

Table of Contents

CHAPTER 11 - SURVEY STANDARDS	11-1
11.1 GENERAL	11-1
11.2 STANDARD FILE NAMES	11-1
11.3 RESOURCE FILES	11-2
11.3.1 CAiCE Feature table	11-2
11.3.1.1 List Files	11-2
11.3.2 CAiCE Cell Library	11-2
11.3.3 Translation Table	11-3
11.3.4 Additional CAiCE Tables and Cell Libraries	11-3
11.3.5 CAiCE Special Characters	11-3
11.4 USING THEME VIEWER TO CREATE GRAPHICS	11-4
11.5 USING CDG2V8 MACRO UTILITY.....	11-9
11.6 GEOPAK SURVEY	11-10
11.7 IMPORTING CAiCE INTO GEOPAK SURVEY	11-11
11.7.1 CREATING KCP POINTS AND SURVEY CHAINS	11-11
11.7.2 CREATING A GEOPAK PROJECT	11-12
11.7.3 IMPORTING A DATASET INTO GEOPAK	11-16
11.7.4 DISPLAY BY FEATURE	11-18
11.7.5 EXPORTING SELECTION TO 2D DELIVERABLE	11-20
11.7.6 VISUALIZING FEATURE ELEMENTS WITH NAVIGATOR.....	11-23
11.8 SURVEYING DATA.....	11-24
11.9 PROFESSIONALS' ELECTRONIC DATA DELIVERY SYSTEM (PEDDS)	11-25
11.10 SYMBOLOGY STANDARDS	11-25
11.11 QUALITY CONTROL.....	11-36
11.12 COUNTY MAPPING	11-37

Chapter 11 - SURVEY STANDARDS

CADD Production Criteria Handbook

11.1 GENERAL

This chapter will describe the minimum CADD requirements for survey operations.

11.2 STANDARD FILE NAMES

Florida Department of Transportation (FDOT) utilizes standard naming conventions for all of its files. Some of the automation implemented in various tools provided by FDOT depends on naming conventions being met. More importantly, the naming convention confers information to the downstream customer of the data.

Standard file names should follow this format: AAAABB##.ext

Where **AAAA** = abbreviated file description, **BB** = Discipline Denotation, **##** =Sequence number.

Note Please see CADD Production Criteria Handbook (CPOCH) Chapter 4 for more information.

The following table defines the Survey File Name Standards in regards to FDOT Projects with the understanding that each file name will include sequence numbering. MicroStation design files are typically produced representing the existing objects located during survey operations and for County Mapping operations.

File Type	File Name	Model Name	File Description	Rule File	Seed File	Critical File
Project Network Control	CTLSRD.dgn	Default	Survey Project Control Sheet	ctlsrd.rul	\$(MX_SEEDIR)fdotseed2d.dgn	
Existing Drainage	DREXRD.dgn	Default	Graphics design file containing existing drainage features	drexrd.rul	\$(MX_SEEDIR)fdotseed2d.dgn	X
Existing DTM	GDTMRD.dgn	Default	Graphics files of ground surface digital terrain models	dtmrd.rul	\$(MX_SEEDIR)fdotseed3d.dgn	
Existing Topography	TREERD.dgn	Default	Tree Survey Sheet	topord.rul	\$(MX_SEEDIR)fdotseed2d.dgn	
Existing Topography	TOPORD.dgn	Default	Graphics design file containing existing topographic features	topord.rul	\$(MX_SEEDIR)fdotseed2d.dgn	X
Existing Topography for R/W Maps	TOPORW.dgn	Default	Right of Way Mapping file containing existing Topography for mapping purposes only	toporw.rul	\$(MX_SEEDIR)rwseed2d.dgn	
Existing Utilities	UTEXRD.dgn	Default	Graphics design file containing existing utility features	utexrd.rul	\$(MX_SEEDIR)fdotseed2d.dgn	X
Verified Utilities	UTVHRD.dgn	Default	Survey of Verified Utilities (3D Version of UTEXRD.dgn)	utexrd.rul	\$(MX_SEEDIR)fdotseed3d.dgn	

Additional geometry input files may also be created for delivery to design. (Example: files of existing profiles, chains, points, etc.) All data delivered to the Department, including necessary directories and survey files, should be placed under the Survey discipline folder, which the FDOT standard directory structure includes for this purpose. Additional sub-directories may be created under the \Survey discipline folder to segregate and organize data. (Example: the case where a CAiCE project is placed within the project directory structure under the \Survey discipline folder for delivery.)

Note See Chapter 4 for requirements in creating additional sub-folders.

11.3 RESOURCE FILES

CAiCE and GEOPAK are the two principal applications used for processing survey data into MicroStation graphics files for FDOT. Each of these programs is feature driven for surveying operations. A feature table is utilized to look-up appropriate element symbology for given objects found in the survey.

The feature table provides the current standards data for Roadway Design and is loaded automatically to a default directory named **x:\CAiCE\FTB**, where “x” is the workstation drive letter where CAiCE is installed, when the FDOT2010 & FDOT Menu options are installed from the FDOT2010 Software Delivery CD. The naming convention for this table includes “E” for English and “10” for the 2010 standards.

11.3.1 CAiCE FEATURE TABLE

The Department provides the CAiCE feature table called **FDOTE_10.ftb** that is required to implement the level numbers (200+ through 9xxx) for the levels corresponding to the MicroStation DGN library file. This table is placed in the \CAiCE\FTB\ directory.

Note Earlier year's standards may also be installed.

A corresponding feature table called **FDOTE_10.ftm** is also loaded to the x:\CAiCE\FTB\ directory to control symbology on alignment chains (Geometry Chains with stationing). This table is used by the *Settings > Object Display > Geometry Chains* command in CAiCE to control the proper symbology of alignment stationing, station tics, and station labels based upon scale.

Note The name of the **.ftm** feature table must match the name of the active **.ftb** feature table in use during a CAiCE session.

11.3.1.1 LIST FILES

Feature List files, **FDOTTOPO.lis**, **FDOTDran.lis**, and **FDOTUtil.lis**, are also installed into the x:\CAiCE\FTB\ directory to assist the user in creating the CAiCE screen graphics containing the appropriate data for producing the three typical graphics files supplied to design, **TOPORD00.dgn**, **DREXR00.dgn**, and **UTEXRD00.dgn**. These List files are listings of the feature codes that belong in the respective design files. Consult your CAiCE documentation on the use of List files.

11.3.2 CAiCE CELL LIBRARY

MicroStation Cell libraries cannot be used or attached by CAiCE directly. (CAiCE could attach a V7 cell Library). The MicroStation cell library was translated to CAiCE's own version of a cell library (*.CCL versus *.CEL, hence **SYENG10.ccl** and **SURVEY10.ccl**). Note the differences in 11.3 for ROW Mapping.

When creating a CTLSRD.dgn file, three MicroStation cells, **CTLDAT**, **CTLDETL**, and **CTLTAB**, have been provided to aid in the insertion of project control data if needed. All three cells can be found in the Right of Way cell library (row.cel).

11.3.3 TRANSLATION TABLE

A Translation Table, *Edgntype.tbl*, is another resource file provided for CAiCE that maps CAiCE line styles to MicroStation custom line styles. This table is loaded automatically by the FDOT2010 Software Install routine into the x:\CAiCE\DGN\ subdirectory and is automatically called by CAiCE when screen graphics are saved to MicroStation graphics.

Note To have compatibility with MicroStation's long name cells and levels, two files, *DGNCell.TBL* and *DGNLevel.tbl*, were introduced and must reside under your \CAiCE\DGN\V8 directory.

11.3.4 ADDITIONAL CAiCE TABLES AND CELL LIBRARIES

Additional CAiCE feature tables and cell libraries are also provided for existing topography files, created for Right-of-Way mapping purposes. Mapping uses additional consolidation of certain monument symbols and has other symbolization requirements. The tables and cell libraries included are:

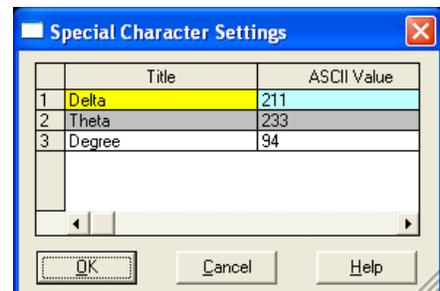
- **FDOTE_10RW.FTB**
Feature table containing the topography features used in ROW Mapping
- **FDOTE_10RW.FTM**
Corresponding table for controlling alignment / chain symbology and bearing / distance chain labeling (attaches automatically when *FDOTE_80RW.FTB* is attached)
- **Survey10.CCL**
CAiCE format of the cell library for use in ROW mapping
- **Survey10.CEL**
MicroStation format of the topo cell library for use in ROW mapping

11.3.5 CAiCE SPECIAL CHARACTERS

Note The MicroStation CDG2V8 Macro Utility described in 11.5 does not support True Type Fonts.

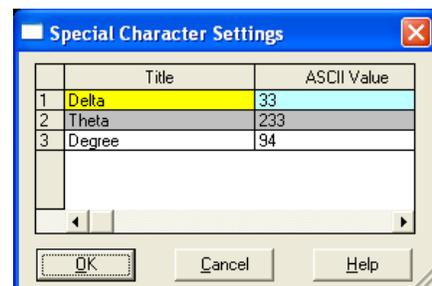
- **FDOT's font library 48 in MicroStation (roadway font)**

This does not use the standard ASCII table for all special characters. In particular, the degree symbol " ° " for MicroStation requires that CAiCE place the hat symbol " ^ " in text strings so MicroStation will look correct when data is translated to MicroStation graphics. To force CAiCE to substitute the " ^ " for " ° ", CAiCE needs to be set by selecting the menu options: *Settings > Special Characters* and set the ASCII value of 94 to represent degrees as shown in the figure to the right.



- **Right of Way project font 58 in MicroStation.**

If exporting to a Right of Way map, CAiCE needs to be set by selecting the menu items: *Settings > Special Characters* and set the ASCII value 33 to the Delta symbol as shown in the figure to the right.

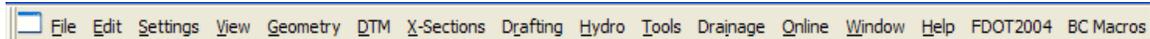


11.4 USING THEME VIEWER TO CREATE GRAPHICS

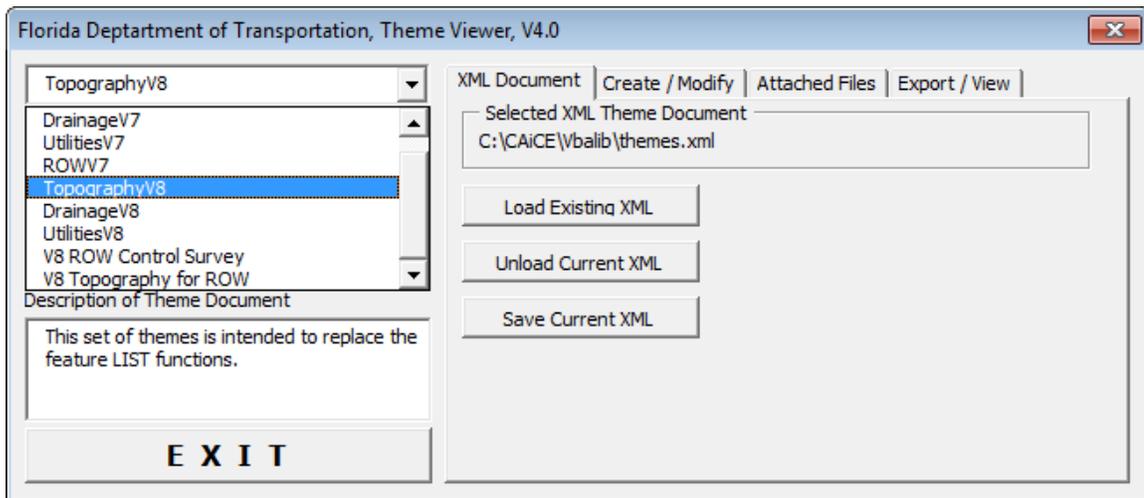
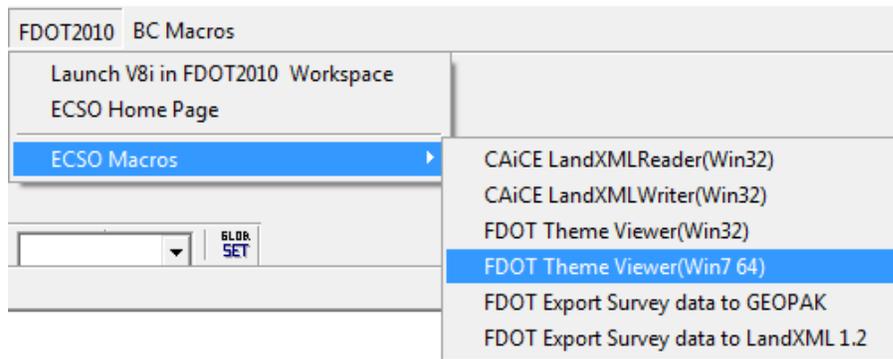
FDOT provides CAiCE VBA Macros that are accessible from the Menu Bar in CAiCE. When the FDOT2010 software is loaded, a folder \FDOT2010\CAiCE is created. The contents of this folder and all subdirectories should be copied to the root of the drive that contains the \CAiCE folder where the application is loaded. This is pointed to by Windows environment variable "KCDIR".

Once done, a custom FDOT2010 menu is added to the CAiCE Menu bar shown below:

Note This is functional only for CAiCE Visual Transportation 10, Service Pack 6 and higher.



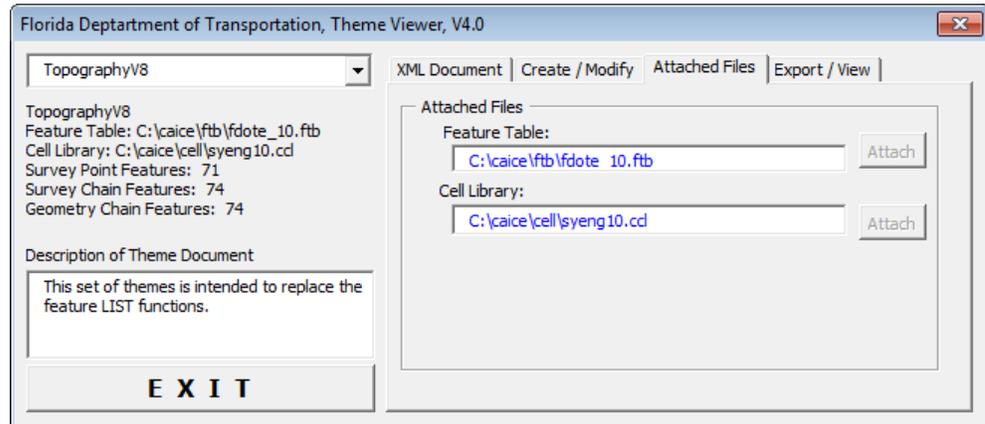
Select the **FDOT2010 > ECSO Macros > Theme Viewer Macro** as shown below:



The Theme Viewer application starts, ready to select a Theme (a series of view commands for Points, Survey Chains, and Geometry Chains to place on the Graphics screen BY Feature Code) from pane at the upper-left.

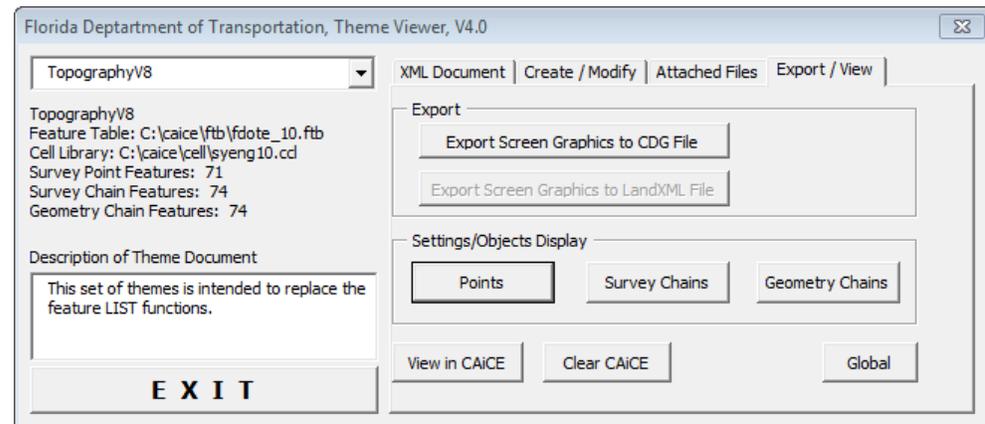
- **Attached Files Tab**

The **Attached Files** Tab sets the proper feature table and cell files for attachment. If CAICE can find the files, they will be shown with blue text like shown below. If the files are shown in red text, you may need to select the [Attach] button to locate them, or the ellipses button [...] to navigate and attach the proper files.

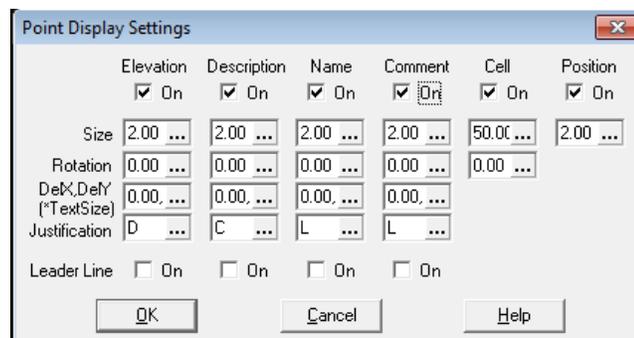


- **Export / View Tab**

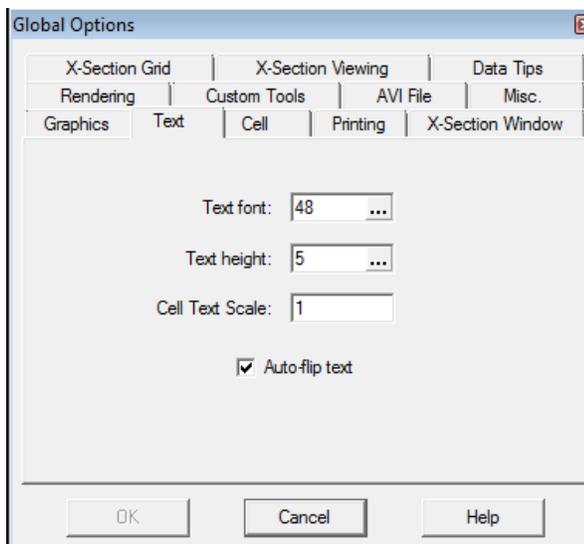
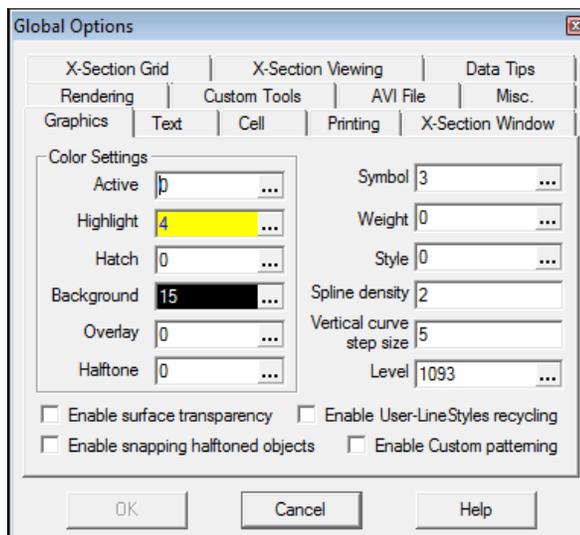
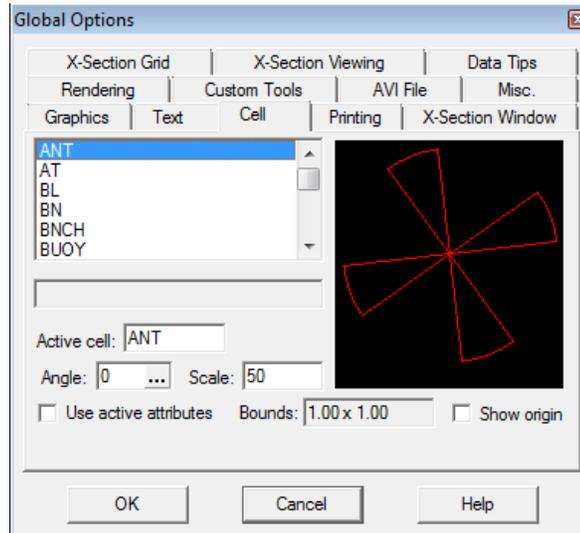
The Export / View Tab sets the Global Options for viewing and Object Display settings for Points, Survey Chains, and Geometry Chains. These settings control how those objects will appear and what additional graphics will be drawn when the theme is executed.



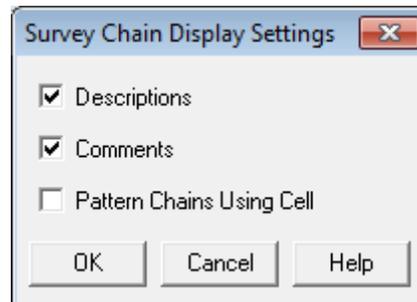
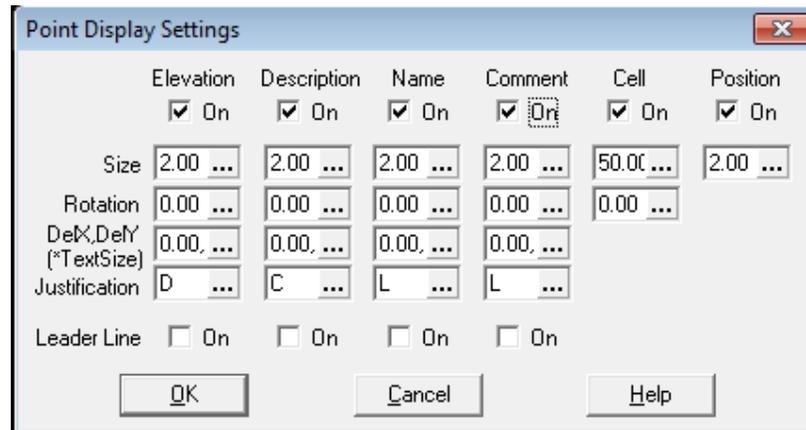
Note With the FDOT_10.ftb; if the point elevation, description, name, comment, cell and position boxes are checked on, these elements will be placed on their own corresponding bylevel when imported into MicroStation using the CDG2V8 Macro Utility described in 11.5. This gives the user the ability to maintain these features in MicroStation or turn each off individually using the MicroStation level display manager.



- Global Options The Theme Viewer interface has the option to set CAiCE Global viewing options with the [Global] button. The following are typically set:

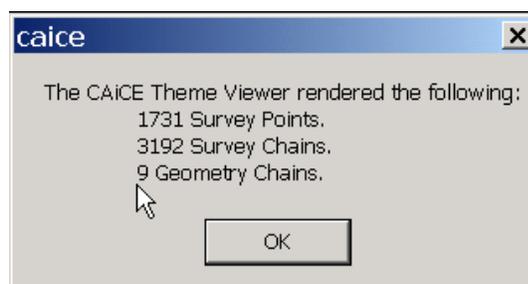


- Point Display Settings / Object Display buttons are also available to set graphics defaults for Points, Survey Chains and Geometry Chains:



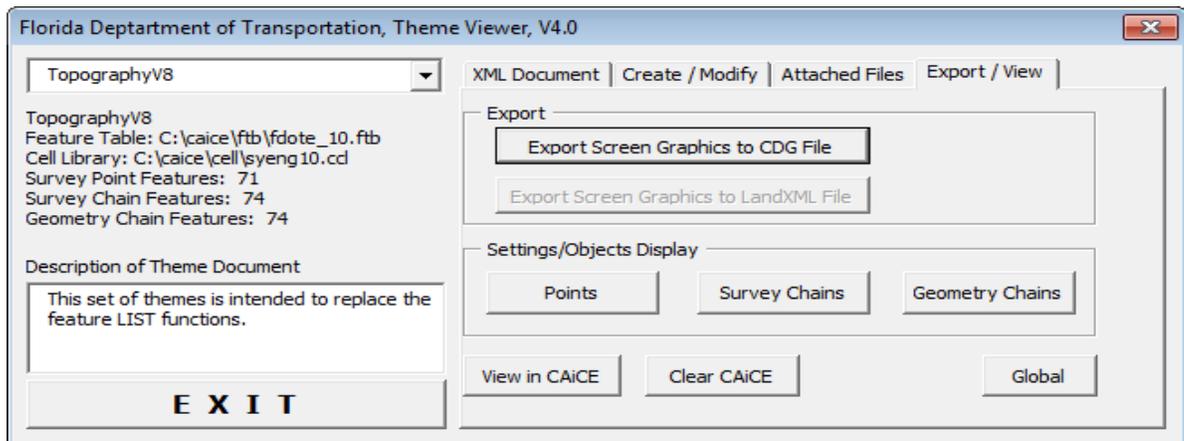
Note The Size values are set to "-1" in the Point Display Settings dialog.

- View in CAiCE button will display the graphics of the loaded theme. CAiCE will draw those objects at the sizes specified in the Global Options dialog Text tab shown previously, and cells at the scale specified by the scale at the Global Options dialog Cell tab. To change those settings to an absolute height each time you create views, change those "-1" values to override the defaults in Global Options. At any time, settings may be saved from the CAiCE Settings menu, for work in later CAiCE sessions. When CAiCE finishes drawing the objects to the screen, summary statistics are displayed:



- Clear CAiCE button clears and expunges the graphics in the CAiCE display window, if the results of the graphic content inside CAiCE are not what was intended. Adjustments can be made to the display settings for Global Options or the element display settings, and the [View in CAiCE] button selected again to redraw the graphics using the new settings.

- Export Screen Graphics to CDG File button exports and saves the graphics displayed on CAiCE's screen to a CAiCE Design Graphics (.**cdg**) file for the themes provided to draw existing topography, existing drainage, existing utilities which correspond to the files needed to create the design files: TOPORD00.dgn, DREXRD00.dgn, and UTEXRD00.dgn. The CDG file is an ASCII file which contains the commands to redraw the elements in CAiCE, and may also be read by a Macro running the FDOT2010 Menu to draw those same elements in MicroStation.
- In the example, once the topo is drawn, the graphics are ready to export by selecting the [Export Screen Graphics to CDG File] button and saving the file name for the topography as TOPORD00.CDG. Clear the graphics, select the next theme (Utilities, Drainage, etc.) as described before and repeat the steps until you have separate CDG files for each theme.



11.5 USING CDG2V8 MACRO UTILITY

Translation to MicroStation files from CAiCE requires the user to save a CAiCE Design Graphics (CDG) file of the graphics displayed on CAiCE's screen using methods described earlier. The CDG file is an ASCII file that contains the primitive points, lines, arcs, text, cell references, etc. that can be converted to MicroStation file format using a utility provided in the FDOT2010 Menu.

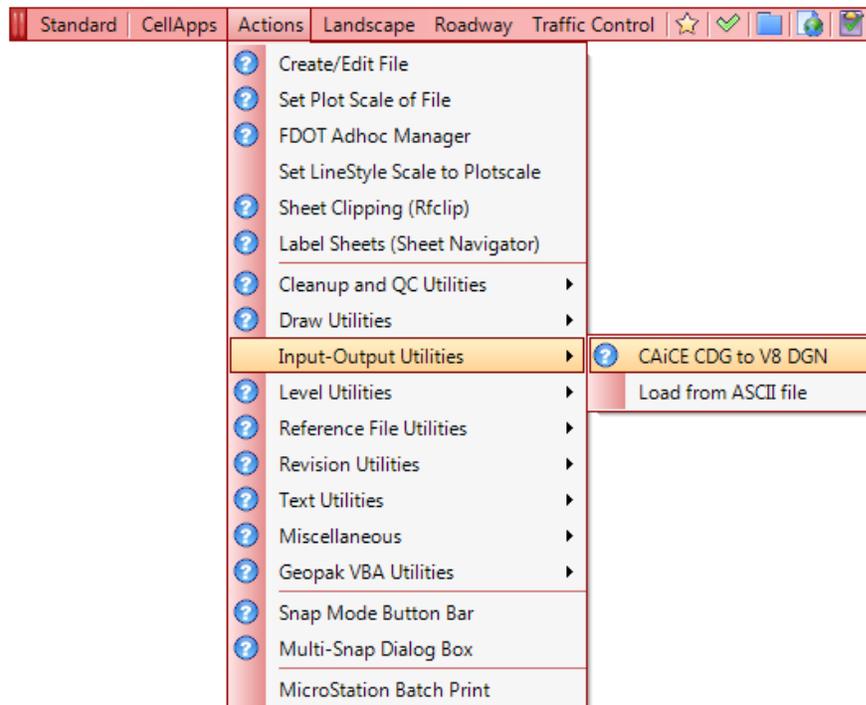
Once the CDG files are created, a design file is opened with MicroStation inside the FDOT2010 workspace for the graphics file you want translated. If the design file does not exist, it can be created from either MicroStation Manager (be certain to use the correct seed file for the type of DGN you are creating, that is a Roadway seed or a Right of Way Seed) or you may use the Create / Edit FDOT2010 Files application.

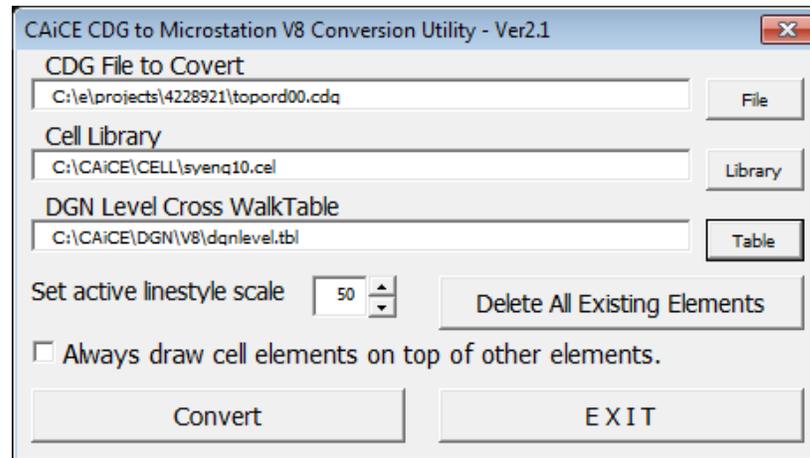
Note The user should pay attention to the MicroStation working environment in which the design file is opened. The user may select an appropriate environment from the FDOT2010 Menu pull down: Standard > Configuration.

Example: a TOPORD00.DGN has been opened created from the *fdotseed2d.dgn* seed file since the TOPORD00.DGN is intended for design. (MicroStation was configured to use the Standard Roadway Menu.)

The Utility is run from selecting the FDOT Menu pull down:

Actions > Input-Output Utilities > CAiCE CDG to V8 DGN as shown below:





- **CDG File to Convert**
The CDG you wish to import
- **Cell Library**
The MicroStation cell library used:
\\FDOT2010\RESOURCES\cell\SYENG.CEL –or– \CAiCE\CELL\SYENG10.CEL
For the Right-of-Way themes use:
\\FDOT2010\RESOURCES\cell\SURVEY.CEL –or– \CAiCE\CELL\SURVEY10.CEL
- **DGN Level Cross Walk Table**
The Level mapping table: \CAiCE\dgn\V8\DGNLEVEL.TBL
- **Set active line style scale**
The Scale for custom line styles
- **Convert button**
The Macro will read the CDG and begin using MicroStation to draw the elements in the CDG (If the conversion gives a VBA error the user needs to uncheck the box “Always draw elements on top of other elements”).
- **Delete All Existing Elements**
This tool deletes all elements in the open DGN file and must be used with caution.
This tool currently works with ordinary CDG files for graphics like lines, arcs, text, etc. IF you are creating a DGN of a TIN model from CAiCE, the triangles are placed as individual shapes in MicroStation. Remember to create a different DGN.

11.6 GEOPAK SURVEY

For GEOPAK, the Survey application uses a feature table called *FDOTE_10.smd*. This feature table is installed into the x:\FDOT2010\geopak\databases\ directory by the FDOT2010 Software Install routine (x is the drive letter where the FDOT2010 software is installed). The *FDOTE_10.smd* can be used when importing CAiCE KCP files or processing OBS files. The *FDOTE_10RW.smd* feature table is used to display the TOPORW.dgn file after importing CAiCE KCP data (see below). Note that older versions of this feature table may also be installed for legacy project compatibility (i.e. *FDOT2004.smd*)

Both GEOPAK and CAiCE use the same cell libraries for survey graphics. The cell library should be referenced from the x:\FDOT2010\RESOURCES\Cell directory and is also called *SYENG.cel*.

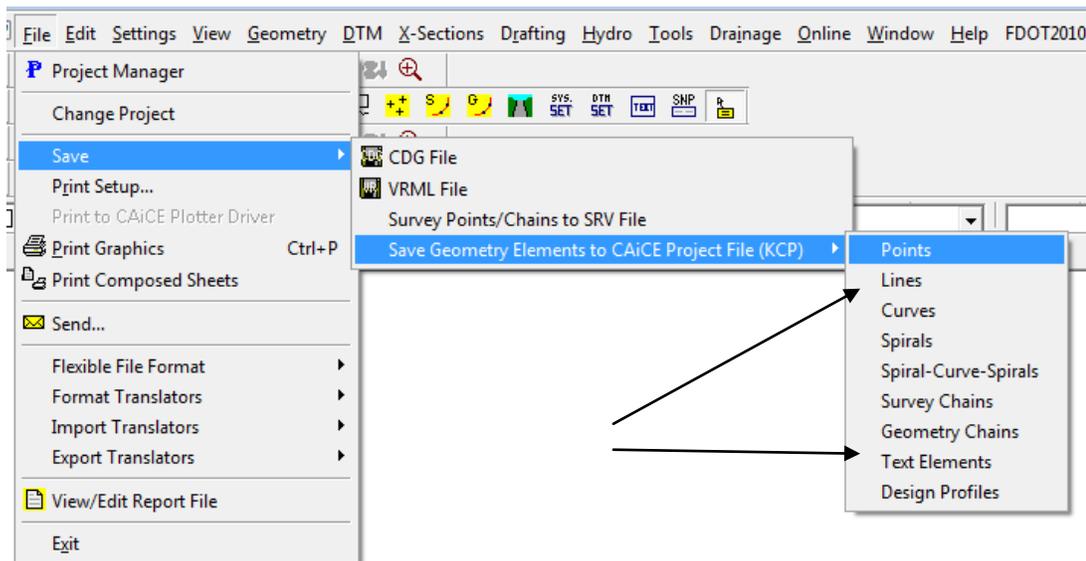
11.7 IMPORTING CAiCE into GEOPAK SURVEY

GEOPAK Survey can be used to import CAiCE points and survey chains directly into a GEOPAK coordinate job file (GPK file) using a CAiCE Project File (KCP). Importing KCP files from CAiCE will preserve the point and survey chain attributes such as features, descriptions and comments while maintaining scale and level structure. The *FDOTE_10.smd* can be used to “visualize” individual features or groups of features such as topography, utilities and drainage. These visualized features can be exported to create compliant deliverables, TOPORD, UTEXRD and DREXRD files, for design.

Note At this time, GEOPAK Survey will not import “geometry chains” from a KCP file into a GEOPAK coordinate geometry file (GPK). Only points and survey chains can be imported from a KCP file using GEOPAK Survey. A GEOPAK “**INPUT**” file must be used to create geometry chains from CAiCE data.

11.7.1 CREATING KCP POINTS AND SURVEY CHAINS

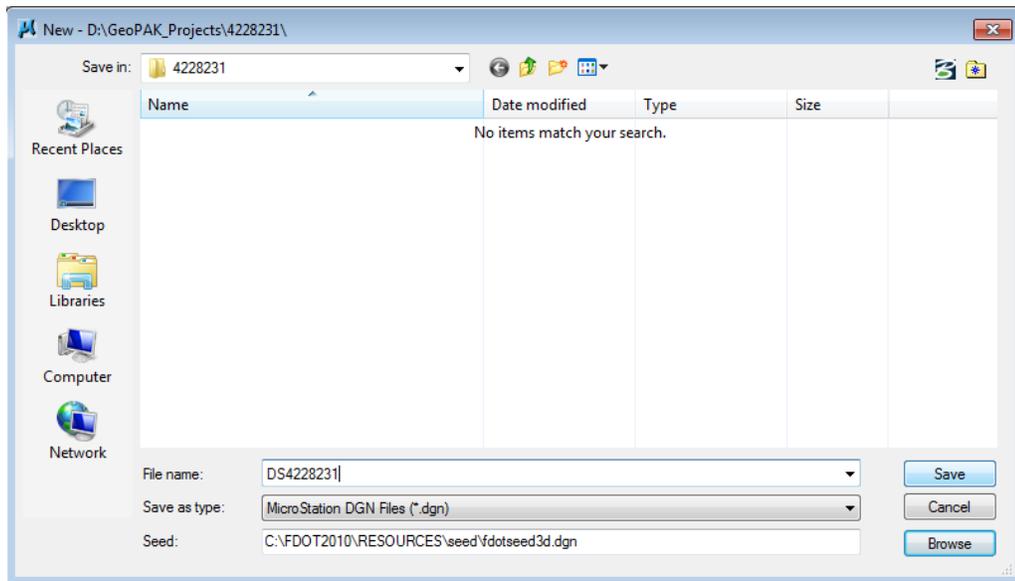
CAiCE will save a KCP file from the menu bar by selecting **File>Save>Save Geometry Elements to CAiCE Project File (KCP)**. Two separate KCP files should be saved for importing into GEOPAK Survey. One containing “**Points**”, the other containing “**Survey Chains**”



11.7.2 CREATING A GEOPAK PROJECT

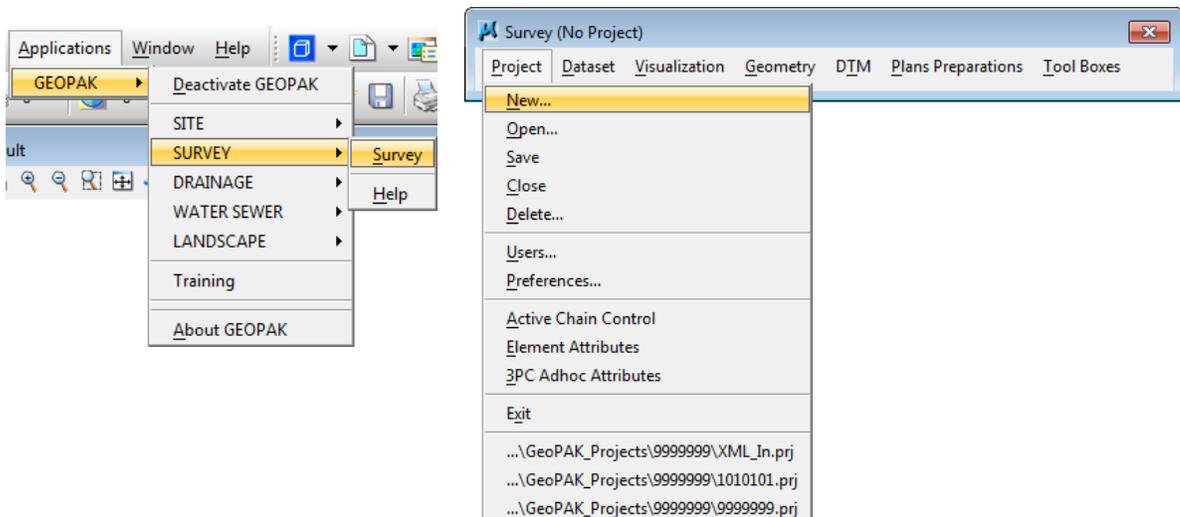
The first step in creating a GEOPAK Project is to create a folder structure (ie. c:\GEOPAK_PROJECTS\1234567). It is important to note that no spaces should be used in the folder structure. This will affect the GEOPAK editor.

Once a folder is created a 3D MicroStation design file should be created in the project folder as a master survey design file. Use the fdotseed3d.dgn seed file to create the master design survey file. This needs to be a 3D MicroStation file to build a surface DTM from the survey data.

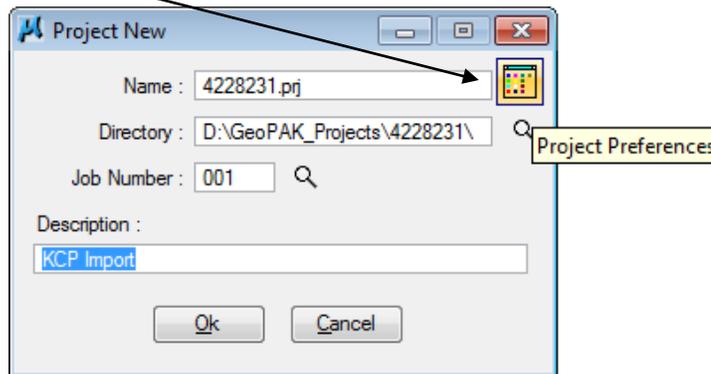


To Create a GEOPAK project, open the MicroStation master survey design file and select from the menu **Applications>GEOPAK>SURVEY>Survey** to open the GEOPAK Survey Menu Bar.

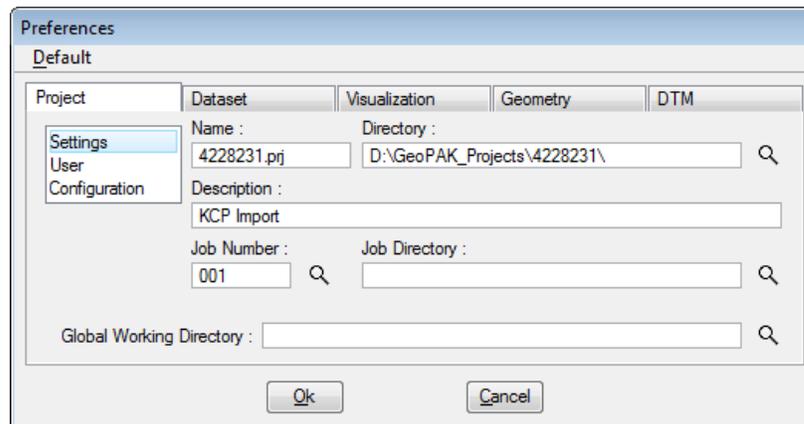
From the Survey Menu Bar select **Project>New...** this will open the Project New dialogue box. It is important to set the preferences for the project before pressing the Ok button.



Select the **Project Preferences** button to set the specific project preferences:

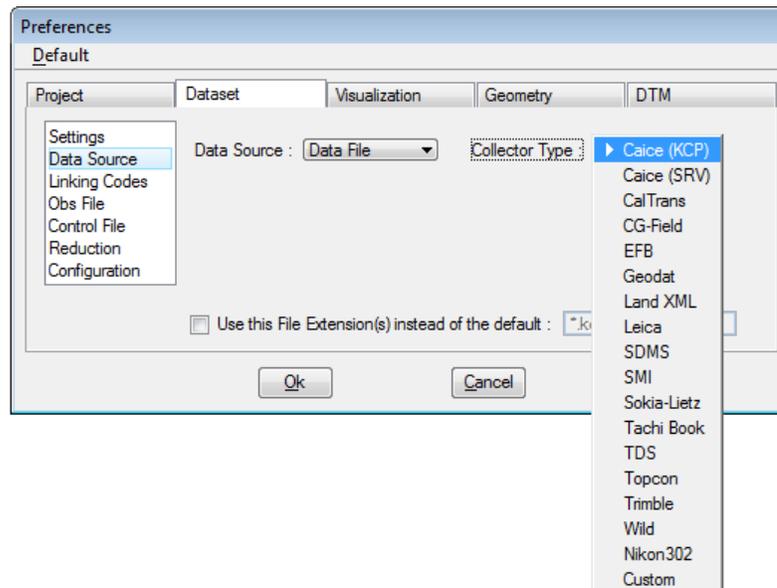


In the Preferences dialogue box under the **Project tab >Settings**, give the project a name, set the working directory and create a GEOPAK coordinate geometry Job Number. Specific user settings can be set under the **Project tab > User** selection:

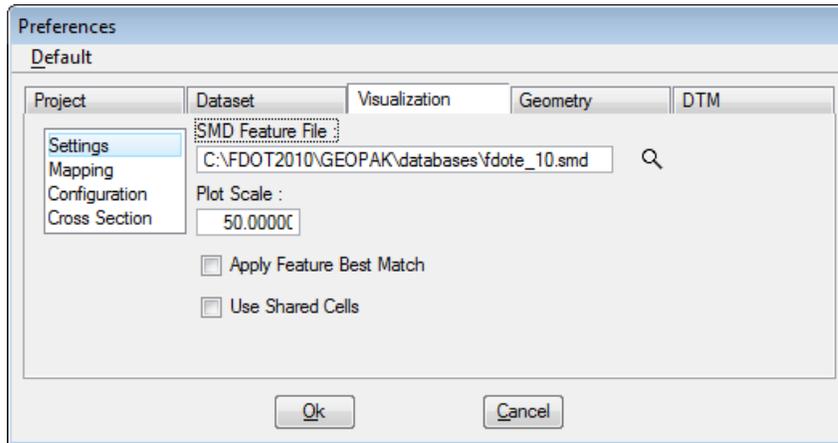


In the Preferences dialogue box under the **Dataset tab >Settings**, the default data set name and description can be set however, these also can be set when the data set is created.

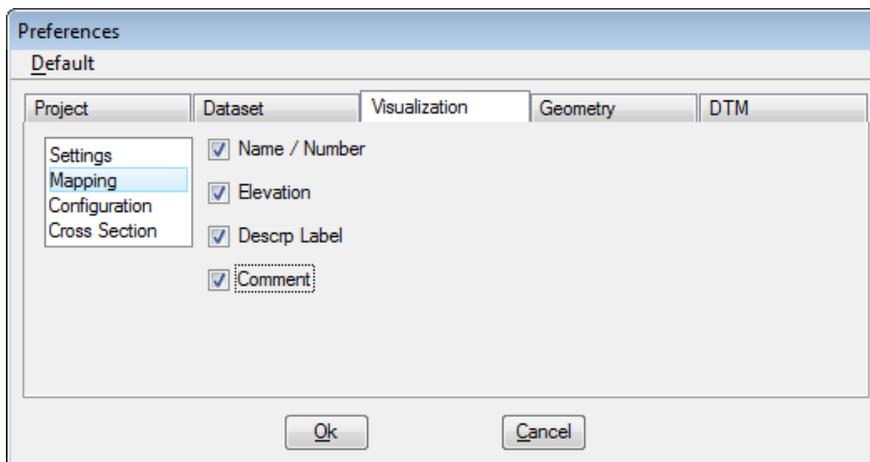
In the Preferences dialog under the Dataset tab > **Data Source**, set the Data Source to “Data File” and the Collector Type to “Caice (KCP)”:



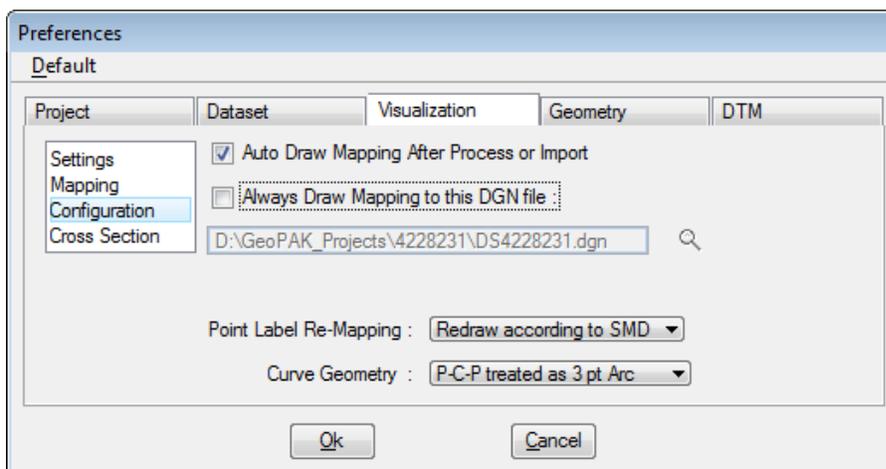
In the Preferences dialogue box under the **Visualization Tab > Settings**, set the SMD Feature File to ...FDOT2010\GEOPAK\databases\fdote_10.smd. Also the Plot Scale of the features to be visualized in the drawing can be set at this time:



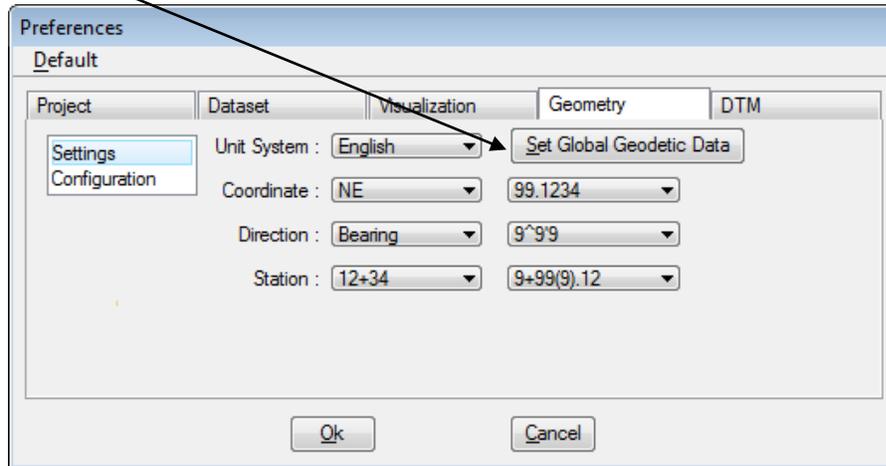
In the Preferences dialogue box under the **Visualization Tab > Mapping**, choose the point attributes that you wish to visualize into the drawing.



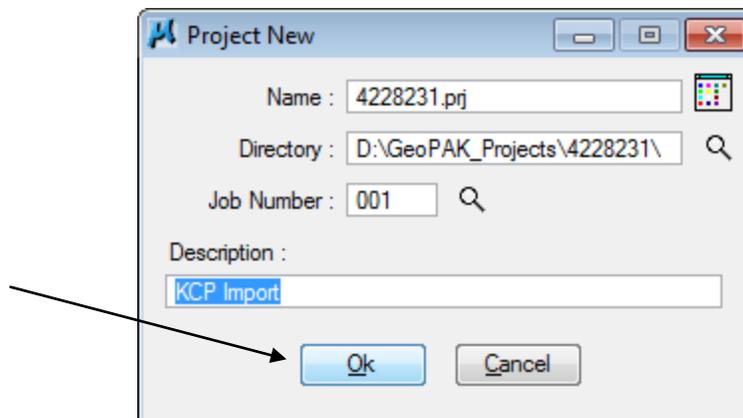
In the Preferences dialogue box under the **Visualization Tab > Configuration**, various settings are available including what file is to be used to visualize the data. If no file is chosen the data will be drawn into the active drawing. Put a check in the Auto Draw Mapping After Process or Import box to automatically visualize elements during import.



In the Preferences dialogue box under the **Geometry Tab > Settings**, select the “Set Global Geodetic Data” button to set the State Plane projection of the project. Also the significant digits shown for the project can be set under the Geometry tab.

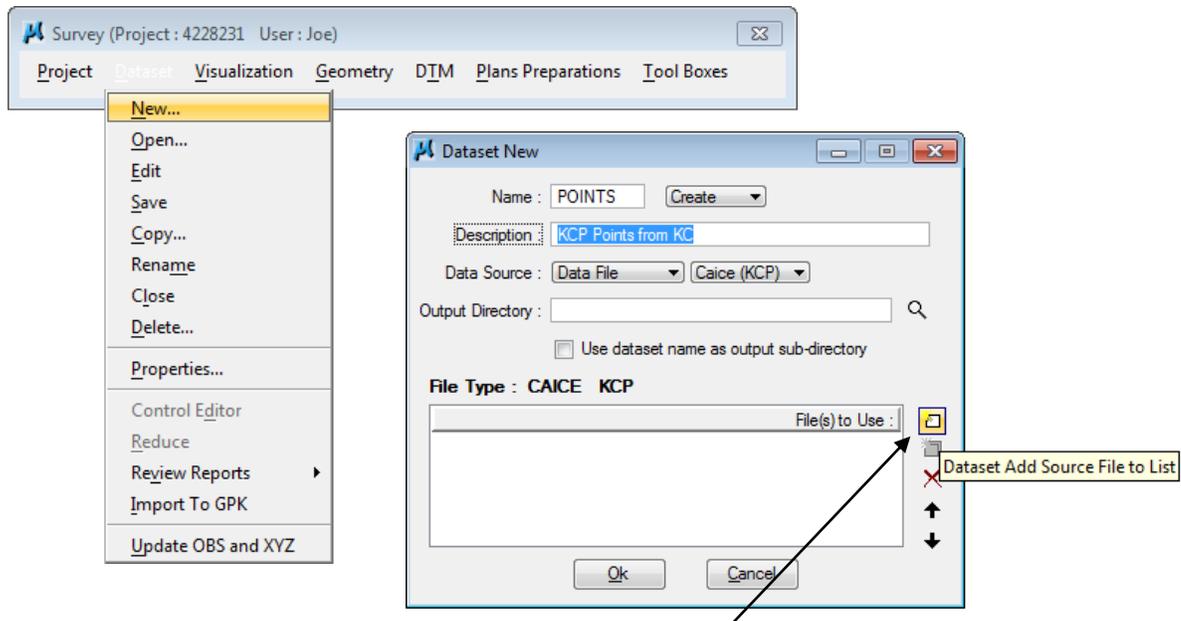


After the preferences are set in the Preferences dialogue box select the Ok button to accept these preferences. In the Project New dialogue box select Ok to create the project.

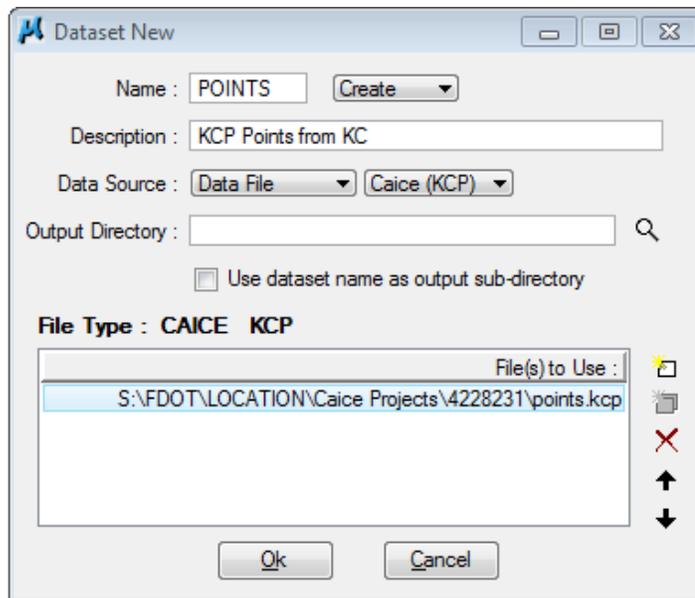


11.7.3 IMPORTING A DATASET INTO GEOPAK

On the Survey Menu Bar select **Dataset>New** to open the Dataset New dialogue box.

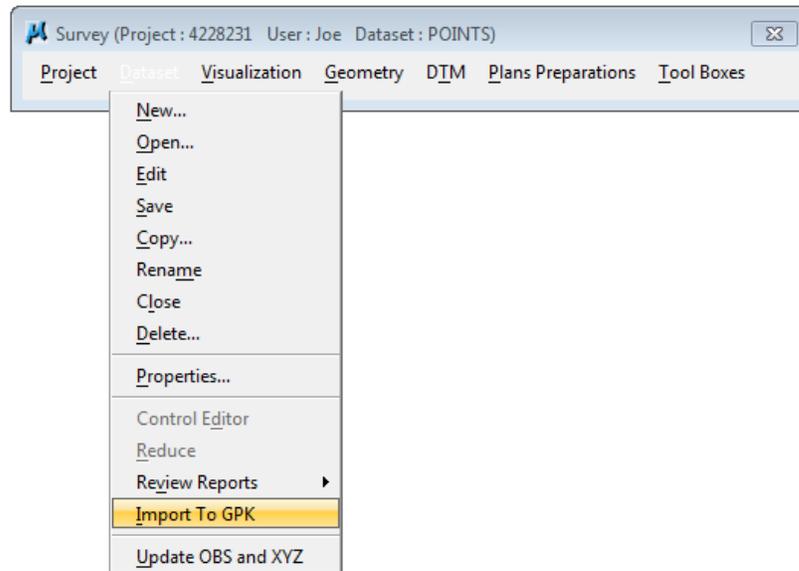


In the Dataset New dialogue box, give the dataset a name. Points should be brought in before the chains. Select the **Dataset Add Source File to List** button and choose the points KCP file saved from CAiCE. The path and file will be added to the Dataset New dialogue box window.

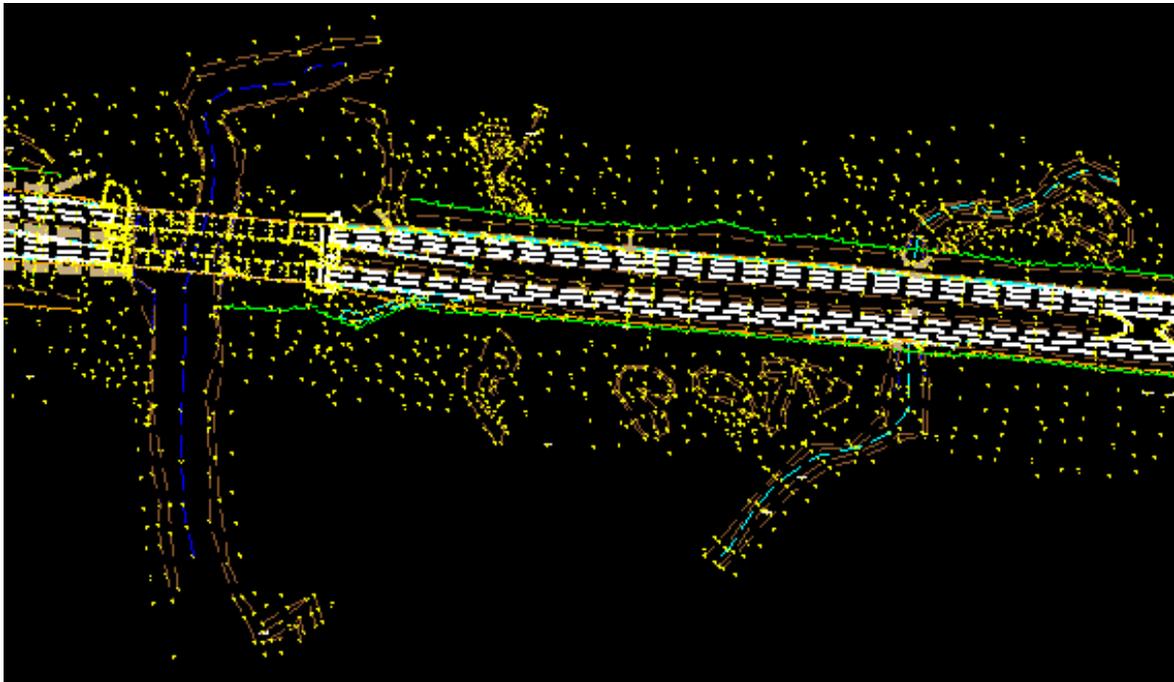


Press **Ok** to create the new dataset. Once the data set is created it can be viewed with the survey editor by selecting **Dataset > Edit** from the Survey Menu Bar.

From the Survey Menu Bar select **Dataset>Import to GPK** to import the points into the Job file created with the project. If the Auto Draw Mapping After Process or Import box is checked then the points will have automatically been drawn into MicroStation during import.



Repeat the IMPORT A DATASET INTO GEOPAK process for the chains KCP file saved from CAiCE. Again, the chains should have automatically been drawn into MicorStation during the import. Also points and chains should be correctly scaled. Once the dataset is imported it can be closed.

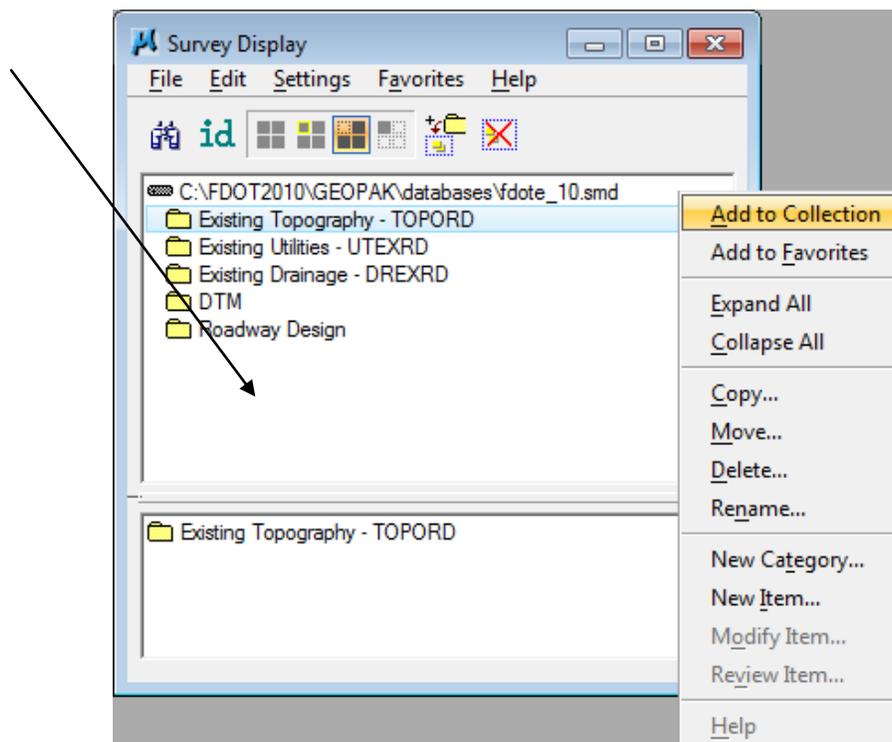


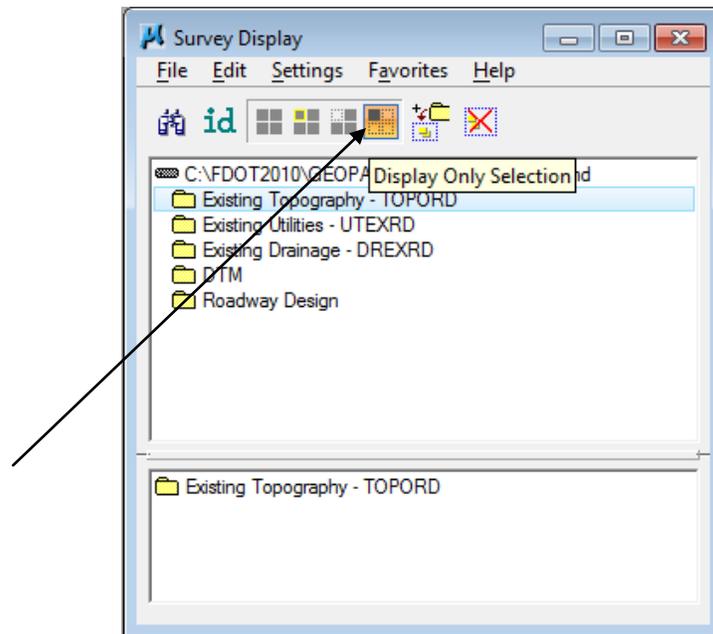
11.7.4 DISPLAY BY FEATURE

Displaying or visualizing the points and survey chains by feature is important for creating the 2D MicorStation deliverables, TOPORD, UTEXRD and DREXRD dgn files. From the GEOPAK Survey Menu Bar select **Visualize>Display>By Feature** to bring up the Survey Display dialogue box. The *fdote_10.smd* feature file should be open and active. The four checker board buttons across the front are the active display modes. The Normal Display shows all features regardless of selection. The Highlight Selection button highlights the current feature selection. The Hide Selection button turns off or “hides” the current feature selection. The Display Only Selection button displays the current selection and turns off all other features

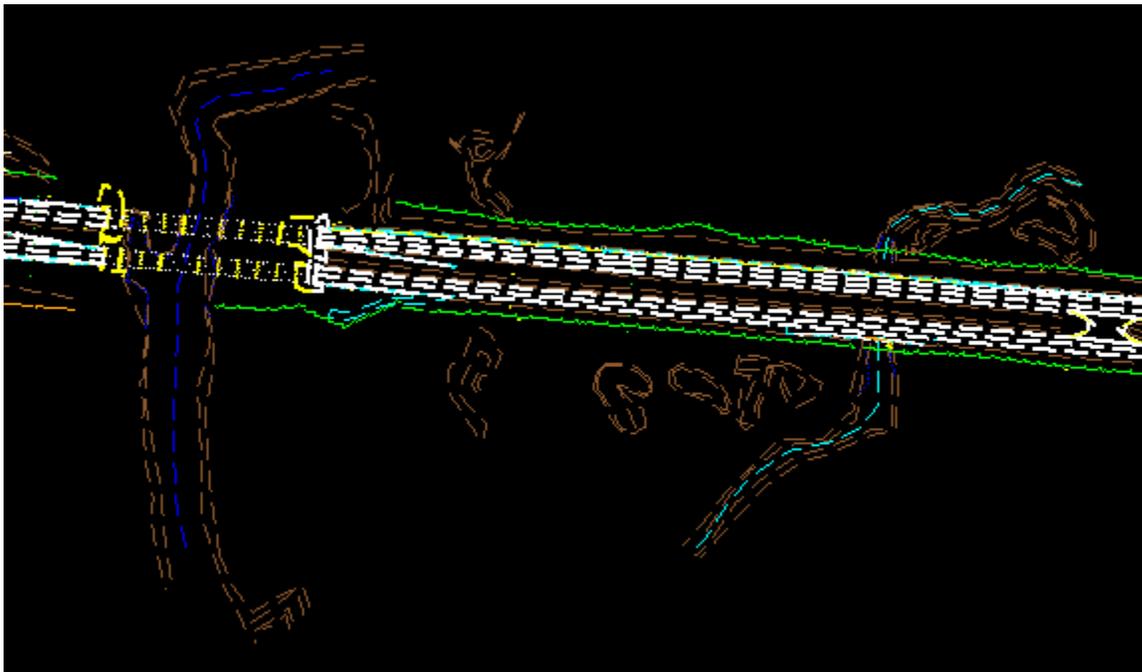
To select a feature or feature group simply highlight the desired folder or open the folder and highlight the desired feature. Another way to select a feature or features from various groups is to right click on a folder or feature and select the **Add to Collection** command. This will add the desired selection to the bottom pane of the Survey Display dialogue box.

Note When the collection pane is populated at the bottom of the Survey Display dialogue box, it overrides all other highlighted folders or features in the above feature list. Only features in the collection pane are “selected” for display purposes.



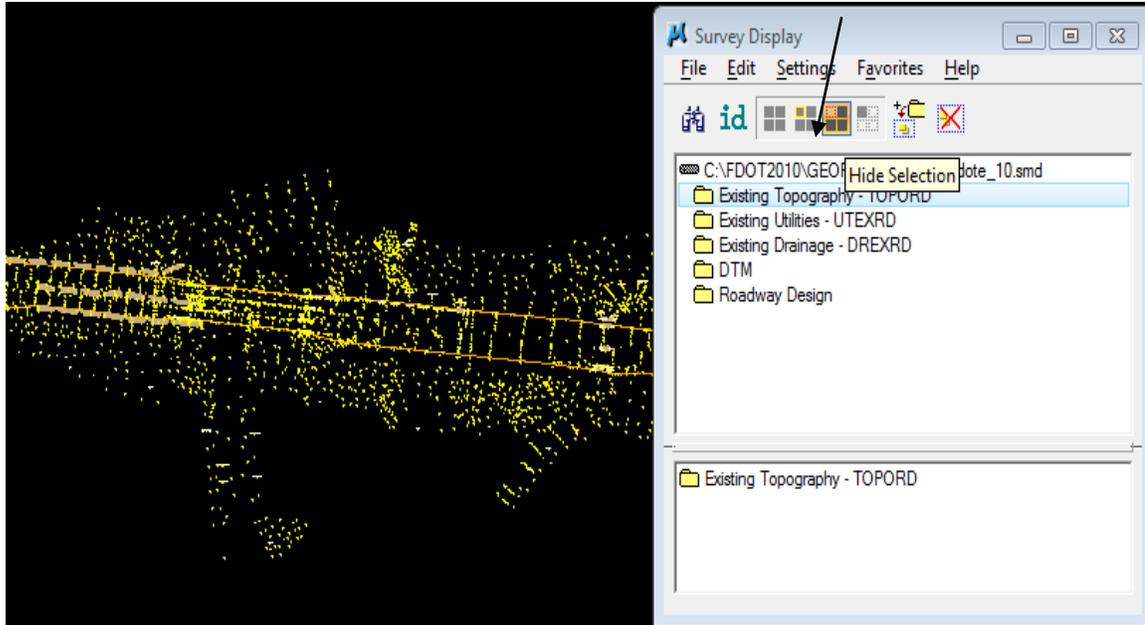


To display only the existing topography as would be shown in the TOPORD.dgn file, highlight the Existing Topography – TOPORD folder and right click to add to the collection pane. Once the Existing Topography is in the collection pane, click on the **Display Only Selection** button to visualize only the selection.

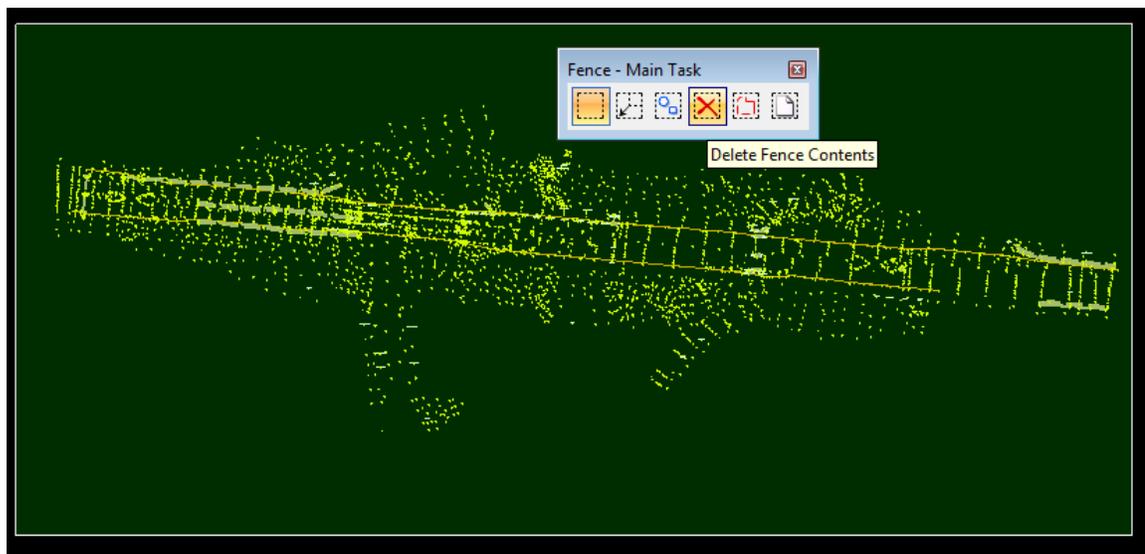


11.7.5 EXPORTING SELECTION TO 2D DELIVERABLE

To create a 2D deliverable, such as the *TOPORD.dgn*, the selection set must be hidden using the **Hide Selection** button on the Survey Display dialogue box. This will show all features except the selection.

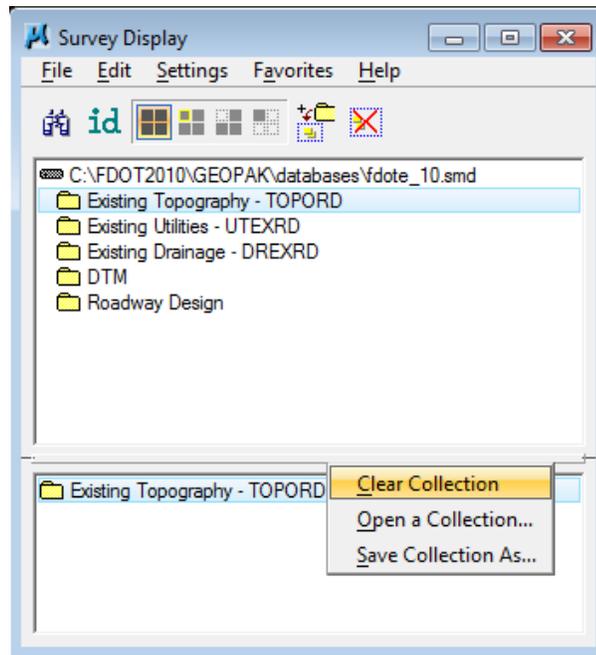


Once the selection set is hidden all other features can be removed from the drawing except for the selection set by fencing and deleting.



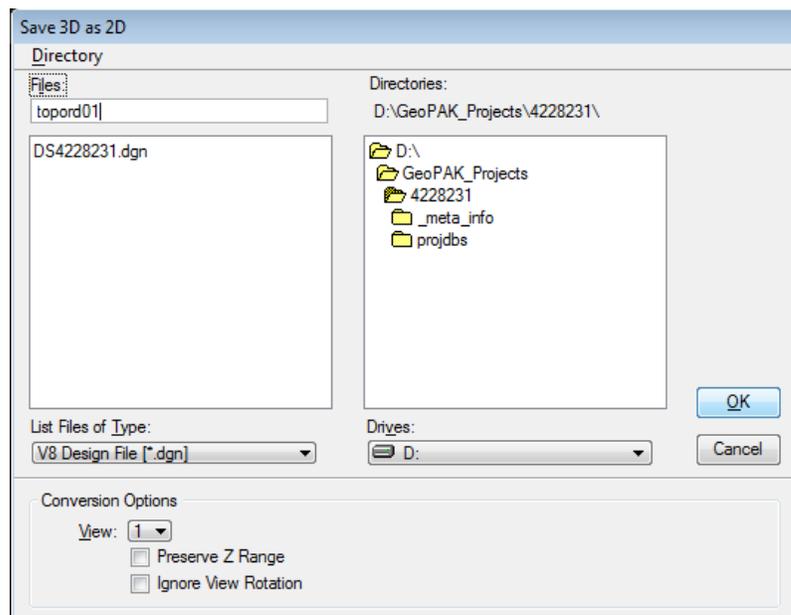
Note Deleting the features only removes the graphic elements from the drawing. All points and chains are in the GEOPAK Job file (GPK) and can be visualized into the drawing again using the GEOPAK Coordinate Geometry (cogo) Navigator.

To Save a collection at the bottom of the Survey Display dialogue box, right click in the pane and click on **Save Collection As...** To clear the collection pane right click and click on **Clear Collection**.

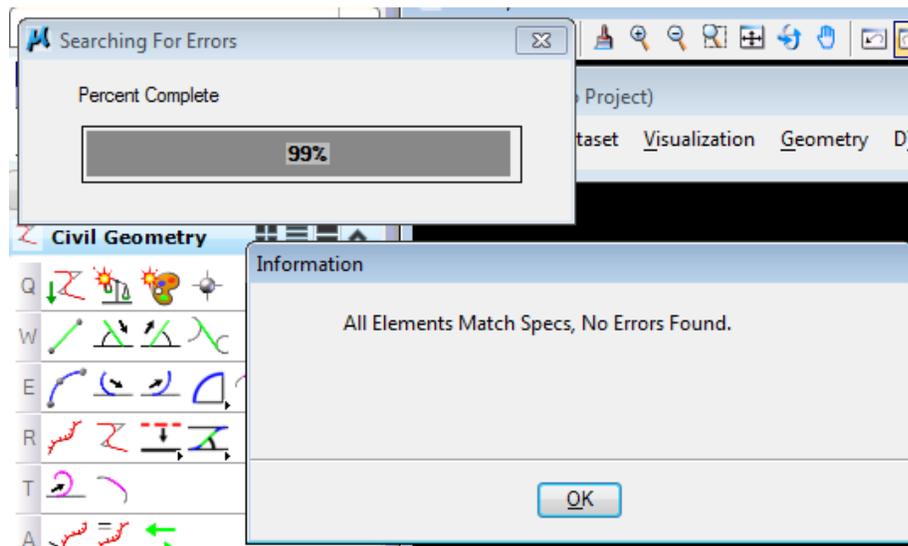
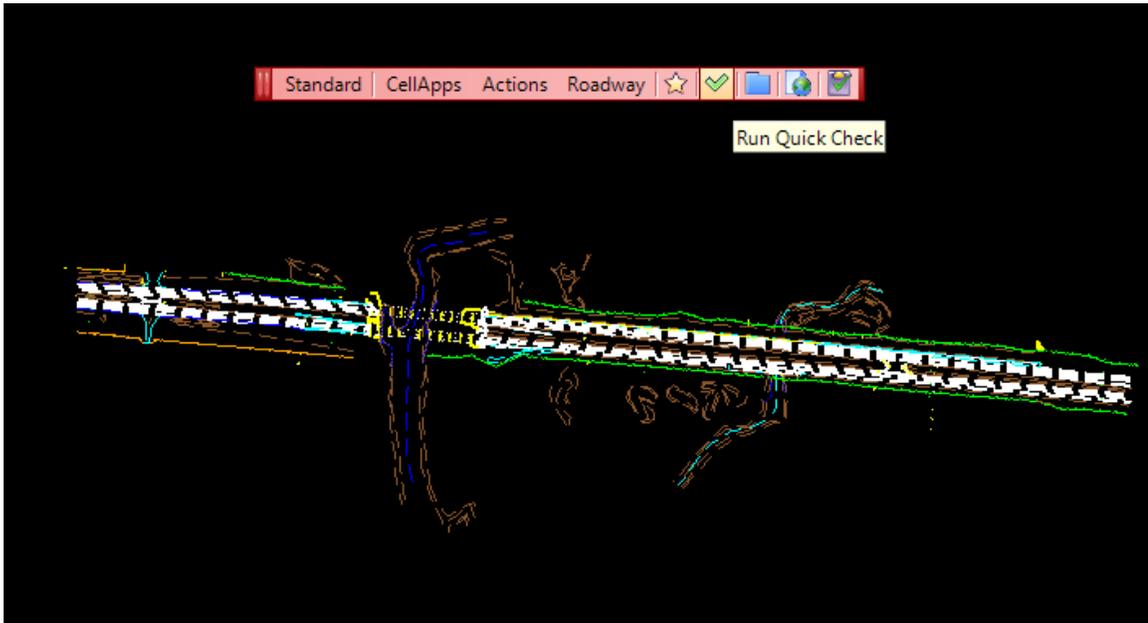


Selecting the **Normal Display** button should show only what is left after deleting all other elements. This would be the original selection that was hidden before the delete. At this point the entire MicroStation file can be exported to a 2D design file as a deliverable.

To export features to a 2D design file, on the MicroStation menu bar select **File > Export > 2D:**



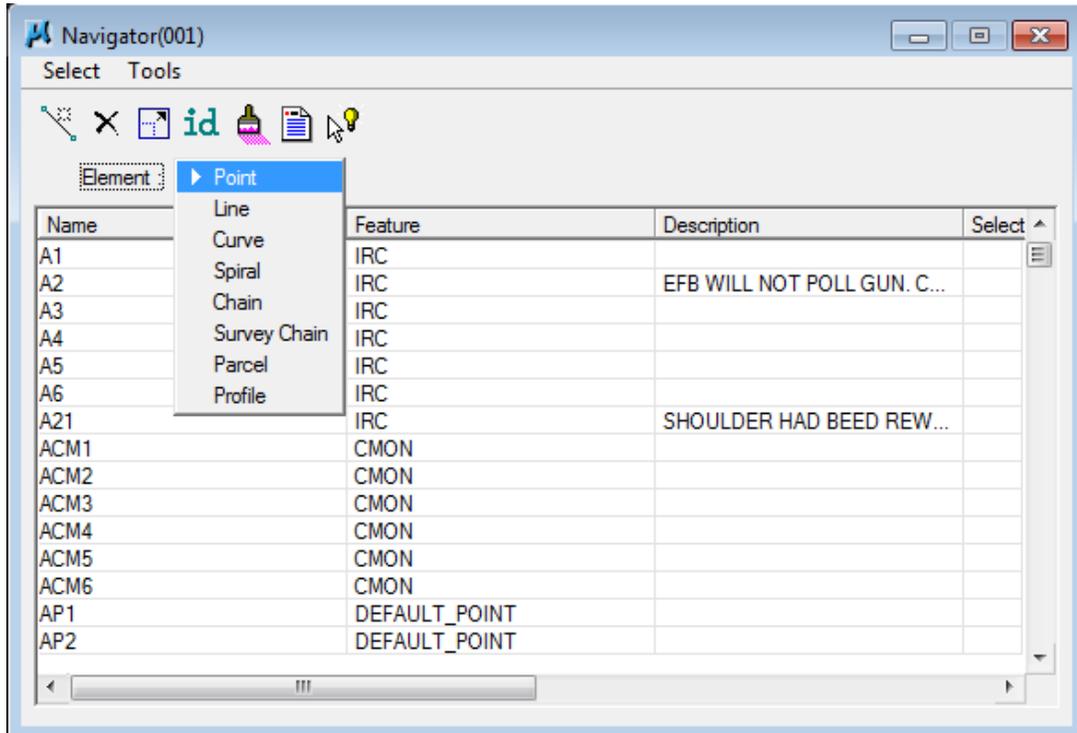
Once the 2D file has been created with the correct naming convention, it can be opened and checked for compliancy.



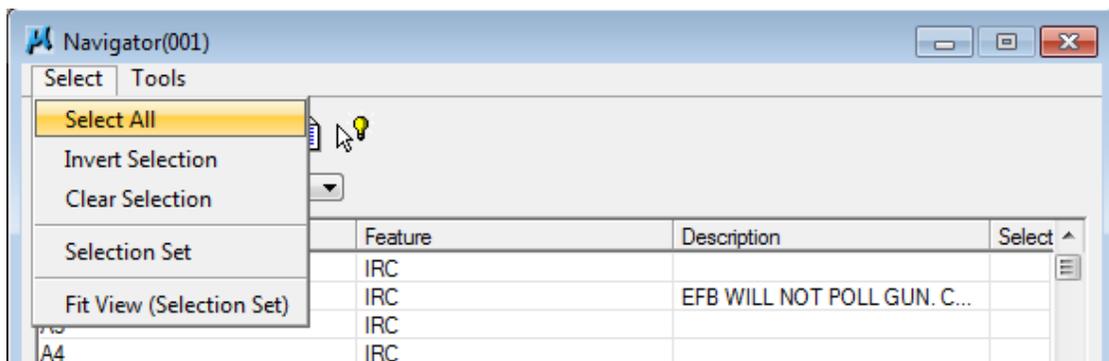
The same process can be used to create the UTEXRD.dgn and the DREXRD.dgn files however, first the features will need to be redrawn or visualized into the original 3D master survey design file using the *GEOPAK Coordinate Geometry (cogo) Navigator*.

11.7.6 VISUALIZING FEATURE ELEMENTS WITH NAVIGATOR

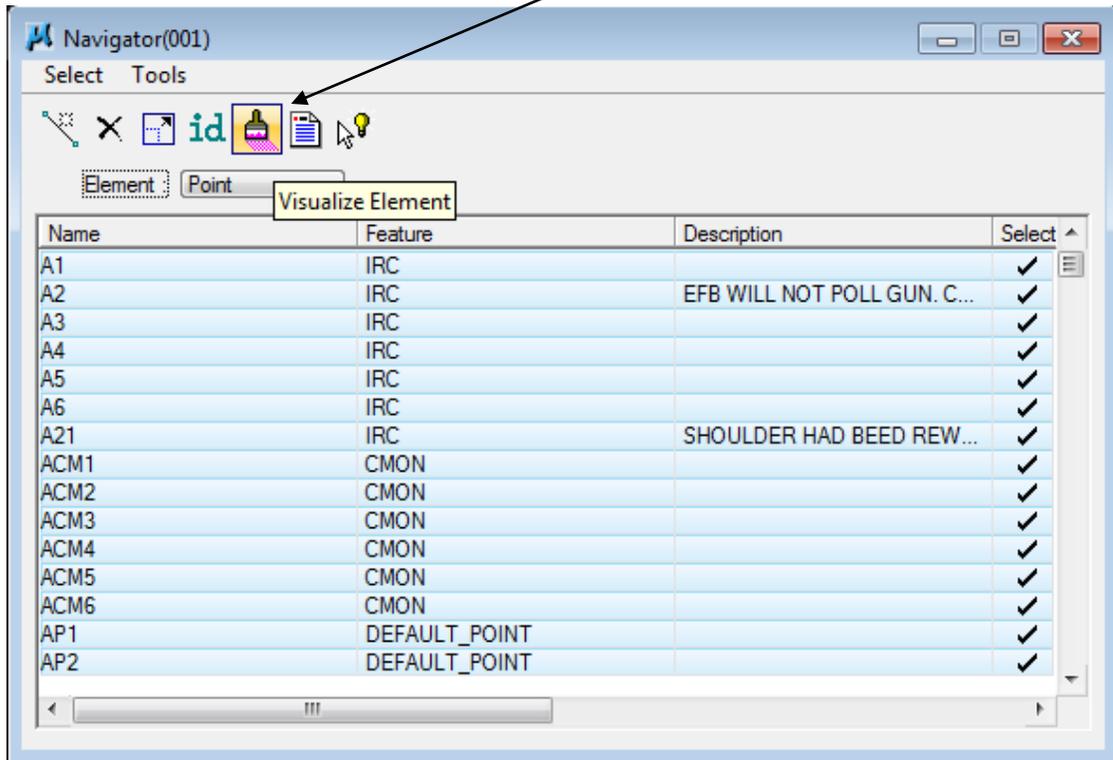
To visualize or draw elements into a MicroStation drawing using Navigator, on the GEOPAK Survey Menu Bar select **Geometry>Navigator**. This will open both Classic Cogo and the associated Navigator dialogue box. Make sure the feature preference in Cogo is set to **“Permanent Visualization”**. To redraw the feature elements into MicroStation set the **Element** selection in the Navigator dialogue box to **“Point”** or **“Survey Chain”** depending on which element to be visualized.



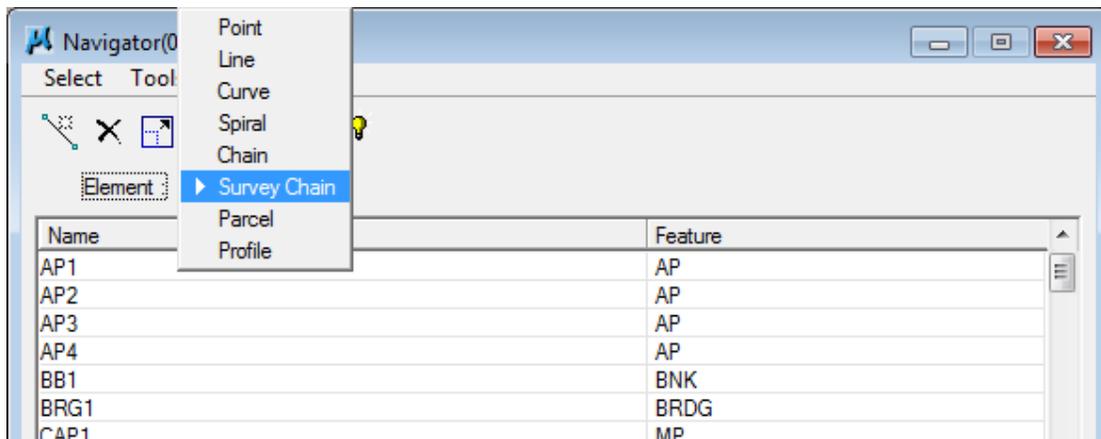
Hit the **Select>Select All** from the menu bar in the Navigator dialogue box. This will select all points in the Job file.



Once the elements are selected, click on the **Visualize Element** button that looks like a paint brush to visualize the features into the MicroStation design file.



The same process can be used to visualize points or survey chains into the design file. Other elements such as lines, curves, geometry chains (chains), parcels and profiles can be visualized also however; they cannot be imported from a KCP file from CAiCE. These elements would need to be created with GEOPAK cogo.



11.8 SURVEYING DATA

The FDOT Surveying Procedure, Topic 550-030-101A and the Surveying Handbook governs the requirements for survey procedure and data deliverables to the Department. The Surveying Handbook is available at:

<http://www.dot.state.fl.us/surveyingandmapping/Manuals/surveyhandbook.pdf>

11.9 PROFESSIONALS' ELECTRONIC DATA DELIVERY SYSTEM (PEDDS)

PEDDS shall be used to Secure and Authenticate project data. When projects are received, the FDOT authenticates the data on the delivered CD. Each time data is transmitted to or received by FDOT the data shall be secured and authenticated. PEDDS shall also be used to authenticate any project specific data received as part of a delivery from an outside source or discipline. For example, an electronic delivery to Roadway from Survey or EMO should be secured and authenticated. Roadway shall electronically secure all files for delivery.

11.10 SYMBOLOGY STANDARDS

Symbology Standards that apply to FDOT Projects are set up under a listing of Standard Level Names with specific ByLevel Color, Style and Weight attributes. These levels are grouped under specific Rule Files which are associated to each valid Standard Filename of each Discipline for the purpose of performing the Quality Control check for FDOT Standard compliancy of each FDOT project design file. Section 11.2 of this chapter provides for the complete Standard File Name listing with associated Rule File.

Note Refer to Chapter 3 FDOT Resource and Support Files to review the Level names listing for each associated Rule File.

- Existing Drainage - DREXRD

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
DREXRD	1008	BoxCulvert_ep	Box Culvert	10	3	1	L	BXC
DREXRD	1026	CrossDrain_ep	Under drains and Cross drains	10	3	1	L	UD
DREXRD	1030	Ditch_ep	Ditch (Top, Bottom and Flow Lines)	7	6	0	L	DTCH
DREXRD	1031	DitchPavt_ep	Ditch Pavement	0	1	0	L	DTCHP
DREXRD	1033	DrainMisc_ep	Catch Basins	10	3	1	L	CB
DREXRD	1033	DrainMisc_ep	Drain Junction Box, Yard/Catch Sp	10	3	1	L	BAS
DREXRD	1033	DrainMisc_ep	Drainage Junction Box	10	3	1	L	JB
DREXRD	1033	DrainMisc_ep	Drainage Pipes and Spouts	10	3	1	L	DRNP
DREXRD	1033	DrainMisc_ep	Special Drainage Feature (Describe)	10	3	1	L	SPD
DREXRD	1033	DrainMisc_ep	Spillways, Flumes or Scuppers	10	3	1	L	SPL
DREXRD	1033	DrainMisc_ep	Yard Drain	10	3	1	L	YD
DREXRD	1036	EndTreat_ep	Flared End Section	10	3	1	L	FES
DREXRD	1036	EndTreat_ep	Mitered End Section	10	3	1	L	MES
DREXRD	1036	EndTreat_ep	Special Endwall	10	3	1	L	SPEW
DREXRD	1036	EndTreat_ep	Straight Endwall	10	3	1	L	SEW
DREXRD	1036	EndTreat_ep	U-Type Endwall	10	3	1	L	UEW
DREXRD	1036	EndTreat_ep	Winged End wall	10	3	1	L	WEW
DREXRD	600	ImageAttachment_dp	Image Attachments	0	0	0		
DREXRD	1054	InletBottom_ep	Drainage Structure Bottoms	10	3	1	L	DRNB

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
DREXRD	1055	InletCurb_ep	Curb Inlets	10	3	1	L	CINL
DREXRD	1055	InletCurb_ep	Median Inlets	10	3	1	L	MEDI
DREXRD	1056	InletDBI_ep	Ditch Bottom Inlet	10	3	1	L	DTCHI
DREXRD	1057	InletGutter_ep	Gutter Inlets (All Types)	10	3	1	L	GI
DREXRD	210	LeaderLine_dp	Leader Line and terminator with Text	0	0	1		
DREXRD	1064	ManholeCovUnk_ep	Manhole Cover, Unknown	0	1	0	P	MH
DREXRD	1069	ManholeSW_ep	Manhole (Storm Water)	10	1	0	P	MHD
DREXRD	1091	PipeCulvert_ep	Pipe Culvert	10	3	1	L	PCULV
DREXRD	1093	PointLocator_ep	Geopak Point Locator for COGO SMD database	4	0	0		
DREXRD	1137	StormSewer_ep	Storm Sewer (size?)	10	3	1	L	STS
DREXRD	1146	TextElevLabel	Elevation Labels	4	0	0		
DREXRD	320	TextMisc	Text - Miscellaneous	0	0	1		
DREXRD	310	TextNotes	Text - Notes	4	0	1		
DREXRD	1147	TextPtLabel	Point Labels	4	0	0		
DREXRD	1148	TextSurveyLabel	Survey Text Labels	0	0	0		
DREXRD	1158	UnderDrain_ep	Under Drain Box	10	3	0	P	UDBX

- **Digital Terrain - DTMRD**

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
DTMRD	1008	DTMTriangles_ep	DTM Triangles (existing ground)	2	0	1		EXIST

- **Existing Topography for Roadway - TOPORD**

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORD	1000	ArchSite_ep	Archeological Site	2	0	1	L	ARST
TOPORD	1001	Attenuator_ep	Attenuation Systems	0	0	1	L	ATTN
TOPORD	202	BaselineSurvey	Baseline Survey	0	0	2		
TOPORD	1002	BankMent_ep	Embankment (Manmade, Top or Bottom)	9	3	0	L	BNK
TOPORD	1003	BarrierWall_ep	Barrier Wall All Types	6	3	0	L	BARW
TOPORD	1003	BarrierWall_ep	Precast Barrier Wall (Temp)	6	3	0	L	TMPW
TOPORD	1004	Beacons_ep	Beacons and Path Illumination	0	0	0	P	BN
TOPORD	1005	BLSurveyCntrl_ep	Baseline Survey Control	0	0	2	L	BLC

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORD	1006	BLSurveyField_ep	Baseline Survey (calculated from BLC)	0	0	2	L	BL
TOPORD	1009	Bridge_ep	Bridge Approaches and Slabs	0	3	1	L	APRS
TOPORD	1010	BridgeEle_ep	Bridge Elements	0	1	0	L	BRDG
TOPORD	1011	Building_ep	Buildings	1	0	0	L	BLDG
TOPORD	1012	BusStop_ep	Bench, Bus Stop	8	3	0	P	BNCH
TOPORD	1186	CableBarrier_ep	Cable Barrier	0	cable_barrier	2	L	CBR
TOPORD	1013	Canal_ep	Canal, Lock	7	3	0	L	CAN
TOPORD	1018	CGBack_ep	Curb and Gutter (Back)	4	3	0	L	CGB
TOPORD	1019	CGep_ep	Curb / Curb and Gutter (at EP & FL)	0	3	0	L	CG
TOPORD	1019	CGFace_ep	Face of Curb and Gutter	4	3	0	L	CGF
TOPORD	1023	ConcSlabs_ep	Concrete Slabs	0	1	1	L	CSL
TOPORD	1025	Core_ep	Core Sample or Test Hole	9	0	0	P	CSH
TOPORD	1027	CurbRamp_ep	Curb Cut Ramp	2	3	0	L	CCR
TOPORD	208	CurveDataLabel_dp	Curve Data Labels PC,PI, PT	0	0	2		
TOPORD	1028	Deck_ep	Deck / Porch	7	1	0	L	DECK
TOPORD	1029	DelineatorPost_ep	Delineator Post, Flexible and Metal	4	1	1	P	DLP
TOPORD	1030	Ditch_ep	Ditch (Top, Bottom and Flow Lines)	7	6	0	L	DTCH
TOPORD	1031	DitchPavt_ep	Ditch Pavement	0	1	0	L	DTCHP
TOPORD	1032	Docks_ep	Docks and Wharfs	0	1	0	L	DOCK
TOPORD	1034	Driveway_ep	Driveway (Drive, Lane, Turnouts)	7	3	0	L	DWY
TOPORD	1035	DummyChains_ep	Dummy Chains	0	0	1	L	DUMB
TOPORD	1037	Fence_ep	Fence (generic)	6	Fence1	0	L	FNC
TOPORD	1039	FloodLight_ep	Flood Light	3	2	0	P	FLD
TOPORD	1042	Furnace_ep	Incinerator, Boiler, or Furnace	8	1	0	P	INCN
TOPORD	1045	Gates_ep	Cattle Guard	7	3	0	p	CGD
TOPORD	1045	Gates_ep	Gates	7	3	0	L	GT
TOPORD	1047	GlareScrn_ep	Glare Screen & Blinds	0	{Curtain }	0	L	GS
TOPORD	1048	GuardrailDbI_ep	Guardrail Double Face	0	grdbl	0	L	GRDBL
TOPORD	1049	GuardrailLt_ep	Guardrail Left	0	grail1	0	L	GRL
TOPORD	1050	GuardrailRt_ep	Guardrail Right	0	grail2	0	L	GRR
TOPORD	1052	Handrail_ep	Handrails	9	3	0	L	HNDRL
TOPORD	1053	Hole_ep	Hole	8	3	0	P	HOLE
TOPORD	600	ImageAttachment_dp	Image Attachments	0	0	0		
TOPORD	1059	LaneLine_ep	Lane Lines (Paint or Thermoplastic)	0	LaneLine_ex ist	1	L	LL
TOPORD	210	LeaderLine_dp	Leader Line and terminator with Text	0	0	1		
TOPORD	1062	Mailbox_ep	Mailbox(s)	8	2	0	P	MBX
TOPORD	1076	MiscEquip_ep	Flag Pole	8	0	0	P	FP

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORD	1076	MiscEquip_ep	Parking Meter	8	0	0	P	PKGM
TOPORD	1077	Monument_ep	Aerial Targets	4	0	0	P	AT
TOPORD	1077	Monument_ep	Concrete Monument (Cast)	4	0	0	P	CMON
TOPORD	1077	Monument_ep	Drill Hole, Plug (Control Monumentation)	4	0	0	P	DH
TOPORD	1077	Monument_ep	Deep Rod Mark	4	0	0	P	DRM
TOPORD	1077	Monument_ep	5/8 Rod and Cap	4	0	0	P	IRC
TOPORD	1077	Monument_ep	Nail, Spike, Pin (Control Monumentation)	4	0	0	P	NL
TOPORD	1077	Monument_ep	Other Marker? (Control Monumentation)	4	0	0	P	OM
TOPORD	1077	Monument_ep	Metal Pipe, Rod, Bar (Control)	4	0	0	P	PIP
TOPORD	1077	Monument_ep	Concrete Monument (Poured)	4	0	0	P	PMON
TOPORD	1077	Monument_ep	Post, Stake, Staub (Control Monumentation)	4	0	0	P	PST
TOPORD	1077	Monument_ep	Hub and Tac	4	0	0	P	SAT
TOPORD	1077	Monument_ep	Stamped Disk	4	0	0	P	STMD
TOPORD	1077	Monument_ep	Stamped Plate	4	0	0	P	STMP
TOPORD	1079	ParkEquip_ep	Camp stove, Grill, Firepit, BBQ	9	2	0	P	CMPST
TOPORD	1079	ParkEquip_ep	Playground Equipment	9	2	0	P	PLEQ
TOPORD	1080	Patternlines_ep	Cross Section Chain	2	1	0	L	XSC
TOPORD	1081	Pavemk_ep	Handicap Pavement Marking	0	2	0	P	HNDC
TOPORD	1081	Pavemk_ep	Pavement Markings (Other)	0	2	0	L	PMRK
TOPORD	1081	Pavemk_ep	Straight Direction Arrow	0	2	0	P	STAROW
TOPORD	1081	Pavemk_ep	Straight and Turn Arrow	0	2	0	P	STATRN
TOPORD	1081	Pavemk_ep	Turn Arrow	0	2	0	P	TA
TOPORD	1082	PavtAsph_ep	Asphalt Pavement Edge	0	3	1	L	AP
TOPORD	1083	PavtConc_ep	Concrete Pavement (Edges)	0	3	1	L	CPVT
TOPORD	1084	PavtConcJoints_ep	Concrete Pavement (Joints)	1	5	1	L	CPVJ
TOPORD	1085	PavtCrown_ep	Asphalt Pavement (Crown)	0	4	1	L	AC
TOPORD	1085	PavtCrown_ep	Concrete Pavement (Crown)	0	4	1	L	CPVC
TOPORD	1086	PavtMisc_ep	Parking Lot, Guardrail Pavement, Misc Pavement	7	3	0	L	MP
TOPORD	1087	PavtTractorXing_ep	Tractor Crossings	0	3	1	L	TX
TOPORD	1088	PavtXover_ep	Crossovers and Detours (Temporary)	0	3	0	L	XO
TOPORD	1089	PedSignal_ep	Pedestrian Signal Unit, Signage	0	2	0	P	PS
TOPORD	1090	Piling_ep	Piling, Piers, or Column	8	3	0	P	PIL
TOPORD	1093	PointLocator_ep	Geopak Point Locator for Cogo SMD database	4	0	0	P	N/A (GEOPAK only)
TOPORD	1105	Pump_ep	Pump Island	7	3	1	L	PMPIS
TOPORD	1107	RailroadMisc_ep	RR Milepost	11	0	0	P	RRMP
TOPORD	1107	RailroadMisc_ep	RR Switch	11	0	0	P	RRS

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORD	1107	RailroadMisc_ep	RR Warning Sign	11	0	0	P	RRWS
TOPORD	1107	RailroadMisc_ep	RR Signal with Gate	11	0	0	P	SWG
TOPORD	1108	RailroadTracks_ep	Railroad Tracks (Rail, Bed)	4	3	0	L	RR
TOPORD	5082	RRBaseline	Baseline:Rail Road Centerline	4	0	2	L	RRCL
TOPORD	1109	RailroadXing_ep	RR Crossing (Roadway Platforms)	11	3	0	L	RRX
TOPORD	219	RefPtLine	Miscellaneous:Survey Reference Point Line / Detail	0	0	1	L	REFL
TOPORD	300	RefPtText	Annotation:Miscellaneous:Text: Survey Data Reference Point	0	0	1		
TOPORD	1110	RipRap_ep	Rip Rap, Rubble	4	3	1	L	RIP
TOPORD	1116	Scratch1_dp	A scratch level for temporary or informational items	4	0	0		
TOPORD	1117	Scratch2_dp	A scratch level for temporary or informational items	5	0	0		
TOPORD	1118	SeaWalls_ep	Sea Walls	0	1	3	L	SEAW
TOPORD	1119	ShldrPaved_ep	Shoulder Edge, Paved	1	3	0	L	SHLDR
TOPORD	1120	ShldrUnpaved_ep	Unpaved Shoulders	0	3	0	L	UNPS
TOPORD	1121	Shrub_ep	Hedges and Shrubs (Boundary)	2	0	0	L	HED
TOPORD	1121	Shrub_ep	Ornamental Plant	2	0	0	P	OP
TOPORD	1121	Shrub_ep	Shrub, Bush	2	0	0	P	SHR
TOPORD	1121	Shrub_ep	Coniferous Shrub	2	0	0	P	SHRC
TOPORD	1121	Shrub_ep	Deciduous Shrub	2	0	0	P	SHRD
TOPORD	1122	SidewalkBack_ep	Sidewalk (Backs)	2	3	0	L	SWKB
TOPORD	1123	SidewalkFront_ep	Sidewalk (Fronts)	1	3	0	L	SWK
TOPORD	1124	Signal_ep	Signal Head	3	2	0	P	SIG
TOPORD	1124	Signal_ep	Signal on Pedestal	3	2	0	P	SIGP
TOPORD	1125	SignalLoop_ep	Traffic Detector Loops	7	1	2	L	TFD
TOPORD	1126	SignalMisc_ep	Signal Controller	3	2	0	P	SIGC
TOPORD	1127	SignalSupport_ep	Signal Supports including Mast Arm	3	2	0	P	SMA
TOPORD	1128	SignMulti_ep	Multi-column Sign (Large Sign)	0	3	1	L	MS
TOPORD	1128	SignMulti_ep	Multicolumn Sign (Small)	0	3	1	P	SMS
TOPORD	1129	SignSingle_ep	Sign (Single Support)	3	2	0	P	SSS
TOPORD	1130	SignSupport_ep	Trusses and Cantilevers for Overhead Signs	0	3	1	L	SGNT
TOPORD	1131	Silo_ep	Silo	11	2	0	P	SILO
TOPORD	1132	Slopes_ep	Levees, Dikes, or Dams	9	3	0	L	LV
TOPORD	1132	Slopes_ep	Natural Slopes (Top or Bottom)	9	3	0	L	SLP
TOPORD	1133	SpanWire_ep	Signal / Span Wire Pole	3	0	0	P	SSP
TOPORD	1135	Stairs_ep	Stairways, Steps	0	3	1	L	STP

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORD	229	StationTicL_dp	Station Tic Marks (Large) and Text	0	0	2		
TOPORD	230	StationTicS_dp	Station Tic Marks (Small) and Text	0	0	2		
TOPORD	1138	Stream_ep	Stream Edge	1	3	0	L	STRM
TOPORD	1138	Stream_ep	Stream Center	1	3	0	L	STRMC
TOPORD	1139	StreamMisc_ep	Buoy	7	0	0	P	BUOY
TOPORD	1139	StreamMisc_ep	Dolphins and Fenders	7	0	0	P	DF
TOPORD	1139	StreamMisc_ep	Stream or Tide Gauge	7	0	0	P	TG
TOPORD	1140	Stump_ep	Stump	2	0	0	P	STM
TOPORD	1141	TankStor_ep	Storage Tank	11	3	0	P	STTK
TOPORD	1142	TankUG_ep	Fill Cap (Underground Tank)	3	0	0	P	FC
TOPORD	302	TextBLStation	Text - B/L Station and Tics	0	0	2		
TOPORD	304	TextCurveData	Text - Curve Data Note	0	0	2		
TOPORD	1146	TextElevLabel	Elevation Labels	4	0	0		
TOPORD	307	TextLabel	Text - Label	0	0	2		
TOPORD	320	TextMisc	Text - Miscellaneous	0	0	1		
TOPORD	310	TextNotes	Text - Notes	4	0	1		
TOPORD	1147	TextPtLabel	Point Labels	4	0	0		
TOPORD	1148	TextSurveyLabel	Survey Text Labels (Misc)	0	0	0	P	MISC
TOPORD	1148	TextSurveyLabel	Survey Text Labels (Misc)	0	0	0	P	NOTE
TOPORD	1149	TopoMisc_ep	Miscellaneous Topography	0	3	1	L	MISC
TOPORD	1151	TrafSeparator_ep	Traffic Separator	6	3	0	L	TFSP
TOPORD	1152	Trail_ep	Roadway, Trail (Unpaved)	9	3	1	L	RD
TOPORD	1153	Trash_ep	Dumpster, Trash Bin	9	0	0	P	DMP
TOPORD	1154	Treadle_ep	Treadle	7	1	5	L	TRD
TOPORD	1155	Tree_ep	Tree	2	0	0	P	TREE
TOPORD	1155	Tree_ep	Coniferous Tree	2	0	0	P	TREEC
TOPORD	1155	Tree_ep	Citrus Tree	2	0	0	P	TREECI
TOPORD	1155	Tree_ep	Cypress Tree	2	0	0	P	TREECY
TOPORD	1155	Tree_ep	Deciduous Tree	2	0	0	P	TREED
TOPORD	1155	Tree_ep	Oak Tree	2	0	0	P	TREEOA
TOPORD	1155	Tree_ep	Palm Tree	2	0	0	P	TREEPA
TOPORD	1155	Tree_ep	Palm Tree Cluster	2	0	0	P	TREEPC
TOPORD	1155	Tree_ep	Pine Tree	2	0	0	P	TREEPI
TOPORD	1156	TreeLine_ep	Groves & Orchards (Boundary)	2	woodline	0	L	GRV
TOPORD	1156	TreeLine_ep	Scattered Trees (Boundary)	2	woodline	0	L	SCT
TOPORD	1156	TreeLine_ep	Woods Line	2	woodline	0	L	WDL
TOPORD	1157	Tributary_ep	Spring	1	0	0	P	SPR
TOPORD	1175	Walls_ep	Walls	9	3	1	L	WALL

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORD	1177	WaterEdge_ep	Edge of Water	7	3	0	L	WEDG
TOPORD	1181	Wetland_ep	W.M.D & D.E.P. Wetlands	1	wetland	0	L	DEP
TOPORD	1182	WetlandEdge_ep	CORPS Wetlands (Marsh or Swamp)	2	wetland	0	L	COE
TOPORD	1182	WetlandEdge_ep	Edge of Mangrove	2	wetland	0	L	EM
TOPORD	1182	WetlandEdge_ep	Edge of Wetlands (Marsh or Swamp)	2	wetland	0	L	MAR
TOPORD	1183	WetlandSym_ep	Marsh Symbol, Wetland Point	2	0	0	P	MAR
TOPORD	1183	WetlandSym_ep	Marsh Symbol, Wetland Point	2	0	0	P	WLPT
TOPORD	1184	WindMill_ep	Wind Mill	1	1	0	P	WIM
TOPORD	1185	XSPt_ep	Cross Section Point, Station	2	1	0	P	XS

• Existing Topography for Right of Way - TOPORW

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORW	1003	BarrierWall_ep	Barrier Wall All Types	6	3	0	L	BARW
TOPORW	1009	Bridge_ep	Bridge Approaches and Slabs	0	3	1	L	APRS
TOPORW	1010	BridgeEle_ep	Bridge Elements	0	1	0	L	BRDG
TOPORW	1011	Building_ep	Buildings	1	0	0	L	BLDG
TOPORW	1023	ConcSlabs_ep	Concrete Slabs	0	1	1	L	CSL
TOPORW	1028	Deck_ep	Deck / Porch	7	1	0	L	DECK
TOPORW	1031	DitchPavt_ep	Ditch Pavement	0	1	0	L	DTCHP
TOPORW	1032	Docks_ep	Docks and Wharfs	0	1	0	L	DOCK
TOPORW	1033	DrainMisc_ep	Drain Junction Box, Yard/Catch Sp	10	3	1	L	BAS
TOPORW	1034	Driveway_ep	Driveway (Drive, Lane, Turnouts)	7	3	0	L	DWY
TOPORW	1035	DummyChains_ep	Dummy Chains	0	0	1	L	DUMB
TOPORW	1037	Fence_ep	Fence (generic)	6	Fence1	0	L	FNC
TOPORW	1045	Gates_ep	Gates	7	3	0	L	GT
TOPORW	600	ImageAttachment_dp	Image Attachments	0	0	0		
TOPORW	1056	InletDBI_ep	Ditch Bottom Inlet	10	3	1	L	DTCHI
TOPORW	1058	JunctBox_ep	Junct. Box / Service Cabinet (Elec/Tel)	3	1	0	P	SRVC
TOPORW	1061	Luminaire_ep	Street Light / Pole	3	2	0	P	LP
TOPORW	1076	MiscEquip_ep	Flag Pole	8	0	0	P	FP
TOPORW	1090	Piling_ep	Piling, Piers, or Column	8	3	0	P	PIL
TOPORW	1097	Power_ep	High Voltage Transmission Line	3	e-oe	0	L	HVL
TOPORW	1105	Pump_ep	Pump Island	7	3	1	L	PMPIS
TOPORW	1107	RailroadMisc_ep	RR Milepost	11	0	0	P	RRMP

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
TOPORW	1619	RRBaseline	Baseline:Rail Road Centerline	0	RR	0	L	RRCL
TOPORW	1115	SateDish_ep	Satellite Dish Antenna	6	4	0	P	SATD
TOPORW	1118	SeaWalls_ep	Sea Walls	0	1	3	L	SEAW
TOPORW	1122	SidewalkBack_ep	Sidewalk (Backs)	2	3	0	L	SWKB
TOPORW	1123	SidewalkFront_ep	Sidewalk (Fronts)	1	3	0	L	SWK
TOPORW	1128	SignMulti_ep	Multi-column Sign (Large Sign)	0	3	1	L	MS
TOPORW	1129	SignSingle_ep	Sign (Single Support)	3	2	0	P	SSS
TOPORW	1130	SignSupport_ep	Trusses and Cantilevers for Overhead Signs	0	3	1	L	SGNT
TOPORW	1131	Silo_ep	Silo	11	2	0	P	SILO
TOPORW	1135	Stairs_ep	Stairways, Steps	0	3	1	L	STP
TOPORW	1138	Stream_ep	Stream Edge	1	3	0	L	STRM
TOPORW	1138	Stream_ep	Stream Center	1	3	0	L	STRMC
TOPORW	1141	TankStor_ep	Storage Tank	11	3	0	P	STTK
TOPORW	1142	TankUG_ep	Fill Cap (Underground Tank)	3	0	0	P	FC
TOPORW	1146	TextElevLabel	Elevations Labels	4	0	0		
TOPORW	320	TextMisc	Text - Miscellaneous	0	0	1		
TOPORW	1147	TextPtLabel	Point Labels	4	0	0		
TOPORW	1148	TextSurveyLabel	Survey Text Labels (Misc)	0	0	0	P	MISC
TOPORW	1148	TextSurveyLabel	Survey Text Labels (Misc)	0	0	0	P	NOTE
TOPORW	1149	TopoMisc_ep	Miscellaneous Topography	0	3	1	L	MISC
TOPORW	1150	Tower_ep	Antenna	3	1	0	P	ANT
TOPORW	1150	Tower_ep	Transmission Tower (Single C)	3	1	0	P	CLMT
TOPORW	1152	Trail_ep	Roadway, Trail (Unpaved)	9	3	1	L	RD
TOPORW	1175	Walls_ep	Walls	9	3	1	L	WALL
TOPORW	1177	WaterEdge_ep	Edge of Water	7	3	0	L	WEDG
TOPORW	1178	WaterMisc_ep	Well (Size Unknown)	1	1	0	P	WELL
TOPORW	1180	Wells_ep	Well Monitoring, Taps	1	1	0	P	MONW
TOPORW	1182	WetlandEdge_ep	Edge of Wetland (Marsh or Swamp)	2	wetland	0	L	MAR
TOPORW	1183	WetlandSym_ep	Marsh Symbol, Wetland Point	2	0	0	P	WLPT

• Existing Utilities - UTEXRD

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
UTEXRD	1004	Beacons_ep	Beacons and Path Illumination.	0	0	0	P	BN
UTEXRD	1014	CATV_ep	Cable TV Line (Aerial)	6	e-otv	0	L	CATV
UTEXRD	1015	CATVBur_ep	Cable TV Line (Buried)	6	e-btv	1	L	BCATV
UTEXRD	1016	CATVCond_ep	Cable TV Conduit System	6	0	1	L	CATVC
UTEXRD	1017	CATVMisc_ep	Cable TV Service Box	6	2	0	P	CATVS
UTEXRD	1024	Conduit_ep	Utility Conduit & Encasements	3	e-cas	0	L	DUCT
UTEXRD	1038	FireHydrant_ep	Fire Hydrant	1	2	0	P	FH
UTEXRD	1039	FloodLight_ep	Flood Light	3	2	0	P	FLD
UTEXRD	1040	FOAer_ep	Fiber Optics Cable Overhead (Size Unknown)	6	e-fof	0	L	FOC
UTEXRD	1041	FOBur_ep	Fiber Optics Telephone (Size Unknown)	6	e-bfo	0	L	FO
UTEXRD	1041	FOBur_ep	Fiber Optics Cable (Underground)	6	e-bfo	0	L	FOCU
UTEXRD	1041	FOBur_ep	Fiber Optics Power (Size Unknown)	3	e-bfo	0	L	FOP
UTEXRD	1041	FOBur_ep	Fiber Optics Power (Underground)	3	e-bfo	0	L	FOPU
UTEXRD	1041	FOBur_ep	Fiber Optics Telephone (Underground)	6	e-bfo	0	L	FOU
UTEXRD	1043	Gas_ep	Gas Line, (Size Unknown)	4	e-g	1	L	GAS
UTEXRD	1043	Gas_ep	Gas Test & Miscellaneous	4	e-g	1	L	GTM
UTEXRD	1044	GasReg_ep	Gas Regulator	4	1	0	P	RG
UTEXRD	1046	Gauges_ep	Gauges	0	0	0	P	GA
UTEXRD	1051	Guys_ep	Guy Anchor	3	1	0	P	GYA
UTEXRD	1051	Guys_ep	Guy Pole (Deadman)	3	1	0	P	GYP
UTEXRD	1051	Guys_ep	Span Guys	3	1	0	L	GYS
UTEXRD	600	ImageAttachment_dp	Image Attachments	0	0	0		
UTEXRD	1058	JunctBox_ep	Junct. Box / Service Cabinet (Elec/Tel)	3	1	0	P	SRVC
UTEXRD	210	LeaderLine_dp	Leader Line and terminator with Text	0	0	1		
UTEXRD	1060	LiteCond_ep	Street Lighting Conductors	3	exlite_cond1	0	L	SLC
UTEXRD	1061	Luminaire_ep	Street Light / Pole	3	2	0	P	LP
UTEXRD	1063	ManholeCover_ep	Manhole Cover (Cable TV)	6	1	0	P	MHCAT V
UTEXRD	1064	ManholeCovUnk_ep	Manhole Cover, Unknown	0	1	0	P	MH
UTEXRD	1065	ManholeCovW_ep	Manhole Cover (Water)	1	1	0	P	MHW
UTEXRD	1066	ManholeElec_ep	Manhole (Electric)	3	1	0	P	MHE

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
UTEXRD	1067	ManholeGas_ep	Manhole (Gas)	4	1	0	P	MHG
UTEXRD	1068	ManholeSS_ep	Manhole (Sanitary Sewer)	2	1	0	P	MHS
UTEXRD	1069	ManholeSW_ep	Manhole (Storm Water)	10	1	0	P	MHD
UTEXRD	1070	ManholeTel_ep	Manhole (Telephone)	6	1	0	P	MHT
UTEXRD	1071	MeterElec_ep	Meter (Electric)	3	1	0	P	ME
UTEXRD	1072	MeterElecUG_ep	Meter (Electric) (Underground)	3	1	1	P	MEU
UTEXRD	1073	MeterGas_ep	Meter (Gas)	4	1	0	P	MG
UTEXRD	1074	MeterUnk_ep	Meter (Size Unknown)	0	1	0	P	M
UTEXRD	1075	MeterWater_ep	Meter (Water)	1	1	0	P	MW
UTEXRD	1078	Oil_ep	Oil Line (all sizes)	4	e-pet	1	L	PETRO
UTEXRD	1092	PipeEncase_ep	Pipe Encasements	0	e-cas	1	L	PIPEN
UTEXRD	1093	PointLocator_ep	Geopak Point Locator for COGO SMD database	4	0	0		
UTEXRD	1094	PolePower_ep	Power Pole	3	1	0	P	PP
UTEXRD	1094	PolePower_ep	Power Pole with Transformer	3	1	0	P	PPT
UTEXRD	1094	PolePower_ep	Shared Pole	3	1	0	P	SHP
UTEXRD	1094	PolePower_ep	Shared Pole with Transformer	3	1	0	P	SHPT
UTEXRD	1095	PoleTel_ep	Telephone Pole	6	1	0	P	TELP
UTEXRD	1097	Power_ep	High Voltage Transmission Lines	3	e-oe	0	L	HVL
UTEXRD	1097	Power_ep	Power Lines (Aerial)	3	e-oe	0	L	PWR
UTEXRD	1098	PowerBur_ep	Buried Power (Unknown Size)	3	e-be	1	L	BPWR
UTEXRD	1098	PowerBur_ep	Buried Conductors (Transmission)	3	e-be	1	L	TRANS
UTEXRD	1099	PowerBurCond_ep	Secondary Conductor Buried	3	e-be	0	L	BSEC
UTEXRD	1099	PowerBurCond_ep	Secondary Conductor Buried	3	e-be	0	L	SEC
UTEXRD	1100	PowerCapcUG_ep	Capacitors (Underground)	3	1	1	L	CAPB
UTEXRD	1101	PowerCond_ep	Conductors (Primary Distribution)	3	e-oe	1	L	PRI
UTEXRD	1102	PowerElecOut_ep	Electrical Outlet	3	1	1	P	ELEO
UTEXRD	1103	PowerMisc_ep	Capacitors (Above Ground)	3	1	0	L	CAPA
UTEXRD	1103	PowerMisc_ep	Electric Service Box (Large)	3	1	0	L	ELECS
UTEXRD	1103	PowerMisc_ep	Fuses (Existing)	3	1	0	L	FUSE
UTEXRD	1103	PowerMisc_ep	Switchgear & Appurtenances	3	1	0	L	SW
UTEXRD	1103	PowerMisc_ep	Transformer	3	1	0	P	TRNF
UTEXRD	1104	PullBox_ep	Wiring Pull Box	3	1	1	P	WPB

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
UTEXRD	1105	Pump_ep	Pump (Petroleum)	7	3	1	P	PMPF
UTEXRD	1105	Pump_ep	Pump Station	7	3	1	P	PMPST
UTEXRD	1106	PumpNonPet_ep	Pump (Non Petroleum)	1	3	1	P	PMP
UTEXRD	1111	Sanitary_ep	Sanitary Sewer (Size Unknown)	2	e-s	1	L	SS
UTEXRD	1112	SanitaryDumpSta_ep	Dump Station (SS)	2	2	0	P	DMPS
UTEXRD	1113	SanitaryFM_ep	Force Main (Size Unknown)	2	e-s	1	L	FM
UTEXRD	1114	SanitaryMisc_ep	Cleanout	2	1	0	P	CLNO
UTEXRD	1114	SanitaryMisc_ep	Sanitary Effluent (Open Channel)	2	1	0	L	SE
UTEXRD	1115	SateDish_ep	Satellite Dish Antenna	6	4	0	P	SATD
UTEXRD	1134	Sprinkler_ep	Sprinkler Head	1	0	0	P	SPH
UTEXRD	1136	Steam_ep	Steam	4	e-stm	1	L	STEAM
UTEXRD	1143	Tele_ep	Telephone Line (Aerial)	6	e-ot	0	L	TEL
UTEXRD	1144	TeleBur_ep	Buried Telephone , Size Unknown)	6	e-bt	1	L	BT
UTEXRD	1144	TeleBur_ep	Buried Telephone, DUCT	6	e-bt	1	L	BTD
UTEXRD	1144	TeleBur_ep	Buried Telephone, TOLL	6	e-bt	1	L	BTT
UTEXRD	1145	TeleMisc_ep	Telephone Booth	6	2	0	P	TB
UTEXRD	1145	TeleMisc_ep	Telephone Service Box (Large)	6	2	0	L	TELS
UTEXRD	1145	TeleMisc_ep	Telephone Pedestal / Service	6	2	0	P	TPD
UTEXRD	1146	TextElevLabel	Text - Elevation Labels	4	0	0		
UTEXRD	320	TextMisc	Text - Miscellaneous	0	0	1		
UTEXRD	310	TextNotes	Text - Notes	4	0	1		
UTEXRD	1147	TextPtLabel	Text - Point Labels	4	0	0		
UTEXRD	1148	TextSurveyLabel	Text - Survey Text Labels	0	0	0		
UTEXRD	1150	Tower_ep	Antenna	3	1	0	P	ANT
UTEXRD	1150	Tower_ep	Transmission Tower (Single C)	3	1	0	P	CLMT
UTEXRD	1150	Tower_ep	High Mast Lighting Poles or	3	1	0	P	HML
UTEXRD	1159	UtilMisc_ep	Miscellaneous Utilities	0	0	0	L	N/A
UTEXRD	1160	Valve_ep	Valve Box (Size Unknown)	0	2	0	P	VB
UTEXRD	1160	Valve_ep	Valve (Size Unknown)	0	2	0	P	VLV
UTEXRD	1161	ValveCover_ep	Valve Cover (Size Unknown)	0	2	0	P	VC
UTEXRD	1162	ValveCvrEff_ep	Valve Cover (Effluent)	5	2	0	P	VCEF
UTEXRD	1163	ValveCvrGas_ep	Valve Cover (Gas)	4	2	0	P	VCG

File Type	Level No.	Level Name	Level Description	ByLevel Color	ByLevel Style	ByLevel Weight	Point/Line	Feature
UTEXRD	1164	ValveCvrSewer_ep	Valve Cover (Sewer)	2	2	0	P	VCS
UTEXRD	1165	ValveCvrWater_ep	Valve Cover (Raw Water)	1	2	0	P	VCRW
UTEXRD	1165	ValveCvrWater_ep	Valve Cover (Water)	1	2	0	P	VCW
UTEXRD	1166	ValveCvrWaterNP_ep	Valve Cover (Non Potable Water)	5	2	0	P	VCNP W
UTEXRD	1167	ValveGas_ep	Valve Box (Gas)	4	2	0	P	VBG
UTEXRD	1167	ValveGas_ep	Valve (Gas)	4	2	0	P	VLVG
UTEXRD	1168	ValveSewer_ep	Valve Box (Sewer)	2	2	0	P	VBS
UTEXRD	1168	ValveSewer_ep	Valve (Sewer)	2	2	0	P	VLVS
UTEXRD	1169	ValveWater_ep	Valve Box (Water)	1	2	0	P	VBW
UTEXRD	1169	ValveWater_ep	Valve (Water)	1	2	0	P	VLWW
UTEXRD	1170	ValveWaterNP_ep	Valve Box (Non-Potable Water)	5	2	0	P	VBNPW
UTEXRD	1170	ValveWaterNP_ep	Valve (Non-Potable Water)	5	2	0	P	VLVNP W
UTEXRD	1171	Vault_ep	Vaults Above Grade	3	1	0	L	AGV
UTEXRD	1171	Vault_ep	Vaults Below Grade	3	1	0	L	BGV
UTEXRD	1172	Vent_ep	Vent	0	1	0	P	VNT
UTEXRD	1173	VentGas_ep	Vent (Gas)	4	1	0	P	VNTG
UTEXRD	1174	VentSewer_ep	Vent (Sewer)	2	1	0	P	VNTS
UTEXRD	1176	Water_ep	Water Line, (Size Unknown)	1	e-w	1	L	WL
UTEXRD	1178	WaterMisc_ep	Faucet	1	1	0	P	FAU
UTEXRD	1178	WaterMisc_ep	Standpipe	1	1	0	P	SP
UTEXRD	1178	WaterMisc_ep	Well (Size Unknown)	1	1	0	P	WELL
UTEXRD	1179	WaterNP_ep	Non-potable Water Line (all sizes)	5	e-npw	1	L	NPWL
UTEXRD	1180	Wells_ep	Well Monitoring, Taps	1	1	0	P	MONW

11.11 QUALITY CONTROL

Quality Control (QC) of graphics files required with the survey delivery is the responsibility of the data producer. FDOT supplies the QC Software as an aid to check for compliance with filename and level/symbology standards of the Department for graphic files. Other quality control standards for Survey data may be applied from the FDOT Survey Procedure, Topic 550-030-101 and Surveying Handbook by the scopes of work developed between the parties.

11.12 COUNTY MAPPING

The production of County Maps is an internal function of the FDOT Surveying and Mapping Office. This document refers to the graphical symbology standards used for the production of those maps for reference. For information regarding file naming conventions and other standards in use during the production of FDOT County maps, contact the Geographic Mapping Office in the FDOT Surveying and Mapping Office at (850) 245-1555.

Files Type	Description	Color	Line Style	Weight	Cell
All	Adjacent County and State Text				
All	Airport Names				
All	Airport Runways			6	
All	Airports Commercial				cscapt
All	Airports Commercial				cap
All	Airports Landing Strip or Private Airport				cslstp
All	Airports Landing Strip or Private Airport				ldarsp
All	Airports Military				csmfld
All	Airports Military				milffad
All	Backdrop	30			
All	Backdrop	60			
All	Bay				2
All	Bay Text				2
All	Bayou and Harbor etc				3
All	Bayou and Harbor etc Text				3
All	Boundary Section Lines (hidden)	31			
All	Bridges			0	
All	Bridges			1	
All	Bridges Interstate	1			
All	Bridges and Drawbridges County Highways	4			
All	Bridges and Drawbridges County Highways Text	8			
All	Bridges and Drawbridges Local Roads				
All	Bridges and Drawbridges Local Roads Text	18			
All	Bridges and Drawbridges State Highways	3			
All	Bridges and Drawbridges State Highways Text	7			
All	Bridges and Drawbridges Toll Roads	5			
All	Bridges and Drawbridges Toll Roads Text	5			
All	Bridges and Drawbridges US Highways	2			
All	Bridges and Drawbridges US Highways Text	6			
All	Bridges Interstate Text	4			
All	Cities Incorporated Area			0	
All	Cities Incorporated Linear Boundaries			1	
All	City Streets			1	
All	Coastal Waterway				csicw

Files Type	Description	Color	Line Style	Weight	Cell
All	Coastal Waterway Text				10
All	College or University	71			
All	College or University Text	30			8
All	Communities and Subdivisions Names without Post Office				3
All	Communities Names with Post Office				2
All	Connecting Roads			2	
All	Coordinate ticks Lat Longs				csotic
All	Coordinate ticks State Plane				csstic
All	County Boundary		7	6	
All	County Parks	70			
All	County Parks Text	148			10
All	County Roads Related Text				
All	County Route Divided Highway Outline and Fill				
All	County Routes Highway Center Lines			3	
All	County Routes Ramps			2	
All	County Seat				cscose
All	County Seat Names			4	
All	County Seat Names			6	
All	Culture			0	
All	Culture			1	
All	Culture			2	
All	Culture Text				1
All	Cut Border				
All	Extended Township Lines	43	3	2	
All	Forbes Purchase		3	3	
All	Forbes Purchase Section lines		3	0	
All	Forbes Purchase Township and Range Lines		3	2	
All	Geographic Features Text			1	
All	Heliports				csheli
All	Intermittent Ponds				1
All	Intermittent Ponds Text				8
All	Interstate Divided Highway Outline and Fill				
All	Interstate Highway Center Lines			3	
All	Interstate Ramps			2	
All	Interstates Related Text				
All	Islands				
All	Islands Text Coastal (Keys etc)			2	
All	Islands Text Inland (Hammocks and Ridges etc)				1
All	Lakes and Ponds				

Files Type	Description	Color	Line Style	Weight	Cell
All	Lakes and Ponds Text				9
All	Land Grant Boundaries		4	0	
All	Legend				
All	Local Roads Divided Highway Outline and Fill				
All	Local Roads Improved	11		1	
All	Local Roads Paved	11		2	
All	Local Roads Related Cells				cslgf0
All	Local Roads Related Cells				cslgf1
All	Local Roads Related Cells				cslgf2
All	Local Roads Related Cells				cslgf3
All	Local Roads Related Cells				cslgf4
All	Local Roads Related Cells				csp1
All	Local Roads Related Cells				csp2
All	Local Roads Related Cells				cspnf1
All	Local Roads Related Cells				cspnf2
All	Local Roads Related Cells				cspsf1
All	Local Roads Related Cells				cspsf2
All	Local Roads Related Text				
All	Local Roads Unimproved	10		1	
All	Mangroves				mg
All	Mangroves				csman1
All	Mangroves				smg
All	Map Border				
All	Map Border Text and Cells				
All	Map Information Text and Cells				
All	Map Information Text and Cells				
All	Masks for Road Features				
All	Masks for Text				
All	Military Bases	66			
All	Military Bases Text	146			7
All	Narrow Canals		5		
All	Narrow Canals		5		
All	Narrow Canals		5		
All	Narrow Canals Text				7
All	Narrow River Creek and Branch and Slough	12		1	
All	Narrow River Creek and Branch and Slough	12		1	
All	Narrow River Creek and Branch and Slough	12		1	
All	Narrow River Creek and Branch and Slough Text				6
All	National Forest	65			

Files Type	Description	Color	Line Style	Weight	Cell
All	National Forest Text	44			1
All	National Park	69			
All	National Park Text	44			2
All	National Wildlife Refuge and Preserve	75			
All	National Wildlife Refuge and Preserve Text	144			3
All	Ocean and Gulf				1
All	Ocean and Gulf Text				1
All	Other Incorporated Names			2	
All	Other Incorporated Names			3	
All	Other Survey Related Text				3
All	Planning Number Interstates				cssir1
All	Planning Number Interstates				cssir2
All	Planning Number Interstates				cssir3
All	Planning Number US Highways				cssus1
All	Planning Number US Highways				cssus2
All	Planning Number US Highways				cssus3
All	Planning Number US Highways				cssus1
All	Planning Number US Highways				cssus2
All	Planning Number US Highways				cssus3
All	Populations				1
All	Quad Borders				
All	Railroad Stations				csrsta
All	Railroads	3			
All	Railroads Text				
All	Road shields County Roads				cs1crs
All	Road shields County Roads				cs2crs
All	Road shields County Roads				cs3crs
All	Road shields County Roads				cs4crs
All	Road shields Interstates				cs1irs
All	Road shields Interstates				cs2irs
All	Road shields Interstates				cs3irs
All	Road shields State Highways				cs1srs
All	Road shields State Highways				cs2srs
All	Road shields State Highways				cs3srs
All	Road shields Toll roads				cs1trs
All	Road shields Toll roads				cs2trs
All	Road shields Toll roads				cs3trs
All	Road shields Toll roads				cstps
All	Road shields US Highways				cs1urs

Files Type	Description	Color	Line Style	Weight	Cell
All	Road shields US Highways				cs2urs
All	Road shields US Highways				cs3urs
All	Road shields US Highways Alternate				cs1usa
All	Road shields US Highways Alternate				cs2usa
All	Road shields US Highways Alternate				cs3usa
All	Road shields US Highways Business				cs1usb
All	Road shields US Highways Business				cs2usb
All	Road shields US Highways Business				cs3usb
All	Seaplane facility				csseap
All	Section Lines		0	0	
All	Section Numbers				1
All	State Boundary		6	6	
All	State Capital				cscptl
All	State Forest	67			
All	State Forest Text	145			4
All	State Park	14			
All	State Park Text	145			5
All	State Prisons	124			
All	State Prisons Text	124			9
All	State Roads Related Text				
All	State Route Divided Highway Outline and Fill				
All	State Routes Highway Center Lines			3	
All	State Routes Ramps			2	
All	State Survey Lines		1	1	
All	State Wildlife Refuge and Preserve	72			
All	State Wildlife Refuge and Preserve	74			
All	State Wildlife Refuge and Preserve Text	147			6
All	Street Related Text				
All	Strip Mining Area	117			
All	Survey by Others		2	1	
All	Survey Correction Text within map				4
All	Swamps				sw3
All	Swamps	15			
All	Swamps Text	45			
All	Toll Divided Highway Outline and Fill				
All	Toll Highway Center Lines			3	
All	Toll Ramps			2	
All	Toll roads Related Text				
All	Town Centers				cscctr

Files Type	Description	Color	Line Style	Weight	Cell
All	Township and Range lines		0	2	
All	Township and Range Tics				csttic
All	Township and Range Text				2
All	Triangulation Station				cstria
All	Triangulation Station				trista
All	Triangulation Station Text	97			2
All	Uninventoried Roads and Features				
All	US Highways Related Text				
All	US Route Divided Highway Outline and Fill				
All	US Routes Highway Center Lines			3	
All	US Routes Ramps			2	
All	Wide Rivers and Canals	12		1	4
All	Wide Rivers and Canals Text				5
All	Wildlife Management Area Text	94			11