

GEOPAK SURVEY



**VISUALIZATION OF SURVEYING DATA
AND DELIVERABLES**

CAiCE

- ◆ CAiCE is no longer being supported or updated. It may eventually be shelved by Autodesk.
- ◆ At some point CAiCE may fail to load or run in Windows.
- ◆ FDOT has no control over these triggers.
- ◆ As long as CAiCE continues to work FDOT will include updated resource files in the state kit to support CAiCE.
- ◆ What happens if CAiCE is gone tomorrow?
- ◆ A greater reliance on MicroStation and GEOPAK.

CAiCE VISUALIZATION

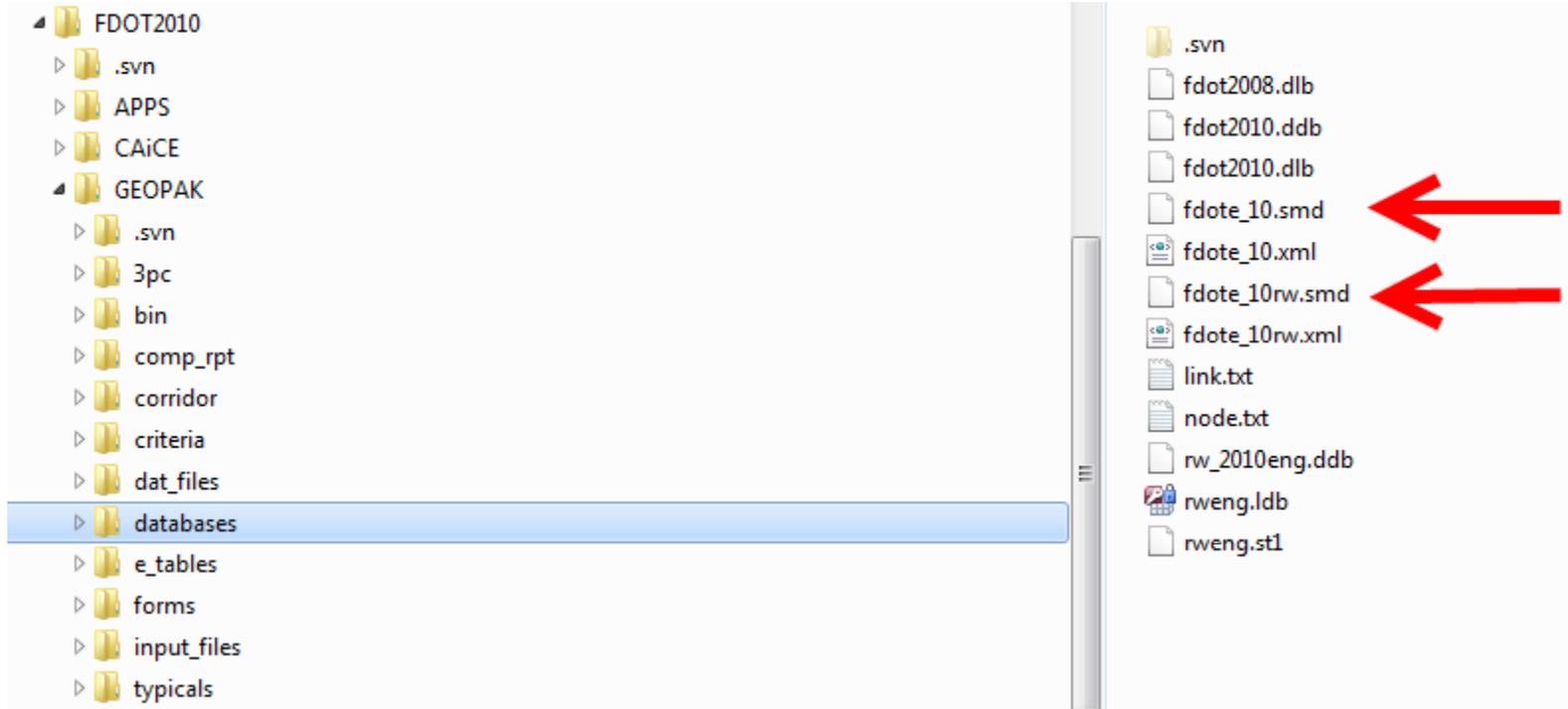
- ◆ In the past the only reliable way to visualize surveying deliverables was through theme viewer or using a CAiCE “LIS” file.
- ◆ Visualize in CAiCE then save a CDG file that can be imported into MicroStation using a MicroStation VBA. (CDGTOV8 Converter)
- ◆ Drawbacks are limited levels and fonts for text. The existing surface TIN for Bentley had to be created in a round about method.

ALTERNATIVES

- ◆ Tweaking the *survey_levels.dgnlib* so that features did not reside on levels with other features that are common to multiple disciplines.
- ◆ Creating standardized zones allows for the presetting of features and filters by zone.
- ◆ The inclusion of the *FDOTE_10.smd* file gave greater flexibility to the way we can view and create surveying deliverables.

GEOPAK SMD

- ◆ What is a GEOPAK SMD file?



GEOPAK SMD

- ◆ Since the summer of 2010 FDOT has included a location surveying SMD file for use with GEOPAK Survey.
- ◆ The SMD files allows the association of preset attributes to a feature code
 - Point or Chain Feature
 - Level, Color, Weight, Line Style, Font, Text Size
 - DTM attributes, Break Lines or Spot Shots
 - Zone, Description and Comments from EFB
- ◆ An XML version of the SMD file can be used with Data Acquisition for the same purpose.

TYPES OF VISUALIZATION

- ◆ MicroStation Level Display Filters
- ◆ GEOPAK Survey Visualization
- ◆ GEOPAK GPK Navigator
- ◆ Data Acquisition Points, Chains, & Zones

MicroStation Level Display Filters

MicroStation Level Display filters allows us to:

- ✓ Create the DREXRD01.dgn
- ✓ Create the TOPORD01.dgn
- ✓ Create the UTEXRD01.dgn
- ✓ Create the TOPORW01.dgn

View 1 - Top, Default [Displayset]

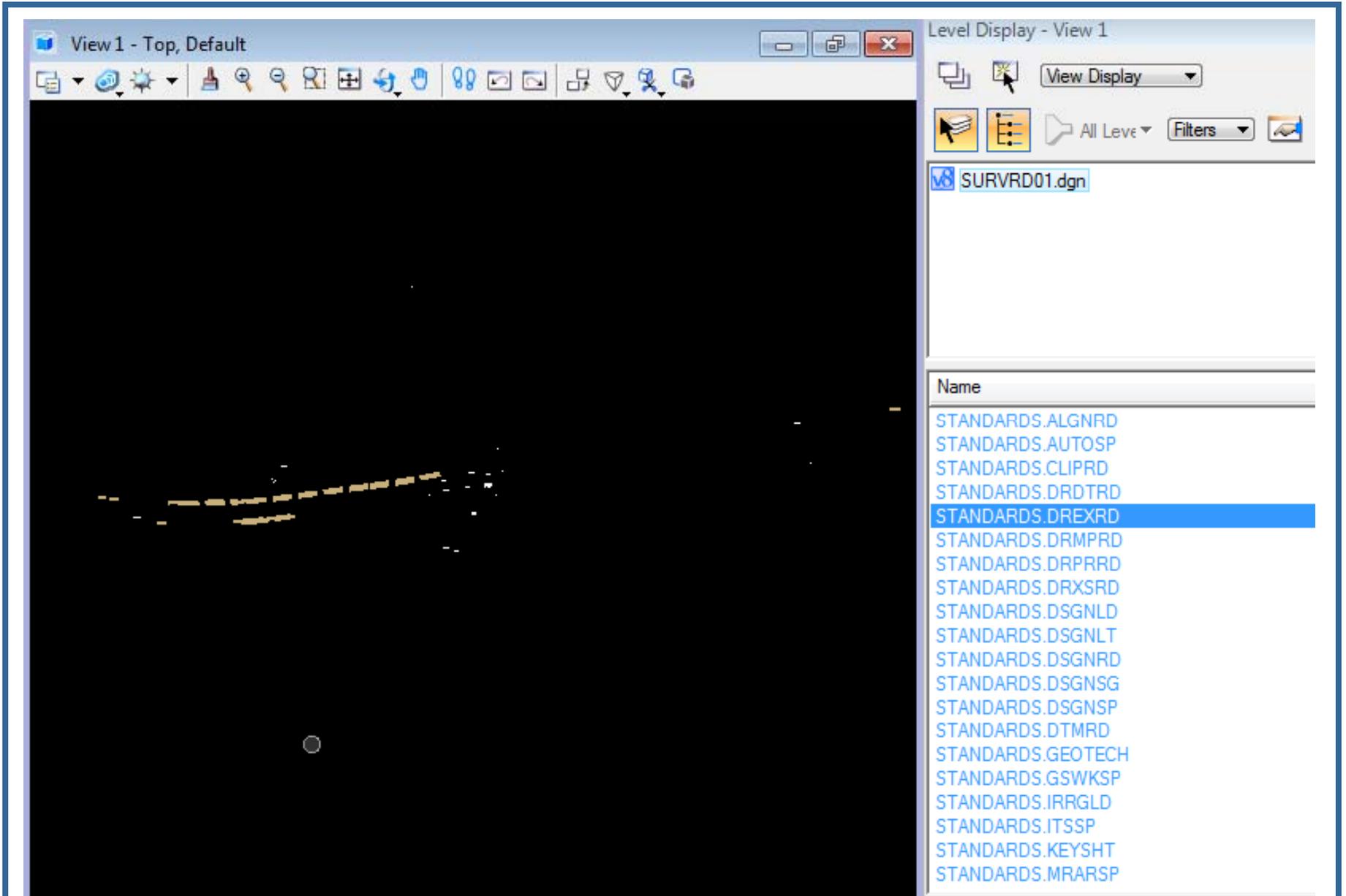
Level Display - View 1

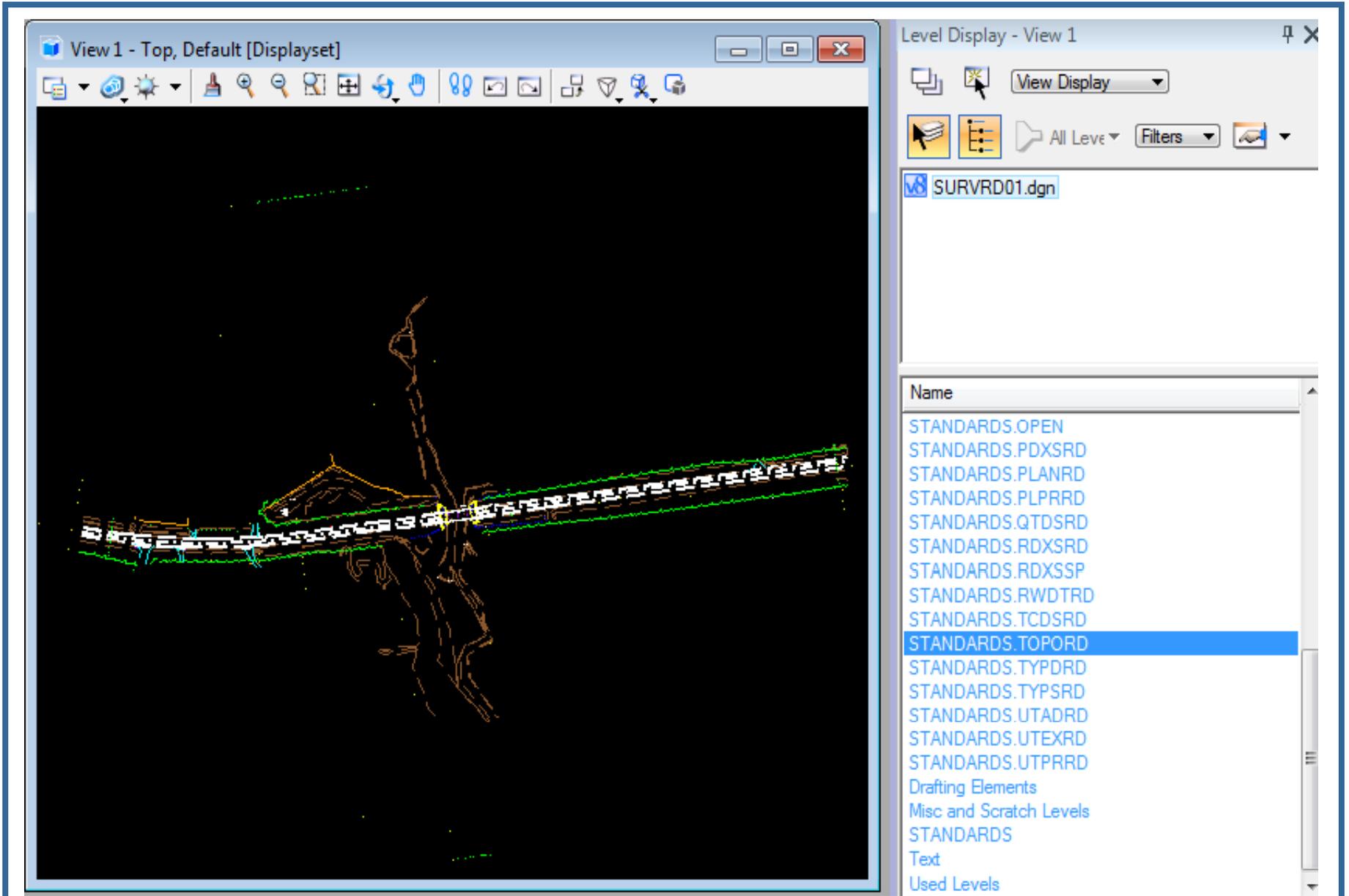
View Display

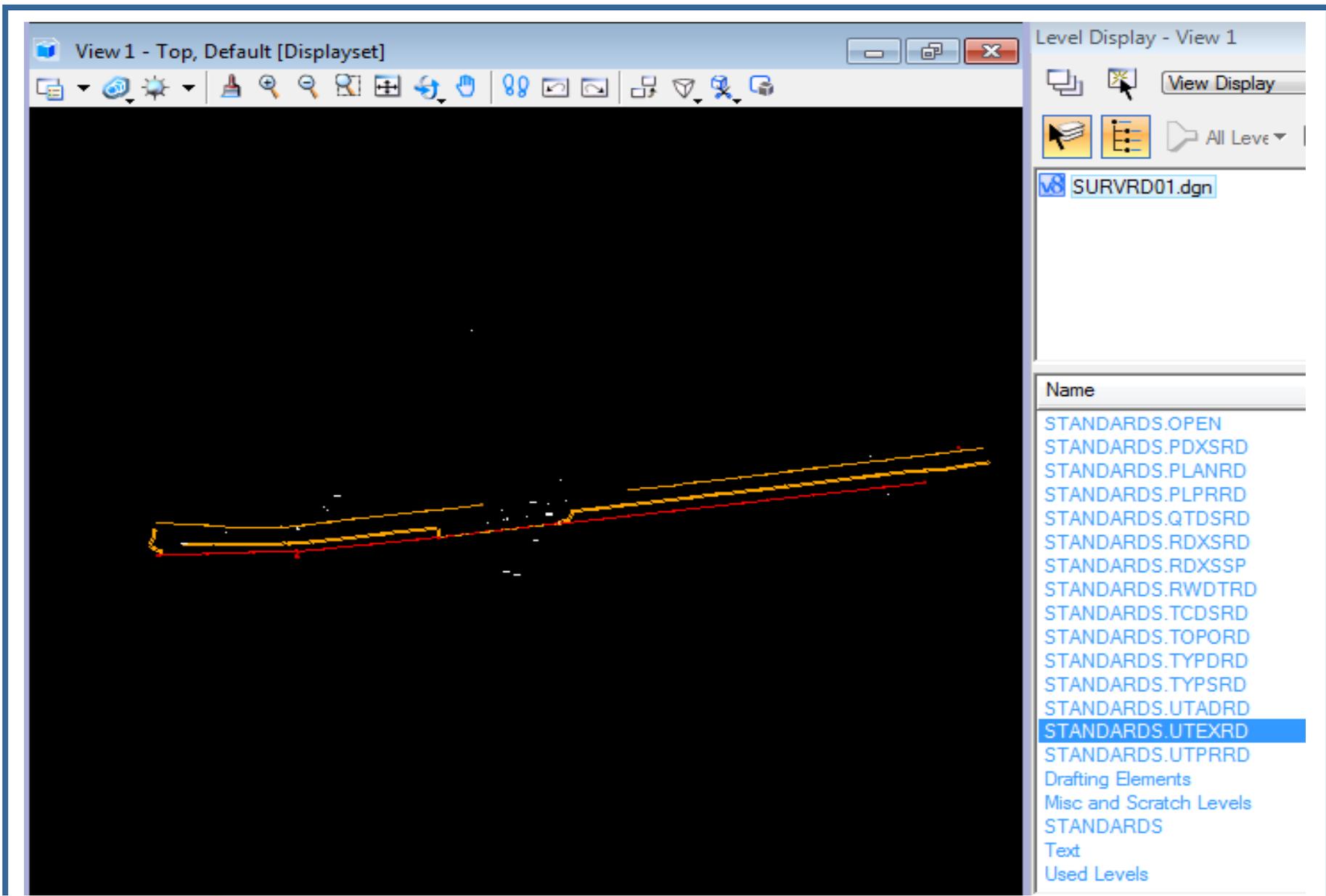
All Levels Filter

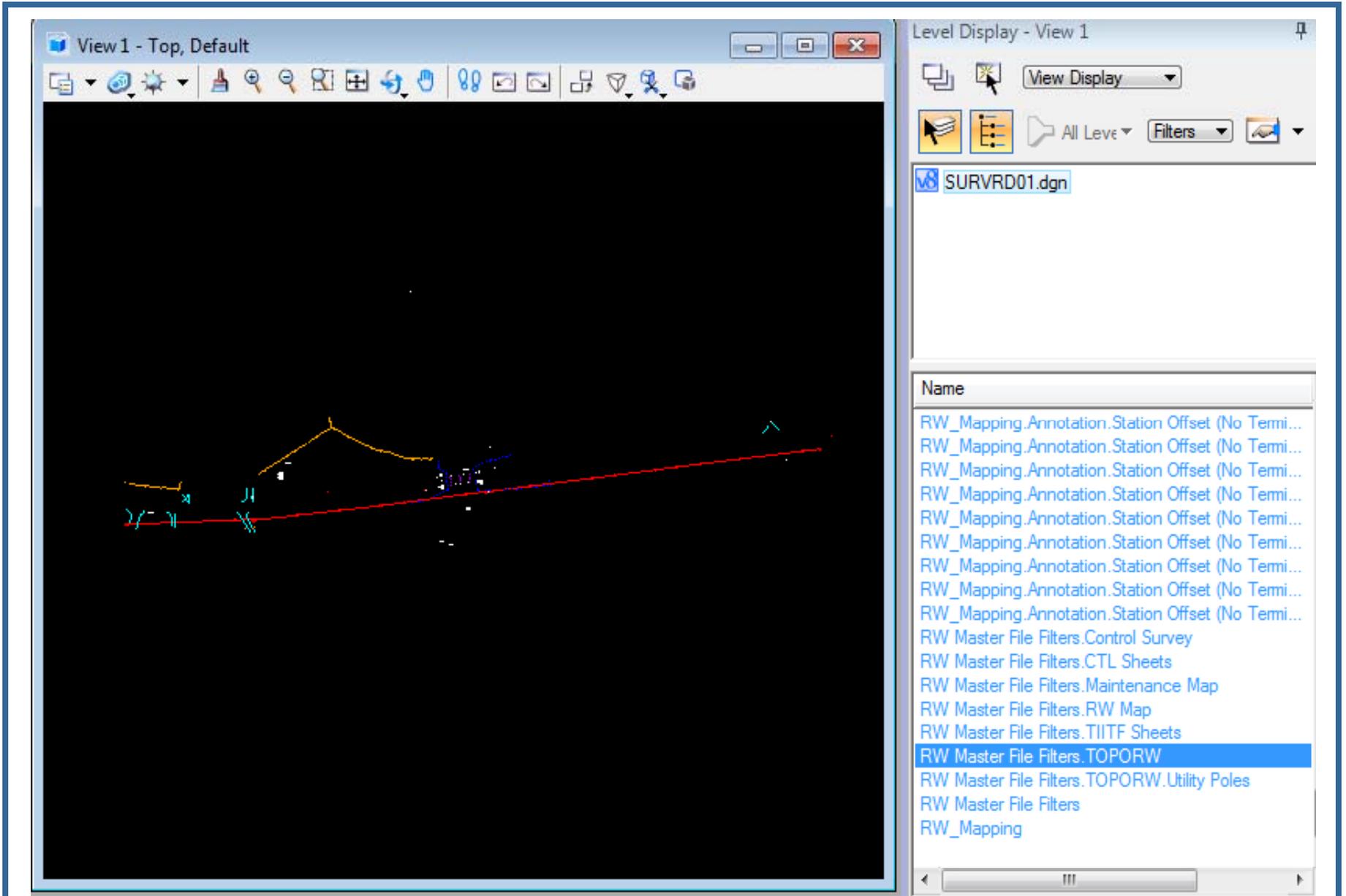
SURVRD01.dgn

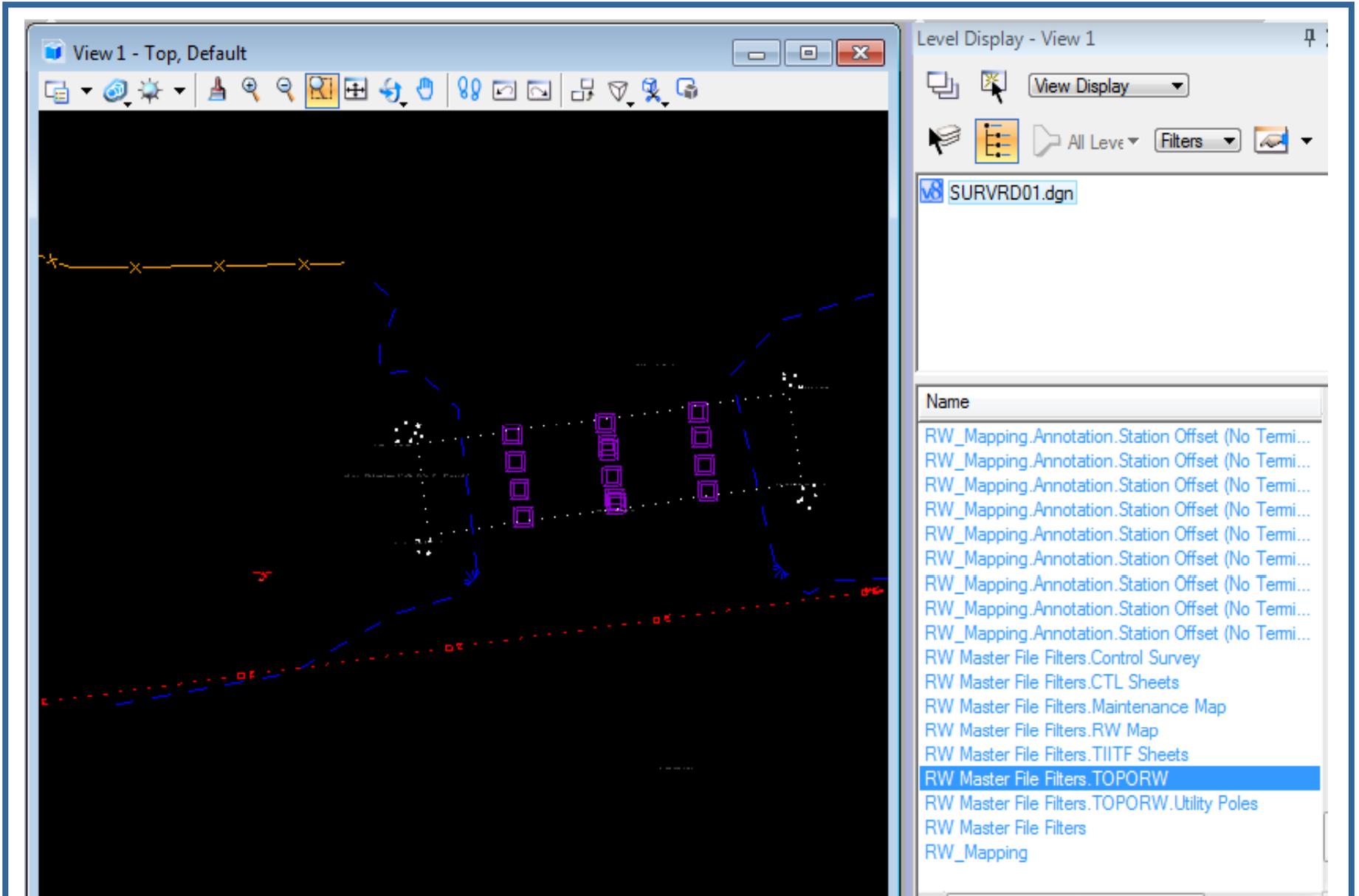
Name
STANDARDS.ALGNRD
STANDARDS.AUTOSP
STANDARDS.CLIPRD
STANDARDS.DRDTRD
STANDARDS.DREXRD
STANDARDS.DRMPRD
STANDARDS.DRPRRD
STANDARDS.DRXSRD
STANDARDS.DSGNLD
STANDARDS.DSGNLT
STANDARDS.DSGNRD
STANDARDS.DSGNSG
STANDARDS.DSGNSP
STANDARDS.DTMRD
STANDARDS.GEOTECH
STANDARDS.GSWKSP
STANDARDS.IRRGLD
STANDARDS.ITSSP
STANDARDS.KEYSHT
STANDARDS.MRARSF









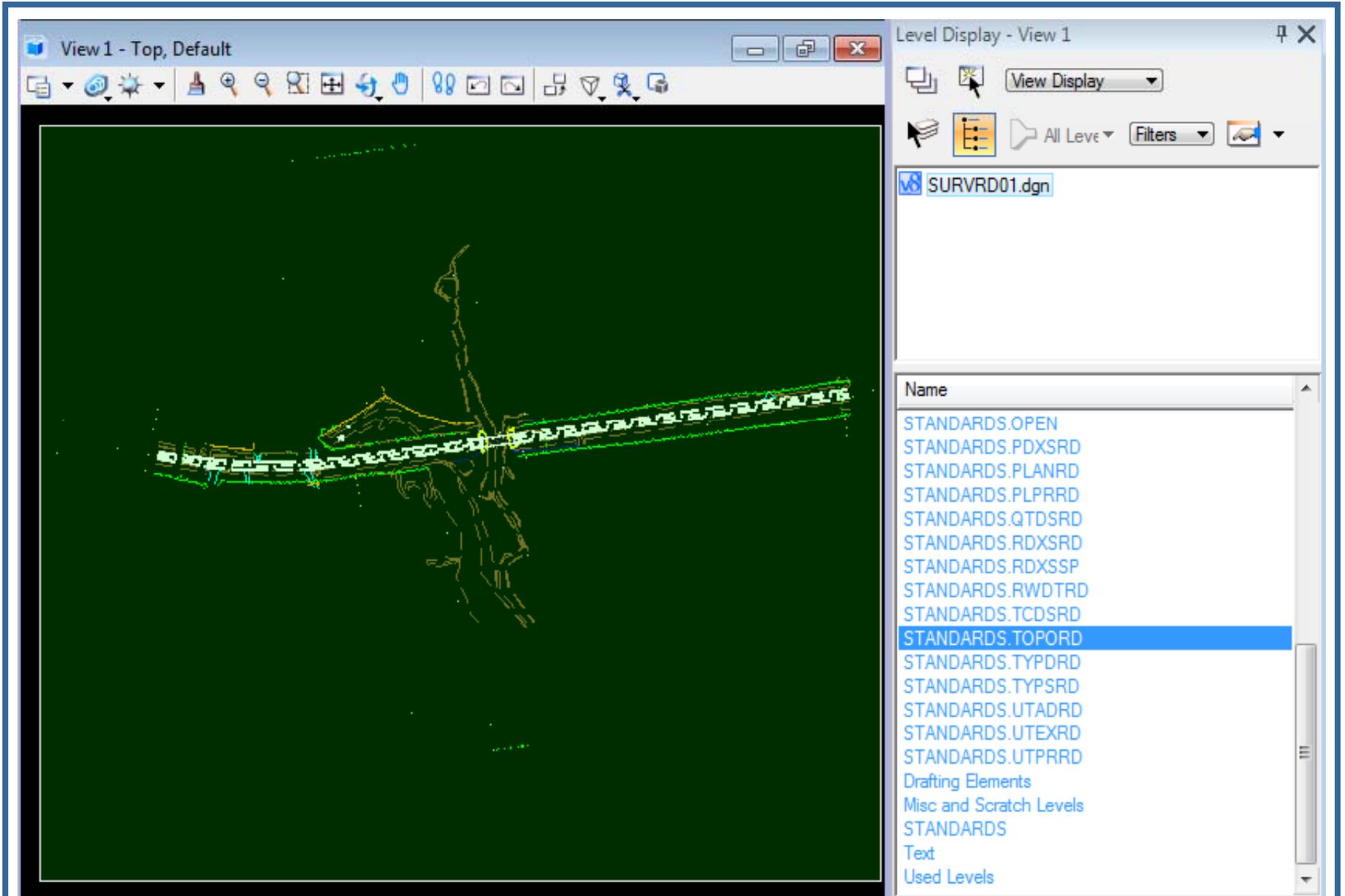


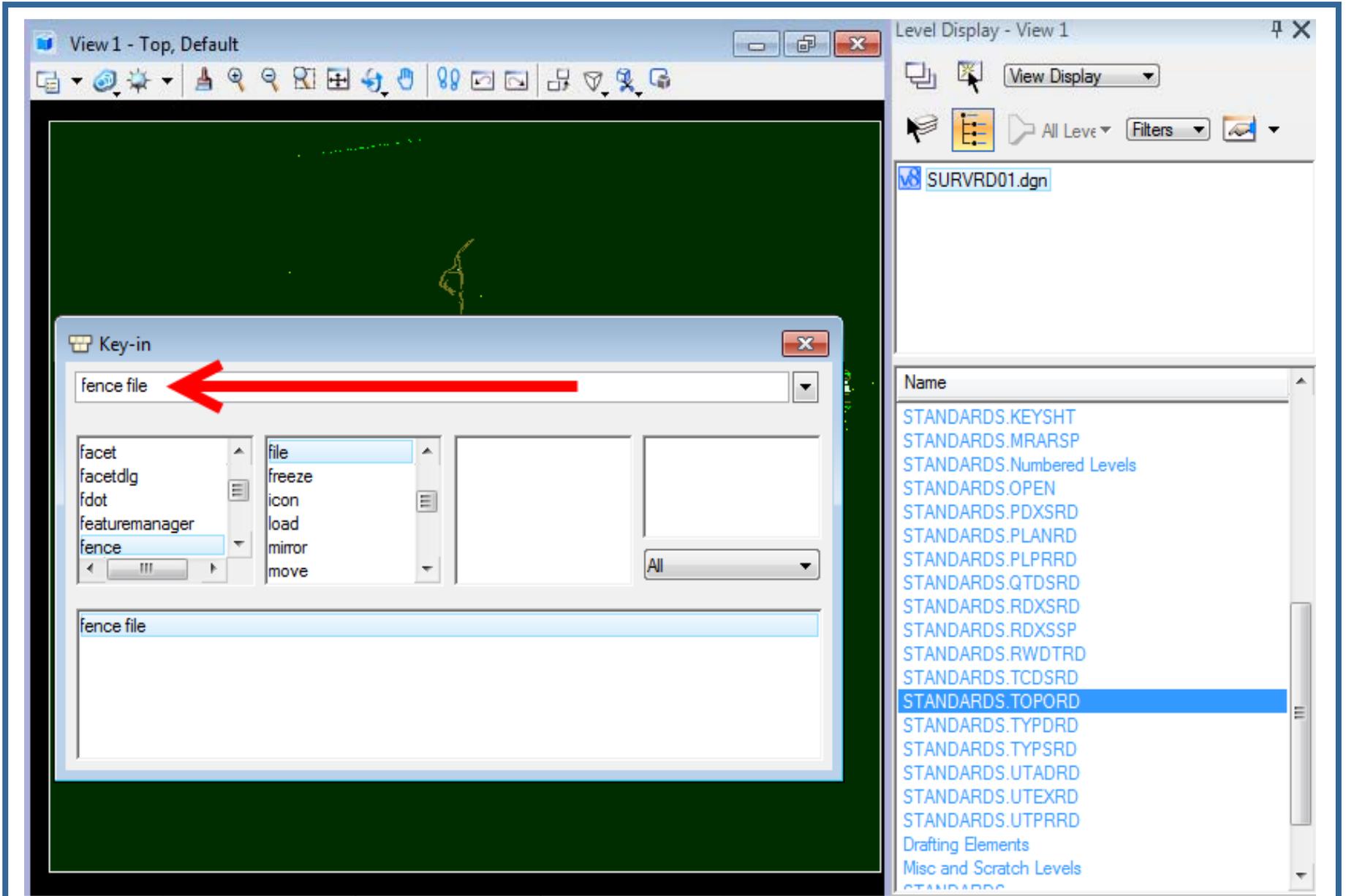
CREATING FDOT SURVEY DELIVERABLES

- ◆ To visualize the DREXRD, TOPORD or UTEXRD elements select the appropriate filter in the level display manager
- ◆ To create the DGN file put a fence around the elements in the view
- ◆ Type in the Key-in box “**fence file**” and the windows “Save As” dialogue box will open so a file can be saved
- ◆ Type in a file name and press “Open”. The dialogue box will close and then you must click on the view to accept the creation of the file

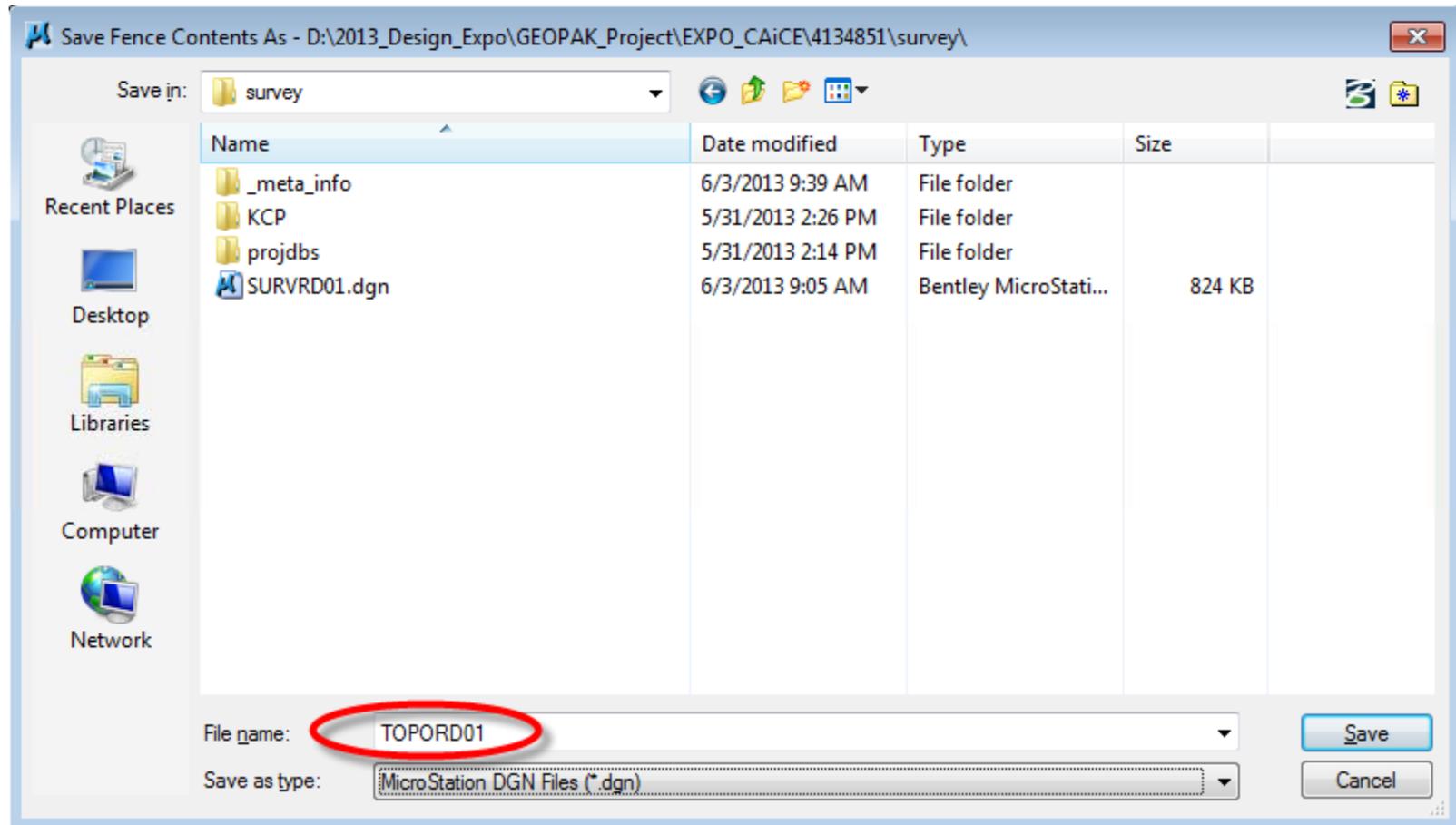
CREATING FDOT SURVEY DELIVERABLES

- ◆ Note that if this is a 3D TOPORD.dgn file a 2D file must be created as the final deliverable
- ◆ Close the current Data Acquisition project file and open the new 3D TOPORD.dgn file.
- ◆ Click on File>Export>2D... to create the TOPORD01.dgn file
- ◆ As in any survey deliverable normal MicroStation editing/labeling will be necessary to complete the deliverable for delivery to design

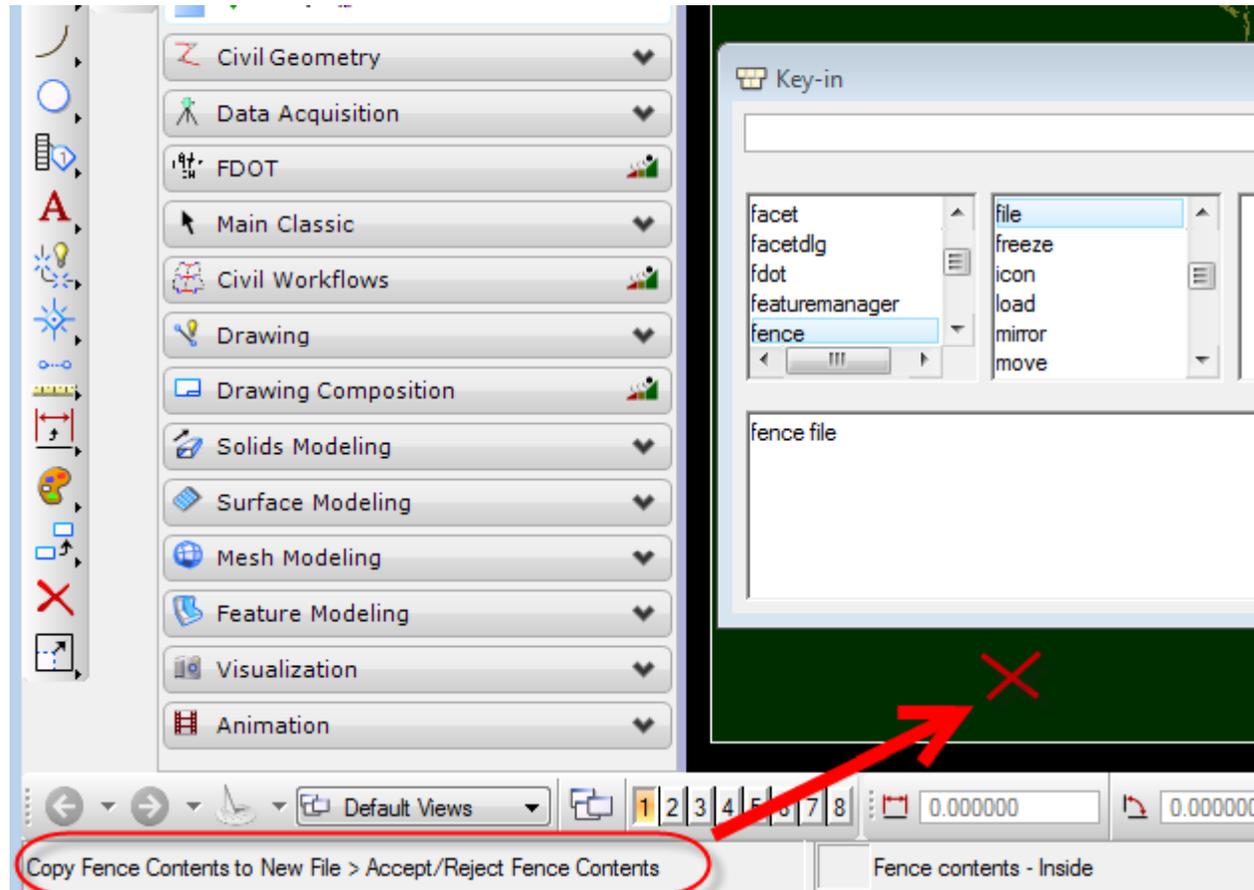




- ◆ Type in the file name to be created and hit save

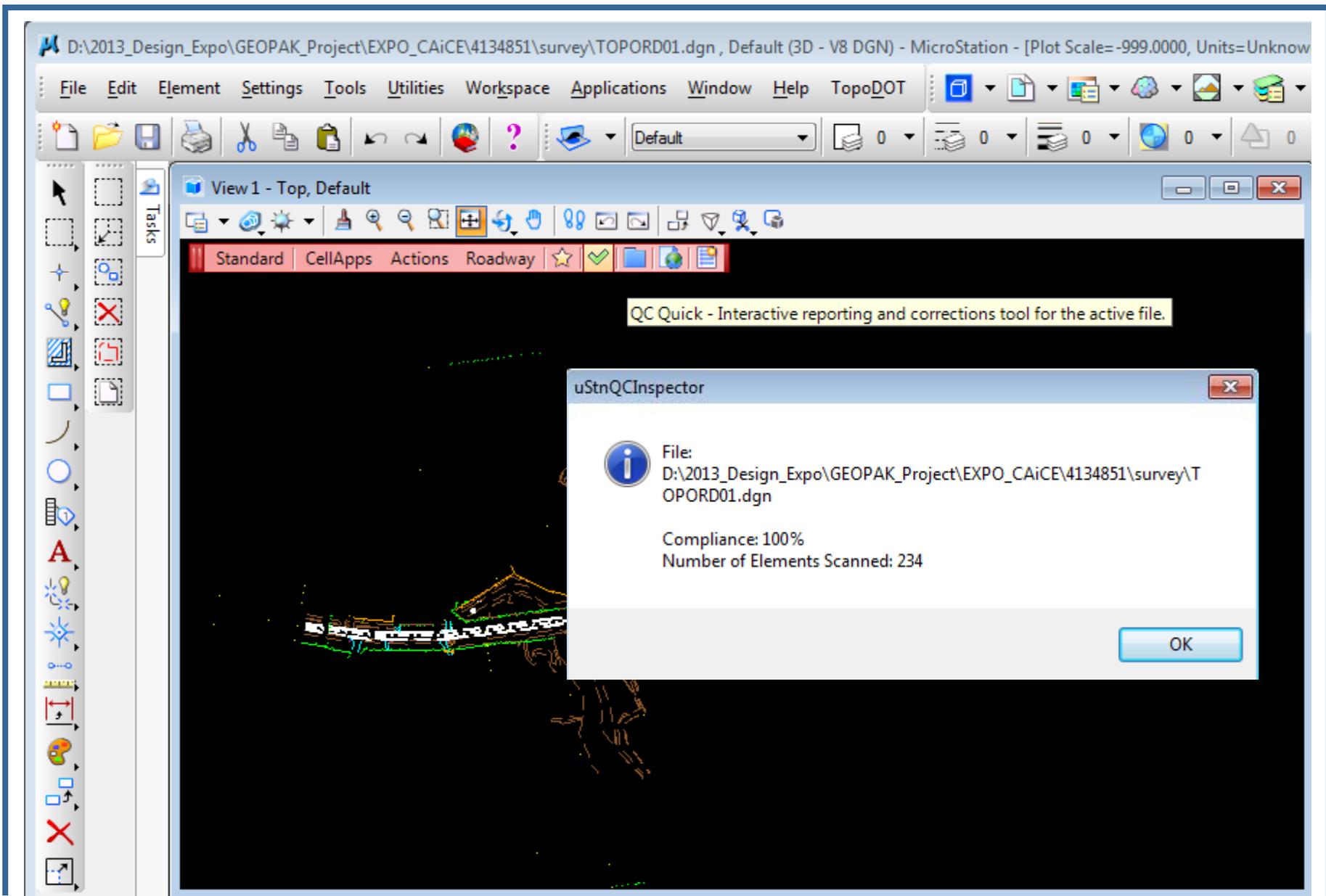


- ◆ Click on the view to accept the fence file creation



QUESTIONS?

ON CREATING DELIVERABLES



GEOPAK Survey Visualization

- ◆ **DATASETS** are the heart of a GEOPAK Survey project.
- ◆ **GPK** Files work hand in hand with datasets.
- ◆ When datasets are active, points and chains can be edited directly from **NAVIGATOR** within **COGO**.
- ◆ GEOPAK Survey has **VISUALIZATION TOOLS** included for visualizing the dataset.

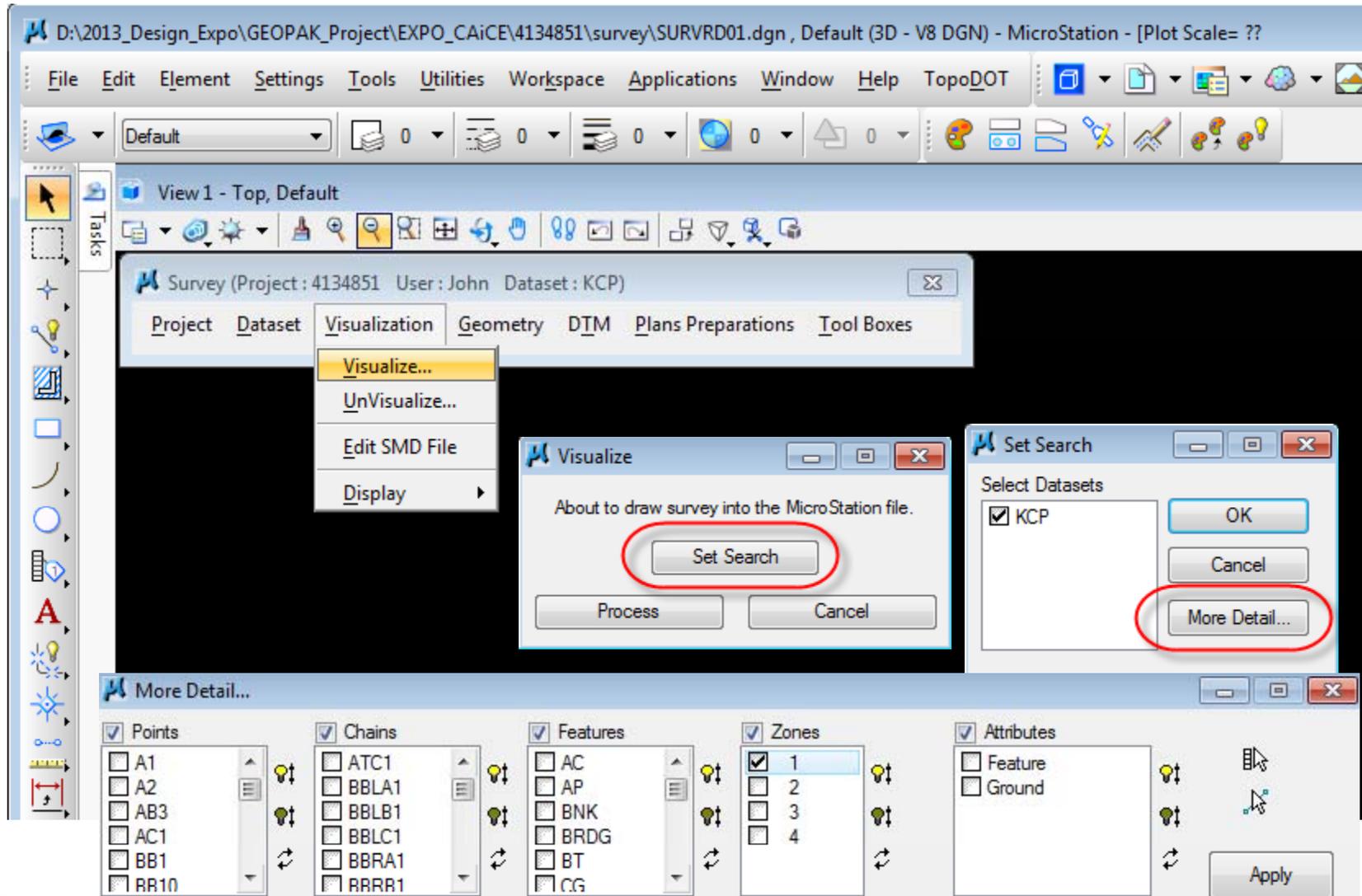
GEOPAK Survey Visualization

- ◆ A dataset can be a variety of types of data.
- ◆ For FDOT purposes we will stick to two types of datasets.
 1. OBS segments to be processed with a CTL file
 2. Imported KCP files. From EFB or CAiCE
- ◆ Either way the result is a dataset and a GPK file containing points and survey chains.

GEOPAK Survey Visualization

- ◆ To Visualize a dataset there must be a GEOPAK Survey Project and an active dataset
 - The entire dataset can be visualized/unvisualized
 - Portions of the dataset can be visualized/unvisualized using the set search criteria
 - Once a dataset or set of coordinates in a GPK file is visualized it can be displayed in a number of ways.

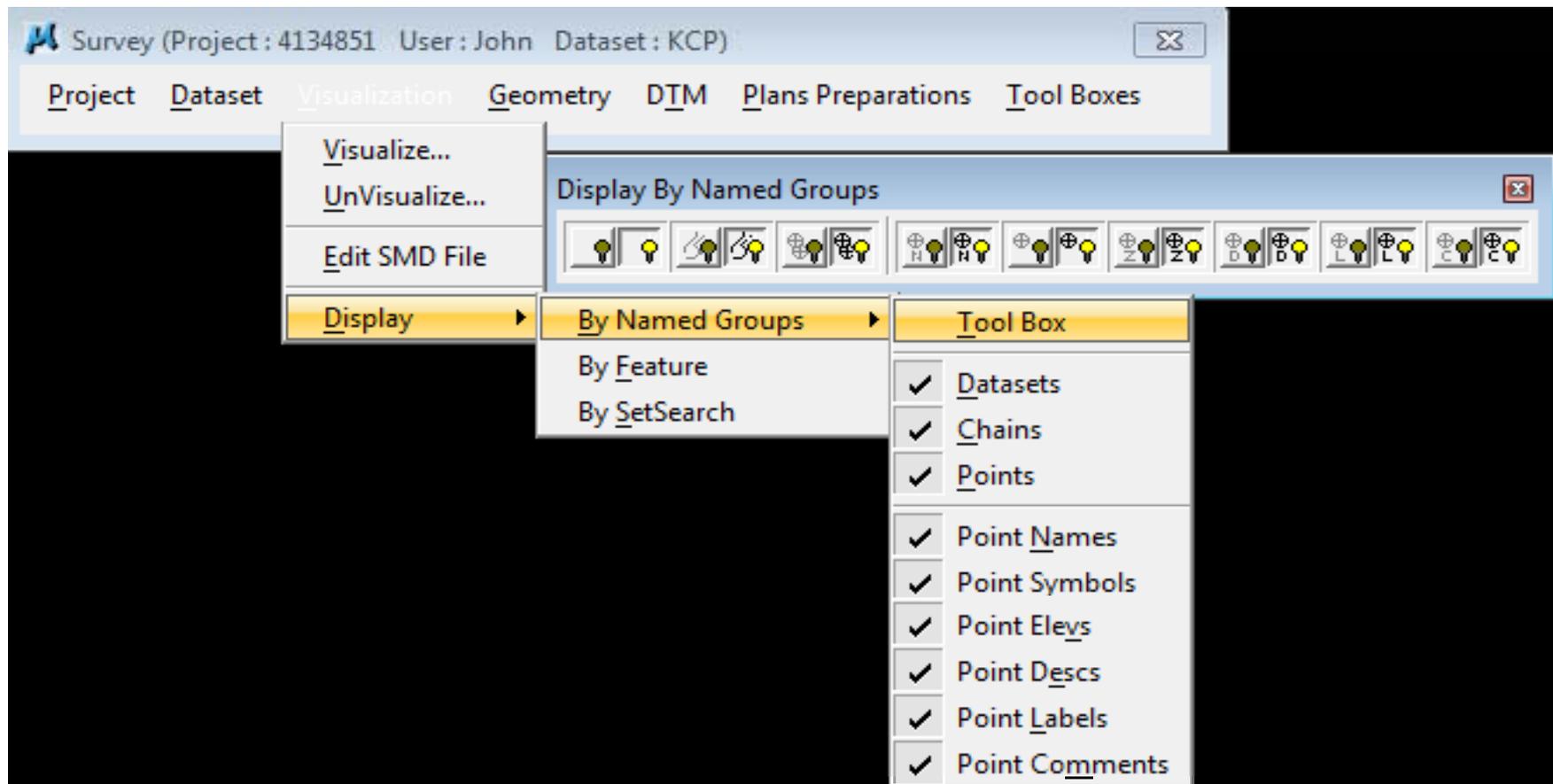
GEOPAK Survey Visualization



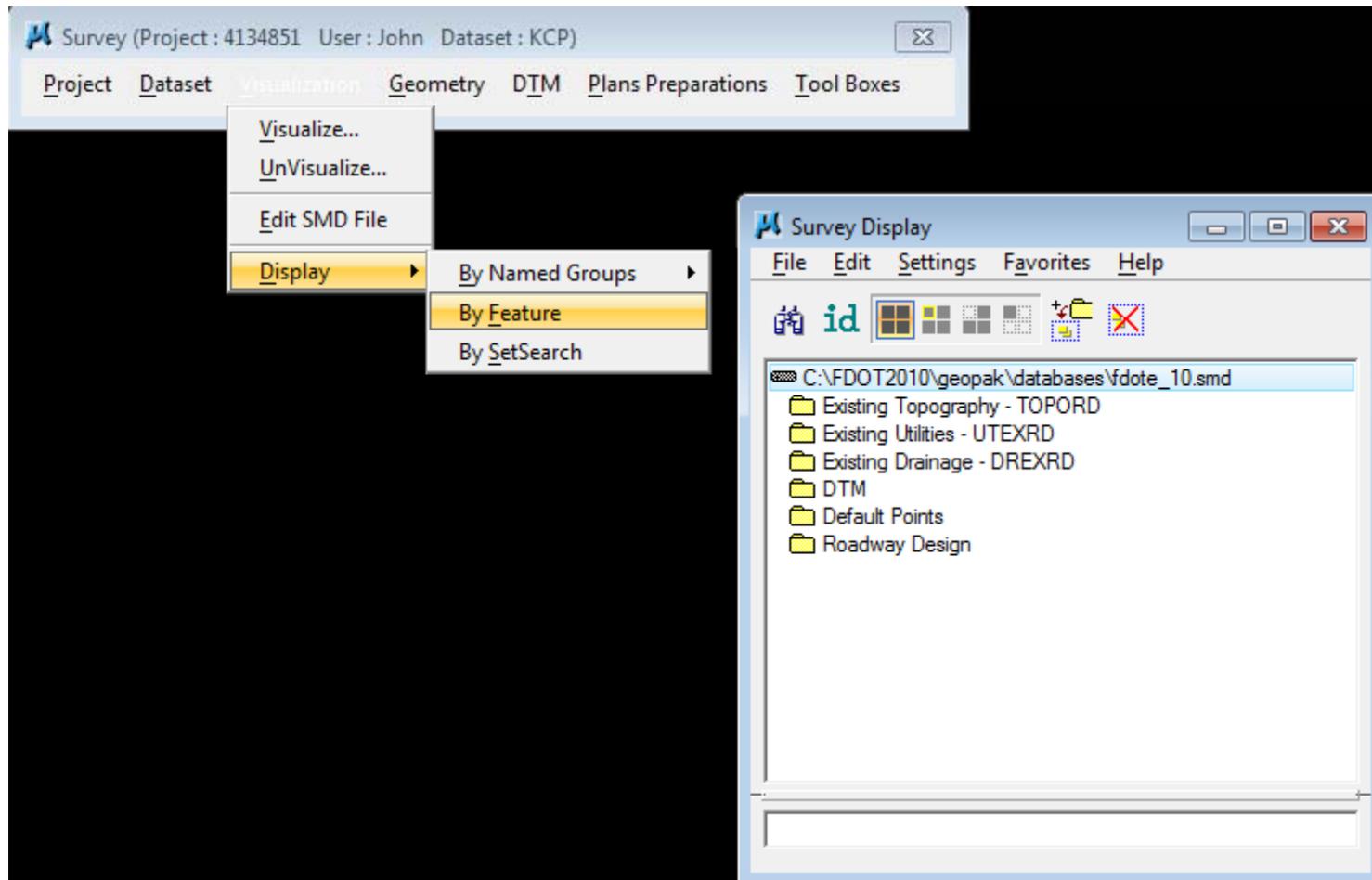
Display GEOPAK Survey Visualization

- ◆ Display by Named Groups
 - ✓ Check the Named Group or use the Named Group Toolbar
- ◆ Display by feature
 - ✓ The SMD allows for various ways to display visualizations
- ◆ Display by set search
 - ✓ Set search criteria can be used to display visualizations

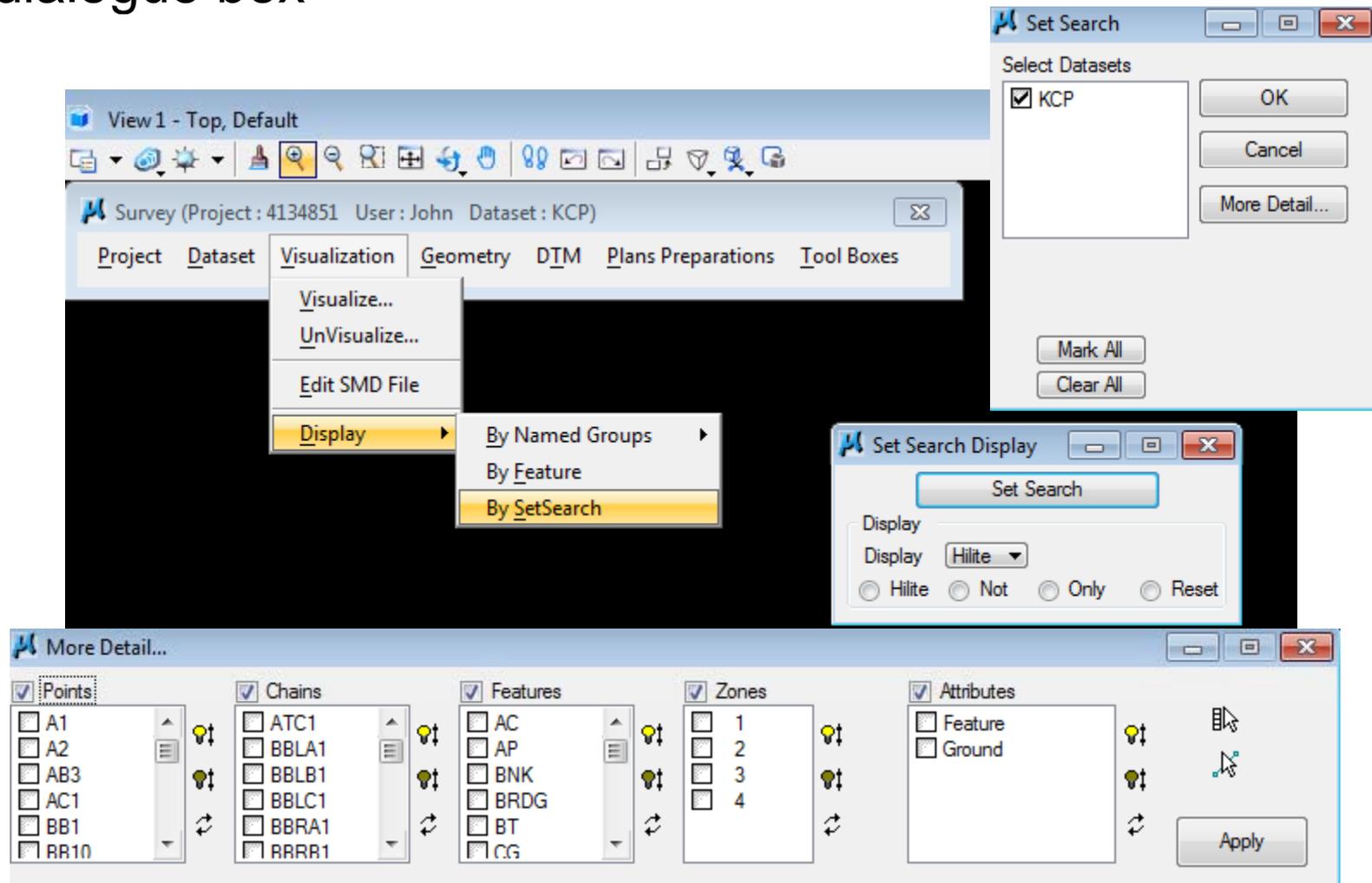
- ◆ To Display By “Named Groups” check the appropriate box or pull up the Named Groups Toolbar



- ◆ To “Display By Feature” use the Survey Display SMD dialogue box



- ◆ To “Display By SetSearch” use the Set Search Display dialogue box



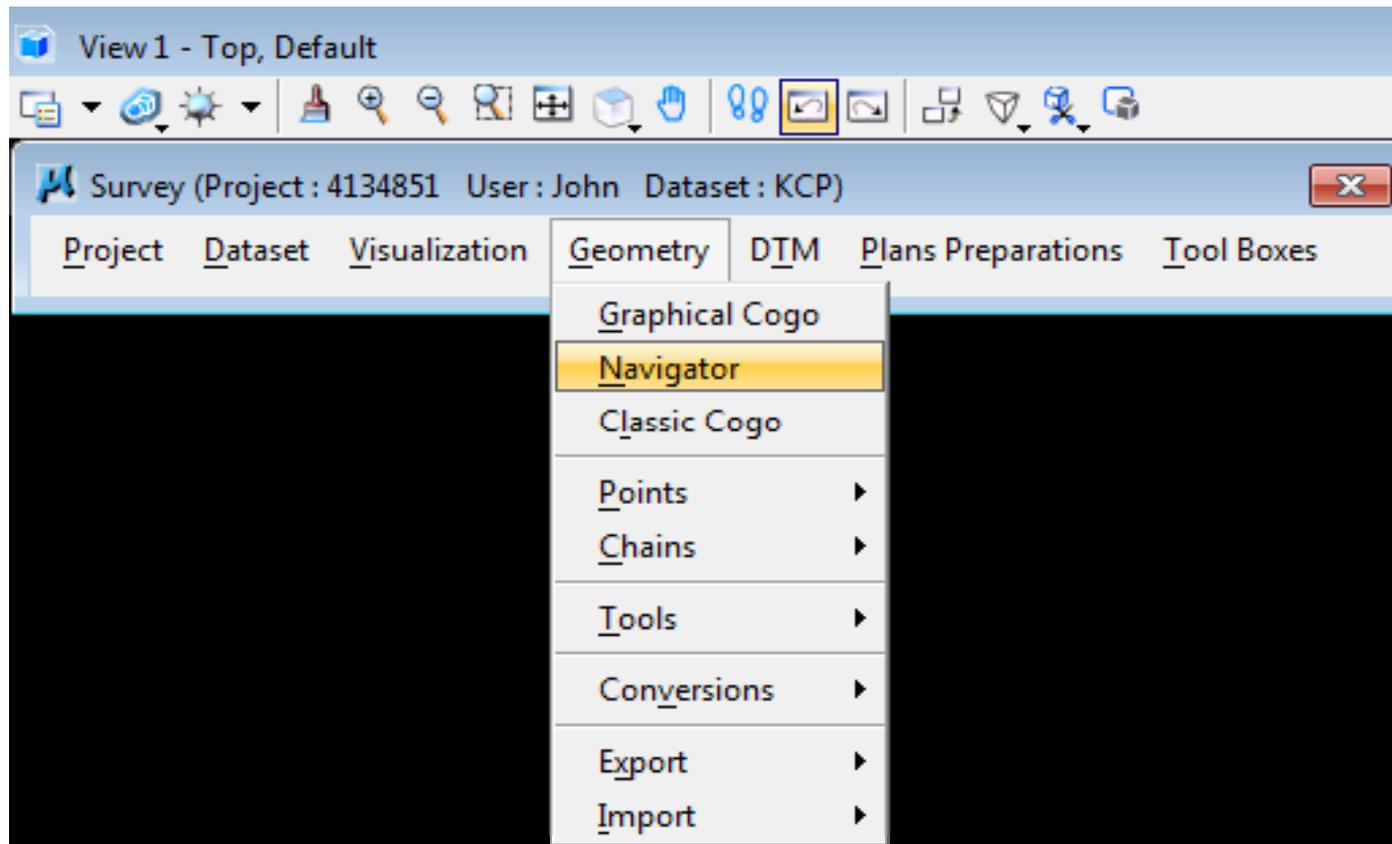
QUESTIONS?

ON GEOPAK VISUALIZAITONS

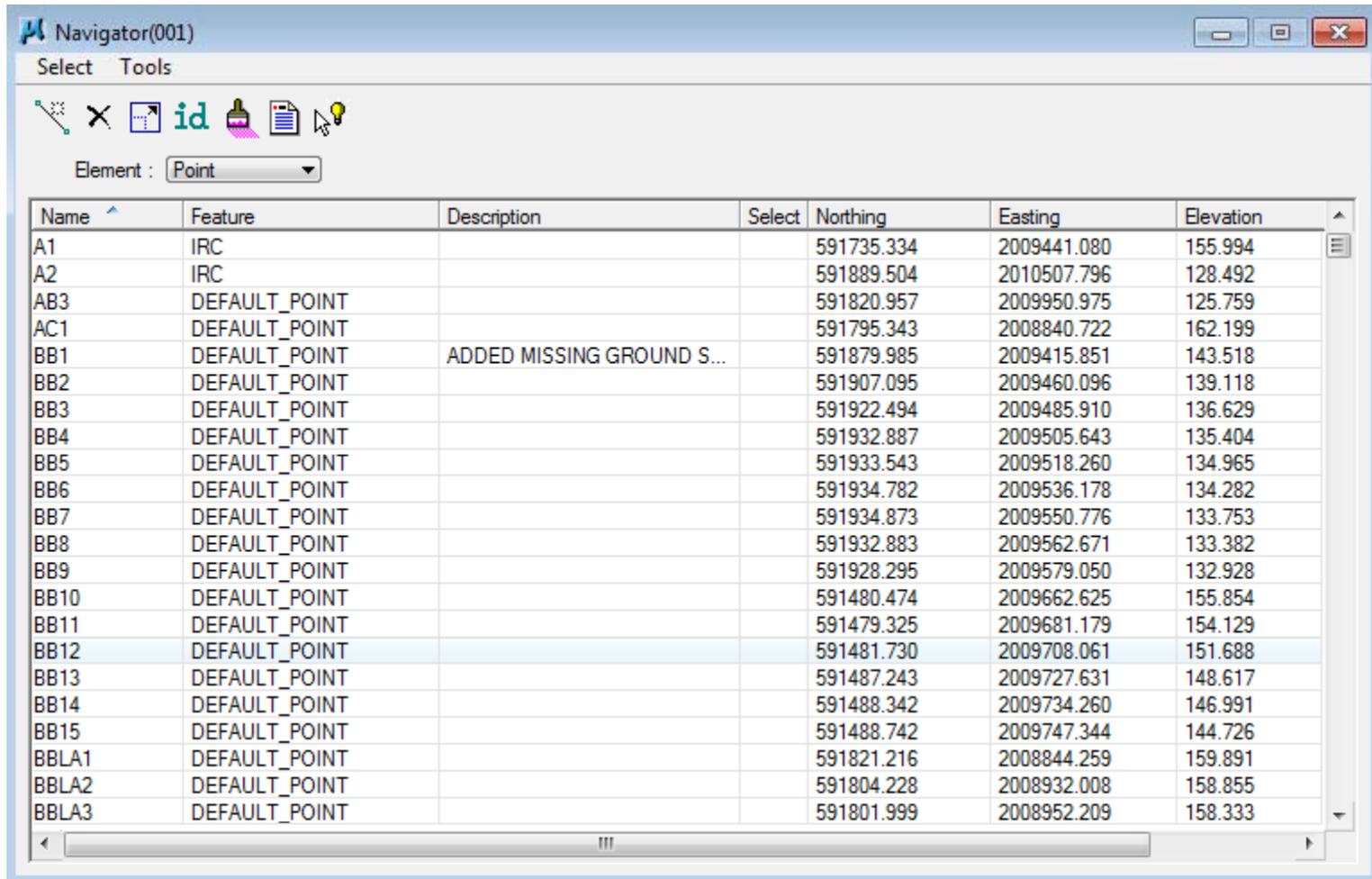
Visualize GPK with Navigator

- ◆ The GPK file can be visualized at any time with Navigator
- ◆ A GEOPAK Survey project or an active dataset is not necessary
- ◆ Activate the GPK Navigator
 - ✓ Choose from the list of Point, Line, Curve, Spiral, Chain, Survey Chain, Parcel, or Profile
 - ✓ Select the elements to be visualized
 - ✓ Click on the “Visualize Element” button to visualize the selected elements

Visualize GPK with Navigator



Visualize GPK with Navigator



The screenshot shows a software window titled "Navigator(001)" with a menu bar containing "Select" and "Tools". Below the menu bar is a toolbar with icons for selection, deletion, and other functions. A dropdown menu labeled "Element:" is set to "Point". The main area of the window contains a table with the following data:

Name	Feature	Description	Select	Northing	Easting	Elevation
A1	IRC			591735.334	2009441.080	155.994
A2	IRC			591889.504	2010507.796	128.492
AB3	DEFAULT_POINT			591820.957	2009950.975	125.759
AC1	DEFAULT_POINT			591795.343	2008840.722	162.199
BB1	DEFAULT_POINT	ADDED MISSING GROUND S...		591879.985	2009415.851	143.518
BB2	DEFAULT_POINT			591907.095	2009460.096	139.118
BB3	DEFAULT_POINT			591922.494	2009485.910	136.629
BB4	DEFAULT_POINT			591932.887	2009505.643	135.404
BB5	DEFAULT_POINT			591933.543	2009518.260	134.965
BB6	DEFAULT_POINT			591934.782	2009536.178	134.282
BB7	DEFAULT_POINT			591934.873	2009550.776	133.753
BB8	DEFAULT_POINT			591932.883	2009562.671	133.382
BB9	DEFAULT_POINT			591928.295	2009579.050	132.928
BB10	DEFAULT_POINT			591480.474	2009662.625	155.854
BB11	DEFAULT_POINT			591479.325	2009681.179	154.129
BB12	DEFAULT_POINT			591481.730	2009708.061	151.688
BB13	DEFAULT_POINT			591487.243	2009727.631	148.617
BB14	DEFAULT_POINT			591488.342	2009734.260	146.991
BB15	DEFAULT_POINT			591488.742	2009747.344	144.726
BBLA1	DEFAULT_POINT			591821.216	2008844.259	159.891
BBLA2	DEFAULT_POINT			591804.228	2008932.008	158.855
BBLA3	DEFAULT_POINT			591801.999	2008952.209	158.333

Visualize GPK with Navigator

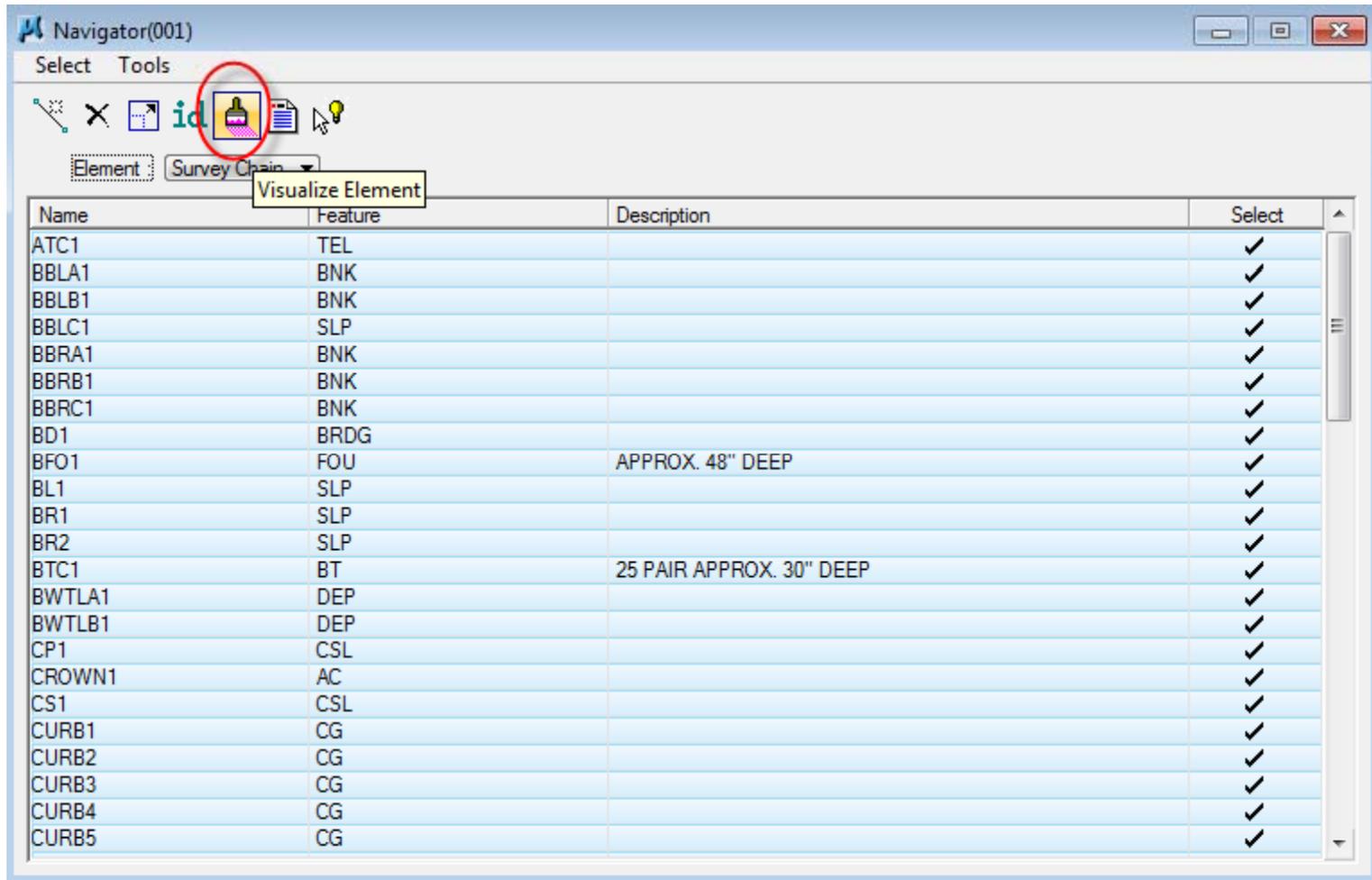
Navigator(001)

Select Tools

Element : Point

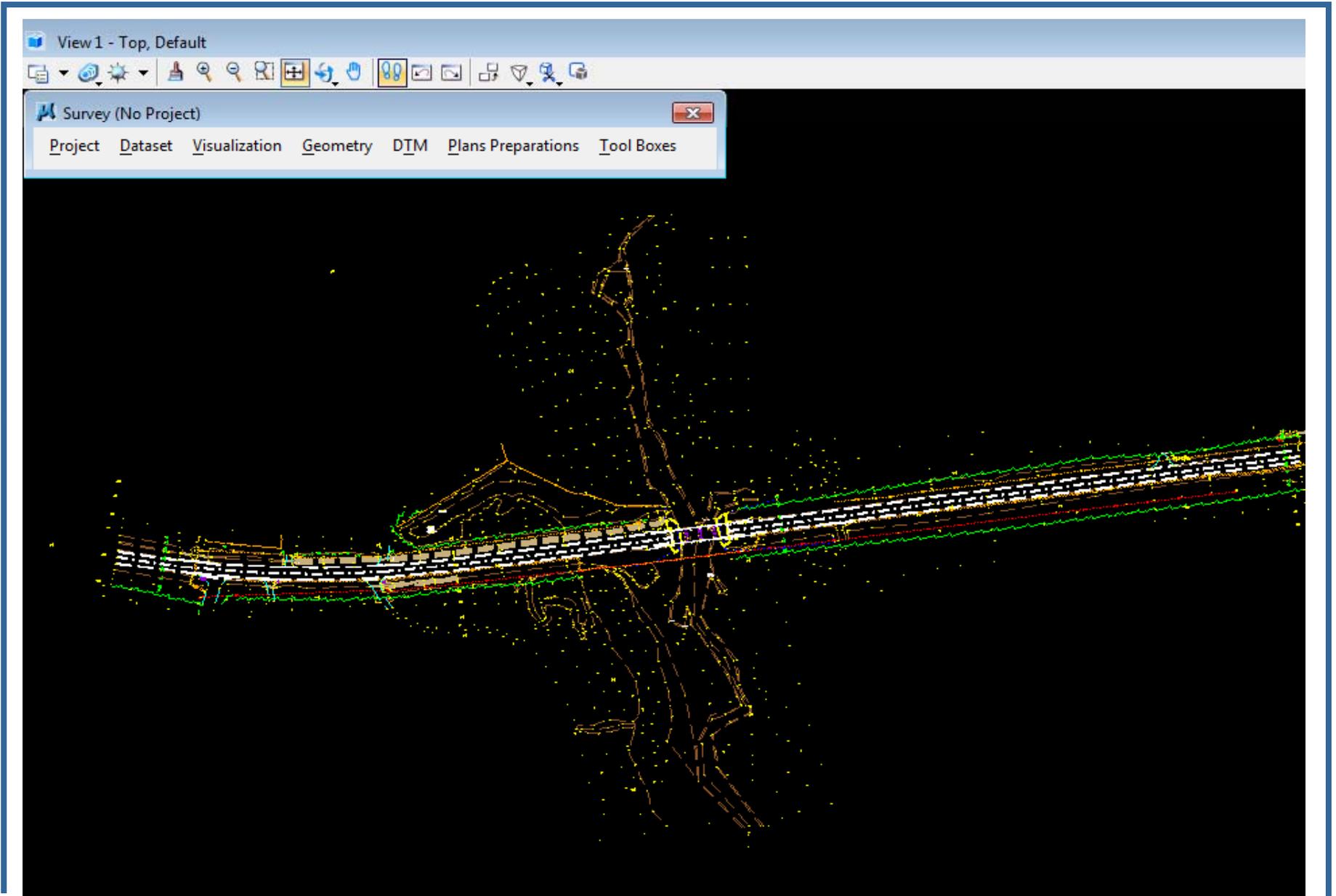
Name	Feature	Description	Select	Northing	Easting	Elevation
A1	IRC		✓	591735.334	2009441.080	155.994
A2	IRC		✓	591889.504	2010507.796	128.492
AB3	DEFAULT_POINT		✓	591820.957	2009950.975	125.759
AC1	DEFAULT_POINT		✓	591795.343	2008840.722	162.199
BB1	DEFAULT_POINT	ADDED MISSING GROUND S...	✓	591879.985	2009415.851	143.518
BB2	DEFAULT_POINT		✓	591907.095	2009460.096	139.118
BB3	DEFAULT_POINT		✓	591922.494	2009485.910	136.629
BB4	DEFAULT_POINT		✓	591932.887	2009505.643	135.404
BB5	DEFAULT_POINT		✓	591933.543	2009518.260	134.965
BB6	DEFAULT_POINT		✓	591934.782	2009536.178	134.282
BB7	DEFAULT_POINT		✓	591934.873	2009550.776	133.753
BB8	DEFAULT_POINT		✓	591932.883	2009562.671	133.382
BB9	DEFAULT_POINT		✓	591928.295	2009579.050	132.928
BB10	DEFAULT_POINT		✓	591480.474	2009662.625	155.854
BB11	DEFAULT_POINT		✓	591479.325	2009681.179	154.129
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BB14	DEFAULT_POINT		✓	591488.342	2009734.260	146.991
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BBLA1	DEFAULT_POINT		✓	591821.216	2008844.259	159.891
BBLA2	DEFAULT_POINT		✓	591804.228	2008932.008	158.855
BBLA3	DEFAULT_POINT		✓	591801.999	2008952.209	158.333

Visualize GPK with Navigator



The screenshot shows the Navigator(001) application window. The 'Tools' menu is open, and the 'Visualize Element' icon is circled in red. A tooltip 'Visualize Element' is visible over the icon. Below the menu, there is a table with the following columns: Name, Feature, Description, and Select. The table contains 25 rows of survey data.

Name	Feature	Description	Select
ATC1	TEL		✓
BBLA1	BNK		✓
BBLB1	BNK		✓
BBLC1	SLP		✓
BBRA1	BNK		✓
BBRB1	BNK		✓
BBRC1	BNK		✓
BD1	BRDG		✓
BFO1	FOU	APPROX. 48" DEEP	✓
BL1	SLP		✓
BR1	SLP		✓
BR2	SLP		✓
BTC1	BT	25 PAIR APPROX. 30" DEEP	✓
BWTLA1	DEP		✓
BWTLB1	DEP		✓
CP1	CSL		✓
CROWN1	AC		✓
CS1	CSL		✓
CURB1	CG		✓
CURB2	CG		✓
CURB3	CG		✓
CURB4	CG		✓
CURB5	CG		✓



QUESTIONS?
ON GPK NAVIGATOR
VISUALIZAITONS

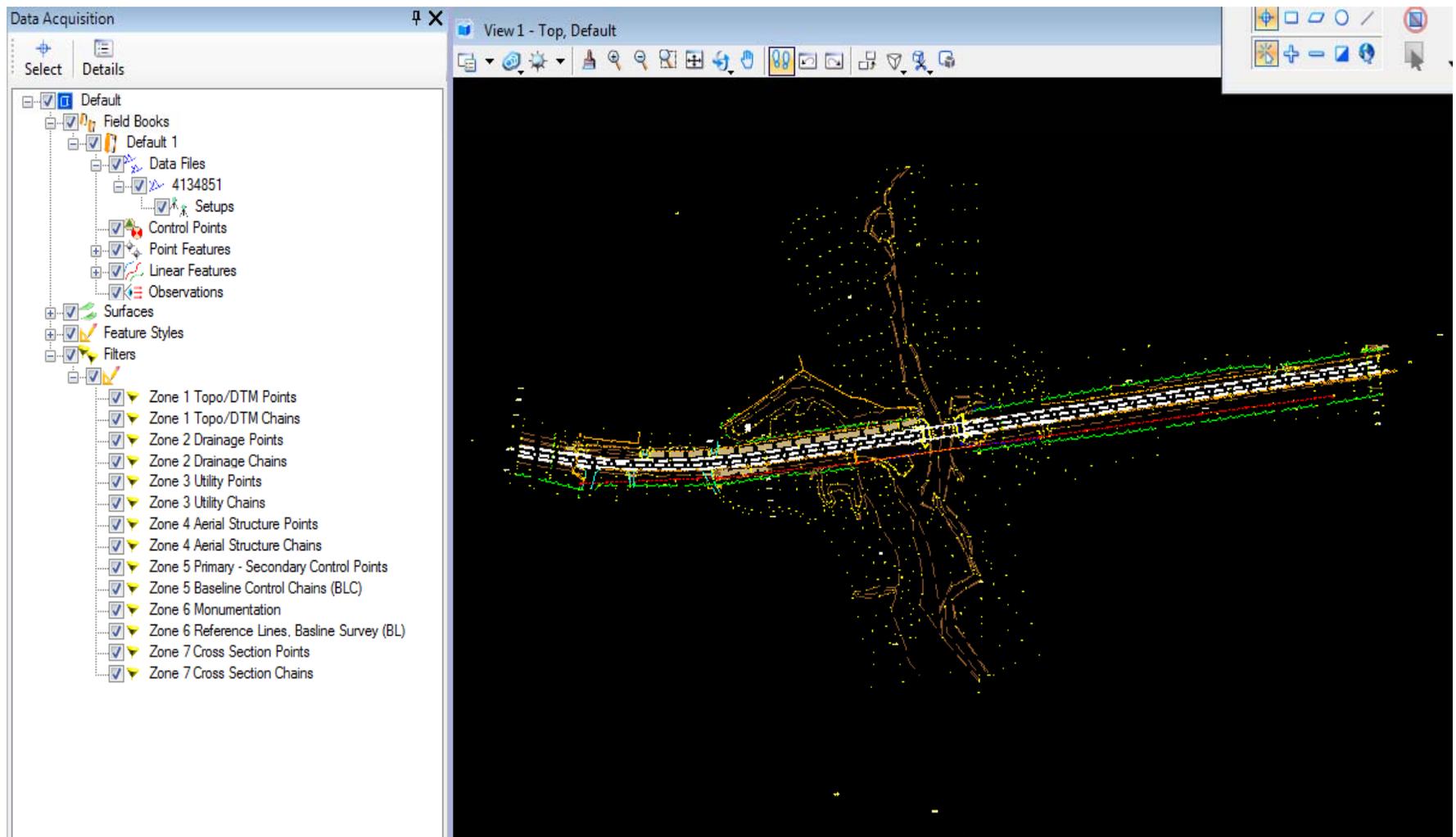
Data Acquisition Visualization

- ◆ Visualization in Data Acquisition is accomplished with a check box
- ◆ Zone Filters have been added to comply with the standardized FDOT zones that will take affect in July 2013
- ◆ It is important that the point zones match the corresponding chain zones
- ◆ Deliverables must be created with level filters
- ◆ To re-visualize key in “dataacquisition redraw”

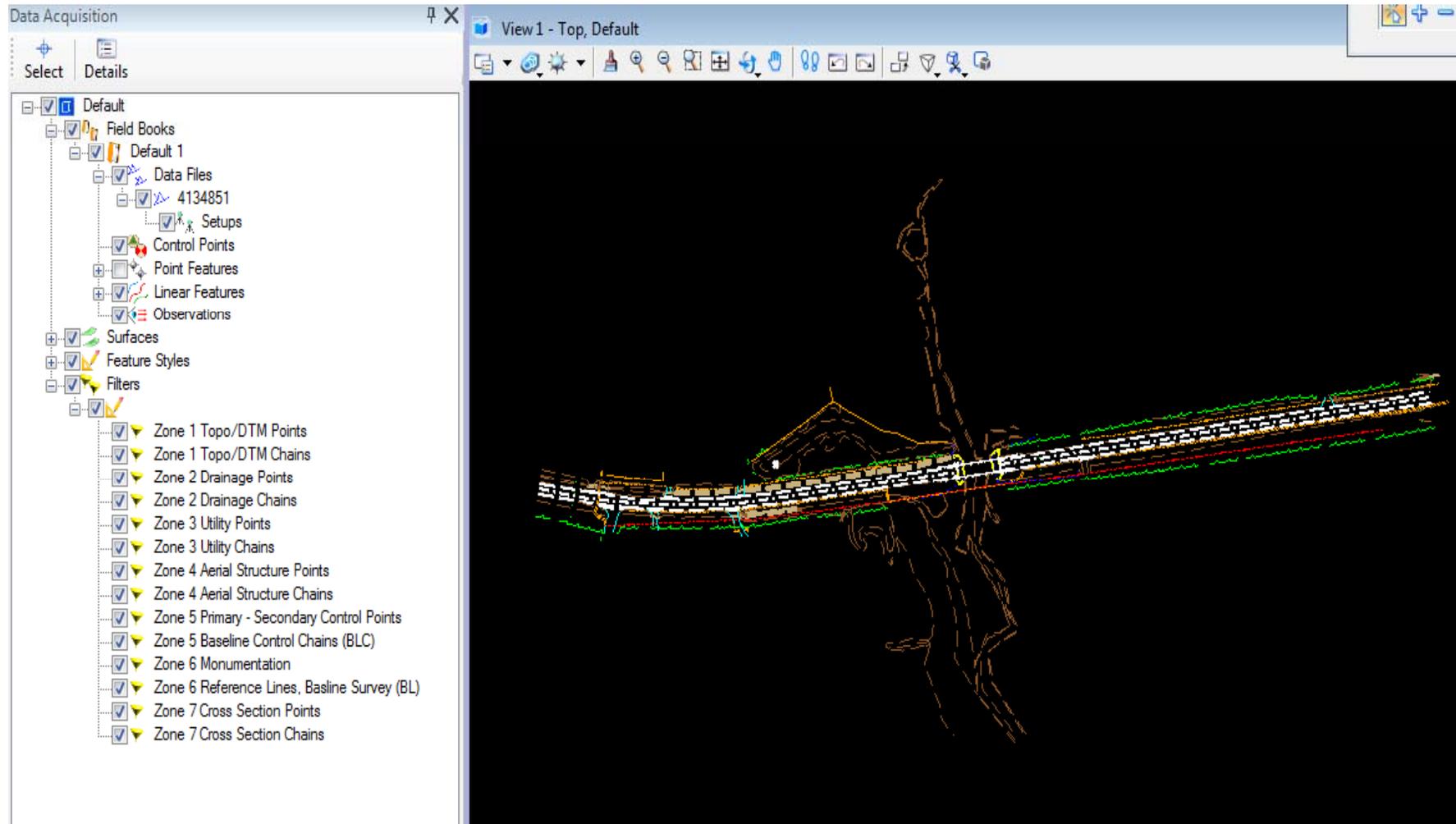
◆ FDOT Standard ZONES Beginning July 2013

Name	Category	Description
Zone 1 Topo/DTM Points		Pavement, Sidewalks, Trees, Fences, Buildings, Ground Shots, etc.
Zone 1 Topo/DTM Chains		Pavement, Sidewalks, Trees, Fences, Buildings, Ground Shots, etc.
Zone 2 Drainage Points		Drainage Structures, Culverts, Inlets, End Walls, etc
Zone 2 Drainage Chains		Drainage Structures, Culverts, Inlets, End Walls, etc
Zone 3 Utility Points		Above ground and Underground Utilities
Zone 3 Utility Chains		Above ground and Underground Utilities
Zone 4 Aerial Structure Points		Superstructures, Bridges and Railroad Overpasses
Zone 4 Aerial Structure Chains		Superstructures, Bridges and Railroad Overpasses
Zone 5 Primary - Secondary Control Points		Horizontal and Vertical Project Control, Traverse Points,
Zone 5 Baseline Control Chains (BLC)		Field Baselines, Traverse lines (BLC)
Zone 6 Monumentation		Property and Boundary Ties, Centerline (Found or Set)
Zone 6 Reference Lines, Baseline Survey (BL)		Reference Lines, Centerline, Baseline Survey
Zone 7 Cross Section Points		Check Cross Sections to verify DTM
Zone 7 Cross Section Chains		Check Cross Sections to verify DTM

- ◆ When a field book is created in D.A. all elements are visualized. Note that all boxes are checked.



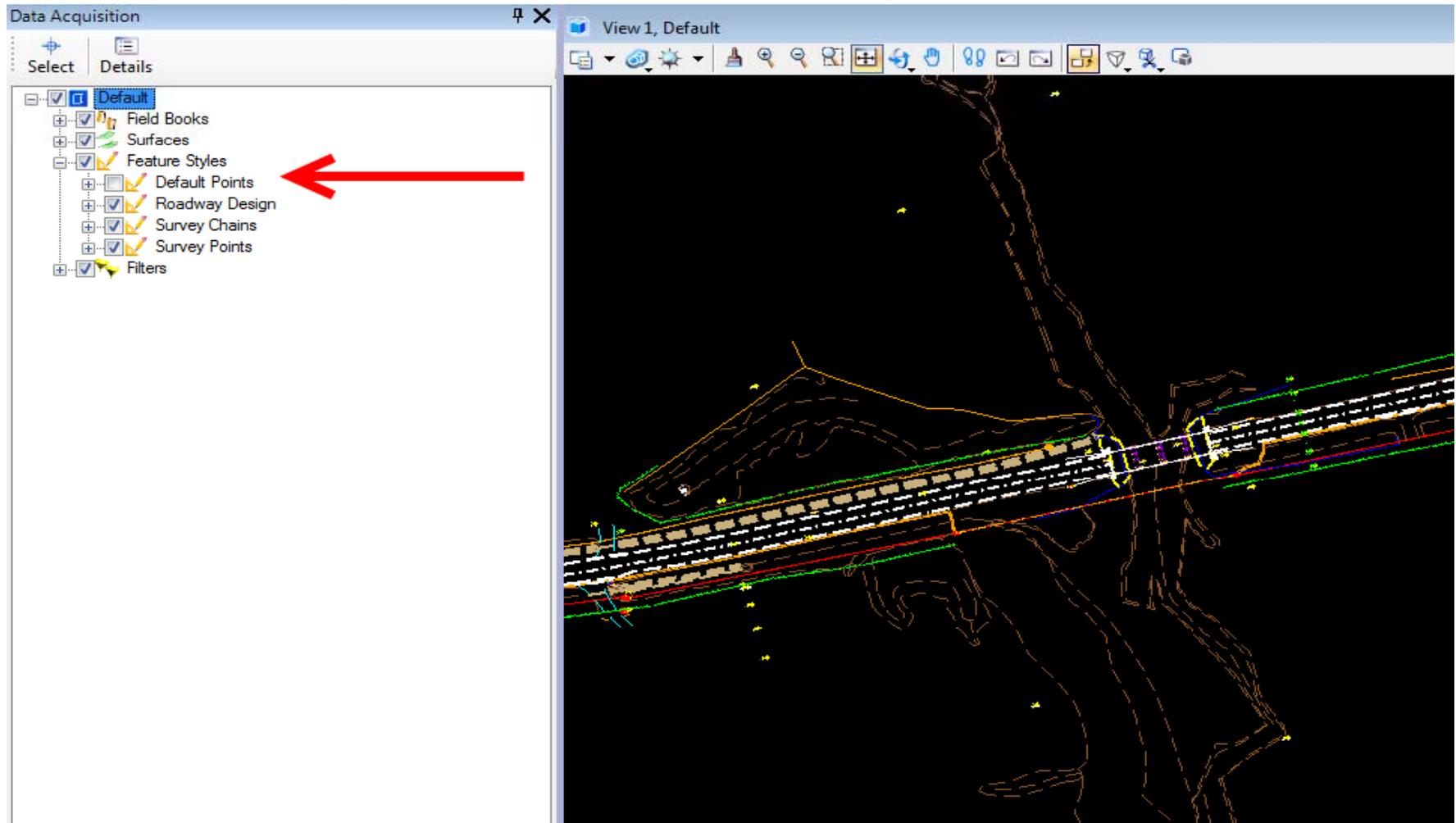
- ◆ To turn off an element, uncheck the box.



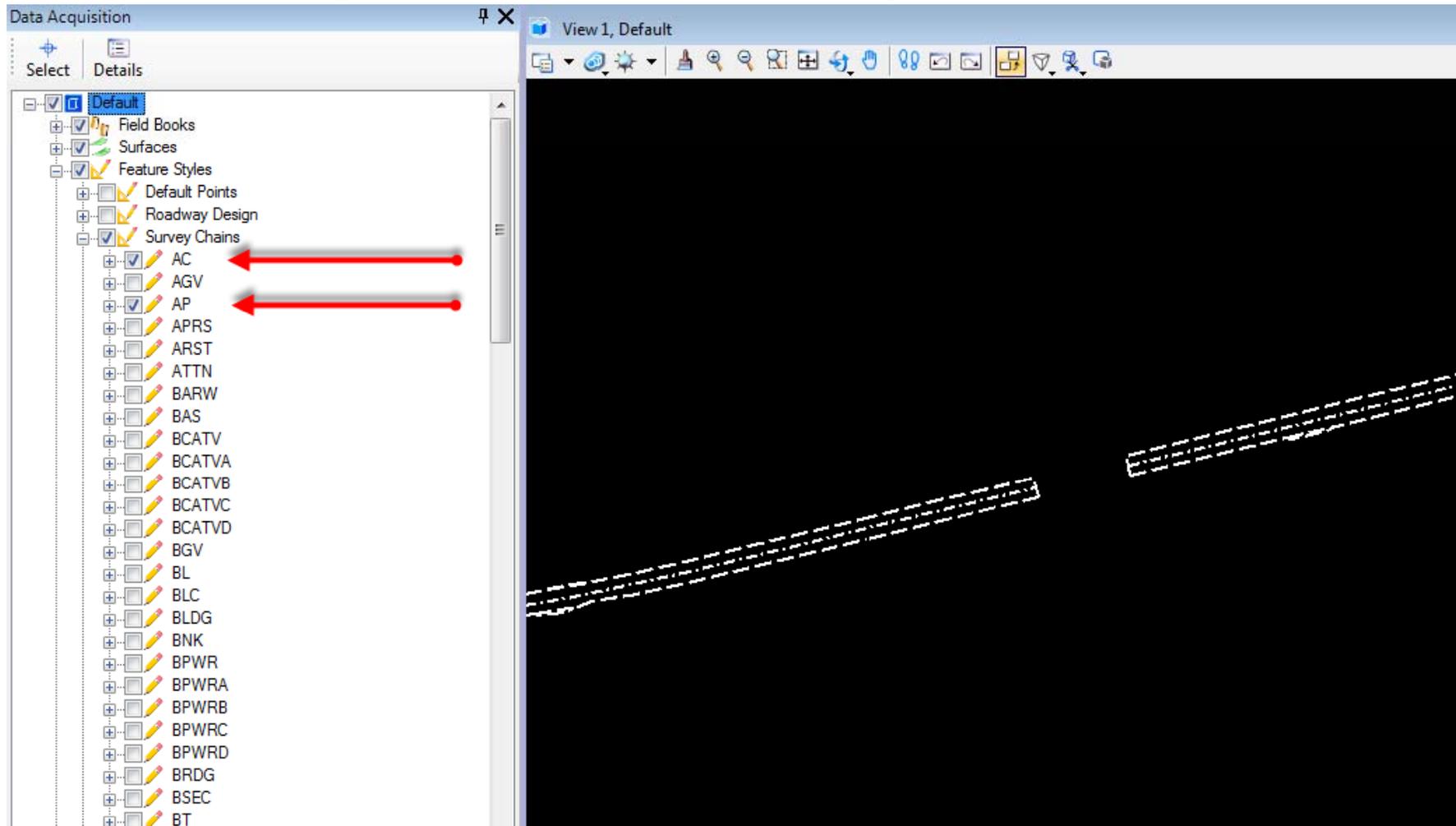
- ◆ To use the Zone filters, uncheck the filter box, then check the individual zones to display them.

The screenshot displays a software interface with two main windows. The left window, titled "Data Acquisition", shows a hierarchical tree view of filters. The "Filters" folder is expanded, and a red arrow points to it. Below it, a list of filters is shown, with checkboxes for each. Two red arrows point to the checkboxes for "Zone 3 Utility Points" and "Zone 3 Utility Chains", which are currently checked. The right window, titled "View 1 - Top, Default", shows a 3D view of a survey line. The line is represented by a dashed yellow line with crosshair markers at each point. The points are labeled with their coordinates: BTC1159.047300, BTC1158.831100, BTC1157.741500, and BTC1156.745100. The line is labeled "BT" in yellow text.

- ◆ Elements can be displayed by feature by checking or unchecking the feature or feature group



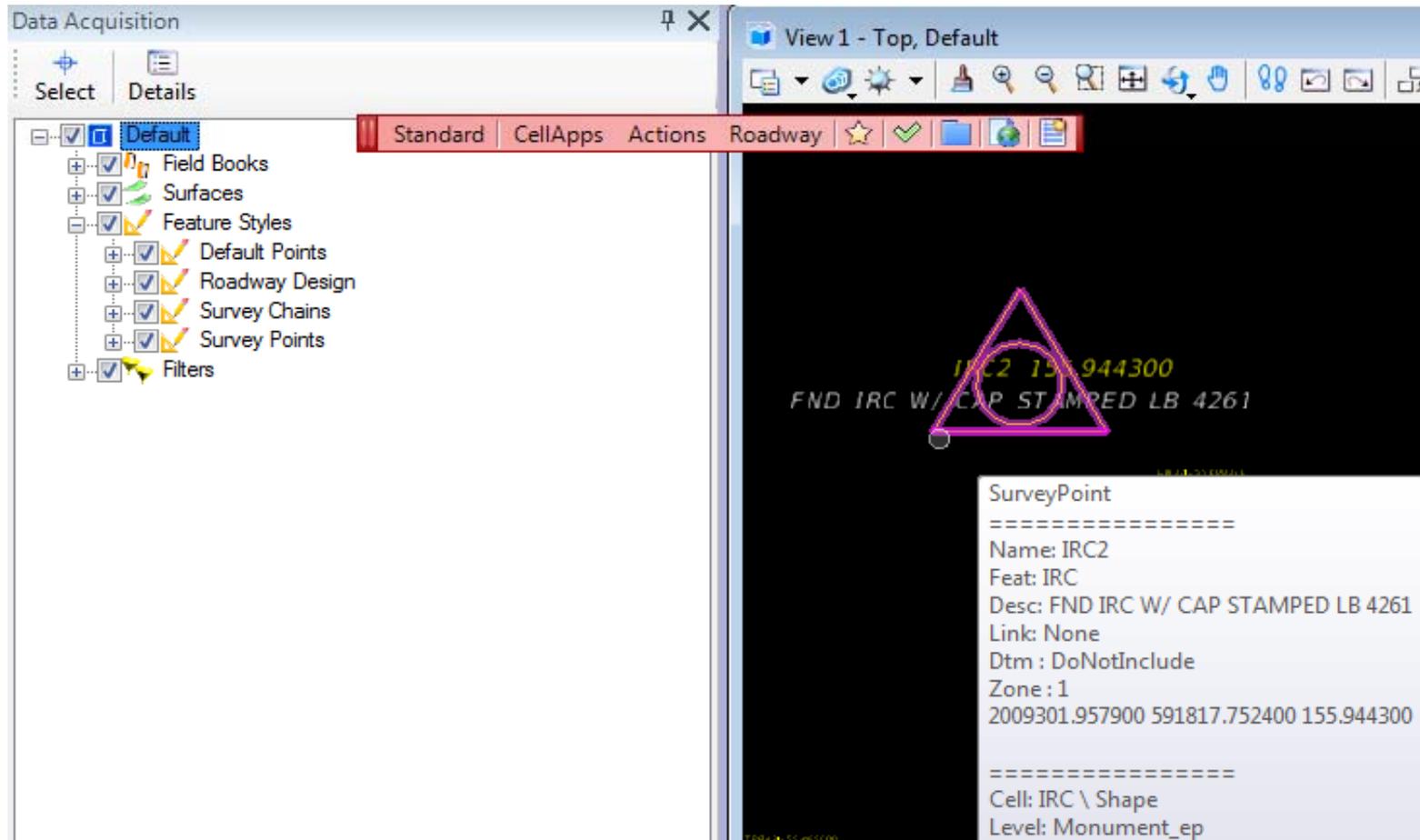
- ◆ Elements can be displayed by feature by checking or unchecking the feature or feature group



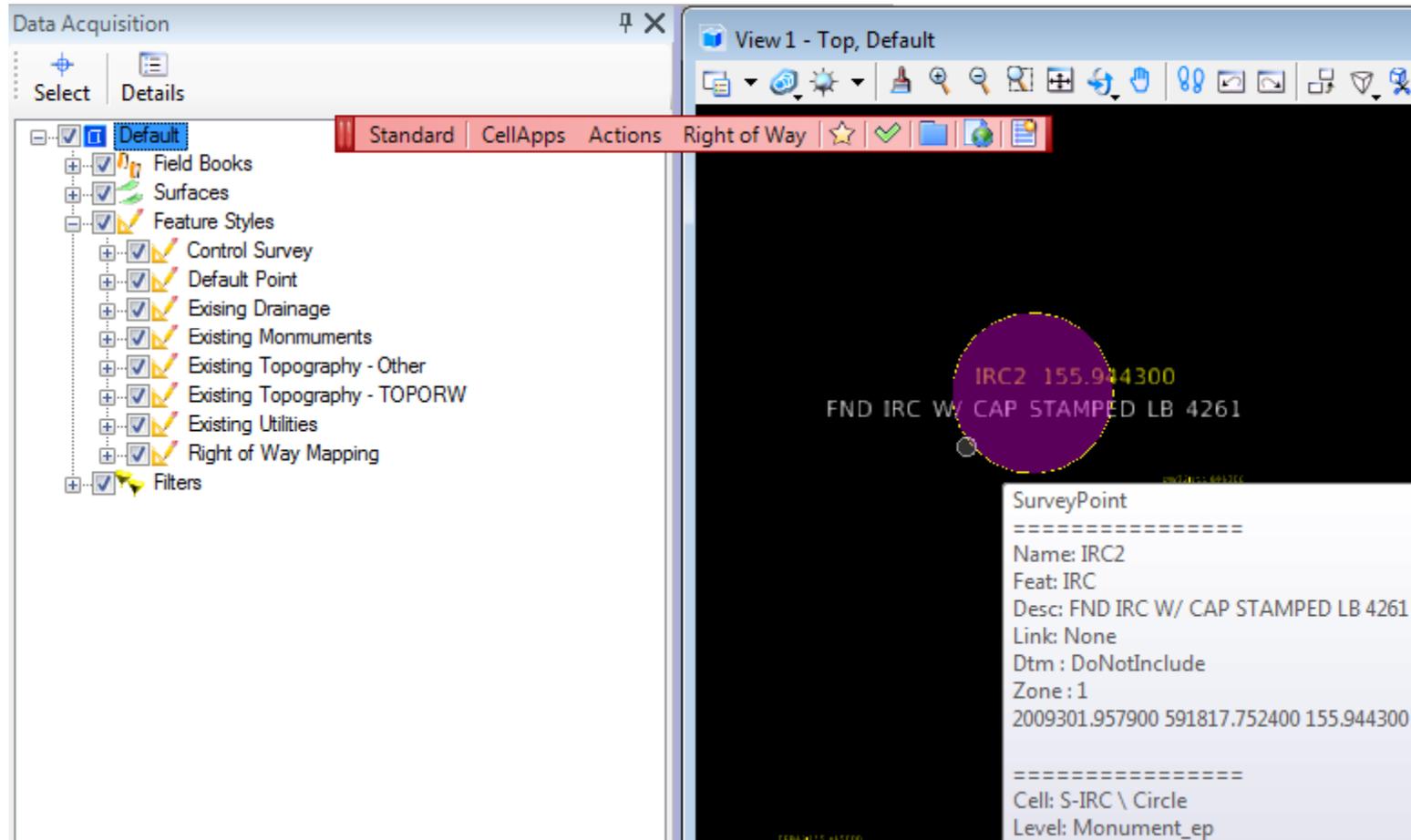
Data Acquisition Redraw

- ◆ Features in Data Acquisition can be re-visualized or redrawn based on the currently attached XML feature table
 - ✓ Attach a different feature table or switch from Roadway to the Right of Way work space
 - ✓ Type in the key-in box “dataacquisition redraw”
- ◆ All features will be redrawn
- ◆ Use the Level Filters to create deliverables

◆ Note the Feature Styles in the Roadway Workspace



- ◆ Note the Feature Styles in the Right of Way Workspace



Model Properties

The screenshot displays the TopoDOT software interface. The main window shows a 3D terrain model with various colored lines and markers. A red arrow points to the 'Edit Model Properties' icon in the toolbar. The 'Model Properties' dialog box is open, showing the following settings:

Type	2D/3D	Name	Description
Design	3D	Default	Master Model

Model Properties

Type: Design | 3D

Name: Default

Description: Master Model

Ref Logical: [Empty]

Scale: 1=1

Line Style Scale: Global Line Style Scale | 50.00000

Update Fields Automatically

Cell Properties

- Can be placed as a cell | Cell Type: Graphic
- Can be placed as an annotation cell

Buttons: OK, Cancel

Model Properties

The screenshot displays the TopoDOT software interface. The main window shows a technical drawing with various lines and annotations. A 'Model Properties' dialog box is open in the foreground, showing the following settings:

- Type: Design (dropdown), 3D (dropdown)
- Name: Default (text field)
- Description: Master Model (text field)
- Ref Logical: (text field)
- Line Style Scale: Global Line Style Scale (dropdown), 1.000000 (text field, circled in red)
- Update Fields Automatically:
- Cell Properties:
 - Can be placed as a cell (Cell Type: Graphic dropdown)
 - Can be placed as an annotation cell

Buttons for 'OK' and 'Cancel' are visible at the bottom of the dialog box.

QUESTIONS?

ON DATA ACQUISITION

VISUALIZAITONS

ANNOTATION SCALE

- ◆ Annotation scale will be introduced in the FDOTSS2 release scheduled for July
- ◆ The drawing scale will need to be set before dropping in the data
- ◆ Annotation scale will need to be turned **off** until data is processed by Data Acquisition
- ◆ Line Style Scale in the Model Properties dialogue box will have to be set to “Annotation Scale”
- ◆ All point labels and existing point cells will be brought in at a static size (approx. 5' across, 1:1)