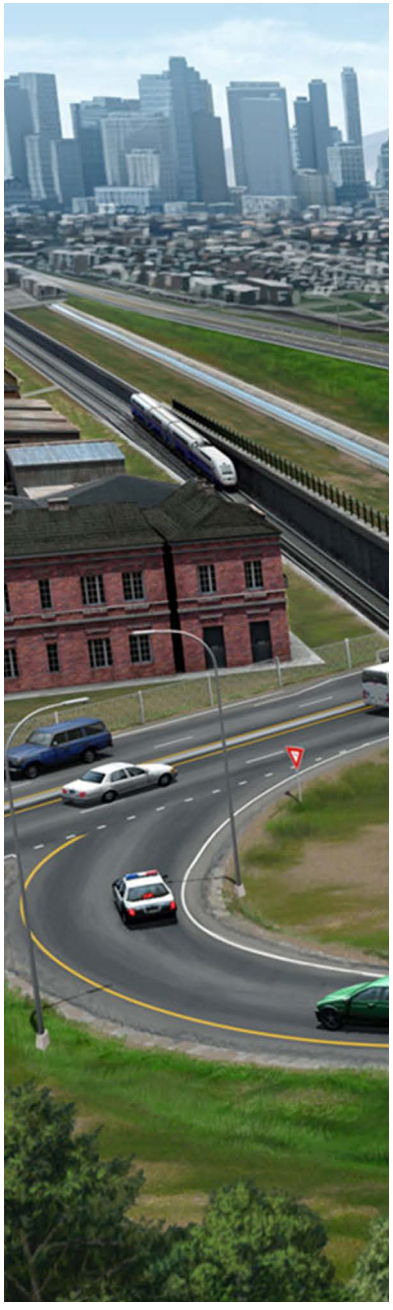


Creating and Managing Utilities

This course is for the **2024 Release 2** *version of:*

OpenRoads Designer CONNECT Edition

OpenRail Designer CONNECT Edition

About this Practice Workbook...

- This workbook is designed for use in Live instructor-led training and for OnDemand self study. OnDemand videos for this course are available on **learning.bentley.com**
- This PDF file includes bookmarks providing an overview of the document. Click on the bookmark to quickly jump to any section in the file.
- Only Imperial files are included in the dataset.
- This course workbook uses the *Training and Examples* WorkSpace and the *Training-Imperial* WorkSet delivered with the software.
- The terms Left-click, Click, Select and Data are used interchangeably to represent pressing the left mouse button. The terms Right-click and Reset are also used interchangeably. If your mouse buttons are assigned differently, such as for left-handed use, you will need to adjust accordingly.

Have a Question? Need Help?

If you have questions while taking this course, you can submit questions to the *Civil Design Forum* on Bentley Communities where peers and Bentley subject matter experts are available to help.

Bentley Institute

Edition: **04-01**

Course Level: **Fundamental**

Exercise 1: Exploring the Design File Structure

Description

In this exercise we will start the software and review the structure of the Design File.

Skills Taught

- Setting the WorkSpace and WorkSet.
- Reference files
- Exploring 3D Views
- Exploring 3D Models

Getting Started

In this section you will open a design file, and review the reference files for the terrain model, existing drainage network and a utility file.

---

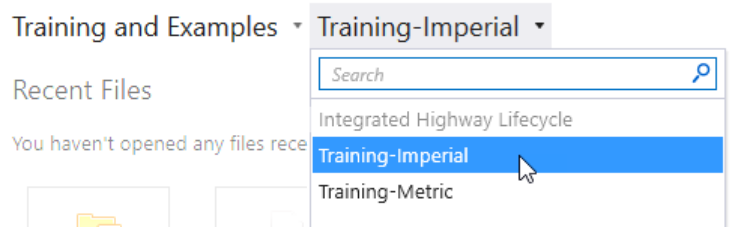
1. Start the software.
2. Set the WorkSpace and WorkSet.

   The WorkSpace and WorkSet define standards that are used by the software, and the ones used for this training are installed during the software installation.

   Typically, the WorkSpace contains organizational standards and the WorkSet contains project standards.

   a. Select **Training and Examples** from the *WorkSpace* drop-down menu.

   b. Select **Training-Imperial** from the *WorkSet* drop-down menu.



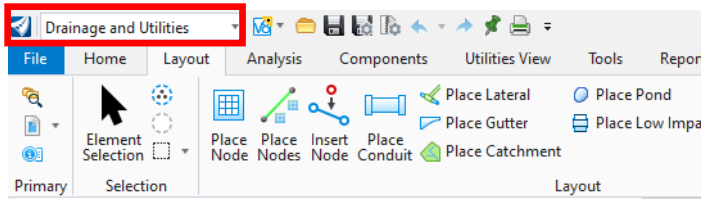
3. Open an existing 2D design file.

   a. Select **Browse**

   b. Browse to *C:\Bentley Training\Creating and Managing Utilities* or other folder where you unzipped the dataset files.

   c. Open the file **SH97_Utilities from Graphics.dgn**

4. Select the **Drainage and Utilities** workflow from the ribbon bar.



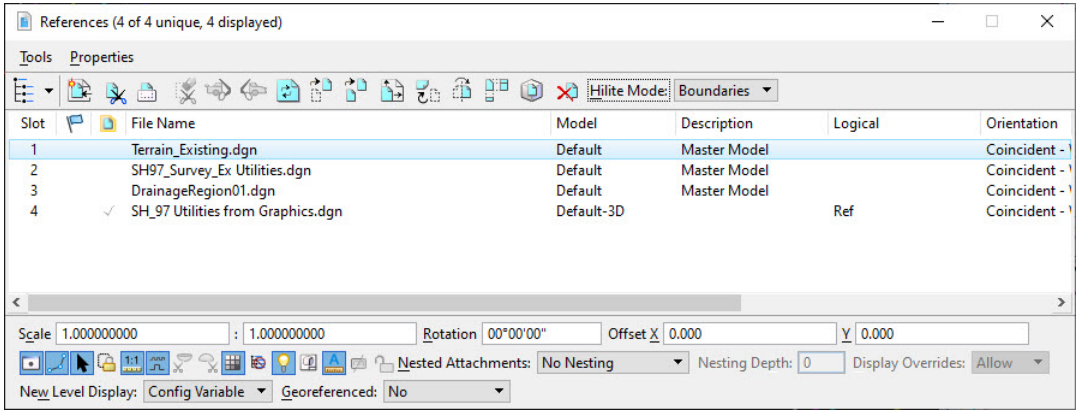
5. With View 1 active, open the *References* dialog.

   a. Review the list of attached files as listed below

      - **Terrain_Existing.dgn**

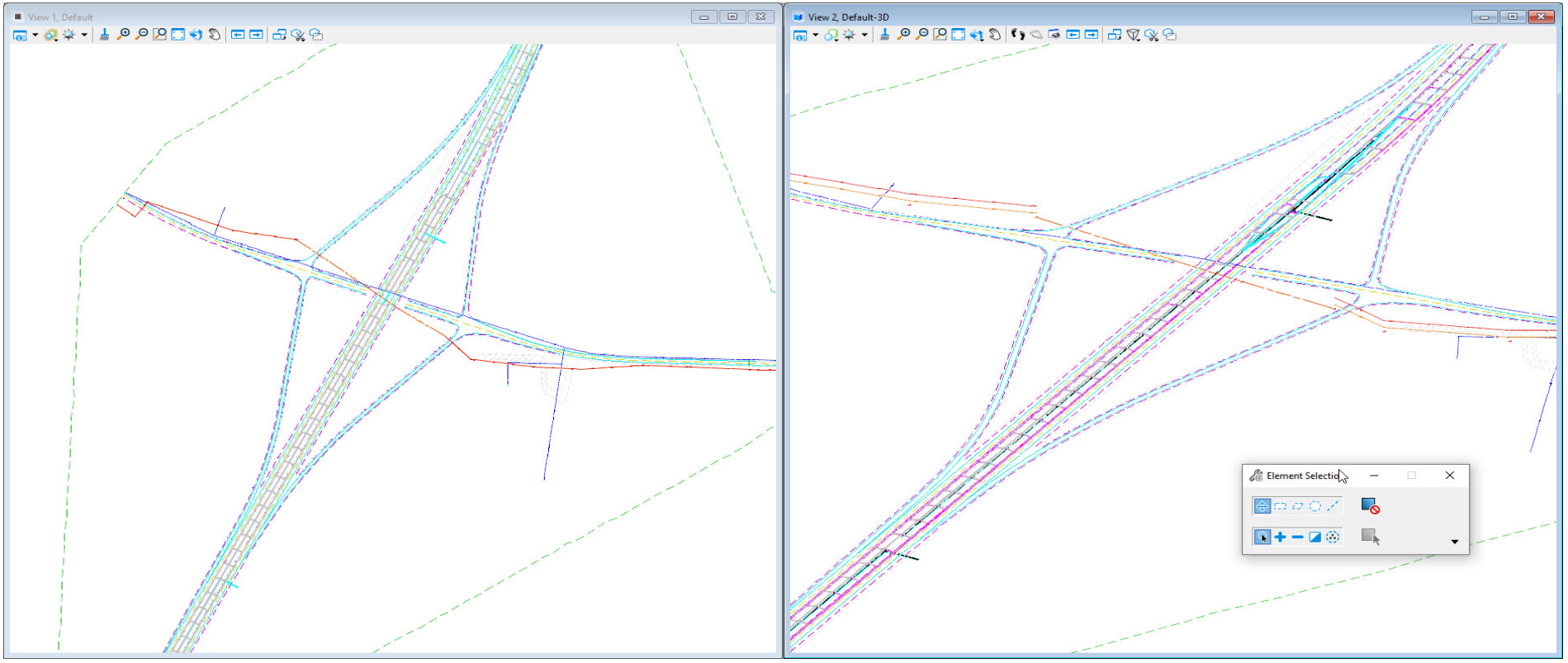
- **SH97_Survey_Ex Utilities.dgn**
- **DrainageRegion01.dgn**
- **SH97_Utilities from Graphics.dgn (Default-3D)**

b. **Close** the *Reference dialog*



6. Select the *Workflow* > **Drainage and Utilities**

Review your file. It should look similar to the images below with a 2D Model and a 3D Model with the terrain, Utility and drainage network files referenced into them.



Exercise 2: Using Filters and Filter Groups to Create Utilities

Description

In this section, we will extract Utilities from source files, by creating individual Utility Filters and combining them together in a Utility Filter group. Then review the results.

Skills Taught

- Create a Utility filter to match an existing 3D Utility
- Create a Graphical filter group to extract multiple utilities.
- Review the results in the Flex Tables.

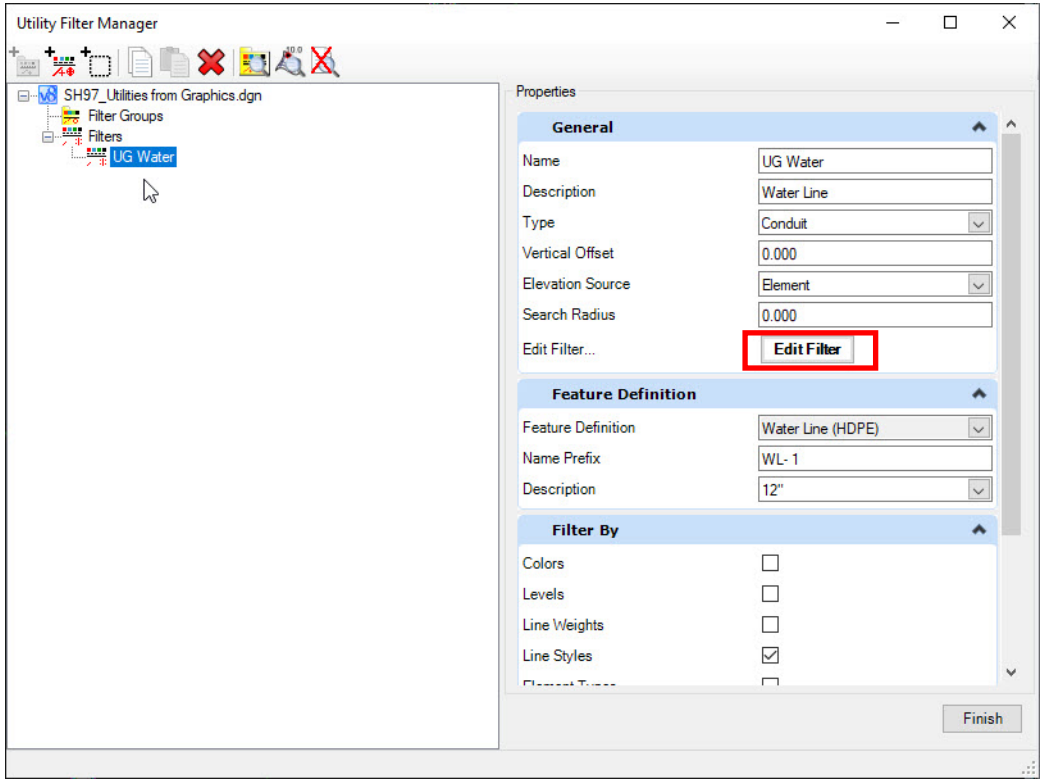
Create Utility Filters - Underground

In this section you will create Utility Filters to define how to extract graphics from various levels in the source graphics design files. In the DGN there are several features that represent Communications and Water utilities and are differentiated by line styles.

1. Select *Layout* > *Layout* > **Filter Manager**

The dialog is separated into two major parts. The left side is a list of Filters and Filter Groups in the active design file. The right side are the details of the Filters and Groups. Grayed out items are read-only.

2. Select **Filters** under the current DGN, *Right-Click* and select **Create Filter**.
3. Enter the following values:
   a. *Name:* **UG Water**
   b. *Description:* **Water Line**
   c. *Type:* **Conduit**
   d. *Vertical Offset:* **0.000**
   e. *Elevation Source:* **Element**
   f. *Search Radius:* **0.000**
   g. *Feature Definition: Link* > *WaterSegment* > **Water Line (HDPE)**
   h. *Name Prefix:* **WL-1**
   i. *Description*: **12”** *(select from the pull-down list)*

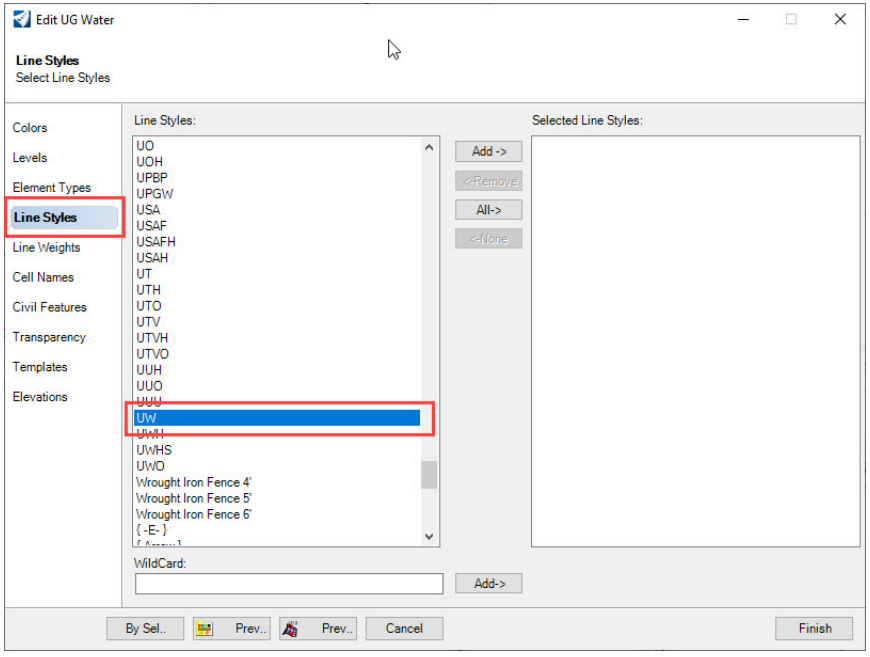


4. Click the **Edit Filter** button in the middle of the dialog

   The *Edit UG Water* dialog is displayed.

   The left pane of the dialog lists all the property types that can be used to define how the graphics will be selected.

   In this case, the utility data is segmented by *Line Styles*



5. Follow the steps below to define the Line Style where the graphics are located

   a. Select **Line Styles**

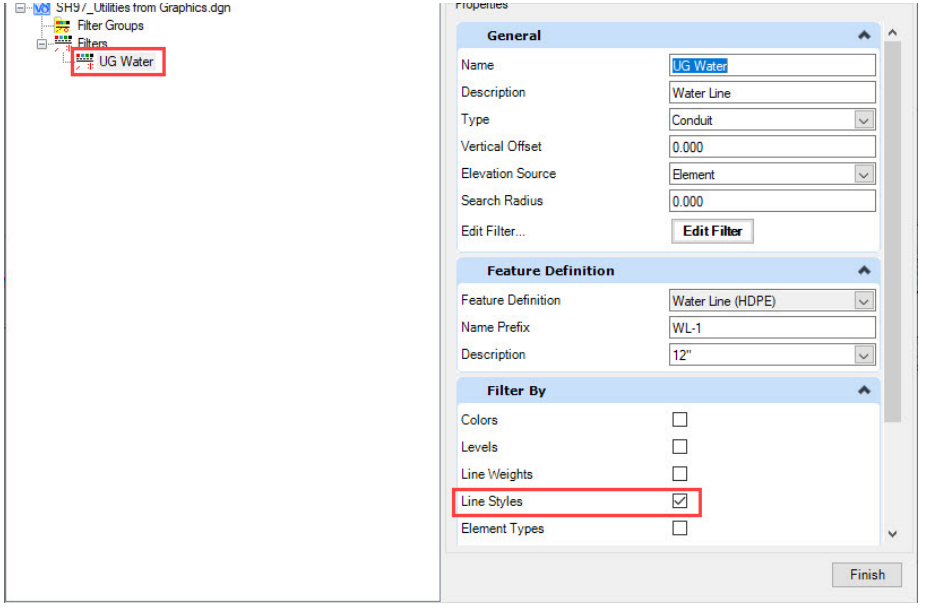
   b. Select **UW**

   c. Select **Add** to move the feature to the *Selected Line Styles* list

   d. Select **Finish** to return to the *Utility Filter Manager* dialog

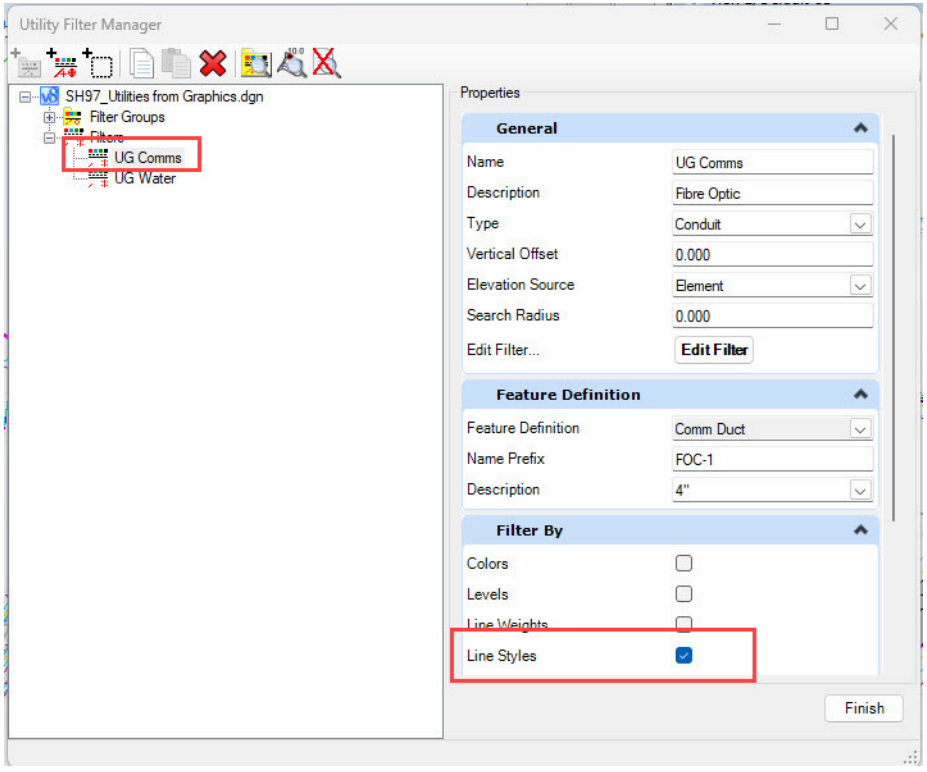
   Note: Do **not** select *Finish* on the Utility Filter Manager dialog.

On the *Utility Filter Manager* dialog, you will see that the Name of the filter has been updated and the Line Styles option is checked on.



We are now going to follow the same steps but for the *UG Communication* utility.

6. Select **Filters** under the current DGN, *Right-Click* and select **Create Filter**.
7. Enter the following values:
   a. *Name:* **UG Comms**
   b. *Description:* **Fibre Optic**
   c. *Type:* **Conduit**
   d. *Vertical Offset:* **0.00**
   e. *Elevation Source:* **Element**
   f. *Search Radius:* **0.000**
   g. *Feature Definition: Link > CommunicationsSegment >* **Comm Duct**
   h. *Name Prefix:* **FOC-1**
   i. *Description*: **4”** *(select from the pull-down list)*

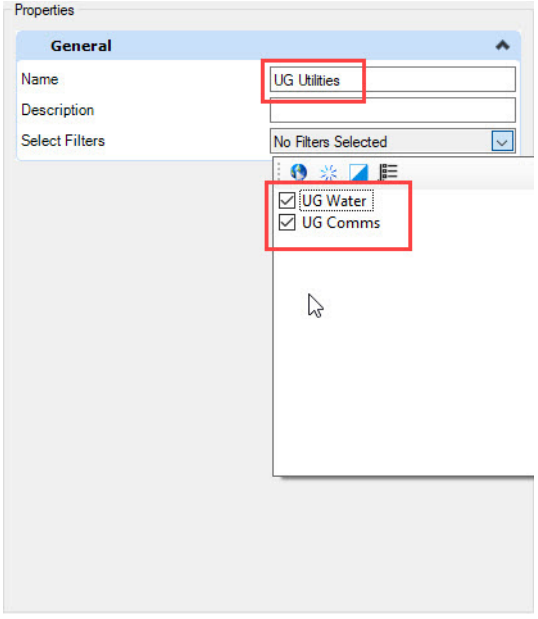


8. Click the **Edit Filter** button in the middle of the dialog

9. Follow the steps below to define the Line Style where the graphics are located
   a. Select **Line Styles**
   b. Select **UFO**
   c. Select **Add** to move the feature to the *Selected Line Styles* list
   d. Select **Finish** to return to the *Utility Filter Manager* dialog

The 2 filters we needed for the underground utilities have now been created, we now need to get them to act together so we need to create a Filter Group.

10. Select **Filter Groups** under the current DGN
    a. *Right-Click* and select **Create Filter Group**
    b. Under *Properties* Select *Name* > **UG Utilities**
    c. *Select Filters* > **UG Comms** and **UG Water**
    d. Select **Finish** to Exit command



Extract Utilities from Graphics using Filter Groups

In this section you will use the Filter Groups created in the previous exercises to extract the utilities from the graphics.

---

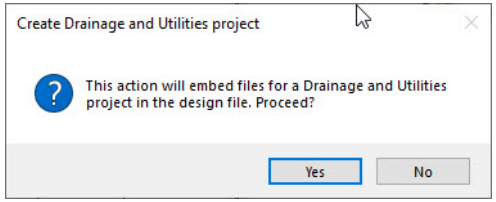
1. Select > **3D View**
2. Select *Layout* > *Layout* > **Extract from Graphic**

   A notification will appear stating 'This action will embed files for a Drainage and Utilities project in the Design file. Proceed?'

   a. Select **Yes**

   b. Another warning appears which is to compact the data base, Select **Yes**

   c. You will have to re-select *Layout* > *Layout* > **Extract from Graphics**



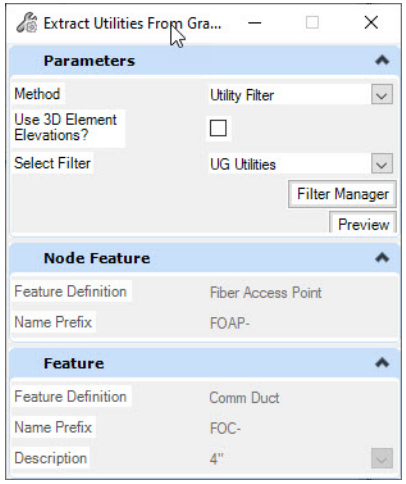
3. On the *Extract Utilities* dialog

   a. Set *Method* > **Utility Filter**

   b. *Check on* > **Use 3D Element Elevations**

   c. Select *Utility Filter* > **UG Utilities**

   Now follow the heads up prompts



   The utilities are now created in the design file.

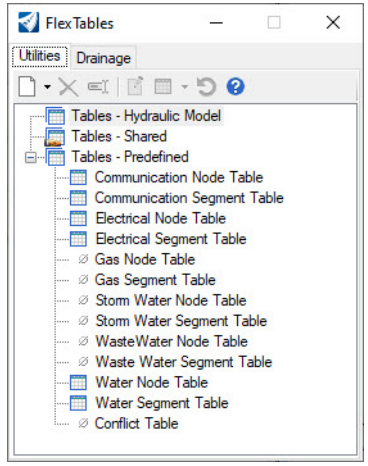
   d. Select <**Esc**> to Exit the command.

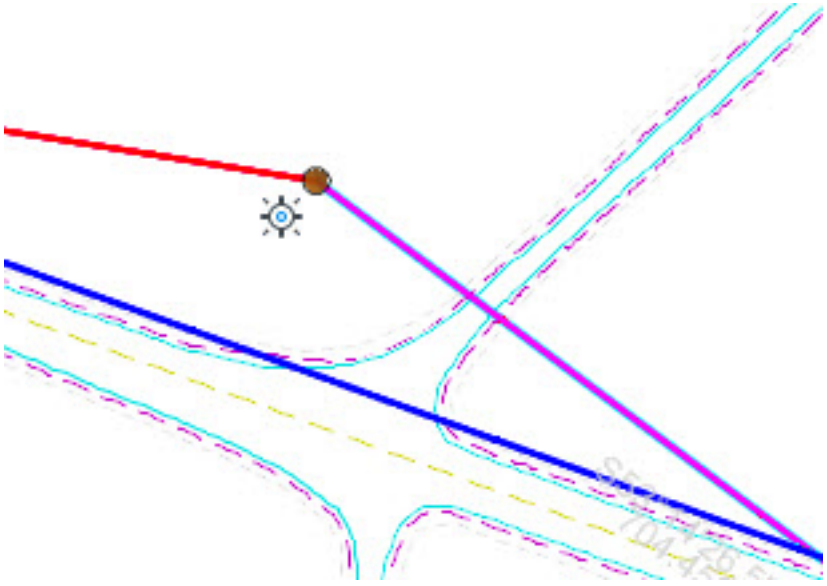
Report the Utilities using Flex Tables

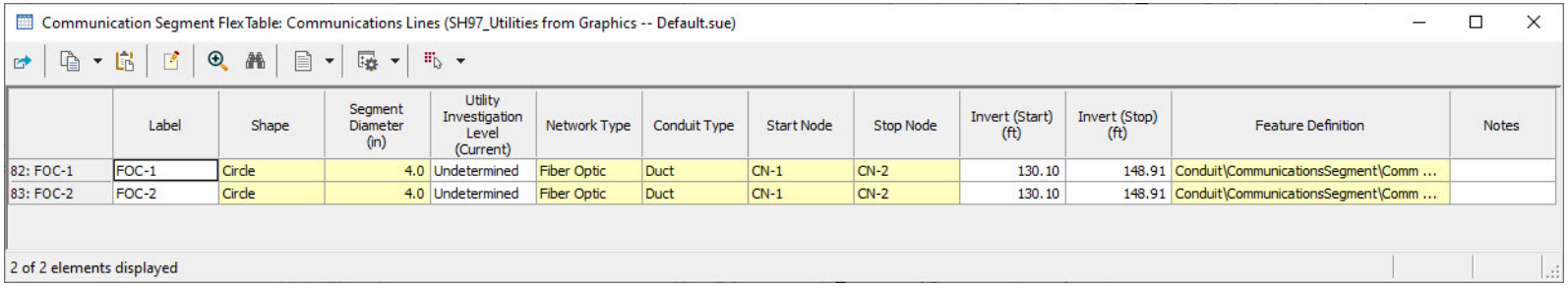
In this section we will report the utilities using Flex Tables

1. Select *Report* > *Tables* > **Flex Tables**
   a. Select the **Utilities** tab
   b. *Double click* on *Tables - Predefined* > **Communication Segment Table**
   c. Ensure the focus is on *View 1*
   d. *Right Click* on the Row *FOC-1 and Select* > **Zoom To**

   FOC-1 will now be highlighted In View 1







	Label	Shape	Segment Diameter (in)	Utility Investigation Level (Current)	Network Type	Conduit Type	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Feature Definition	Notes
82: FOC-1	FOC-1	Circle	4.0	Undetermined	Fiber Optic	Duct	CN-1	CN-2	130.10	148.91	Conduit\CommunicationsSegment\Comm ...	
83: FOC-2	FOC-2	Circle	4.0	Undetermined	Fiber Optic	Duct	CN-1	CN-2	130.10	148.91	Conduit\CommunicationsSegment\Comm ...	

e. **Close** the *Flex Table*

f. **Close** the *Flex Table Dialog*

Exercise 3: Create a Utility and Extract from Graphics

Description

In this section we will create a Gas Line Utility by offsetting from a designed centreline, then we will extract it using the method Selection and drape it onto the active surface. Finally we will review the Gas Line in the 3D View. We will also show how to import an individual utility.

.

Skills Taught

- Create a 2D Utility
- Drape the 2D Utility on to the Active Terrain with an offset
- Review the 3D View
- Import an Individual Utility

Create a Utility and Extract from Graphics using method Selection

In this section we will create a utility by offsetting from a designed centreline, then we will drape it onto a surface and finally we will extract it using the method Selection.

1. Select > **2D View**
2. Select *Home > Primary > Attach Tools >* **References**

   We are going to create the utility with an offset from a centreline feature of the main highway. In order to do this we need to attach two reference files, the geometry for the alignment and the road corridor.

   a. On the *Reference dialog,* Select *Tools* > **Attach**

   b. From the data set folder Select **SR97_Geometry.dgn** and **SR97_Corridor.dgn**

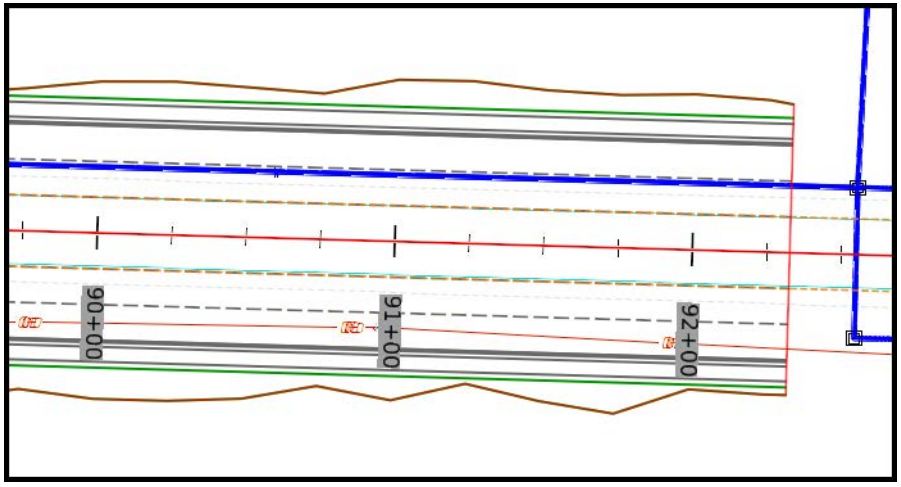
   c. Leave Attachment Method as *Coincident World*

   d. Select **Open**

   e. **Close** the *Reference Dialog*

3. Select the Workflow, *OpenRoads Modeling*

   a. Window in to around **Sta 90+00**



4. Select *Geometry > Horizontal > Offsets and Tapers >* **Single Offset Partial**

Note: The feature definition we are going to use is of no relevance as we are going to convert this feature to a Utility feature.

a. Locate the Element to offset from Select *>* **Complex Element SR97**

b. *Offset >* **48.00'**

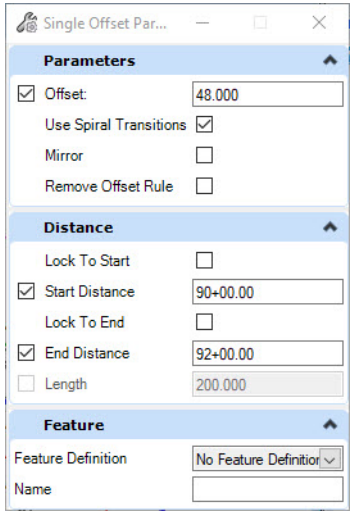
c. *Start Distance >* **90+00'**

d. *End Distance >* **92+00'**

e. *Feature Definition >* **No Feature Definition**

f. *Mirror >* **No**

g. Select **<Esc>** to Exit the Command



Note: We have now created a feature that we can use as a Reference for our utility. Because the feature we have created has no elevations we are going to drape it onto the Active Terrain Model, which in this case is Terrain Existing.

5. Select the Workflow, *Drainage and Utilities*

6. Select *Layout >* **Extract from Graphic**

a. Set *Method >* **Selection**

b. *Feature Definition > Link > GasSegment >* **Gas Line (HDPE)**

c. *Name Prefix >* **GL-1**

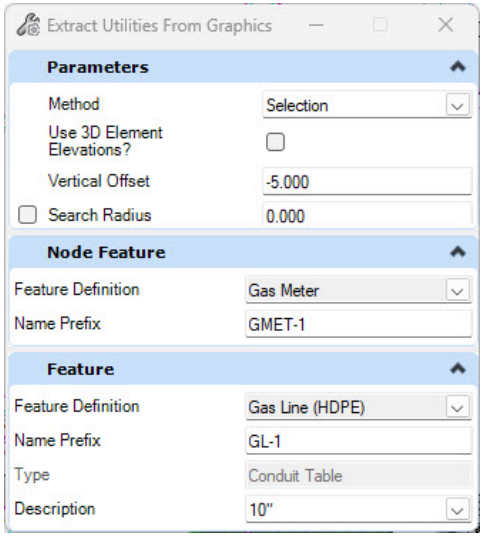
d. *Description >* **10"**

e. *Node Feature >* **Gas Meter**

f. *Name Prefix >* **GMET-1**

g. *Uncheck >* **Use 3D Element Elevations**

h. *Vertical Offset >* **-5.0'**



Follow the *heads up prompts* to create the feature

i. Select the **Offset Feature** Just created

j. **Reset** for no more Elements

k. **Reset** to use the *Active Terrain Model*

l. Select **<Esc>** to Exit Command

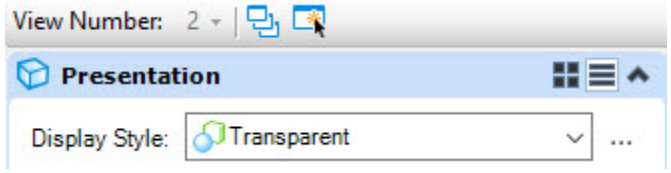
7. View the Gas Line in 3D

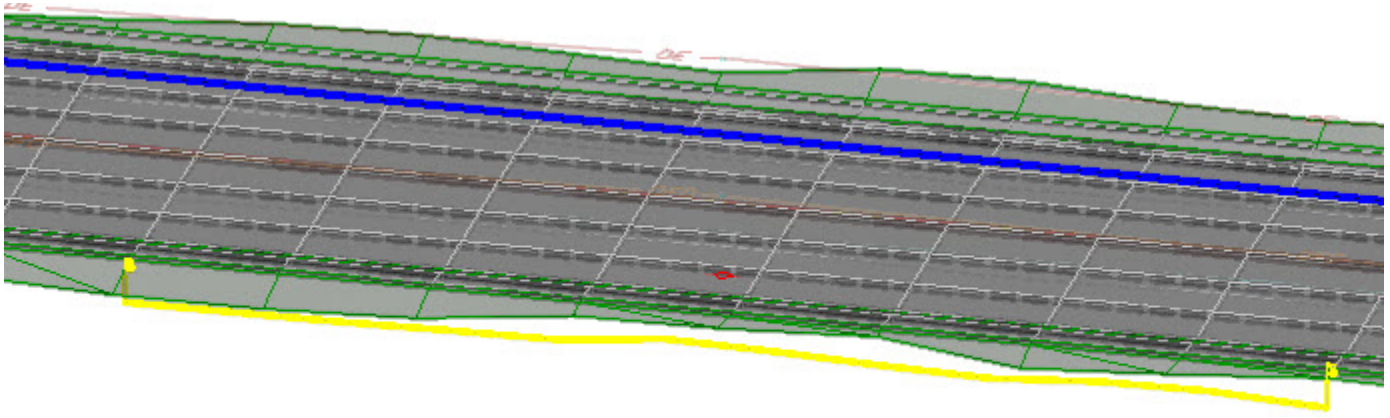
a. *Click* in the **3D View**

b. Select > **View Attributes**

c. Change the *Display Style* > **Transparent**

d. *Window* to around **Sta 9+00**





Note: You will see the Gas Line in the 3D View. Because we draped the feature with an offset of -5.0’ from the Active Terrain model you will see that the Gas Line follows the terrain.

Also, because we set a Feature Definition for the Node, you will see nodes at the start and end of the Gas Line.

8. Select *Home > Primary > Attach Tools >* **References**

   a. On the *Reference dialog,* Select *Tools* > **Attach**

   b. Select the References **SR97_Geometry.dgn** and **SR97_Corridor.dgn**

   c. Turn off the display of theses references in both the 2D and 3D Views

   d. **Close** the *Reference Dialog*

   Now we are going to import a utility from a graphic.

   Window to the area between the existing ramps and you will see a Gas line. This utility is a 3d Graphic and we are now going to import it into our Utilities model.

9. Select *Layout* > **Extract from Graphic**

   a. Set *Method* > **Selection**

   b. *Feature Definition > Conduit > GasSegment >* **Gas Line (HDPE)**

   c. *Name Prefix* > **GL-2**

   d. *Description* > **12”**

   e. *Node Feature* > **Gas Meter**

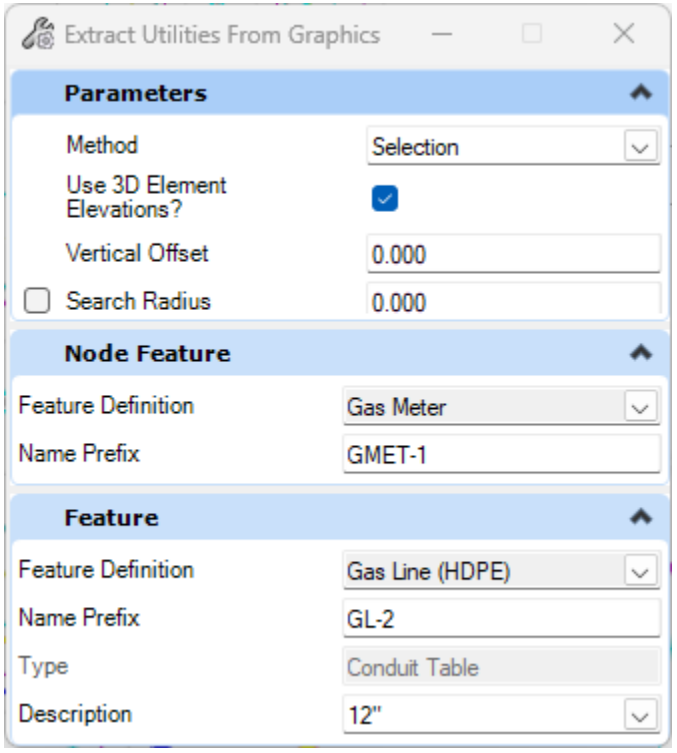
   f. *Name Prefix* > **GMET-1**

   g. *Check* > **Use 3D Elements**

   h. *Vertical Offset* > **0’**

   Follow the *heads up prompts* to create the feature.

   i. Select **<Esc>** to Exit Command



10. View the Gas Line in 3D

    a. *Click* in the **3D View**

    We have now completed the importing of underground utilities we are now going to import the overhead utilities.

Create a Utility Profile

1. Continue in the **SH97_Utility from Graphics.dgn** file.

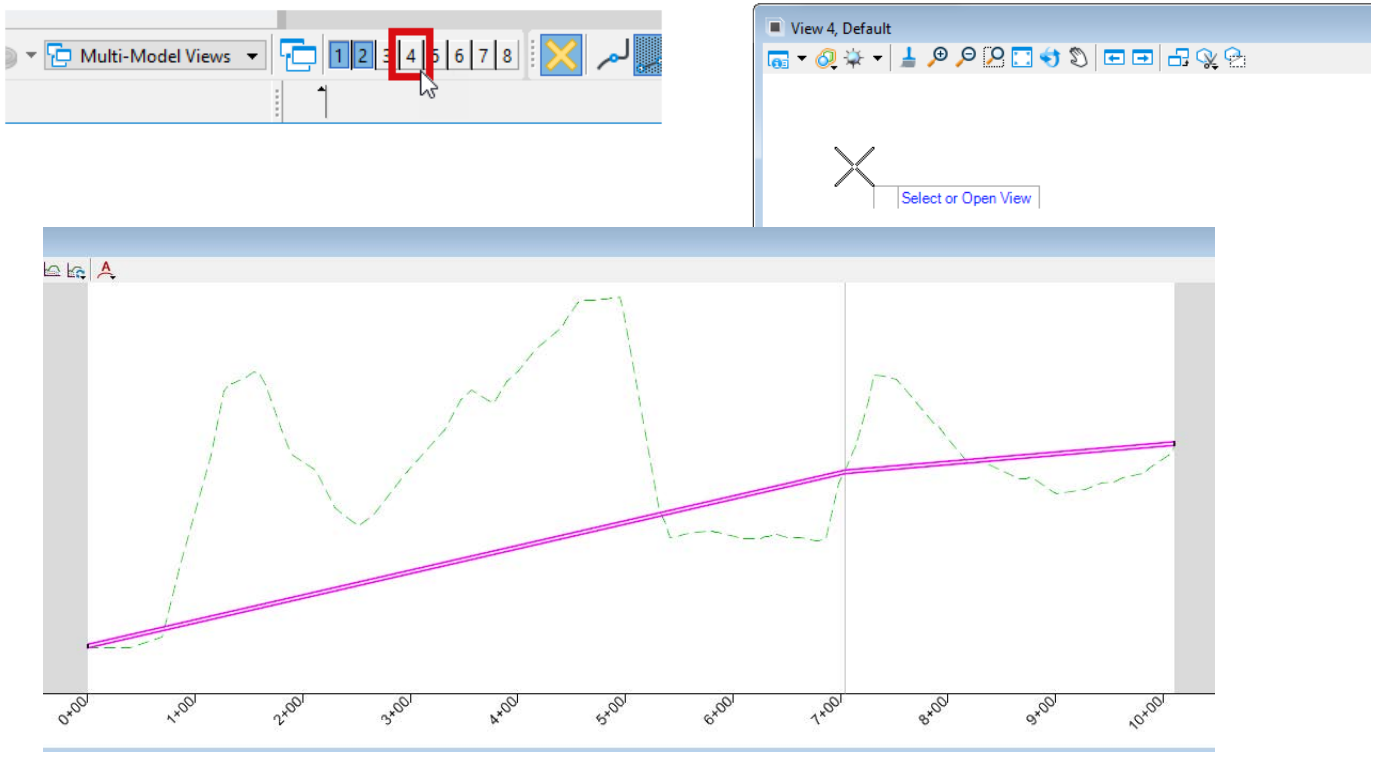
   a. **Window Area** to the area between the existing ramps north end of the project.

   b. *Select* and *Hover* over the **FOC-1 Communication Cable** utility and then select **Open Profile Model** from the *Context Sensitive toolbar*.

   c. Following the prompts, select *View 4* from the *Manage View Groups* ribbon, and then place a *data point* in View 4 when it opens.

   The profile is displayed in the view.

   d. **Close** > *View 4*



Exercise 4: Create Utilities using Model Builder

Description

This exercise will show you how you can use Model Builder to create Utilities from data in an Excel spreadsheet. For a more in depth look at the Model Builder functionality explore the *Import Drainage Data from Excel* course.

.

Skills Taught

- Choose the Drainage and Utilities workflow
- Select and setup mappings in Model Builder
- Use Model Builder to create the Utilities

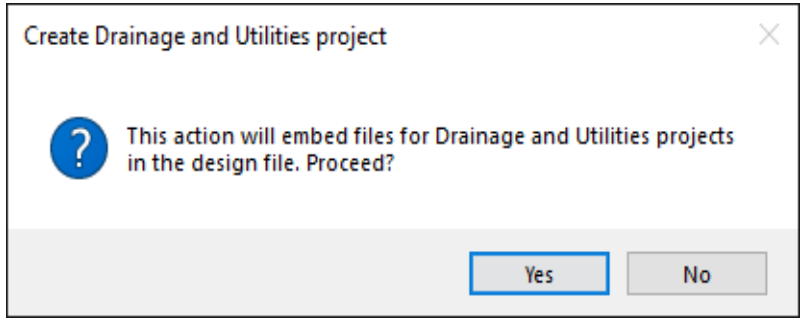
Initiating the Connection

1. **Open** the file **SH97_Utilities from Model Builder.dgn**

2. Select, *Tools > General Tools >* **ModelBuilder**

   If this is the first time that a *Drainage and Utilities* tool has been selected with this file, you will get a warning that a utility model needs to be created in the design file. Select **Yes**.

   You may well be prompted to Compact the Database, if so select **Yes**

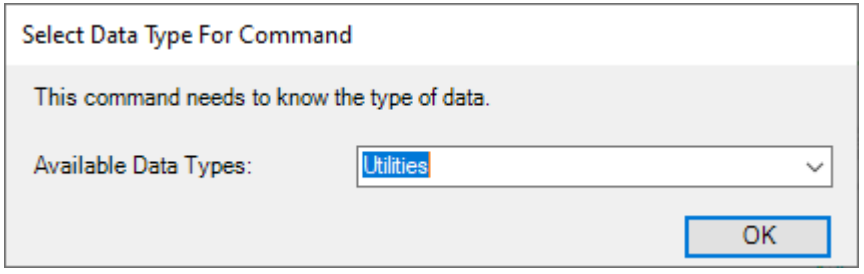


NOTE: Model Builder can be used to import data for both drainage and other types of utilities.

It is critical that you specify what *type of data* you are working with.

a. Select, *Available Date Types >* **Utilities**

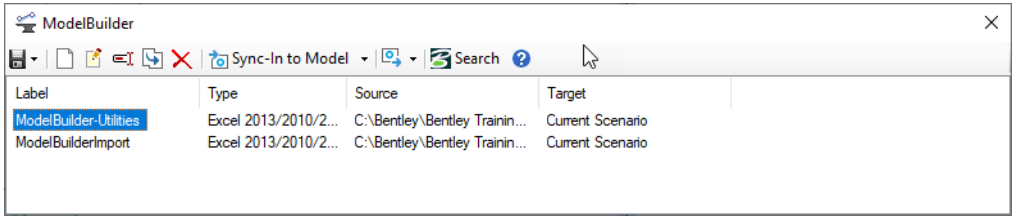
b. Select *>* **OK**



The *ModelBuilder* dialog opens

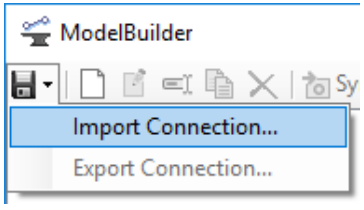
If your ModelBuilder dialog is **empty** as shown below, *move forward to the next step*

NOTE: If you see *ModelBuilder Utilities* and *ModelBuilderImport Tables* listed in the Model Builder dialog, this suggests that this class has previously been run on this computer. It is safest to delete this entry and then move forward.



To delete an **existing** entry in the Model Builder dialog right click on the entry and Select > **Delete**

3. On the *Model Builder* dialog, Select *> Import/Export >* **Import Connection**

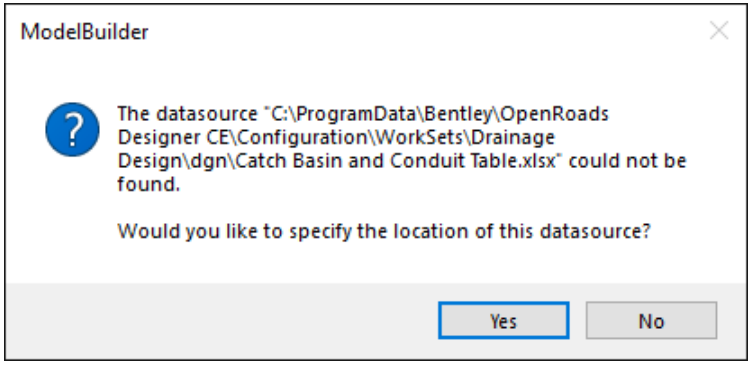


a. Browse to *C:\Bentley Training\Importing Creating and Managing Utilities*

b. Select > **ModelBuilder-Utilities.mbc**

c. Select > **Open**

d. Select > **Yes** (at the prompt to specify the location of the data source file)



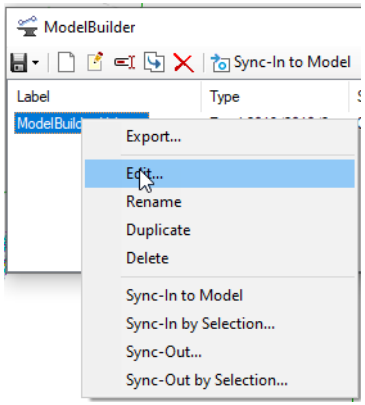
e. In the *Specify Datasource Location* dialog, browse to *C:\Bentley Training\Importing Creating and Managing Utilities*

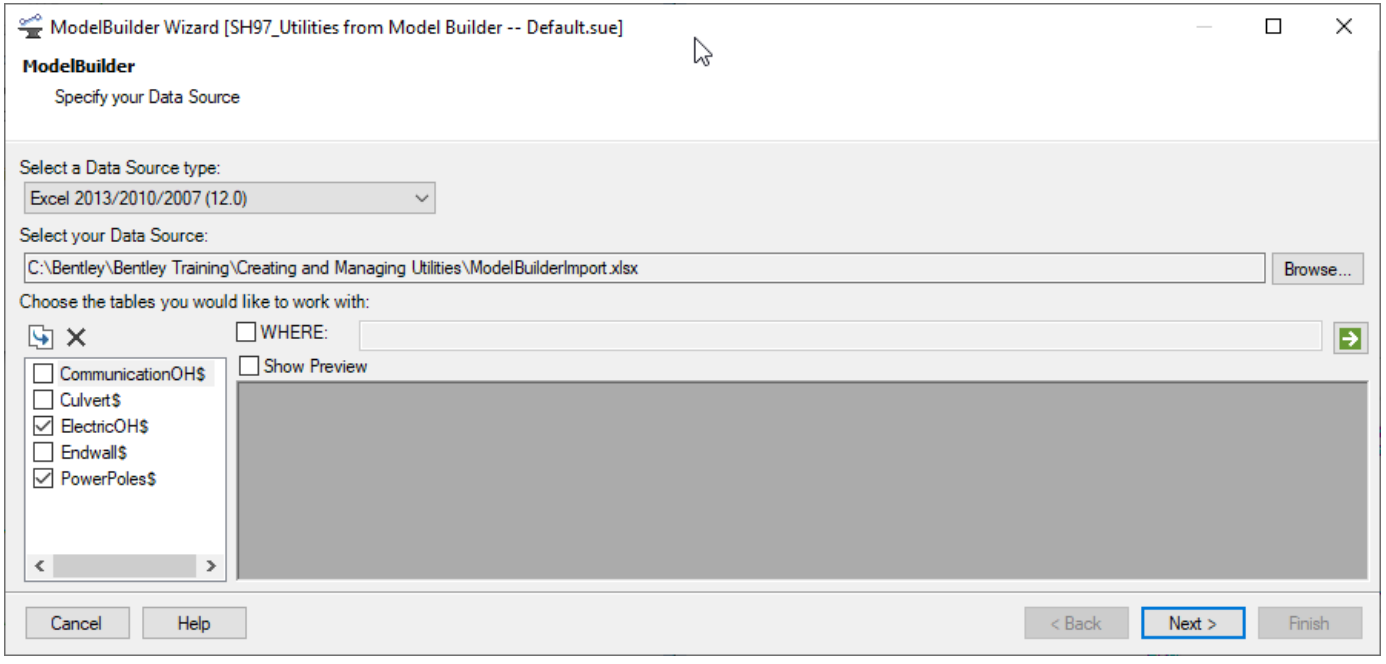
f. Select > **ModelBuilderImport.xlsx**

g. Select > **OK**

4. *Right click* on the **ModelBuilder-Utilities.mbc**
5. Select > **Edit**

   This opens the *ModelBuilder Wizard* dialog.





Specify the Data Source

The first page of the ModelBuilder Wizard is the *Specify your Data Source* screen.

---

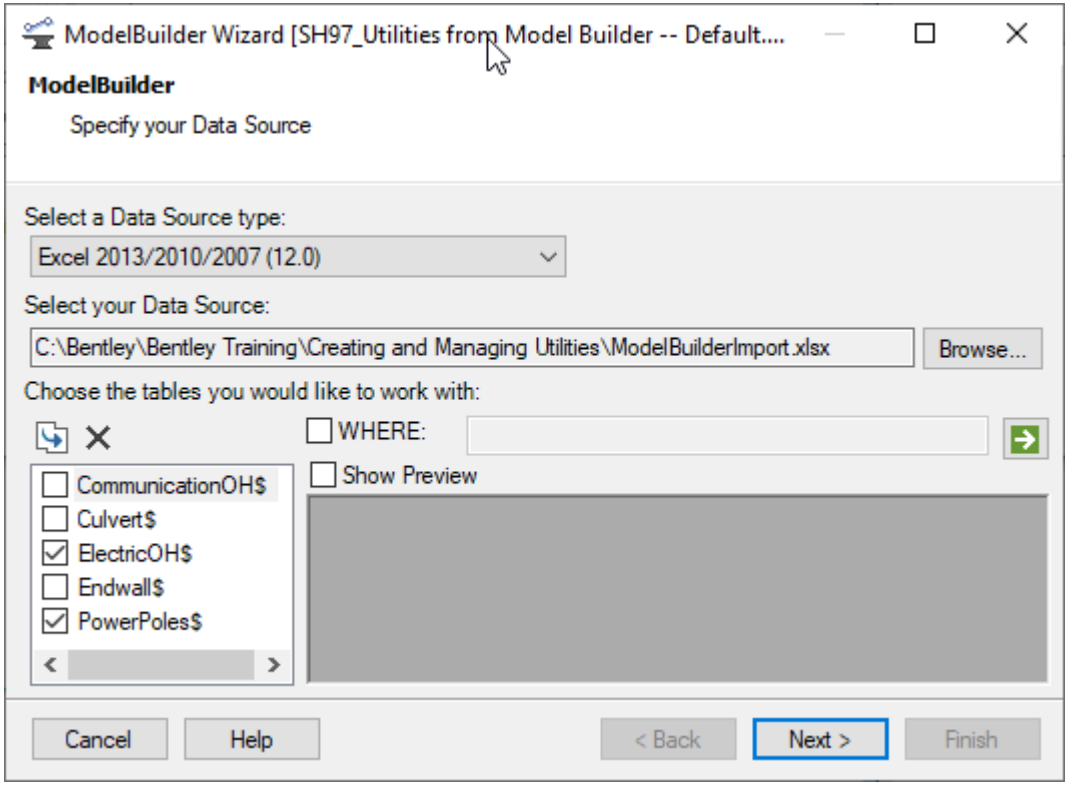
1. Verify that **Excel 2013/2010/2007 (12.0)** is selected in the *Select your Data Source type* drop down menu

   a. Verify that *C:\Bentley Training\Creating and Managing Utilities***ModelBuilderImport.xlsx** is shown in the *Select your Data Source* field

   If not, browse and select the file.

   ModelBuilderImport.xlsx is a ModelBuilder Connection, which has already been set up to import data from an Excel spreadsheet. This spreadsheet has been created using external software. You have been told that it represents surveyed Utilities, and you have been asked to create a 3D model to reflect it.

   A ModelBuilder Connection is a mapping between data in an external file, and data in the design file. Once a connection and its mappings have been set up, the external data can be changed as often as required, and ModelBuilder can be used to synchronize the two.

   The lower left side of the ModelBuilder Wizard shows the names of the sheets in the Excel file, which are described as tables in this dialog. In this case there are five:

   - 'CommunicationOH$'
   - 'Culvert$'

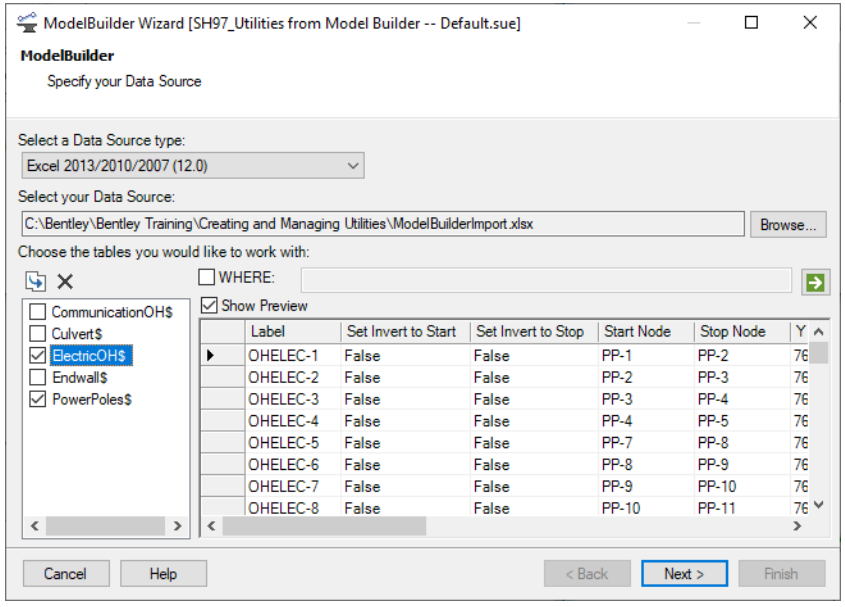
- ‘ElectricOH$’
- ‘Endwall$’
- ‘PowerPoles$’

Note: For this exercise we are just going to Import the *ElectricOH* and the *PowerPoles* utilities. So ensure that the *CommunicationsOH*, *Culvert* and *Endwall* options are de-selected.

2. Select > **‘ElectricOH$’**

   a. Select > **Show Preview**

   A preview shows you the content of the selected table.

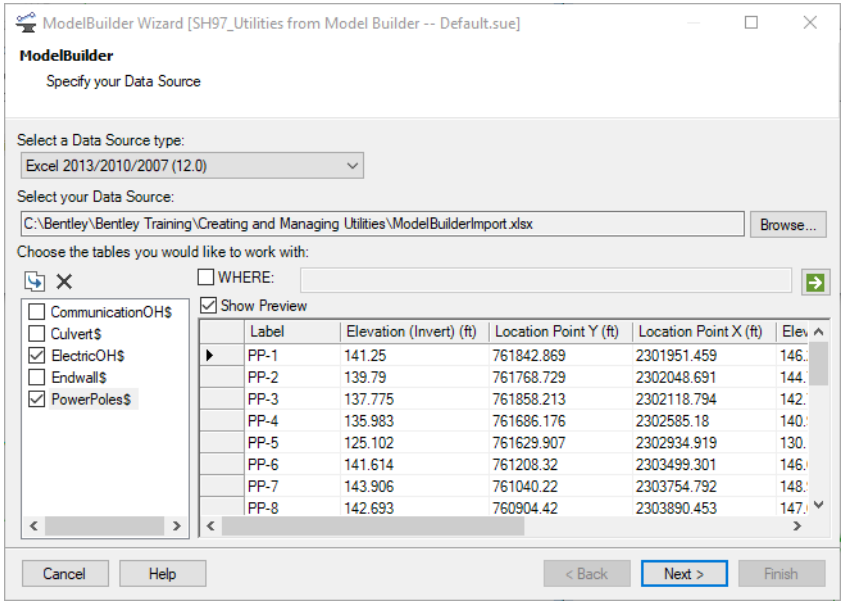


ModelBuilder has read the *“ElectricOH”* sheet, used the text in *row 1* for the column titles, then listed the data below them. The *“PowerPoles”* sheet is very similar.

3. Select > **'PowerPoles$'**

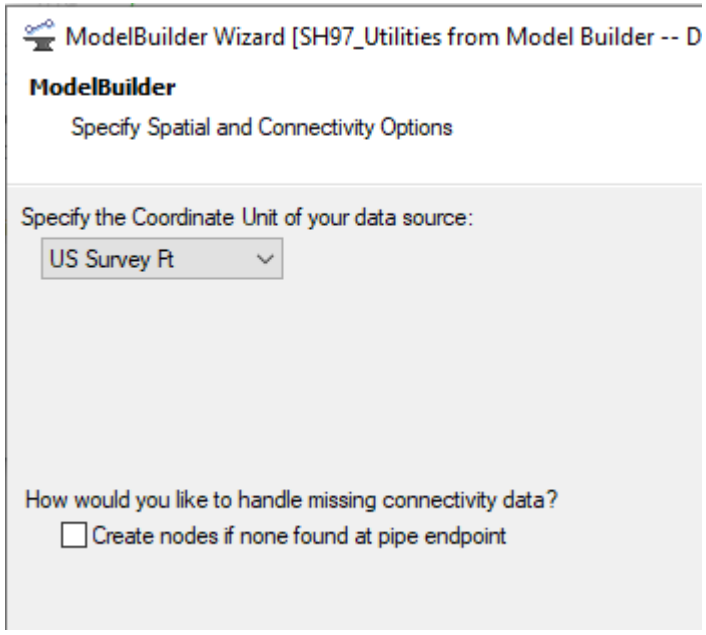
NOTE: The columns titled *Start Node* and *Stop Node* tell ModelBuilder which nodes each conduit connects to, so it's crucial that this data is available.

a. Select > **Next**



The *Specify Spatial and Connectivity Options* screen is displayed.

b. Verify that the units are set to **US Survey Ft**



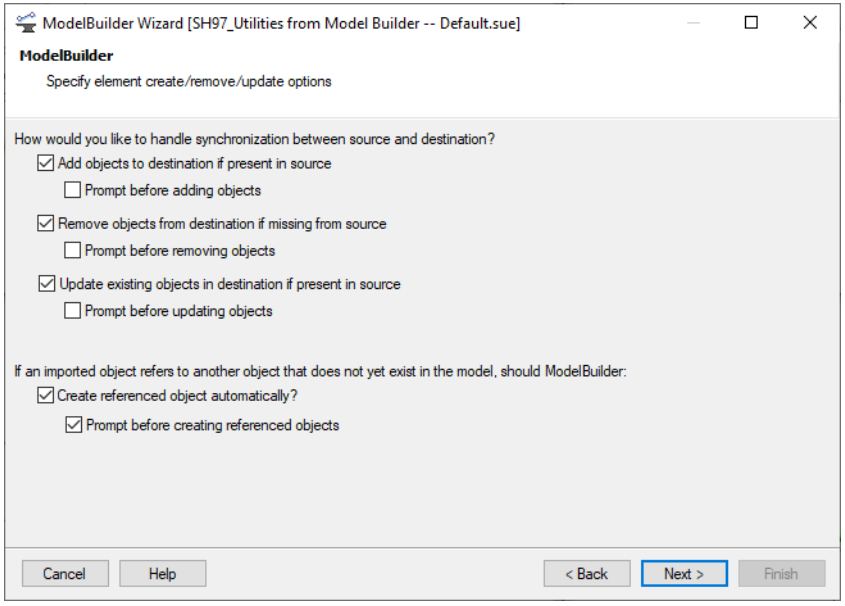
NOTE: The *Create nodes if none found at pipe endpoint* option is not checked, because the data should be complete. If there are any nodes missing, then ModelBuilder will tell you so that you can correct the data.

c. Select > **Next**

The next page is *Specify element create/remove/update options.* This is where you tell ModelBuilder how to handle situations where there are differences between the source and destination data.

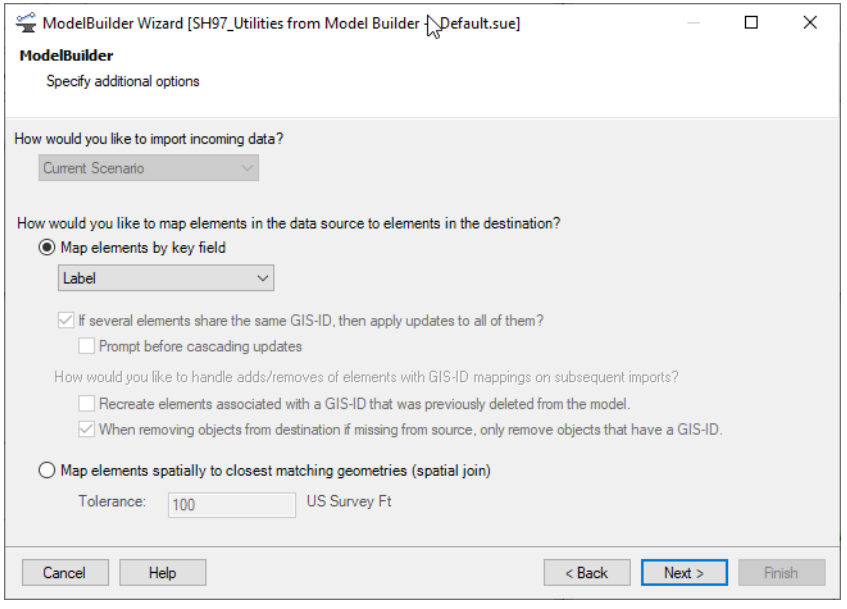
Review the settings and make sure that they match the image on the right.

d. Select > **Next**



This page is *Specify additional options.* This is where you tell ModelBuilder which scenario to import the data into and what key piece of information you will use to tie the objects together. For Excel data, the key field will be the *Label.*

e. Select > **Next**



Field Mappings – Catch Basins

The next steps are where you specify field mappings for each table in the Excel file.

1. Ensure that the **ElectricOH$,** table is selected.

   a. On the **Settings** tab, note the following mappings:

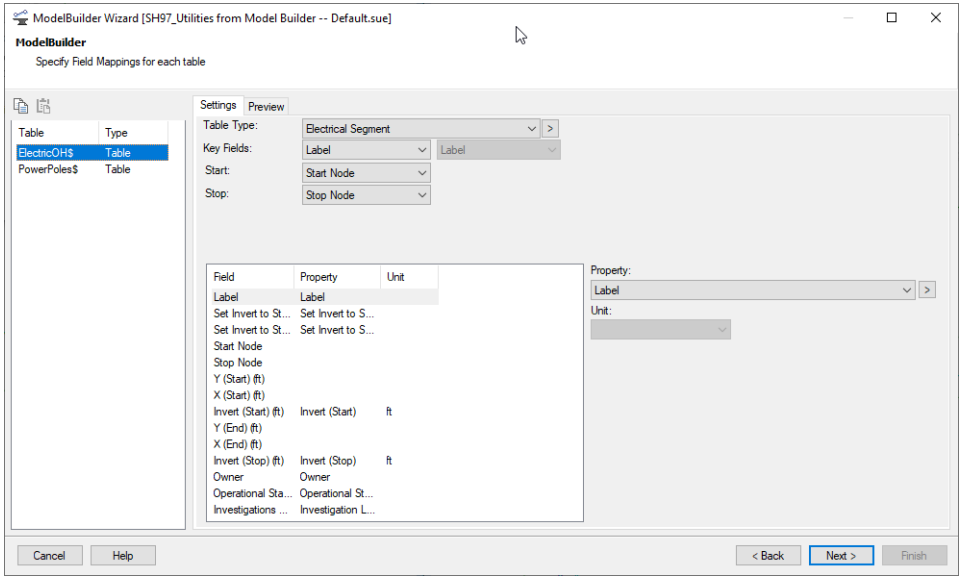
   Table Type: **Electric Segment**

   Key Fields: **Label**

   Start: **Start Node**

   Stop: **Stop Node**

   These are mandatory settings – they must be set.



   Below the columns in the Combination Inlet sheet are listed in the Field column. The Property column to the right of it shows the Drainage and Utilities property and unit.

   b. Verify or set the following mappings:

Field	Property/Unit
Set Invert to Start:	**Set Invert to Start**
Set Invert to Stop:	**Set Invert to Stop**
Invert Start:	**Invert Start /ft**
Invert Stop:	**Invert Stop /ft**
Owner	**Owner**
Operational Status:	**Operational Status**
Investigations:	**Investigation Level**

2. Ensure that the **PowerPoles$,** table is selected.

   a. On the **Settings** tab, note the following mappings:

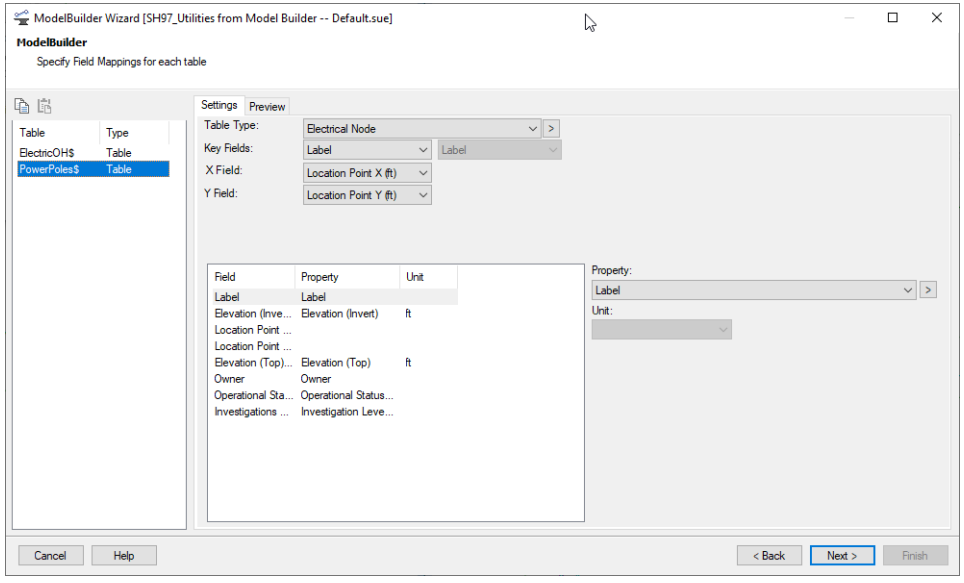
   Table Type: **Electric Node**

   Key Fields: **Label**

   X Field: **Location Point X (ft)**

   Y Field: **Location Point Y (ft)**

   These are mandatory settings – they must be set.



   Below the columns in the Combination Inlet sheet are listed in the Field column. The Property column to the right of it shows the Drainage and Utilities property and unit.

   b. Verify or set the following mappings:

Field	**Property/Unit**
Elevation (Invert) (ft):	**Elevation (Invert)/ft**
Elevation (Top) (ft):	**Elevation (Top)/ft**
Owner	**Owner**
Operational Status:	**Operational Status**
Investigations:	**Investigation Level**

   c. Select > **Next**

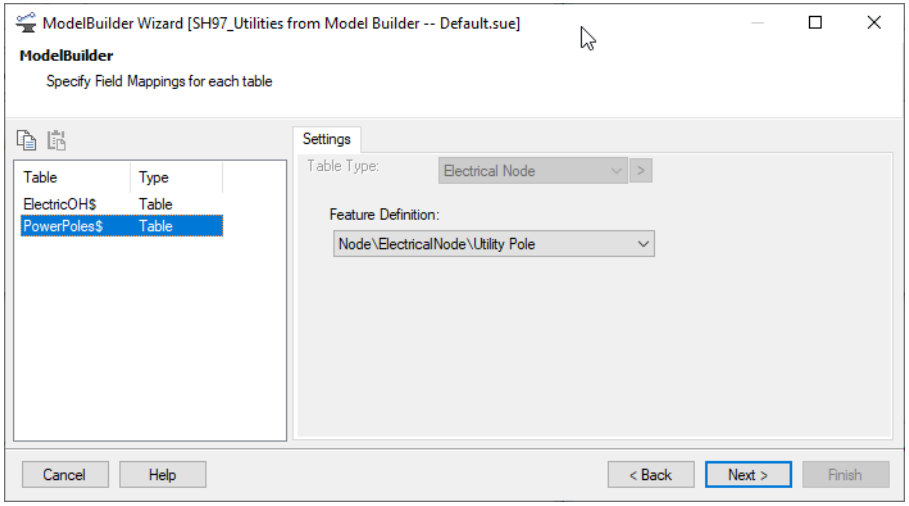
Feature Mappings – Feature Definitions

This page of the wizard lets you set the *Feature Definition* to use for each table.

---

1. On the **Settings** tab, set the following mappings:

Table	Feature Definition
'ElectricOHt$'	*Conduit**Electrical Segment***Direct Bury Cable**
– Missing Node	<none>
'PowerPoles$'	*Node**Electrical Node***Utility Pole**

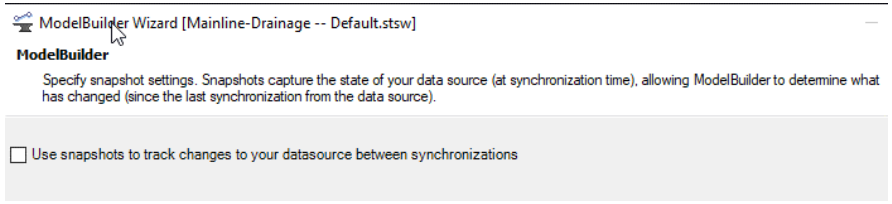


   a. Select > **Next**

Final Steps

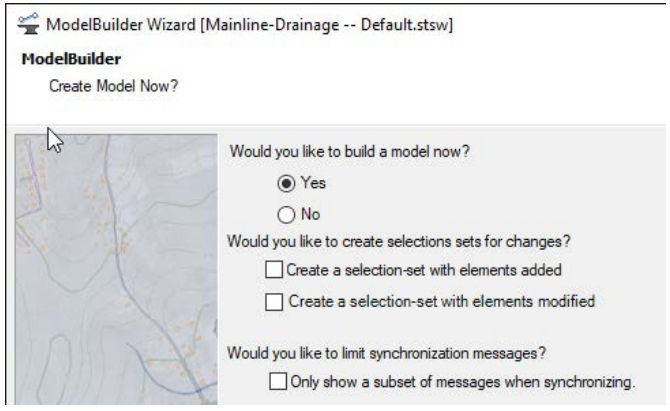
Snapshots can be used to track changes in the data between runs of ModelBuilder. If enabled, on the second and subsequent runs a dialog is displayed that shows you what has changed since the last time you synchronized the data. This option is *not* required for the class.

1. Click **Next**



   Ensure that *Would you like to build a model now?*

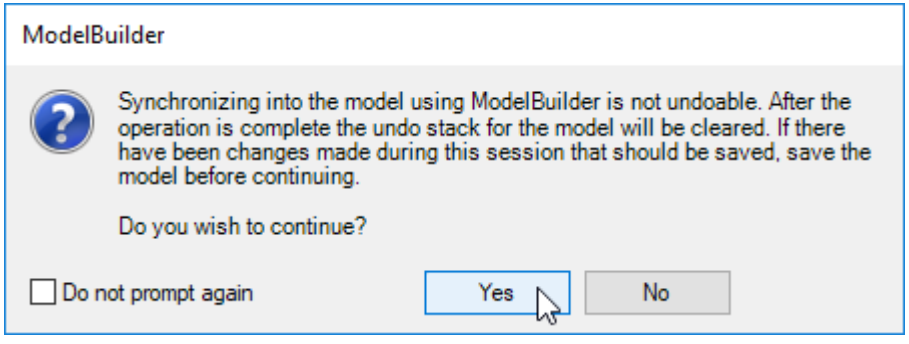
   a. Is set to **Yes**



   b. Select > **Finish**

   c. Select > **Yes** to confirm that you are happy to continue.

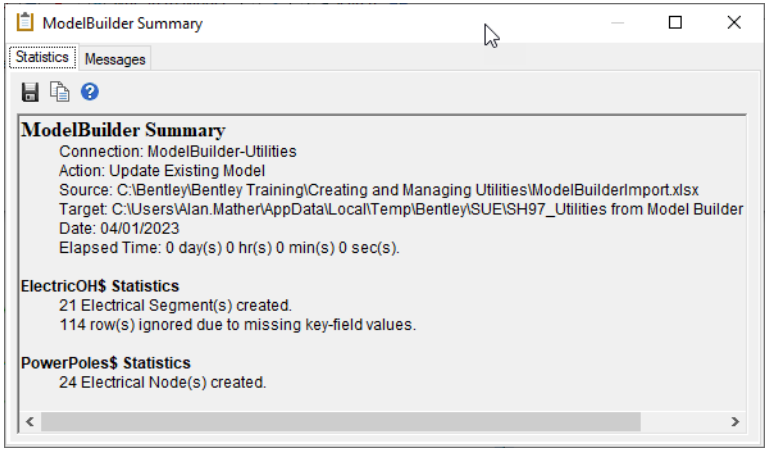
   The Excel data is now processed.



When this is complete, you will see a summary panel which tells you what ModelBuilder has done.

- ElectricOH
- Power Poles

The summary panel tells you what's happened.

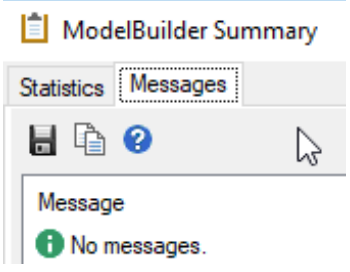


NOTE: The design file has not been updated yet.

You will note on the summary dialog under ElectricOH$,the message states that there were 114 row(s) ignored due to missing key-field values. This is because there are blank lines in the spread sheet.

The *Messages* tab is also worth checking, in case there are any issues. In this case, there are no messages.

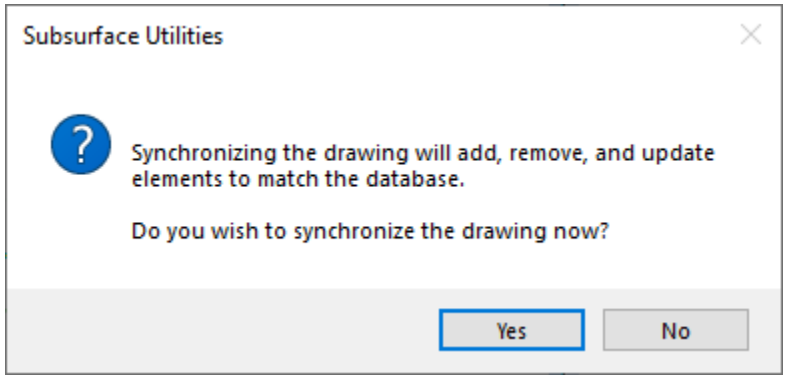
d. **Close** the *ModelBuilder Summary* dialog.



e. **Close** the *ModelBuilder* dialog.

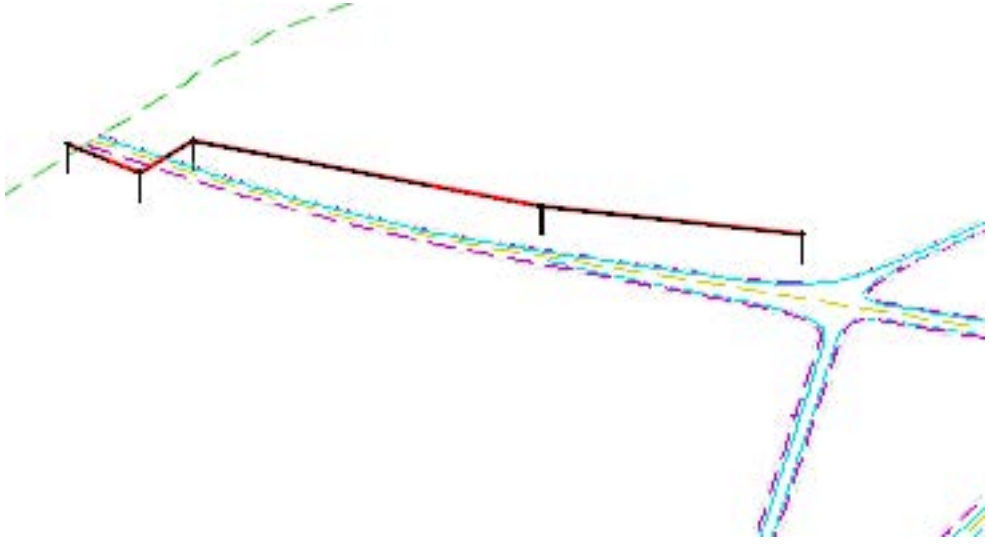
f. Select > **Yes**

To confirm that you want to synchronize the drawing.



The design file is now updated, which takes a few moments.

g. *Review* the results in the **3D View**



Exercise 5: Conflict Detection

Description

In this exercise we will determine which, if any, of our Utilities conflicts with the designed Drainage Network or any of the designed structures.

Skills Taught

- Set up the Conflict Detection parameters (conflict targets, soft clearances, resulting Conflict Nodes)
- Review Conflict results using the Flex Tables.

Detecting Hard Conflicts

We will now check the Utilities against the Drainage Network.

---

1. Open file **SH97_Utility Conflicts.dgn**

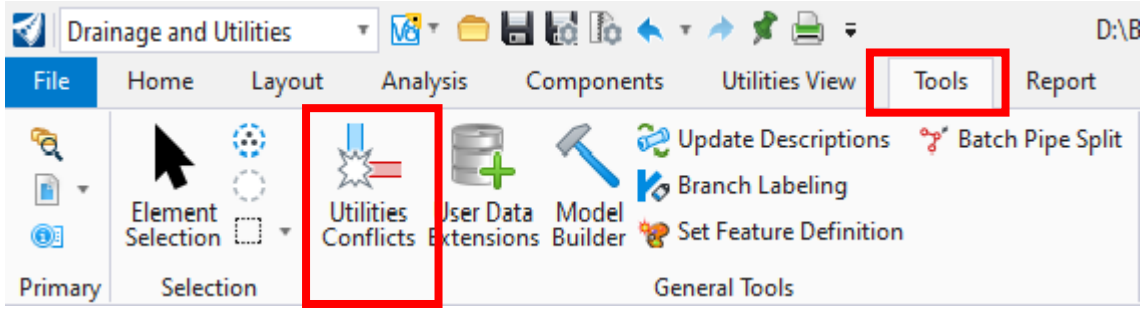
   Note: What we have in this DGN is the *Road Design Corridor*, *Drainage Design* and the *Utilities* that we imported. The display of the *Road Corridor* and *Bridge design* are switched off on both the *2D* and *3D* Views.

2. Ensure that the **3D** view is the active view.

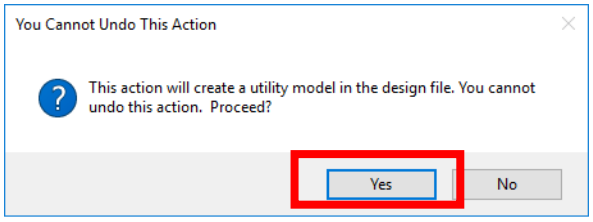
   Note: Conflict detection must be done in the 3D Model, the Utilities Conflict dialog is disabled if the 2D Model is active.

   The Utilities Conflict Detection tool works with the active dgn and any reference files with their Display On.

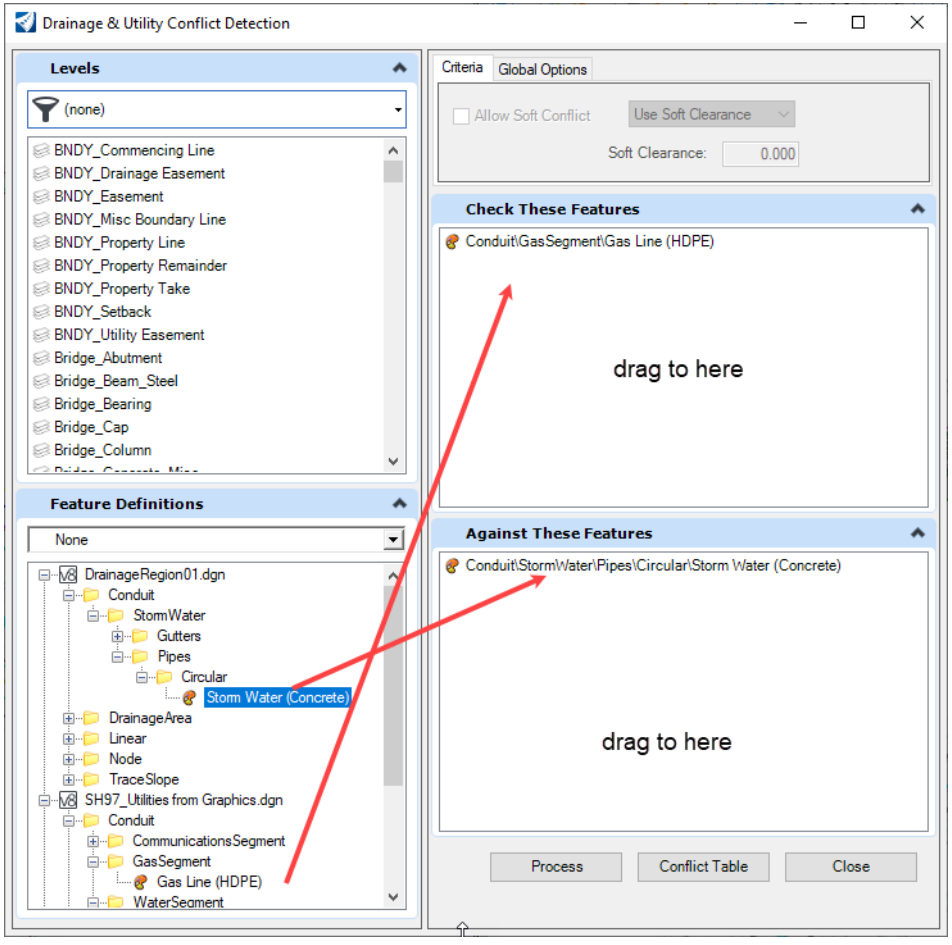
3. Select *Tools* > *General Tools* > **Utilities Conflicts**



If the file does not have a Utility database the first command selected will prompt you for permission to create it.



4. From the *Subsurface Utility Conflict Detection* dialog, define the features to be analyzed by dragging the appropriate *Feature Definitions* into the *Subset* boxes



The Utility Conflict Detection tool is similar to Bentley Navigator's Conflict Detection tool. It does incorporate some additional utility-optimized functionality, including:

- Utility conflict detection creates a node feature at all conflicts. This node can be featurized and visualized the same as any other utility
- Node type
- The found conflict nodes can be reported and edited in FlexTables
- Multiple conflicts between two features are identified, not just the first one
- Feature Definitions can be used to define conflict sets
- OpenRoads trenches can define soft conflict envelopes

Note: The *Check These Features* and *Against These Features* sets can be defined by Level contents or by Feature Definitions.

5. Select *SH97_Utilities from Graphics.dgn***Conduit\GasSegment\Gas Line (HDPE)** Feature Definition and drag it to the *Check These Features* list.

   a. Select the following feature definitions and drag it to the *Against These Features* list.

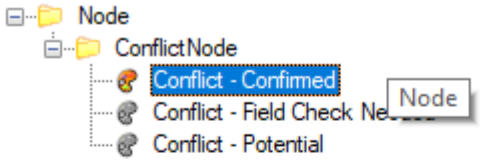
   - *DrainageRegion01.dgn***Conduit\StromWater\Pipes\Circular\Storm Water (Concrete)**

   b. Ensure that the **Allow Soft Conflict** option in the *Criteria* tab in the upper middle of the Conflict Detection dialog is cleared.

   The result of Clash Detection is a node at each conflict. The nodes can be any node defined by a Feature Definition. We need to specify how to represent detected conflicts. Our workspace represents a clash with a red sphere.

   c. Click on the **Global Options** tab

d. For *Feature Definition*, select *Node > ConflictNode >* **Conflict-Confirmed**



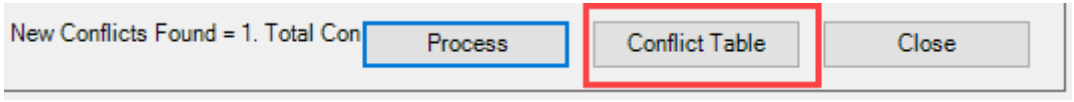
e. Click **Process**

Status dialogs open and close. No “results confirmations or summaries” are provided, but nodes are created at the conflicts and are displayed in the design file. The conflict nodes obey the symbology definitions as defined by the Conflict Node Feature Definition.

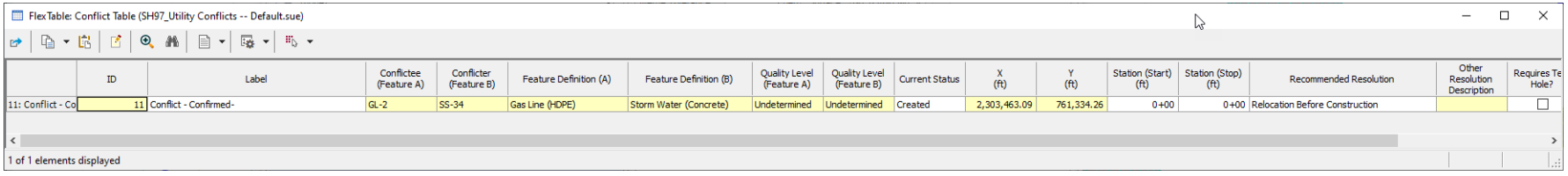
Numerous tools can be used to methodologically evaluate the conflicts.

Note: Conflict Nodes and be located vertically at the conflict itself or at a designated terrain.

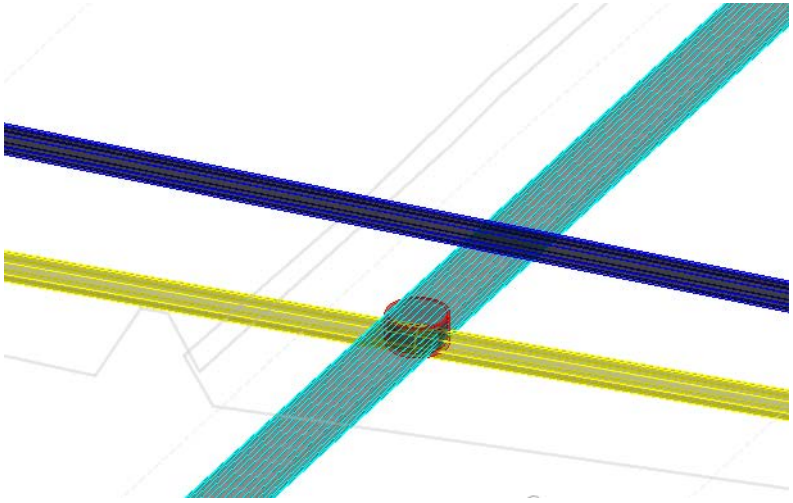
6. Once Processing has finished on the *Drainage and Utility Conflict Detection* dialog, Select *>* **Conflict Table**



This Opens the *Flex Tables-Conflict Table*.



You will note that there is **1 conflict**.



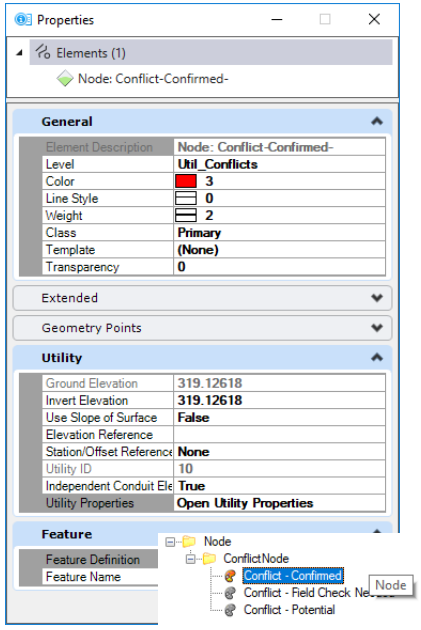
7. We are now going to Save the conflict in a file
   a. On the Flex Table, Select > **Export to File**
   b. Change > *Save as type* > **Comma Delimited File (*.csv)**
   c. *File Name* > **Conflict 1**
   d. Select > **Save**
   e. **Close** the *Flex Table Conflict Table*
   f. **Close** the *Drainage and Utilities Conflict Detection* Dialog

Managing the Results

Once the conflicts have been found, engineering decisions can be made. Because existing data is often of questionable quality, especially elevations, a common procedure for many conflicts is to request field confirmation of the location of the existing utility. Boring or “pot holing” at the potential conflict location may find that

- A conflict does not actually exist
- The existing utility may need relocation or abandonment
- The proposed design might need editing.

In many cases, a work order to evaluate the existing condition may be required. Changing the Feature Definition of the Conflict Node to a Field Request type is commonly the next step in managing conflict resolution.



Running another conflict detection tests does NOT delete any previously-created conflict nodes.

You will want to plan what you want to do with the existing nodes.

Do they have value (like ‘Borehole Needed’) or are you running a series of conflict tests whose results are not “permanent”?

The conflict nodes we just created have no long-term use, nor will any of the nodes created in the next exercises. We will delete the results of each test.

Deleting Conflict Nodes

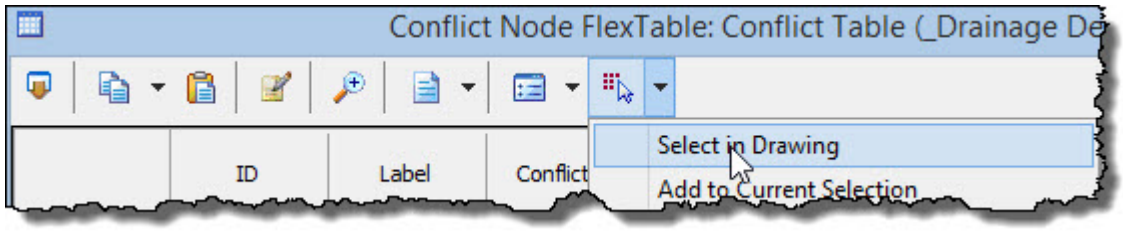
Conflict Nodes are like any other node and can be deleted like any other node.

A preferred way to delete nodes is via selection sets created by FlexTables and Queries. Once a selection set is active, click Delete.

---

1. Make sure a 2D View is active, as Select in Drawing only works in 2D.
2. Select *Utilities View > Results Views >* **Flex Tables**
   a. Select > *Utilities Tab >* **Conflict Table**
   b. **Double Click** on the *Conflict Table*
   c. In the *FlexTable* toolbar, Select > **Select in Drawing** icon

   This highlights and creates a selection set in the drawing.

   d. Select **Delete** from the *Drawing Ribbon* or press **Delete** on your keyboard
   e. **Close** the *Flex Table Conflict Node Table*
   f. **Close** the *Flex Table Dialog*

   Note that double-clicking the Predefined Query Nodes > All Conflicts will also create a selection set of the conflict nodes.

Detecting Soft Conflicts

What is a Soft Conflict. This is where a Utility does not actual find an actual conflict but reports a conflict within a range.

---

1. Remaining in **SH97_Utility Conflicts.dgn**
2. Ensure that the 3D view is the active view
3. Select *Tools > General Tools* **> Utilities Conflicts**

   a. **Clear** the dialog of the previous entries.

   b. Select the *SH97_Utilities from Graphics.dgn***Conduit\CommunicationsSegment\Comm Duct** feature definition and drag into *Check These Features.*

   c. Select the following Utility and drag into the *Against These Features.*

      - *SH97_Utilities from Graphics.dgn***Conduit\WaterSegment\Water Line (HDPE)**

   d. Select the **Conduit\CommunicationsSegment\Comm Duct**

   e. Enable the *Allow Soft Conflict* check box.

   f. Type a *Soft Clearance* of **20'**

   This will look for any clashes within 20 foot of the Water Lines.

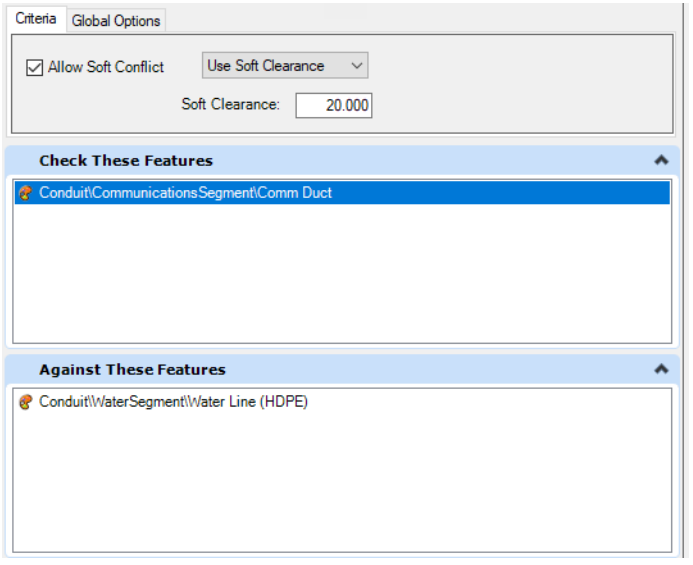
   g. **Process** the Conflict Detection...

   Conflict nodes, including hard conflicts, are created again.

   How many conflicts are there with a **20'** clearance?

   Feel free to delete your results and try other Soft Clearance values.

   Full Storm Network Clash Detection



To check the full storm network against the other utilities, simply drag all the Storm Sewer Feature Definitions and Drainage Node Feature Definitions into the Check This list and Process.

h. Check the **Conflict Table** and Review the results

FlexTable: Conflict Table (SH97_Utility Conflicts -- Default.sue)

	ID	Label	Conflictee (Feature A)	Conflicter (Feature B)	Feature Definition (A)	Feature Definition (B)	Quality Level (Feature A)	Quality Level (Feature B)	Current Status	X (ft)	Y (ft)	Station (Start) (ft)	Station (Stop) (ft)	Recommended R
12: Conflict - Co	12	Conflict - Confirmed-	FOC-2	WL-17	Comm Duct	Water Line (HDPE)	Undetermined	Undetermined	Created	2,303,291.11	761,368.91	0+00	0+00	Relocation Before Cor
13: Conflict - Co	13	Conflict - Confirmed-1	FOC-1	WL-17	Comm Duct	Water Line (HDPE)	Undetermined	Undetermined	Created	2,303,291.11	761,368.91	0+00	0+00	Relocation Before Cor
14: Conflict - Co	14	Conflict - Confirmed-2	FOC-2	WL-36	Comm Duct	Water Line (HDPE)	Undetermined	Undetermined	Created	2,303,291.11	761,368.91	0+00	0+00	Relocation Before Cor
15: Conflict - Co	15	Conflict - Confirmed-3	FOC-1	WL-36	Comm Duct	Water Line (HDPE)	Undetermined	Undetermined	Created	2,303,291.11	761,368.91	0+00	0+00	Relocation Before Cor

4 of 4 elements displayed

i. **Delete** the results from the *Flex Table*

j. **Close** the *Flex Table Conflict Table*

k. **Close** the *Drainage & Utility Conflict Detection* Dialog

Exercise 6: Detecting Clashes with Corridor Meshes

Description

In this exercise we will show how to identify utilities that clash with the Road Corridor Meshes

Skills Taught

- Checking Conflicts with Road Corridor Mesh

1. Continue in the file **SH97_Utility Conflicts.dgn**

   a. Select the **3D view**.

2. Select **Utilities Conflicts**

   The Feature Definitions are grouped by active and reference files; there are a number of them.

   a. **Clear** the dialog of the previous entries.

   b. Drag the *SH97_Utilities from Graphics.dgn* **Conduit\Water Segment\Water Line HDPE** Feature Definition to the *Check These Features* list

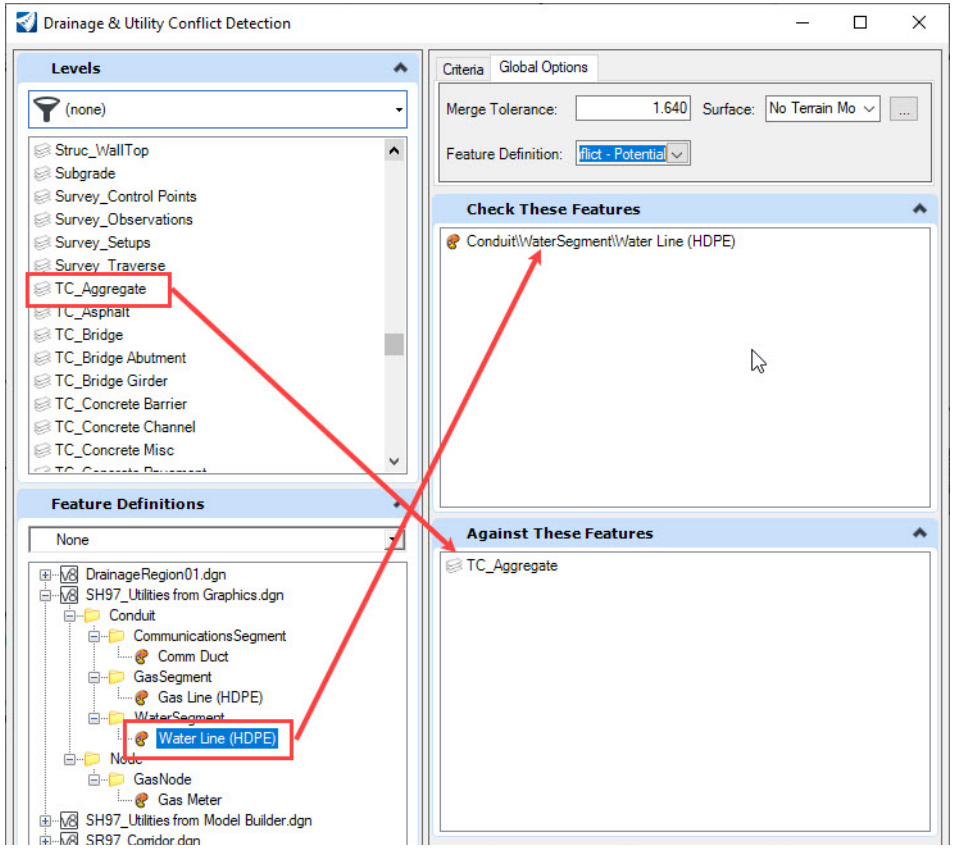
   c. Drag the from the Levels pane **TC_Aggregate** Level to the *Against These Features* list.

   d. Click on the **Conduit\Water Segment\Water Line HDPE** in the *Check These* list.

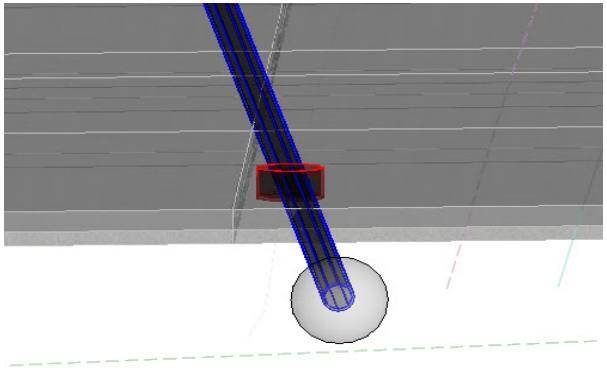
   e. **Select** the *Global Options*

   f. Under *Global Options*, ensure that *Feature Definition* is set to *Node > ConflictNode >* **Conflict Potential**

   g. Select **Process**



h. Review Results, Select **Conflict Table**



i. **Flex table** results.

FlexTable: Conflict Table (SH97_Utility Conflicts -- Default.sue)

	ID	Label	Conflictee (Feature A)	Conflicter (Feature B)	Feature Definition (A)	Feature Definition (B)	Quality Level (Feature A)	Quality Level (Feature B)	Current Status	X (ft)	Y (ft)	Station (Start) (ft)	Station (Stop) (ft)	Recommer
49: Conflict - Co	49	Conflict - Confirmed-	WL-9	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,304,790.50	760,920.79	0+00	0+00	Relocation Befo
50: Conflict - Co	50	Conflict - Confirmed-1	WL-10	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,304,773.60	760,922.12	0+00	0+00	Relocation Befo
51: Conflict - Co	51	Conflict - Confirmed-2	WL-19	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,302,439.33	761,683.92	0+00	0+00	Relocation Befo
52: Conflict - Co	52	Conflict - Confirmed-3	WL-19	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,302,032.06	761,902.04	0+00	0+00	Relocation Befo
53: Conflict - Co	53	Conflict - Confirmed-4	WL-28	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,304,790.50	760,920.79	0+00	0+00	Relocation Befo
54: Conflict - Co	54	Conflict - Confirmed-5	WL-29	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,304,773.60	760,922.12	0+00	0+00	Relocation Befo
55: Conflict - Co	55	Conflict - Confirmed-6	WL-38	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,302,439.33	761,683.92	0+00	0+00	Relocation Befo
56: Conflict - Co	56	Conflict - Confirmed-7	WL-38	TC_Aggregat...	Water Line (HDPE)	TC_Aggregate Typ A	Undetermined	Undetermined	Created	2,302,032.06	761,902.04	0+00	0+00	Relocation Befo

8 of 8 elements displayed

j. **Close** the *Flex Table Conflict Table*

k. **Close** the *Drainage and Utilities Conflict Detection* Dialog

l. **Exit** the Software

Summary

In this course we have learned how to import Utilities into our Drainage and Utility model using methods selection and Filters Groups. We have also imported utilities using Model Builder.

We then learned how to detect conflicts between Utilities, the drainage network and the Road mesh. Also we have learned how to report those clashes.