Annotation Scaling in AutoCAD: Bringing the Technology Home

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Come and learn how to implement annotation scaling in your organization. Whether you would like to start with baby steps or go full bore, you will learn all levels of migrating these tools into your daily workflow. Learn about annotation scaling and how it works with hatching, text, linetype scale, dimensions, and all of the other options. See how you can "bring this technology home," improve your productivity, and reduce unnecessary hours spent on annotations. This class is designed to assist you in building a new workflow for annotation in your organization.

Learning Objectives

At the end of this class, you will be able to:

- Spend less time annotating drawings

- Explain annotation scaling

- Integrate annotation scaling into your current workflow

- Use annotation commands, tools, and styles

About the Speaker

KaDe is a technical specialist for U.S. CAD, and provides training, network licensing services, and migration services. She has been using AutoCAD® since 1987 and has been a trainer since 1993. KaDe is an AutoCAD certified professional and an Autodesk Certified Instructor with ACI qualifications. She has been the recipient of the Autodesk Instructor Quality Award twice, and has presented at AU seven times. Her experience is widely varied and includes real-world application of AutoCAD in AEC, mapping, civil, and manufacturing Industries. She enjoys teaching, and her specialty is relating to the class participants and helping them to get the most out of the training course, whatever it may be.

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Spend Less Time Annotating Drawings!

Getting annotation placed on our drawing sheets that is accurate and meets our organization's CAD standards is one of the biggest challenges we face. Especially when it comes to the amount of time spent getting the annotation in place.

Annotative Scaling (in AutoCAD 2008 and above) can be used as a way to reduce time spent creating annotations on our drawings.

Annotative Scaling can be used for the following items:

- Linetypes
- Text
- Dimensions
- Multileaders
- Hatches
- Blocks
- Attributes

Doing the Linetype Dance

Does this sound familiar?

1. Set LTSCALE to 40 (or some other number) in model space so that you can see your linetypes while you're doing your work.
2. Print your drawing from your layout. OOPS, your linetypes didn't print correctly.
3. Set LTSCALE to 1.
4. Set PSLTSCALE to 1.
5. Reprint your drawings.

How much time is wasted resetting LTSCALES and reprinting?

Doing the Layer Dance

Does this sound like your office?

- Do you have multiple dimension styles for each scale factor that you use?
- Do you have a layer for every scale factor that you use?
- Do you have to create multiple versions of the same text, dimension, etc... for each scale factor that you use?
- Do you have to freeze layers for every viewport for all of the annotation layers that you're NOT using for that viewport?

How much time is wasted creating and manipulating multiple objects, styles and layers?

Figure 1 - How your layout might look before Annotation Scaling is applied
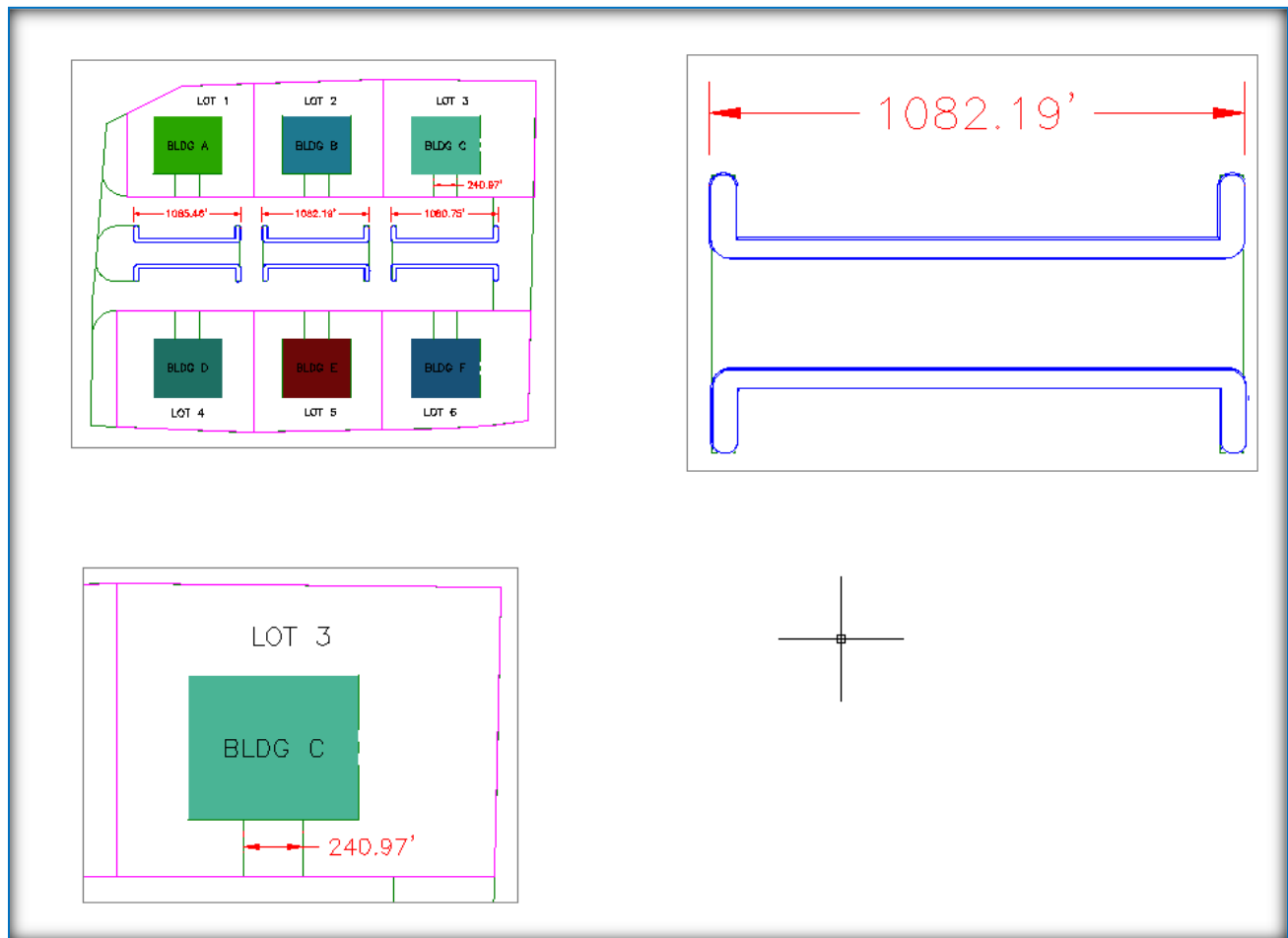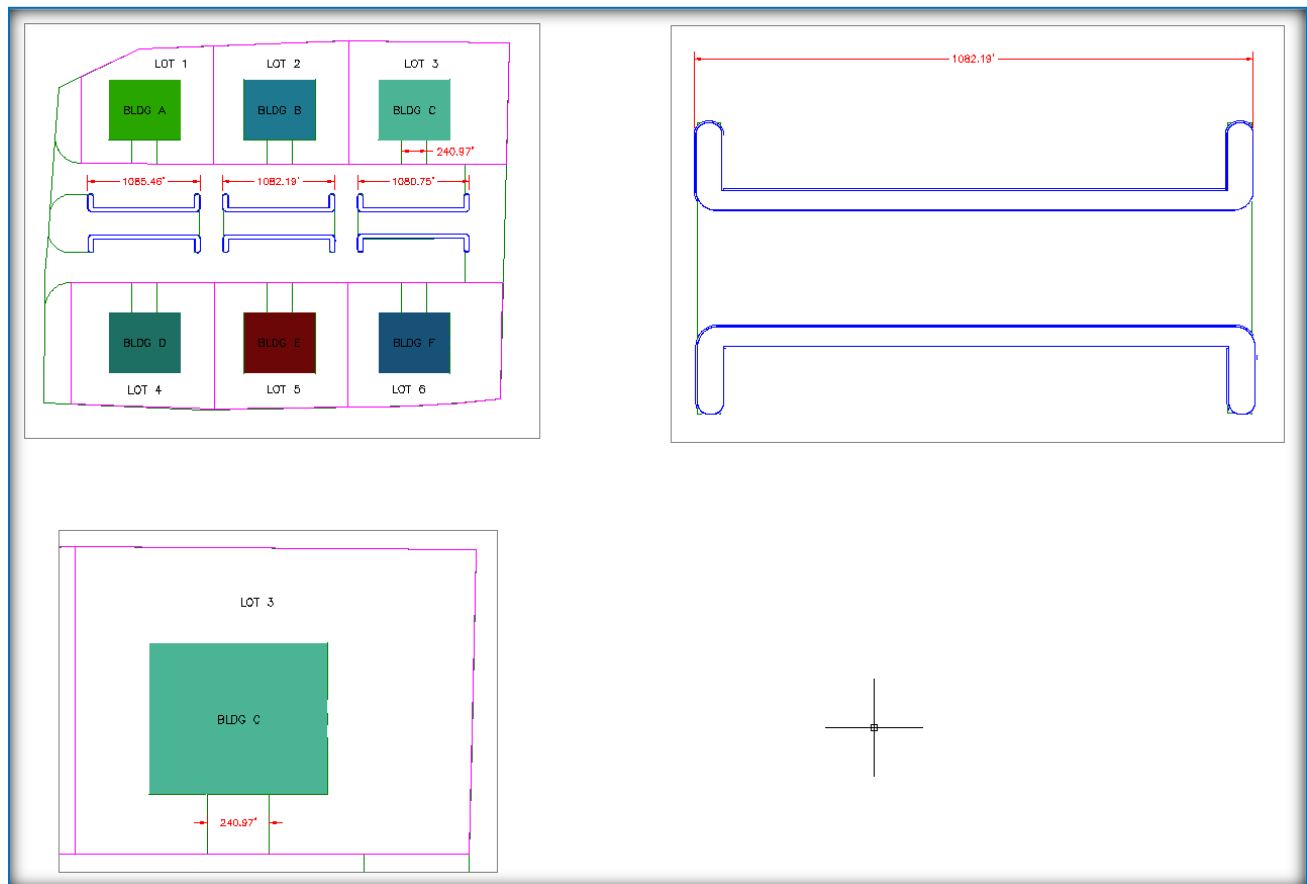

Did you notice in Figure 1 that the text heights are different in each viewport?

This is because the text and dimensions were created at a specific scale. In order to create text that looked good for each viewport they would have had to create multiple dimensions and text at different sizes and then manipulate the layers individually in each viewport.

Another method that some organizations use is to create text and dimensions on top of the paper space. But that comes with its own challenges, particularly the challenge of the viewport changing and the text having to be repositioned. Even when using the DIMREGEN command, the dimension often has to be adjusted.

Figure 2 - How your layout might look after Annotation Scaling is applied

Did you notice in Figure 2 that the text heights are consistent across each viewport?

This is because the text and dimensions were created with annotative styles and assigned multiple scale factors. Using this technique ensures that the text and dimensions will create multiple representations automatically for each scale factor.

This method saves time for the person creating the drawing. All annotative objects are automatically scaled based on the scale factors assigned to them.

Annotation Scaling – Understanding the Basics

<u>The THREE things you need to know to make annotation scaling work for you!</u>

1. You must have an annotative style set current to create annotative text, dimensions or multileaders. In Figure 3 below, note how the styles have a triangular shape in front of the name. This indicates that it is an annotative style.

Figure 3 - Annotative Styles
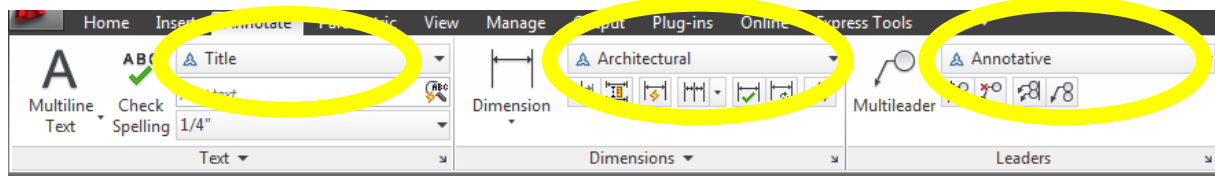
2. Before you start creating annotative objects, make sure the Annotation Scale is set to an appropriate scale, regardless of whether you are in regular model space or model space through your viewport. **TIP: If you are in your viewport, don't type ZOOM 1/100XP to change the viewport scale. This will only set the view scale and not the annotation scale! Using the toolbar or the properties menu will ensure that the annotation scale is also set.**

3. Know what ANNOAUTOSCALE does and how to control it. This variable controls what scale factors are automatically assigned to all of your objects! By default, if the button is enabled when you switch scale factors, ALL of your annotative objects will have the new scale factor added to their list of scale factors. That may sound good, but it won't be what you want all the time. Only enable this setting if you really mean it!!

Annotative Linetypes

Setting linetypes to be annotative is a simple transition! The variable to control your annotative linetype scaling is MSLTSCALE (0 or 1). Setting MSLTSCALE to 1 enables linetypes to read the current annotation scale that is set and use it as its scale factor.

1. Set MSLTSCALE to 1.
2. Set PSLTSCALE to 1.
3. Set your LTSCALE to 1 (or a slight variation).

Annotative Text

Having your text height size automatically is a huge time saver! Text can be added either through the main model space or in model space through the viewport.

1. You need to have a text style that is set to Annotative. Notice how the prompt changes to say "Paper Text Height" instead of just "Height". That is because you are now specifying the paper or printing text height instead of a model space height.
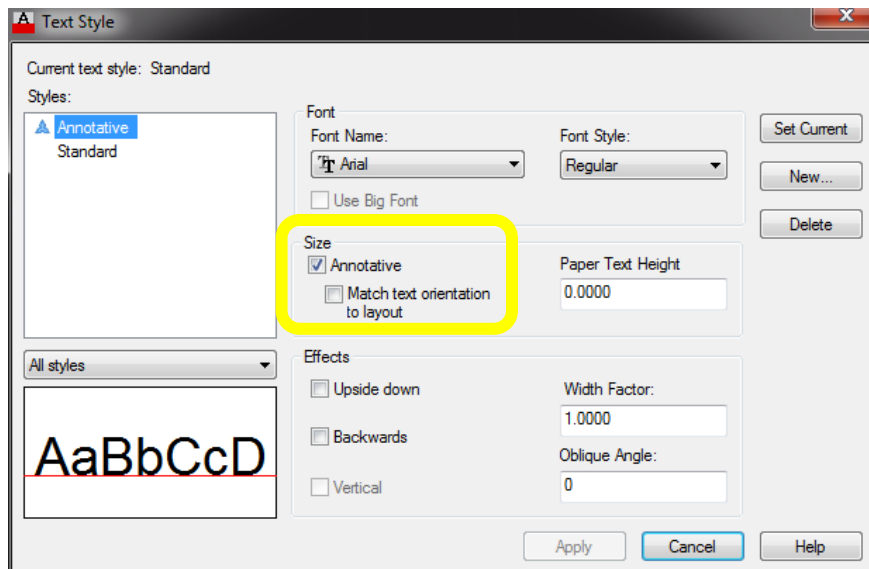
2. Make sure Annotation Scale is set correctly.
3. Start your text command and when prompted for the height, enter the height that you want the text to be in your layout.
4. AutoCAD will automatically multiply the size of your text based on your current annotation scale.

Tips

- You can set text height in your text style (if that is your standard) or you can set it when you create your text.
- When using paragraph text, pick your first corner, then before you pick your second corner for your text box, type H for Height and set the "paper text height" at that point. It's much easier than if you do it when you get into the MTEXT editing box and will save you some grief.

Annotative Dimensions

The best thing about annotative dimensioning is that you will generally only need ONE dimension style per type of dimensioning that you are doing. You may still need multiple styles for other reasons, but never for scaling purposes! Dimensions can be placed in the main model space or in model space through your viewport.

1. Make sure the current dimension style is set to Annotative. Go to the "Fit" tab in the Dimension Style editor and look in the "Scale for dimension features" section.
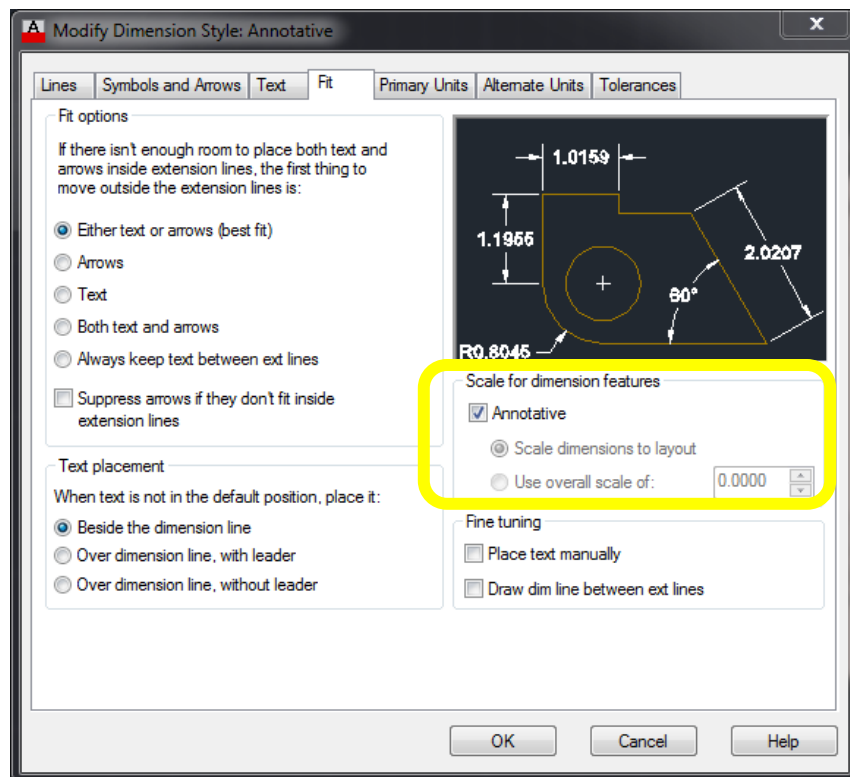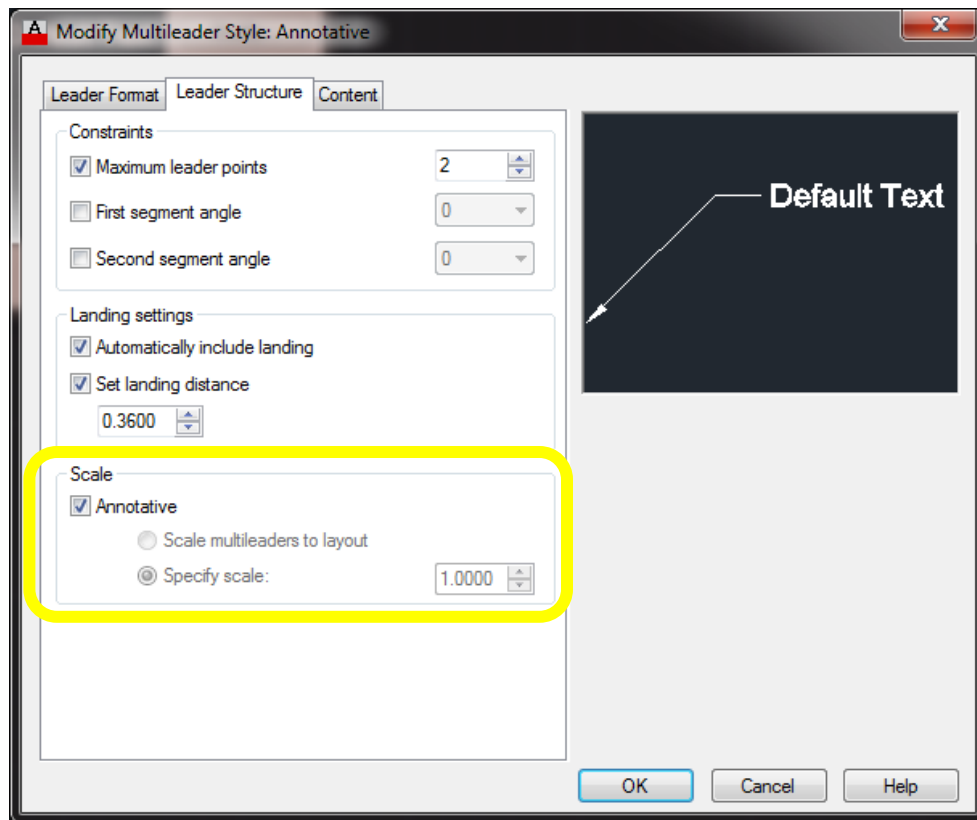

2. Make sure the Annotation Scale is set correctly.
3. Place your dimensions as needed. They will be sized automatically.

Annotative Multileaders

Multileaders have their own styles; therefore you will need to make sure you have a multileader style set as annotative before you begin.

1. Set the current multileader style to Annotative. Go to the multileader style editor (mleaderstyle or MLS) and modify the style. Go to the "Leader Structure" tab and look for the "Scale" setting to change it to "Annotative".


2. Make sure the Annotation Scale is set correctly.
3. Place your multileaders as needed. They will be sized automatically.

Annotative Hatch Patterns

One of the best things about annotative hatch patterns is the reduction in file size. This is because you are not creating several hatch patterns just to get the look you need in your viewports! Creating annotative hatch patterns is an easy process.

1. Make sure the Annotation Scale is set correctly.
2. Start the Hatch command and turn on the ANNOTATIVE button.
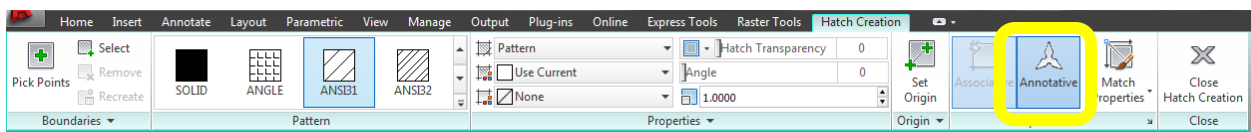
3. Select your pattern, and any other settings that you desire.
4. Use typical methods to select boundary areas (pick points or select).
5. Hatches will size automatically based on the current Annotative Scale.

Tips

*   If you need your hatch pattern scale changed slightly (generally due to personal preference), just tweak the scale factor of the hatch pattern slightly. I might use a scale of anywhere from .5 to 2 to get the size I like. The viewports will automatically size it from there based on the viewport scale.
*   Use the "Select New Boundary Set" function to reduce the time that AutoCAD takes to detect a boundary. After you pick the button make a window around the area you are working in or select limited objects to work with. Now when you use the Pick Points option, it will only detect boundaries from objects that you selected.
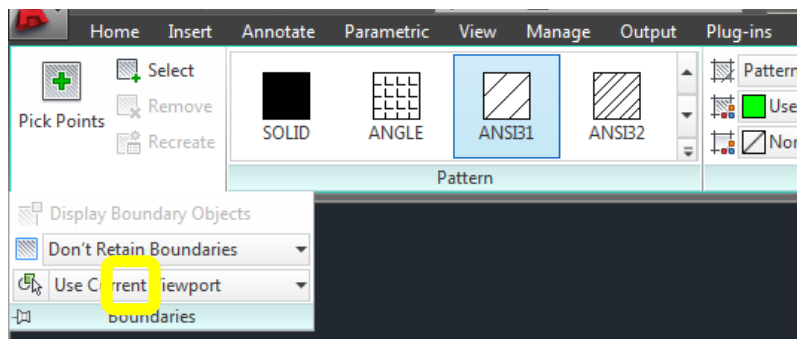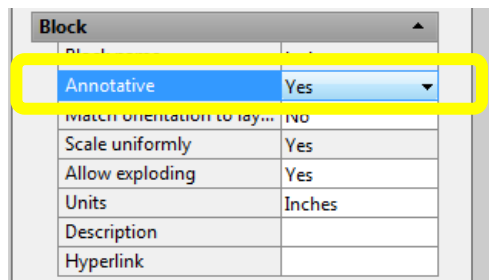
Annotative Blocks

Why would you need annotative blocks? Any block that needs to be the same size when it prints regardless of the viewport scale should be annotative. Some examples would be callouts, note bubbles, etc… Setting the blocks as annotative will make it much easier as the block will be sized automatically from the viewport scale.

1. When creating a block that you want to be Annotative, click the check box for "Annotative" in the Behavior section of the Block Definition dialog box.
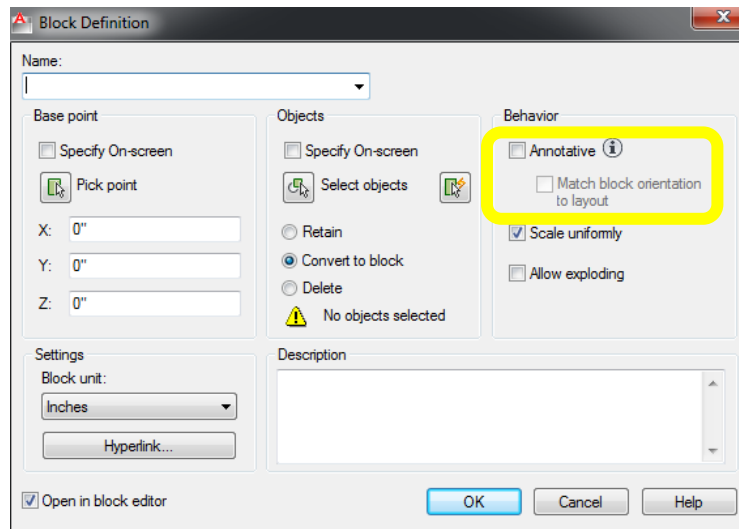
2. You can also edit the annotative behavior of an existing block using the BEDIT command (block editor). Type BEDIT and click on an existing block. In the block editor go to the PROPERTIES palette and look for the "Block" section, then look for the Annotative property and change it to YES.


3. Before inserting the annotative block, make sure your Annotative Scale is set correctly.

Annotative Attributes

Setting attributes to be annotative can be useful when you want the text in a block to change size, but not the block itself.

To set an attribute to be annotative do the following:

1. In the Attribute Definition dialog box under the "Text Settings" section, select the "Annotative" check box.
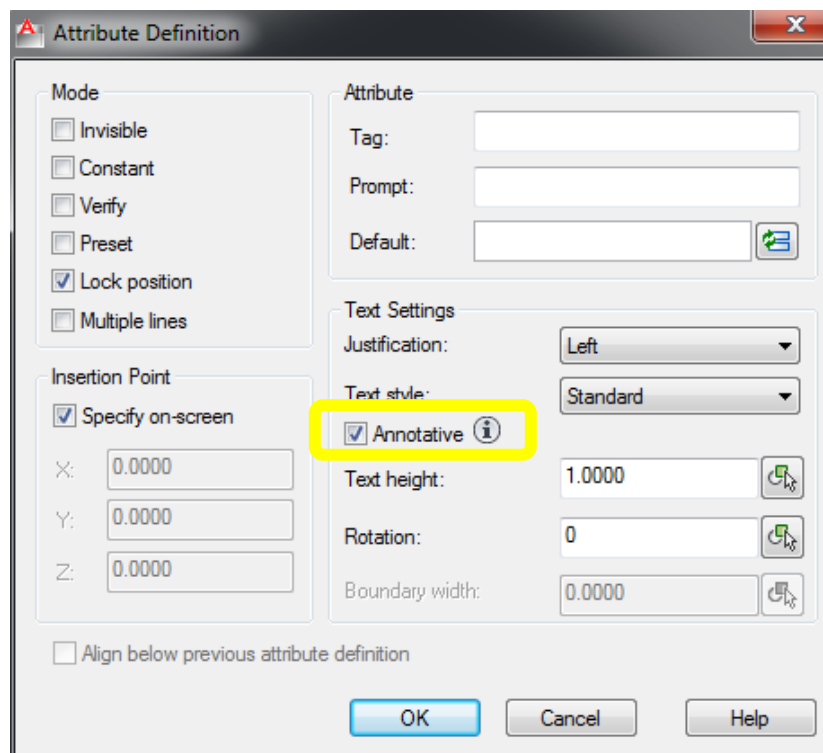

2. Make sure the Annotative Scale is set correctly.
3. Insert the block and enter your attribute value(s). The text should scale appropriately.

Setting Additional Annotation Scales

Now that you have annotative objects you may want to add additional annotative scales to some of your objects. For example, if you are working in a viewport and created a hatch pattern, you may want to add another annotation scale to that hatch pattern so that it can be viewed in a viewport with a different scale factor.

There is more than one method to add additional scale factors to an object.

- Select the object, right-click and choose "Annotative Object Scale" from the right-click menu. Then click Add/Delete Scales. You will get a dialog box that will allow you to add additional scales for the object(s) that you selected. You can do other annotative scale tasks from this menu as well.
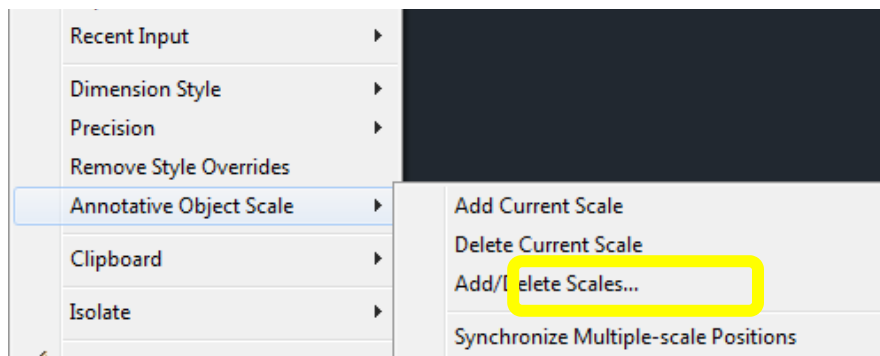
- From the "Annotate" tab in the "Annotation Scaling" panel, you can choose "Add/Delete Scales". You can do other annotative scale tasks from this menu as well.
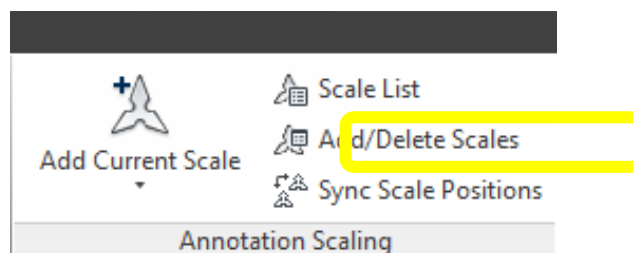
Changing Existing Drawings to Annotative Scaling

Below are several workflows for converting existing content to annotative scaling. Linetype scaling does not require a special workflow. So the previous workflow described will work effectively.

Workflow for converting existing text, dimensions or multileaders to annotative scaling:

1. Bring annotative text, dimension, and multileader styles into the current file (try using Design Center!).
2. Identify dimensions, text or multileader objects that need to be converted to annotative objects.
3. Set the annotative scale current that you would like to apply to your objects.
4. Use QSELECT or manually select the objects you want to change.
5. When the objects are selected, go to the PROPERTIES palette.
6. Change the STYLE assigned to the objects to the correct annotative style.
7. If the ANNOTATIVE setting (in Properties) is not set to YES then change it to YES.

The objects should now be assigned to the correct annotative scale and should stay the same size as they were. If you need to you can select your text objects and change the "Paper Text Height" to a more appropriate height. Add scales as needed using "Add/Delete Scales".

- ***Using QSELECT to filter objects is an excellent way to speed up this process!***

Workflow for converting existing hatch to annotative scaling:

1. Set the annotative scale current that you would like to apply to your hatches.
2. Select any Hatch patterns you would like to change.
3. Go to the PROPERTIES palette.
4. Change the ANNOTATIVE setting (in Properties) from NO to YES.
5. Change the SCALE (in Properties) of the hatch pattern to 1 (or something similar).

The hatch pattern will now be annotative and have an annotative scale assigned to it. Add additional annotative scales as needed.

Workflow for converting existing blocks (and attributes) to annotative scaling:

1. Open the block in BEDIT, go to PROPERTIES and change ANNOTATIVE to YES.
2. Save the changes to the block and update your external file (if using wblocks).
3. Open the drawing that you'd like to update the block in.
4. Set the correct annotative scale current.
5. Using the INSERT command, bring in the new version of the block.
6. The Insert command will ask you if you want to redefine the block. Choose yes.
7. If you have any attributes, synchronize the blocks with the ATTSYNC command.

Integrating Annotative Scaling into your Organization's Workflow

Once the decision has been made to use Annotative Scaling, the most import thing you can do is to MAKE A PLAN! A poorly planned integration will lead to frustration for the CAD users and for management.

What decisions need to be made in regards to integrating Annotative Scaling?

- What annotative functionality do we need/want?
    - Linetype Scaling
    - Text
    - Dimensions
    - Multileaders
    - Hatches
    - Blocks
    - Attributes
- Who is going to update the organization's template(s) and CAD standards with the necessary styles, blocks, attributes, variables, etc…?
- What functionality should be integrated first? Or should we roll out all the functionality at once?
- How and when should our CAD users be trained on the new standards?

What if we only want to "dip our toes" into the Annotative "Pool"?
Starting Small

If starting small works best for your organization, then start by integrating Linetype Scaling into your workflow. This is a relatively minor change and only requires two changes in your workflow.

1. Have the users change the following variable settings (these changes can also be applied with a script or by some other programming method)
    a. MSLTSCALE=1
    b. PSLTSCALE=1
    c. LTSCALE=1 (you should experiment with this setting in your drawings to get the best result)
2. Have the users set the Annotation Scale in model space.

Now the linetypes should show correctly whether you are in model space or paper space.

We want to use Annotative Scaling, but we only have the resources to "wade" in.
Middle Ground

If you have limited resources and need a quick start, then add to the "Starting Small" workflow by also integrating some or all of the following components:

- Annotative Hatches
- Annotative Text
- Annotative Dimensions
- Annotative Multileaders

Someone will need to update your styles in your template file(s).

The workflow for the users to add annotative text, dimensions, and multileaders is as follows:

1. The user sets the appropriate Annotation Scale in either the viewport or model space.
2. The user selects the appropriate style (text, dimension, or multileader) from the ribbon.
3. The user places the objects in model space as previously described in this document.
4. All text, dimensions, and multileaders will automatically scale based on the current annotative scale.
5. Additional scales can be added when needed by using the "Add/Delete Scales" command (OBJECTSCALE).

The workflow for the users to add annotative hatching is as follows:

1. The user sets the appropriate Annotation Scale in either the viewport or model space.
2. The user starts the Hatch command and enables the "Annotative" setting in the Hatch ribbon "Properties" panel or in the Hatch dialog box.
3. The user places hatch patterns as desired.
4. All hatch patterns will reflect the current annotative scale.
5. Additional scales can be added when needed by using the "Add/Delete Scales" command (OBJECTSCALE).

We want to use all of the Annotative features! We are ready to "dive" in!
Full Bore

> For those who have the necessary resources to manage all the components, you can build on the two previous workflows by adding the following:
>
> - Annotative Blocks
> - Annotative Attributes
>
> These are the most time consuming of all the annotative components. This is because you will need to assign someone to update your blocks. The number of blocks that you have that need to be set as annotative will determine the amount of time needed for this task. You may also want to consider new annotative blocks at this time.
>
> *This isn't a time consuming process for the users, the bulk of the work is on the CAD Manager or those assisting with updating the blocks.*
>
> In addition to previous workflows, the users will also have to add the following:
>
> 1. Before inserting any annotative blocks, the user will need to set the appropriate Annotative Scale.
> 2. The user will place the blocks in model space and the blocks (or attributes) should scale automatically based on the current Annotative Scale.

Now that we have outlined three distinctive plans, you can decide where your organization fits in! Pick a plan that will work for you based on your available resources.

Also, consider that your local Autodesk reseller has technical specialists that can assist you with this process. You may have monetary resources, but perhaps not the time or experience to implement these changes yourself.

Training Your Users

You will need to provide your users with an overview of annotative scaling and the changes it will bring to your organization, along with some basic training on annotation scaling functionality.

- Meet in a conference room or via a conference call to discuss the changes to your standards and demonstrate the new workflow(s).
- Provide online or live training for your users to have them try out the new workflows hands-on (your favorite Autodesk Training Center can assist you with this).
- Provide additional workflow documentation that will be readily accessible for the user (Electronic or printed documentation).

## Annotative Command and Variable Definitions – a list to rely on!

ANNOALLVISIBLE: Hides or displays annotative objects that do not support the current annotation scale. When this variable is set to 1, annotative objects that are assigned to more than one annotation scale will only display one annotation scale. This variable setting is saved individually for model space and each layout.

   0 = Only annotative objects that support the current annotative scale are displayed

   1 = All annotative objects are displayed

ANNOAUTOSCALE: Updates annotative objects to add the annotation scale when the annotation scale is changed. When using the icon below the functionality is set to the value of 4 (when enabled) or -4 (when disabled) by default. A negative value maintains the setting but disables the functionality.
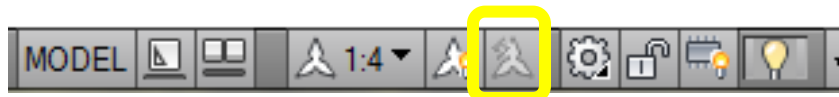
   0 (or any negative value) = Newly set annotation scale is not added to annotative objects

   1 = Adds the newly set annotation scale to annotative objects that support the current scale except for those on layers that are turned off, frozen, locked or that are frozen only in the viewport

   2 = Adds the newly set annotation scale to annotative objects that support the current scale except for those on layers that are turned off, frozen, or that are frozen only in the viewport

   3 = Adds the newly set annotation scale to annotative objects that support the current scale except for those on layers are that are locked

   4 = Adds the newly set annotation scale to all annotative objects that support the current scale

ANNORESET: Resets the location of all alternative scale representations of any objects that are selected. You can use grips to edit positions of annotative objects, and then use this command if you need to synchronize the positions later. They will synchronize to match the location of the object's current scale representation. In addition to typing this command it can also be selected by selecting the object and then accessing it from the right-click menu and then additionally from the Annotate Ribbon tab under the Annotation Scaling panel as shown below.
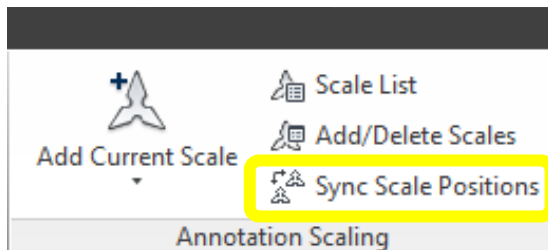

ANNOUPDATE: Updates existing annotative objects to match the current properties of their styles. When a text object is selected and the style assigned to it has a fixed paper space height, the size of the text will be changed. If an annotative object is updated to a non-annotative style, the object becomes non-annotative and any alternate scale representations are removed.

CANNOSCALE: Sets the name of the current annotation scale for the current space. You can only enter a named scale that exists in the drawing's named scale list.

OBJECTSCALE: An annotative object can support several annotation scales for viewing at different scales. You can add or delete scales from the list of scales assigned to the selected annotative objects. Using this command will open a dialog box to edit the scales. In addition to typing this command it can also be selected by selecting the object and then accessing it from the right-click menu and then additionally from the Annotate Ribbon tab under the Annotation Scaling panel as shown below. You can also type this command as –OBJECTSCALE to use it from the command line only (perhaps in a script).
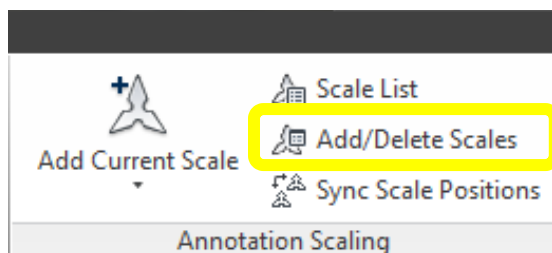
SCALELISTEDIT: Displays a dialog box with a list of predefined scales used throughout the program. This list can be easily modified to display only the scales you need. In addition to typing this command it can also be accessed from the Annotate Ribbon tab under the Annotation Scaling panel as shown below. You can also type this command as –SCALELISTEDIT to use it from the command line only (perhaps in a script).
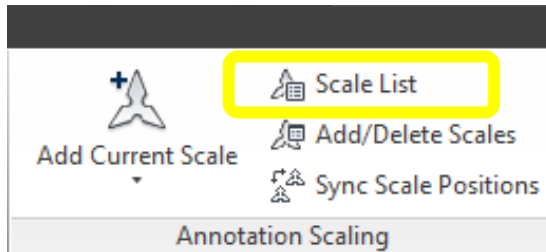
SELECTIONANNODISPLAY: Controls whether alternate scale representations are temporarily displayed in a dimmed state when an annotative object is selected.