Explore Project Explorer in Autodesk Civil 3D
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Learning Objectives

- Review / Understand Project Explorer Capabilities
- Design / Modify your design
- Validate your design using Project Explorer
- Report and share data with the touch of a button!

Description

Take control of your project like never before! Project Explorer brings a whole new level of design to your projects. This session takes you through a live project and the benefits you'll gain by implementing Project Explorer. Even on the simplest of projects, you will see a huge time/cost savings by being able to review and modify your design as well as utilize automated reports that will help you further understand your design at every step of the game. Get ready to start exploring like never before.

Speaker(s)

As an accomplished consultant for over 15+ years, Shawn Herring is a well-known figure in the civil infrastructure design community. Shawn has many titles, Consulting & Services Manager for ProSoft, Owner of Region Engineering & Surveying and Co-Founder of RealityOne which specializes in LiDar and drone reality capture.

Over the past decade Shawn has been involved in hundreds of projects across the country. During his vast career, Shawn has trained thousands of CADD users, helped hundreds of civil infrastructure companies and major Department of Transportations implement new technologies, standardize workflows and enhance productivity. Shawn has been a part of 100's of Drone and LiDar scanning projects, ranging from simple roadway scans to complex contaminated land restoration projects consisting of 1000's of acres.

Shawn is a contributor/author for several local, national and international publications. His forward thinking and professional insights have been published in UC&D magazine, Informed Infrastructure and AUGI magazine to name a few. Shawn has traveled the US and Canada as guest presenter/key note speaker for many user groups and industry-specific conferences. He has also been a sought-after presenter at Autodesk University over the past several years.

In addition to being a highly sought-after industry consultant, outside of the office, Shawn enjoys spending his personal time with his family and being in the outdoors. He also believes in giving back to his community. Shawn sits on many local advisory boards and volunteers his time with incredible organizations like the Boys & Girls club of America, Make-A-Wish Foundation, the Boy Scouts of America and the Special Olympics.
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Review / Understand Project Explorer Capabilities (No Tutorial)

What is Project Explorer?
Project Explorer provides users with an easy-to-use Civil 3D design model review tool and user-configurable report generator. Civil 3D users now have a more efficient way to access, interact, and share the staggering array of design information that is in a Civil 3D model.

Project Explorer:
- Simplifies project data navigation, review, and model editing.
- Makes it easier to discover and evaluate design criteria warnings to help meet design standards.
- Facilitates more efficient generation of custom reports and tables that help meet delivery requirements.

With Project Explorer, project teams can reduce overall design times, better manage project complexity, and leverage project resources more effectively.

How is it used?
Typically, to manage project and drawing objects, users would use the Toolspace Prospector tab in Civil 3D.

Now, you can view and edit Civil 3D designs in a tabbed series of object lists, profile and section views, parameter lists, and many other design review tools.

Now, you can validate your design using an extensive range of dynamic tooltips.

And now, you can automate the production of user configurable reports, spreadsheets, dynamic tables, and AutoCAD drawings.

Customizing the Project Explorer Window
There are two different aspects to the customization of the user interface:

User Interface Layout
The layout of content is handled from the Layout Options window, which can be accessed from the Layout... button in the bottom left of the main Project Explorer window. You can use this window to edit the layout, visibility, and name of all data columns. Layout Options can be saved to Layout Styles which can also be used to control the layout of reports and tables.

User Interface Preferences
The remaining options in the Project Explorer window such as fonts, colors, the layout, and visibility of Object Category tabs, and profile view colors and scales, are controlled from the Project Explorer Preferences window.
Project Explorer – Design / Modify your design

Working in Project Explorer
All information displayed in the Project Explorer window is live geometric project data from the Civil 3D model. Therefore, if something is modified or added to the Civil 3D model, the content in Project Explorer will update automatically. If you use dual monitors, consider keeping Project Explorer open on your second monitor while you work in Civil 3D.

Alignments & Profiles
Being able to see all alignments, profiles and sections in one area, and to be able to switch between features is key to streamlining workflows. Here, we will start with viewing and editing alignments, profiles and sections within project explorer.

Assemblies & Corridors
A massive amount of data exists within your assemblies and even more so within your corridor model. Project Explorer streamlines the viewing and editing of these models and provides insight into the data behind the scenes like never before.

Pipe Networks
The options within Project Explorer for pipe networks are never ending! You can easily switch between pipe runs, edit multiple lines, SWAP MULTIPLE parts and make global changes that you’ve always wanted to make, but never had the option to.

Point Groups, Surfaces & Parcels
The are many other objects in Project Explorer you can view, edit, analyze and report on. Here we will quickly explore a few additional tools.

There are essentially three key ways to make changes to your Civil 3D design from the Project Explorer window.

- Double-click any highlighted parameter to directly edit the underlying individual value.
- Right-click a selection of objects or points to access a slightly more limited range of parameters which can be edited for multiple selections.
- Use a dedicated tool such as the Edit Pipe Run tool or the Swap Multiple Parts tool.
Tutorial #1: Editing the Civil 3D Model

The section below is a quick tutorial on working with your Civil 3D design in Project Explorer.

Editing the Civil 3D Model

This tutorial demonstrates the use of the editing tools in Project Explorer to apply some design changes to pipes and corridors.

You'll use the new Multiple Part Swap feature to edit a pipe network, then use the Assembly editing tools to widen the roadway on a corridor. Optionally, you'll then update the reports that were previously generated.

Let's Go!!

In Autodesk Civil 3D, open the drawing (Or any DWG containing Civil Objects): Design Base.dwg.

To learn about the report updating capabilities of the Object Sets, work through Tutorial #2 below, before commencing this tutorial. In this case, you should use the end result from that tutorial as your starting point for the following tasks.

First, open the Project Explorer window if it is not already open.

1. From the Civil 3D ribbon, select the Add-Ins tab and open the Project Explorer window.
2. Select the Pipe Networks tab in the Project Explorer window. You will see a single pipe network listed, called SEWER. You will work with this pipe network throughout this tutorial.
Setting the Reference Surface for multiple pipes and structures

Some later steps in this tutorial depend on having a reference surface set for all structures and pipes in this pipe network. Project Explorer allows the reference surface to be set for multiple parts of a pipe network in a single operation.

1. Ensure that the Structures tab is activated at sub-object level and select all structures in the Structures List (except SSMH 1 and 2)

2. From the right-click menu, select **Set Reference Surface(s)** and select **Overall FG** from the drop-down list.

3. Select the Pipes tab and select all pipes in the Pipes List.

4. From the right-click menu, select **Set Reference Surface(s)** and select **Overall FG** from the drop-down list to set the reference surface for all selected pipes.

Note: A shaded area now appears in the pipe network profile view. This shaded area indicates the minimum and maximum pipe cover depth range. This range is derived from the currently assigned pipe rule set, and will be used later in this tutorial to help determine whether the required cover depth is violated by changes that will be made to the slope of the pipes.
Editing pipe runs

1. From the pipe network profile view toolbar, set the start and end structure for the pipe run to:
   - Start Structure: SSMH – (6)
   - End Structure: SSMH – (10)
   - Comparison Surface: Existing Ground

2. Increase the vertical exaggeration of the profile view to 1:5.

3. Select Pipes from the part category tab as indicated below.

The profile view displays a pipe run representing the shortest path through the pipe network between the selected start and end structure.

Swapping Multiple Parts in a Pipe Network

Project Explorer allows multiple pipe network parts to be swapped in a single operation. You’ll use this tool now to make some changes to the pipe diameters on the pipe run.

1. Select the following pipes in the Pipes list in the Project Explorer window.
   - Pipe - (1) through Pipe – (5)
2. Right-click the selected pipes and select Swap Part(s) from the right-click menu.
3. From the **Swap Part Size** dialog, select the **10” PVC SS** and click **OK**.
Project Explorer allows the slope of an entire pipe run to be adjusted in a single operation. Let's try this now:
1. Check that the pipe network profile view settings are set to:
   - Start Structure: SSMH – (16)
   - End Structure: SSMH – (6)
   - Comparison Surface: Overall FG

2. Change the vertical exaggeration of the pipe network profile view to 1 : 10 to make it easier to see the pipe slope changes that you will apply.

3. Press the Edit Pipe Run button in the main toolbar of the Pipe Networks tab.

4. The Edit Pipe Run Slope and Elevations dialog opens.

5. Your aim is to adjust the start elevation of the pipe run but hold the elevation of the pipe at the end of the pipe run. Also, you need to apply a constant slope of 1.0% across all pipes while maintaining the crown elevation of each pipe at every intermediate structure.

6. Change the pipe run Control Parameters to Hold Pipe Run End Elevation.

7. Change the method for Hold Pipe Elevation to the Invert option.

8. Change the Pipe Run Slope to 1.00%.

9. Change the Pipe Elevation Offset at Structures to 0.10.

10. Click OK to close the dialog and return to the Project Explorer window. The pipe run is updated to give the following result.
Next, you'll apply a design change to a corridor by modifying the width of the main roadway.

First, ensure that any changes you apply to this assembly are immediately reflected in the associated corridor.

1. Select the **Corridors** tab in the Project Explorer window.
2. In the corridor list select **Legacy Farms - SF** and scroll across the list until you see the **Automatic Rebuild** parameter. Double click the existing value in this field and set it to **YES**.

3. Select the **Assemblies** tab in the Project Explorer window.
4. In the assemblies list select **Typical 60' ROW - Full**.
5. In the subassemblies list for this assembly, in the Right group, select **LaneSuperelevationAOR**.
6. The parameters for this subassembly are displayed and the assembly Section View indicates the geometry of the selected subassembly.

7. Double-click the width parameter and change the value from 14.500 to **16.000**.
8. Make the same change on the right side.

9. Note that the changes you have applied here are immediately reflected in both the Section View and in the AutoCAD viewport.

10. Select the **Corridors** tab in the main Project Explorer window.

11. In the corridor section view toolbar, select **Point Code(s)** from the **Find** drop down list and select **Back_Curb** from the list of available codes. This will highlight the location of the updated Back_Curb point codes in the section view.

**Tip:** Highlight the location of multiple point codes by entering a comma delimited list into this field. *(i.e. Back_Curb, ETW)*

![Diagram showing point codes highlighted in section view]
Project Explorer – Validate your design using Project Explorer

Validate Your Design
Dynamic violation reporting is an important feature within the Project Explorer window. Violation reporting quickly draws your attention to:

- Areas of your design which may not fully meet your design goals
- Objects within your civil model which are considered to be in an abnormal state.

Because Project Explorer always displays live information from the civil model, you can monitor how each violation is impacted by every design decision you make.

Project Explorer provides support for a growing list of violation conditions. The current list is summarized as follows:

**Alignments and profiles**
This alignment contains no entities.
This profile contains no entities.
Profile start station (chainage) falls beyond the station range of the associated alignment.
Profile end station (chainage) falls beyond the station range of the associated alignment.
Alignment entity is not tangential with an adjacent alignment entity.
Profile entity is not tangential with an adjacent profile entity.
Alignment entity does not comply with one or more rules in the assigned Design Check Set.
Profile entity does not comply with one or more rules in the assigned Design Check Set.

**Pipe Networks**
Pipe Networks: This pipe network contains no pipes or structures.
Pipe Networks: This pipe network references a Parts List which is missing or invalid. (v4.0.2.0)
Pipes: Minimum pipe cover of \(x\) is violated by \(y\).
Pipes: Maximum pipe cover of \(x\) is violated by \(y\).
Pipes: Minimum pipe slope of \(x\) is violated by \(y\).
Pipes: Maximum pipe slope of \(x\) is violated by \(y\).
Pipes: Minimum pipe length of \(x\) is violated by \(y\).
Pipes: Maximum pipe length of \(x\) is violated by \(y\).
Pipes: There is no structure assigned to the start of this pipe.
Pipes: There is no structure assigned to the end of this pipe.
Structures: There are no pipes connected to this structure.
Structures: Maximum diameter or width of \(x\) for pipe(s) connected to this structure is violated by \(y\).
Structures: Maximum pipe drop of \(x\) across structure is violated by \(y\).
Structures: Rim elevation of \(x\) for this structure does not match the referenced surface elevation of \(y\).

**Assemblies**
This assembly contains no subassemblies.
This assembly is not referenced to any corridors.
This (feature line) point code does not exist in the referenced code set style. (v1.9.9.1)

**Corridors**
This corridor definition is out of date.
This corridor contains no baselines.

**Point Groups**
This point group definition is out of date.
This point group contains no points.

**Surfaces**
This surface definition is out of date.
This surface contains no triangles or cells.
Sample Line Groups
This sample line group contains no sample lines.

AutoCAD Blocks
There are no references to this block definition in this drawing.

Object Sets
The Layout Options file for this Object Set does not exist.
The output path for this Object Set does not exist.
An object within this Object Set no longer exists.

Report History Window
The output path for this previously generated report no longer exists.
This previously generated report file no longer exists.

So as you can see, there are more options in alignments and pipe networks. But this list will continue to grow. For now, select the pipe networks tab in Project Explorer, switch to the Pipes tab and look for any items with a warning symbol. Hover over that symbol to see your design warning.

The warning shown below, reviews your Pipe Rules and notices that we exceed the 400’ between structure rules!!
Project Explorer – Report and share data with the touch of a button!

Sharing & Reporting Data
Within your Civil 3D files there is an abundance of information. As you know, within Civil 3D there are many reporting methods for creating tables and exporting reports.

Project Explorer has its own built in, customizable and exportable, reports and tables. These can be built from individual objects as well as a group of “Object Sets”.

Also within Project Explorer are the options to export out to 2D AutoCAD drawings. This export ONLY the Civil 3D Entities, and no other linework.

Object Sets
The **Object Sets** tab in the main Project Explorer window allows one or more sets of objects to be persistently defined in your AutoCAD drawing. Object Sets are particularly useful for automating the generation of one or more reports from your drawing. Actions may be associated with each Object Set, and these actions can be triggered with just a single mouse click. For example, a report generating action could be used to create a report file using a pre-configured Layout Style, Report Style, Output File Name, and Path.

Reports
There are two key methods for generating reports and spreadsheets from Project Explorer. The quickest and simplest method is to use the Quick Report to File option. Alternatively, if more control is required over the content or scope of the report, or if it is likely to require updating repeatedly, an Object Set can be used to control the generation of your report.

Generate AutoCAD Drawings
The purpose of the 2D drawing export function in Project Explorer is to allow users to generate DWG files containing simplified 2D versions of their Civil 3D content. Exported geometry should look identical in plan but be built only from 2D entities. Sub-surface geometry and complex relationships that exist in the source Civil 3D drawing should be excluded from the exported drawing.

Generate AutoCAD Tables
There are two key methods for generating AutoCAD Tables from Project Explorer. The quickest and simplest method is to use the Quick Report to AutoCAD table option which supports the creation of static AutoCAD tables only. Alternatively, if more control is required over the content or scope of the table, or if it is likely to require updating repeatedly, an **Object Set** can be used to control the generation of your table. The Object Sets workflow supports the creation of dynamic AutoCAD tables which are linked back to source object geometry in Civil 3D.
Tutorial #2: Object Sets & Reporting

The section below is a quick tutorial on working with Object Sets and Reporting in Project Explorer.

Object Sets allow you to create a selection of objects in a Civil 3D drawing. Object Sets are remembered in each AutoCAD drawing. Object Sets can have optional actions associated with them. Actions are generally configured to generate report files or to export data files. Filters can be applied to certain types of objects in an object set to (for instance):

- Compare an alignment with another alignment in terms of offset/elevation/crossfall on a station by station basis.
- A start and end structure to produce a pipe run report.
- A comparison surface to show pipe depths at regular intervals in a pipe run report.
- Specific point codes to restrict the types of feature line included in a corridor report.

Working with Object Sets

This tutorial demonstrates the use of Object Sets in Project Explorer to simultaneously generate two broadly identical reports to a Microsoft Word DOCX file and a Microsoft Excel XLSX file. The use of object sets will allow you to easily ensure that the content of both files is kept in-sync, even after a design change.

Object Sets allow complex reports to be generated, featuring a range of content from a Civil 3D model. In this example, the report will include a pipe run between two specific structures on a pipe network, and a station based report of the gutter lines on a corridor.

In Autodesk Civil 3D, open the drawing: Design Base_2.dwg

Creating the first Object Set

1. From the Civil 3D ribbon, select the Add-Ins tab and click Launch Project Explorer to open the Project Explorer window.
2. Select the Object Sets tab in the Project Explorer window, then click the New Object Set button on the toolbar to start creating the first object set in the current drawing.
The **Create Object Set** dialog box opens.

**Configuring the Object Set**

To define an object set which generates a report, you need to create a file name, file type, and output path for the report, then configure the content and layout of the report using a Layout Style and a Report Style.

1. Select **Report to DOCX File** from the **Action** drop down list.
2. Set the required Output Path if desired.

3. Change the Layout Style setting to **Use Specific Layout Style**, then click the **Edit** button to start defining the layout of this report.

   The **Layout Options** dialog opens.

**Layout Style Options**

Layout Styles define the heading, visibility, and order of every column of data in the report. The units of numerical values can also be controlled from a layout style.

![Layout Options Dialog](image)

From this dialog you will define the layout style which will be applied to the outgoing report. Most importantly, you can choose to turn off some data columns from your report.

1. On the **Corridors** tab of the Layout Options dialog box, ensure that **Configure Column Layout for Corridor Feature Line Points** is selected.

2. From the list view, clear the following column labels:
   - Point
   - Region
   - Assembly
3. On the **Pipe Networks** tab of the Layout Options dialog box, ensure that **Configure Column Layout for Pipe Networks** is selected.

4. From the list view, **clear** the following column labels:
   - Structure Plan Label Style
   - Pipe Plan Label Style
   - Structure Plan Layer
   - Pipe Plan Layer

5. Change the drop-down list to **Configure Column Layout for Pipe Runs**.

6. From the list view, clear everything. Then, just select the following items:
   - Pipe Run Distance
   - Part Name
   - Easting
   - Northing
   - Invert Out
   - Invert
   - Invert In
• Reference Surface
• Reference Surface Elevation
• Reference Surface Cover/Depth

7. At this point, you may rename or reorder any of the selected columns to match the standards in your organization. Columns may be renamed by double-clicking on the required label, or by right-clicking and selecting Rename from the right-click menu.

8. Select the General tab (far right) and note the options here to set the format of numerical values such as angles/bearings, stations, elevations, and slopes.

9. To use a specific layout style with an object set, you need to save these settings to a layout style and associate the resulting file with this object set.

10. Click the Save button, and save the layout style to a path and file name of your choice.

11. Click OK to close the Layout Options dialog and return to the Create Object Set dialog box.

Report Style Options

Next, you’ll set up a Report Style to determine the page formatting, fonts, table style, and header/footer content of the outgoing report.

1. In the Create Object Set dialog, under the Report Style section, press the Edit button.
2. The Report Options dialog opens.
3. On the **Page Options** tab, set the page size to **A4**, and the page orientation to **Portrait**.

4. On the **Font Options** tab, set the preferred font to **Corbel** and the font size to **10pt**.
5. Save these settings to a Report Style and associate the resulting file with this object set. Click the **Save** button, and save the report style to a path and file name of your choice.

6. Click **OK** to close the **Report Options** dialog and return to the Create Object Set dialog.

Note that you have now created references in your object set to the layout style and report style that you just defined.

Click **OK** to close the **Create Object Set** dialog. You have now completed setting up our first object set.

Next you will populate the object set with some objects.

**Populating an Object Set**

The objects that you place in your object set will determine the content of our generated report. In the next steps you will use two different methods to add objects to this object set.

**To add a corridor from the Object Sets tab:**

1. On the **Object Sets** tab of the main Project Explorer window, click the **Add/Remove Object(s) to/from Object Set** button.
2. On the **Corridors** tab of the resulting dialog, select the **Legacy Farms** corridor and click **OK**.
<table>
<thead>
<tr>
<th>Index</th>
<th>Object Name</th>
<th>Parent Name</th>
<th>Object Type</th>
<th>Sub-Object Type</th>
<th>Object Table</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BL - Coachman Lane - (1)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>BL - Handcart Lane - (2)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>BL - Rickshaw Lane - (3)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>BL - Phase 1 Road A - (4)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>BL - CR1 - (5)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>BL - CR2 - (6)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>BL - Carriage Lane - (7)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<td></td>
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<tr>
<td>8</td>
<td>BL - Buckboard Lane - (8)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<td></td>
</tr>
<tr>
<td>9</td>
<td>BL - 1 - (9)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>BL - 2 - (10)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<tr>
<td>11</td>
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<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<tr>
<td>12</td>
<td>BL - bulb2 - phase 3 - (12)</td>
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<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
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<td></td>
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<tr>
<td>13</td>
<td>BL - bulb2a - phase 3 - (13)</td>
<td>LEGACY FARMS - SF</td>
<td>Corridor Baseline</td>
<td>Corridor Feature Lines</td>
<td>Yes</td>
<td></td>
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</table>

**Corridor Feature Lines (28)**

<table>
<thead>
<tr>
<th>Feature Line Name</th>
<th>Feature Line Style</th>
<th>Start Station</th>
<th>End Station</th>
<th>Start Offset</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalk_Out</td>
<td>Basic Feature Line</td>
<td>1+39</td>
<td>6+50</td>
<td>-27.0333</td>
<td>-3</td>
</tr>
<tr>
<td>Sidewalk_In</td>
<td>Basic Feature Line</td>
<td>1+39</td>
<td>6+50</td>
<td>-22.0333</td>
<td>-2</td>
</tr>
<tr>
<td>Back_Curb</td>
<td>Corridor Curb Line</td>
<td>1+39</td>
<td>6+50</td>
<td>-14.0333</td>
<td>-1</td>
</tr>
<tr>
<td>Top_Curb</td>
<td>Corridor Curb Line</td>
<td>1+39</td>
<td>6+50</td>
<td>-13.5033</td>
<td>-1</td>
</tr>
<tr>
<td>Flowline_Gutter</td>
<td>Corridor Flowline</td>
<td>1+39</td>
<td>6+50</td>
<td>-13.4200</td>
<td>-1</td>
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<tr>
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<td>1+39</td>
<td>6+50</td>
<td>-11.5000</td>
<td>-1</td>
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<td>6+50</td>
<td>-11.5000</td>
<td>-1</td>
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<tr>
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<td>-11.5000</td>
<td>-1</td>
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<td>6+50</td>
<td>-11.5000</td>
<td>-1</td>
</tr>
<tr>
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<td>6+50</td>
<td>-11.5000</td>
<td>-1</td>
</tr>
<tr>
<td>Crown_Pave1</td>
<td>Basic Feature Line</td>
<td>1+39</td>
<td>6+50</td>
<td>0.00000</td>
<td>-1</td>
</tr>
<tr>
<td>Crown_Base</td>
<td>Basic Feature Line</td>
<td>1+39</td>
<td>6+50</td>
<td>0.00000</td>
<td>-1</td>
</tr>
</tbody>
</table>
Back in the main Project Explorer window you can see that the corridor has been added to our Object Set.

3. Optionally, you can now specify the corridor feature lines to include in your report by adding a point code filter. Click the Add/Edit Filter button to open the Sort and Filter Content dialog. Select the ETW point code and click OK.

1. Open the Pipe Networks tab of the main Project Explorer window. From the main toolbar, set the start structure of the Pipe Network profile view to SSMH – (16) and the end structure to SSMH – (6). This determines the path and route of the displayed pipe run. Set the comparison surface of the pipe run to Overall FG.

2. Ensure that the Pipe Run sub-object category tab is selected, then right-click the selected pipe network from the list. From the right-click menu, select Add to Object Set (Pipe Run), then select Object Set - (1) from the related sub-menu. The selected pipe run is added to your object set.

3. Return to the Object Sets tab to verify that there are now two objects listed in your object set.

4. At this point, you can test the report creation process from your new object set by clicking the Run Selected Action button on the Object Sets tab of the main Project Explorer window.
5. The report is generated. Open Microsoft Word to inspect the resulting report file.
Duplicating an Object Set

You can now use Object Sets to generate this report to two different file formats simultaneously. You can achieve this by duplicating this object set, and making a few edits to the duplicate.

1. On the **Object Sets** tab of the main Project Explorer window, right click your existing object set and select **Copy** from the right-click menu.
2. Right-click again and select **Paste** from the menu. You now have two identical object sets containing the same objects and filters.
3. Double-click the new object set to open the **Edit Object Set** dialog, then change the Action to **Report to XLSX File**.
4. Change the Object Set name from **Object Set - (1) - Copy** to **Object Set - (1) to Excel**.
5. Click **OK** to close the Edit Object Set dialog box and return to the main Project Explorer window.
6. Use the same technique to change the name of the first object set to **Object Set - (1) to Word**. You have now defined two Object Sets which are identical apart from the file type of the generated report.
7. Click the **Run All Actions** button in the main toolbar. Actions are processed from all object sets in the drawing, which in this case will cause your report to simultaneously be written to a DOCX file and an XLSX file. Review the resulting files in Microsoft Word and Microsoft Excel.

What's Next?

Now that you have successfully configured two Object Sets in your drawing, both reports can be regenerated at any time simply by selecting **Run All Actions** in the Project Explorer window.

A few things you could try:

1. Try applying some design changes to your Civil 3D model then regenerate the reports to review the effect of those design changes.
2. Try reconfiguring the data columns in these reports by editing the Layout Style which is associated with the two object sets. Regenerate the reports to review the effect of these changes.
3. Try changing the style of these reports by editing the Report Style which is associated with the two Object Sets. Regenerate the reports to review the effect of these changes.
Tutorial #3: Generating Quick Reports

Getting started

In Autodesk Civil 3D, open drawing: Design Base_2.dwg

There are two ways to generate reports in Project Explorer. The quickest, easiest way to generate a report of a single element from your Civil 3D model is to use the Quick Report function. Right-click any listed item in the Project Explorer window to access the associated Quick Report options.

1. From the Civil 3D ribbon, select the Add-Ins tab and click Launch Project Explorer to open the Project Explorer window.
2. On the Alignments tab of the Project Explorer window, locate the alignment Buckboard Lane, and right-click the associated profile: FG-(Buckboard Lane).
3. Select Quick Report to File from the right-click menu.

The Create Quick Report dialog opens.
Configuring your quick report

To generate a Quick Report you need to choose a file type for the report, then configure the content and layout of the report using a Layout Style and a Report Style.

Layout Styles define the heading, visibility, and order of every column of data in the report. The units of numerical values can also be controlled from a Layout Style.

Report Styles define the page formatting, fonts, table style, and header/footer content of outgoing reports.

Layout and Report Styles can be saved and retrieved at any time, but for this tutorial you will define your requirements manually.

1. Ensure that the File Type drop down list is set to PDF File. Note that the file name of the outgoing report file can be derived from a series of dynamic variables during the creation
process, or you can specify a fixed file name in this dialog. By default, the report file name will be made up of a combination of the drawing name and selected object name.

2. Change the Layout Style setting to **Use Custom Layout Style**, then click the **Edit Layout Style** button.

**Layout style options**

From this dialog box you will define the layout of the outgoing report.

1. In the Alignments tab of the Layout Options dialog box, ensure that **Set Column Layout for Alignments/Profiles** is selected.
2. From the list view, ensure that just the first seven columns are selected: Alignment/Profile Name, Type, Start Station, End Station, Length.
3. At this point, you may rename or reorder any of the selected columns to match the standards in your organisation. Columns may be renamed by double-clicking on the required label, or by right-clicking and selecting **Rename** from the right-click menu.
4. Change the drop-down list on the Alignments tab to **Set Column Layout for Alignment/Profile Calculated Stations**.

5. From the list view, ensure that just the following columns are selected: Point, Station, Easting, Northing, Elevation, Bearing, Alignment Radius, Gradient, Profile Radius.

6. Select the **General** tab and note the options here to set the format of numerical values such as angles/bearings, stations, elevations, and slopes. Changes applied here will only affect the outgoing Quick Report.
7. Click **OK** to close the Layout Options dialog and return to the Quick Report dialog.

**Report style options**

Next, you'll specify the style of the outgoing report.

1. Click the **Edit Report Style for Quick Reports** button. The **Report Options** dialog opens.
2. On the **Page Options** tab, set the Page Size to **A4**, and the page orientation to **Portrait**.

3. On the **Font Options** tab, set the **Preferred Font** to **Corbel** and the font size to 10pt.

4. On the **Table Options** tab, set the **Header Row Background Color** to a color of your choice.

5. Optionally, on the **Report Header** tab, select the **Add Image to Header** checkbox and click the **Browse** button to select a company logo image file from your computer.

6. Finally, click **OK** to close the Report Options dialog and return to the Quick Report dialog.

### Generate the report

1. You are now ready to generate the report. From the Quick Report dialog, press the **OK** button and choose a path in which to save the PDF report file.

2. The report is generated. Open Adobe Acrobat to inspect the resulting report file.
If you wish to change the layout or style of the report, right-click the same object in the Project Explorer window and select the Quick Report to file option again. Your preferences will be remembered from the previous quick report.
Writing the same report to Excel

On the **Alignments** tab of the Project Explorer window, relocate the alignment **Buckboard Lane**, and right-click the associated **FG-(Buckboard Lane)** Design Profile.

Ensure that the **Calculated Stations** sub-object tab is selected, then right-click the selected profile and select **Quick Report to File (Calculated Stations)** from the right-click menu.

```
Add to Object Set (Calculated Stations)
Quick Report to File (Calculated Stations)... [Selected]
Quick Report to AutoCAD Table (Calculated Stations)...
Quick Export to 2D AutoCAD DWG File...
Set Description(s)...
Set Alignment Style(s)...
Set Profile Style(s)...
Select (in AutoCAD Viewport)
Zoom to
Pan to
Delete...
Profile Properties...
```

The **Create Quick Report** dialog box opens.

Configuring the report for export to Excel

1. Change the file type to XLSX file to generate an Excel file.
As you have previously configured your report settings, you can just accept the current layout style and report style, or you can make some minor adjustments if you wish.

2. Click the OK button to generate the file.

**Version Control in Project Explorer**

Note that a unique Report Version and Report Revision number is assigned to every report generated from Project Explorer. By default these values are incremented in the following scenarios:

- The Report Version is incremented every time a new session of AutoCAD is started.
- The Report Revision is incremented every time a report is updated.

This behavior may be modified from the Project Explorer Preferences dialog which can be opened by clicking the Preferences button in the main Project Explorer window.
**MISC:**

**EXPORT to 2D AutoCAD DWG File**

**Quick Export to 2D AutoCAD DWG**

To use the Quick Export to 2D AutoCAD DWG option, select one or more objects from any object list pane in the Project Explorer window and select the "Quick Export to 2D AutoCAD DWG" option from the right-click menu.

**Alternative DWG Export Workflow using Object Sets**

Multiple 2D DWG files can be generated or updated repeatedly using the Object Sets feature in Project Explorer.

To create a new Object Set which generates a 2D DWG file, select one or more objects from any object list pane in the Project Explorer window and select Add to Object Set ➤ New Object Set from the right-click menu.
KEYBOARD SHORTCUTS

There are three key types of keyboard shortcut in Project Explorer:

- Shortcuts which enable you to instantly zoom or pan to any currently selected object in the AutoCAD viewport from the Project Explorer window.
- Shortcuts which enable you to easily identify an object, sub-object, or object relationship displayed in the Project Explorer window, by applying temporary highlighting to the AutoCAD viewport.
- Shortcuts which enable you to access the Civil 3D Properties window for any selected object in the Project Explorer window.

<table>
<thead>
<tr>
<th>Keyboard Shortcut</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>Zoom to the selected Project Explorer object in the AutoCAD viewport.</td>
</tr>
<tr>
<td>P</td>
<td>Pan to the selected Project Explorer object in the AutoCAD viewport.</td>
</tr>
<tr>
<td>S</td>
<td>Select the selected Project Explorer object in the AutoCAD viewport.</td>
</tr>
<tr>
<td>C</td>
<td>Clear (or de-select) the current selection in the AutoCAD viewport.</td>
</tr>
<tr>
<td>A (or E)</td>
<td>Open the Civil 3D Properties dialog for any selected object.</td>
</tr>
<tr>
<td>CTRL</td>
<td>Temporarily highlight the selected Project Explorer object (or sub-object) in the AutoCAD viewport.</td>
</tr>
<tr>
<td>CTRL A</td>
<td>Select all items in the list (for list views that support multiple item selections).</td>
</tr>
<tr>
<td>CTRL C</td>
<td>Copy selected list items to clipboard.</td>
</tr>
</tbody>
</table>