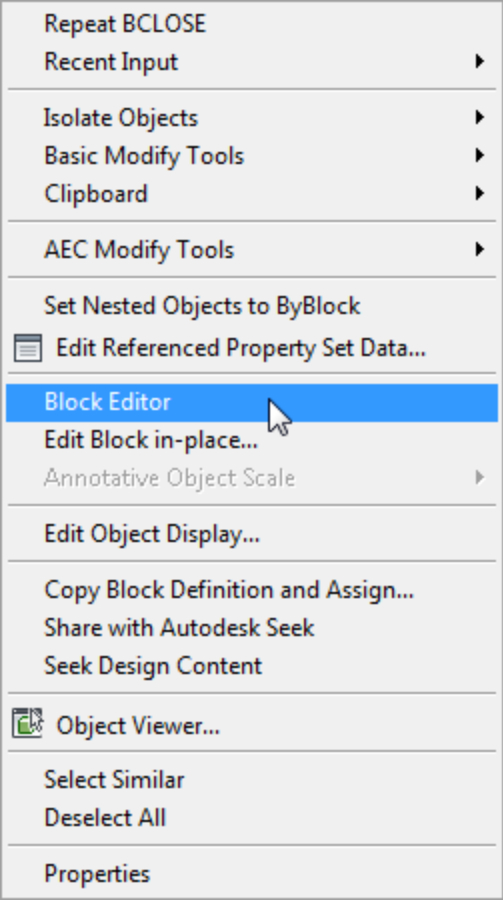
Elevation: +0'



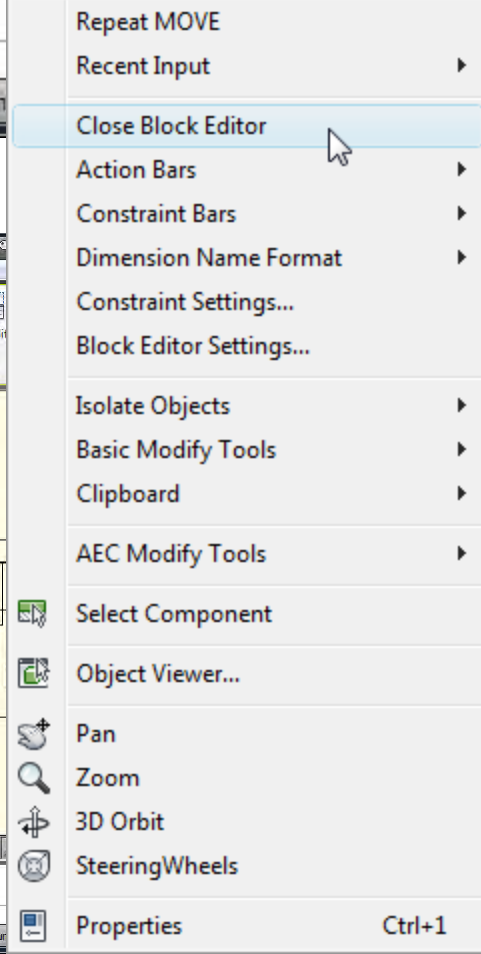
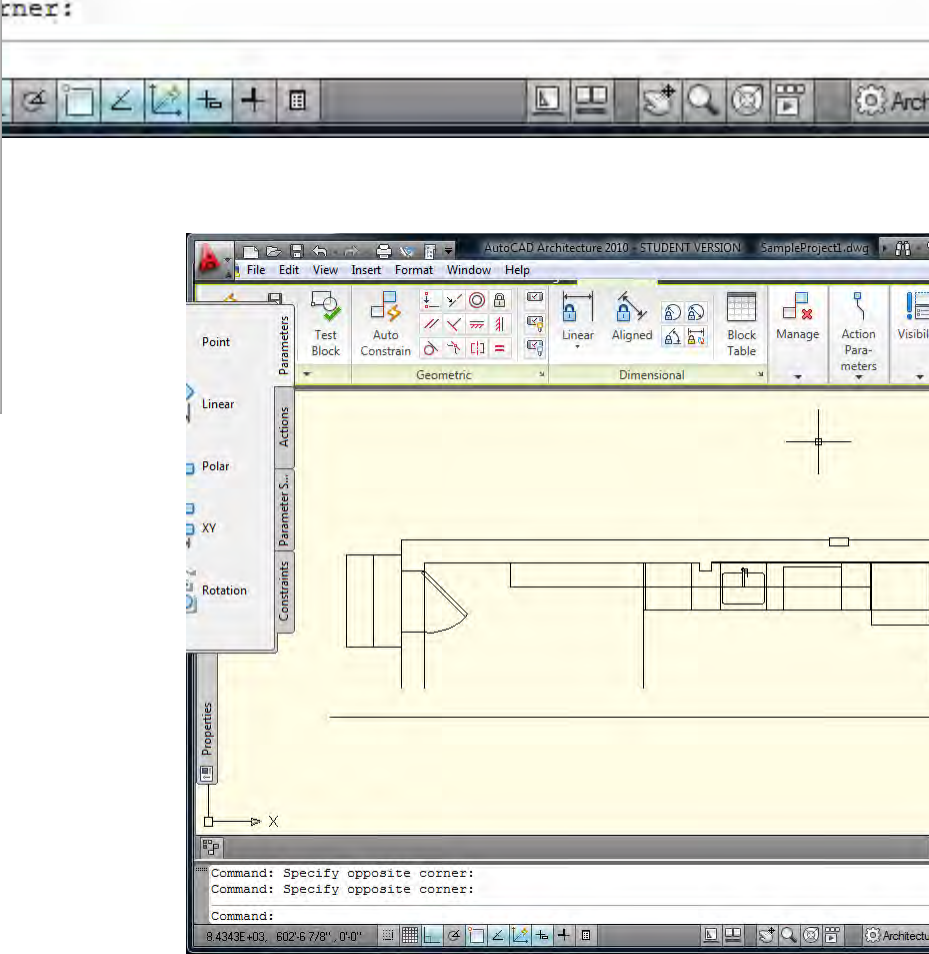
Note that the writeblock file you've created is a new AutoCAD .dwg file – it can be used and edited in the same manner you'd use any other AutoCAD file.

When inserting a new writeblock into a drawing, a *link* is created so that updates to the source writeblock automatically propagate into the file it's used in.



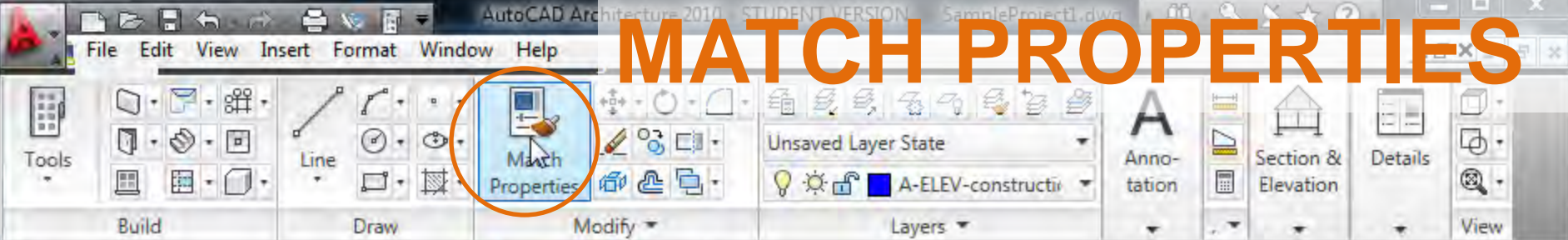


3. Make revisions to the block.
4. With no objects selected, right-click, select “**Close Block Editor.**”
5. You’ll be prompted to save changes to block source file – select yes to propagate changes.



1. The block may be edited at the source file, or from within the drawing it's being used in.
2. Select block, right-click, select “**Block Editor**”.

MATCH PROPERTIES



Properties palette for a selected object:

No selection	
General	
Color	ByLayer
Layer	A-ELEV-constr...
Linetype	Contin...
Linetype scale	0.0075
Lineweight	ByLayer
Thickness	0"
3D Visualization	
Material	ByLayer
Shadow display	Casts and Rece...
Plot style	
View	
Center X	930'-1 1/4"
Center Y	567'-5 3/4"
Center Z	0"
Height	6'-0 5/16"
Width	13'-1 9/16"
Misc	

Once line colors, weights and other attributes have been assigned to a drawing the **Match Properties** tool will be useful. It allows you to select the attributes of one item and assign them to others elements.

Although you can type **matchprop** into the command line, it's a long command and easiest to access from the palette shown above.

Select the source, then select the objects to which the properties will be applied.

Command line and status bar:

Command:
Command: *Cancel*
Command: *Cancel*
Command:

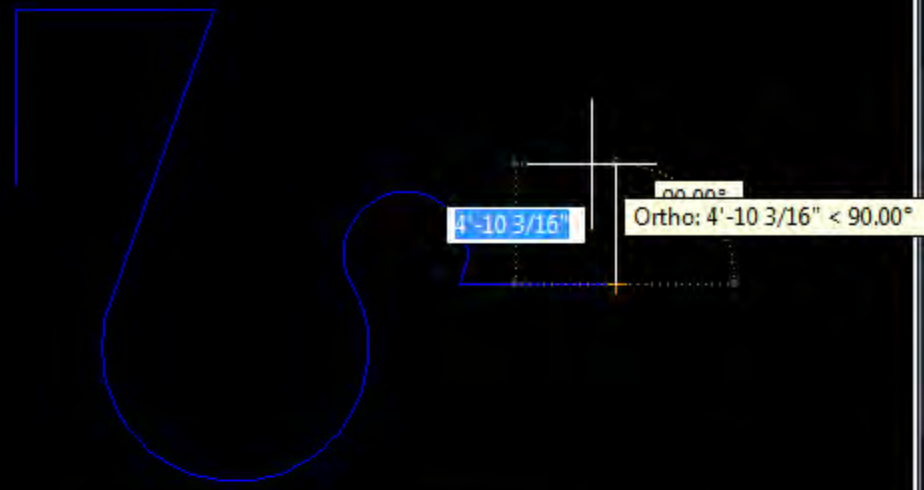
Status bar: 1.1153E+04, 570'-2 5/8", 0'-0" | Architecture | Elevation: +0"

POLYLINE

A polyline is a connected sequence of line segments that function as a single object. Type **PL**, **spacebar** to access it. Click on the drawing to begin, using **Ortho (F8)** as necessary.

Type **ARC**, **spacebar** mid-command to add curved line segments. Type **L** to return to straight lines.

Return to your original point to complete the shape, right-click and select Enter or Close.

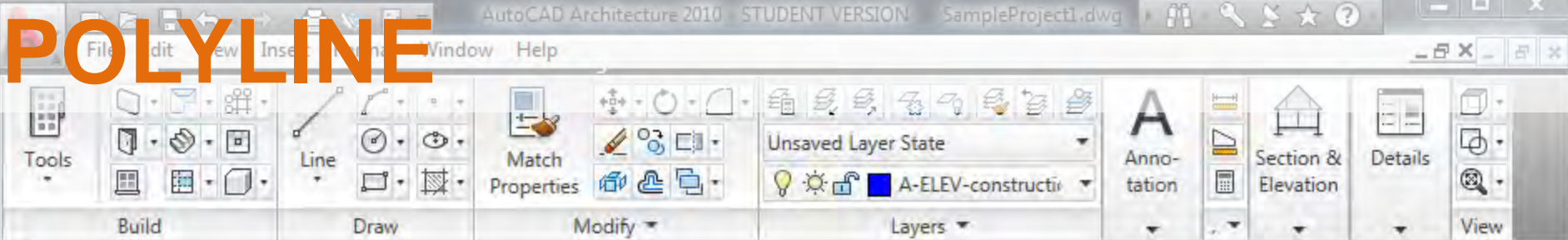


Specify endpoint of arc or [Angle/Center/Close/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]: 1
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]:
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]:

994'-7 3/4", 558'-3 5/8", 0'-0"

Architecture Elevation: +0"

POLYLINE



Perpendicular 1106'-0 1/8" < 31.48°

While drawing a polyline (or any other line), type **PER** mid-command to extend a line perpendicular to another line in the distance.

Type **C** mid-command and the polyline will automatically close itself.

Polylines are especially useful when adding tone or hatch to an irregularly shaped area.

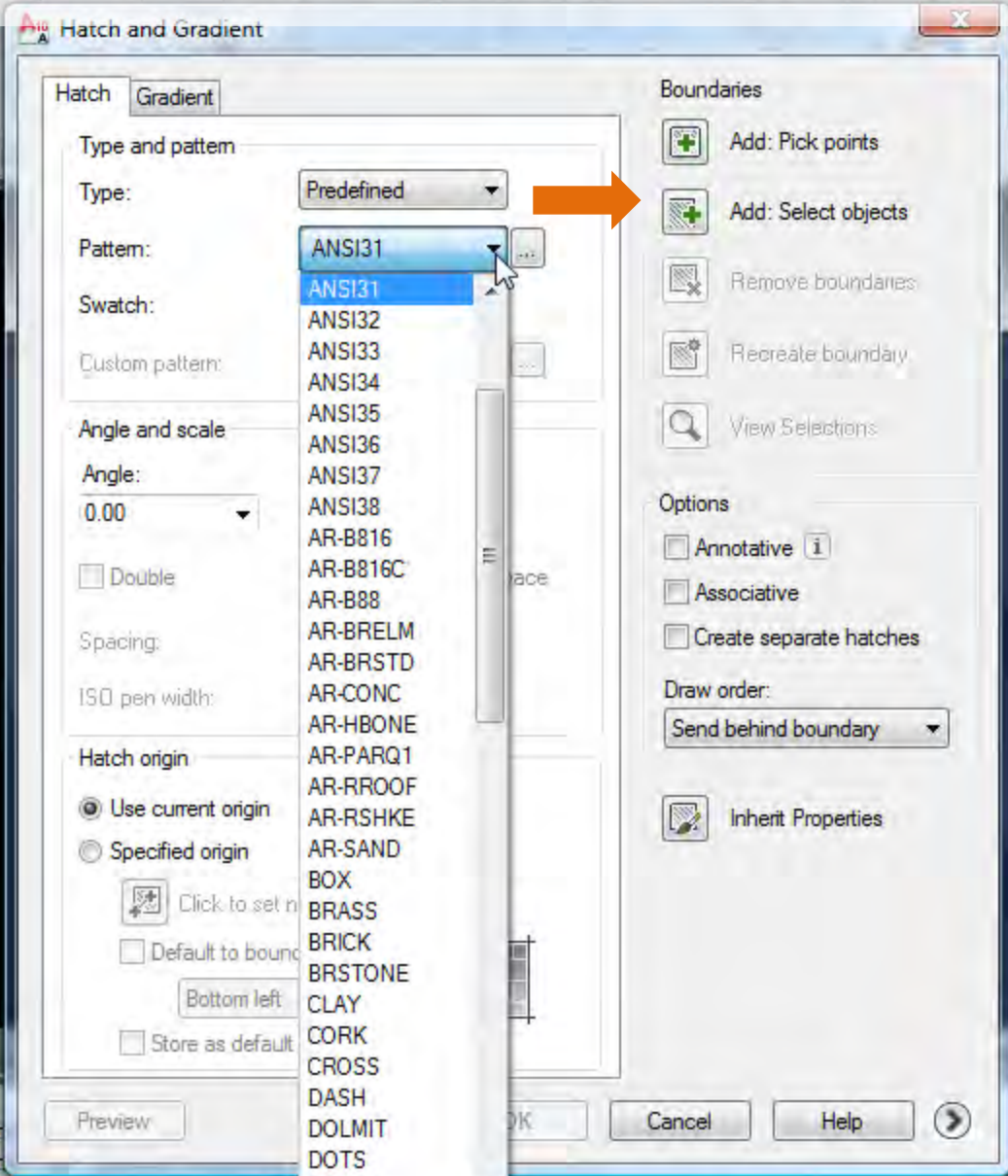
Select the polyline (or other geometric object) and type **EXPLODE** to turn it into individual line segments.

Properties

Command: *Cancel*
Command: 1 LINE Specify first point:
Specify next point or [Undo]: per
to
943'-2 1/4", 577'-7 5/8", 0'-0"

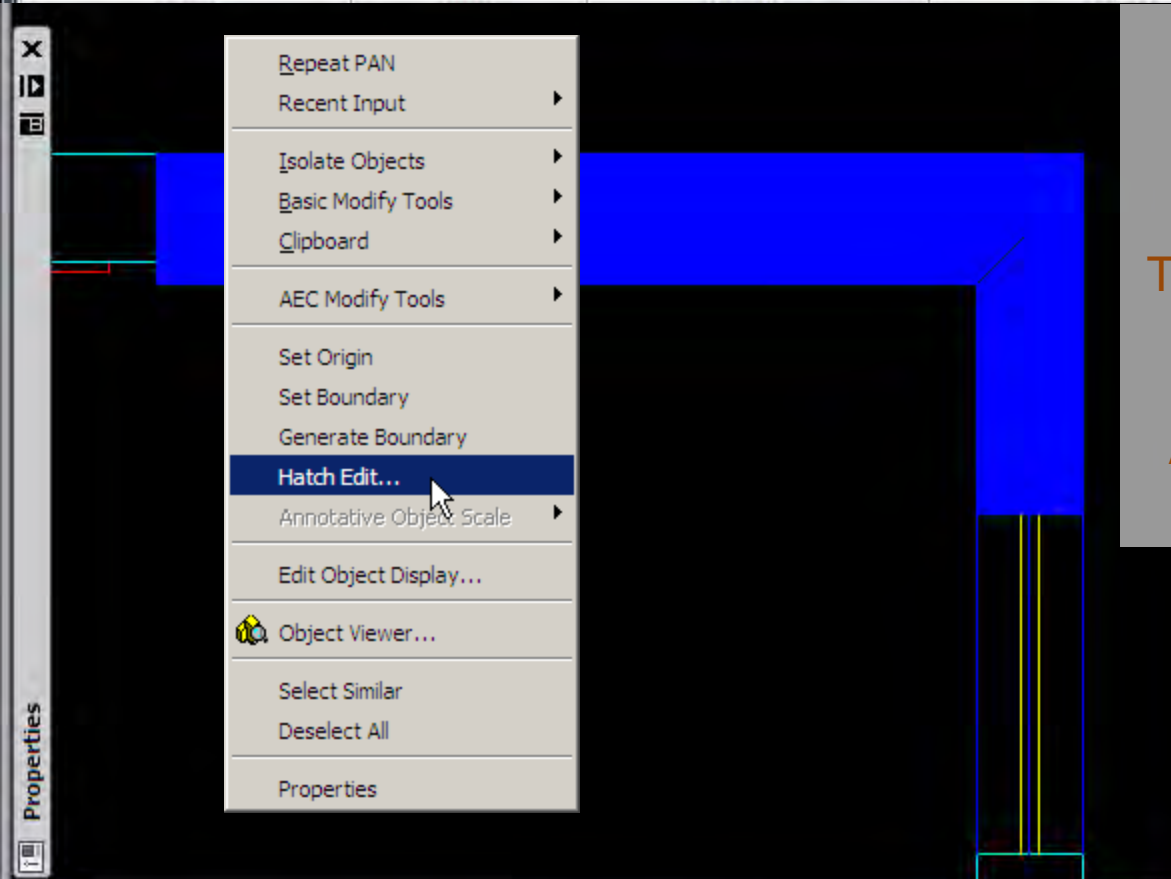
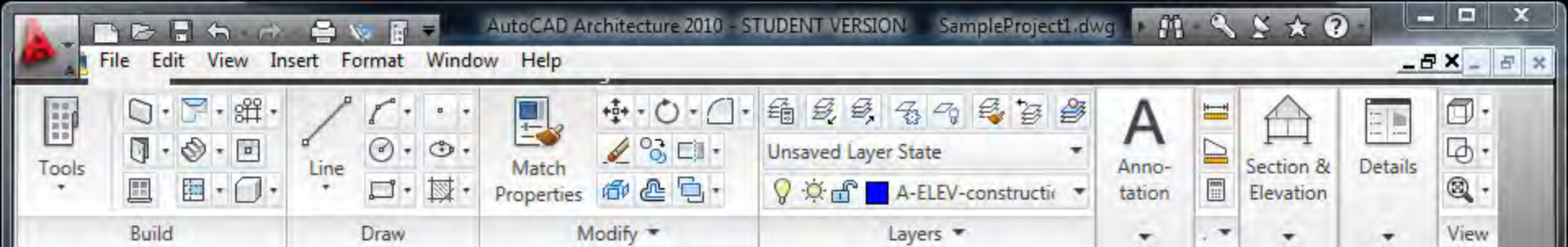
HATCH

To add hatch, type **BH**, spacebar. Select a pattern from the pull-down menu. Click **Add: Select Objects**. You'll be brought to your drawing to choose objects to hatch. When done, **right-click**, **Enter**. Click **OK**.

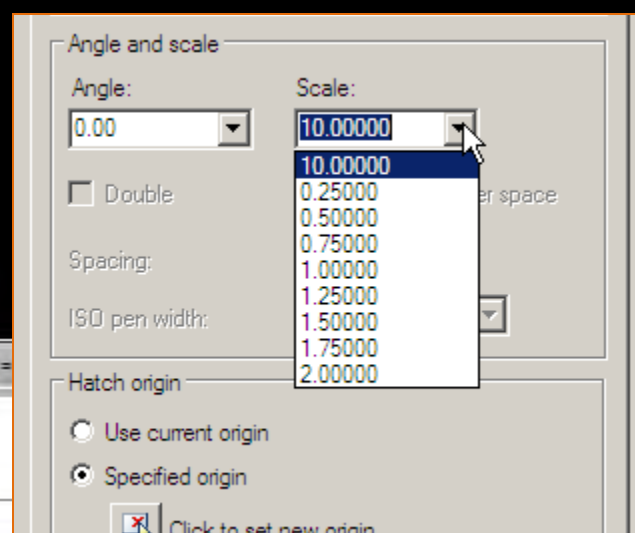


Hatch may only be added to areas with closed boundaries (geometric shapes, polylines).

Command: rec RECTANG
Specify first corner point
Specify other corner point
Command: bh



Your hatch might be too dense. This will make AutoCAD run slowly is generally undesirable. To adjust it, select the hatch area, right click, select **Hatch Edit**. Adjust the Scale from within the window that appears.



Command: Specify opposite corner: *Cancel*
Command: p PAN
Press ESC or ENTER to exit, or right-click to display shortcut menu.

Press pick button and drag to pan:

PATTERNS

When is it appropriate to use patterns in a drawing?

Very, very, *very* rarely for the same reasons we don't use green grass and lifelike trees in architectural models.

Patterns often distract from overall design ideas and prevent the ability to customize the overall layout of the elements.

For your drawings, you may only use hatch patterns in a limited manner, in a very light lineweight.

