Getting Started with CAD

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Getting started with CAD

Overview

The aim of this guide is to provide you with a general introduction to working with CAD in 12d Synergy V4.

CAD Plugins

Supported CAD Products

Plugins are available to integrate 12d Synergy with the following CAD products:

- AutoCAD
    - AutoCAD Standard
    - AutoCAD Civil 3D
    - AutoCAD Map 3D
    - AutoCAD Architecture
    - AutoCAD Electrical
    - AutoCAD Mechanical
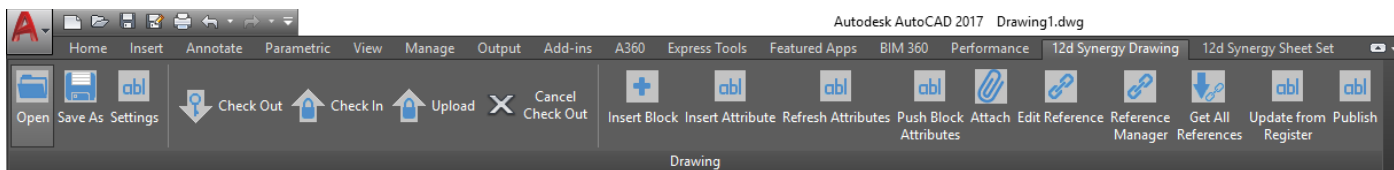   - AutoCAD Plant 3D
- BricsCAD

12d Synergy Commands

There are a range of 12d Synergy buttons available. In AutoCAD, these are separated into two groups for functions related to drawings and sheet sets. These can be found:

1. As tabs in the AutoCAD ribbon.
2. As drop down menus.
3. As toolbars.

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Drawing Commands

Button	Command	Description
Open	12dSynergyOpen	Opens a drawing from 12d Synergy
Save As	12dSynergySaveAs	Adds the currently active drawing to 12d Synergy
Settings	12dSynergyConfigure	Allows you to adjust settings related to the CAD plugin.
Check Out	12dSynergyCheckOut	Check out the currently active drawing
Check In	12dSynergyCheckIn	Check in the currently active drawing
Upload	12dSynergyUpload	Upload changes made to the currently active drawing while keeping it checked out
Cancel Check Out	12dSynergyCancelCheckOut	Cancel a check out
Insert Block	12dSynergyInsertBlock	Insert a block into the current drawing from a drawing file in 12d Synergy
Insert Attribute	12dSynergyInsertAttribute	Insert an attribute from 12d Synergy into the current drawing
Refresh Attributes	12dSynergyRefreshAttributes	Update the attributes and layouts in your current drawing with changes that have been made in 12d Synergy
Attach	12dSynergyAttach	Attach an Xref, Image, PDF, Data Link or Point Cloud from a file in 12d Synergy
Edit Reference	12dSynergyRefEdit	Checks out and allows editing of an Xref in the current drawing
Reference Manager	12dSynergyManageReferences	Allows you to view and edit 12d Synergy references in the current drawing

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Get All References	12dSynergyGetAllReferences	Gets the latest version of all 12d Synergy references in the current drawing
Update from Register	12dSynergyUpdateFromRegister	Updates the layouts in the current folder based on a selected excel register file
Publish	12dSynergyPublish	Publish a drawing or set of drawings
Load Synergy User Interface	12dSynergyLoadCUI	Load the 12d Synergy custom user interface file which contains a 12d Synergy menu, ribbon and toolbox
Reload Synergy User Interface	12dSynergyReloadCUI	Unload and reload the 12d Synergy customer user interface
Repair References	12dSynergyRepairReferences	Convert the path of referenced files from an id to a local path

Working with Drawings

Adding a Drawing to 12d Synergy

When working with a new drawing, you can add it to 12d Synergy directly from the plugin. To add a drawing you have open:

4. Select the "12d Synergy Drawing" button group
5. Select "Save As"
6. Enter the name that the drawing will be saved as in 12d Synergy and select "Save".
7. Select a location to save the file.

Opening a Drawing

To open a drawing from 12d Synergy:

1. Select the "12d Synergy Drawing" button group
2. Select "Open"
3. Navigate to the correct job and folder and select the file you want to open.

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Working on a Drawing

You can check your drawing file in and out directly from the CAD plugin with the "12d Synergy Drawing" button group.


"Upload" will upload the changes you have made to your drawing without checking the file in, allowing you to keep working.

Inserting a Block

The "Insert Block" button allows you to insert a block into the current drawing from a drawing file saved in 12d Synergy. To insert a block:

1. Select the "12d Synergy Drawing" button group

2. Select "Insert Block"

3. Navigate to the correct job and folder and select the file you want to insert from

4. Then follow the prompts to specify the insertion point, scale and rotation by selecting points on the screen, or by entering values into the command line.
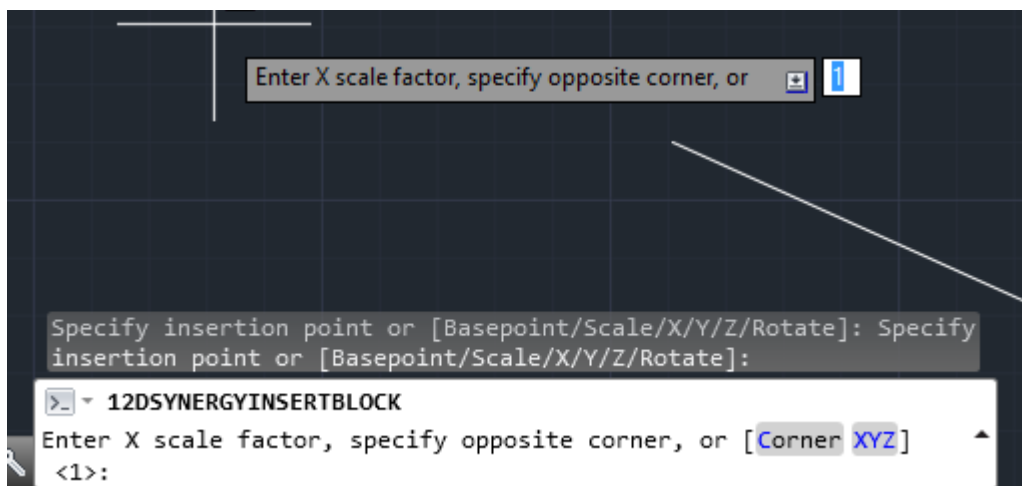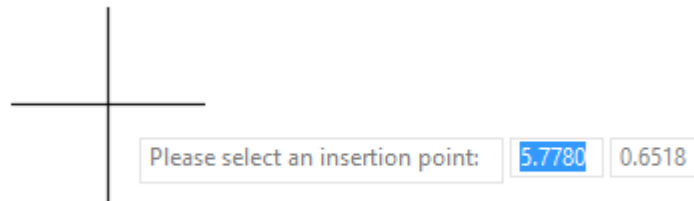

Inserting Attributes

Inserting Attributes from 12d Synergy

The simplest way to use an attribute from 12d Synergy is with the "Insert Attribute" button. This does not associate with a layout and can be inserted in the drawing as a field. Changes made to the value of this attribute in 12d Synergy will be dynamically reflected in the drawing when the file is downloaded.

1. Select the "12d Synergy Drawing" button group

2. Select "Insert Attribute"

3. Select an attribute from the list of available attributes

4. Select an insertion point in the drawing

Making Changes to Attributes

Changes from 12d Synergy

Changes can be made to inserted attributes or linked layout attributes from the 12d Synergy Client. When a drawing file is loaded in the CAD plugin, it will automatically update any inserted attributes or layout attributes with their values from 12d Synergy. Changes made in the 12d Synergy Client after the file was opened can be loaded into the drawing by selecting the "Refresh Attributes" button found in the "12d Synergy Drawing" button group.

Pushing Layout Attribute Changes to 12d Synergy

When a drawing file in 12d Synergy has been linked to its layout attributes, you can push changes made in the file back to 12d Synergy. Simply select the "Push Block Attributes" button found in the "12d Synergy Drawing" button group.

Changes from a CAD Register Spreadsheet

To update attributes in your drawings from a register file:

1. Ensure that all of the drawings that need to be updated are located in the same folder as the current drawing

2. Select the "12d Synergy Drawing" button group

3. Select "Update from Register"

4. Select the spreadsheet file

5. Any drawings in the same folder as the current drawing file that match the file names in the 1st column will now be updated

The drawing file names are required to be in the 1st column and the layout names in the 2nd column. Attribute names are to be entered in the 1st row from the 3rd column onwards.

◢	A	B	C	D	E
1	DWG	Layout	PROJNUM	STATUS	TYPE
2			20160001	PD	
3					
4					
5	20160001-BC-PL-001.dwg	Layout1	20160001	BC	PL
6	20160001-PD-CL-001	Layout1	20160001	PD	CL
7	20160001-PD-CL-001	Layout2	20160001	PD	CL
8	20160001-PD-CL-001.dwg	Layout3	20160001	PD	CL
9	20160001-PD-PL-001.dwg	Layout1	20160001	PD	PL

Attaching References

For DWG files, 12d Synergy is able to track references for XREFs, images, PDFs, excel data links and point clouds. To begin attaching a file:

1. Select the "12d Synergy Drawing" button group

2. Select "Attach"

3. Select the type of file you want to attach
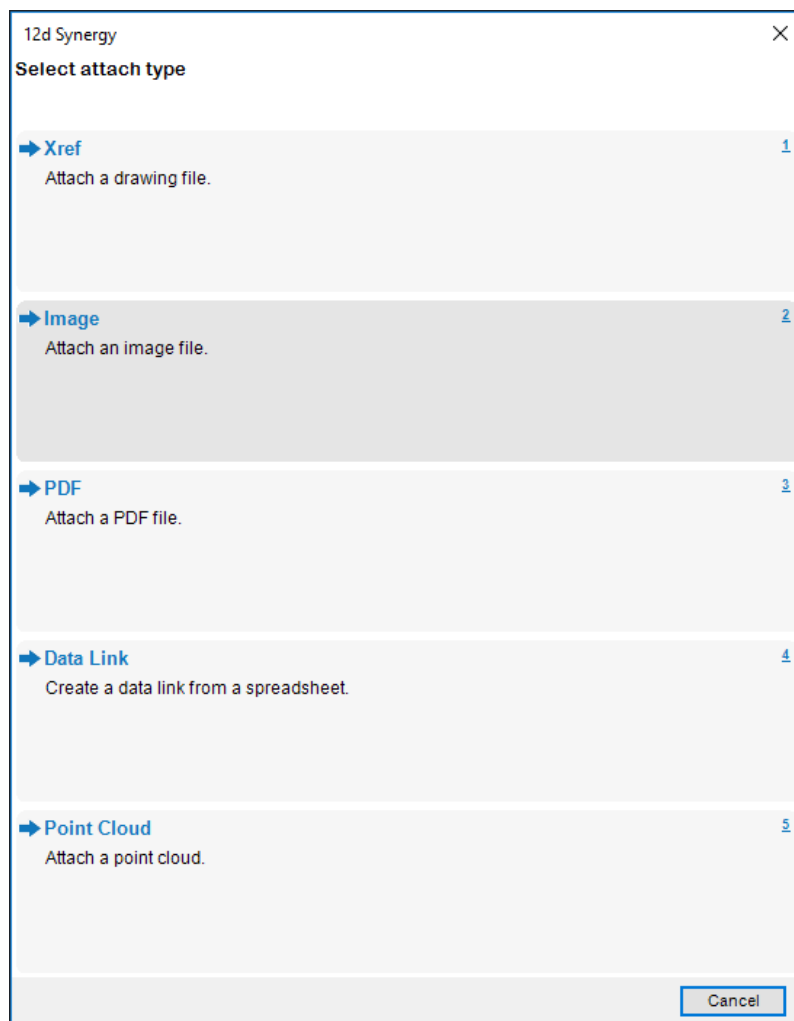
Xref

After selecting the drawing file from 12d Synergy, you will be prompted with an AutoCAD dialog to specify the attachment options.
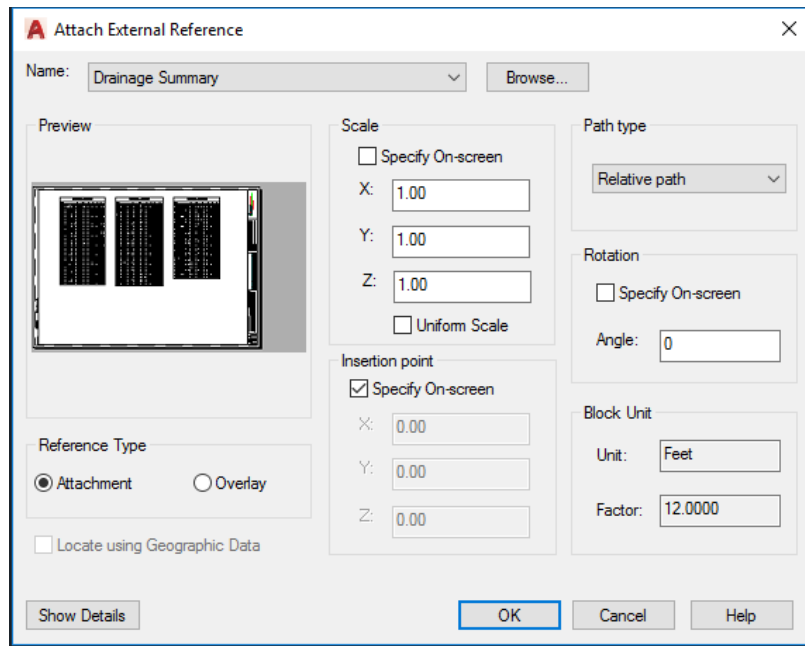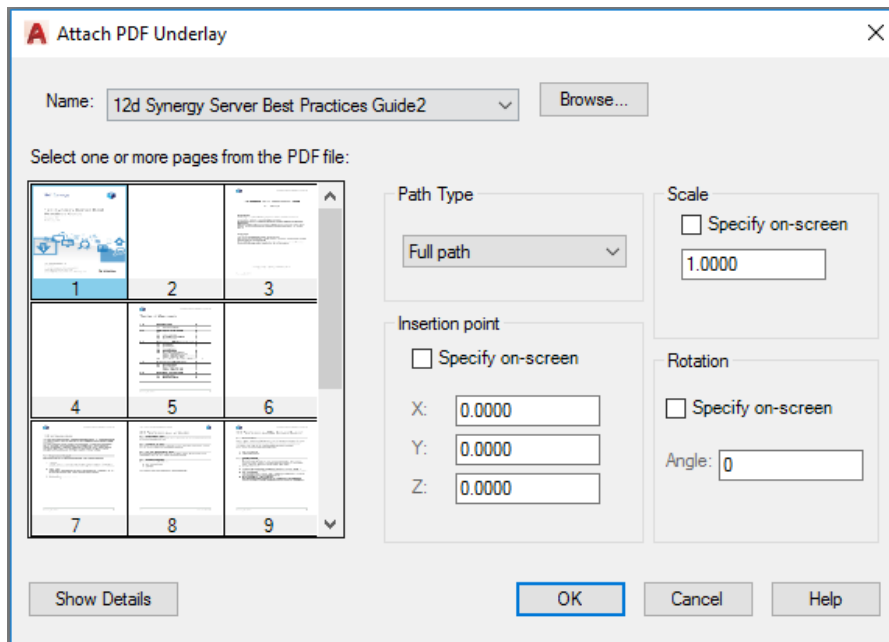

Image

After selecting the image file from 12d Synergy, you will be prompted with an AutoCAD dialog to specify the attachment options.
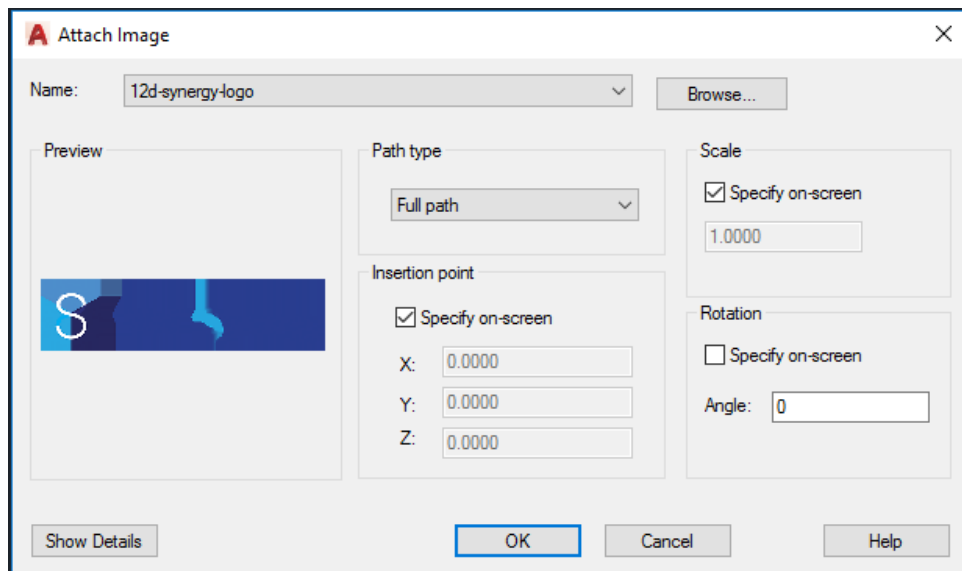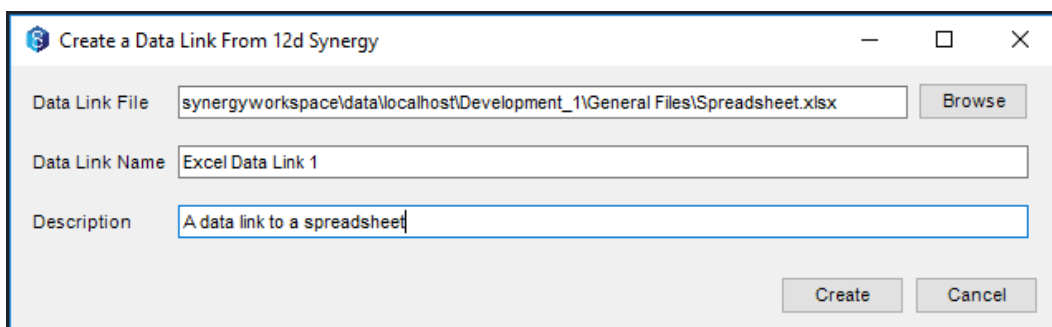

PDF

After selecting the pdf file from 12d Synergy, you will be prompted with an AutoCAD dialog to specify the page and attachment options.

Data Link

You will be prompted with a dialog to select data link attachment options.

1. Select "Browse" to select an excel file from 12d Synergy that you want to attach

2. Fill in the remaining details and select "Create"

The data link has now been created and can be inserted as a table into the current drawing. By default, the link will have been created for the whole spreadsheet. To modify the data link to use a specific range:

1. Use the "_DATALINK" command in the AutoCAD command line or select Insert-> Data Link

2. Right click on the name of the data link you have created and select "Edit"

3. You will be prompted with a dialog where you can specify the range from the chosen excel file.
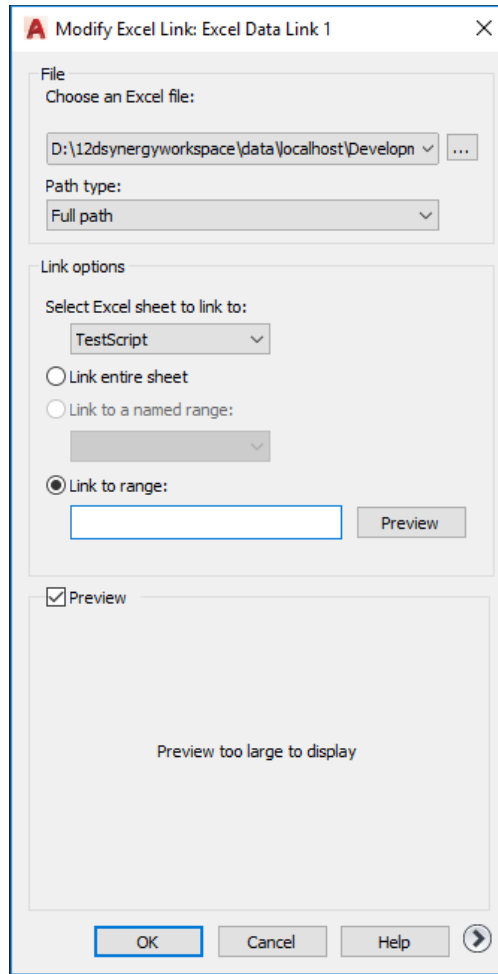
Point Cloud

When prompted to select a point cloud, you have the choice of selecting a point cloud scan file (RCS) or a point cloud project file (RCP). In order to use a point cloud project file, the project folder must have been added to 12d Synergy as a managed folder. This will allow all the files in the point cloud project to be downloaded when a file with this reference is checked out.
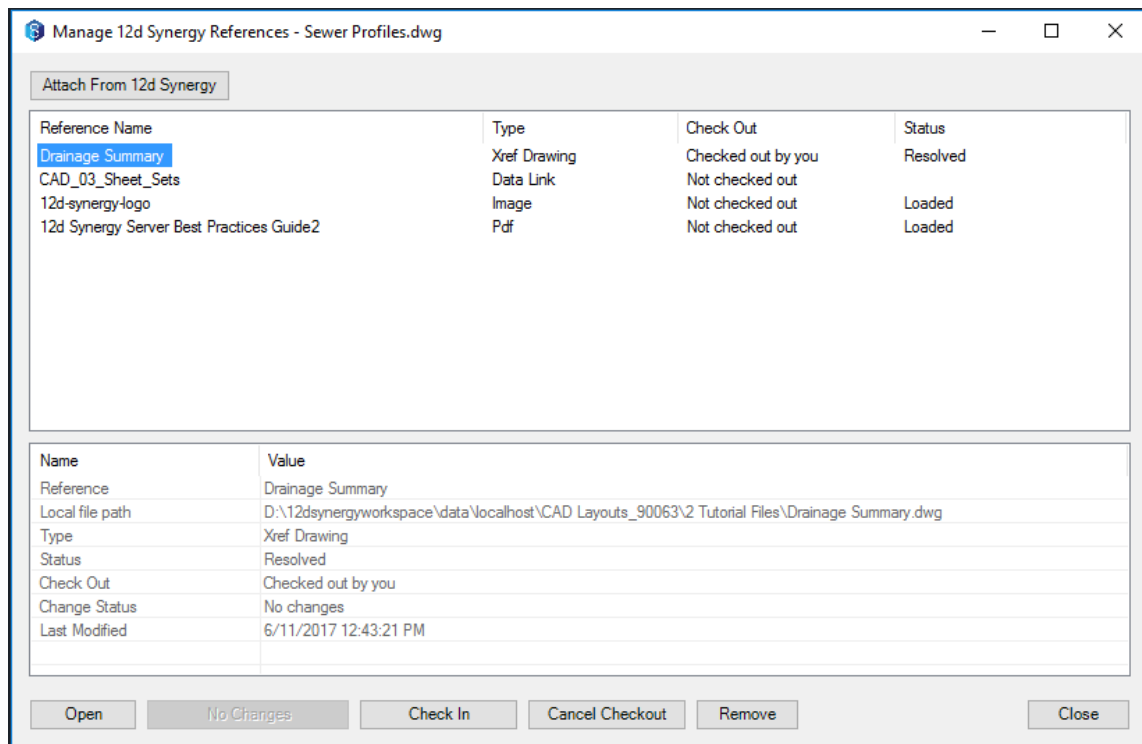
Once you have selected the point cloud, you will be prompted with a dialog to specify the attachment options.
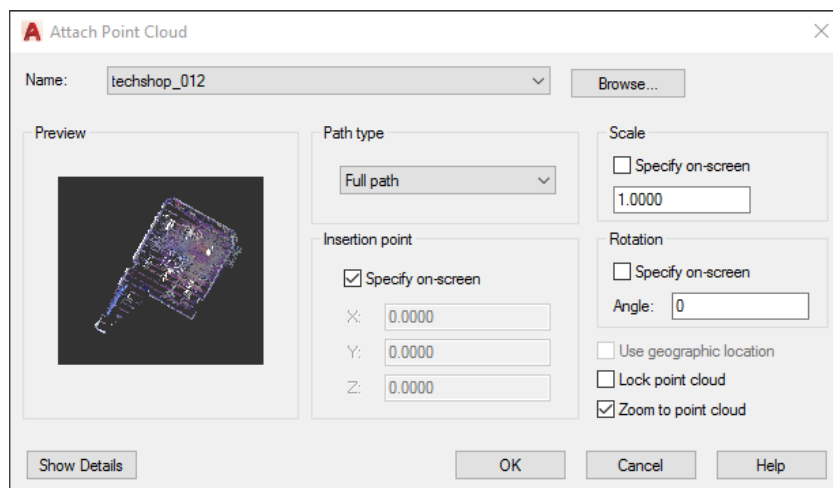
Managing References

References that have been added to the current drawing can be viewed by selecting "Reference Manager" in the "12d Synergy Drawing" button group.

Selecting a file will show the details of the file and will allow you to get the latest changes, check in/out, cancel check out and remove. Xref drawing references can also be opened from here.

Editing Xref Drawings

To edit an xref drawing directly within the current drawing:

1. Select the "12d Synergy Drawing" button group

2. Select "Edit Reference"

3. Select an xref object in the drawing

4. If the selected xref has not been checked out, you will be prompted to check out the file first

5. You will then be prompted with an AutoCAD dialog where you can select options to edit the xref

6. When you have finished editing the reference and the changes have been saved, you can use the "Reference Manager" to check the xref file back in

Downloading Referenced Files

When a file that is referenced in an opened drawing file is checked into 12d Synergy by another user, you will be notified of the changes. Alternatively, select "Get References" from the "12d Synergy Drawing" button group to download the latest versions of all referenced files.
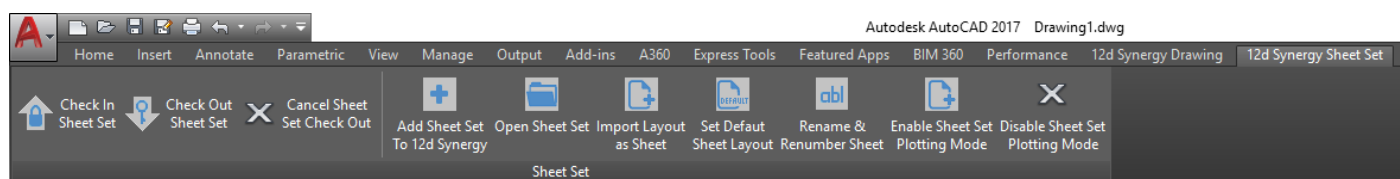
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Publishing

To publish:

1. Select the "12d Synergy Drawing" button group
2. Select "Publish"
3. You will be prompted with an AutoCAD dialog where you can select the publishing options

Sheet Set Commands

12d Synergy commands for sheet sets are available in AutoCAD and AutoCAD variations.

Button	Command	Description
Check In Sheet Set	12dSynergyCheckInDST	Check in a currently active sheet set
Check Out Sheet Set	12dSynergyCheckOutDST	Check out a currently active sheet set
Cancel Sheet Set Check Out	12dSynergyCancelCheckOutDST	Cancel a sheet set check out
Add Sheet Set To 12d Synergy	12dSynergyAddSheetSet	Add a sheet set to 12d Synergy
Open Sheet Set	12dSynergyOpenSheetSet	Open a sheet set from 12d Synergy
Import Layout As Sheet	12dSynergyImportLayoutAsSheet	Imports a layout from a 12d Synergy drawing file as a sheet
Set Default Sheet Layout	12dSynergySetDefaultSheetLayout	Sets a drawing file in 12d Synergy as the default sheet for a sheet set
Rename and Renumber Sheet	12dSynergyRenameRenumberSheet	Rename and renumber a sheet in a sheet set

Enable Sheet Set Plotting Mode	12dSynergyToggleSheetSetPlottingMode	Enable sheet set plotting mode
Disable Sheet Set Plotting Mode	12dSynergyToggleSheetSetPlottingMode	Disable sheet set plotting mode

Working with Sheet Sets

Adding a Sheet Set to 12d Synergy

Sheet set DST files and their associated sheet files can be tracked by 12d Synergy. To add a sheet set to 12d Synergy:

1. Select the "12d Synergy Sheet Set" button group

2. Select "Add Sheet Set to 12d Synergy"

3. The currently active sheet set will be selected, or if there is more than one open, you will be prompted to select one of the active sheet sets.
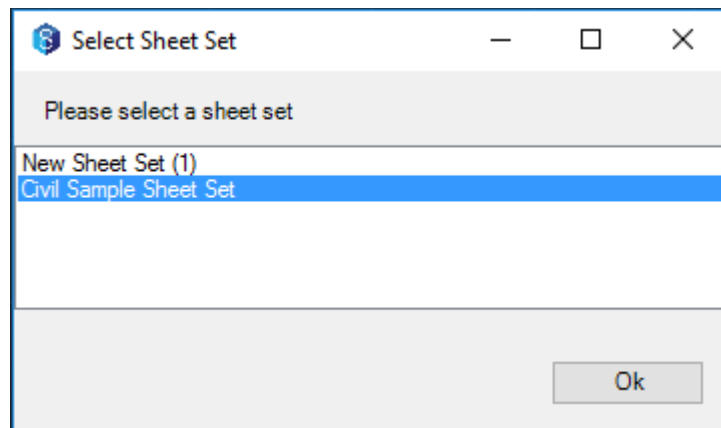
4. Enter the name that the sheet set file will be saved as in 12d Synergy and select "Save"

5. Select a location to save the file.

Opening a Sheet Set

To open a sheet set from 12d Synergy:

1. Select the "12d Synergy Sheet Set" button group

2. Select "Open"

3. Navigate to the correct job and folder and select the sheet set DST file you want to open.

Editing a Sheet Set
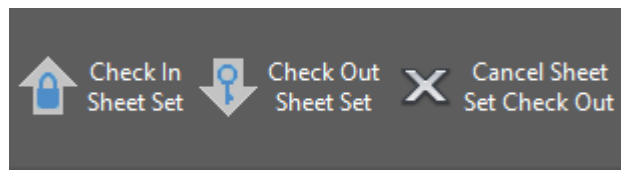
The sheet set will be locked whenever you don't have the sheet set checked out. Options to add and remove sheet files and edit the sheet set properties will be greyed out and a lock symbol will appear next to the name of the sheet set in the AutoCAD sheet set manager.
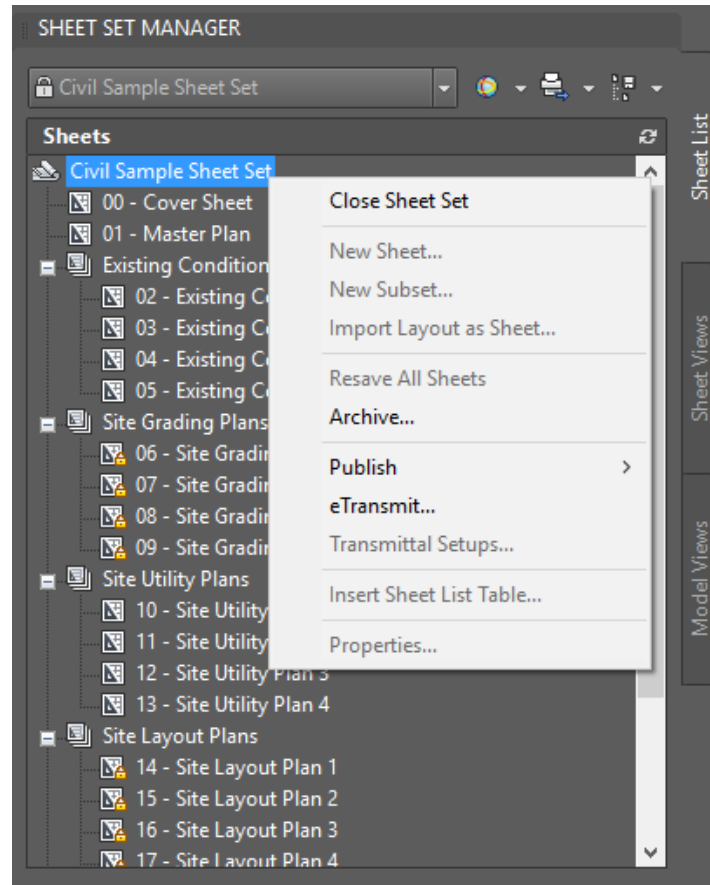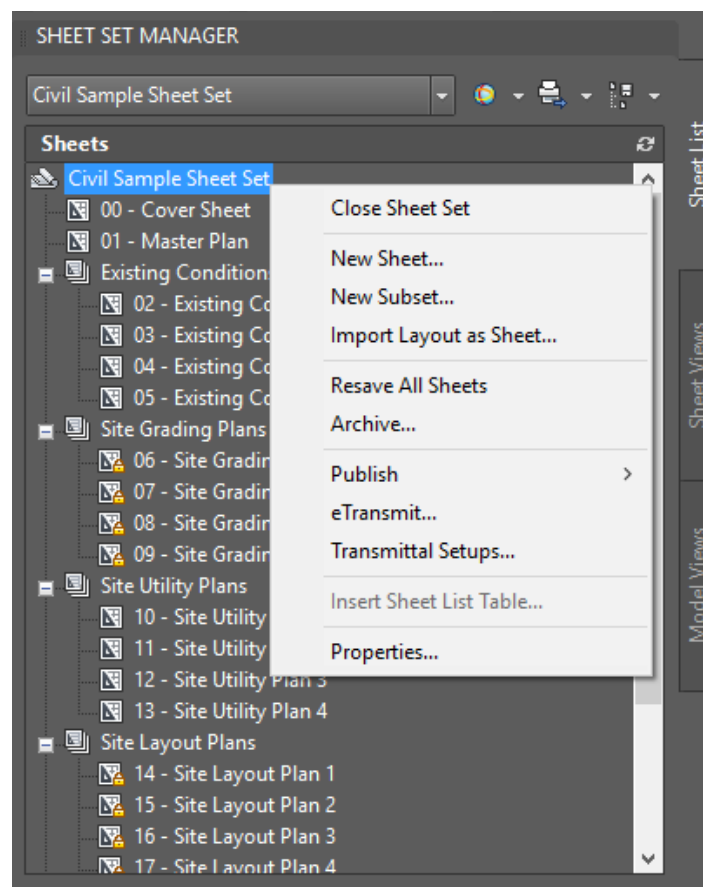

To unlock a sheet set:

1. Select the "12d Synergy Sheet Set" button group.

2. Select "Check Out Sheet Set"

3. If there is more than one sheet set open, you will be prompted to select one of the active sheet sets.
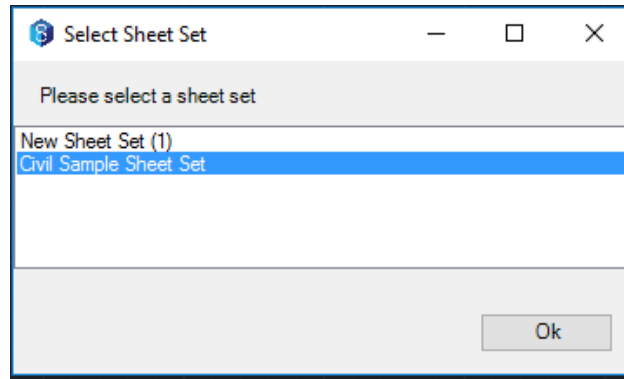
4. Once the sheet set is checked out, the lock symbol will be removed and the options will no longer be greyed out.

Once you have finished making changes, you can check the sheet set back in using the "Check In Sheet Set" button in the "12d Synergy Sheet Set" button group. Other users with the CAD plugin who have the sheet set open will receive a notification that it has changed and they will be given the option to download the new version.

Import Layout as Sheet

To add a layout from a 12d Synergy drawing as a new sheet in a sheet set:

1. Ensure that the sheet set is checked out

2. Select the "12d Synergy Sheet Set" button group.

3. Select "Import Layout as Sheet"

4. If there is more than one sheet set open, you will be prompted to select one of the active sheet sets.
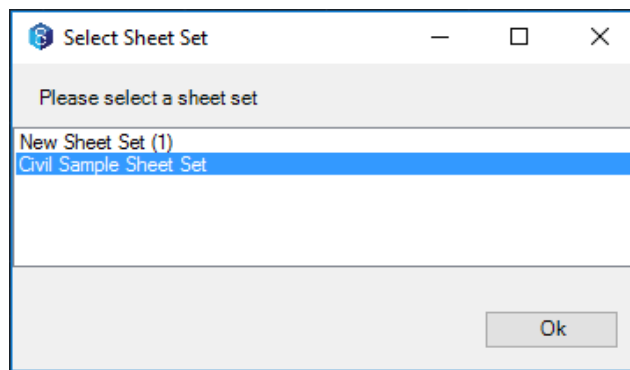
5. You will then be prompted with a dialog with layout and sheet options
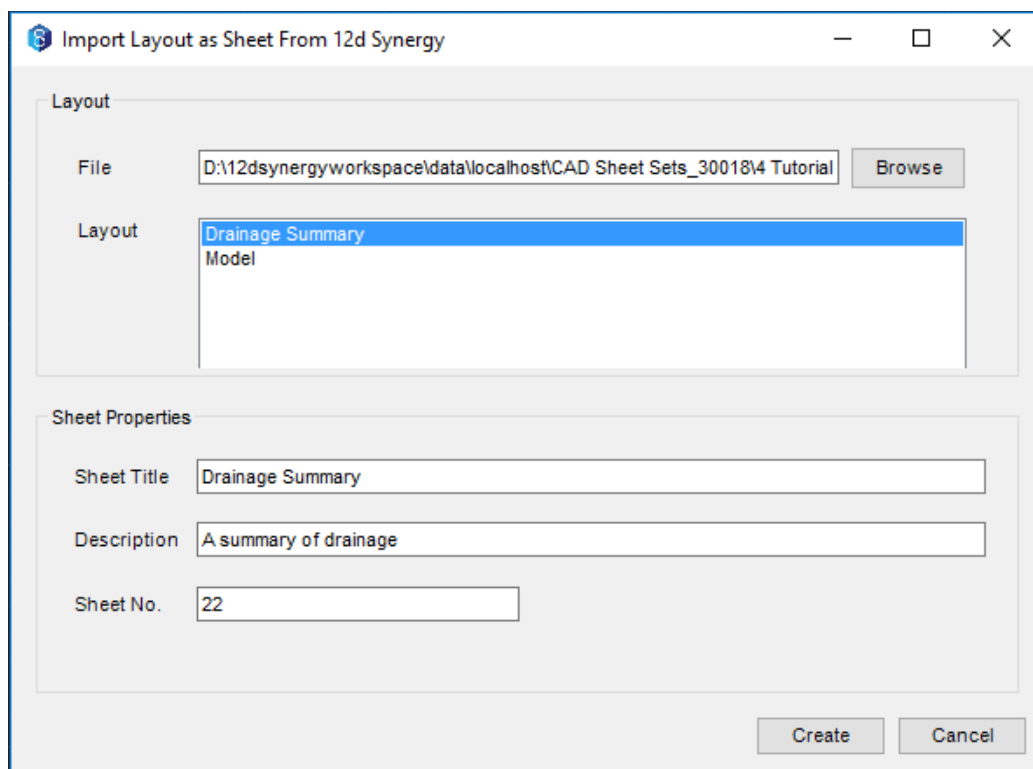
6. Select "Browse" to select a drawing file from 12d Synergy

7. Select the layout you want to use as the new sheet

8. Enter a sheet title, description and sheet number

9. Select "Create"

10. The sheet will then appear in the AutoCAD sheet set manager

Set Default Sheet Layout

To change the default sheet used for a sheet set:

1. Ensure that the sheet set is checked out

2. Select the "12d Synergy Sheet Set" button group.

3. Select "Set Default Sheet Layout"

4. If there is more than one sheet set open, you will be prompted to select one of the active sheet sets.
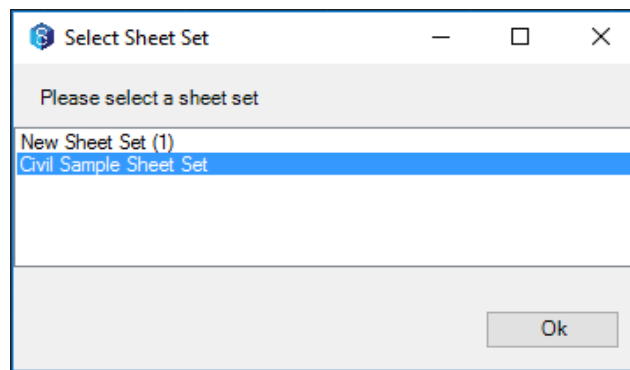
5. You will then be prompted with a dialog with file and layout options
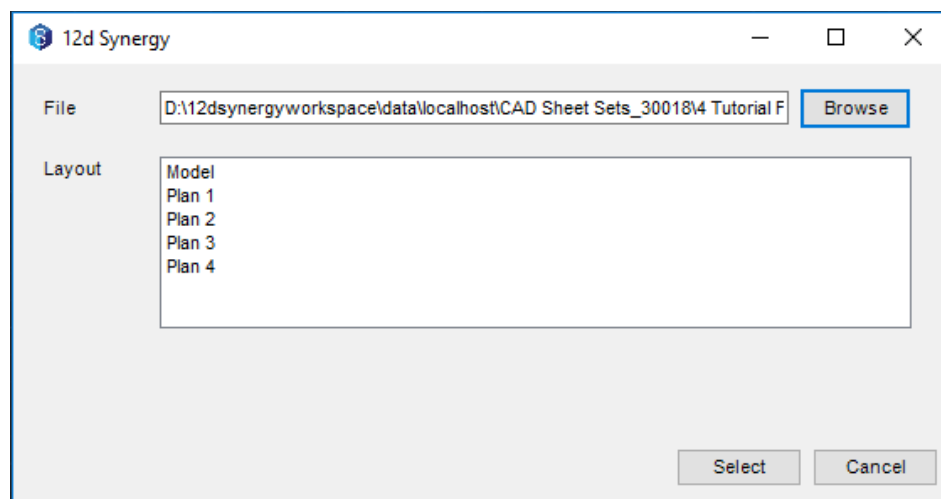
6. Select "Browse" to select a drawing file from 12d Synergy

7. The layouts from the selected drawing file will appear. Select the layout that you want to use as the default sheet layout

8. Select "Select"

9. This drawing will now be set as the sheet creation template in the sheet set properties

Rename and Renumber Sheets

To rename and renumber sheets:

1. Ensure that the sheet set is checked out

2. Select the "12d Synergy Sheet Set" button group.

3. Select "Rename and Renumber Sheet"

4. If there is more than one sheet set open, you will be prompted to select one of the active sheet sets.
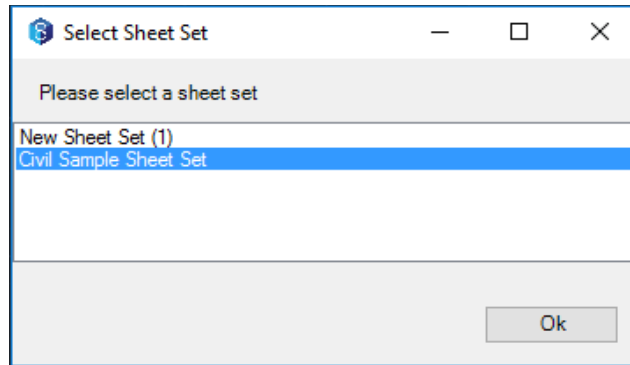
5. You will then be prompted with a dialog with sheet options
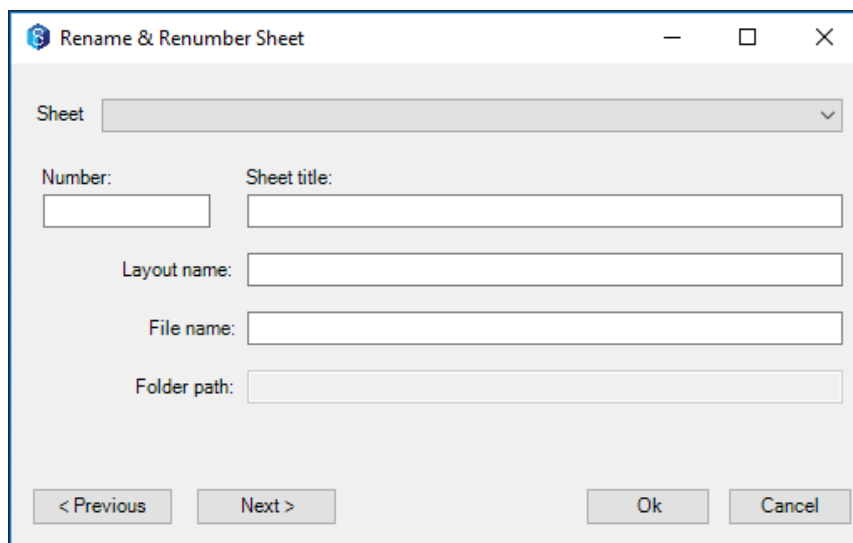
6. Select the "Sheet" drop down menu and select a sheet from the list
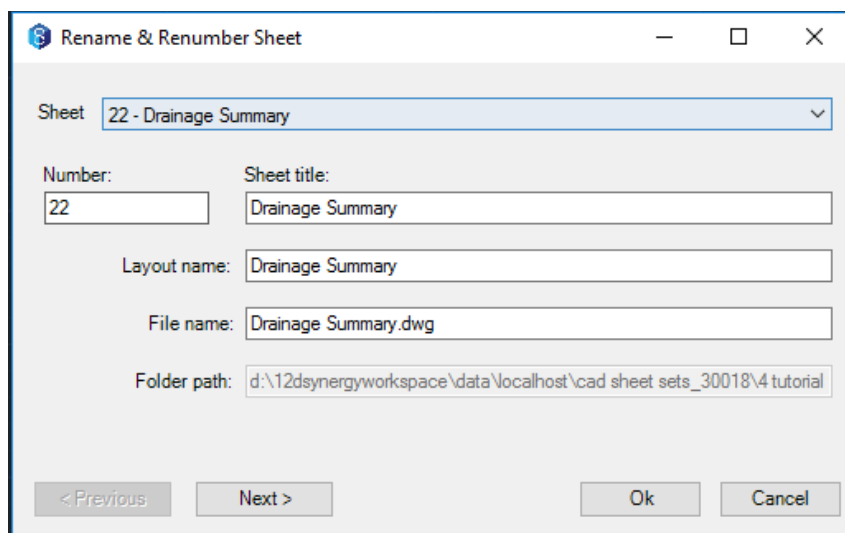
7. The remaining fields of the dialog will be populated with the existing values for the selected sheet

8. Edit the values as desired for "Number", "Sheet title", "Layout name", "File name", and "Folder path"

9. To continue making changes to other sheets, select "Next" or "Previous". Otherwise select "Ok"

10. If the sheet set file is not checked out, you will be prompted to check out the file now

Sheet Set Plotting

To ensure you have all the necessary sheet files and to prevent popups during the plotting process, you will need to enable sheet set plotting mode.

1. Select the "12d Synergy Sheet Set" button group.

2. Select "Enable Sheet Set Plotting Mode"

3. If there is more than one sheet set open, you will be prompted to select one of the active sheet sets.
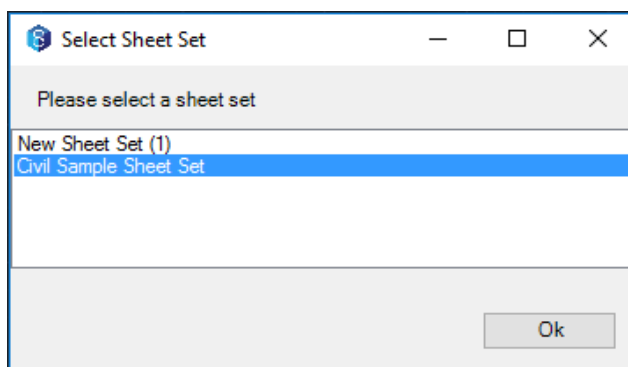
4. Sheet set plotting mode is now active and you can begin plotting with the existing AutoCAD tools from the sheet set manager

5. Once you have finished plotting, select "Disable Sheet Set Plotting Mode" in the "12d Synergy Sheet Set" button group

Data Shortcuts Commands

AutoCAD Civil 3D will have an additional set of commands that can handle data shortcuts projects. These are found under the "12d Synergy Data Shortcuts" ribbon.
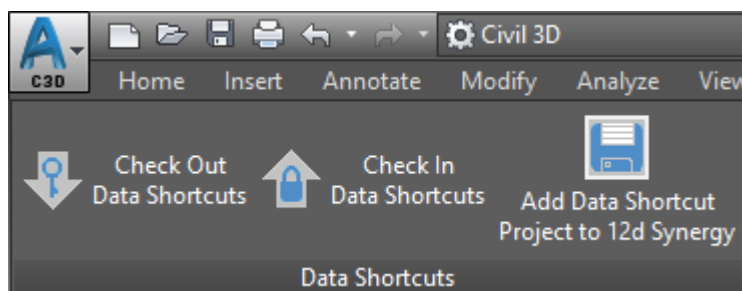
Button	Description
Check Out Data Shortcuts	Check out the current data shortcuts project

Check In Data Shortcuts	Check in the current data shortcuts project
Add Data Shortcut Project to 12d Synergy	Cancel a sheet set check out

Working with Data Shortcuts

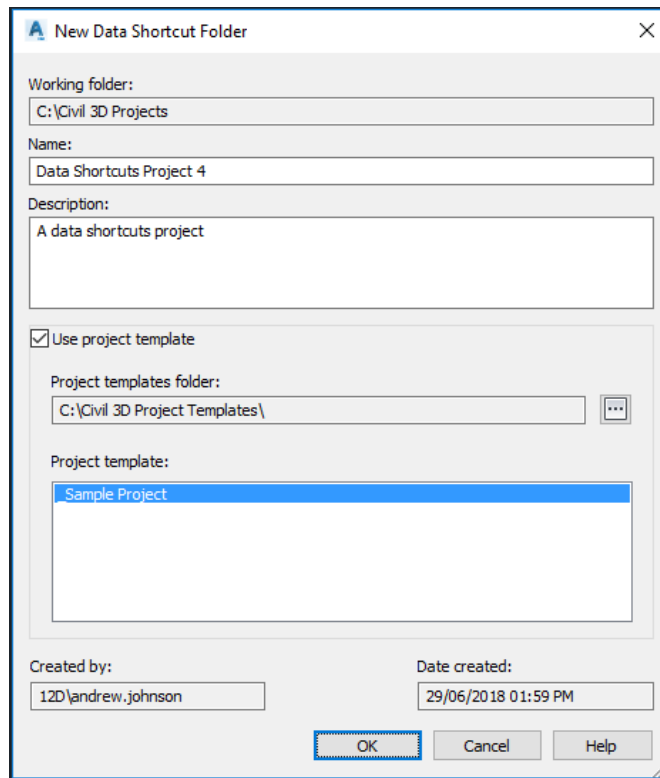### Adding a Data Shortcuts Project to 12d Synergy

If you do not yet have a data shortcuts project folder:

1. Open the Toolspace, and in the Prospector tab, select the Master View
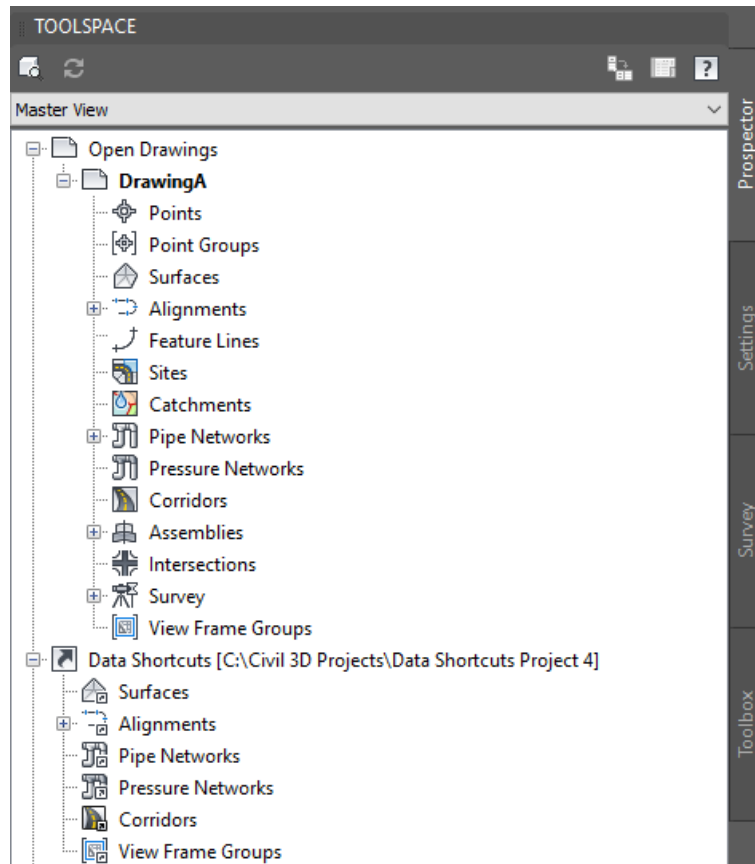
2. Right click on the "Data Shortcuts" collection, and select "New Data Shortcuts Project Folder"

3.   Enter the name, description and optionally a project template

To add your data shortcuts project to 12d Synergy:

1.   Ensure that the active drawing has been added to 12d Synergy and is currently checked out

2.   Open the Toolspace, and in the Prospector tab, select the Master View

3.   Right click on the "Data Shortcuts" collection, and select "Associate Project to Current Drawing"
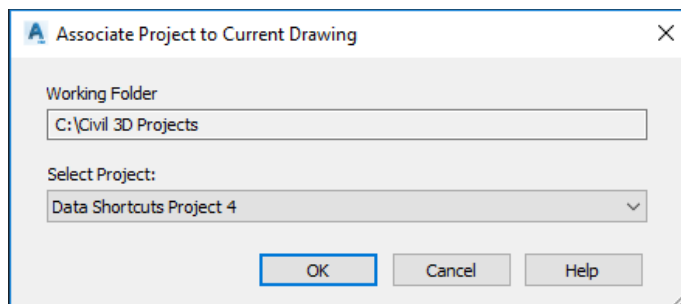
4.   In the "Select Project" drop down menu, select your data shortcuts project

5.   Select "Ok"

6.   Select the "12d Synergy Data Shortcuts" button group.

7.   Select "Add Data Shortcut Project to 12d Synergy"

8.   Select a folder location in 12d Synergy where the data shortcuts project will be stored

9.   The Civil 3D plugin will now add the data shortcuts project folder to 12d Synergy
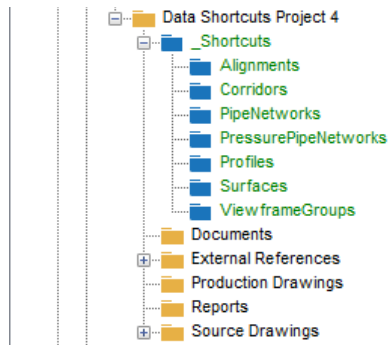
10. Once the project has been added, a message will appear in Civil 3D notifying that your data shortcuts path has been changed
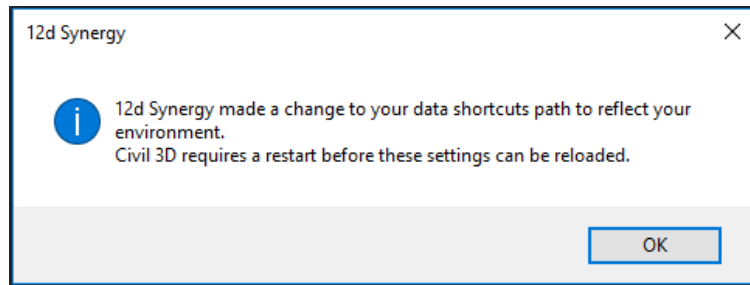
11. Select "Ok"

12. Save your drawing file, but keep it checked out

13. Restart AutoCAD Civil 3D

14. Ensure that you open the drawing file that was associated with your data shortcuts project

15. The Toolspace should now show the local workspace location of the data shortcuts project folder in the "Data Shortcuts" collection
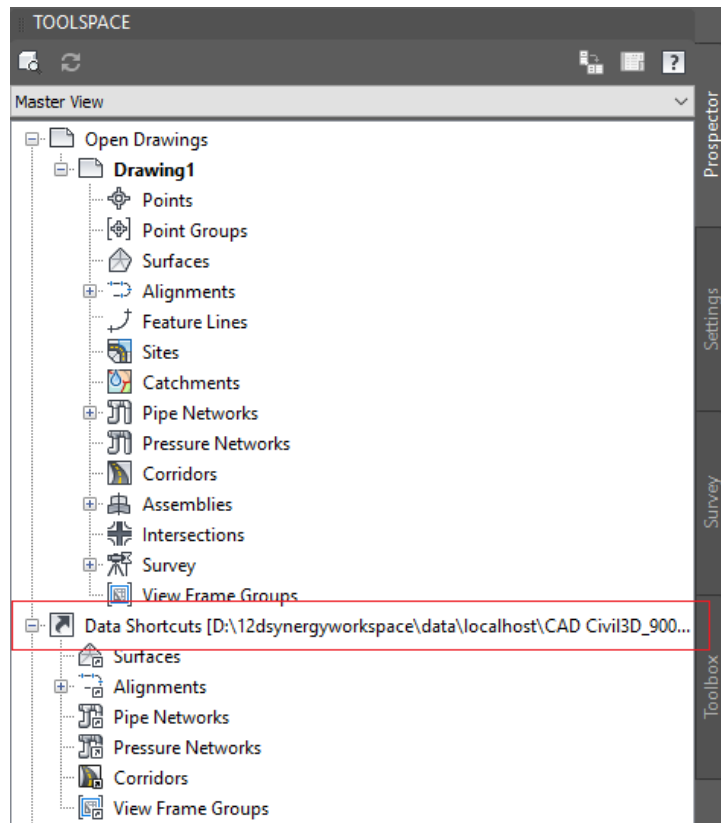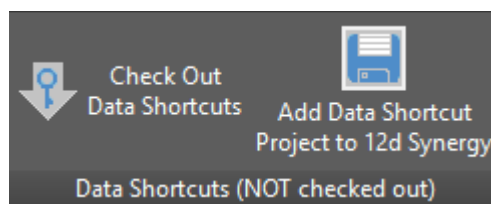
Editing a Data Shortcuts Project

Note: The data shortcuts project folder must be checked out before you can start adding data shortcuts to the project.

Before editing a data shortcuts project:

1. Select the "12d Synergy Data Shortcuts" button group

2. If the data shortcuts project is not checked out, select "Check Out Data Shortcuts"

To add objects in the active drawing file to your data shortcuts project:

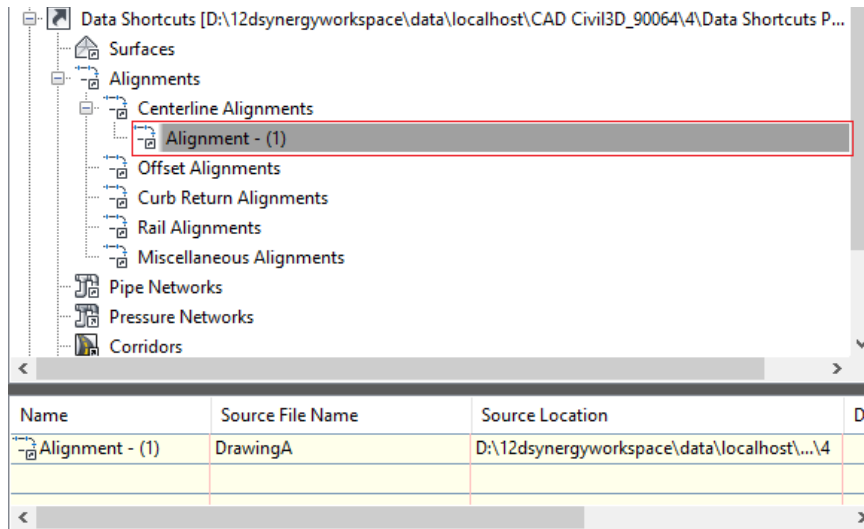1. Go to the Toolspace and in the Prospector tab, select the Master View
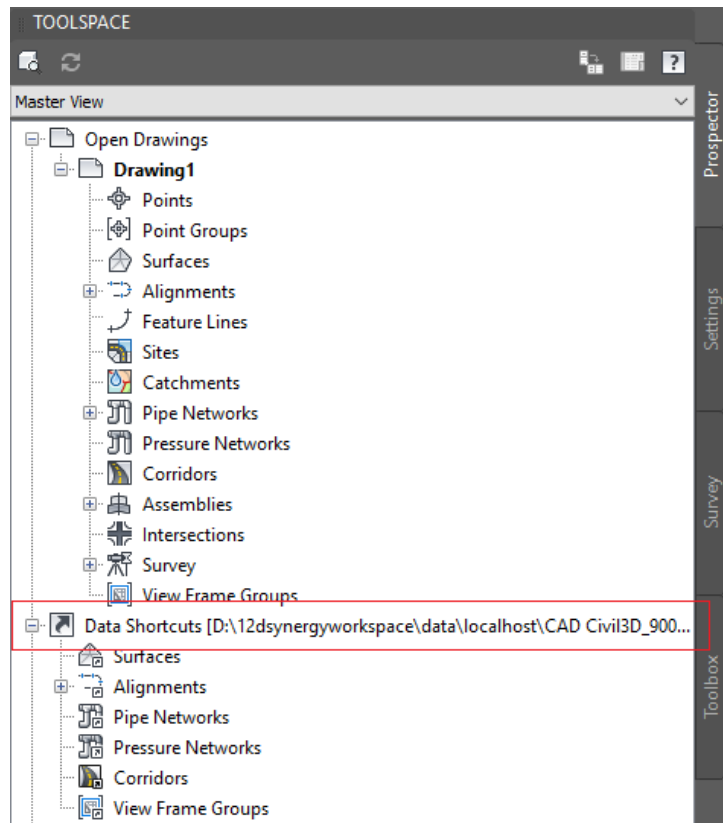
2. Right click on the "Data Shortcuts" collection and select "Create Data Shortcuts"
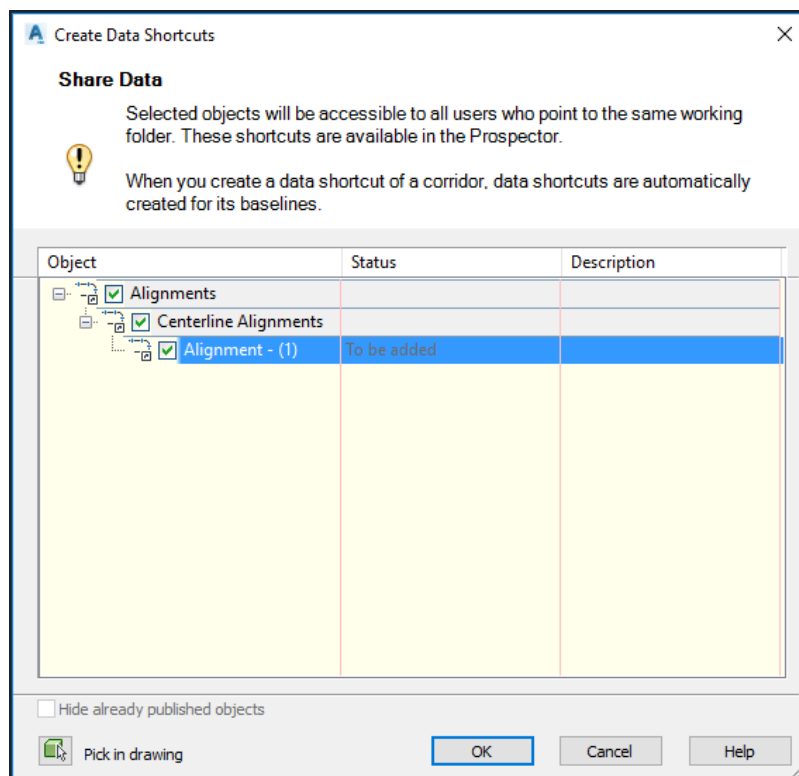
3. Select the objects that you want to add as data shortcuts

4. Select "Ok"

5. The select object/s should now appear under their object type in the "Data Shortcuts" collection

6. If you are finished making changes, you can now check in the data shortcuts project by selecting "Check In Data Shortcuts" in the "12d Synergy Data Shortcuts" button group
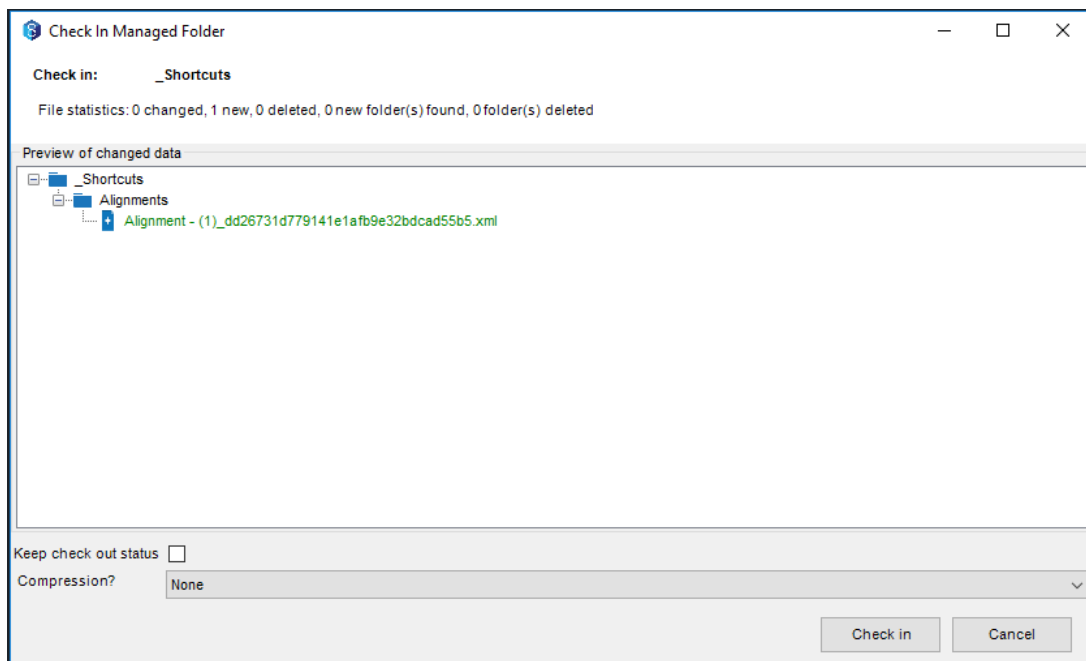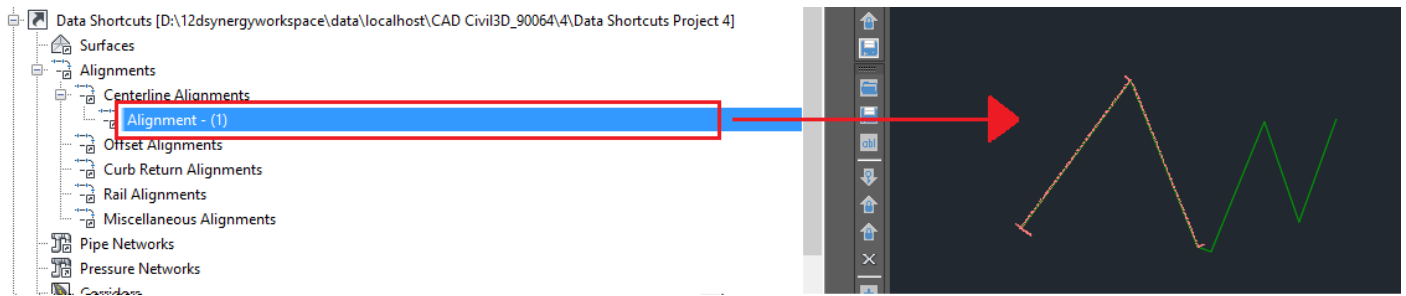

7. A dialog containing the modified data shortcuts will appear. Select "Check In" to continue

Adding Data Shortcuts to Your Drawings

To add data shortcuts to your drawings from an associated data shortcuts project:

1. Go to the Toolspace and in the Prospector tab, select the Master View

2. Simply drag the data shortcut object into the drawing

If your drawing is not yet associated with a data shortcuts project that has been added to 12d Synergy:

1. In the 12d Synergy Client, right click on the data shortcuts project folder and select "Get All"

2. In AutoCAD Civil 3D, go to the Toolspace and in the Prospector tab, select the Master View

3. Right click on the "Data Shortcuts" collection and select "Set Working Folder"

4. Select the parent folder of the data shortcuts project folder

5. Right click on the "Data Shortcuts" collection and select "Associate Project to Current Drawing"
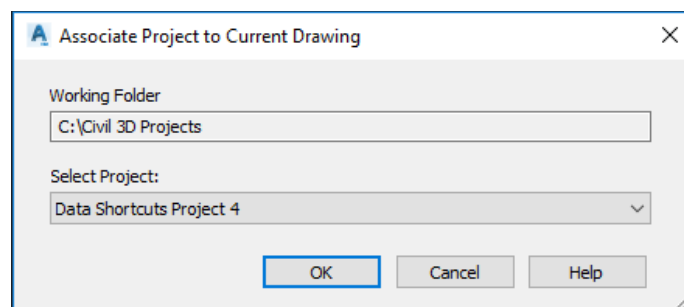
6. Select the data shortcuts project

Map 3D

AutoCAD Map 3D has an additional button group "12d Synergy Maps" with a single command "Map Insert from 12d Synergy".
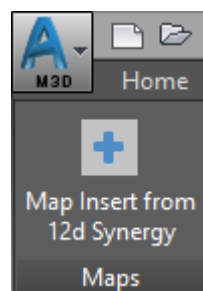
Map Insert from 12d Synergy

This uses the AutoCAD Map 3D command MAPIINSERT, but allows you to select an image file from 12d Synergy.

1. Select the "12d Synergy Maps" button group

2. Select "Map Insert from 12d Synergy"

3. Navigate to the correct job and folder and select the image file you want to insert

Opening DWGs

DWG is a common format used between many CAD products, including AutoCAD and Civil3D. 12d Synergy generally operates by allowing your local machine to determine which product to open based on the extension.

However, this can be a problem for files like DWG that are shared, or for programs that require additional command line attributes, such as whether it should be imperial or metric.

V4 introduces File Launchers, which can be configured at both a user and a system wide level, to allow you to provide users with choices on what to do for certain application data.

Adding a New Global File Launcher

In the 12d Synergy Administrator, you can add new File Launchers that apply across the system. This means that any files that match the extensions set will allow users to open the file with the application – if the application is installed.

1. Go to System Rules -> File Launchers

2. Click the + button

3. You can supply a cosmetic name and a description, which will be displayed to the user when they try to open the file

4. When specifying the arguments, you should include {FILE} to specify where in the command line that 12d Synergy uses the file should be substituted.

Adding a User Only File Launcher

Users can also add file launchers that are specific to them. This is done under the Window -> File Launchers potion.

Layouts

Using the 12d Synergy Client, you can import your layouts and their attributes from your drawing files. You can then edit the attribute values which will be updated in the actual drawings.
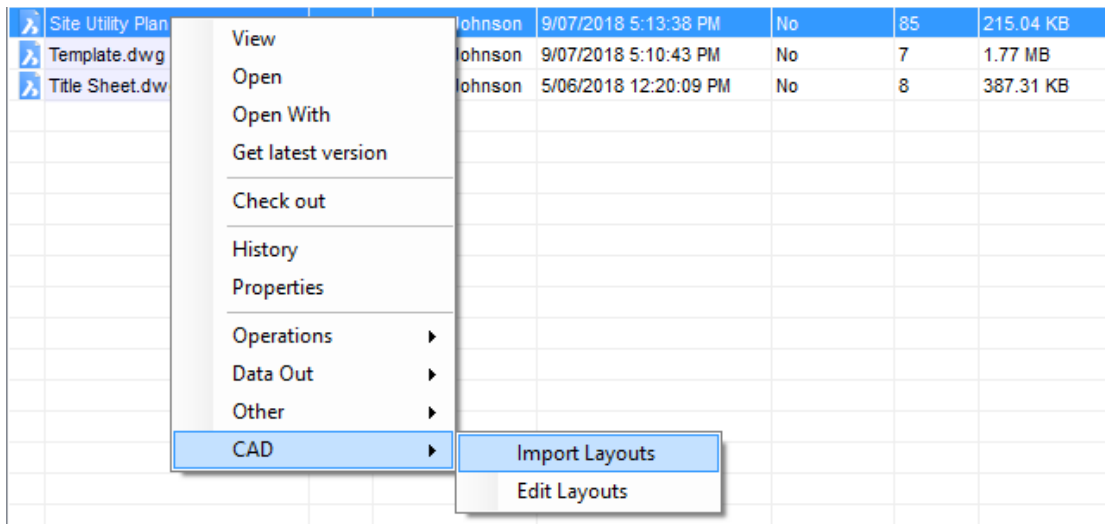
Adding Layouts to 12d Synergy

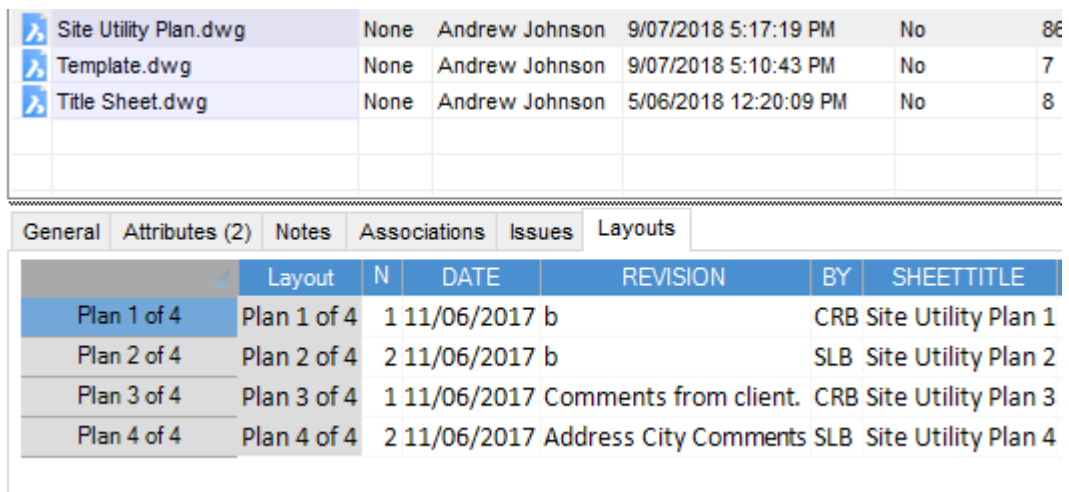### Importing Layouts from a Drawing File

To import layouts from a drawing file into 12d Synergy:

1. Right click on the drawing file in the 12d Synergy Client

2. Select CAD -> Import Layouts

3. Select the "Layouts" tab in the file details panel to view the imported layouts and attributes

Adding New Layouts

To manually add a new layout:

1. Ensure the file is checked out

2. Ensure the "Layouts" tab is selected

3. Select Operations -> Add Layout

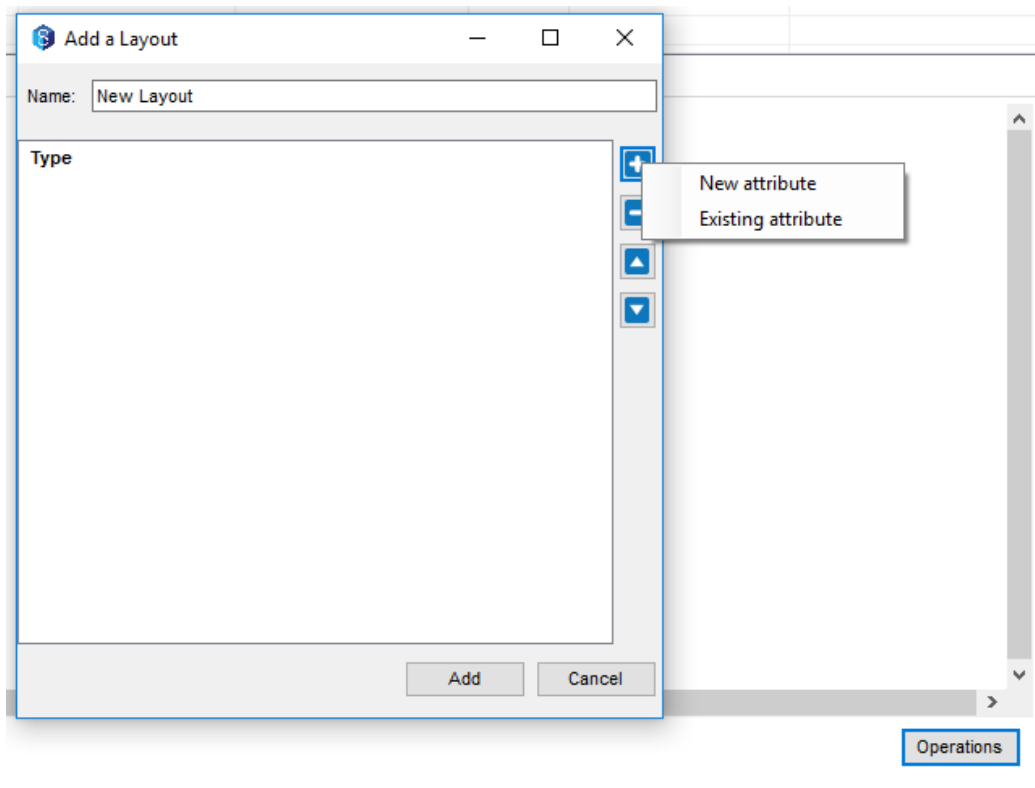4. Select "Yes" to create a layout from a template, or "No" to create a new layout

Creating a Layout from a Template

After selecting "Yes" to create a layout from a template:

1. Select the template you want to create from

2. Select "Select"

Creating a New Layout

After selecting "No" to create a new layout:

1. Enter the name of the layout

2. Select the plus sign (+) to add attributes to this layout

3. Select "Add" to finish creating the layout

Adding from Another Layout

To add a layout using the attributes from another layout you have already created:

1. Ensure the file is checked out

2. Ensure the "Layouts" tab is selected

3. Select the layout that you want to copy from

4. Select Operations -> Copy Layout

5. Enter the name of the new layout

6. Select the plus sign (+) to add additional attributes to this layout or the minus sign (-) to remove attributes

7. Select "Add" to finish creating the layout

Editing Layouts

To edit a layout name or attributes:

1. Ensure the file is checked out

2. Ensure the "Layouts" tab is selected

3. Select the layout that you want to edit

4. Select Operations -> Edit Layout

Deleting Layouts

To delete one or more layouts:

1. Ensure the file is checked out

2. Ensure the "Layouts" tab is selected

3. Select the layouts that you want to delete

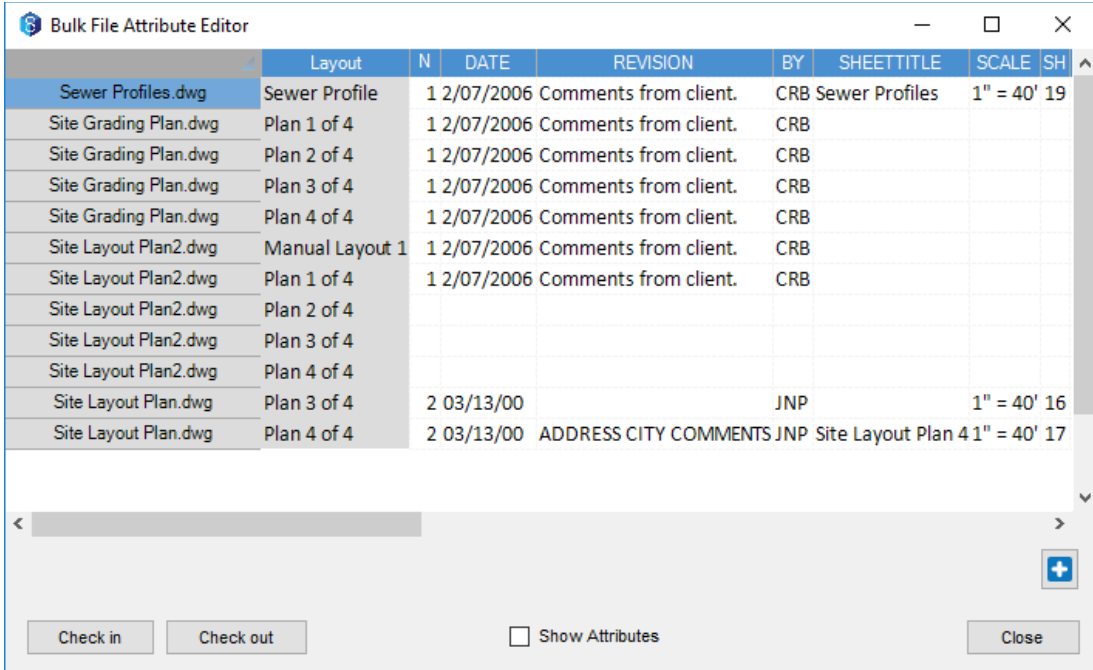4. Select Operations -> Delete Layout

5. Confirm to delete the layouts

Editing Layout Attribute Values

With the file checked out, you can edit the values of attributes in a layout directly in the "Layouts" tab.

Using the Bulk Attribute Editor

To edit the layouts from multiple files at the same time:

1. Highlight the files to you want to edit. Ensure that each selected file has at least one layout

2. Select the "Edit Layouts" button, or right click on a file and select CAD -> Edit Layouts

Checking In/Out

If any rows are greyed out, it means the file they belong to is not checked out. Highlight any of the greyed out rows and select "Check Out' to begin editing.
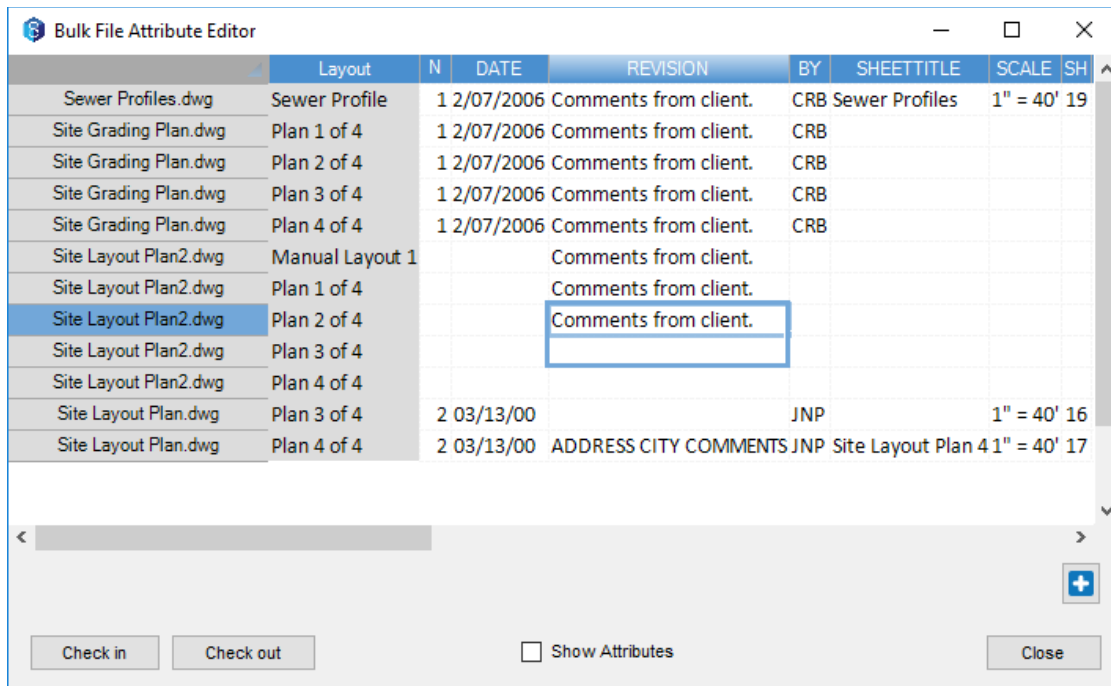
Copy/Paste

Use Ctrl+C and Ctrl+V to copy and paste values between cells or a range of cells. Ensure that the data type is the same between corresponding cells or the value will not copy.

Drag Fill

To quickly copy the value of a cell or range of cells into cells above or below:

1. Select the cell or cell range that you want to copy from

2. Rest your cursor in the lower-right corner of the selected range so that it turns into a plus sign (+)

3. Drag the fill handle down or up across the cells that you want to fill

4. When you let go, the values should be filled to the other cells

Layout Templates

You can create a folder, job or system template which can be used when adding new layouts to a drawing file.

To create a layout template at the folder or job level:

1. In the 12d Synergy Client job tree, right click on a job or folder and select "Edit Job" or "Edit Folder"

2. Select Rules -> CAD Layout Templates

3. Select the (+) sign to create a new layout template

To create a layout template at the system level:

1. Open the 12d Synergy Administrator

2. Select System Rules -> CAD Layout Templates

3. Select the (+) sign to create a new layout template

Troubleshooting

AutoCAD 12d Synergy Custom User Interface

The 12d Synergy ribbon, menu and toolbox does not appear.

Solution 1

In the AutoCAD command line, run the command "12dSynergyLoadCUI"

Solution 2

In the AutoCAD command line, run the command "12dSynergyReloadCUI"

Solution 3

1. In the AutoCAD command line, run the command "LOADCUI"
2. Browse to the 12d Synergy Client installation directory and if you are using a 64 bit version of AutoCAD, select the "64" folder.
3. Select the appropriate AutoCAD version DLL file. Eg. For AutoCAD 2019, select 12dSynergy_ACAD_2019_Plugin.dll

The 12d Synergy menu or toolbox appears, but the ribbon does not appear.

Solution 1

In the AutoCAD command line, run the command "12dSynergyReloadCUI"

12d Synergy