# Pinellas County CADD Standards Manual for Survey and Civil Engineering

*April, 2020*
Version 1.0

**CADD Standards Manual**

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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 Statues, 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 2020* 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
- Pipes 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 2020 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 |
|---|---|
| PC2020.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 of 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 PC2020.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 layers |

## 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 test 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:\2020\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.

**AutoCAD Standard Lineweights**

| mm | inch | | ISO |
|------|------|---|-----|
| 0.00 | | | |
| 0.05 | .002 | | |
| 0.09 | .003 | | |
| 0.13 | .005 | | |
| 0.15 | .006 | | |
| 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

<u>Plots</u>

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.

<u>Plotter Configuration Files</u>

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.

<u>Plot Borders</u>

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 |

<u>Plot Style Tables (*.ctb)</u>

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 2020 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 PC2020.dwt file.

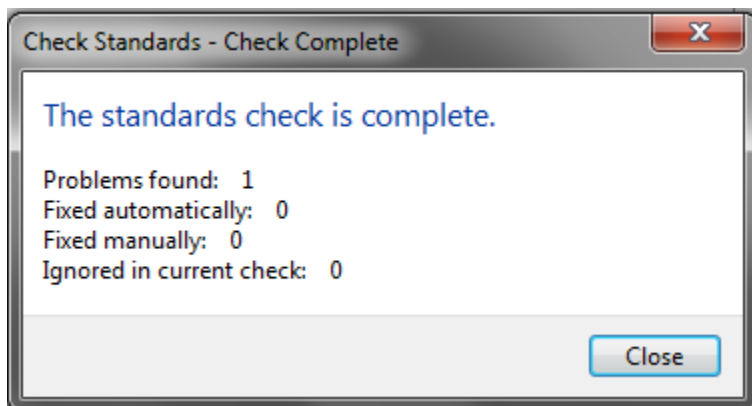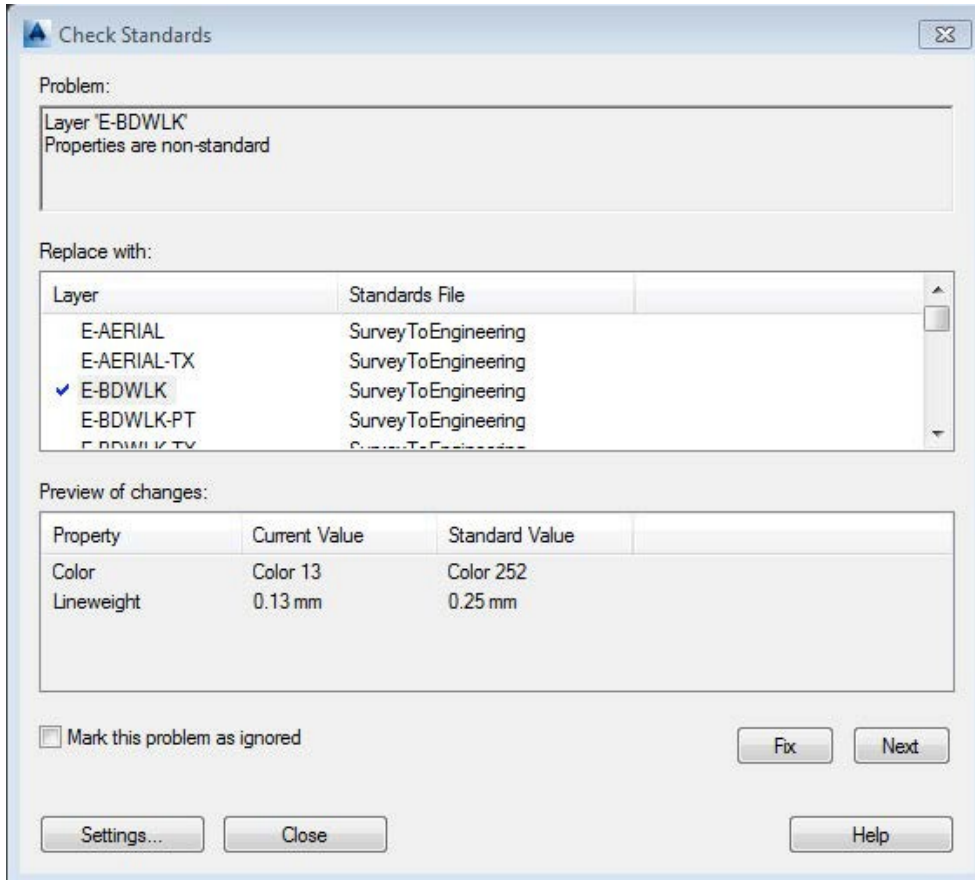The DWS files are found in the L:\2020\Data\LayerStandards folder
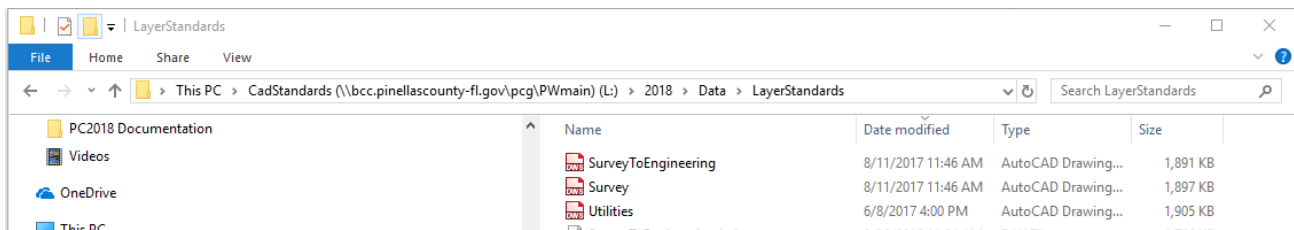


The first time the standards checker is run, a DWS file will need to be associated with the file. Choose the appropriate DWS file as noted above. Once associated, the utility will run and display a dialog box that shows the total number of errors in the drawing:
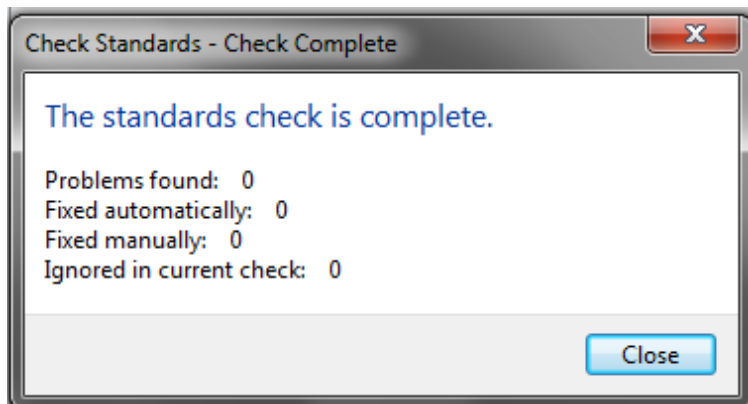
Production drawings should not contain any standards errors.  Should the drawing contain standards errors, a dialog box will be displayed giving the user a chance to address each problem individually.

Check Standards dialog box:

**Problem:**
Layer 'E-BDWLK'
Properties are non-standard

**Replace with:**

| Layer | Standards File |
|---|---|
| E-AERIAL | SurveyToEngineering |
| E-AERIAL-TX | SurveyToEngineering |
| ✔ E-BDWLK | SurveyToEngineering |
| E-BDWLK-PT | SurveyToEngineering |
| E-BDWLK-TX | SurveyToEngineering |

**Preview of changes:**

| Property | Current Value | Standard Value |
|---|---|---|
| Color | Color 13 | Color 252 |
| Lineweight | 0.13 mm | 0.25 mm |

☐ Mark this problem as ignored          Fix      Next

Settings...      Close                    Help

Check Standards - Check Complete dialog box:

**The standards check is complete.**

Problems found:   1
Fixed automatically:   0
Fixed manually:   0
Ignored in current check:   0

Close

# 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
- Surfaces
- Alignments
- Profiles
- Sections

- Parcels
- Pipe Networks
- Corridors
- Survey Figures

## 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.
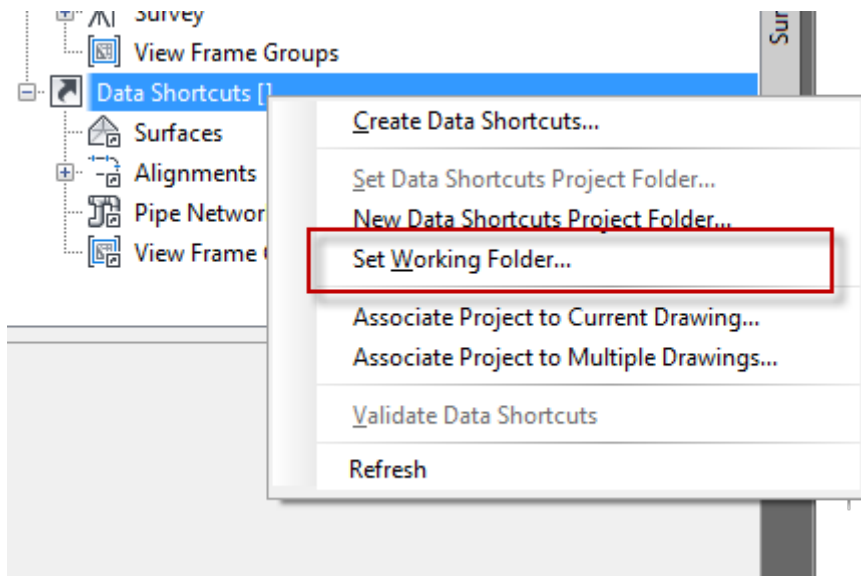


Next, right click on "Data Shortcuts" from the prospector tab and select "New Data Shortcuts Project Folder…".

![Pinellas County logo]
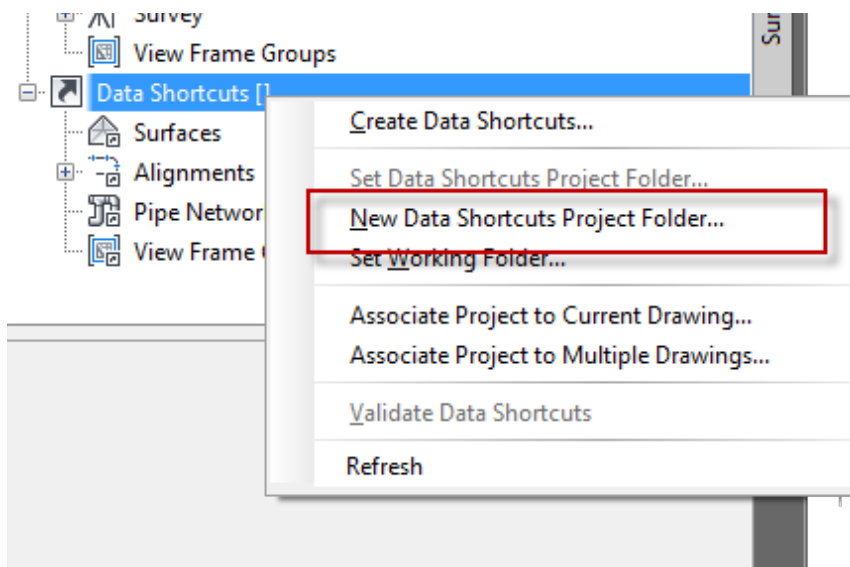
**CADD Standards Manual**

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.
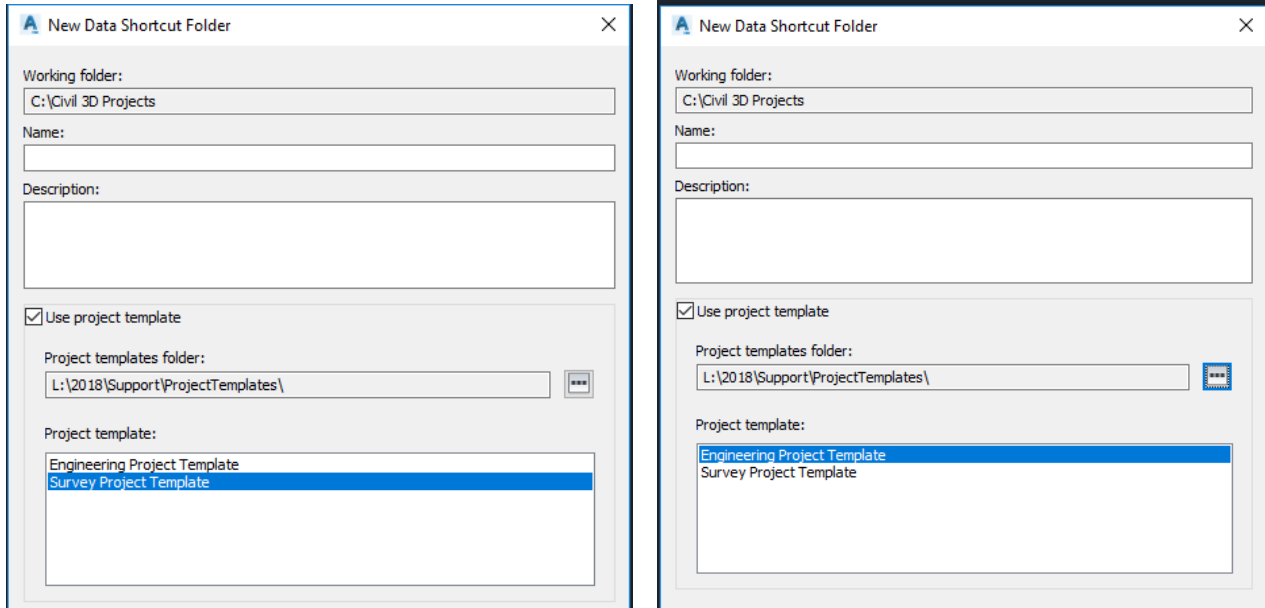


Once complete, the new project will be listed in prospector and the directory system will be created based on the applicable project template:
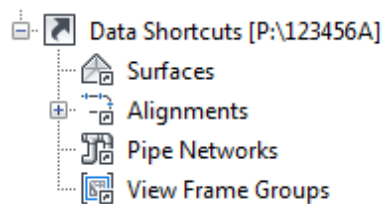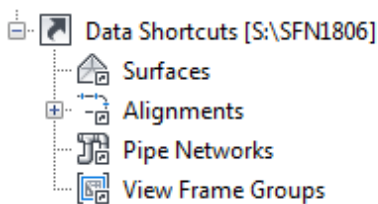
Survey Project Template
- Corresp
- Dwg
- Photos
  - Project Pictures
  - Project Video
- Reports
- Research
- Scans
- Survey Output Files
- Title Commitments

Engineering Project Template
- Calculations
  - Archive
  - Bentley Modeling
    - CulvertMaster
    - FlowMaster
    - HEC
    - PondPack
    - SewerCAD
    - StormCAD
    - WaterCAD
  - HydroFlow
  - ICPR
  - Pump Station
  - SSA
- Plans
  - Dwg
    - Production
    - Source
  - PDF
- Reports

## Civil 3D Drawing Creation

After launching Civil 3D using the included PC icon, the product is configured to automatically use the PC2020.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
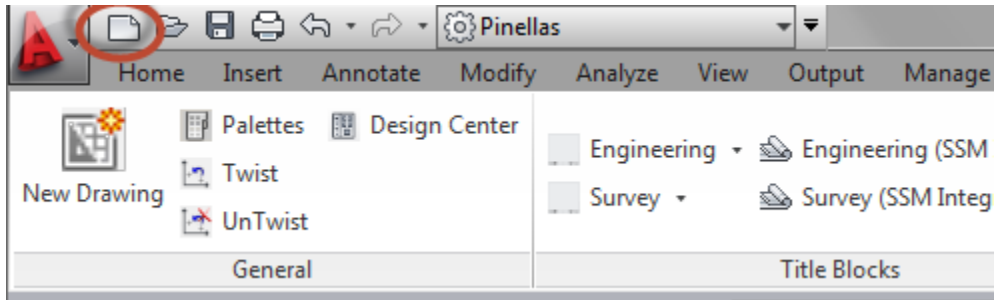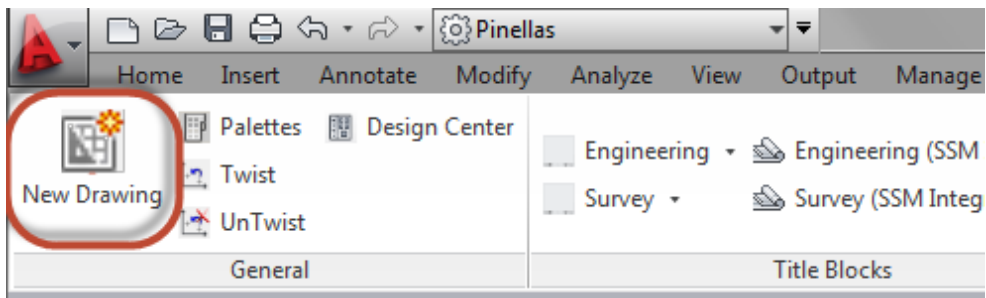
## Standard File Names

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
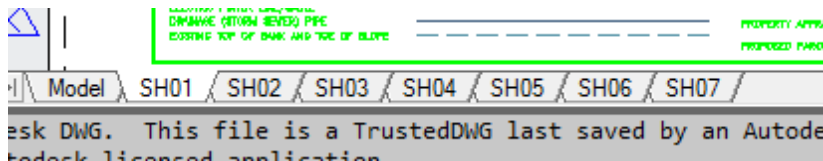
## Survey Drawing File Naming Conventions

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 2020 will have the name f1800-c3d-2020.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 2020 will have the name f1800-c3d-2020-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:
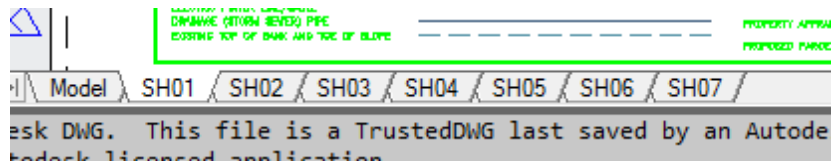
The name for a **REVISED** pipe network drawing:

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 2020 will have the name p100-c3d-2020.dwg.

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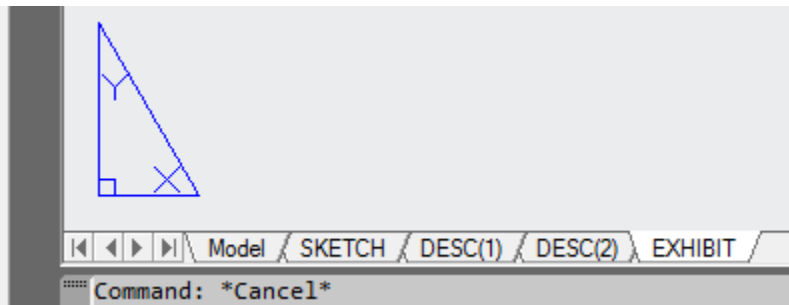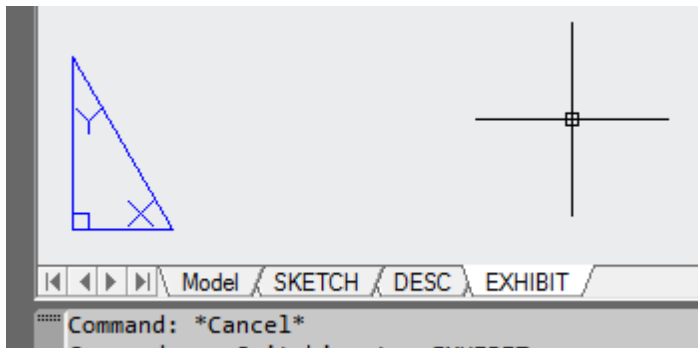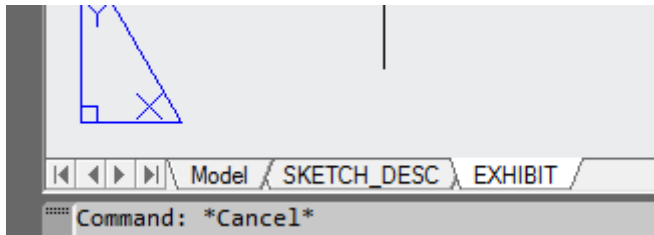
The name for a **REVISED** standard sketch and description:

# 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 2020 will have the name p100-c3d-2020-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:
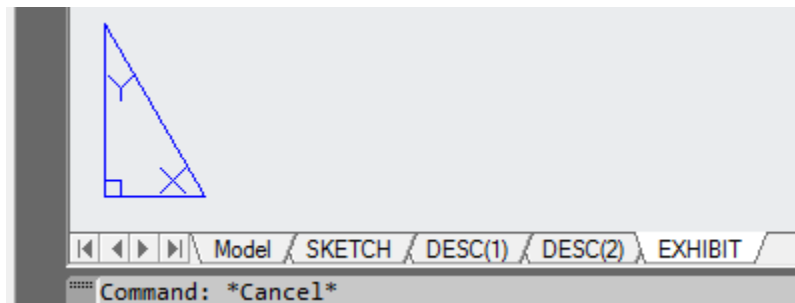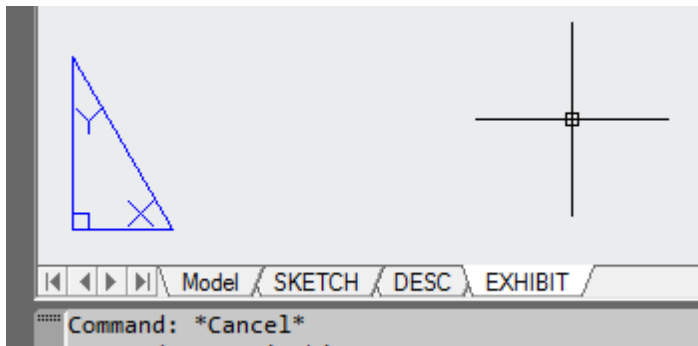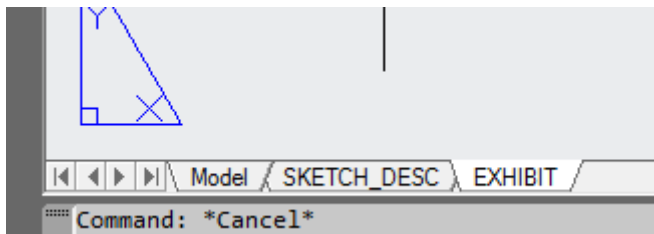
The name for a standard 8 ½ x 11 exhibit that accompanies a sketch and description:

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-*<subject >*-c3d-*<version number>.dwg*

Exhibits are created for various purposes and are not standard.  The user should replace the <subject> 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-2020.dwg.

Example: An exhibit prepared to depict limits of multiple plats would have the subject abbreviation "plats", such as exhibit-plats-c3d0-2020.

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-2020.dwg |
| Survey Pipes Drawing | F####-PIPES-C3D-2020.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 |
| Plan and Elevation | ****-PE.dwg |
| Bridge Hydraulic Recommendations | ****-BHR.dwg |
| Construction Sequence | ****-CS.dwg |
| Foundation Layout | ****-FDL.dwg |
| Superstructure Plan | ****-SUPL.dwg |
| Superstructure Details | ****-SUPDT.dwg |
| Finished Grade Elevations | ****-FGE.dwg |
| Endbent Plan | ****-EBPL.dwg |
| Endbent Details | ****-EBDT.dwg |
| Pier Plan / Elevation | ****-PPEPL.dwg |
| Pier Details | ****-PPEDT.dwg |
| Slope Protection Details | ****-SPDT.dwg |
| Finish Grade Elevations | ****-FGE.dwg |
| AASHTO Type (?) Beam - Standard Details - Index No. (?) | ****-BDT.dwg |
| AASHTO Type (?) Beam - Table of Beam Variables | ****-BV.dwg |
| Buildup Deflection Data Table for I-Beams Index No. S-900 | ****-BDD.dwg |
| Composite Elastomeric Bearing Pads - Index No. 501 | ****-CEBP.dwg |
| Approach Slabs - Geometric Layout | ****-ASGEO.dwg |
| Approach Slabs (Flexible Pavement Approaches) Index No. S-900 | ****-ASPVT.dwg |
| Retaining Wall General Notes | ****-RWGN.dwg |
| Retaining Wall Plan | ****-RWP.dwg |
| Retaining Wall Elevation | ****-RWE.dwg |
| Retaining Wall Details | ****-RWDT.dwg |
| Reinforcement Bar List | ****-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
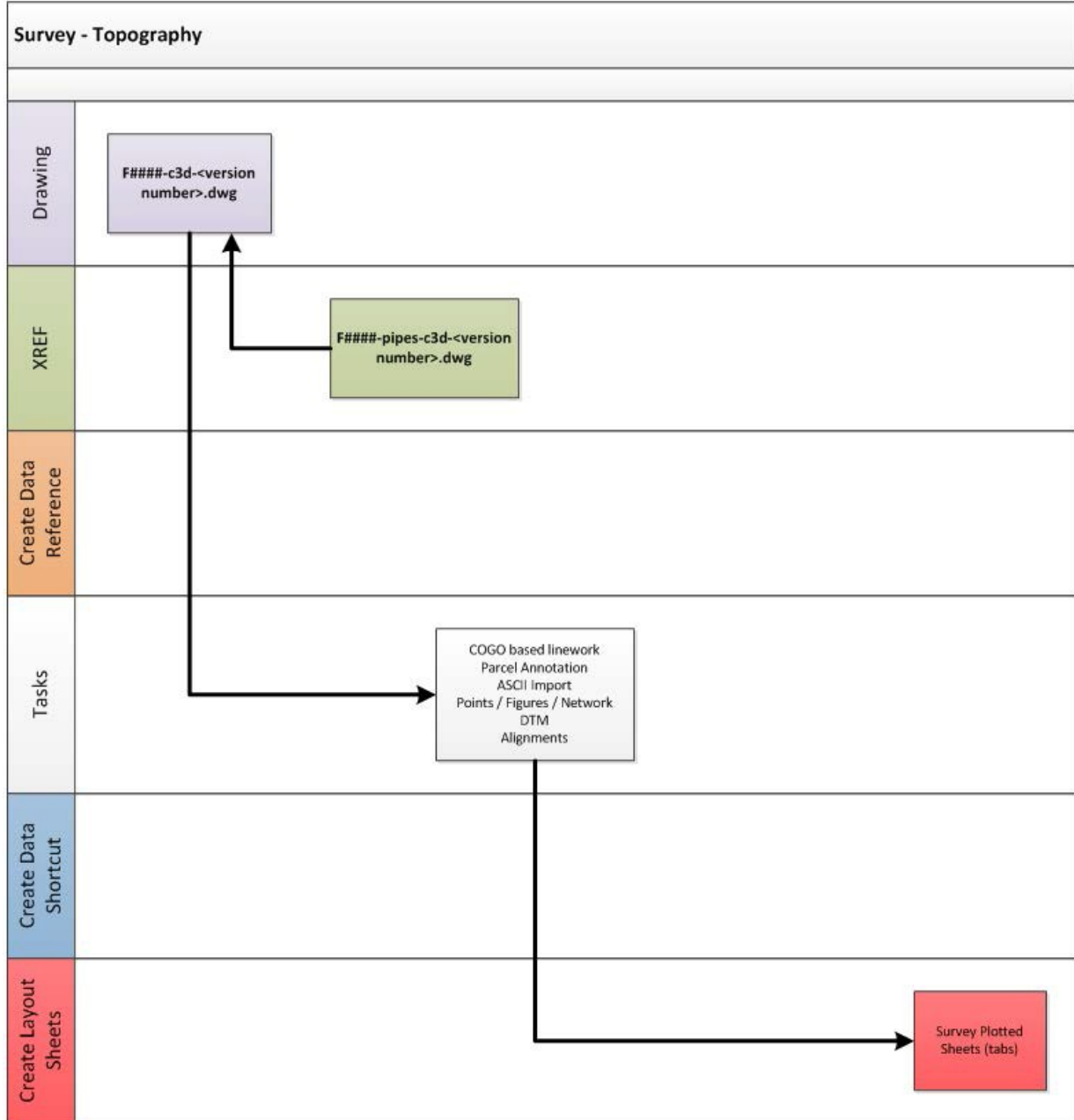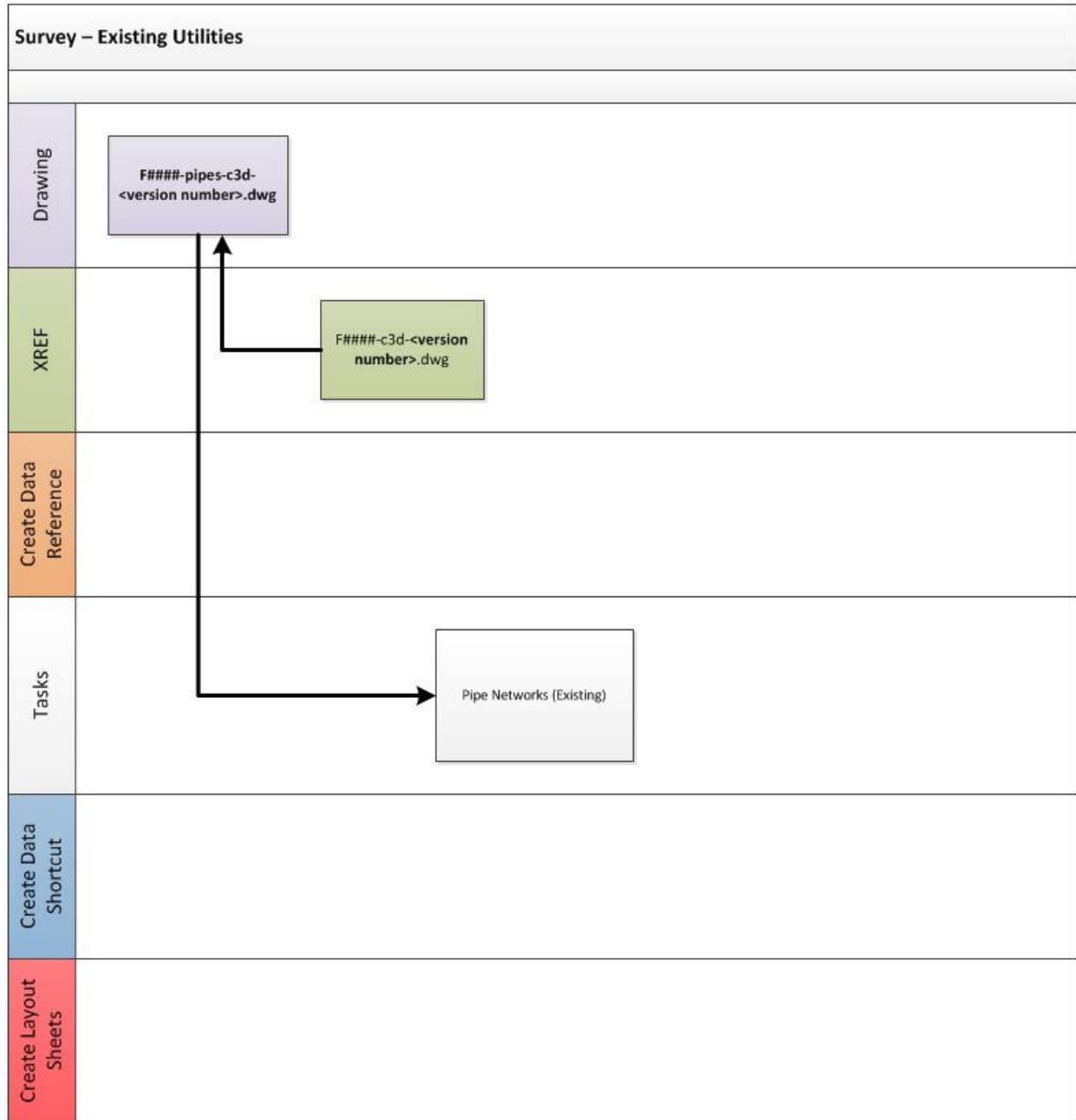
Survey Pipes to Engineering Pipes Drawing Setup

- Set up project (see Civil 3D Standards Section)
- Set up Sheet Set Manager (see Sheet Set Manager Section)
- Save survey file F####-C3D-2020.DWG to the project Source directory
- Save survey file F####-PIPES-C3D-2020.DWG to the project Source directory
- Save copy of F####-PIPES-C3D-2020.DWG as F####-PIPES-BASE.DWG

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Survey to Engineering Drawing Setup

- Save copy of survey file F####-C3D-2020.DWG as F####-BASE.DWG
- XREF F####-PIPES-BASE.DWG into this drawing

**Survey Base to Engineering Base Setup**

| | |
|---|---|
| **Drawing** | F####-BASE.dwg (Source) |
| **XREF** | F####-PIPES-BASE.dwg |
| **Create Data Reference** | |
| **Tasks** | Change Layer States / Delete Survey Plotted Sheets |
| **Create Data Shortcut** | Surface(s) / Alignment(s) / Pipe Network(s) |
| **Create Layout Sheets** | |

Layout

Drainage Map

| Drainage Map | |
|---|---|
| **Drawing** | ****-DRM.dwg (Production) |
| **XREF** | F####-BASE.dwg<br>****-LAY.dwg<br>****-TAX.dwg |
| **Create Data Reference** | |
| **Tasks** | Surface based on LiDAR<br>Drainage area delineation |
| **Create Data Shortcut** | |
| **Create Layout Sheets** | Drainage Map Sheets |

Corridor

| Corridor | | |
|---|---|---|
| **Drawing** | ****-CORR.dwg (Source) | |
| **XREF** | | F####-BASE.dwg ****-LAY.dwg |
| **Create Data Reference** | | EG Surface Alignments Profiles |
| **Tasks** | | Corridor Modeling |
| **Create Data Shortcut** | | FG Corridor Surface |
| **Create Layout Sheets** | | |

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

| Storm Drainage | |
|---|---|

**Drawing**
****-STM.dwg (Source)

**XREF**
F####-BASE.dwg
****-LAY.dwg

**Create Data Reference**
Composite Surface
Pipe Networks

**Tasks**
Storm Drainage Pipes

**Create Data Shortcut**
Storm Pipe Networks

**Create Layout Sheets**

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Grading

| Grading | |
|---|---|

**Drawing**
****-GRAD.dwg
(Production)

**XREF**
F####-BASE.dwg
****-CORR.dwg

**Create Data Reference**
EG Surface
FG Corridor Surface
Pipe Networks

**Tasks**
Detail Grading
Points
Grading Objects
Feature Lines

**Create Data Shortcut**
FG Overall Surface
Composite EG/FG Surface

**Create Layout Sheets**
Detail Grading Sheets
(if necessary)

Utilities

| Utilties | |
|---|---|
| **Drawing** | ****-UTL.dwg (Production) |
| **XREF** | F####-BASE.dwg ****-LAY.dwg |
| **Create Data Reference** | Composite Surface Pipe Networks |
| **Tasks** | Proposed Utilities |
| **Create Data Shortcut** | Pipe Networks |
| **Create Layout Sheets** | Utility Plan/Profile Sheets (if necessary) |

Drainage Structure

| Drainage Structure | |
|---|---|
| **Drawing** | ****-DRST.dwg (Production) |
| **XREF** | ****-CORR.dwg |
| **Create Data Reference** | EG Surface FG Overall Alignments Pipe Networks |
| **Tasks** | Sample Lines Cross Sections |
| **Create Data Shortcut** | |
| **Create Layout Sheets** | Drainage Structure Sheets |

Plan / Profiles

**Plan / Profiles**

| | |
|---|---|
| Drawing | ****-PLPR.dwg (Production) |
| XREF | F####-BASE.dwg ****-LAY.dwg |
| Create Data Reference | EG Surface FG Overall Alignments Profiles Pipe Networks Viewframe Groups |
| Tasks | Plan Production Tools Annotation |
| Create Data Shortcut | |
| Create Layout Sheets | Plan & Profile Sheets |

Demolition Plan

**CADD Standards Manual**

## 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:\2020\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 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 |

| 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 |

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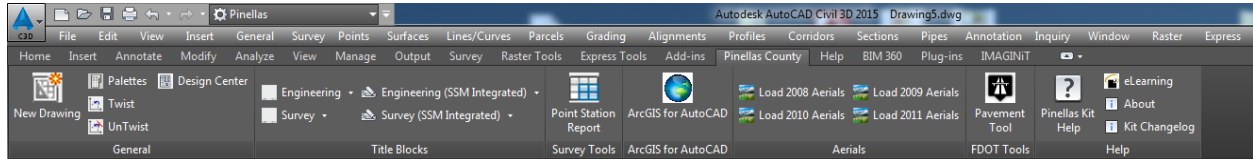
Once data shortcuts have been created, the source drawing should never be moved or renamed. Doing so will cause the shortcut to become broken.

A short video demonstrating how to fix a broken reference can be found here

## Pinellas County Ribbon Tab



General Pane
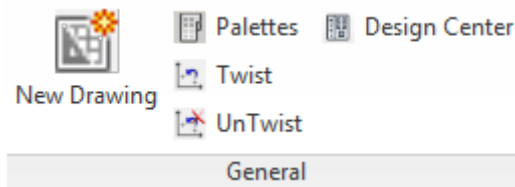


 The new drawing icon should be used when creating new drawings from scratch to ensure the appropriate PC Kit template is being used.
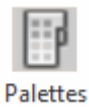
 Icon toggles tool palettes on and off.

 Routine to more quickly perform DVIEW Twist operations.
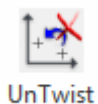
 Routine to undo DVIEW Twist operations.

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

Title Blocks Pane
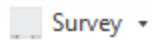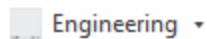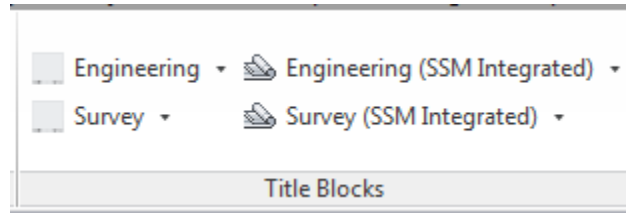




The left two icons of this pane are used to insert PC standard title blocks into the current drawings. These title blocks do not include any sheet set manager integrated fields.
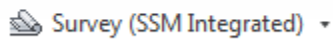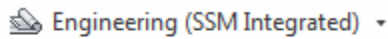


The right two icons of this pane are used to insert PC standard title blocks into the current drawings. These title blocks do include sheet set manager integrated fields. These title blocks should be used most of the time.

Survey Tools Pane
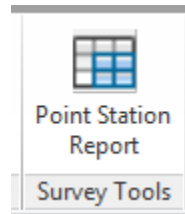




This icon launches a custom application that creates a point report that includes alignment station and offset information.

Aerials Pane
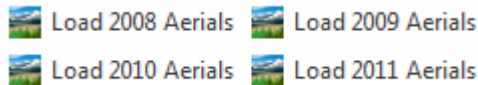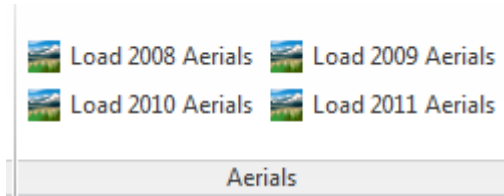


 These icons are used to create a WMS data connection to PC aerial photos. The WMS connection information is saved within the DWG file and is accessible outside the county. No additional software is required to use this functionality.

FDOT Tools Pane
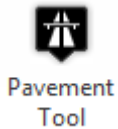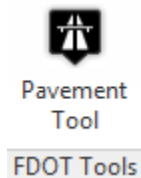


 This icon launches the FDOT pavement marking tool within the PC kit.

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
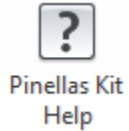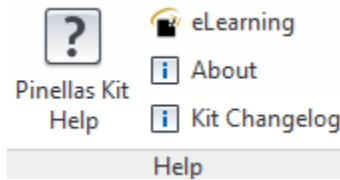




Launches PC CAD standards manual.
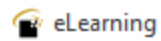


This icon launches the IMAGINiT Technologies client portal website. PC employees have full access to all white papers, video tech tips, blogs and discussion forums contained on this site. Additionally, this is the gateway into the ProductivityNOW Solo site.
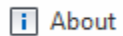


Displays release notes about the version of the PC Kit currently installed.
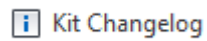


Displays the kit change log.

# 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

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## 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 PC2020.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 |
| ASPHPAT* | ASPHPAT | <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 |

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| 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-DPVMT-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 |
| 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 |

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| 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-STRIPE-PT |
| LPOLE | LPOLE | <none> | $* | E-UT-LP-PT |
| MAGNO* | MAGNO | Description Only | $1" MAGNOLIA | E-TREE-PT |

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| 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 |
| 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 |

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| 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-STRIPE-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 |

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| 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 |

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## 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 |
|---|---|---|---|
| ASPHPAT | Yes | E-RD-EP | ASPHPAT |
| 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 |

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| | | | |
|---|---|---|---|
| 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-STRIPE | 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 |

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| | | | |
|---|---|---|---|
| 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 |

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## 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.
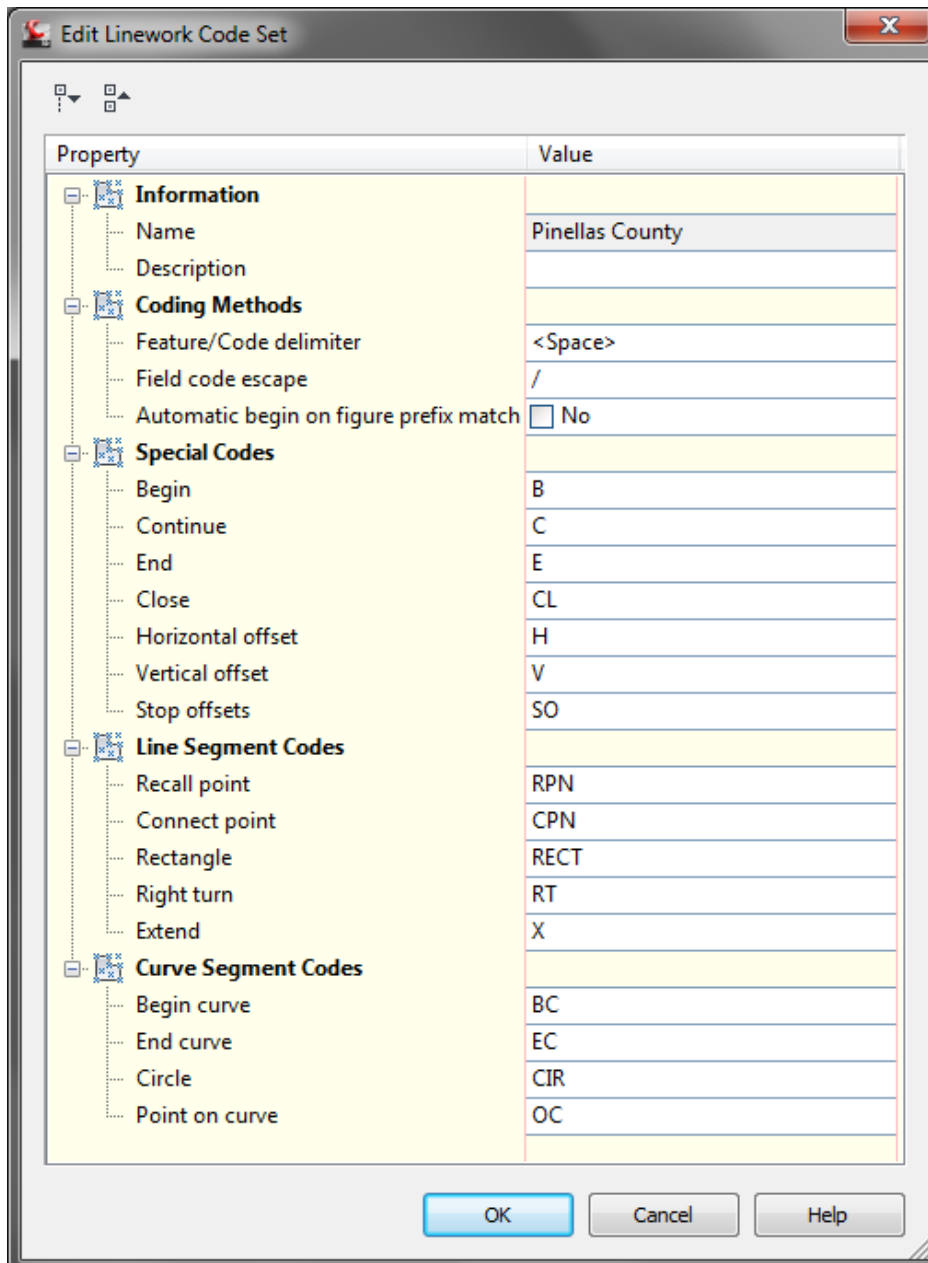
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## Graphic Symbols



Graphic line symbols:

| Symbol description | | Symbol description |
|---|---|---|
| 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 |
| (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 |
| (EXISTING W/ ACQUISITION) | | FOUND PINCH PIPE |
| SECTION LINE | | SET CONCRETE MONUMENT |
| ORIGINAL LOT LINE/FORMER OWNERSHIP LINE/ | | SET NAIL & DISC/CAP BRASS DISC |
| VACATED EASEMENTS | | SET IRON ROD |
| TREE LINE | | XCUT (FOUND) |
| FENCE LINE | | XCUT (SET) |
| COMMUNICATION LINE | | SUB PARCEL NO. |
| TRAFFIC CONTROL LINE | | |
| ELECTRIC POWER LINE/CABLE | | BLOCK NUMBER |
| DRAINAGE (STORM SEWER) PIPE | | |
| EXISTING TOP OF BANK AND TOE OF SLOPE | | PROPERTY APPRAISER PARCEL NUMBER |
| | | PROPOSED PARCEL |

Symbol legend (icons):

BACKFLOW PREVENTER
BENCHMARK
CENTERLINE
COMMUNICATIONS BOX
COMMUNICATIONS MANHOLE
DECIDUOUS TREE (OAK UNLESS OTHERWISE ANNOTATED)
DELTA ANGLE
DRAINAGE CLEAN OUT
DRAINAGE MANHOLE
ELECTRICAL OUTLET
EVERGREEN TREE
FIRE HYDRANT
GAS VALVE
GATE VALVE
GRATE INLET
GUY WIRE
HOSE BIB

JUNCTION BOX
LIGHT POLE
MAILBOX
MONITOR WELL
PALM TREE
PEDESTRIAN SIGNAL
POLE/POST
POWER BOX
PROPERTY LINE
RECLAIMED WATER MANHOLE
RECLAIMED WATER METER
RECLAIMED WATER VALVE
SANITARY SEWER CLEANOUT
SEWER MANHOLE

SHRUB
SIGN
SPRINKLER HEAD
SPRINKLER HEAD VALVE
SURVEY LINE
TARGET
TRAFFIC SIGNAL POLE
TRAFFIC SIGNAL PULL BOX
UNDERDRAIN BOX
UTILITY POLE
WATER METER
WATER VALVE

## 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](#)

**CADD Standards Manual**

# 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 PC2020.dwt drawing template.  These styles have been created to control the aesthetics of the labels including layer, font, increment, text height, and precision.
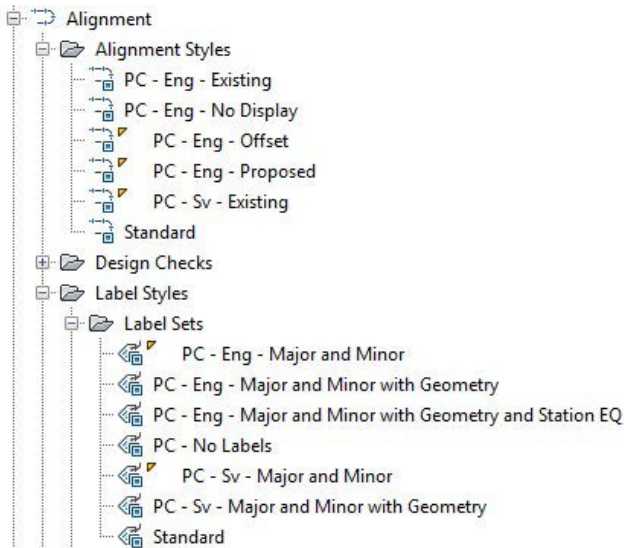
**CADD Standards Manual**

## 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.

```
Surface
    Surface Styles
        PC_ENG-Border Only
        PC_ENG-Elevation Analysis
        PC_ENG-No Display
        PC_ENG-Proposed 0.1' and 0.5'
        PC_ENG-Proposed 1' and 5'
        PC_ENG-Proposed 2' and 10'
        PC_ENG-Slope Banding
        PC_ENG-Watershed
        PC_SV-Existing 0.1' and 0.5'
        PC_SV-Existing 1' and 5'
        PC_SV-Existing 2' and 10'
        PC_SV-Surface Editing
        Standard
```
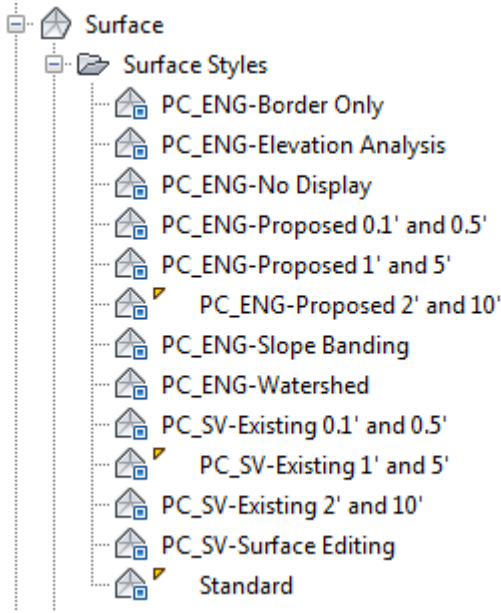
Naming standardization will be based upon the following conventions:

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.

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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 PC2020.dwt drawing template.  Label styles for contours, slopes, and spot elevations have been provided:

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```
Surface
    Surface Styles
    Label Styles
        Contour
            PC - Eng - Major
            PC - Sv - Major
            Standard
            Expressions
        Slope
            PC - Eng - Percent
            PC - Eng - Run Rise
            Standard
            Expressions
        Spot Elevation
            PC - Eng - 0.1
            PC - Eng - 0.01
            PC - Eng Basin
            PC - Sv - 0.01
            PC - Sv - 0.1
            PC Eng sta_off_elev
            PC Eng Utility Fire Hydrant Assembly
            Standard
            Expressions
```
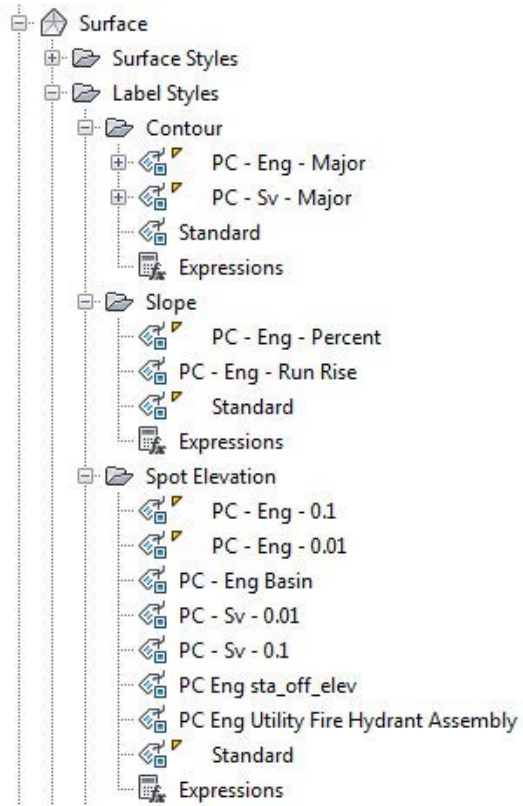
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## Survey Title Blocks
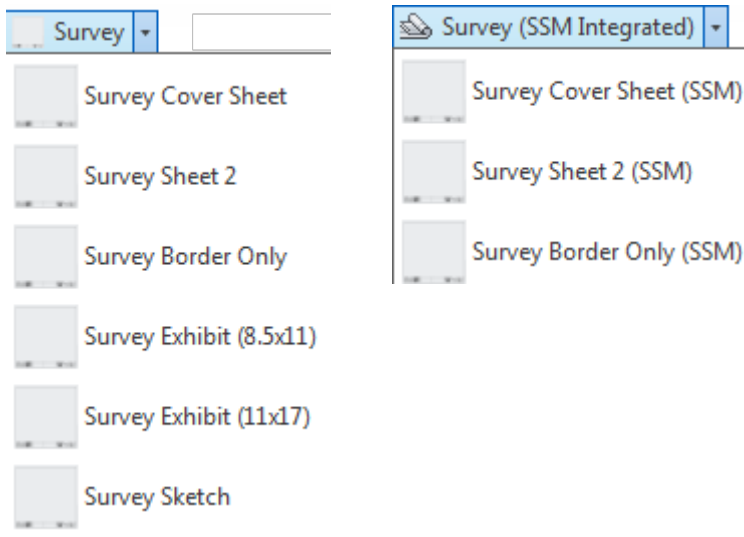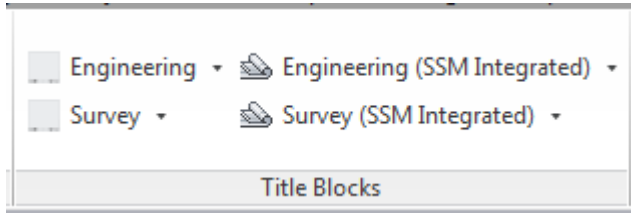




- Survey Cover Sheet – This is the first sheet of the survey. It includes the Title of Project, Vicinity Map, Pinellas County Map, Graphic Symbols, and Sheet Index.

- 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

| Survey Process | Procedure |
|---|---|
| LDT 2006 to Civil 3D 2014 Project Conversion | A step by step process for converting existing LDT 2006 projects to Civil 3D 2014 projects can be found here. |
| Alignment Creation | A step by step process for alignment creation can be found here. |
| Surface Creation | A step by step process for surface creation can be found here. |
| Pipe Network Creation | A step by step process for pipe network creation can be found here. |
| Checker Program | A step by step process for the checker program can be found here. |
| Mapping QC Checklist | The QC checklist can be found here. |
| Mapping & Transmittal Process | A step by step mapping & transmittal process can be found here. |

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

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# 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

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## 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.

**CADD Standards Manual**

Alignment Stationing and Labeling

To control how stations appear in Civil 3D, alignment label sets have been created and included with the main PC2020.dwt drawing template. These styles have been created to control the aesthetics of the labels including layer, font, increment, text height, and precision.
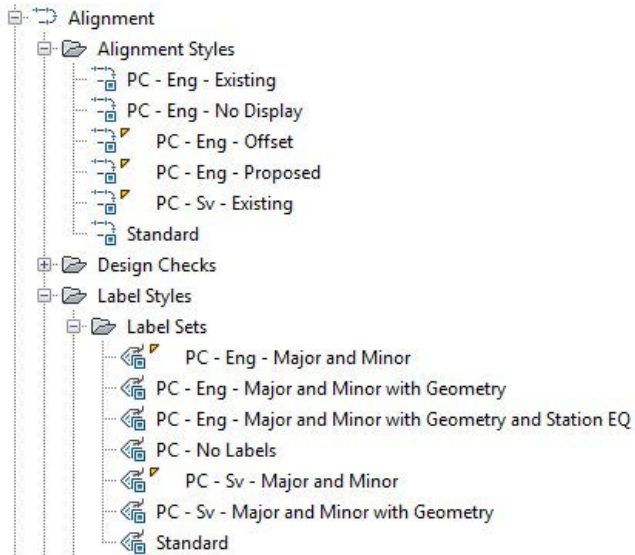


Alignments can be created from a variety of methods including the traditional alignment creation tools as well as from polylines or points.

## 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.

```
Surface
   Surface Styles
      PC_ENG-Border Only
      PC_ENG-Elevation Analysis
      PC_ENG-No Display
      PC_ENG-Proposed 0.1' and 0.5'
      PC_ENG-Proposed 1' and 5'
      PC_ENG-Proposed 2' and 10'
      PC_ENG-Slope Banding
      PC_ENG-Watershed
      PC_SV-Existing 0.1' and 0.5'
      PC_SV-Existing 1' and 5'
      PC_SV-Existing 2' and 10'
      PC_SV-Surface Editing
      Standard
```
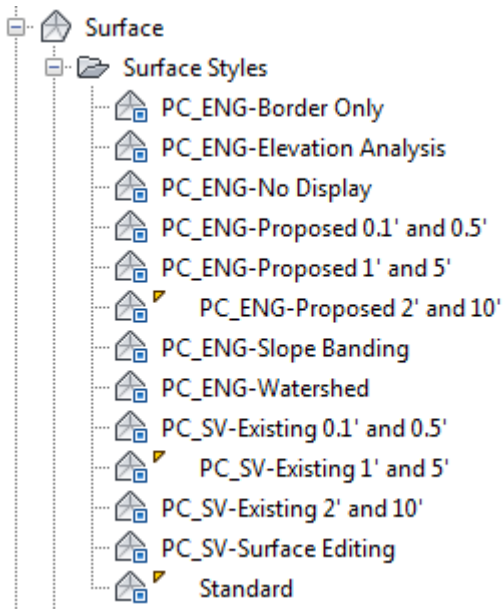
Naming standardization will be based upon the following conventions:

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.

**CADD Standards Manual**



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 PC2020.dwt drawing template. Label styles for contours, slopes, and spot elevations have been provided:

**CADD Standards Manual**
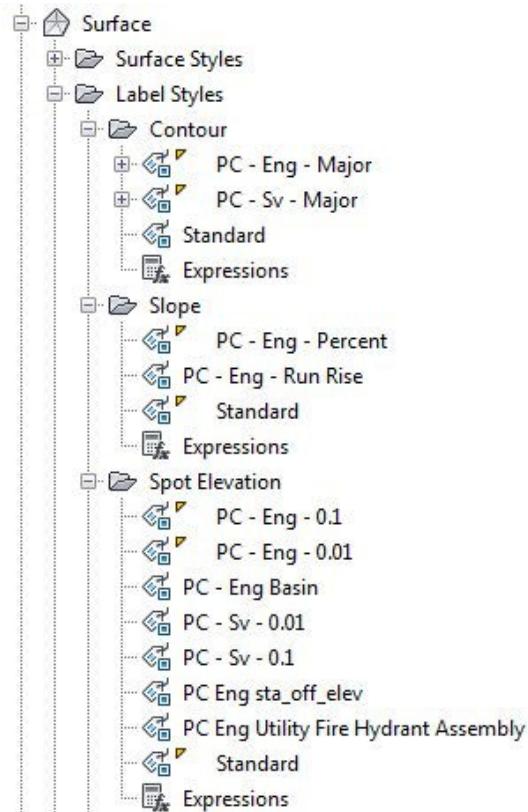


## Profiles

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.
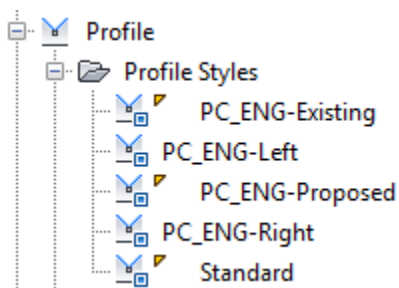


A short video on existing ground profile creation can be seen by clicking here.

**CADD Standards Manual**

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.
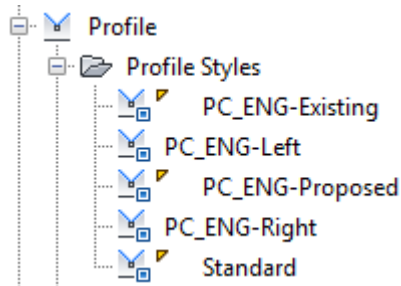
A short video on existing ground profile creation can be seen by clicking here.

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.
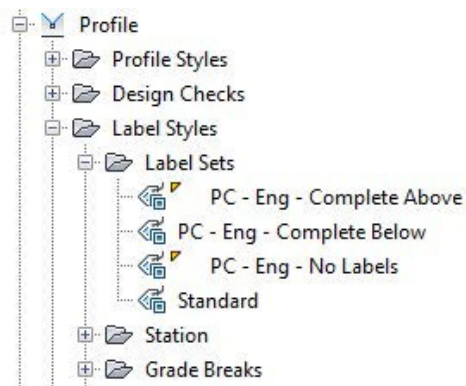
**CADD Standards Manual**

## 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".



---
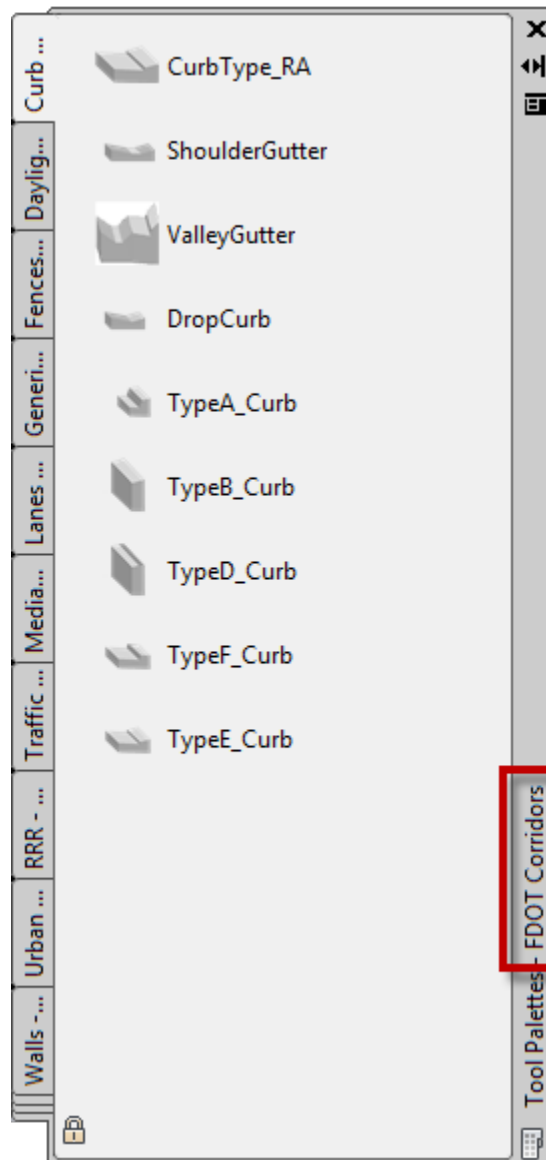
**CADD Standards Manual**

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.

## 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.
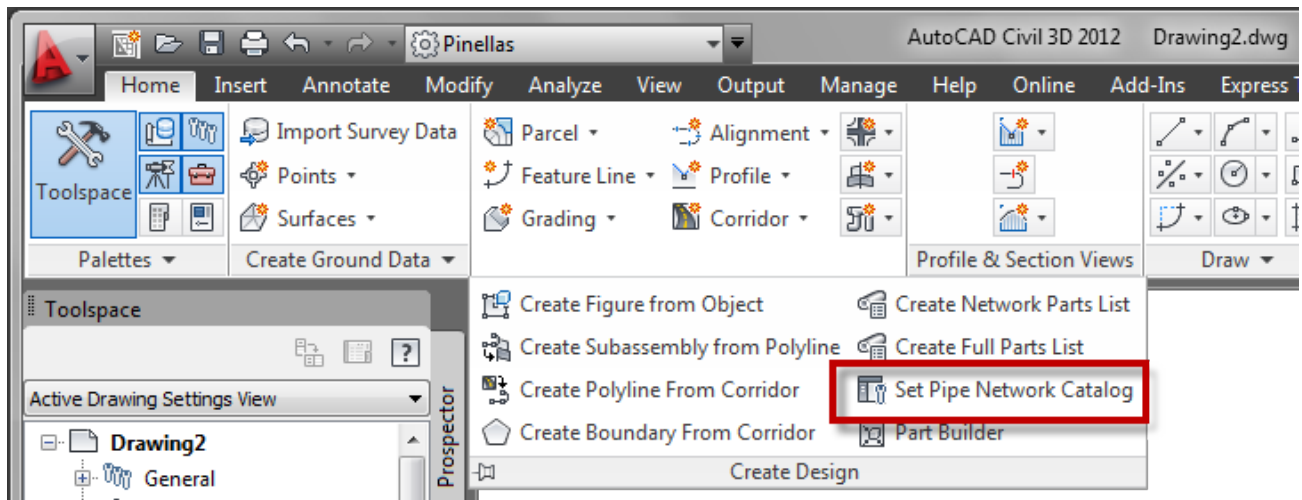
**CADD Standards Manual**
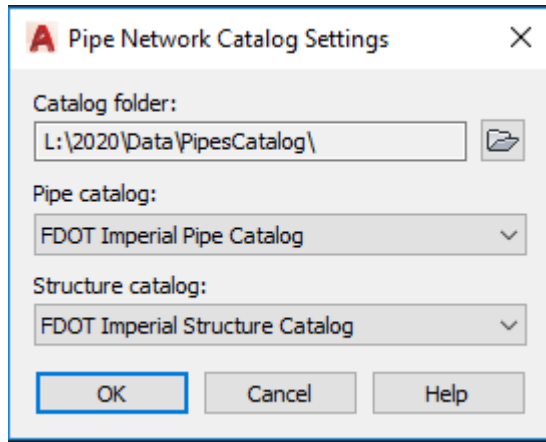


Since Civil 3D only allows for one part catalog to be associated to a drawing at a time, the out of the box parts are not available.

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.
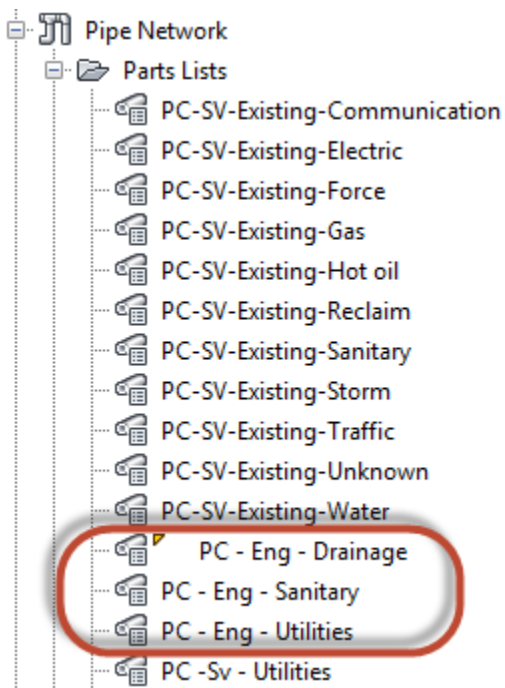


It is important to note that parts in the part catalog can be added to these lists at any point in time depending on the design situation. If making edits to the part lists, make sure to completely fill out all the columns including pay item so that quantity take-offs can be run as the design progresses.

**CADD Standards Manual**
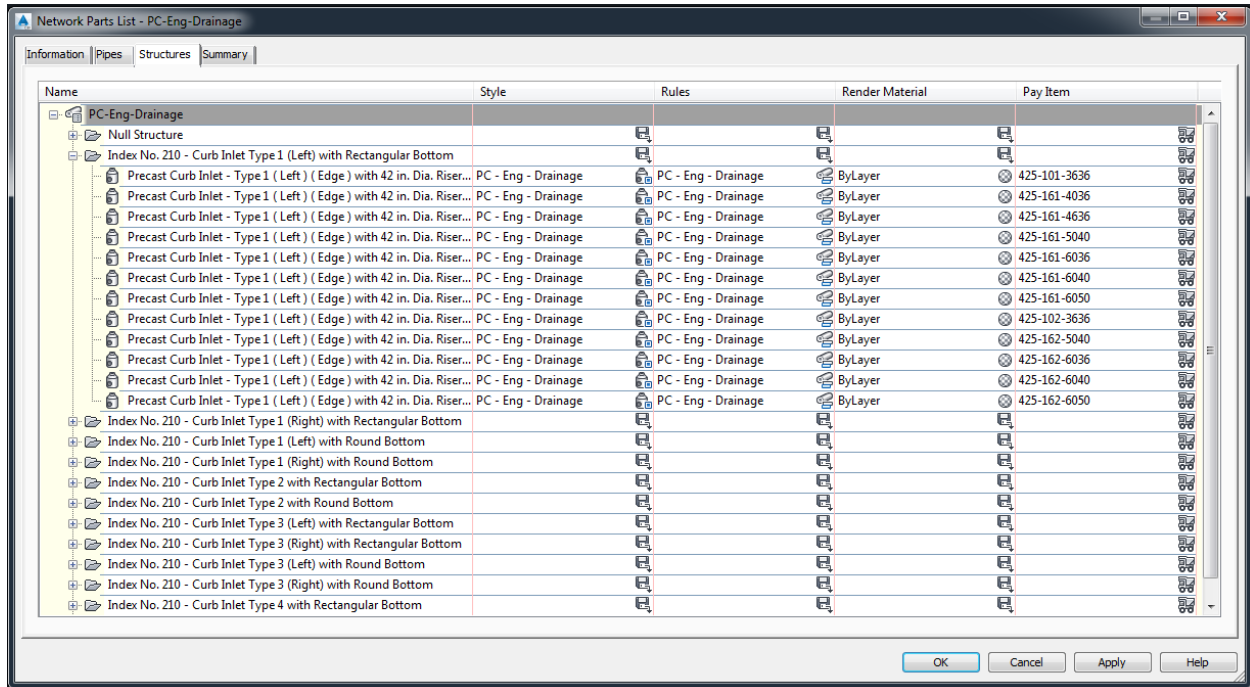


Several videos have been created demonstrating pipes design tasks:

- 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

**CADD Standards Manual**

## 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:\2020\Support\Templates\PCPlanProduction.dwt

Utilizing the plans production tools in Civil 3D is a fairly straight forward, 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:\2020\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:\2020\Data\PayItemData\PCCategories.xml

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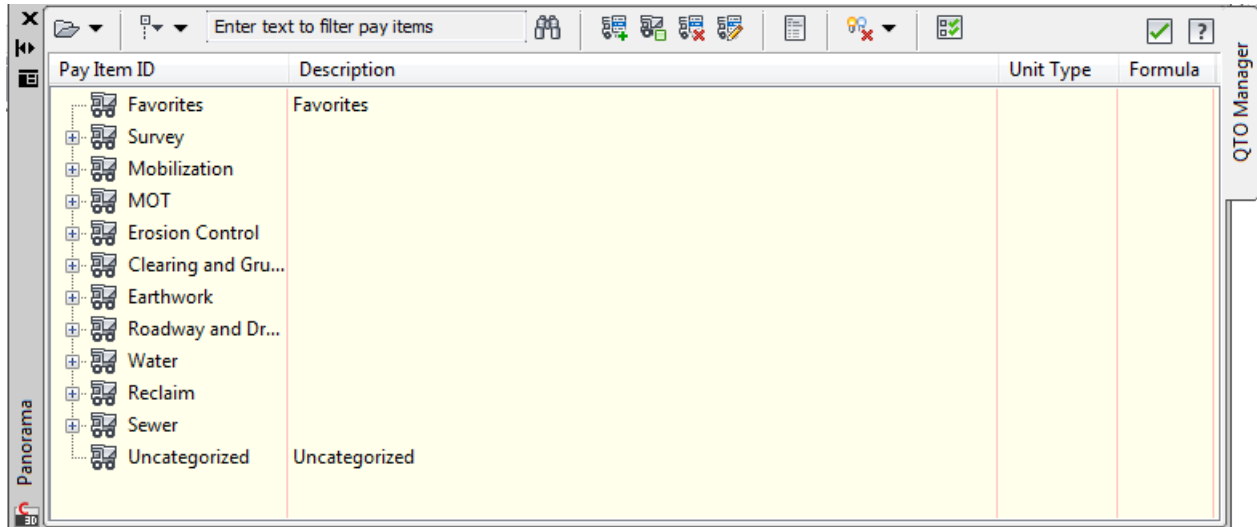


This interface is used for assigning pay item information to existing geometry in a drawing.  Part lists for pipes have also been pre-configured with pay item information.
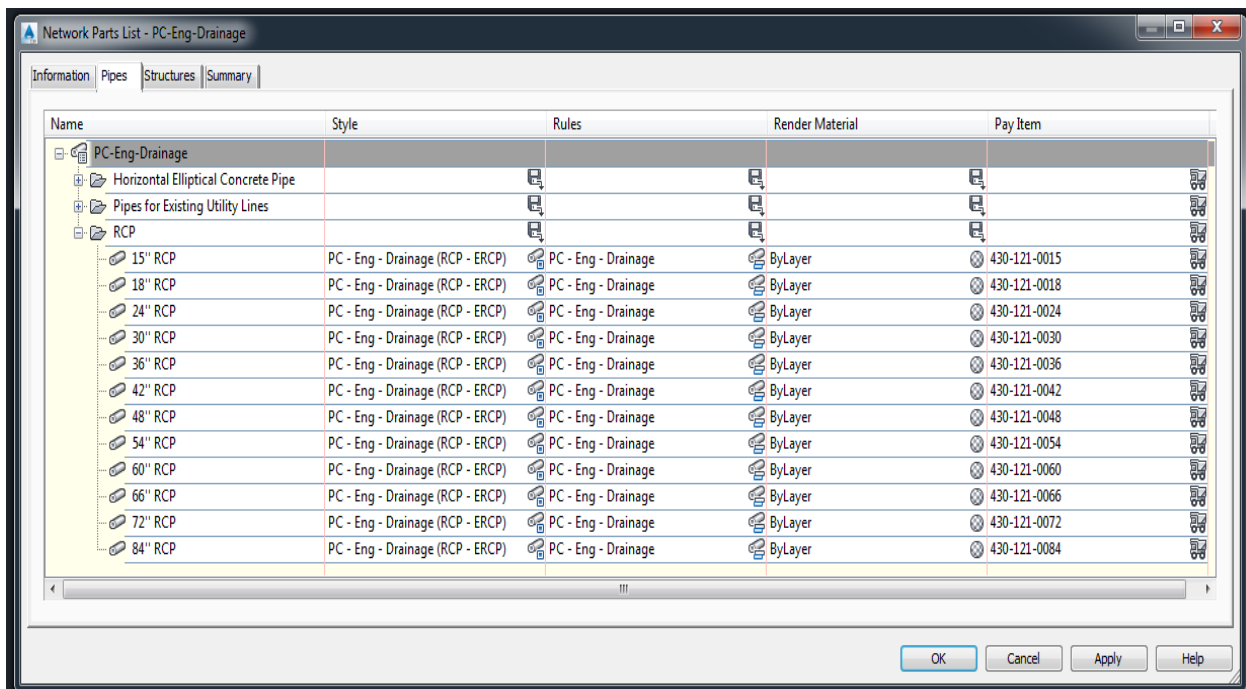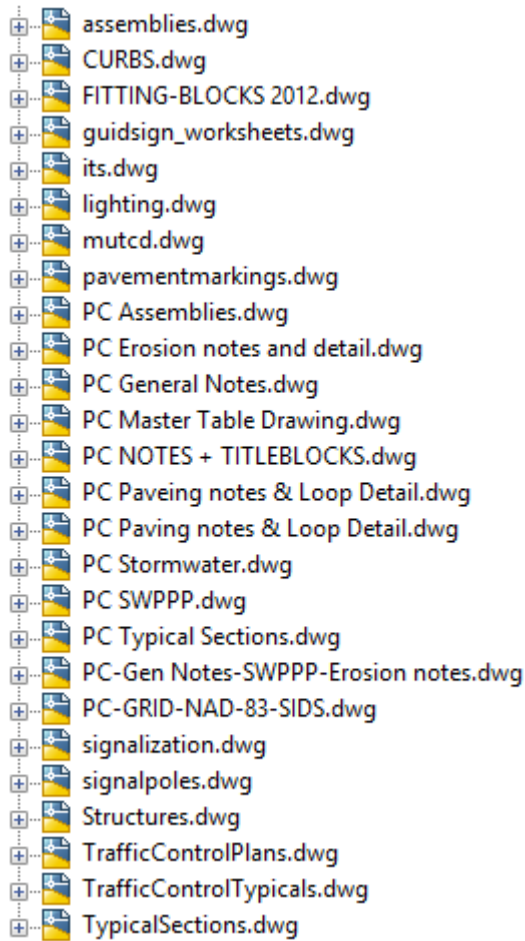
**CADD Standards Manual**

## Symbology

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

L:\2020\Data\Libraries

- assemblies.dwg
- CURBS.dwg
- FITTING-BLOCKS 2012.dwg
- guidsign_worksheets.dwg
- its.dwg
- lighting.dwg
- mutcd.dwg
- pavementmarkings.dwg
- PC Assemblies.dwg
- PC Erosion notes and detail.dwg
- PC General Notes.dwg
- PC Master Table Drawing.dwg
- PC NOTES + TITLEBLOCKS.dwg
- PC Paveing notes & Loop Detail.dwg
- PC Paving notes & Loop Detail.dwg
- PC Stormwater.dwg
- PC SWPPP.dwg
- PC Typical Sections.dwg
- PC-Gen Notes-SWPPP-Erosion notes.dwg
- PC-GRID-NAD-83-SIDS.dwg
- signalization.dwg
- signalpoles.dwg
- Structures.dwg
- TrafficControlPlans.dwg
- TrafficControlTypicals.dwg
- TypicalSections.dwg

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

**CADD Standards Manual**

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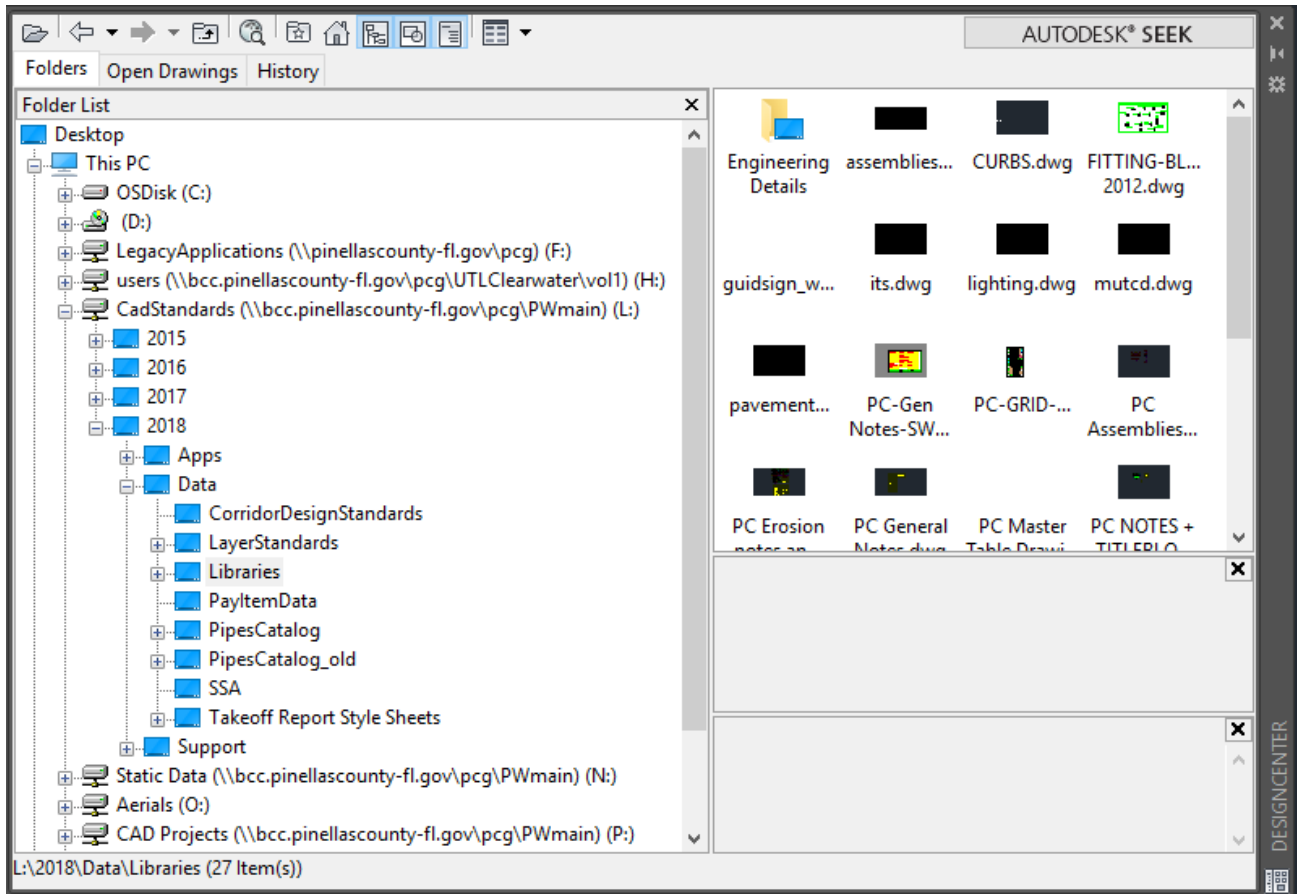
## Project Journal File

A Project Journal (with a file Index included) will be produced and delivered with each Civil Engineering project. The purpose for this journal is to aid downstream customers of the CADD data so they may utilize existing CADD work in their processes. The format of the journal will be an electronic file that is created with the project and will be included with the project data on the prescribed media.  The journal will contain the following information:

- A listing (Index) of the files delivered, including brief descriptions of each file in the directory structure and where the file is located.
- Documentation about the data (metadata) including major processes used, special CADD decisions made, exceptions to standards that were made, problems encountered and work around, or other important issues that arose during the course of the CADD work.  For example, if a custom line style needed to be created, the format, coding, layer association and files where that line style was used would be documented in the Journal.
- Other documentation such as the design software used, particular software settings, and other information that would help a downstream user of the data understand where and how the data was created should be documented.
- All information necessary for the regeneration or use of those files by subsequent customers of the CADD data
- Document the geometry database, controlling alignment and profile names and geometry input/output files, relevant survey information, cross sections and the methodology used to obtain the final geometric controls in the CADD product.
- The project journal must be kept up to date as the CADD design work progresses and delivered with the project on the CD for archival purposes.

An example of the project journal is shown below:

**Pinellas County**

**CADD Standards Manual**

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*PROJECT DESCRIPTION*

**Project ID Number (PID):** 123456A

**Project Name:** <Type Project Name Here>
**Project Manager:** <Name>

**Engineering of Record (PE):** <Name, PE>
**Project Designer:** <Name>
**Project Directory:** P:\CAD Projects
**Survey File Number (SFN):** SFN1234

---

*SCOPE OF WORK:*

<The scope of work for project 123456A goes here. Include as much detail as necessary to define the work done for the project.>

---

This file is located at the root of the individual project directory.

**PINELLAS COUNTY NETWORK PATH:**

**P:\CAD Projects**\123456A

**FULL PATH TO THE PROJECT JOURNAL DOCUMENT:**

<Network Drive letter>:\\CAD Projects\<Project Number>\Project Journal_123456A.docx

EXAMPLE: P:\CAD Projects\123456A\ Project Journal_123456A.docx

**PROJECT TYPE:** <WATER, SANITARY SEWER, DRAINAGE, ROADWAY, ETC...>

**ORIGINAL PROJECT DATE:** <00/00/20XX

**SECTION** 00, **TOWNSHIP** 00 **SOUTH**, **RANGE** 00 **EAST**

---

**ENGINEERING DESIGN - OBJECTIVE / SCOPE:**

---

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**ENGINEERING DESIGN STANDARDS/CRITERIA:**

- **PRELIMINIARY DESIGN:**
  - o APPROVED BY: <NAME>
  - o DATE: 00/00/20XX
  - o LINK TO STANDARDS CHECKER: <Hyperlink>
- **30% DESIGN**
  - o APPROVED BY: <NAME>
  - o DATE: 00/00/20XX
- **60% DESIGN**
  - o APPROVED BY: <NAME>
  - o DATE: 00/00/20XX
- **90% DESIGN**
  - o APPROVED BY: <NAME>
  - o DATE: 00/00/20XX
- **100% FINAL (AS-BID)**
  - o APPROVED BY: <NAME>
  - o DATE: 00/00/20XX

**ENGINEERING DESIGN EXCEPTIONS:**

**START DAILY AND/OR EVENT LOG FORMAT:**

**LOG ENTRY:**

DATE: 00/00/20XX – <CADD USER NAME>: <Brief description of the daily work or changes to the design or non-compliance to the CADD Standards.

**CADD Standards Manual**

# 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 | |
| 0BORD | 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 – spot light, 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 |

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| | |
|---|---|
| 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-STRIPE | Pavement stripes and markings, stop bars, cross walks, lane lines |
| E-SURV_GIBSON | |
| E-SURV_LEONARD | |
| E-SURV_NEAL | |
| E-SURV_NOTE | |
| E-SURV_NOTE_AERIAL | |
| E-SURV_SCHOLPP | |
| E-SURV_STANDRIDGE | |
| 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 |

**CADD Standards Manual**

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

| P-DR-DIP | Ductile iron pipe |
|---|---|
| P-DR-RCP | Reinforced concrete pipe |
| P-DR-ST | |
| P-DR-UD | Underdrain |
| P-DRW | Driveway into parking lots and residences |
| 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 | Hand rail |
| P-HOTOIL | Hot oil line |
| P-LTD | Lighting devices – spot light, 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. |

**CADD Standards Manual**

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

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

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# 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 employees 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

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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.



Example 1

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## 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.



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.

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## 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 plans set (using the appropriate qualifiers or exculpatory language).