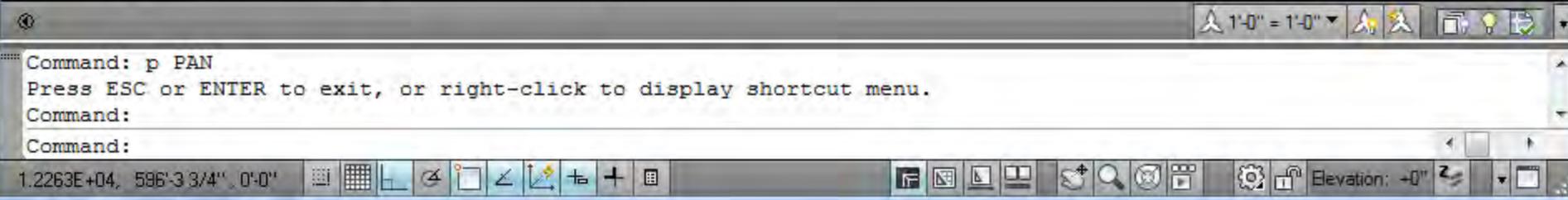
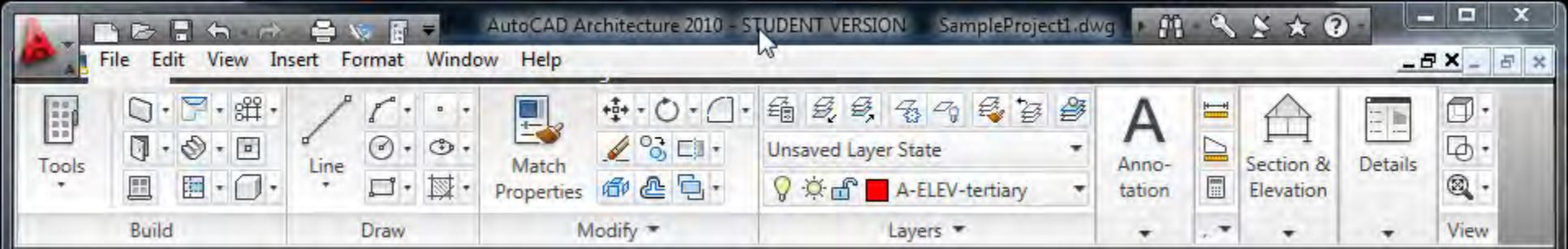


Line	
General	
Color	ByLayer
Layer	A-ELEV-primary
Linetype	Continuous
Linetype scale	1.0000
Plot style	ByColor
Lineweight	1.00 mm
Hyperlink	0.80 mm
Thickness	0.90 mm
3D Visualization	
Material	1.06 mm
	1.20 mm
	1.40 mm
Geometry	
Start X	1.58 mm
Start Y	2.00 mm
Start Z	2.11 mm
End X	1045'-8 3/8"
End Y	583'-11 1/8"
End Z	0"
Delta X	19'-9 1/8"
Delta Y	0"
Delta Z	0"

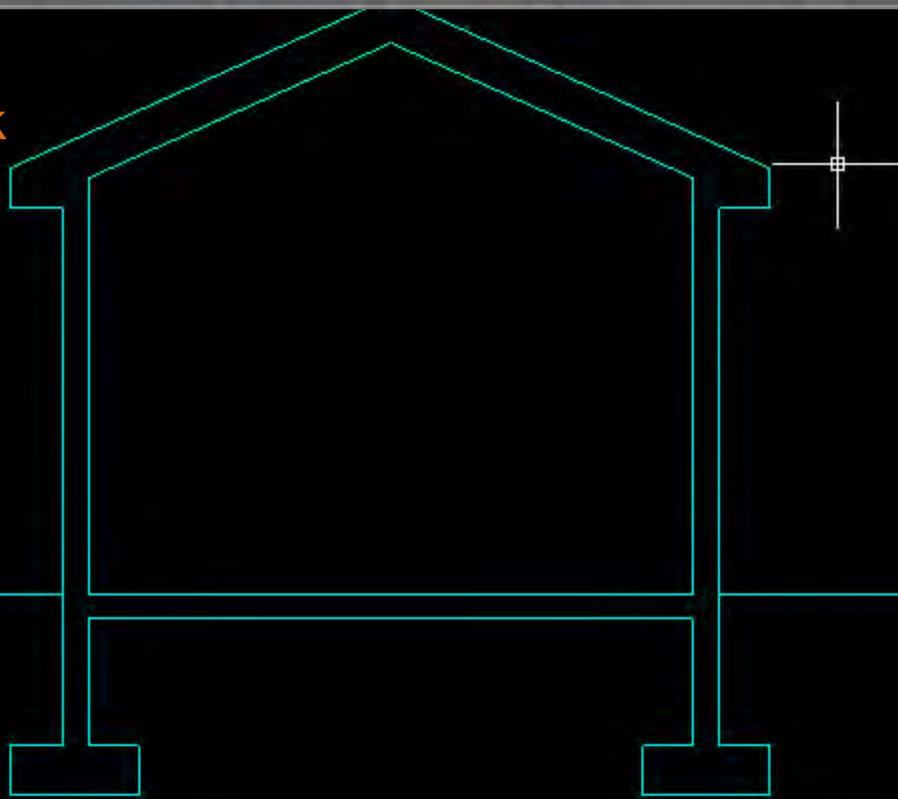
Despite having set line weights up in a drawing, it is often necessary to add individual lines of different weights – for example, ground lines in *sections and elevations* must be a thicker line weight than all other lines.

Use the properties window on individual lines to accomplish this change.





When drafting in AutoCAD, we work with Plotstyles to keep our linework consistent. However, sometimes it's necessary to create individual thicker lines for specific elements like ground lines.



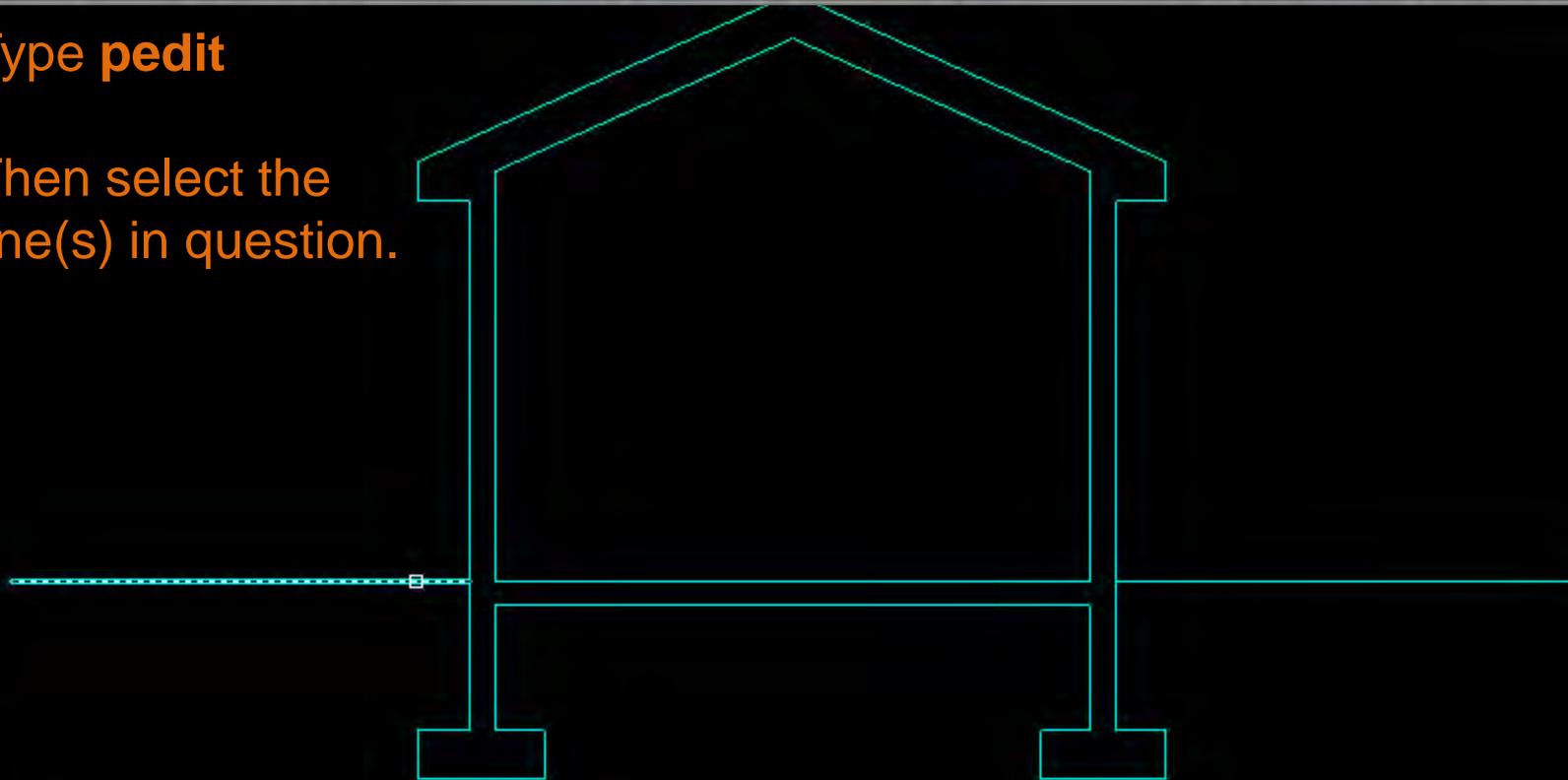
We can accomplish this by turning the line(s) in question into polylines through the following process...





Type **pedit**

Then select the
line(s) in question.



Properties

1:1 Medium Detail Cut Plane: 3'-6"

Command: *Cancel*

Command: *Cancel*

Command: Pedit

Select polyline or [Multiple]:

1.9213E+04, 712'-1 3/8", 0'-0"

Elevation: +0"

Type Y to turn the selection into a polyline

```
Select objects: 1 found  
Select objects: 1 found, 2 total  
Select objects:
```

```
Convert Lines and Arcs to polylines [Yes/No]? <Y> y
```

Then type W to adjust the line thickness

```
Select objects: 1 found, 2 total  
Select objects:  
Convert Lines and Arcs to polylines [Yes/No]? <Y> y
```

```
Enter an option [Close/Open/Join/Width/Fit/Spline/Decurve/Ltype gen/Undo]: w
```

Enter a numerical value (in mm) for the polyline thickness

```
Select objects:  
Convert Lines and Arcs to polylines [Yes/No]? <Y> y  
Enter an option [Close/Open/Join/Width/Fit/Spline/Decurve/Ltype gen/Undo]: w  
Specify new width for all segments: .5
```

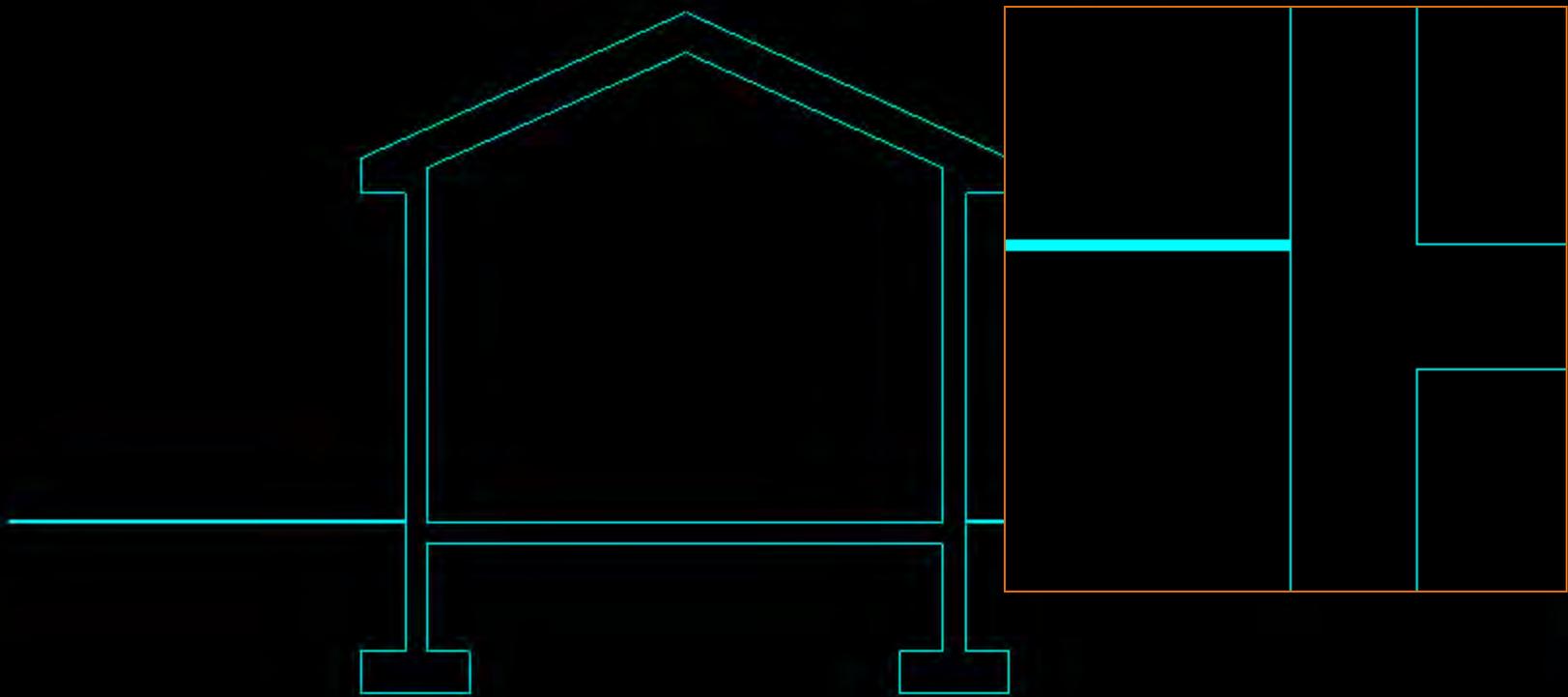
AutoCAD Architecture 2010 - STUDENT VERSION SampleProject1.dwg

File Edit View Insert Format Window Help

Tools Build Draw Modify Layers Annotation Section & Elevation Details View

Line Match Properties

Unsaved Layer State A-ELEV-tertiary



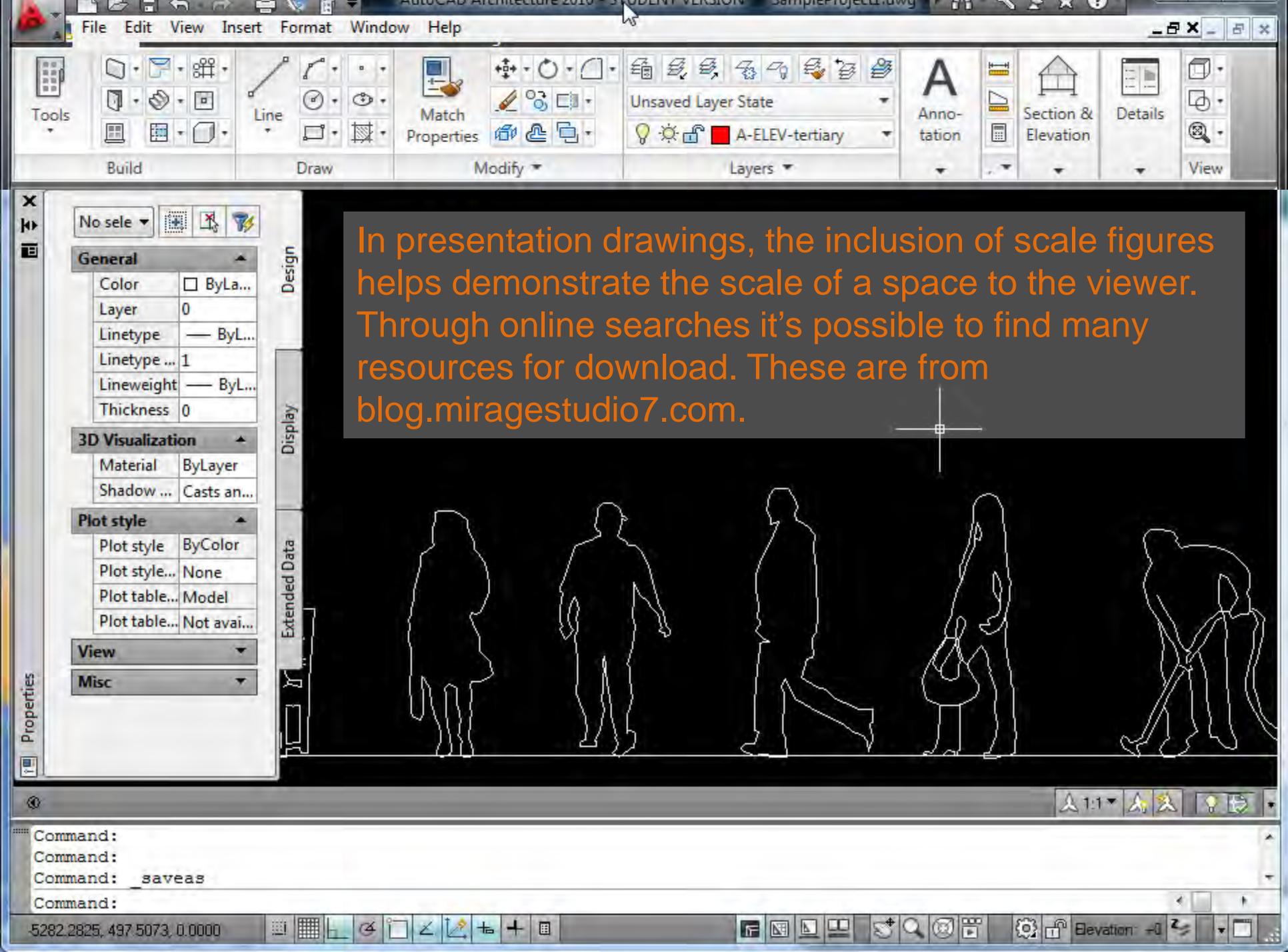
Press Enter to end the command. Zoom in to view results.

Properties

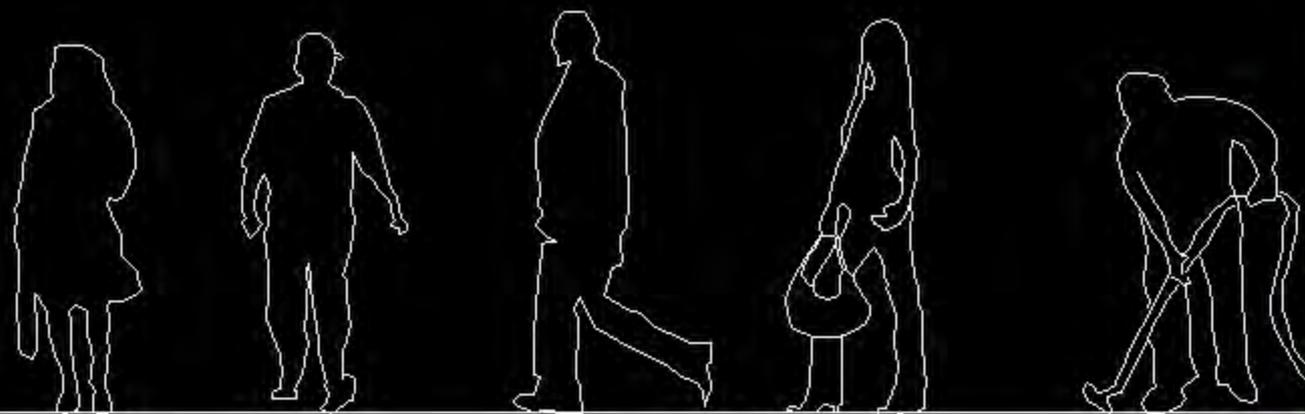
1:1 Medium Detail Cut Plane: 3'-6"

Enter an option [Close/Open/Join/Width/Fit/Spline/Decurve/Ltype gen/Undo]:
Command: p PAN
Press ESC or ENTER to exit, or right-click to display shortcut menu.

Press pick button and drag to pan.



In presentation drawings, the inclusion of scale figures helps demonstrate the scale of a space to the viewer. Through online searches it's possible to find many resources for download. These are from blog.miragestudio7.com.

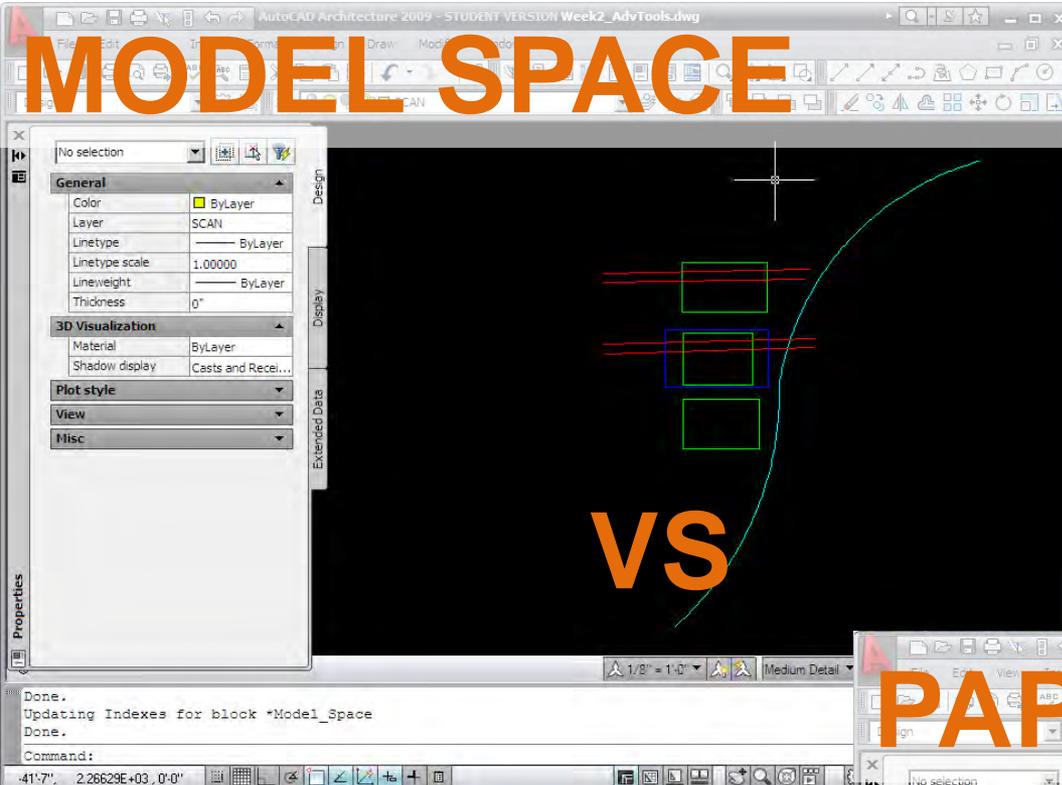


Command:
Command:
Command: _saveas
Command:

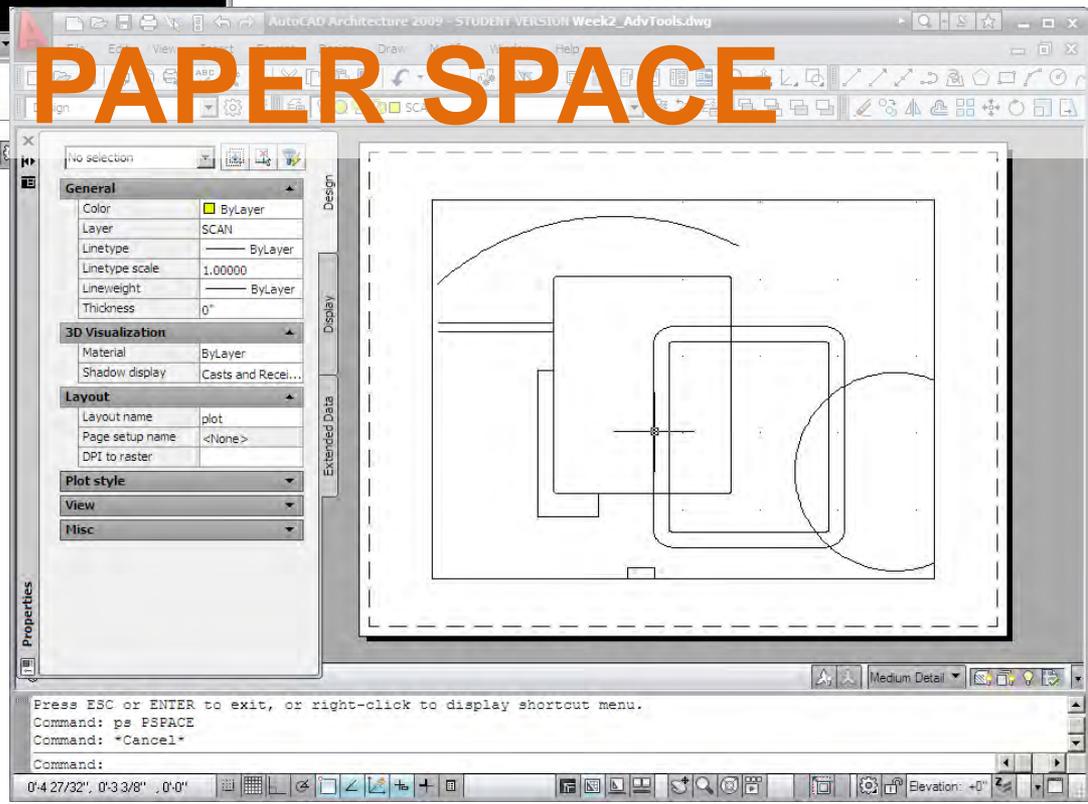
5282.2825, 497.5073, 0.0000

1:1

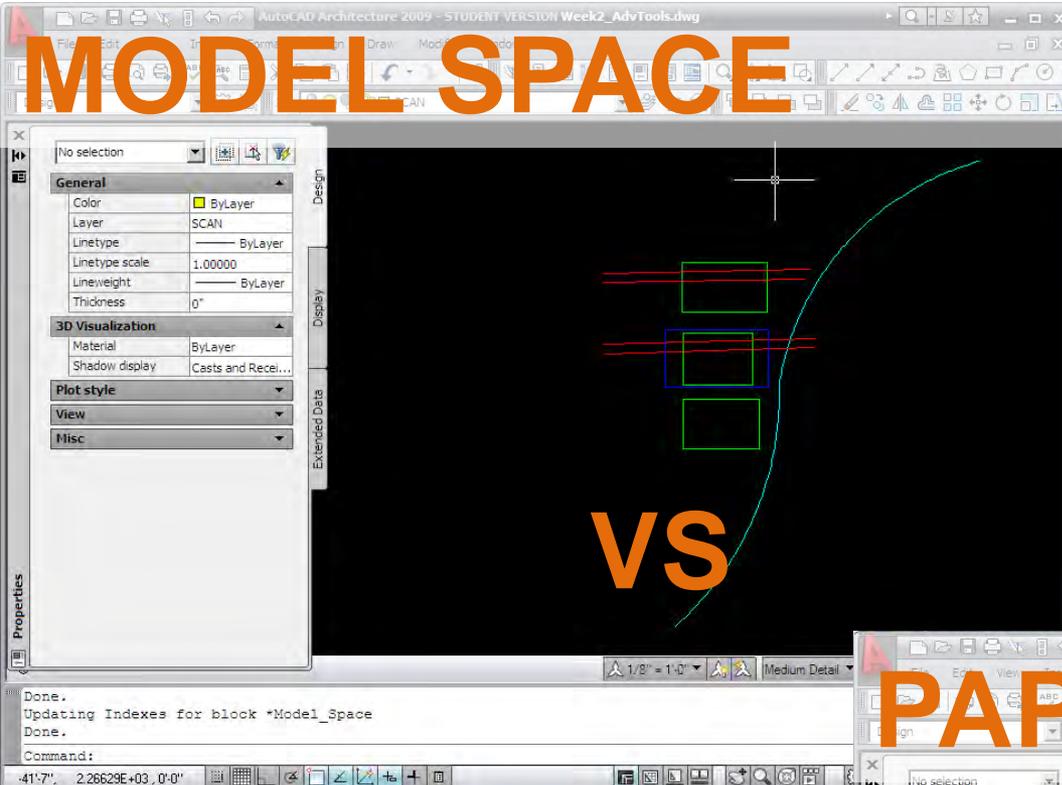
Elevation: +0



The *annotation* of all drawings is to be completed in **Paper Space**.

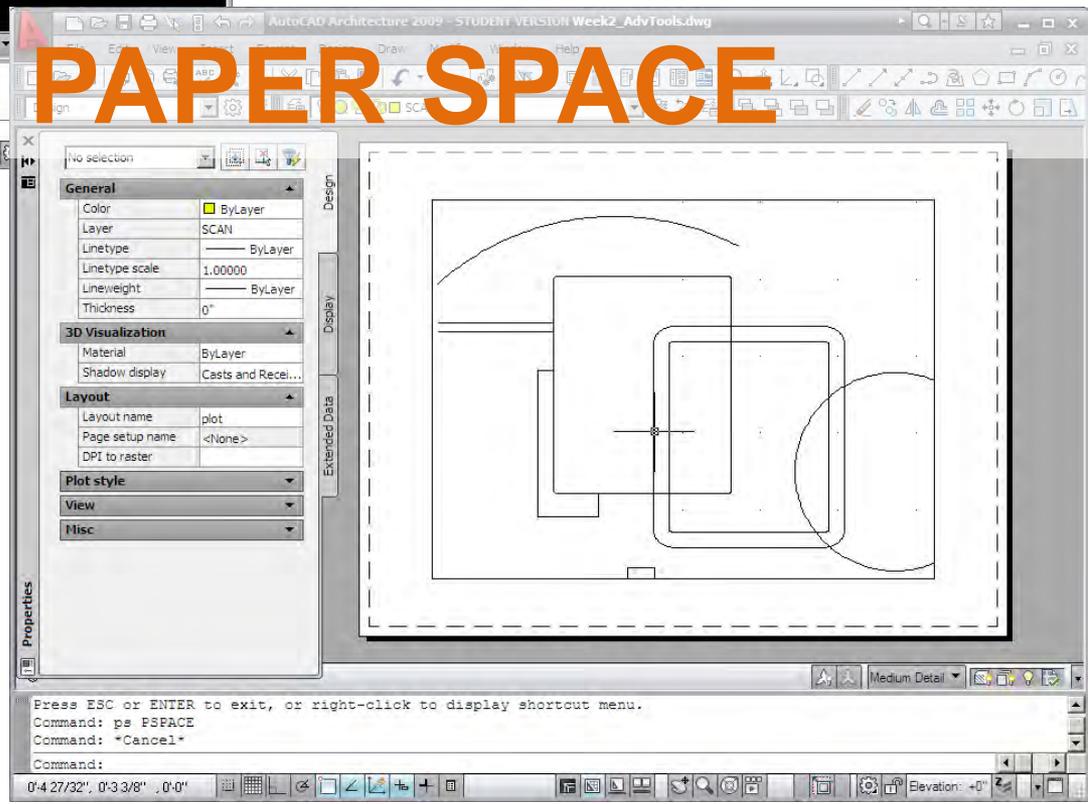


Why?

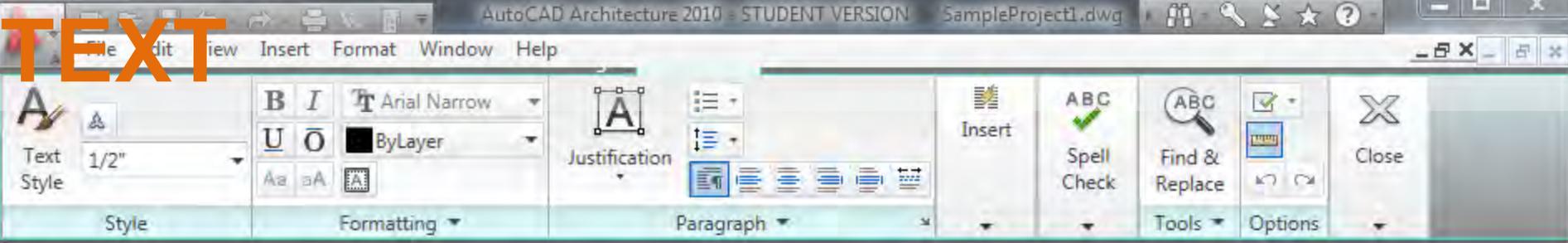


In **Model Space**, everything is drawn at 1:1 (full) scale.

However, we need to be able to plot drawings at a wide range of scales while maintaining a consistent appearance of line weights, text, symbols and other drawing elements.

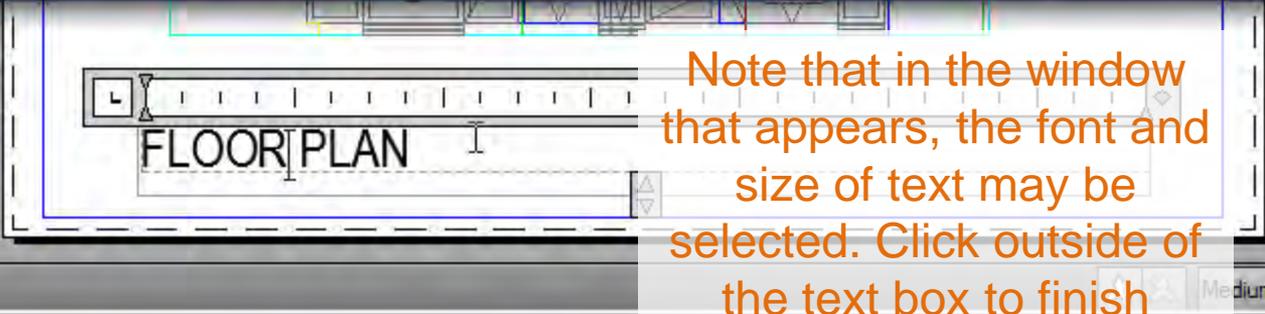
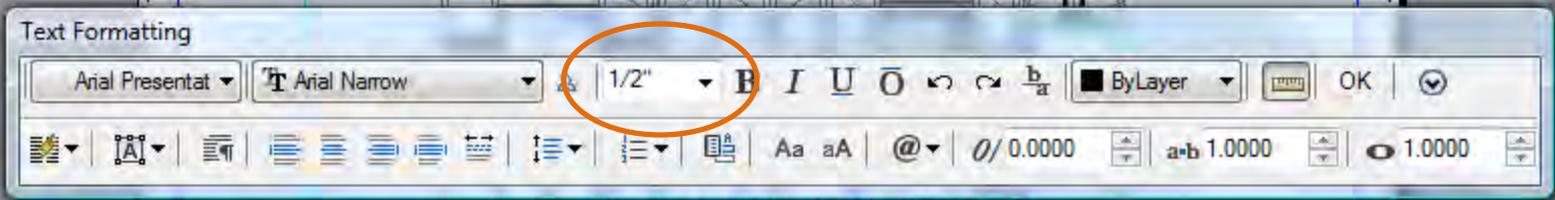


TEXT



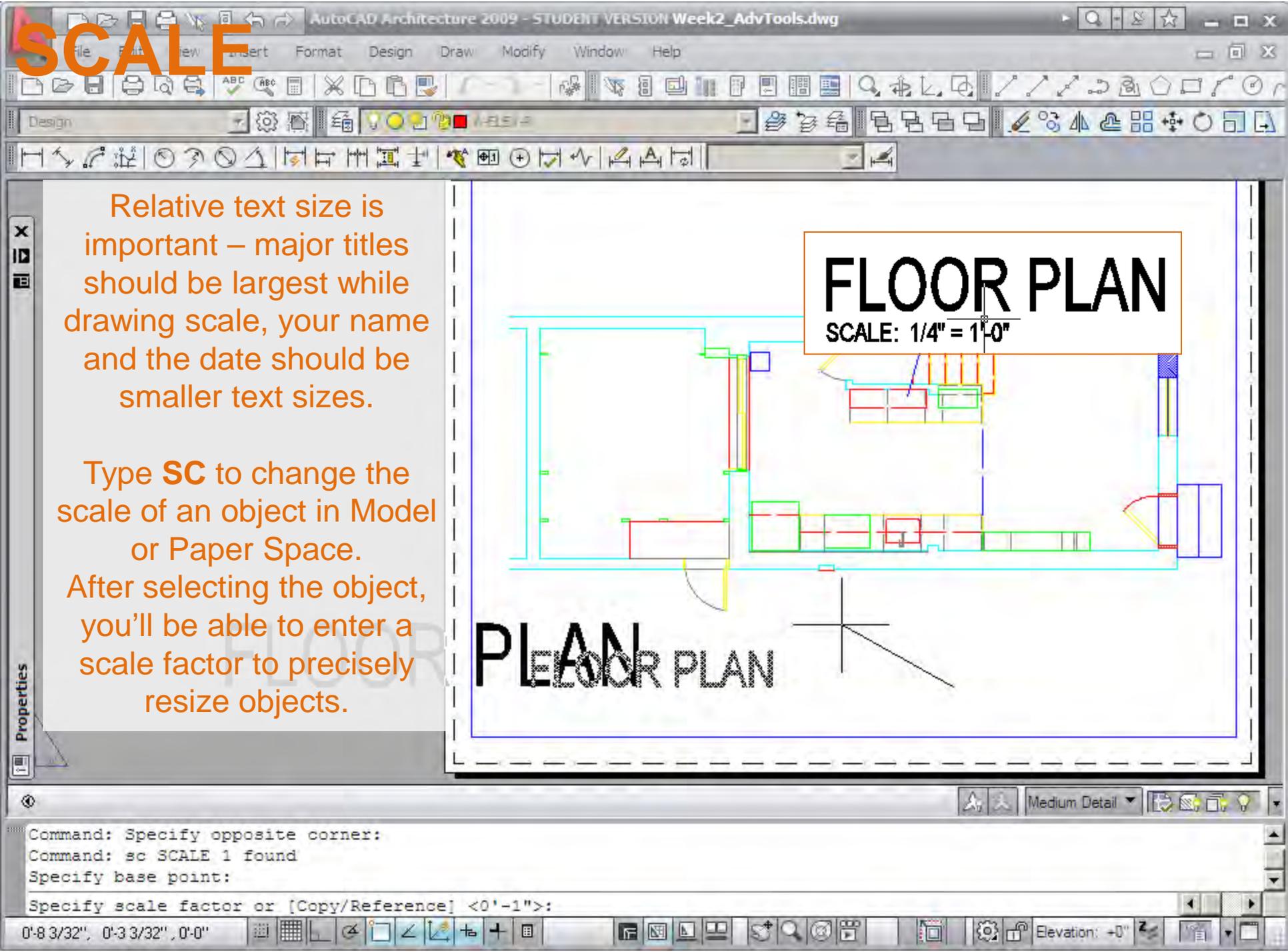
To create text, type **MTEXT**, spacebar. To edit text you've already created, double-click it in the drawing.

Use sans serif fonts in architectural drawings. Develop a strategy for the relative size of text: title, your name, the date, drawing scale, etc.



Note that in the window that appears, the font and size of text may be selected. Click outside of the text box to finish editing the text.

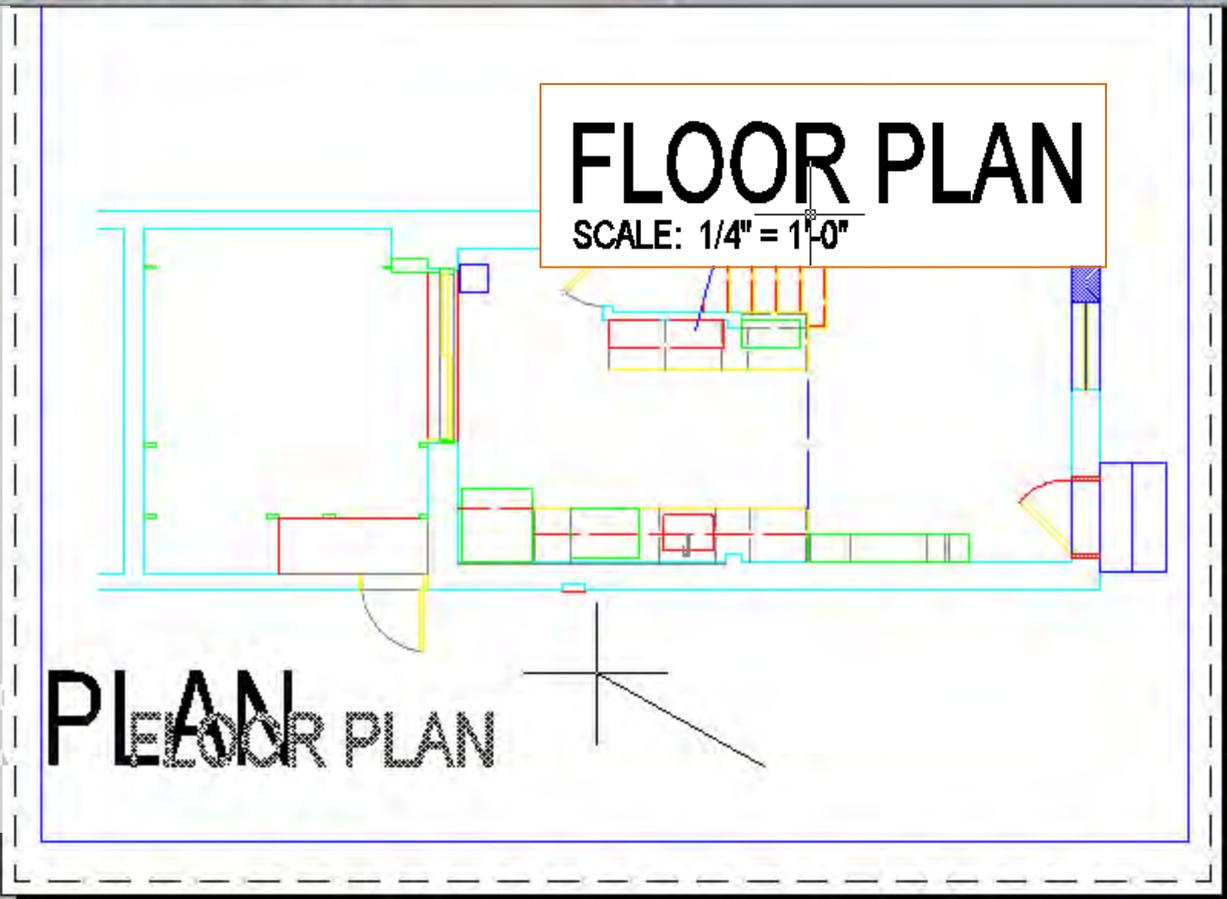




SCALE

Relative text size is important – major titles should be largest while drawing scale, your name and the date should be smaller text sizes.

Type **SC** to change the scale of an object in Model or Paper Space. After selecting the object, you'll be able to enter a scale factor to precisely resize objects.

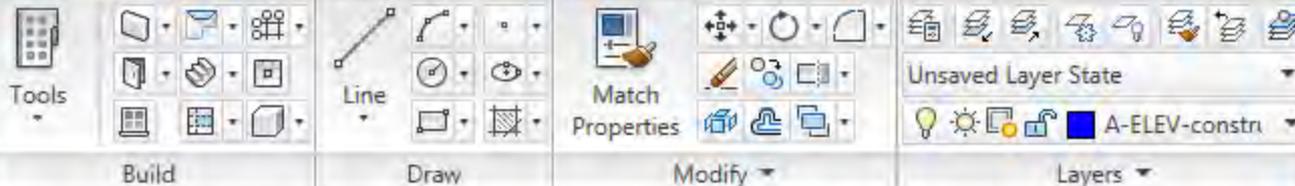


Command: Specify opposite corner:
Command: sc SCALE 1 found
Specify base point:
Specify scale factor or [Copy/Reference] <0'-1">:

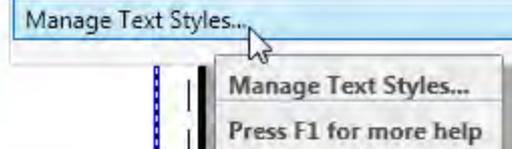
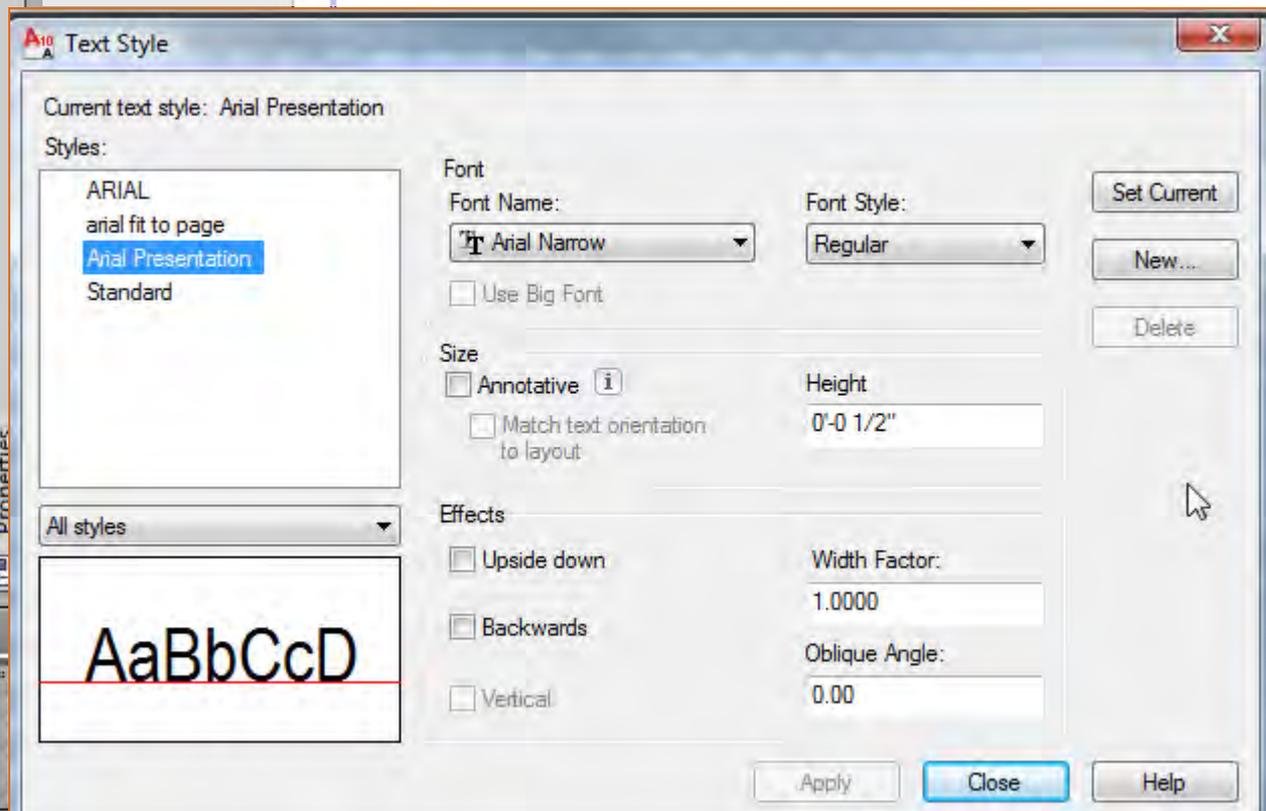
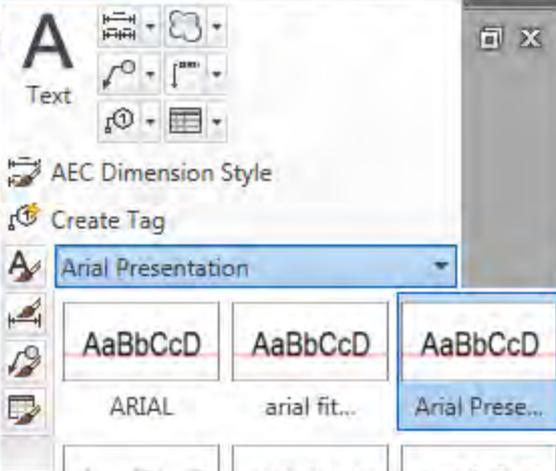
0'-8 3/32", 0'-3 3/32", 0'-0"

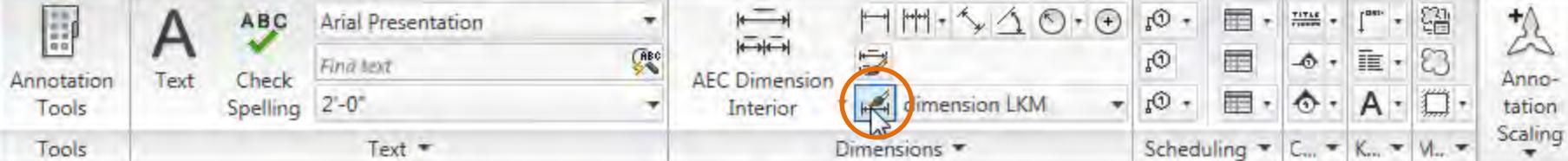
Elevation: +0'

Home Insert Annotate Render View Manage

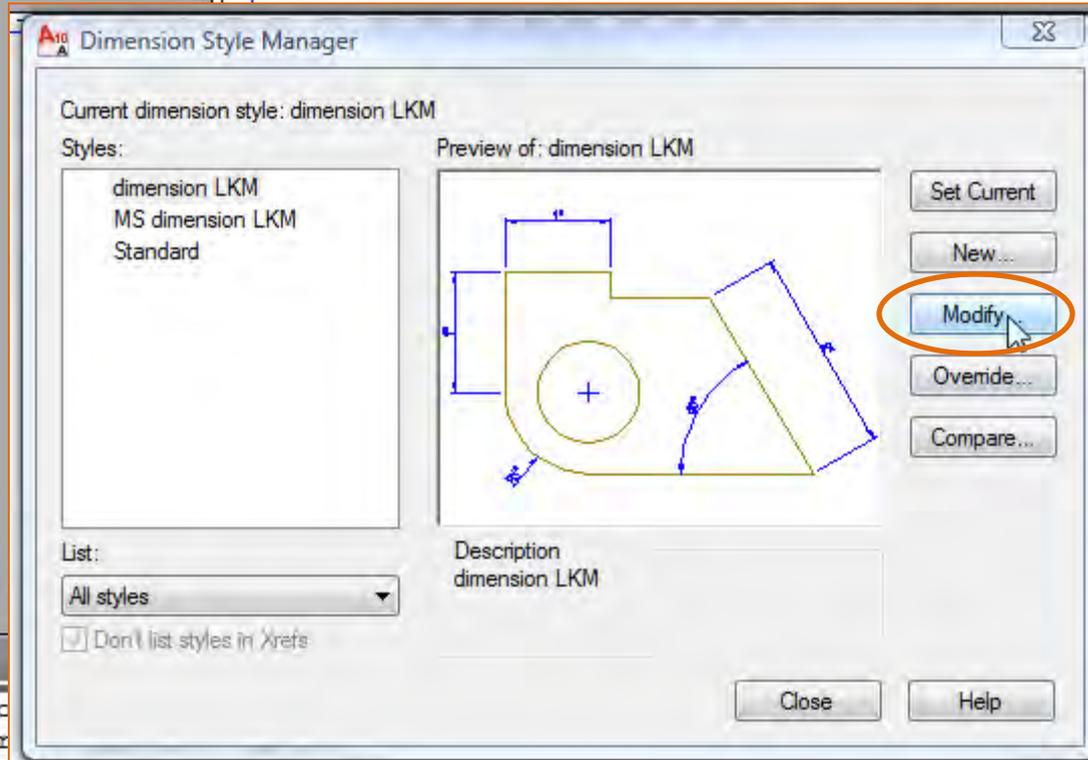


Annotative text styles can be preset: Home tab >
 Annotation > Manage Text Styles
 Keep in mind that the text is placed in paperspace, so
 its height is relative to the page size.

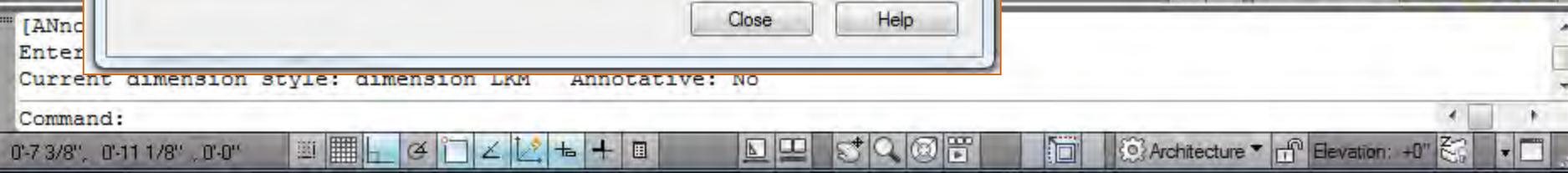




Dimensions also must be added to your drawings. To adjust these settings, go to the Annotate tab > Dimensions > Dimension Style to make adjustments.



Select New or Modify (if you are using the Sample Project file).



DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines | Symbols and Arrows | Text | Fit | Primary Units | Alternate Units | Tolerances

Dimension lines

Color:

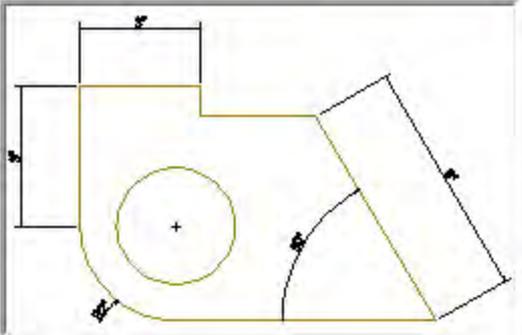
Linetype:

Lineweight:

Extend beyond ticks: 0"

Baseline spacing: 1/8"

Suppress: Dim line 1 Dim line 2



Extension lines

Color:

Linetype ext line 1:

Linetype ext line 2:

Lineweight:

Suppress: Ext line 1 Ext line 2

Extend beyond dim lines: 1/8"

Offset from origin: 1/8"

Fixed length extension lines

Length: 1"

OK Cancel Help

Current dimension style
Command: '_dimstyle
Command: '_dimstyle
Command:

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines Symbols and Arrows **Text** Fit Primary Units Alternate Units Tolerances

Arrowheads

First: Closed filled

Second: Closed filled

Leader: Closed filled

Arrow size: 0'-0 3/32"

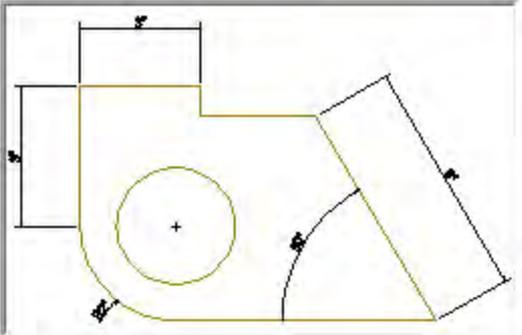
Center marks

None Mark Line

0'-0 3/32"

Dimension Break

Break size: 1/8"



Arc length symbol

Preceding dimension text
 Above dimension text
 None

Radius jog dimension

Jog angle: 45.00

Linear jog dimension

Jog height factor: 1 1/2" * Text height

OK Cancel Help

Current dimension style
Command: '_dimstyle
Command: '_dimstyle
Command:

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines | Symbols and Arrows | **Text** | Fit | Primary Units | Alternate Units | Tolerances

Text appearance

Text style: Arial dimension

Text color: ByLayer

Fill color: None

Text height: 1/4"

Fraction height scale: 1.0000

Draw frame around text

Text placement

Vertical: Above

Horizontal: Centered

View Direction: Left-to-Right

Offset from dim line: -0 1/32"

Text alignment

Horizontal

Aligned with dimension line

ISO standard

OK Cancel Help

```
Current dimension style is 'ASAP'
Command: '_dimstyle'
Command: '_dimstyle'
Command:
```

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines | Symbols and Arrows | **Text** | Fit | Primary Units | Alternate Units | Tolerances

Text Style

Current text style: Arial dimension

Styles:

- ARIAL
- Arial dimension**
- arial fit to page
- Arial Presentation
- Standard

All styles

AaBbCcD

Font

Font Name: Arial Narrow

Font Style: Regular

Use Big Font

Size

Annotative

Height: 0'-0 1/8"

Match text orientation to layout

Effects

Upside down

Width Factor: 1.0000

Backwards

Oblique Angle: 0.00

Vertical

Buttons: Apply, Cancel, Help

Dimension text = 22'-
Command:
Command: e ERASE 1 found
Command:

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines Symbols and Arrows Text **Fit** Primary Units Alternate Units Tolerances

Fit options

If there isn't enough room to place both text and arrows inside extension lines, the first thing to move outside the extension lines is:

- Either text or arrows (best fit)
- Arrows
- Text
- Both text and arrows
- Always keep text between ext lines
- Suppress arrows if they don't fit inside extension lines

Text placement

When text is not in the default position, place it:

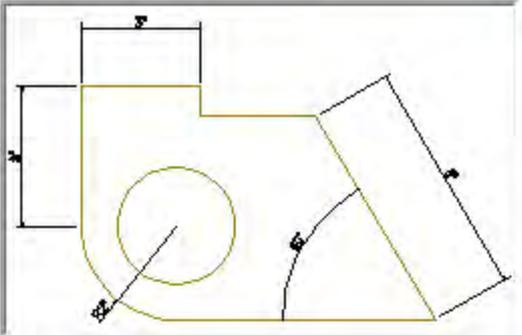
- Beside the dimension line
- Over dimension line, with leader
- Over dimension line, without leader

Scale for dimension features

- Annotative *i*
- Scale dimensions to layout
- Use overall scale of:

Fine tuning

- Place text manually
- Draw dim line between ext lines



OK Cancel Help

Current dimension style
Command: '_dimstyle'
Command: '_dimstyle'
Command:

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines | Symbols and Arrows | Text | Fit | Primary Units | Alternate Units | Tolerances

Linear dimensions

Unit format: Architectural

Precision: 0'-0 1/16"

Fraction format: Not Stacked

Decimal separator: '(Period)

Round off: 0"

Prefix:

Suffix:

Measurement scale

Scale factor: 1.0000

Apply to layout dimensions only

Zero suppression

Leading Trailing

Sub-units factor: 8'-4"

0 feet 0 inches

Sub-unit suffix:

Angular dimensions

Units format: Decimal Degrees

Precision: 0

Zero suppression

Leading Trailing

OK Cancel Help

Current dimension style
Command: '_dimstyle
Command: '_dimstyle
Command:

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines | Symbols and Arrows | Text | Fit | Primary Units | **Alternate Units** | Tolerances

Display alternate units

Alternate units

Unit format: Decimal

Precision: 0.00

Multiplier for alt units: 25.4000

Round distances to: 0"

Prefix:

Suffix:

Zero suppression

Leading Trailing

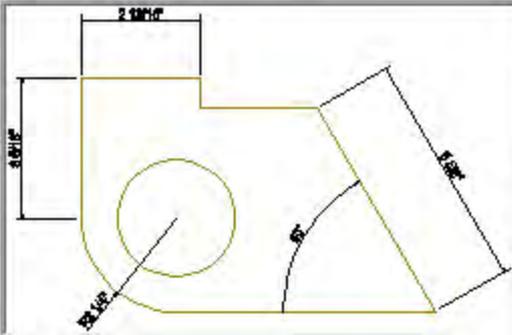
Sub-units factor: 8'-4" 0 feet 0 inches

Sub-units suffix:

Placement

After primary value

Below primary value



OK Cancel Help

Current dimension style
Command: '_dimstyle
Command: '_dimstyle
Command:

DIMENSION STYLE SETTINGS

Modify Dimension Style: dimension LKM

Lines | Symbols and Arrows | Text | Fit | Primary Units | Alternate Units | Tolerances

Tolerance format

Method:

Precision:

Upper value:

Lower value:

Scaling for height:

Vertical position:

Tolerance alignment

Align decimal separators

Align operational symbols

Zero suppression

Leading 0 feet

Trailing 0 inches

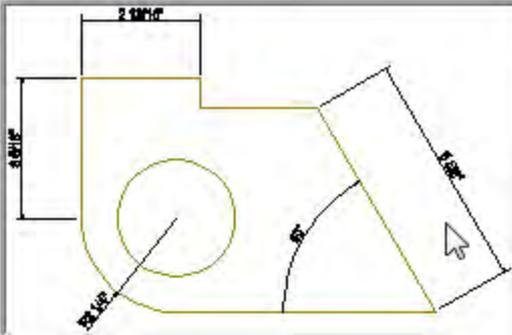
Alternate unit tolerance

Precision:

Zero suppression

Leading 0 feet

Trailing 0 inches



The diagram shows a mechanical part with several dimensions and tolerance annotations. A horizontal dimension of 2.5000" is shown at the top. A vertical dimension of 3.8000" is shown on the left. A diagonal dimension of 0.5000" is shown on the right. A circular feature is dimensioned with a diameter of 2.5000". A tolerance of ±0.0000" is shown for a specific feature. A mouse cursor is visible over the diagram.

Current dimension style
Command: '_dimstyle'
Command: '_dimstyle'
Command:

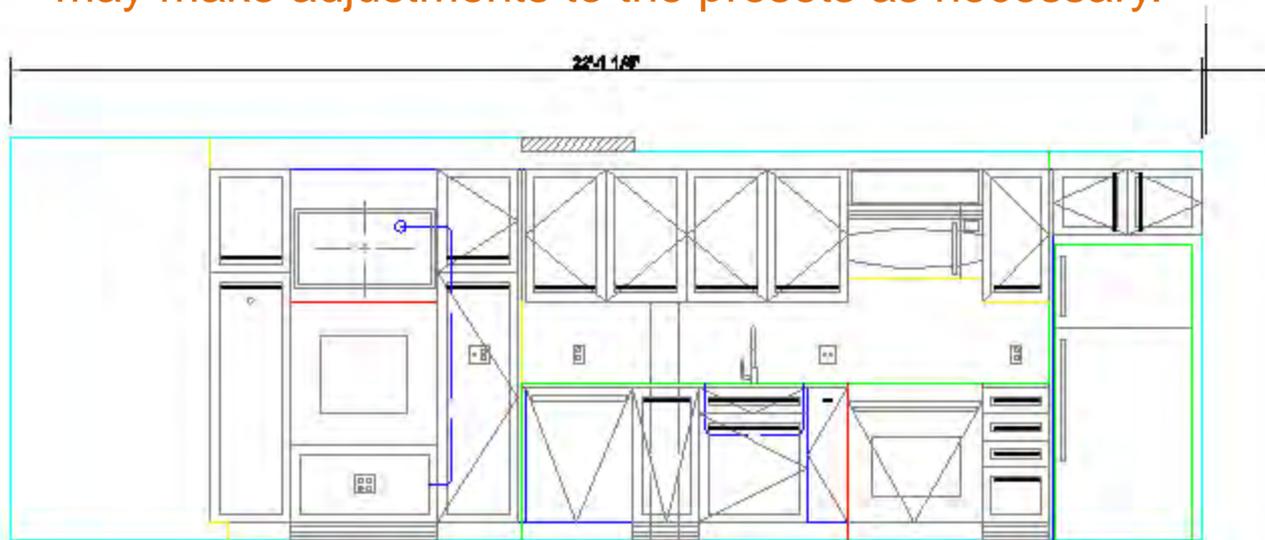
Annotation Tools: Text, Check Spelling, Arial dimension, Final text, 2'-0"

Dimensions: AEC Dimension Interior, dimension LKM

Scheduling, C..., K..., V...

Annotation Scaling

Type **dimlin** to add dimensions to your drawing. You may make adjustments to the presets as necessary.



Specify first extension line origin or <select object>:
Specify second extension line origin:
Specify dimension line location or

[Mtext/Text/Angle/Horizontal/Vertical/Rotated]:

1'-1 1/16", 0'-7 1/16", 0'-0"

Architecture

Elevation: +0'

File Edit View Insert Format Window Help

Annotation Tools Text Check Spelling

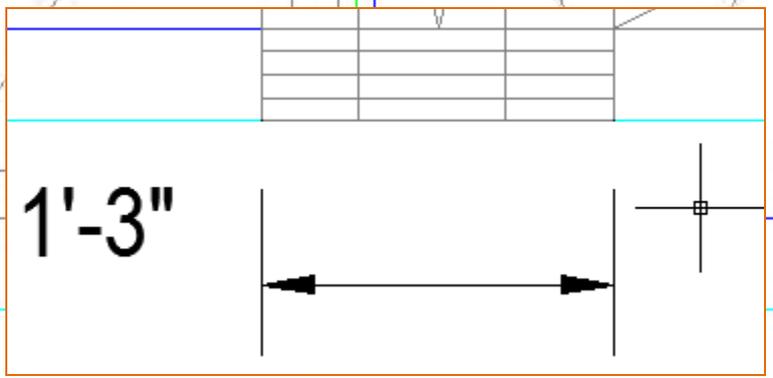
Arial dimension
Find text
2'-0"

AEC Dimension Interior dimension LK

Text Dimensions

- Repeat DIMLINEAR
- Recent Input
- Dim Text position**
 - Above dim line
 - Centered
 - Home text
 - Move text alone**
 - Move with leader
 - Move with dim line
- Precision
- Dim Style
- Flip Arrow
- Continue
- Oblique
- Update
- Reassociate
- Isolate Objects
- Basic Modify Tools
- Clipboard
- AEC Modify Tools
 - Annotative Object Scale
- Edit Object Display...
- Edit Dimension Style...
- Object Viewer...
- Select Similar
- Deselect All
- Properties

If the dimension text is too large to fit between the arrows, you may position it independently. After it's drawn, select the dimension and *right-click*. Then, select **Dim Text position > Move text alone**.



Properties

Medium Detail

[Mtext/Text/Angle/Horizontal/Vertical/Rotated]:
Dimension text = 1'-3"
Command:
Command:

Move dimension text alone

Home Insert Annotate Render View Manage

A

ABC

Arial dimension

Find text

AEC Dimension

Dimension LKM

Scheduling

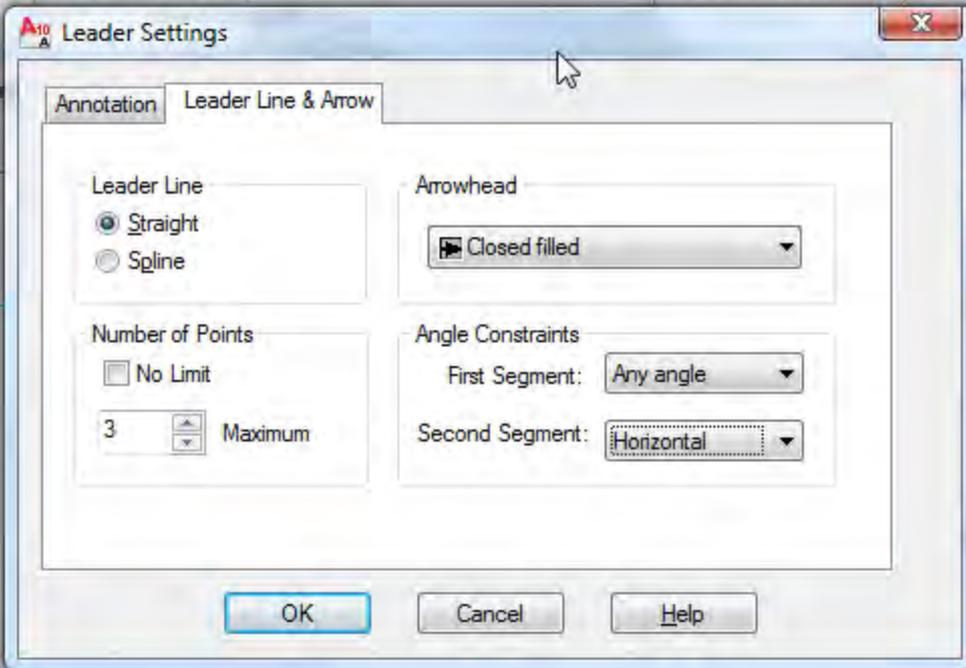
C...

K...

M...



Annotation Scaling



When moving text outside of dimension lines, use a leader to point to its original location: type **Qleader**, **Spacebar**. Type **S** to adjust the settings of the leader.

1'-3"

1'-3"

Command: *Cancel*

Command: *Cancel*

Command: qlleader

Specify first leader point, or [Settings] <Settings>: s

0'-8 1/8", 0'-2 1/8", 0'-0"

Architecture

Elevation: +0"

To setup a page for large format plotting, begin with **pagesetup**.

Page Setup - presentation

Page setup

Name: <None>

Printer/plotter

Name: **Adobe PDF** Properties

Plotter: Adobe PDF Converter - Windows System Driver - b...

Where: Documents*.pdf

Description:

Paper size: **ARCH D**

Plot area

What to plot: **Window** Window<

Plot offset (origin set to printable area)

X: 12.472377 inches Center the plot

Y: 7.775866 inches

Plot scale

Fit to paper

Scale: Custom

1 inches = 1 unit

Scale lineweights

Plot style table (pen assignments)

lkm.ctb

Display plot styles

Shaded viewport options

Shade plot: As displayed

Quality: Normal

DPI: 300

Plot options

Plot object lineweights

Plot with plot styles

Plot paperspace last

Hide paperspace objects

Drawing orientation

Portrait

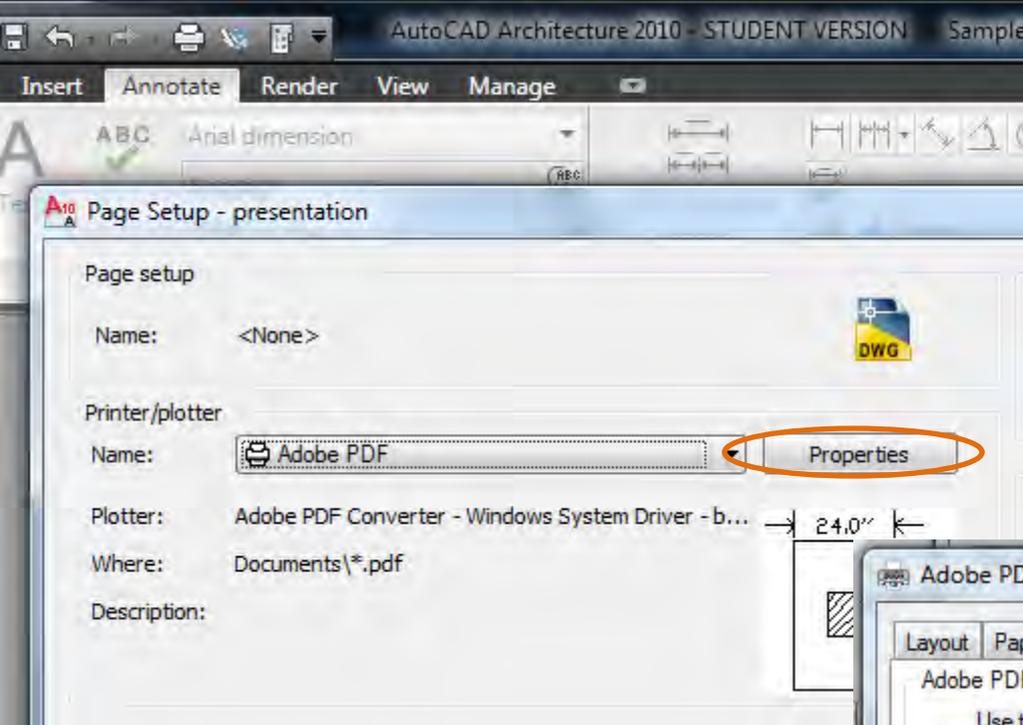
Landscape

Plot upside-down

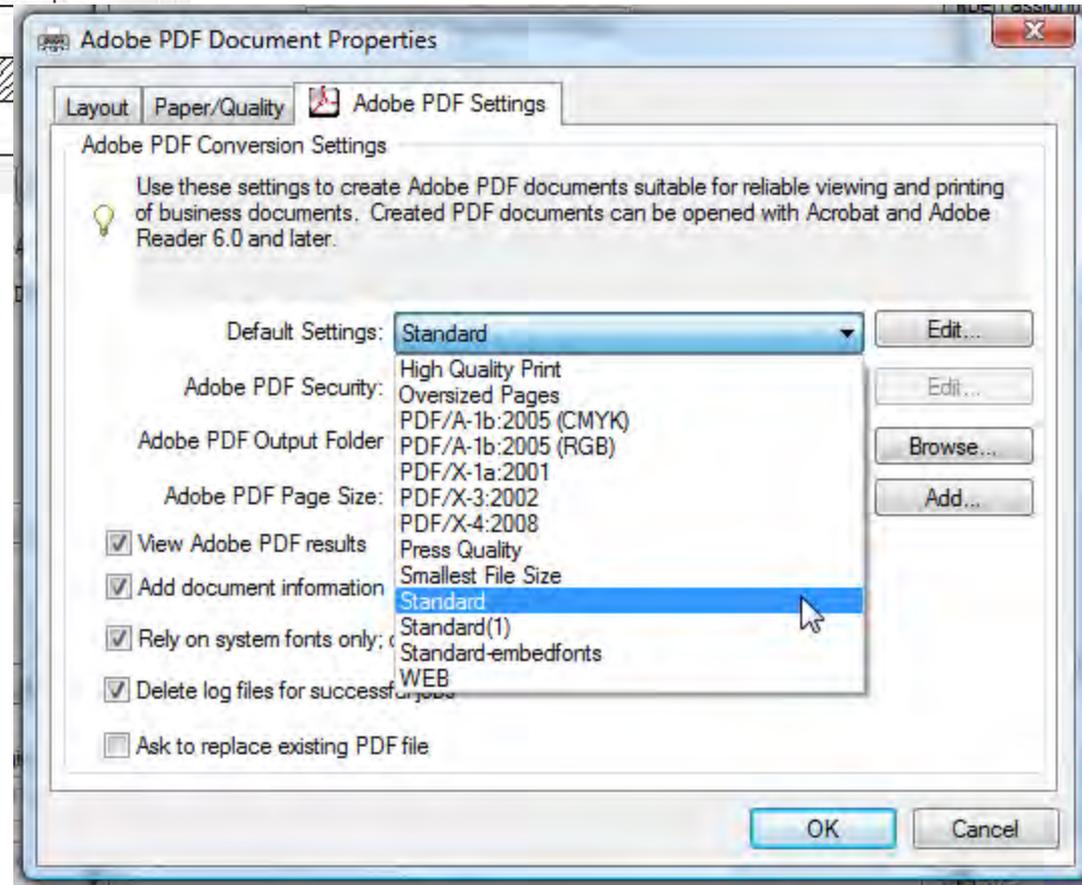
Preview... OK Cancel Help

ARCH D is a 24" x 36" page

Command: *Ca
Command: *Ca
Command: pagesetup

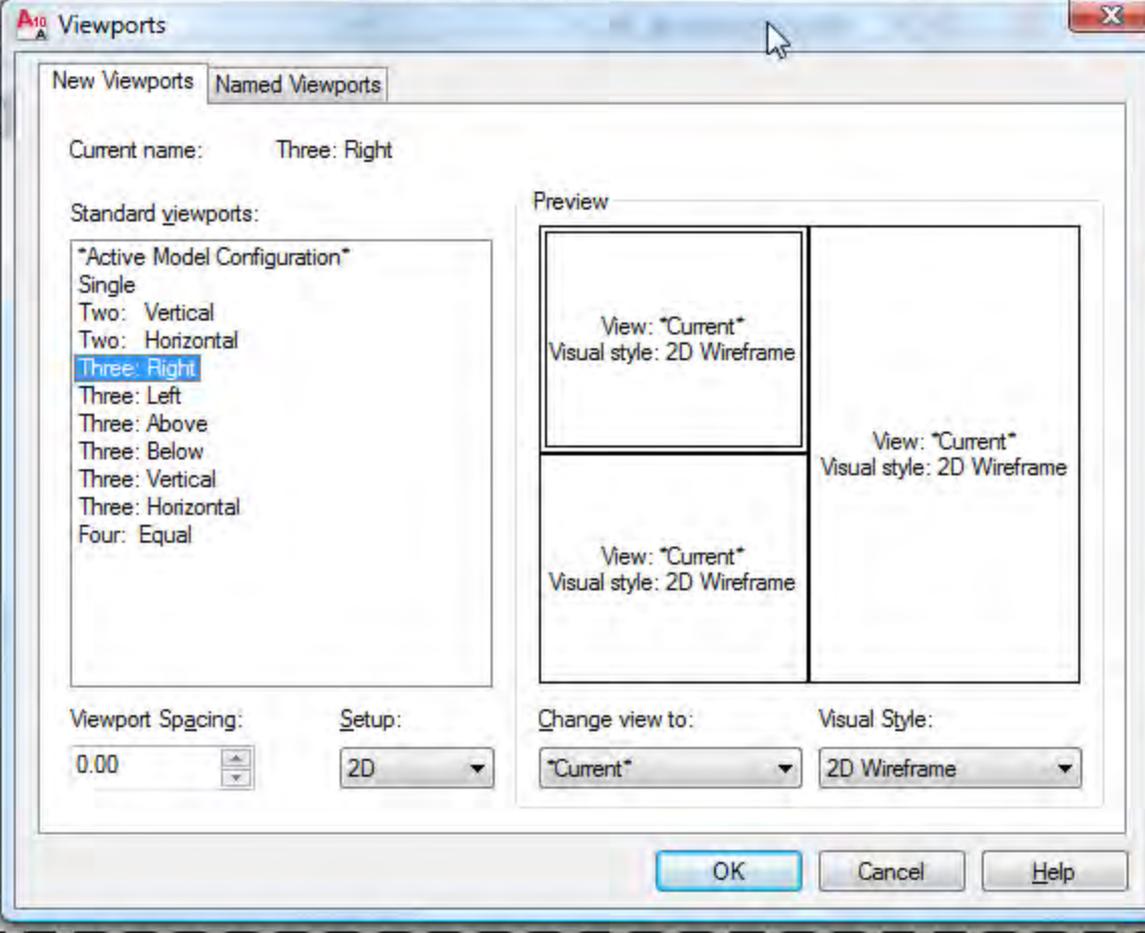


If your prints are not of high enough quality, check the Properties for your plot settings



Select Standard or High Quality Print from the options.

Home Insert Annotate Render View Manage



Note that in the **vports** window, viewport boundaries can be configured for specific presentation layouts.

Command: *Cancel*
Command: pagesetup
Command: pagesetup
Command: vports

0'-0 5/16", 0'-10 1/16", 0'-0"

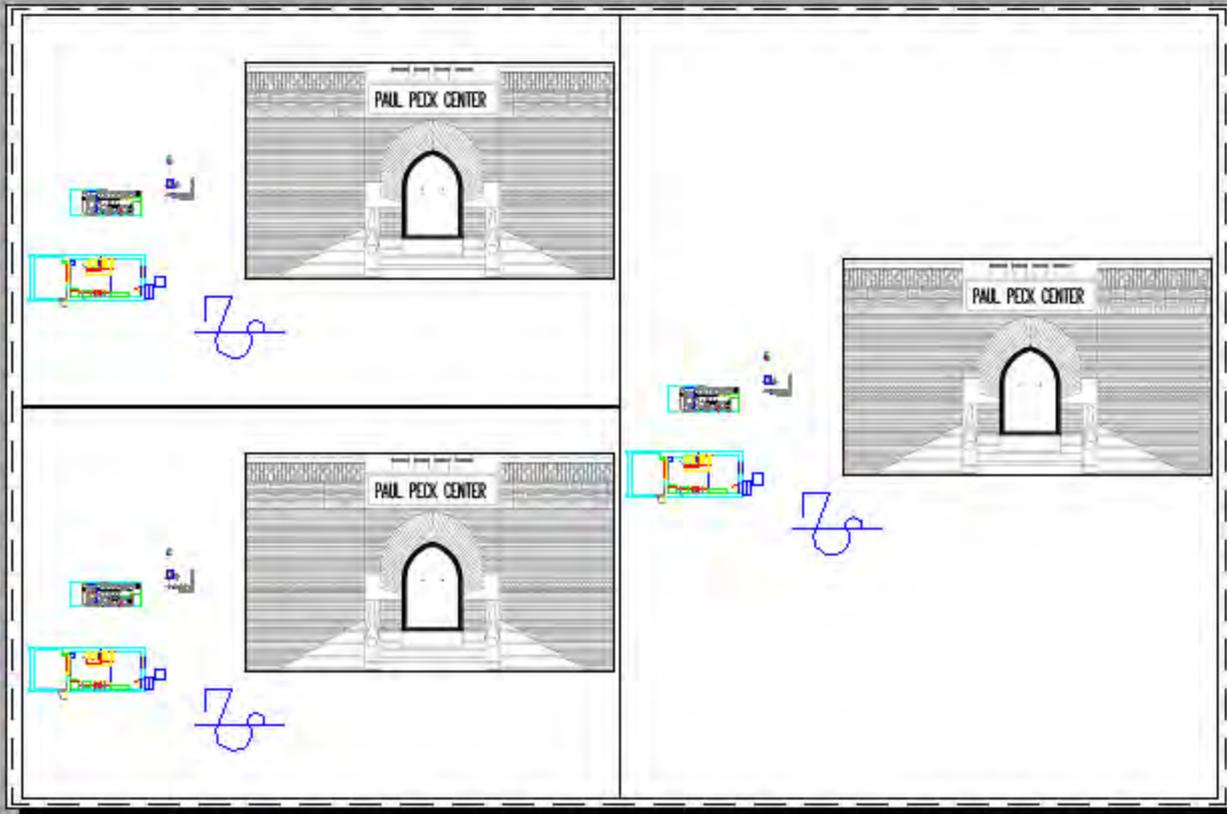
Architecture Elevation: +0'

Annotation Tools: Text, Check Spelling, Arial dimension, Final text, 2'-0"

Dimensions: AEC Dimension Interior, dimension LKM

Scheduling, C..., K..., V...

Annotation Scaling



Setting up a page properly takes time.

Properties

Medium Detail

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

Annotation Tools: Text, Check Spelling, Arial dimension, Final text, 1/8"

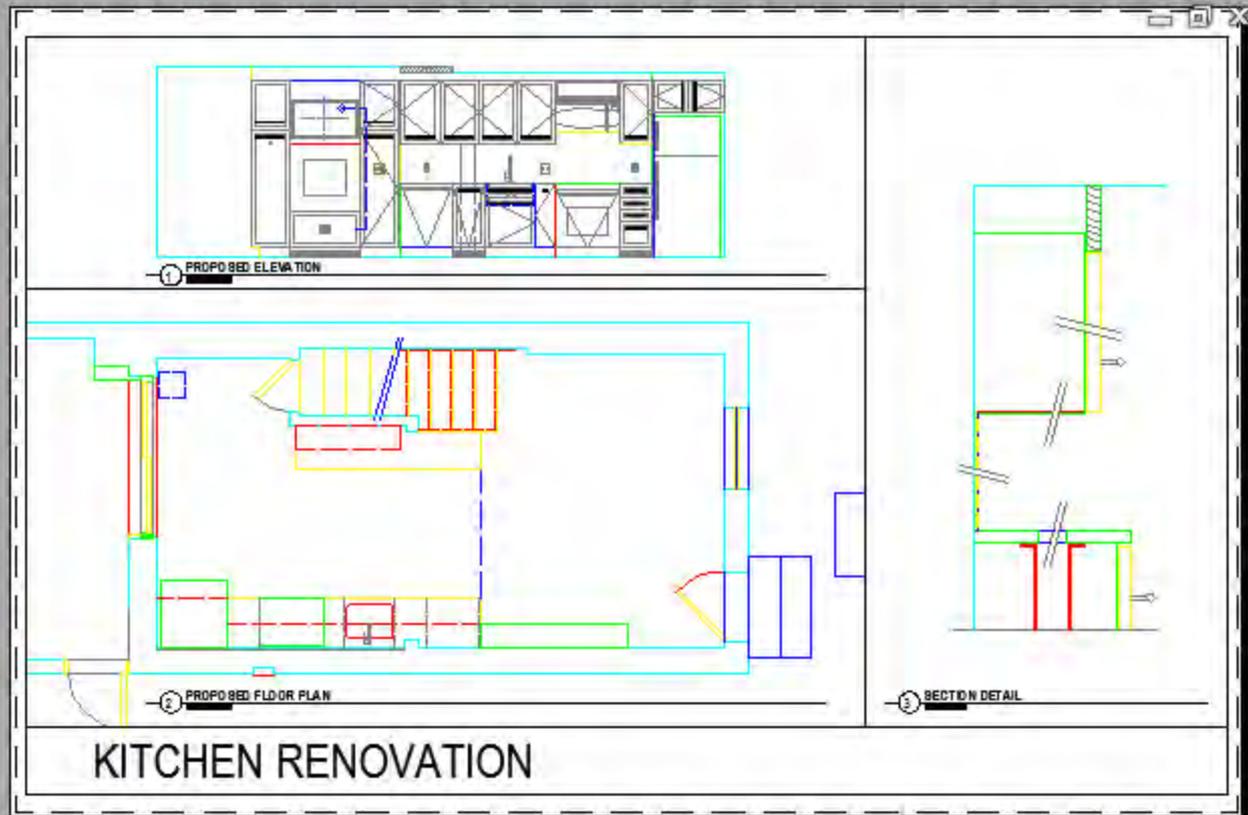
Dimensions: AEC Dimension Interior, dimension LKM

Scheduling, C..., K..., V...

Annotation Scaling

Zoom in the ensure that drawings align appropriately.

Be sure to include drawing titles and project titles, as well as the drawing scale.



Medium Detail

Command: *Cancel*

Command: P PAN

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

Command:

0'-3" 0'-6 11/16" 0'-0"

Architecture

Elevation: +0"

Annotation Tools

Text

Check Spelling

Arial dimension

Find text

1/8"

AEC Dimension Interior

dimension LKM

Scheduling

C...

K...

V...

Annotation Scaling

1

PROPOSED ELEVATION

SCALE: 3/4" = 1'-0"

Develop an annotation system so that viewers know what they are looking at and how drawings relate to one another



Properties

Medium Detail

Command: *Cancel*

Command: p PAN

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

Command:

0'-1 7/16", 0'-6 15/16", 0'-0"

Architecture

Elevation: +0'

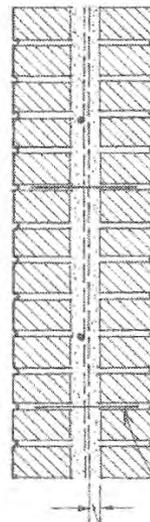
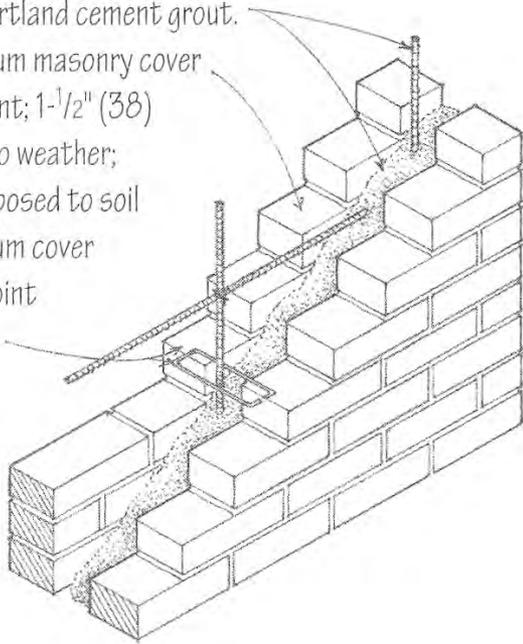
Project 1, Assignment 3:

Survey a section cut along
the north exterior wall.

What is the material
composition of the exterior
wall?

How can you tell what's
happening inside the wall?

- Reinforcing steel bars are fully embedded in portland cement grout.
- $\frac{3}{4}$ " (75) minimum masonry cover for reinforcement; $1\frac{1}{2}$ " (38) when exposed to weather; 2" (51) when exposed to soil
- $\frac{5}{8}$ " (16) minimum cover for horizontal joint reinforcement



Reinforced masonry walls use steel reinforcing bars placed in thickened joints or cavities with a fluid grout mix of portland cement, aggregate, and water for greater strength in carrying vertical loads and increased resistance to buckling and lateral forces. It is essential that a strong bond develop between the reinforcing steel, grout, and masonry units.

Reinforced Grouted Masonry

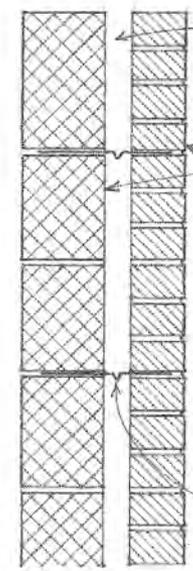
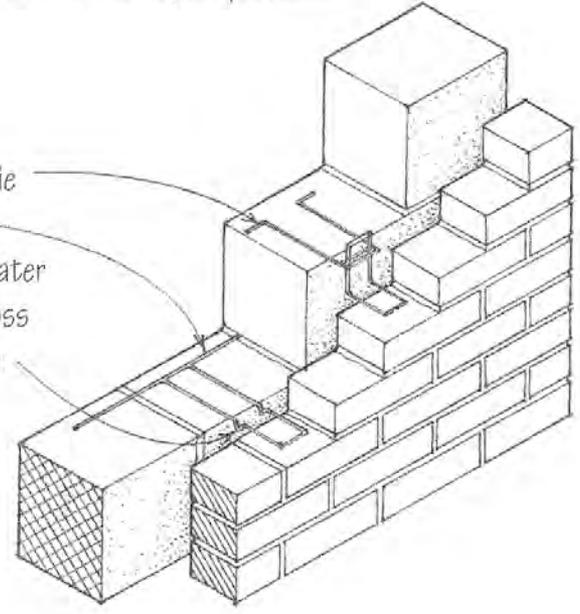
- Reinforced grouted masonry should conform to the requirements for plain grouted masonry. See 5.17.
- Metal wall ties
- $\frac{1}{4}$ " (6) minimum between reinforcement and masonry for fine grout; $\frac{1}{2}$ " (13) minimum cover for coarse grout

Cavity Walls

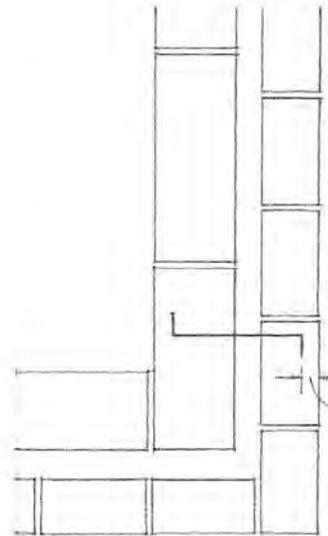
Cavity walls are constructed of a facing and a backing wythe of either solid or hollow masonry units, completely separated by a continuous air space and bonded with metal wall ties or horizontal joint reinforcement. Cavity walls have two advantages over other types of masonry walls:

1. The cavity enhances the thermal insulation value of the wall and permits the installation of additional thermal insulation material.
2. The air space acts as a barrier against water penetration if the cavity is kept clear, and if adequate weep holes and flashing are provided.

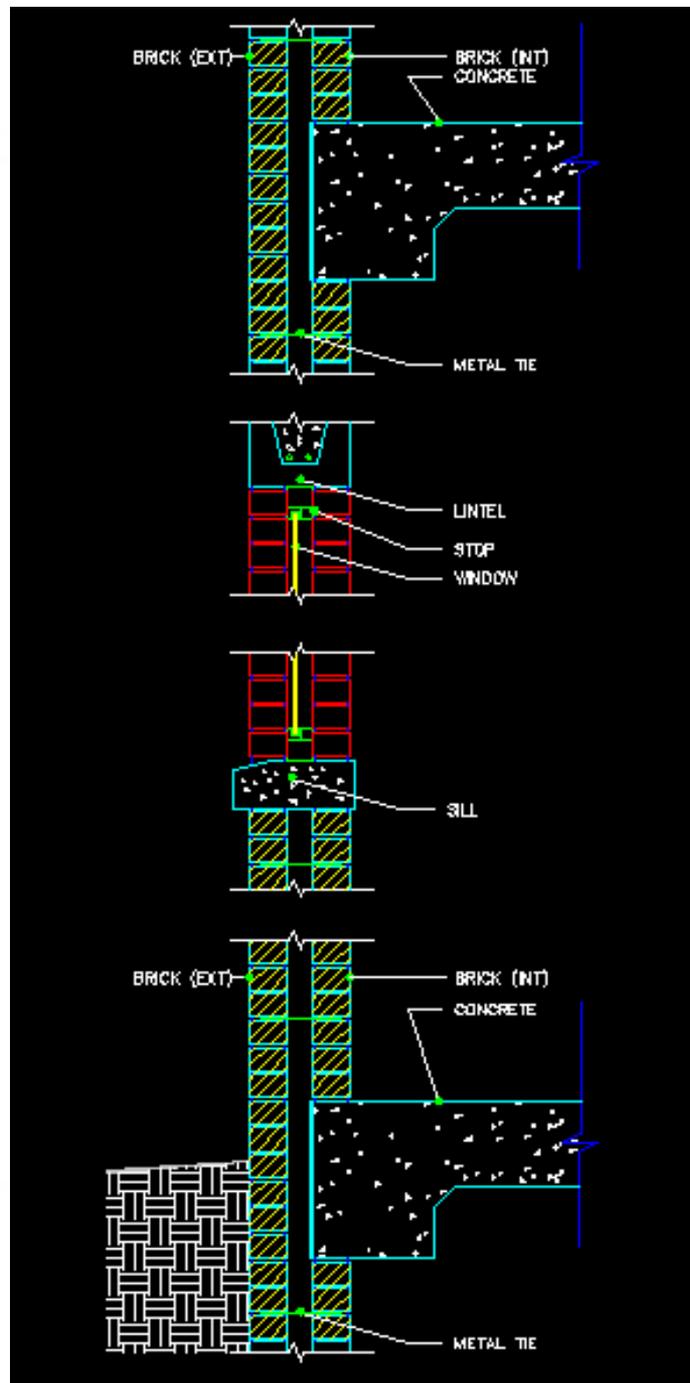
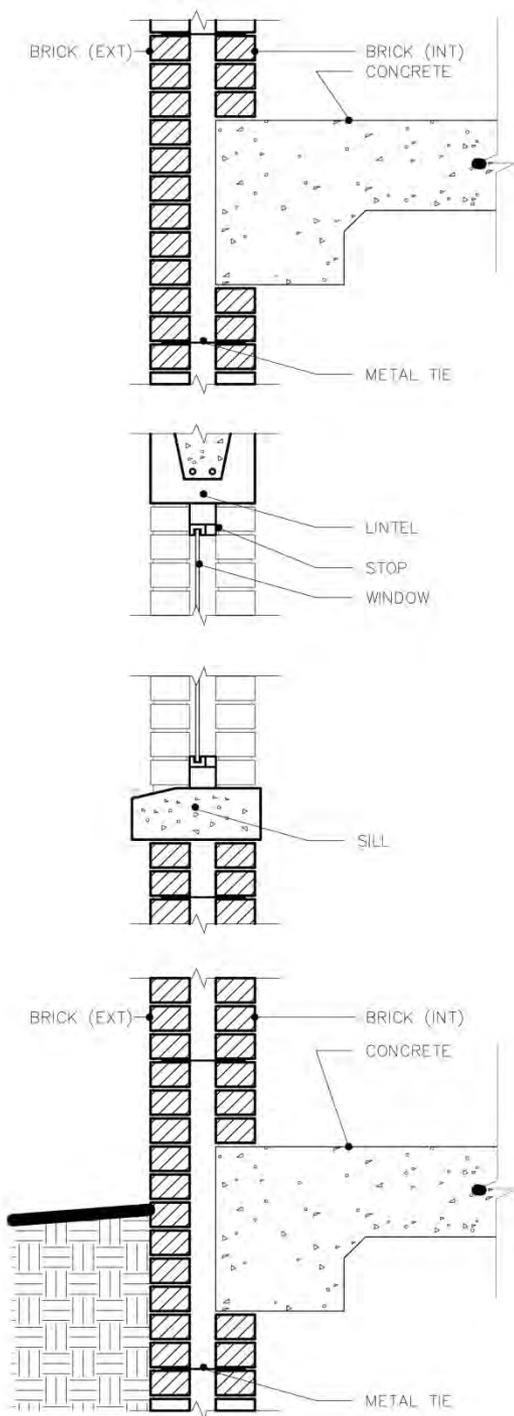
- Adjustable loop tie
- Ladder loop tie
- Drip to prevent water from running across tie to inner wythe



- Cavity to be not less than 2" (51) nor more than 4-1/2" (115) wide
- Solid or hollow masonry units
- Both facing and backing wythes to have a 4" (100) minimum nominal thickness. When computing the ratio of unsupported height or length to thickness, the value for thickness is equal to the sum of the nominal thicknesses of the inner and outer wythes.
- 3/16" (5) minimum ϕ tie of corrosion-resistant metal for each 4-1/2 sf (0.42 m²) of wall area for cavities up to 3" (75) wide; for wider cavities, provide a metal tie for each 3 sf (0.28 m²) of wall area.



- Stagger ties in alternate courses w/ a maximum vertical distance between ties of 16" (405) and a maximum horizontal spacing of 36" (915).
- Place additional ties at 3' (915) o.c. maximum around openings within 12" (305) of the edges of the openings.
- 5/8" (16) minimum mortar cover for joint reinforcement.



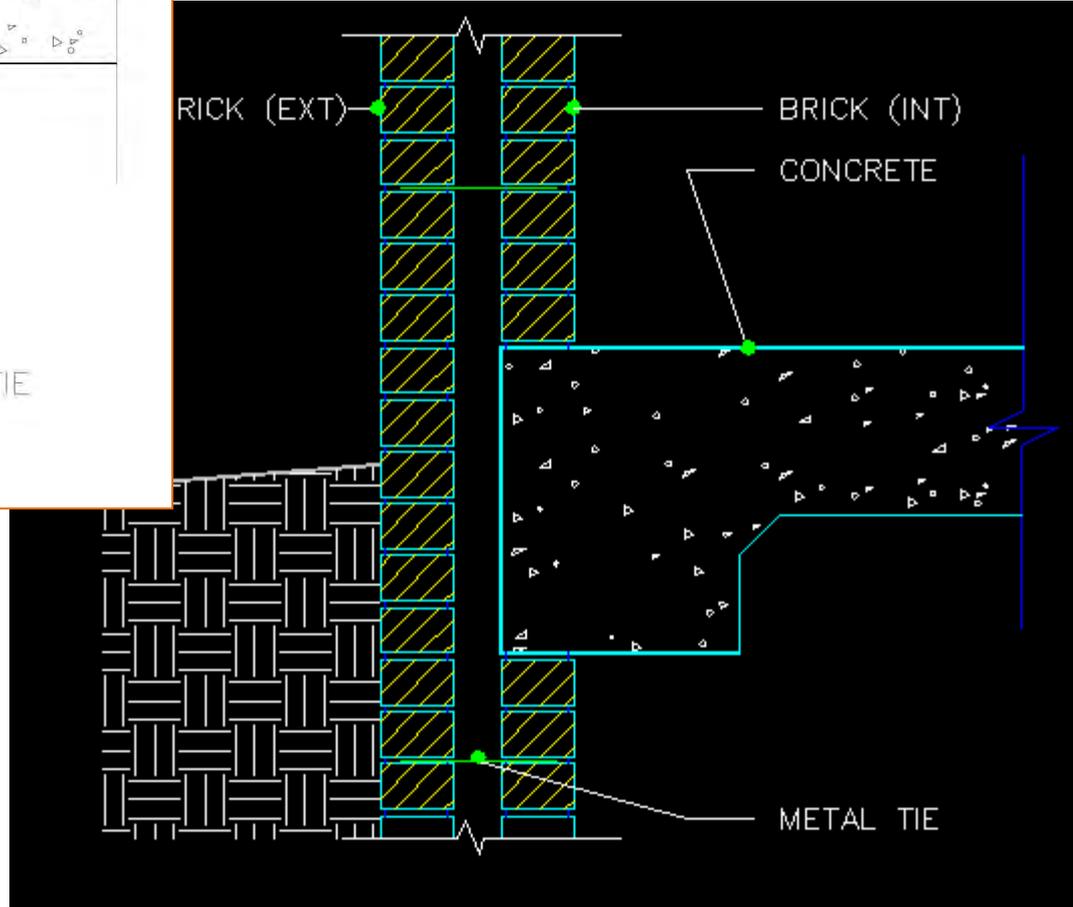
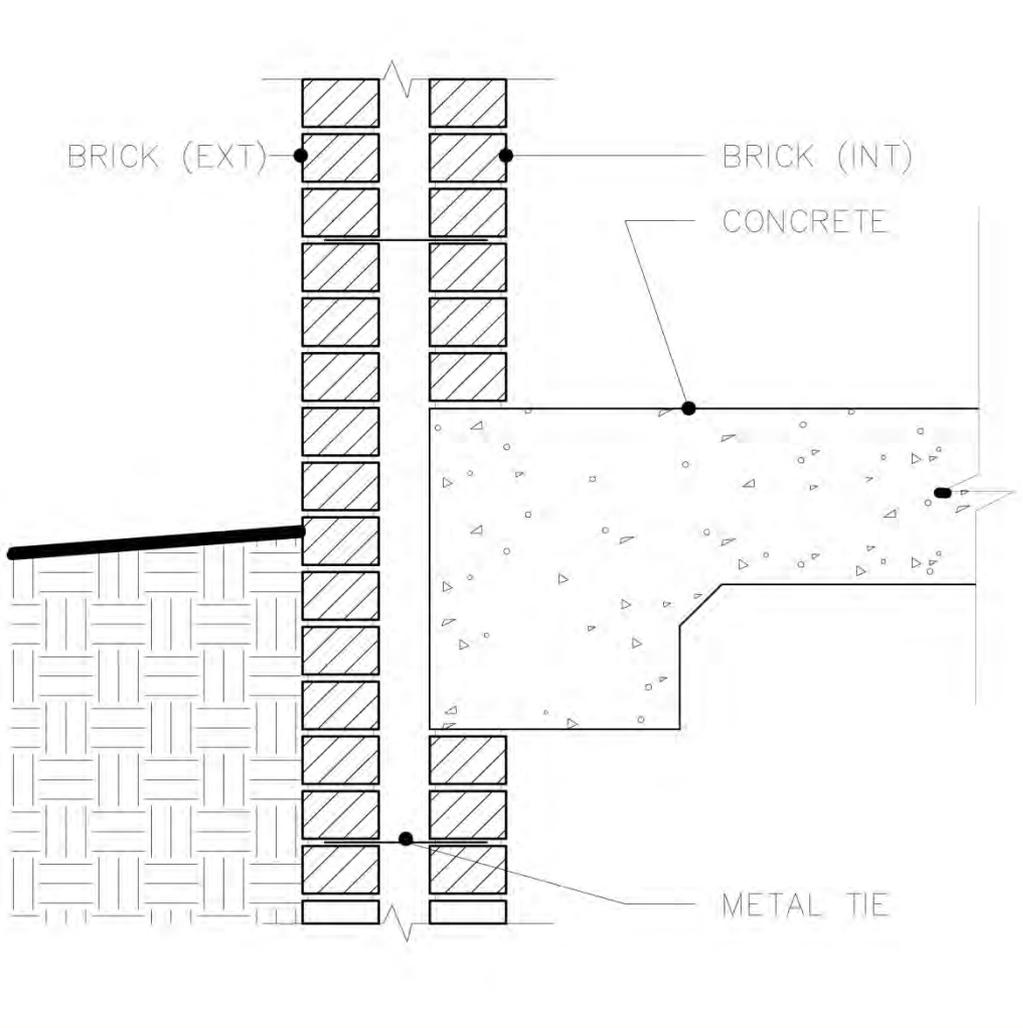
Project 1, Assignment 3:

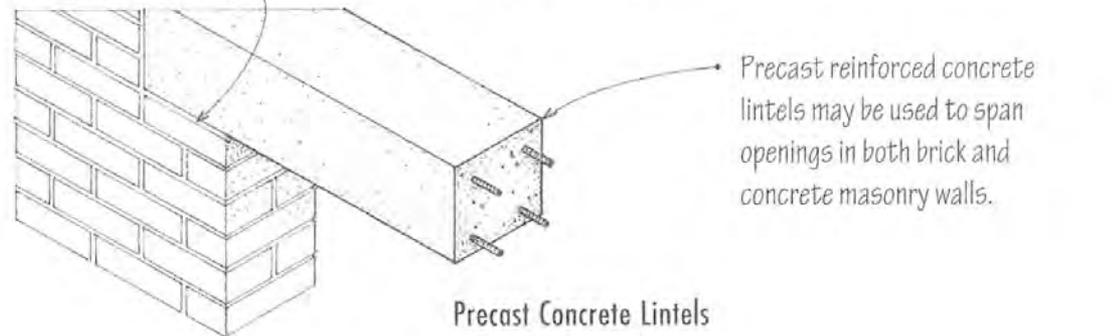
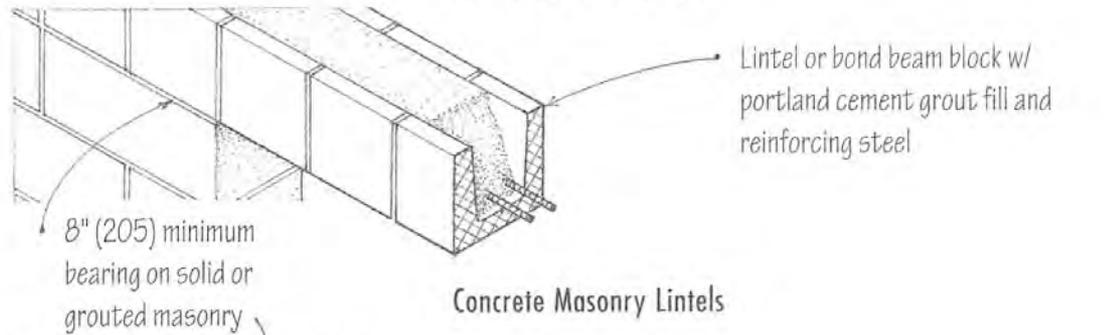
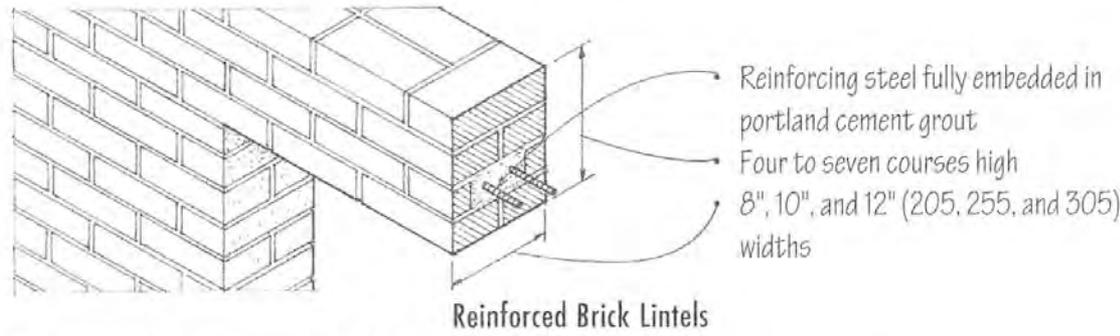
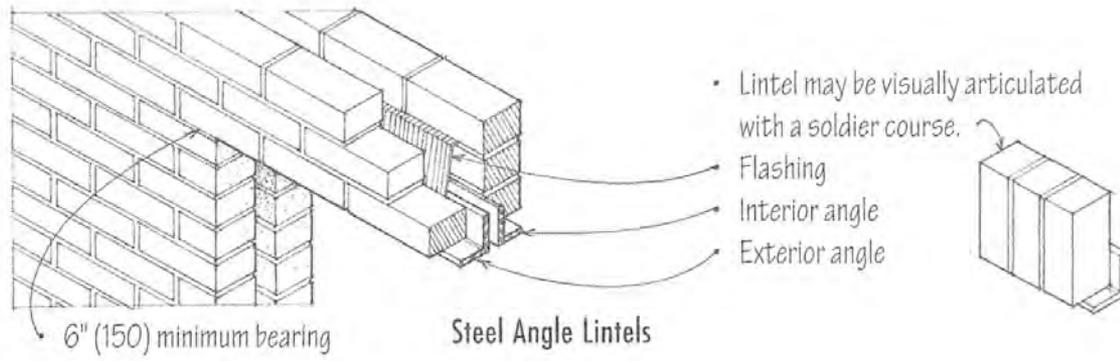
Draft in AutoCAD a *continuous* section (the image shown here is *not* a continuous section).

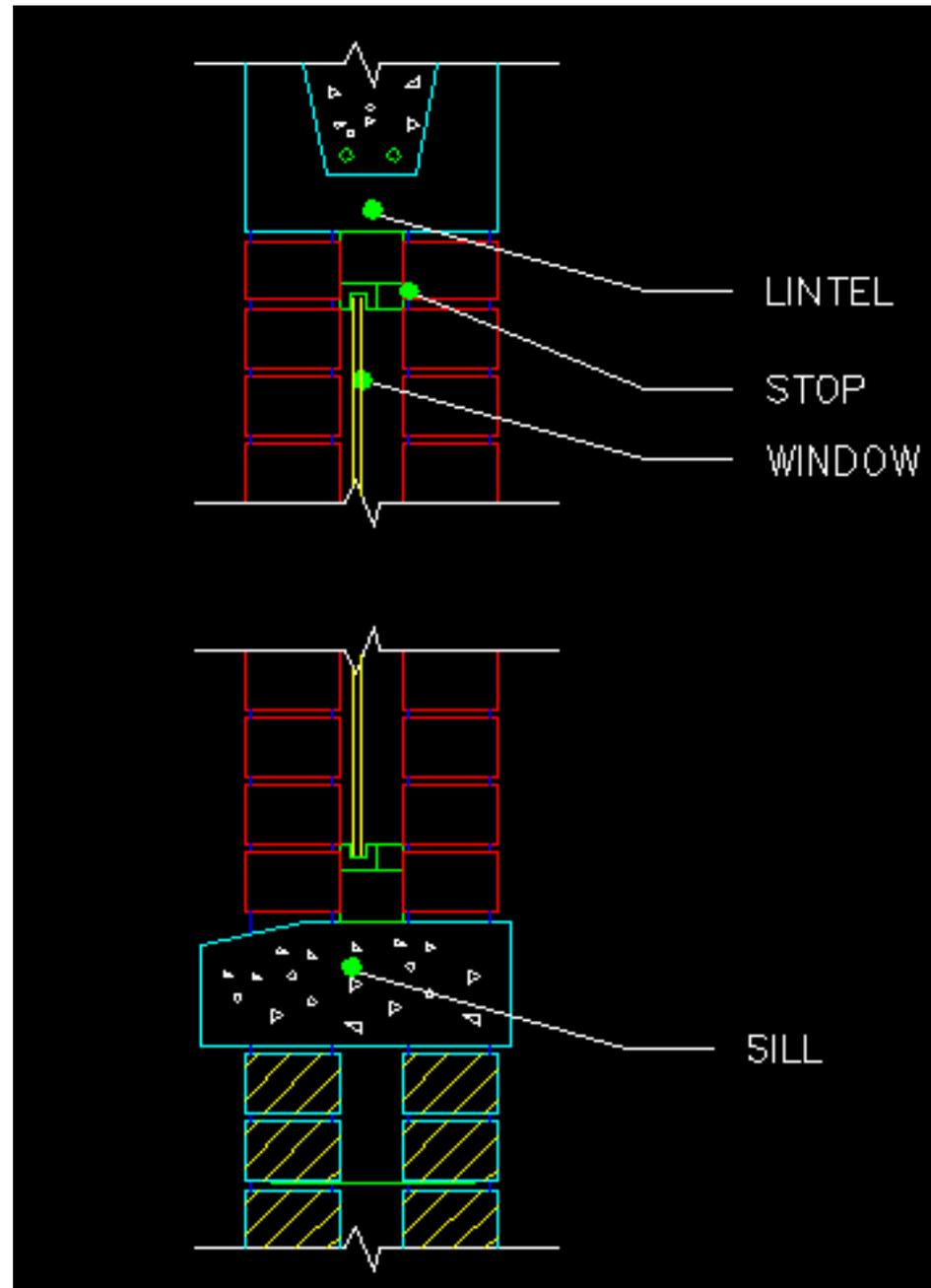
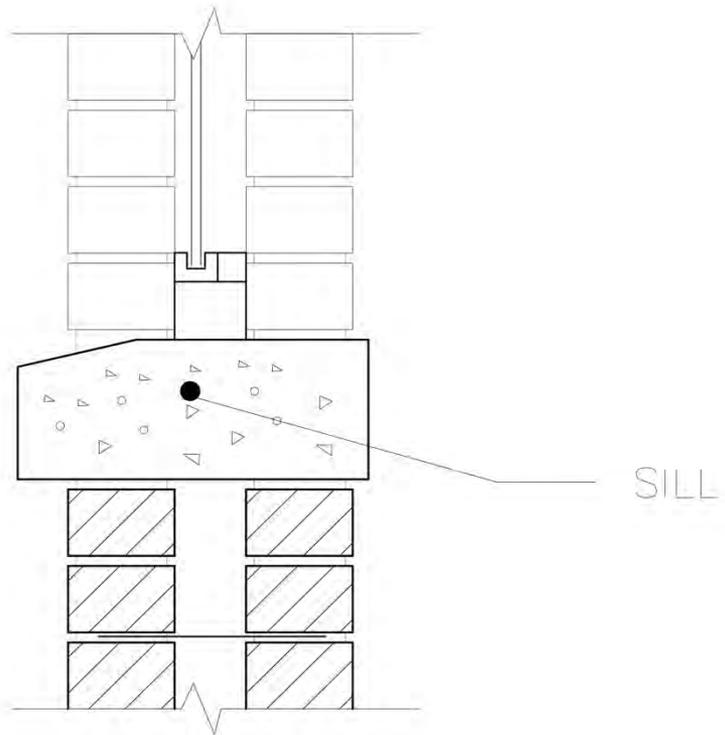
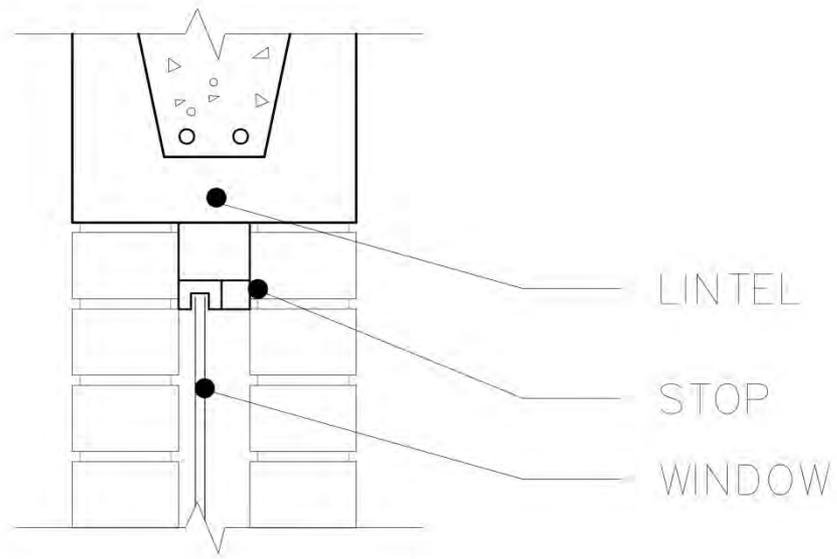
Annotate and dimension your drawings (the screen shot shown here from AutoCAD is *not* properly annotated).

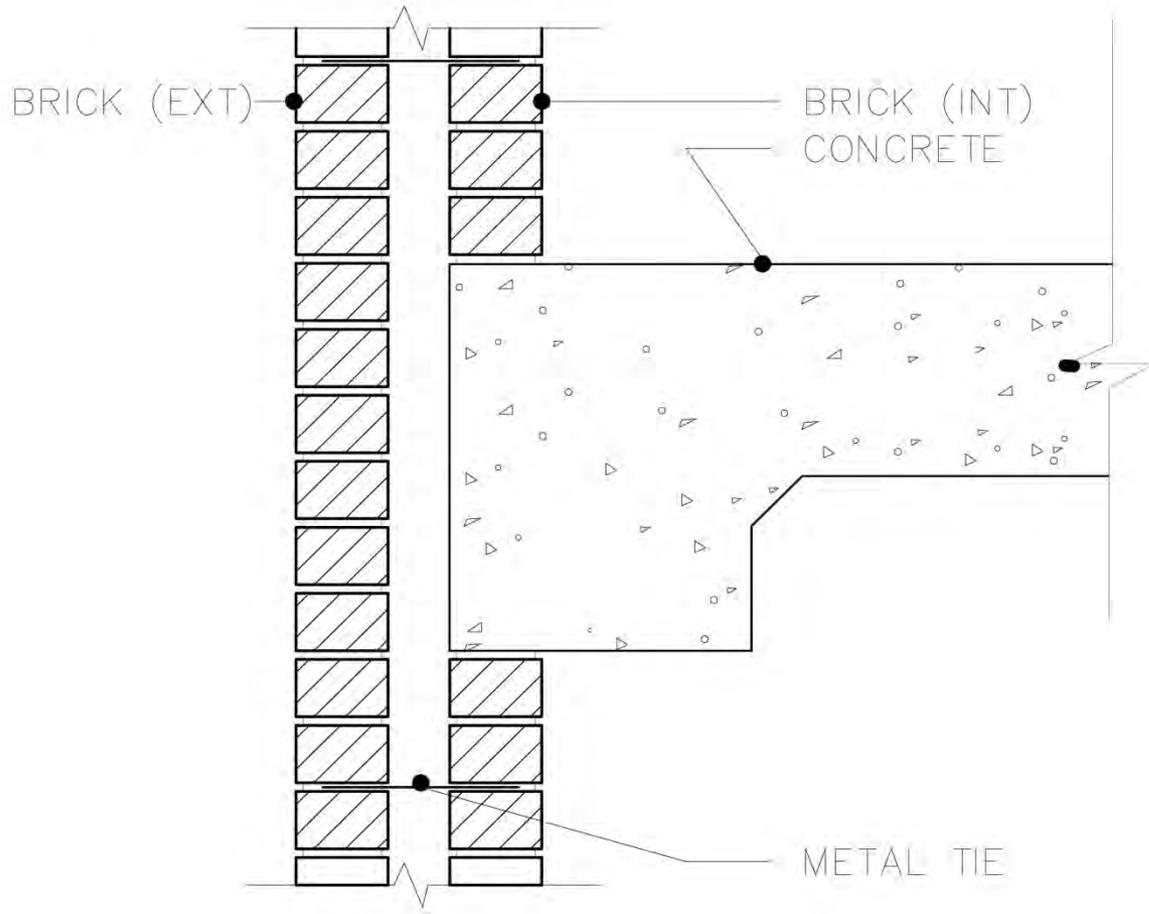
Use line weights and layers accordingly.

Arrange the plan, elevation and section on a sheet as per the assignment instructions. Plot first to PDF, then on a 24"x36" page.









CADD Lab this week

Plotting demo -
you must attend!

