



THE CORPORATION OF THE CITY OF KITCHENER

CADD Procedures and Guidelines for the Preparation of Engineering Drawings

**Development Services Department
Engineering Services**

CADD Procedures and Guidelines for the Preparation of Engineering Drawings

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CADD Procedures and Guidelines for Engineering Staff Preparing Construction Drawings and Other Good Stuff

Updated: January 2, 2025

1. File Management

1.1. Xref's

External references (Xref's) are to be Overlay and Relative unless otherwise noted. X'ref's insertion points, scales, and rotation should never be specified and should always be left at the default of 0.

1.2. Project Workflow

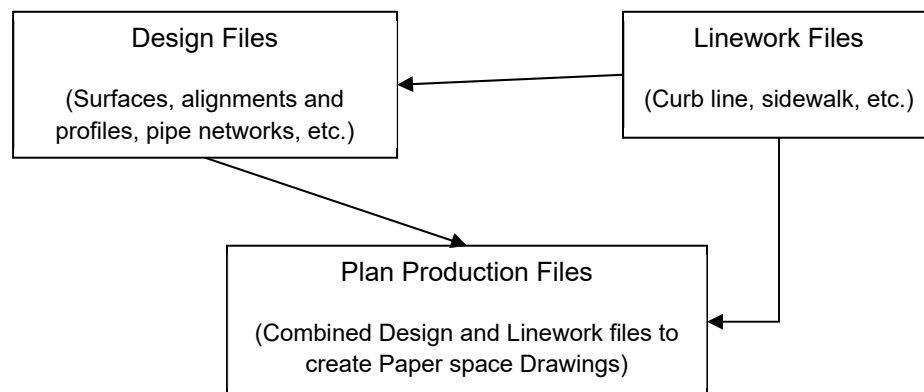
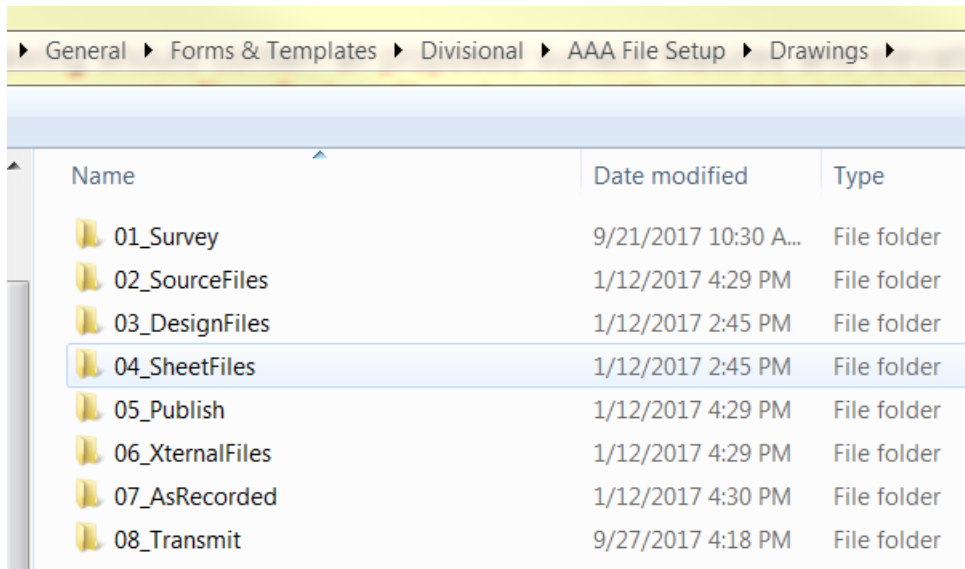


Figure 1: Project workflow example

1.3. Project file location and naming convention

Drawings shall be located on the server in the folders as shown below in Figure 2.



Name	Date modified	Type
01_Survey	9/21/2017 10:30 A...	File folder
02_SourceFiles	1/12/2017 4:29 PM	File folder
03_DesignFiles	1/12/2017 2:45 PM	File folder
04_SheetFiles	1/12/2017 2:45 PM	File folder
05_Publish	1/12/2017 4:29 PM	File folder
06_XternalFiles	1/12/2017 4:29 PM	File folder
07_AsRecorded	1/12/2017 4:30 PM	File folder
08_Transmit	9/27/2017 4:18 PM	File folder

Figure 2: Project Folder Structure

02_SourceFiles folder shall contain the data shortcuts or other data extracted from any other CAD file, internal or external

03_DesignFiles shall contain drawings such as alignments, corridor, pipes, etc.

04_SheetFiles shall contain all the CAD sheet drawings

05_Publish shall contain all the drawings which have been published from AutoCAD, there should not be any CAD files in this folder

06_XternalFiles should contain all external files received from an outside source

07_AsRecorded is only to be used for the purposes of creating the as recorded drawings

08_Transmit is to be used for the purposes of combining drawings to be exported to external agencies

1.4. Drawing Nomenclature and File Management

The following list of drawing names is what should be included in a project.

One thing to be mindful of is that when creating new drawings you should always start from the template. **Do not use another drawing by performing a SaveAs or copying another file, this has been known to cause issues with drawing stability.**

For PIC drawings they should be created as a separate file, eg. Save the Pr_Sheets as Pr_Sheets_Display.

ProjectName_Corridor

This file should contain proposed horizontal and vertical alignments and the corridor.

ProjectName_Cover_Sheets

This file will contain the cover sheet and legend / table of content sheet.

ProjectName_Detail_Sheets

This file will contain detail sheets for the contract drawings which will show typical cross sections as well as other typical details or notes.

ProjectName_Display_board

This file will contain layouts required to produce display boards for PIC's, this is generally produced by performing a Save As of the Pr_Sheets drawing.

ProjectName_Drain_Areas

This file will contain the sanitary and storm drainage area plans.

StreetName_Ex_Sheets

This file will contain all existing sheets to be used for the contract drawings. Each street shall be a separate file. No proposed information shall be shown on these drawings.

ProjectName_Fabric

This file will contain only the property fabric.

ProjectName_Linework

This file will contain all existing and proposed linework as well as any text which may be labeling the existing features (i.e. watermain, driveway material, house number) no Civil3D object data should be in this drawing.

ProjectName_Pipes

This file will contain all existing and proposed pipe work, this drawing will be Xref'd into the sheets.

StreetName_Pm_Sheets

This drawing should contain the proposed pavement marking and signage, all labels regarding this sheet should be placed in this drawing.

StreetName_Pr_Sheets

This file will contain all proposed sheets to be used for the contract drawings. Each street shall be a separate file. Infrastructure being removed shall not be shown on these drawings.

ProjectName_Quantities

This file should be used only for the generation of quantities from the design.

ProjectName_Sections

This drawing should have the corridor drawing xref attached (not overlaid).

StreetName_Sections_Sheets

This drawing should contain the proposed cross sections.

ProjectName_Staging

This file should be used for generation of a construction staging plan as your project requires. Limits of staging should be drawn directly in the model space of this drawing. This file may also be used for PIC's.

StreetName_Sw_Sheets

This drawing should contain all proposed surface features and elevations. Each street shall be a separate file. Curb radii and road widths are labeled in this drawing.

ProjectName_Topo

This file should contain only the topographic data from the field survey. In this file you will generate your existing ground surface, and existing horizontal alignment.

1.5. Data Shortcut

Before you begin setup your projects data shortcut folder

- 1) Right click on Data Shortcuts in the Toolspace pallete and use the Set Working Folder command, the folder needs to be set for each project on the server placed in the 02_SourceFiles folder

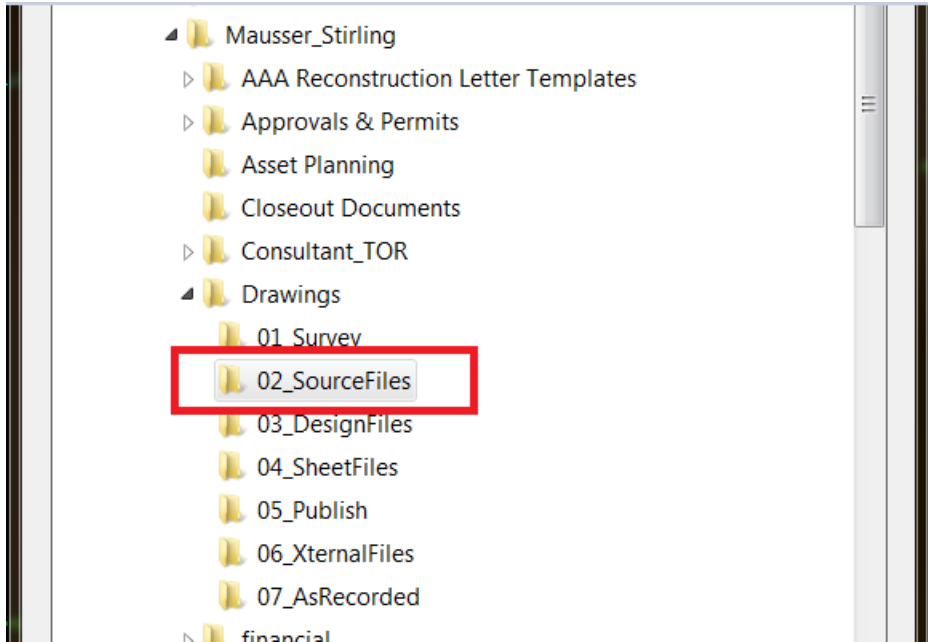


Figure 3: Data Shortcut Location

- 2) Right click on Data Shortcuts in the Toolspace palette and select the highlighted command shown below

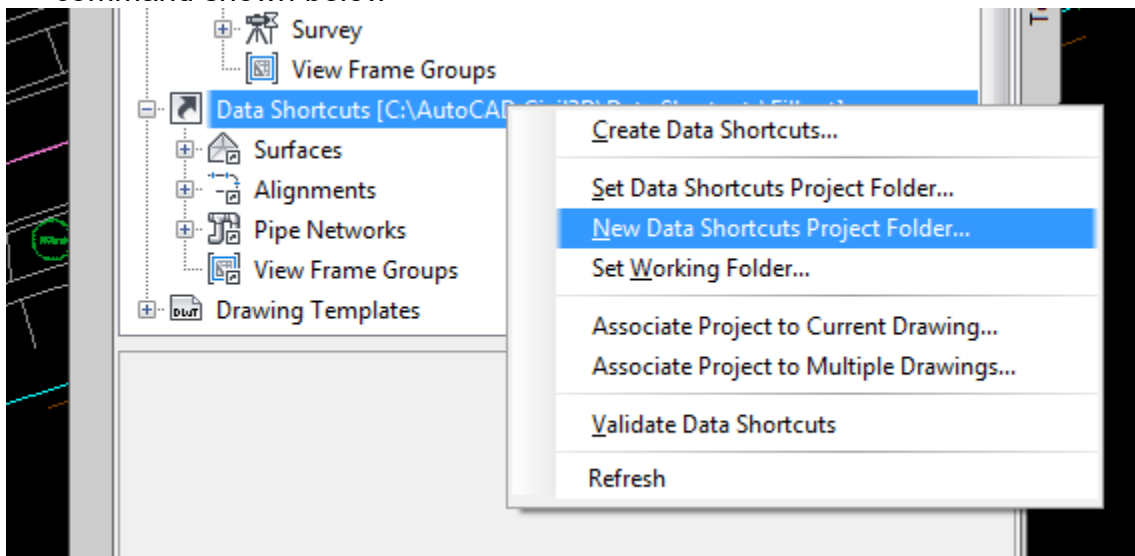


Figure 4: Data Shortcut Project Folder

- 3) Enter the name of the Data Shortcut project folder

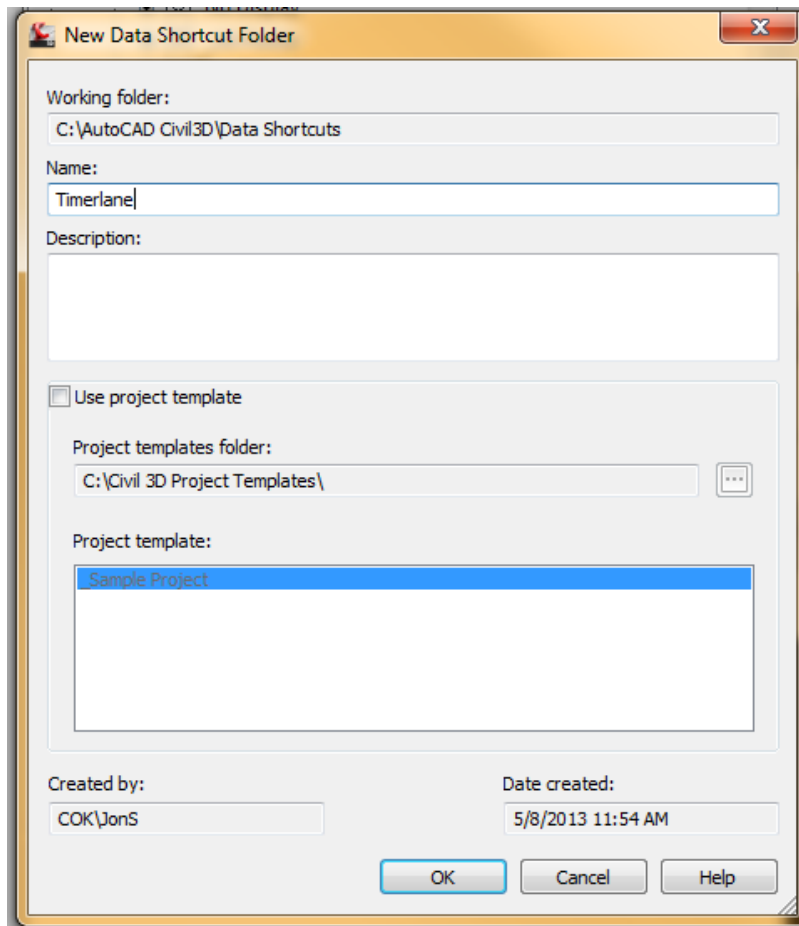


Figure 5: New Data Shortcut Folder

2. Design Development Stages

In general the design phase of a project progresses through five (5) separate stages

1. Data Collection
2. Existing Conditions and Base Plan Preparation
3. Preliminary Design
4. Detailed Design
5. Implementation

3. Data Collection

In addition to the topographic survey already completed, other sources of data collection should be completed, which may include CCTV data, photographic inventory of the site, review of the files maintained by the building division, other engineering plans (i.e. site plans), ArcReader, OnPoint and the file room as necessary, etc.

4. Existing Conditions and Base Plan

S:\General\01-01-627 Administration- General\Design & Approvals\Standard Dwgs\Design_Drafting Standards\COK_CADD Procedure and Guidelines_2025.docx

4.1. Base Survey File

The base survey file is created by our Surveyor and saved in the 01_Survey folder.

4.2. Topo Drawing Setup

1. Open the survey drawing and perform a SaveAs (into the 03_DesignFiles folder) and rename the file to ProjectName_Topo.dwg.
2. update all point groups,
3. delete the following survey figure types from the Topo drawing (which do not contribute to the surface);
 - Buildings
 - Fences
 - Hedges
 - Other lines that may cross the road that don't appear to belong
4. create a TIN surface named 'OG', in the description field enter the original survey date, use the last day of field survey for multiple day work eg. Surveyed May 6, 2013,
5. add the point group OG to your surface,
6. add breaklines to your surface, only lines which form the representation of the ground should be included, **do not** add building lines, fences as these features may not have been shot at the ground level,



Figure 6: Breaklines

7. Once you have added all the survey figures to your surface change their style to No Display, the quickest way to do this is by selecting all figures and opening up the properties window,
8. Create a data shortcut of the OG surface,
9. For purposes of display in the Sheets the Display point group should be at the top priority followed by No Display

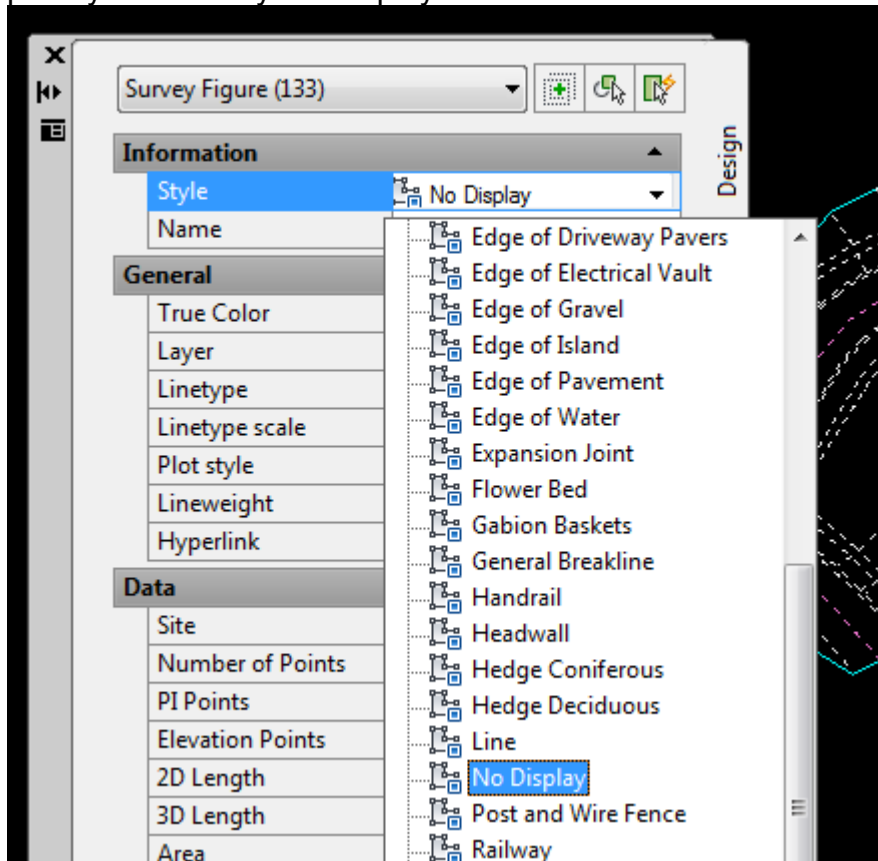


Figure 7: Breaklines to No Display

10. Review the surface fault lines to ensure accurate data representation (especially around retaining walls, ditches, etc).
11. Once created add the Linework drawing in as an Overlaid Xref on layer '0'

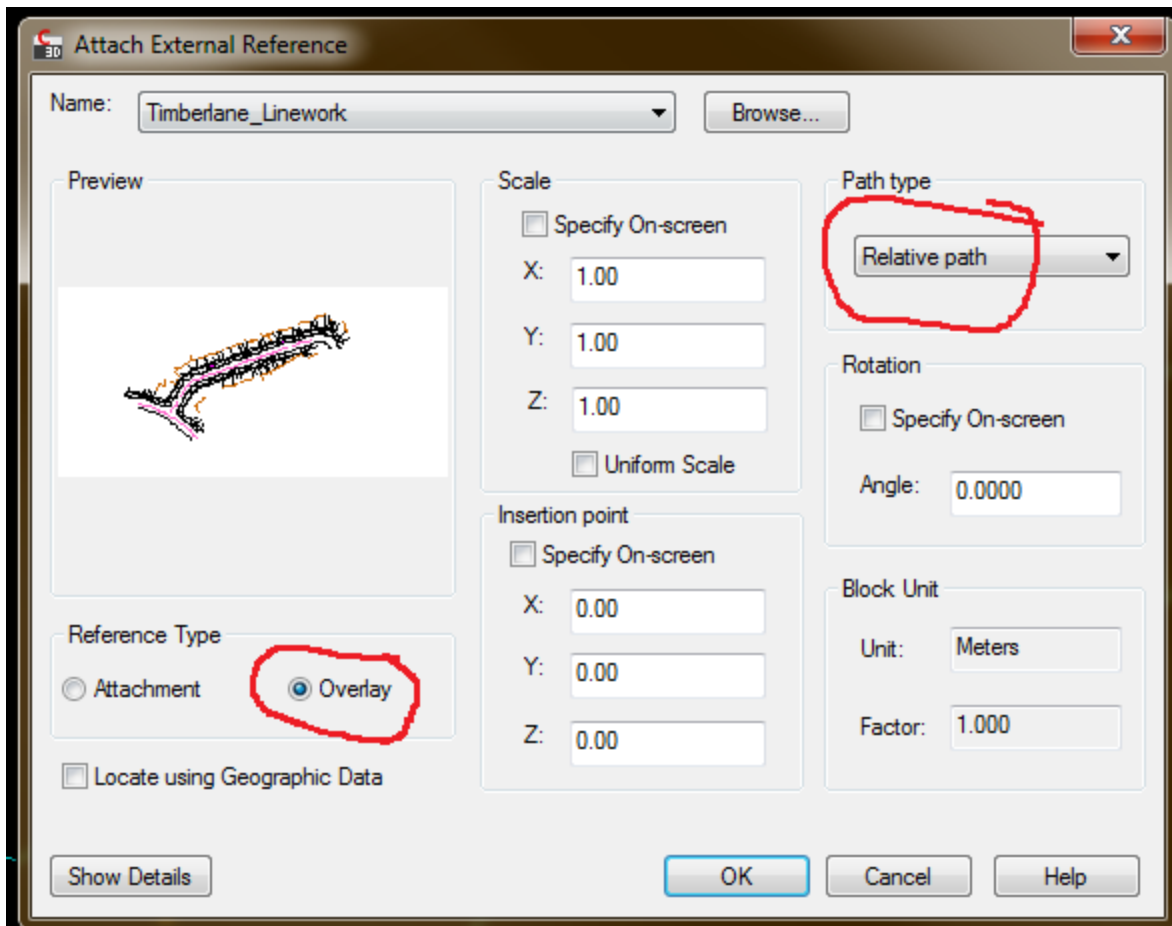


Figure 8: Attach External Reference

4.3. Linework Drawing Setup

1. Open the survey DWG, update the point groups, move the No Display point group to the top, update the point groups and do a regenall,
2. Select all of the lines in the drawing and explode them,
3. Select all of the lines again and select convert 3d polylines to 2d polylines,

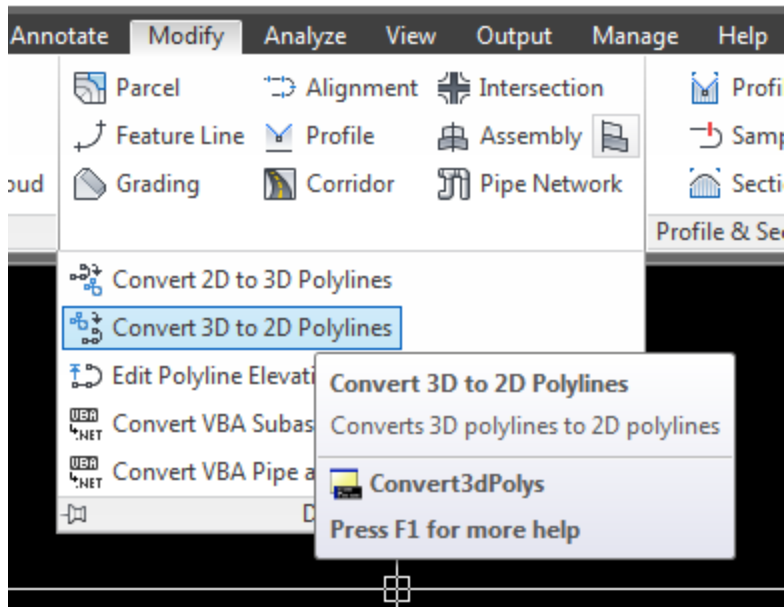


Figure 9: Convert 3D to 2D Polylines

4. Select all of the polylines again and change their elevation to zero, the quickest way to do this is in the properties window.
5. Copy all of the linework to the clipboard (or create a wblock),
6. Create a new drawing from the template and perform SaveAs to ProjectName_Linework

4.4. Linework Drawing Cleanup

Buildings

1. Ensure all building corners are joined and that the building face is one continuous polyline.
2. Building hatching should be ANSI31 0.5m wide, hatch pattern scale should be 0.10 with rotation to suit, the global width of the polyline representing the building face should 0.15 thick

Fences

3. Select all lines on the EX_FENCE layer, make sure they join where appropriate, and change the linetype scale to 4.0

Guiderail

4. Select all lines on the EX_GUIDERAIL layer, change the linetype scale to 5.0

Address Label

5. Add the note label 'City of Kitchener – Address' to one property

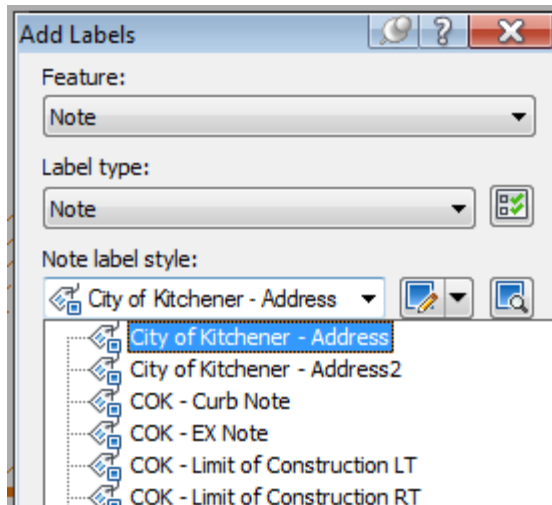


Figure 10: Address Label

6. Explode the label so that it becomes MTEXT, change the rotation to match the road.

Surface Features Label

7. Label the existing sidewalk and driveways (behind the sidewalk) using MTEXT on the EX_TEXT layer, the label shall be configured as below.

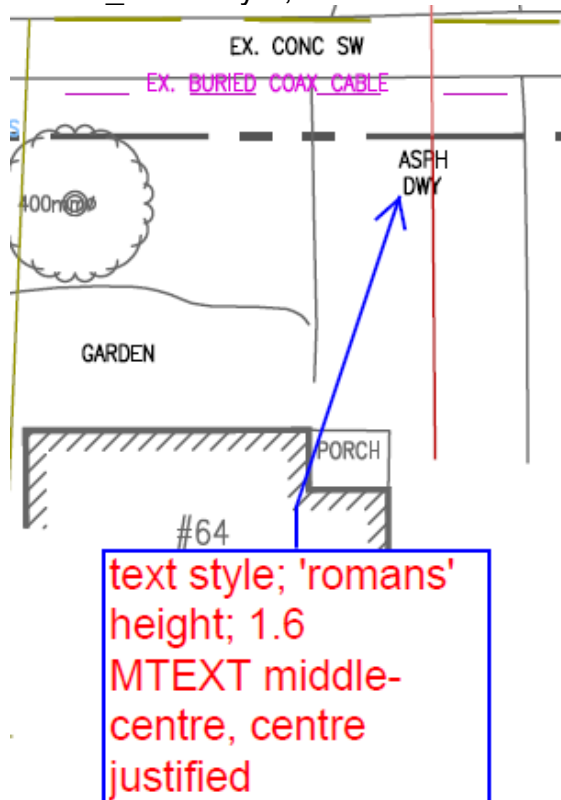


Figure 11: Driveway and Sidewalk Label

Retaining Wall

8. Wherever a retaining wall has been surveyed you will need to offset the linework to the centre of the wall and add a thickness to the polyline.

Hedges

9. Hedges are surveyed along the centreline of the hedge the code will define the width (ie. HD 600 is 600mm wide hedge). Offset the centreline to represent each side of the hedge, use the REVCLOUD command to change the linetype (arc lengths min. 0.25, max. 0.50)
10. Draw in the gas mains and services based on valve locations from the survey and from information obtained from ArcReader
11. Once you have completed drawing your existing pipe network (see procedure below) Xref the Pipes drawing and draw in the sewer service connections based on CCTV video
12. After soliciting third-party utility companies for location of their existing underground plant it should be drawn in based on the information provided. If they provide CAD drawings do not take this file for containing the correct location. Much of this information is schematic. You should interpret the dimensions and draw the plant in yourself.
13. For concrete encased duct structures a hatching pattern should be used, the pattern 'ANSI31' should be used with a scale of 0.10 and an appropriate hatch angle. The linetype of the concrete encasement should be set to 'Continuous'. The final product should appear as below.

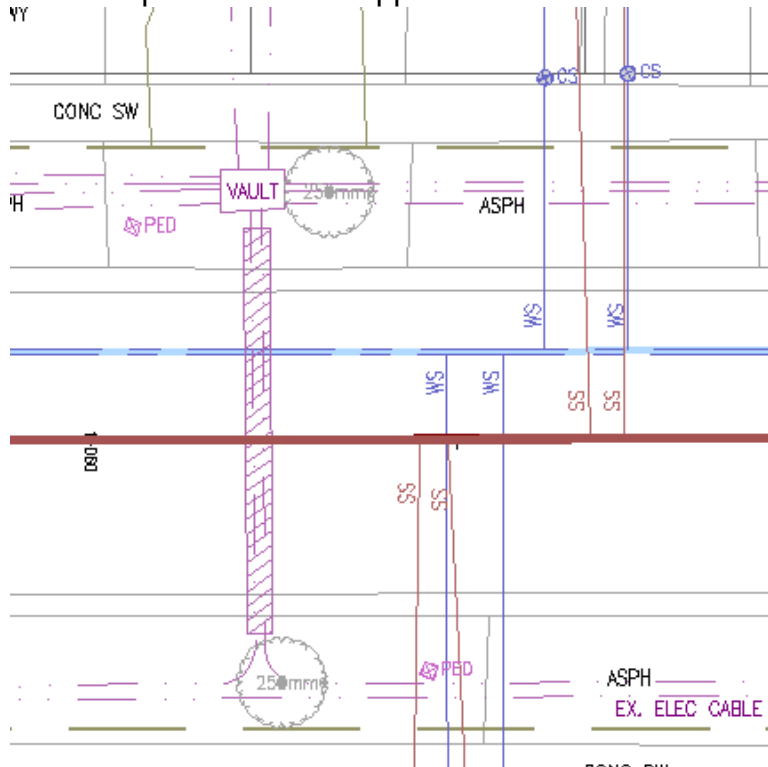


Figure 12: Duct Structure Hatching

GRCA Regulation Limit Line

Clip the regulation line from OnPoint and paste into CAD in the approximate location.
Trace the regulation line with a polyline.

The polyline should be on layer GRCA_Limit with a linetype scale of 25.0.

4.5. Fabric Drawing Setup

1. Start with a new drawing (qnew) and **SaveAs** ProjectName_Fabric,
2. On the insert menu select the import command.

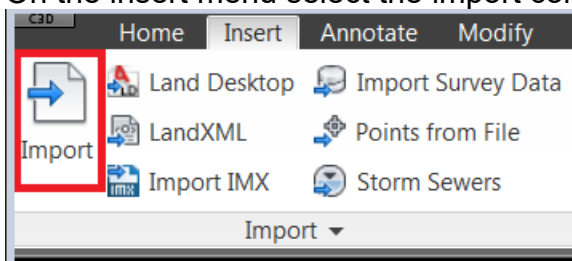


Figure 13: Parcel Fabric Import

3. Navigate to the following folder location **O:\Secured\GIS_Data\Microstation** and open the 'Land Parcel.dgn' file.
4. In the Import DGN Settings dialog box make sure the import into current drawing box is checked.

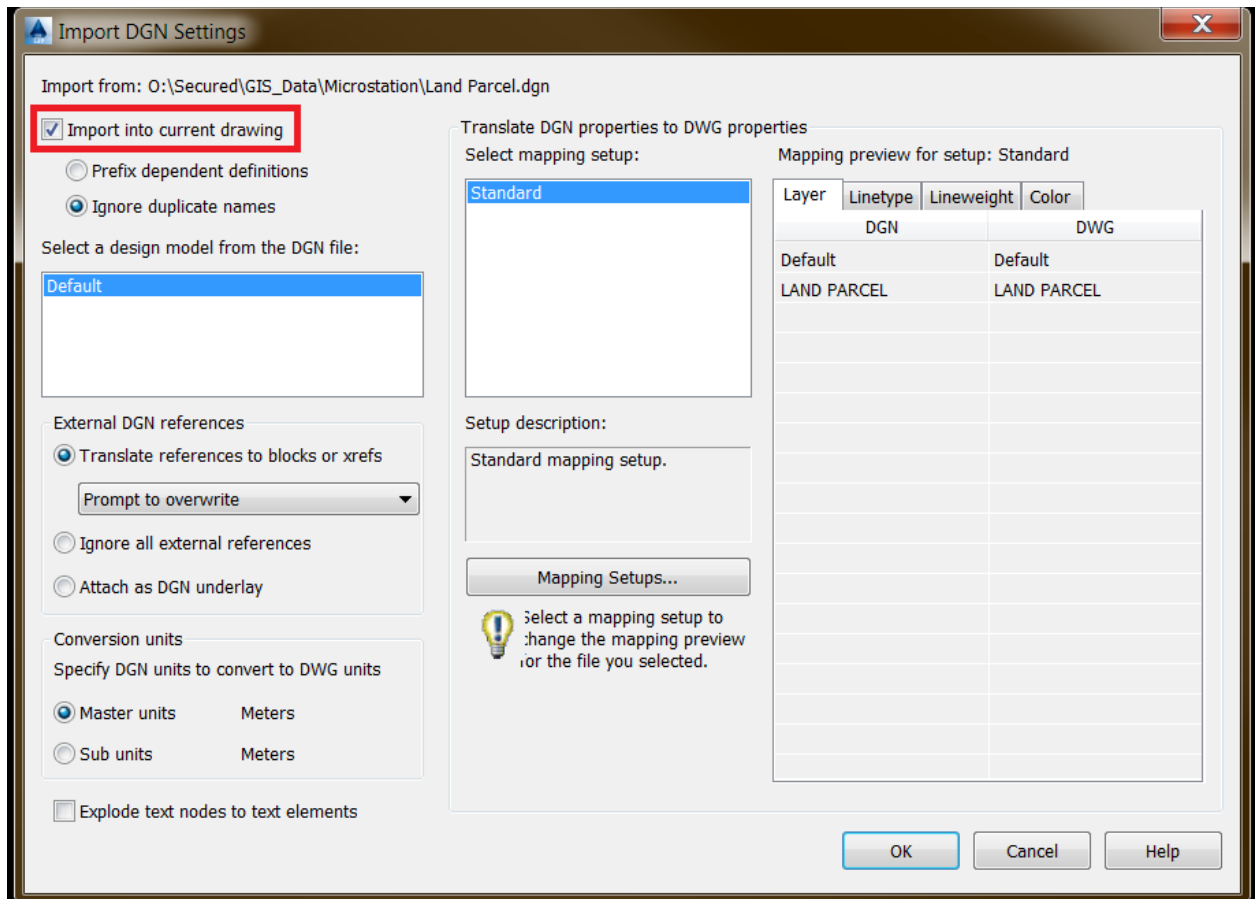


Figure 14: Import DGN Settings

5. Add the Topo drawing in as an Xref with property bars turned on to check placement.

4.6. Fabric Drawing Cleanup

1. Delete properties outside of 2km radius (suggestion only area may need to be larger depending on the drainage area),
2. For the properties along your project explode the polygons and change the layers of the linework, Right-of-way lines should be changed to "EX_LEGAL_ROW", the lot lines should be changed to "EX_LEGAL_LOT"
3. For the best appearance in the drawing the right-of-way lines should be joined together as a polyline.

4.7. Horizontal Alignment Creation

1. Create a new drawing and save it as ProjectName_Corridor
2. Add overlay X'ref's of the Fabric, Linework, and Topo drawings,
3. Create a new horizontal alignment that approximately follows the existing centerline of roadway (we will modify it later to fit the proposed centerline alignment).

WARNING – Never create an alignment from an object, Autodesk best management practices state alignments from objects can be problematic.

4. Create a new horizontal alignment for streets which intersect the project street as well.
5. In the Alignment Properties window change the reference point station to 1+000 then pick the reference point on the drawing, the reference point should be at a common location such as an intersecting street centreline

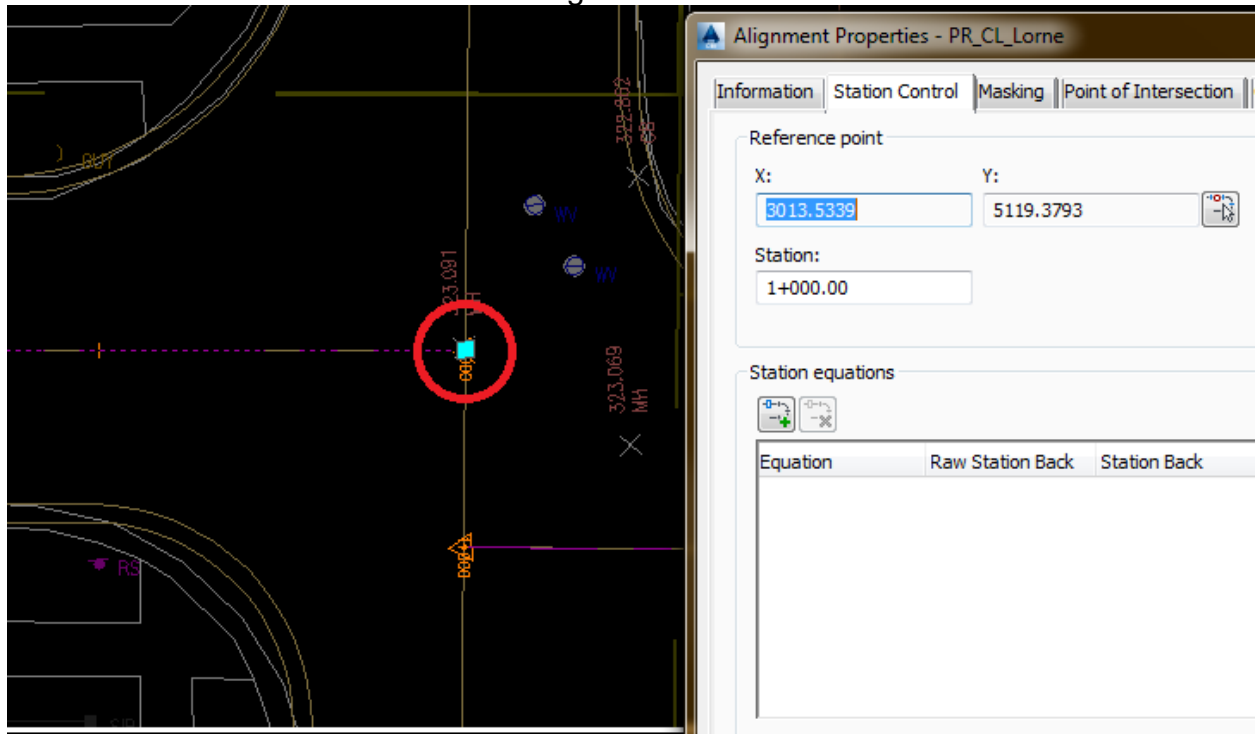


Figure 15: Alignment Reference Point

The beginning station should always start at 1+000 (because corridors do not like negative stations)

6. Offset intersections should have separate alignments (this will make corridor modelling easier)
7. At tee intersections add a PI at the middle of the intersection

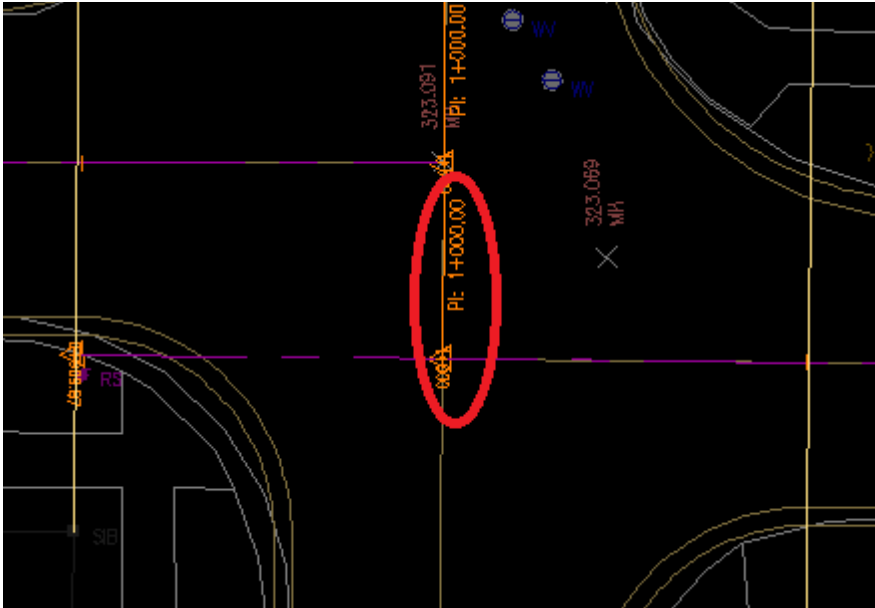


Figure 15: Offset Intersection Alignment

8. The tail end of the alignment should be masked

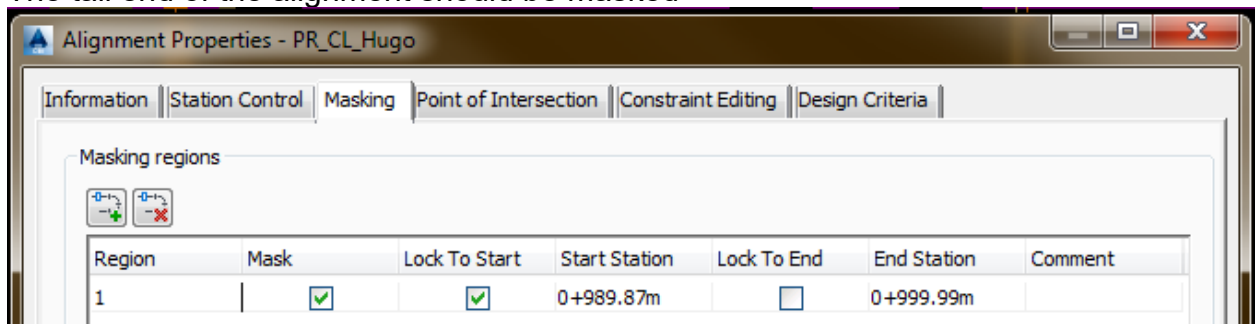


Figure 16: Alignment Masking

4.8. Existing Vertical Profile Creation

1. Next create a profile from a surface, sample the OG surface on the horizontal alignment and create a profile view.
2. Repeat step 1 above for each road alignment. Add example of how profiles are arranged
3. Now create data shortcuts for the alignments and profiles you created so far in this drawing

4.9. Existing Pipes Creation

1. Start a new drawing and Save as 'ProjectName_Pipes'
2. Add the Linework, Fabric and Topo drawings in as overlay X'ref's

- Open the _Topo drawing, right click on Point Groups in Toolspace, use the arrows to bring the 'Structures' point group to the top, save the drawing, reload the _Topo Xref

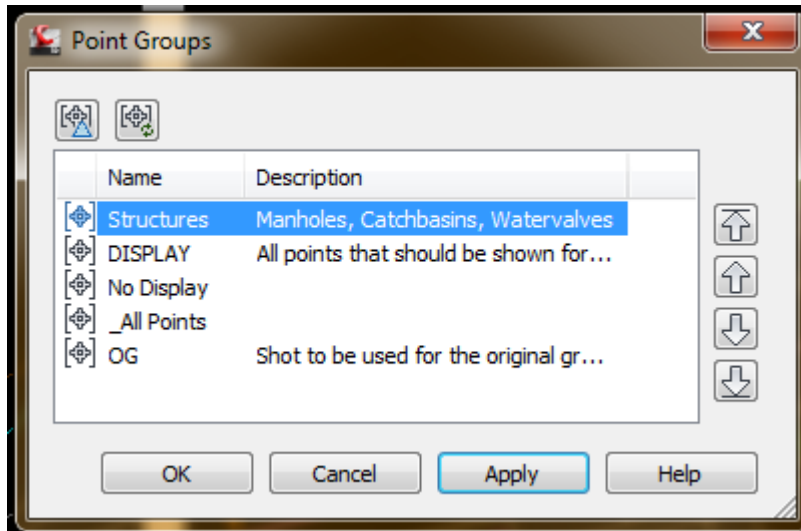


Figure 17: Point Group Order

- Add the OG surface data to the drawing by creating a Reference to the data shortcut

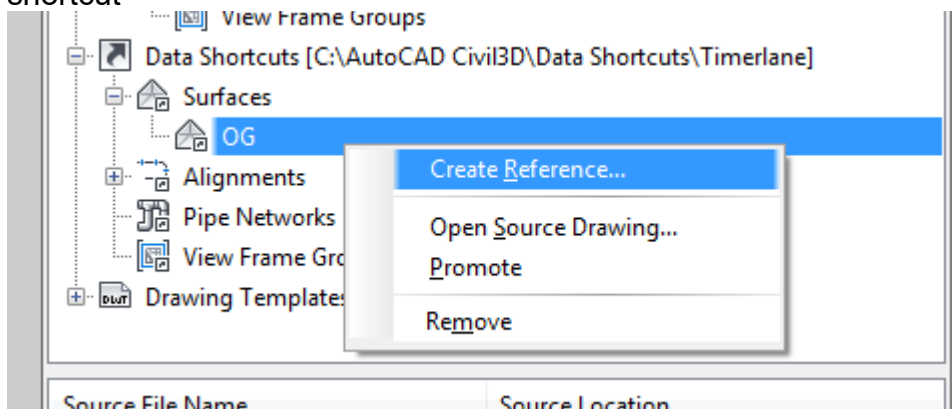


Figure 18: Data Reference Creation

- Repeat the previous step to create a reference for the horizontal alignment and vertical profile for each street

Sewers

- Right click on the 'EX_SANITARY' Pipe network in the toolspace and select Network Properties
- In the Layout Settings tab change the surface name to reference the OG surface

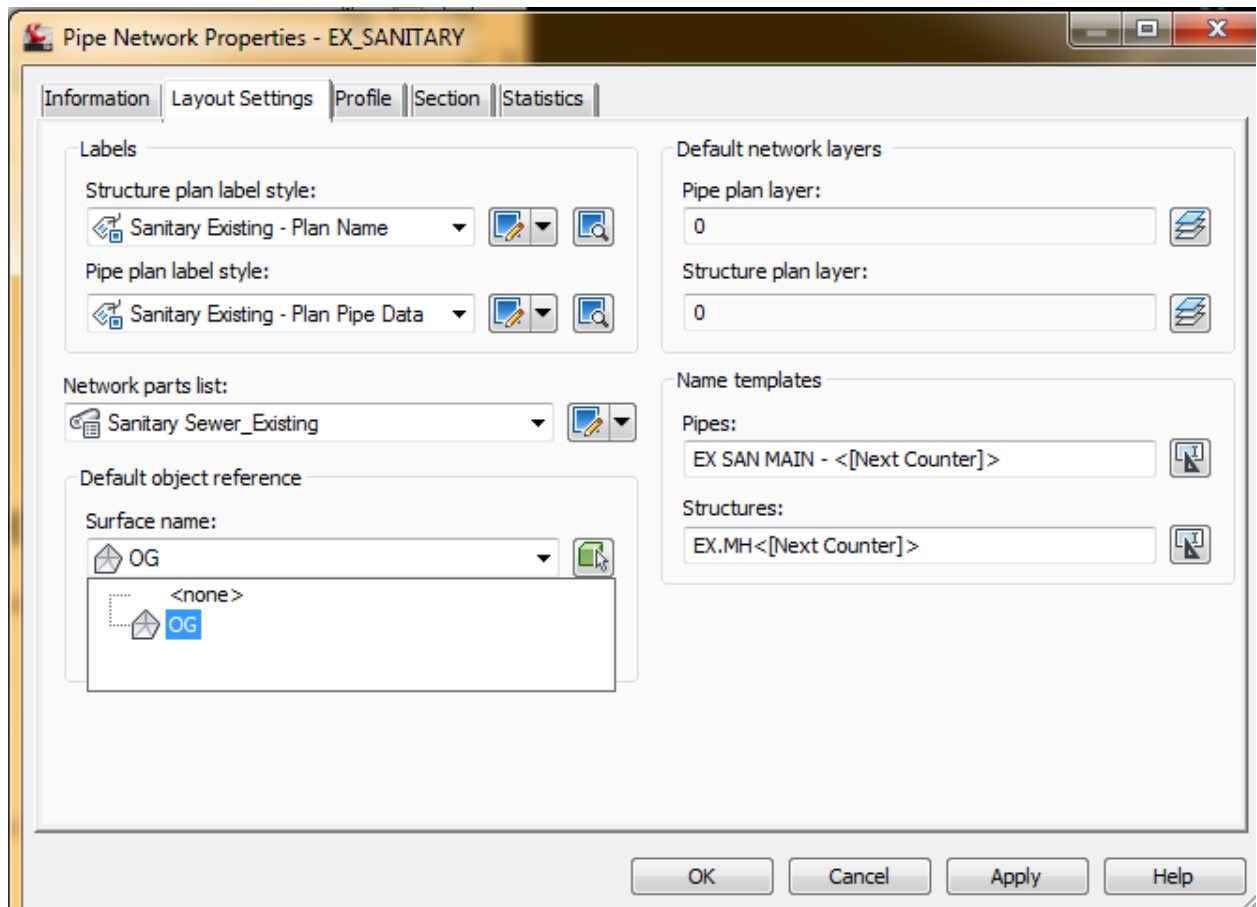


Figure 19: Pipe Network Properties

8. Right click on the 'EX_SANITARY' Pipe network in the toolspace and select Edit Network and begin to draw your sanitary sewer system.
9. Repeat the above steps for the storm sewer system.
10. Create profile views for each street and add the applicable pipes and structures to each profile (see section 4.10 below)
11. After you have drawn your sewer network, you will need to change the pipe flow direction method. Select a pipe right-click and select **Pipe Properties** select the Part Properties tab and change the pipe flow direction method to **By Slope**

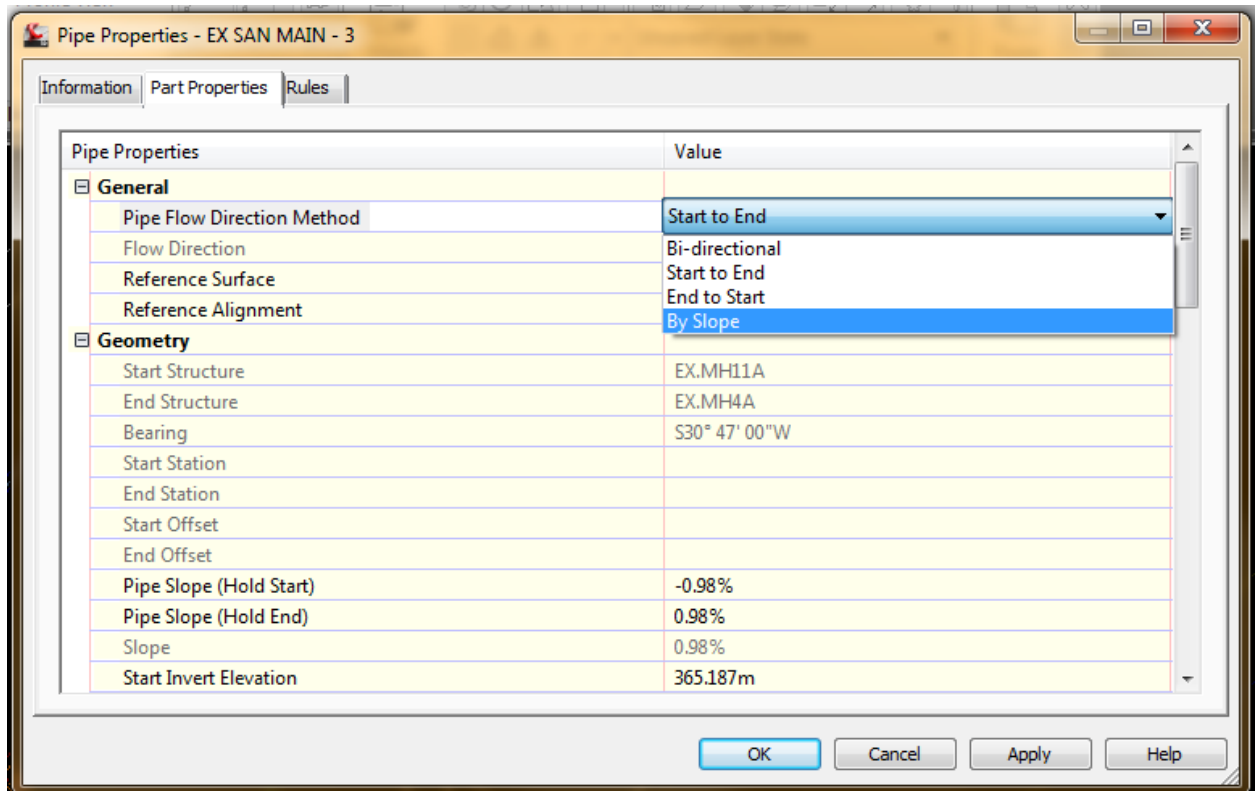


Figure 20: Pipe Properties

12. The structures will grab an elevation from the original ground surface which is great since the pipe rules will tell your network how it should be drawn, however the top of lid elevation should be modified to match the surveyed elevation. In the Structure Properties window on the Part Properties tab change the Automatic Surface Adjustment to **False** then change the Insert Rim Elevation to match the surveyed elevation.

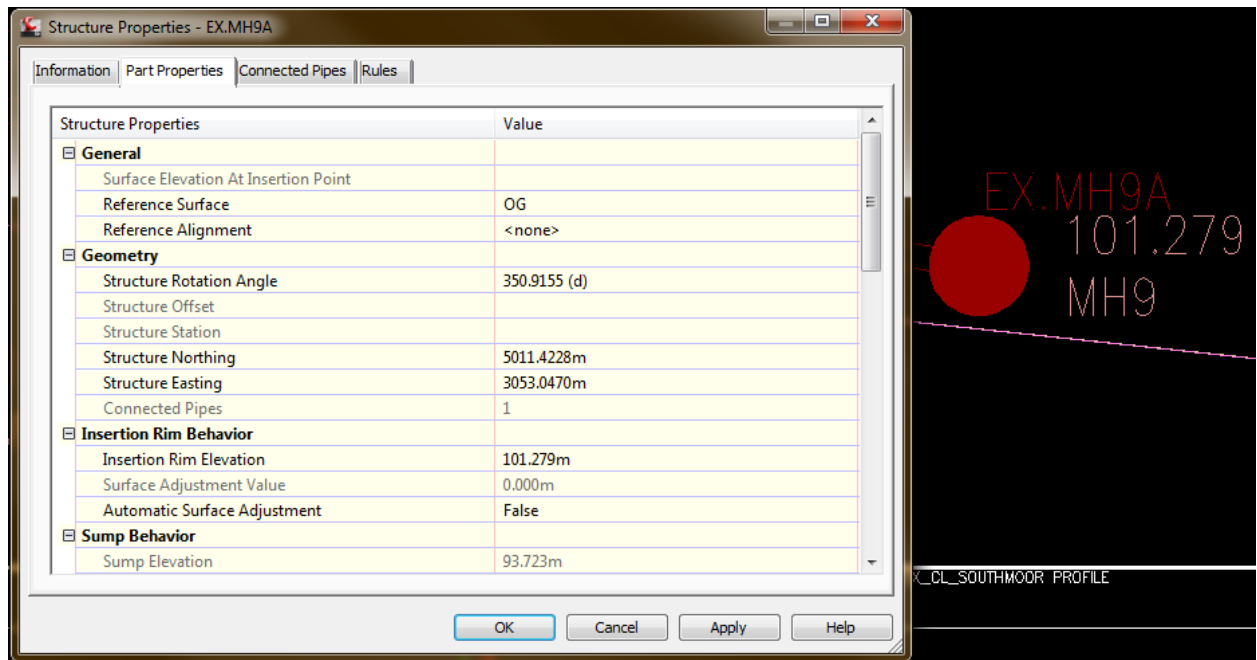


Figure 21: Structure Rim Behaviour

13. When setting the invert elevations of your pipe network use the existing plan and profile drawings that are available.
14. Once dips have been completed the pipe inverts (and sometimes sizes or alignments) should be modified to replicate what was discovered in the field (sometimes this is an amalgamation and best guess based on the information available).

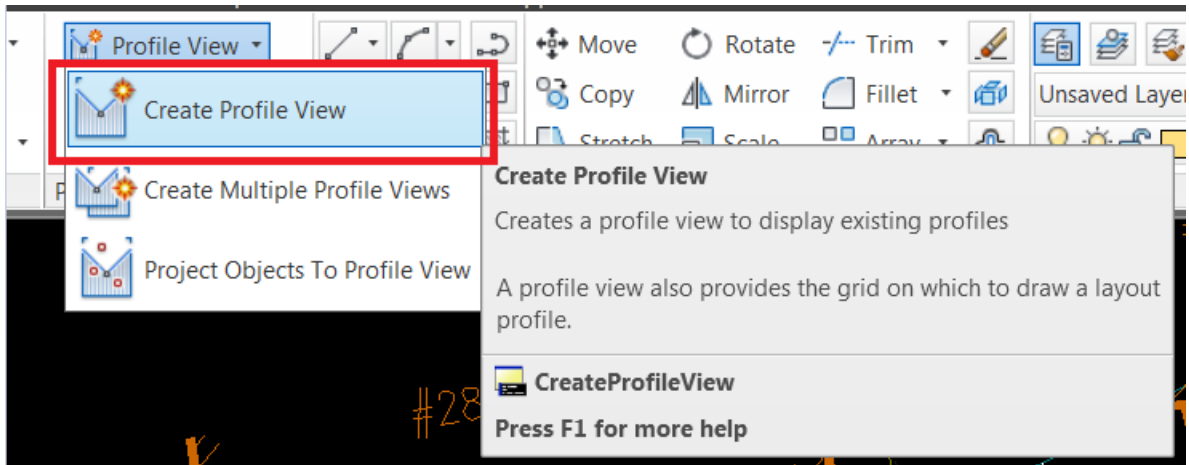
Repeat steps 6 through 14 above to create the existing storm sewer network.

Existing Water Main

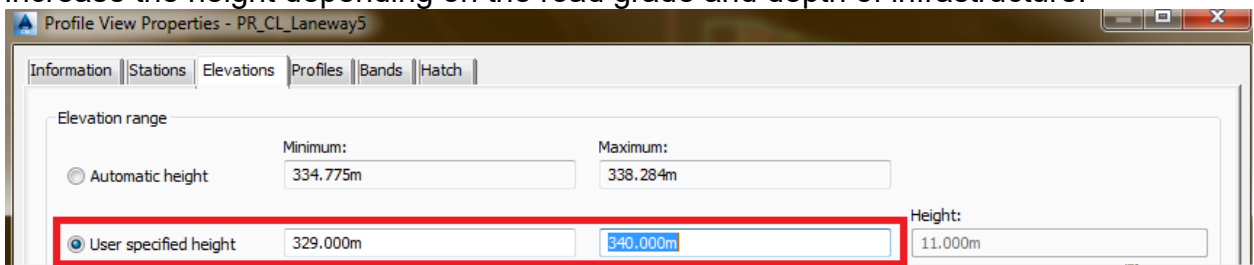
1. In the ProjectName_Pipes.dwg you will create the existing water supply network.
2. Change the reference surface for the EX_WATERMAIN Pressure Pipe Network to OG in the same way we do for sewers.
3. Then draw the watermain (this needs some more work)

4.10. Profile Creation

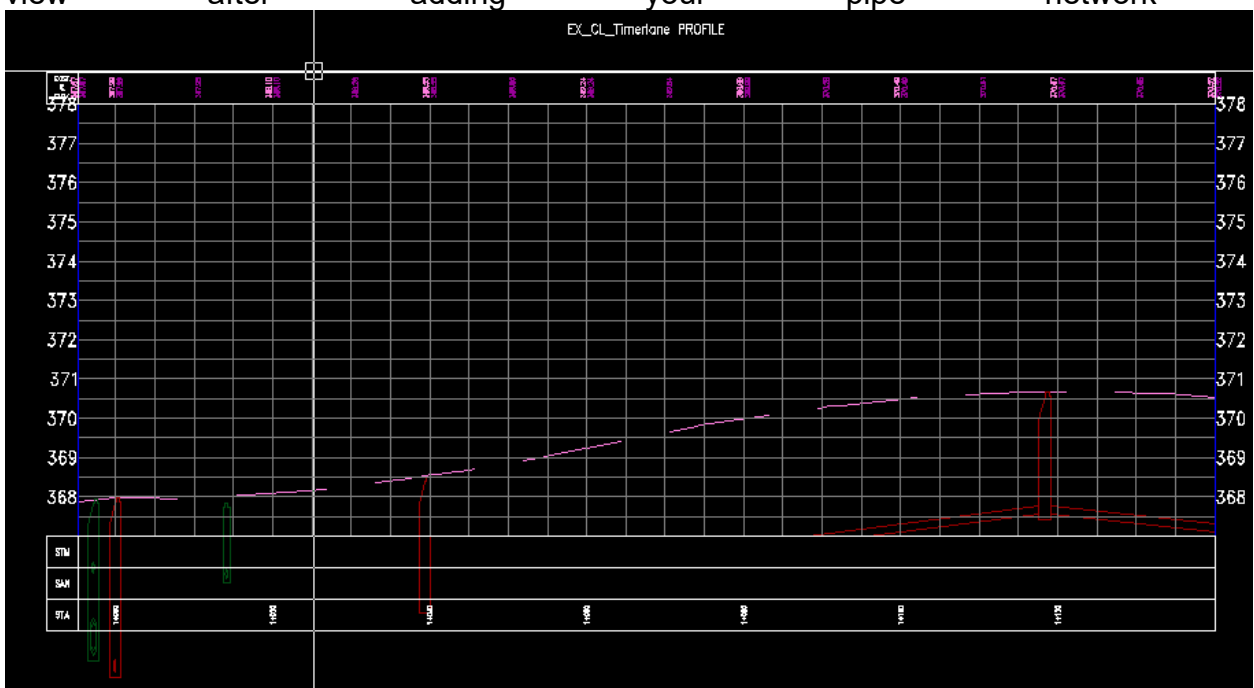
1. In the pipes drawing create the profiles for each street (to be used for the sheets display)
2. Select the Create Profile View command

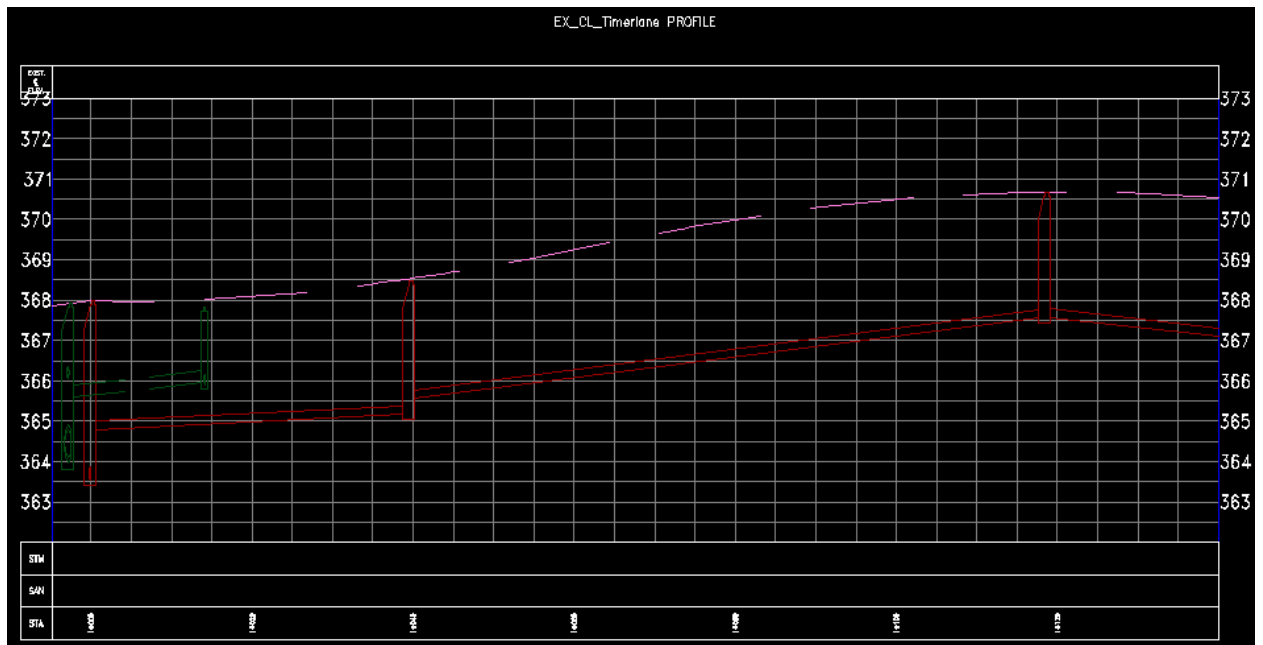


3. In the profile setup dialog box on the Profile View Height tab make sure to select the user specified as opposed to the automatic option (the default minimum should be 11.00m, it is preset to match the height of our sheets). You may need to increase the height depending on the road grade and depth of infrastructure.



4. Draw your pipe network parts in profile view, you may need to adjust your profile view after adding your pipe network

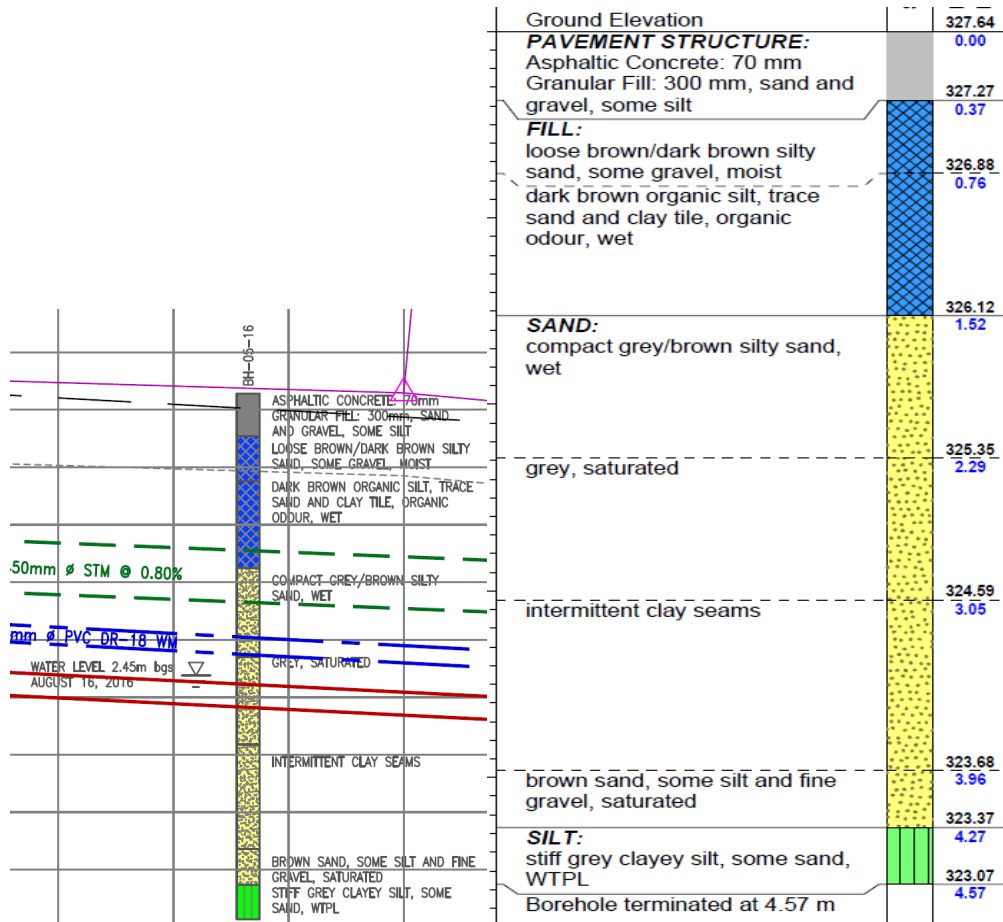




5. Add all labels to the pipe network in both plan and profile.

4.11. Boreholes

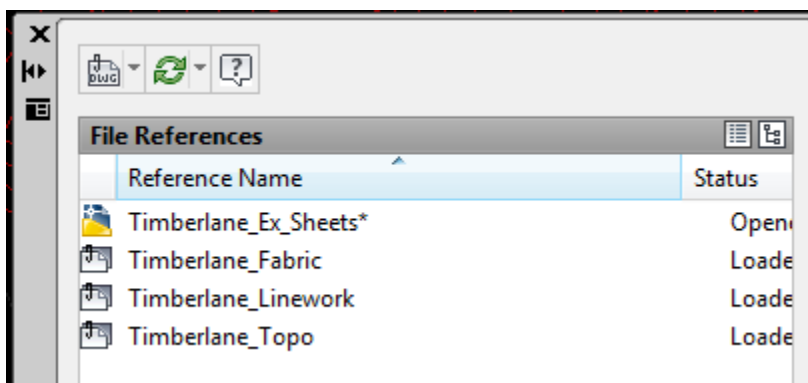
1. Boreholes are to be drawn in the pipes drawing on the layer GEOTECH.
2. Boreholes are surveyed (when found) and should be drawn in the profile based on the surveyed elevation.
3. If the borehole hasn't been surveyed use the coordinates provided in the geotechnical report.
4. If coordinates aren't provided use best judgement based on the key plan from the geotechnical report.
5. Boreholes should be represented as closely as possible to what is shown in the geotechnical report.



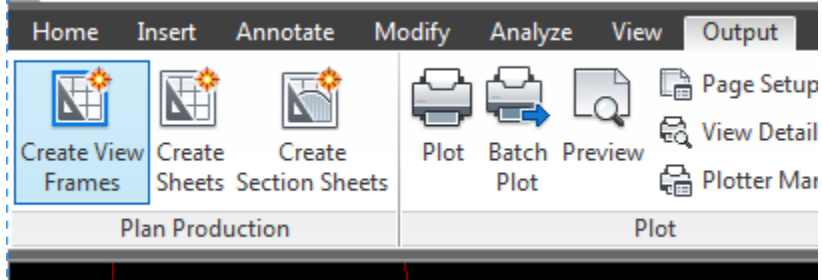
6. Boreholes should be drawn 1.0m wide.
7. The text should be romans style 1.6 (paper) height.

4.12. Existing Conditions Sheet Setup

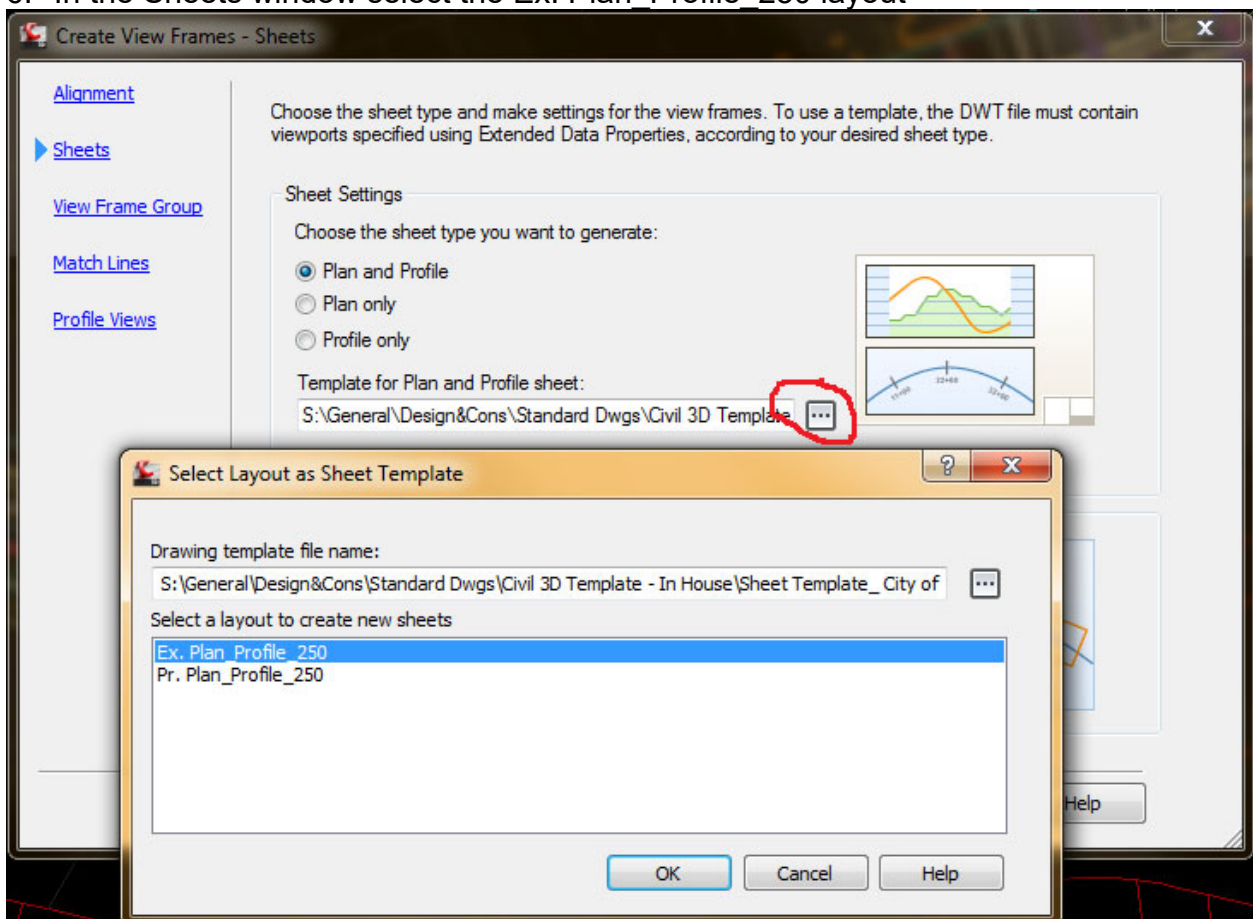
1. Start a new drawing Save the drawing as StreetName_Ex_Sheets
2. Add overlayed Xref's (_Fabric, _Linework, _Topo, _Pipes)



3. Ensure that the DISPLAY point group in the _Topo drawing is at the top of the order and the No Display is second
4. Add the data shortcut of the horizontal alignment into the drawing.
5. Go to the **Output** tab and select **Create View Frames**



6. In the Sheets window select the Ex. Plan_Profile_250 layout



7. In the view frame group window change the Name field to match your street name

Alignment

Sheets

View Frame Group

Match Lines

Profile Views

Specify object creation criteria for the view frame group and view frames.

View Frame Group

Name:

TIMBERLANE_EX_CONDITIONS

Description:

View Frame

8. Accept all the defaults in the Match Lines window and click next
9. Review the defaults they should appear as below, then click on **Create View**

Alignment

Sheets

View Frame Group

Match Lines

Profile Views

The following profile view information is required to determine the distances

Profile View Style

Select profile view style:

City of Kitchener Profile View

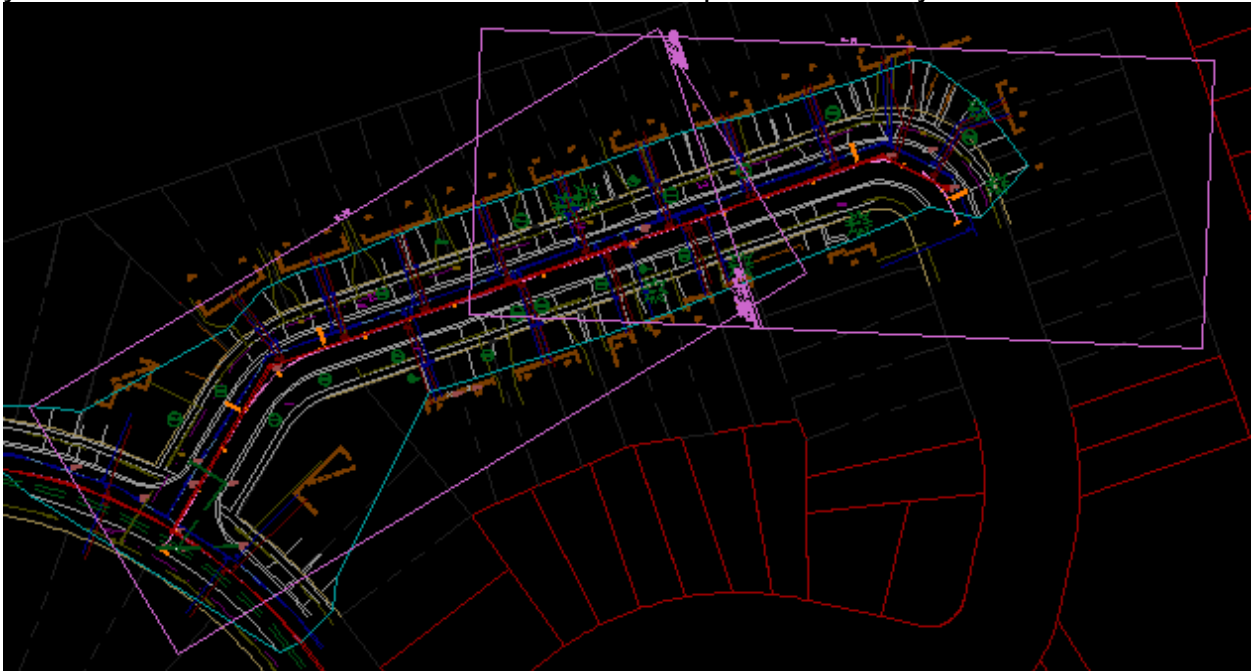
Band Set

Select band set style:

City of Kitchener - Full Set

Frames

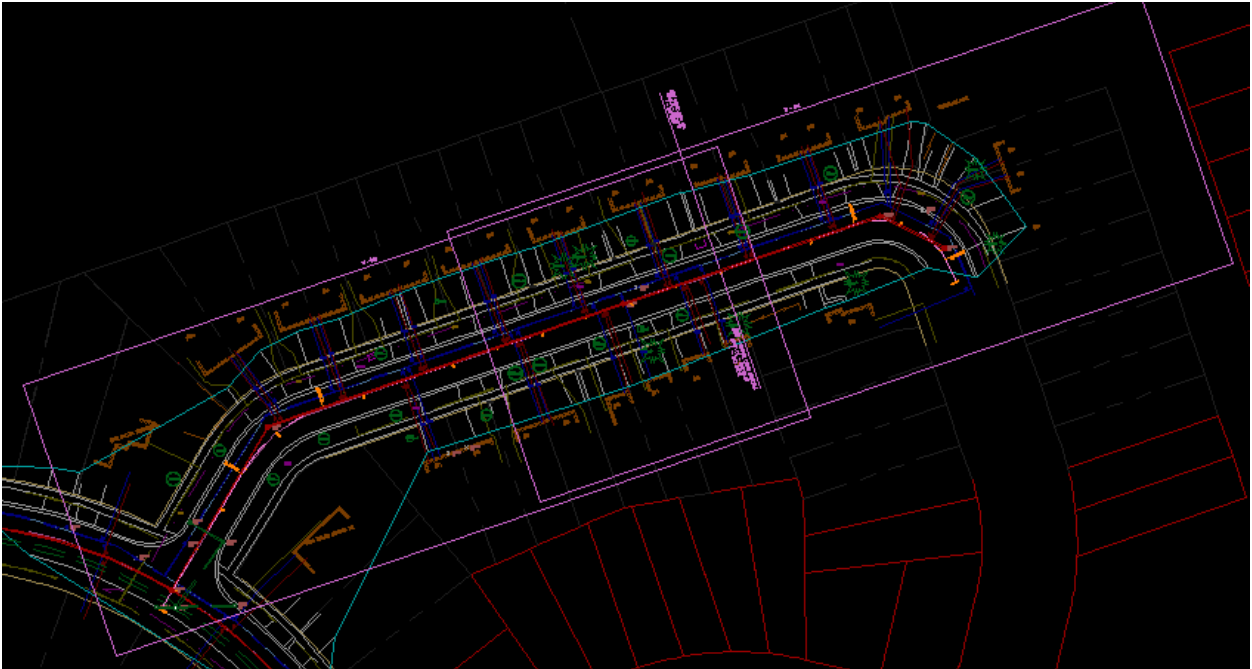
10. In cases where you don't have a long tangential sections you may have to adjust your view frame to optimize your view



11. To adjust the view frames in the image above we draw a line parallel to the alignment then rotate that line 90 degrees so that it is perpendicular to the alignment and move it to the centre of the view frame

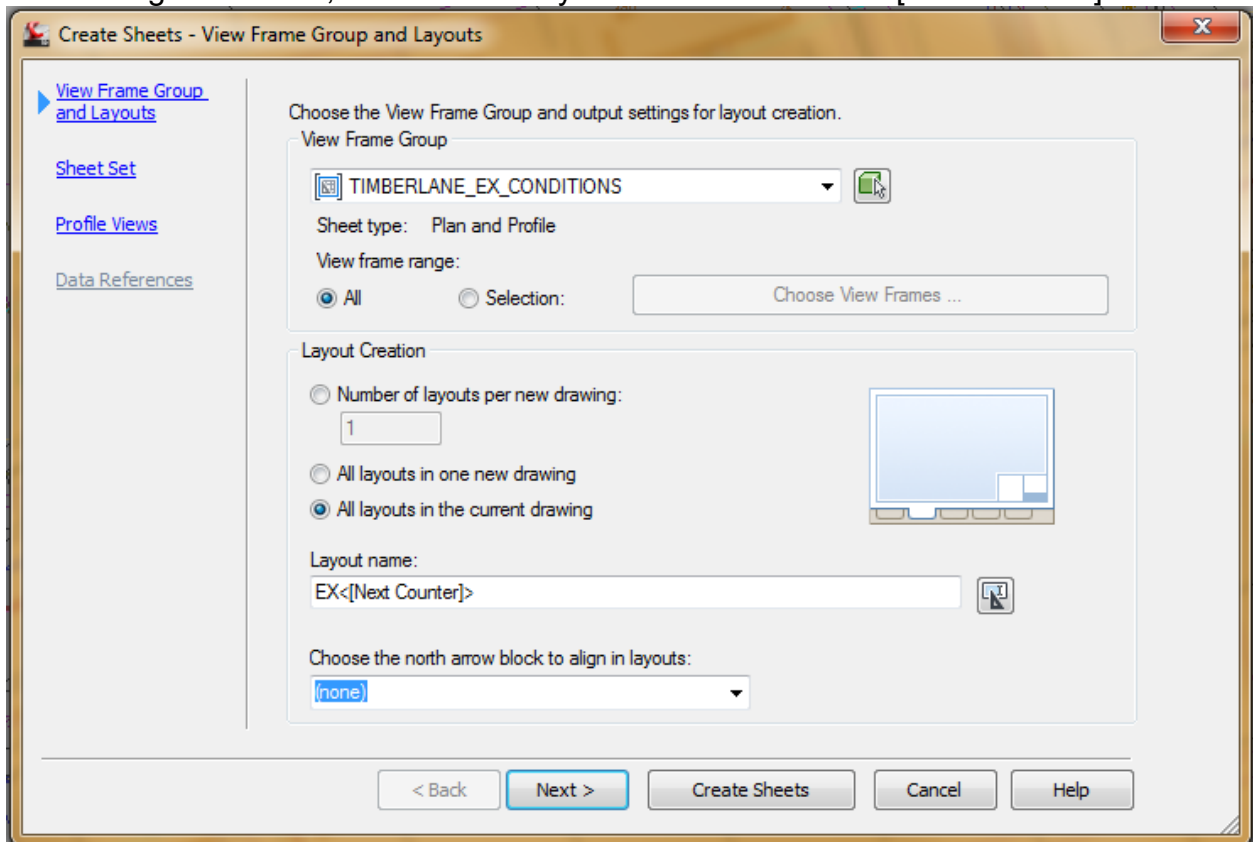


12. Once adjusted your view frames should appear as below

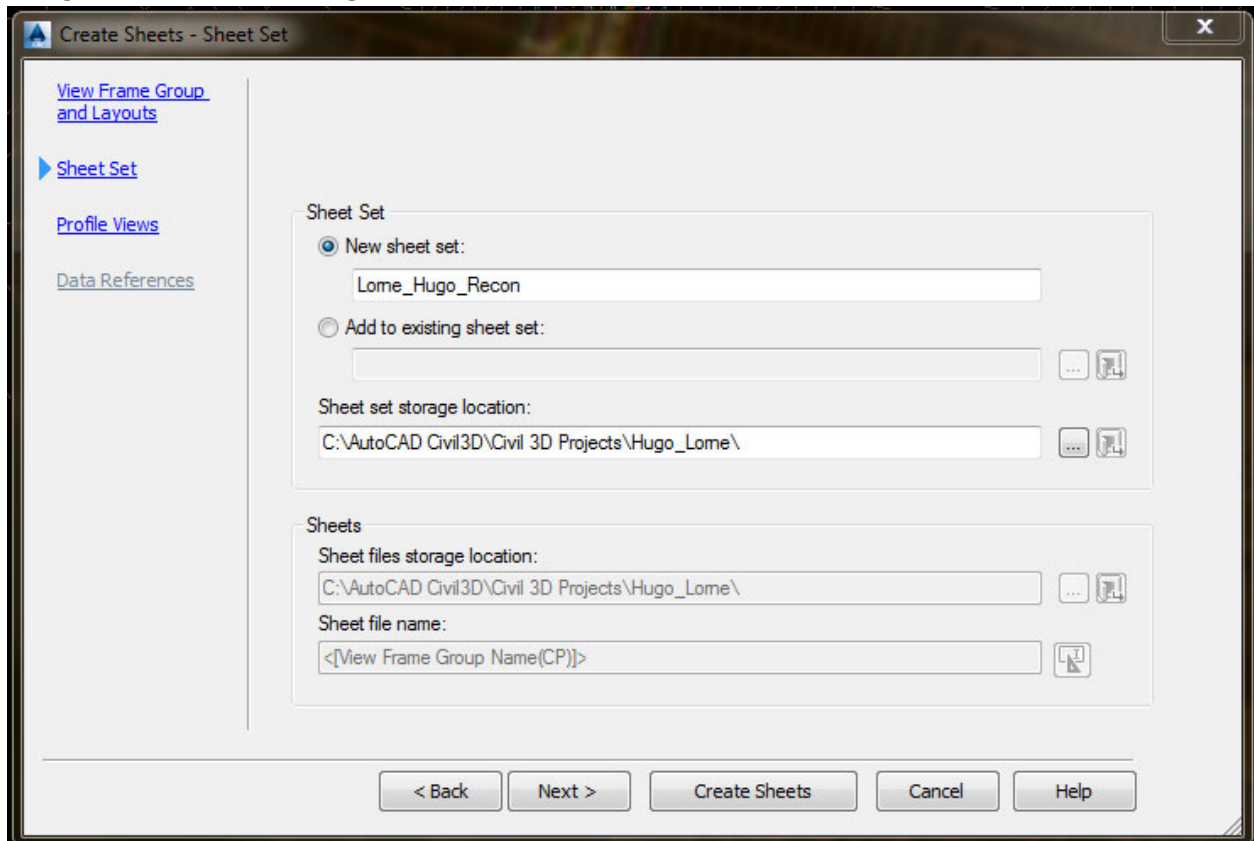


13. Next select **Create Sheets** from the Output tab

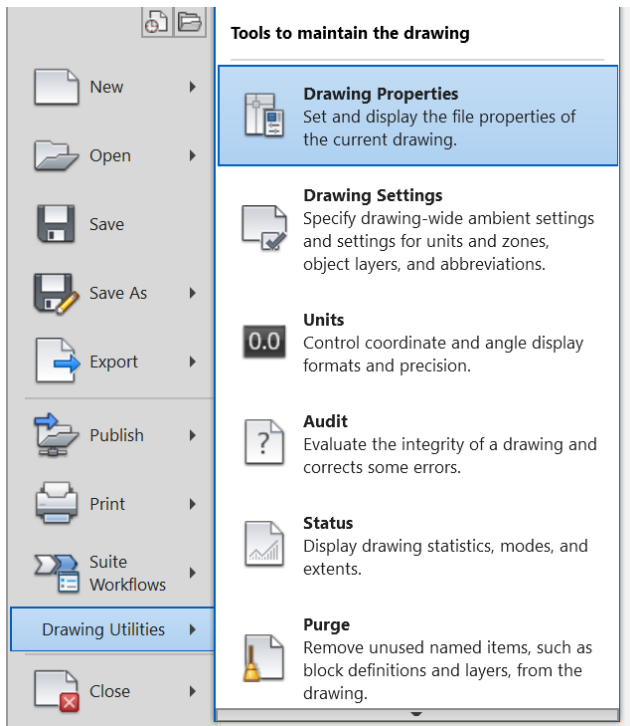
14. On the View Frame Group and Layouts ensure that All layouts in the current drawing is selected, and that the Layout name is set to EX<[Next Counter]>



15. Select the Sheet Set tab, since this is the first sheet set of the project we will create a new sheet set (when adding additional sets select 'Add to existing sheet set') make sure to change the sheet set name to ProjectName_Recon then select Create Sheets click **OK** to save



16. When prompted to place your profile view select an area directly above or below the Xref'd profile from the Pipes drawing.
17. Switch to the layout tab and line up the Xref'd profile to the paper space grid, then lineup the plan to the profile view
18. Go to the Drawing Properties menu under the Drawing Utilities menu



19. In the Summary tab add your name as shown by the example below

General	Summary	Statistics	Custom
Title:			
Subject:			
Author:	J.Seip		
Keywords:			

20. On the Custom tab fill out the Value column with the applicable information see example below

General Summary Statistics Custom

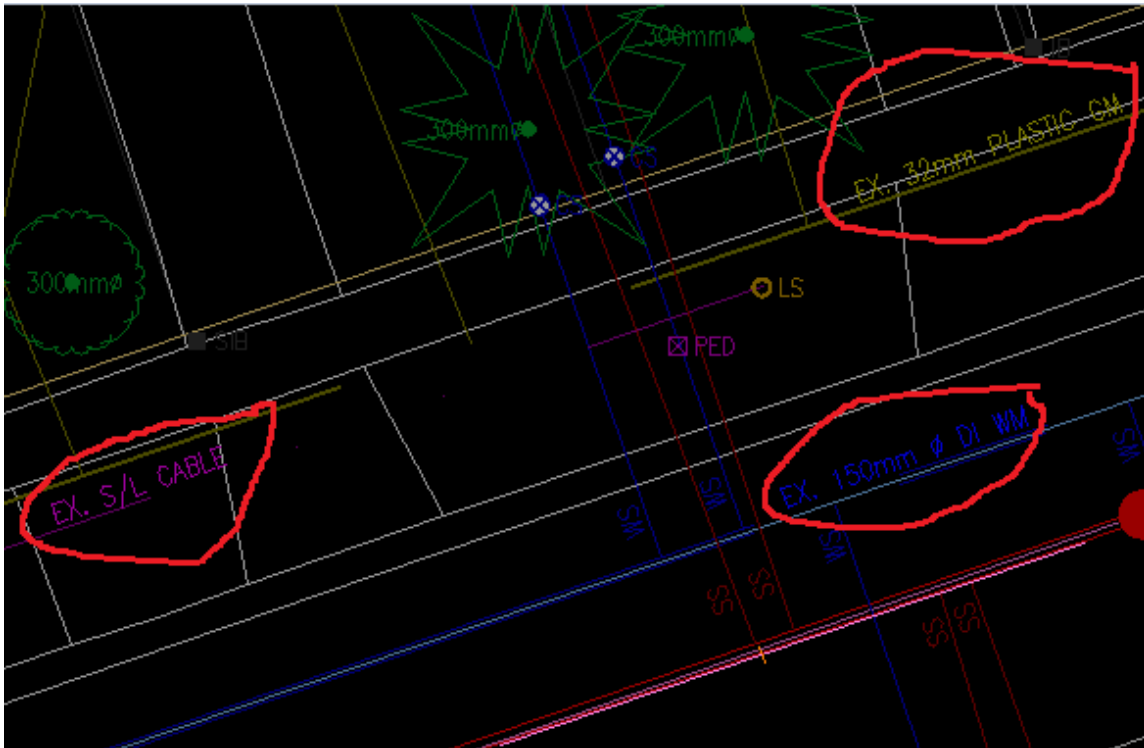
Custom properties:

Name	Value
Drawing Number	1000
Designed by	J.Seip
Approved by	J.Seip
Street	Main Street
Total sheets	10

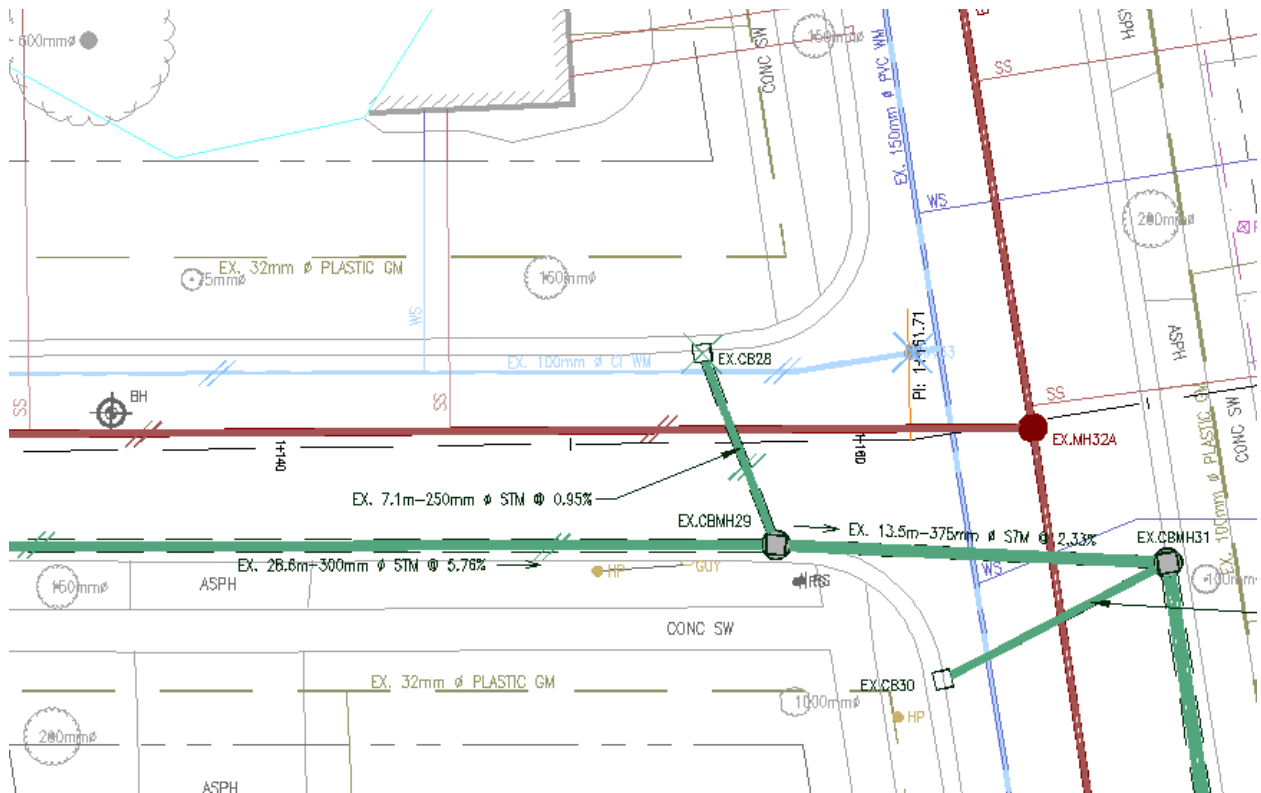
Add...

Delete

21. Switch back to model space and begin adding existing text labels to the linework.
22. Set the text style to RomanS, text height in model space should be 0.4, all static infrastructure labels should be added



23. Add labels to identify the surface material as shown
24. Modify the remaining text in the sheet to match your project.
25. Once you know what infrastructure is being removed after your preliminary design is complete, add the removal symbols to the model space of your layout, the result should appear as below. Spacing along the main line should be about 20 metres.



4.13. Existing Conditions Deliverables

By this stage of your project you should have the following deliverables completed:

1) Existing Conditions Plan and Profile Sheets

Before you send the drawings to utility companies for their existing plant markup and request for upgrades go through the check list in Appendix B.

Existing conditions and removals plans do not need to be complete for issuance to third party utility companies, you can continue to work on them while you wait for their information.

Existing conditions plan and profiles also serve as a good tool for discussion during the kick-off meeting and to assist with complete scope definition.

5. Preliminary Design

Preliminary design should begin with the development of a cross section for the project as well as a horizontal and vertical alignment, so that a corridor can be created.

Preliminary design shall be carried out in the following steps:

1. Development of horizontal alignment and cross section (location of curbs and sidewalks),
2. Vertical alignment then a corridor with revisions to the vertical alignment based on grading parameters, restraints and review of cross sections,
3. Sewer main line and water main lines should be designed with consideration for future extension of services.

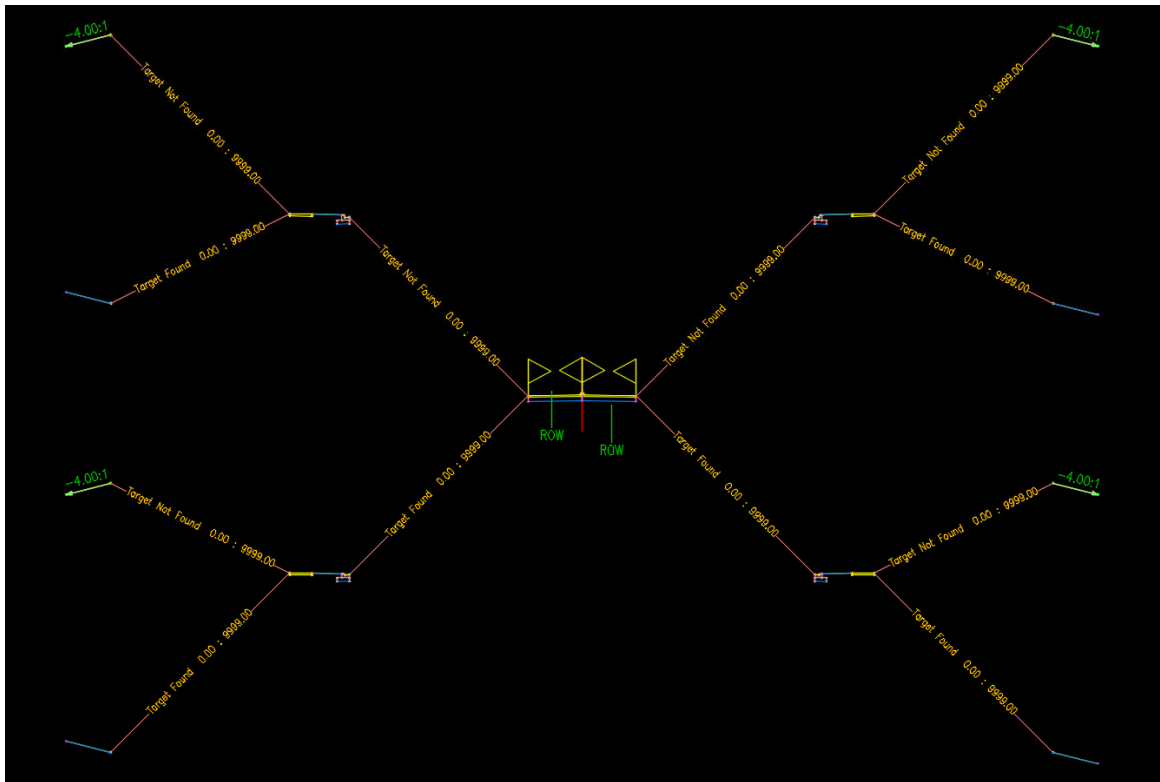
5.1. Curb and Sidewalk Development

1. In the Linework drawing, draw the proposed edge of pavement, gutter line, back of curb, the front and back of sidewalk and the driveway aprons.
2. Driveway aprons should be drawn according to Development Manual Std. Dwg. 109
3. When matching at intersections the proposed back of curb should match the existing back of curb, when the road was no curb the gutter line should match the edge of existing asphalt. **ADD EXAMPLE**

5.2. Corridor Development

When grading a corridor and attempting to match existing grade the designer should adjust the corridor elements (independently or in conjunction) in the following order to complete the design;

- a) Adjust the vertical profile,
- b) Adjust the cross fall of the road (uniformly where possible),
- c) Adjust the boulevard grade.



ADD example of what the assembly should look like, label each subassembly being used ***IMPORTANT*** the driveway behind the sidewalk should be an assembly which can be targeted horizontally.

5.3. Corridor Creation

1. The proposed horizontal alignment should already have been created to create the existing sheets; it may need to be modified based on your design of your road.
2. All intersecting streets will need both proposed horizontal and vertical alignments as well.
3. The linework representing the curb and sidewalks should not be contained in this drawing, alignments should be used to represent these features, lines and polylines do not have names unlike alignments and therefore are less identifiable.
4. Create the necessary alignments for the targets you will need for your corridor, typical alignment targets are as follows;
 - a. Right-of-way limit; ROW_STREET_RT, ROW_STREET_LT
 - b. Sidewalk; BSW_STREET_RT, FSW_STREET_LT
 - c. Edge of pavement/curb line; EP_STREET_RT, EP_STREET_LT
5. Target alignments should be in the miscellaneous category with the Corridor design style and no alignment labels

Create Alignment - Layout

Name: ROW_Patricia_RT

Type: Miscellaneous

Description:

Starting station: 0+000.00m

General | Design Criteria

Site: <None>

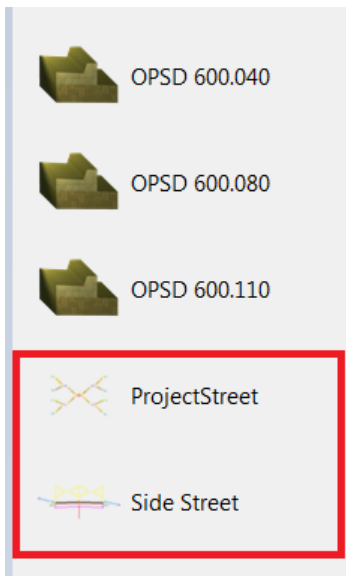
Alignment style: City of Kitchener - Corridor design

Alignment layer: 0

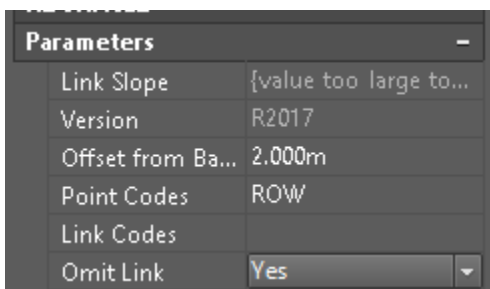
Alignment label set: <No Labels>

OK Cancel Help

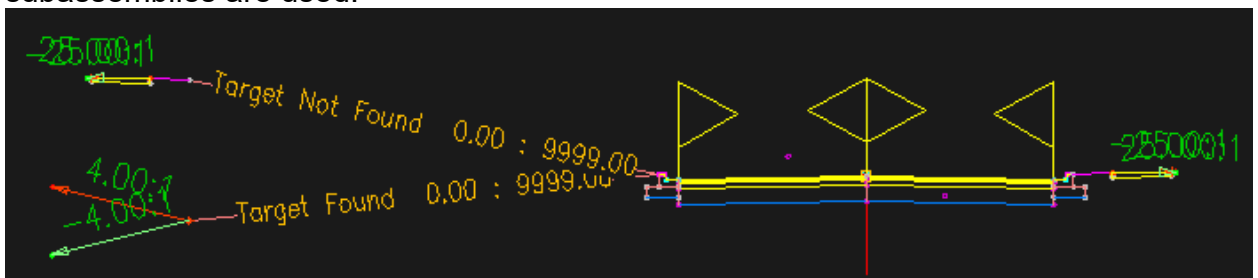
6. After you've created your vertical profile and target alignments create your assembly, prebuilt assemblies are provided in The City of Kitchener tool palette shown below, however you may create your own if needed.



7. The assembly should be comprised of the following subassemblies
8. In order to get the ROW label marker to show up in the sections add the LinkOffsetOnSurface subassembly to the main assembly location with an offset from the centreline and revise the link code to include ROW, be sure to omit the link and revise the codes accordingly.



9. When using polylines to set corridor targets the objects shall be placed on the layer named "CORRIDOR_TARGET" polylines should only be used when target subassemblies are used.



10. Whether you have boulevards that are not the same width throughout your project or you want to control the grades along a sidewalk by adding a back or front of sidewalk profile you should create alignments following both the front and back of sidewalk. The sidewalk alignment should be named PR_FSW_StreetName_RT (BSW for back of sidewalk). Note the alignment type, style and labels below.

11. Also don't forget to create the road allowance alignments, named ROW StreetName LT (RT).

Create Alignment - Layout

Name: PR_FSW_Garden_RT

Type: Miscellaneous

Description:

Starting station: 0+000.00m

General Design Criteria

Site: <None>

Alignment style: City of Kitchener - Corridor design

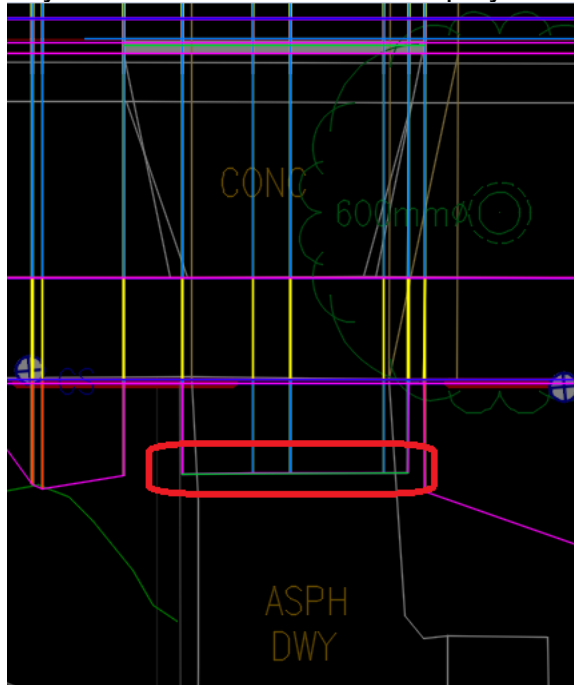
Alignment layer: 0

Alignment label set: <No Labels>

OK Cancel Help

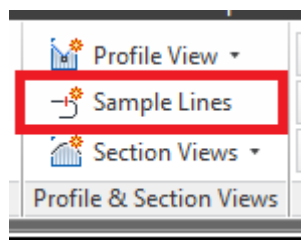
12. The corridor should almost always be the same as the project (street) name.
13. Make sure to add a sample station at the approximate centre line of each driveway ramp so that you can review the grades at each driveway rather than the closest station in the corridor. For steeper vertical alignments or wide driveways you may want to sample a driveway in more than one location.
14. Add in information about intersections, including checking the curb return profiles.

15. Where appropriate a poly line should be drawn at driveways for use as a target beyond the ROW. This polyline should be targeted in the corridor.

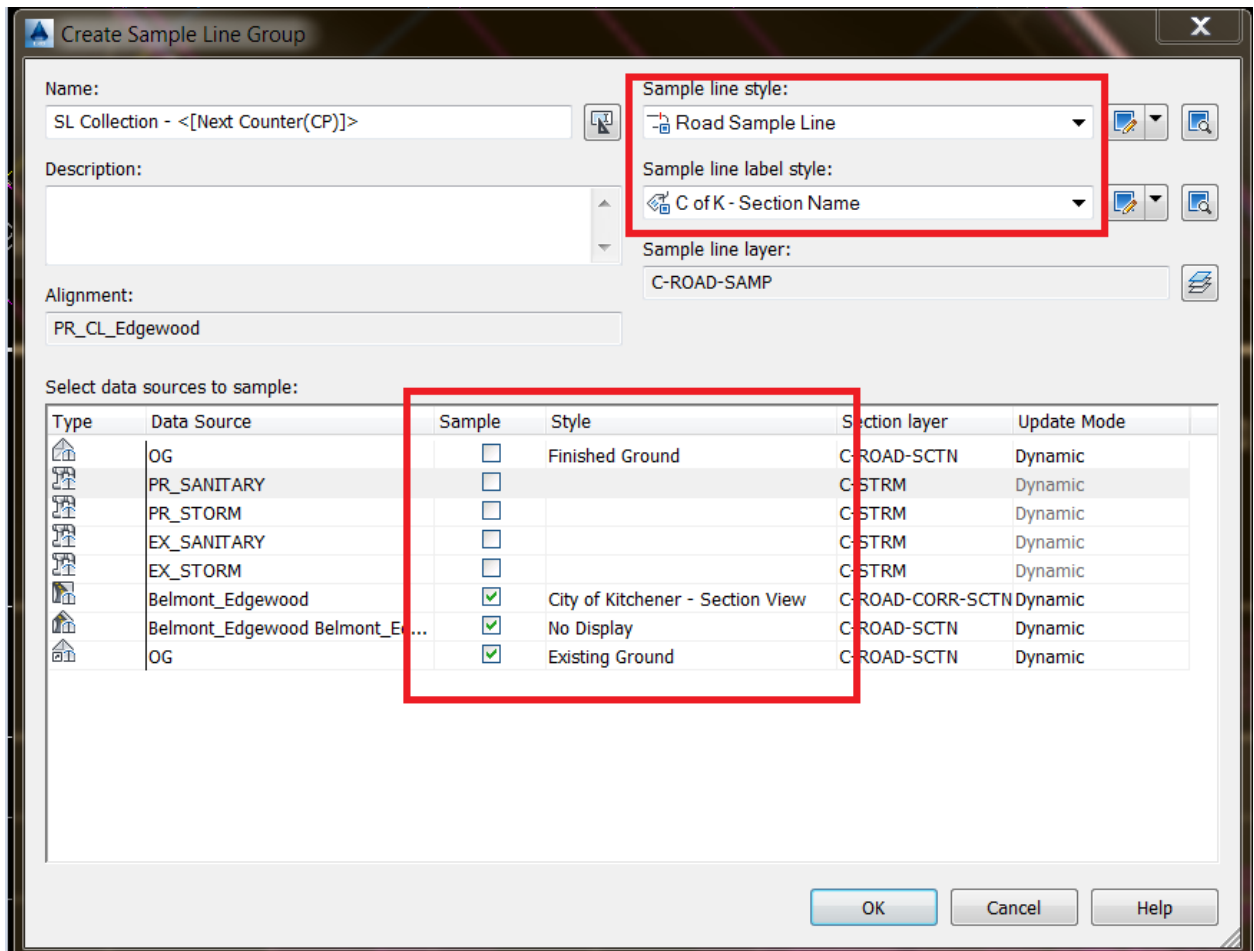


5.4. Proposed Driveway Cross Sections Drawing

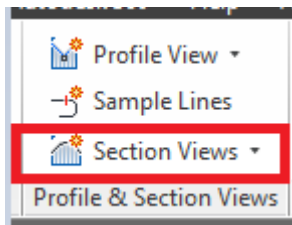
1. Create a new drawing called ProjectName_Section_Sheets
2. Insert the corridor drawing as an Xref and create sheets



3. Use the Sample Lines command and create samples lines from the corridor
4. In the dialog box deselect the sewers as a data source, and change the styles as shown below.



5. Once the sample lines have been created delete the unnecessary sample lines, the important ones we want to keep are at driveways and some walkways.



6. In the Section Views pop-out select the Create Multiple Views command.
7. In the Create Multiple Section Views Dialog box select the alignment and group name, make sure you have the correct Section view style selected

Create Multiple Section Views - General

General

[Section Placement](#)

[Offset Range](#)

[Elevation Range](#)

[Section Display Options](#)

[Data Bands](#)

[Section View Tables](#)

Select alignment: PR_CL_Mausser

Sample line group name: SL Collection - 2

Station range

☒ Automatic Start: 0+760.31m End: 1+039.52m

☐ User specified: 0+760.31m 1+039.52m

Section view name: <[Section View Station]> (<[Next Counter(C

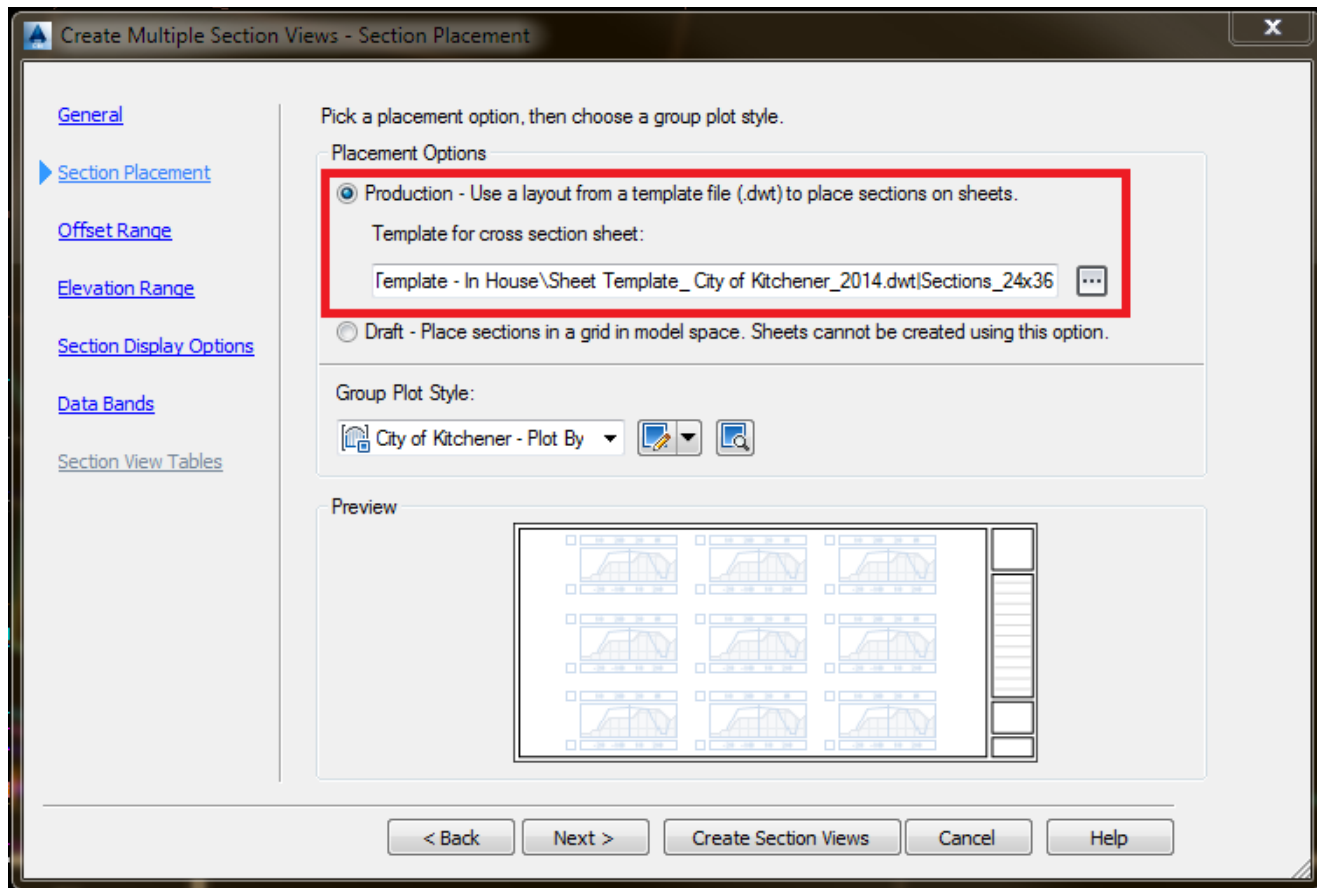
Description:

Section view layer: C-ROAD-SCTN-VIEW

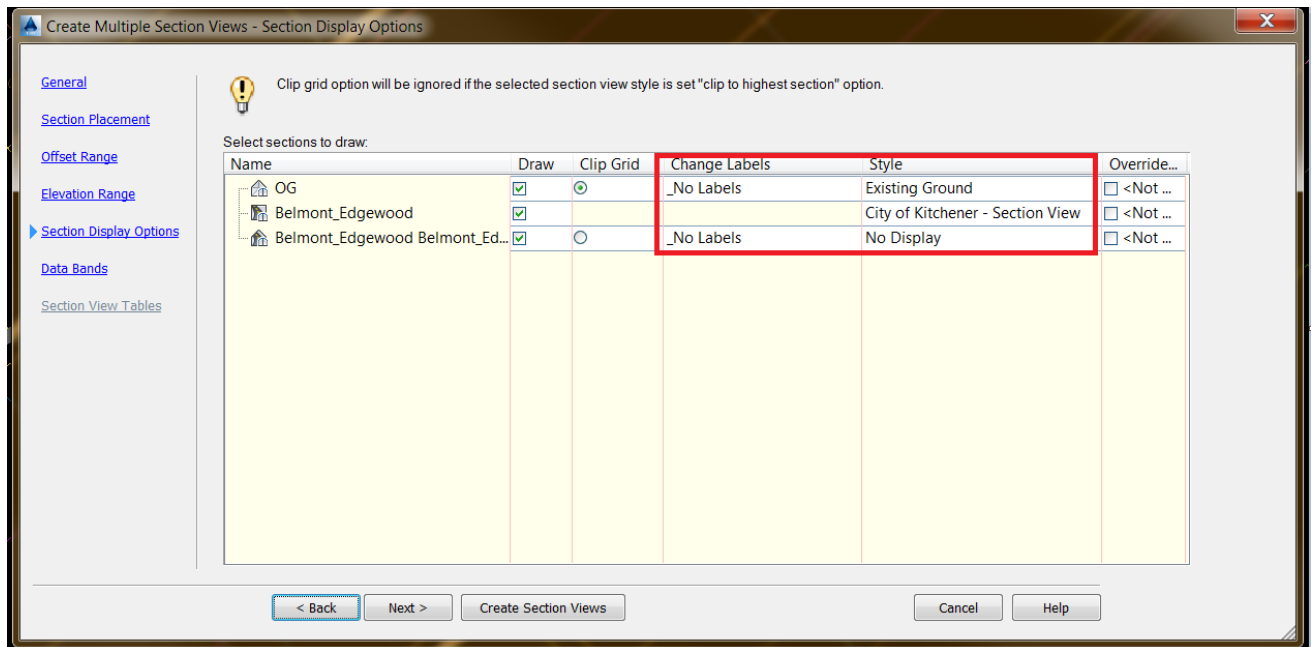
Section view style: City of Kitchener - Road

< Back Next > Create Section Views Cancel Help

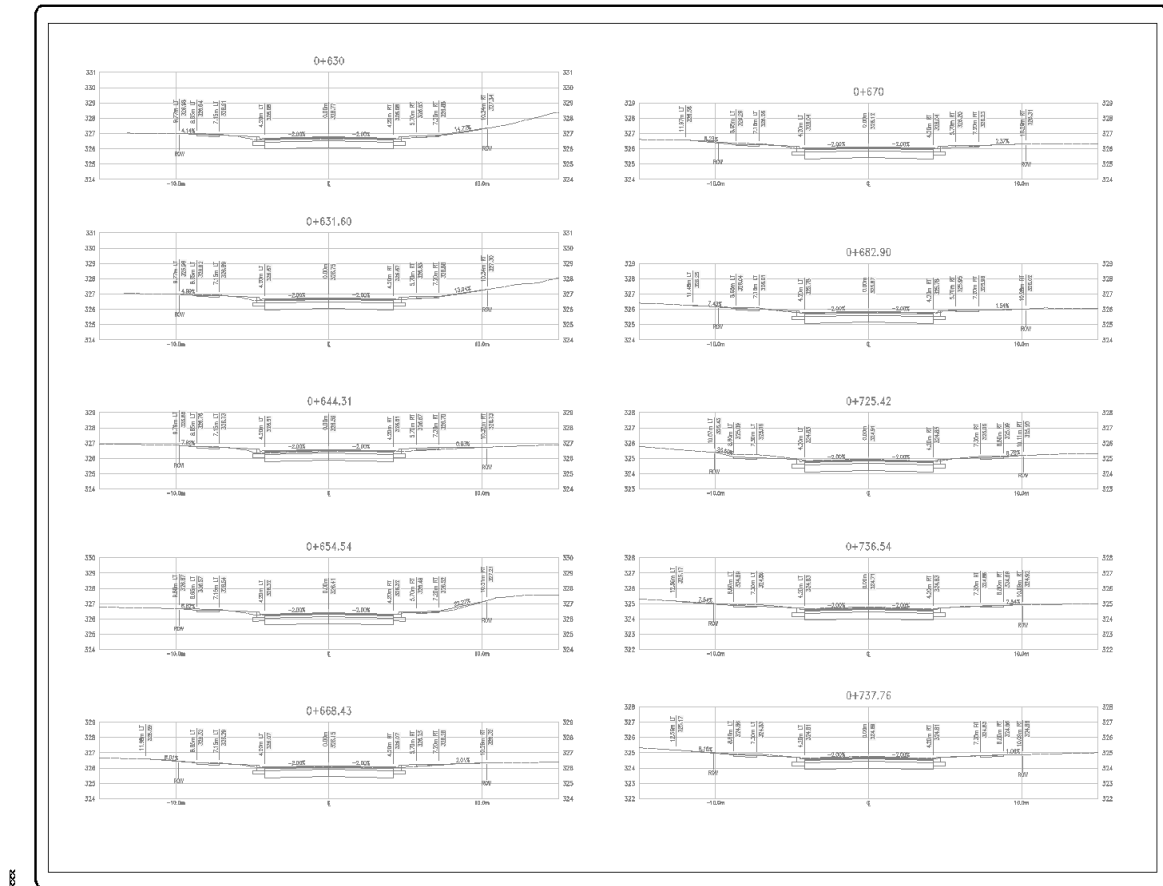
8. Select the Production placement option using the City's template



9. In the offset range tab the offset range should be set to 15 metres each side (unless more is required)
10. In the section display options tab change the label display for the OG surface to _No Labels and the style to Existing Ground
11. Change the labels for the surface to _No Labels and the style to No Display.



12. Select no bands for the section views
13. Insert a new layout from the Sheets template (Sections_24x36).
14. Adjust the viewport accordingly.
15. Your sheet should appear as below.



5.5. Proposed Pipes

Open up the pipes drawing which was created during the existing conditions cleanup.

Sewers and watermain should be drawn according to design guidelines in the City of Kitchener development manual and DGSSMS.

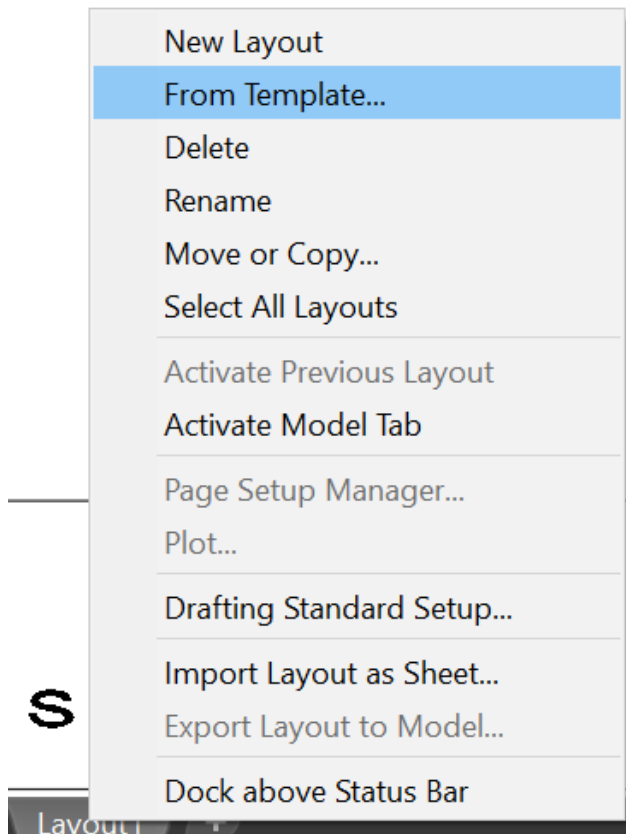
5.6. Drainage Area Plans

Once the alignment and position of sewers have been determined the drainage area plans should be created so we can size the sewers.

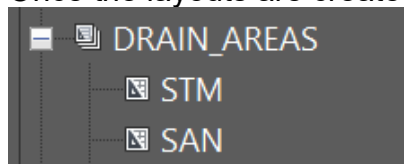
1. Create a new drawing and save it as ProjectName_Drain_Areas
2. Add overlay X'ref's of the Fabric, Linework, Topo, and CONTOUR drawings
3. The CONTOUR.dwg file at the following location 'O:\Secured\GIS_Data\AutoCAD\' should be copied into the project file folder under the 02_SourceFiles folder

S:\General\01-01-627 Administration- General\Design & Approvals\Standard Dwgs\Design_Drafting Standards\COK_CADD Procedure and Guidelines_2025.docx

4. Trim the Contour drawing to a limited area similar to what was done with the Fabric drawing.
5. Drainage areas should be drawn as closed polylines.
6. Create a new layout, (one for sanitary and one for storm) from the template in the same drawing



7. Once the layouts are created add them to your sheet set as their own subset



Before you send the drainage area plans for review go through the check list in Appendix B.

5.7. Proposed Plan and Profile Sheets

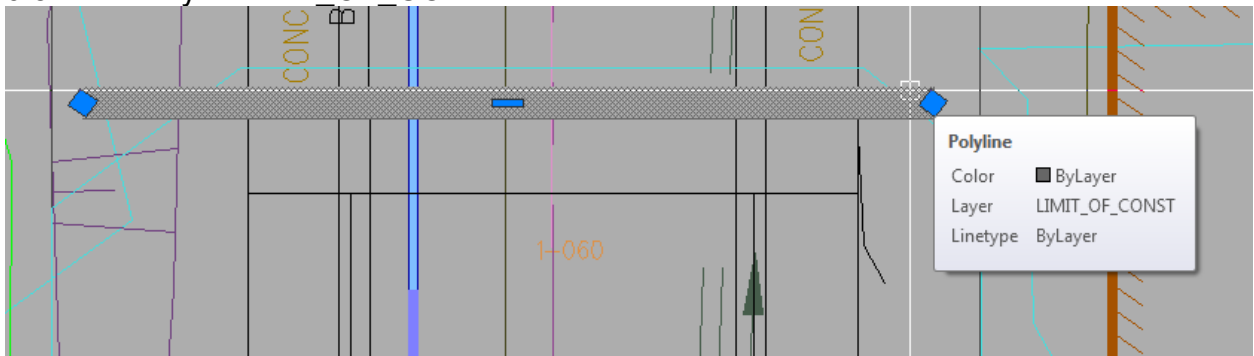
1. Start a new drawing Save the drawing as StreetName_Pr_Sheets
 2. Repeat steps X through X from the Existing Conditions Plan and Profile setup
 3. When creating the proposed sheets select Add to Existing Sheet Set **EXAMPLE**
- S:\General\01-01-627 Administration- General\Design & Approvals\Standard Dwgs\Design_Drafting Standards\COK_CADD Procedure and Guidelines_2025.docx

5.8. Construction Staging Plan

1. Start a new drawing Save the drawing as ProjectName_Staging
2. Repeat steps X through X from the Existing Conditions Plan and Profile setup
3. Add labels to show street names (text size and style....

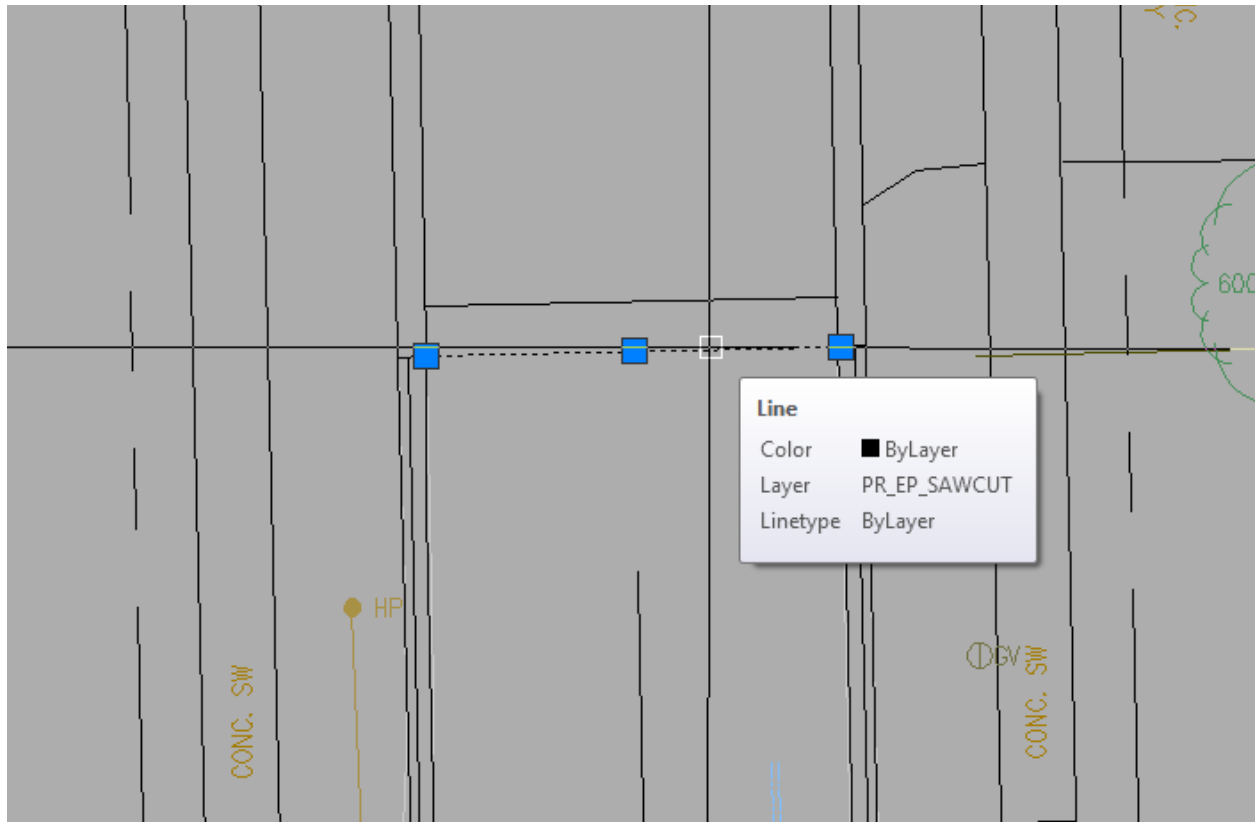
5.9. Linework Drawing

1. Add the limit of construction line to this drawing, the polyline thickness should be 0.5 on the layer LIMIT_OF_CONST



Select all limit of construction lines you have drawn and make sure to use the display order - send to back command

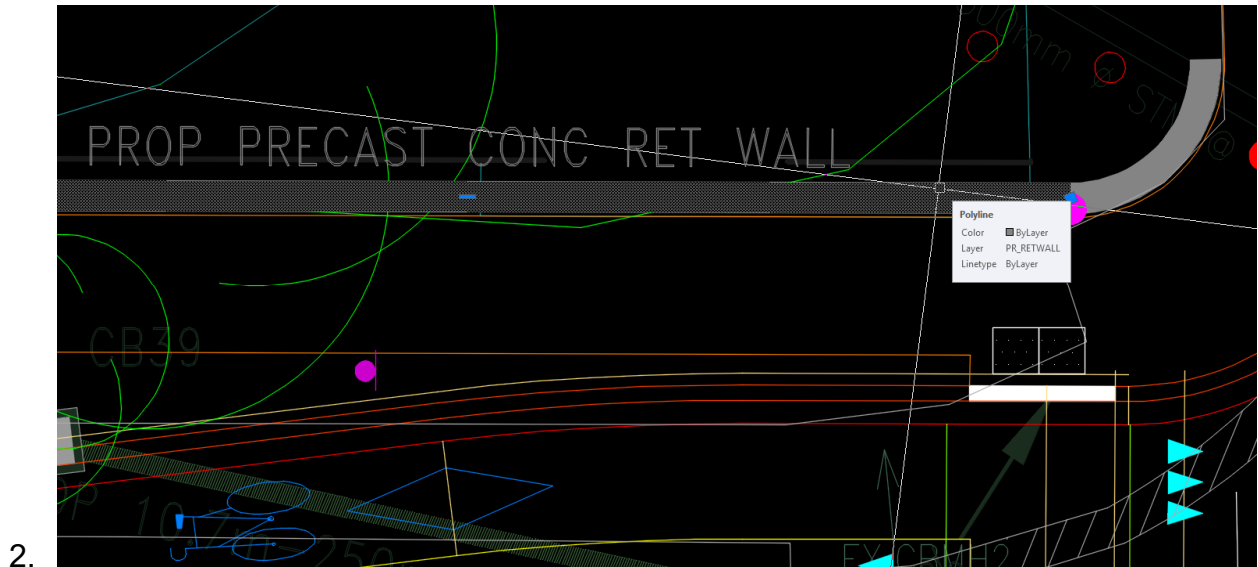
2. When matching into existing the sawcut line shall be differentiated from the edge of pavement match line, the sawcut line as shown below should only be shown on the surface works and elevation plan.



- 3.
4. The driveway ramp hatching for concrete should be ANSI37 on the PR_DW_HATCH layer at a suitable angle at a scale of 0.1
5. Hatching for a stamped coloured concrete driveway ramp or boulevard is to be on the PR_DW_HATCH layer at a suitable angle, pattern to be 'HONEY' at a scale of 0.075
6. Sidewalk ramps (including some multi-use trail ramps) should be hatched with 'ZIGZAG' pattern on PR_SW_HATCH_200 layer at a suitable angle at a scale of 0.1
- 7.

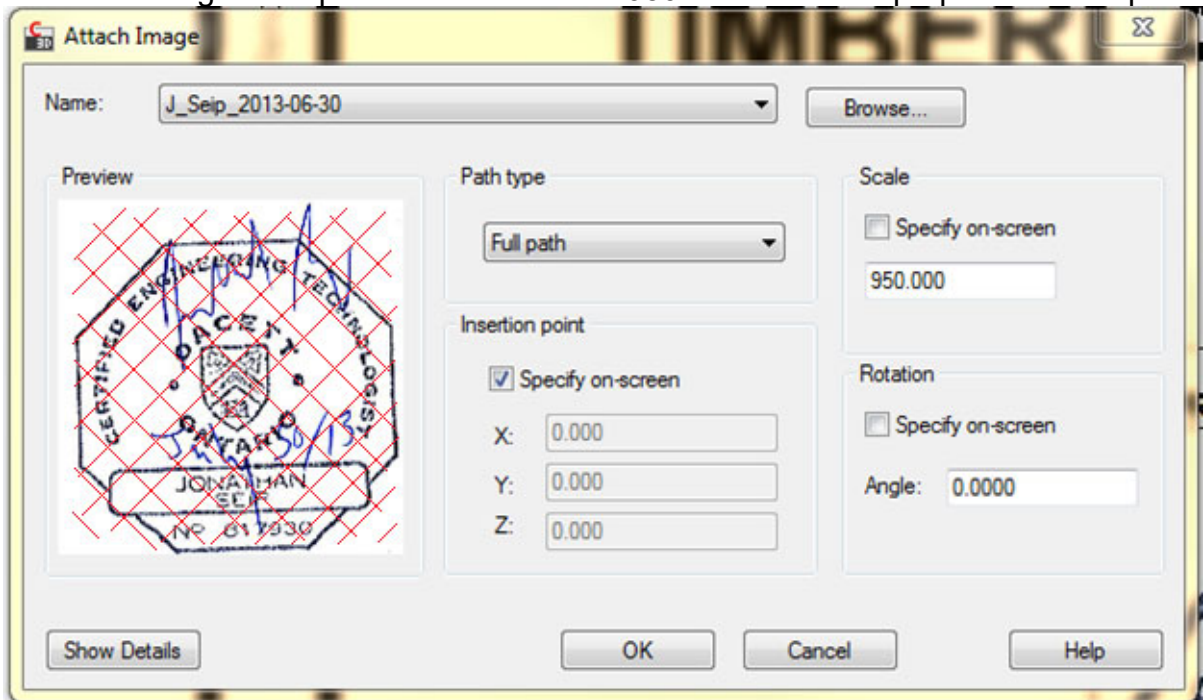
5.10. Retaining Wall Design

1. Areas identified as needing a retaining wall to match existing grade shall be identified in the linework drawing using a polyline with a thickness of 0.4m on the PR_EP_SAWCUT layer



5.11. Professional Seal Stamp

1. When inserting a stamp the scale should be 950 to achieve the proper size stamp.



5.12. Preliminary Design Deliverables

By this stage of your project you should have the following deliverables completed:

- 1) Existing Conditions Plan and Profile Sheets
- 2) Proposed Conditions Plan and Profile Sheets
- 3) Typical Cross Section Sheet
- 4) Drainage Area Plans (Sanitary and Storm)
- 5) Sewer Design Sheets

Before you send the drawings for review go through the check list in Appendix B.

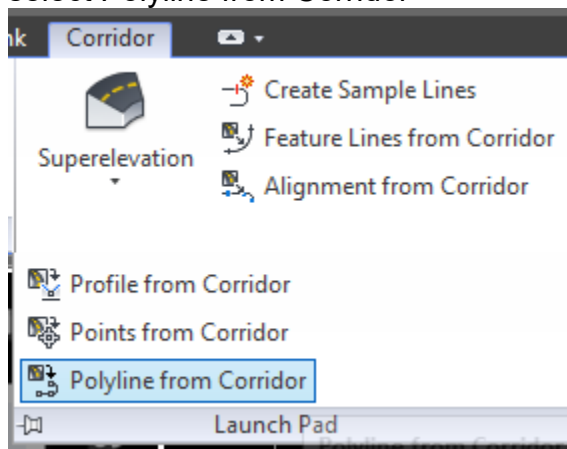
6. Detailed Design

6.1. Cover Sheets

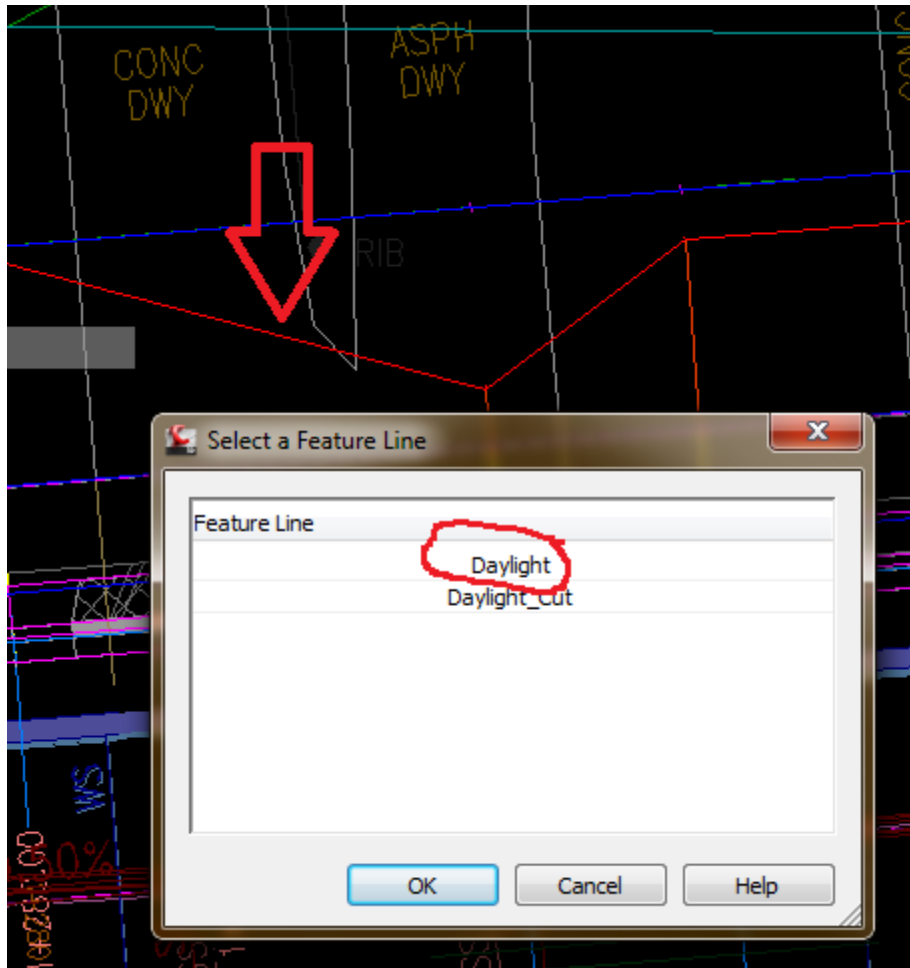
Both the Title Sheet and Legend Sheet should be imported as a layout from the template.

6.2. Limit of Restoration

1. To add the limit of restoration to your drawings from your ProjectName_Corridor drawing go to the modify ribbon and select Corridor, go to the Launch Pad and select Polyline from Corridor



2. The select the Corridor Link that you want to create the restoration limit from, in this case we select the limit of the grading as shown below and select Daylight



3. After you have completed this select all of the Polylines and insert them into your Linework drawing.
4. Once in the Linework drawing change the Polylines to 2D Polylines, then change to their correct layer.
5. A
- 6.

Proposed Subgrade

Trace the proposed centreline profile and copy it down the appropriate distance. Put the polyline on the PR_SUBGRADE layer and change the linetype scale to 4.0.

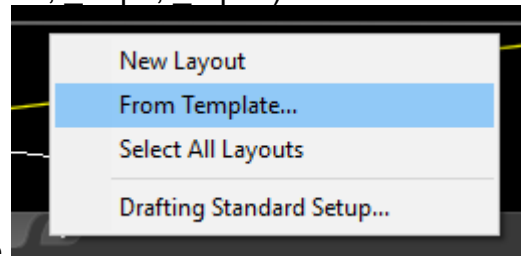
6.3. Retaining Wall Design

1. Draw the approximate limit of the retaining wall in the linework drawing (previously completed in the preliminary design phase).
2. Create an alignment at the back of the sidewalk / front of wall and sample the proposed ground surface.

3. Create an offset (approx.. 0.5m) alignment at the back of the wall along the top (where you are attempting to match existing grade), sample the existing ground surface.
4. Superimpose the profile of the existing ground surface at the back of the wall onto the front of wall profile.

6.4. Retaining Wall Sheet Setup

1. Start a new drawing Save the drawing as ProjectName_Retwall_Sheets
2. Add overlayed Xref's (_Fabric, _Linework, _Topo, _Pipes)



3. Import a new layout using the template
4. Select the Pr. Plan_Profile_250 sheet layout
5. Typically, the retaining wall sheet has a scale of 1:100, change the drawing scale to 1:100 or as your specific case requires
6. Delete the profile view linework (NOT THE VIEWPORT) in the sheet
7. Change the viewports to match your drawing scale
8. Draw

6.5. Proposed Surface Works and Elevations Sheets Setup

1. Sheets should be setup in the same manner as you would the existing conditions plan and profile with the exception that when choosing a sheet template use plan only

6.6. Detailed Design Deliverables

By this stage of your project you should have the following deliverables completed:

- 1) Construction Staging Plan
- 2) Existing Conditions Plan and Profile Sheet(s)
- 3) Proposed Conditions Plan and Profile Sheet(s)
- 4) Typical Cross Section Sheet(s)
- 5) Retaining Wall Sheet(s)
- 6) Surface Works and Elevations Plan(s)
- 7) Pavement Marking and Signage Plan(s)
- 8) Traffic (Signal) Control Plan (Regional Sheet)

- 9) Drainage Area Plan(s) (Sanitary and Storm)
- 10) Sewer Design Sheet(s)

Before you send the drawings for review go through the check list in Appendix B.



THE CORPORATION OF THE CITY OF KITCHENER

Appendix A – List of AutoCAD Commands

**Development Services Department
Engineering Services**

CHSPACE	Changes an object from model to paper space or vice versa.
NCOPY	Copies an object from an external reference.
OVERKILL	Deletes duplicate lines on top of each other.
XCLIP	Clip objects from an external reference.
XLIST	List an externally referenced object.



THE CORPORATION OF THE CITY OF KITCHENER

Appendix B – Deliverable Checklists

**Development Services Department
Engineering Services**

Preliminary Design Deliverable Checklist:

Existing Conditions Plan and Profile Sheets

- ☐ Plan and Profile match up
- ☐ Street name, limits of plan and profile, and sheet number are filled out
- ☐ Sewer and watermain are shown and labeled in both plan and profile
- ☐ Hydrants and valves are shown
- ☐ Service connections are shown

Proposed Conditions Plan and Profile Sheets

- ☐ Plan and Profile match up
- ☐ Street name, limits of plan and profile, and sheet number are filled out
- ☐ Sewer and watermain are shown and labeled in both plan and profile
- ☐ Hydrants and valves are shown
- ☐ Service connections are shown

Typical Cross Section Sheet

- ☐ Cross sections are titled
- ☐ Dimensions are added to each section

Drainage Area Plans (Sanitary and Storm)

- ☐ Each street shown is labelled
- ☐ Each pipe and manhole is labelled (do not label catchbasins)
- ☐ Overland flow routes are labelled
- ☐ Legend has been added to drawing
- ☐ Areas have been defined and labelled

Detailed Design Deliverable Checklist:

Construction Staging Plan

- ☐ All street names labelled
- ☐ Construction stages labelled
- ☐ Construction stage shown

Existing Conditions Plan and Profile Sheet

- ☐ Plan and Profile match up
- ☐ Street name, limits of plan and profile, and sheet number are filled out
- ☐ Sewer and watermain are shown and labeled in both plan and profile
- ☐ Hydrants and valves are shown
- ☐ Service connections are shown
- ☐ True and construction north arrows are properly orientated
- ☐ Notes section is updated to reflect the design
- ☐ Remaining title block information is filled out
- ☐ Driveway aprons/curb cuts are shown
- ☐ Anodes, fittings on water system are shown and labeled
- ☐ Sewer and watermain information is included in the band label
- ☐ Required notes are added to the drawings to facilitate construction
- ☐ Service connections are shown

Proposed Conditions Plan and Profile Sheet

- ☐ Plan and Profile match up
- ☐ Street name, limits of plan and profile, and sheet number are filled out
- ☐ Sewer and watermain are shown and labeled in both plan and profile
- ☐ Hydrants and valves are shown
- ☐ Service connections are shown
- ☐ True and construction north arrows are properly orientated
- ☐ Notes section is updated to reflect the design

- ☐ Remaining title block information is filled out
- ☐ Driveway aprons/curb cuts are shown
- ☐ Anodes, fittings on water system are shown and labeled
- ☐ Sewer and watermain information is included in the band label
- ☐ Required notes are added to the drawings to facilitate construction
- ☐ Service connections are shown

Typical Cross Section Sheet

- ☐ Cross sections are titled
- ☐ Dimensions are added to each section

Retaining Wall Sheet

- ☐ Sheets are titled
- ☐ Typical section of retaining wall shown to reflect the design
- ☐ Shop drawing note is added to titleblock
- ☐ True and construction north arrows are properly orientated

Surface Works and Elevations Plan

- ☐ Street name, limits of plan, and sheet number are filled out

Pavement Marking and Signage Plan

- ☐ Street name, limits of plan, and sheet number are filled out

Drainage Area Plans (Sanitary and Storm)

- ☐ Each street shown is labelled
- ☐ Each pipe and manhole is labelled (do not label catchbasins)
- ☐ Overland flow routes are labelled

- ☐ Legend has been added to drawing
- ☐ Areas have been defined and labelled



THE CORPORATION OF THE CITY OF KITCHENER

Appendix C – Text Style and Sizing Guidelines

**Development Services Department
Engineering Services**

