



**Pinellas County CADD Standards  
Manual for Survey and Civil  
Engineering**

*October 2023*  
Version 1.0

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# Introduction

## Purpose

The electronic files created during the process of developing a Computer Aided Design and Drafting (CADD) project for Pinellas County (from here on referred to as “PC”) are to be shared and referenced by many different individuals and must satisfy various needs. The electronic files must be shareable in a format that most, if not all, parties can utilize. Therefore, CADD processes must be established for disciplines that share in the CADD development workflow. This CADD Standards Manual outlines the required standards, conventions, and formats necessary to ensure the most usable CADD data set to the foreseeable customers of the CADD data, while providing the producer / developer of the CADD data information necessary to accomplish the task.

## Scope

This CADD Standards Manual sets forth supplemental guidelines to the Pinellas County – CADD Project Administration Manual. The material presented within this guideline will be monitored as a critical requirement under the CADD Quality Assurance plan. This document is written for CADD users producing plans and maps for PC. It provides the guidelines to produce electronic CADD files according to PC CADD standards in conjunction with PC CADD software.

## General

Chapter 334 of the Florida Statutes, known as the Florida Transportation Code, establishes the responsibilities of the State, Counties, and Municipalities for the planning and development of the transportation systems serving the people of Florida, with the objective of assuring development of an integrated, balanced statewide system. The Code's purpose is to protect the safety and general welfare of the people of the State and to preserve and improve all transportation facilities in Florida. Under Section 334.044(2), the Code sets forth the powers and duties of PC in conjunction with the Department of Transportation to develop and adopt uniform minimum standards and criteria for the design, construction, maintenance, and operation of public roads.

The guidelines in this PC CADD Standards Manual and the FDOT Production Criteria represent minimum requirements that must be met for the development PC CADD projects. While the guidelines contained in this writing provide a basis for uniform CADD practice for PC projects, precise rules that would apply to all possible situations that may arise are impossible to give. Situations will exist where these standards will not apply. If variances from the PC CADD Project Administration Manual or PC CADD Standards Manual are necessary for a project, they must be approved in writing by the Project Manager and documented in the Project Journal file as defined herein.

## Pinellas County Kit

PC utilizes Autodesk software as a standard for all civil engineering and land surveying projects. PC currently uses the following CADD software products:

- AutoCAD Civil 3D
- AutoCAD Raster Design

To help increase, enforce, and maintain consistency of the drawings created for PC, the *Pinellas County Kit for Civil 3D 2023* has been created and is required for all projects. Leveraging components of the FDOT State Kit, the PC Kit includes Civil 3D content necessary to complete projects for PC. The following custom content is included in the PC Kit for Civil 3D:

- Drawing templates containing Civil 3D styles
- Plans production templates
- Project templates
- Sheet Set Manager template
- Title blocks
- Pipe's catalog
- Quantity take-off pay items
- PC ribbon tab and workspace
- Design Center content
- Autodesk Batch Standards Checker files

All new projects must use the latest version of the PC Kit. The kit is available on the [Pinellas County website](#). Please make sure you are using the latest version of the kit prior to starting any PC project.

## Release Notes

The Pinellas County Kit for Civil 3D 2023 is designed to be centralized on a network share and has several dependencies to function properly. For detailed release and installation information, please view the [release notes](#).

# AutoCAD Standards

## Pinellas County Standard Template Files

Included with the PC Kit for Civil 3D are 3 drawing template files that have been configured with PC standards. These templates should be used when working on PC projects:

Template File Name	Description
PC2023.dwt	This is the main template file that should be used when starting any new Engineering or Surveying drawing.
PCPlanProduction.dwt	This template file should only be used when using the plans production tools contained within Civil 3D.
PCTitleBlocks.dwt	This file contains all the PC standard title blocks. This file should not be used directly! Instead, use the insert title block routine built into the Pinellas County ribbon tab.

## Layers

All PC standard layers are included in the PC2023.dwt drawing template. To help navigate through the layer list, several layer filters have been created depending on the situation:

Layer Filter	Description
All Used Layers	All layers that contain entities in the drawing
PC C3D Object	Civil 3D object layers
PC Engineering	Layer filter to isolate proposed layers
PC Survey	Layer filter to isolate existing layers
PC Production-non-util	Layer filter used in conjunction with the invert filter option to isolate non-utility

## AutoCAD Styles

### Text Styles

All text in an AutoCAD drawing has a text style associated with it. When you enter text, AutoCAD uses the current text style, which sets the font, size, angle, orientation, and other text characteristics.

PC has standardized on using annotative text styles for placing text inside of drawings. Annotative text allows the ability to automatically size the model space text height based on the plotted height of the text and the current annotation scale.

Text Style	Font	Plotted Height	Description
PC-Sv	Simplex	0.10"	Existing Text – 0.10" plotted
PC-Sv 0.15	romand	0.15"	Existing Text – 0.15" plotted
PC-Sv 0.20	romand	0.20"	Existing Text – 0.20" plotted
PC-Eng	Simplex	0.12"	Proposed Text – 0.12" plotted
PC-Eng 0.15	Simplex	0.15"	Proposed Text – 0.15" plotted
PC-Eng 0.20	romand	0.20"	Proposed Text – 0.20" plotted
PC-Eng 0.25	romand	0.25"	Proposed Text – 0.25" plotted

### Dimension Styles

In the PC standard template file(s), you will be able to select the dimension style based on the final output scale of your drawing. PC assigns the default "PC-Proposed" style to dimensions until you set another style as current. Dimension styles are set to be annotative and will size in model space to reflect the current annotation scale.

Unless you create a separate style for leaders, or change leader properties using the Properties window, leader lines have the same properties as dimension lines.

Dimension Style	Description
PC-Sv-Existing	Used for dimensioning of existing objects – Plotted text height is 0.10"
PC-Eng-ByLayer	Used for dimensioning of proposed objects – Plotted text height is 0.15"



## Fonts

Fonts define the shapes of the text characters that make up each character set. In AutoCAD, you can use TrueType fonts in addition to the AutoCAD compiled shape (SHX) fonts.

The PC Standard for all Labels is “Simplex.shx” with a height set by the output scale of the drawing.

## Linetypes

Linetype definition files define AutoCAD linetypes. These files have the extension .lin. AutoCAD linetypes are composed of a series of dots and dashes separated by spaces and can contain embedded shape and text objects. The default linetype file is acad.lin. You can print this file to better understand how to construct linetypes.

Linetypes that are composed of only dots, dashes, and spaces are considered simple linetypes. Linetypes that contain embedded shape and text objects along with dots, dashes, and spaces are complex linetypes. Although AutoCAD handles these two types of linetypes similarly, their definitions are considerably different. Users are strongly discouraged from creating their own custom line styles; instead using the PC supplied standard line style files listed below:

L:\2023\Support\Linetypes\PinCo.lin

### PC Custom Linetype Files

To use a linetype you must first load it into your drawing. A linetype definition must exist in an LIN library file before a linetype can be loaded into a drawing. If a new (non-standard) custom linestyle is developed by a user, those resource files must be delivered with the project. Users shall not modify the PC delivered standard custom line style files. You can assign a linetype to a layer, set the current linetype control for the new layer to be (BYLAYER). All newly created objects are drawn using the current linetype (except for text and inserted blocks).

## Line Weight

Standard lineweights are defined in the PC standard layer tables as referenced from the standard layers section mentioned above. An AutoCAD standard lineweight table is listed below for reference purposes. Currently PC does not use lineweights as defined by the object's layer, but instead references lineweight by color in the CTB (Color Table) file.

mm		inch	ISO
0.00			
0.05	.002		
0.09	.003		
0.13	.005		
0.15	.008		
0.18	.007		X
0.20	.008		
0.25	.010		X
0.30	.012		
0.35	.014		X
0.40	.016		
0.50	.020		X
0.53	.021		
0.60	.024		
0.70	.028		X
0.80	.031		
0.90	.035		X
1.00	.039		
1.06	.042		
1.20	.047		X
1.40	.056		
1.58	.062		
2.00	.078		X
2.11	.083		

PC uses the standard color table within AutoCAD in the following fashion:

Colors 1-9,250-254 - Standard colors **shared** for both existing and proposed data representation

Colors 11-249 - (ODD numbered colors) Existing layers (Survey)

Colors 10-248 – (EVEN numbered colors) Proposed layers (Engineering)

## Plotting with AutoCAD Civil 3D

### Plots

Regarding the production of plots, all plots shall be to scale on the standard PC standard Layout tab sheet setup files applicable to the specific discipline and their applicable standards. In addition, the plots (hardcopy paper) shall contain a plot stamp with the following items:

Network drive path, file name, and date at the lower left-hand corner of the sheet.

For all PDF plots, the PDFSHX setting must be set to 0. If Civil 3D was started with the Icon, this will be automatic.

### Plotter Configuration Files

The trend from Autodesk is to utilize the Microsoft plotter drivers as much as possible and therefore minimal PC3 files are being shipped with the PC Kit. Two PC3 files included with the kit are:

1. DWF6 ePlot.pc3
2. DWG to PDF.pc3

These files should be used to create DWF's and PDF's respectively.

### Plot Borders

The following PC standard sheets have three plot borders, they are:

Actual Paper Size	Plot Size	Plotting Limits	Paper Size
22" x 36"	22" x 34"	33.94" x 21.94"	Custom
11" x 17"	11" x 17"	16.94" x 10.94"	ANSI B
8.5" x 11"	8.5" x 11"	10.50" x 8.00"	Letter

### Plot Style Tables (\*.ctb)

For color-dependent plot style tables, an object's color determines how it is plotted. These plot style table files have .ctb extensions. You cannot assign color-dependent plot styles directly to objects. Instead, to control how an object is plotted, you change its color. For example, all objects assigned the color red in a drawing plot the same way.

PC has assigned color-dependent plot style tables (CTB's) to layouts. Two CTB files are provided as part of the kit depending on the department:

1. DEI Engineering.ctb
2. DEI Survey.ctb

## CAD Standards Checker




To help ensure adherence to the established standards, PC utilizes the CAD Standards Checker that is built into Civil 3D 2023 and has provided 3 DWS files that are to be used:

- Survey.dws
- SurveyToEngineering.dws
- Utilities.dws

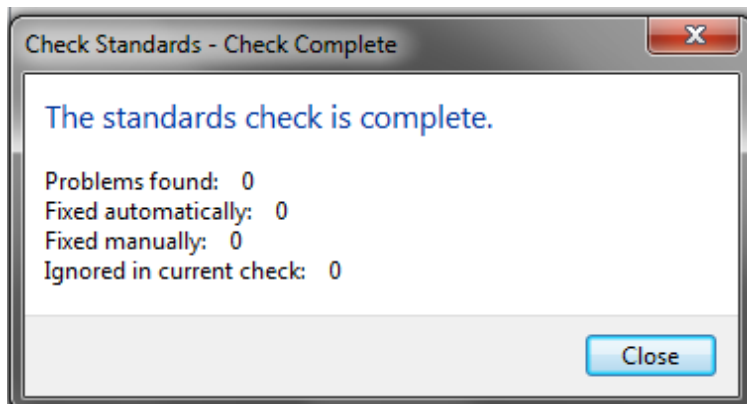
These DWS files correlate to one of the 3-layer states included in the PC2023.dwt file.

The DWS files are found in the L:\2023\Data\LayerStandards folder

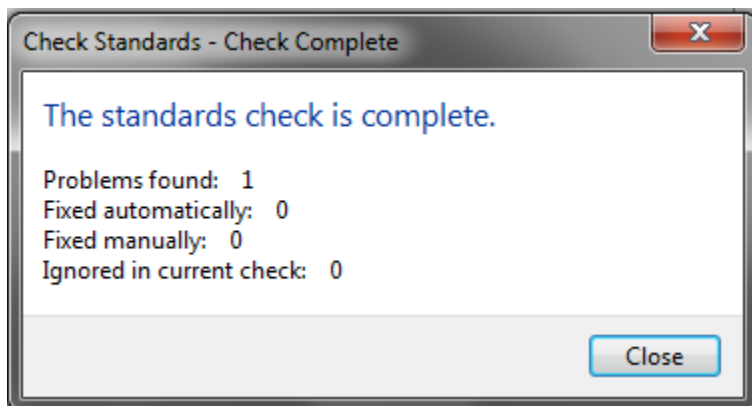
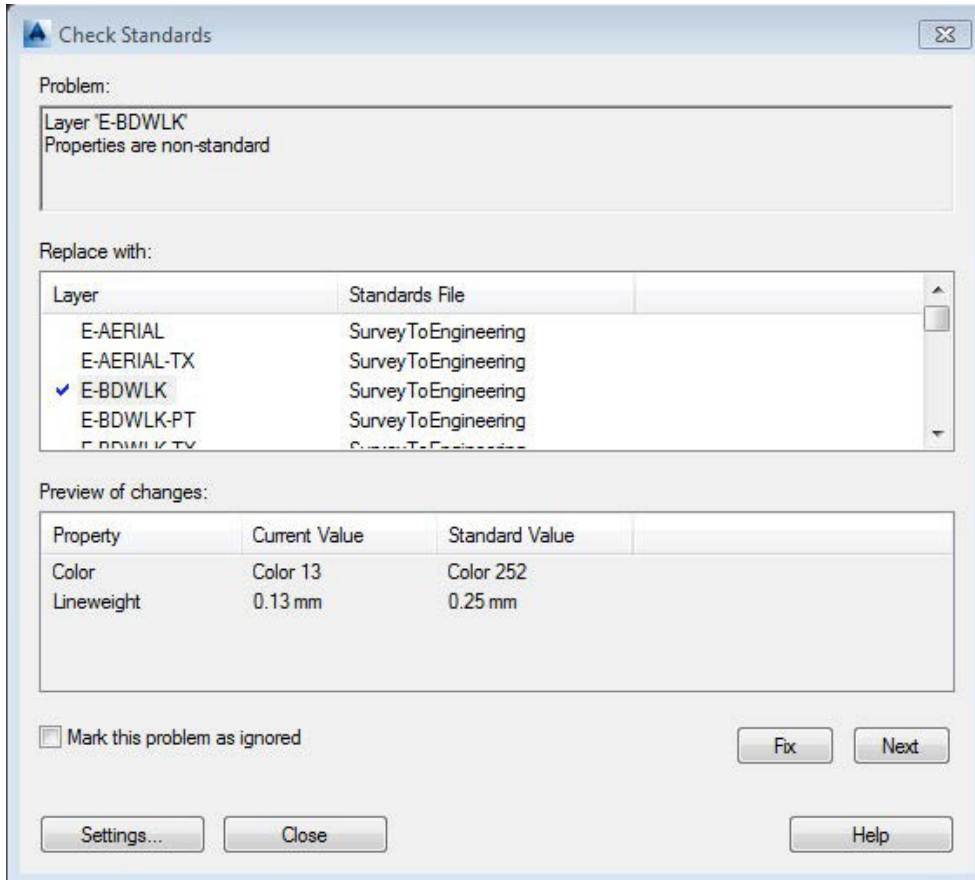
v\pcg\PWmain) (L:) > 2021 > Data > LayerStandards

Name	Date modified	Type	Size
 Survey.dws	8/11/2017 11:46 AM	AutoCAD Drawing...	1,897 KB
 SurveyToEngineering.dws	8/11/2017 11:46 AM	AutoCAD Drawing...	1,891 KB
 Utilities.dws	6/8/2017 4:00 PM	AutoCAD Drawing...	1,905 KB

The first time the standards checker is run, a DWS file will need to be associated with the file. Choose the appropriate DWS file as noted above. Once associated, the utility will run and display a dialog box that shows the total number of errors in the drawing:



Production drawings should not contain any standards errors. Should the drawing contain standards errors, a dialog box will be displayed giving the user a chance to address each problem individually.



# Civil 3D Standards

## Civil 3D Objects

To ensure the integrity and continuity of an efficient workflow and design process throughout the survey, design, construction, and Building Information Modeling (BIM) processes, all PC projects shall require the use of Civil 3D objects.

The following design items must be created as Civil 3D objects and must be assigned PC object styles using the provided Civil 3D drawing template that is included with the PC Kit for Civil 3D:

- Points
- Survey Figures
- Corridors
- Parcels
- Pipe Networks
- Sections
- **Surfaces**
- Alignments
- Profiles

## Starting Civil 3D

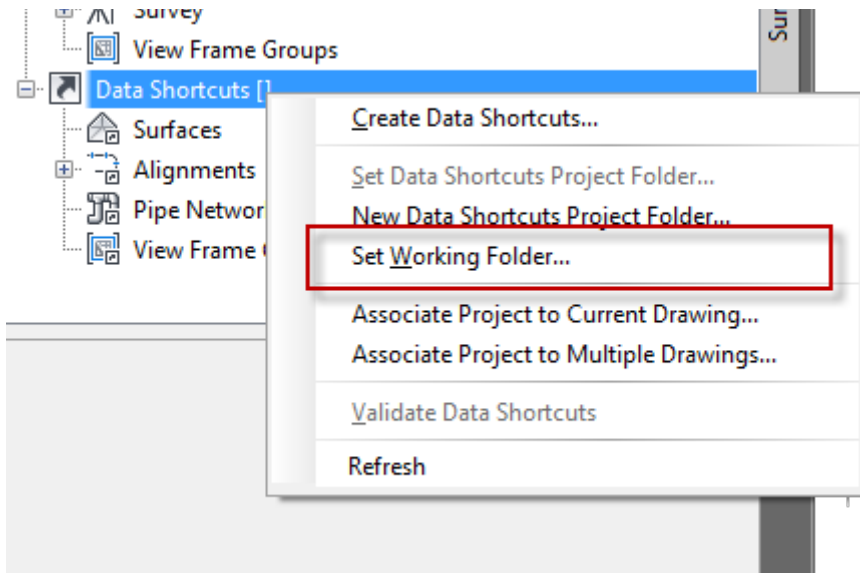
To ensure the PC environment is enabled when starting Civil 3D, it is important to launch the software using the supplied icon:



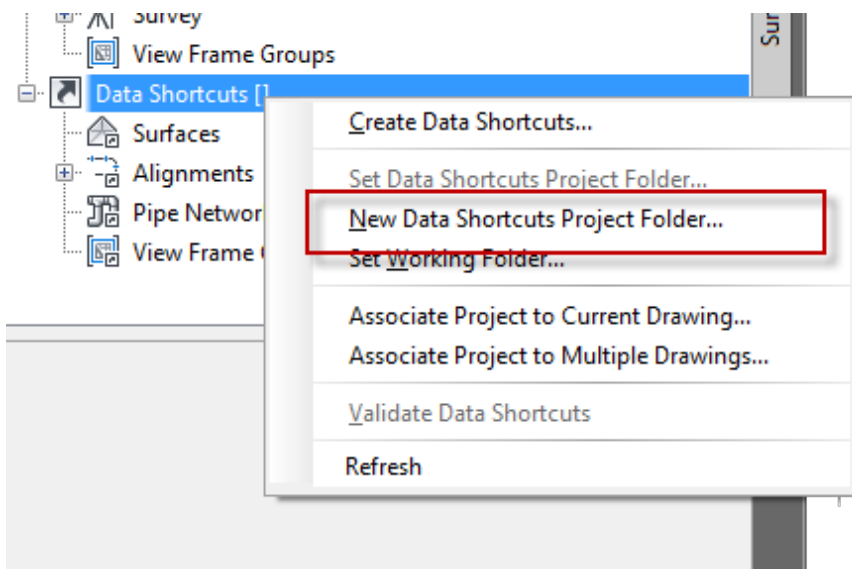
## Civil 3D Projects

AutoCAD Civil 3D uses projects to manage and organize all the data for a job that you are working on. This data includes the drawing files, data shortcuts, and survey database. Each project will have its own unique directory path. Survey projects will continue to be named based on the SFN (Survey File Number – F####) numbering convention. Engineering projects will be named based on the PC Project Identification Number (PID \*\*\*\*) as provided by OPUS.

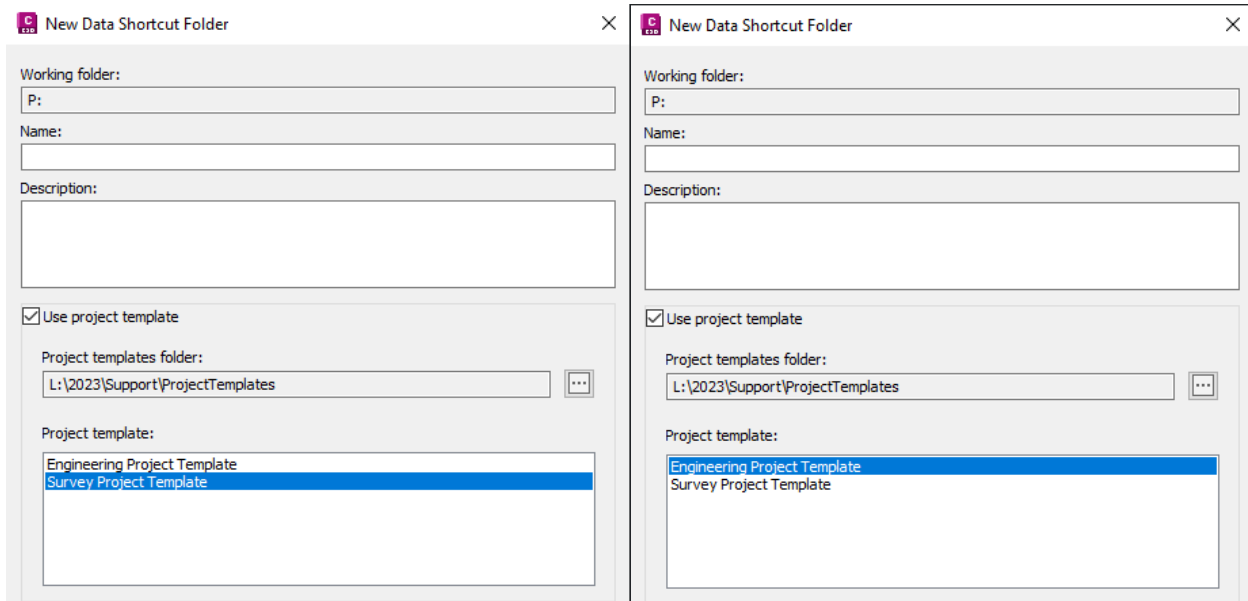
To create a project in Civil 3D, right click on “Data Shortcuts” from the prospector tab and select “Set Working Folder...”. Make sure to use the designated division drive letter.



Next, right click on “Data Shortcuts” from the prospector tab and select “New Data Shortcuts Project Folder...”.

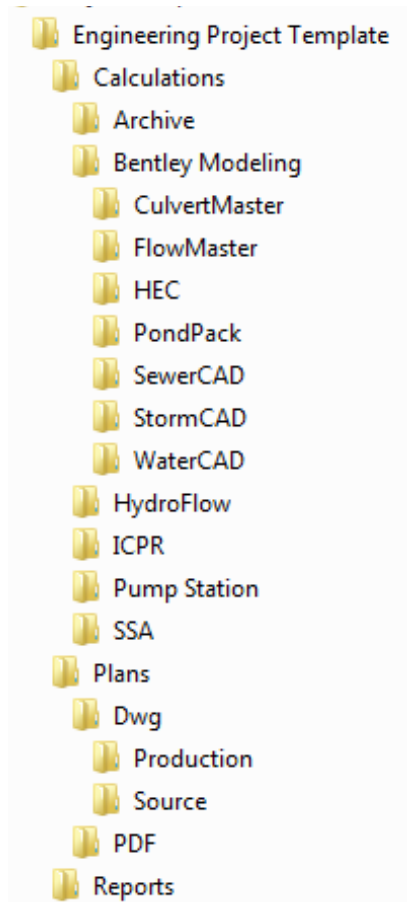
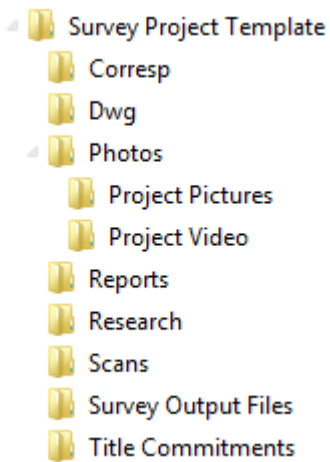
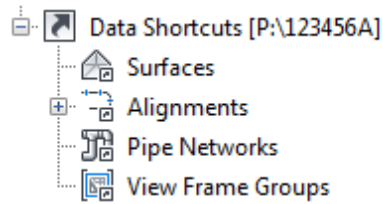
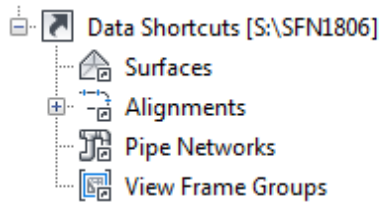


In the resulting dialog box, make sure that the working folder is set to the designated division drive letter. Give the project a name based on the SFN (F####) or the PID (\*\*\*\*) number assigned to the project. Make sure that “Use project template” is selected and the appropriate project template is selected according to the project discipline.



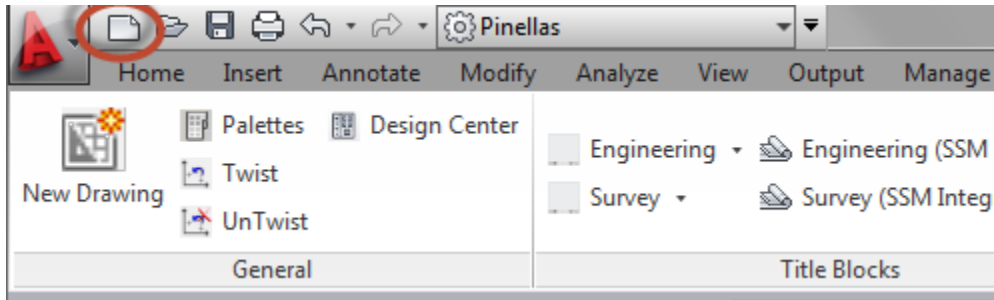


Once complete, the new project will be listed in prospector and the directory system will be created based on the applicable project template:

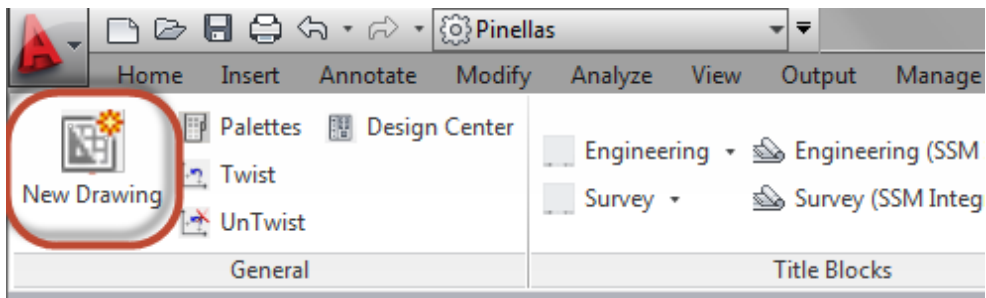


### Civil 3D Drawing Creation

After launching Civil 3D using the included PC icon, the product is configured to automatically use the PC2023.dwt template file. There are buttons on the quick access bar as well as the PC ribbon tab that can be used to create additional drawings and will ensure the appropriate template containing the PC styles is used:



Or



## Standard File Names

The following file naming convention shall be used for all design files. The file naming convention as defined for each discipline shall be used in combination with the previously defined PC standard project directory structure. In the event a particular file type that is needed for the project is not addressed in this document, use the file naming convention as a template, or consult with the project manager to determine the proper file name and its parameters.

**NOTE:** Some overlap in project drawing creation is expected to occur depending upon the design group's need for a multiple document environment. **Whether or not this is the case, the original drawing and the sheets contained therein must reflect the tab (layout) series number naming convention proposed in the accompanying file naming tables.**

### Standard File name extensions

- AutoCAD drawing file - .dwg
- AutoCAD template file - .dwt
- AutoCAD drawing exchange format - .dxf
- AutoCAD drawing web format - .dwf
- AutoCAD drawing standards format - .dws

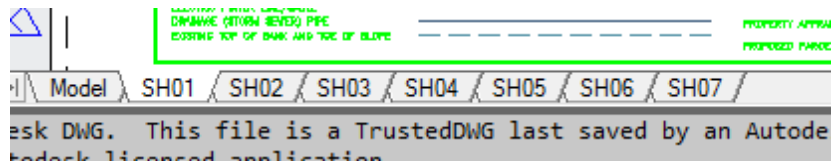
## Survey Drawing File Naming Conventions

The name for a standard survey or worksheet:

***f<SFN number>-c3d-<version number>.dwg***

Example: A standard survey for SFN 1800 that is created with Civil 3D version 2023 will have the name f1800-c3d-2023.dwg.

The layout tabs for a standard survey or worksheet:



When a survey contains pipe networks, a second drawing should be created using the following naming convention.

***f<SFN number>-pipes-c3d-<version number>.dwg***

This drawing will contain no layout tabs. All work should be done in model space.

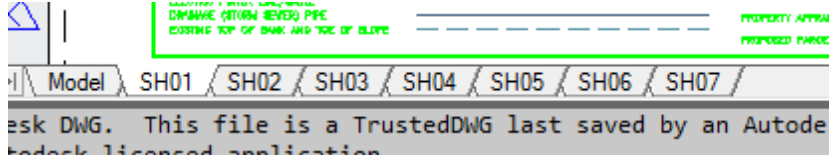
The name for a **REVISED** standard survey or worksheet:

***f<SFN number>-c3d-<version number>-r#.dwg***

“r#” represents the revision number.

Example: The first complete set of revisions to a standard survey for SFN 1800 that is created with Civil3D version 2023 will have the name f1800-c3d-2023-r1.dwg. This name will continue to be used throughout the mapping process until the survey is signed and sealed. Once signed and sealed, if a second revision is needed, the survey will have the extension “r2”.

The layout tabs for a REVISED standard survey or worksheet:



The name for a **REVISED** pipe network drawing:

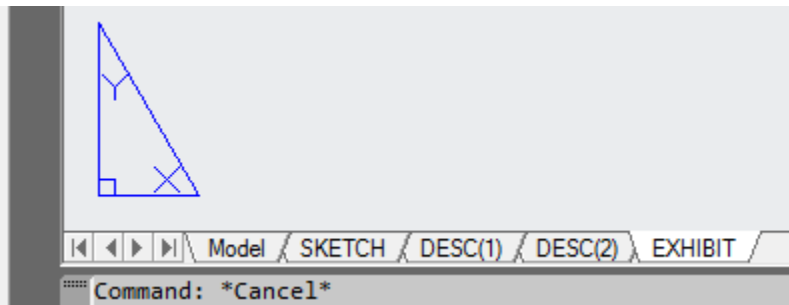
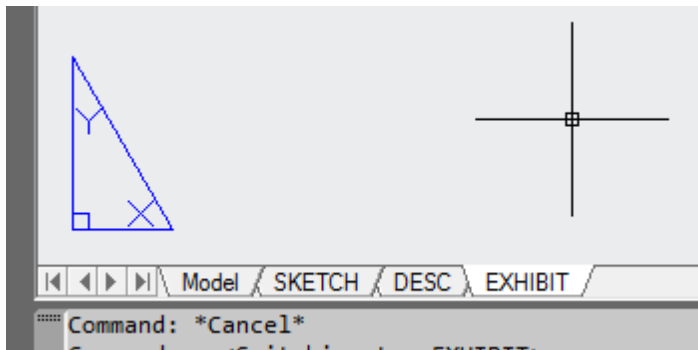
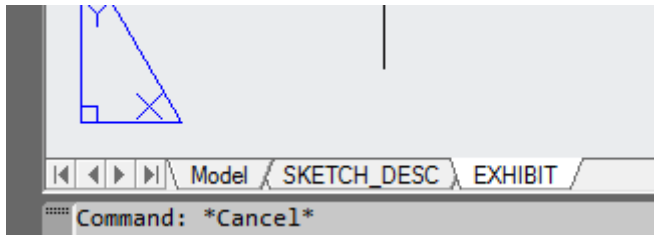
f<*SFN number*>-pipes-c3d-<*version number*>-r#.dwg

The name for a standard sketch and description:

***p<parcel number>-c3d-<version number>.dwg***

Example: A standard sketch and description for parcel P100 that is created with Civil3D version 2023 will have the name p100-c3d-2023.dwg.

The layout tabs for a standard sketch and description:



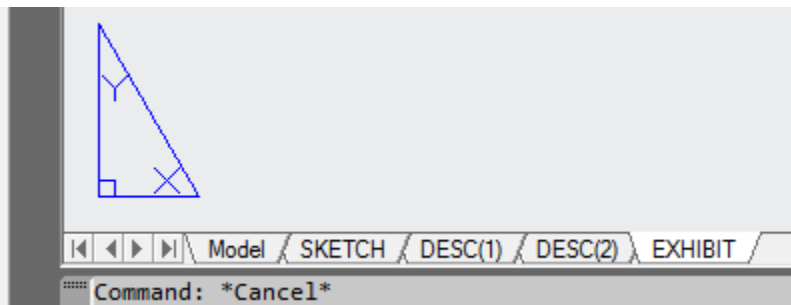
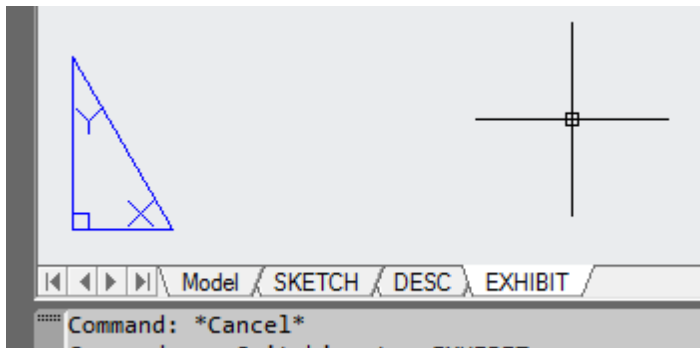
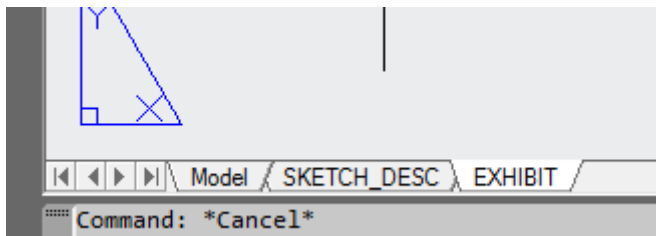
The name for a **REVISED** standard sketch and description:

*p<parcel number>-c3d-<version number>-r#.dwg*

“r#” represents the revision number.

Example: The first complete set of revisions to a standard sketch and description for parcel P100 created with Civil3D version 2023 will have the name p100-c3d-2023-r1.dwg. This name will continue to be used throughout the mapping process until the sketch and description is signed and sealed. Once signed and sealed, if a second revision is needed, the sketch and description will have the extension “r2”.

The layout tabs for a REVISED standard sketch and description:



The name for a standard 8 ½ x 11 exhibit that accompanies a sketch and description:

A standard .dwg naming convention is not needed. The exhibit should be included as a layout tab in the sketch and description (see above).

The name for an 11 x 17 exhibit.

***exhibit- $\langle$ subject  $\rangle$ -c3d- $\langle$ version number  $\rangle$ .dwg***

Exhibits are created for various purposes and are not standard. The user should replace the  $\langle$ subject $\rangle$  field with a short abbreviation for the type of exhibit. The abbreviation is left to the user's discretion.

Example: An exhibit prepared to accompany a title commitment would have the subject abbreviation "tc", such as exhibit-tc-c3d-2023.dwg.

Example: An exhibit prepared to depict limits of multiple plats would have the subject abbreviation "plats", such as exhibit-plats-c3d0-2023.

The layout tabs for an 11 x 17 exhibit.

The layout tabs for an 11 x 17 exhibit are also not standard. Try to hold one of the naming conventions for the layout tabs shown above if possible.



### Engineering Drawing File Naming Conventions

Sheet Description	File Name
Key Sheet/Vicinity Map	****-KEY.dwg
Quantities/ Summary of Pay Items	****-QTY.dwg
General Notes/Legend	****-GEN.dwg
Symbology/Linetypes	****-SLL.dwg
Coordinate Geometry	****-CG.dwg
Layout	****-LAY.dwg
Drainage Map	****-DRM.dwg
Typical Section	****-TYP.dwg
Existing Structures/Demolition Plan	****-DEMO.dwg
Plan / Profiles	****-PLPR.dwg
Grading	****-GRAD.dwg
Drainage Structure Sheets	****-DRST.DWG
Cross Sections	****-XS.dwg
Details, 01, 02, 03 ...	****-DTL01.dwg
Environmental	****-ENV.dwg
Mitigation	****-MIT.dwg
SWPPP	****-SWPP.dwg
Erosion Control Plan/Notes	****-EROS.dwg
Geotechnical	****-GEO.dwg
Temporary Traffic Control Plans	****-TTCP.dwg
Signing & Marking Plan	****-SPM.dwg
Signalization Plan	****-SIG.dwg
ATMS	****-ATMS.dwg
Landscaping Plan	****-LS.dwg
User Defined	****-USER.dwg
Survey Drawing	F#####-C3D-2023.dwg
Survey Pipes Drawing	F#####-PIPES-C3D-2023.dwg
Engineering Survey Base Map	F#####-BASE.dwg
PC - Utilities (WM, SS, FM, & RCWM)	****-WM.dwg
	****-SS.dwg
	****-FM.dwg
	****-RCWM.dwg
	****-UTL.dwg
Other - Utilities	****-UT-(owner).dwg
Utility Relocation	****-URL.dwg
Corridor Model	****-CORR.dwg
Storm Drainage	****-STM.dwg
3D Presentation	****-3DP.dwg
Sheet Index	****-IND.dwg

<b>Plan and Elevation</b>	****-PE.dwg
<b>Bridge Hydraulic Recommendations</b>	****-BHR.dwg
<b>Construction Sequence</b>	****-CS.dwg
<b>Foundation Layout</b>	****-FDL.dwg
<b>Superstructure Plan</b>	****-SUPL.dwg
<b>Superstructure Details</b>	****-SUPDT.dwg
<b>Finished Grade Elevations</b>	****-FGE.dwg
<b>Endbent Plan</b>	****-EBPL.dwg
<b>Endbent Details</b>	****-EBDT.dwg
<b>Pier Plan / Elevation</b>	****-PPEPL.dwg
<b>Pier Details</b>	****-PPEDT.dwg
<b>Slope Protection Details</b>	****-SPDT.dwg
<b>Finish Grade Elevations</b>	****-FGE.dwg
<b>AASHTO Type (?) Beam - Standard Details - Index</b>	****-BDT.dwg
<b>AASHTO Type (?) Beam - Table of Beam Variables</b>	****-BV.dwg
<b>Buildup Deflection Data Table for I-Beams Index</b>	****-BDD.dwg
<b>Composite Elastomeric Bearing Pads - Index No.</b>	****-CEBP.dwg
<b>Approach Slabs - Geometric Layout</b>	****-ASGEO.dwg
<b>Approach Slabs (Flexible Pavement Approaches)</b>	****-ASPVT.dwg
<b>Retaining Wall General Notes</b>	****-RWGN.dwg
<b>Retaining Wall Plan</b>	****-RWP.dwg
<b>Retaining Wall Elevation</b>	****-RWE.dwg
<b>Retaining Wall Details</b>	****-RWDT.dwg
<b>Reinforcement Bar List</b>	****-RBL.dwg

NOTE:

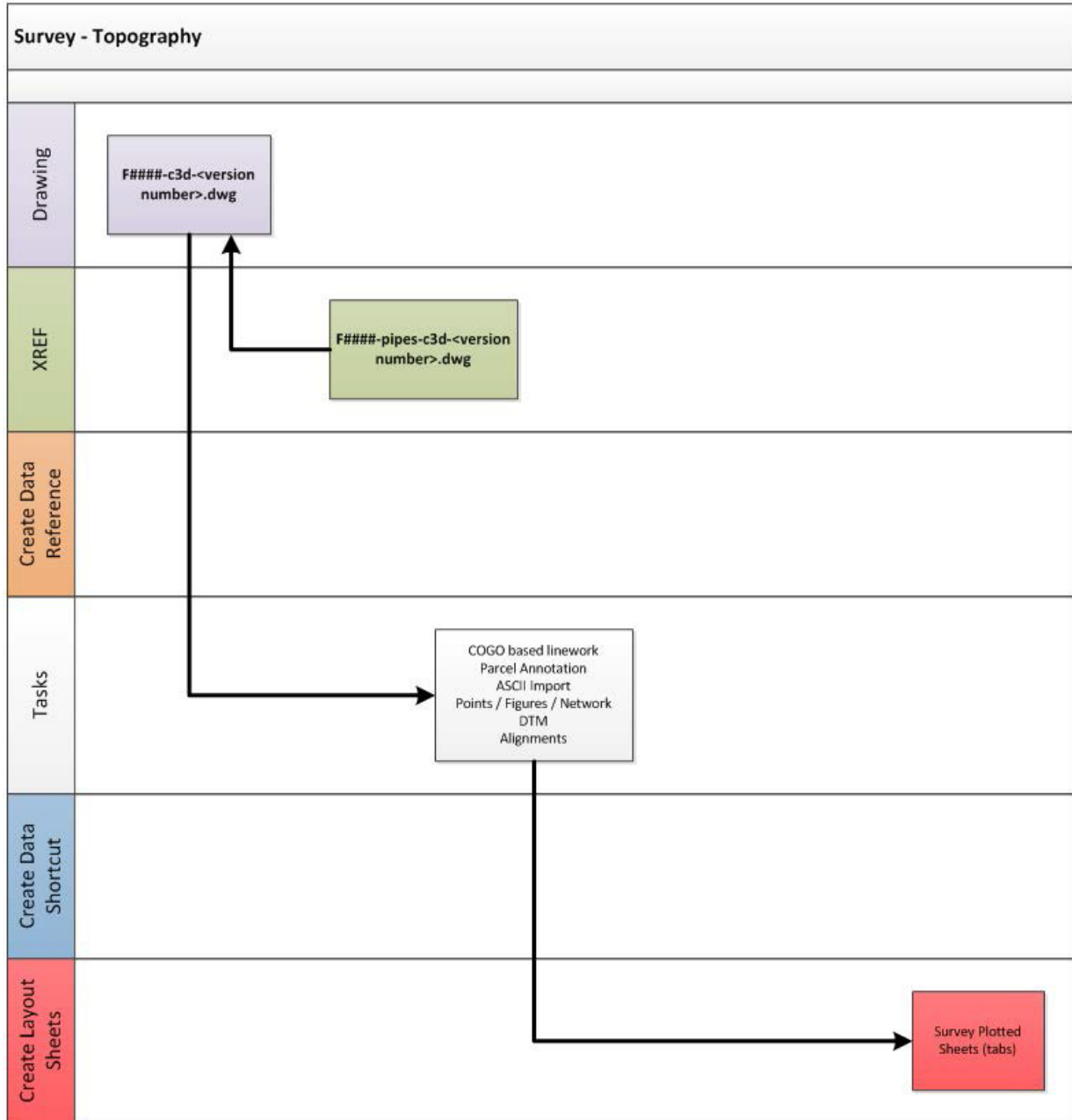
\*\*\*\* = PID number

#### = SFN

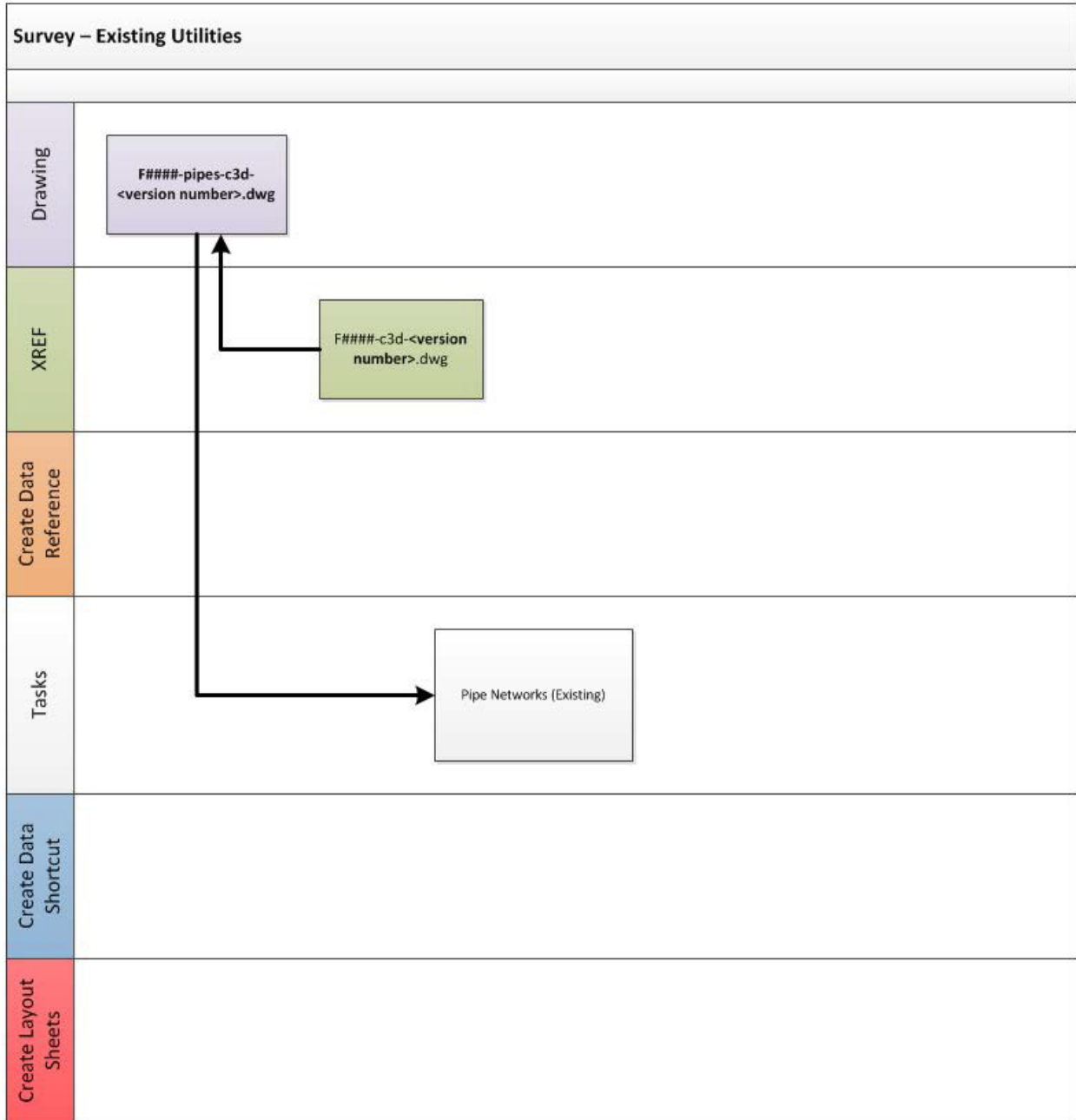
### **Civil 3D Workflows and Drawing Combinations**

While it is virtually impossible to describe every potential sheet necessary in a plan set, the following workflows describe common engineering and surveying tasks.

Survey – Topography

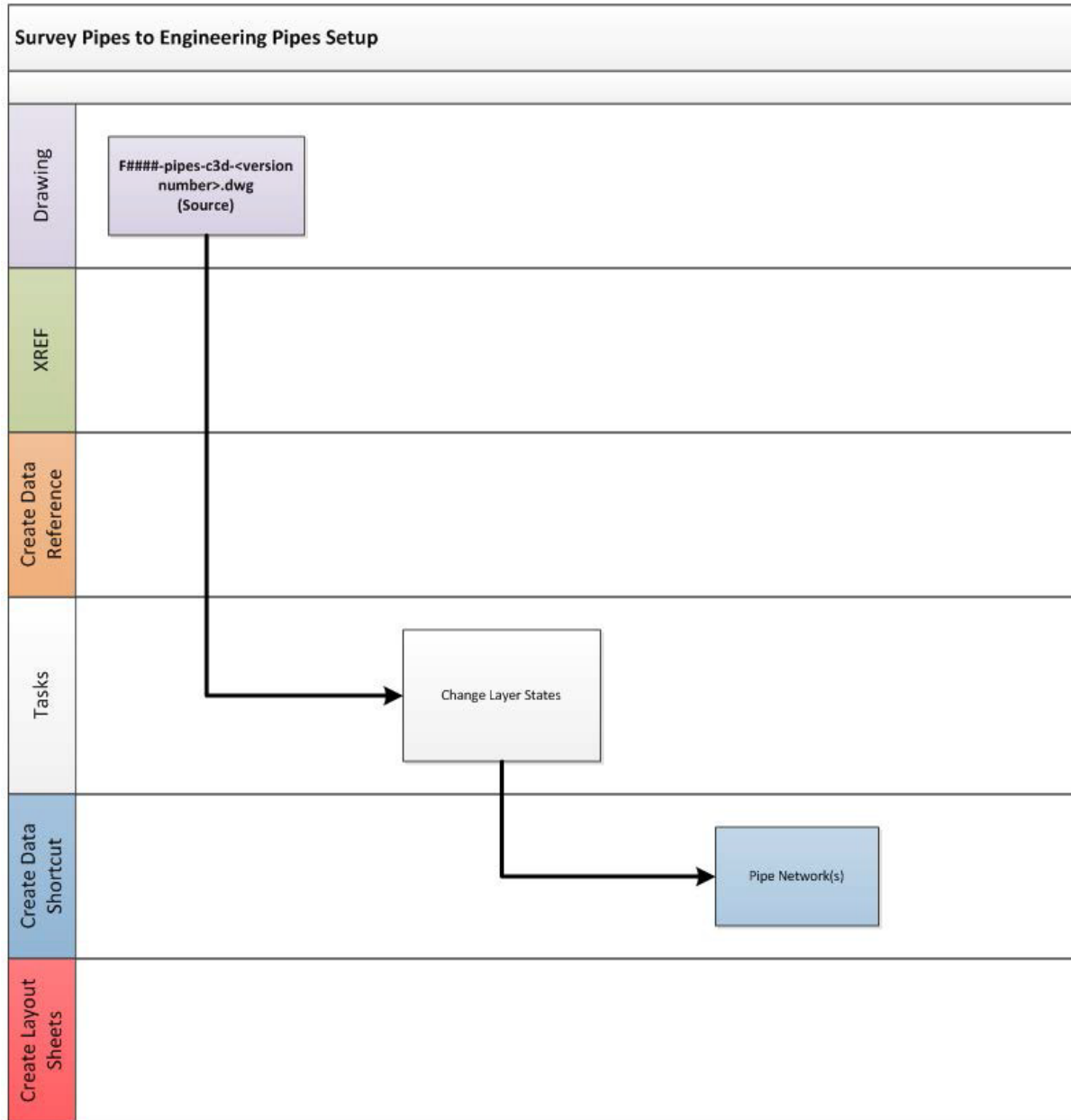


Survey – Existing Utilities



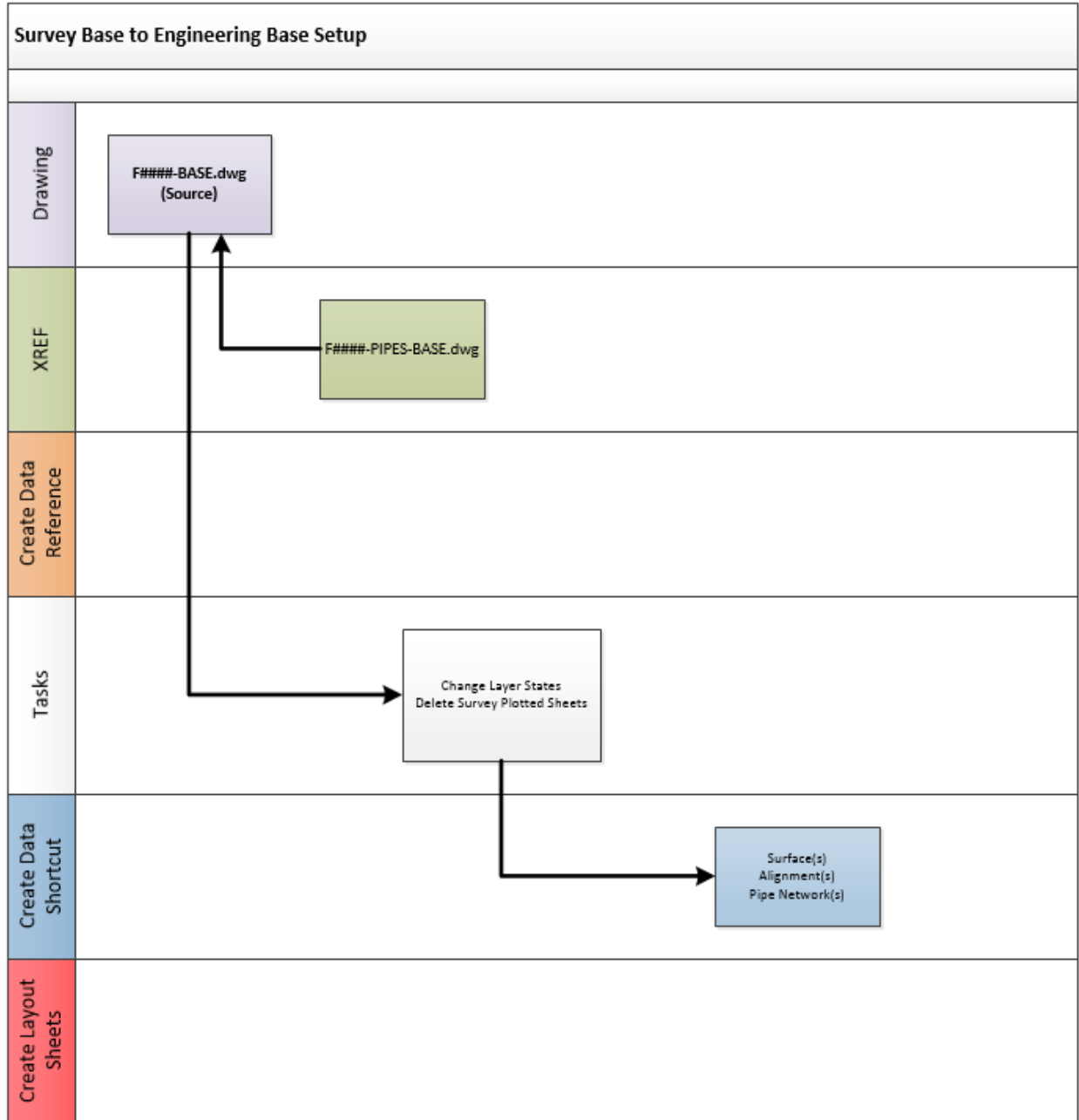
Survey Pipes to Engineering Pipes Drawing Setup

- Set up project (see Civil 3D Standards Section)
- Set up Sheet Set Manager (see Sheet Set Manager Section)
- Save survey file F####-C3D-2023.DWG to the project Source directory
- Save survey file F####-PIPES-C3D-2023.DWG to the project Source directory
- Save copy of F####-PIPES-C3D-2023.DWG as F####-PIPES-BASE.DWG

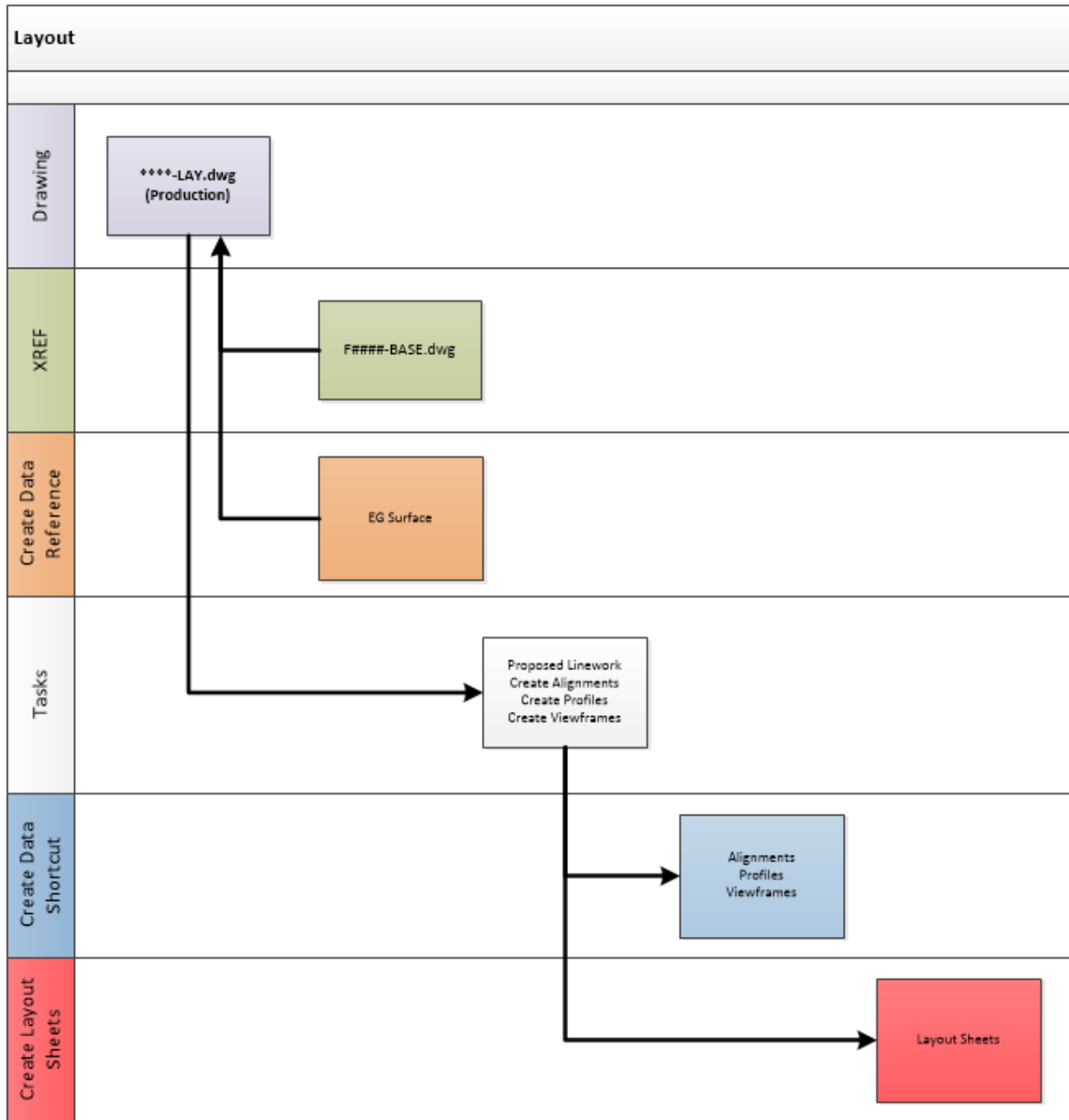


Survey to Engineering Drawing Setup

- Save copy of survey file F####-C3D-2023.DWG as F####-BASE.DWG
- XREF F####-PIPES-BASE.DWG into this drawing

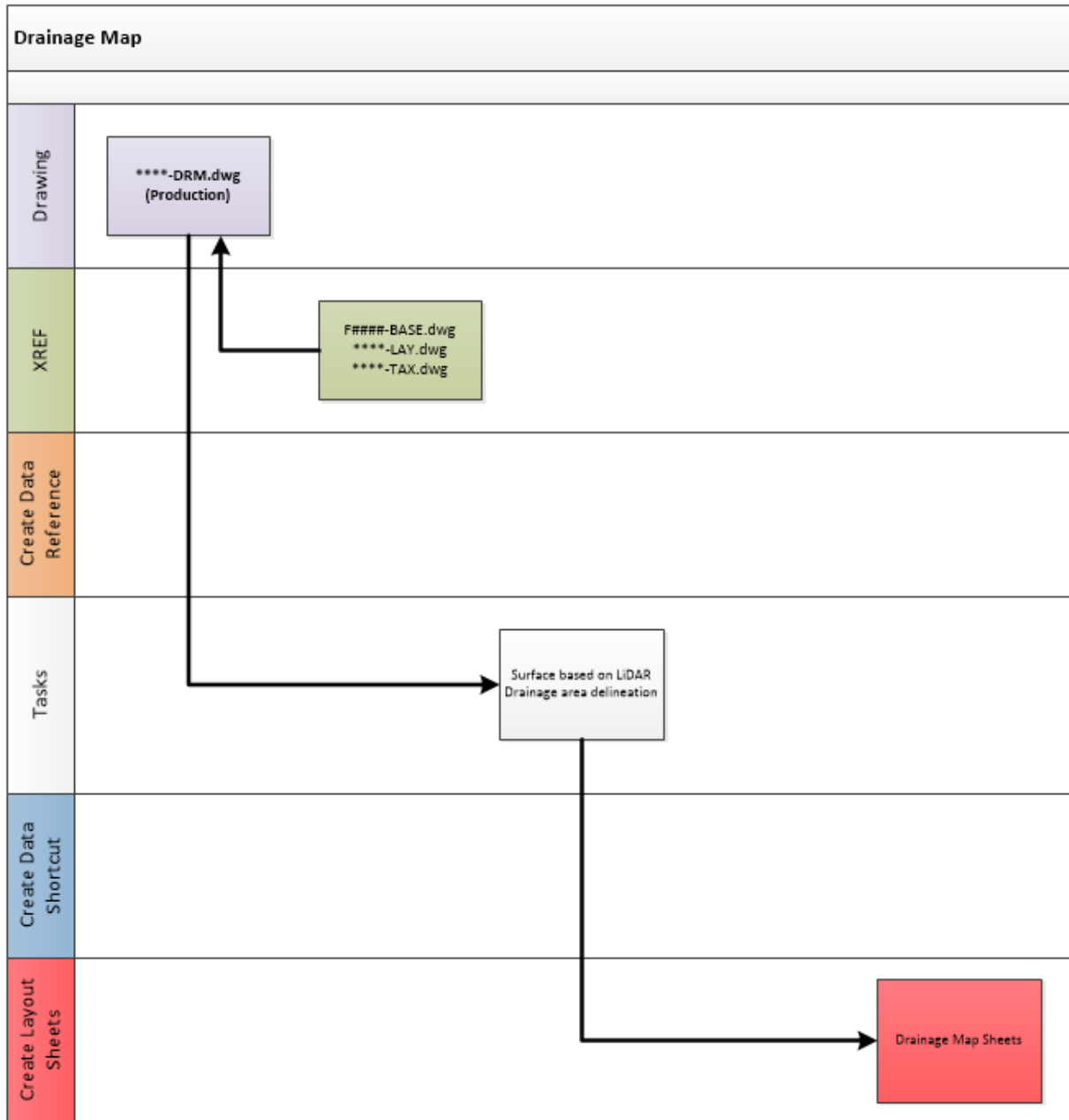


Layout

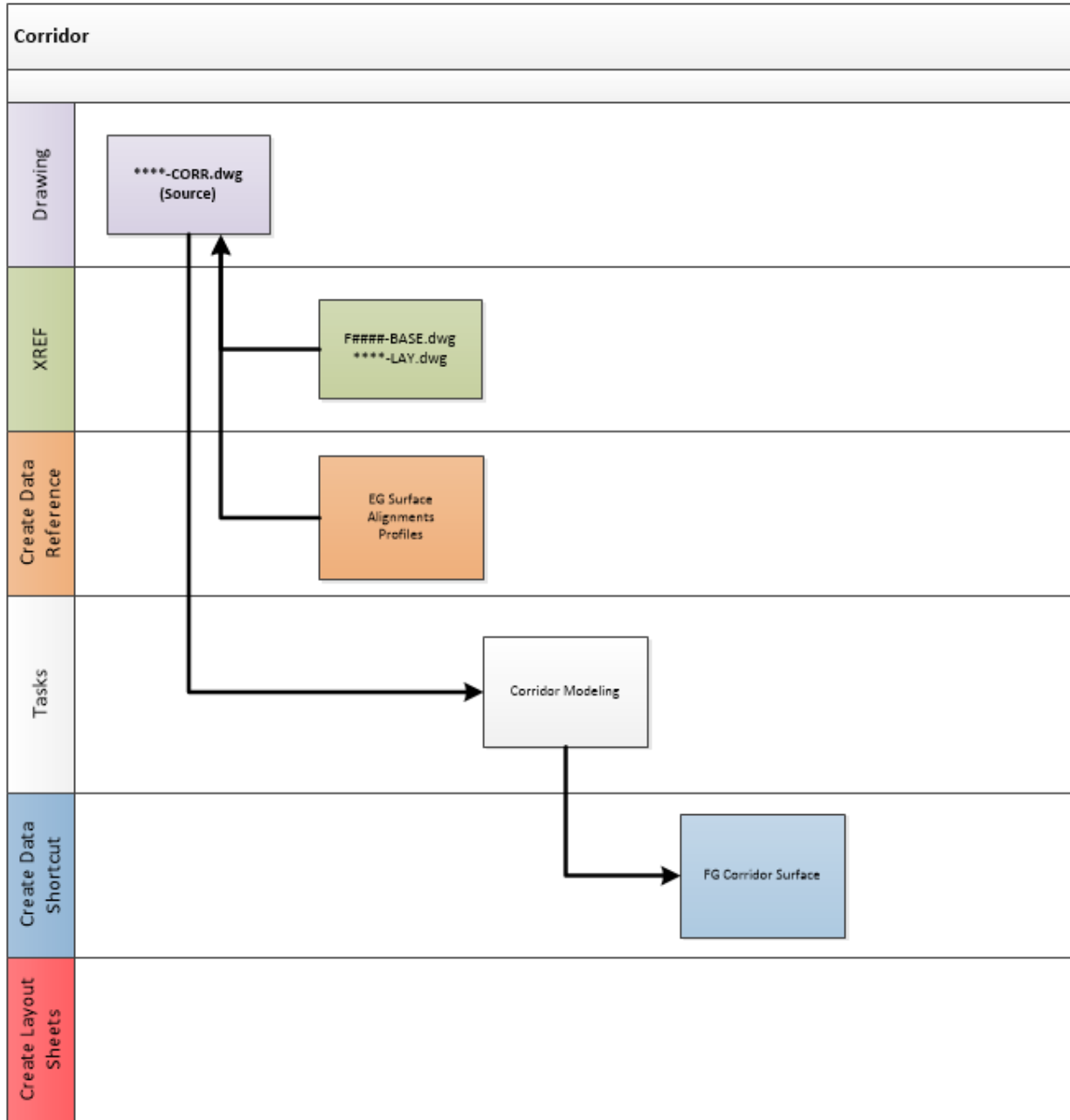




Drainage Map

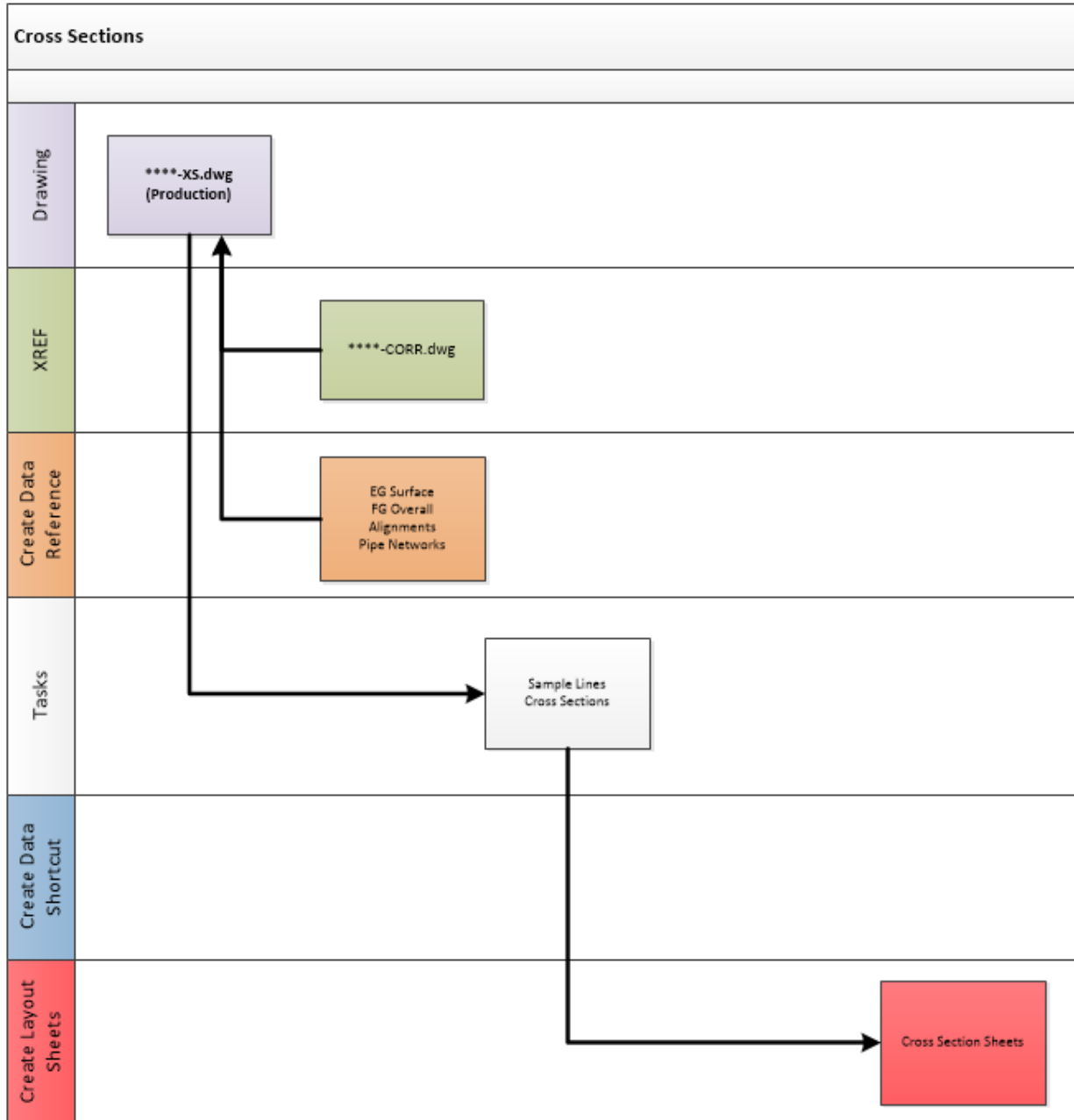


Corridor

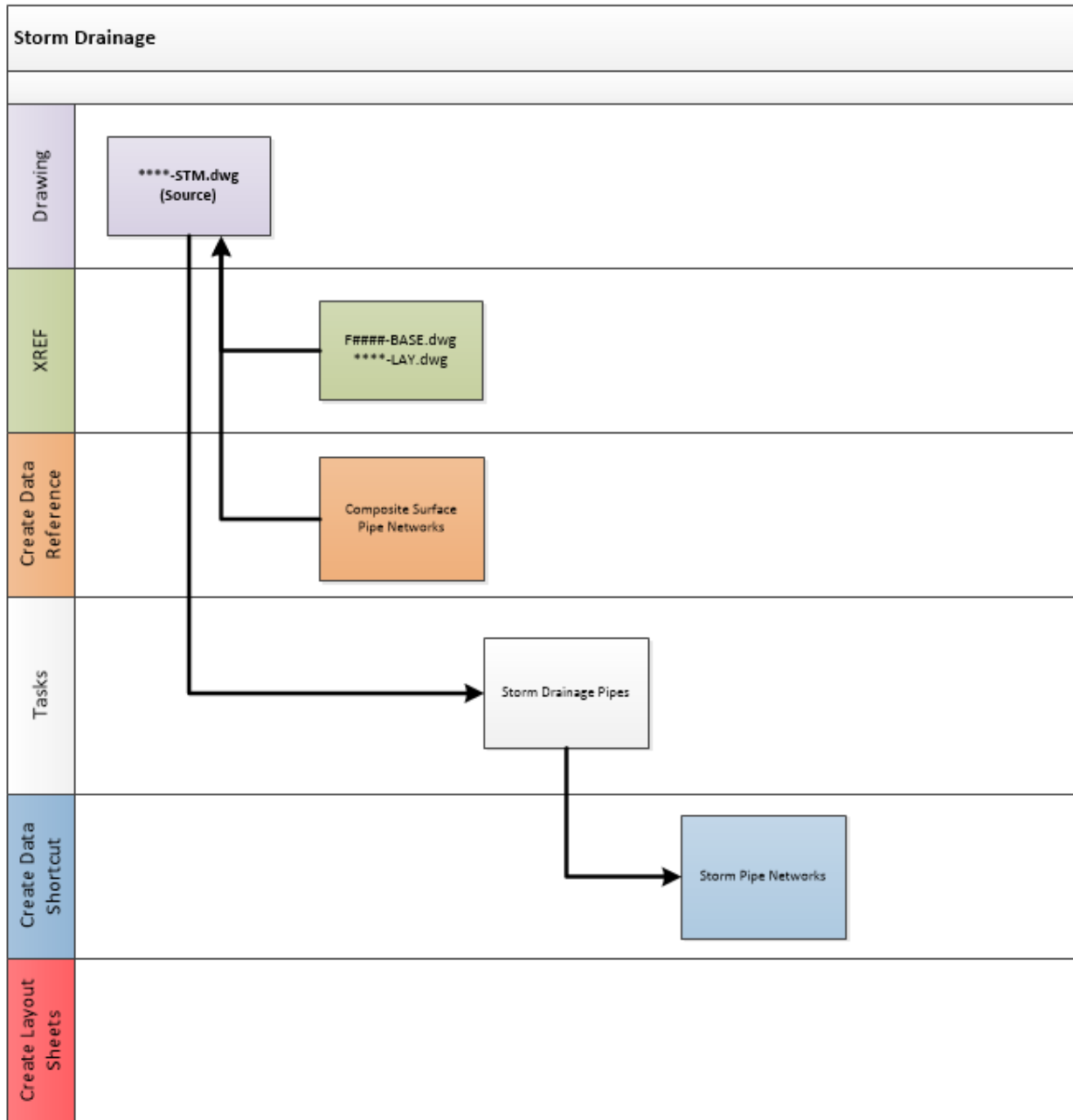


Cross Sections

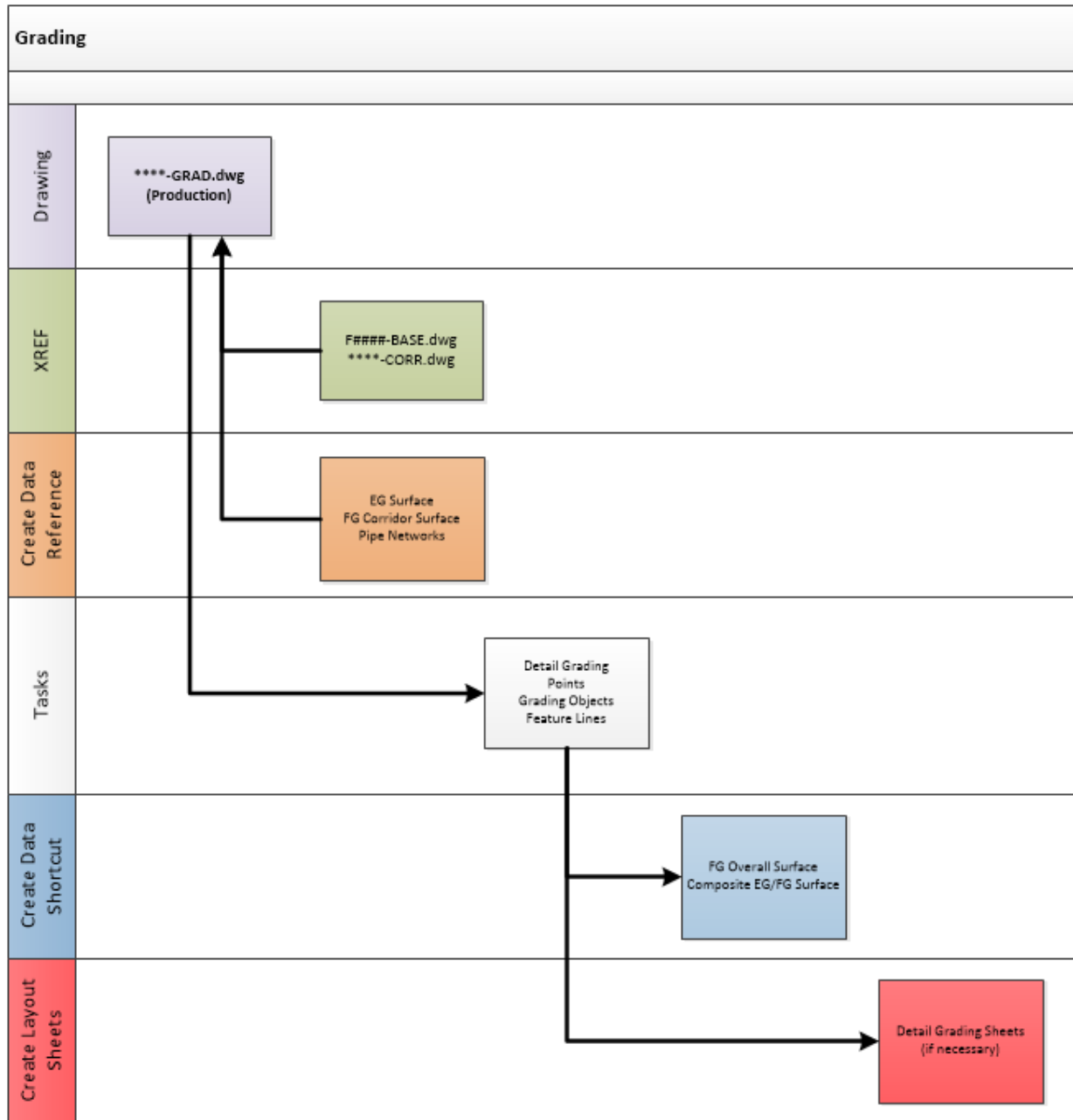
- Change the scale of the drawing equal to the desired scale of the cross sections prior to creating the cross sections.



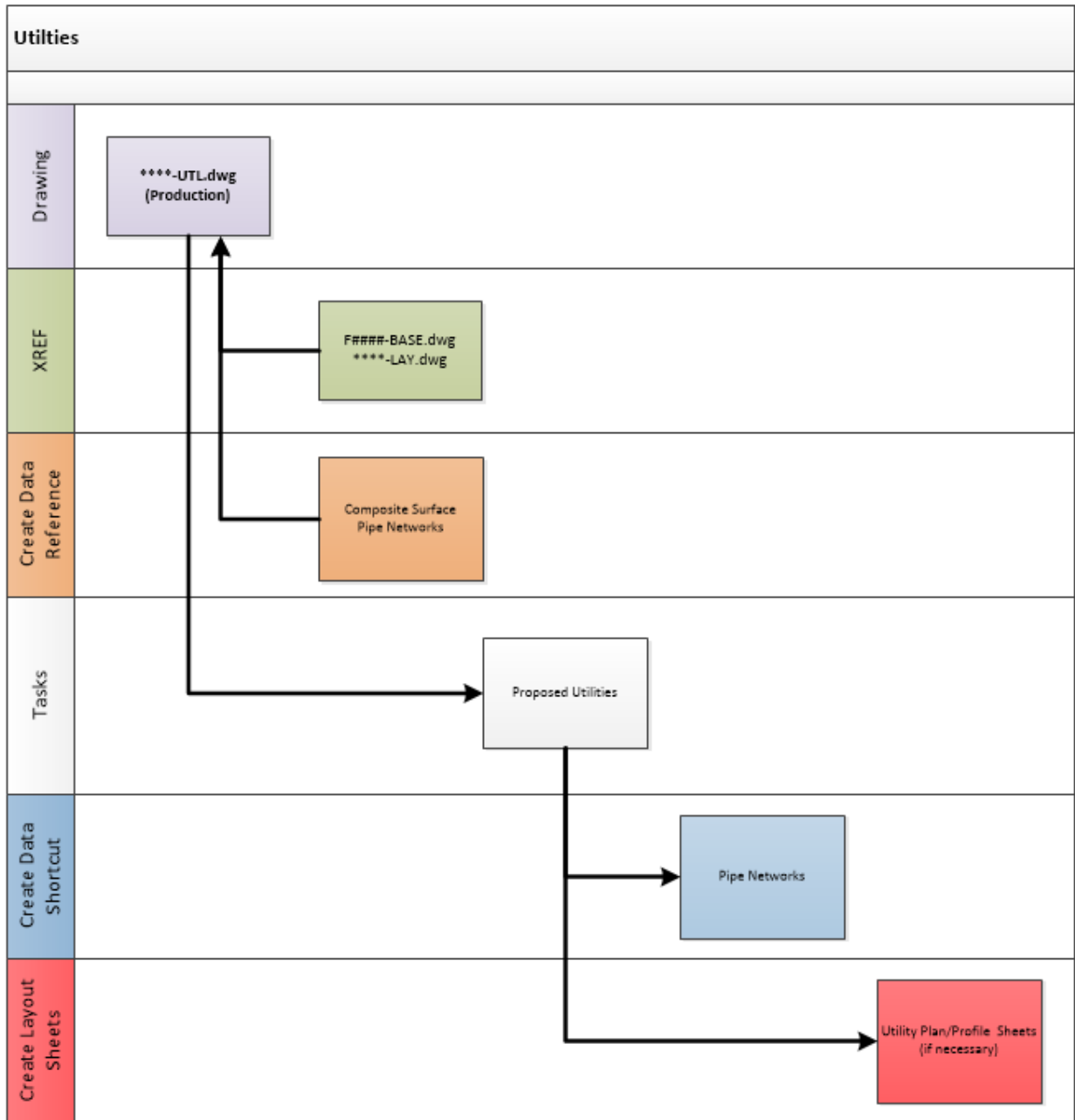
Storm Drainage



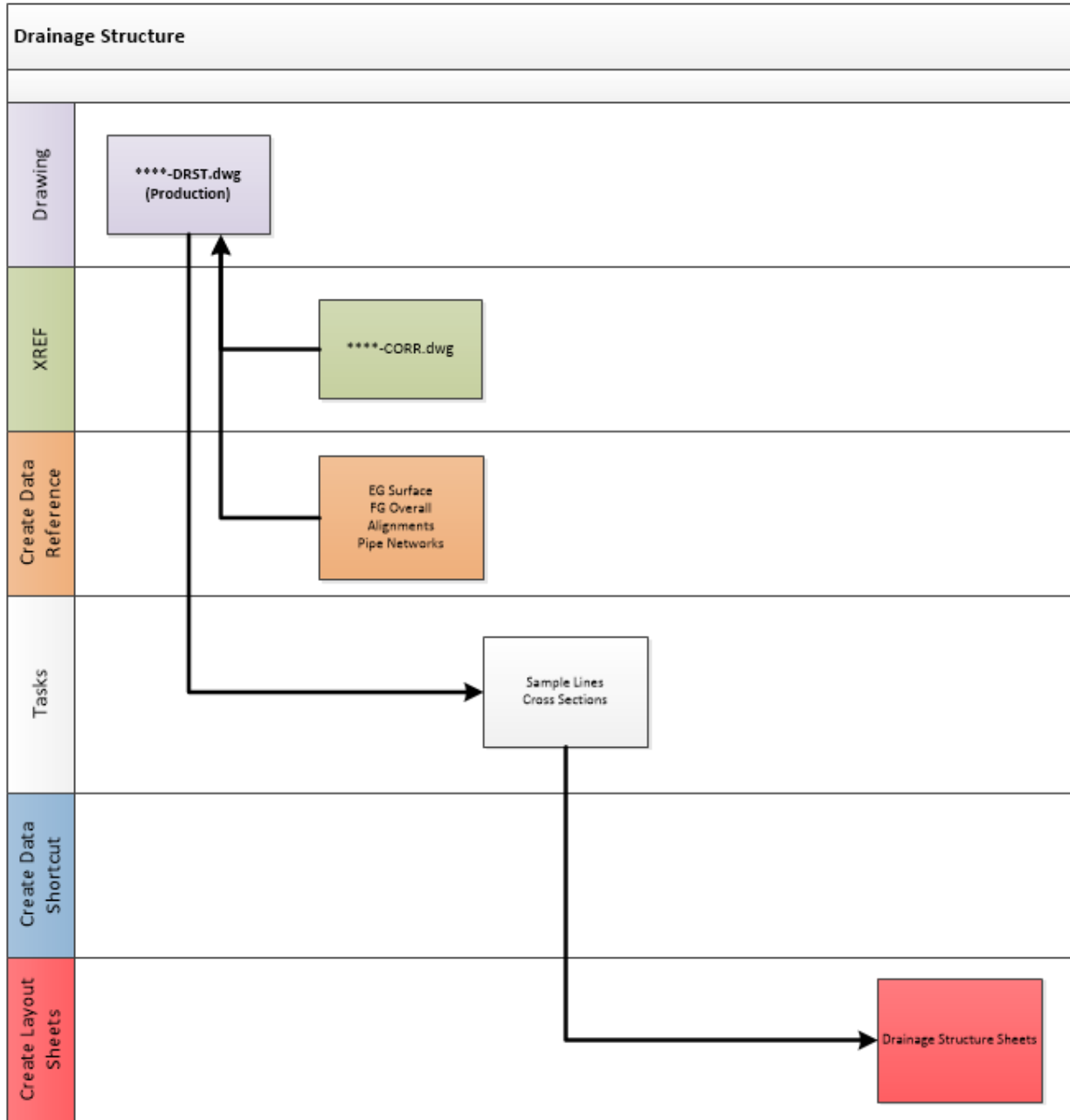
Grading



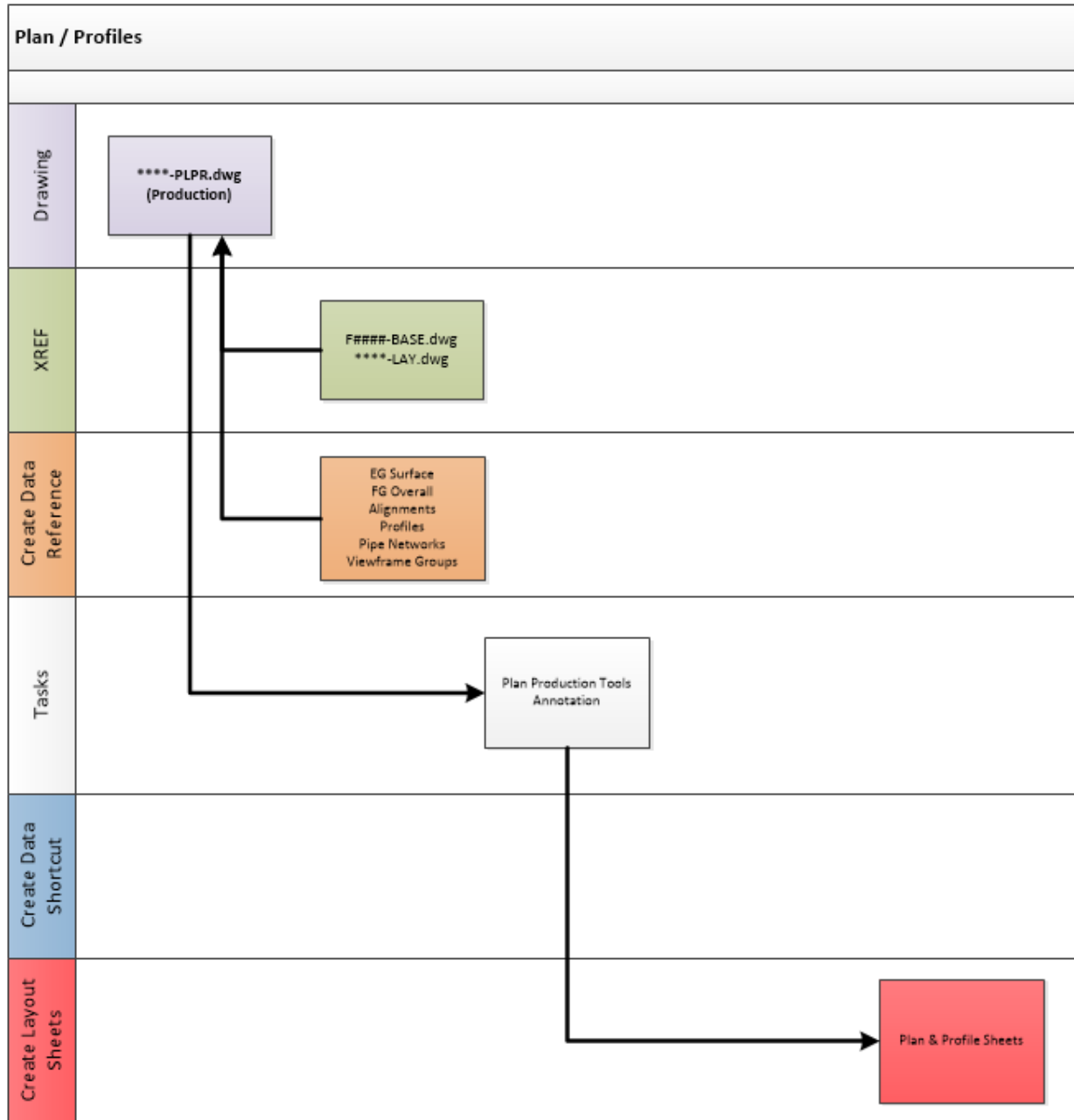
Utilities



Drainage Structure

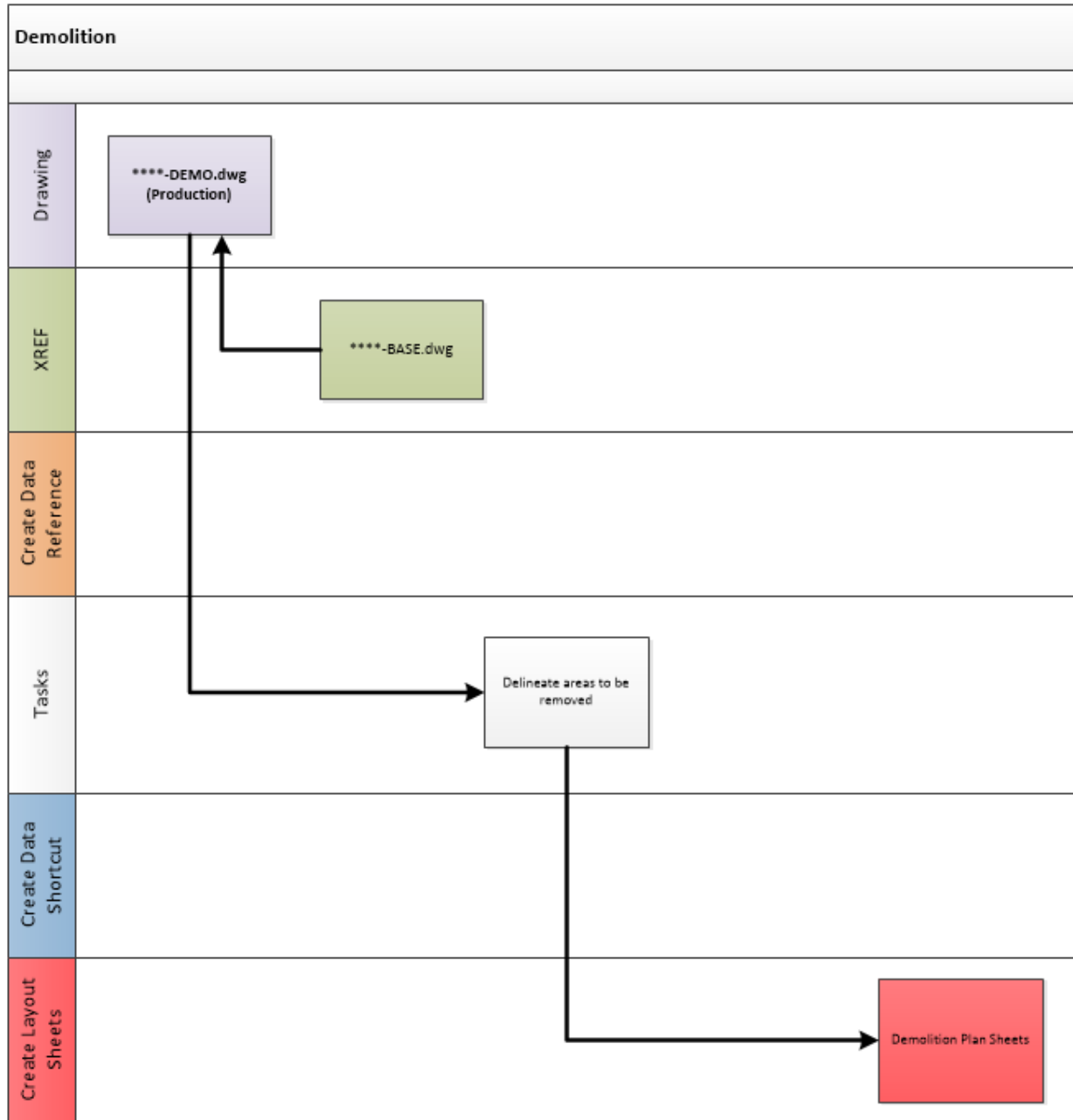


Plan / Profiles





Demolition Plan



## Sheet Set Manager

To help organize and plot drawings, sheet set manager has been implemented. A PC sample sheet set is included with the kit and should be used to create project sheet sets. Project based sheet sets only need to be created once per project and should be stored within the project directory structure.

The existing sheet set template can be found at: L:\2023\Support\SSM\Pinellas Sample.dst

Several PC title blocks have fields created that link with this sample sheet set. From the PC ribbon tab, any title blocks listed in the insert title block routine that have (SSM) at the end of the name are sheet set manager integrated.

Layout tabs created in the various design drawings can be added to the sheet set by dragging and dropping the layout tab in the applicable location on the sheet set.

A short video demonstrating how to create a new sheet set and add sheets can be found [here](#).

The screen shots below show the customized fields in the sheets as well as the overall sheetset:

Sheet Custom Properties	
Checked_By	XXXX
Designed_By	XXXX
Drawn_By	XXXX
Eng_Description_1	XXXX
Eng_Description_2	XXXX
Eng_Description_3	XXXX
Sv_Checked_By	XXXX
Sv_Plan_Type	XXXX
Sv_Project_Location	XXXX
Sv_Stationing	XXXX
Sv_Surveyed_By	XXXX
Sv_Surveyed_By_Date	.
Sv_Technician	XXXX

Sheet Set Custom Properties	
Date	XXXX/XXXX
Eng_Engineer_Of_Record	XXXX.XXXX
Eng_Engineer_Of_Record_Num	XXXX
Eng_Financial_PID	XXXXXX
Eng_Proj_Manager	XXXX.XXXX
Eng_Proj_Manager_Phone	999.999.9999
Eng_Proj_No	XXXX
Eng_Title_1	X
Eng_Title_2	XX
Eng_Title_3	XXX
Sv_PID	XXXX
Sv_Project_1	XXXX
Sv_Project_2	XXXX
Sv_Project_3	XXXX
Sv_Project_4	XXXX
Sv_SFN	XXXX
Sv_Title_1	XXXX
Sv_Title_2	XXXX
Sv_Title_3	XXXX
Total_Sheets	XX

An example of each title block demonstrating the location of the SSM fields can be found [here](#).

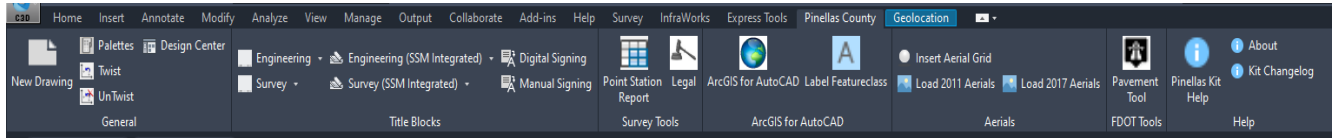
## **Data Shortcuts**

Data shortcuts will be used to share Civil 3D object data from one drawing within the project to another. Drawings should be kept small and combined as necessary based on the defined workflows to maintain performance within the application.

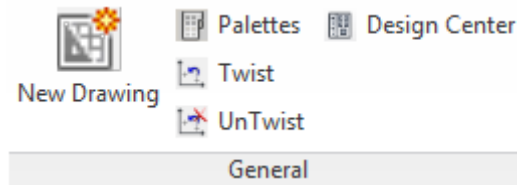
Once data shortcuts have been created, the source drawing should never be moved or renamed. Doing so will cause the shortcut to become broken.

A short video demonstrating how to fix a broken reference can be found [here](#)

## Pinellas County Ribbon Tab



### General Pane



**New Drawing** The new drawing icon should be used when creating new drawings from scratch to ensure the appropriate PC Kit template is being used.



**Palettes**

Icon toggles tool palettes on and off.



**Twist**

Routine to more quickly perform DVIEW Twist operations.



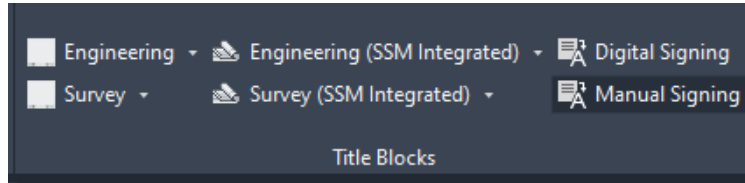
**UnTwist**

Routine to undo DVIEW Twist operations.



Opens Design Center so that you can insert items such as typical sections, standard symbology and other PC standard items.

Title Blocks Pane



Engineering ▾

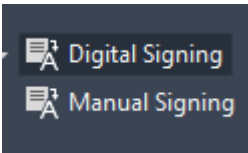
Survey ▾

The left two icons of this pane are used to insert PC standard title blocks into the current drawings. These title blocks do not include any sheet set manager integrated fields.

Engineering (SSM Integrated) ▾

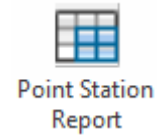
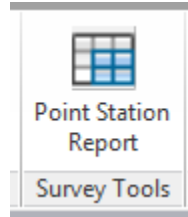
Survey (SSM Integrated) ▾

The middle two icons of this pane are used to insert PC standard title blocks into the current drawings. These title blocks do include sheet set manager integrated fields. These title blocks should be used most of the time.



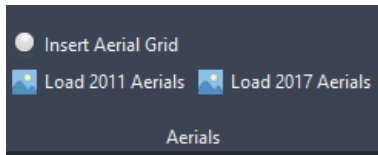
The right two icons of this pane are used to change the layer state of the drawing.

Survey Tools Pane



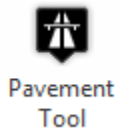
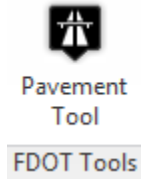
This icon launches a custom application that creates a point report that includes alignment station and offset information.

Aerials Pane



These icons are used to create a WMS data connection to PC aerial photos. The WMS connection information is saved within the DWG file and is accessible outside the county. No additional software is required to use this functionality.

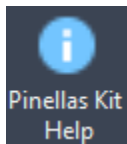
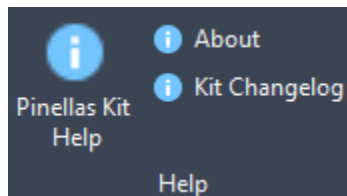
FDOT Tools Pane



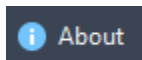
This icon launches the FDOT pavement marking tool within the PC kit.

NOTE: This tool needs to be run from the FDOT kit first to setup the necessary files prior to using it from the Pinellas configuration.

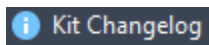
Help Pane



Launches PC CAD standards manual.



Displays release notes about the version of the PC Kit currently installed.



Displays the kit change log.

# Survey & Mapping

## Points

Project data points contain both horizontal and vertical data relative to the chosen coordinate zone – HARN/FL Florida State Plane, West Zone, US Foot. Vertical datum is NAVD 1988.

## Point Format

Project data will be represented and contained within a comma-delimited file stored with the project. The desired data point format for the Survey and Mapping Section as follows:

- FIELD ONE --- Point Identifier Number
- FIELD TWO --- Northing Coordinate Value
- FIELD THREE --- Easting Coordinate Value
- FIELD FOUR --- Point Elevation
- FIELD FIVE --- Point Code Identifier(s)

## Point Groups

Project data points will be organized into groups within Civil 3D to facilitate more efficient point data management and utilization. The standard point groups used by the Survey and Mapping Section are listed below:

- No Point – No Label – Select points pre-determined not to display a point marker or label
- Monumentation – Found and set monumentation and control points
- Storm – Storm sewer points
- Sanitary – Sanitary sewer points
- Calc – Calculated points
- GP – Ground points – points taken at arbitrary locations along the existing terrain
- VVH – Verified vertical and horizontal underground utilities
- No display – Turns off all points in the drawing
- \_All Points – All points in the drawing (this point group is controlled by Civil 3D)
- Review - Turns on all points, all point styles and all label styles



## Point Label Styles

Point Label Styles are used by the Survey and Mapping Division to graphically depict data points within Civil 3D. Point Label Styles are defined within the Label Styles collection under Points within the Settings tab of Toolspace. Variations in point label styles exist for visual display purposes. The following represents label styles defined in the Civil 3D template:

- <none>
- Description Only
- Elevation and Description
- Elevation Only
- Existing Spot Elevation
- Point Number and Description
- Point Number and Elevation
- Point Number Elevation and Description
- Point Number Only
- Proposed Northing & Easting
- Proposed Spot Elevation
- Standard

## Symbology and Description Keys

Contained inside of the PC2023.dwt template file, are point styles and a description key set that should be used when importing survey data to ensure the appropriate symbols are utilized and inserted on the appropriate layer.

Description Key Set: Pinellas County

Code	Style	Point Label Style	Format	Layer
ADS*	ADS	<default>	\$1" ADS INV	E-DR-PIPE-PT
ARBOR*	ARBOR	Description Only	ARBORVITAE	E-TREE-PT
ASHPAT*	ASHPAT	<default>	\$*	E-RD-EP-PT
AUPIN*	AUPIN	Description Only	\$1" AUS PINE	E-TREE-PT
AVOCADO	AVOCADO	Description Only	\$*	E-TREE-PT
BARRICA*	BARRICA	<default>	\$*	E-TRAFCTL-PT
BC*	BC	<default>	\$*	E-RD-BC-PT
BDWLK*	BDWLK	<default>	\$*	E-BDWLK-PT
BENCH*	BENCH	<default>	\$*	E-MISC-PT
BENT*	BRIDGE	<default>	\$*	E-RD-BRIDGE
BERM*	BERM	<default>	\$*	E-DR-PT

BFLPR*	BFLPR	<none>	\$*	E-WM-PT
BKL*	BKL	<default>	\$*	E-BKL-PT
BLDG*	BLDG	<default>	\$*	E-BLDG-PT
BOXCUL*	BOXCUL	<default>	\$*	E-DR-PT
BRIDGE*	BRIDGE	<default>	\$*	E-RD-BRIDGE-PT
BRUSH*	BRUSH	<none>	\$*	E-TREE-VEG-PT
BSHOT*	BSHOT	<default>	\$*	E-BSHOT-PT
BUMPER*	BUMPER	<default>	\$*	E-MISC-PT
BUSH*	BUSH	Description Only	\$*	E-TREE-VEG-PT
CACTUS*	CACTUS	Description Only	\$*	E-TREE-VEG-PT
CALC	CALC	Point Number Only	\$*	E-CALC-PT
CAMPH*	CAMPH	Description Only	\$1" CAMPHOR	E-TREE-PT
CBOX*	CBOX	<none>	\$*	E-UT-COMM-PT
CEDAR*	CEDAR	Description Only	\$1" CEDAR	E-TREE-PT
CITR*	CITR	Description Only	\$1" CITRUS	E-TREE-PT
CL*	CL	<default>	\$*	E-CL-PT
CMH*	CMH	<none>	\$*	E-UT-COMM-PT
CMP*	CMP	<default>	\$1" CMP Inv.	E-DR-PIPE-PT
CONC*	CONC	<default>	\$*	E-SLAB-PT
CPORT*	CPORT	<default>	\$*	E-BLDG-PT
CYPR*	CYPR	Description Only	\$1" CYPRESS	E-TREE-PT
DAM*	DAM	<default>	\$*	E-DAM-PT
DECK*	DECK	<default>	\$*	E-DECK-PT
DIPD*	DIPD	<default>	\$1" DIPD	E-DR-PIPE-PT
DIPS*	DIPS	<default>	\$1" DIPS	E-SAN-DIP-PT
DIPW*	DIPW	<default>	\$1" DIPW	E-WM-DIP-PT
DMH	DMH	<default>	\$*	E-DR-PT
DOCK*	DOCK	<default>	\$*	E-DOCK-PT
DP*	DP	<default>	\$*	E-DR-DPVMPT-PT
DWA*	DWA	<default>	\$*	E-DRW-PT
DWB*	DWB	<default>	\$*	E-DRW-PT
DWC*	DWC	<default>	\$*	E-DRW-PT
DWD*	DWD	<default>	\$*	E-DRW-PT
DWG*	DWG	<default>	\$*	E-DRW-PT
DWM*	DWM	<default>	\$*	E-DRW-PT
DWS*	DWS	<default>	\$*	E-DRW-PT
ECMP##X	C##X##	<default>	\$*	E-DR-PT
ECMP17X	C##X##	<default>	17"x13" ECMP Inv	E-DR-PIPE-PT
ECMP21X	C##X##	<default>	21"x15" ECMP Inv	E-DR-PIPE-PT

ECMP24X	C##X##	<default>	24"x18" ECMP Inv	E-DR-PIPE-PT
ECMP28X	C##X##	<default>	28"x20" ECMP Inv	E-DR-PIPE-PT
ECMP35X	C##X##	<default>	35"x24" ECMP Inv	E-DR-PIPE-PT
ECMP42X	C##X##	<default>	42"x29" ECMP Inv	E-DR-PIPE-PT
ECMP49X	C##X##	<default>	49"x33" ECMP Inv	E-DR-PIPE-PT
ECMP53X	C##X##	<default>	53"x41" ECMP Inv	E-DR-PIPE-PT
ECMP57X	C##X##	<default>	57"x38" ECMP Inv	E-DR-PIPE-PT
ECMP60X	C##X##	<default>	60"x46" ECMP Inv	E-DR-PIPE-PT
ECMP64X	C##X##	<default>	64"x43" ECMP Inv	E-DR-PIPE-PT
EEQ	EEQ	<none>	\$*	E-UT-ELEC-PT
EO*	EO	<none>	\$*	E-UT-ELEC-PT
EPA*	EPA	<default>	\$*	E-RD-EP-PT
EPB*	EPB	<default>	\$*	E-RD-EP-PT
EPC*	EPC	<default>	\$*	E-RD-EP-PT
ERCP##X##	R##X##	<default>	\$*	E-DR-PT
ERCP18X1	R##X##	<default>	18"x12" ERCP Inv	E-DR-PIPE-PT
ERCP23X1	R##X##	<default>	23"x14" ERCP Inv	E-DR-PIPE-PT
ERCP30X1	R##X##	<default>	30"x19" ERCP Inv	E-DR-PIPE-PT
ERCP34X2	R##X##	<default>	34"x22" ERCP Inv	E-DR-PIPE-PT
ERCP38X2	R##X##	<default>	38"x24" ERCP Inv	E-DR-PIPE-PT
ERCP42X2	R##X##	<default>	42"x27" ERCP Inv	E-DR-PIPE-PT
ERCP45X2	R##X##	<default>	45"x29" ERCP Inv	E-DR-PIPE-PT
ERCP53X3	R##X##	<default>	53"x34" ERCP Inv	E-DR-PIPE-PT
ERCP60X3	R##X##	<default>	60"x38" ERCP Inv	E-DR-PIPE-PT
ERCP68X4	R##X##	<default>	68"x43" ERCP Inv	E-DR-PIPE-PT
ERCP76X4	R##X##	<default>	76"x48" ERCP Inv	E-DR-PIPE-PT
ERCP83X5	R##X##	<default>	83"x53" ERCP Inv	E-DR-PIPE-PT
ERCP91X5	R##X##	<default>	91"x58" ERCP Inv	E-DR-PIPE-PT
ERD*	ERD	<default>	\$*	E-RD-EP-PT
ERG*	ERG	<default>	\$*	E-RD-EP-PT
ERM*	ERM	<default>	\$*	E-RD-EP-PT
ERSH*	ERSH	<default>	\$*	E-RD-EP-PT
F60D*	F60D	<default>	\$*	E-MON-FND-PT
FBD*	FND	Point Number Only	\$*	E-MON-FND-PT
FCM*	FCM	Point Number Only	\$*	E-MON-FND-PT
FEN*	FEN	<default>	\$*	E-FENCE-PT
FF	FLEL	Elevation and	\$*	E-FLEL-PT
FH	FH	<none>	\$*	E-WM-PT
FIP*	FIP	Point Number Only	\$*	E-MON-FND-PT

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FIR*	FIR	Point Number Only	\$*	E-MON-FND-PT
FL*	FL	<default>	\$*	E-DR-FLOW-PT
FNC*	FNC	Point Number Only	\$*	E-MON-FND-PT
FND*	FND	Point Number Only	FNDK	E-MON-FND-PT
FOC*	FOC	Point Number Only	\$*	E-MON-FND-PT
FPCED*	FPCED	Point Number Only	\$*	E-MON-FND-PT
FPCSD*	FPCSD	Point Number Only	\$*	E-MON-FND-PT
FPK*	FPK	Point Number Only	\$*	E-MON-FND-PT
FPOLE	FPOLE	Description Only	FLAG POLE	E-MISC-PT
FPPIPE*	FPPIPE	Point Number Only	\$*	E-MON-FND-PT
FRC*	FRC	Point Number Only	\$*	E-MON-FND-PT
FRRS*	FRRS	Point Number Only	\$*	E-MON-FND-PT
FRVT*	FRVT	Point Number Only	\$*	E-MON-FND-PT
FTBAR*	FTBAR	Point Number Only	\$*	E-MON-FND-PT
FXCUT*	FXCUT	Point Number Only	\$*	E-MON-FND-PT
FXDL*	FXDL	<default>	\$*	E-TRAFCTL-PT
FYC*	FYC	Point Number Only	\$*	E-MON-FND-PT
GATE*	GATE	<default>	\$*	E-FENCE-PT
GM	GM	<none>	\$*	E-UT-GAS-PT
GP	GP	<default>	\$*	E-GP-PT
GRAIL*	GRAIL	<default>	\$*	E-GRAIL-PT
GRATE*	GRATE	<none>	\$*	E-DR-PT
GRAVE*	GRAVE	<default>	\$*	E-GRAVE-PT
GTANK	GTANK	<default>	\$*	E-UT-TANK-PT
GTEST	GV	<none>	\$*	E-UT-GAS-PT
GUYWIRE	GUYWIRE	<none>	\$*	E-UT-ELEC-PT
GV	GV	<none>	\$*	E-UT-GAS-PT
GWALL*	GWALL	<default>	\$*	E-GWALL-PT
GYM	GYM	<default>	\$*	E-MISC-PT
HDWALL*	HDWALL	<default>	\$*	E-DR-PT
HEDGE*	HEDGE	<default>	\$*	E-TREE-VEG-PT
HOSEBIB	HOSEBIB	<none>	\$*	E-WM-PT
HRAIL	HRAIL	<default>	\$*	E-HRAIL-PT
HRAIL*	HRAIL	<default>	\$*	E-HRAIL-PT
HWM	HWM	<default>	\$*	E-HWM-PT
INLET	INLET	<default>	\$*	E-DR-PT
INLET*	INLET	<default>	\$*	E-DR-PT
JACAR*	JACAR	Description Only	\$1" JACARANDA	E-TREE-PT
LIFTSTA*	LIFTSTA	<default>	\$*	E-SAN-LIFT-PT

LIGHT	LIGHT	<none>	\$*	E-LTD-PT
LL*	LL	<default>	\$*	E-STRIFE-PT
LPOLE	LPOLE	<none>	\$*	E-UT-LP-PT
MAGNO*	MAGNO	Description Only	\$1" MAGNOLIA	E-TREE-PT
MAPLE*	MAPLE	Description Only	\$1" MAPLE	E-TREE-PT
MAPLEC	MAPLEC	Description Only	MAPLE CLUSTER	E-TREE-PT
MBOX	MBOX	<none>	\$*	E-MISC-PT
MES*	MES	<default>	\$*	E-DR-PT
MH	MH	<none>	\$*	E-UT-MISC-PT
MHW	MHW	<default>	\$*	E-MHW-PT
MLW	MLW	<default>	\$*	E-MLW-PT
MROW*	ROW	<default>	\$*	E-ROW-PT
MWELL	MWELL	<none>	\$*	E-MWELL-PT
OAK*	OAK	Description Only	\$1"	E-TREE-PT
OAKC	OAKC	Description Only	OAK C	E-TREE-PT
OH	OH	<default>	\$*	E-UT-UNK-PT
OHW	OHW	<default>	\$*	E-OHW-PT
OLW*	OLW	<default>	\$*	E-OLW-PT
PALM*	PALM	Description Only	\$1"	E-TREE-PT
PALMC	PALMC	Description Only	PALM C	E-TREE-PT
PEDPOLE	PEDPOLE	<none>	\$*	E-UT-PSP-PT
PILE	BRIDGE	<default>	\$*	E-RD-BRIDGE-PT
PINE*	PINE	Description Only	\$1"	E-TREE-PT
PINEC	PINEC	Description Only	PINE C	E-TREE-PT
PIPE*	PIPE	<default>	\$*	E-DR-PT
PLNTR*	PLNTR	<default>	\$*	E-PLNTR-PT
POOL*	POOL	<default>	\$*	E-MISC-PT
POOLEQ	POOLEQ	<default>	\$*	E-MISC-PT
POST	POST	<none>	\$*	E-POST-PT
PUMP	PUMP	<default>	\$*	E-PUMP-PT
PUNK*	PUNK	Description Only	\$1" PUNK	E-TREE-PT
PUNKC	PUNKC	Description Only	PUNK CLUSTER	E-TREE-PT
PVCD*	PVCD	<default>	\$1" PVC Inv	E-DR-PT
PVCS*	PVCS	<default>	\$1" PVC Inv	E-SAN-GR-PT
PWRBX	PWRBX	<none>	\$*	E-UT-ELEC-PT
RCM	RCM	<none>	\$*	E-RCWM-PT
RCMH	RCMH	<none>	\$*	E-RCWM-PT
RCP*	RCP	<default>	\$1" RCP Inv	E-DR-PIPE-PT
RCV	RCV	<none>	\$*	E-RCWM-PT

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RIPRAP*	RIPRAP	<default>	\$*	E-RIPRAP-PT
ROCK	ROCK	<default>	\$*	E-ROCK-PT
ROW*	ROW	<default>	\$*	E-ROW-PT
RR*	RR	<default>	\$*	E-RR-PT
RRGATE	RRGATE	<default>	\$*	E-RR-PT
S60D	S60D	<default>	\$*	E-MON-SET-PT
SBORE	SBORE	<default>	\$*	E-MISC-PT
SCM*	SCM	Point Number Only	\$*	E-MON-SET-PT
SDCO*	SDCO	<default>	\$*	E-DR-PT
SEPTIC	SEPTIC	<default>	\$*	E-SAN-PT
SGP	SGP	<default>	\$*	E-SGP-PT
SH	SH	<none>	\$*	E-SPKL-PT
SHV	SHV	<none>	\$*	E-SPKL-PT
SHW	SHW	<default>	\$*	E-SHW-PT
SIGN*	SIGN	<none>	\$*	E-SIGN-PT
SIP*	SIP	Point Number Only	\$*	E-MON-SET-PT
SIR*	SIR	Point Number Only	\$*	E-MON-SET-PT
SKIMMER	SKIMMER	<default>	\$*	E-DR-PT
SLAB*	SLAB	<default>	\$*	E-SLAB-PT
SLOT	SLOT	<default>	\$*	E-DR-PT
SLW	SLW	<default>	\$*	E-SLW-PT
SNC*	SNC	Point Number Only	\$*	E-MON-SET-PT
SND*	SND	Point Number Only	\$*	E-MON-SET-PT
SOC*	SOC	Point Number Only	\$*	E-MON-SET-PT
SPCED*	SPCED	Point Number Only	\$*	E-MON-SET-PT
SPCSD*	SPCSD	Point Number Only	\$*	E-MON-SET-PT
SPIL*	SPIL	<default>	\$*	E-DR-SPIL-PT
SPK*	SPK	Point Number Only	\$*	E-MON-SET-PT
SPRUCE*	SPRUCE	Description Only	\$1" SPRUCE	E-TREE-PT
SRC*	SRC	Point Number Only	\$*	E-MON-SET-PT
SSCO	SSCO	<none>	\$*	E-SAN-PT
SSMH	SSMH	<none>	\$*	E-SAN-GR-PT
SSVT	SSVT	<default>	\$*	E-SAN-GR-PT
STAKE	STAKE	<default>	\$*	E-MON-SET-PT
STATUE	STATUE	<default>	\$*	E-MISC-PT
STEP*	STEP	<default>	\$*	E-SW-PT
STPBAR*	STPBAR	<default>	\$*	E-STRIFE-PT
STRUC*	STRUC	<default>	\$*	E-DR-PT
SV	SEWERV	<none>	\$*	E-SAN-PT

SW	SW	<default>	\$*	E-SW-PT
SW#	SW	<default>	\$*	E-SW-PT
SW##	SW	<default>	\$*	E-SW-PT
SW###	SW	<default>	\$*	E-SW-PT
SWALE*	SWALE	<default>	\$*	E-SWALE-PT
SWALL*	SWALL	<default>	\$*	E-SWALL-PT
SWB*	SWB	<default>	\$*	E-SW-PT
SWF*	SWF	<default>	\$*	E-SW-PT
SXCUT*	SXCUT	Point Number Only	\$*	E-MON-SET-PT
SYC*	SYC	Point Number Only	\$*	E-MON-SET-PT
TB*	TB	<default>	\$*	E-TB-PT
TGT*	TGT	<none>	\$*	E-CTRL-PT
THROAT	THROAT	<default>	\$*	E-DR-PT
TRBX*	TRBX	<none>	\$*	E-TRAFCTL-PT
TREE*	TREE	Description Only	\$1" TREE	E-TREE-PT
TREEC	TREEC	Description Only	TREE CLUSTER	E-TREE-PT
TREEL*	TREEL	<default>	TREE LINE	E-TREE-PT
TRP	TRP	<none>	\$*	E-TRAF-PL-PT
TRPBX	TRPBX	<none>	\$*	E-TRAFCTL-PT
TS*	TS	<default>	\$*	E-TS-PT
UC*	UC	<default>	\$*	E-UT-COMM-PT
UDBOX	UDBOX	<none>	\$*	E-DR-PT
UE*	UE	<default>	\$*	E-UT-ELEC-PT
UF*	UF	<default>	\$*	E-SAN-FM-PT
UG*	UG	<default>	\$*	E-UT-GAS-PT
UO*	UO	<default>	\$*	E-UT-HOTOIL-PT
UP	PPOLE	<none>	\$*	E-UT-UP-PT
UQ*	UQ	<default>	\$*	E-UT-UNK-PT
UR*	UR	<default>	\$*	E-RCWM-PT
US*	US	<default>	\$*	E-SAN-GR-PT
UW*	UW	<default>	\$*	E-WM-PT
UX*	UX	<default>	\$*	E-UT-TRAFCTL-PT
V-CALC	V-CALC	<default>	\$*	E-V-CALC-PT
VCPD*	VCPD	<default>	\$1" PVC Inv	E-DR-PT
VCPS*	VCPS	<default>	\$1" PVC Inv	E-SAN-GR-PT
WALL*	WALL	<default>	\$*	E-WALL-PT
WATER	WATER	<default>	\$*	E-DR-PT
WEIR*	WEIR	<default>	\$*	E-WEIR-PT
WETLN*	WETLN	<default>	\$*	E-WETLAND-PT

WM	WM	<none>	\$*	E-WM-PT
WSFTNR	WSFTNR	<default>	\$*	E-WM-PT
WV	WV	<none>	\$*	E-WM-PT
XWALK*	XWALK	<default>	\$*	E-TRAFCTL-PT
XXX*	XXX	<default>	\$*	E-CTRLCHK-PT

### Figure Prefix Database

Included with the PC Kit is a figure prefix database that should be used when importing data to ensure the linework is inserted on the appropriate layer as well as tagged as a breakline.

Figure Prefix Database: Pinellas County

Name	Breakline	Layer	Style
ASHPAT	Yes	E-RD-EP	ASHPAT
BARRICA	No	E-TRAFCTL	BARRICA
BC	Yes	E-RD-BC	BC
BDWLK	No	E-BDWLK	BDWLK
BERM	Yes	E-DR	BERM
BLDG	No	E-BLDG	BLDG
BRIDGE	No	E-RD-BRIDGE	BRIDGE
BRUSH	No	E-TREE-VEG	BRUSH
BUMPER	No	E-MISC	BUMPER
CL	Yes	E-CL	CL
CPORT	No	E-BLDG	CPORT
DAM	No	E-DAM	DAM
DECK	No	E-DECK	DECK
DOCK	No	E-DOCK	DOCK
DP	Yes	E-DR-DPVMT	DP
DWA	Yes	E-DRW	EDGE OF DRIVE
DWB	Yes	E-DRW	EDGE OF DRIVE
DWC	Yes	E-DRW	EDGE OF DRIVE
DWD	Yes	E-DRW	EDGE OF DRIVE
DWG	Yes	E-DRW	EDGE OF DRIVE

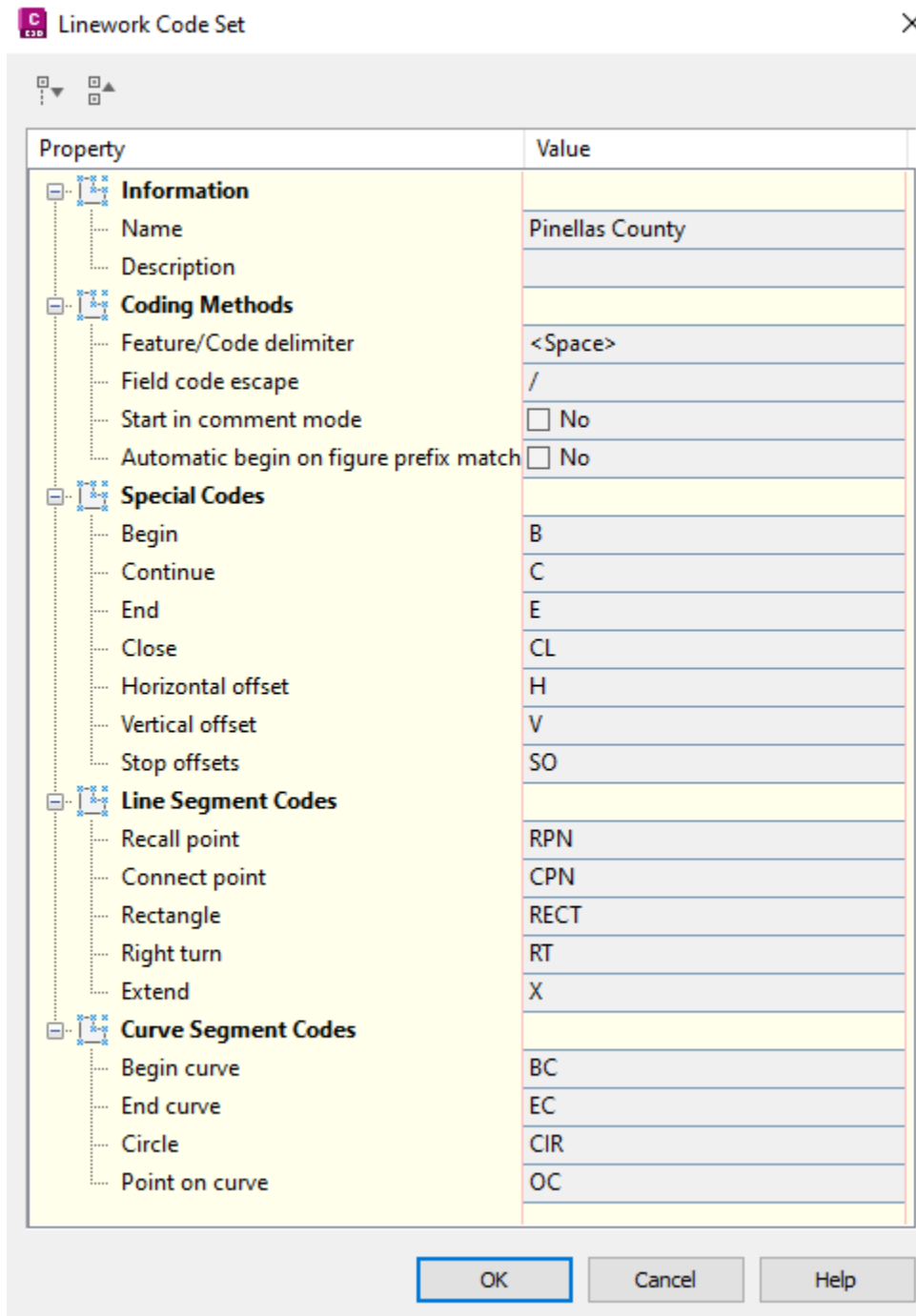


DWM	Yes	E-DRW	EDGE OF DRIVE
DWS	Yes	E-DRW	EDGE OF DRIVE
EPA	Yes	E-RD-EP	EDGE OF PAVE
EPB	Yes	E-RD-EP	EDGE OF PAVE
EPC	Yes	E-RD-EP	EDGE OF PAVE
ERD	Yes	E-RD-EP	EDGE OF PAVE
ERG	Yes	E-RD-EP	EDGE OF PAVE
ERM	No	E-RD-EP	EDGE OF PAVE
ERSH	No	E-RD-EP	EDGE OF PAVE
FL	Yes	E-DR-FLOW	FL
GRAIL	No	E-GRAIL	GRAIL
GRAVE	No	E-GRAVE	GRAVE
HDWALL	Yes	E-DR	HDWALL
HEDGE	No	E-TREE-VEG	HEDGE
HWM	No	E-HWM	HWM
LL	No	E-STRIPES	LANE
LIFTSTA	No	E-SAN-LIFT	LIFTSTA
MES	No	E-DR	MES
MHW	No	E-MHW	MHW
MLW	No	E-MLW	MLW
OHW	No	E-OHW	OHW
OLW	No	E-OLW	OLW
PLNTR	No	E-PLNTR	PLANTER
POOL	No	E-MISC	POOL
RIPRAP	No	E-RIPRAP	RIPRAP
ROCK	No	E-ROCK	ROCK
RR	Yes	E-RR	RR
SHW	No	E-SHW	SHW
SLAB	Yes	E-SLAB	SLAB
SLW	No	E-SLW	SLW
SPIL	Yes	E-DR-SPIL	SPIL

SW	Yes	E-SW	SW
SWALE	Yes	E-SWALE	SWALE
SWALL	Yes	E-SWALL	SWALL
SWB	Yes	E-SW	SWB
SWF	Yes	E-SW	SWF
TB	Yes	E-TB	TB
TS	Yes	E-TS	TS
WEIR	No	E-WEIR	WEIR
HRAIL	No	E-HRAIL	HRAIL
UC	No	E-UT-COMM	UC
UE	No	E-UT-ELEC	UE
UF	No	E-SAN-FM	UF
UG	No	E-UT-GAS	UG
UO	No	E-UT-HOTOIL	UO
UQ	No	E-UT-UNK	UQ
UR	No	E-RCWM	UR
US	No	E-SAN-GR	US
UW	No	E-WM	UW
UX	No	E-UT-TRAFCTL	UX
WETLN	No	E-WETLAND	WETLAND
FEN	No	E-FENCE	FENCE
STRUC	No	E-DR	STRUCTURE
GATE	No	E-FENCE	GATE
SIGN	No	E-SIGN	SIGN
INLET	No	E-DR	INLET
WALL	No	E-WALL	WALL
BENCH	No	E-MISC	BENCH
BENT	No	E-RD-BRIDGE	BRIDGE
CLRR	Yes	E-CL	CL
CONC	Yes	E-SLAB	SLAB
STPBR	No	E-STRIPE	LANE
TREEL	No	E-TREE-VEG	BRUSH
SKIMMER	No	E-DR	SKIMMER
XWALK	No	E-TRAFCTL	XWALK
STEP	No	E-SW	STEP
GWALL	Yes	E-GWALL	GWALL
BKL	Yes	E-BKL	BKL

### **Linework Codesets**

PC has developed and included a custom linework codeset that should be utilized when collecting field data and importing it into Civil 3D. This codeset will ensure linework is drawn between the applicable field codes.



## Graphic Symbols

CENTERLINE		SANITARY SEWER GRAVITY LINE	
CONTOUR LINE		FORCE MAIN (SANITARY SEWER)	
EXISTING TOPOGRAPHIC FEATURE		GAS LINE	
SURFACE WATER/WETLAND BOUNDARY		HOT OIL LINE	
SURVEY REFERENCE LINE		RECLAIMED WATER LINE	
RIGHT-OF-WAY (EXISTING)		POTABLE WATER	
RIGHT-OF-WAY LINE (PROPOSED)		UNKNOWN UTILITY	
RIGHT-OF-WAY LINE (EXISTING W/ ACQUISITION)		FOUND CONCRETE MONUMENT	
PROPERTY OR DEED LINE		FOUND NAIL & DISC/CAP BRASS DISC	
EASEMENT LINE		FOUND IRON ROD	
EASEMENT LINE (PROPOSED)		FOUND IRON PIPE	
EASEMENT LINE (PROPOSED) (EXISTING W/ ACQUISITION)		FOUND FINCH PIPE	
SECTION LINE		SET CONCRETE MONUMENT	
ORIGINAL LOT LINE/FORMER OWNERSHIP LINE/VACATED EASEMENTS		SET NAIL & DISC/CAP BRASS DISC	
TREE LINE		SET IRON ROD	
FENCE LINE		XCUT (FOUND)	
COMMUNICATION LINE		XCUT (SET)	
TRAFFIC CONTROL LINE		SUB PARCEL NO.	
ELECTRIC POWER LINE/CABLE		BLOCK NUMBER	
DRAINAGE (STORM SEWER) PIPE		PROPERTY APPRAISER PARCEL NUMBER	
EXISTING TOP OF BANK AND TOE OF SLOPE		PROPOSED PARCEL	

BACKFLOW PREVENTER		JUNCTION BOX		SHRUB	
BENCHMARK		LIGHT POLE		SIGN	
CENTERLINE		MAILBOX		SPRINKLER HEAD	
COMMUNICATIONS BOX		MONITOR WELL		SPRINKLER HEAD VALVE	
COMMUNICATIONS MANHOLE		PALM TREE		SURVEY LINE	
DECIDUOUS TREE (OAK UNLESS OTHERWISE ANNOTATED)		PEDESTRIAN SIGNAL		TARGET	
DELTA ANGLE		POLE/POST		TRAFFIC SIGNAL POLE	
DRAINAGE CLEAN OUT		POWER BOX		TRAFFIC SIGNAL PULL BOX	
DRAINAGE MANHOLE		PROPERTY LINE		UNDERDRAIN BOX	
ELECTRICAL OUTLET		RECLAIMED WATER MANHOLE		UTILITY POLE	
EVERGREEN TREE		RECLAIMED WATER METER		WATER METER	
FIRE HYDRANT		RECLAIMED WATER VALVE		WATER VALVE	
GAS VALVE		SANITARY SEWER CLEANOUT			
GATE VALVE		SEWER MANHOLE			
GRATE INLET					
GUY WIRE					
HOSE BIB					

## Importing ASCII Files

The ASCII point file is imported directly into Civil 3D to create the point data, figures, and symbology on their designated layer as defined within the PC CADD Standard.

A short video demonstrating how to import ASCII files can be found [here](#)

## Alignments

Alignments are used as a graphical reference for locating and identifying existing features horizontally along a linear path through the surveyed site.

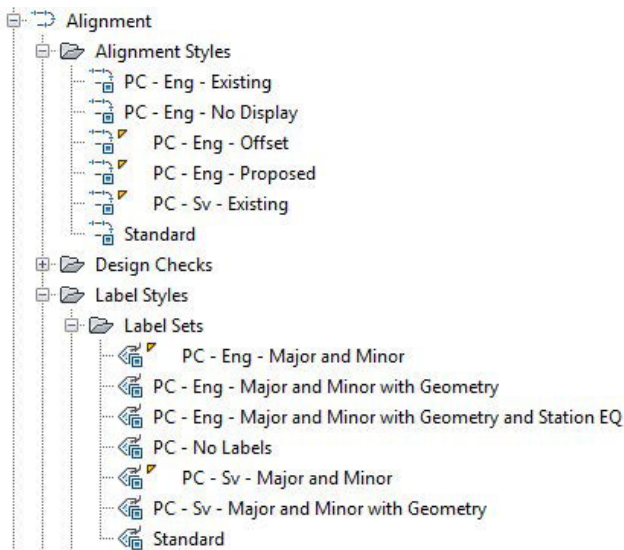
### Standard Alignments

Standard alignments will be drawn from the West to the East and from the South to the North along the survey site. All standard survey alignments will be given the acronym SRL for survey reference line and an explicit description given in the description dialog box of the alignment represented. Additional standard alignments will be numbered accordingly. PC design settings are displayed below:

*Example: SRL1, 2, 3, etc.*

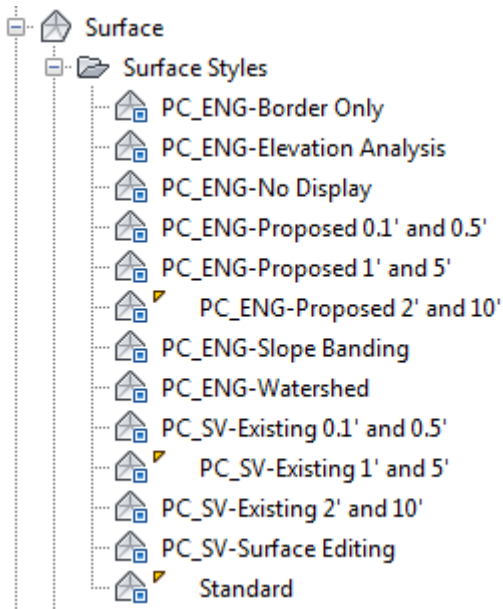
### Alignment Stationing and Labeling

To control how stations appear in Civil 3D, alignment label sets have been created and included with the main PC2023.dwt drawing template. These styles have been created to control the aesthetics of the labels including layer, font, increment, text height, and precision.



## Digital Terrain Models (Surfaces)

The existing DTM, or surface, will be created using one of the included surface object styles. This will ensure adherence to the PC CADD standard.



Naming standardization will be based upon the following conventions:

a. **Survey**

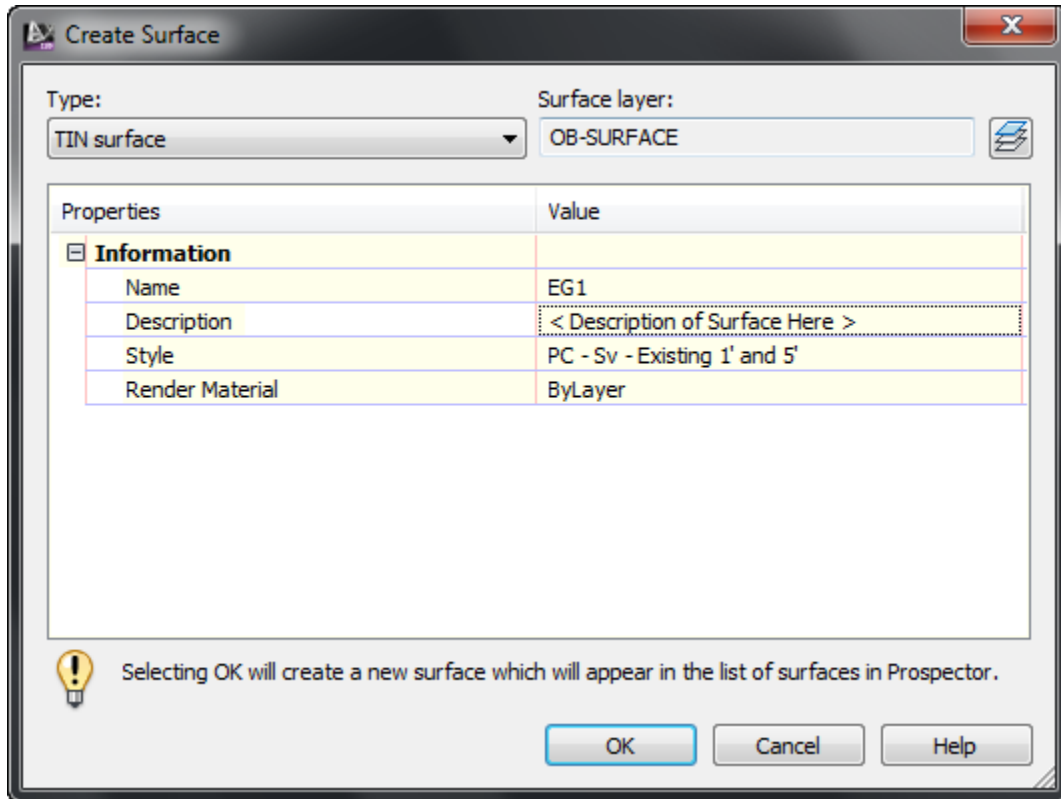
Surface Name: EG1, EG2, EG3, etc...

Surface Description – Surface description, technician’s initials, original creation date, and modification descriptions to follow the above information.

b. **AS-BUILT**

Surface Name: AB1, AB2, AB3, etc...

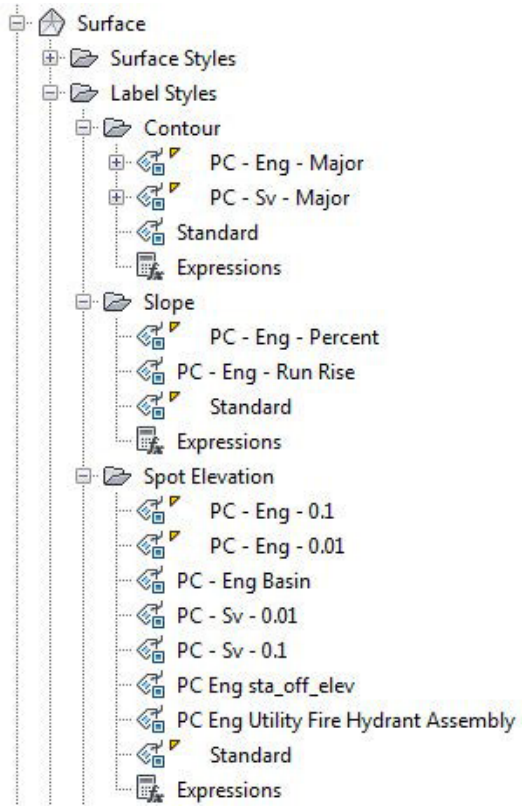
Surface Description – Surface description, technician’s initials, original creation date, and modification descriptions to follow the above information.



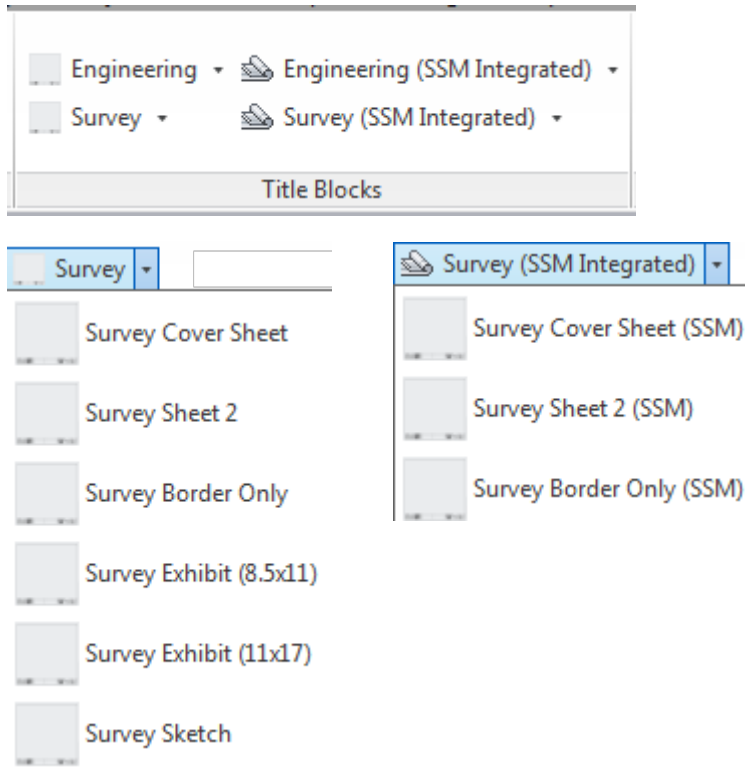
Click [here](#) to see a short video on surface creation. Once a surface has been created, it can be easily modified to more accurately reflect real life conditions. Click [here](#) to see a short video on surface editing.

Once a surface has been created, any surface labels should use existing styles provided in the PC2023.dwt drawing template. Label styles for contours, slopes, and spot elevations have been provided:





## Survey Title Blocks



- Survey Cover Sheet – This is the first sheet of the survey. It includes the Title of Project, Vicinity Map, Pinellas County Map, Graphic Symbols, and Sheet Index.
- Survey Sheet 2 – This sheet includes the Land Surveyor Report, Abbreviations, Alignments, Monumentation/Control Point Table, and Existing Structure Tables.
- Survey Border Only – This Title Block is used for the Plan View Sheets.
- Survey Exhibit (8.5X11) – This Title Block is used for the Exhibits that are created with Sketch and Descriptions.

- Survey Exhibits (11X17) - This Title Block is used for the Exhibits that are created other than Exhibits for Sketch and Descriptions.
- Survey Sketch – This Title Block to be used for Sketch and Descriptions.
- The title blocks with (SSM) as suffixes are Sheet Set Manager integrated. Use these Title Blocks as described above.

### Additional Survey Process Information

<b>LDT 2006 to Civil 3D 2014 Project Conversion</b>	A step by step process for converting existing LDT 2006 projects to Civil 3D 2014 projects can be found <a href="#">here</a> .
<b>Alignment Creation</b>	A step by step process for alignment creation can be found <a href="#">here</a> .
<b>Surface Creation</b>	A step by step process for surface creation can be found <a href="#">here</a> .
<b>Pipe Network Creation</b>	A step by step process for pipe network creation can be found <a href="#">here</a> .
<b>Checker Program</b>	A step by step process for the checker program can be found <a href="#">here</a> .
<b>Mapping QC Checklist</b>	The QC checklist can be found <a href="#">here</a> .
<b>Mapping &amp; Transmittal Process</b>	A step by step mapping & transmittal process can be found

Note: Some of the processes outlined above are directed towards PC staff and not consultants

# Civil Engineering

## Points

Project data points consist of existing engineering data gathered from the project location as determined by the project's PM to assist in the engineering development process. Project data points contain both horizontal and vertical data relative to the chosen coordinate zone – HARN/FL Florida State Plane, West Zone, US Foot. Vertical datum is NAVD 1988.

### Points by Range

The point range for PC is specified below:

- Project Point data – data representative of the project limits as defined by the project's PM. All PC "Proposed" project point data shall occupy the point range of **100,000 to Infinity**.

**NOTE:** If additional project data points are required prior to survey acquisition, it will be necessary for the PM to specify a NAP, or Next Available Point number.

## Point Format

Project data will be represented and contained within a comma-delimited file stored with the project. The desired data point format for the PC standards is as follows:

FIELD ONE --- Point Identifier Number

FIELD TWO --- North Coordinate Value

FIELD THREE --- East Coordinate Value

FIELD FOUR --- Point Elevation

FIELD FIVE --- Point Code Identifier

## Point Label Styles

Point Label Styles are used by Engineering to graphically depict data points within Civil 3D. Point Label Styles are defined within the Label Styles collection under Points within the Settings tab of Toolspace. Variations in point label style exist for visual display purposes. The following represents label styles defined in the Civil 3D template:

- <none>
- Description Only
- Elevation and Description
- Elevation Only
- Existing Spot Elevation
- Point Number and Description
- Point Number and Elevation
- Point Number Elevation and Description
- Point Number Only
- Proposed Northing & Easting
- Proposed Spot Elevation
- Standard

## Alignments

Alignments are used as a graphical reference for locating and identifying existing plan features horizontally along a linear path through the surveyed site. Station location and elevation along an alignment provide the basis for geometric creation.

### Standard Construction Alignments

Standard construction alignments will be drawn from the West to the East and from the South to the North along the survey site. All standard construction alignments will be given the acronym CRL for Construction Reference Line and an explicit description given in the description dialog box of the roadway represented. Additional standard construction alignments will be numbered accordingly. PC design settings are displayed below:

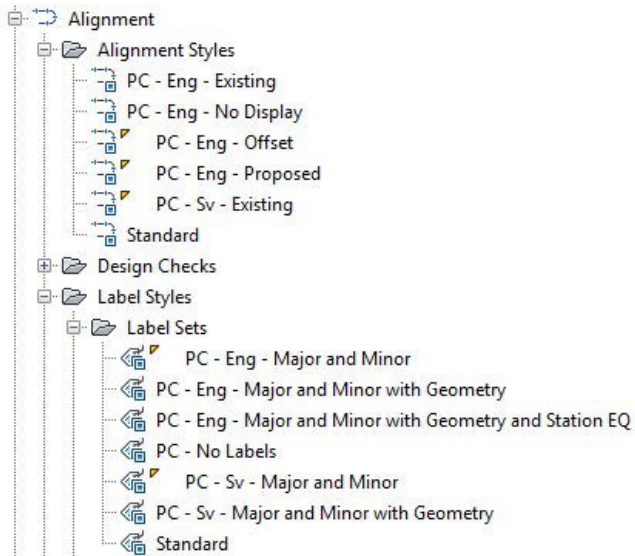
Example: **CRL1, 2, 3, etc.**

### Standard Offset Alignments

Alignments can also be used as to stretch templates horizontally and/or vertically in order to accommodate areas where the roadway offsets or elevations are irregular, such as when a road widens for a passing lane. By using transition regions on a cross section template, you do not need to have multiple templates to accommodate these varying conditions.

### Alignment Stationing and Labeling

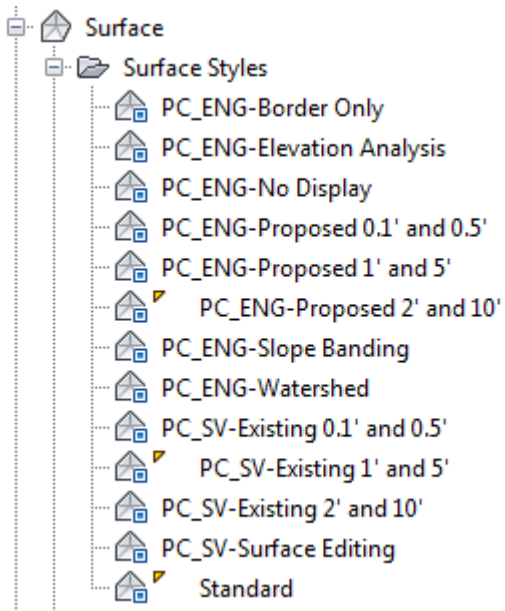
To control how stations appear in Civil 3D, alignment label sets have been created and included with the main PC2023.dwt drawing template. These styles have been created to control the aesthetics of the labels including layer, font, increment, text height, and precision.



Alignments can be created from a variety of methods including the traditional alignment creation tools as well as [from polylines](#) or [points](#).

## Digital Terrain Models (Surfaces)

The proposed DTM, or surface, will be created using one of the included surface object styles. This will ensure adherence to the PC CADD standard.

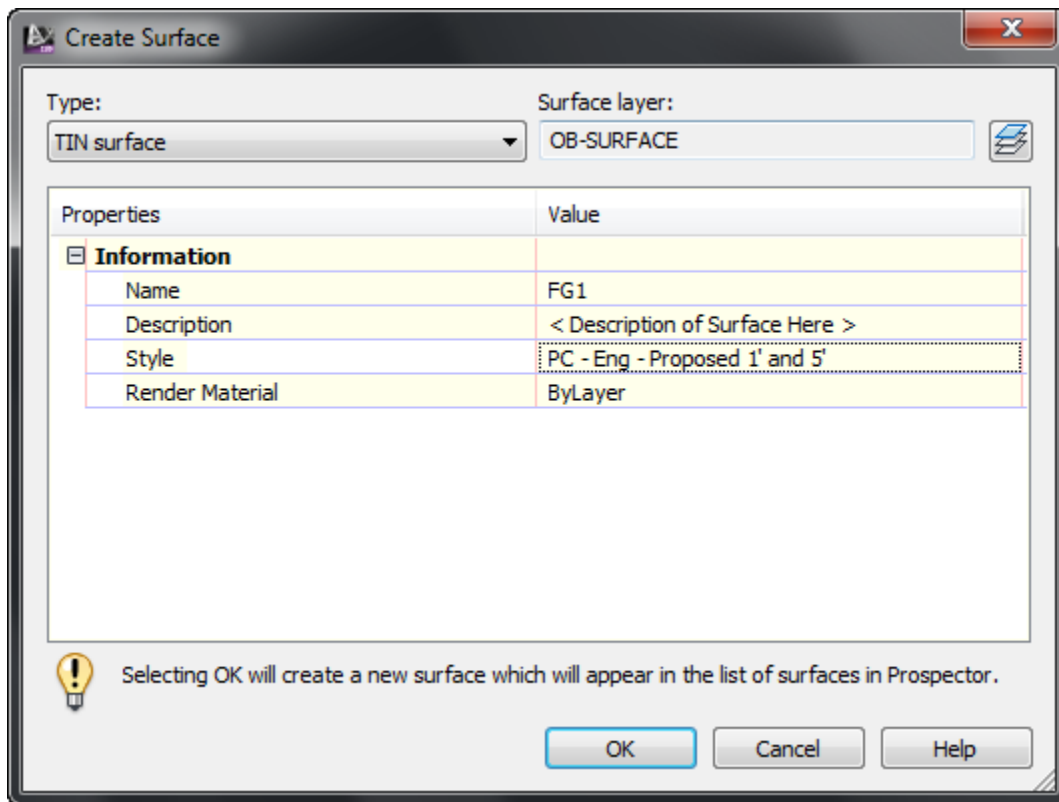


Naming standardization will be based upon the following conventions:

a. **Design**

Surface Name: FG 1, FG2, FG3, etc....

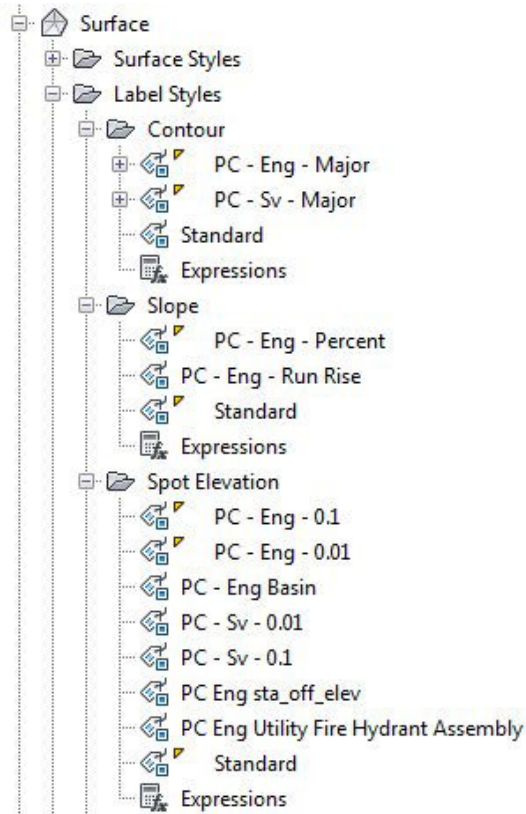
Surface Description – Surface description, technician’s initials, original creation date, and modification descriptions to follow the above information.



Click [here](#) to see a short video on surface creation. Once a surface has been created, it can be easily modified to more accurately reflect real life conditions. Click [here](#) to see a short video on surface editing.

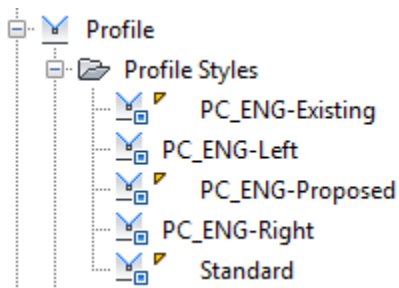
Once a surface has been created, any surface labels should use existing styles provided in the PC2023.dwt drawing template. Label styles for contours, slopes, and spot elevations have been provided:





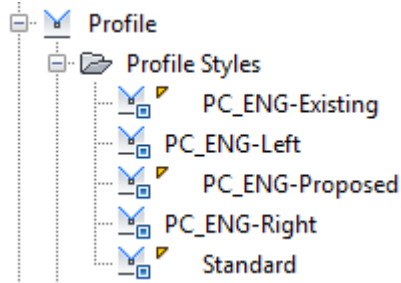
## Profiles

Use the profiles commands to create existing ground or finished ground profiles. You can sample a surface to obtain surface data along an alignment from which to generate the existing ground profile. Once sampled, the profile can be displayed according to a variety of styles included in the kit templates.



A short video on existing ground profile creation can be seen by clicking [here](#).

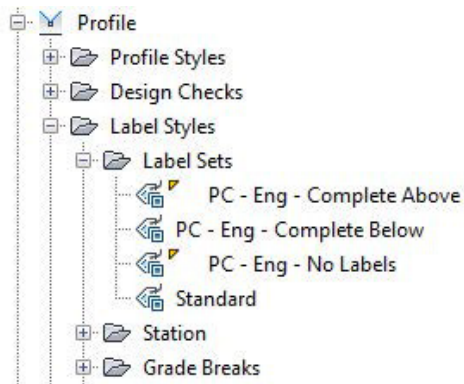
Once the existing ground surface profile has been created, proposed profiles can be created in a similar manor as creating alignments. Several profile styles have been included in the kit templates depending on the type of profile represented.



A short video on existing ground profile creation can be seen by clicking [here](#).

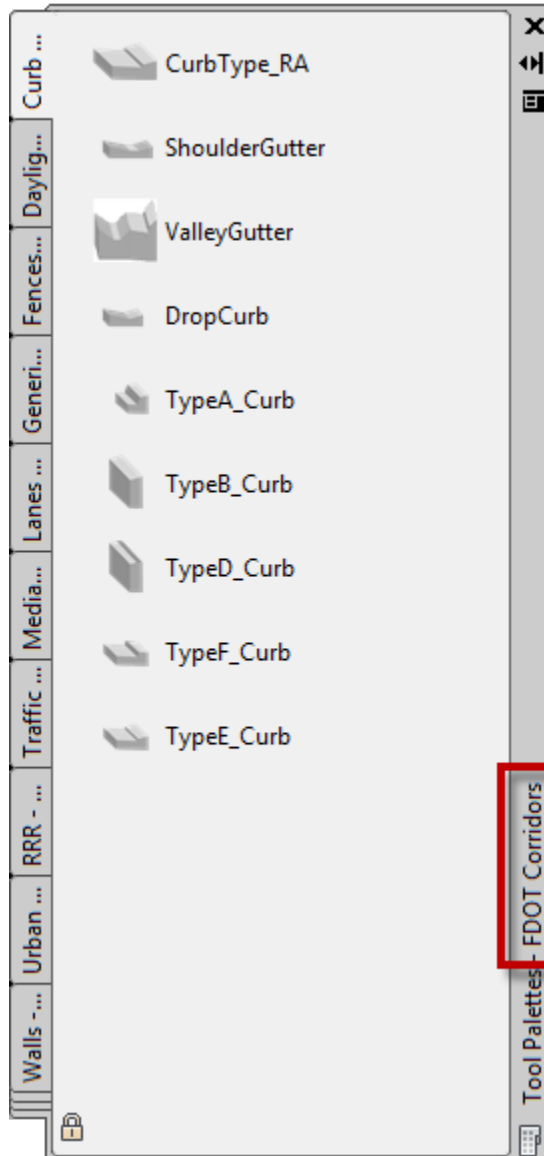
Design profiles can be edited easily and in a similar manor as horizontal alignments. A short video on existing ground profile creation can be seen by clicking [here](#).

Profile label styles have been included in the kit templates and should be used when creating profiles. Two profile label sets have been created that will automatically set the correct styles for major station, minor station, grade break, tangent, and vertical curve annotation according to the PC standard.



## Corridors

Once an alignment and profile exist, the last item to create is an assembly. An assembly is Civil 3D terminology for a cross sectional template. Subassemblies are the building blocks of assemblies. Subassemblies represent lanes, curb, gutter, sidewalks, medians, etc. On top of the several hundred subassemblies that ship with Civil 3D, the PC Kit leverages the custom subassemblies created by the FDOT. To use the FDOT subassemblies, make sure to select the tool palette group named “FDOT Corridors”.



One benefit to creating accurate corridor models is that they can be used to calculate earthwork quantities as well as be displayed in cross sections. To calculate accurate earthwork quantities, accurate surfaces need to be created based on the corridor that represent the top surface and likely a datum (bottom) surface.

To watch a short video on corridor surface creation, click [here](#).

## Cross-Sections

Cross-sections in Civil 3D are created from sample lines. The PC Kit uses a width of 75' on the left and right.

<input type="checkbox"/> <b>Left Swath Width</b>	
Snap to an alignment	False
Alignment	SRL1
Width	75.00'
<input type="checkbox"/> <b>Right Swath Width</b>	
Snap to an alignment	False
Alignment	SRL1
Width	75.00'

This will create a cross section that will fit one column on each page.

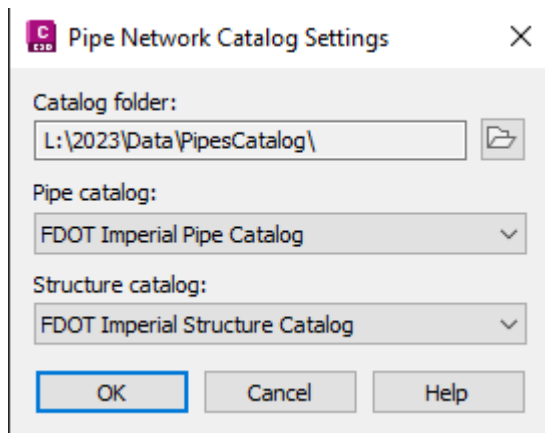
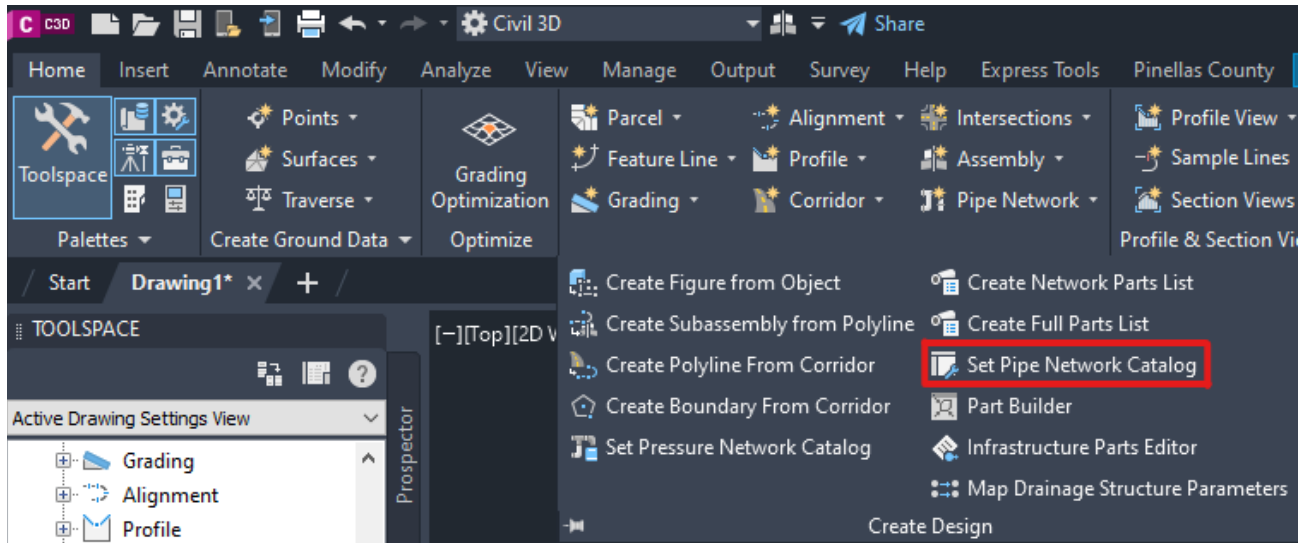
If you are generating earthwork and need to show the cut and fill values, you will need to change these widths to 70'.

If you want to fit two columns on each page, you will need to change these widths to  $\leq 30'$ , depending on how much you need to show.

## Pipes

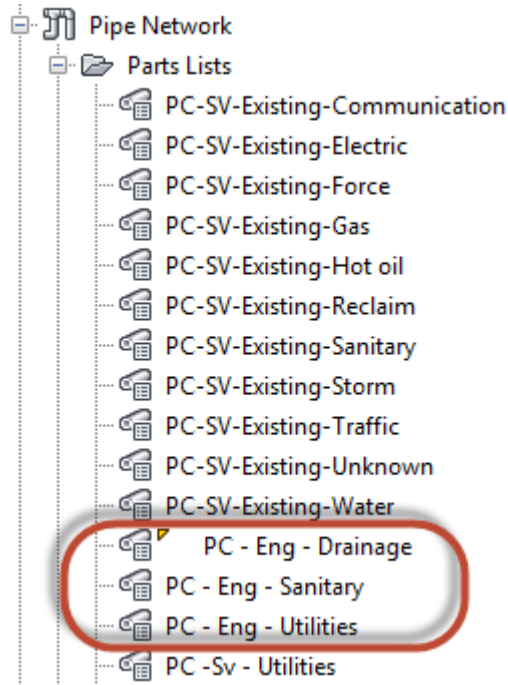
Pipe networks in Civil 3D are made up of structure objects and pipe objects. The PC Kit utilizes the significant investment the FDOT made in the pipe catalogs and links to a copy of the FDOT catalog.

Although the PC Kit templates should automatically point to the PC part catalog, it is good practice to double check prior to creating pipe networks in a drawing.

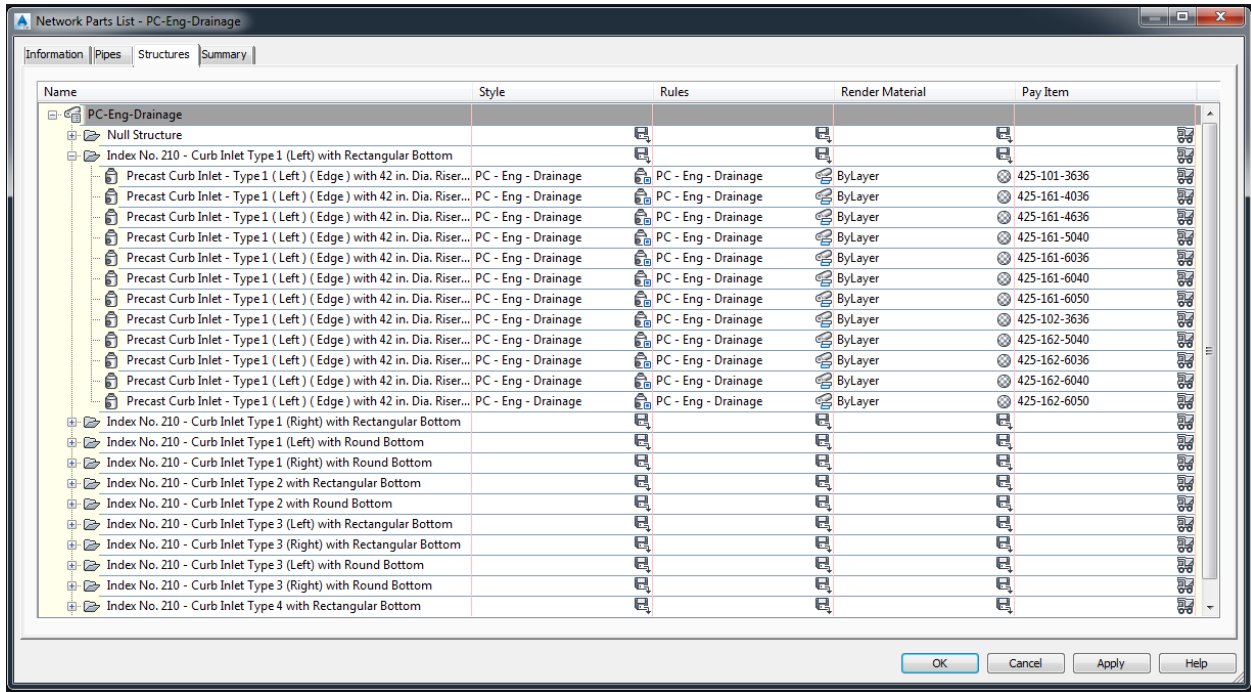


Since Civil 3D only allows for one part catalog to be associated to a drawing at a time, the out of the box parts are not available.

Sample part lists with some of the most common values have been included in the PC Kit template. Part lists for drainage, sanitary, and other utilities have been created to use as a base.



It is important to note that parts in the part catalog can be added to these lists at any point in time depending on the design situation. If making edits to the part lists, make sure to completely fill out all the columns including pay item so that quantity take-offs can be run as the design progresses.



Several videos have been created demonstrating pipes design tasks:

- To watch a short video on creating pipe networks, click [here](#)
- To watch a short video on adding pipe networks to profiles, click [here](#)
- To watch a short video on adding pipes and structures to existing networks, click [here](#)

## Plans Production

The plans production tools included in Civil 3D help in the creation of plan only, profile only, plan/profile, and cross section sheets. Included in the PC Kit is a template file that includes predefined layouts for plan/profile and section sheets. The layouts defined in this template include PC title blocks that are sheet set manager integrated.

This template is found at: L:\2023\Support\Templates\PCPlanProduction.dwt

Utilizing the plans production tools in Civil 3D is a straightforward, two-step process:

1. View frames must be created along an alignment that either exists directly in the drawing or is data shortcut into the drawing. For a short video of this process, click [here](#).
2. Once view frames have been created, the plans production routines can be run. For a short video of this process, click [here](#).

## Quantity Take-Off

The Quantity Take-Off tools included in Civil 3D help with performing take offs of a given design. Included in the PC Kit is a CSV file that contains the approved pay item codes and descriptions. Although this file has already been associated with the PC template files, it can be found at:

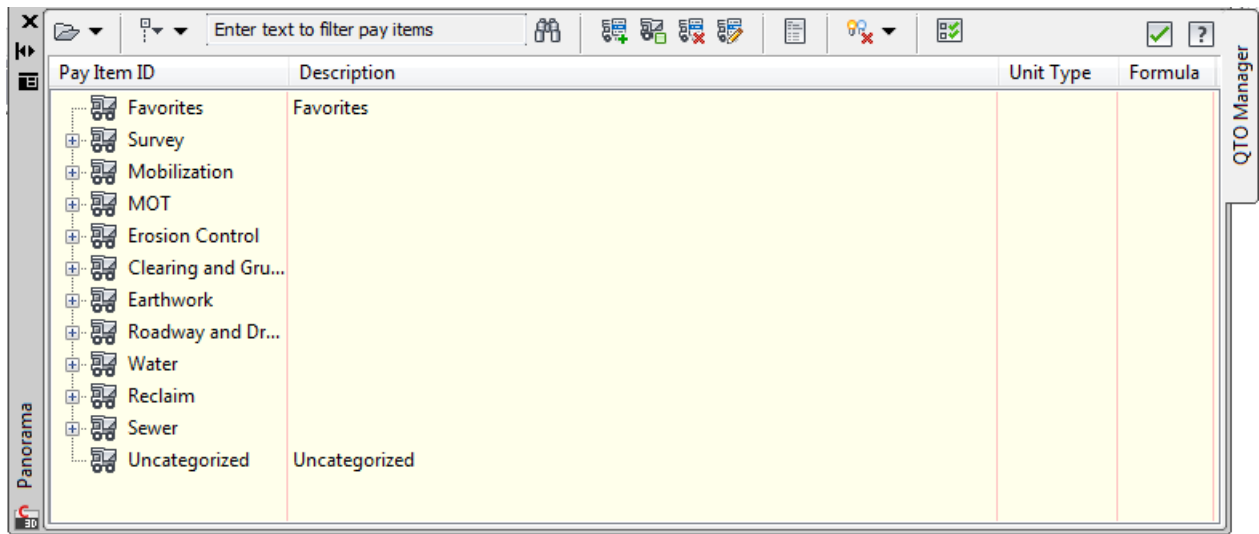
L:\2023\Data\PayItemData\PCStandardPayItems.csv

Also included is a categorization file that will help parse the supplied pay items into manageable categories. This file can be found at:

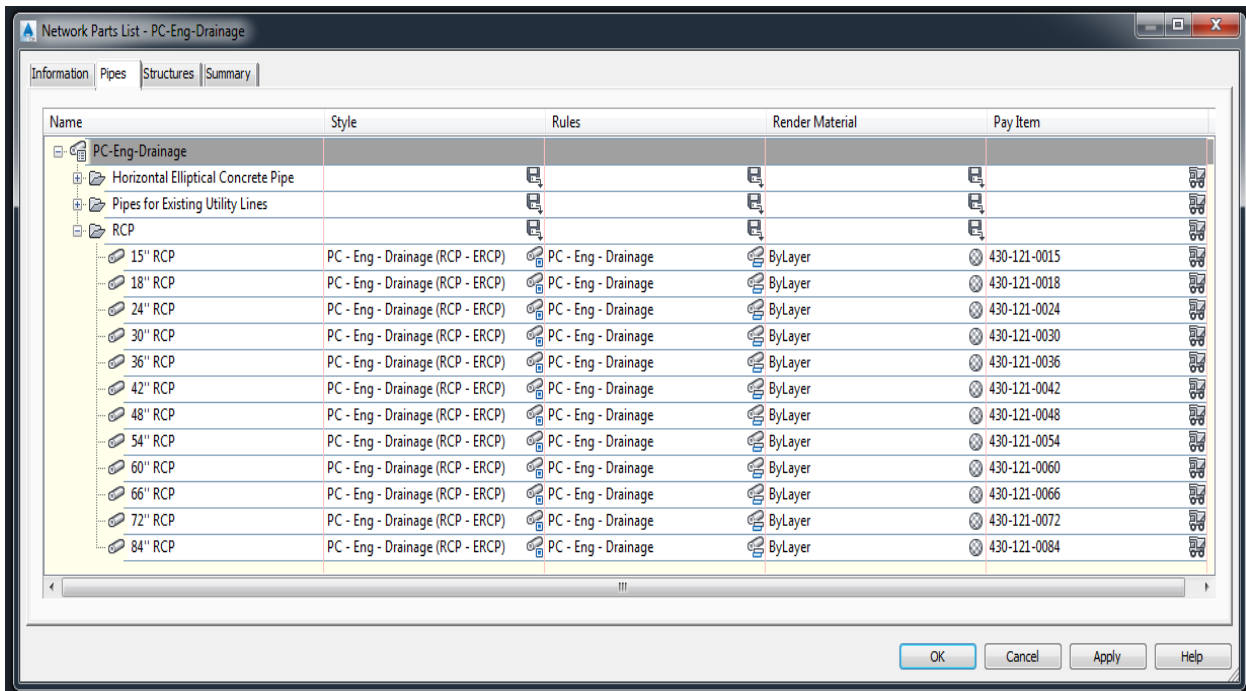
L:\2023\Data\PayItemData\PCCategories.xml



The main QTO interface is preconfigured to point to PC standard pay items:



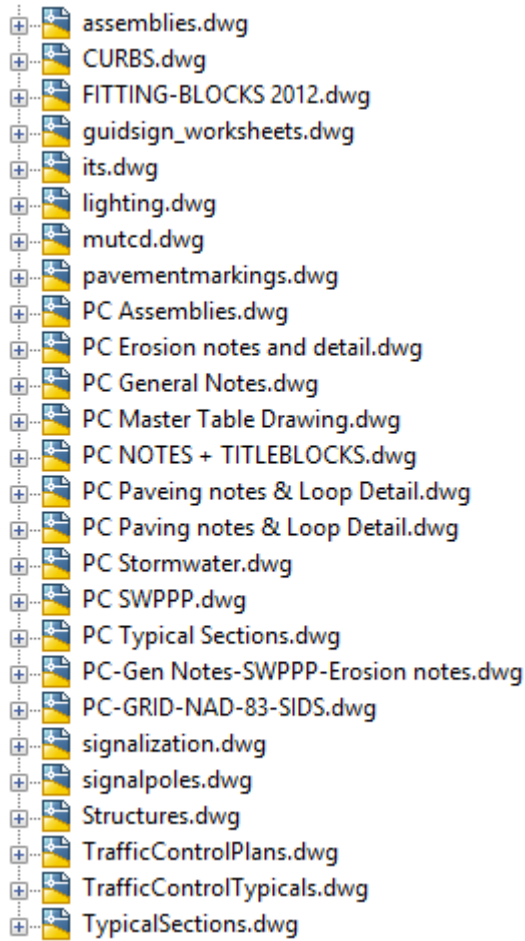
This interface is used for assigning pay item information to existing geometry in a drawing. Part lists for pipes have also been pre-configured with pay item information.



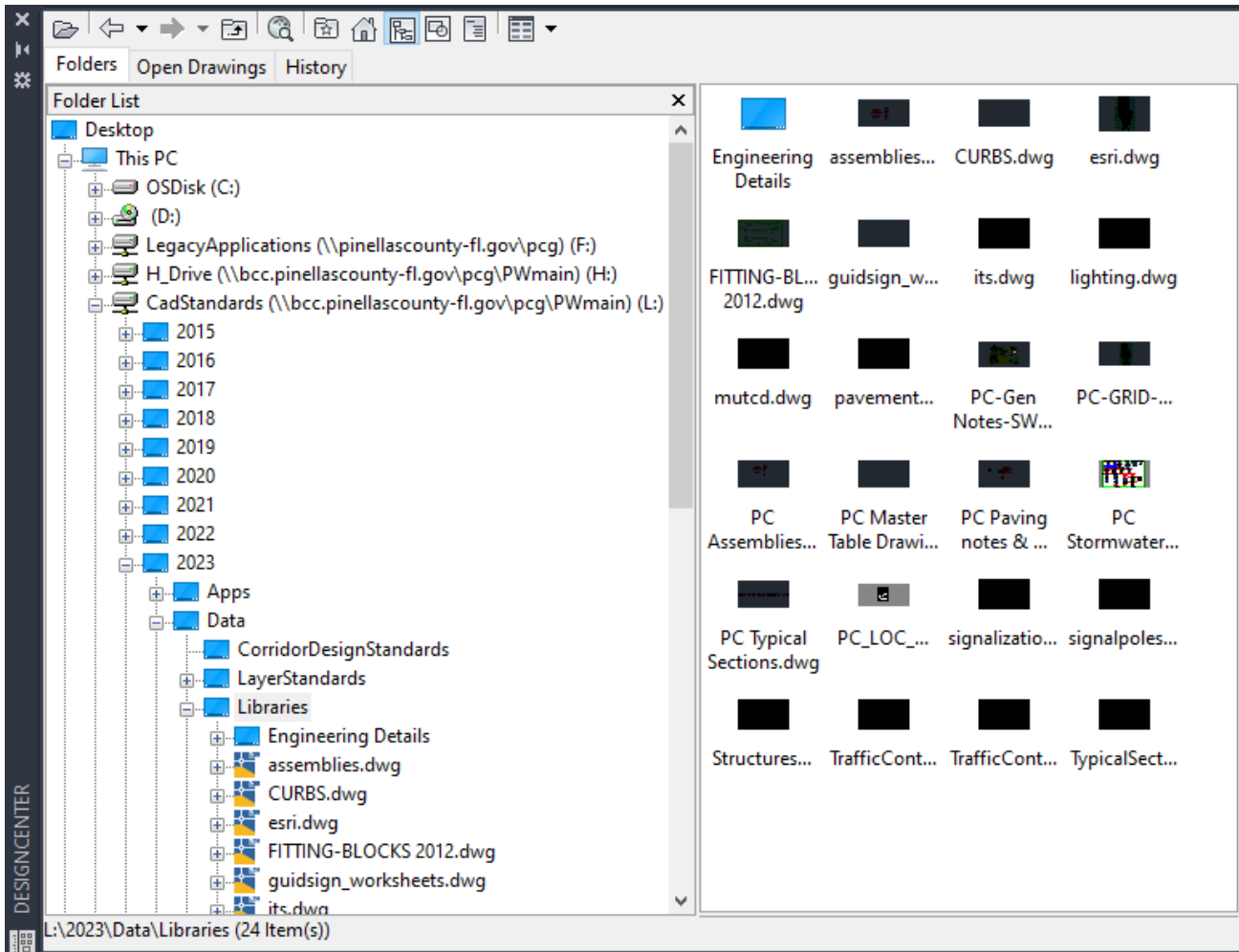
## Symbology

The PC Kit includes several drawings containing symbols and typical sections. These files are in the following location:

L:\2023\Data\Libraries



Design Center is intended to be used to access these files and import the appropriate blocks or sections.



# Standard CADD Layers

## Layer Prefix and Suffix Descriptions

PREFIX	DESCRIPTION
E-	Existing
P-	Proposed
F-	Future
PS-	PaperSpace / Layout Tabs
X-	External Reference Layers (Xref's)

SUFFIX	DESCRIPTION
-PT	Point - Land Desktop Point Objects
-TX	Text Data
-HT	Hatch Patterns
(none)	Linework & Symbology

## Standard Layers

NAME	DESCRIPTION
0	
OBORD	Title block layer for insertion
CONSTLN	Conceptual construction lines
Defpoints	
E-AERIAL	Xref data aerial image
E-BDWLK	Boardwalk material
E-BLDG	Building footprint, carports, decks
E-BSHOT	Bottom shot (water, sounding lakes, ponds, etc.)
E-CALC	Calculated field point
E-CL	Centerline
E-CONSULT	Consultant xref civil and/or detail services data
E-CTRL	Survey lines
E-DAM	Earth dam or drainage dams
E-DECK	Decks – freestanding or attached to building structures
E-DIM	Dimensions
E-DOCK	All structures over water or beach areas – boat dock, boat ramps, etc.
E-DR	Miscellaneous drainage items

E-DR-DPVMT	Ditch pavement
E-DR-FLOW	Drainage flow line such as ditches, swales, etc.
E-DR-PIPE	Drainage pipes
E-DR-SKMR	Drainage skimmer (Body-2)
E-DR-SLOT	Drainage structure slot
E-DR-SPIL	Drainage spillway (Body-2)
E-DR-UD	Underdrain
E-DR-WEIR	Weirs
E-DRW	Driveway line placement
E-ESMT	Roadway or conservation easement
E-FENCE	Fence and fence lines
E-GRAIL	Guard rail
E-GRAVE	Grave or grave sites
E-HWM	High water mark
E-LOTORIG	Original lot line
E-LTD	Lighting devices – spotlight, yard lights, etc.
E-MHW	Mean high water mark
E-MISC	Flag poles, mailbox, testing holes, gym
E-MLW	Mean low water mark
E-MON-FND	Monuments – found – concrete, iron rods, iron pipes, yellow/red caps, pk nail and disk, etc.
E-MON-SET	Monuments – set – concrete, iron rods, iron pipes, yellow/red caps, pk nail and disk, etc.
E-MWELL	Monitoring well
E-OHW	Ordinary high-water line
E-OLW	Ordinary low water line
E-OWNER	Feature owner information
E-PEGC	Existing profile centerline
E-PL	Property line or plat line
E-PLNTR	Planter – concrete or wood structure, etc.
E-POLE	Pole
E-PUMP	Small sewer or water pumps
E-RCWM	Reclaimed water main information – pipes, fittings, features, etc.
E-RD	Roadway
E-RD-ASPH	Asphalt roadway material
E-RD-BC	Roadway back of curb
E-RD-BRIDGE	Bridge portion of roadway
E-RD-BRK	Brick roadway material
E-RD-CNTR	Roadway centerline

E-RD-CONC	Concrete roadway material
E-RD-CURB	Curb in roadway system
E-RD-DIRT	Dirt roadway material
E-RD-EP	Edge of roadway pavement
E-RD-GRVL	Gravel roadway material
E-RD-MRL	Marl roadway material
E-RD-SHELL	Shell roadway material
E-RIPRAP	Rip rap – drainage control device
E-ROCK	Rock clusters – designed for erosion control, etc.
E-ROW	Right of way line
E-RR	Railroad
E-SAN	Sanitary sewer
E-SAN-DIP	Sanitary sewer – ductile iron pipe
E-SAN-FM	Sanitary sewer – force main
E-SAN-GR	Sanitary sewer – gravity line
E-SAN-LIFT	Sanitary sewer – lift station
E-SECT	Section lines
E-SGP	Submerged ground point
E-SHW	Seasonal high-water mark
E-SIGN	Signs of all types number if large billboards with notes
E-SLAB	Concrete slab
E-SLW	Seasonal low water mark
E-SPKL	Sprinkler system
E-STRIPLE	Pavement stripes and markings, stop bars, cross walks, lane lines
E-SURV_GIBSON	
E-SURV_LEONARD	
E-SURV_NEAL	
E-SURV_NOTE	
E-	
E-SURV_SCHOLPP	
E-	
E-SURV_ZELLER	
E-SURVEY-MRKR	
E-SURVEY-PT-TBL	
E-SW	Sidewalks
E-SWALE	CL of drainage swales
E-SWALL	Seawall structure
E-SWAMP	Swamp line
E-TB	Top of bank – retention/detention areas, lakes, ditches, creeks, etc.

E-TOPO-BDRY	Surface boundary
E-TOPO-CONT-MAJ	Major contours
E-TOPO-CONT-MIN	Minor contours
E-TOPO-PNTS	Surface points
E-TOPO-SPOT	Spot elevation labels
E-TOPO-TIN	TIN lines
E-TRAF	Traffic devices
E-TRAF-PL	Traffic signal pole, mast arm, mono tube, etc.
E-TRAFCTL	Traffic control devices, flexible delineators, etc.
E-TREE	General trees, tree lines
E-TREE-VEG	Shrub, brush, etc.
E-TS	Toe of slope
E-UT-COMM	Utilities – Communication
E-UT-ELEC	Electrical surface features – guy wires, lights, electrical poles, etc.
E-UT-GAS	Gas system – private utility
E-UT-HOTOIL	Hot oil line
E-UT-LP	Light pole
E-UT-OH	Overhead utility lines
E-UT-POLE	Power pole (Body-2)
E-UT-PSP	Pedestrian signal pole
E-UT-TANK	Gasoline, diesel tanks (Body-2)
E-UT-TRAFCTL	Traffic control
E-UT-UNK	Unknown utility
E-UT-UP	
E-UTS-GAS	
E-WALL	Wall lines
E-WEIR	Weir data and a drainage structure
E-WETLAND	Wetlands
E-WM	Water main information – pipes, fittings, features, hosebib, etc.
E-WM-DIP	Water main ductile iron pipe material
E-XEG	
HATCH	Hatch
NARROW	North Arrow
OB-ALIGNMENT	Civil 3D object layer: alignments
OB-ASSEMBLY	Civil 3D object layer: assemblies
OB-BUILDING	Civil 3D object layer: buildings
OB-CATCHMENT	Civil 3D object layer: catchments
OB-CORRIDOR	Civil 3D object layer: corridors
OB-FEATURE	Civil 3D object layer: feature lines

<b>OB-GENERAL</b>	<b>Civil 3D object layer: general notes</b>
<b>OB-GRADING</b>	<b>Civil 3D object layer: gradings</b>
<b>OB-INTERFERENCE</b>	<b>Civil 3D object layer: pipe interferences</b>
<b>OB-INTERSECTION</b>	<b>Civil 3D object layer: intersections</b>
<b>OB-MASSHAUL</b>	<b>Civil 3D object layer: mass haul diagrams</b>
<b>OB-MATCHLINE</b>	<b>Civil 3D object layer: match lines</b>
<b>OB-MATERIAL</b>	<b>Civil 3D object layer: materials</b>
<b>OB-PARCEL</b>	<b>Civil 3D object layer: parcels</b>
<b>OB-PIPE</b>	<b>Civil 3D object layer: pipes</b>
<b>OB-POINT</b>	<b>Civil 3D object layer: points</b>
<b>OB-PROFILE</b>	<b>Civil 3D object layer: profiles</b>
<b>OB-SAMPLE</b>	<b>Civil 3D object layer: sample lines</b>
<b>OB-SECTION</b>	<b>Civil 3D object layer: sections</b>
<b>OB-SHEET</b>	<b>Civil 3D object layer: sheets</b>
<b>OB-STRUCTURE</b>	<b>Civil 3D object layer: structures</b>
<b>OB-SUBASSEMBLY</b>	<b>Civil 3D object layer: subassemblies</b>
<b>OB-SUPER</b>	<b>Civil 3D object layer: superelevation</b>
<b>OB-SURFACE</b>	<b>Civil 3D object layer: surfaces</b>
<b>OB-SURVEY</b>	<b>Civil 3D object layer: survey</b>
<b>OB-VIEWFRAME</b>	<b>Civil 3D object layer: viewframes</b>
<b>P-ARCH</b>	<b>Architectural drawing data</b>
<b>P-BLDG</b>	<b>Building footprint, carports, decks, finished floor elev</b>
<b>P-BOTT</b>	<b>Bottom of ditch or pond, water body, etc.</b>
<b>P-CAP</b>	
<b>P-CL</b>	<b>Centerline</b>
<b>P-CNTR</b>	<b>Centerline</b>
<b>P-CONC</b>	<b>Concrete</b>
<b>P-CONT-MJR</b>	<b>Major contours</b>
<b>P-CONT-MNR</b>	<b>Minor contours</b>
<b>P-DAM</b>	<b>Earth dam or drainage dam</b>
<b>P-DECK</b>	<b>Decks – freestanding or attached to building structures</b>
<b>P-DIM</b>	<b>Dimensions</b>
<b>P-DOCK</b>	<b>All structures over water or beach areas - boat dock, boat ramps, etc.</b>
<b>P-DR</b>	<b>Drainage feature information</b>
<b>P-DR-DIP</b>	<b>Ductile iron pipe</b>
<b>P-DR-RCP</b>	<b>Reinforced concrete pipe</b>
<b>P-DR-ST</b>	
<b>P-DR-UD</b>	<b>Underdrain</b>
<b>P-DRW</b>	<b>Driveway into parking lots and residences</b>



P-DRW-DIRT	Dirt driveway into parking lots and residences
P-FENCE	Fence and fence line
P-FG	Finish ground
P-GRAIL	Guard rail
P-HANDRAIL	Handrail
P-HOTOIL	Hot oil line
P-LTD	Lighting devices – spotlight, yard lights, etc.
P-MISC	Flag poles, mailbox, testing holes, gym, etc.
P-MWELL	Monitoring well
P-PEGL	Left ground
P-PEGR	Right ground
P-PFGC	Proposed finished ground
P-PFGCT	Proposed finished ground text
P-PIER	Support structures – piers, pier post, etc.
P-PILE	Pilings
P-PL	Property line
P-PLNTR	Planter – concrete or wood structure, etc.
P-POLE	Pole
P-PUMP	Small sewer or water pumps
P-PUMPSTA	Sanitary sewer pump station
P-PVGRID	Profile grid
P-PVGRIDT	Profile grid text
P-RCWM	Reclaimed water main information – pipes, fittings, features, etc.
P-RD-ASPH	Asphalt roadway material
P-RD-BC	Roadway back of curb
P-RD-BRK	Brick roadway material
P-RD-CONC	Concrete roadway material
P-RD-CURB	Curb in roadway system
P-RD-EP	Roadway edge of pavement
P-RD-GRVL	Gravel roadway material
P-RD-SHELL	Shell roadway material
P-REBAR	Rebar
P-RIPRAP	Rip rap – drainage control device
P-ROCK	Rock clusters – designed for erosion control, etc.
P-ROW	Right of way line
P-RR	Railroad
P-SAN-FM	Sanitary sewer – force main
P-SAN-GR	Sanitary sewer – gravity line
P-SGP	Submerged ground point

<b>P-SHOULDER</b>	<b>Roadway shoulder</b>
<b>P-SIGN</b>	<b>Signs of all types - number if large billboard with notes</b>
<b>P-SILTFENCE</b>	<b>Silt fence</b>
<b>P-SLAB</b>	<b>Concrete slab, etc.</b>
<b>P-SPKL</b>	<b>Sprinkler system, etc.</b>
<b>P-STRIFE</b>	<b>Pavement stripes</b>
<b>P-STRIFE 10-30</b>	<b>Pavement stripes – 10 / 30 skip</b>
<b>P-STRIFE 2-4</b>	<b>Pavement stripes – 2 / 4 skip</b>
<b>P-STRIFE 5-15</b>	<b>Pavement stripes – 5 / 15 skip</b>
<b>P-STRIFE 6-10</b>	<b>Pavement stripes – 6 / 10 skip</b>
<b>P-SW</b>	<b>Sidewalks</b>
<b>P-SWALE</b>	<b>CL of drainage swale</b>
<b>P-SWALL</b>	<b>Seawall structure</b>
<b>P-SWAMP</b>	<b>Swamp line</b>
<b>P-TB</b>	<b>Top of bank – retention/detention areas, lakes, ditches, creeks, etc.</b>
<b>P-TOS</b>	<b>Toe of slope</b>
<b>P-TRAF</b>	<b>Traffic devices</b>
<b>P-TRAF-PL</b>	<b>Traffic signal pole, mast arm, mono tube, etc.</b>
<b>P-TRAFCTL</b>	<b>Traffic control devices, flexible delineators, etc.</b>
<b>P-TREE</b>	<b>General trees</b>
<b>P-TREE-VEG</b>	<b>Shrub, bush, etc.</b>
<b>P-TRENCH</b>	<b>Trench</b>
<b>P-TRENCHW</b>	
<b>P-TS</b>	
<b>P-TURB</b>	
<b>P-UT</b>	<b>Utilities – private utility</b>
<b>P-UT-ATLAS</b>	<b>Utilities from atlas data</b>
<b>P-UT-ATLAS-OH</b>	<b>Utilities – overhead lines from atlas data</b>
<b>P-UT-CATV</b>	<b>Cable TV – private utility</b>
<b>P-UT-CATV_B</b>	
<b>P-UT-CATV_OH</b>	
<b>P-UT-ELEC</b>	<b>Electrical surface features – guy wires, lights, electrical poles, etc.</b>
<b>P-UT-ELEC-OH</b>	<b>Overhead electric features</b>
<b>P-UT-ELEC_B</b>	
<b>P-UT-GAS</b>	<b>Gas system – private utility</b>
<b>P-UT-GAS_B</b>	
<b>P-UT-LP</b>	<b>Light pole</b>
<b>P-UT-OH</b>	<b>Overhead utility lines</b>
<b>P-UT-PP</b>	<b>Power pole (Body-2)</b>

<b>P-UT-PSP</b>	<b>Pedestrian signal pole</b>
<b>P-UT-TANK</b>	<b>Gasoline, diesel tanks (Body-2)</b>
<b>P-UT-TEL</b>	<b>Telephone system – private utility</b>
<b>P-UT-TEL_B</b>	
<b>P-UT-TEL_OH</b>	<b>Overhead telephone lines</b>
<b>P-UT-UNK</b>	<b>Unknown utility</b>
<b>P-WALL</b>	<b>Wall lines</b>
<b>P-WEIR</b>	<b>Weir data and a drainage structure</b>
<b>P-WM-DIP</b>	<b>Water main ductile iron pipe material</b>
<b>P-WM-PVC</b>	<b>Water main poly vinyl chloride material</b>
<b>P-XFG</b>	
<b>P-XGRID</b>	<b>Profile grid</b>
<b>P-XGRIDT</b>	<b>Profile grid text</b>
<b>P-XSSAM</b>	<b>Sample lines</b>
<b>PS-BSCALE</b>	<b>Paper space bar scale</b>
<b>PS-CNOTES</b>	<b>Paper space construction notes</b>
<b>PS-GNOTES</b>	<b>Paper space general notes</b>
<b>PS-NARROW</b>	<b>Paper space north arrow</b>
<b>PS-SHEET</b>	<b>Paper space sheet manager</b>
<b>PS-TX-L</b>	<b>Standard sheet large text size</b>
<b>PS-TX-M</b>	<b>Standard sheet medium text size</b>
<b>PS-TX-S</b>	<b>Standard sheet small text size</b>
<b>PS-VIEWPORT</b>	<b>Paper space viewport</b>
<b>X-AERIAL</b>	<b>External reference – aerial image</b>
<b>X-ARCH</b>	<b>External reference – architectural data</b>
<b>X-CONSULT</b>	<b>External reference – consultant civil and/or detail services data</b>
<b>X-DESIGN</b>	<b>External reference – civil data</b>
<b>X-GIS</b>	<b>External reference – GIS data</b>
<b>X-OBJECTS</b>	<b>External reference – Miscellaneous object data (MS Word, Excel, OLE)</b>
<b>X-SURVEY</b>	<b>External reference – survey data</b>
<b>X-UT-ATLAS</b>	<b>External reference – utilities from atlas data</b>

# Digital Delivery

## General

The act of signing, dating, and sealing transmitted plans, specification, reports, or other documents is collectively referred to as signing and sealing.

This policy provides Pinellas County Public Work's requirements of signing and sealing plans and documents in conformance with Florida Statutes and Florida Administrative Code. The laws and rules referenced in this policy are primarily those governing professional engineers. Other licensed professionals that are required to sign and seal plans or documents are to follow the laws and rules applicable to their profession. **61G15-23.002 Seals Acceptable to the Board.** It is the licensee's responsibility to comply with the signing and sealing requirements applicable to their profession's laws and rules. It is Public Work's responsibility to verify that the documents are signed and sealed, and transmitted in accordance with this policy.

## Signing and Sealing Contract Plans

The transmitted contract plans Signed and Sealed by the responsible professional(s) become the Record Set. Every sheet of the Record Set must be signed and sealed, except for the following sheets that may be appended to the contract plans set:

- Existing Bridge Plans,
- Developmental Design Standards, and
- Plans that are prepared by an employee of a Utility or other employee exempted under Section 471.003, Florida Statutes, except as follows.
  - Utility plans that modify or detail attachments to a bridge or other structure belonging to the Department must Sign and Seal the sheets affecting such bridge or structure.
  - Plans prepared by nonexempt parties for a Utility must be Signed and Sealed.

Every sheet of the Record Set must include a title block that contains information for the professional engineer that will Sign and Seal the sheet, showing:

1. The name, address, and license number of the engineer, or
2. If practicing through a duly authorized engineering business, the name and license number of the engineer, and the name, address, and certificate of authorization number of the engineering business, or
3. If employed by a local, State or Federal agency, the name and license number of the engineer, and the name and address of the agency.

A non-engineering licensed professional that will Sign and Seal the sheet must show similar information in the title block related to their profession.

## **Manual Signing and Sealing**

Manual Delivery is the standard practice for Signing and Sealing, and transmittal of contract documents. If you choose to print, sign, and seal final approved plan sheets, each sheet must contain an original engineer/architect signature and seal. Copies of signatures and seals are not acceptable. The requirements for manually Signing and Sealing are covered in the Laws and Rules for each licensee's profession.

## **Digital Signing and Sealing**

Digital Delivery is a method of electronically transmitting contract documents to Public Works. This includes the creation of Portable Document Format (PDF) files of contract plans and specifications, which are Signed and Sealed with a Digital Signature. Digital certificates used to sign documents submitted to Pinellas County must be acquired from one of the approved digital Certificate Authorities on the website and be of a National Institute of Standards and Technology (NIST) assurance level of three (3) or higher.

Place the following note along the right edge of plan sheets that are digitally Signed and Sealed:

“THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.”

The rule number referenced in the note above applies to the engineering professional that is Signing and Sealing the sheet. A non-engineering licensed professional should use the rule number that applies to their profession:

- Surveyors, Rule 5J-17.062, F.A.C.
- Geologists, Rule 61G16-2.005, F.A.C.
- Landscape Architects, Rule 61G10-11.011, F.A.C.
- Architects, Rule 61G1-16.005, F.A.C.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

### Single Digital Signature

Component plans that will be Signed and Sealed by a single professional (signatory) may place a signature block on the component Key Sheet in lieu of using a Signature Sheet. Listing the sheets contained in the PDF to be Signed and Sealed is not required. See Example 1.

####  
####  
####

**PID ####**  
**FINANCIAL PID ####**

**PINELLAS COUNTY  
LOCATION MAP**

**INDEX OF PLANS**

SHEET NO.	SHEET TITLE
XX	KEY SHEET
XX	DRAINAGE MAP
XX-XX	GENERAL NOTES
XX	TYPICAL SECTIONS
XX	LAYOUT PLANS
XX	PLAN & PROFILES
XX	CROSS SECTIONS
XX	DRAINAGE STRUCTURES
XX	DRIVEWAY SECTIONS
XX	STORMWATER POLLUTION PREVENTION PLAN
XX	EROSION & SEDIMENT CONTROL PLAN
XX	SIGNING & PAVEMENT MARKING PLAN
XX	SIGNALIZATION PLANS
XX	UTILITY ADJUSTMENT
XX-XX	TOPOGRAPHIC SURVEY

**KEY MAP**  
NOT TO SCALE

**PINELLAS COUNTY  
PUBLIC WORKS**

**LARRY S. WALKER, P.E.**  
LICENSE NO. 99991  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER

PROJECT MANAGER: BEN G. EDWARDS  
727-864-8404  
PINELLAS COUNTY  
14 SOUTH FORT MARSHALL AVENUE  
CLEARWATER, FLORIDA 34616  
PHONE: 727/464-2588

PREPARED BY:  
**LARRY S. WALKER, P.E.**  
LICENSE NO. 99991  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER



LARRY S. WALKER, P.E. No. 99991 DATE

ENCLOSURE OF RECORD

Example 1

## Multiple Digital Signature

A Signature Sheet is required for component plans that will be Signed and Sealed by more than one professional. See example 2.

<div style="text-align: center;">  <p><b>LUKE S. WALKER</b> No 99991 Date: 2016.03.09 16:52:48 - 4'00"</p> <p><small>THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY LUKE S. WALKER</small></p> <p><small>PROFESSIONAL ENGINEER</small></p> <p><small>STATE OF FLORIDA</small></p> <p><small>CERTIFICATE OF AUTHORIZATION: 12345</small></p> <p><small>LUKE S. WALKER, P.E. NO. 99991</small></p> </div> <p><small>THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 6305-23.004, F.A.C.</small></p> <p style="text-align: center;"><u>INDEX OF PLANS</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">SHEET NO.</th> <th style="width: 85%;">SHEET TITLE</th> </tr> </thead> <tbody> <tr><td>01</td><td>KEY SHEET</td></tr> <tr><td>02</td><td>SIGNATURE SHEET</td></tr> <tr><td>03</td><td>GENERAL NOTES</td></tr> <tr><td>04</td><td>TYPICAL SECTIONS</td></tr> <tr><td>05</td><td>LAYOUT PLANS</td></tr> <tr><td>06-13</td><td>PLAN &amp; PROFILES</td></tr> <tr><td>14-19</td><td>CROSS SECTIONS</td></tr> <tr><td>20-22</td><td>DRAINAGE STRUCTURES</td></tr> <tr><td>23-24</td><td>DRIVEWAY SECTIONS</td></tr> <tr><td>25-26</td><td>STORMWATER POLLUTION PREVENTION PLAN</td></tr> <tr><td>27</td><td>EROSION &amp; SEDIMENT CONTROL PLAN</td></tr> <tr><td>28-30</td><td>SIGNING &amp; PAVEMENT MARKING PLAN</td></tr> </tbody> </table>	SHEET NO.	SHEET TITLE	01	KEY SHEET	02	SIGNATURE SHEET	03	GENERAL NOTES	04	TYPICAL SECTIONS	05	LAYOUT PLANS	06-13	PLAN & PROFILES	14-19	CROSS SECTIONS	20-22	DRAINAGE STRUCTURES	23-24	DRIVEWAY SECTIONS	25-26	STORMWATER POLLUTION PREVENTION PLAN	27	EROSION & SEDIMENT CONTROL PLAN	28-30	SIGNING & PAVEMENT MARKING PLAN	<div style="text-align: center;">  <p><b>LAN B. SOLD</b> No 99994 Date: 2016.10.14 14:44:24 - 4'00"</p> <p><small>THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY LAN B. SOLD</small></p> <p><small>PROFESSIONAL ENGINEER</small></p> <p><small>STATE OF FLORIDA</small></p> <p><small>CERTIFICATE OF AUTHORIZATION: 54321</small></p> <p><small>LAN B. SOLD, P.E. NO. 99994</small></p> </div> <p><small>THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 6305-23.004, F.A.C.</small></p> <p style="text-align: center;"><u>INDEX OF PLANS</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">SHEET NO.</th> <th style="width: 85%;">SHEET TITLE</th> </tr> </thead> <tbody> <tr><td>02</td><td>SIGNATURE SHEET</td></tr> <tr><td>31-39</td><td>UTILITY ADJUSTMENT</td></tr> </tbody> </table>	SHEET NO.	SHEET TITLE	02	SIGNATURE SHEET	31-39	UTILITY ADJUSTMENT								
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Example 2

## Signing and Sealing Revisions

Design revisions are modifications to the plans, specifications, and estimate submittal after it has been accepted by Public Works. All revisions should be prepared by the same professional that Signed and Sealed the plan sheet contained in the Record Set or the original document.

## **Foreign Plan Sheets**

In some cases, designers have no choice but to scan pre-existing hardcopy sheets to create digital sheet files. In such cases, those plan sheets should be scanned at minimum of 600 DPI resolution, to PDF. If scanning hardcopy plans that bear a raised seal, then the raised seal should be shaded/burnished before scanning so the seal appears clearly in the scanned image. Scanned existing plan sheets already signed and sealed on paper must not be re-signed and sealed with Digital Signature. However, they may be signed-only (not sealed) by a responsible party only to take accountability for their inclusion within a contemporary plan set (using the appropriate qualifiers or exculpatory language).