THURSTON COUNTY
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THURSTON COUNTY PUBLIC WORKS DEPARTMENT

Design and Construction Division

CADD & Civil 3D User Guidelines

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THURSTON COUNTY PUBLIC WORKS DEPARTMENT

DESIGN AND CONSTRUCTION DIVISION

CADD & Civil 3D User Guidelines

Prepared for:
Thurston County Public Works Department
Design & Construction Division

Table of Contents

Chapter 1 - Introduction

- User Responsibilities
- General Care
- Version Control
- Reference Files
- Basis of Guidelines
- AutoCAD Layers
- AutoCAD Lineweights
- Plot Styles – Color or Style Dependency
- Types of Plot Style Tables
- AutoCAD Sheet Sets
- Archive and eTransmit

Chapter 2 - Project Startup

- Setting TC_PD_C3D.dwt File As the Default Template

Chapter 3 - Creating Project Drawing (.dwg) Files

- Drawings Based on Your Template
- Incorporating Civil 3D Drawings Created using a Different Template
- Incorporating Non-AutoCAD or Non-Civil 3D Drawings

Chapter 4 - Creating Topographic Survey Drawings

- Starting a New Drawing
- Surface Modeling Process
- Saving Your Drawing

Chapter 5 - Creating the Existing Ground Surface

- **Creating the Existing Ground Surface**
- **Adding Data to the Surface Definition**
- **Best Practices for Adding Data to a Surface Definition**
- **Creating the Existing Ground Data Shortcut**

Chapter 6 - Creating Civil Design Drawings

- **Starting a New Drawing**
- **Creating the Existing Ground Surface Reference**
- **Existing Ground Surface**

Chapter 7 - Road Design

- **Alignments**
- **Alignment Styles**
- **Alignment Label Sets**
- **Create Alignments from Polyline (Ribbon Interface: Create Alignment from Objects)**
- **Create Alignment by Layout (Ribbon Interface: Alignment Creation Tools)**
- **Profiles**
- **Create Profile from Surface**
- **Create Profile Views (Existing Ground Profiles)**
- **Create Profile by Layout**
- **Adjusting Band Data**
- **Creating Data Shortcuts to the Alignment and Profile**

Chapter 8 - Cross Sections & Cross Section Views

- **Starting a New Drawing**
- **Creating the Existing Ground Surface, Alignment & Profile References**
- **Sample Lines & Sample Line Groups**
- **Creating Sample Lines & Sample Line Groups**
- **Computing Earthwork and Material Volumes**
- **Adding Volume Tables & Reports**
- **Create Section View / Create Multiple Section Views**

Chapter 9 - Creating View Frames & Generating Sheet Sets

- **Creating View Frames & View Frame Groups (Ribbon Interface: Annotate Tab →Create View Frames)**
- **Creating Sheets & Sheet Sets (Ribbon Interface: Create Sheets)**

Chapter 10 – Data Shortcut Workflow

- **Creating the Data Shortcut**
- **Creating the Data Shortcut Reference**

Chapter 11 – Creating a Survey Database

- **New Survey Database**
- **Populating the Survey Database**

Appendix

Appendix A – Reference & Project File Names

Appendix B – Layer Naming

Appendix C – Field Code & Linework Definition

Appendix D – Civil 3d Project Design and Plans Production Workflow

Appendix E – Thurston Co. / APWA Standard Legend

Appendix F – Thurston Co. CADD Standards AutoCAD Menu

Appendix G – Support Files and Paths

Chapter

1

Introduction

This document outlines Thurston County Design & Construction AutoCAD and Civil 3D guidelines.

Thurston County Design and Construction perform a high level engineering design and construction services. County personnel primarily use Autodesk AutoCAD and Civil 3D software to prepare project plans. This document addresses CADD and Civil 3D guidelines and standards, and also compatibility issues between the two products.

These standards are intended to be neither static nor all-inclusive and thus will be updated and enhanced as appropriate. Suggestion for improvements are strongly encouraged so that subsequent updates to this manual will reflect both the input and needs of the CADD user.

Users Responsibilities

Adherence to the standards and procedures contained in this manual is essential in preserving a homogeneous character in drawings issued by your agency or firm, and in increasing the efficient use of project time and management. This uniformity allows information to be correctly keyed, added and displayed at any phase in the project.

Modifications of the standards and procedures in this manual may be necessary for specific situations. Submit the required temporary modifications in memo form to the CADD Manager. Do not make arbitrary changes without prior approval.

Submit requests for permanent changes in memo form to the CADD Manager, for review and possible inclusion in this manual. Requests for deviation shall document (1) why the current procedure or standard is inapplicable or ineffective; (2) what the proposed deviation or change should be; and (3) how it would improve the CADD standards or procedures and the overall productivity.

The most efficient use of AutoCAD is not necessarily in the initial creation of a file, but in the ability to reuse the file or any part of the file at a future date. The true meaning of CADD productivity is embodied in not having to do the old job again, rather than simply

doing the old job faster. As an example, the reuse and modification of "Prototype Drawings" can yield a very efficient use of project time and economics. On a broad scale this can be very productive; however, the reuse process must not end here. Each user must continually examine the reusability of any information in a current file. The massing of information in differing libraries will take time and effort on the part of the users and computer management staff; however, future dividends of this endeavor will be advantageous.

General Care

Extreme care should be taken in the overall maintenance of both computer hardware and software. In the case of software, a general cleanup will be needed if the user encounters a system "lock-up", "crash" or the display of a systems error. For this cleanup, the user should immediately notify the MIS. In the case of computer hardware, every effort should be made to keep the keyboard, monitor and CPU free from foreign substances that may be detrimental to the system. Eating or drinking over or near any computer equipment is not recommended. In addition, the general area around each workstation should be maintained in a neat and orderly manner.[ii]

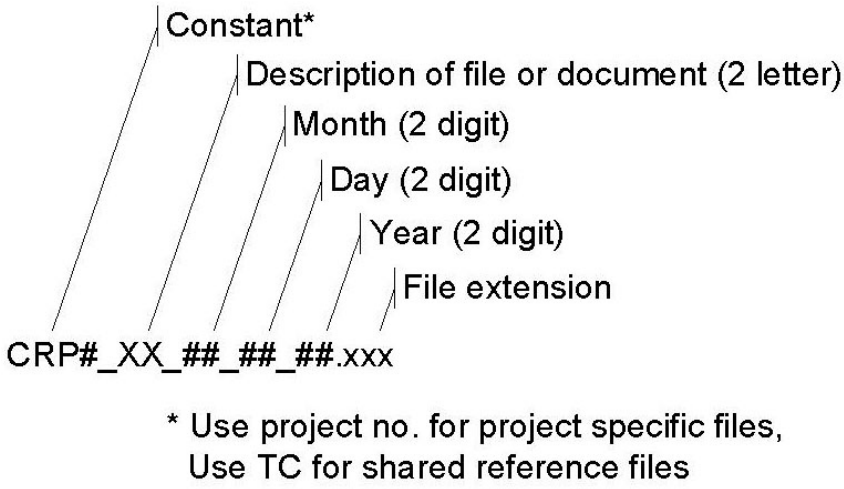
Reference Files & Project Files

Reference files are files that are commonly shared internally, with consultants, and outside agencies. Reference files may consist of prototype data files for Civil 3D, standard borders, project logos, standard border text, and background drawings. These files are to be used as provided without modification to name or contents. Only the person providing the master source of the Reference files should modify them.

Project files are created per project and are stored in the specific project folder on the network. Project files may consist of AutoCAD & Civil 3D files, sheet set files, PDF or DWF files, and design application files.

Version Control

Version control numbering is established for AutoCAD and Civil 3D reference files & project files, it is necessary for all working drawings or files. The standard naming for version control is as follows:

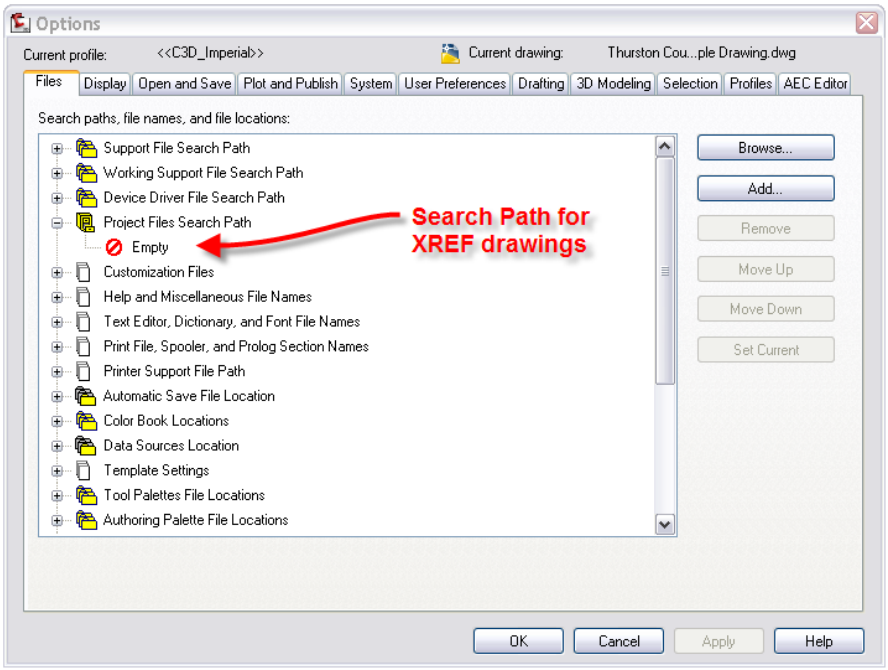


For example: **<CRP#>_XS_12_10_09.dwg** would be the project cross sections AutoCAD drawing created on December 10, 2009.

Description of files or documents will need to be updated as needed. See Appendix A for current descriptions.

Reference Files

Reference files should be maintained in a central area of your network and maintained by the CADD manager. Depending on the organizations preference, individual users can map Civil 3D and/or CAD to the network version of the files or copy files and place them in their appropriate local folder location.



Reference file locations are mapped using the Civil 3D Options → File Tab

The Options dialog box can be accessed by entering **OP** at the command line in Civil 3D, or by selecting **Options** in the Menu Browser.

CAD Guidelines

CAD guidelines and standards are a necessity to maintain drawing consistency and efficiency throughout an organization.

Basis of Guidelines

The guidelines have been developed referring to the Washington State Chapter of APWA standards [iii]. The APWA standards have been modified in order to suit Thurston County Design, Construction, and Survey business processes.

These standards have been developed for use by public works agencies, utility districts and consulting engineers working with Thurston County. Although they are primarily designed for use on computer-generated drawings, the symbols and linetypes should be used on manually drawn plans to maintain consistency.

AutoCAD Layers

Thurston County prototype drawing includes all layers that are normally used for survey topographical data, and design. Layer conventions are based on four-part layer names to allow the user to control layer display and status through the use of filters. Each part name describes a particular characteristic of the entities contained in that layer.

- The first part of the name is the discipline that the objects are associated with.
- The second part name describes the type of object to be drawn.
- The third part describes the state of the object; and
- The fourth part of the name represents the AutoCAD entity that is being used.

AutoCAD Lineweights

The following are valid lineweight values used for plots:

Lineweight (mm)	Lineweight (In.)
0.15	0.006
0.20	0.007
0.30	0.012
0.40	0.016
0.50	0.020
0.70	0.028
1.00	0.039

Plot Styles – Color or Style Dependency

In previous versions of AutoCAD, plotted line weights depended on the display color. In recent versions, display color now has nothing to do with plot characteristics if using Named Plot styles. A Named Plot style is an object property assigned to all object on either a by-layer or a by-object basis.

Types of Plot Style Tables

- Color Dependent Plot Style Table – CTB
- Named Style Table – STB

Thurston County drawings primarily use named plot styles (STB). If color dependent plot styles (CTB) are used, the equivalent color to name is listed. The following table lists the style name, and associated plot characteristics.

Note: This plot style table creates black and white plots with various lineweights and screening.

Thurston.stb(TC_PS_…stb)/Thurston.ctb(TC_PS…ctb)

Style Name (STB)	Equivalent Color (CTB)	Lineweight (mm)	Screening (%)
TEXT_BOLD	Red (1)	0.70	100
TEXT_MED_BOLD	Blue (5)	0.65	100
TEXT_LITE	Cyan (4)	0.30	100
TEXT_MED	Yellow (2)	0.50	100

TEXT_MED_LT	8	0.45	100
TEXT	Green (3)	0.40	100
DETAIL_BOLD	Red (1)	0.70	100
DETAIL_MED	Green (3)	0.40	100
DETAIL_MED_LT	Cyan (4)	0.30	100
DETAIL_LITE	Magenta (6)	0.15	100
DETAIL	Green (3)	0.40	100
PROPOSED	Yellow (2)	0.50	100
PROP_BOLD	Red (1)	0.70	100
EXISTING	255	0.30	80
CONTOURS	120	0.30	60
CONTOURS_IDX	124	0.50	80
DIMENSION	Green (3)	0.40	100
75%_SCREEN	250	0.40	75
50%_SCREEN	251	0.40	50
40%_SCREEN	252	0.40	40
30%_SCREEN	253	0.40	30
20%_SCREEN	254	0.40	20
GRIDLINES	131	0.05	100
OBJECT	na	Uses objects lineweight	100

AutoCAD Sheet Sets

You create a sheet set with the Create a Sheet Set wizard. In the wizard, you can either create a sheet set from scratch based on existing drawings or use an existing sheet set as a template. With either method, layouts from several drawing files are imported into the sheet set. The associations and information that define a sheet set are stored in a sheet set data (DST) file.

There are many benefits to using the Sheet Set Manager template including:

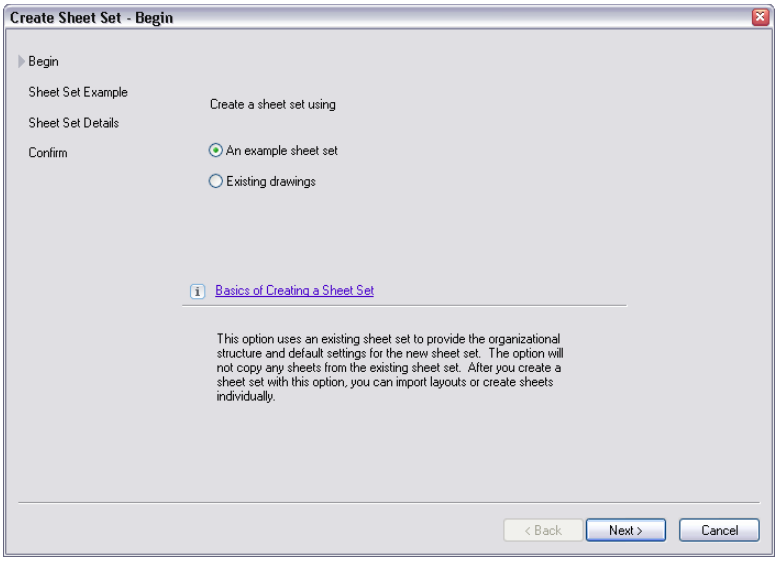
- Easy sheet data management
- Custom properties linked to dynamic fields that automatically get updated
- Detail and section referencing blocks containing dynamic fields that automatically get updated
- Updatable sheet index table
- Batch plotting
- Easily shared or stored using etransmit or archive commands.

Note: The sheet set data file should be stored in a network location that is accessible to all sheet set users on the network.

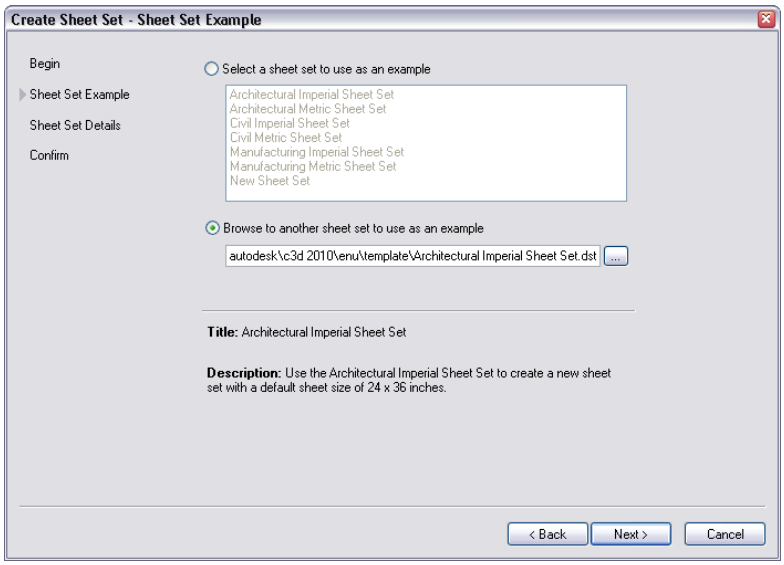
To create a sheet set, you should perform the following steps:

- Consolidate drawing files. It is recommended that you move the drawing files to be used in the sheet set into a small number of folders. This will simplify sheet set administration.
- Eliminate multiple layout tabs. It is recommended that each drawing you plan to use in the sheet set have only one layout to be used as a sheet in the sheet set. This is important for access to sheets by multiple users. Only one sheet in each drawing can be open at a time.
- Select *New Sheet Set* from the *File* pull down menu or the *Sheet Set Manager* palette to open the Create Sheet Set Wizard. The following outlines the Sheet Set Wizard dialog.

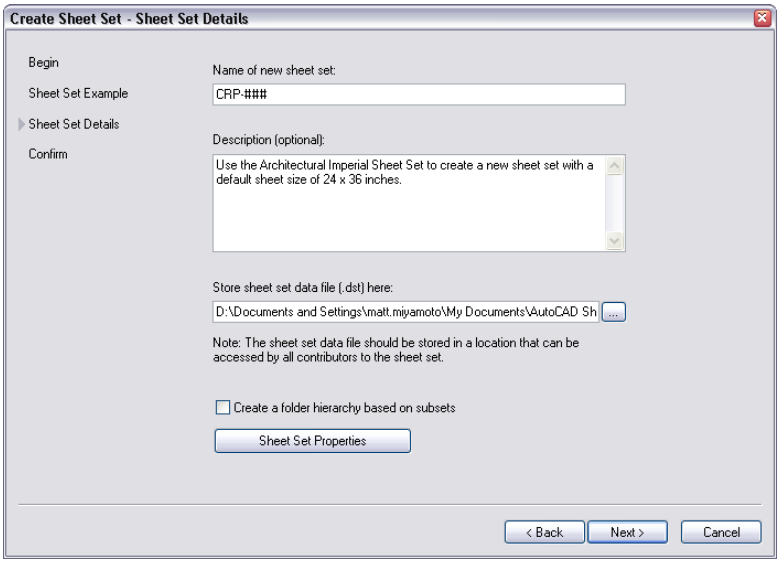
1. **Begin** - Select the *An Example Sheet Set* button and select *next*.



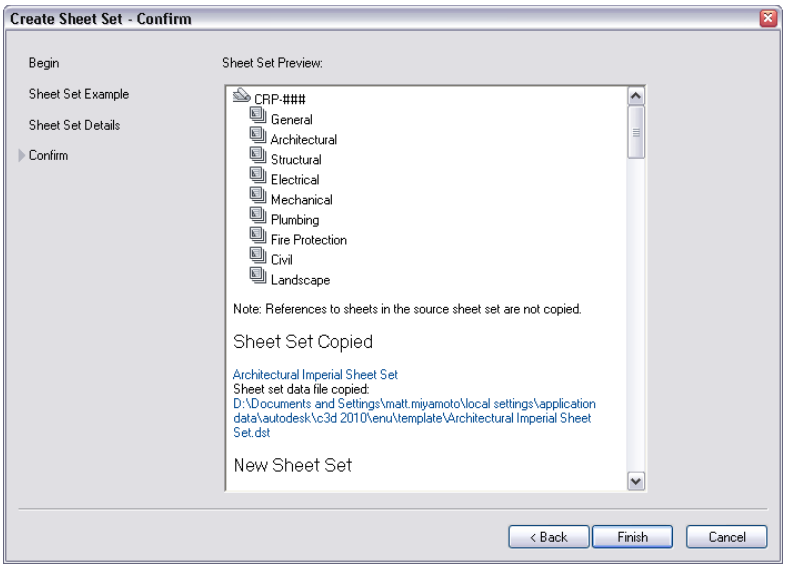
2. **Sheet Set Example** – Select **TC_Sheet_Set** from the example list or if not listed Select the *Browse to another sheet set to use as an example* button and browse to the Thurston Co. sheet set template located at **\DESIGN\Engineering\CAD_Files\Sheet_Sets\ TC_Sheet_Set.dst**



3. **Sheet Set Details** - Name the sheet set using the CRP No. and the project name. Enter a description if applicable. In the *Store sheet set data file (dst.) here:* box enter or browse to the CRP file for the project and find the **AutoCAD Sheet Set** folder. Select *Next*.



4. **Confirm** - Check the *Sheet Set Preview* for errors then select *Finish.*



You are now ready to import layouts or add new sheets into the Sheet Set Manager. By using the Sheet Set Template you are taking advantage of the custom properties which are linked to fields in the Thurston Co. title block. Right click the sheet set title under sheets in the Sheet Set Manager and select *properties*. Under **Sheet Set Custom Properties** type in the appropriate information into the cells provided, use a space to leave a blank cell. Select *OK*.

Note: Although it is possible to use several layouts from the same drawing file as separate sheets in a sheet set, it is not recommended because it makes concurrent access to each layout by multiple users impossible. This practice can also reduce your management options and can complicate the organization of your sheet sets.

When using Civil 3D's Create Sheets command, locating under General → Plan Production Tools → Create Sheets, you are allowed to add the automatically generated Plan & Profile sheets to an existing sheet set or create a new sheet set.

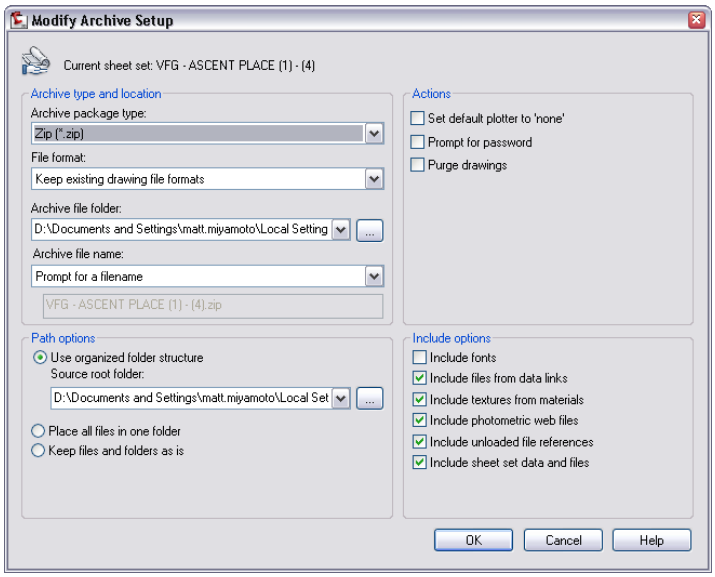
Archive and eTransmit

With a sheet set established for each project you can organize plan sets better for yourself and others. You should use the Archive and the eTransmit commands to assure that your data is complete when you transfer files to disk (Archive), or email transmittals (eTransmit). Project sheet sets should be archived as soon as possible after the project has gone to bid to preserve the functionality of the original documents. Projects should be archived to a single folder on the shared network and all linked files should be included. You may need to explode data linked objects like tables and text to prevent errors.

To create a PS&E archive, you should perform the following steps:

- Open the Sheet Set that you wish to archive and right click the Sheet Set title under Sheets in the Sheet Set Manager. Select *Archive*, the Archive a Sheet Set dialog is opened.
- Check to make sure all the sheets are included. You can also exclude any files that may not be needed by unchecking them in any of the tabs on the Archive a Sheet set dialog. Enter any notes that may be relevant to the archive set and select the *Files Tree* tab.
- Select the *Add File* button and add any relevant files to the archive set (engineer estimates, specification documents, etc.) these should show on the files tree as user added files.
- Select the *Modify Archive Setup* button. In the *Archive file folder* drop down list browse to the projects archive folder. Set the other parameters according to figure 4-b or any variation you may need. Select *OK*.

Figure 4-b



- Select *OK* on the Archive a Sheet Set dialog.

To create an email transmittal package you should follow the same steps outlined for the archive setup but instead select *eTransmit* on the sheet set right click menu then select a transmittal setup and make any modifications needed by selecting the *Transmittal Setups* button. For ease of use a standard transmittal setup has been created called **TC_Transmit_1** please do not modify this setup, use the Standard setup or create a new setup if needed. Save your zip file in a transmittal folder under the CRP folder.

Note: Keep in mind that you can also use these commands without a sheet set within a dwg file. When using a sheet set make sure the title of the sheet set is highlighted when you right click for use of the eTransmit command.

Plotting Sheet Sets

Entire sheet sets or individual sheets within a sheet set can be easily plotted in one step using the Publish command. There are several ways to publish a sheet set.

To publish a sheet set using the page set-ups for each individual drawing:

- Open the Sheet Set that you wish to publish and right click the Sheet Set title. Select *Publish> Publish to plotter*, AutoCAD plots all the sheets in the sheet set according to the specifications of each individual drawing's page set-up.

To publish a sheet set as a PDF:

- Open the Sheet Set that you wish to publish and right click the Sheet Set title. Select *Publish> Publish to PDF*. Drawings will be plotted in PDF format according to the specifications of each individual drawing's page setup.

To publish a sheet set as a DWF or DWFx:

- Open the Sheet Set that you wish to publish and right click the Sheet Set title. Select *Publish> Publish to DWF(x)*. Drawings will be plotted in DWF or DWFx format according to the specifications of each individual drawing's page setup.

To publish a sheet set with different Page Setups:

- Open the Sheet Set that you wish to publish and right click the Sheet Set title. Select *Publish> Manage Page Setup*

Chapter

2

Project Startup

This document outlines the Thurston County Design & Construction Project Startup Process for Setting the Default Template File path.

When beginning a new Civil 3D project, it is always best practice to start with your own organizations Civil 3D Drawing Template. Template files (.dwt) contain pre-determined layers, styles, and settings that streamline project creation process, and reduce time spent on creating these items from scratch.

Thurston County Public Works Department's Civil 3D Drawing Template is called **TC_PD_C3D.dwt** and is located in **O:\DESIGN\Engineering\CAD_Files\ACAD Defaults\Templates**

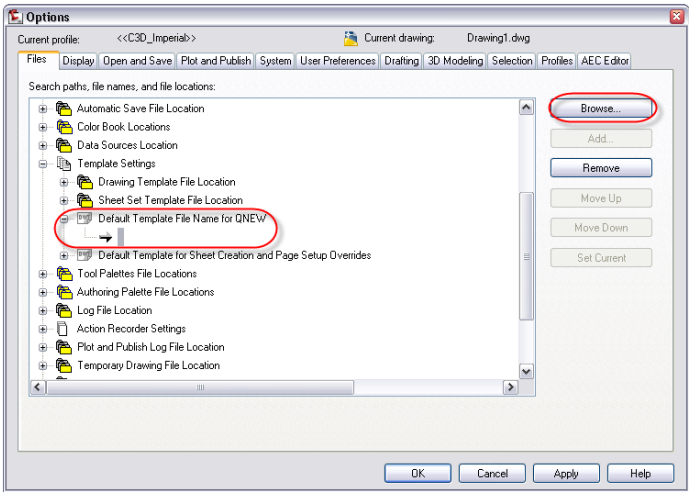
To save additional time, this template can be set as the default template for the QNEW command in Civil 3D which creates a new blank drawing file based on the specified Template.

Highlighted below are some features in the Thurston Co. Civil 3D design drawing template:

- Layers, layer filters and descriptions
- Object styles
- Text styles
- Label Styles
- Multileader styles
- Dimension styles
- Table styles
- Multiline styles
- Description Key Sets, Figure Prefix Databases & Linework Code Sets
- Point groups

Setting TC_PD_C3D.dwt File as the Default Template

1. Launch Civil 3D
2. With a blank drawing open, enter **OP** at the command line to launch the Options dialog
3. In the **FILES** tab of the Options dialog, expand (click on "+") **Template Settings**
4. Expand **Default Template File Name for QNEW**
5. Under Default Template File Name for QNEW, click **BROWSE** to select the TC_PD_C3D.dwt file



6. Browse to the location of the TC_PD_C3D.dwt file, select the file, then click **OPEN**
7. The path to the file should now appear below Default Template File Name for QNEW
8. Click **Apply**, then **OK**

The default template file for the QNEW command is now set to Thurston County's custom Civil 3D template. When creating new drawings, click on the QNEW button in the Quick Access Toolbar, or enter QNEW at the command line to create a new, blank drawing file containing all of Thurston County's styles and settings.

Chapter

3

Creating Project Drawing (.dwg) Files

This document outlines the Thurston County Design & Construction Drawing File creation process for New Project Drawing files

When beginning a project, there are three common scenarios that design teams typically encounter. The following Best Practices outline the recommended steps for:

1. Incorporating a Civil 3D drawing Based on the Custom TC Template
2. Incorporating a Civil 3D drawing that was created using a different template
3. Incorporating Non-AutoCAD drawings

Drawings Based on The Custom TC Template

In situations where a project is managed from start to finish within your organization, drawing files will most likely be created using your custom Civil 3D template. An example of this situation is where a surveyor has collected data and created a topographic survey drawing using the proper template file as the starting point, or where an existing drawing has already been created by another engineer at your organization. This is the most ideal situation, and requires little to no adjustments to the provided drawing file.

When provided with this type of file, simply open the drawing using Civil 3D, and you can begin work on the project. As a Best Practice, run the **–PURGE** and **AUDIT** commands to remove unnecessary files and fix possible errors when working on a drawing for the first time.

Incorporating Civil 3D Drawings Created using a Different Template

This is one of the most common situations encountered when working with a consultant or outside provider. In this case, you have a Civil 3D drawing file, however it was created using styles and settings that do not match your custom template. To resolve this issue, you can simply drag and drop styles from your custom template file into the provided drawing.

To incorporate your custom styles and settings into another drawing, open the provided file and your custom template side by side. In the window for your custom template, switch to the **SETTINGS** tab in the Toolspace, and drag your desired styles into the project drawing. If the provided drawing file contains styles with the same name, you will be prompted to overwrite or ignore the copied file. Once you have dragged and dropped the proper styles from your drawing template into the provided drawing file, they will appear in the Settings tab of the provided drawing and you will have access to them when working with Civil 3D objects.

Once again, the **–PURGE** and **AUDIT** commands should be run after the styles are copied to fix errors and purge unnecessary files.

Incorporating Non-AutoCAD or Non-Civil 3D Drawings

The third common scenario is when a non-AutoCAD or non-Civil 3D drawing or information is provided. In this case, you will be incorporating the provided data into an existing or new drawing created using your custom template.

Non-AutoCAD Drawings

When working with drawings created using other types of software, begin by starting a new drawing file based on your custom template. With the blank drawing open, use the **INSERT** command to insert the provided file into the blank drawing. The insert command will work with AutoCAD .dwg files, Eagle Point .dwg files, and .DXF files. If Microstation .dgn files or other software application files are provided, use **FILE →IMPORT →IMPORT FROM OTHER FORMATS**. The available file formats are: WMF, SAT, DGN, and 3DS.

Importing Design Data

The INSERT and IMPORT commands will work for importing linework and shapes into your new Civil 3D drawing. Additional object data from Eagle Point Projects and LandXML files can also be imported. When moving from Eagle Point to Civil 3D, rather than losing legacy project information, you can use LandXML Files to import design data from an Eagle Point project into Civil 3D. LandXML files can be generated from Eagle Point and imported into Civil 3D to transfer design information from one program to another.

For Land XML Files, use **FILE→IMPORT→ IMPORT LANDXML** (after the Land XML File has been created through Eagle Point). Select the Land XML file you wish to import, then click **OPEN**.

Triangulated Irregular Network (TIN) Lines

When working with previously created ground models, drawing files may be provided that contain a Triangulated Irregular Network (TIN) View of a surface. TIN lines are 3D line segments whose endpoint vertices connect two known point on a ground model. When TIN lines are provided in a drawing file, they should be added directly to a Surface's Definition collection as **Breaklines**.

If 3D Faces are provided, they should be added to the surface definition through the **Drawing Objects** item.

Points

If a point file is provided, those points can be imported directly into Civil 3D to create Point Objects using the **Points → Import/Export Points → Import Points** command. Civil 3D will read the point file, and use the information to automatically create points in the drawing. New points will be added to the **All Points** point group, and can be further organized once created.

As with the previous methods, it is recommended that the **–PURGE** and **AUDIT** commands are run on the file after inserting and importing files.

Chapter

4

Creating Topographic Survey Drawings

This document outlines the Thurston County Design & Construction Process for Creating New Topographic Survey Drawings

Surveyors are typically the first designers to work on project drawings. They are responsible for adding and creating the objects and information for the existing features on a project site. Surveyors are also responsible for creating the Existing Ground model which the Civil Design Engineer will use as the basis of their design.

Starting a New Drawing

Surveyors and Survey drafters should begin to create topographic drawings in Civil 3D by starting a blank file using the TC_PD_C3D.dwt file.

Begin by launching Civil 3D 2010. If the TC_PD_C3D.dwt file is set as the Default Template File for QNEW, the blank drawing that appears will be based on the custom template. If it is not set as the default, use **FILE → NEW** to open the Select Template dialog, and select the TC_PD_C3D.dwt file.

To set the TC_PD_C3D.dwt file as the default, refer to **Setting TC_PD_C3D.dwt File As the Default Template** in the **Project Startup** file.

The drawing file created from the TC_PD_C3D.dwt file contains the proper Point Styles, Point Label Styles, and Description Key Set for importing Survey information.

Surface Modeling Process

As a Best Practice, there are four steps to creating a Civil 3D surface model. Following these steps will help reduce errors that may be encountered in the modeling process.

1. Assemble Data

   In this step, surveyors should organize and assemble the different types of data they have for the project. Organizing and assembling data will help streamline the process of adding data to a surface definition. Points, Point Groups, and Contours should be created, imported and organized.

2. Add Data to the Surface Definition

   Once your data has been assembled, assign data to your surfaces Definition collection by right-clicking on the proper heading and selecting Add…

3. Evaluate your Surface

   Once data has been added to a surface's Definition, a Civil 3D Surface object is automatically generated. As a Best Practice, users should evaluate the surface by inspecting triangulation, and using 3D Views or Object Viewer to check for erroneous points and spot elevations that may exist.

4. Add More Data, Modify Data, Apply Surface Edits

   After evaluating the surface model, fix any errors or make adjustments by adding more data (Breaklines & Boundaries), modifying the data (Add/Delete lines and points), and apply surface edits (Raise/Lower Surface for datum adjustment, Simplify Surface for Point Removal and Edge Contraction)

Saving Your Drawing

Save this drawing as: <CRP#_SV_MM_DD_YY.dwg>

For more information pertaining to standard file naming conventions, refer to **Chapter 1 - CADD & Civil 3D User Guidelines.**

Chapter

5

Creating the Existing Ground Surface

This document outlines the Thurston County Design & Construction Process for Creating the Existing Ground Surface Model

Once points and other survey information have been added and organized in the drawing file, the next step for the Surveyor is to create the Existing Ground Surface Model. The surface model is generated based on different types of data that is added to its Definition collection.

The following steps outline the Best Practices for creating and adding data to a Civil 3D Exiting Ground Surface model.

Creating the Existing Ground Surface

1. In the Prospector tab of the Toolspace, right-click **SURFACES** and select **CREATE SURFACE**
2. In the Create Surface dialog box, enter a name (i.e. Existing Ground). The Style **E – Contours 2' and 10'** is set as default by the template file. Accept the default setting for Render Material and click OK
3. A "+" sign now appears next the Surfaces collection in the Prospector tab, notifying you that a Surface has been created in the drawing.

Adding Data to the Surface Definition

1. In the Prospector tab, expand (click on "+") the Surfaces collection. The surface you created (Existing Ground) should appear below.
2. Expand Existing Ground, then expand the Definition collection.
3. To add data to the Surface definition, **right-click** on the proper heading (i.e. Point Groups, Point Files, Contours) and select **Add…**

Best Practices for Adding Data to a Surface Definition

When adding data to a Surface's definition collection, it is always best to add them in the order that promotes proper modeling. It is recommended that Data should be added as follows:

1. Point Groups & Point Files
2. Contours
3. Breaklines
4. Drawing Objects & DEM Files
5. Edits
6. Boundaries *

NOTE: Not all types of data are included for every surface. Typical surfaces are created using Point Groups or Point Files, Contours, Breaklines and Boundaries. The recommended order reflects a situation where all types of data have been provided.

*In the case of Boundaries, Civil 3D now includes a new Data Clip Boundary type that should be added BEFORE all other data (prior to Point Groups & Point Files).

Creating the Existing Ground Data Shortcut

Once the Existing Ground surface has been created in the Topo drawing, a Data Shortcut should be created to allow designers to access the Surface data without being able to make adjustments to the surface.

For instructions on creating a Data Shortcut to the Existing Ground surface, refer to the *Creating the Data Shortcut* section of **Chapter 10 - Data Shortcuts Workflow**.

Chapter

6

Creating Civil Design Drawings

This document outlines the Thurston County Design & Construction Process for creating New Civil Design project drawings.

With the topographic survey drawing, and Existing Ground model, design engineers can begin working on their design. The first step to generating a Civil Design drawing is to create a new drawing file, and create a data reference to add the Existing Ground surface information to the drawing.

Starting a New Drawing

Designers should begin with a new Civil 3D drawing that was created using the TC_PD_C3D.dwt file.

Begin by launching Civil 3D. If the TC_PD_C3D.dwt file is set as the Default Template File for QNEW, the blank drawing that appears will be based on the custom template. If it is not set as the default, use **FILE → NEW** to open the Select Template dialog, and select the TC_PD_C3D.dwt file.

To set the TC_PD_C3D.dwt file as the default, refer to **Setting TC_PD_C3D.dwt File As the Default Template** in the Chapter 2 - Project Startup file.

The drawing file created from the TC_PD_C3D.dwt file contains the proper Styles and Settings for streamlining the creation of Roadway Alignments, Profiles, and Cross Sections.

Save this drawing as: CRP#_CD_MM_DD_YY.dwg>

For more information pertaining to standard file naming conventions, refer to Chapter 1 - CAD & Civil 3D User Guidelines.

Creating the Existing Ground Surface Reference

When working in large scale projects, Data Shortcuts can be incorporated to reduce file size and improve organization of drawing objects. Provided that a topographic survey drawing and Existing Ground model have been generated for the project by your surveyor, a Data Reference to the surface must be created to provide access to the surface data.

For instructions on Creating Data Shortcut References, refer to Chapter 10 - Data Shortcuts Workflow. The new drawing you created using the TPCW-Custom.dwt file in the section above is referred to as the Consumer Drawing in the document.

NOTE: For smaller scale projects, Data Shortcuts may not be necessary.

Existing Ground Surface

The Existing Ground surface will appear in the Prospector tab of the Toolspace under the Surfaces collection once the Data Reference has been created. A small symbol will appear next to the Surface name identifying it as a Data Shortcut object. The Definition collection will also be missing from the Surface because it is defined in the Source drawing. Any changes to the surface will need to be done in the Source drawing.

If the original Data Shortcut object is modified in its Source drawing, the consumer drawing will notify its user that the reference is out of date and needs to be Synchronized once the changes have been saved. Synchronizing the drawing will apply all changes to the referenced object in the consumer drawing.

Chapter

7

Road Design

This document outlines the Thurston County Design & Construction Process for creating Road Design files, including Alignments, Profiles, and Profile Views.

After the Civil Design drawing has been saved, and a Data Reference to the Existing Ground surface has been created, designers can begin the task of Roadway Design.

Civil 3D roads consist of an Alignment, Profile, and Assembly. The alignment and profile represent the horizontal and vertical layout of the road's path, and the assembly is a representation of the road's typical cross section. When put together, the alignment, profile, and assembly create a 3D representation of the roadway called a Corridor. These objects can all be used to generate Plan & Profile Views, as well as Cross Section Views.

Alignments

Alignments represent he horizontal geometry of a defined path. In terms of roadway alignments, there are two common tools used for creating alignments in Civil 3D. **Create Alignment from Polyline**, and **Create Alignment by Layout.**

Alignment Styles

The appearance of an alignment in the drawing is controlled by the alignments Object Style. The TCPW-Custom.stb file contains the default **TC – Road Centerline** style that is automatically assigned to alignments created using both commands.

Alignment Label Sets

Alignment labels, which include stationing and geometry points are applied to the alignment automatically as it is created. The labels that appear are determined by the Alignment Label Set. The TC_PD_C3D.dwt file includes the default **TC-Roadway Major Station & Geometry Points** Label Set, which automatically adds labels at 100-foot station increments and horizontal geometry points.

Create Alignments from Polyline (Ribbon Interface: Create Alignment from Objects)

The Create Alignments form Objects command is located in the pull-down menus under **Alignment →Create Alignment from Polyline.**

Although the pull-down command refers to a polyline, in Civil 3D, designers are also allowed to select lines, arcs, and XREF objects to create alignments. These objects must share common vertices in order to create a continuous alignment. Any gaps between segments should be resolved before starting the command.

Create Alignment by Layout (Ribbon Interface: Alignment Creation Tools)

The Create Alignments form Objects command is located in the pull-down menus under **Alignment →Create Alignment by Layout.**

Activating the Create Alignment by Layout command will launch the **Create Alignment – Layout** dialog box where you will be prompted to enter an alignment Name, Site, and Design Criteria. By default, the **TC-Road Centerline** object style, and **TC-Roadway Major Stations & Geometry Points** label set will be assigned when using this command.

Once you have specified the information in the dialog box, the Alignment Layout Toolbar will appear on screen for your use in creating a new roadway alignment.

Profiles

Profiles represent the vertical geometry of the roadway. Typical road designs include two profiles; one representing the elevations along the Existing Ground Surface, and the other representing the proposed road's vertical geometry.

Civil 3D includes two commands for creating these profiles. Create Profile from Surface, and Create Profile by Layout.

Create Profile from Surface

The Create Profile from Surface command is found under **Profiles →Create Profile from Surface** in the Profile pull-down menu.

Activating the Create Profile from Surface command launches the Create Profile from Surface dialog box. In the dialog box, you will specify the Alignment, and Surface that you wish to sample for the creation of the surface profile. Once the proper alignment has been selected and surface has

been added, the name will appear in the Profiles List. The default style **E-Ground Profile** is automatically assigned by the template for the profile display, and the **No Labels** label set is also applied.

Create Profile Views (Existing Ground Profiles)

Once a profile has been created, a Profile View can be generated to graphically display the Profile Information. When using the Create Profile from Surface command, the option to Draw in Profile View appears in the Create Profile from Surface Dialog box. Selecting Draw in Profile View launches the Create Profile View dialog box, which allows you to select the alignment and enter a Profile View Name. The Profile View Style is set to **TC-Profile View** by the template file. You are also allowed to specify a Station Range, and Profile View Height. The profile styles and band set have are also set by the template file.

Create Profile by Layout

With an existing ground profile and profile view created, you can create your Finished Grade profile using the Profile Layout Tools. Access the tools by selecting **Profiles →Create Profile by Layout** from the **Profiles** pull-down menu, and selecting the Profile View (by left-clicking on the grid). The **Create Profile – Draw New** dialog box appears, and is where you can provide a Name, and specify Design Criteria. The Profile Style and Label Sets are set by the template.

Adjusting Band Data

When a Profile View is created using the Draw in Profile View option, the Band information only displays Existing Ground elevations because the Finished Grade Profile does not yet exist. After using the Profile Layout Tools, the Band information can be reset to show both Existing and Finished Grade elevations.

To add the Finished Grade Elevations, select the Profile View (left-click on the grid), and select **Profile View Properties.** In the Profile View Properties dialog box, switch to the **Bands** tab. In the List of Bands box, scroll to the right until you are able to see the Profile1 and Profile2 columns. By default Civil 3D assigns the Existing Ground Profile as Profile 1. **Left-click** in the cell below the **Profile2** heading to select the Finished Grade Profile you created using the Profile Layout Tools. Once the profile has been selected, click **Apply** and **OK** to exit and update the Bands.

Creating Data Shortcuts to the Alignment and Profile

In order to reduce file size for larger scale projects, Data Shortcuts can once again be incorporated. Alignments and Profiles can be shared through the use of Data Shortcuts by following the same process involved in creating Data Shortcuts for the Existing Ground surface.

Profiles are associated and grouped under the Alignments collection in Civil 3D, so selecting a Profile from the list of objects will automatically select its parent alignment. Selecting only the alignment will allow you to share alignment information without sharing profile information.

For instructions on creating Data Shortcuts, refer to **Chapter 10 - Data Shortcuts Workflow**.

NOTE: Profile Views are NOT shared through Data Shortcuts. Only the data and information used in creating the profile views are shared. If you wish to see your shared profile in a Profile View in the new consumer drawing, you must re-create the Profile View using the **Profiles → Create Profile View** command under the Profiles pull-down menu.

Chapter

8

Cross Sections & Cross Section Views

This document outlines the Thurston County Design & Construction Process for Creating Sample Lines, Computing Earthwork and Material Volumes, Generating Volume Tables, Creating Cross Sections & Cross Section Views.

Generating Cross Sections and Cross section views can be done once the alignment, profile, and corridor model have been created in Civil 3D. Roadway cross sections in Civil 3D are generated along Sample Line Groups, which are used to determine the station and swath width for each of the sections.

After the Alignment and Profile have been defined, an Assembly must be created and applied in order to produce a corridor model. You can have any number of assemblies in your drawing file, each representing a typical roadway cross section. Typical assemblies can be created ahead of time and saved into your Toolpalettes to save drafting time on future projects.

Once a corridor model exists in the drawing, follow the steps below to generate a Sample Line Group and generate Cross Section Views.

Starting a New Drawing

Designers should begin with a new Civil 3D drawing that was created using the TC_PD_C3D.dwt file.

Begin by launching Civil 3D. If the TC_PD_C3D.dwt file is set as the Default Template File for QNEW, the blank drawing that appears will be based on the custom template. If it is not set as the default, use **FILE → NEW** to open the Select Template dialog, and select the TC_PD_C3D.dwt file.

To set the TC_PD_C3D.dwt file as the default, refer to **Setting TC_PD_C3D.dwt File As the Default Template** in the **Chapter 2 - Project Startup** file.

The drawing file created from the TC_PD_C3D.dwt file contains the proper Styles and Settings for streamlining the creation of Roadway Alignments, Profiles, and Cross Sections.

Save this drawing as: CRP#_XS_MM_DD_YY.dwg>

For more information pertaining to standard file naming conventions, refer to **Chapter 1 - CADD & Civil 3D User Guidelines**.

Creating the Existing Ground Surface, Alignment & Profile References

When working in large scale projects, Data Shortcuts can be incorporated to reduce file size and improve organization of drawing objects. Provided that the Data Shortcuts have been created for the Existing Ground surface, Alignments, and Profiles in your project, data references can be created to incorporate the information into your Cross Section drawing.

For instructions on Creating Data Shortcut References, refer to the *Creating the Data Shortcut* section of **Chapter 10 - Data Shortcuts Workflow**. The new drawing you created using the TPCW-Custom.dwt file in the section above is referred to as the Consumer Drawing in the document.

NOTE: For smaller scale projects involving a shorter or smaller numbers of alignments and profiles, Data Shortcuts may not be necessary.

Sample Lines & Sample Line Groups

Sample Lines are graphical representations for the location of each roadway cross section. Sample Lines are assigned to Stations along an alignment, and have a user defined swath width to determine the distance from the centerline that the section is sampled.

Creating Sample Lines & Sample Line Groups

Begin the process of creating sample lines and a sample line group by selecting **Sections → Create Sample Lines** from the Sections pull-down menu.

When prompted, select the alignment on which you wish to create sample lines. In the **Create Sample Line Group** dialog box, specify a **Name** (by default the Sample Line Group will have the name of its parent alignment followed by a number). The styles of the Sample Lines and Labels are pre-set by the drawing template.

In the **Select Data Sources to Sample** window, select all sources you want to include in your cross section. Typically this includes the Existing Ground, Corridor, and Datum surface generated from the corridor model. Assign the proper styles for each object in the Style column of the Select Data Sources to Sample window.

After clicking **OK**, the Sample Line Toolbar will appear. Use the available tools to generate sample lines along your alignment. **Options include:**

By Range of Stations – Allows the user to specify a station range and interval along the station range to automatically generate a series of sample lines.

At a Station – The default setting for creating a sample line, this option allows the user to specify a single station for creation of a single sample line.

From Corridor Stations – Allows the user to use the existing corridor frequency as the locations for sample lines.

Pick Points on Screen – Allows the user to define points along the path of a sample line.

Select Existing Polylines – Allows the user to select an existing polyline in the drawing and use that to create a sample line.

There is no correct value or location for generating sample lines. In general, it is best practice to increase the frequency of sample lines along curved portions of the road to produce a better overall representation of the roadway. The default values have been set to sample at 50-foot increments along straight segments and 25-foot segments along curves. In areas with small curve radiuses, this value may be reduced.

When the sample line creation process is complete, sample lines at the specified stations or along the station range will appear in the drawing. These lines are set to a non-plotting layer, and should not appear on plan sheets.

Computing Earthwork & Material Volumes

After a Sample Line Group has been generated for an alignment, Earthwork and Material Volume computations can be done. Once calculations are complete, the information can be added to drawing files quickly using the Add Tables option within the Sections pull-down menu.

To Compute Materials, select **Sections → Compute Materials.** The Select a Sample Line Group dialog will appear, where you must **select** an **Alignment** and **Sample Line Group** to compute materials from. The alignment and sample line group must be created prior to starting the Compute Materials command. After selecting the appropriate alignment and sample line group, click **OK**.

The Compute Materials dialog box will appear. Specify the **Quantity Takeoff Criteria** from the drop down list at the top left, then set the appropriate objects under the **Object Name** column of the dialog box. For **Earthworks** and **Cut & Fill** volumes, you must set the appropriate Existing Ground surface and Datum surface for computation. For roadway **Materials**, you must specify the corridor shape that corresponds to the **Material Name** (Pavement, Base, Subbase, etc.) shown on the list.

When computing earthwork and cut & fill quantities, be sure to use the Datum surface generated from the corridor model. The Datum surface represents the bottom most geometry of a road

model. This surface type excludes the areas that will be replaced with future pavement, base, and sub-base materials.

Adding Volume Tables & Reports

After the Compute Materials command has been completed, the information is now available within Civil 3D to generate an Earthwork or Material Volume Table. To add a table, select **Sections → Total Volume** or **Sections → Material Volume** accordingly.

In the Volume Table dialog box, select the appropriate Table Style and verify the alignment and sample line group name. Under the Split Table section, you are allowed to specify the number of rows per table, and number of tables per stack. By default it is set to 20 rows and three (3) stacks. The offset distance (space between tables), tile pattern and behavior are also set here.

For dynamic tables, be sure to select the **Dynamic** option under the **Behavior → Relativity Mode:** option. Dynamic tables will remain linked to their alignments and sample line groups, and will automatically update when changes are made.

To generate a Volume Report, select **Sections → Generate Volume Report…** In the **Report Quantities** dialog box, select the Alignment, Sample Line Group, and Material List. Under the **Select a Style Sheet** option, select the proper .XSL file for the material type. Verify that the **Display XML Report** option is un-checked, then click **OK**.

A Volume Report will be generated and can be saved as an external file as needed.

Create Section View / Create Multiple Section Views

After generating a Sample Line Group, the information within the group can be used to create Cross Section Views. The horizontal and vertical scales of the cross section views are determined by the drawings scale shown in the status bar on the bottom right of the screen. The template has been set to automatically calculate vertical scale at 2x the horizontal scale (i.e. 1:10 H → 1:5 V).

Once the scale has been properly set, there are two options for creating Cross Section Views.

Create Section View – Creates a single section view from a sample line that the user selects. For this option, the plot style is defaulted to plot all.

Create Multiple Section Views – Creates multiple section views from a Sample Line group along the entire station range, or user specified station range. The Section View Style and Group Plot Style are set by the template file to plot by page.

Chapter

9

Creating View Frames & Generating Sheet Sets

This document outlines the Thurston County Design & Construction Process for Creating View Frames and Generating Sheets using the Civil 3D Plan Production Tools.

With an Alignment and Profile in the drawing, the Civil 3D can automatically generate View Frames & View Frame Groups to display the portions of the alignment that will fit on each scaled sheet. View Frames are generated based on user defined constraints for Layout and Scale.

By Default, a 1:40 Scale, ANSI D 22x34 sheet has been set up for creation of View Frames.

Creating View Frames & View Frame Groups (Ribbon Interface: Annotate Tab →Create View Frames)

Activate the Create View Frames dialog box by entering **CREATEVIEWFRAMES** at the command line.

On Page 1 of the Create View Frames dialog, select the proper Alignment and Station Range you wish to generate View Frames for.

On Page 2, Select the Plan and Profile option as the type of sheet you want to generate, then click the Ellipsis (…) button under the Sheet Settings section and select the TC **34x22 Plan & Profile.dwt** file.

In the View Frame Placement section, select the orientation of the View Frames. The two included options are:

Along the Alignment – rotates the View Frames orientation to follow the path of the parent alignment.

Rotate to North – View Frames will be automatically set to always display North at 90 degrees.

The option to show a buffer area at the beginning of the alignment is also on Page 2. The template has been set to include a 50' buffer before the start of the alignment.

NOTE: The TC 34x22 Plan & Profile.dwt file must be saved to a common location on the server, or placed in the Plan Production subfolder of each user's workstation. Once the file has been mapped, its location should be saved to the template file.

A View Frame Group is automatically created for the View Frames, and is named:

VFG - <Alignment Name> - ##

If you wish to specify a different name, the option is available under the View Frame Group section on Page 3.

Match lines have been set to snap to a 25-foot increment by default. If you wish to change the increment, the option is available under the Positioning section of Page 4.

Accept the defaults on Page 5 for Profile View and Band Set styles, then click **Create View Frames**

After View Frames have been generated, they will appear as Cyan rectangles in the drawing. They are set to a No Plot layer, and are not intended to appear on plan sheets.

Creating Sheets & Sheet Sets (Ribbon Interface: Create Sheets)

With View Frames now in the drawing, Sheets can be generated. Activate the create sheets command by entering **CREATESHEETS** at the command line.

The Create Sheets dialog will appear, with options for sheet creation.

Page 1 of the dialog allows you to select the View Frame Group for use in generating sheets. When multiple alignments and View Frame Groups exist in the drawing, they will appear in the drop down list under the View Frame Group Section. In this section, you may also specify whether to generate sheets for all frames within the group or for selected frames.

In the Layout Create section, the option for generating sheets in a **New Drawing** or **Current Drawing** are available. If selecting New Drawings, you may also specify to create one layout (sheet) per drawing or all layouts in the same drawing. Names for the new layouts are also specified here. By default each new layout is named: Sheet - ##

Page 2 of the dialog allows users to specify a New Sheet Set or Existing Sheet set to add the created sheets to. When creating a new sheet set, the default name will be: VFG - <Alignment Name> - ##

Accept the defaults on Pages 3 and 4 of the dialog, then click **Create Sheets**.

You will be prompted to save your file and pick a reference point for your profiles in the existing drawing (pick a point off to the side similar to how you would normally generate a profile view).

Once the drawing has been saved and reference spot has been selected, Civil 3D will automatically create sheets based on the specified View Frame Group and add them to a Sheet Set.

When the process is complete, new layouts will exist in the current drawing or new drawing files will be created (based on your selection on Page 2 of the dialog).

NOTE: Annotations are not automatically generated when creating sheets. Only a layout containing border and viewports displaying Plan and Profile views are generated. Adjustments and additions to the viewports and layouts may be required before construction documents are printed.

Chapter

10

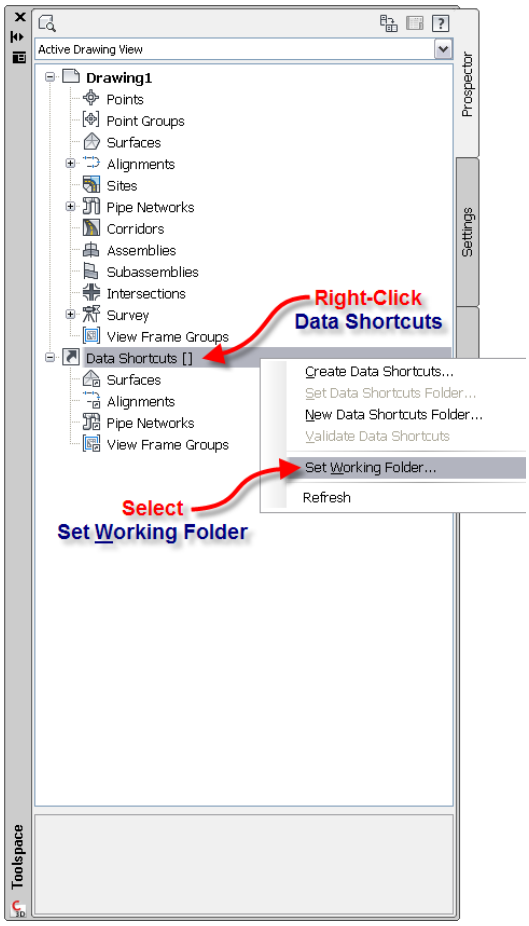
Data Shortcuts Workflow

The following steps outline the process for creating Data Shortcuts to Civil 3D objects contained within a .DWG file. The term Source drawing refers to the .DWG file where the original Civil 3D object exists, and Consumer drawing refers to the .DWG file where the reference will be created. Prior to beginning these steps, the objects (Surfaces, Alignments, Pipe Networks, View Frame Groups) must already exist in the Source drawing and the Source drawing must be Saved.

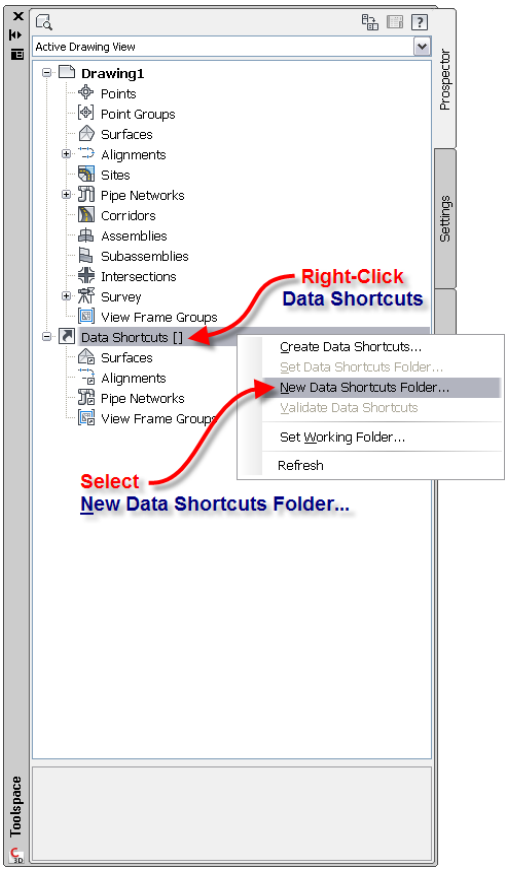
Creating the Data Shortcut

1. In the Source drawing, right-click on the **Data Shortcuts** collection in the **Toolspace** → **Prospector** tab and select **Set Working Folder**

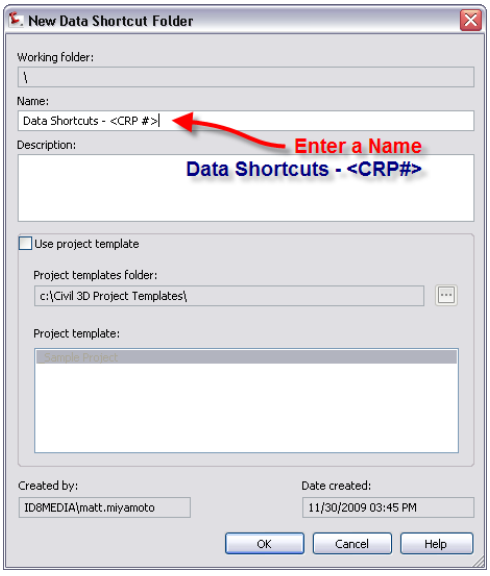
2. In the **Browse For Folder** window, browse to and select the appropriate project folder on your server **(O:\DESIGN\Engineering\Data_Shortcuts)** then click **OK**.



3. Right-click on the **Data Shortcuts** collection again in the **Toolspace** → **Prospector** tab and select **New Data Shortcut Folder**.

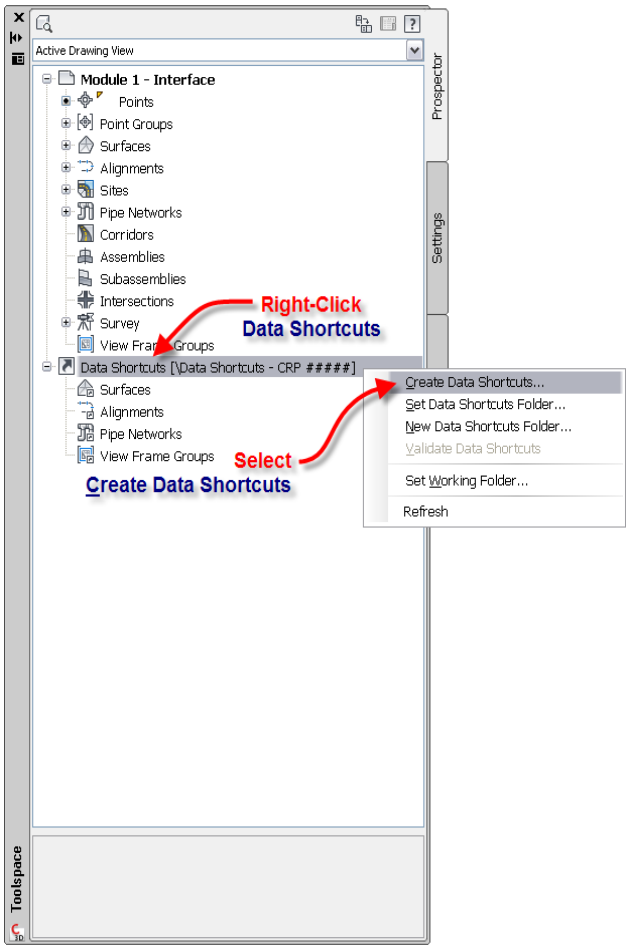


4. In the **New Data Shortcut Folder** window, specify a name for the folder (i.e. **Data Shortcuts - <CRP#>**), then click **OK.**

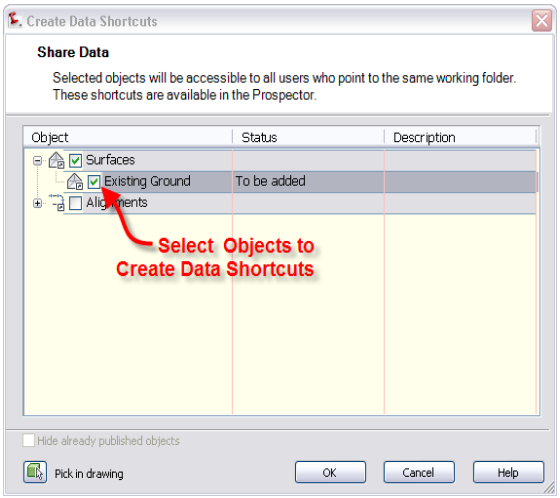


- If a Data Shortcuts folder already exists for your project, select **Set Data Shortcuts Folder** instead of New Data Shortcuts Folder in Step 3 and browse to the existing Data Shortcuts folder under your CRP number.

5. Right-click on the **Data Shortcuts** collection again in the **Toolspace → Prospector** tab and select **Create Data Shortcuts.** In the **New Data Shortcut Folder** window, specify a name for the folder (i.e. **Data Shortcuts - <CRP#>**), then click **OK.**



6. In the **Create Data Shortcuts** window, select the Civil 3D objects (surfaces, alignments, pipe networks, view frame groups) you wish to create data shortcuts for from the list that appears and click **OK.**



7. **Save** the Source drawing, and close as needed.

Creating the Data Shortcut Reference

1. **Open** or **Create** the Consumer drawing to receive the shortcut data. When creating a new Consumer drawing, use the **Save As** command to save the file before creating a data reference.

2. In the Consumer drawing, right-click on the **Data Shortcuts** collection in the **Toolspace → Prospector** tab and select **Set Working Folder**

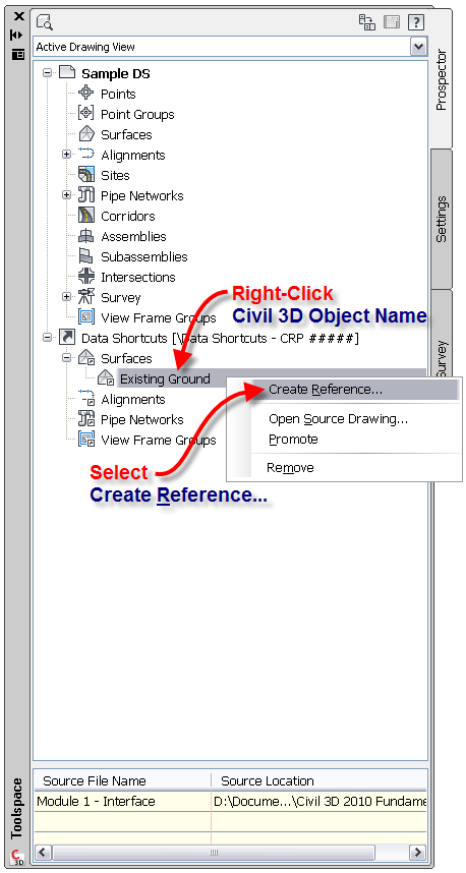
3. In the **Browse For Folder** window, browse to and select the appropriate project folder on your server **(O:\DESIGN\Engineering\Data_Shortcuts)** then click **OK**.

4. Right-click on the **Data Shortcuts** collection again in the **Toolspace → Prospector** tab and select **Set Data Shortcut Folder**.

5. Browse to and Select the **Data Shortcuts - <CRP#>** folder.

6. **Expand** (click on "+") the relative Data Shortcut object collections (**Toolspace → Prospector tab → Data Shortcuts → <Object>**).

7. Right-click the item to be referenced and select **Create Reference…** You will be prompted to select the styles and other settings required to display the object in the Consumer drawing.



8. Repeat for all objects as needed. Objects will appear in the Prospector tab collections once the references are created.

9. **Save** the Consumer drawing.

   *Steps 1 through 5 can also be accessed via the Ribbon Interface → Manage Tab → Data Shortcuts Panel

Chapter

11

Survey Database Workflow

The survey department should be responsible for setting up a survey database for each project,

The folder "Database" will be added to the CRP project folder template under the "Survey" folder for use in all new projects

Survey shall use a Survey Database for all survey related processes in Civil 3D including importing points and linework; this gives the user more control over the data and more functionality within the program. A survey database is also the only way to bring in linework automatically using ASCII files.

Survey user settings will need to be set for each individual machine that will be used to edit survey data, settings will need to be changed to access certain files including the figure prefix database (line work definition file) and the linework code set (for reading ASCII point files). The description key set (point definition file) is set automatically in the Thurston Co. standard Civil 3d template and it can be dragged and dropped into older files.

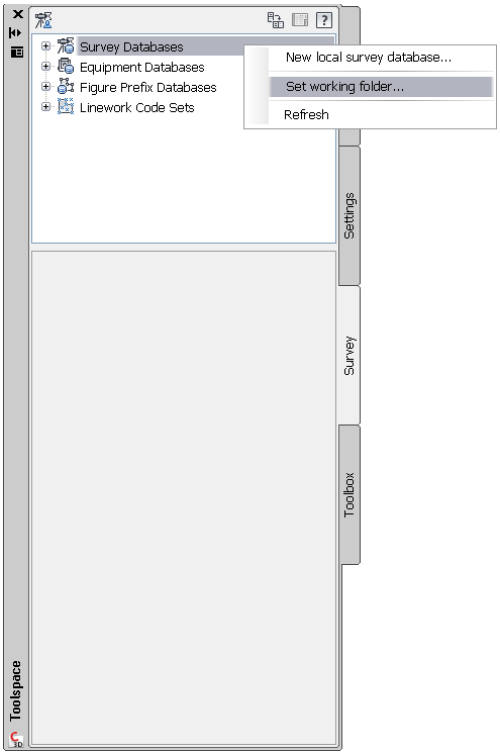
One of the only changes to be made with the process of collecting shots in the field will be changing the linework descriptors to match the codes defined in the linework code set, the new codes used will need to be implemented by survey and used for all new projects.

Creating a Survey Database

The following steps outline the process for creating a Survey Database using the Civil 3D Toolspace Survey tab. Survey Databases are a way for Surveyors to organize and store survey information in an external source. Setting up and creating a Survey database is one way for surveyors to back up their original topographic data collected in the field.

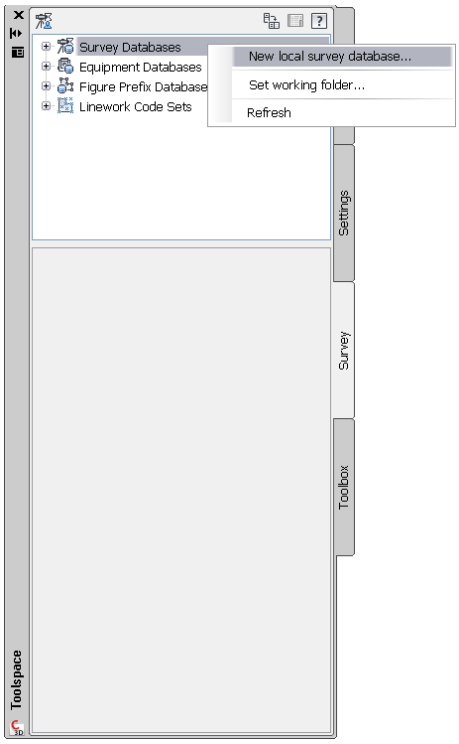
New Survey Database

1. In the drawing file, switch to the **Survey tab** of the Toolspace. **Right-click** on the Survey Databases collection and select **Set the Working Folder…**

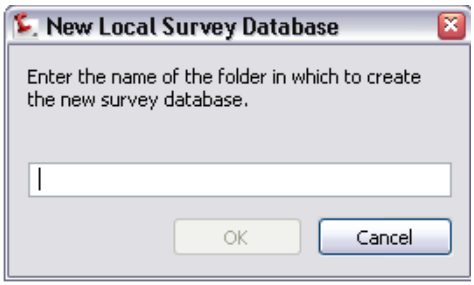


In the **Browse for Folder** window, browse to the location of your CRP Project folder (**O:\DESIGN\County Road Projects\<CRP#>\Survey\Database)** then click **OK**

2. Right-click on Survey Databases again, and select **New Local Survey Database…**



3. Enter a Name for the New Local Survey Database, then click **OK**

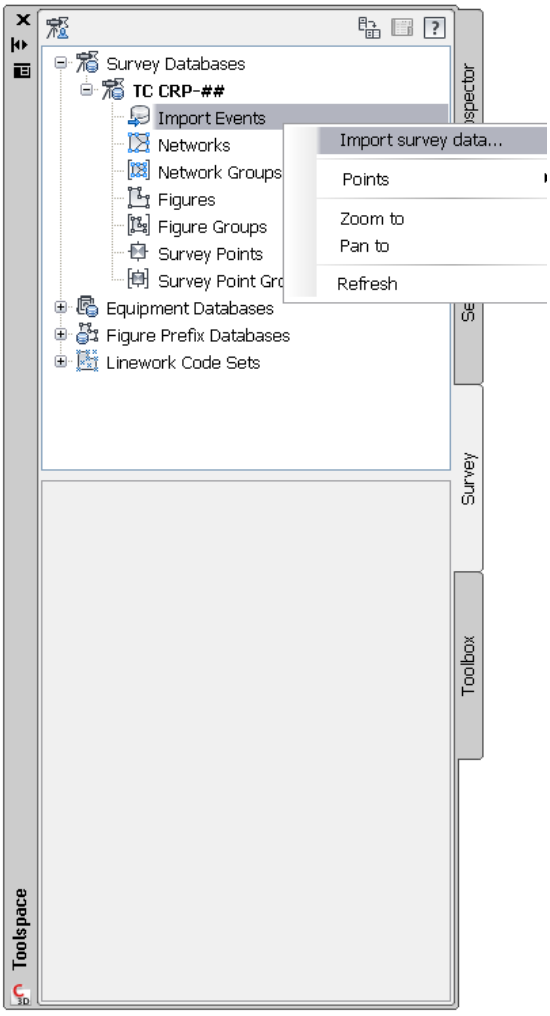


After clicking OK, your survey database will appear in the Survey Databases collection of the Toolspace → Survey Tab.

Also included in the Survey tab are the Equipment Databases, Figure Prefix Databases, and Linework Code Sets collections. When populated, these database collections greatly improve the consistency and efficiency of data transfer from field data collectors to Civil 3D drawings.

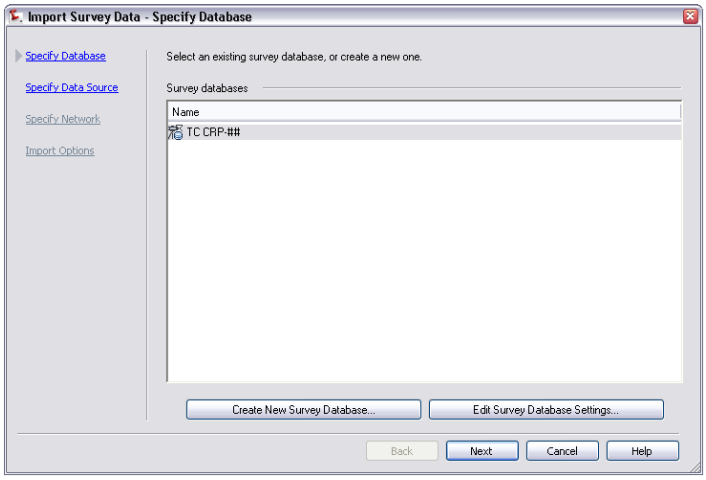
Populating the Survey Database

1. After the Survey Database has been created, data can be imported to populate it. To import data into your survey database, expand its collection (click on "+", then **right-click** on **Import Events** and select **Import Survey Data…**



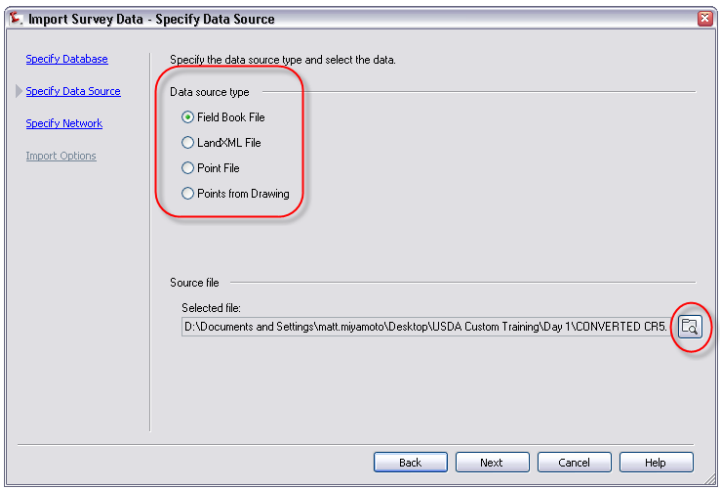
2. The **Import Survey Data Wizard** will appear on screen to walk you through the process of importing data into your survey database. On **Page 1**, specify the Database you wish to import data into. You can **pick an existing database**, or choose to **Create New Survey Database**

   Select or create the appropriate database, then click **NEXT**.



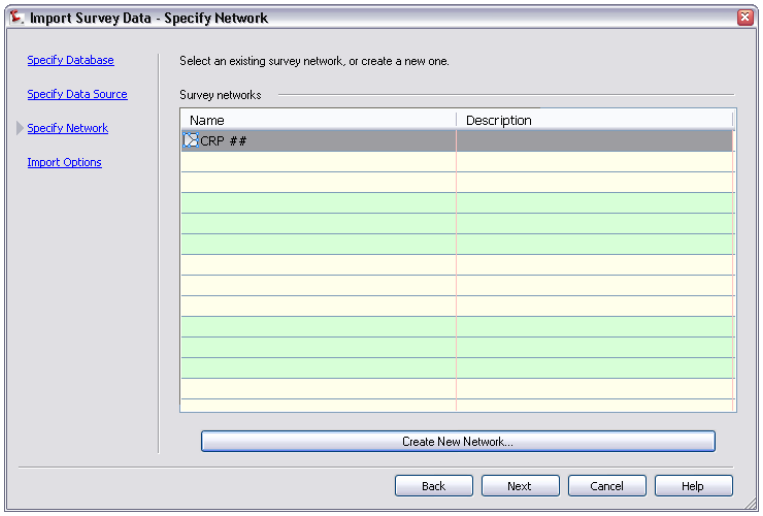
3. On Page 2 of the Wizard, specify the Data Source Type. You are allowed to import Autodesk Fieldbook (.FBK), LandXML (.XML), Point Files, and also Points from the Drawing*

   After selecting the source type, select the **Source File** by clicking on the folder icon under the Source File section. After selecting the appropriate file, click **NEXT**



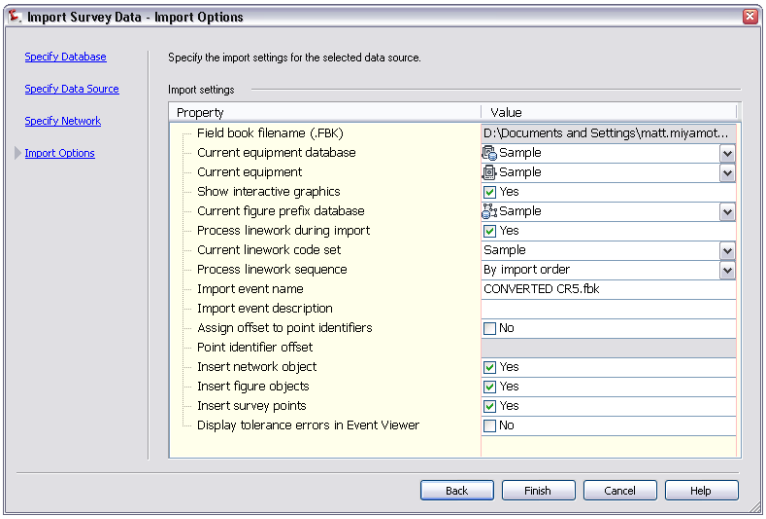
   NOTE*: Civil 3D point objects in the drawing are not automatically added to a Survey Database. The database is an external file that must be updated when points are created manually or imported directly into the drawing file.

4. **Page 3** of the Wizard allows you to specify the Network to import the data into. Networks can be created to identify phases of a project, or different dates of field data collection. You may select an existing network in the database if one exists, or use the **Create New Network**… option to add a new network to the database.



When creating a new network, the New Network dialog box will appear, and you may provide a name and description for the network. After selecting or creating the network, click **NEXT**

5. **Page 4** of the Wizard allows you to specify the **Import Options** for importing your survey data. Depending on the type of File, this page may vary in terms of options. Here you are allowed to verify the File Name, Current Equipment Database, Figure Prefix Database, Linework Code Set, and other import options.



After selecting the appropriate files and options, click **FINISH** to complete the import process.

6. **Save** the drawing.

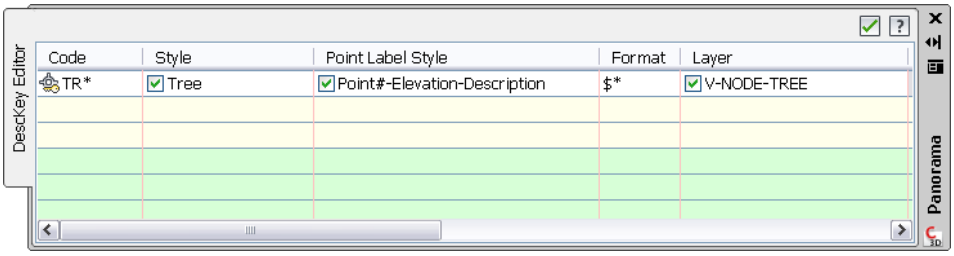
7. Repeat as necessary for different Source File types.

Description Key Sets, Figure Prefix Databases & Linework Code Sets

When working with Survey data files (ASCII .TXT, Fieldbook .FBK, etc.) there are additional features in Civil 3D that can be incorporated to reduce drafting time and increase overall efficiency and consistency when preparing drawings.

Description Key Sets

Description Key sets are available within Civil 3D, outside of the Survey database, and allow users to automatically assign point styles, point label styles, layers, and other settings to points that are imported into the drawing through ASCII .TXT and other types of point files. The styles and layers are assigned for each point depending on the point description contained within the point file. This is referred to as the "Code" in the Description Key Set.



The Description Key Editor is shown above, and includes a code for Tree shots. Based on the Code above, any point imported into the drawing that has a description or "Code" beginning with the letters "TR" will automatically be assigned the point style of Tree, and point label style of Point#-Elevation-Description. The Point Object will also be placed on the layer V-NODE-TREE.

Description Key Sets can be found under the **Points** collection in the **Settings tab** of the Toolspace. The editor can be accessed by **right-clicking** on the **Description Key Set Title** and selecting **Edit Keys...** To add additional Codes, simply **right-click on one of the existing codes** in the **DescKey Editor** and select **New…**

NOTE: When assigning Point Styles and Point Label Styles through Description Keys, those styles override any style assigned by a Point Group. To control the Point Style and Label Style through Point Groups after importing points with a Description Key Set, you must **check the boxes for Style and Point Label Style** in the **Overrides tab** under **Point Group Properties**.

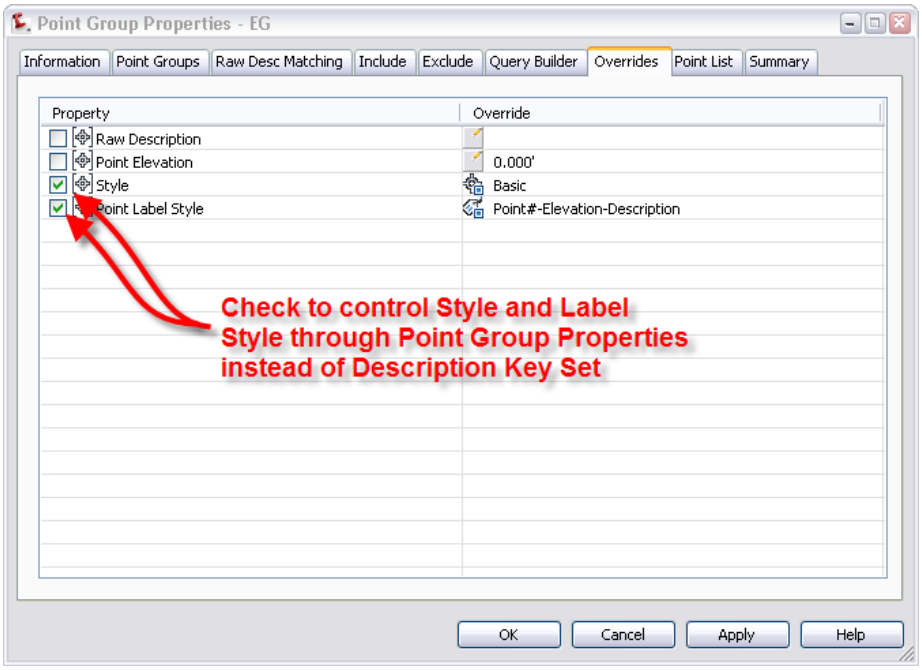
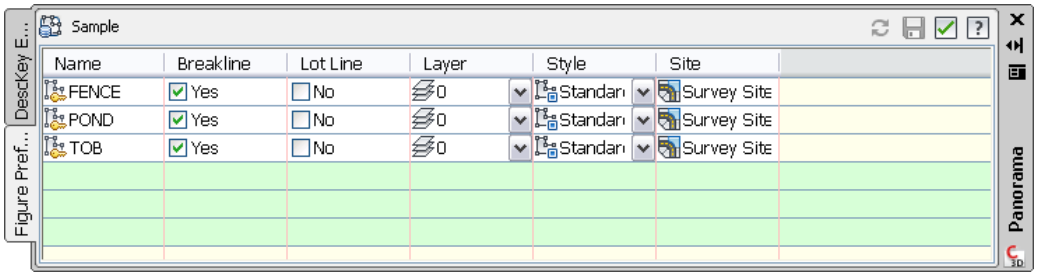

Point Group Properties - EG
Information
Point Groups
Raw Desc Matching
Include
Exclude
Query Builder
Overrides
Point List
Summary
Property
Override
Raw Description
Point Elevation
0.000'
Style
Basic
Point Label Style
Point#-Elevation-Description
Check to control Style and Label Style through Point Group Properties instead of Description Key Set
OK
Cancel
Apply
Help

Figure Prefix Databases

When working within the Survey Database, you may use a Figure Prefix Database to automatically generate Survey Figures from Points imported through the Import Events process outlined above. The Figure Prefix Database works in a similar fashion to a Description Key Set, except it assigns linework to points rather than markers and labels. When a point description is included in the Figure Prefix Database, Civil 3D will automatically generate linework connecting points with the same description.

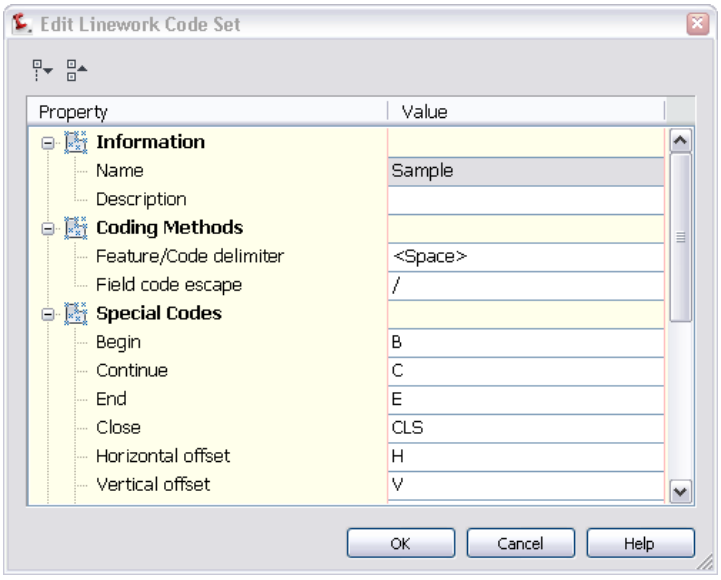


The Figure Prefix Database shown above includes Names for FENCE, POND, and TOB figures. This means that when point information is imported using the Import Events option, points with the Description FENCE will be connected by breaklines that are automatically generated. Separate figures will also be generated for POND and TOB points. When using Figure Prefix Databases, it is important to shoot survey points in order. The points will be connected by breaklines in the order that they are shown in the point files, therefore if points are shot in a criss-cross or zig-zag fashion, the breaklines will reflect those shots.

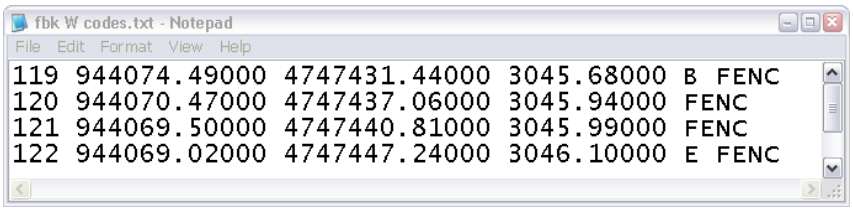
Figure Prefix Databases are found in the **Survey tab** of the Toolspace, under the **Figure Prefix Databases collection**. To edit an existing database, **right-click on its title** and select **Edit…** To add more prefixes, **right-click on one of the existing Names** and select **New…**

Linework Code Sets

Linework Code Sets are also one of the available features within the **Survey tab** of the Toolspace. Linework Codes are related to data collected in the field, and help to identify Survey figures and other linework by adding additional information to the point description within the point file or data collector. Linework Code Sets contain specific codes or shortcuts that allow a surveyor to identify points for Beginning, Ending, Closing, Offsetting, and other properties of survey figures. When specified ahead of time, these codes and increase the speed and efficiency of field data collection and processing of point files.



The codes shown above are common shortcuts for Begin, Continue, End, Close, and Horizontal and Vertical Offsets. Including these codes before the point description in a point file identify them as their respective points on a figure.



The image above shows a point file that has Linework Codes added to its point descriptions. When imported into Civil 3D through Import Events, this point file will produce four points that are connected by a breakline that Begins (B) at point 119 and Ends (E) at point 122.

When working with Description Key Sets, Figure Prefix Databases, and Linework Code Sets, it is important to work closely with your Surveyor to come up with the best solution or combination of solutions that produces the data set and drawings you prefer. In Civil 3D, the Figure Prefix Database will automatically generate linework for figures contained within it, however the Surveyor must know the specific descriptions to input in the field to accommodate the information in the database. Surveyors must also ensure that points are shot and recorded in the order that points are to be connected by linework, or to include a modifier with the point description such as TOB1 and TOB2 to identify separate figures and linework for opposite Top of Bank shots.

As a best practice, always double check the linework and figures generated by the databases, code, and key sets for accuracy prior to beginning your design.

Appendix A

Reference File Name Descriptions

SB	Standard border drawing
PD	Prototype drawing/Default template file
XS	Prototype cross-section drawing
PP	Prototype plan and profile drawing
FC	Field code/node definition file
LD	Linetype definition file
TC	Thurston County designator

Project File Name Descriptions

SV	Base Topo drawing
CD	Civil Design drawing
AD	Architectural Design drawing
XS	Cross-section drawing
PP	Plan and profile drawing
TF	Topographical points file
SS	Sheet set file
CP	Current plans set
CS	Current specifications set

Appendix B

Layer Naming

First part of the name describes discipline.

CI	CIVIL DESIGN
GS	GAS
OL	OIL
PO	POWER
RE	REFERENCE
SS	SANITARY SEWER
SD	STORM DRAINAGE
SF	SURFACE FEATURES
SV	SURVEY
TL	TELEPHONE
FO	FIBER OPTICS
TF	TRAFFIC
TV	CABLE TELEVISION
WA	WATER
DR	DRAFTING

Second part of the name depends on discipline chosen, some of which cross to other disciplines.

Objects under RE (layers for title blocks, match lines, etc.)

MTCH	MATCH LINE
GRID	PROFILE GRID
TITL	TITLE BLOCK

Objects under SV

CNTL	CENTERLINE
CONT	CONTOUR
CTRL	CONTROL
CITY	CORPORATE LIMIT
CNTY	COUNTY
DATM	DATUM
DLCM	DONATION LAND CLAIM
ESMT	EASEMENT
LROW	LIMITED ACCESS ROW
LOTN	LOT NUMBER
MEAN	MEANDER
NORA	NORTH ARROW
PRCL	PARCEL
PROP	PROPERTY
QSCT	QUARTER SECTION
RANG	RANGE
PARK	RESERVATION/PARK/FOREST
ROFW	RIGHT OF WAY
SECT	SECTION
16ST	SIXTEENTH SECTION
SOIL	SOIL BORING
STAT	STATE
TWNS	TOWNSHIP

Objects under CI

ALGN	ALIGNMENT
PRFL	PROFILE
PRVW	PROFILE VIEW
SURF	SURFACE
VRFM	VIEW FRAME
XSEC	CROSS SECTION

Objects under TV, GS, OL, PO, SS, SD, FO, and TL

ALIN	AERIAL LINE
BLIN	BURIED CONDUIT
GLIN	GRAVITY LINE
PLIN	PRESSURE LINE
METR	METER
SERV	SERVICE
STCR	STRUCTURE
VALV	VALVE

Objects under SF

BLDG	BUILDING
BUSS	BUS STOP
DTCH	CREEK/DITCH
CURB	CURB/SIDEWALK
PVMT	EDGE PAVEMENT
EMBT	EMBANKMENT
FENC	FENCE
GURD	GUARD RAIL
LAKE	LAKE/POND
MAIL	MAIL BOX
RLRD	RAILROAD
WALL	RETAINING WALL
RIPR	RIP RAP
RIVR	RIVERBANK
ROCK	ROCKERY

SHOR	SHORELINE
SIGN	SIGN
SWMP	SWAMP/MARSH
VEGE	VEGETATION
LITE	YARD LIGHT

Objects under TF

CHAN	CHANNELIZATION
SIGL	SIGNALIZATION
SIGN	TRAFFIC SIGN

Objects under WA

GLIN	GRAVITY LINE
PLIN	PRESSURE LINE
FHYD	FIRE HYDRANT
FITT	FITTING
METR	METER
SERV	SERVICE
STCR	STRUCTURE
VALV	VALVE

Objects under DR

GENR	STANDARD DETAIL
MISC	MISCELLANIOUS ENTITY

Third part names describe the object's condition.

EXST	EXISTING
PROP	PROPOSED
PRO1	PROPOSED OPTION 1
PRO2	PROPOSED OPTION 2
PRO3	PROPOSED OPTION 3
PERM	PERMANENT
TEMP	TEMPORARY
DEPR	DEPRESSION
INDX	INDEX

FOUN	FOUND
THEO	THEORETICAL

Fourth part names describe AutoCAD related entities.

DIM	DIMENSION
LIN	LINETYPE
PNT	POINT
SYM	SYMBOL
TXT	TEXT
HCH	HATCH PATTERN
OST	OFFSET (ALIGNMENT TYPE)
WID	WIDENING (ALIGNMENT TYPE)
LBL	LABEL
TTL	TITLE TEXT
BDR	BORDER (SURFACES)
PVI	POINT OF VERTICAL INTERSECTION (PROFILES)

Miscellaneous Layers

VPORT	VIEWPORTS LAYER
NO PLOT	NON-PLOTTING LAYER FOR MISCELLANEOUS LINEWORK

APPENDIX C

Field Code & Linework Definition

Points

FIELD CODE	DESCRIPTION	SYMBOL	LAYER
1	HOUSE CORNER	X	SF-BLDG-EXST-PNT
2	GARAGE CORNER	X	SF-BLDG-EXST-PNT
3	SHED CORNER	X	SF-BLDG-EXST-PNT
4	PUMP HOUSE CORNER	X	SF-BLDG-EXST-PNT
5	BUILDING CORNER	X	SF-BLDG-EXST-PNT
6	CARPORT CORNER	X	SF-BLDG-EXST-PNT
7	DECK CORNER	X	SF-BLDG-EXST-PNT
8	CONCRETE PAD CORNER	X	SF-BLDG-EXST-PNT
9	MOBIL HOME CORNER	X	SF-BLDG-EXST-PNT
10	BARN CORNER	X	SF-BLDG-EXST-PNT
11	MAIL BOX	X	SF-MAIL-EXIST-SYM
14	BENCH	X	SF-MISC-EXST-PNT
15	CL AC ROAD	X	SF-PVMT-EXST-PNT
16	EDGE OF AC ROAD	X	SF-PVMT-EXST-PNT
17	FOG LINE	X	TF-CHAN-EXST-PNT
18	CL GRV ROAD	X	SF-GRVL-EXST-PNT
19	EDGE GRV RD	X	SF-GRVL-EXST-PNT
20	EDGE AC DRV	X	SF-PVMT-EXST-PNT
21	EDGE GRV DRV	X	SF-GRVL-EXST-PNT

22	CL CONC ROAD	X	SF-PVMT-EXST-PNT
23	EDGE CONC RD	X	SF-PVMT-EXST-PNT
24	EDGE PARKING	X	SF-PVMT-EXST-PNT
25	SHOT ON PAVEMENT	X	SF-PVMT-EXST-PNT
27	CL RAILROAD TRACK	X	SF-RLRD-EXST-PNT
28	PNT ON RAIL	X	SF-RLRD-EXST-PNT
29	BRIDGE CORNER	X	SF-BRDG-EXST-PNT
30	CL BRIDGE	X	SF-BRDG-EXST-PNT
33	CL STRIPE	X	TF-CHAN-EXST-PNT
35	BACK CONC WALK	X	SF-PVMT-EXST-PNT
36	FACE CONC WALK	X	SF-PVMT-EXST-PNT
38	BACK AC WALK	X	SF-PVMT-EXST-PNT
39	FACE AC WALK	X	SF-PVMT-EXST-PNT
42	BK VERT CONC C/G	X	SF-CURB-EXST-PNT
43	FC VERT CONC C/G	X	SF-CURB-EXST-PNT
44	BK ROLLED C/G	X	SF-CURB-EXST-PNT
45	BK VERT CONC CURB	X	SF-CURB-EXST-PNT
46	FC VERT CONC CURB	X	SF-CURB-EXST-PNT
47	CL EXTRUDED CONC CURB	X	SF-CURB-EXST-PNT
48	CL EXTRUDED AC CURB	X	SF-CURB-EXST-PNT
49	BK AC TILT UP C	X	SF-CURB-EXST-PNT
50	GUTTER LINE	X	SF-CURB-EXST-PNT
57	CL BOTTOM SWALE	X	SF-DITCH-EXST-PNT
61	BOTTOM V-DITCH	X	SF-DITCH-EXST-PNT
62	DITCH LINE	X	SF-DITCH-EXST-PNT

63	TOP OF DITCH	X	SF-DITCH-EXST-PNT
64	SHOULDER	X	SF-RDWY-EXST-PNT
65	TOP BACK OF DITCH	X	SF-DITCH-EXST-PNT
66	BOTTOM ASPHALT DITCH	X	SF-DITCH-EXST-PNT
70	STUCCO FENCE	X	SF-FENC-EXST-PNT
73	FENCE P0ST	X	SF-FENC-EXST-PNT
74	CHAIN LINK FENCE	X	SF-FENC-EXST-PNT
75	WIRE MESH FENCE	X	SF-FENC-EXST-PNT
76	BARBED WIRE FENCE	X	SF-FENC-EXST-PNT
77	MESH/BARBED WIRE FENCE	X	SF-FENC-EXST-PNT
78	WOOD BOARD FENCE	X	SF-FENC-EXST-PNT
79	WOOD RAIL FENCE	X	SF-FENC-EXST-PNT
80	ELECTRIC FENCE	X	SF-FENC-EXST-PNT
81	ROCK FENCE	X	SF-FENC-EXST-PNT
82	GATE POST	XBOX	SF-FENC-EXST-PNT
83	IRON FENCE	X	SF-FENC-EXST-PNT
86	TOP INSIDE COR WALL	X	SF-WALL-EXST-PNT
87	TOP OUTSIDE COR WALL	X	SF-WALL-EXST-PNT
88	BOTTOM INSIDE COR WALL	X	SF-WALL-EXST-PNT
89	BOTTOM OUTSIDE COR WALL	X	SF-WALL-EXST-PNT
90	TOP INSIDE EDGE OF WALL	X	SF-WALL-EXST-PNT
91	TOP OUTSIDE WALL	X	SF-WALL-EXST-PNT
92	BOTTOM EDGE WALL	X	SF-WALL-EXST-PNT

93	RETAINING WALL (TOP/BOT)	X	SF-WALL-EXST-PNT
100	SANSEW MANHOLE	SSMH	SS-STCR-EXST-SYM
101	CLEAN OUT	SSCO	SS-STCR-EXST-SYM
102	SEPNTIC TANK	CIR	SS-STCR-EXST-SYM
103	DRAINFIELD CORNER	X	SS-STCR-EXST-SYM
104	DISTRIBUTION BOX	XBOX	SS-STCR-EXST-SYM
110	STORMSEWER MANHOLE	SDMH	SD-STCR-EXST-SYM
111	CATCH BASIN	SDCB	SD-STCR-EXST-SYM
112	INLET	SSCO	SD-STCR-EXST-SYM
113	CMP	X	SD-GLIN-EXST-PNT
114	CONC CULVERT	X	SD-GLIN-EXST-PNT
115	PVC PIPE	X	SD-GLIN-EXST-PNT
116	OUTLET	SSCO	SD-STCR-EXST-SYM
117	FLEX PIPE	X	SD-GLIN-EXST-PNT
118	YARD DRAIN	SDCB	SD-STCR-EXST-SYM
119	ADS PIPE	X	SD-GLIN-EXST-PNT
120	HYDRANT	WFH2	WA-FHYD-EXST-SYM
121	WTRVAL	WV	WA-VALV-EXST-SYM
123	BLOW OFF	WBOV	WA-VALV-EXST-SYM
124	WATER METER	WMET	WA-METR-EXST-SYM
125	FAUCET	WTF	WA-VALV-EXST-SYM
126	FH GUARD POST	WGP	WA-FITT-EXST-SYM
127	WELL CASING	DCIR	WA-VALV-EXST-SYM
128	SPRINKLER HEAD	XCIR	WA-VALV-EXST-SYM
129	SPRINKLER CNTR BOX	BOX	WA-VALV-EXST-SYM

130	POWER POLE	PPOLE	PO-STCR-EXST-SYM
131	GUY POLE	UP	PO-STCR-EXST-SYM
132	GUY ANCHOR	UPA	PO-STCR-EXST-SYM
133	POWER VAULT	PV	PO-STCR-EXST-SYM
134	POWER MANHOLE	MH	PO-STCR-EXST-SYM
135	TRANSFER BOX	XBOX	PO-STCR-EXST-SYM
136	POWER+PHONE POLE	PTPOLE	PO-STCR-EXST-SYM
137	SERVICE POLE	UP	PO-STCR-EXST-SYM
138	LUMINARE	TSLA	TF-SIGL-EXST-SYM
140	TELEPHONE POLE	TPOLE	TL-STCR-EXST-SYM
141	TELEPHONE MANHOLE	SDM	TL-STCR-EXST-SYM
142	TELEPHONE BOX	TBOX	TL-STCR-EXST-SYM
143	CABLE TV BOX	TVBOX	TV-STCR-EXIST-SYM
144	FUEL INLET	X	GS-VALV-EXST-SYM
145	FUEL VENT	X	GS-VALV-EXST-SYM
147	GAS METER	GMET	GS-METR-EXST-SYM
148	GAS VALVE	GASV	GS-VALV-EXST-SYM
150	TV SATILITE ANTENNA	XCIR	TV-STCR-EXIST-SYM
151	UG POWER LOCATE	X	PO-BLIN-EXST-PNT
152	UG GAS LINE LOCATE	X	GS-PLIN-EXST-PNT
153	UG TELEPHONE LOCATE	X	TL-BLIN-EXST-PNT
154	WATER LINE LOCATE	X	WA-PLIN-EXST-PNT
155	SANSEW LINE LOCATE	X	SS-PLIN-EXST-PNT
156	STORMDRAIN LINE LOCATE	X	SD-GLIN-EXST-PNT
158	POWER PEDESTAL	PBOX	PO-STCR-EXST-SYM

159	TELEPHONE BOOTH	TBOX	TL-STCR-EXST-SYM
160	GROUND SHOT	X	SF-TOPO-EXST-PNT
161	PROPANE TANK	X	SF-STCR-EXST-PNT
163	TOE OF SLOPE	X	SF-TOPO-EXST-PNT
164	TOP OF SLOPE	X	SF-TOPO-EXST-PNT
165	SHOT ON SLOPE	X	SF-TOPO-EXST-PNT
166	DAYLIGHT SHOT	X	SF-TOPO-EXST-PNT
167	TOP OF CUT	X	SF-TOPO-EXST-PNT
168	TOE OF CUT	X	SF-TOPO-EXST-PNT
170	LINE ON VEGETATION	X	SF-VEGE-EXST-PNT
171	HIGH WATER MARK	X	SF-TOPO-EXST-PNT
172	SHOT ON BEACH	X	SF-TOPO-EXST-PNT
173	CL OF CREEK	X	SF-DTCH-EXST-PNT
174	THREAD OF CREEK	X	SF-DTCH-EXST-PNT
175	EDGE OF CREEK	X	SF-DTCH-EXST-PNT
176	CL OF RIVER	X	SF-DTCH-EXST-PNT
177	THREAD OF RIVER	X	SF-DTCH-EXST-PNT
178	EDGE OF RIVER	X	SF-DTCH-EXST-PNT
179	CENTER OF SPRING	X	SF-TOPO-EXST-PNT
180	EDGE OF MARSH	X	SF-SWMP-EXST-PNT
181	TOE OF POND	X	SF-LAKE-EXST-PNT
182	GRID POINT	X	SF-TPOP-EXST-PNT
183	EDGE OF FLAGGED WETLAND	X	SF-SWMP-EXST-PNT
185	EDGE OF LAWN	X	SF-VEGE-EXST-PNT
186	GRADE BREAK	X	SF-TOPO-EXST-PNT

187	ASPHALT BREAK LINE	X	SF-TOPO-EXST-PNT
188	WATER SHOT	X	SF-LAKE-EXST-PNT
189	TOP OF BANK	X	SF-TOPO-EXST-PNT
190	TOP OF POND	X	SF-LAKE-EXST-PNT
196	SIGN POST	SFSN	SF-SIGN-EXST-SYM
197	PEDESTRIAN POLE	TPB	TF-SIGL-EXST-SYM
198	TRAFFIC CONTROL VAULT	TSC	TF-SIGL-EXST-SYM
199	TRAFFIC LIGHT	TSPL	TF-SIGL-EXST-SYM
200	SIGNAL J-BOX	TJB1	TF-SIGL-EXST-SYM
201	GUARDRAIL	X	SF-GURD-EXST-PNT
202	GUARDRAIL POST	XBOX	SF-GURD-EXST-PNT
203	BOLLARD	CIR	SF-BLRD-EXST-SYM
225	TREE LINE	X	SF-VEGE-EXST-PNT
228	EDGE OF PLANTING AREA	X	SF-VEGE-EXST-PNT
231	SCHOOL MAST ARM	TPOL	TF-SIGL-EXST-SYM
232	SHRUB	SFS	SF-VEGE-EXST-SYM
234	TREE W/ DESCRIPNTION	SFD	SF-VEGE-EXST-SYM
236	SHRUB/HEDGE LINE	X	SF-VEGE-EXST-PNT
237	SNAG	X	SF-VEGE-EXST-PNT
238	STUMP	X	SF-VEGE-EXST-PNT
239	LOG	X	SF-VEGE-EXST-PNT
241	BOULDER	CIR	SF-ROCK-EXST-SYM
243	PILING	CIR	SF-BRDG-EXST-SYM
246	FND PK AND FLASHER	SCIRP	SV-CTRL-FOUN-SYM
247	FND IRON PIPE	IPCIR	SV-CTRL-FOUN-SYM

248	FND REBAR	SCIRP	SV-CTRL-FOUN-SYM
249	FOUND PK NAIL	SCIRP	SV-CTRL-FOUN-SYM
250	FOUND HUB & TACK	SIP	SV-CTRL-FOUN-SYM
251	FOUND REBAR & CAP	SCIRP	SV-CTRL-FOUN-SYM
252	FOUND TACK	SCIRP	SV-CTRL-FOUN-SYM
253	FOUND MON IN CASE	SMIC	SV-CTRL-FOUN-SYM
254	FOUND RR SPIKE	SCIRP	SV-CTRL-FOUN-SYM
255	FOUND PLAT MON	SMON	SV-CTRL-FOUN-SYM
260	SET BENCH MARK	SBM	SV-CTRL-EXST-SYM
261	SET IRON PIPE	IPCIR	SV-CTRL-EXST-SYM
263	SET REBAR	IPCIR	SV-CTRL-EXST-SYM
264	SET PK NAIL	SCIR	SV-CTRL-EXST-SYM
265	SET HUB+TACK	BOXP	SV-CTRL-EXST-SYM
266	SET REBAR W/CAP	SCIR	SV-CTRL-EXST-SYM
267	SET TACK	SCIR	SV-CTRL-EXST-SYM
268	SET MONUMENT IN CASE	SMIC	SV-CTRL-EXST-SYM
269	SET RAILROAD SPIKE	SCIRP	SV-CTRL-EXST-SYM
270	SET PLAT MONUMENT	SMIC	SV-CTRL-EXST-SYM
275	P-LINE	X	SV-CTRL-EXST-PNT
276	L-LINE	X	SV-CTRL-EXST-PNT
277	TRAVERSE LINE	X	SV-CTRL-EXST-PNT
300	ROW LINE	X	SV-ROFW-EXST-LIN
301	PROPERTY LINE	X	SV-PROP-EXST-LIN
302	PLAT LINE	X	SV-PLAT-EXST-LIN
303	SECTION LINE	X	SV-SECT-EXST-LIN

304	1/4 SECTION LINE	X	SV-QSCT-EXST-LIN
305	1/16 SECTION LINE	X	SV-16ST-EXST-LIN
550	MISC	X	MISC_PNT

Linework

FIELD CODE	BREAKLINE	LAYER	LINETYPE
1	Yes	SF-BLDG-EXST-LIN	EXBUILD
2	Yes	SF-BLDG-EXST-LIN	EXBUILD
3	Yes	SF-BLDG-EXST-LIN	EXBUILD
4	Yes	SF-BLDG-EXST-LIN	EXBUILD
5	Yes	SF-BLDG-EXST-LIN	EXBUILD
6	Yes	SF-BLDG-EXST-LIN	EXBUILD
7	Yes	SF-BLDG-EXST-LIN	EXBUILD
8	Yes	SF-BLDG-EXST-LIN	EXBUILD
9	Yes	SF-BLDG-EXST-LIN	EXBUILD
10	Yes	SF-BLDG-EXST-LIN	EXBUILD
15	Yes	SV-CNTL-EXST-LIN	EXCNTL
16	Yes	SF-PVMT-EXST-LIN	HIDDEN2
17	No	TF-CHAN-EXST-LIN	HIDDEN2
18	Yes	SF-GRVL-EXST-LIN	HIDDEN2
19	Yes	SF-GRVL-EXST-LIN	HIDDEN2
20	Yes	SF-PVMT-EXST-LIN	HIDDEN2
21	Yes	SF-GRVL-EXST-LIN	HIDDEN2
22	Yes	SF-PVMT-EXST-LIN	HIDDEN2
23	Yes	SF-PVMT-EXST-LIN	HIDDEN2
24	Yes	SF-PVMT-EXST-LIN	HIDDEN2
25	No	SF-PVMT-EXST-LIN	HIDDEN2
26	Yes	SF-PVMT-EXST-LIN	HIDDEN2
27	Yes	SF-RLRD-EXST-LIN	Continuous
28	Yes	SF-RLRD-EXST-LIN	Continuous
29	Yes	SF-BRDG-EXST-LIN	HIDDEN2
30	Yes	SF-BRDG-EXST-LIN	HIDDEN2
31	No	0	
32	No	TF-CHAN-EXST-LIN	HIDDEN2
33	No	TF-CHAN-EXST-LIN	HIDDEN2
34	No	0	

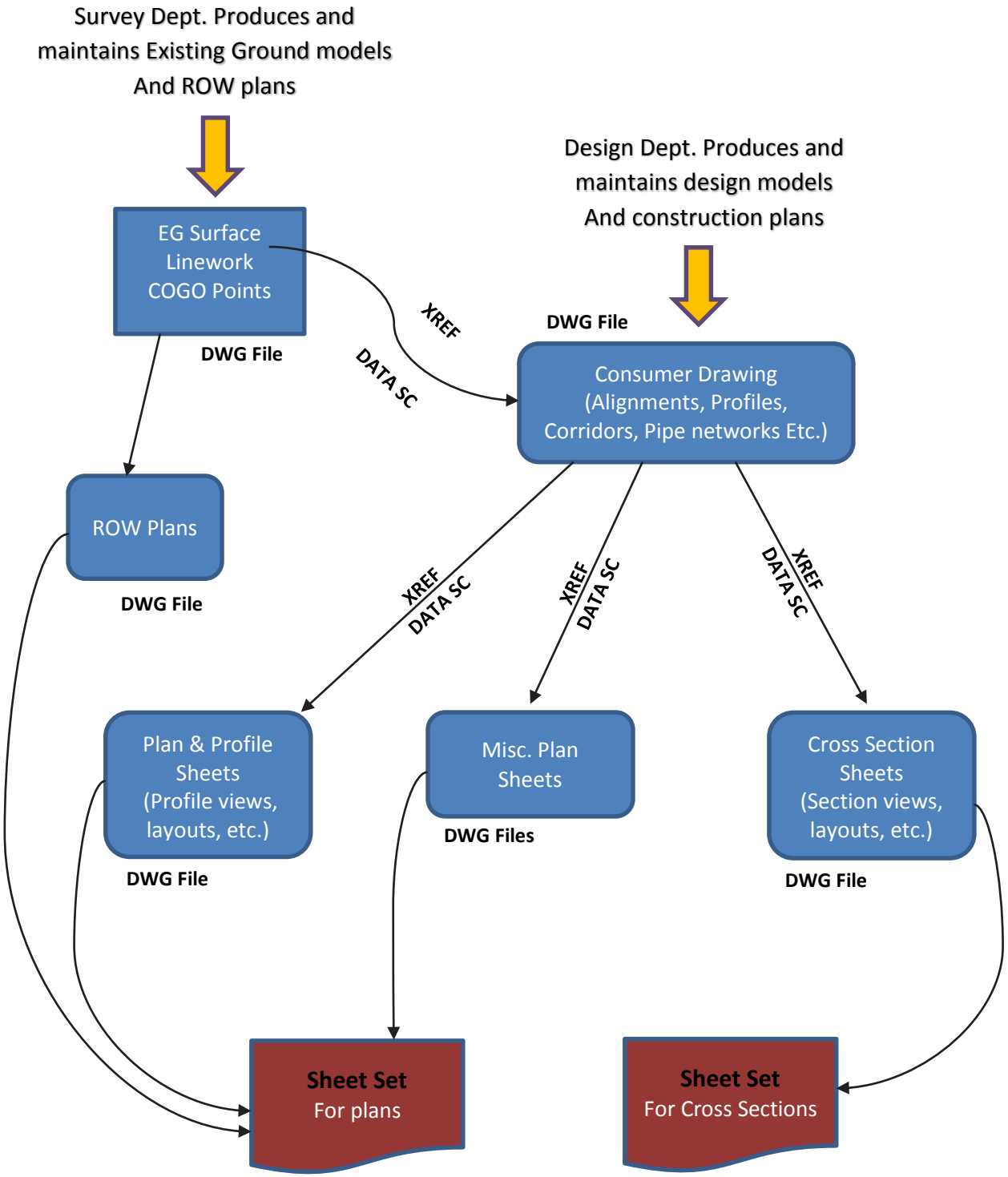
FIELD CODE	BREAKLINE	LAYER	LINETYPE
35	Yes	SF-WALK-EXST-LIN	Continuous
36	Yes	SF-WALK-EXST-LIN	Continuous
37	Yes	SF-WALK-EXST-LIN	Continuous
38	Yes	SF-WALK-EXST-LIN	Continuous
39	Yes	SF-WALK-EXST-LIN	Continuous
42	Yes	SF-CURB-EXST-LIN	Continuous
43	Yes	SF-CURB-EXST-LIN	Continuous
44	Yes	SF-CURB-EXST-LIN	Continuous
45	Yes	SF-CURB-EXST-LIN	Continuous
46	Yes	SF-CURB-EXST-LIN	Continuous
47	Yes	SF-CURB-EXST-LIN	Continuous
48	Yes	SF-CURB-EXST-LIN	Continuous
49	Yes	SF-CURB-EXST-LIN	Continuous
50	Yes	SF-CURB-EXST-LIN	Continuous
51	Yes	SF-CURB-EXST-LIN	Continuous
52	No	0	
57	Yes	SF-DITCH-EXST-LIN	DITCH_LINE
61	Yes	SF-DITCH-EXST-LIN	DITCH_LINE
62	Yes	SF-DITCH-EXST-LIN	DITCH_LINE
63	Yes	SF-DITCH-EXST-LIN	DITCH_LINE
64	Yes	SF-RDWY-EXST-LIN	Continuous
65	Yes	SF-DITCH-EXST-LIN	DITCH_LINE
66	Yes	SF-DITCH-EXST-LIN	DITCH_LINE
70	No	SF-FENC-EXST-LIN	FENCE_LINE
73	No	SF-FENC-EXST-LIN	FENCE_LINE
74	No	SF-FENC-EXST-LIN	FENCE_LINE
75	No	SF-FENC-EXST-LIN	FENCE_LINE
76	No	SF-FENC-EXST-LIN	FENCE_LINE
77	No	SF-FENC-EXST-LIN	FENCE_LINE
78	No	SF-FENC-EXST-LIN	FENCE_LINE
79	No	SF-FENC-EXST-LIN	FENCE_LINE
80	No	SF-FENC-EXST-LIN	FENCE_LINE
81	No	SF-FENC-EXST-LIN	FENCE_LINE
82	No	0	
83	No	SF-FENC-EXST-LIN	FENCE_LINE
83BOP	No	0	
84	No	SF-FENC-EXST-LIN	FENCE_LINE
86	Yes	SF-WALL-EXST-LIN	Continuous
87	Yes	SF-WALL-EXST-LIN	Continuous

FIELD CODE	BREAKLINE	LAYER	LINETYPE
88	Yes	SF-WALL-EXST-LIN	Continuous
89	Yes	SF-WALL-EXST-LIN	Continuous
90	Yes	SF-WALL-EXST-LIN	Continuous
91	Yes	SF-WALL-EXST-LIN	Continuous
92	Yes	SF-WALL-EXST-LIN	Continuous
93	Yes	SF-WALL-EXST-LIN	Continuous
93ESMN	No	0	
93RW	No	0	
94	No	0	
95	No	0	
97	No	0	
113	No	SD-GLIN-EXST-LIN	X_STORM_DRAIN
114	No	SD-GLIN-EXST-LIN	X_STORM_DRAIN
115	No	SD-GLIN-EXST-LIN	X_STORM_DRAIN
117	No	SD-GLIN-EXST-LIN	X_STORM_DRAIN
119	No	SD-GLIN-EXST-LIN	X_STORM_DRAIN
146	No	0	
149	No	TV-BLIN-EXST-LIN	X_CABLE_TV
150	No	TL-FOBLIN-EXST-LIN	FIBER_OPTIC
151	No	PO-BLIN-EXST-LIN	X_POWER_BURIED
152	No	GS-PLIN-EXST-LIN	X_GAS_LINE
153	No	TL-BLIN-EXST-LIN	X_TELE_CABLE_BURIED
154	No	WA-PLIN-EXST-LIN	X_WATER_LINE
155	No	SS-PLIN-EXST-LIN	X_SANITARY_SEWER
156	No	SD-GLIN-EXST-LIN	X_STORM_DRAIN
162	No	0	
163	Yes	SF-TOPO-EXST-LIN	Continuous
164	Yes	SF-TOPO-EXST-LIN	Continuous
165	No	0	
167	Yes	SF-TOPO-EXST-LIN	Continuous
168	Yes	SF-TOPO-EXST-LIN	Continuous
170	No	SF-VEGE-EXST-LIN	Continuous
173	No	SF-CREK-EXST-LIN	Continuous
174	No	SF-CREK-EXST-LIN	Continuous
175	No	SF-CREK-EXST-LIN	Continuous
176	No	SF-RIVR-EXST-LIN	STREAM
177	No	SF-RIVR-EXST-LIN	STREAM

FIELD CODE	BREAKLINE	LAYER	LINETYPE
178	No	SF-RIVR-EXST-LIN	STREAM
180	No	SF-SWMP-EXST-LIN	MARSH
181	No	SF-LAKE-EXST-LIN	LAKE
182	No	0	
183	No	SF-SWMP-EXST-LIN	MARSH
185	No	SF-VEGE-EXST-LIN	Continuous
186	Yes	SF-TOPO-EXST-LIN	Continuous
187	Yes	SF-PVMT-EXST-LIN	HIDDEN2
189	Yes	SF-TOPO-EXST-LIN	Continuous
190	No	SF-LAKE-EXST-LIN	LAKE
191	No	0	
193	No	0	
194	No	0	
195	No	0	
198	No	0	
199	No	0	
200	No	0	
201	No	SF-GURD-EXST-LIN	Continuous
225	No	SF-VEGE-EXST-LIN	Continuous
228	No	SF-VEGE-EXST-LIN	Continuous
232	No	0	
233	No	0	
236	No	SF-VEGE-EXST-LIN	Continuous
242	No	0	
253	No	0	
275	No	SV-CTRL-PROP-LIN	Continuous
276	No	SV-CTRL-PROP-LIN	Continuous
277	No	SV-CTRL-EXST-LIN	Continuous

Appendix D

THURSTON COUNTY PUBLIC WORKS
CIVIL 3D PROJECT DESIGN AND PLANS PRODUCTION WORKFLOW



Appendix E

Thurston Co. / APWA Standard Legend

WATER SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION	(ABBR)	BLOCK	LAYER
		CAP/PLUG		WCAP	WA-FITT-3333-SYM
		COUPLING	(CPL)	WCOUP/WCOUPP	WA-FITT-3333-SYM
		GUARD POST	(GP)	WGP/WGPP	WA-FITT-3333-SYM
		REDUCER	(RED)	WRED/WREDP	WA-FITT-3333-SYM
		THRUST BLOCK	(TB)	WTB/WTBP	WA-FITT-3333-SYM
		WATER METER	(WM)	WMET/WMETP	WA-METR-3333-SYM
		FIRE HYDRANTS:			
FH		2-NOZZLE	(FH)	WFH2/WFH2P	WA-FHYD-3333-SYM
		3-NOZZLE	(FH)	WFH3/WFH3P	WA-FHYD-3333-SYM
		JOINTS:			
		FLANGE/BLIND FL	(FL)/(BL FL)	WFL	WA-FITT-3333-SYM
		MECHANICAL	(MJ)	WMJ	WA-FITT-3333-SYM
		PUSH-ON/HUB		WHUB	WA-FITT-3333-SYM
		THREAD	(THD)	WTH	WA-FITT-3333-SYM
		VALVES:			
		AIR RELIEF	(AIR)	WARV/WARVP	WA-VALV-3333-SYM
		BLOW-OFF	(BO)	WBOV/WBOVP	WA-VALV-3333-SYM
		BUTTERFLY	(BF)	WBFV/WBFVP	WA-VALV-3333-SYM
		CHECK	(CK)	WCKV/WCKVP	WA-VALV-3333-SYM
WV		GATE/GENERAL	(WV)	WGV/WGVP	WA-VALV-3333-SYM
		PLUG VALVE	(PV)	WPV/WPVP	WA-VALV-3333-SYM

3333 = USE EXST/PROP

GAS/POWER/TELEPHONE SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION	(ABBR)	BLOCK	LAYER
		GAS METER	(GM)	GMET/GMETP	GS-METR-3333-SYM
		GAS VALVE	(GV)	GV/GVP	GS-VALV-3333-SYM
		PAD MOUNTED TRANSFORMER	(P TRAN)	PTRAN/PTRANP	PO-STCR-3333-SYM
P	P	POWER VAULT	(POW V)	PV/PVP	PO-STCR-3333-SYM
		TRANSMISSION TOWER	(TRANS TWR)	PTWR	PO-STCR-EXST-SYM
Op Per Pole		UTILITY POLE	(PP, TP)	UP/UPP	11-STCR-3333-SYM
Service Pole / Guy Pole		UTILITY POLE ANCHOR		UPA/UPAP	11-STCR-3333-SYM
Phone Riser		TELEPHONE RISER	(TEL R)	TELR/TELRP	TL-STCR-3333-SYM
T	T	TELEPHONE VAULT	(TEL V)	TV/TVP	TL-STCR-3333-SYM

11 = USE PO/TL

3333 = USE EXST/PROP

SURVEY SYMBOLS

SYMBOL THEOR./ EXIST.	SYMBOL FOUND/ PROP.	DESCRIPTION	(ABBR)	BLOCK	LAYER
		ANGLE POINT	(AP)	SAP/SAPP	SV-CTRL-3333-SYM
		BENCH MARK	(BM)	SBM/SBMP	SV-CTRL-3333-SYM
		BLOCK CORNER	(BC)	SBC/SBCP	SV-CTRL-3333-SYM
		IRON PIPE	(IP)	SIP/SIPP	SV-CTRL-3333-SYM
		MONUMENT (IN CASE)	(MIC)	SMIC/SMICP	SV-CTRL-3333-SYM
		MONUMENT (SURFACE)	(MON)	SMON/SMONP	SV-CTRL-3333-SYM
		OWNERSHIP TIE	(OT)	SOT	SV-LOT#-3333-SYM
		SECTION DATA:			
		SECTION CENTER		SSCT	SV-SECT-3333-SYM
		SECTION CORNER		SSC/SSCP	SV-SECT-3333-SYM
		QUARTER CORNER		SQC/SQCP	SV-QSCT-3333-SYM
		SIXTEENTH CORNER		SSXC/SSXCP	SV-16ST-3333-SYM
		CLOSING CORNER		SCC/SCCP	SV-222A-3333-SYM
MC	MC	MEANDER CORNER	(MC)	SMC/SMCP	SV-222A-3333-SYM
WC	WC	WITNESS CORNER	(WC)	SWC/SWCP	SV-SECT-3333-SYM
		SOIL BORING	(SB)	SSB/SSBP	SV-SOIL-3333-SYM
		SPOT ELEVATION	(SE)	SSE/SSEP	SV-CTRL-3333-SYM
		TAX LOT / PARCEL NUMBER		STLN	SV-222B-3333-SYM

222A = USE RANG/SECT/TWNS
222B = USE PRCL/LOTN
3333 = USE EXST/PROP OR FOUN/THEO

BLOCK: SNA

LAYER: SV-NORA-3333-SYM

BLOCK: SDAT

LAYER: SV-DATM-3333-SYM

SIGNALIZATION SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION	(ABBR)	BLOCK	LAYER
		AERIAL DISCONNECT		TAD/TADP	TF-SIGL-3333-SYM
		AERIAL TERMINAL COMPARTMENT		TATC/TATCP	TF-SIGL-3333-SYM
		DETECTORS:			
		DIPOLE DETECTOR		TDD/TDDP	TF-SIGL-3333-SYM
		QUADRAPOLE DETECTOR		TQD/TQDP	TF-SIGL-3333-SYM
		PEDESTRIAN DETECTOR		TPD/TPDP	TF-SIGL-3333-SYM
		EMERGENCY VEHICLE INDICATOR LIGHTS:			
		INDICATOR LIGHTS		TIL/TILP	TF-SIGL-3333-SYM
		OPTICOM SENSOR		TOS/TOSP	TF-SIGL-3333-SYM
		OPTICOM SENSOR W/ INDICATOR LIGHTS		TOSL/TOSLP	TF-SIGL-3333-SYM
		FLASHING WARNING SYSTEM		TFWS/TFWSP	TF-SIGL-3333-SYM
		JUNCTION BOX (TYPE I, II, III)	(JB)	TJB1/TJB1P TJB2/TJB2P TJB3/TJB3P	TF-SIGL-3333-SYM TF-SIGL-3333-SYM TF-SIGL-3333-SYM
		PEDESTRIAN PUSHBUTTON POST W/ PUSHBUTTON	(PB)	TPB/TPBP	TF-SIGL-3333-SYM
		PEDESTRIAN SIGNAL HEAD		TPSH/TPSHP	TF-SIGL-3333-SYM
		POLE NOTE		TPN	TF-SIGL-3333-SYM
		R/R CROSSING GATE		TRG/TRGP	TF-SIGL-3333-SYM
		R/R CROSSING SIGNAL		TRC/TRCP	TF-SIGL-3333-SYM
		SIGNAL CONTROLLER		TSC/TSCP	TF-SIGL-3333-SYM
		SIGNAL LOAD CENTER		TSLC/TSLCP	TF-SIGL-3333-SYM
		STREET LIGHT ASSEMBLY		TSLA/TSLAP	TF-SIGL-3333-SYM
		TRAFFIC SIGNS:			
		BRIDGE		TSB/TSBP	TF-SIGN-3333-SYM
		CANTILEVERED		TSCL/TSCLP	TF-SIGN-3333-SYM
		SINGLE POST		TSS/TSSP	TF-SIGN-3333-SYM
		DOUBLE POST		TSD/TSDP	TF-SIGN-3333-SYM
		TRAFFIC SIGNAL POLE		TPOL/TPOLP	TF-SIGL-3333-SYM
		TRAFFIC SIGNAL POLE W/ LUMINAIRE		TSPL/TSPLP	TF-SIGL-3333-SYM
		TRAFFIC SIGNAL SUPPORT POLE		TSPOL/TSPOLP	TF-SIGL-3333-SYM
		VEHICLE SIGNAL HEAD		TVH/TVHP	TF-SIGL-3333-SYM
		VEHICLE SIGNAL HEAD W/ARROW INDICATOR		TVHA/TVHAP	TF-SIGL-3333-SYM
		WIRE NOTE		TWN	TF-SIGL-3333-SYM

3333 = USE EXST/PROP

SANITARY/STORM SEWER SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION	(ABBR)	BLOCK	LAYER
		SAN. SEWER CLEAN OUT	(CO)	SSCO/SSCOP	SS-STCR-3333-SYM
		SAN. SEWER MANHOLE	(SSMH)	SSMH/SSMHP	SS-STCR-3333-SYM
		STORM DRAIN CATCH BASIN	(CB)	SDCB/SDCBP	SD-STCR-3333-SYM
		STORM DRAIN CULVERT	(CULV)	SDC/SDCP	SD-GLIN-3333-SYM
		STORM DRAIN MANHOLE	(SDMH)	SDMH/SDMHP	SD-STCR-3333-SYM

3333 = USE EXST/PROP

CHANNELIZATION SYMBOLS

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION	BLOCK	LAYER
		BIKE PATH	CB/CBP	TF-CHAN-3333-SYM
		HANDICAP SYMBOL	CHS/CHSP	TF-CHAN-3333-SYM
		H.O.V. LANE SYMBOL	CHOV/CHOVP	TF-CHAN-3333-SYM
ONLY	ONLY	ONLY	CO/COP	TF-CHAN-3333-SYM
R R	R R	RAILROAD CROSSING	CRR/CRRP	TF-CHAN-3333-SYM
SCHOOL	SCHOOL	SCHOOL	CSC/CSCP	TF-CHAN-3333-SYM
STOP	STOP	STOP	CS/CSP	TF-CHAN-3333-SYM
		LANE CONTROL ARROWS:		
		STRAIGHT ARROW	CSA/CSAP	TF-CHAN-3333-SYM
		LT.RT.STR.ARROW	CLRS/CLRSP	TF-CHAN-3333-SYM
		LEFT-RIGHT ARROW	CLR/CLRP	TF-CHAN-3333-SYM
		2-WAY LEFT TURN	C2W/C2WP	TF-CHAN-3333-SYM
		LEFT TURN ARROW	CLT/CLTP	TF-CHAN-3333-SYM
		RIGHT TURN ARROW	CRT/CRTP	TF-CHAN-3333-SYM
		LEFT-SRAIGHT ARROW	CLS/CLSP	TF-CHAN-3333-SYM
		RIGHT-STRAIGHT ARROW	CRS/CRSP	TF-CHAN-3333-SYM
		RAISED MARKERS:		
		LANE MARKERS TYPE I	CLM1/CLM1P	TF-CHAN-3333-SYM
		LANE MARKERS TYPE II	CLM2/CLM2P	TF-CHAN-3333-SYM

3333 = USE EXST/PROP

SURFACE FEATURES/LANDSCAPING

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION	BLOCK	LAYER
BUS	BUS	BUS STOP	SFBS/SFBSP	SF-BUSS-3333-SYM
		EMBANKMENT	SFB/SFBP	SF-EMBT-3333-SYM
		MAIL BOX	SFMB/SFMBP	SF-MAIL-3333-SYM
		RIP RAP	SFRR/SFRRP	SF-RIPR-3333-SYM
		ROCKERY	SFR/SFRP	SF-ROCK-3333-SYM
		SHRUB	SFS/SFSP	SF-VEGE-3333-SYM
		SIGN	SFSN/SFSNP	SF-SIGN-3333-SYM
		TREE (Conifer)	SFC/SFCP	SF-VEGE-3333-SYM
		TREE (Deciduous)	SFD/SFDP	SF-VEGE-3333-SYM
		YARD LIGHT	SFL/SFLP	SF-LITE-3333-SYM

3333 = USE EXST/PROP

LINETYPES

LINETYPE	DESCRIPTION	COLOR	LT NAME	LAYER
	SURFACE FEATURES:			
	BUILDING LINE (EXISTING)	GREEN	EXBUILD	SF-BLDG-EXST-LIN
	BUILDING LINE (PROPOSED)	GREEN	CONTINUOUS	SF-BLDG-PROP-LIN
	CREEK/DITCH CENTERLINE (EXIST.)	WHITE	DITCH	SF-DTCH-EXST-LIN
	CREEK/DITCH CENTERLINE (PROP.)	GREEN	DITCH	SF-DTCH-PROP-LIN
	CURB/PAVEMENT/SIDEWALK (EX)	WHITE	CONTINUOUS	SF-222A-EXST-LIN
	CURB/PAVEMENT/SIDEWALK (PROP)	CYAN	CONTINUOUS	SF-222A-PROP-LIN
	FENCE (EXISTING)	YELLOW	FNC1	SF-FENC-EXST-LIN
	FENCE (PROPOSED)	CYAN	FNC1	SF-FENC-PROP-LIN
	GUARDRAIL (EXISTING)	YELLOW	EGR1	SF-GURD-EXST-LIN
	GUARDRAIL (PROPOSED)	CYAN	PGR1	SF-GURD-PROP-LIN
	LAKE/POND	WHITE	LAKE	SF-LAKE-EXST-LIN
	MARSH/SWAMP PERIMETER	WHITE	MARSH	SF-SWMP-EXST-LIN
	RAILROAD	WHITE	R1R1	SF-RLRD-EXST-LIN
	RETAINING WALL (EXISTING)	WHITE	ERW1	SF-WALL-EXST-LIN
	RETAINING WALL (PROPOSED)	CYAN	PRW1	SF-WALL-PROP-LIN
	RIVERBANK/SHORELINE	CYAN	CONTINUOUS	SF-222B-EXST-LIN 222A = USE CURB/PVMT 222B = USE RIVR/SHOR
	SURVEY:			
	CENTERLINE (EXISTING)	YELLOW	EXCNTL	SV-CNTL-EXST-LIN
	CENTERLINE (PROPOSED)	GREEN	PROCNTL	SV-CNTL-PROP-LIN
	CONTOUR (DEPRESSION)	YELLOW	DEC1	SV-CONT-DEPR-LIN
	CONTOUR (EXISTING)	YELLOW	CON	SV-CONT-EXST-LIN
	CONTOUR (INDEX)	CYAN	CON	SV-CONT-INDX-LIN
	CONTOUR (PROPOSED)	CYAN	CONTINUOUS	SV-CONT-PROP-LIN
	DONATION LAND CLAIM (EXIST.)	CYAN	DLC	SV-DLCM-EXST-LIN
	DONATION LAND CLAIM (PROP.)	GREEN	DLC	SV-DLCM-PROP-LIN
	EASEMENT (PERMANENT)	CYAN	CONTINUOUS	SV-ESMT-PERM-LIN
	EASEMENT (TEMPORARY)	CYAN	TEMPESMT	SV-ESMT-TEMP-LIN
	MEANDER LINE	YELLOW	MEANDER	SV-MEAN-EXST-LIN
	PROPERTY LINE (EXISTING)	YELLOW	PROPERT	SV-PROP-EXST-LIN
	PROPERTY LINE (PROPOSED)	CYAN	PROPERT	SV-PROP-PROP-LIN
	RANGE/TOWNSHIP LINE	GREEN	CONTINUOUS	SV-222A-EXST-LIN
	RESERVATION/PARK/FOREST (EX)	CYAN	PARK	SV-PARK-EXST-LIN
	RESERVATION/PARK/FOREST (PRO)	GREEN	PARK	SV-PARK-PROP-LIN
	RIGHT-OF-WAY (EXISTING)	CYAN	EXROW	SV-ROFW-EXST-LIN
	RIGHT-OF-WAY (PROPOSED)	GREEN	CONTINUOUS	SV-ROFW-PROP-LIN
	RIGHT-OF-WAY (LIMITED ACCESS)	CYAN	ROWL1	SV-LROW-EXST-LIN
	RIGHT-OF-WAY (LIMITED ACCESS)	GREEN	ROWL1	SV-LROW-PROP-LIN
	SECTION LINE	GREEN	SECT	SV-SECT-EXST-LIN
	QUARTER SECTION LINE	CYAN	QTRSECT	SV-QSCT-EXST-LIN
	SIXTEENTH SECTION LINE	CYAN	16THSECT	SV-16ST-EXST-LIN
	STATE/COUNTY/CORPORATE LIMIT	GREEN	STATE	SV-222B-EXST-LIN
	STATE/COUNTY/CORPORATE LIMIT	GREEN	STATE (PLINE .03"WIDE)	SV-222B-PROP-LIN 222A = USE RANG/TWNS 222B = USE STAT/CNTY/CITY
	UTILITIES (EXISTING):			
TV	CABLE TELEVISION (AERIAL)	RED	ATV	TV-ALIN-EXST-LIN
TV	CABLE TELEVISION (BURIED)	RED	TV	TV-BLIN-EXST-LIN
FM	FORCE MAIN	MAGENTA	FM	SS-PLIN-EXST-LIN
G	GAS	MAGENTA	G	GS-PLIN-EXST-LIN
O	OIL	MAGENTA	O	OL-PLIN-EXST-LIN
P	POWER (AERIAL)	RED	AP	PO-ALIN-EXST-LIN
P	POWER (BURIED)	RED	P	PO-BLIN-EXST-LIN
S	SANITARY SEWER	WHITE	S	SS-GLIN-EXST-LIN
STE	STEAM	MAGENTA	STE	ST-PLIN-EXST-LIN
D	STORM DRAINAGE	WHITE	D	SD-2222-EXST-LIN
T	TELEPHONE (AERIAL)	RED	AT	TL-ALIN-EXST-LIN
T	TELEPHONE (BURIED)	RED	T	TL-BLIN-EXST-LIN
	UTILITY SERVICE LINE (GENERAL)	YELLOW	SERV	11-SERV-EXST-LIN
W	WATER	MAGENTA	W	WA-2222-EXST-LIN 11 = INDICATE UTILITY TYPE 2222 = USE GLIN/PLIN
	UTILITIES (PROPOSED):			
	MAIN LINE (LIST TYPE, SIZE, ETC.)	*	CONTINUOUS (P-LINE .04" WIDE)	11-2222-PROP-LIN
	SERVICE (LIST TYPE, SIZE, ETC.)	*	CONTINUOUS	11-SERV-PROP-LIN 11 = INDICATE UTILITY TYPE 2222 = USE ALIN/BLIN/GLIN/PLIN ALIN = AERIAL LINE BLIN = BURIED CONDUIT GLIN = GRAVITY LINE PLIN = PRESSURE LINE

* COLOR DEPENDS ON TYPE OF UTILITY (E.G. POWER, WATER, ETC.)
*** INSERT ELEVATION AT 6' INTERVALS (TEXT 0.1" HIGH)

NOTES

1. PRINT APWADOC2.DOC FOR MORE INFORMATION ON SYMBOL/LINETYPE INSERTION AND USE OF APWA MENUS.
2. INSERT MON OR MON-IN-CASE SYMBOLS INTO CENTER OF MONUMENTED SECTION CORNERS.
3. USE WATER VALVE AND FITTING SYMBOLS FOR SEWER FORCEMAIN VALVES AND FITTINGS.
4. LINETYPES ARE LOADED FROM THE APWALIN2.LIN LINETYPE FILE.
5. DITCH LINETYPE FLOW DIRECTION ARROW MUST BE INSERTED AT ENDS OF DASHED LINES AS SHOWN ABOVE (BLOCK NAME IS "FL").
6. COMPOSITE LINETYPES ARE DRAWN USING LISP ROUTINES IN APWA MENUS. ALTERNATE METHOD IS TO INSERT BLOCKS ALONG CONTINUOUS LINES AS FOLLOWS:

LINETYPE	BLOCK	SPACING (INCHES)
EXISTING FENCE	FP	1.0
PROPOSED FENCE	FP	1.0
EXISTING GUARDRAIL	GR	1.0
PROPOSED GUARDRAIL	GRP	1.0
EXISTING RAILROAD	RR	0.5
EXISTING RETAINING WALL	EW	0.25
PROPOSED RETAINING WALL	PW	0.25
DEPRESSION CONTOUR	DEP	0.1
LIMITED ACCESS R.O.W.	LA	0.1

7. LINEWEIGHTS ARE BASED ON DISPOSABLE LIQUID INK PLOTTER POINT SIZES:

COLOR	PEN SIZE	NUMBER
YELLOW	0.25	3x0
MAGENTA RED WHITE	0.35	0
CYAN	0.5	1
GREEN	0.7	2 1/2

MORE SIZES AVAILABLE IF USE REFILLABLE PLOTTER POINTS.

NO	DATE	BY	APPR	REVISIONS

American Public Works Association — Washington State Chapter

Approved By

DESIGNED BY DATE

DRAWN BY DATE

CHECKED BY DATE

CADD STANDARDS

OCTOBER 1988

SHT 1 OF 1

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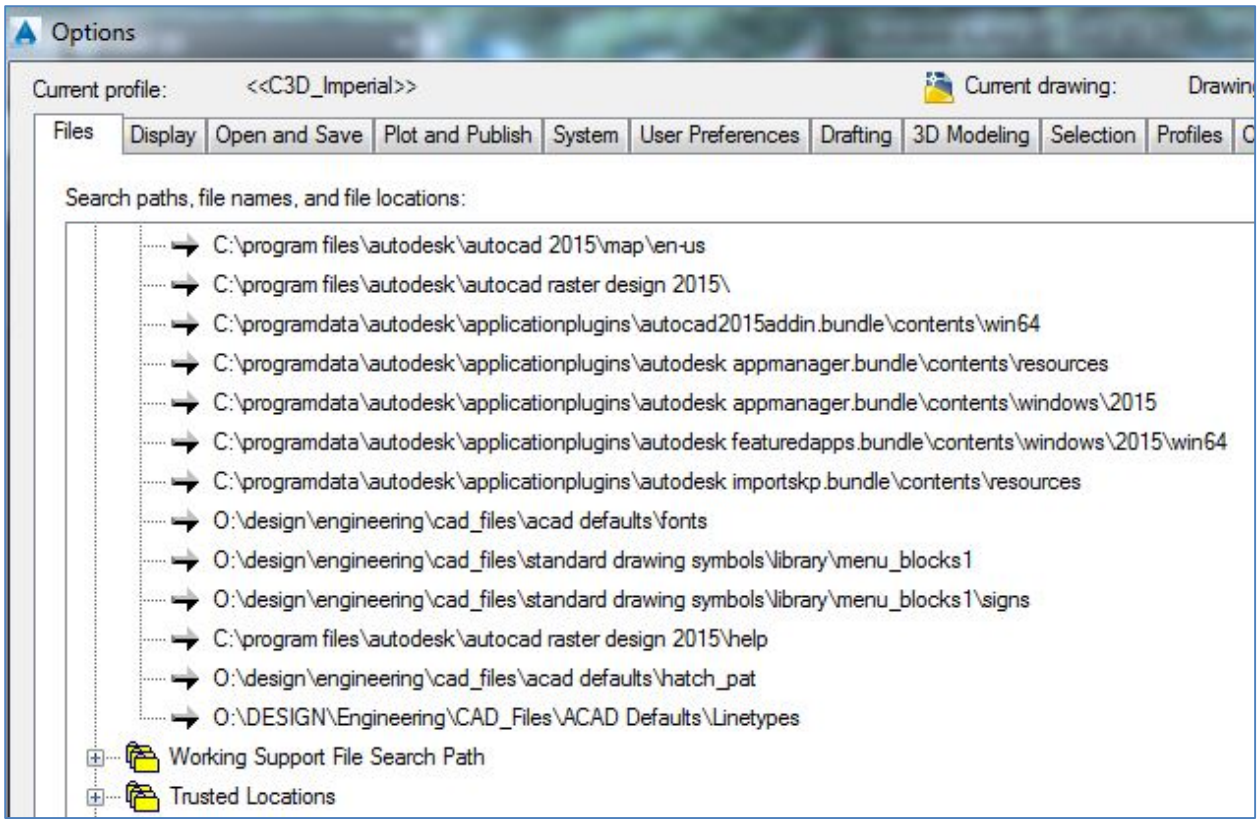
Appendix F

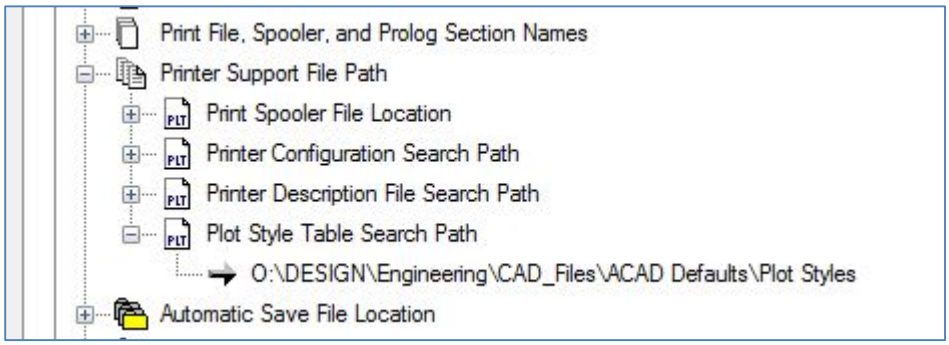
Thurston Co. CADD Standards AutoCAD Menu

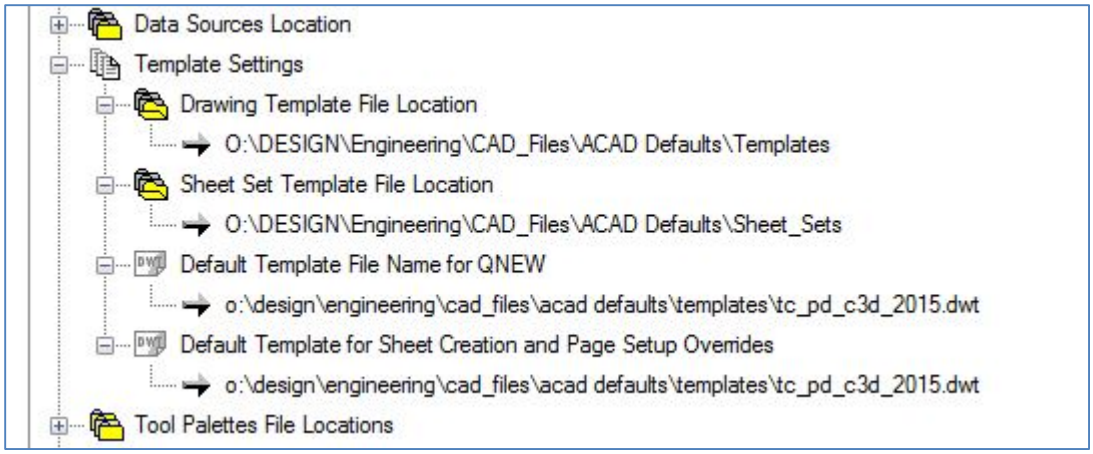
The TC Standards Menu for AutoCAD has been created to simplify adherence to standards and to provide quick access to the block library and standard symbols. The TC Standards menu saves time and prevents errors by automating routine CAD operations like layer creation, text style creation, standard symbols and details insertion, custom layer tools and access to the CADD Manual. The menu is loaded as an external cui file (**TC_Enterprise_2.cuix**) and relies on certain support paths that should be specified in the support path search tab in the AutoCAD options settings. See Appendix G – Support Files and Paths for more information.

Appendix G

Support Files and Paths



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Template Settings
Drawing Template File Location
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Sheet Set Template File Location
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Default Template File Name for QNEW
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Default Template for Sheet Creation and Page Setup Overrides
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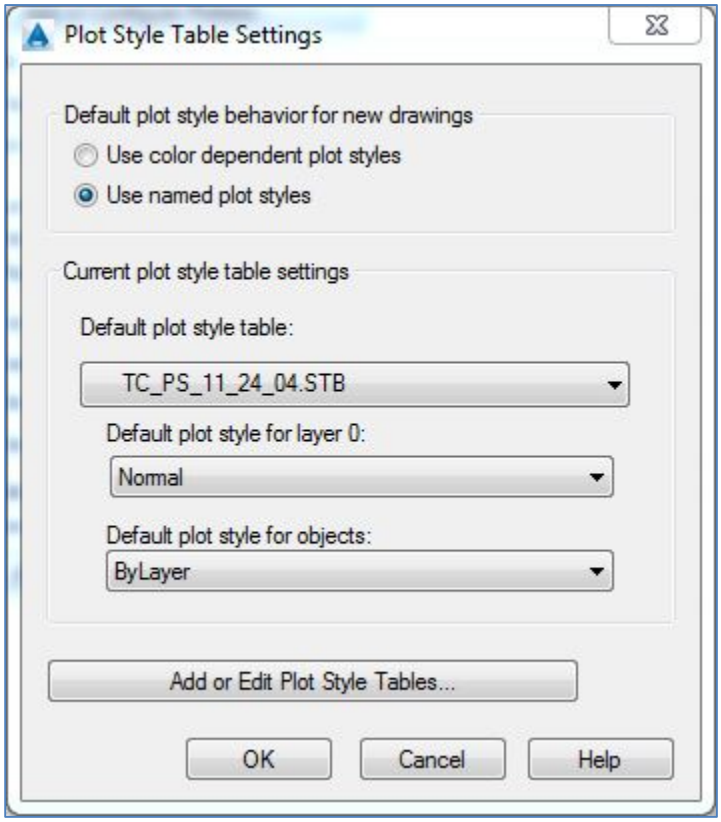
Tool Palettes File Locations


Plot Style Table Settings
Default plot style behavior for new drawings
Use color dependent plot styles
Use named plot styles
Current plot style table settings
Default plot style table:
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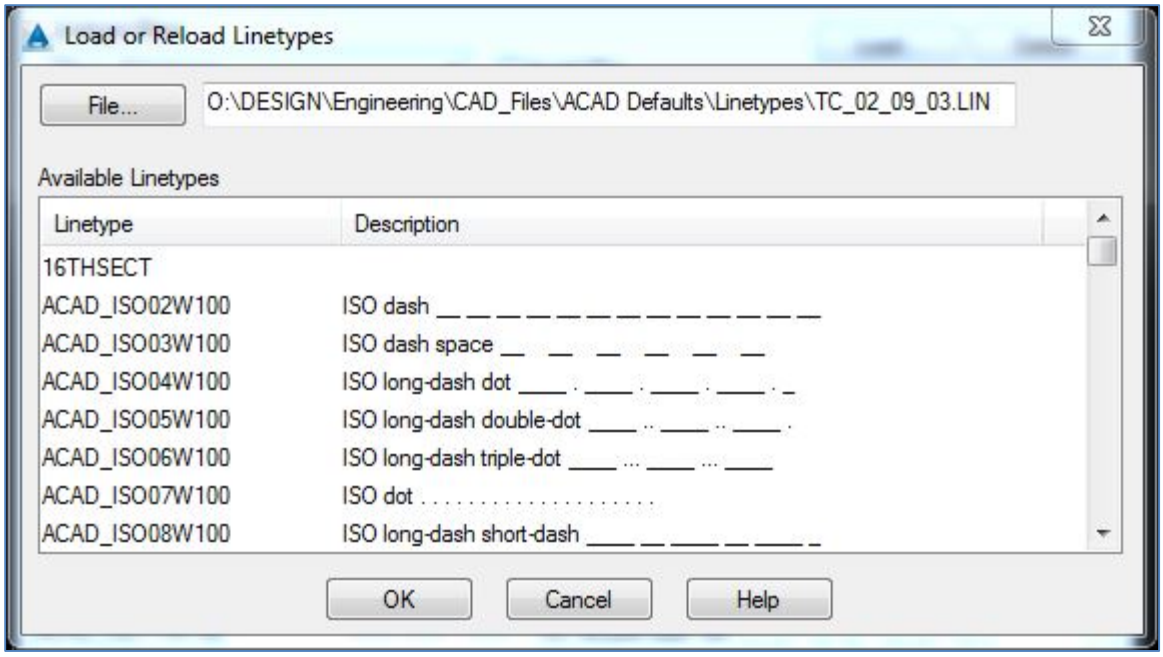
Default plot style for layer 0:
Normal
Default plot style for objects:
ByLayer
Add or Edit Plot Style Tables...
OK
Cancel
Help


Load or Reload Linetypes
File...
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Available Linetypes
Linetype
Description
16THSECT
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ISO dash
ACAD_ISO03W100
ISO dash space
ACAD_ISO04W100
ISO long-dash dot
ACAD_ISO05W100
ISO long-dash double-dot
ACAD_ISO06W100
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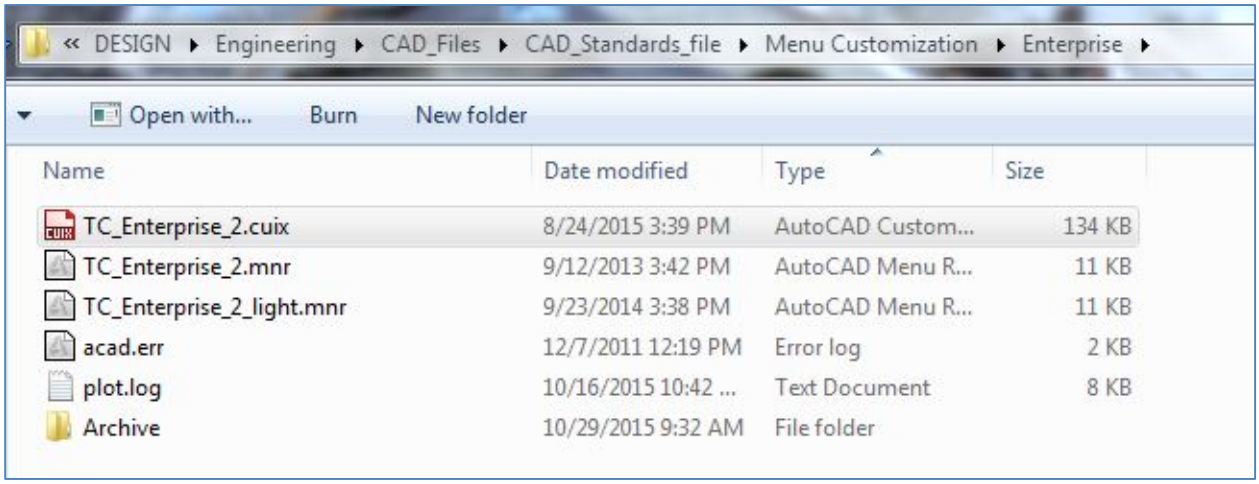
ACAD_ISO07W100
ISO dot
ACAD_ISO08W100
ISO long-dash short-dash
OK
Cancel
Help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Name
Date modified
Type
Size
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134 KB
TC_Enterprise_2.mnr
9/12/2013 3:42 PM
AutoCAD Menu R...
11 KB
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