

# AutoCAD Tips and Tricks to Improve Efficiency

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# About the speakers



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# PRIZES!!!

Who is the most recent user to begin working  
with AutoCAD based products?

Who has the most experience working with  
AutoCAD based products?



# Safety



- Slips, trips and falls are the second leading cause of injury and death.
- In the United States approximately 25,000 slips, trips and falls occur every day.
- 15% of all claims are from slips, trips and falls.



# Class Description

Do you find yourself behind on design projects? Are you wanting to familiarize yourself with AutoCAD better to become more efficient? In this class we will discuss how to manipulate settings / options to improve speed. We will also discuss how to setup drawings using x-refs and utilizing paper space and model space. We will also look at how layer commands and object display settings can reduce clutter in your drawings to make it easier to manipulate components in your drawing. This class will be a great class to help you become more familiar with some of the options in AutoCAD and make you take that next step in your career using the many tools AutoCAD has to offer.

# Learning Objectives

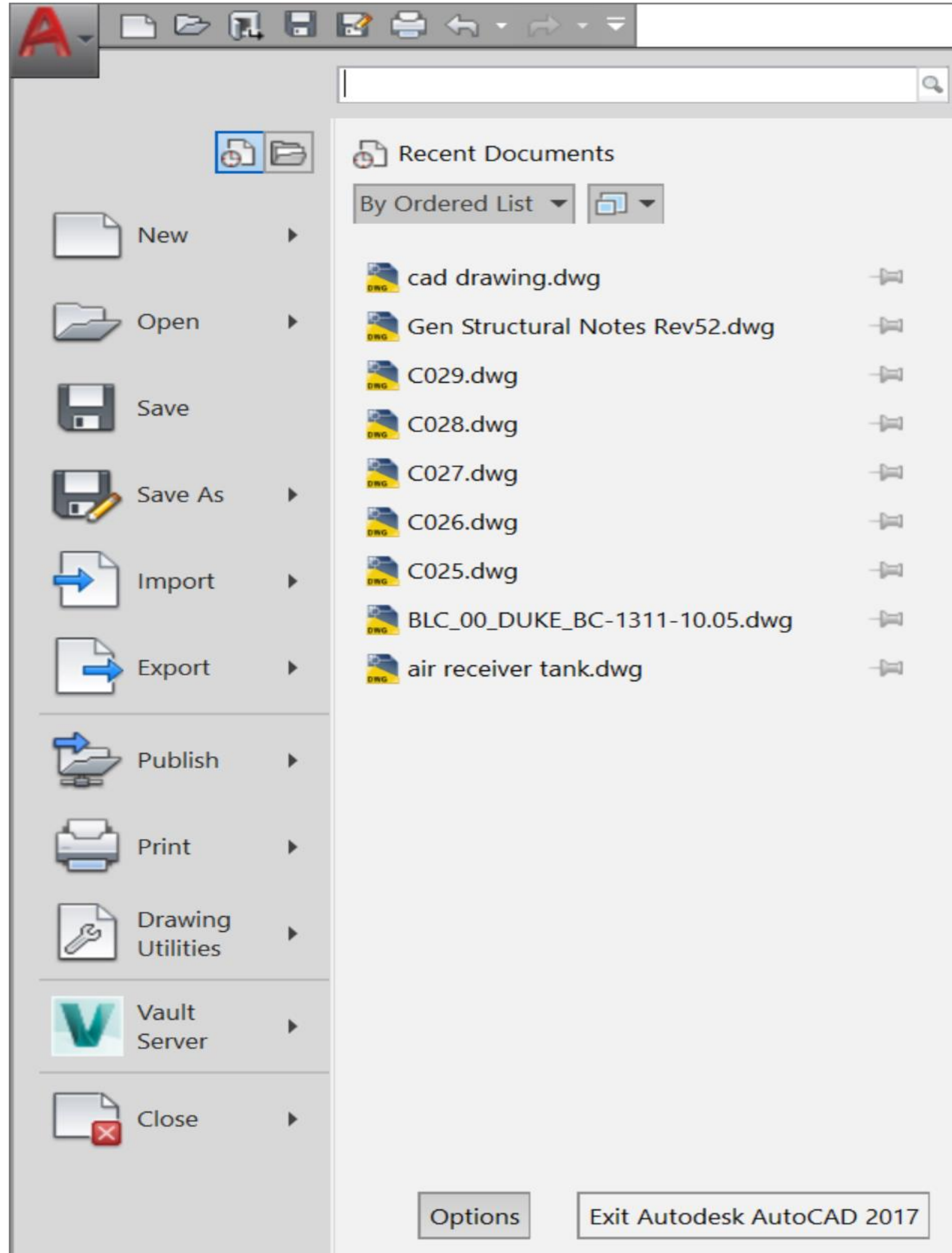
- Manipulate settings in the options menu and keyboard shortcuts
- Modify dimension style settings
- Utilize various layering commands to display objects differently
- Organize drawings using x-refs and model space / paper space

# Options Menu

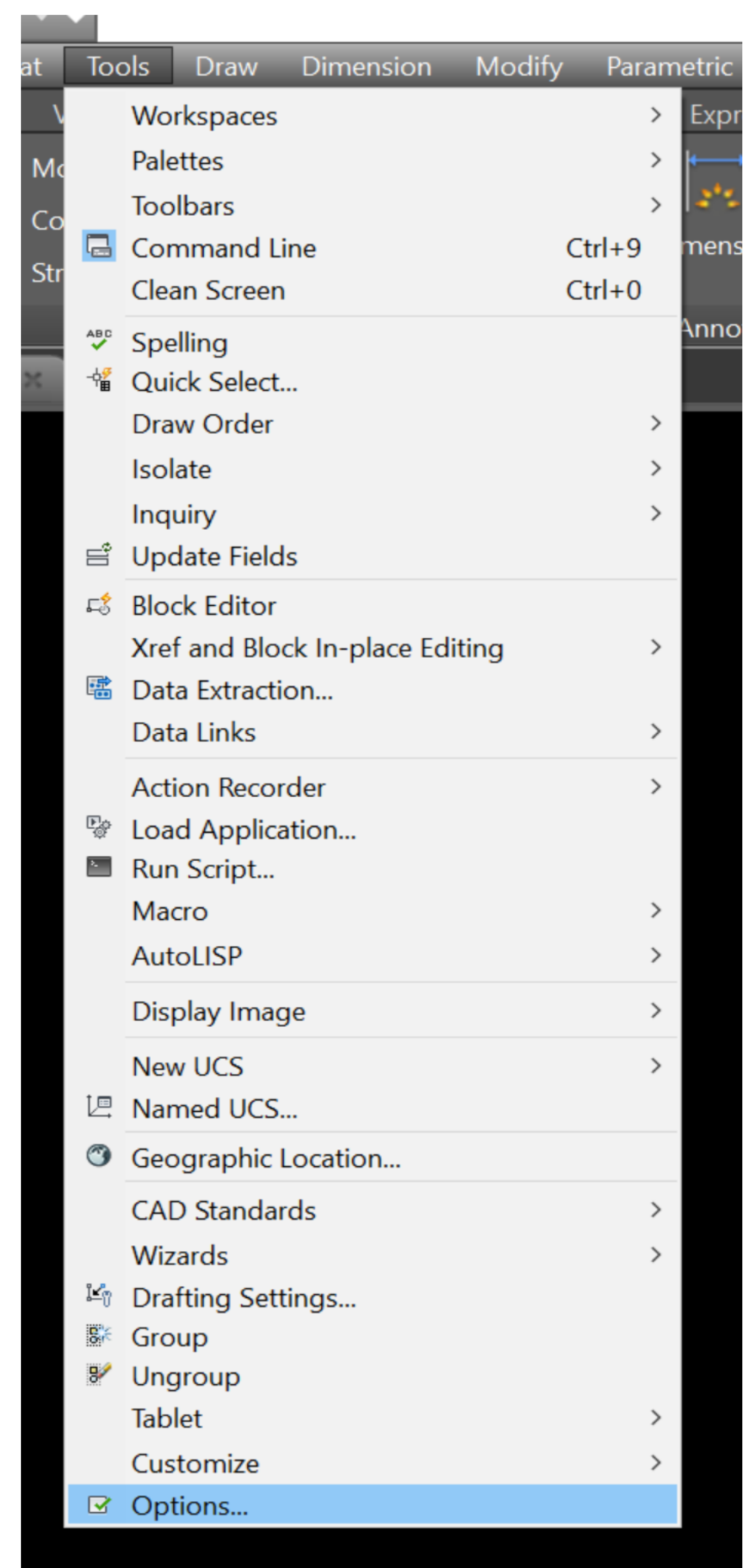




# How to access the Options Menu



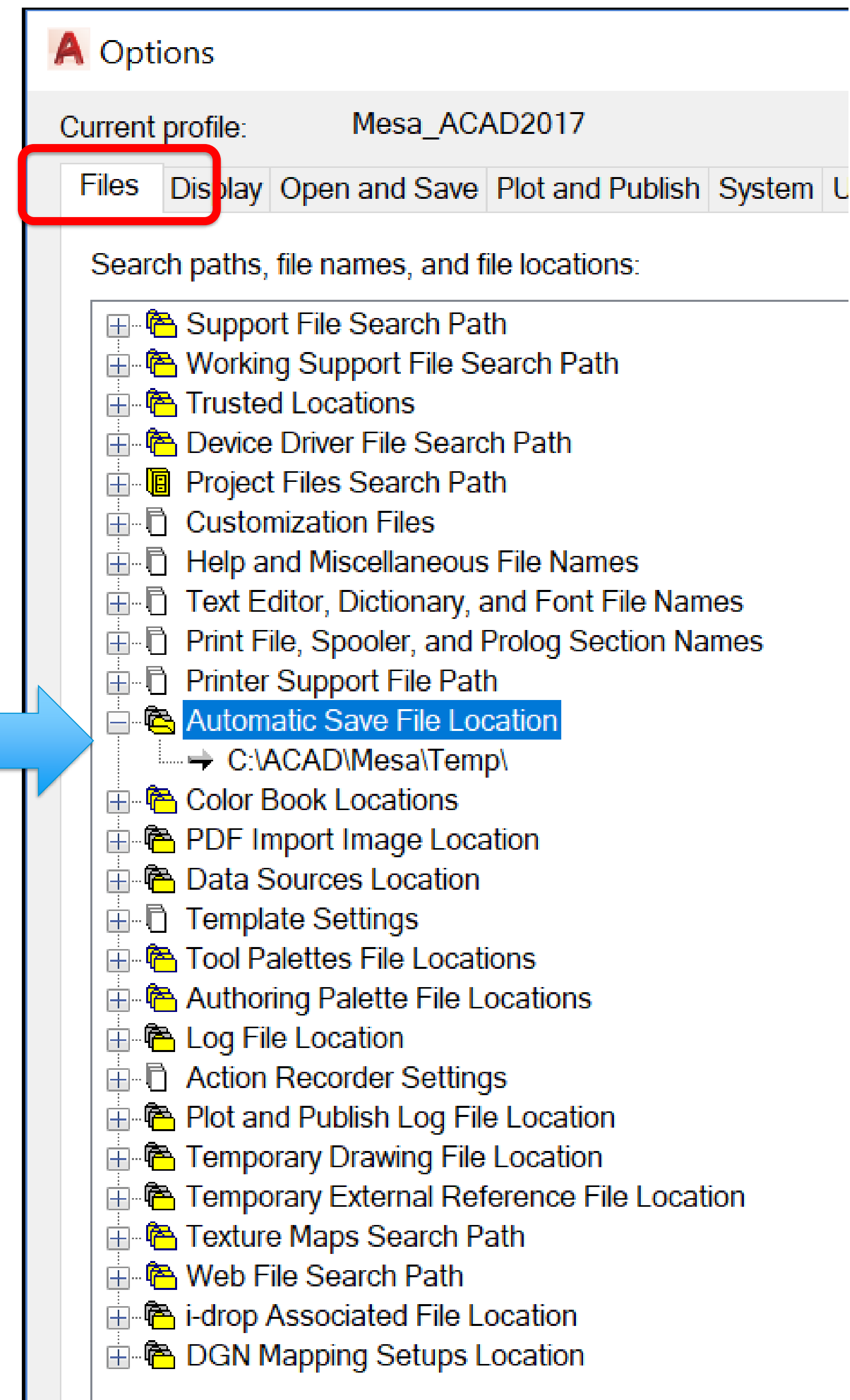
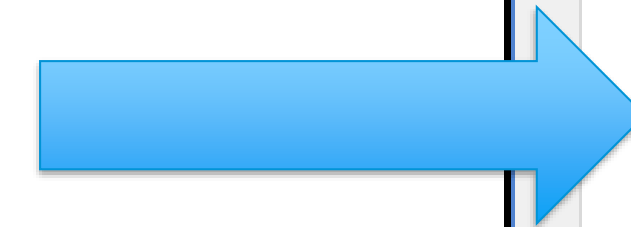
Type “OP” or  
“OPTIONS” in the  
command window





# Options Menu – Files Tab

FATAL ERROR: When AutoCAD shuts down without warning, this is where you can find the autosave file.



# Options Menu – Display Tab

**A** Options

Current profile: Mesa\_ACAD2017      Current drawing: cad drawing.dwg

Files **Display** Open and Save Plot and Publish System User Preferences Drafting 3D Modeling Selection Profiles

---

**Window Elements**

Color scheme: Dark

☐ Display scroll bars in drawing window

☐ Use large buttons for Toolbars

☒ Resize ribbon icons to standard sizes

☒ Show ToolTips

1.00 Number of seconds before display

☒ Show shortcut keys in ToolTips

☒ Show extended ToolTips

2 Number of seconds to delay

☒ Show rollover ToolTips

☒ Display File Tabs

Colors... Fonts...

---

**Layout elements**

☒ Display Layout and Model tabs

☒ Display printable area

☒ Display paper background

☒ Display paper shadow

☐ Show Page Setup Manager for new layouts

☒ Create viewport in new layouts

---

**Display resolution**

100 Arc and circle smoothness

8 Segments in a polyline curve

0.5 Rendered object smoothness

4 Contour lines per surface

---

**Display performance**

☐ Pan and zoom with raster & OLE

☒ Highlight raster image frame only


☒ Apply solid fill

☐ Show text boundary frame only

☐ Draw true silhouettes for solids and surfaces


---


**Crosshair size**

100 

---

**Fade control**

Xref display 50 

In-place edit and annotative representations 70 

This will toggle  
on/off the  
model and  
layout tabs



How to change  
the crosshair size  
in your drawing





# Options Menu – Open and Save Tab

**A** Options

Current profile: Mesa\_ACAD2017

Current drawing: cad drawing.dwg

Files Display **Open and Save** Plot and Publish System User Preferences Drafting 3D Modeling Selection Profiles

## File Save

Save as:

AutoCAD 2004/LT2004 Drawing (\*.dwg)

☒ Maintain visual fidelity for annotative objects

☒ Maintain drawing size compatibility

Thumbnail Preview Settings...

50 Incremental save percentage

## File Safety Precautions

☒ Automatic save

10 Minutes between saves

☒ Create backup copy with each save

☐ Full-time CRC validation

☐ Maintain a log file

ac\$ File extension for temporary files

Digital Signatures...

☒ Display digital signature information

## File Open

9 Number of recently-used files

☐ Display full path in title

## Application Menu

9 Number of recently-used files

## External References (Xrefs)

Demand load Xrefs:

Enabled with copy

☒ Retain changes to Xref layers

☒ Allow other users to Refedit current drawing

## ObjectARX Applications

Demand load ObjectARX apps:

Object detect and command invoke

Proxy images for custom objects:

Show proxy graphics

☒ Show Proxy Information dialog box

What version of AutoCAD the file will be saved in

How often AutoCAD will run an automatic save file

# Options Menu – User Preferences

**A** Options

Current profile: Mesa\_ACAD2017      Current drawing: cad drawing.dwg

Files   Display   Open and Save   Plot and Publish   System   **User Preferences**   Drafting   3D Modeling   Selection   Profiles

Windows Standard Behavior

- ☒ Double click editing
- ☒ Shortcut menus in drawing area

Right-click Customization...

Insertion scale

Default settings when units are set to unitless:

Source content units: Inches

Target drawing units: Inches

Hyperlink

- ☒ Display hyperlink cursor, tooltip, and shortcut menu

Fields

- ☒ Display background of fields

Field Update Settings...

Priority for Coordinate Data Entry

- ☐ Running object snap
- ☐ Keyboard entry
- ☒ Keyboard entry except scripts

Associative Dimensioning

- ☐ Make new dimensions associative

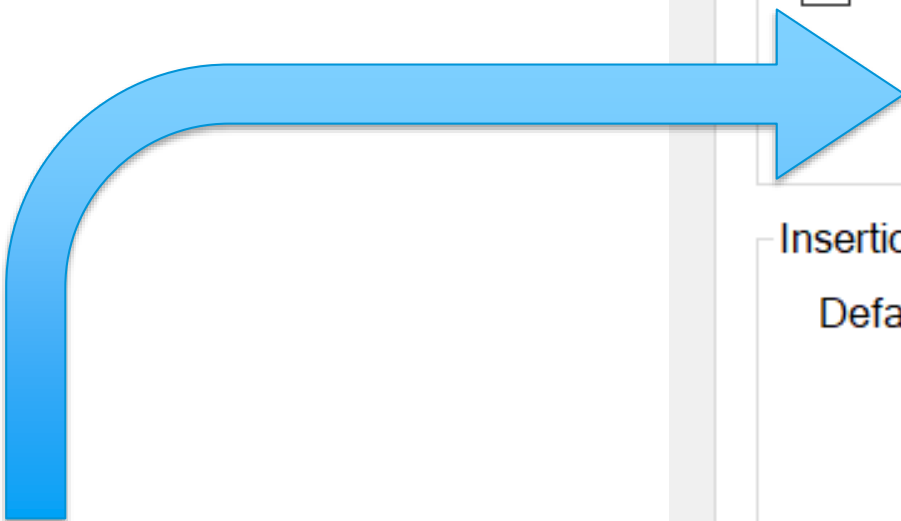
Undo/Redo

- ☒ Combine zoom and pan commands
- ☒ Combine layer property change

Block Editor Settings...

Lineweight Settings...

Default Scale List...



**A** Right-Click Customization

☐ Turn on time-sensitive right-click:

- Quick click for ENTER
- Longer click to display Shortcut Menu

Longer click duration: 250 milliseconds

Default Mode

If no objects are selected, right-click means

- ☐ Repeat Last Command
- ☒ Shortcut Menu

Edit Mode

If one or more objects are selected, right-click means

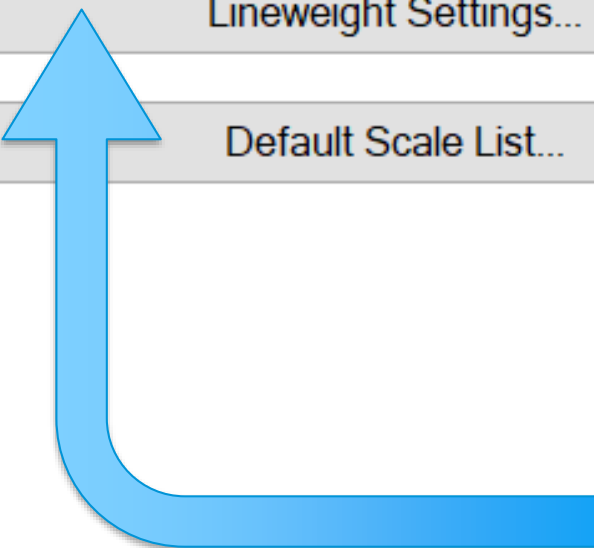
- ☐ Repeat Last Command
- ☒ Shortcut Menu

Command Mode

If a command is in progress, right-click means

- ☐ ENTER
- ☐ Shortcut Menu: always enabled
- ☒ Shortcut Menu: enabled when command options are present

Apply & Close   Cancel   Help



**A** Lineweight Settings

Lineweights

- ByLayer
- ByBlock
- Default
- 0.00 mm

Units for Listing

- ☒ Millimeters (mm)
- ☐ Inches (in)

☒ Display Lineweight

Default 0.18 mm

Adjust Display Scale

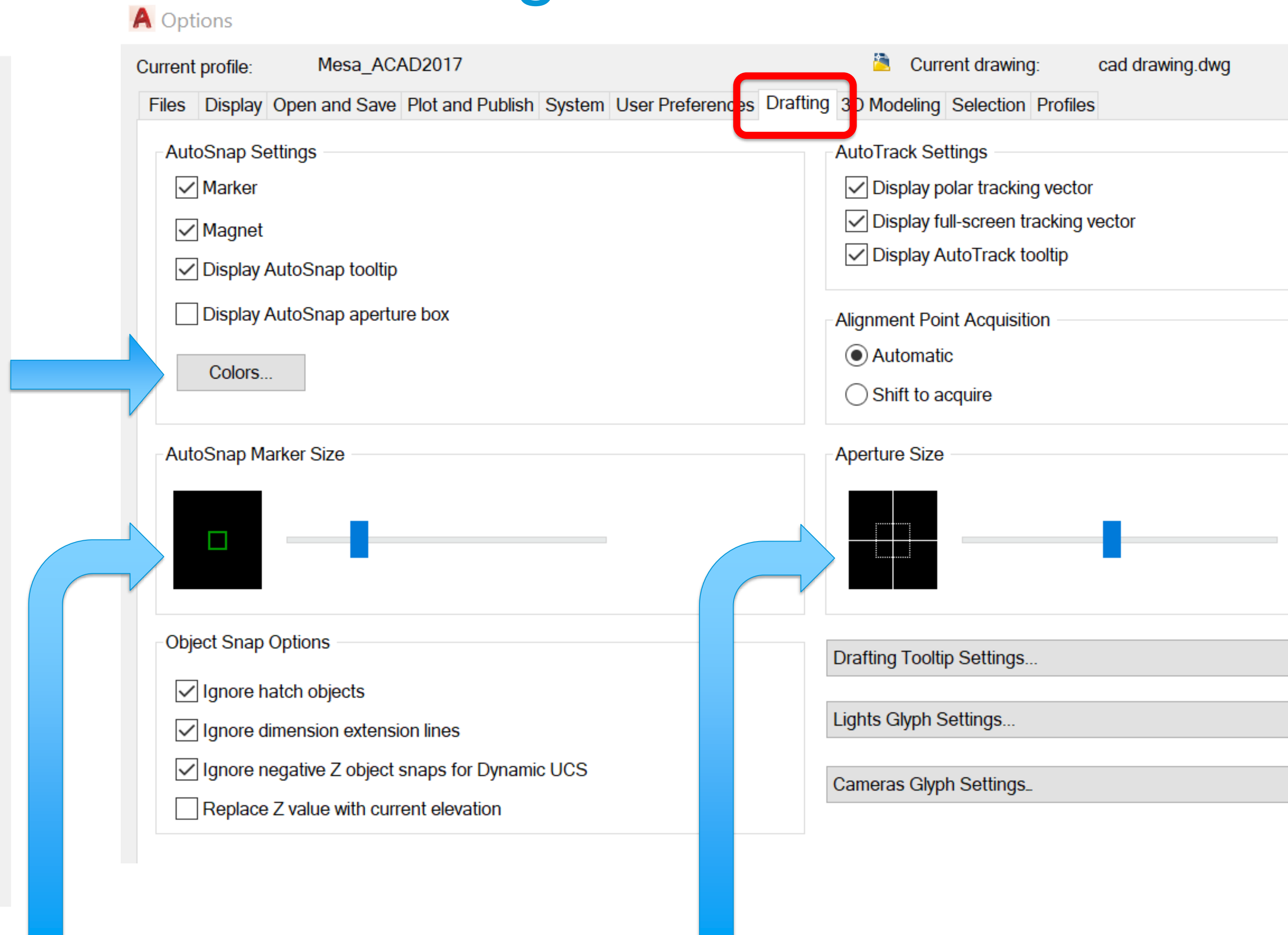
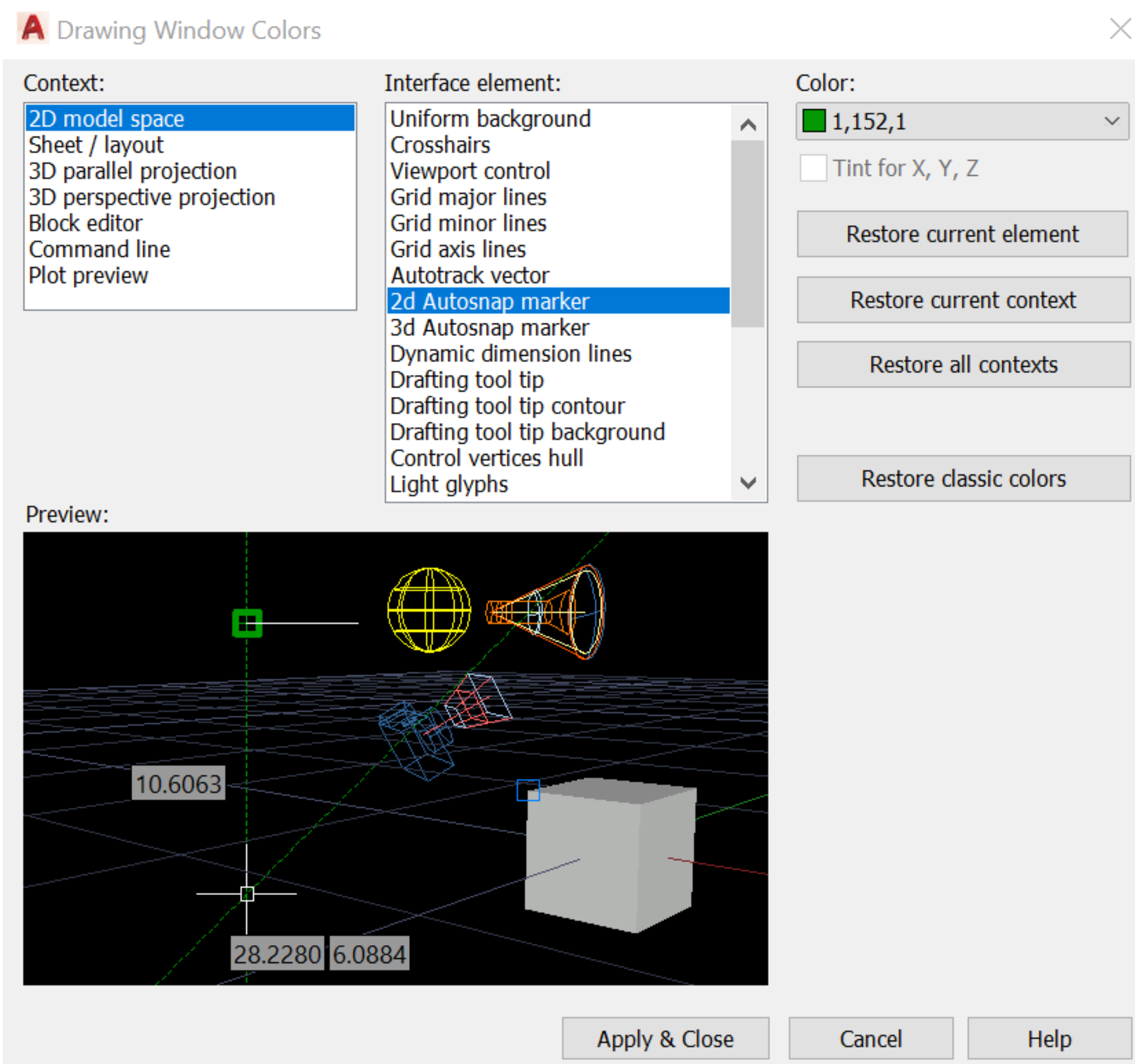
Min Max

Current Lineweight: ByLayer

Apply & Close   Cancel   Help



# Options Menu – Drafting



Location to change the  
AutoSnap Marker Size

Location to change  
the Aperture Size

# Keyboard Shortcuts





# Keyboard Shortcuts

	Display Help	Toggle text screen	Toggle object snap mode	Toggle 3DOsnap	Toggle Isoplane	Toggle Dynamic UCS	Toggle grid mode	Toggle ortho mode	Toggle snap mode	Toggle polar mode	Toggle object snap tracking	Toggle dynamic input mode			
Esc	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	PrtScn SysRq	ScrLK	Pause Break
~ `	! 1	@ 2	# 3	\$ 4	% 5	^ 6	& 7	* 8	( 9	) 0	— -	+ =	Backspace	Home	End
Tab	Q QSAVE	W WBLOCK	E ERASE	R REDRAW	T MTEXT	Y	U	I INSERT	O OFFSET	P PAN	{ [	} ]	 \ _	Insert	Page Up
Caps Lock	A ARC	S STRETCH	D DIMSTYLE	F FILLET	G GROUP	H HATCH	J JOIN	K	L LINE	: ;	" ,	Enter	Delete	Page Down	
Shift TOGGLE ORTHO MODE	Z ZOOM	X EXPLODE	C CIRCLE	V VIEW	B BLOCK	N NEW	M MOVE	< ,	> .	? /	Shift TOGGLE ORTHO MODE		▲		
Ctrl	Start	Alt							Alt		Ctrl		◀	▼	▶

- Q

QSAVE / Saves the current drawing.
- A

ARC / Creates an arc.
- Z

ZOOM / Increases or decreases the magnification of the view in the current viewport.
- W

WBLOCK / Writes objects or a block to a new drawing file.
- S

STRETCH / Stretches objects crossed by a selection window or polygon.
- X

EXPLODE / Breaks a compound object into its component objects.
- E

ERASE / Removes objects from a drawing.
- D

DIMSTYLE / Creates and modifies dimension styles.
- C

CIRCLE / Creates a circle.
- R

REDRAW / Refreshes the display in the current viewport.
- F

FILLET / Rounds and fillets the edges of objects.
- V

VIEW / Saves and restores named views, camera views, layout views, and preset views.
- T

MTEXT / Creates a multiline text object.
- G

GROUP / Creates and manages saved sets of objects called groups.
- B

BLOCK / Creates a block definition from selected objects.
- N

NEW / Create a new drawing
- H

HATCH / Fills an enclosed area or selected objects with a hatch pattern, solid fill, or gradient fill.
- J

JOIN / Joins similar objects to form a single, unbroken object.
- M

MOVE / Moves objects a specified distance in a specified direction.
- I

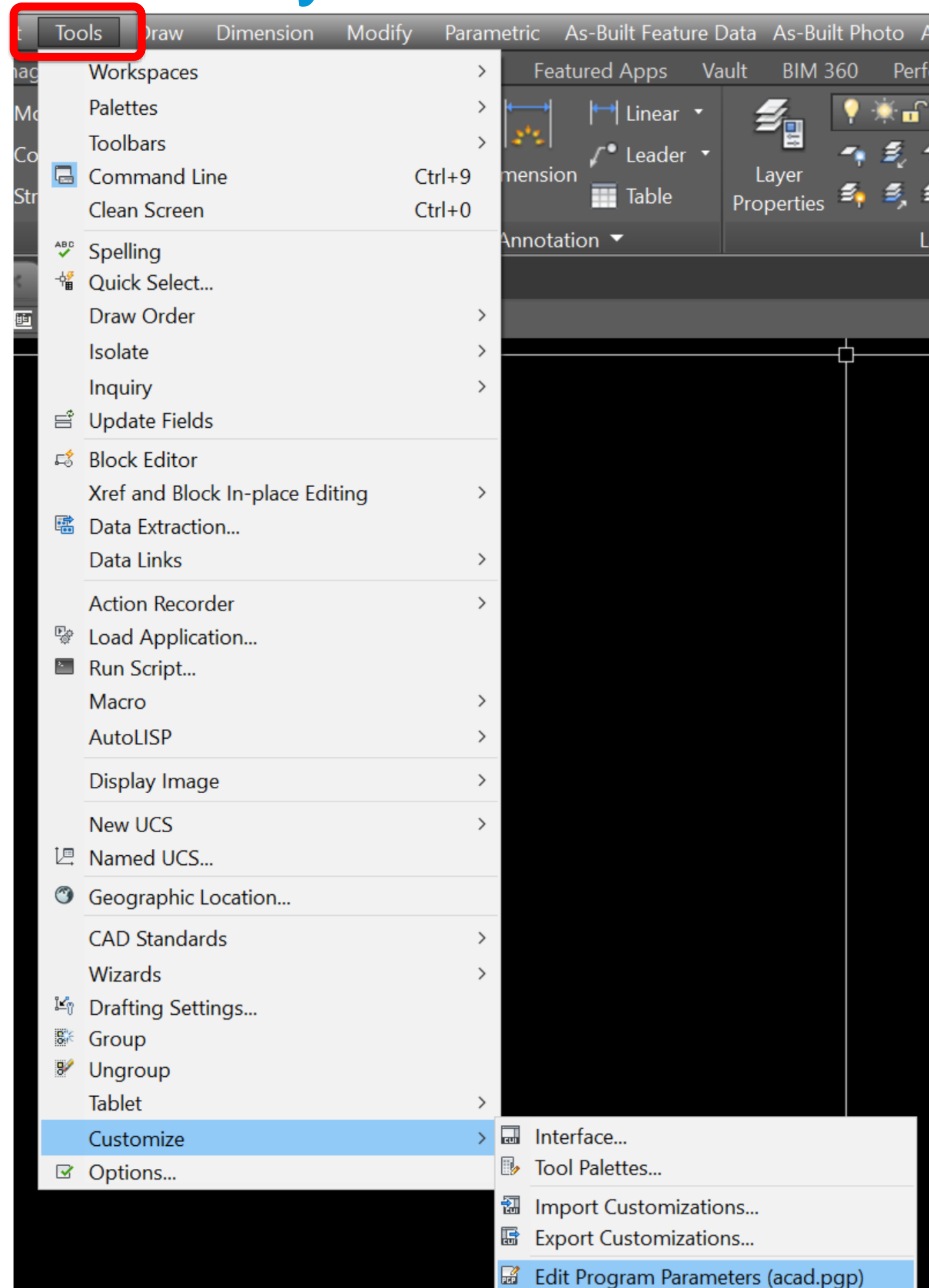
INSERT / Inserts a block or drawing into the current drawing.
- O

OFFSET / Creates concentric circles, parallel lines, and parallel curves.
- L

LINE / Creates straight line segments.
- P

PAN / Adds a parameter with grips to a dynamic block definition.

# Keyboard Shortcuts – Edit Program Parameters



3A,	*3DARRAY
3DMIRROR,	*MIRROR3D
3DNavigate,	*3DWALK
3DO,	*3DORBIT
3DP,	*3DPRINT
3DPLOT,	*3DPRINT
3DW,	*3DWALK
3F,	*3DFACE
3M,	*3DMOVE
3P,	*3DPOLY
3R,	*3DROTATE
3S,	*3DSCALE
A,	*ARC
AC,	*BACTION
ADC,	*ADCENTER
AECTOACAD,	*-ExportToAutoCAD
AA,	*AREA
AL,	*ALIGN
3AL,	*3DALIGN
AP,	*APPLOAD
APLAY,	*ALLPLAY
AR,	*ARRAY
-AR,	*-ARRAY
ARR,	*ACTRECORD
ARM,	*ACTUSERMESSAGE
-ARM,	*-ACTUSERMESSAGE
ARU,	*ACTUSERINPUT
ARS,	*ACTSTOP
-ARS,	*-ACTSTOP
ATI,	*ATTIPEDIT
ATT,	*ATTDEF
-ATT,	*-ATTDEF
ATE,	*ATTEDIT
-ATE,	*-ATTEDIT
ATTE,	*-ATTEDIT

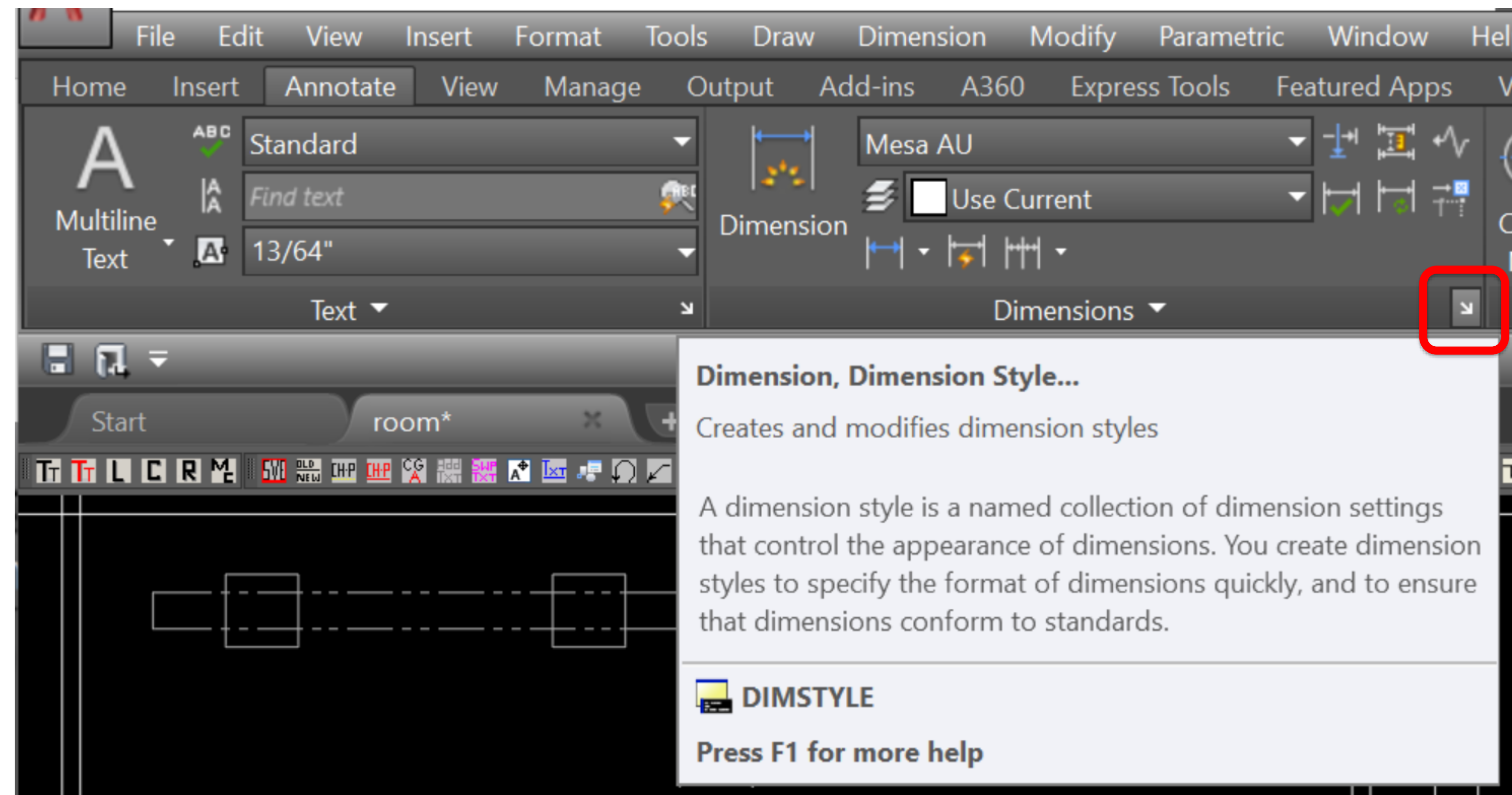
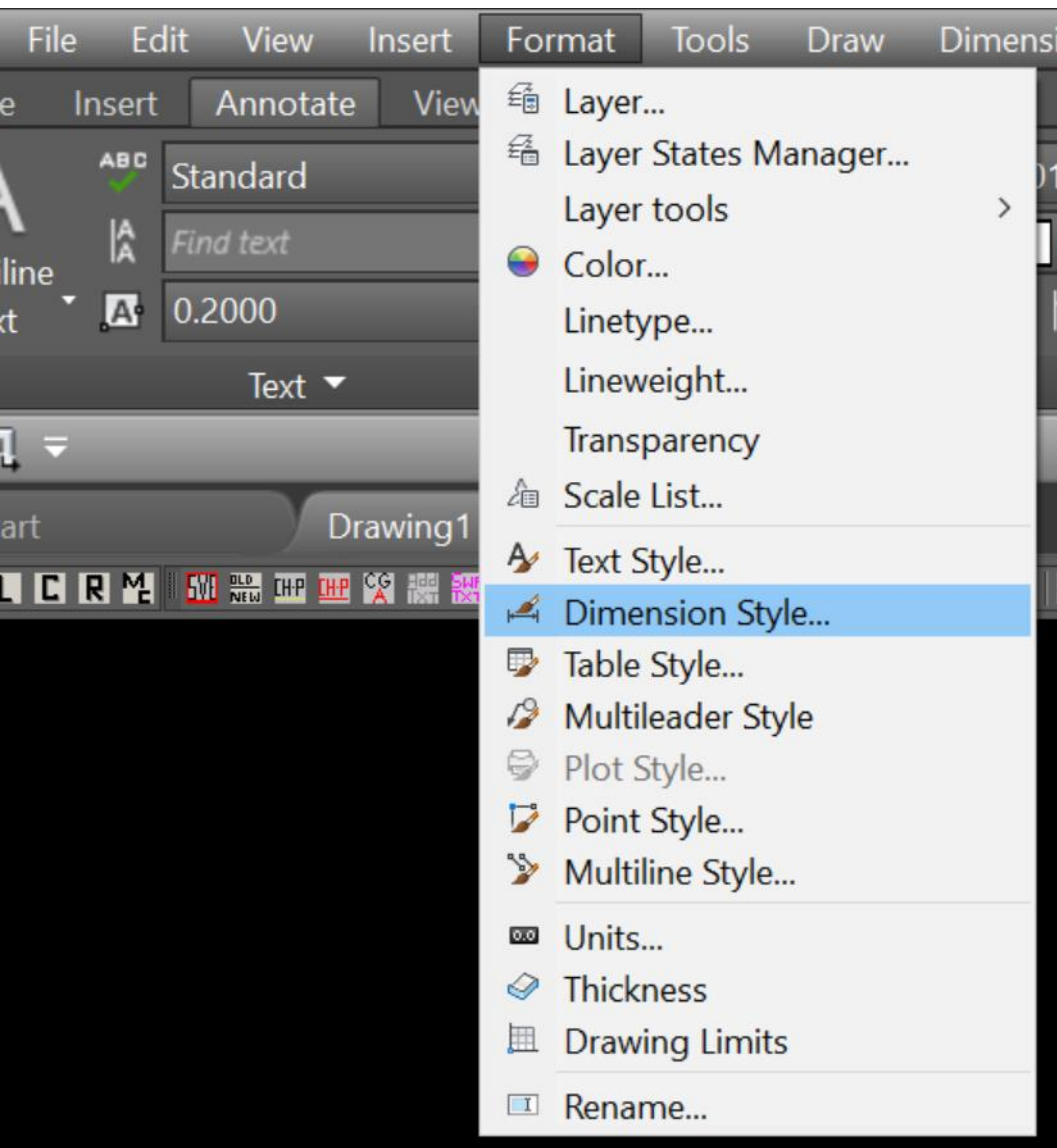


# Dimension Styles



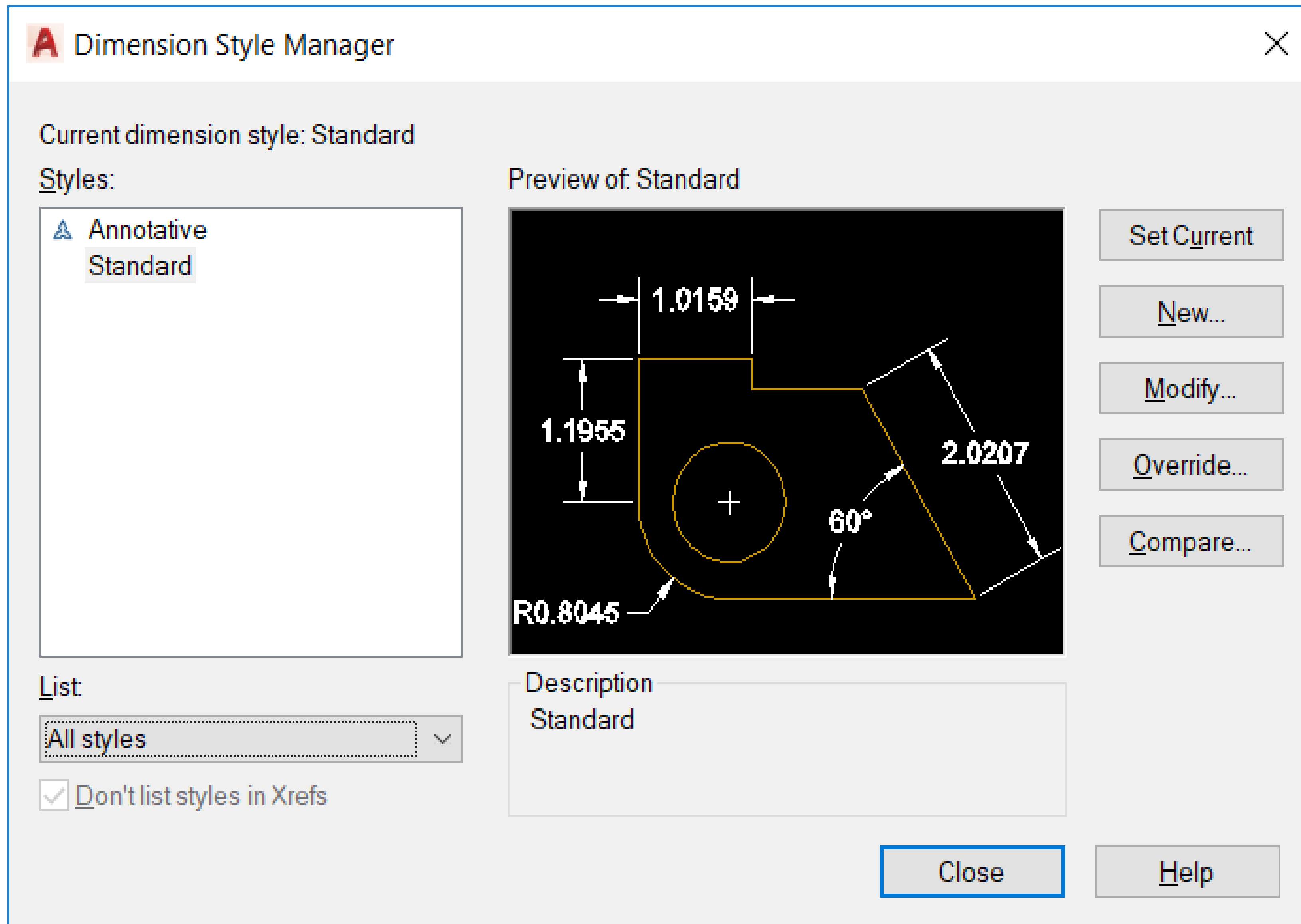


# How to Access the Dimension Style Manager



Type "dimsty" in the command window

# Dimension Style Manager





# Dimension Style Manager

**S**et **C**urrent

Sets currently selected dimension style used for new dimensions

**N**ew...

New Dimension Style Dialog Box

**M**odify...

Modify Dimension Style Dialog Box (Similar to New)

**O**verride...

Override Dimension Style Dialog Box (Similar to New)

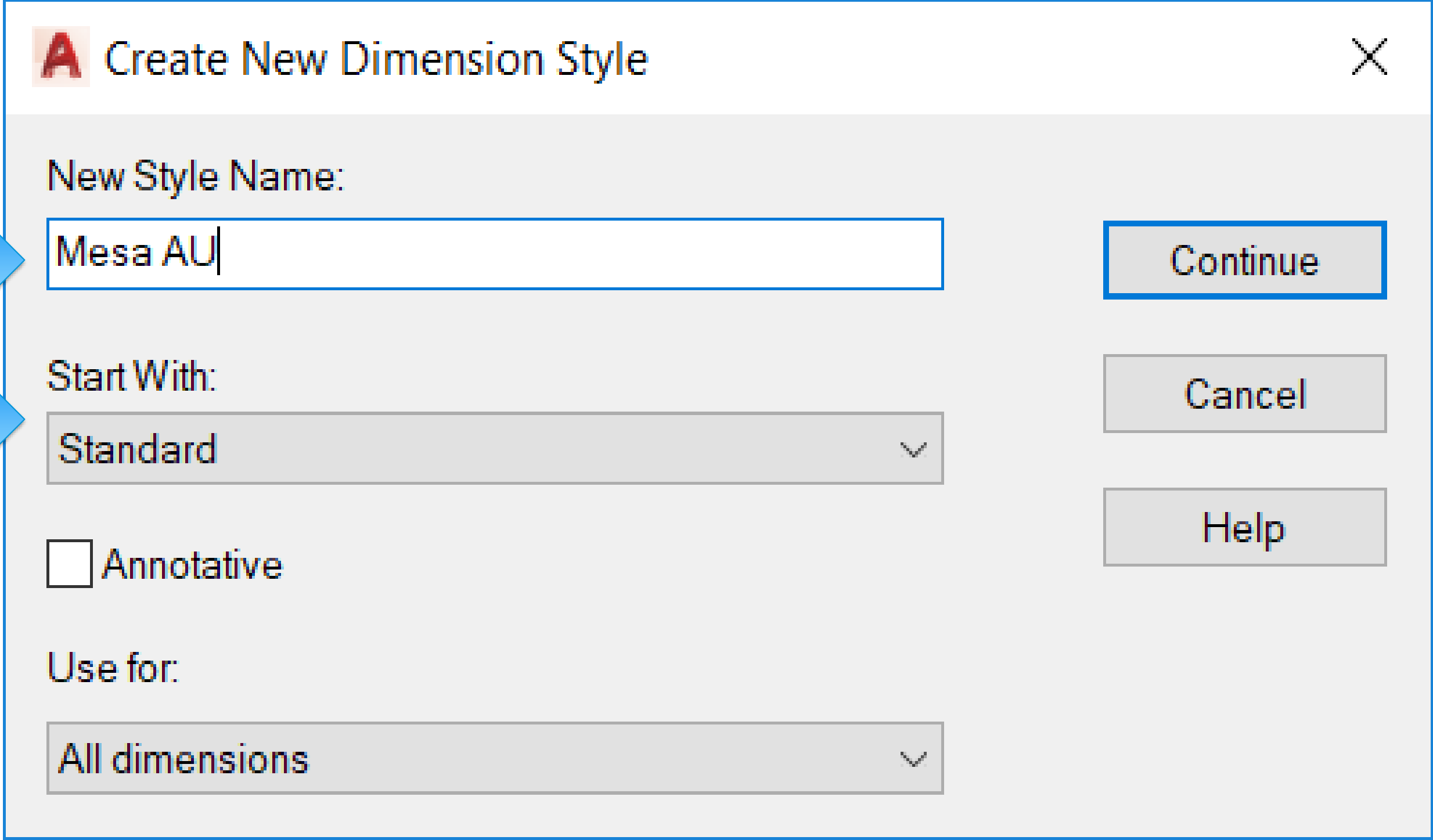
**C**ompare...

Compares two different dimension styles

# New Dimension Style Dialog

Name of Style to be Defined →

Baseline for New Style →



**A** Create New Dimension Style

New Style Name:  
Mesa AU

Start With:  
Standard

☐ Annotative

Use for:  
All dimensions

Continue

Cancel

Help

# New Dimension Style Dialog - Lines

Adjust dimension line and  
extension line properties

**A** New Dimension Style: Mesa AU

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

Dimension lines

Color: ☐ ByBlock

Linetype: ☐ ByBlock

Lineweight: ☐ ByBlock

Extend beyond ticks: 0.0000

Baseline spacing: 0.3800

Suppress: ☐ Dim line 1 ☐ Dim line 2

Extension lines

Color: ☐ ByBlock

Linetype ext line 1: ☐ ByBlock

Linetype ext line 2: ☐ ByBlock

Lineweight: ☐ ByBlock

Suppress: ☐ Ext line 1 ☐ Ext line 2

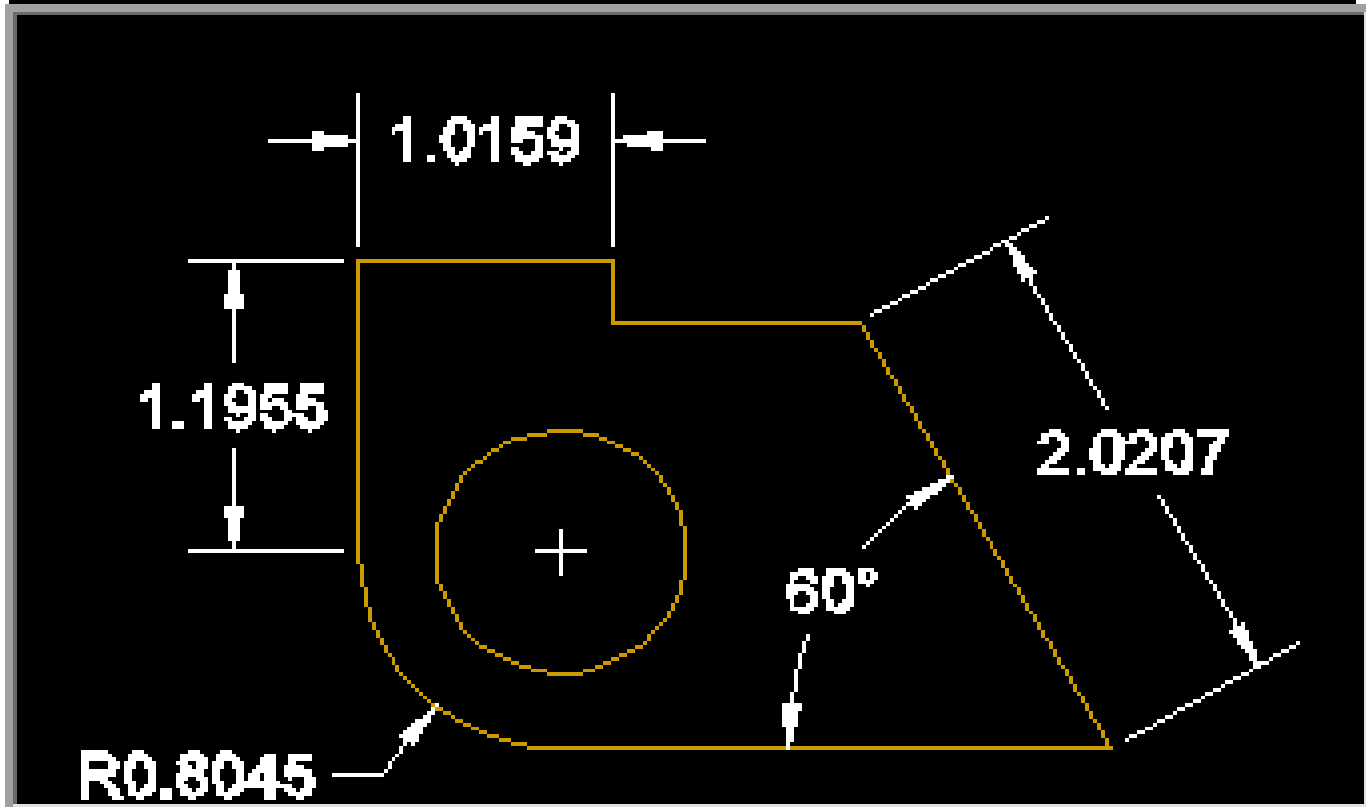
Extend beyond dim lines: 0.1800

Offset from origin: 0.0625

☐ Fixed length extension lines

Length: 1.0000

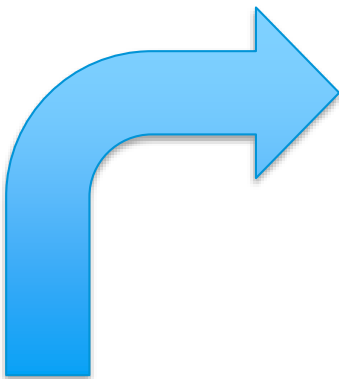
OK Cancel Help



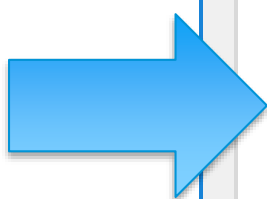
The preview shows a mechanical part with several dimensions: a horizontal dimension of 1.0159, a vertical dimension of 1.1955, a circular feature with a radius of R0.8045, a 60-degree angle, and a slanted dimension of 2.0207. The dimension lines and extension lines are shown in a light blue color.



# New Dimension Style Dialog – Symbols and Arrows



Arrowhead properties  
Type and Size



Leader:

- Closed filled
- Closed filled
- Closed blank
- Closed
- Dot
- Architectural tick
- Oblique
- Open
- Origin indicator
- Origin indicator 2
- Right angle
- Open 30
- Dot small
- Dot blank
- Dot small blank
- Box
- Box filled
- ◁ Datum triangle
- ◀ Datum triangle filled
- ↗ Integral
- None
- User Arrow...

New Dimension Style: Mesa AU

LinesSymbols and ArrowsTextFitPrimary UnitsAlternate UnitsTolerances

Arrowheads

First:  
➤ Closed filled

Second:  
➤ Closed filled

Leader:  
➤ Closed filled

Arrow size:  
0.1800

Center marks

☐ None

☒ Mark

☐ Line

0.0900

Dimension Break

Break size:  
0.1250

Arc length symbol

☒ Preceding dimension text

☐ Above dimension text

☐ None

Radius jog dimension

Jog angle:  
45

Linear jog dimension

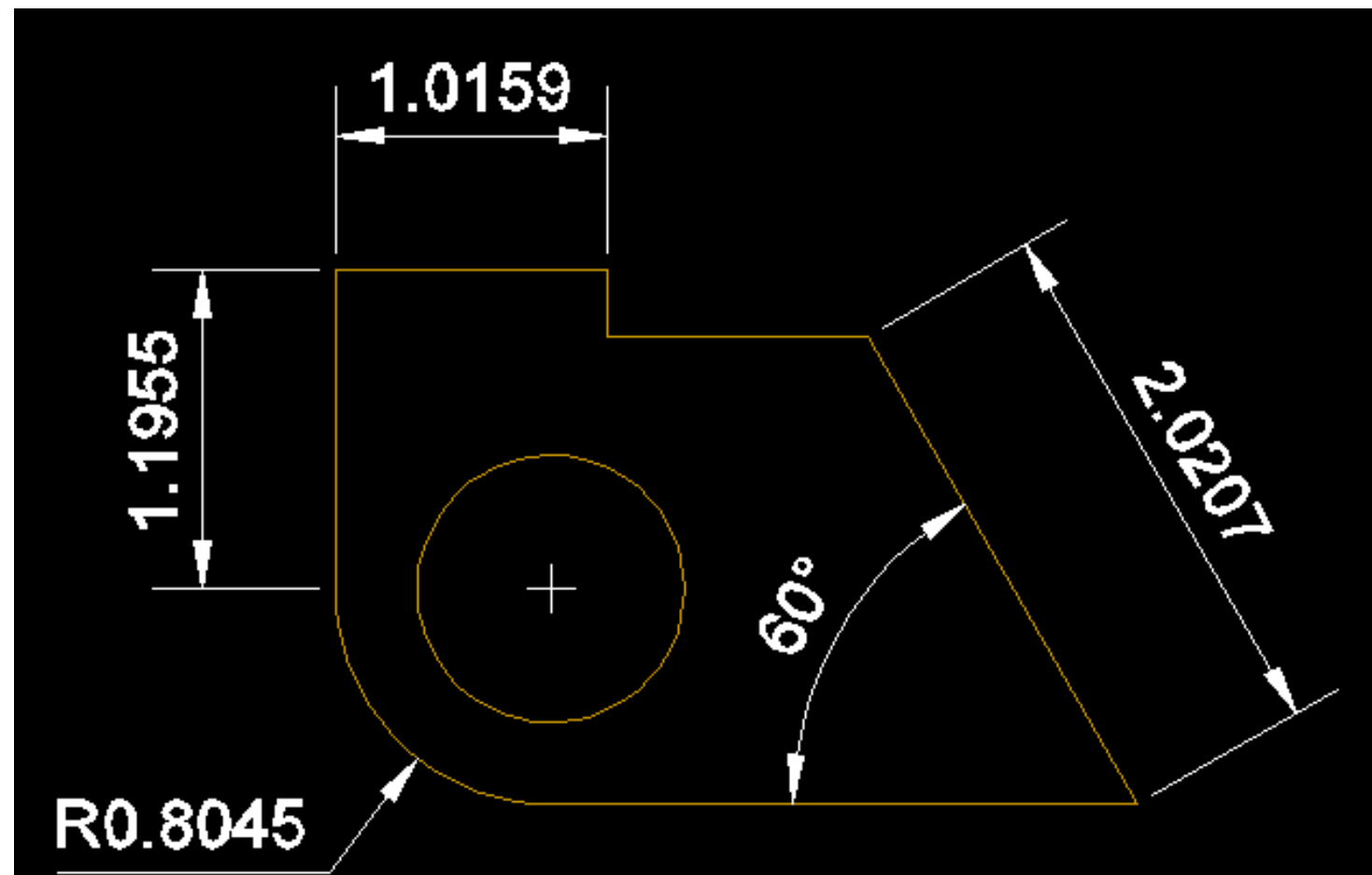
Jog height factor:  
1.5000 \* Text height

OK

Cancel

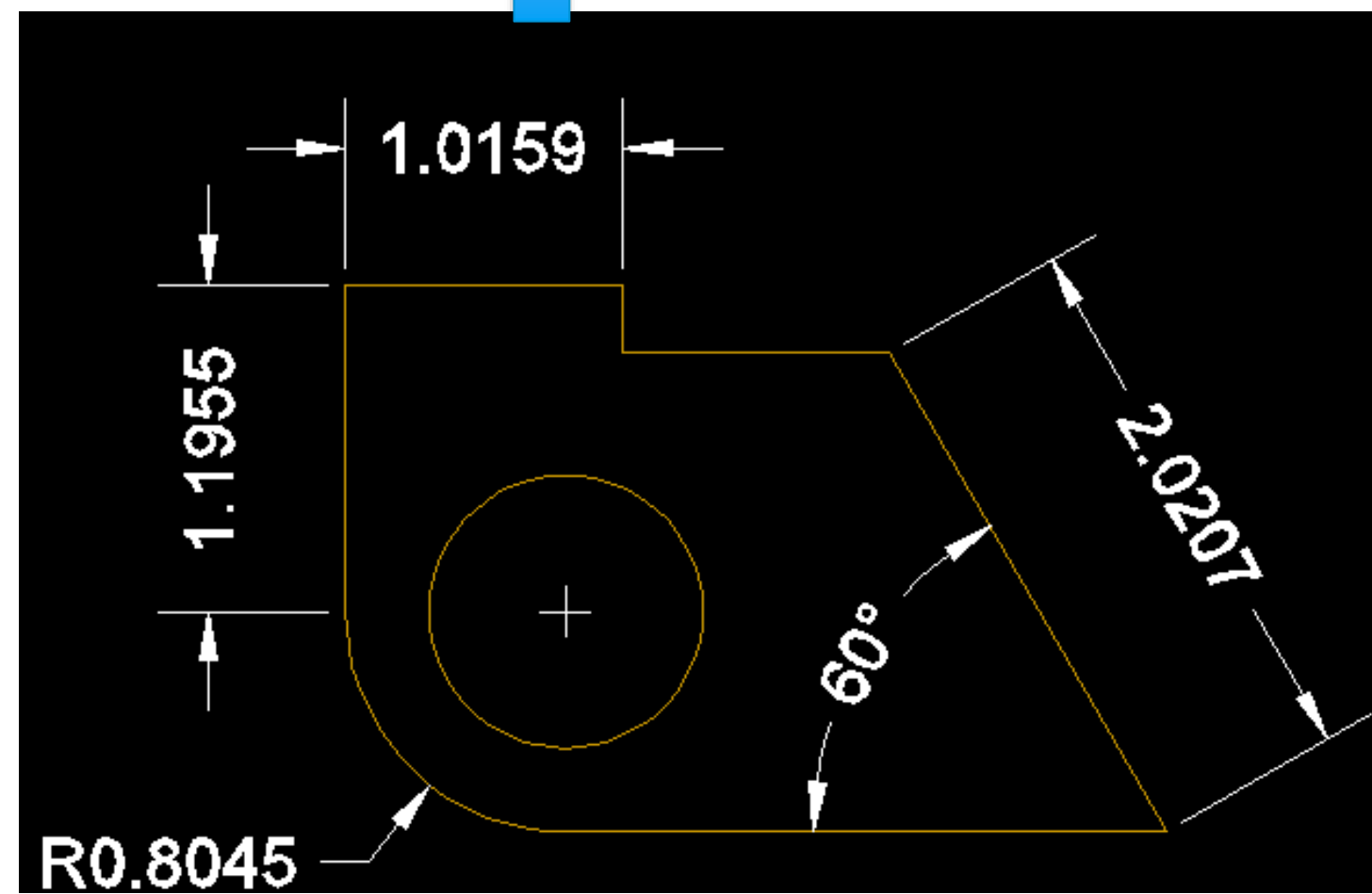
Help

# New Dimension Style Dialog – Text



Vertical - Above

Vertical - Centered



Text  
Properties  
(Style)

Text  
Placement

**New Dimension Style: Mesa AU**

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

**Text appearance**

Text style: Standard

Text color: ☐ ByBlock

Fill color: ☐ None

Text height: 0.1800

Fraction height scale: 1.0000

☐ Draw frame around text

**Text placement**

Vertical: Centered

Horizontal: Centered

View Direction: Left-to-Right

Offset from dim line: 0.0900

**Text alignment**

☒ Horizontal

☐ Aligned with dimension line

☐ ISO standard

OK Cancel Help

# New Dimension Style Dialog - Fit

Selection of component which will be relocated if fitment doesn't allow

Text placement when fitment doesn't allow default location

**New Dimension Style: Mesa AU**

Lines Symbols and Arrows **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
- ☐ Scale dimensions to layout
- ☒ Use overall scale of: 1.0000

**Fine tuning**

- ☐ Place text manually
- ☐ Draw dim line between ext lines

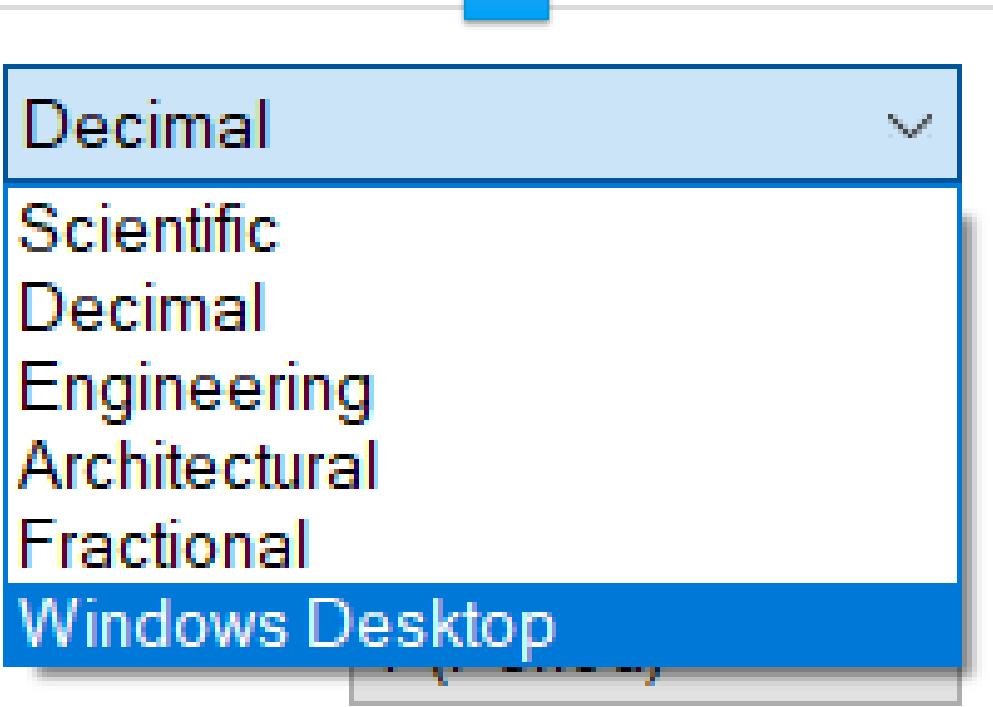
OK Cancel Help

All size related variables are multiplied by this overall scale factor (DIMSCALE)

TIP: DIMSCALE is typically the first step for dimension styles and should be set as family wide variable



# New Dimension Style Dialog – Primary Units



Selection of linear dimension Primary Units

Linear dimension scale factor.

**A** New Dimension Style: Mesa AU

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

Linear dimensions

Unit format: Decimal

Precision: 0.0000

Fraction format: Horizontal

Decimal separator: '.' (Period)

Round off: 0.0000

Prefix:

Suffix:

Measurement scale

Scale factor: 1.0000

☐ Apply to layout dimensions only

Zero suppression

☐ Leading ☐ Trailing

Sub-units factor: 100.0000

Sub-unit suffix:

☒ 0 feet ☒ 0 inches

Angular dimensions

Units format: Decimal Degrees

Precision: 0

Zero suppression

☐ Leading ☐ Trailing

OK Cancel Help

# New Dimension Style Dialog – Alternate Units

**A** New Dimension Style: Mesa AU

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: 0.0000

Prefix:

Suffix:

Zero suppression

☐ Leading ☐ Trailing

Sub-units factor: 100.0000

Sub-units suffix:

☒ 0 feet ☒ 0 inches

Placement

☒ After primary value ☐ Below primary value

1.1955 [30.37]

1.0159 [25.80]

2.0207 [51.33]

60°

R0.8045 [R20.44]

OK Cancel Help

# New Dimension Style Dialog – Tolerances

**A** New Dimension Style: Mesa AU

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

**Tolerance format**

Method: Limits

Precision: 0.00

Upper value: 0.0000

Lower value: 0.0000

Scaling for height: 1.0000

Vertical position: Top

**Tolerance alignment**

☐ Align decimal separators

☒ Align operational symbols

**Zero suppression**

☐ Leading ☒ 0 feet

☐ Trailing ☒ 0 inches

**Alternate unit tolerance**

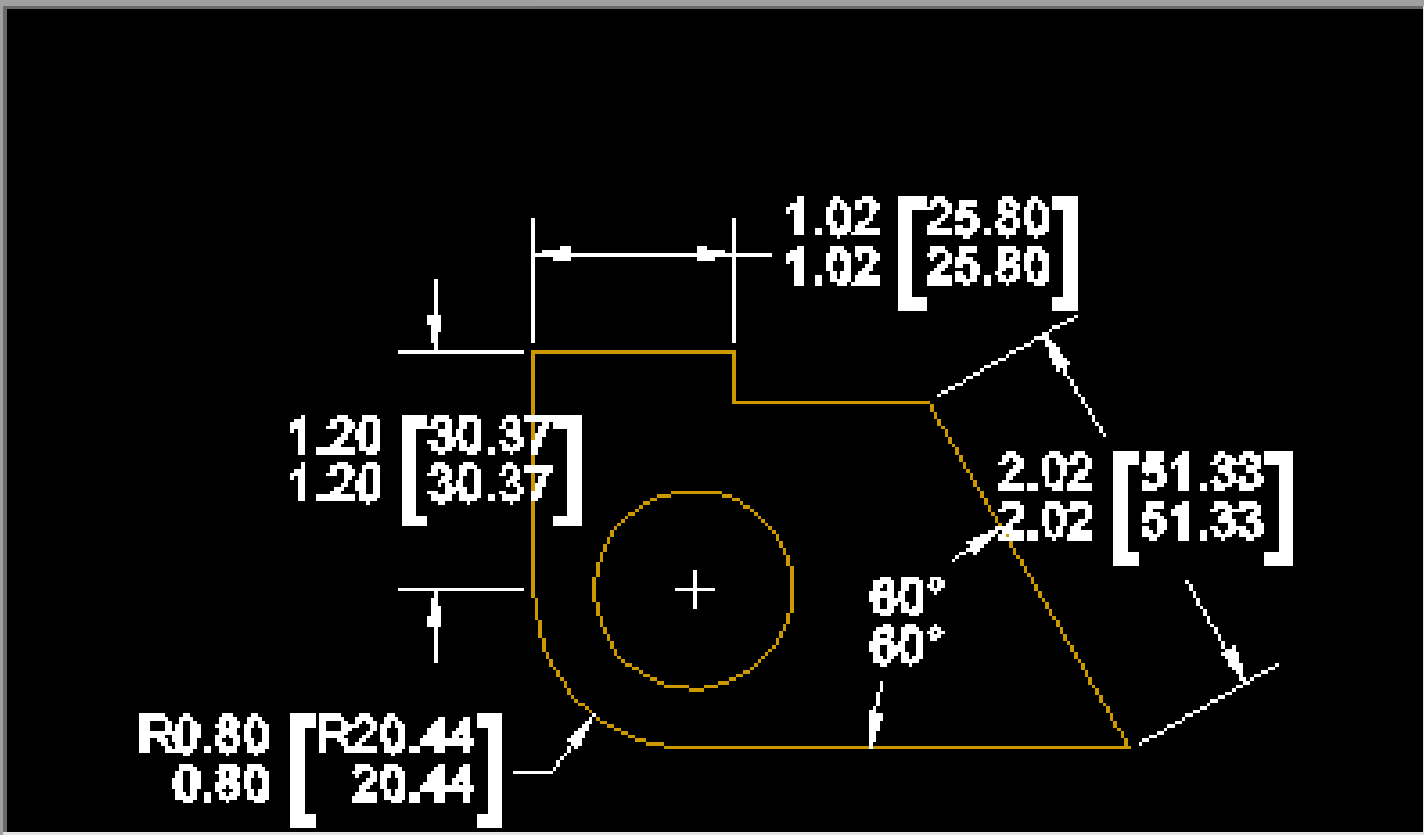
Precision: 0.00

**Zero suppression**

☐ Leading ☒ 0 feet

☐ Trailing ☒ 0 inches

OK Cancel Help



The technical drawing shows a mechanical part with the following dimensions and tolerances:

- Horizontal dimension: 1.02 [25.80]
- Vertical dimension: 1.20 [30.37]
- Diagonal dimension: 2.02 [51.33]
- Radius: R0.80 [20.44]
- Angle: 60°



# Dimension Style Manager – Modify and Override

Set Current

New...

Modify...

Override...

Compare...

These dialogs are identical to “New” Dimension Style Dialog

- Modify: Change of dimension variables which applies to new as well as updates existing dimensions
- Override: Change of dimension variables which only applies to new dimensions. Therefore, it does not update existing dimensions.

TIP: Style overrides can be saved to the dimension style by using the right click shortcut menu if desired to be permanent

# Dimension Style Manager – Compare

Indicates number of difference between dimension styles as well as detailed listing of differences



Compare Dimension Styles

Compare:

Standard

With:

Mesa AU

AutoCAD found 10 differences:

Description	Variable	Standard	Mesa AU
Arrow size	DIMASZ	0.1800	0.1250
Dim line color	DIMCLRD	BYBLOCK	1 (red)
Ext line color	DIMCLRE	BYBLOCK	1 (red)
Fraction format	DIMFRAC	0	1
Length units	DIMLUNIT	2	4
Precision	DIMDEC	4	3
Text color	DIMCLRT	BYBLOCK	2 (yellow)
Text style	DIMTXSTY	Standard	Mesa AU
Tol precision	DIMTDEC	4	3
Tol text scale factor	DIMTFAC	1.0000	0.7000

Close

Help



Copy comparison results to clipboard

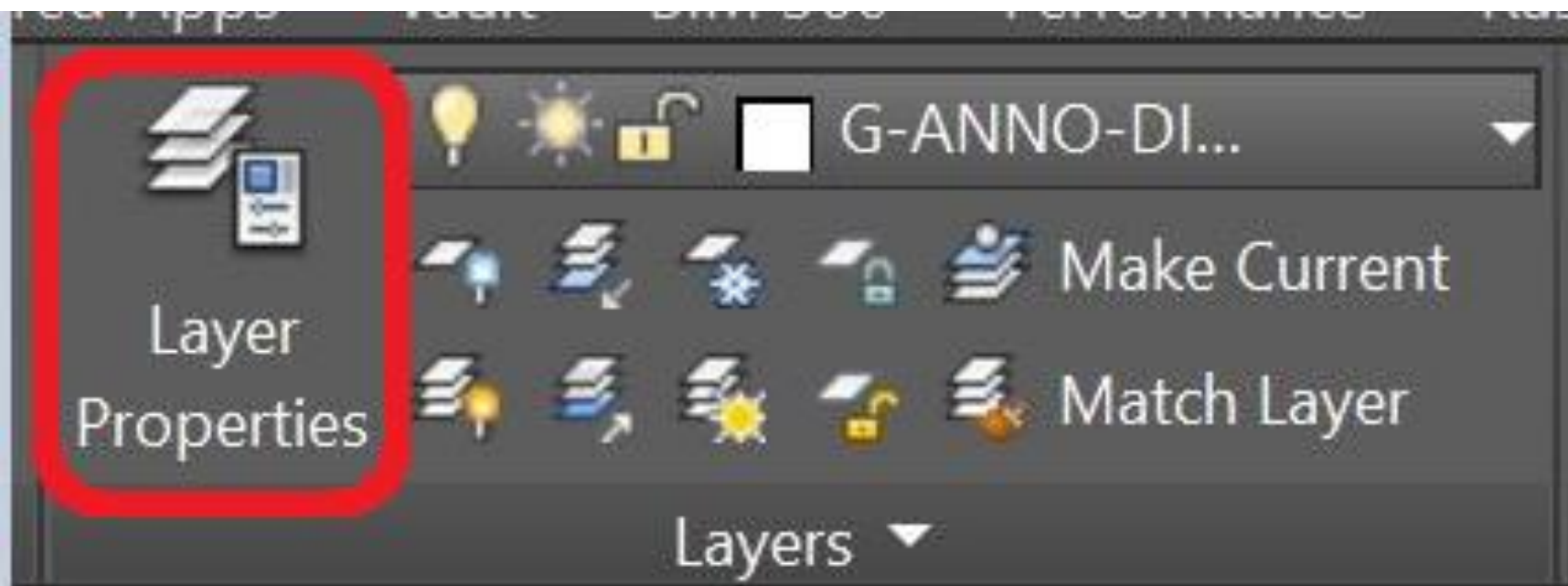
TIP: Select desired dimension style and compare with NONE to displace full listing of variables and settings for one dimension style

# Layer Properties



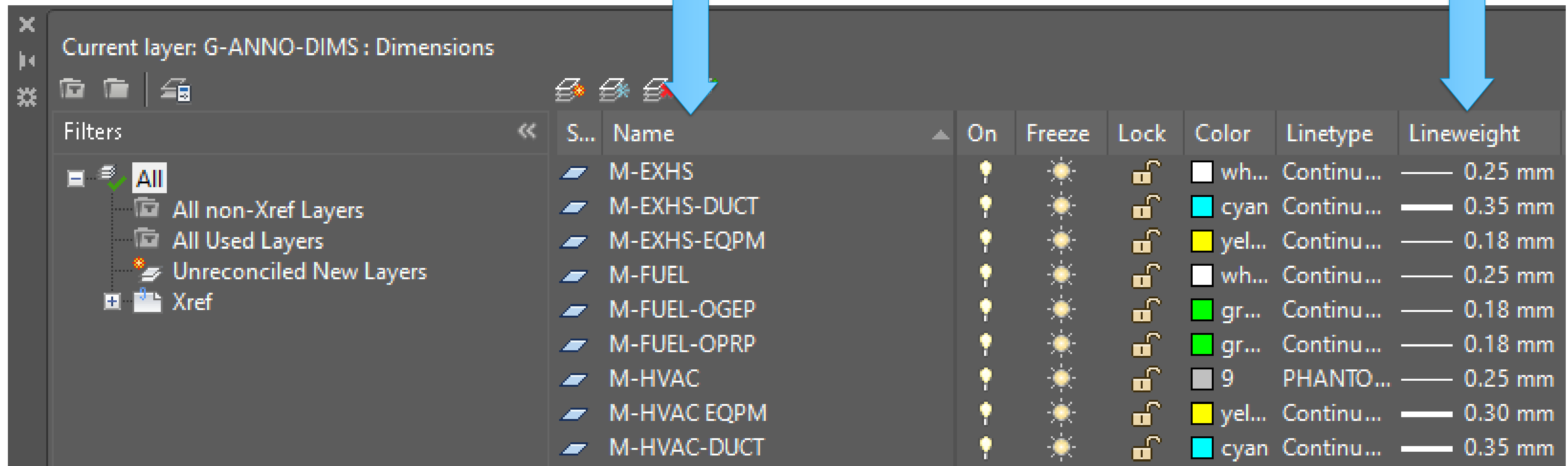


# How to access the layer properties manager



If you click on a heading, the column will sort ascending or descending.

If you do not want to display any of these settings, right click on the heading and uncheck the check box beside the heading



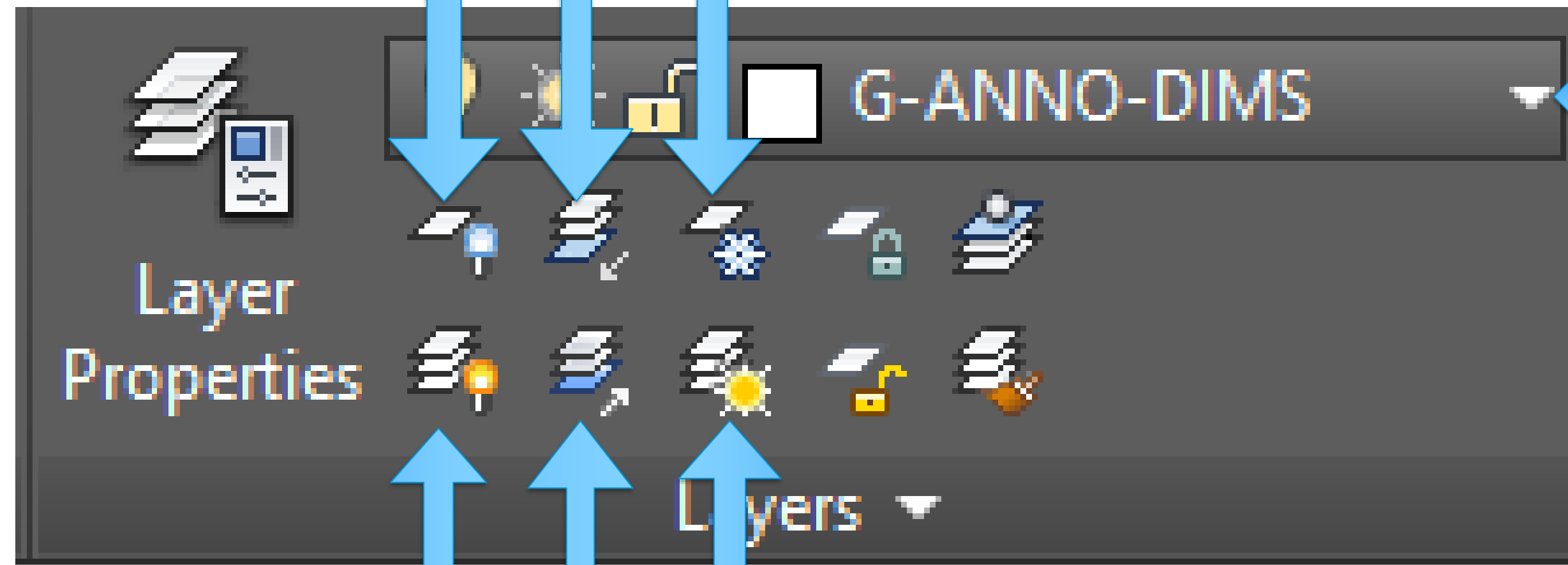
# Layer Options

Isolate - Hides or locks all layers except for those of the selected objects

Off - Turns off the layer of the object that is selected

Freeze the layer of selected objects

Current layer



TIP: AutoCAD still sees objects that are on an “OFF” layer but does not see those objects if the layer is “Frozen”. Therefore, regens are faster if layers are frozen. Also, you can turn off the current layer, but you can not freeze the current layer.

Turn on all layers in the drawing (except for the frozen layers)

Unisolate - Restores all layers that were hidden or locked

Thaws all layers in the drawing

# Layer Properties Demonstration



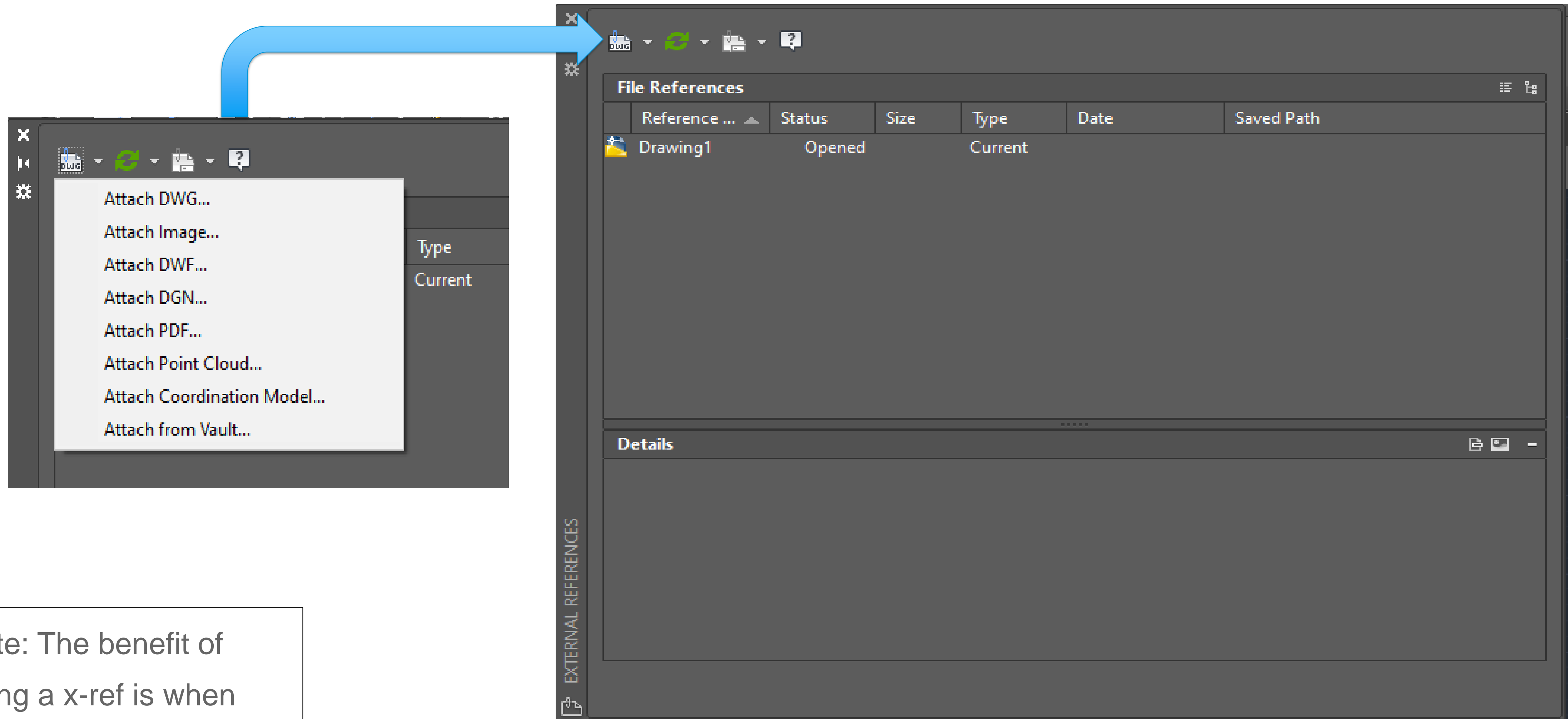


# External References





# External References



Note: The benefit of using a x-ref is when the referenced drawing changes, it will update the current drawing.

- Type "XREF", "EXTERNALREFERENCES" or "XATTACH" in the command window
- Go to the "view" tab, then "palettes" panel, then "external references" palette
- Go to the "tools" menu, then click "palettes", then click "reference manager".

# External References

Attach External Reference

Name: civil Browse...

Preview

Scale

☐ Specify On-screen

X: 1.00

Y: 1.00

Z: 1.00

☐ Uniform Scale

Path type

Full path

Rotation

☐ Specify On-screen

Angle: 0

Reference Type

☒ Attachment ☐ Overlay

☐ Locate using Geographic Data

Insertion point

☒ Specify On-screen

X: 0.00

Y: 0.00

Z: 0.00

Block Unit

Unit: Inches

Factor: 1.0000

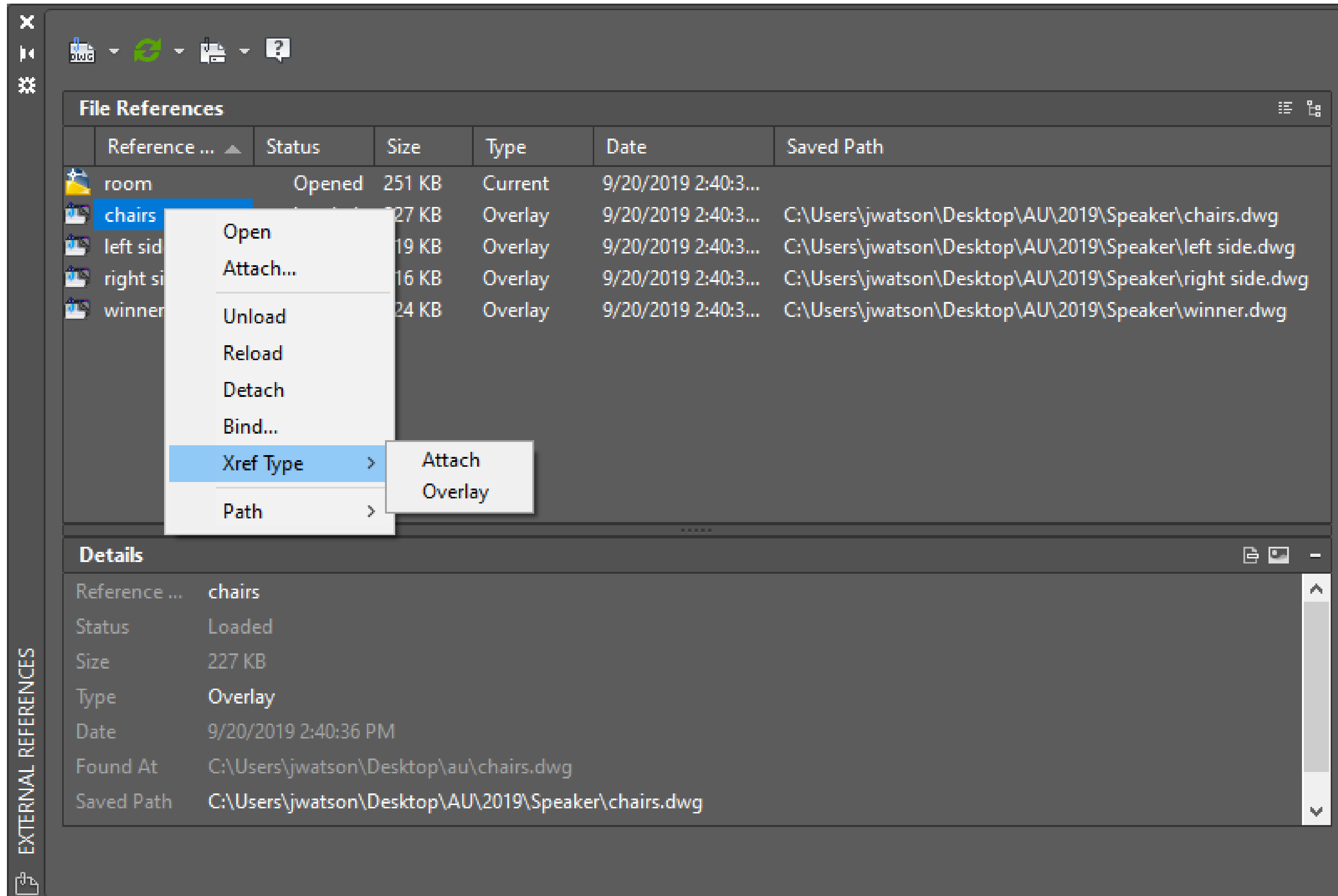
Show Details OK Cancel Help

Overlay is used when  
you just want to  
insert a drawing as  
reference.

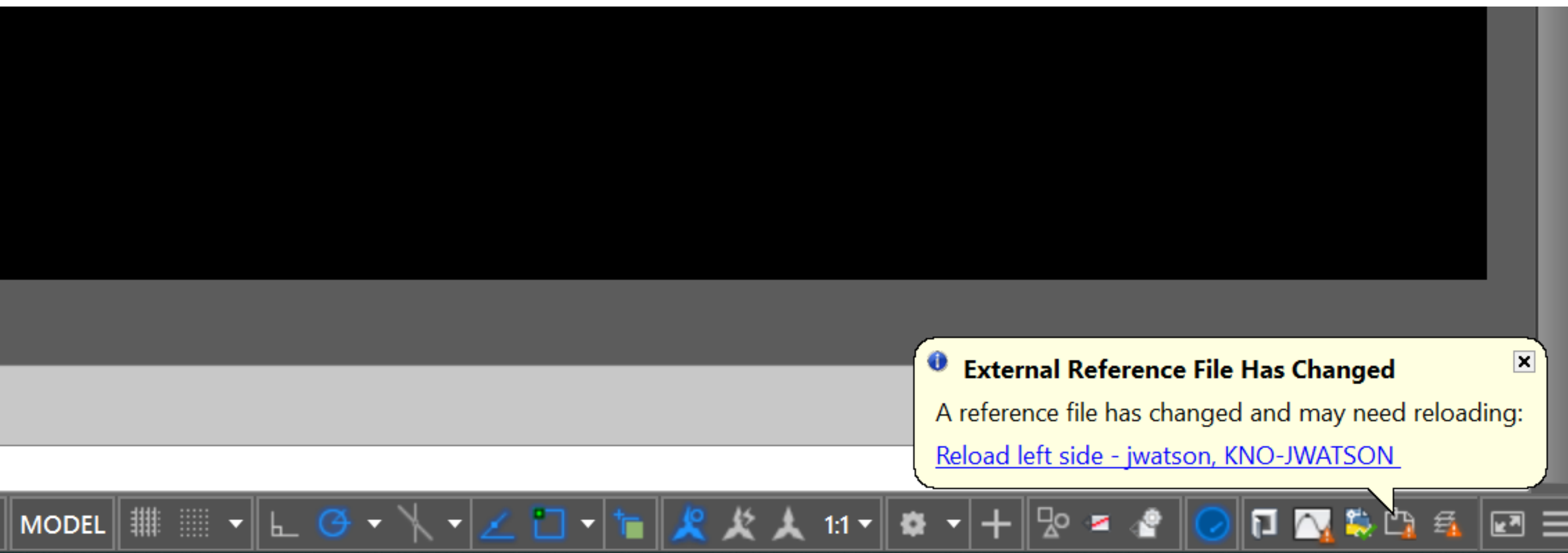
When you use the  
attachment option  
then the drawing  
becomes part of the  
master drawing.

Modify the path of  
the selected files.

# External References – How to Change the Type



# External References – Out of Date



A screenshot of the "File References" panel in a CAD software interface. The panel displays a table of external references. The table has columns for Reference Name, Status, Size, Type, Date, and Saved Path. The "left side" reference is highlighted with a yellow warning icon and the status "Needs reloading".

Reference Name	Status	Size	Type	Date	Saved Path
chairs	Opened	242 KB	Current	10/2/2019 4:46:4...	
left side	Needs reloading	219 KB	Overlay	11/15/2019 7:33:...	.\left side.dwg
right side	Loaded	218 KB	Overlay	10/2/2019 4:45:4...	.\right side.dwg
winner	Loaded	236 KB	Overlay	10/2/2019 4:46:2...	.\winner.dwg



# External Reference Demonstration

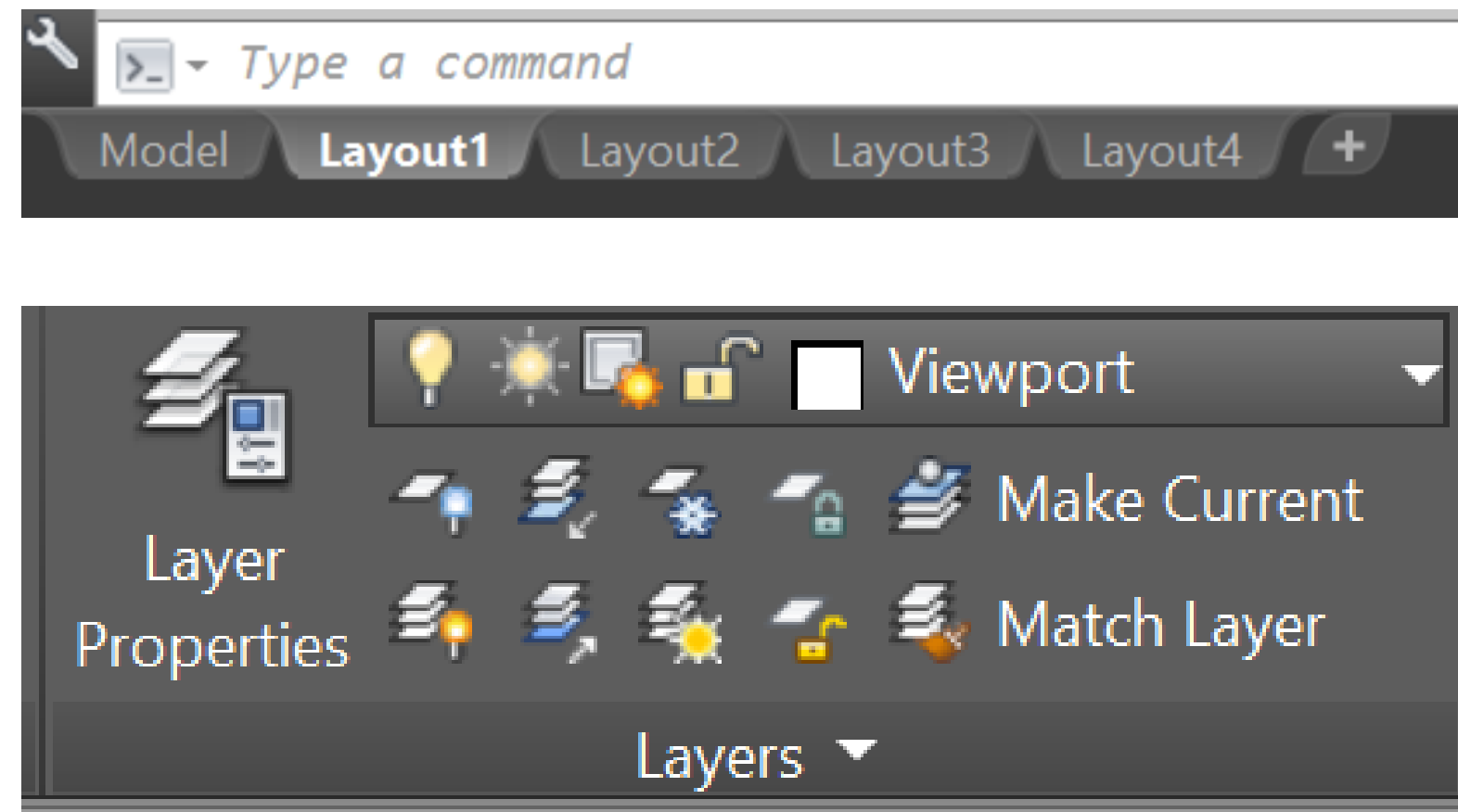


# Model Space vs. Paper Space

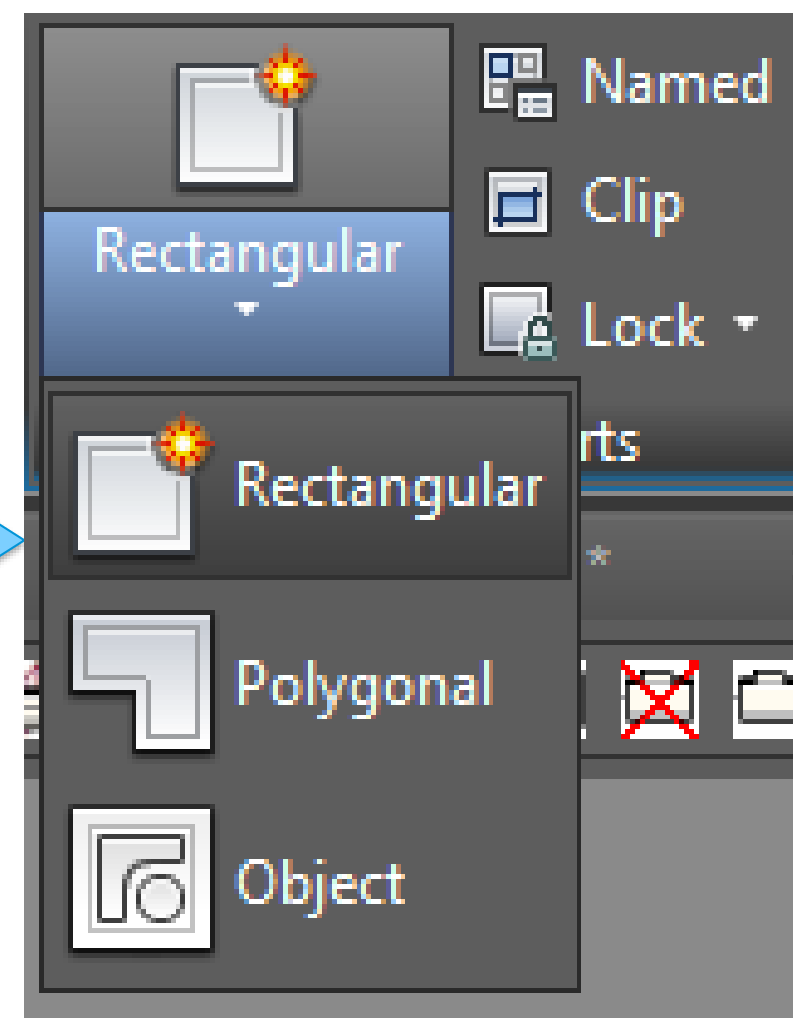
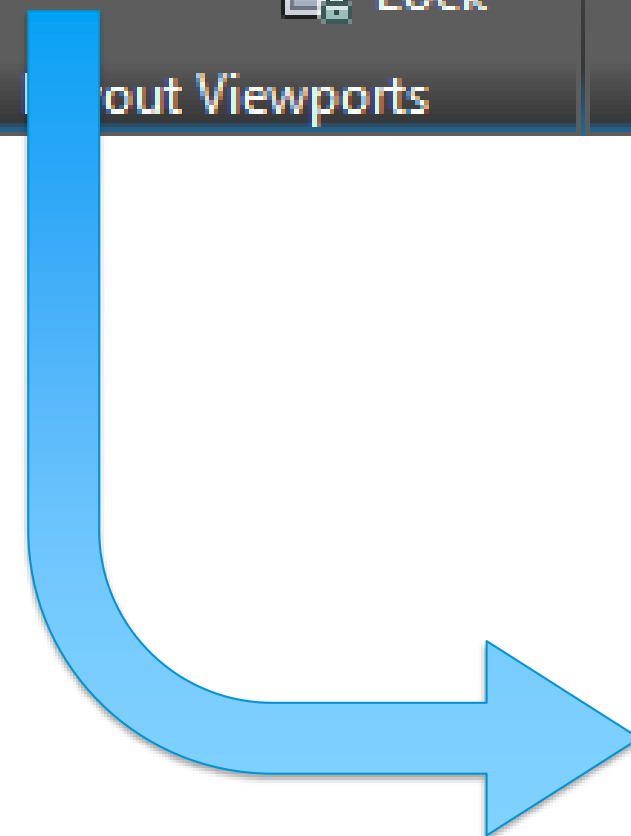
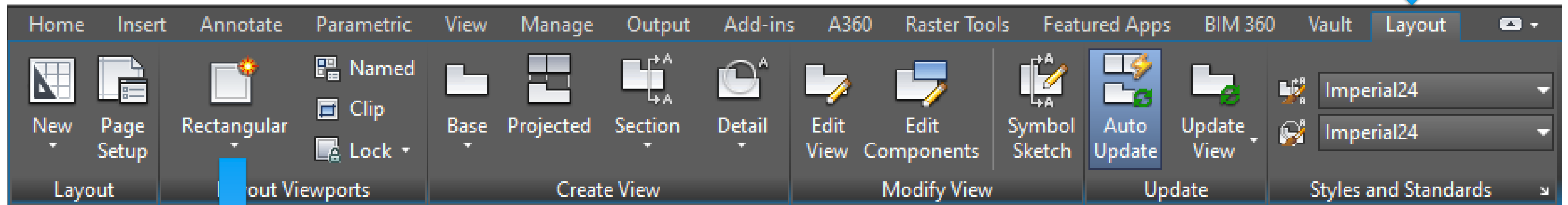
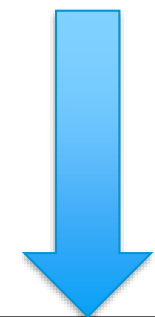


# Model Space vs. Paper Space – Creating a Viewport

- Select appropriate layout tab
- Make the layer current you want to viewport to show up on
- Select type of viewport
- Select boundaries for viewport



Layout tab appears only when you are in the layout tab





# Model Space vs. Paper Space – Creating a Viewport

Viewport

General

Color

ByLayer

Layer

G-ANNO-DIMS

Linetype

ByLayer

Linetype scale

1.000000

Plot style

ByColor

Lineweight

ByLayer

Transparency

ByLayer

Hyperlink

Geometry

Center X

1'-5 7/16"

Center Y

1'-7 3/4"

Center Z

0"

Height

1'-0 49/64"

Width

2'-3 3/32"

Misc

On

Yes

Clipped

No

Display locked

No

Annotation scale

1:1

Standard scale

1/4" = 1'-0"

Custom scale

1/64"

UCS per viewport

Yes

Layer property overrides

No

Visual style

2D Wireframe

Shade plot

As Displayed

Linked to Sheet View

No

Scale to fit

1:1

1:2

1:4

1:5

1:8

1:10

✓ 1:16

1:20

1:30

1:40

1:50

1:100

2:1

4:1

8:1

10:1

100:1

1/128" = 1'-0"

1/64" = 1'-0"

1/32" = 1'-0"

1/16" = 1'-0"

3/32" = 1'-0"

1/8" = 1'-0"

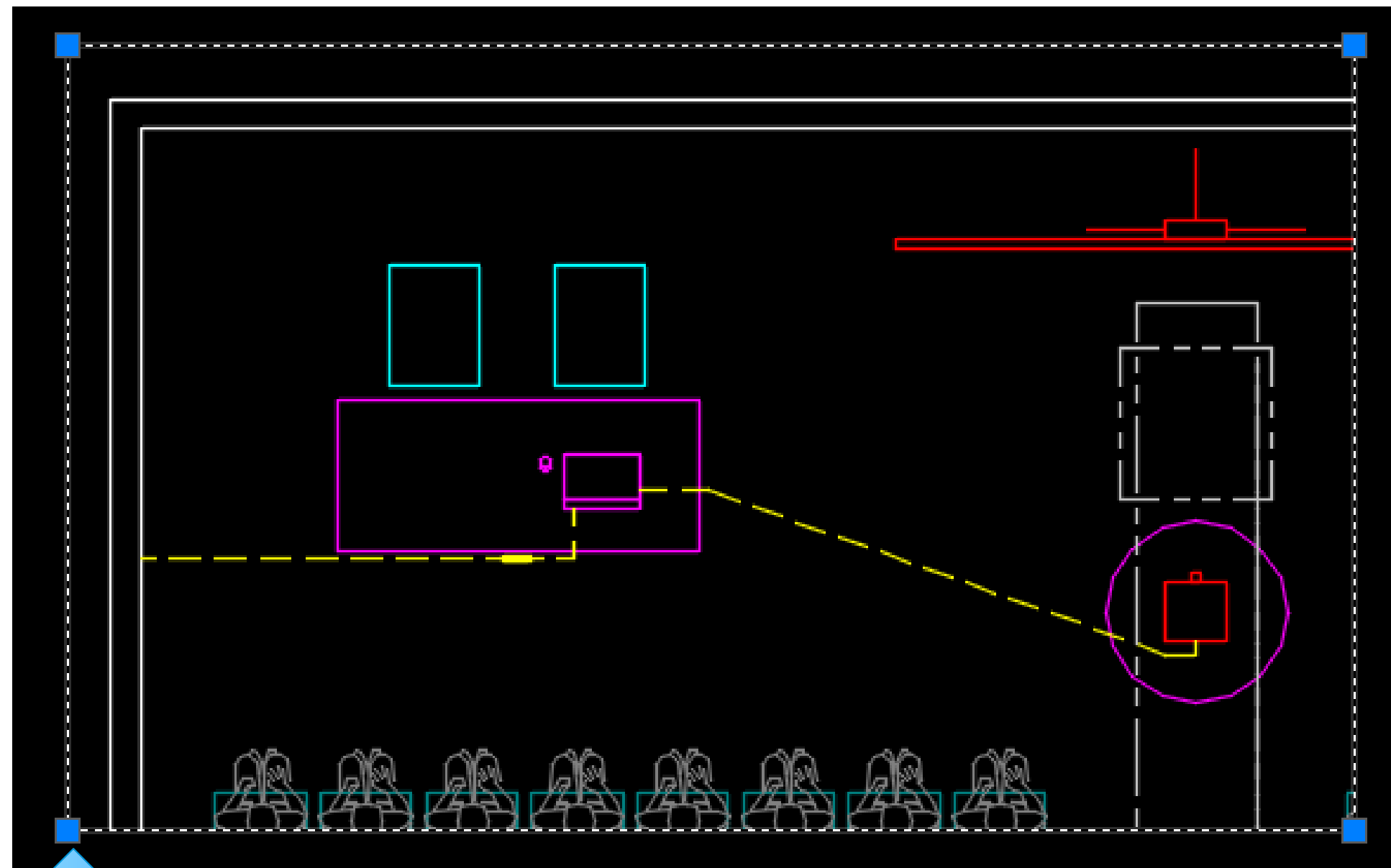
3/16" = 1'-0"

Select viewport scale

TIP: When the DIMASSOC system variable is set to “2”, dimensions will automatically apply the required scale factor in paperspace dimensions. Dimensions are associated with the geometric object in model space.



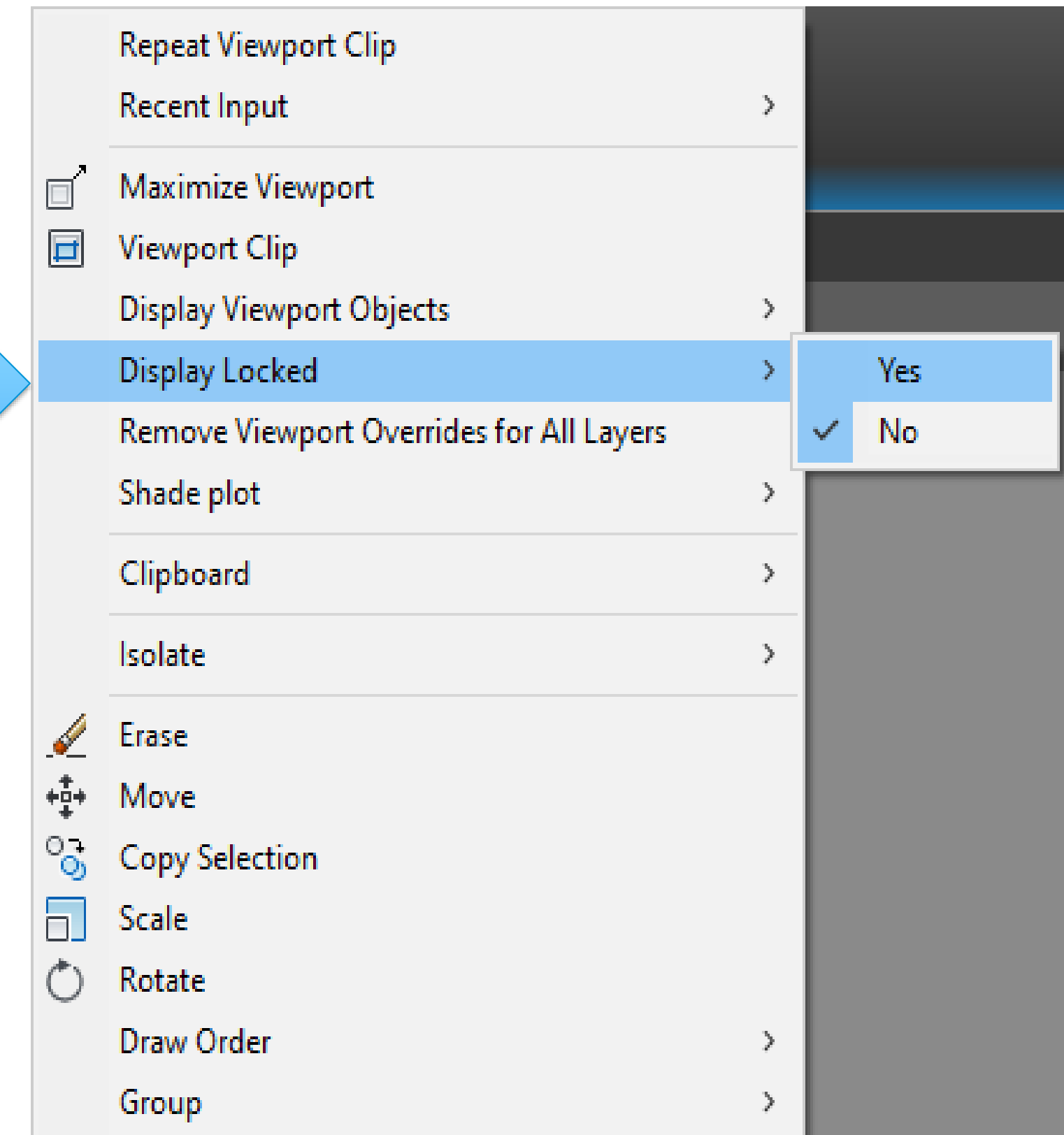
# Model Space vs. Paper Space – Creating a Viewport



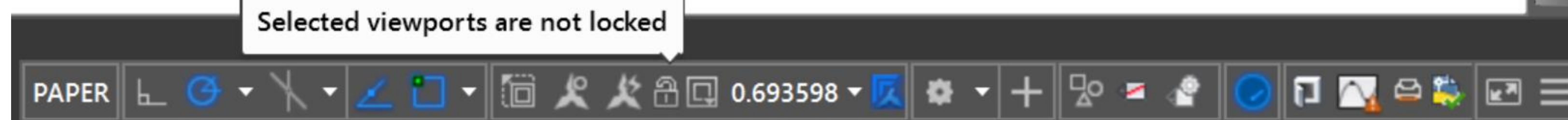
Modify size of viewport by the grips and move viewport with move command


Misc	
On	Yes
Clipped	No
Display locked	No
Annotation scale	1:1
Standard scale	Custom
Custom scale	11/16"
UCS per viewport	Yes
Layer property overrides	No
Visual style	2D Wireframe
Shade plot	As Displayed
Linked to Sheet View	No

Lock viewport once it is set in your drawing








































































Selected viewports are not locked



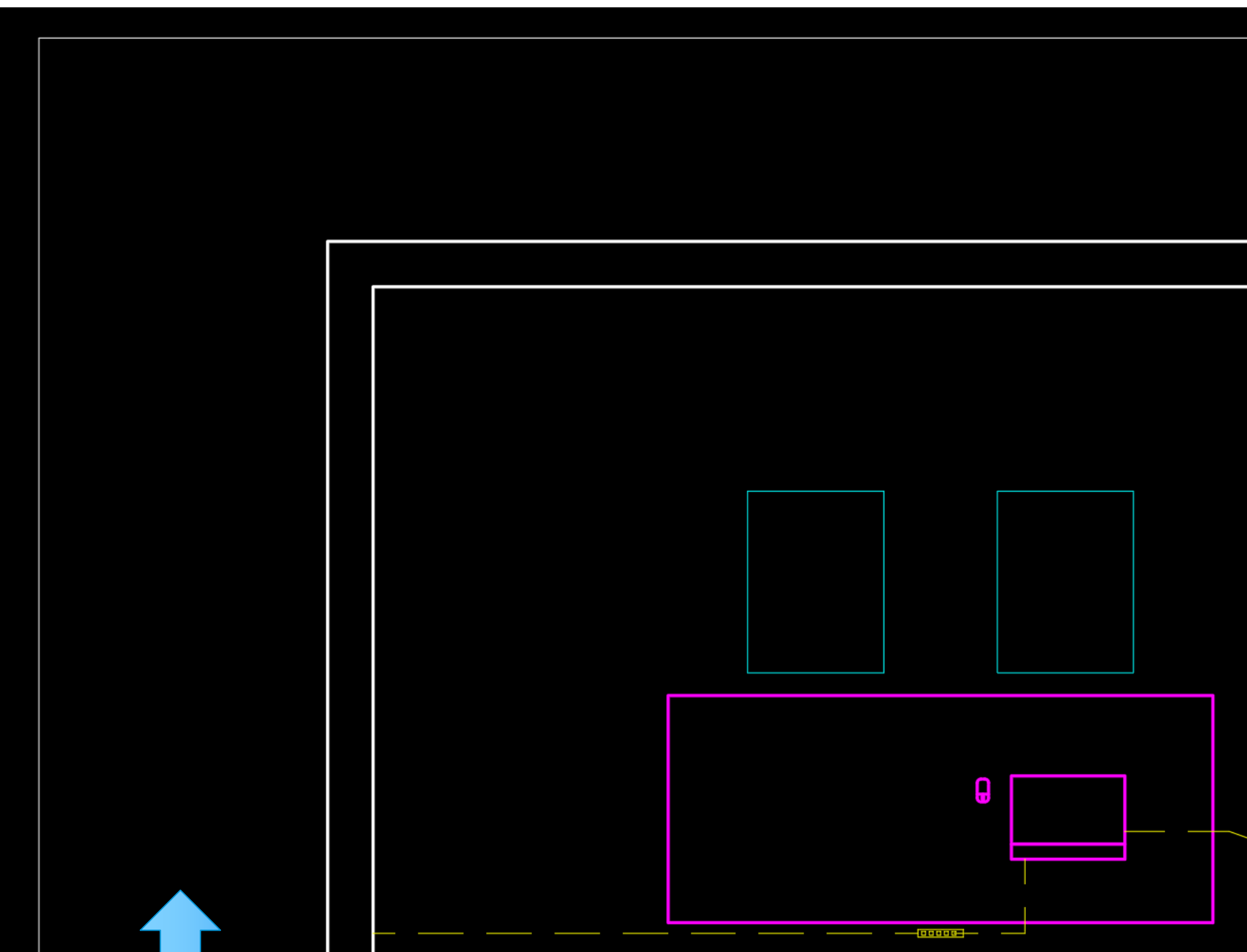
A		B		C		D					
8							REVISION				8
							REV	DESCRIPTION	DATE	DRAWN	
							0	ISSUED FOR CONSTRUCTION			
7	<div>NEW VIEWPORT</div>										7
6											6
5											5
4											4
3											3
2											2
1											1
A											B
UNLESS OTHERWISE SPECIFIED				SIGNATURES		DATE		<div> MESA ASSOCIATES, INC. ENGINEERS AND CONSULTANTS 10824 MURDOCK DRIVE KNOXVILLE, TN 37932 (865) 671-5409</div>		1	
<div>DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± .06 3 PL DECIMALS ± .025 ANGLES ± 5° FRACTIONS ± 1/32</div> <div>THIS DRAWING CONTAINS PROPRIETARY INFORMATION WHICH IS TO BE HELD CONFIDENTIAL AND MAY NOT BE REPRODUCED OR DISCLOSED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF MESA ASSOCIATES, INC. OR DULY AUTHORIZED REPRESENTATIVE THEREOF.</div>				DRAWN MESA							
				CHECKED MESA							
				APPROVED							
				PROJ ENGR		AU PAPERSPACE EXAMPLE					
				PROJ MGR							
				USE CLIENT DWS NO		SIZE	PRODUCT ID	DWS NO.	REV		
				N/A		A	PRODID	AU PAPERSPACE	0		
				SCALE		NONE		PROJECT NO.	000	SHEET 1 OF 1	

# Model Space vs. Paper Space – Manipulating Layers in Viewports

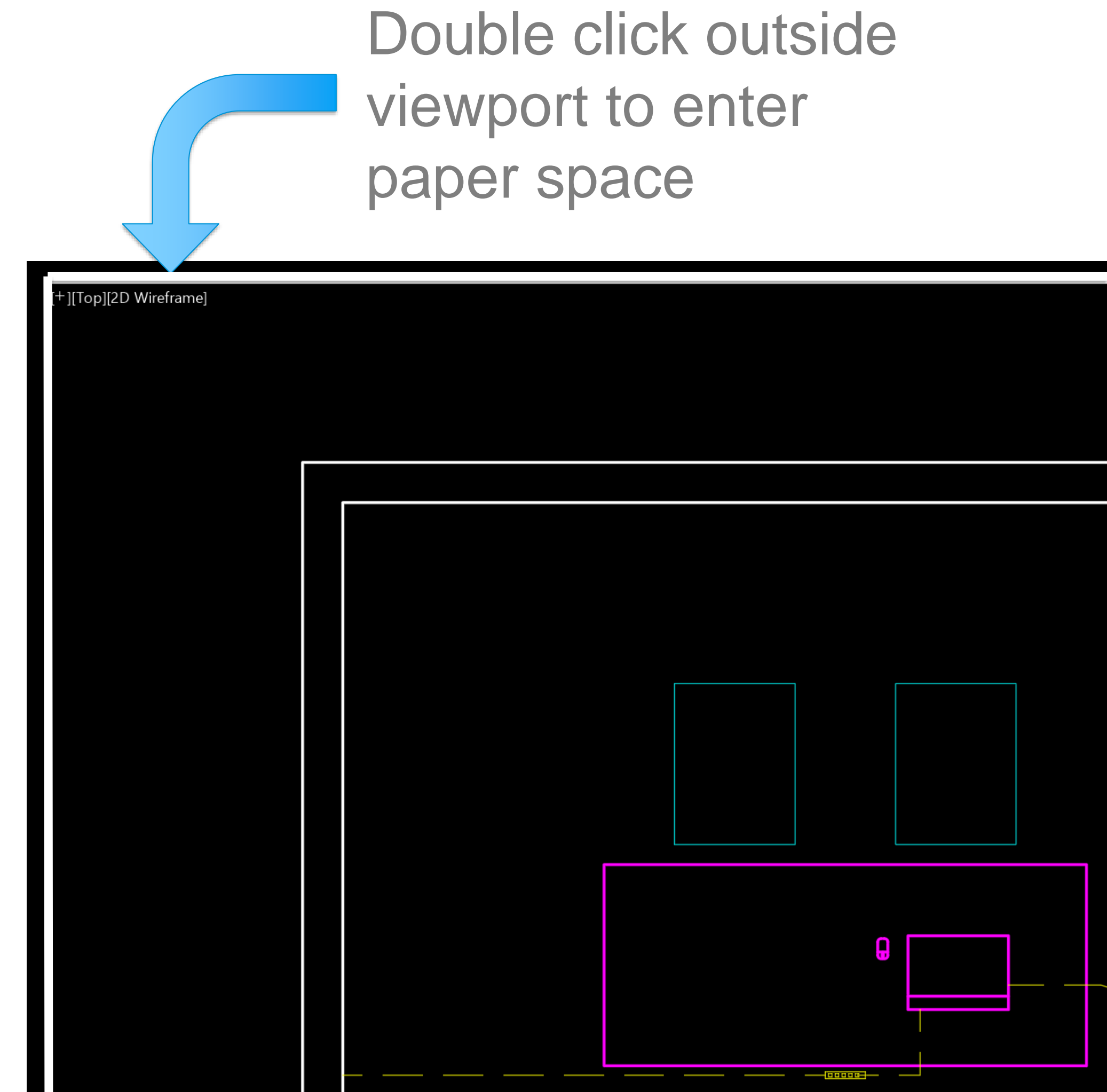
New VP Freeze	VP Freeze	VP Color	VP Linet...	VP Linew...
		 white	Continu...	— Defa...
		 cyan	Continu...	— 0.18...
		 magenta	Continu...	— 0.35...
		 red	Continu...	— 0.35...
		 white	Continu...	— 0.35...
		 white	Continu...	— Defa...
		 magenta	Continu...	— Defa...
		 cyan	Continu...	— 0.18...
		 magenta	Continu...	— 0.35...
		 red	Continu...	— 0.35...
		 white	Continu...	— 0.35...
		 white	Continu...	— Defa...
		 magenta	Continu...	— Defa...
		 yellow	chairs D...	— 0.00...
		 white	Continu...	— 0.18...
		 white	Continu...	— 0.18...
		 red	Continu...	— 0.18...
		 white	Continu...	— 0.00...
		 white	Continu...	— 0.00...
		 white	Continu...	— 0.50...
		 white	Continu...	— 0.18...
		 cyan	Continu...	— 0.18...
		 white	Continu...	— 0.18...

- New VP Freeze
- VP Freeze
- VP Color
- VP Linetype
- VP Lineweight

# Model Space vs. Paper Space – Layout Tab



Double click inside viewport to enter model space

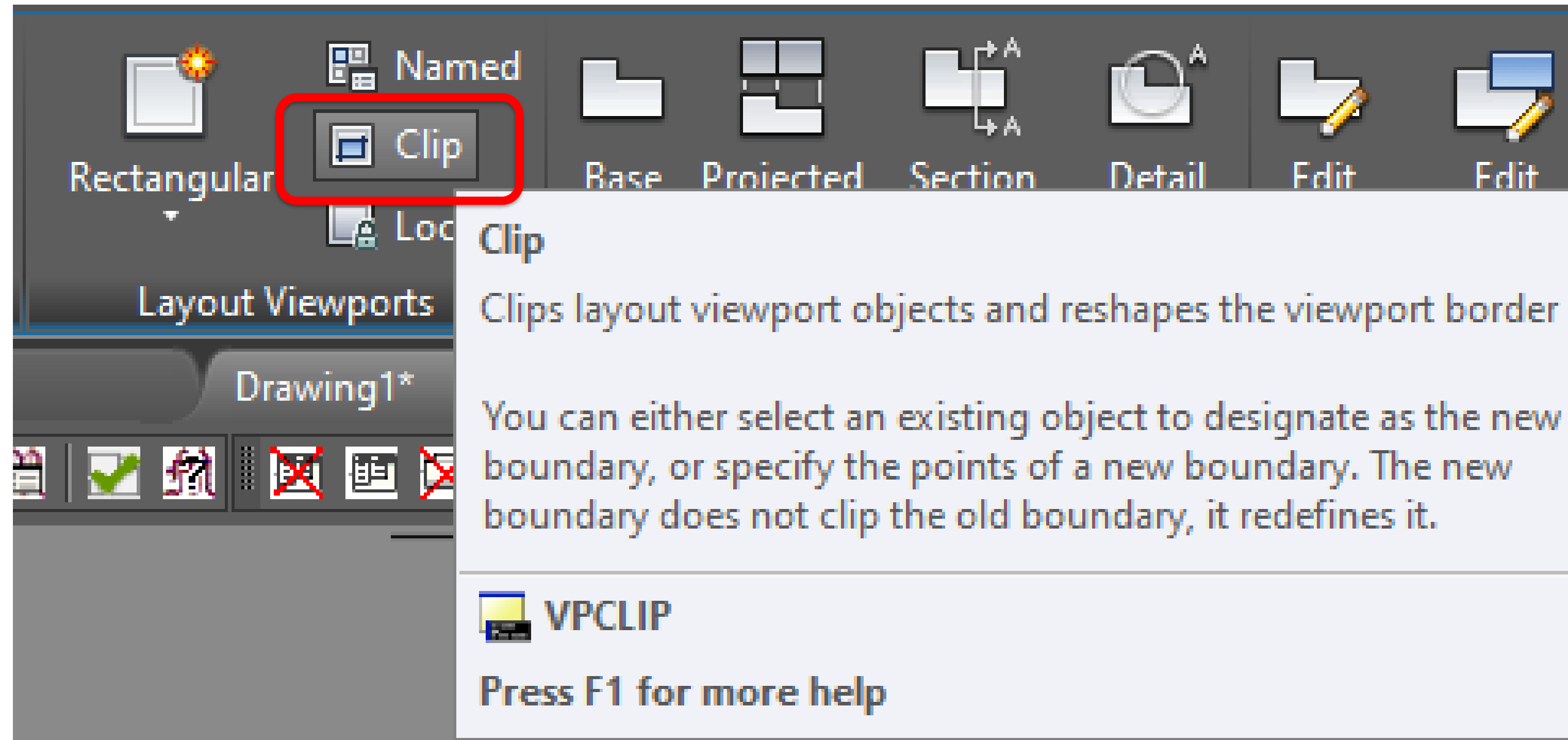


Double click outside viewport to enter paper space

Thick line represents you are in model space



# Model Space vs. Paper Space – Viewport Clipping



This can be helpful if you already have your drawings setup but need to add something to your drawing and you don't want to have to change the viewport scale.

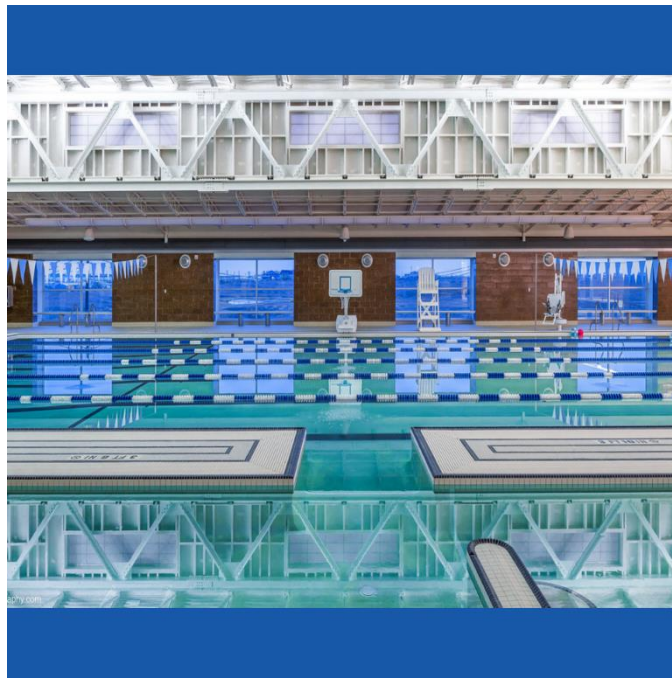
# Model Space vs. Paper Space Demonstration



# Learning Objectives

- Manipulate settings in the options menu and keyboard shortcuts
- Modify dimension style settings
- Utilize various layering commands to display objects differently
- Organize drawings using x-refs and model space / paper space



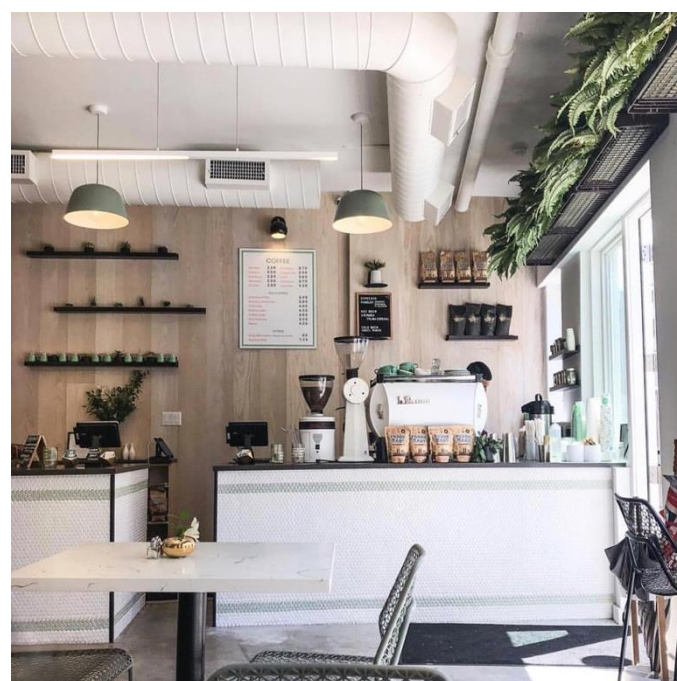


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