

Investigate how to use and Implement the CAD Standards Manager in AutoCAD

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Autodesk Expert Elite



About the speaker

Sam Lucido



Speaker at AU for the past 7 years

- I am a CAD Services Manager and Senior Civil Designer with Haley & Aldrich, Inc.
- AutoCAD since early 1990s
- Civil 3D and Map 3D since 2007
- Technical Writer for AUGIWorld and on AUGI Board of Directors
- Autodesk Certified professional and Expert Elite Member
- Owner of CADproTips.com
- **If I can teach you one thing and make you think then I have done my job**

Your First line of defense – Lab Assistants



R.K. McSwain

R.K has worked in the Civil Engineering/Survey field for over 20 years and currently serves as CAD Manager for a leading Civil Engineering firm based in Texas. R.K. has over 20 years experience in application development and training classes for various CAD applications. R.K. created CAD Panacea (<http://cadpanacea.com>) in 2005 as a resource for CAD users all over the world. He is a member of the Autodesk Expert Elite and multiple Autodesk Customer Councils.



Kimberly Fuhrman

Kim has over 20 years of experience with Autodesk products in both civil and architectural fields. She serves on the Architectural Advisory Committees for several technical colleges, and on the Executive Committee for the USGBC-Central Pennsylvania Community. She is a Revit Architecture Certified Professional, an Expert Elite member, Revit Inside the Factory Insider (formerly Gunslinger), and serves as president of AUGI. She has been a speaker at Autodesk University



Lee Ambrosius

Lee Ambrosius is a Principal Learning Experience Designer at Autodesk, Inc., for the AutoCAD and AutoCAD LT products on Windows and Mac. He works primarily on the customization, developer, and CAD administration documentation along with the user documentation. Lee has presented at Autodesk University for about 15 years on a range of topics, from general AutoCAD customization to programming with the ObjectARX technology. He has authored several AutoCAD-related books, with his most recent project being AutoCAD Platform Customization: User Interface, AutoLISP, VBA, and Beyond.





Summary

- In this class you will use the CAD standards manager to configure templates, attach drawings to a standards file to check consistency. We will also use the batch checker to create a violation report and understand how to use the powerful layer translator.
- **Most importantly, you'll be able to bring back value to your employer and the knowledge to help you excel within your field.**

Download the Handout

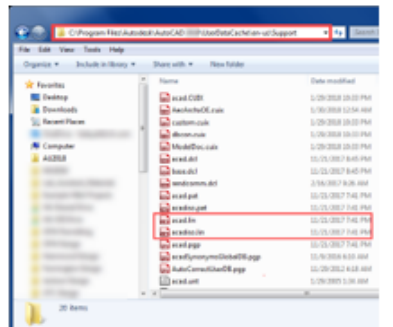
You can download the handout on the class website as well as the dataset for all exercises

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Introduction

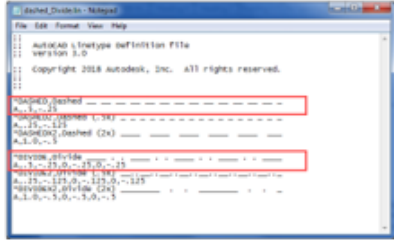
AutoCAD comes with several linetypes: continuous, dashed (various lengths), dotted, dash-dot, border, center, and so on. But you can make your own. A simple linetype is just a pattern of dashes, dots, and spaces. A complex linetype can include text and shapes. The linetype name and definition determine the dash sequence, the dash lengths, the dash and space lengths, and the characteristics of any included text or shapes. You can use any of the standard linetypes that AutoCAD provides, or you can create your own linetypes.

The LTN files included in AutoCAD are acad.ltn and acadiso.ltn. AutoCAD comes with several simple and some complex linetypes stored in acad.ltn and found in the support folder under C:\Program Files\Autodesk\AutoCAD 2009\lisp\acad\lisp\support. See the image below for an example of the file location of the default linetypes and the 3 default .ltn files.



A LTN file is simply a text file that contains definitions of many simple and complex linetypes. To create or modify linetype definitions, use the LTN file using a text editor or word processor or use the regedit tool. The regedit command line will reveal this command: `regedit /s "C:\Program Files\Autodesk\AutoCAD 2009\lisp\acad\lisp\support\acad.ltn"`. Other you create a linetype, you must load the linetype before you can use it.

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I have highlighted 2 linetypes as shown above that we will be exploring. As you can see a linetype is a series of positive and negative numbers that tell AutoCAD how long to draw or raise a pen. Positive numbers lower the pen (draw a line), negative numbers will raise it (create a space).

Let's start by creating a simple linetype with the dashed line since that one is the easiest to explain. For the code that would be just fine and spaces.

DASHED Dashed

This first line will start with an (*) asterisk which will tell AutoCAD that it's a descriptor and not to use the code. Immediately following the * is the name of the linetype (DASHED) followed by a comma. After the comma, you can enter the name of your linetype and follow it up with ten characters or the LTN code to define the line. You should keep the description to 45 characters, anything over that would be hard to read in the linetype manager. Let's review those numbers. The second line must begin with the letter D (align), followed by a list of pattern descriptors that define the pen-up length (spaces), pen-down length (dashed), and dot. You can include comments in an LTN file by beginning the line with a semicolon (;).

Let's look at the letters and number of a few linetypes. Notice the syntax for **DASHED A,5,-25,0,-25,0,-12**

A = alignment (required)


The letter A is the alignment field which specifies the action for pattern alignment at the ends of individual lines, circles, and arcs.

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Let's take a look at the syntax for **DASHED A,5,-25,0,-25,0,-12**

- A = alignment (required)
- 5 = tell AutoCAD to lower the pen and move .5 units
- 25 = tell AutoCAD to raise the pen and move .25 units

Notice below that after the -25 space the linetype begins to repeat itself starting with the 5 distance again and continuing with the pattern.

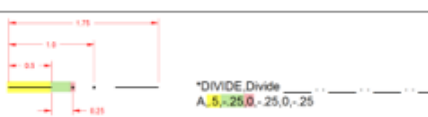


The numbers indicate a repeating pattern starting with a dash 5 units long, a space 25 drawing units long. The pattern continues for the length of the line. One more element that is included with AutoCAD linetypes is the dot. Let's review the linetype file again looking at the circle line as shown below.

Notice the syntax for **DIVIDE A,5,-25,0,-25,0,-12**


- A = alignment (required)
- 5 = tell AutoCAD to lower the pen and move .5 units
- 25 = tell AutoCAD to raise the pen and move .25 units
- 0 = tell AutoCAD to place a dot

Notice the 0 segments below and see the illustration to show where the dots will be placed within our line.



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and set the angle for the line for with a 'D' height. It is very important to define it with a height of 'D'. Using a multiple font, you can take on the characteristics of that font which is benefit of the Type font. I have highlighted the areas below to illustrate the items that you will need to change to create the linetype. Notice that there is another linetype in the area name **Multiple**. No need to create that just yet, we will be using that one later in this document.



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Let's create a linetype with the letter A for **Multiple** to our dash-dot linetype but for this one AutoCAD will display the letter A in the middle of the line. Open up the **MULTIPLE** file and add the following sequence for another line.

MULTIPLE A,5,-25,0,-25,0,-12


MULTIPLE A,5,-25,0,-25,0,-12

MULTIPLE A,5,-25,0,-25,0,-12

Figure 1 (below) and match up the numbers in your line with what is dimensioned. This will give you a better idea of what those numbers represent graphically.



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The parameters remain the same except for a new string which will be enclosed in brackets. Repeating with the brackets controls the text size, position and rotation. A description of what each letter or bracket represents is shown in Figure 2 (below).

- [] = enclose the text string and parameters.
- A = AutoCAD what should be displayed in the text
- S = style of the font.
- R = rotate this to 0. Set the rotation of the text to 0, relative to the line.
- X = the x-offset (shifts the text along the x axis)
- Y = the y-offset (shifts the text along the y axis)
- U = variable variable to control the position of the text.

The colors shown below represent the parameters that are set within the line. Now if you want to create another line with a different letter simply copy and paste this line and just change the font. You could make lines for any letter in the alphabet.

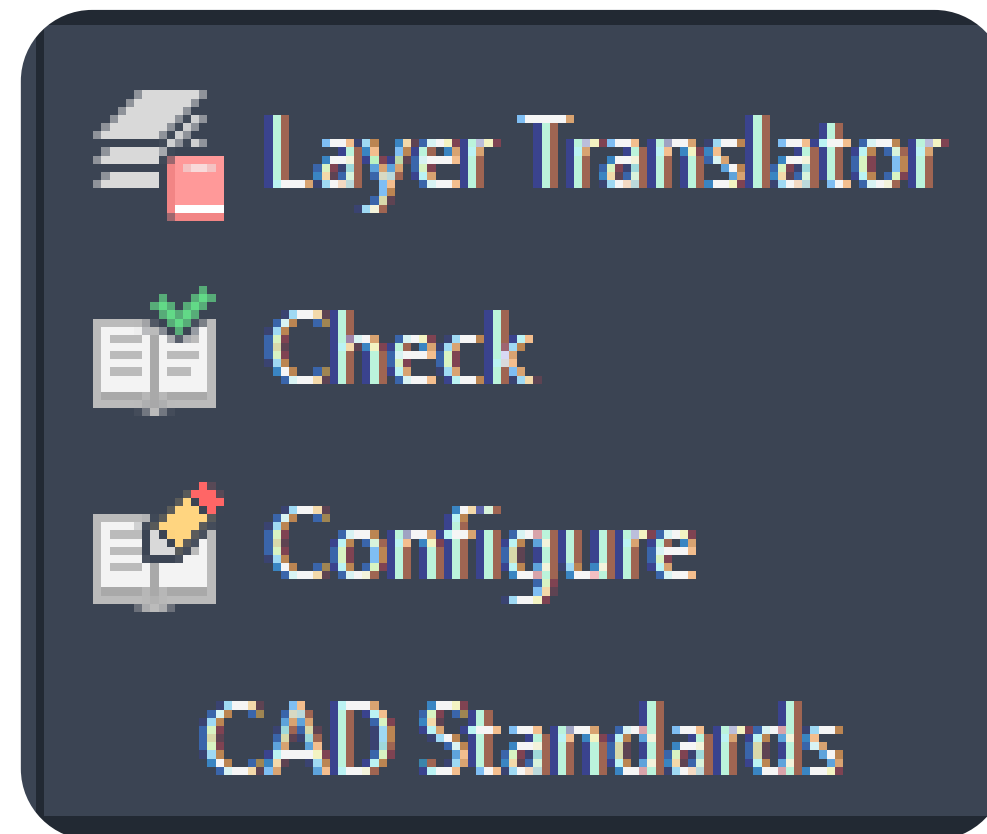
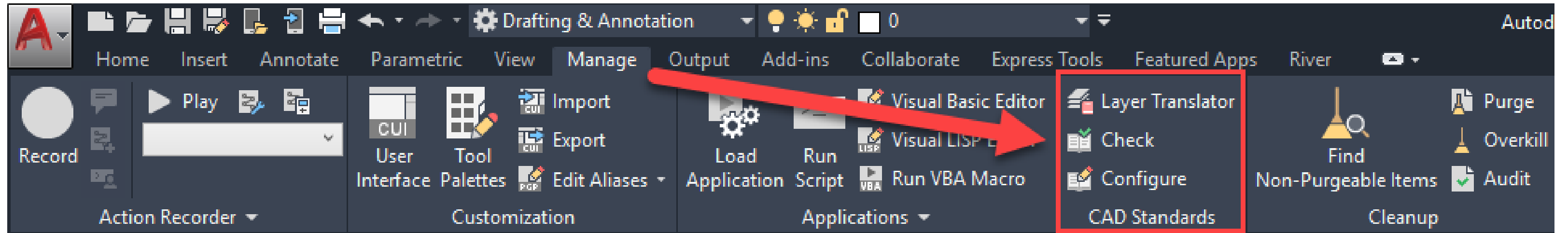
What if the line you want has more letters? Simply take that '12' at the end and add '12' and this will accommodate for more letters. Let's do that for six more additional lines as shown. Try it out with 5 or 6 letters or maybe even some numbers.



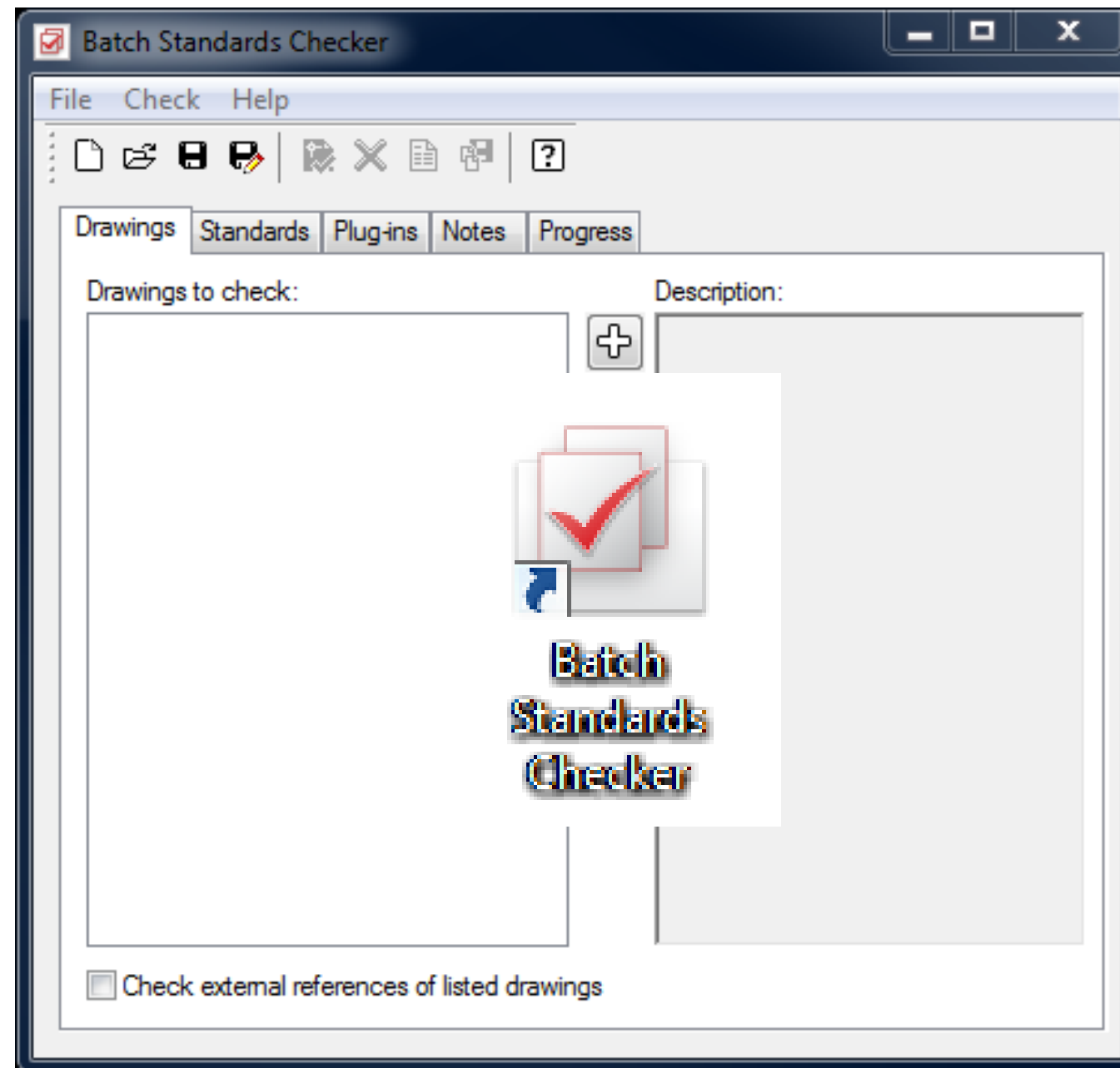
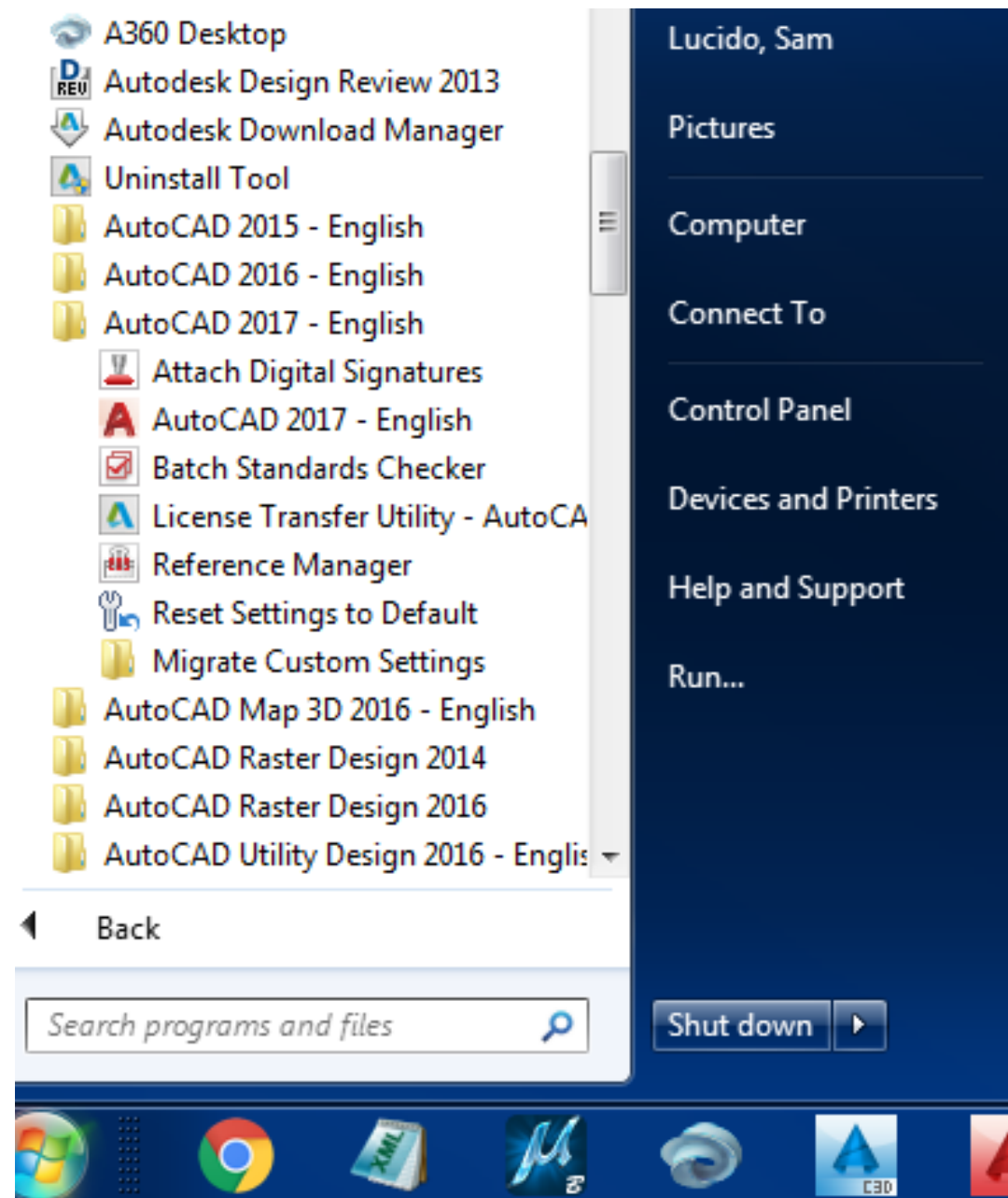
Key Learning Objectives

- Identify, Change and Create standards files (.dws) to define your company CAD standards.
- Attach a CAD Standards file to a drawing and check for text styles, linetypes, layers, multileaders, and dimensions.
- Use the Layer Translator to automate the process of changing layers to adhere to your company standards.
- Use the Batch Standards Checker to audit a drawing for standards violations creating a report detailing all violations.

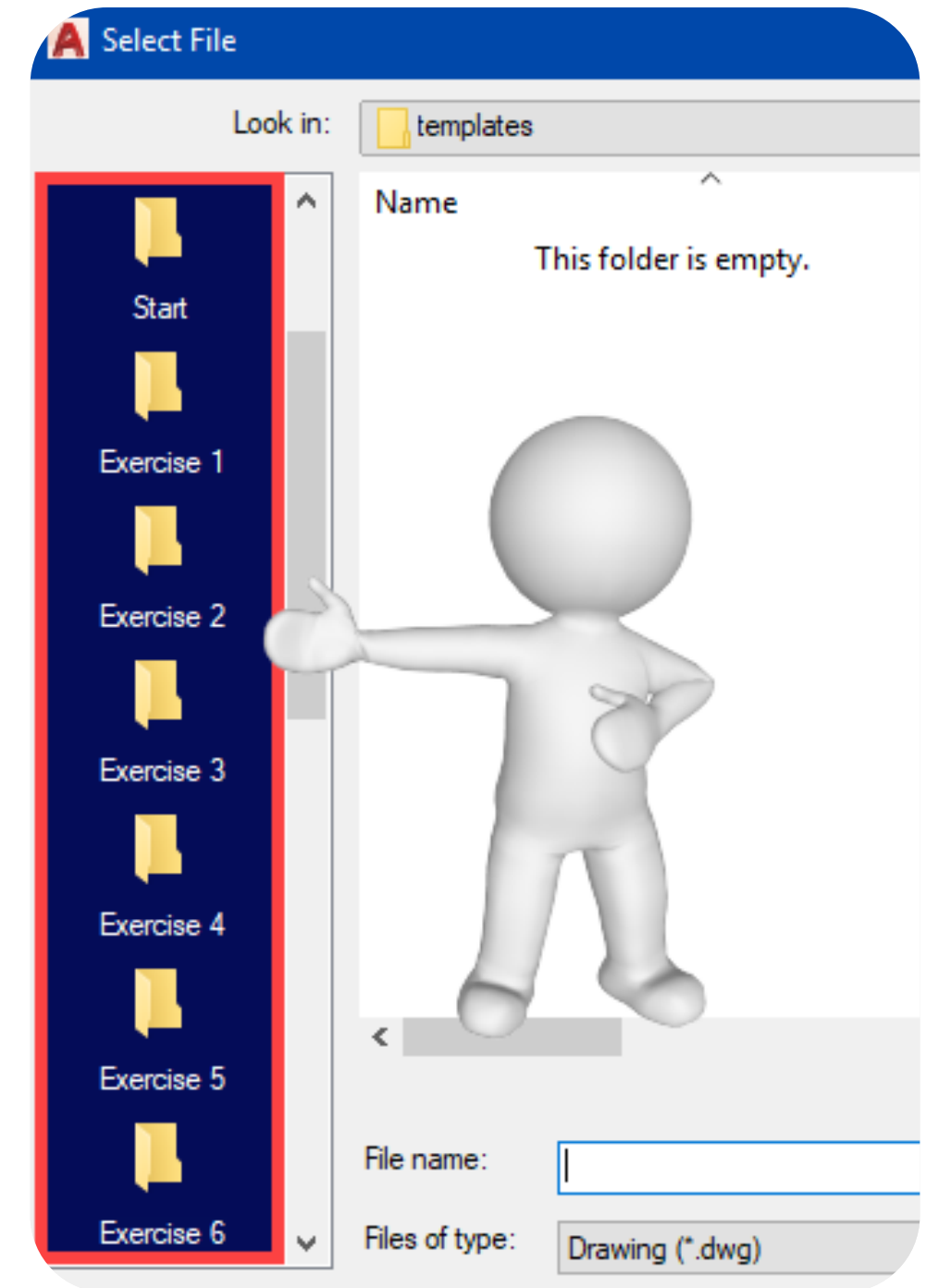
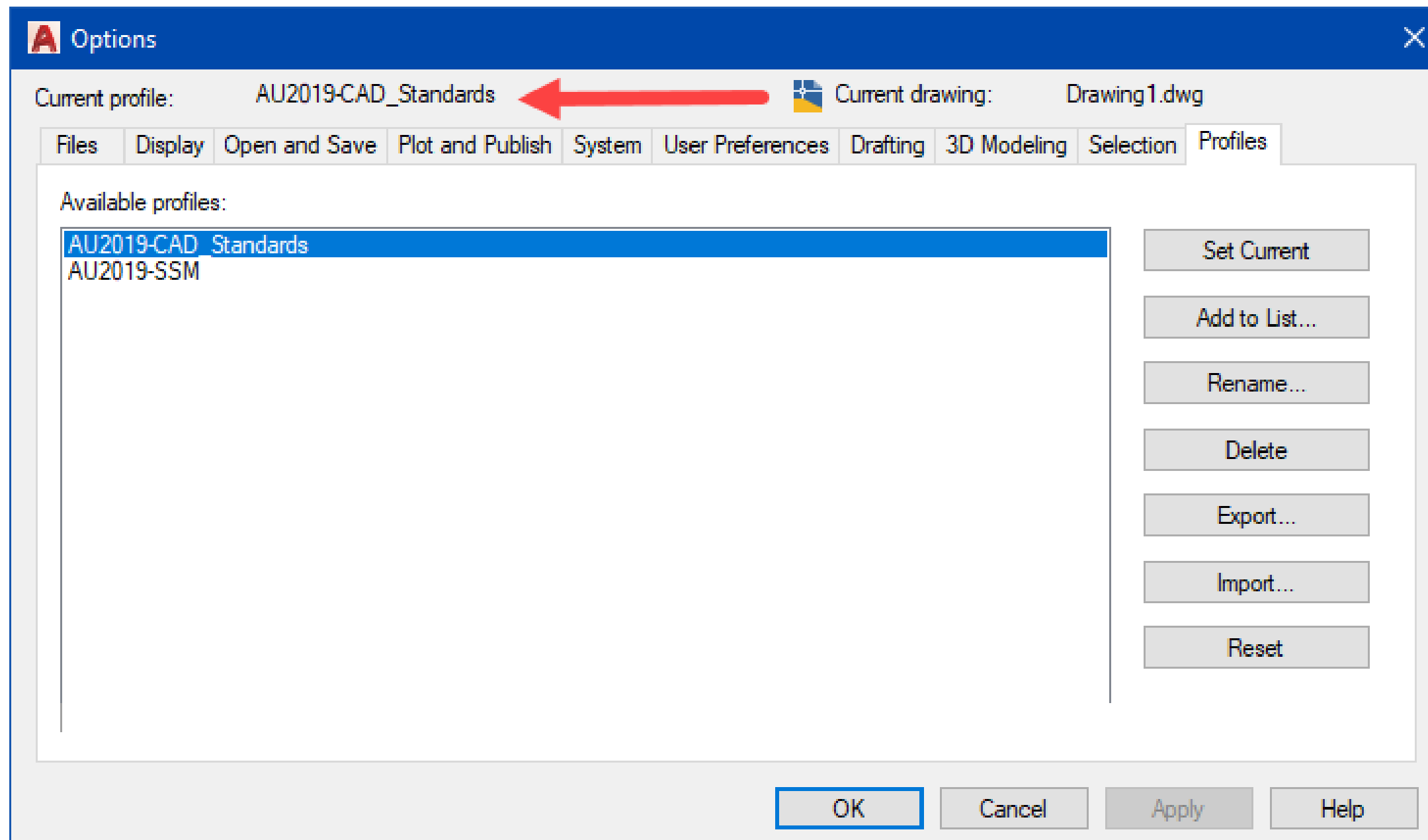
CAD Standards Manager on the Ribbon



Batch Standards Checker outside of AutoCAD



Load the Profile

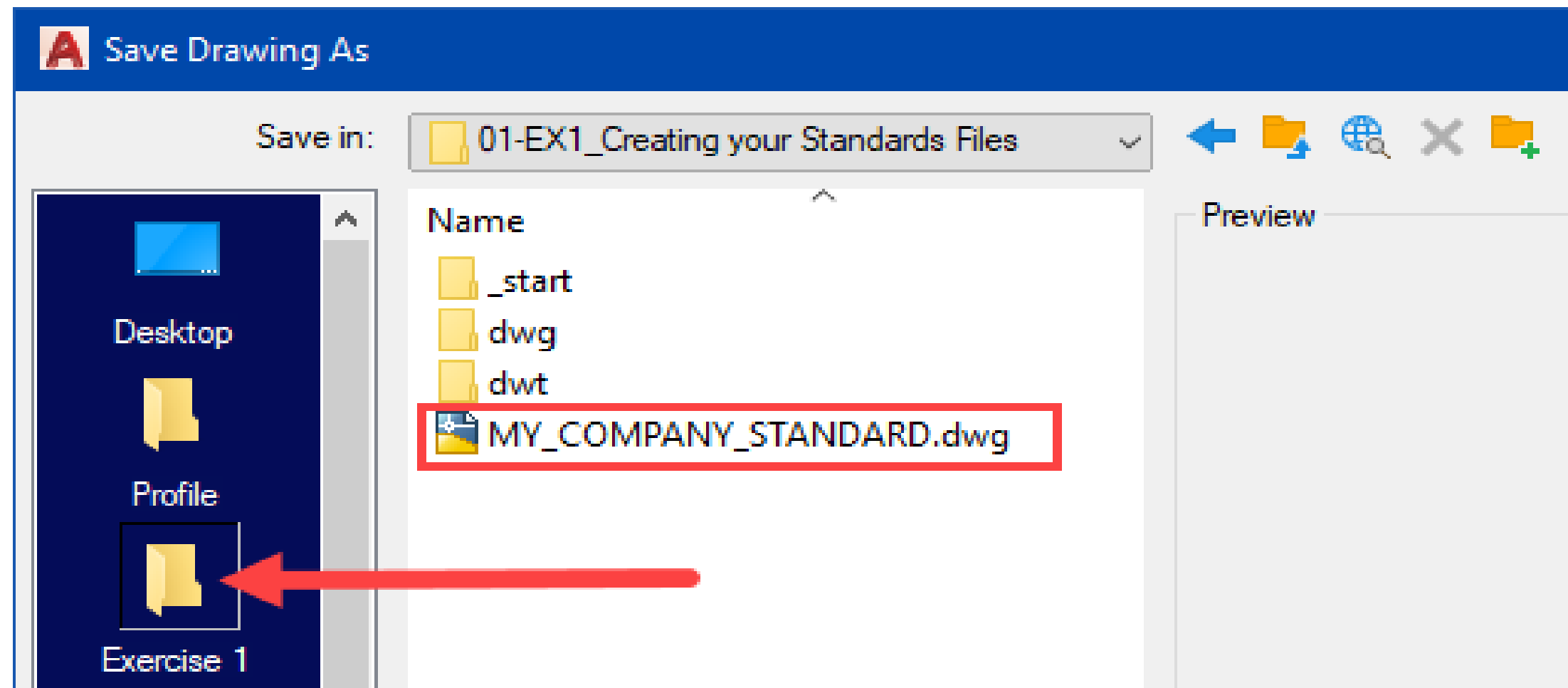


1. Options > Profiles > AU2019-CAD_Standards > Set Current

Exercise 1

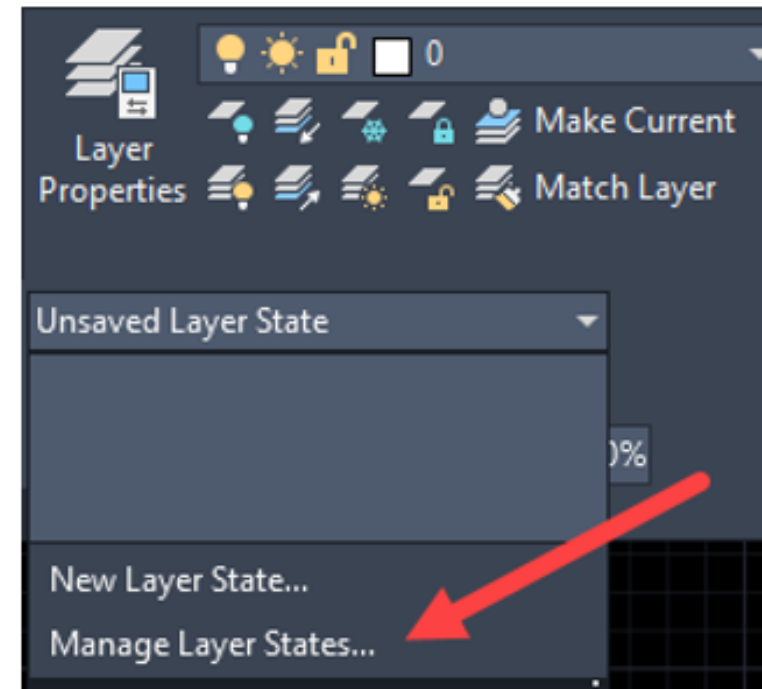
Building the Standards file

1. Create new drawing and name it **MY_COMPANY_STANDARD.dwg** and save in the Exercise 1 folder as shown below.



Adding Layers to your Standards file

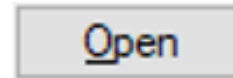
1. From the layers panel of the Ribbon pull down the layer state button as shown and select **Manage Layer States**.



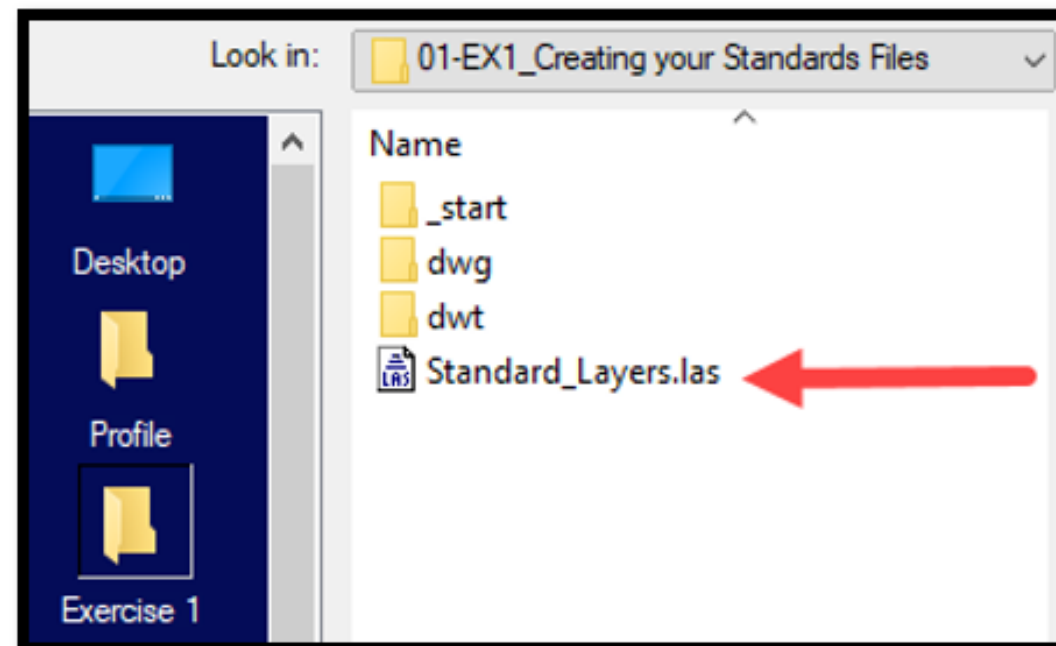
2. Select import from the dialog box.



3. Move to the Exercise 1 folder and select the Standard layers.las and choose open.

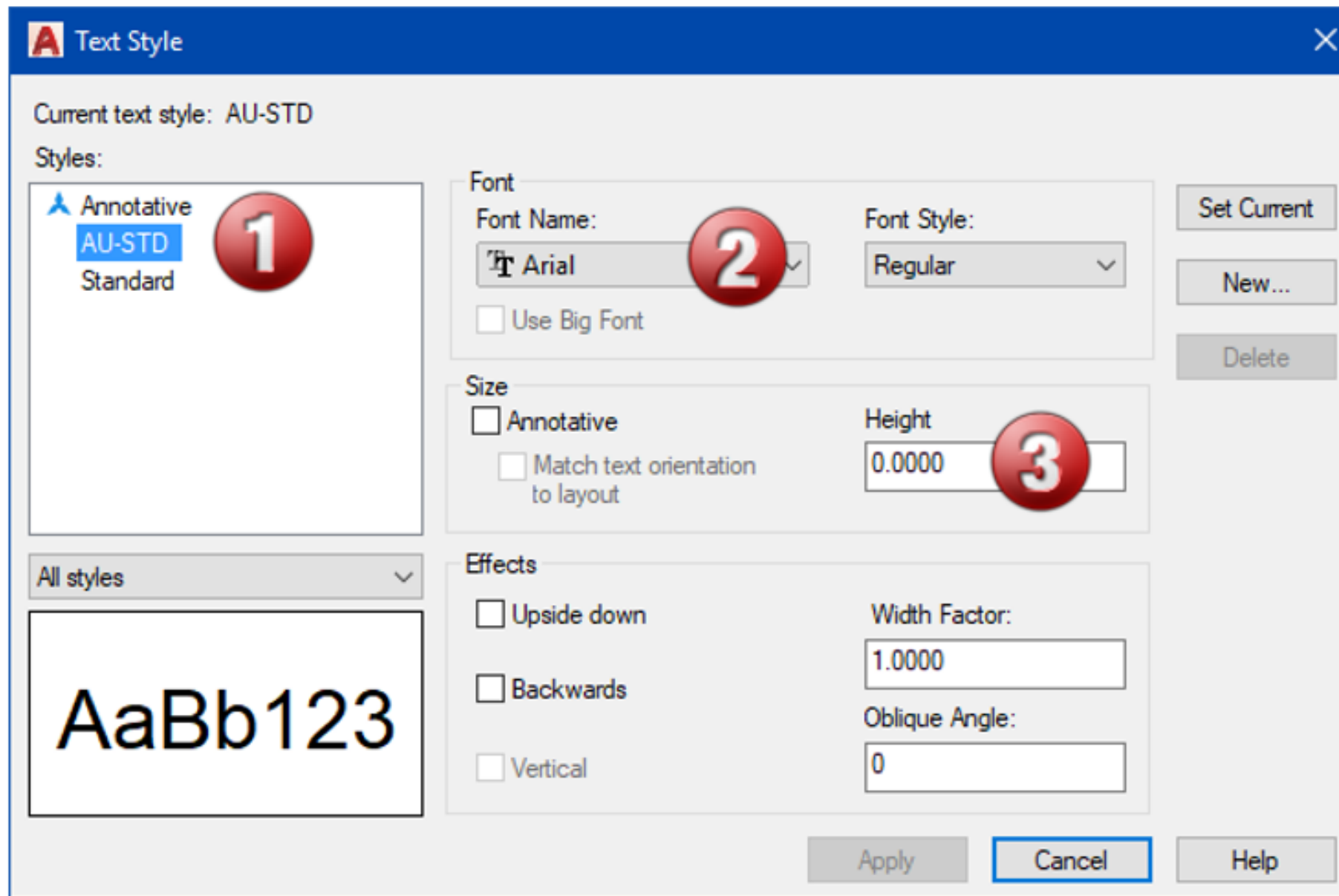


This file is a layer states file created from our standard drawing. This will give us the ability to import all of our standard layers into our drawing quickly. Another way to accomplish this is to use Designcenter (ADC).



Adding Text Styles to your Standards file

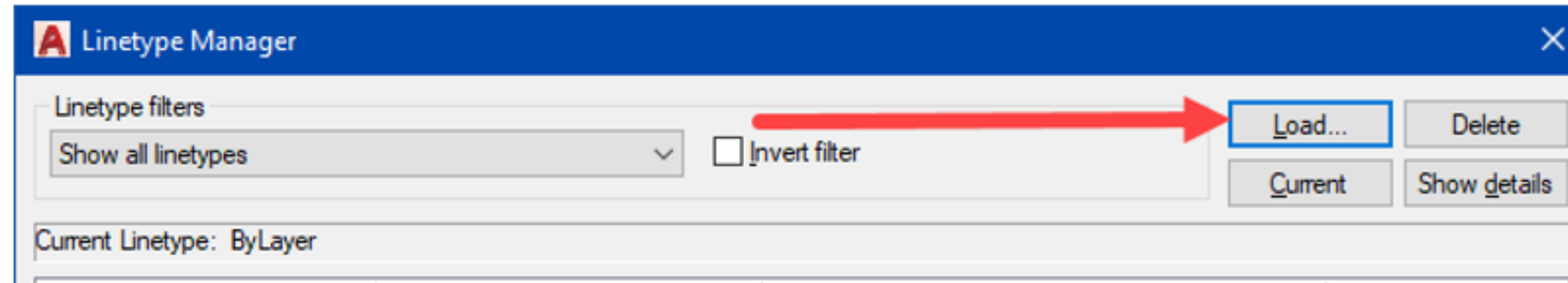
1. Create the AU-STD style and follow the steps shown in Figure 8. We do not want to make this annotative or give it a height as the text height is defined within the linetype. Use the ltscale system variable to change the size of a font in a linetype.



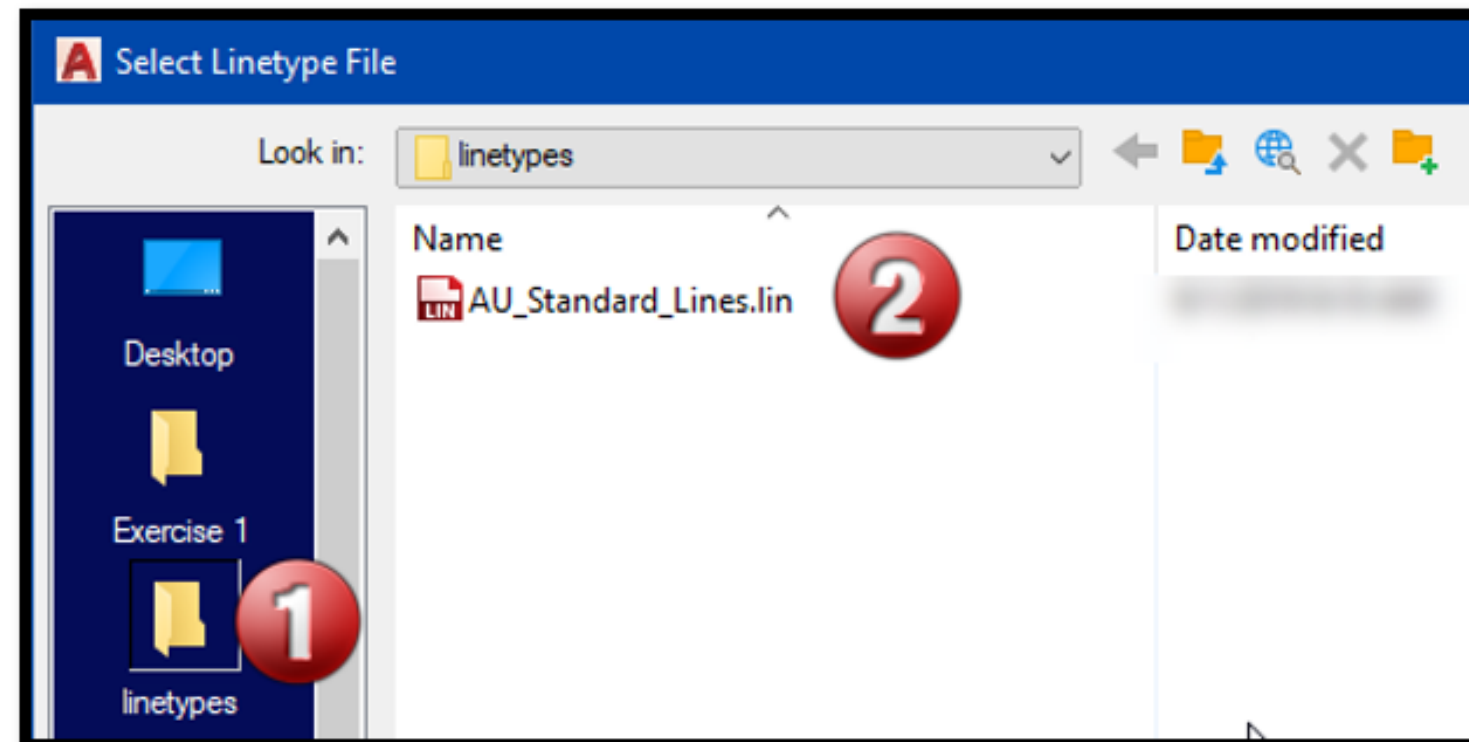
2. Cancel out of this command and type style at the command prompt again.
3. Create a new text style named AU-SHP. This style will use the wingdings font as our standard text. We are creating a linetype with special characters defining a shape.

Adding Linetypes to your Standards file

1. Staying in our current drawing with our text styles set, type LT or ltype at the command prompt.
2. Select **L**oad from the dialog box.
3. Select **F**ile.

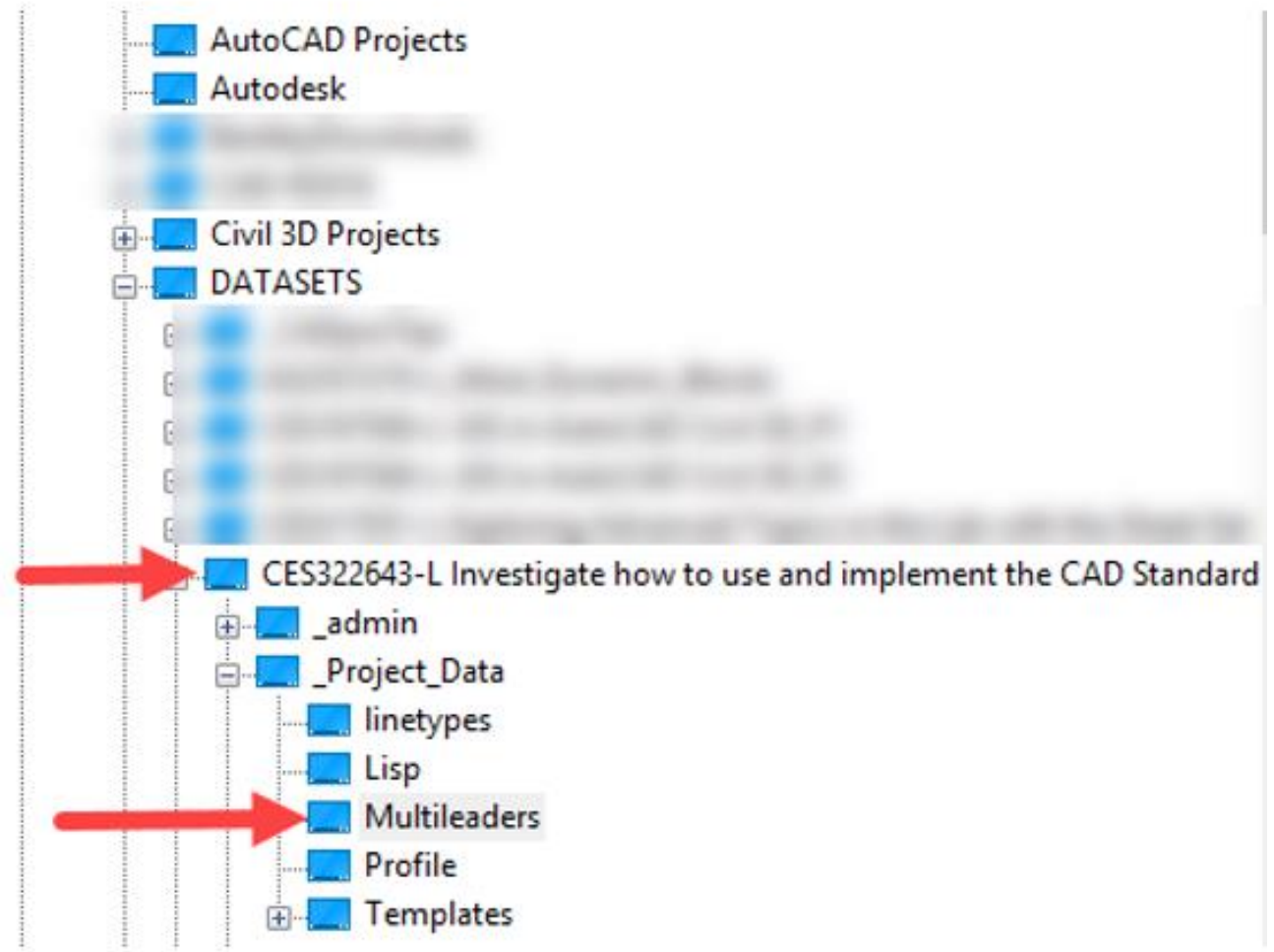


4. Navigate to the Linetype folder (1) and select the AU standard linetype file (2). In most companies there will be a standard linetype file that you can add to your standard. This linetype file contains examples of font style linetypes using the style name that we created in our standard.

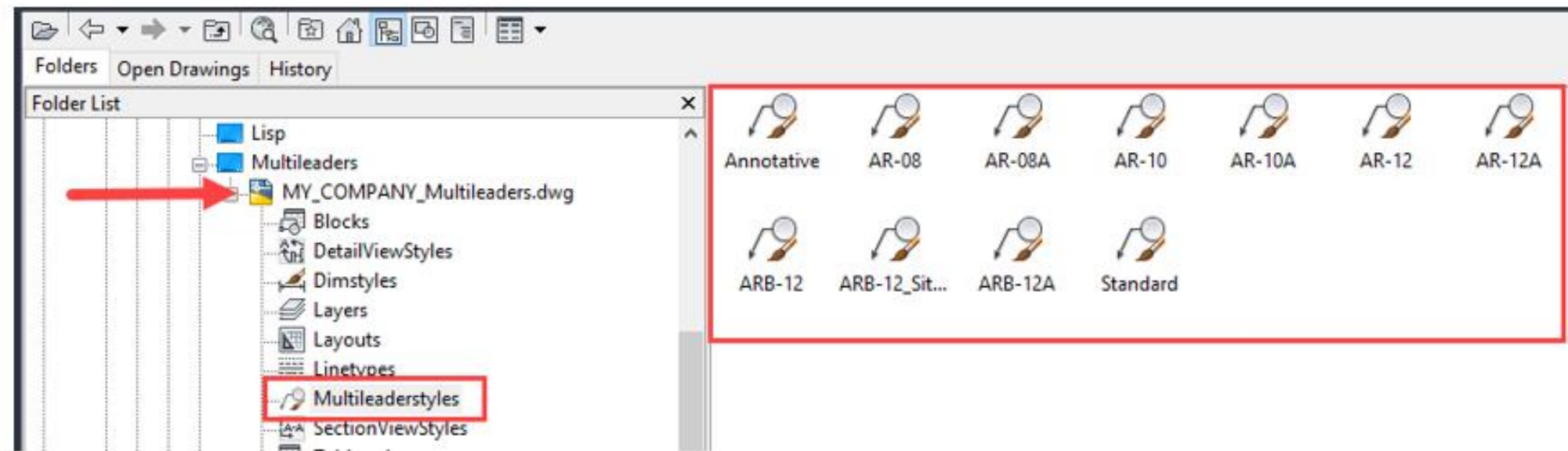


Adding Multileaders to your Standards file

1. Type ADC at the command prompt to bring up Designcenter.
2. Navigate to our project folder as shown and expand the folder then check the multileader section

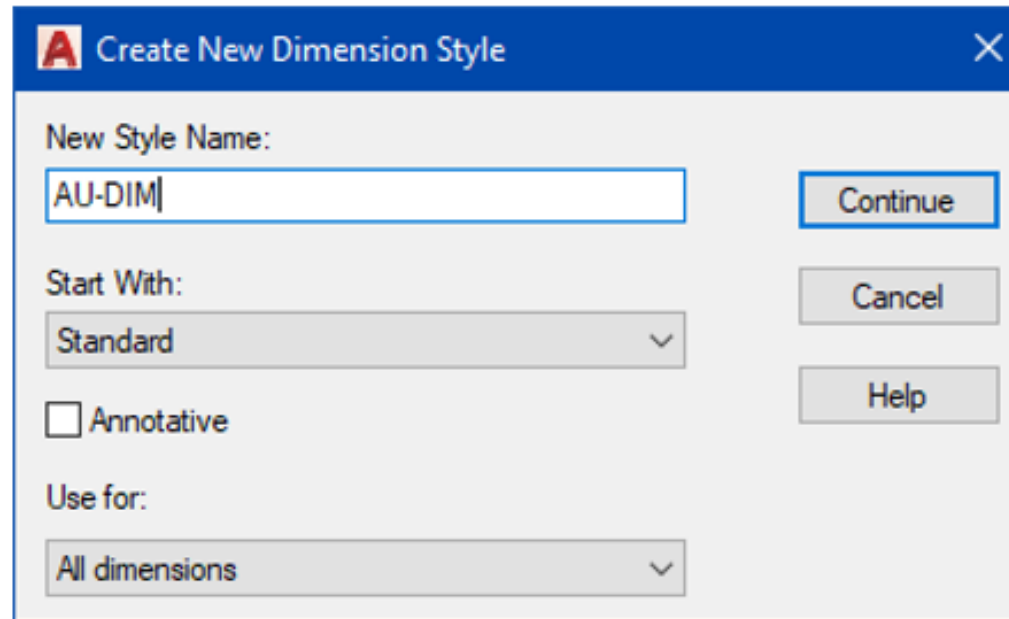


3. Double click the multileader section and then select Multileaderstyles within the drawing file.
4. Drag and drop all of the multileaders within the right window into your standard file.

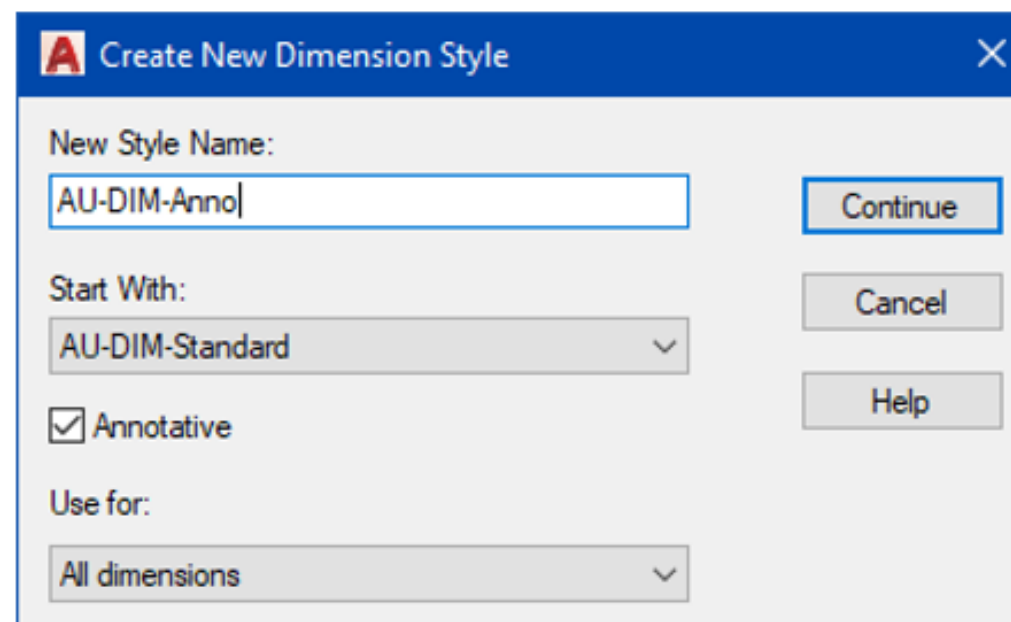


Adding Dimensions to our Standards file.

1. Keep working in the company standards drawing file.
2. Type ddim at the command prompt to bring up the dimension style manager and select **New**.
3. Create a new dimension style starting with Standard and Name it AU-DIM



4. Create a Second dimensions style and name it AU-DIM-Anno and make it annotative.

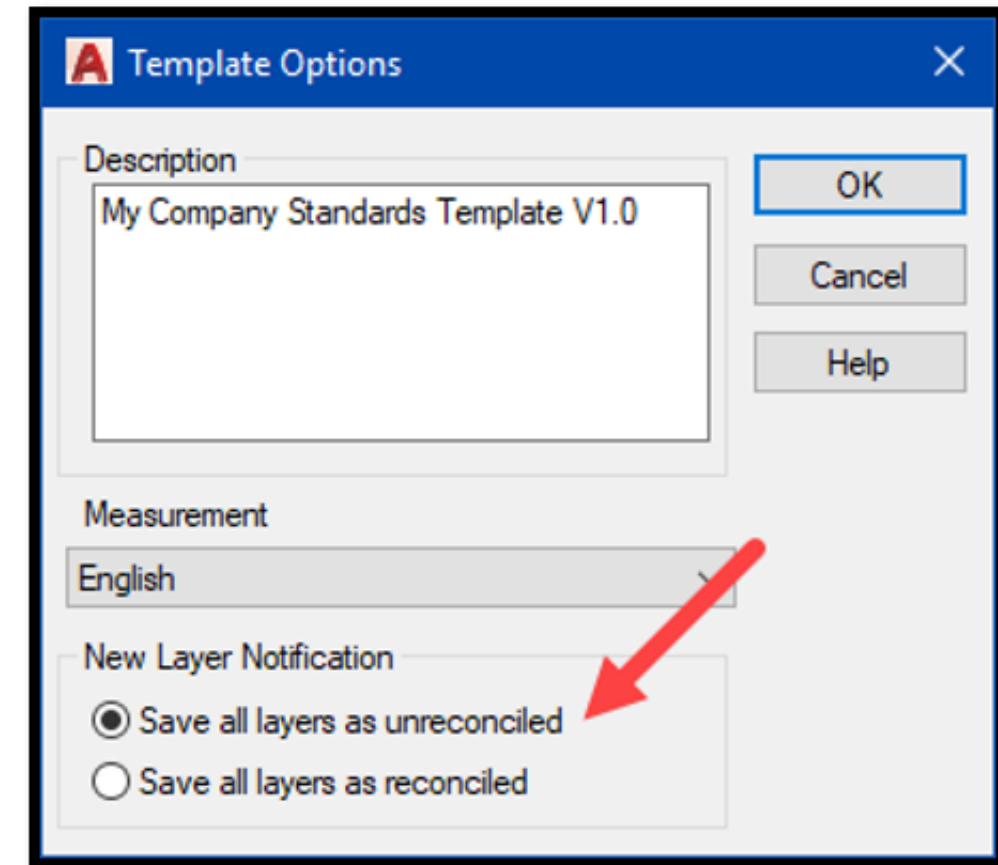


Exercise 2

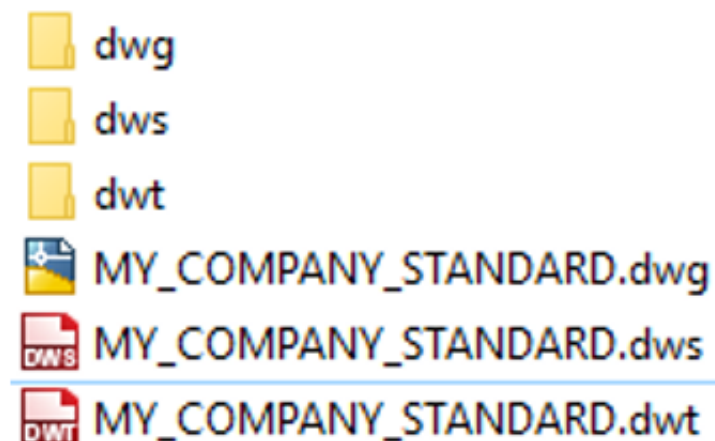
1. We now have to save our drawing file to a template then a standard.
2. Save your drawing in the Exercise 2 folder as a dwg file.
3. Save the same drawing as a template file (.dwt) and place within the Exercise 2 folder.

When you save to a template you will get the following dialog box. If you are not concerned about new layers and layer naming conventions within the drawing, then leave this button checked. If you choose layers as reconciled you are telling your template that the layers within the template are your company standard and once someone adds a new layer to the drawing AutoCAD will give you a warning.

Steps to Save your Standards file




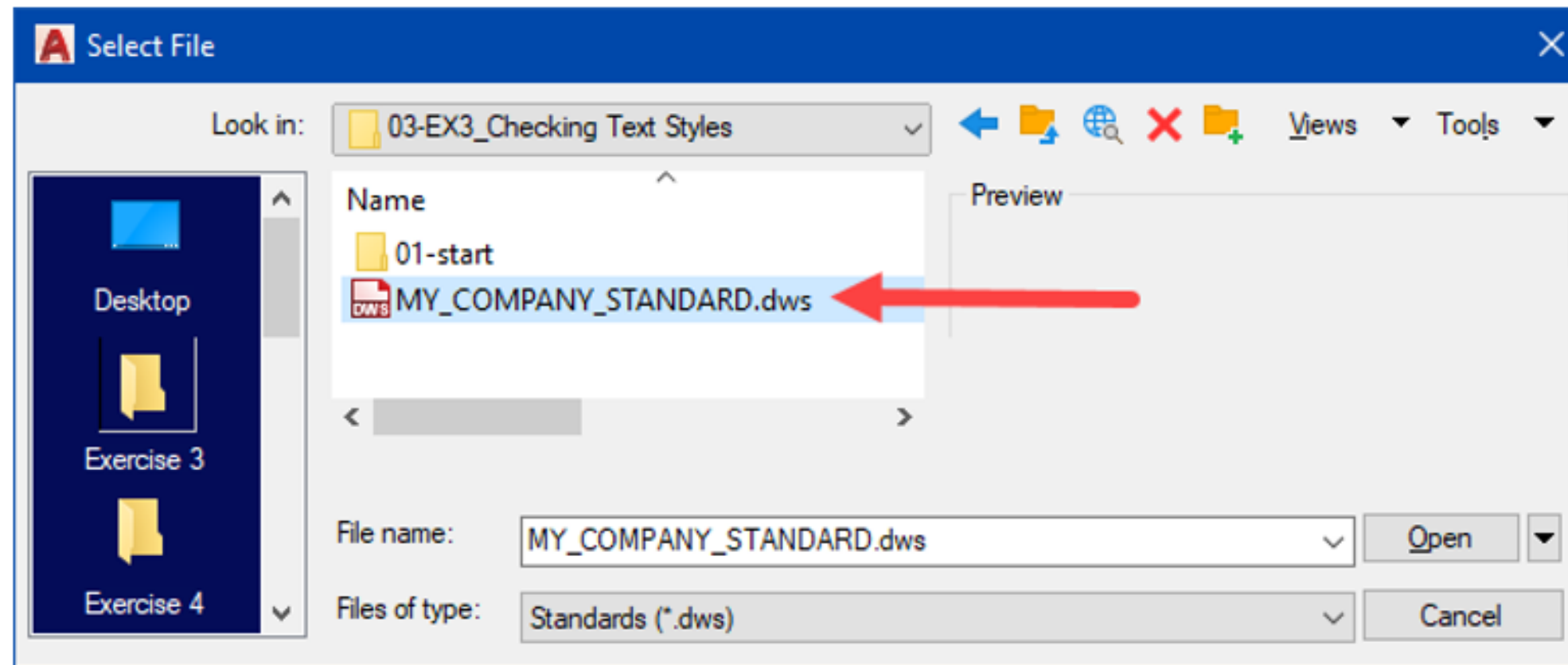
4. Save the template and give it a description and check the radio button Save all layers as unreconciled.
5. The final step is to save the template file to a drawing standards file (.dws).



Exercise 3

Checking your drawing for text violations

1. Open drawing **01-Basemap.dwg** in the Exercise 3 folder as shown.
2. Type Style at the command prompt to look at the text styles within this drawing. As you can see these are not part of our company standard.
3. On the Manage Tab of the Ribbon move to the CAD Standards panel and select Configure. Select the  sign and add the *My_Company_Standard.dws* to the window as shown.
4. Move to the Exercise 3 folder and select the My_Company_Standard.dws file and select Open.

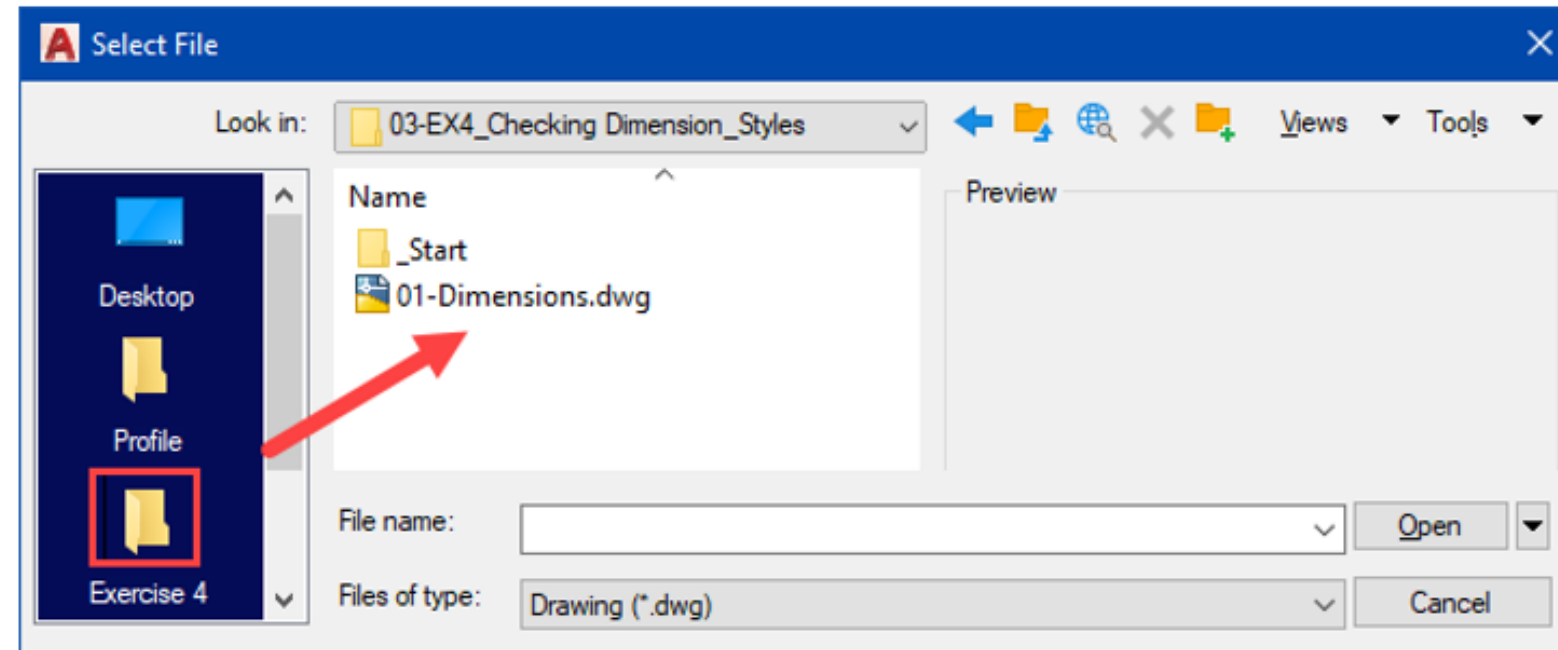


5. You have now attached your standards file to the current drawing.

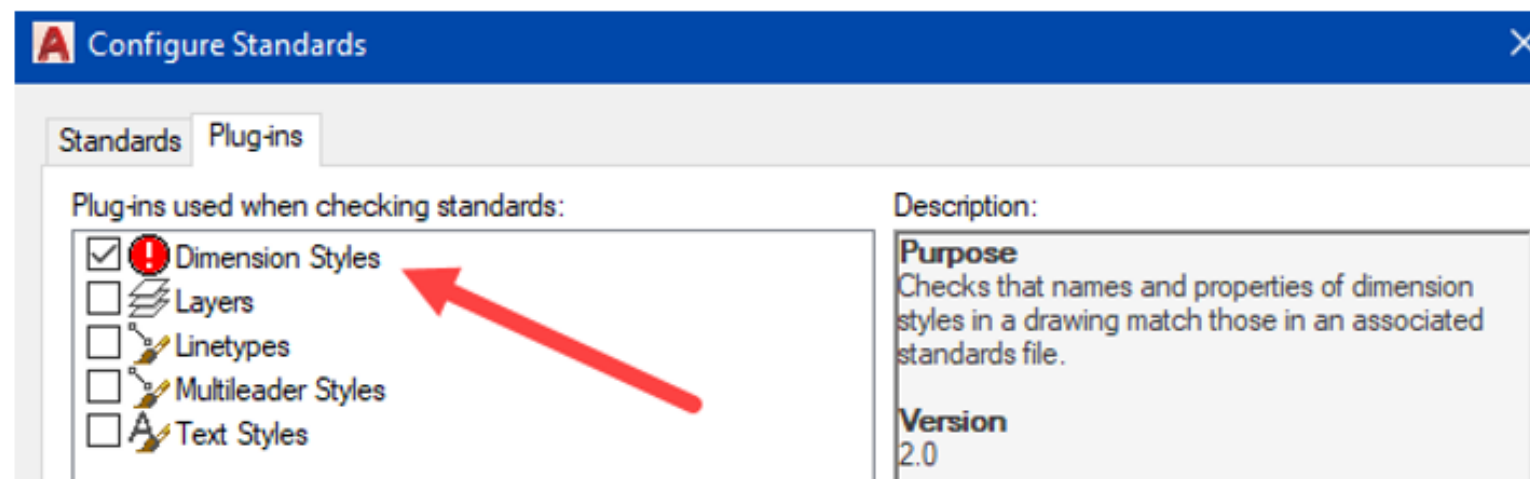
Exercise 4

Checking your drawing for dimension violations

1. Open drawing **01-dimensions.dwg** in the Exercise 4 folder.



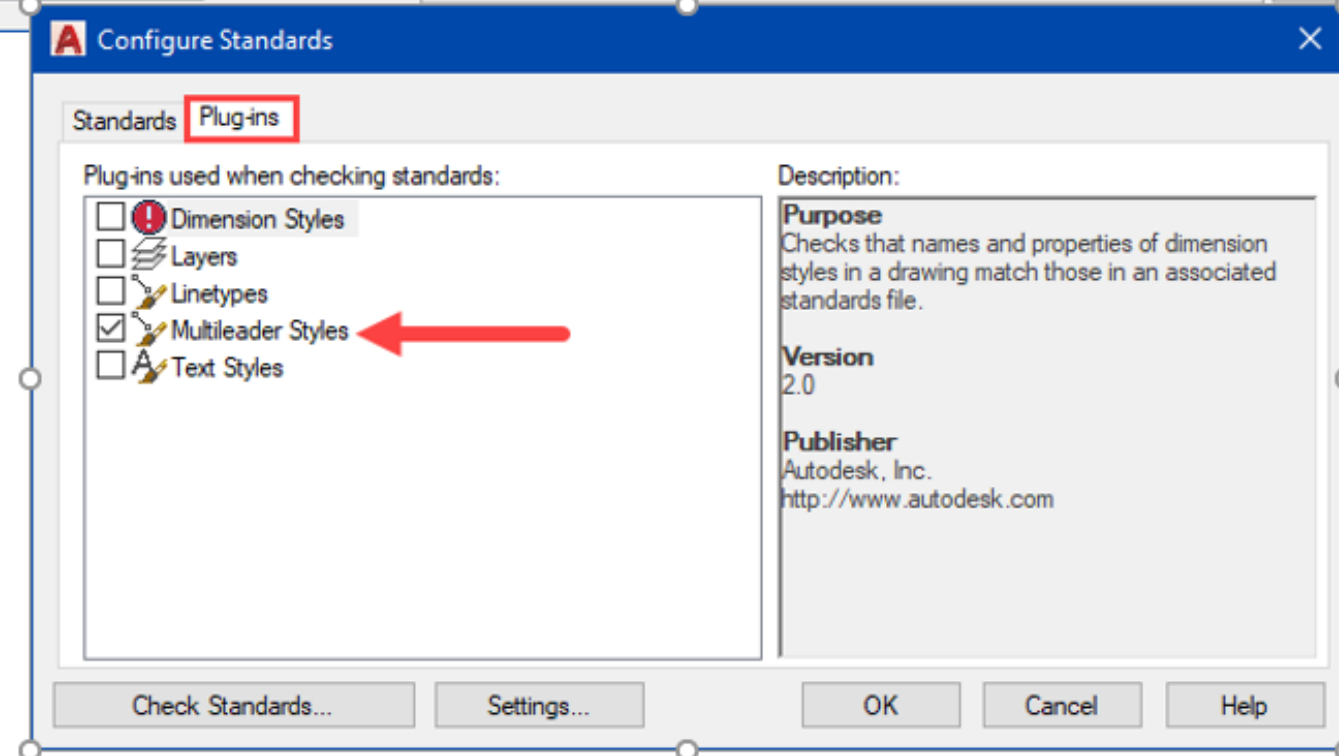
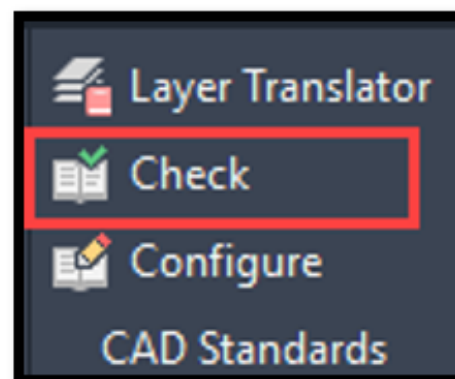
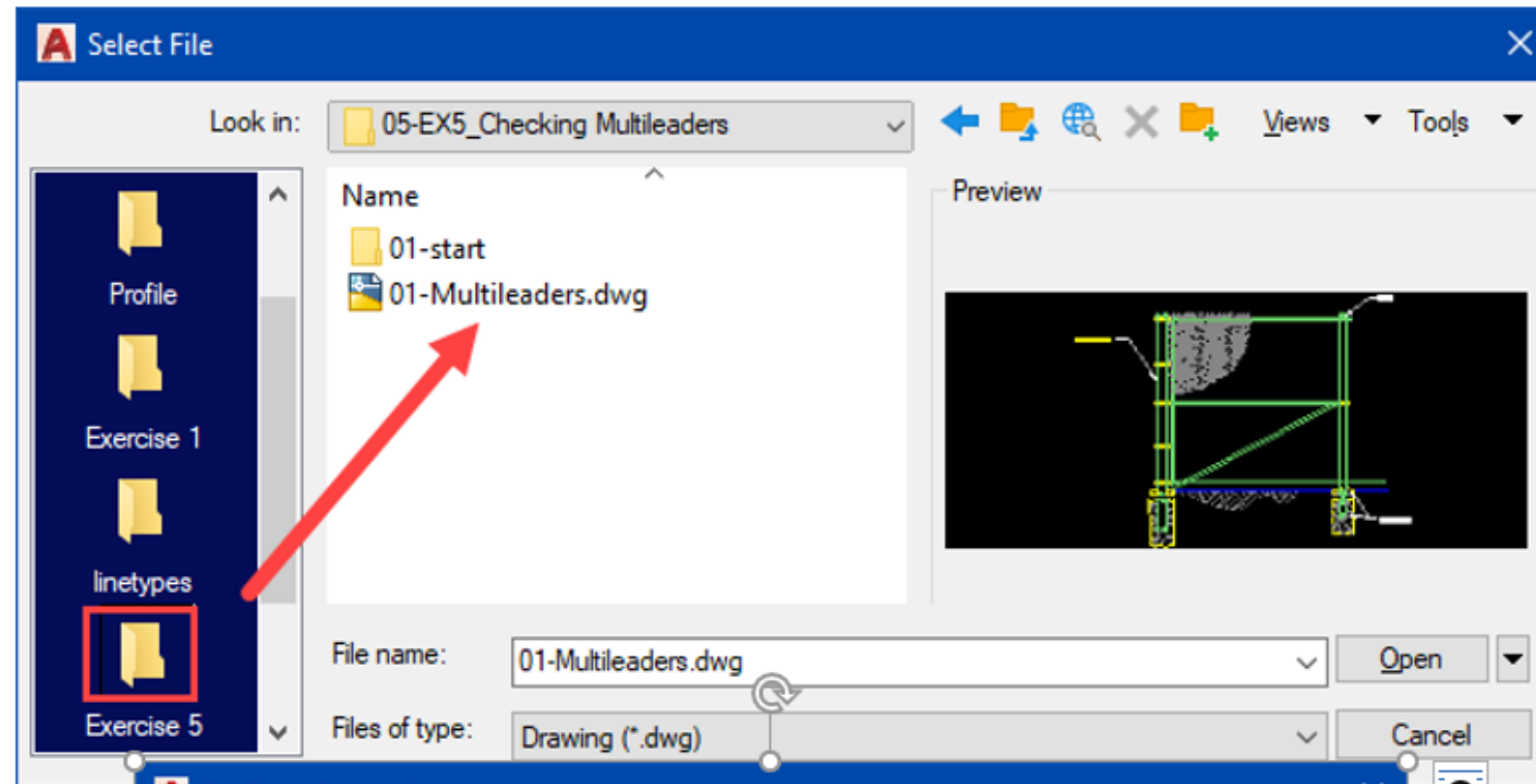
2. Move back out to the CAD Manager Panel on the Ribbon and select Configure > Plug-ins > Uncheck the Text Styles and check the dimension style as shown below.



1. Run the Check and replace the dimension style with AU-STD.

Exercise 5 Checking your drawing for multileader violations – NEW!

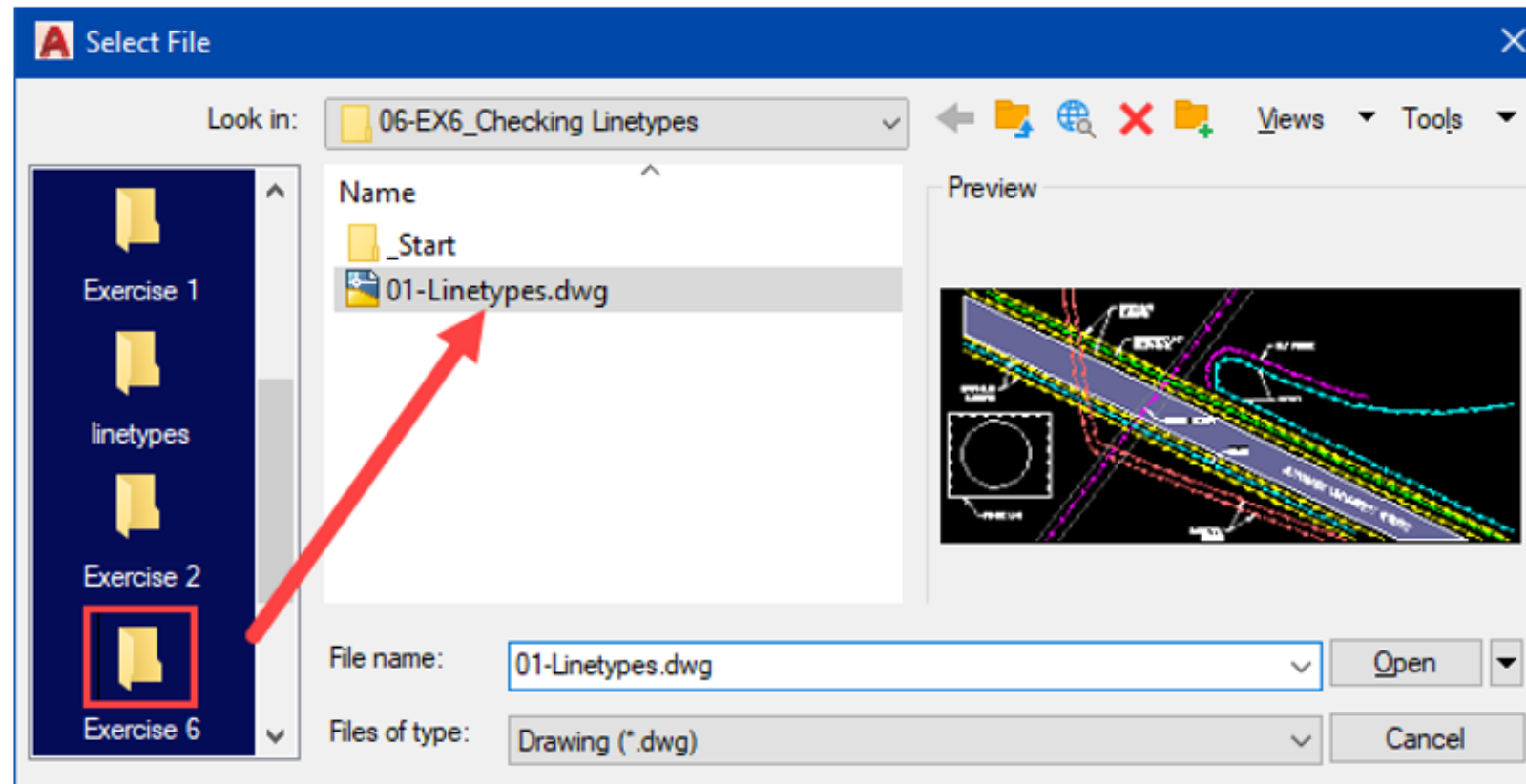
1. Open drawing 01-Multileaders in the Exercise 5 folder as shown.
2. Move to the Manage tab of the Ribbon and add our Company Standard file.
3. On the plug-ins tab uncheck everything except for Multileaders and select OK.
4. On the plug-ins tab uncheck everything except for Multileaders and select OK.
5. On the CAD Standards panel of the Ribbon Select Check.



Exercise 6

Checking your drawing for Standard Linetypes

1. Open the 01-linetypes drawing in the Exercise 6 folder.
2. Type linetype at the command prompt to view all the linetypes in the current drawing. Shown below are several linetypes from an outside source that we would like to convert to our standard.



DRDLINE
Eo
FENCE1
SANSS
SFFF
STMSS
T1
wATER

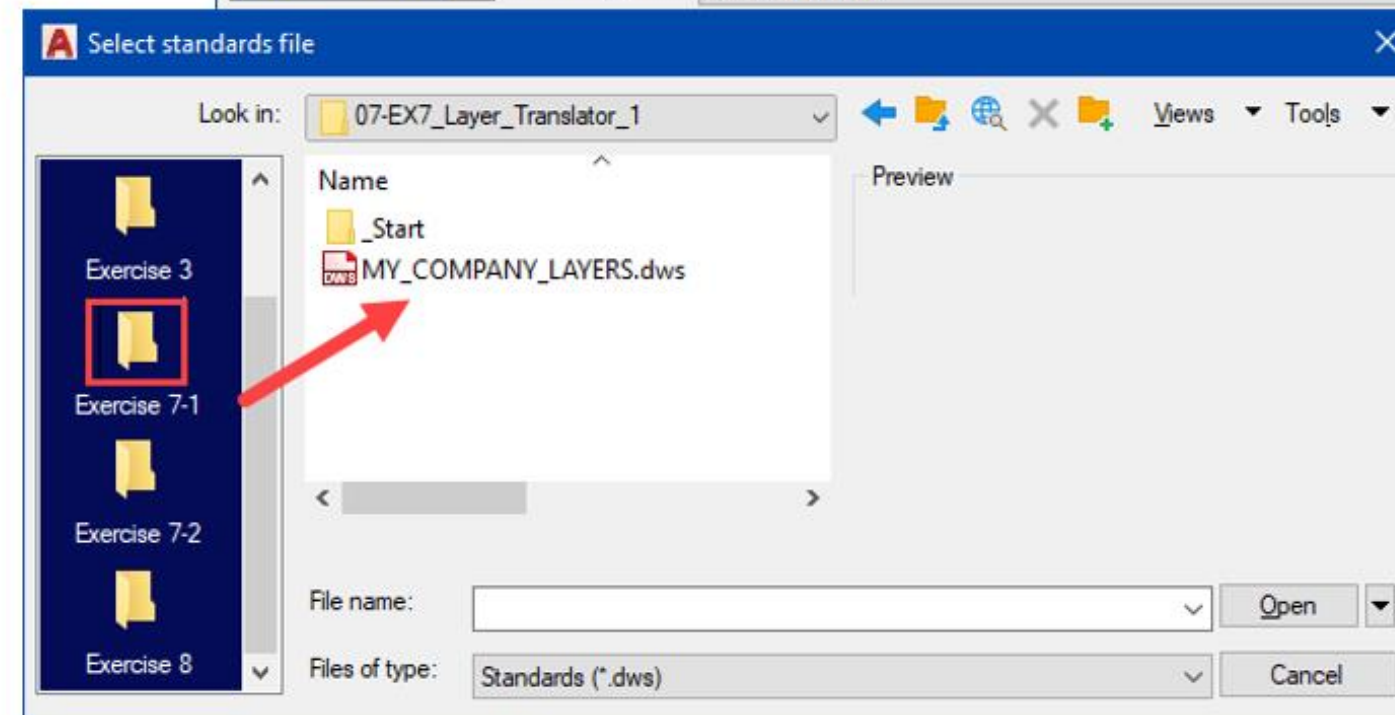
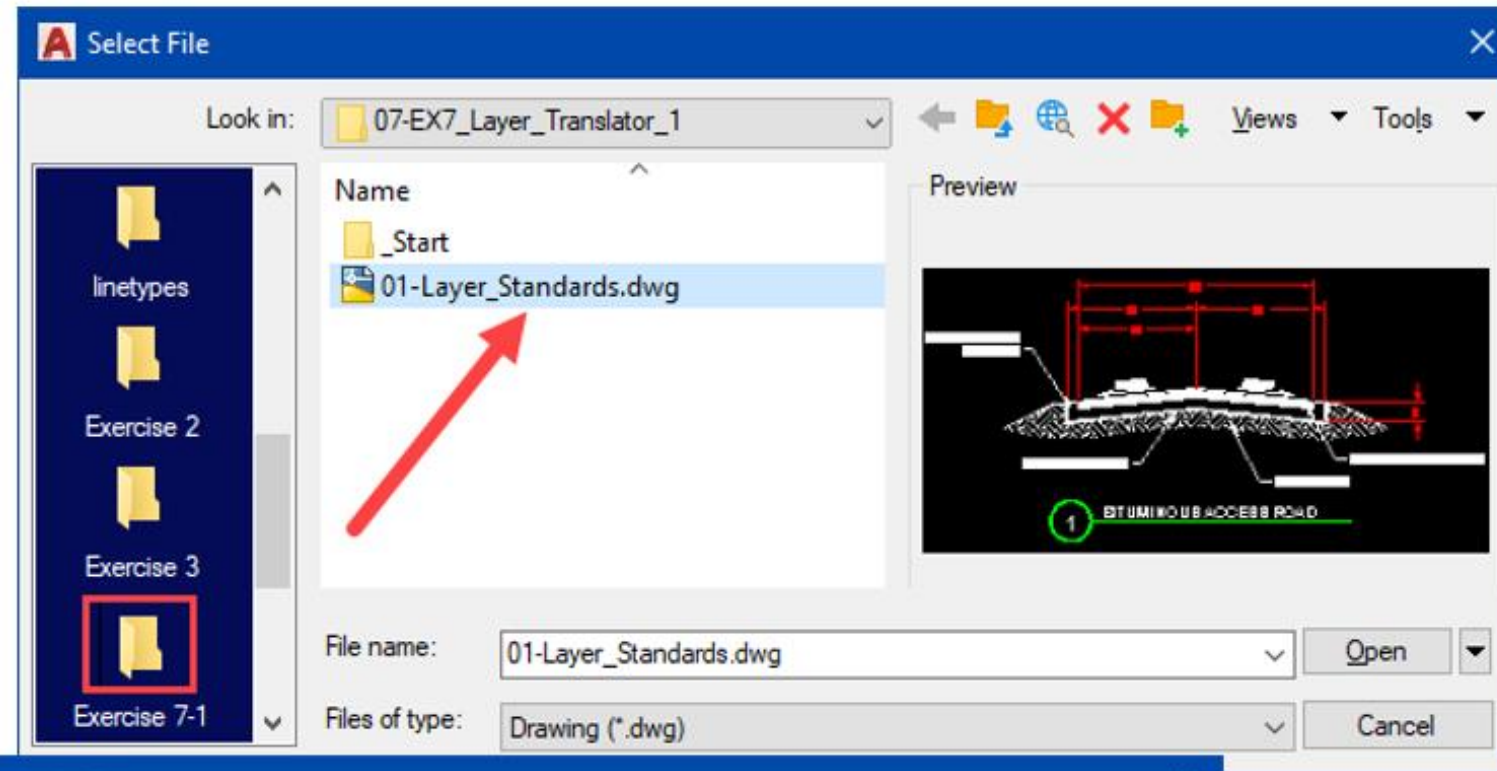
—D —D —D —D —D —D - DRAIN LINE ----- DD ----- DD ----- DD -----
—EO —EO —EO —EO —EO —EO - Overhead_Electric ----- Eo ----- Eo ----- Eo -----
—x —x —x —x —x —x - Fence Line ----- xx ----- xx ----- xx -----
—S2 —S2 —S2 —S2 —S2 —S2 - Sanitary Sewer ----- S2 ----- S2 ----- S2 -----
—11 —11 —11 —11 —11 —11 - Silt Fence ----- 11 ----- 11 ----- 11 -----
—S1 —S1 —S1 —S1 —S1 —S1 - Storm Sewer ----- S1 ----- S1 ----- S1 -----
—T1 —T1 —T1 —T1 —T1 —T1 - Telephone_Over ----- T1 ----- T1 ----- T1 -----
—W —W —W —W —W —W - WATER LINE ----- W ----- W ----- W -----

Exercise 7-1

Checking Standard Layers

In this exercise we are going to load up our standard layers and check those against a detail drawing.

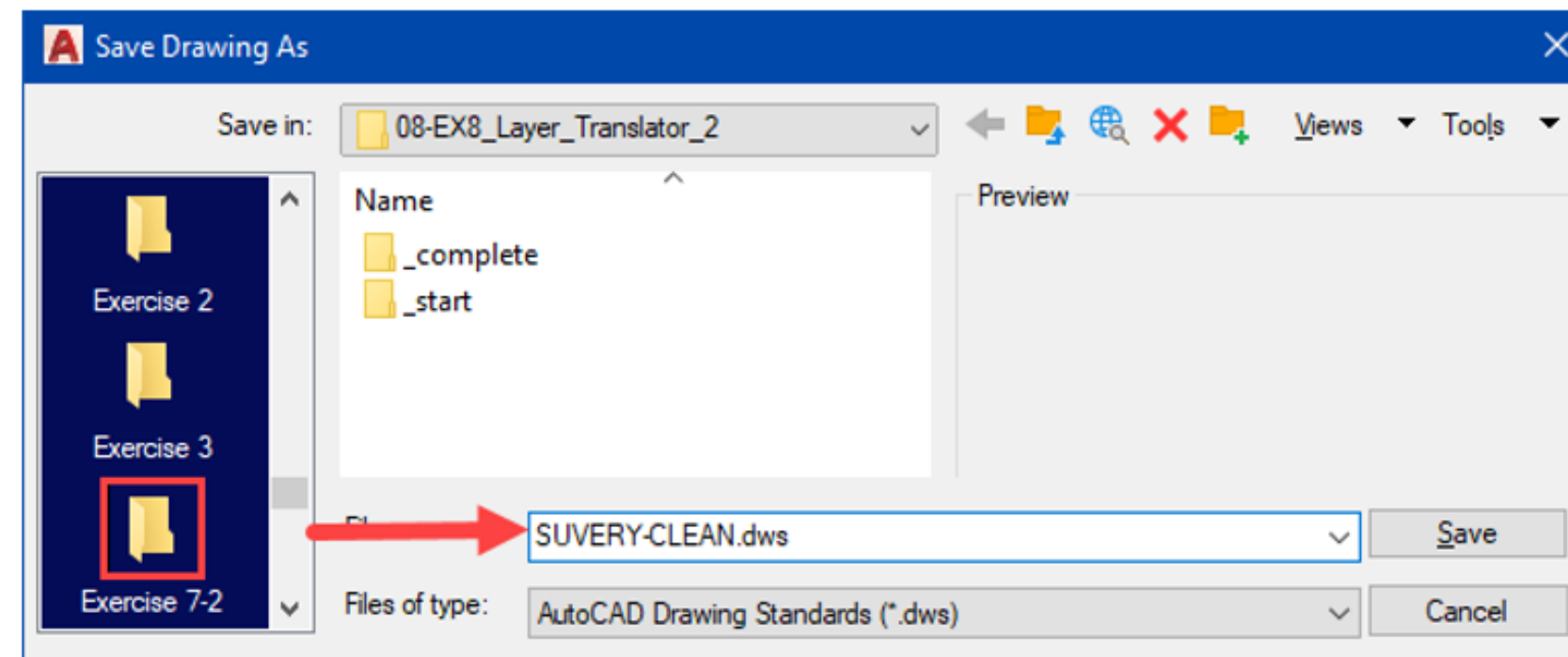
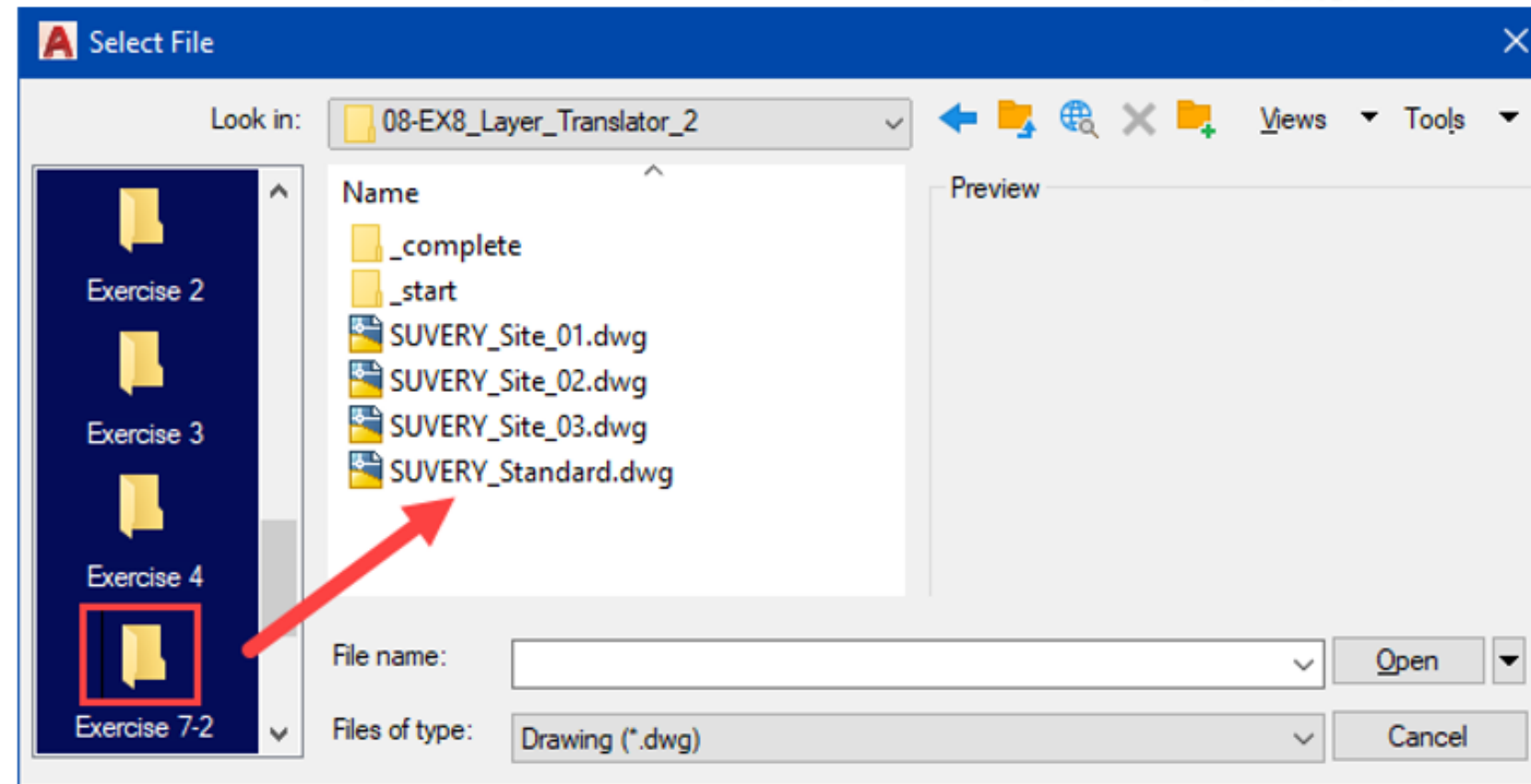
1. Open **01-Layer_Standards.dwg** in the Exercise 7-1 folder.
2. Move to Exercise 7-1 folder and select
3. On the plug ins tab uncheck everything but the layers box.
4. Select Check Standards.
5. Move through each of the layers in the drawing and match to your standard layer).



Exercise 7-2

Using the Layer Translator

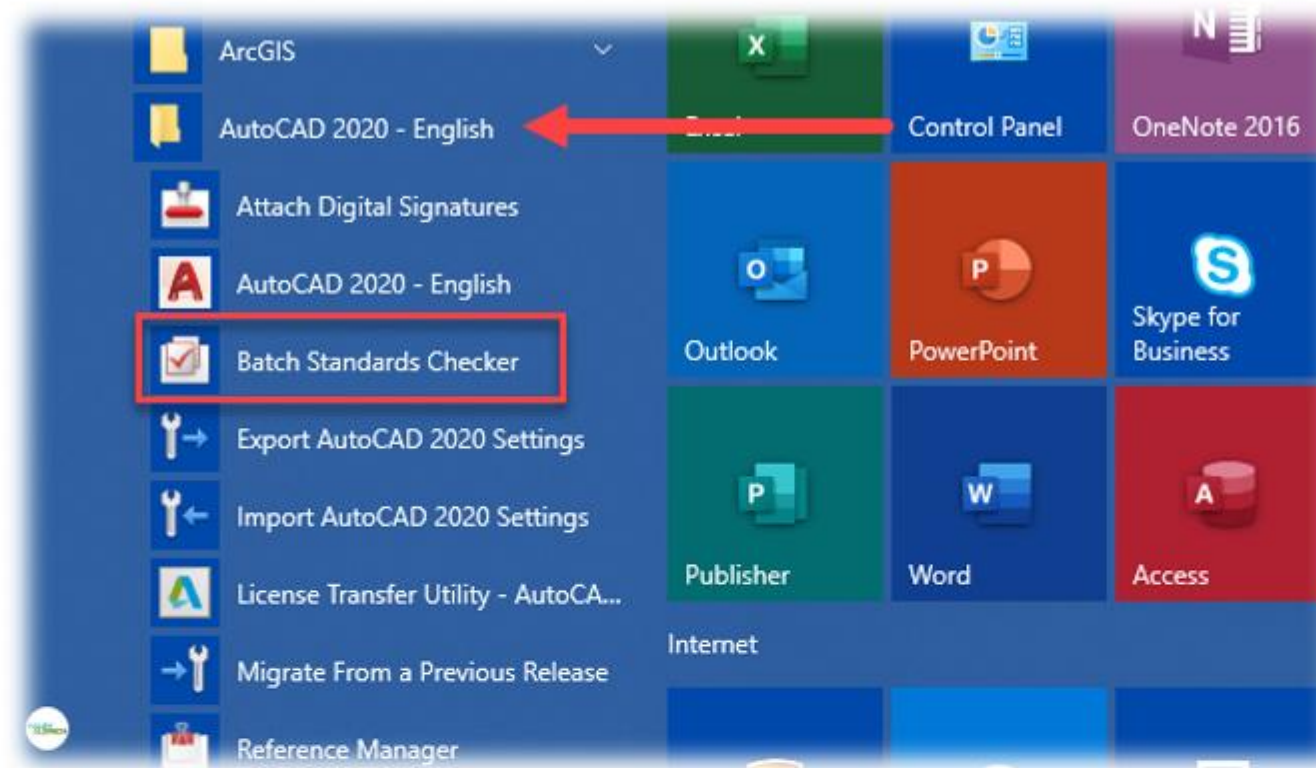
1. From the Exercise 7-1 folder open Survey_Standard.dwg.
2. Type Layer and review all the setting to make sure they are what you would like to see on your standard survey. Change any colors, linetypes, or properties that you would like to modify.
3. After a review Save the drawing as a dws file and place it in the Exercise 7-2 folder and name it **SURVEY-CLEAN.dws**
4. Open Site Survey 01.dwg survey drawing files located within the folder.
5. On the manage tab of the Ribbon select Layer Translator.
6. Select from the dialog box. Notice all of your layers in the current drawing have been loaded to the left window.
7. Navigate to the Exercise 7-2 folder and load **SURVEY_CLEAN.dws**



Exercise 8

Batch Standards Checker in AutoCAD

1. Click Start menu > All Programs > Autodesk > [Product Folder] > Batch Standards Checker.



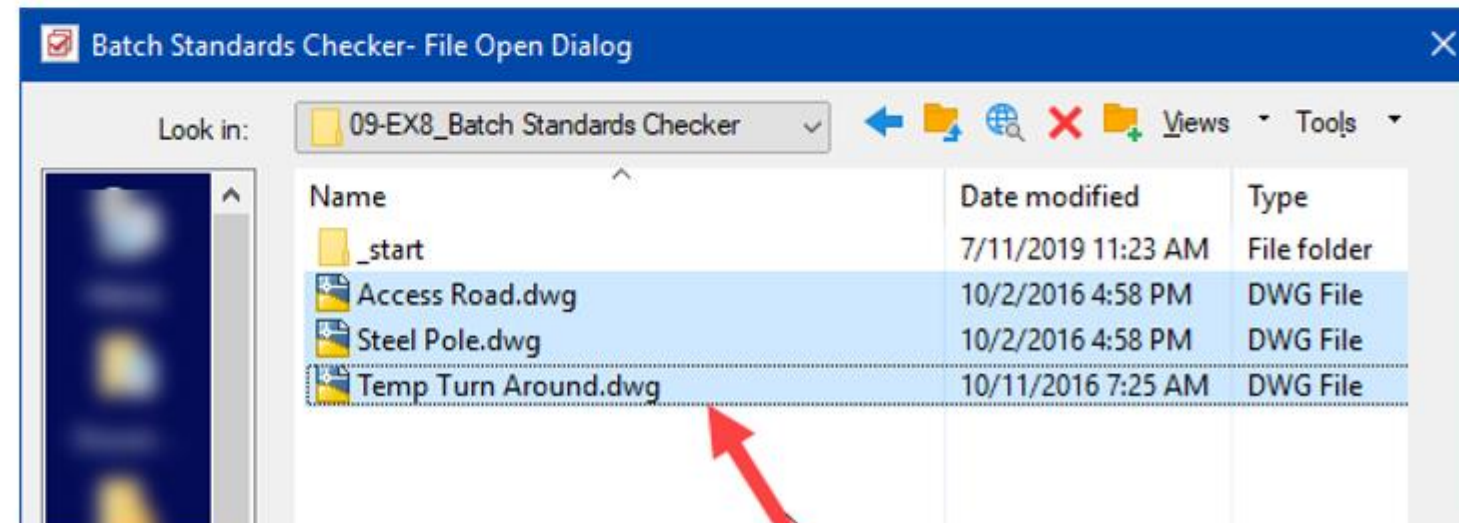
2. On the Drawings tab, click the + button (Add Drawing).



3. Browse to the Exercise 8 folder and select all 3 drawings that are in the folder.

4. All your drawings have been added to the Batch Standards Checker.

Follow the handout to run through creating the report in the CAD Standards Checker



Thank you!

My name is Sam Lucido and I am **CADproTips**



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