

Appendix 2

CIC BIM User Guide for Preparation of Statutory Plan Submissions

Civil 3D



December 2020

Disclaimer

Whilst reasonable efforts have been made to ensure the accuracy of the information contained in this publication (Reference Materials), the CIC nevertheless encourages readers to seek appropriate independent advice from their professional advisers where possible. Readers should not treat or rely on this publication (Reference Materials) as a substitute for such professional advice.

Enquiries

Enquiries about this Reference Materials may be made to the CIC Secretariat at:

38/F, COS Centre
56 Tsun Yip Street, Kwun Tong, Kowloon
Hong Kong

Tel: (852) 2100 9000

Fax: (852) 2100 9090

Email: bim@cic.hk

Website: www.cic.hk

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This Reference Materials will only become truly useful if as many organisations adopt it as possible. To that extent, it may be freely distributed and used in any format necessary, provided credit is given to the CIC.

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Preface

The Construction Industry Council (CIC) is committed to seeking continuous improvement in all aspects of the construction industry in Hong Kong. To achieve this aim, the CIC forms Committees, Task Forces and other forums to review specific areas of work with the intention of producing Alerts, Reference Materials, Guidelines and Codes of Conduct to assist participants in the industry to strive for excellence.

The CIC appreciates that some improvements and practices can be implemented immediately whilst others may take more time for implementation. It is for this reason that four separate categories of publication have been adopted, the purposes of which are as follows:

Alerts	The Alerts are reminders in the form of brief leaflets produced quickly to draw the immediate attention of relevant stakeholders to the need to follow some good practices or to implement some preventive measures in relation to the construction industry.
Reference Materials	The Reference Materials are standards or methodologies generally adopted and regarded by the industry as good practices. The CIC recommends the adoption of the Reference Materials by industry stakeholders where appropriate.
Guidelines	The Guidelines provide information and guidance on particular topics relevant to the construction industry. The CIC expects all industry stakeholders to adopt the recommendations set out in the Guidelines where applicable.
Codes of Conduct	The Codes of Conduct set out the principles that all relevant industry participants should follow. Under the Construction Industry Council (Cap 587), the CIC is tasked to formulate codes of conduct and enforce such codes. The CIC may take necessary actions to ensure compliance with the codes.

If you have read this publication, we encourage you to share your feedback with us. Please take a moment to fill out the Feedback Form attached to this publication in order that we can further enhance it for the benefit of all concerned. With our joint efforts, we believe our construction industry will develop further and will continue to prosper for years to come.

Foreword

I am glad to see the release of **CIC BIM User Guide for Preparation of Statutory Plan Submissions Civil 3D (December 2020)**. This software specific user guide shall be read in conjunction with the **CIC BIM Standards for Preparation of Statutory Plan Submissions (December 2020)**.

This software specific user guide is only provided to demonstrate the feasibility of drawings generation with the Standards.

With the software specific user guides which contains step by step procedures of modelling, BIM users can easily apply the templates for the generation of statutory plan submission drawings.

Feedback on the CIC BIM User Guide for Preparation of Statutory Plan Submissions Civil 3D (December 2020) from practitioners subsequent to the issuance of this publication will be considered in future revisions.

On behalf of the CIC, I would like to thank everyone who has contributed to producing this CIC BIM User Guide for Preparation of Statutory Plan Submissions Civil 3D (December 2020), in particular to the members of the Task Force on BIM Standards.

Ar. Ada FUNG, BBS

Chairperson

Committee on Building Information Modelling

Construction Industry Council

December 2020

1 Hardware / System Requirements

Hardware / system requirement for modellings, coordination and visualization on desktop/notebook computers and mobile devices should be determined by the BIM managers for different projects on a case by case basis. The minimum requirement varies for different applications, project sizes and operating systems.

<https://knowledge.autodesk.com/support/civil-3d/troubleshooting/caas/sfdcarticles/sfdcarticles/System-requirements-for-Autodesk-Civil-3D-2019.html>

2 Civil3D Basics

This guideline only provides the necessary information to produce 2D statutory submission drawings. Please refer to the official websites linked below for a complete understanding of Civil 3D.

Civil 3D help menu :

<https://help.autodesk.com/view//CIV3D/2019/ENU/>

Civil 3D Tutorials :

<https://knowledge.autodesk.com/support/civil-3d/getting-started/caas/CloudHelp/cloudhelp/2019/ENU/Civil3D-Tutorials/files/GUID-B6CF98F9-FF6F-4FF5-8022-60EB21A611A7-htm.html>

<http://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-B6CF98F9-FF6F-4FF5-8022-60EB21A611A7>

2.1 User Interface and View Cube

Information about Civil 3D user interface could be found on the website below :

The user interface in Civil 3D help menu

<https://help.autodesk.com/view//CIV3D/2019/ENU/?guid=GUID-1E48C776-CBA8-4346-865E-D89F0060FA59>

Tutorial video for Civil 3D user interface

<https://knowledge.autodesk.com/support/civil-3d/learn-explore/caas/CloudHelp/cloudhelp/2020/ENU/Civil3D-UserGuide/files/GUID-1D83362E-A5D9-4FB8-959E-D262D6166260-htm.html?v=2020>

Apart from some concepts like Workspaces, Ribbon, Toolbars as mentioned in the link above, users also need to understand the concept of view cube. Please note civil 3D might behave differently in 3d mode (view cube is not only showing one face) and 2D mode (view cube is not only showing one face)

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-E6D3896C-AF39-4F5C-A57C-CACE2A1117F9>

2.2 Coordination System

Users are suggested to adopt Hong Kong Principal Datum (HKPD) for vertical datums and HK1980 Grid coordinates for horizontal coordinates in Civil 3D. Please refer to the document from Lands Department for more information.

<https://www.geodetic.gov.hk/common/data/pdf/explanatorynotes.pdf>

2.3 Layer

Visibility of Civil 3D objects is generally controlled by Layer, user could use the Layer Properties Manager to control the Layer in Civil 3D, please refer to the link below for more information.

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-B297EBD9-D68C-47E1-87CE-1B3798496599>

Apart from Layer Properties Manager, visibility of Civil 3D objects could also be controlled by Style Manager, please refer to section 2.13 in this document for more information.

2.4 External Reference

Users could attach any drawings as an external reference, this could be done by using the “xref” command, please see the link below for more information :

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-A987D2FF-45BD-474E-99C1-E6316A42F667>

If users want to make the Xref a permanent part of the drawing and no longer an externally referenced file. Users may bind the xref files.

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-1BC15FC3-D900-4293-B210-BFC3B9C088BC>

2.5 Creating Surface Model

Topographic models need to be prepared first for site formation design, the video below introduced how surfaces could be modelled in Civil 3D

<https://knowledge.autodesk.com/support/civil-3d/getting-started/caas/CloudHelp/cloudhelp/2016/ENU/Civil3D-UserGuide/files/GUID-299B2BBB-0314-4F16-9395-73DEF95DD666-htm.html>

2.6 Parcel

Parcel objects in Autodesk Civil 3D are typically used to represent real estate parcels, such as lots in a subdivision. More information could be found from the webpage here :

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-B7C2A5F5-B258-44FD-8D3C-764AE8EE923D>

2.7 Grading

Grading should be used for slop design in Civil 3D, some features such as grading style could be applied to specify the type of slope, please refer to the tutorial below for details.

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-8144BA2B-9B57-41CC-8602-9B3525C78497>

2.8 COGO Points

Coordinate geometry (COGO) points could be used to create surfaces, it could also be used to annotate point objects in the 3D environment with customized 2D annotation to be shown on drawings. With Dynamo and Civil 3D 2020, users could generate 3D solids by information stored in those COGO points. This would be demonstrated by soil nail models in this user guide in section 4.9.

please refer to the link below for more information about COGO points

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-7EDF7EC4-829A-45B2-970F-AB559275E077>

2.9 Alignment and Profile

Alignments are a combination of horizontal lines, curves, and spirals that are viewed as one object. It can represent road centrelines, pipe networks, and other construction baselines. Creating and defining a horizontal alignment is one of the first steps in the roadway, railroad, or site design. Please refer to the links below for more information about alignments :

Tutorial videos for alignment :

<https://knowledge.autodesk.com/support/civil-3d/getting-started/caas/CloudHelp/cloudhelp/2016/ENU/Civil3D-UserGuide/files/GUID-C480B5B6-C255-4CE3-9FD2-16F0FBEB64C3-htm.html>

Alignments in Civil 3D help menu:

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-CEBA3465-40E9-4DC3-BAC9-FBBB89ACB028>

Vertical curves need to be defined along a horizontal alignment in order to create 3D alignments. Please refer to the links below for more information about the profile:

Profile in Civil 3D help menu:

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-768C10C5-7C9F-44F0-BDF2-4156801A41B2>

2.10 Corridor and Assembly

A corridor can be used to model a variety of features, such as highways, channels, and runways. To model a corridor, users need first to define (i) Alignment and (ii) Profile and (iii) Assembly in Civil 3D. Besides, users may use the Civil 3D subassembly composer (SAC) to create parametric sections for the corridor.

Tutorial videos for corridor :

<https://knowledge.autodesk.com/support/civil-3d/getting-started/caas/CloudHelp/cloudhelp/2016/ENU/Civil3D-UserGuide/files/GUID-8012B66B-26D9-4ED9-BF3E-959CEBA75BDE-htm.html>

Assembly tutorial in Civil 3D help menu:

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-2F3011CB-15DC-49E3-BB8B-B04A02B2C12E>

Tutorial videos for subassembly composer:

<https://www.youtube.com/playlist?list=PLjsw5HrA4MXn0qTwXCASOBInYeG2jN8KI>

2.11 Pipe Network, Part builder and Pressure Network

Pipe network should be used in Civil 3D for underground utility systems, such as storm sewers or sanitary sewers. A pipe network can contain pipes only, structures (such as manholes) only, or both pipes and structures. In this sample, surface channel is suggested to be modelled by corridor while catch pits are suggested to be modelled by structures in a pipe network.

Part builder in Civil 3D is used to create custom pipes or structures. More information about pipe network could be found from the webpage below.

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-E8FEA9DD-5FF9-464E-8E64-5020D4AB047A>

For underground utility systems with pressure such as water transmission system or gas pipes.

<https://help.autodesk.com/view/CIV3D/2019/ENU/?guid=GUID-3DE91FE5-D6DB-4A92-85DA-C2024099EE5F>

2.12 Objects, Styles and Properties

Some concepts such as objects, styles and properties are essential to manage information in Civil 3D, please refer to the link below for more details.

<https://knowledge.autodesk.com/support/civil-3d/getting-started/caas/CloudHelp/cloudhelp/2016/ENU/Civil3D-UserGuide/files/GUID-33FE8CC1-EC9B-41DE-A9CB-0843CEE17E12-htm.html>

2.13 Labels, Tags and Dimensioning

Users can annotate Civil 3D objects with labels that update dynamically when the drawing objects change. Labels can contain single or multiple lines of text, blocks, ticks, lines, and direction arrows. Many label styles have two modes: label and tag. Tags are used to identify labelled objects within a table. Please see the link below for more information.

<https://knowledge.autodesk.com/support/civil-3d/learn-explore/caas/CloudHelp/cloudhelp/2020/ENU/Civil3D-UserGuide/files/GUID-489FBBA1-A16B-40DE-9536-EC2AA533FFC4-htm.html?st=tag>

2.14 Model Space, Paper Space and Drawing Production

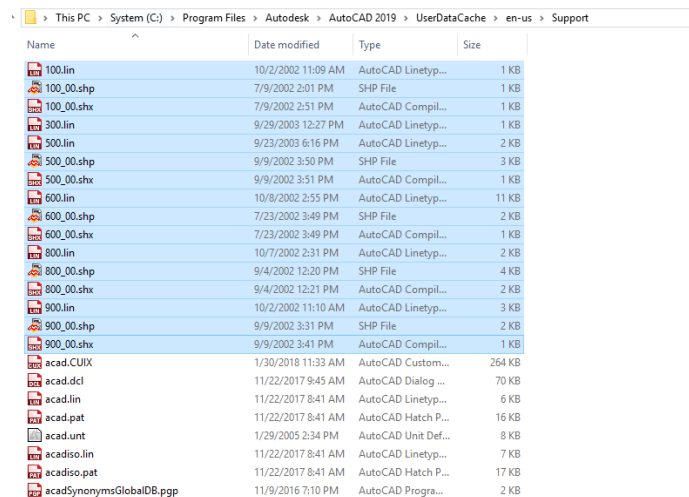
Like AutoCAD, Model Space and Paper Space are essential concepts for drawing production. More information could be found from the link below :

<https://knowledge.autodesk.com/support/autocad/getting-started/caas/CloudHelp/cloudhelp/2019/ENU/AutoCAD-Core/files/GUID-990538B6-DDA1-4190-BCC0-BB5BA94C9879-htm.html>

3 Getting Start

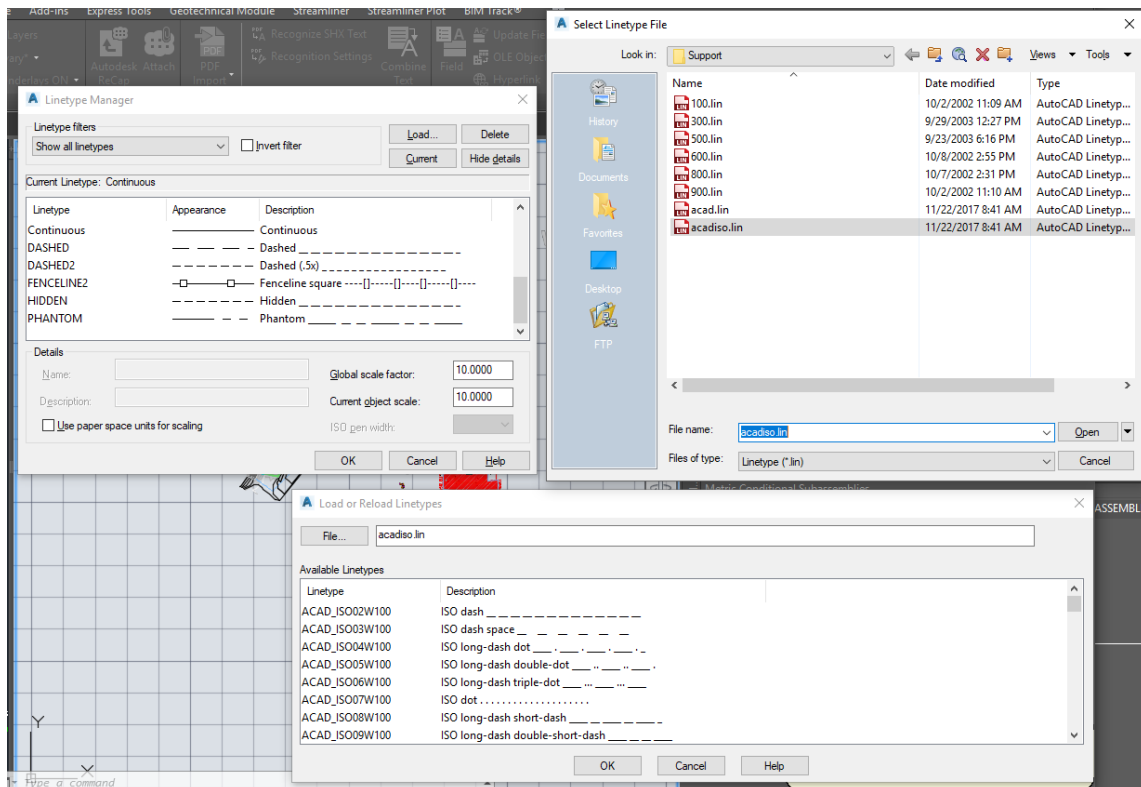
3.1 Opening Project Template

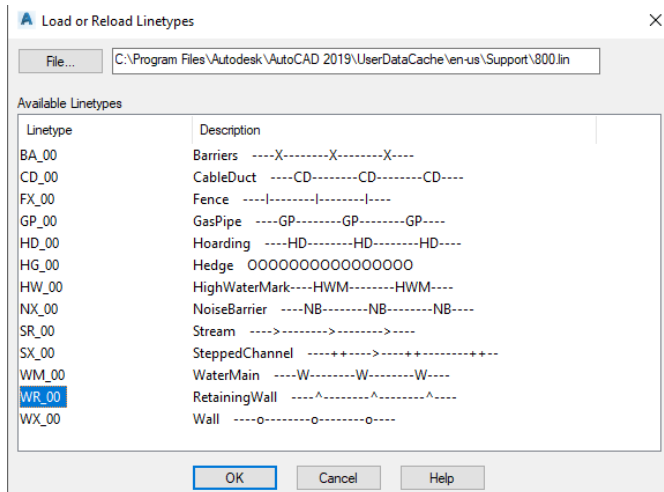
Download the line type files from [DevB website](#) and put them to C:\Program Files\Autodesk\AutoCAD 2019\UserDataCache\en-us\Support.



Name	Date modified	Type	Size
100.lin	10/2/2002 11:09 AM	AutoCAD Linetyp...	1 KB
100_00.shp	7/9/2002 2:01 PM	SHP File	1 KB
100_00.shx	7/9/2002 2:51 PM	AutoCAD Compil...	1 KB
300.lin	9/29/2003 12:27 PM	AutoCAD Linetyp...	1 KB
500.lin	9/23/2003 6:16 PM	AutoCAD Linetyp...	2 KB
500_00.shp	9/9/2002 3:50 PM	SHP File	3 KB
500_00.shx	9/9/2002 3:51 PM	AutoCAD Compil...	1 KB
600.lin	10/8/2002 2:55 PM	AutoCAD Linetyp...	11 KB
600_00.shp	7/23/2002 3:49 PM	SHP File	2 KB
600_00.shx	7/23/2002 3:49 PM	AutoCAD Compil...	1 KB
800.lin	10/7/2002 2:31 PM	AutoCAD Linetyp...	2 KB
800_00.shp	9/4/2002 12:20 PM	SHP File	4 KB
800_00.shx	9/4/2002 12:21 PM	AutoCAD Compil...	2 KB
900.lin	10/2/2002 11:10 AM	AutoCAD Linetyp...	3 KB
900_00.shp	9/9/2002 3:31 PM	SHP File	2 KB
900_00.shx	9/9/2002 3:41 PM	AutoCAD Compil...	1 KB
acad.CUIX	1/30/2018 11:33 AM	AutoCAD Custom...	264 KB
acad.dcl	11/22/2017 9:45 AM	AutoCAD Dialog ...	70 KB
acad.lin	11/22/2017 8:41 AM	AutoCAD Linetyp...	6 KB
acad.pat	11/22/2017 8:41 AM	AutoCAD Hatch P...	16 KB
acad.unt	1/29/2005 2:34 PM	AutoCAD Unit Def...	8 KB
acadiso.lin	11/22/2017 8:41 AM	AutoCAD Linetyp...	7 KB
acadiso.pat	11/22/2017 8:41 AM	AutoCAD Hatch P...	17 KB
acadSynonymsGlobalDB.pgk	11/9/2016 7:10 PM	AutoCAD Progra...	2 KB

Type "linetype" command in Civil 3D and load the linetype files needed to Civil 3D



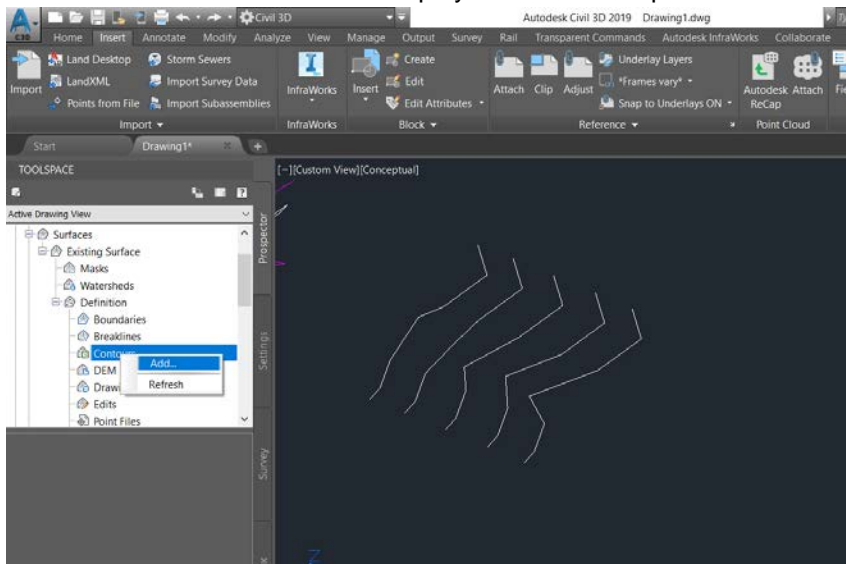


3.2 Opening Project Template

Open a new project in Civil 3D by opening Civil 3D → click “New” button → choose “drawing template (.dwt)” in Files of type. And then choose “Civil 3D_CIC_template.dwt to open a new file.

3.3 Create Tin Surfaces

Import Contour lines as 3D polylines in Civil 3D. In Tool Space, right-click at “Surface” and then choose “Create Surface”. Enter the name of the surface to create and then right-click “Contour” under the definition, enter the name of the information set (3D polylines) to be chosen and then choose those 3D polylines in model space. Press enter to end selection.

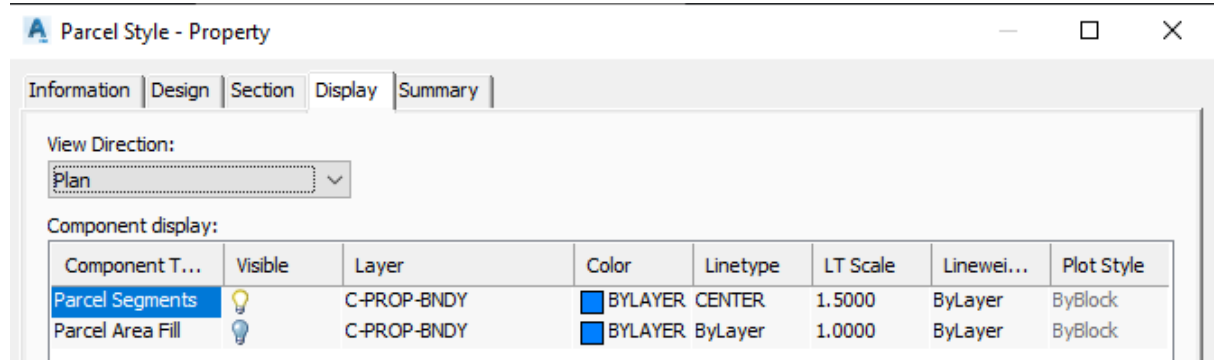


The created surface will have all contour data from selected 3D polylines.

3.4 Create Site Boundary

One way of representing Site Boundary is to use Parcel object which is an enclosed boundary.

Draw a polyline in model space, then press the button “Ribbon > Home > Create Design > Parcel > Create Parcel from Objects” and select the polyline. Press enter after selection. Specify “Site” and “Parcel Style” then press Okay. The representation of boundary can be customized via Parcel Style as shown below



3.5 Creating Feature Lines and Grading

Feature line is one basic building block when working with Grading in Civil 3D. All gradings are essentially started from feature lines. The process of creating Grading will create additional feature lines from the origin feature lines.

3.5.1 Create Feature Line

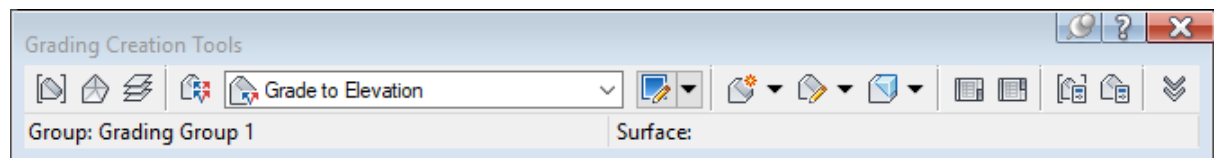
One way of creating new feature line is to draw a polyline (representing the platform boundary) in model space, then press the button “Ribbon > Home > Create Design > Feature Lines > Create Feature lines from Objects” and select the polyline. Press enter after selection.



Elevations of feature line can also be edited by selecting a feature line and click on Elevation Editor button on Feature Line contextual ribbon.

3.5.2 Create Grading

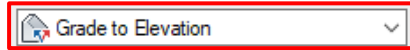
The steps below show how to create Grading

1. Open Grading Creation Tools by clicking on Home>Grading>Grading Creation Tools button.



2. Set a Grading Group which will contain all gradings by clicking on  button. A Grading Group is used to organize gradings into named collections for surface creation and volume computations.
3. Set a target Surface by clicking on  button. This will be used as the base surface when selecting Grade to Surface criteria to create Grading.

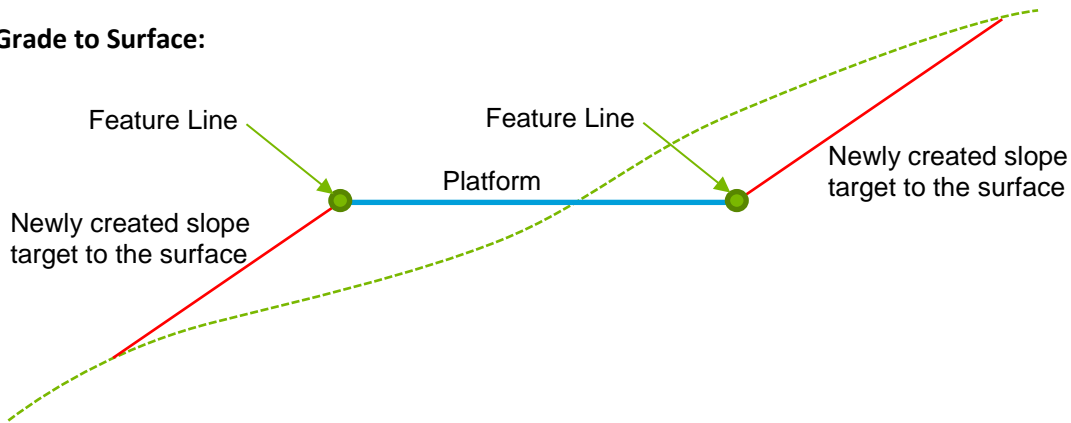
4. Select a suitable grading criterion to create Grading by selecting from the dropdown box




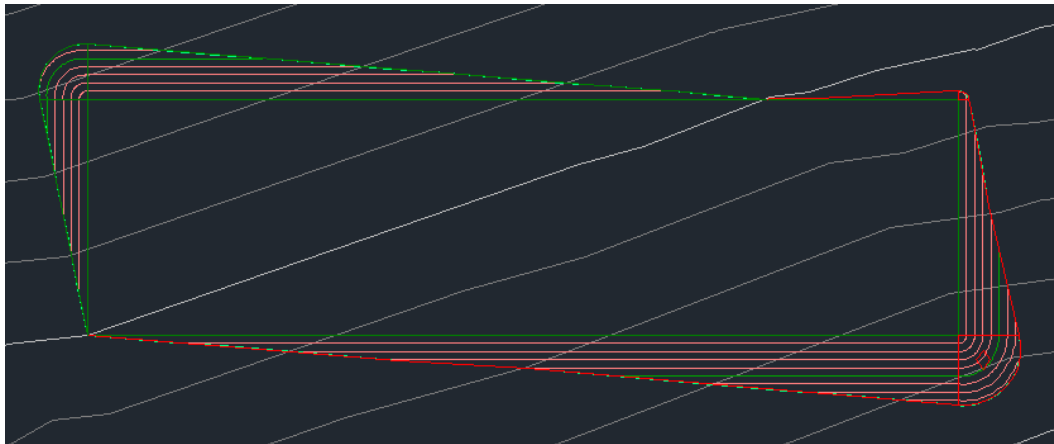
. There are four methods to create Grading: Grade to Distance, Grade to Elevation, Grade to Relative Elevation and Grade to Surface. For example, when selecting Grade to Surface, the Grading (slope) will be created from the original feature line to the selected surface by a given slope such as 3.00:1. The image below demonstrates the newly created slope when using Grade to Surface criterion.

→

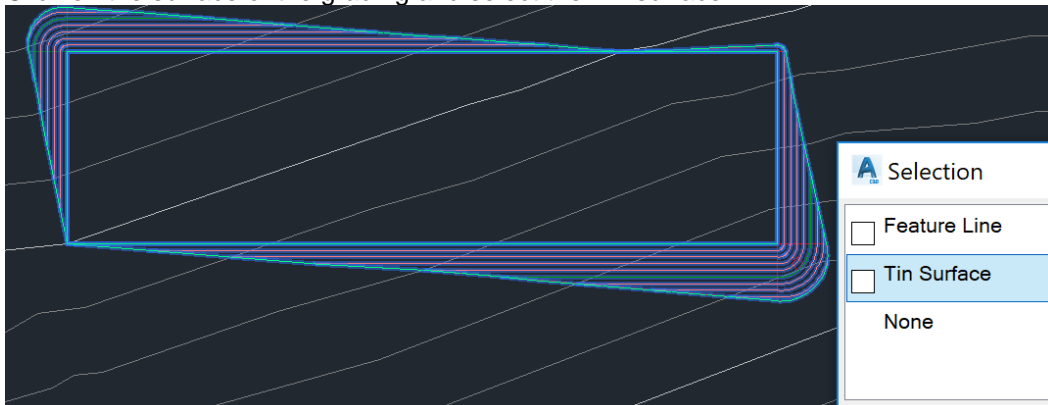
Grade to Surface:



5. Create Grading by clicking on  button. Follow the instructions on the command line to create Grading from the selected feature line. It should be noted that when asking for Cut or Fill format, you can select the **Slope** and enter **2:1** for 2:1 slope.



Click on the surface of the grading and select the Tin surface



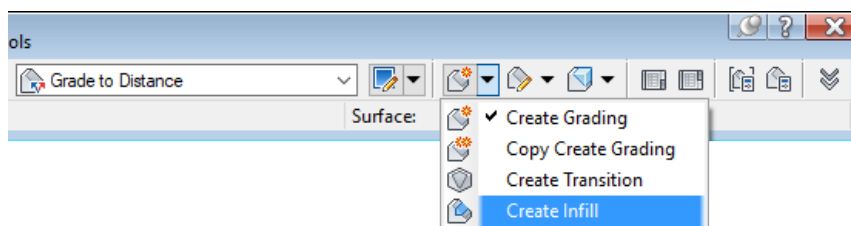
Then, view it in Object Viewer and you will see that the platform is not filled



3.5.3 Create Infill

When creating Grading, only the part along the selected feature line is created. The inside area of the feature line is still not filled. The Infill will help to create this area.

On Grading Creation Tools toolbar, click on Create Infill

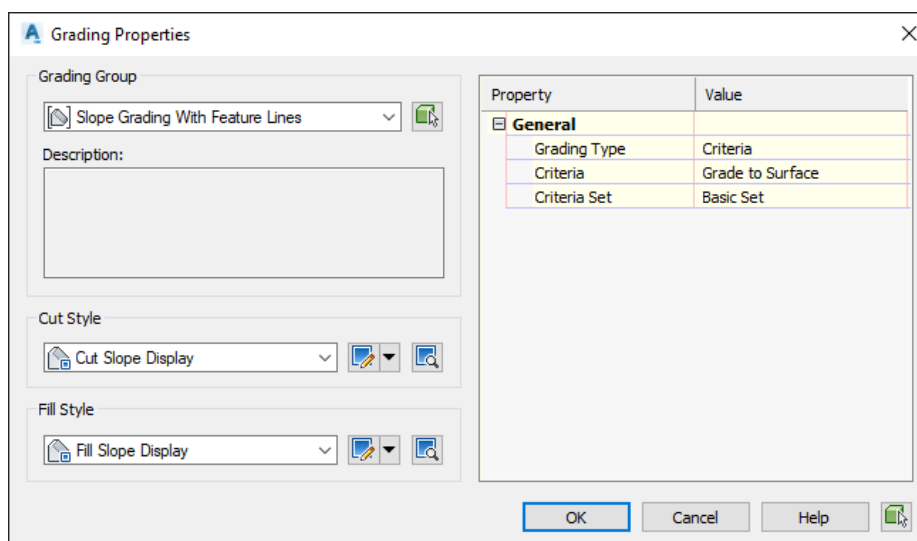



Click on the inner side of the feature line to create Infill for that area. The surface will now cover the inside area, as shown in the example below:

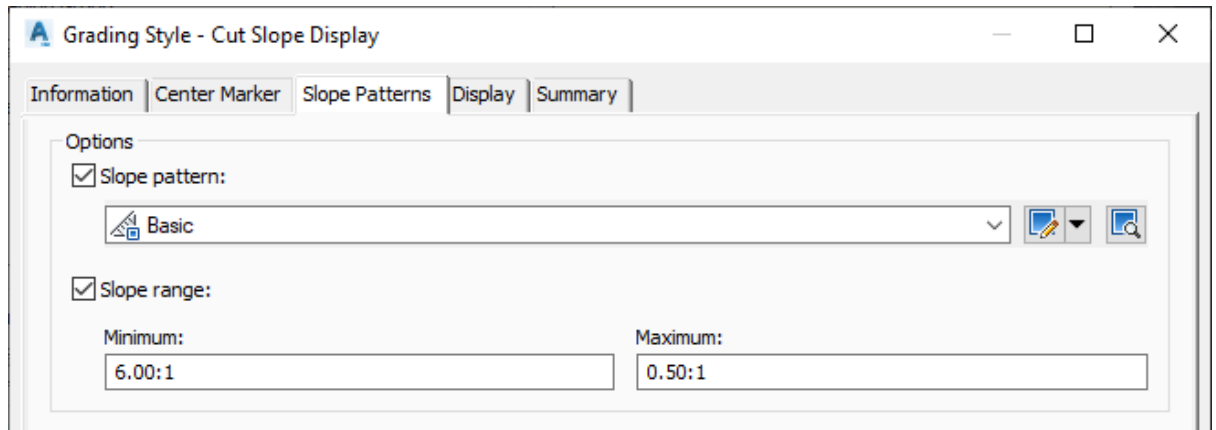



3.5.4 Edit cut/fill slope pattern

Select the Grading object. On the contextual ribbon, select Grading Properties button.



Select  button to edit Cut or Fill Style.



Check on Slope pattern to show the slope pattern for the Grading and click on  button next to selected slope pattern to customize the display of Slope pattern.

3.6 Create Alignments

Please refer to section 2.9 Alignment and Profile for details on working with the Alignments.

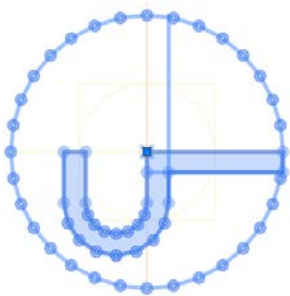
One quick way is to create Alignment from the object. To do that, draw a polyline in model space, then press the button "Ribbon > Home > Create Design > Alignment > Create Alignment from Objects" and select the polyline. Press enter after selection. Select the direction of the Alignment. Specify the name of the alignment and "Alignment Style" then press OK.

3.7 Create Corridor for Slope Drainage

Create corridor by subassembly composer for an open channel; edit alignment style to add arrow; add alignment label to specify channel type and size

Corridor can be used to create an open channel.

Create a custom subassembly to represent the typical cross-section for the open channel. Please refer to 2.10 Corridor and Assembly on how to work with a corridor and custom assembly.



Create alignment and corresponding vertical profile for the open channel. The insertion point of the assembly will follow the alignment on the plan view and its elevation will follow the profile.

Create corridor to represent the open channel by pressing button “Ribbon > Home > Create Design > Corridor > Corridor”

Create Corridor

Name:

Description:

Corridor style:

Corridor layer:

Baseline type:

☒ Alignment and profile

☐ Feature line

Alignment:

Profile:

Assembly:

The <None> selection creates an empty corridor. Regions, assemblies, and targets can be added later.

Target Surface:

☐ Set baseline and region parameters

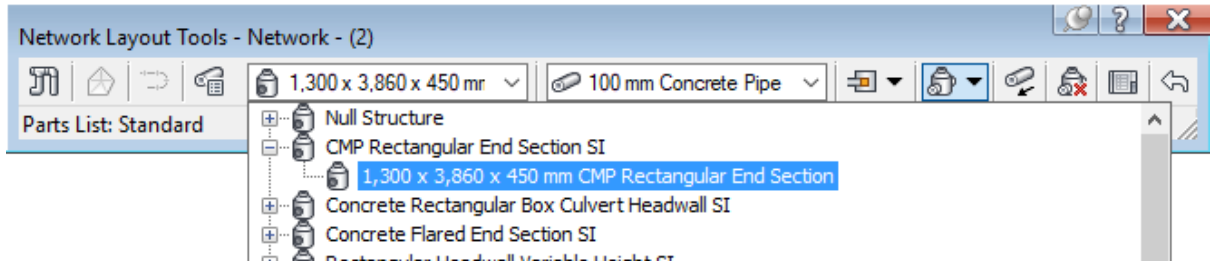
OK **Cancel** **Help**

Specify the Corridor name, alignment, profile and the assembly, then click OK button.

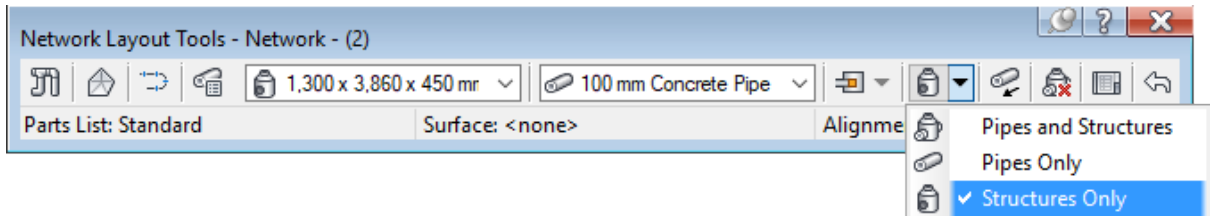
3.8 Create Pipe Network Structure for Catchpits

To create Catchpits, press the button “Ribbon > Home > Create Design > Pipe Network > Pipe Network Creation Tools”. Specify the Network name and the Network parts list. The Network parts list contains all structure’s types and sizes to be used in this Pipe Network. Press OK to start creating Pipe Network, the Network Layout Tools toolbar will be shown.

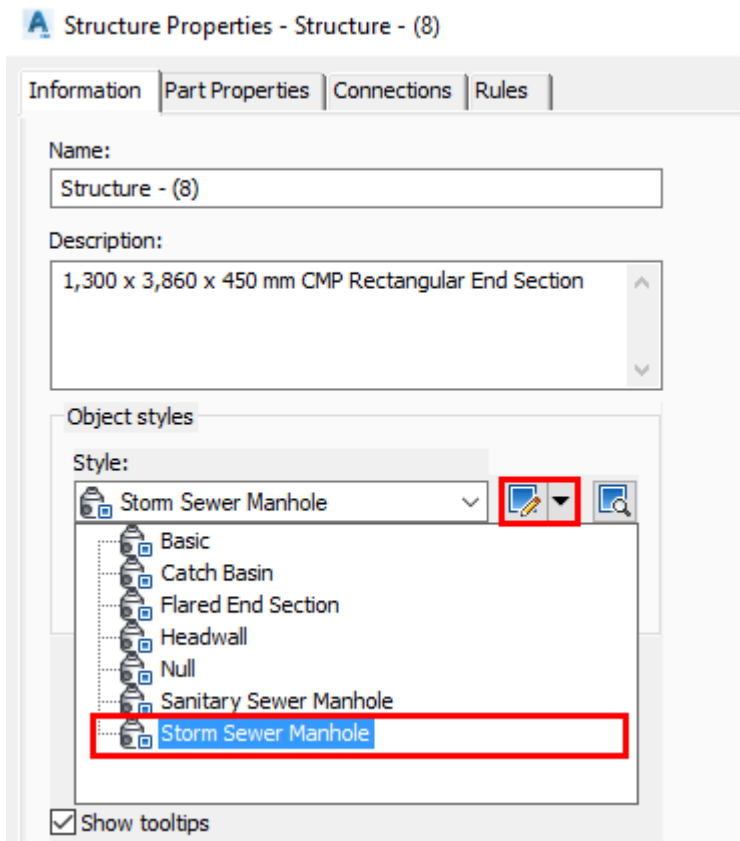
Select the required Catchpit type and size.




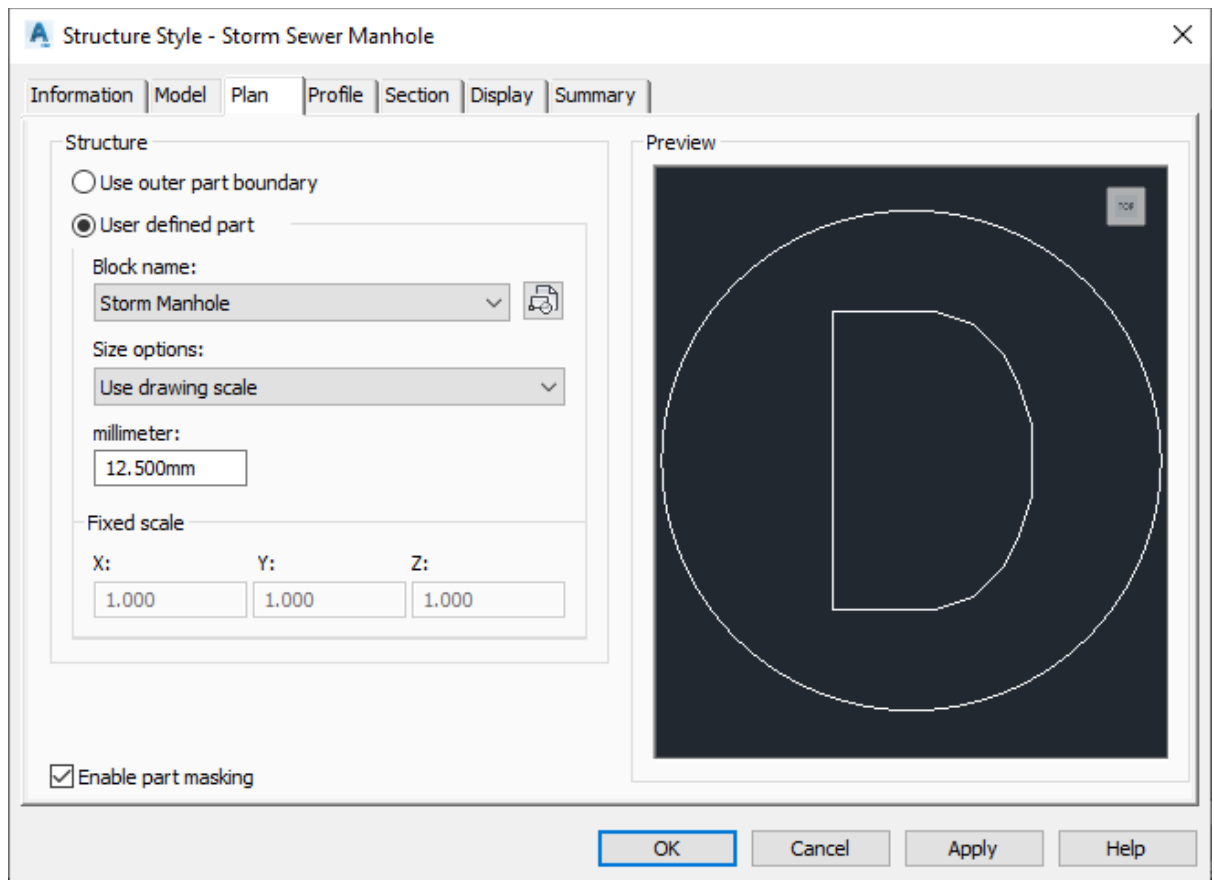
Then click on Structures Only and then pick a point for the desired location of the catchpit.



The display of Catchpits on plan drawings can be customized by changing the Structure Style or editing the current Structure Style. To do that, select on any Catchpit, right-click and select Structure Properties... In the Structure Properties dialogue select the desired display style.

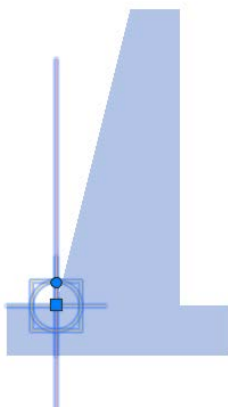


If you want to customize the selected style, click on  button to customize the selected style. In the Structure Style dialogue, you can also specify a block to represent the catchpit on plan drawing.



3.9 Create Corridor for Retaining Walls

Select a suitable Retaining Wall subassembly in the Tool Palettes. If there is no subassembly matched the requirements, the custom subassembly can be created.

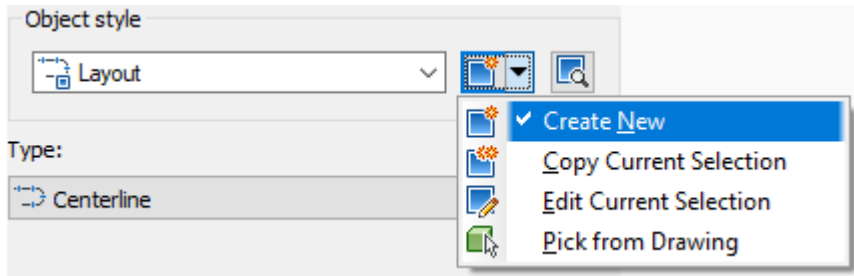


Create alignment and profile required to generate Retaining wall corridor.

Create Corridor using created alignment, profile and assembly.

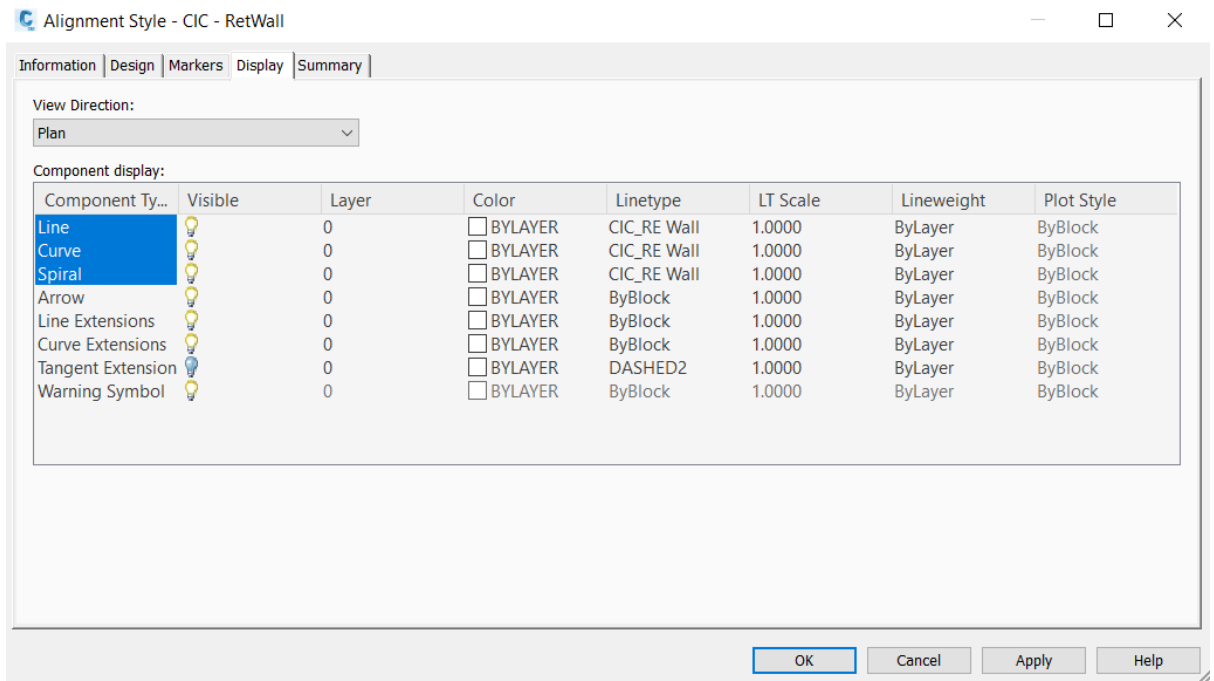
The representation of retaining wall on plan view can be obtained by changing the alignment style or by extracting the feature lines from retaining wall corridor and then change its style. The steps below show how to change the Alignment Style.

Select on the Alignment > Right-click > Alignment Properties. In Alignment Properties dialogue, on Information tab, select Create New in Object style area.



This will open the Alignment Style dialogue. In this dialogue, on Information tab, enter the name for this Alignment Style.

On the Display tab, select Plan under View Direction, then changes the Linetype and LT scale to match the required display of retaining wall symbol.




Press OK to accept the creation of new Alignment Style and then select the newly created style to apply to selected Alignment.

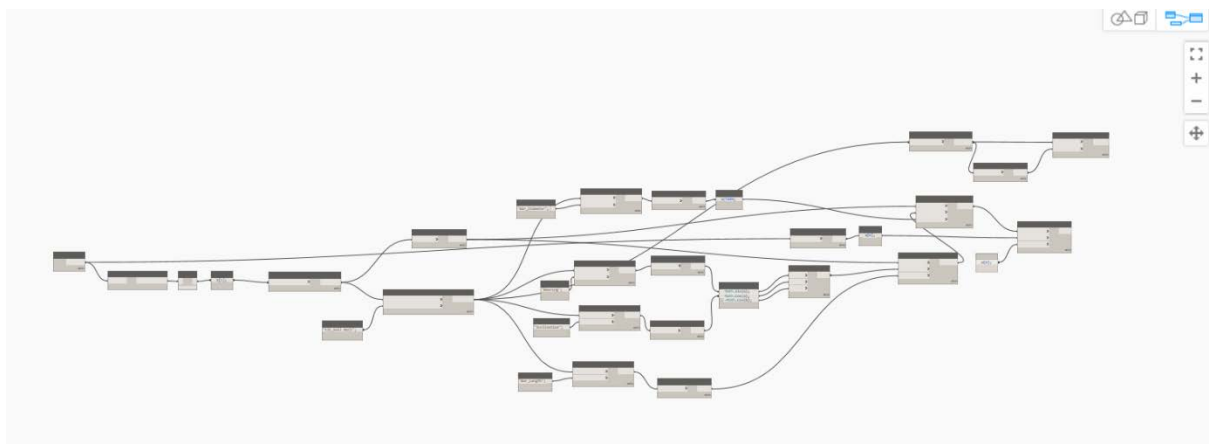
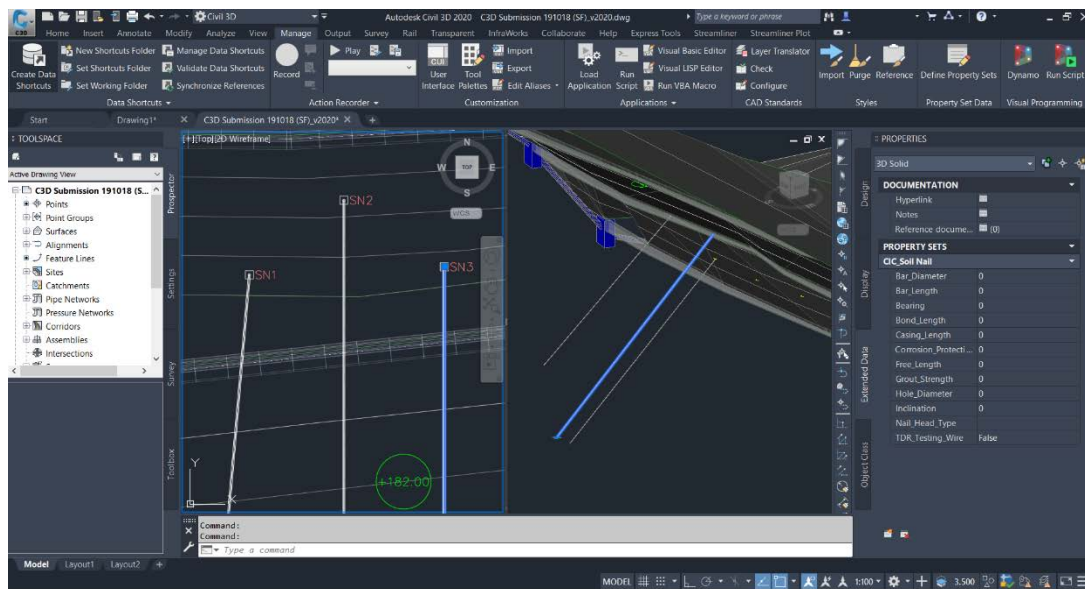
3.10 Create Soil Nails

COGO points are used to model soil nails in Civil 3D. 3D soil nails can be created by using dynamo with Civil 3D 2020 after the information is filled to the COGO points in Civil 3D. Press the button “Ribbon > Home > Create Ground data > Points > Create Points -Surface > Random Points”, then select the surface before picking the location of points on the plan view. Adjust the COGO point “Style” to “Soil Nail – plan view” and “Point Label Style” to describe only.

Type “STYLEMANAGER” in the command bar, choose Documentation Objects > Property Set Definitions to apply “CIC_Soil Nail” for COGO points. In property menu, choose

“Extended Data” and add the “CIC_Soil Nail” data set by pressing the  button at the left button in property menu. Format of extended data could be customized by users in C3D Style Manager.

For Civil 3D 2020 users, they could press “Manage > Dynamo” and open the dynamo “Soil Nail to 3D” to generate 3D soil nails based on the information they entered in the COGO points.



3.11 Civil 3D Geotechnical Module for Ground Investigation

The Geotechnical Module is a free add-on to AutoCAD Civil 3D. It is a cut down version of HoleBASE SI Extension and can connect to HoleBASE SI to give CAD and BIM teams instant access to centrally-held geotechnical data. Users could apply information such as Excel tables (in csv format) and AGS files to create 3D models and 2D drawings for ground investigation data. Please refer to the links below for more information about Geotechnical Module :

1 - Creating a Project

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial1-169074377.htm>

2 - Importing Data into your Project

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial2-69074436.htm>

3 - Viewing Borehole Data

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial3-169074440.htm>

4 - Creating Geological Surfaces

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial4-169074452.htm>

4a - Geotechnical Layer Management in 2018

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial4a-226416567.htm>

5 - Creating Geotechnical Profile Views

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial5-%20169246644.htm>

5a - New features for creating and editing Geotechnical Profile Views

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial5a-226416579.htm>

5b - Creating 3D Fence Diagrams

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial5b-226416547.htm>

6 - Managing Geotechnical Hatches and Styles

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial6-169246655.htm>

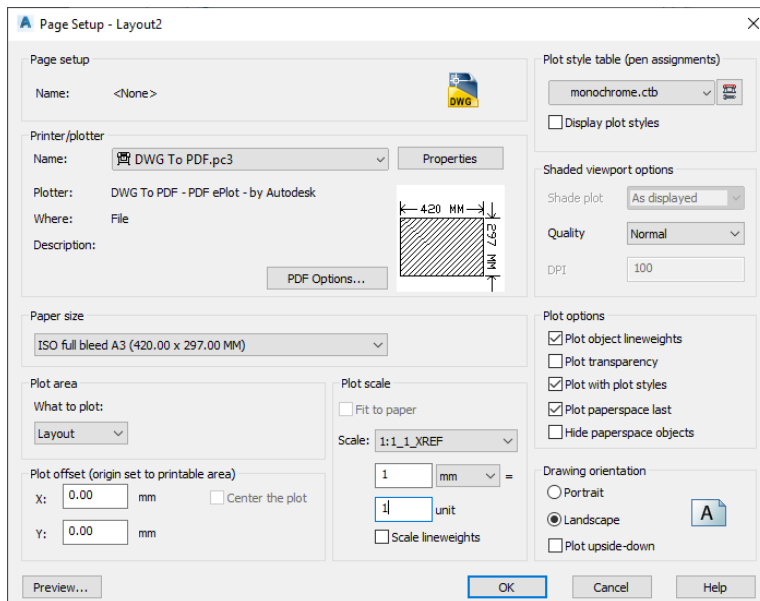
6a - Changes to the Hatch Manager and the new Export command

<http://assist.keynetix.com/Content/Pages/GeoTechModule/Tutorial6a-226416553.htm>

4 2D drawing production

4.1 Page setup

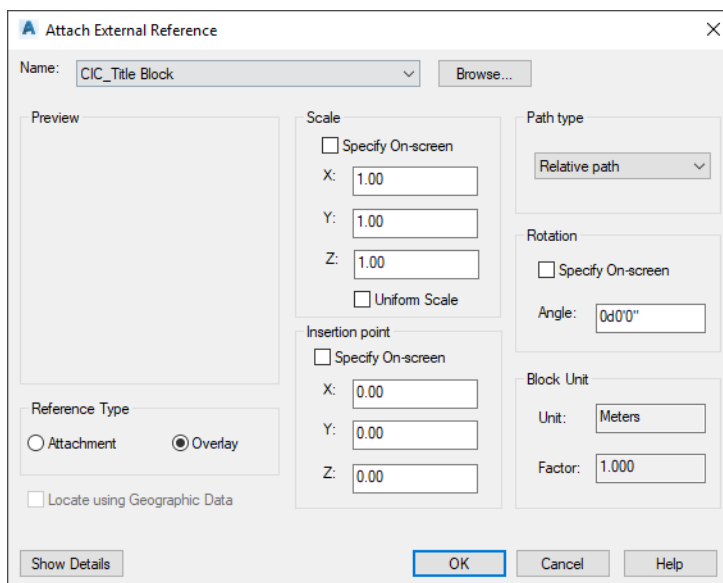
To perform page setup, click on the desired layout (at the lower-left corner) to switch from model space to paper space. Right-click on the layout, select Page Setup Manager.... Make sure the desired layout is selected in the dialogue, select Modify... button.



Select desired Printer, Paper size, Plot style table, Drawing orientation and other options and then click OK. Then click OK.

4.2 Attaching Title Block to Paper Space

One way to attach the Title Block to Paper Space is to use XREF. Click on “Ribbon > Insert > Reference > Attach”. Under Files of type, select Drawing (*.dwg). Then browse to the folder containing the title block drawing file. Then click Open. The Attach External Reference dialogue will be shown. Enter the options as shown on the dialogue below, then click OK.



The title block will be inserted on the current layout.

4.3 Insert Viewport to Paper Space (Layout)

Paper Space (or Layout) is a space to prepare drawing for printing. Layout viewports will be created to display different views of model space. To insert a new layout viewport to the current layout, in the command line, type **MV** then press Enter. Then specify two corners of the viewport. Select the newly created viewport. On the Properties palette, Under Misc > Custom Scale, enter a scale ratio as you wish. Then adjust the side and position of the viewport to display the desired object. To prevent the viewport from being changed, on Properties palette, under Misc > Display locked, select Yes.

4.4 Add Dimensions and Labels to Drawings

When working with labels and dimensions in Civil 3D, they are considered as annotation objects. These objects are scaled differently from model objects so that they can be printed out in a consistent and desirable size.

Annotation objects can be non-annotative or annotative.

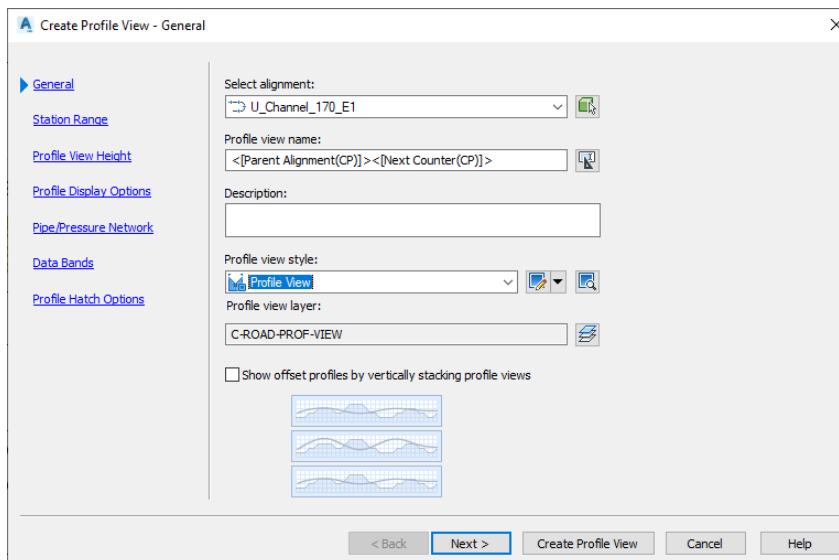
- Non-annotative objects, require a fixed size or scale that is calculated based on the scale used to plot the drawing.
- Annotative objects automatically adjust to display uniformly at the same size or scale regardless of the scale of the view.

Details about annotation objects can be referenced from the following link

<http://help.autodesk.com/view/ACD/2019/ENU/?guid=GUID-F8E4E984-71C5-4812-B1A0-3BD0A6BB0BDF>

4.5 Create Profile Views for Alignment

Profile Views are used to display information of vertical profiles within an alignment. To create a Profile View of an alignment, click on “Ribbon > Home > Profile & Section Views > Create Profile View”.



In the Create Profile View wizard, select the alignment, provide the Profile View name, select the Profile view style and then click Create Profile View or lick Next > to specify additional options for the Profile View.

5 Export Civil3D Models as Deliverables

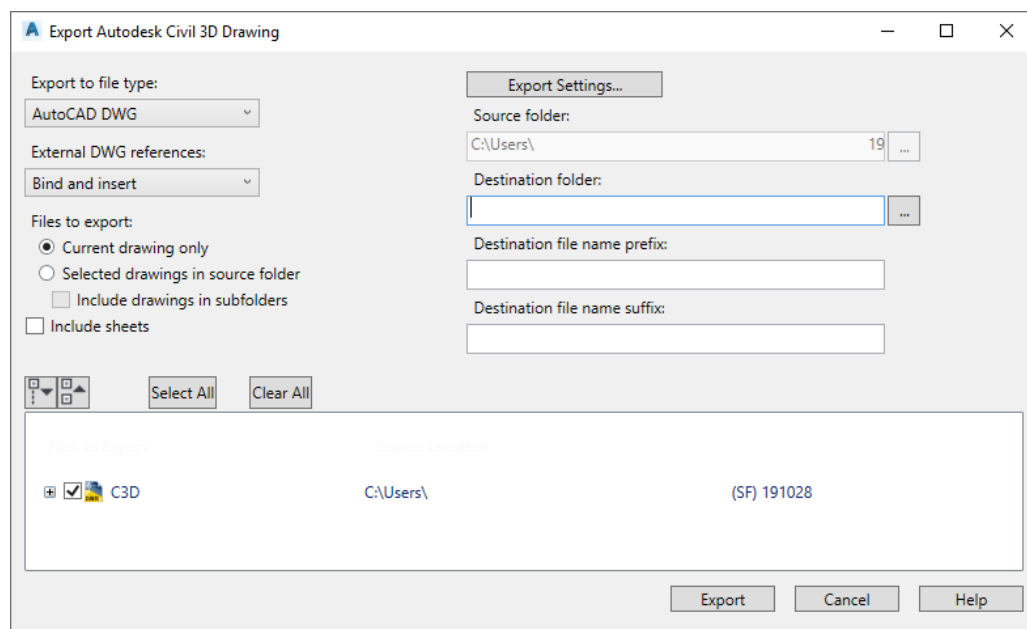
5.1 Export 2D drawings as PDF or DWG

5.1.1 Export to DWG

The file format of Civil 3D is DWG. So AutoCAD can be used to open the DWG file. However, in some circumstances, the Civil 3D objects will not be displayed when opening the file using AutoCAD.

One way to tackle this issue is to install AutoCAD Civil 3D Object Enabler. The Civil Object Enabler is a freeware application that you can use to access Autodesk AutoCAD Civil 3D drawing files.

Another safer way is to export Civil 3D drawing to AutoCAD. This process will convert all Civil 3D objects to AutoCAD objects so that they will be displayed correctly in AutoCAD. To convert to AutoCAD, click on “Ribbon > Output > Export Civil 3D Drawing”, select exporting options in the displayed dialogue and click Export.



5.1.2 Export to PDF

Users can generate individual PDF files for each layout or generate just one multi-page PDF file.

On the bottom-left corner of Civil 3D window, press and hold the Ctrl key while clicking on the layout tabs that you want to export.

Right-click and select Publish Selected Layouts.

In the Publish dialogue box, in the Publish To: drop-down list, select PDF.

In the PDF preset drop-down list, select the preset that you want to use.

Note: The program includes several PDF presets that are optimized for the purpose identified by its name. For example, the AutoCAD PDF (Web and Mobile) preset generates PDF files optimized for viewing on mobile devices and Web browsers.

In the Publish Options information section, verify that the options meet your requirement. If not: Click Publish Options.

To generate a multi-page PDF file, select Multi-sheet file. To generate one PDF file for each layout, clear the Multi-sheet file check box.

Specify the settings for the PDF file.

Click OK.

Click Publish.

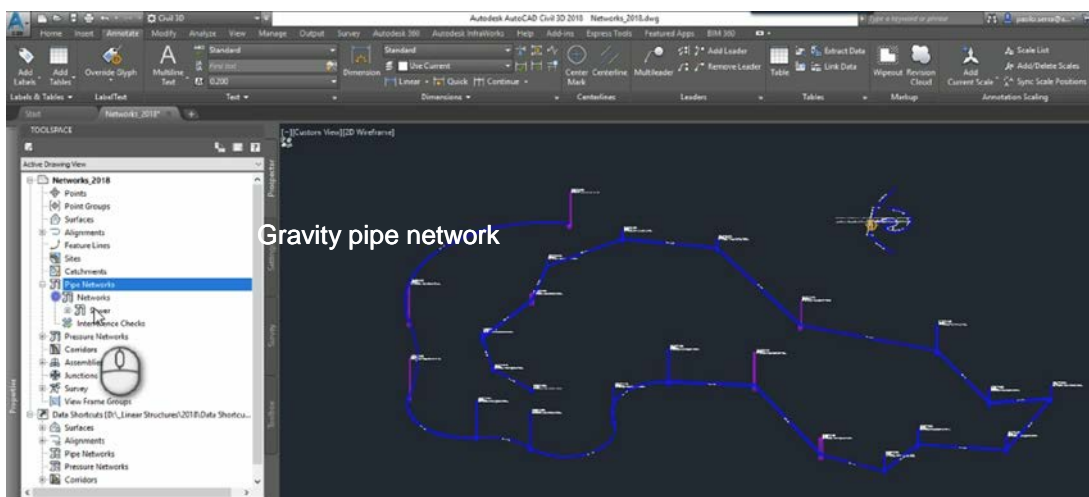
Tip: You can improve publishing performance by turning off background publishing. To turn off background publishing, clear the Publish in the background check box (Publish Controls group) in the Publish dialogue box.

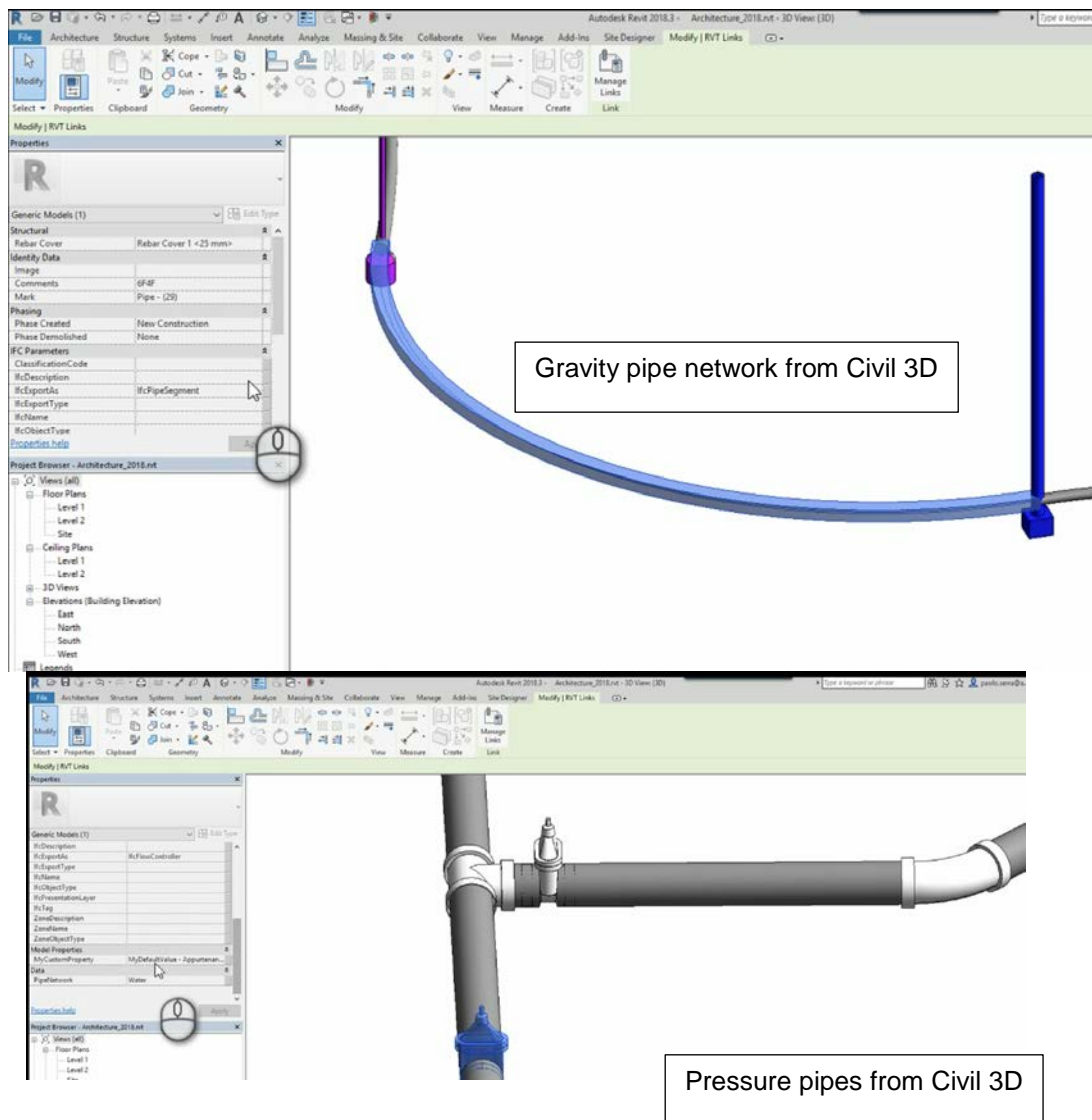
5.2 Integration of Civil 3D and Revit

- 1) Surface in C3D 2019 or above support **Site collaboration with Civil 3D** and can be linked by Revit, please see <http://www.infrastructure-reimagined.com/four-ways-latest-civil-3d-2019-features-will-improve-efficiency/>
- 2) There are plenty of external dynamo packages to connect Revit and Civil 3D by Dynamo, for example, Civil3D pipe network or road can be regenerated using Dynamo from an excel exported from C3D. Please refer to this link for more information :

CivilConnection - Civil 3D Pipe and Pressure Pipe Networks in Revit

<https://knowledge.autodesk.com/support/revit-products/learn-explore/caas/screencast/Main/Details/e1a65e28-8868-493c-b3b6-cf071abaf60a.html>





- 3) For coordination, Civil 3D and Revit can each read and write in NavisWorks format, facilitating the sharing of design data. Please read [Coordination Models at Autodesk.com](http://www.autodesk.com/coordination-models).

5.3 Integration of Civil 3D and GIS

Civil 3D 2020.1 introduces the Autodesk Connector for ArcGIS in Civil 3D, allowing you to directly to connect to the GIS data you need in Esri's ArcGIS Online. You can Save Back to ArcGIS, you can also Publish Civil 3D objects to ArcGIS, including: alignments, feature lines, parcels, pipe networks, and points. Please see <http://www.infrastructure-reimagined.com/civil3d2020-1>

Feedback Form

CIC BIM User Guide for Preparation of Statutory Plan Submissions Civil 3D December 2020

To improve future editions of this publication, we would be grateful to have your comments.

(Please put a "✓" in the appropriate box.)

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56 Tsun Yip Street
Kwun Tong, Kowloon
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