

# ***BENTLEY DATA ACQUISITION***



# ***DATA ACQUISITION Version Requirements***

- ◆ MicroStation V8i/GEOPAK SS2 (.566) or
- ◆ Power GEOPAK SS2 (.566)

**Note: Version .566 is a Bentley update to version .536  
(08.11.07.566)**

- ◆ FDOT2010 or FDOTSS2

# ***ISSUES AND LIMITATIONS WITH D.A. SS2***

- ◆ When processing an OBS in D.A., Geodesy is **NOT** being applied
- ◆ D.A. SS2 does not process OBS “Taping”, “SOE”, or “Eccentricity”
- ◆ Tolerances and Error Estimates must be set in a configuration variable or defaults will be used. This includes turning on and off the Least Squares Adjustment.
- ◆ Use the latest FDOT seed file

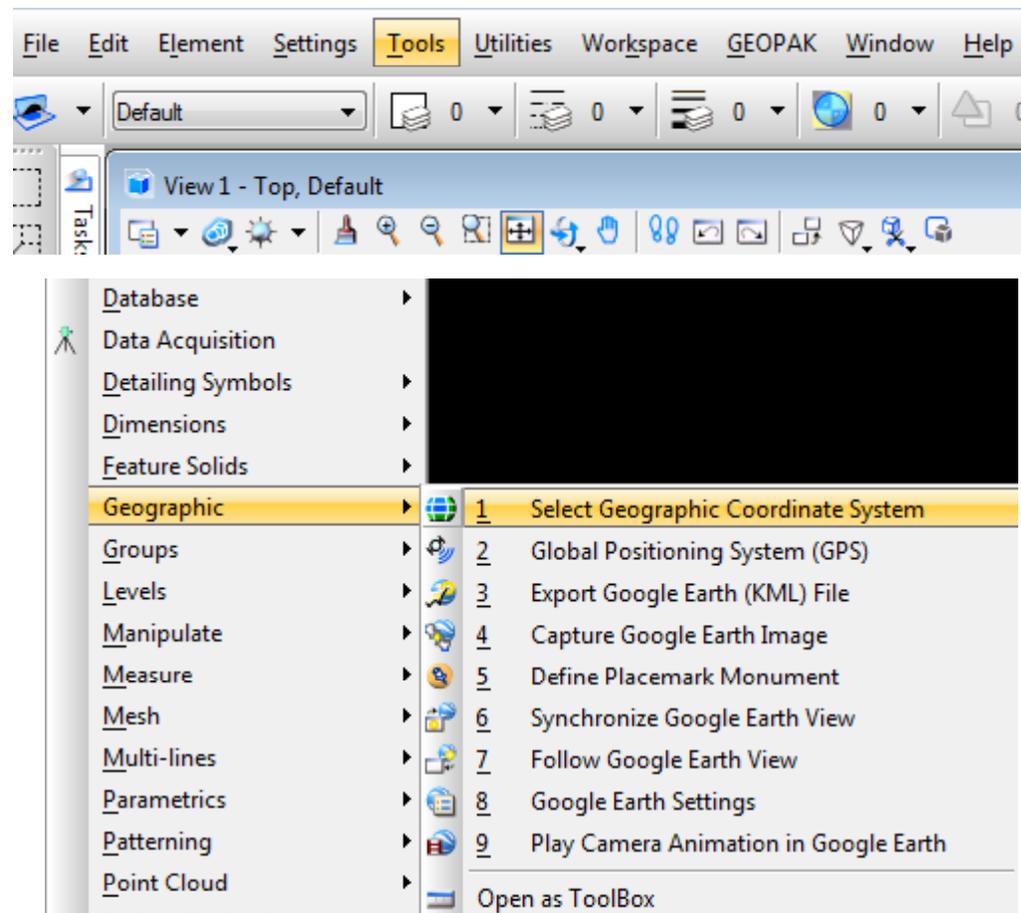
## 3D vs. 2D

- ◆ Although a 2D seed file can be used for some purposes, like creating the 2D TOPORD.dgn survey deliverable, generally for surveying purposes a 3D seed file should be used.
- ◆ If a surface is to be created a 3D seed file is necessary
- ◆ The future is 3D deliverables

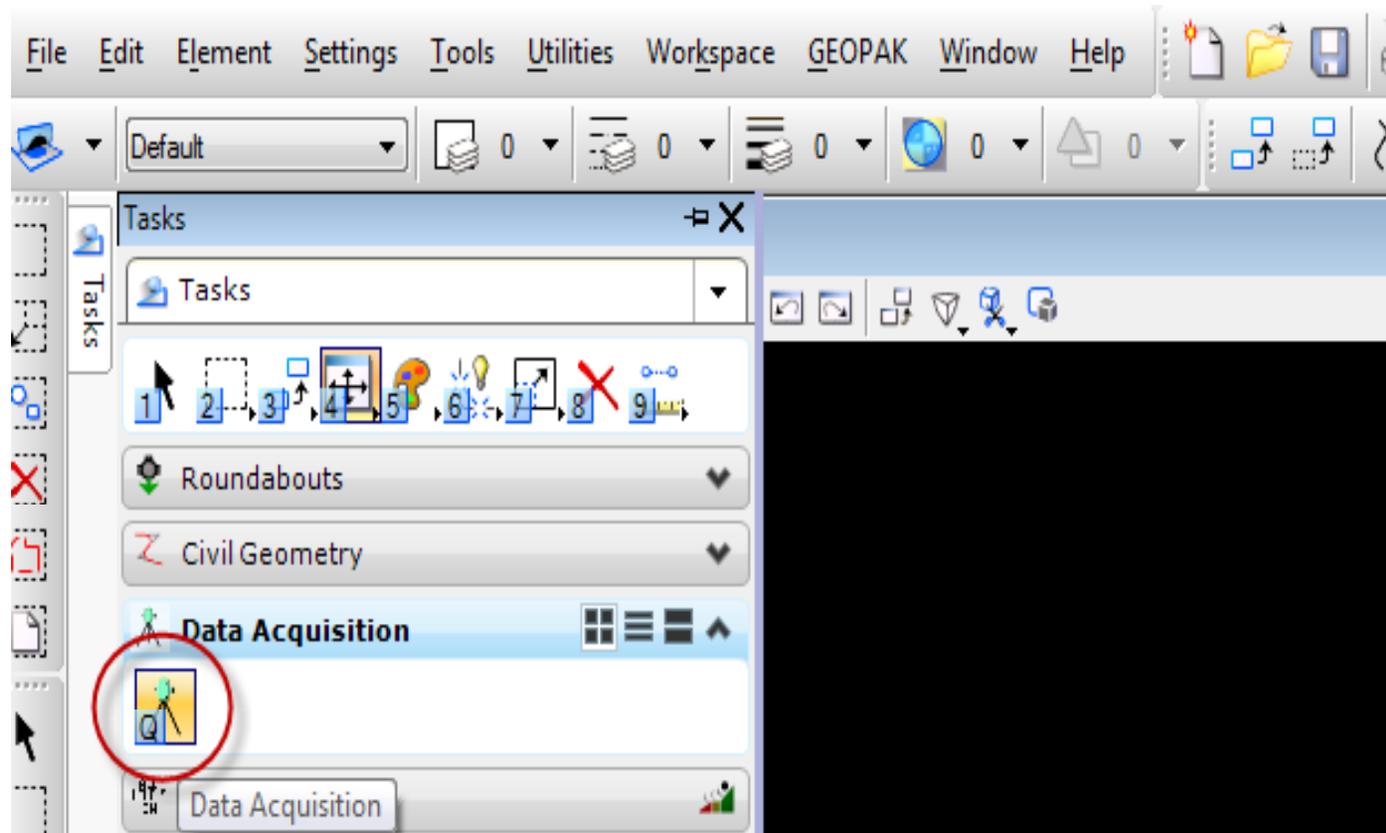
# ***STYLE FILES ARE PRESET IN FDOT2010***

- ◆ A Style file is the equivalent of a feature table
- ◆ For Roadway Design the style file is **fdote\_10.xml** or **fdot\_ss2.xml**
- ◆ For Right of Way Mapping the style file is **fdote\_10rw** or **fdot\_ss2rw.xml**
- ◆ In FDOT software the style files are automatically set by the configuration.
- ◆ Remember this Key-in: “**dataacquisition redraw**”

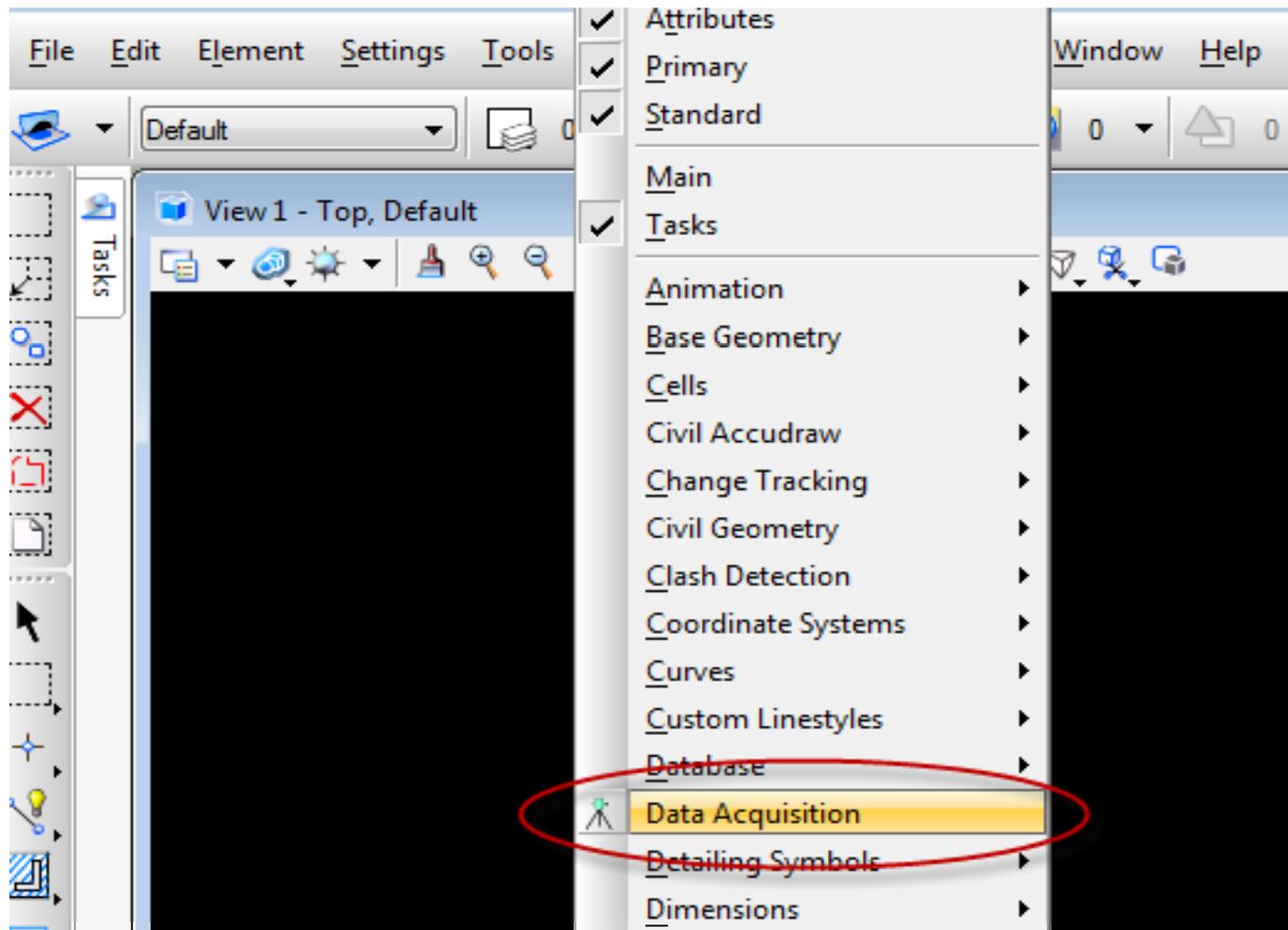
# MICROSTATION GEOGRAPHIC COORDINATE SYSTEMS



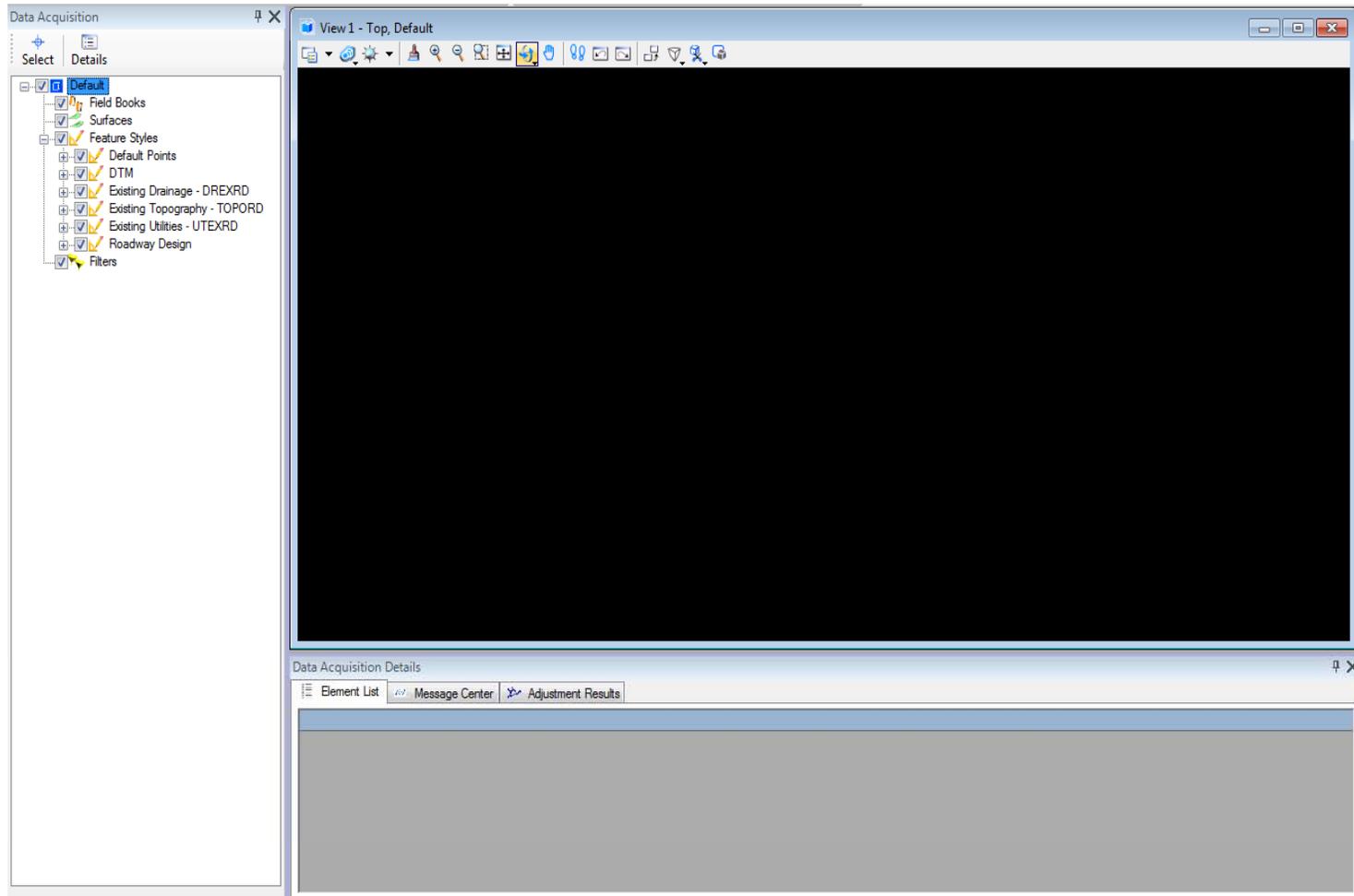
# ACTIVATE DATA ACQUISITION



# ACTIVATE DATA ACQUISITION



- ◆ The D.A. dialogue box and the D.A details dialogue box will open and can be docked



# FDOT SEED FILES CONTAIN DESIGN FILE SETTINGS FOR D.A.

Design File Settings

Category	
Active Angle	
Active Scale	
Angle Readout	
Axis	
Color	
Data Acquisition	
Element Attributes	
Fence	
Grid	
Isometric	
Locks	
Snaps	
Stream	
Views	
Working Units	

Import Coordinates As Contr	Never
Control Point Features	TRAV CP NS PK

Linking Codes

Link Code Before Feature	True
Link Codes	0 None 0 Q;1 S
Linking Method	Field Code
Feature Exclusions	1 P 0 PP
Disable Dynamic Linear Link	False

Data File Parsing

Data Import Items	4 Neutral File *.x
Use Substitute Strings	True
Substitute Strings	1 1 ST 1 6 END
Description Separator	-

Focus Item Description

Select category to view.

OK

Cancel

Data Import Items													
Use	Vendor	Title	Filter	FileTypeIn	FileTypeOut	Executa	Executa	FormatFi	Arg1	Arg2	Arg3	Projectio	
True	InRoads	InRoads Intermediate File	*.fwd	None	Intermediate			Survey.ti					
True	LandXML	LandXML	*.xml	None	LandXML								
True	LeicaDBX	Leica DBX	*.xcf	None	None								
True	TrimbleLinkEngine	Trimble Link Engine	*.job	None	None								
True	FieldGenius	Field Genius	*.dbf	None	None								
True	CAiCE Project	CAiCE Project	*.pt4	None	LandXML								
True	GEOPAK	CAiCE SRV	*.srv	CAiCESRV	Intermediate								
True	GEOPAK	CAiCE KCP	*.kcp	CaiceKCP	Intermediate								
True	GEOPAK	CAiCE KCM	*.kcm	CaiceKCM	Intermediate								
True	GEOPAK	Observation OBS	*.obs	ObsFile	Neutral								
True	GEOPAK	XYZ CTL Type	*.xyz	XyzFile	Neutral								
True	GEOPAK	SDMS PRJ File	*.prj	SDMS File	Neutral								
True	GEOPAK	SDMS PAC File	*.pac	SDMS File	Neutral								
True	GEOPAK	SDMS CAL File	*.cal	SDMS File	Neutral								
True	GEOPAK	Trimble DC	*.dc	RawFile	Intermediate								
True	GEOPAK	Lietz-Sokkia SDR33 14Char	*.sdr	RawFile	Intermediate								
True	GEOPAK	TDS 48,95,FS2	*.rw5	RawFile	Intermediate								
True	GEOPAK	TDS 48,95,FS2 (Australia)	*.raw	RawFile	Intermediate								
True	GEOPAK	Geodimeter 500	*.dat	RawFile	Intermediate								
True	GEOPAK	SMI Version 7	*.raw	RawFile	Intermediate								
True	GEOPAK	SMI Version 6	*.raw	RawFile	Intermediate								
True	GEOPAK	Leica Data Pro	*.gsi	RawFile	Intermediate								
True	GEOPAK	WildSoft2 GIF-10	*.fld	RawFile	Intermediate								
True	InRoads	InRoads AASHTO SDMS	*.sdm	RawFile	Neutral		Survey.e	Sdms.ti					
True	InRoads	InRoads Topcon FC4	*.fc4	RawFile	Neutral		Survey.e	Topcon.t					
True	InRoads	InRoads TDS Rw5	*.rw5	RawFile	Neutral		Survey.e	Tds.tiw					
True	InRoads	InRoads TDS Raw	*.raw	RawFile	Neutral		Survey.e	Tds.tiw					
True	InRoads	Mississippi DOT	*.txt	RawFile	Neutral		Survey.e	MISSDO					
True	InRoads	Comma delimited PtNumNE	*.txt	RawFile	Neutral		Survey.e	ASCII-C					
True	InRoads	Comma delimited PtNumXY	*.txt	RawFile	Neutral		Survey.e	ASCII-C					
True	InRoads	Comma delimited PtNumNE	*.txt	RawFile	Neutral		Survey.e	ASCII-C					
True	InRoads	Space delimited PtNumNEZ	*.txt	RawFile	Neutral		Survey.e	ASCII-S					
True	InRoads	Space delimited PtNumXYZ	*.txt	RawFile	Neutral		Survey.e	ASCII-S					
True	InRoads	Space delimited XYZ	*.txt	RawFile	Neutral		Survey.e	ASCII-S					
True	ControlCTL	Control File	*.ctl	CoordFile	Intermediate								
True	InRoads	InRoads Styles	*.xin	StylesFile	None								
True	GEOPAK	GEOPAK SMD	*.xml	StylesFile	None								
True	MX	MX Styles	*.pss	StylesFile	None								
True	InRoads	Surface	*.dtm	SurfaceFile	None								
True	GEOPAK	Surface	*.tin	SurfaceFile	None								
True	Lidar	Surface	*.las	SurfaceFile	None								
True	LandXML	Surface	*.xml	SurfaceFile	None								
True	None	Surface	*.xyz	SurfaceFile	None								
True	MX	Surface	*.fil	SurfaceFile	None								
True	Raster	USGS SDTS DEM Raster S	*.catd.d	SurfaceFile	None								
True	Raster	DTED Raster Surface	*.dt0	SurfaceFile	None								
True	Raster	DTED Raster Surface	*.dt1	SurfaceFile	None								
True	Raster	DTED Raster Surface	*.dt2	SurfaceFile	None								
True	Raster	USGS DEM ASCII Raster S	*.dem	SurfaceFile	None								
True	Raster	SPOT Dimap Raster Surface	*.dim	SurfaceFile	None								
True	Raster	ERDAS IMG Raster Surface	*.img	SurfaceFile	None								
True	Raster	TIF Raster Surface	*.tif	SurfaceFile	None								

# SETTING UNITS FOR DATA ACQUISITION

Design File Settings

Category

- Active Angle
- Active Scale
- Angle Readout
- Axis
- Color
- Data Acquisition
- Element Attributes
- Fence
- Grid
- Isometric
- Locks
- Snaps
- Stream
- Views
- Working Units

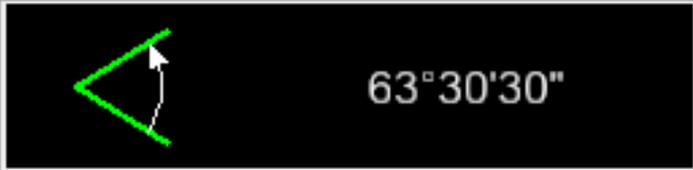
Modify Angle Readout Settings

Format: DD MM SS

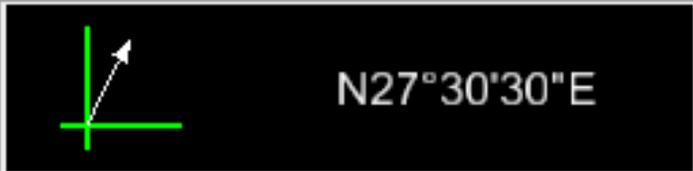
Accuracy: 0

OK

Cancel



Direction Mode: Bearing



Focus Item Description

Set the mode used for direction readout.

# SETTING UNITS FOR DATA ACQUISITION

Design File Settings

Category

- Active Angle
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- Axis
- Color
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- Element Attributes
- Fence
- Grid
- Isometric
- Locks
- Snaps
- Stream
- Views
- Working Units**

Modify Working Unit Settings

Linear Units

Format: MU

Master Unit: Survey Feet Label: '

Sub Unit: Survey Inches Label: "

Accuracy: 0.12

Custom

Advanced Settings

Resolution: 304800 per Distance Survey Foot

Working Area: 5.59683E+006 Miles

Solids Area: 2.66877 Miles

Solids Accuracy: 1.40911E-007 Survey Feet Edit

Focus Item Description

Set decimal accuracy up to six decimal places, fractional accuracy to 1/2, 1/4, 1/8, 1/16, 1/32, or 1/64, or scientific accuracy up to eight

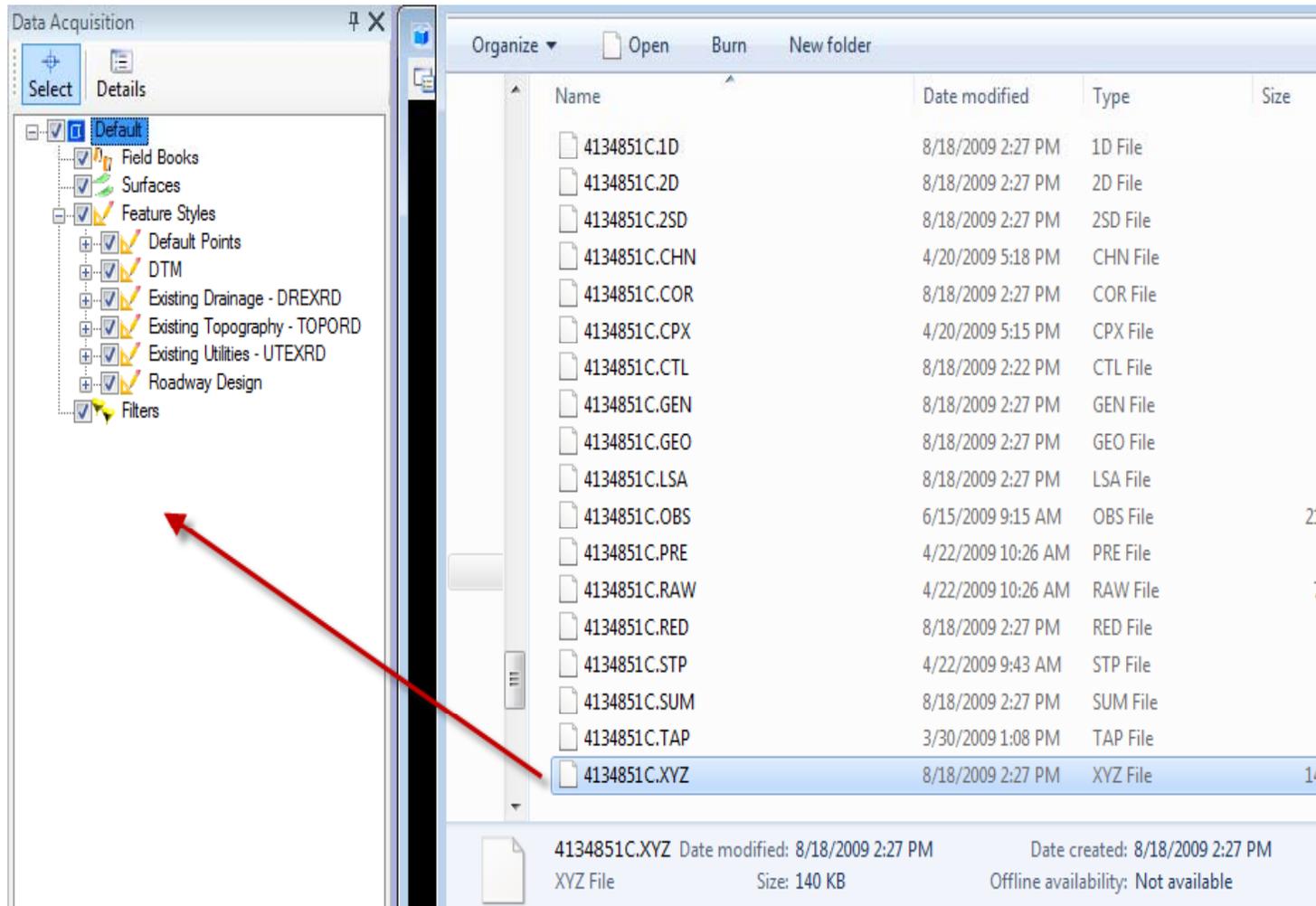
OK

Cancel

# ***FDOT LOCATION SURVEYING WORKFLOW FOR D.A. SS2***

- ◆ EFB for Windows field data collection
- ◆ Process the segment in EFB
- ◆ Drag and drop the “XYZ” file into the Data Acquisition tree.
- ◆ The Data Format dialogue box will pop up. Press the Accept XYZ CTL Type button to import the XYZ file.
  - D.A. will automatically extract the chains for that segment from the associated “OBS” file with the same name.

# Drag and Drop the “XYZ” File



The screenshot shows a software interface with two main panels. The left panel, titled 'Data Acquisition', contains a tree view with the following structure:

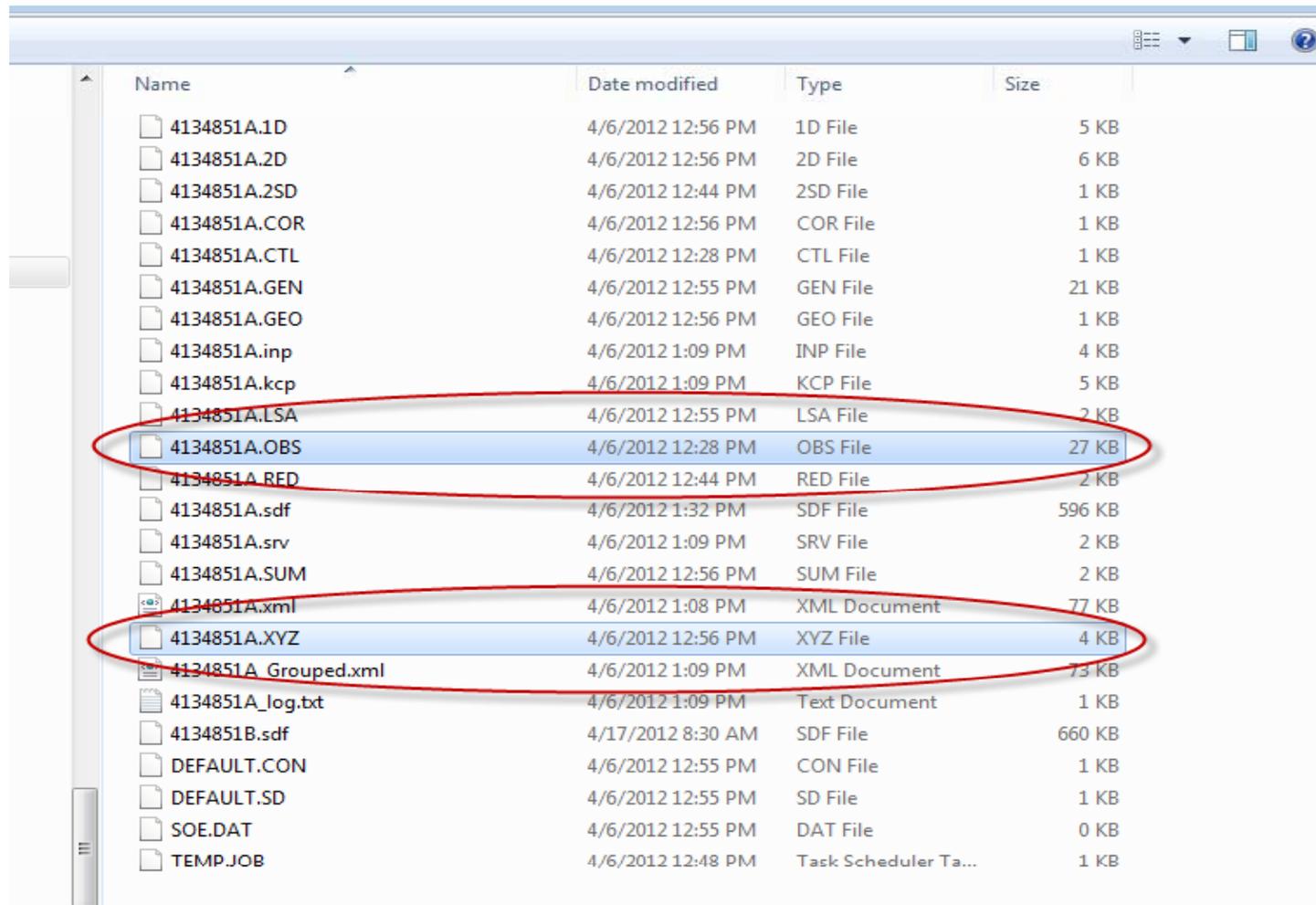
- Default
- Field Books
- Surfaces
- Feature Styles
  - Default Points
  - DTM
  - Existing Drainage - DREXRD
  - Existing Topography - TOPORD
  - Existing Utilities - UTEXRD
  - Roadway Design
- Filters

The right panel shows a file list with columns for Name, Date modified, Type, and Size. The file '4134851C.XYZ' is selected and highlighted in blue. A red arrow points from this file to the 'Filters' folder in the left panel.

Name	Date modified	Type	Size
4134851C.1D	8/18/2009 2:27 PM	1D File	
4134851C.2D	8/18/2009 2:27 PM	2D File	
4134851C.2SD	8/18/2009 2:27 PM	2SD File	
4134851C.CHN	4/20/2009 5:18 PM	CHN File	
4134851C.COR	8/18/2009 2:27 PM	COR File	
4134851C.CPX	4/20/2009 5:15 PM	CPX File	
4134851C.CTL	8/18/2009 2:22 PM	CTL File	
4134851C.GEN	8/18/2009 2:27 PM	GEN File	
4134851C.GEO	8/18/2009 2:27 PM	GEO File	
4134851C.LSA	8/18/2009 2:27 PM	LSA File	
4134851C.OBS	6/15/2009 9:15 AM	OBS File	2:
4134851C.PRE	4/22/2009 10:26 AM	PRE File	
4134851C.RAW	4/22/2009 10:26 AM	RAW File	:
4134851C.RED	8/18/2009 2:27 PM	RED File	
4134851C.STP	4/22/2009 9:43 AM	STP File	
4134851C.SUM	8/18/2009 2:27 PM	SUM File	
4134851C.TAP	3/30/2009 1:08 PM	TAP File	
4134851C.XYZ	8/18/2009 2:27 PM	XYZ File	1:

4134851C.XYZ Date modified: 8/18/2009 2:27 PM Date created: 8/18/2009 2:27 PM  
XYZ File Size: 140 KB Offline availability: Not available

# Chains are extracted from the OBS with the same name as the XYZ file



Name	Date modified	Type	Size
4134851A.1D	4/6/2012 12:56 PM	1D File	5 KB
4134851A.2D	4/6/2012 12:56 PM	2D File	6 KB
4134851A.2SD	4/6/2012 12:44 PM	2SD File	1 KB
4134851A.COR	4/6/2012 12:56 PM	COR File	1 KB
4134851A.CTL	4/6/2012 12:28 PM	CTL File	1 KB
4134851A.GEN	4/6/2012 12:55 PM	GEN File	21 KB
4134851A.GEO	4/6/2012 12:56 PM	GEO File	1 KB
4134851A.inp	4/6/2012 1:09 PM	INP File	4 KB
4134851A.kcp	4/6/2012 1:09 PM	KCP File	5 KB
4134851A.LSA	4/6/2012 12:55 PM	LSA File	2 KB
4134851A.OBS	4/6/2012 12:28 PM	OBS File	27 KB
4134851A.RED	4/6/2012 12:44 PM	RED File	2 KB
4134851A.sdf	4/6/2012 1:32 PM	SDF File	596 KB
4134851A.srv	4/6/2012 1:09 PM	SRV File	2 KB
4134851A.SUM	4/6/2012 12:56 PM	SUM File	2 KB
4134851A.xml	4/6/2012 1:08 PM	XML Document	77 KB
4134851A.XYZ	4/6/2012 12:56 PM	XYZ File	4 KB
4134851A Grouped.xml	4/6/2012 1:09 PM	XML Document	73 KB
4134851A_log.txt	4/6/2012 1:09 PM	Text Document	1 KB
4134851B.sdf	4/17/2012 8:30 AM	SDF File	660 KB
DEFAULT.CON	4/6/2012 12:55 PM	CON File	1 KB
DEFAULT.SD	4/6/2012 12:55 PM	SD File	1 KB
SOE.DAT	4/6/2012 12:55 PM	DAT File	0 KB
TEMP.JOB	4/6/2012 12:48 PM	Task Scheduler Ta...	1 KB

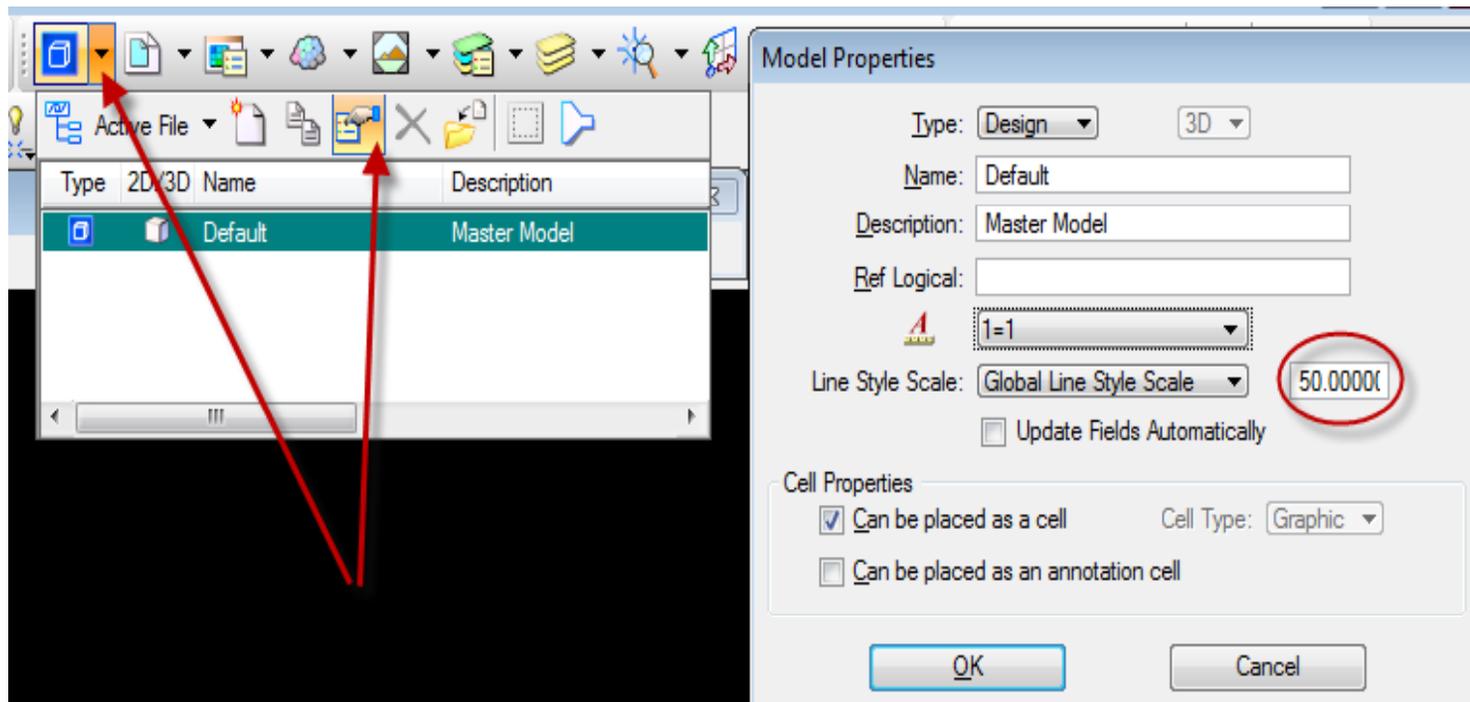
## *Field Books*

- ◆ Continue dragging and dropping segments into D.A. until all segments have been added to the field book
- ◆ The field book can be renamed from Default 1 to an appropriate name
- ◆ Additional field books can be added by right clicking and selecting “New...”
- ◆ Data can be added to the “New field book by right clicking on that field book.

# *POINT SCALES ARE SET BY THE FDOT XML STYLE FILE*

- ◆ Cells will be brought in at 5 times their original scale (1"=50').
- ◆ Line styles for linear features will be brought in at a 1.00 scale factor.
- ◆ To view the line styles at a desired scale from the Models pull down, click on Model Properties and set the line style scale to the desired scale.

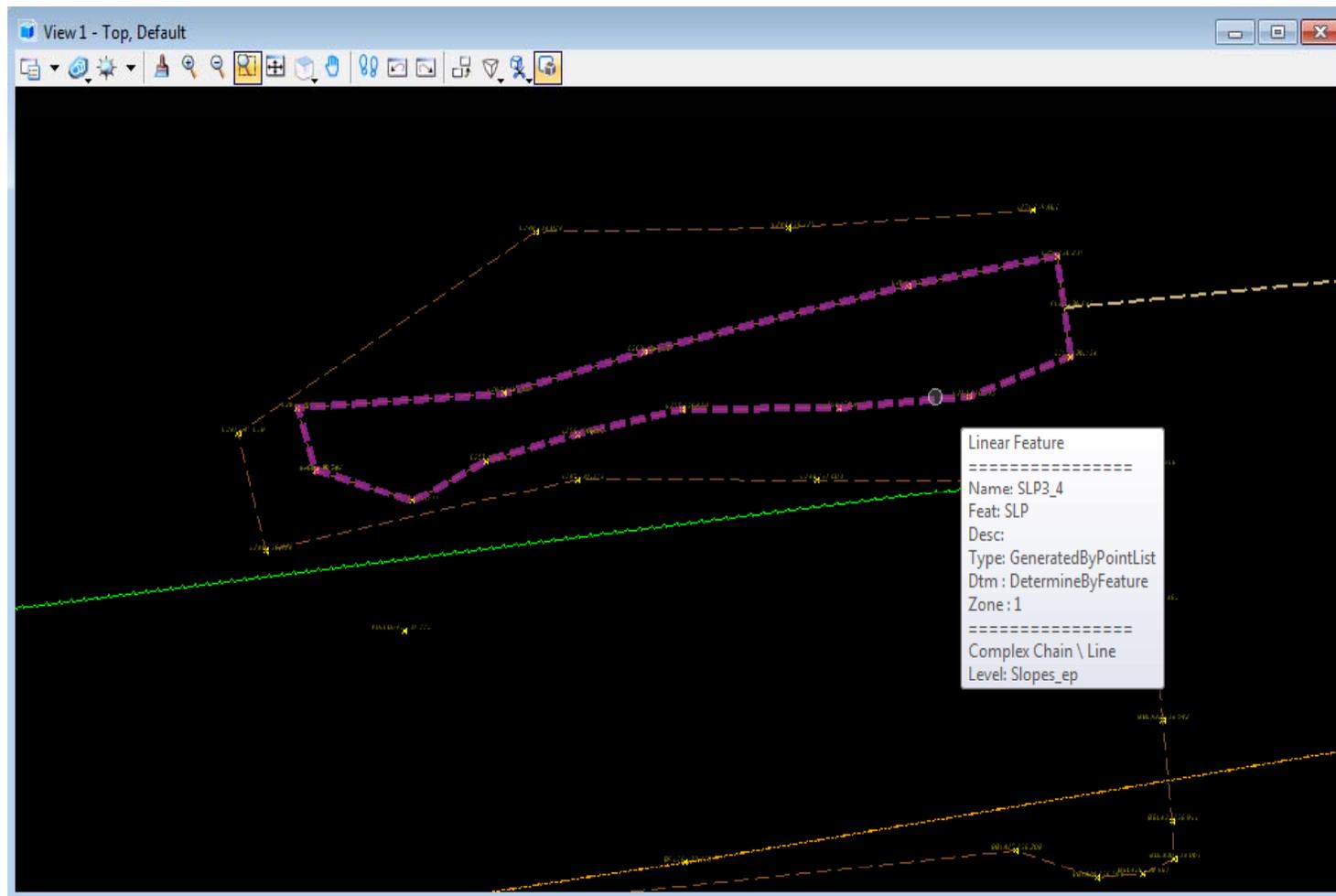
# LINE STYLE SCALES CAN BE VISUALIZED IN MODEL PROPERTIES



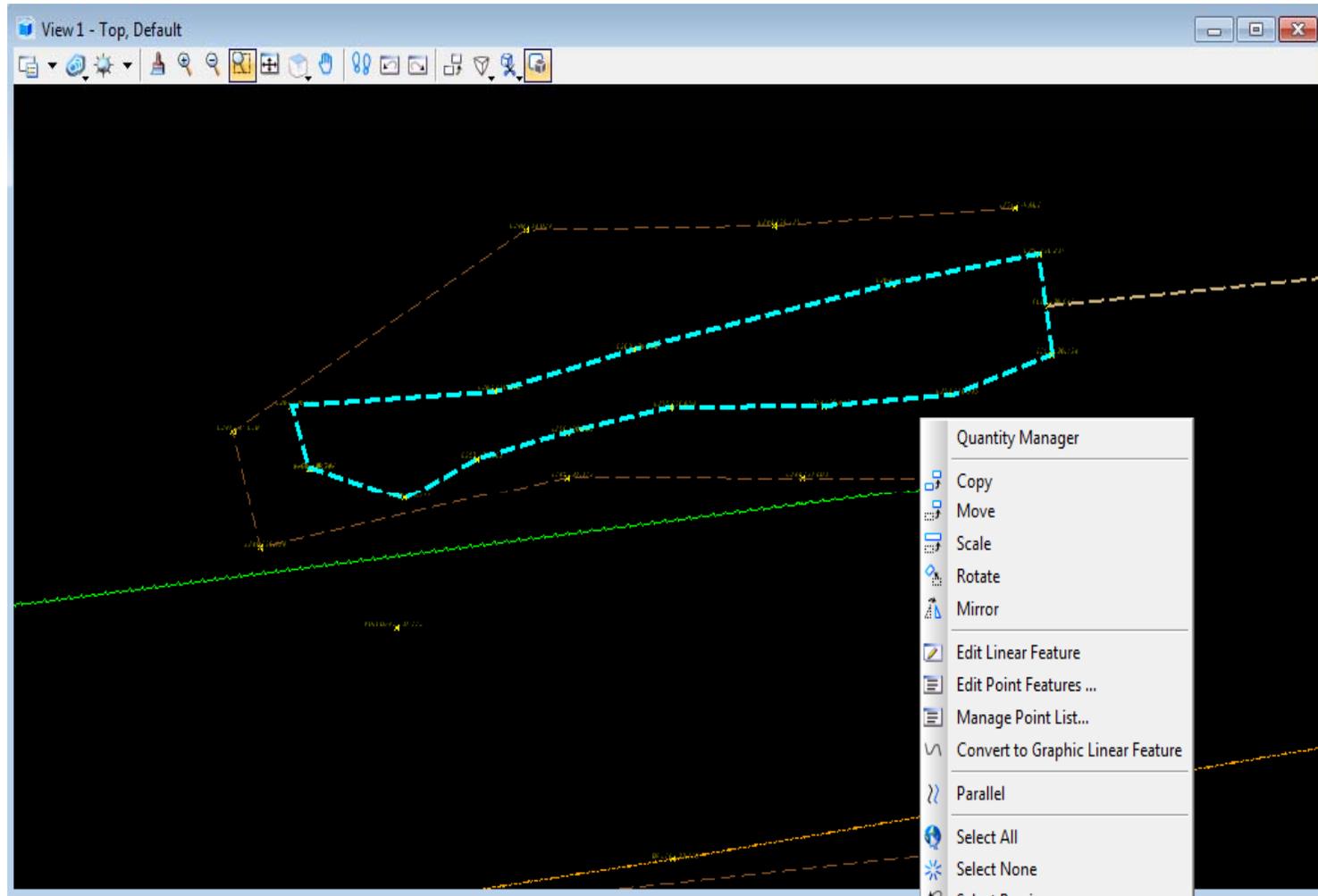
# ***CHAIN EDITING***

- ◆ Data Acquisition has tools for building and editing linear features (chains).
- ◆ Editing the OBS to add or edit collected chains is also an option and provides legacy data that can be used across multiple platforms, including CAiCE and Civil 3D.
- ◆ For Data Acquisition it is a simple process to delete the field book and re-drag and drop the XYZ segments to visualize the updated chains

- ◆ Hovering over the chain will give you information about that chain.



- ◆ Right clicking on the chain will give access to chain editing functionality



- ◆ Chain editing functionality can also be accessed from the D.A. tree

The screenshot displays the Data Acquisition (D.A.) tree on the left and a 3D view of a terrain model on the right. The 'SLP' feature type is highlighted in the tree, and a context menu is open over the 'Data Acquisition Details' table, with 'Edit Point Features ...' selected. A red circle highlights the 'SLP' feature in the tree, and a red arrow points from it to the context menu option.

Name	Display	DTM Attribute	Feature	Attributes Pair	Zone	Description	Creation Type	VBA Macro	Length	Field Book Na
SLP3_2	True	DetermineByFeature	SLP				ByP		33.515	Default 1
SLP3_3	True	DetermineByFeature	SLP				ByP		79.450	Default 1
SLP3_4	True	DetermineByFeature	SLP				ByP		76.309	Default 1
SLP3_5	True	DetermineByFeature	SLP				ByP		327.836	Default 1
SLP3_6	True	DetermineByFeature	SLP				ByP		179.129	Default 1
SLP4	True	DetermineByFeature	SLP				ByP		696.754	Default 1
SLP4_1	True	DetermineByFeature	SLP				ByP		152.570	Default 1

- ◆ The “Link Code” in the chain point list dialogue controls curvature.

The screenshot shows a software window titled 'View 1 - Top, Default' displaying a 2D plot of a survey chain. The plot features a series of points connected by dashed lines, with a cyan circle highlighting a specific point. Below the plot is a 'Data Acquisition Details' window with a table listing survey points and their link codes.

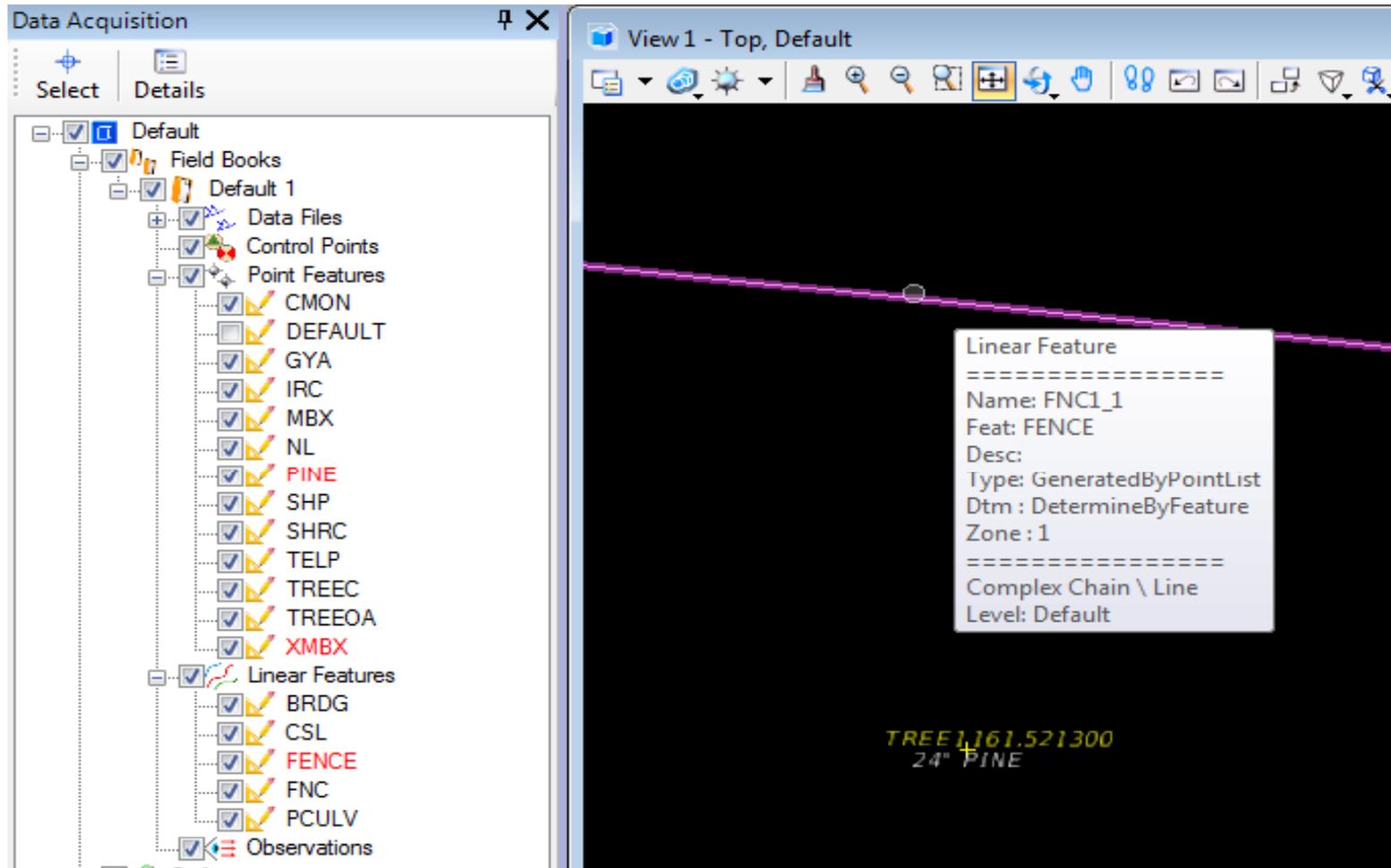
Name	Display	Link Code	Feature	Attributes Pair	DTM Attribute	Zone	Description	Easting	Northing	Elevation	VE
G251	True	ArcPC	DEFAULT		DetermineByFeature	1		2010927.596	592024.409	136.237	
G252	True	None	DEFAULT		DetermineByFeature	1		2010928.199	592020.623	136.734	
G253	True	Start	DEFAULT		DetermineByFeature	1		2010923.620	592019.125	136.535	
G254	True	StartPC	DEFAULT		DetermineByFeature	1		2010917.740	592018.697	136.443	
G255	True	ArcPC	DEFAULT		DetermineByFeature	1		2010910.675	592018.657	136.659	
G256	True	NonTanPC	DEFAULT		DetermineByFeature	1		2010905.957	592017.710	136.683	
		ArcSingle									
		ArcToArc									
		NonTanPT									

- ◆ Selecting “Manage Point List” will allow changes in the point order

The screenshot displays a software interface for point cloud management. The main window shows a 3D visualization of a point cloud with a red dashed line indicating a path or boundary. A red circle highlights a specific point in the cloud. The 'Point Feature List: SLP3\_4' dialog box is open, showing a list of point features. The 'Data Acquisition Details' panel at the bottom left contains the following table:

Data Acquisition Details				
Element List				
List				
Name	Display	Link Code	Feature	
G251	True	ArcPC	DEFAULT	
G252	True	None	DEFAULT	
G253	True	None	DEFAULT	
G254	True	None	DEFAULT	
G255	True	None	DEFAULT	
G256	True	None	DEFAULT	

- ◆ Features that do not match the Style File will show up in the D.A. tree in red

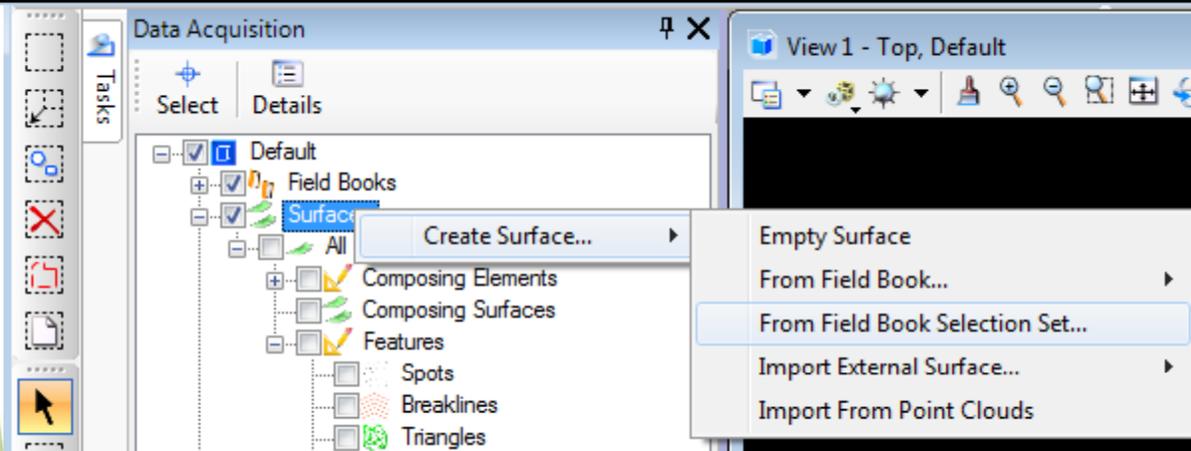
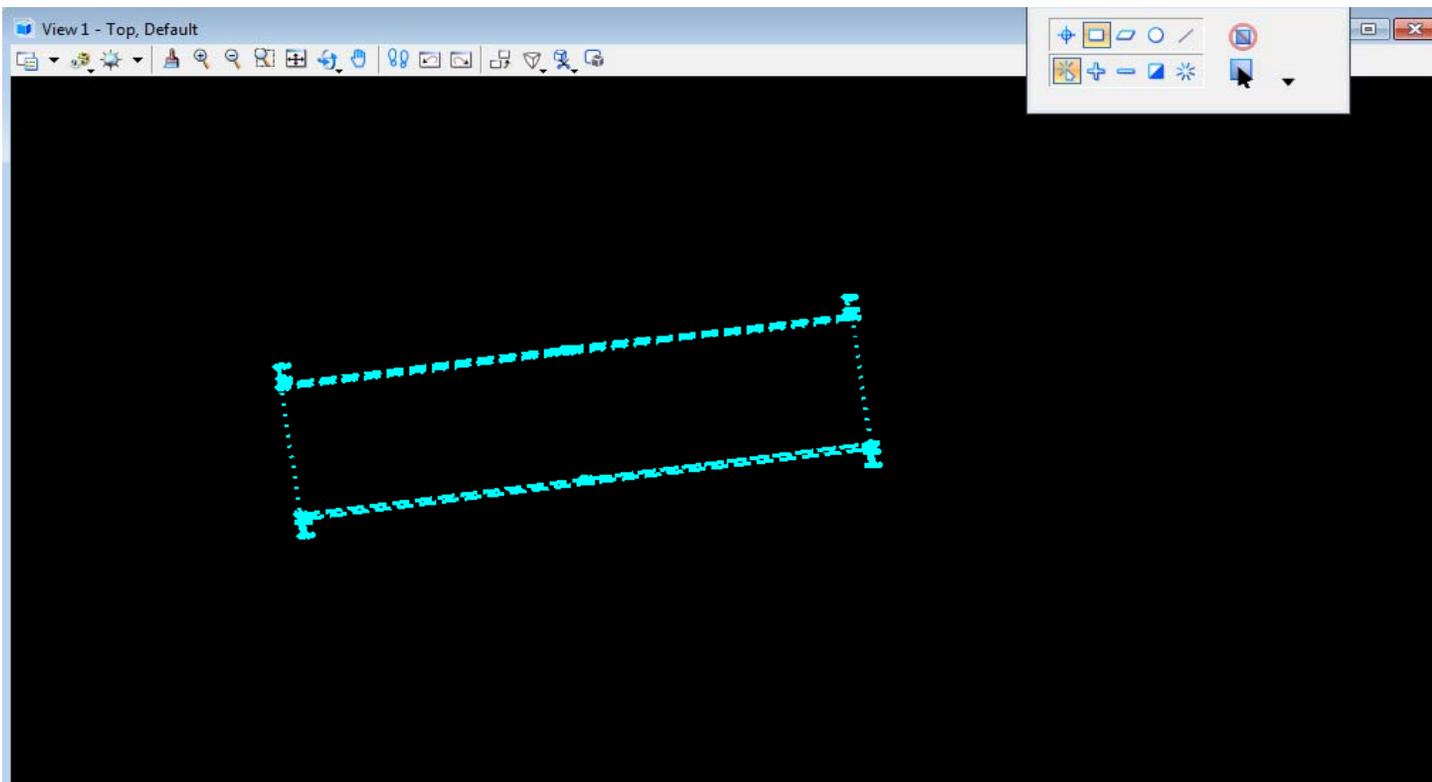


# ***SURFACES***

- ◆ Surfaces are created automatically.
- ◆ The “All Field Books” surface is created by default. This surface is made up of all data in the database.
- ◆ Checking the appropriate box in the Surface tree will show the graphics for that attribute.
- ◆ Right clicking on the Surface will allow the user to export the surface to permanent graphics or a TIN file.

## *Creating Specific Surfaces*

- ◆ Right Clicking on Surfaces in the DA tree will allow the user to create a new surface
- ◆ Creating a surface from a selection set will allow users to create a surface in a specific area from graphical data in the current view
- ◆ Select the desired data, right click on “Surfaces” and create a surface from the field book selection set
- ◆ DTM point attributes can be edited by using chain editing functionality



- ◆ Rename the surface, give a side length and change the “Dissolve Type” to side length

The screenshot displays the 'Data Acquisition' environment in AutoCAD Civil 3D. The left-hand 'Data Acquisition' tree shows a hierarchy of objects, with 'Surfaces' expanded to show 'Bridge Deck' selected. The main view area shows a 3D perspective of a bridge deck structure. The bottom 'Data Acquisition Details' panel shows the 'Survey Surface' table with the following data:

Name	Dissolve Type	Side Length	Triangles	Breaklines	Major Contour	Minor Contour	High Range	Low Range	Creation Type	Field Book So
Bridge Deck	SideLength	100	77	3	20	5	2009922.896	2009819.185	GeneratedByP	

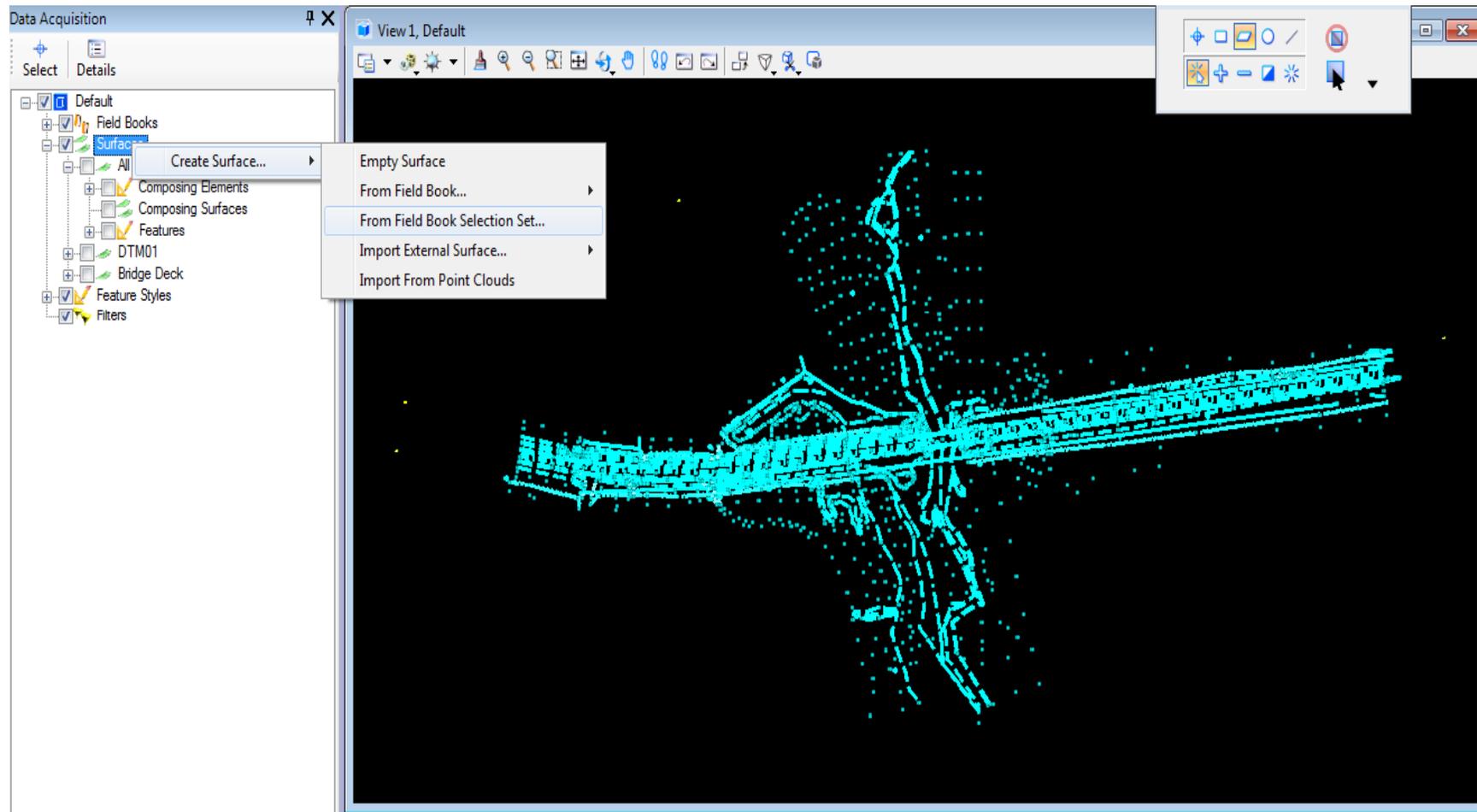
- ◆ The “DTM Attribute” in the chain point list dialogue controls DTM properties.

Data Acquisition Details

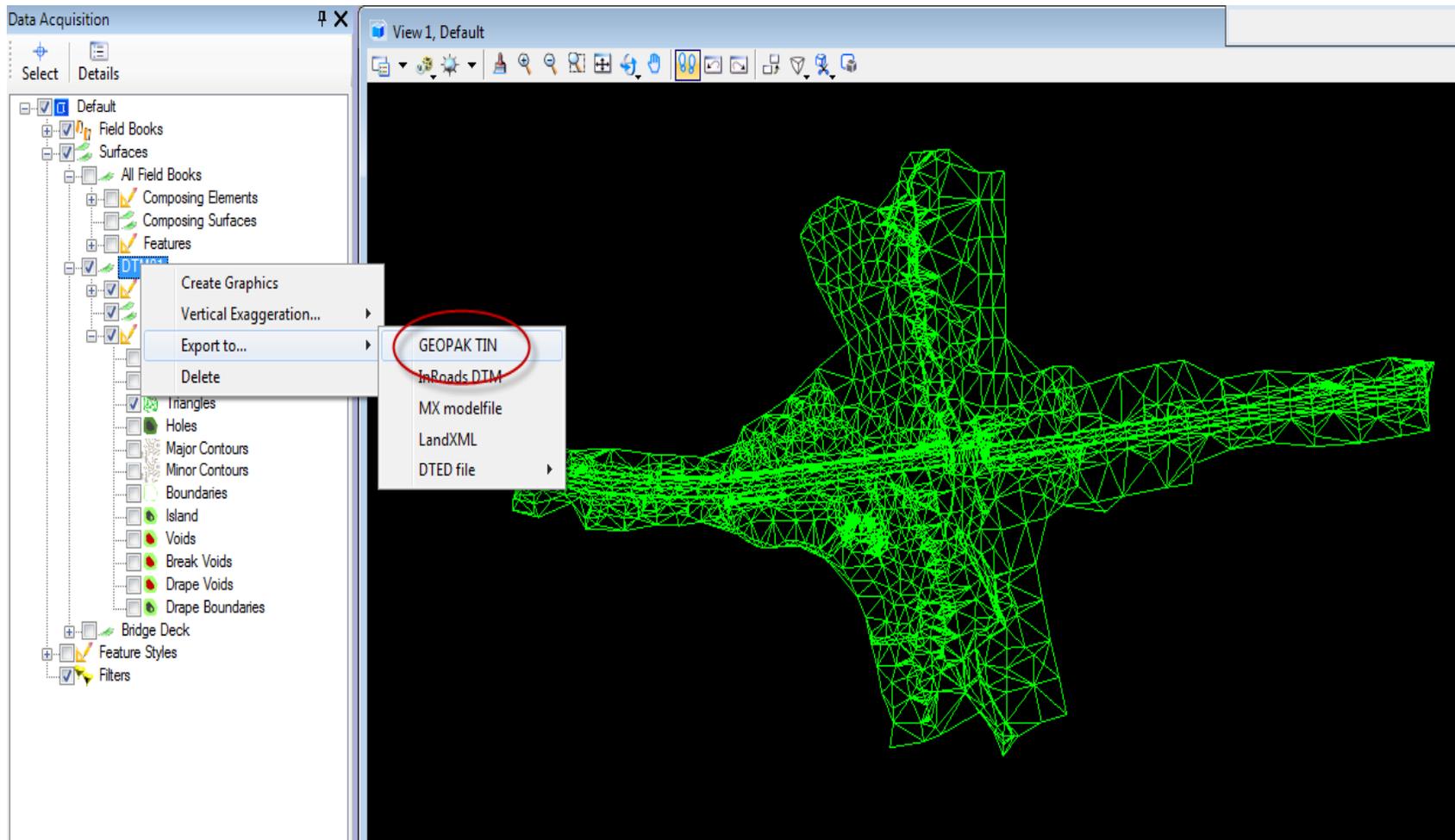
Element List Message Center Adjustment Results

List												
Name	Display	Link Code	Feature	Attributes Pair	DTM Attribute	Zone	Description	Easting	Northing	Elevation	VE	
FCR7	True	None	DEFAULT_PO		DetermineByFeature	2		2009922.554	591832.152	131.765		
FCR9	True	None	DEFAULT_PO		DetermineByFeature	2		2009922.365	591833.698	131.689		
FCR5	True	None	DEFAULT_PO		DetermineByFeature	2		2009872.530	591827.252	131.796		
FCR4	True	None	DEFAULT_PO		NotSet	2		2009822.875	591820.370	132.197		
FCR11	True	None	DEFAULT_PO		DetermineByFeature	2		2009823.025	591818.940	132.056		
FCR3	True	None	DEFAULT_PO		DoNotInclude	2		2009823.410	591816.438	131.593		
BCA3	True	None	DEFAULT_PO		Spot	2		2009824.059	591816.573	131.597		
BCA7	True	None	DEFAULT_PO		SpotAndBreak	2		2009823.659	591818.954	132.071		
BCA4	True	None	DEFAULT_PO		Breakline	2		2009823.733	591819.752	132.205		
BDR3	True	None	DEFAULT_PO		Void	2		2009872.713	591826.375	131.795		
BDR4	True	None	DEFAULT_PO		BreakVoid	2		2009921.760	591832.769	131.755		
BDR5	True	None	DEFAULT_PO		DrapeVoid	2		2009921.963	591832.065	131.763		
BDR6	True	None	DEFAULT_PO		Boundary	2		2009922.234	591829.628	131.744		
FCR8	True	None	DEFAULT_PO		DrapeBoundary	2		2009922.896	591829.767	131.262		
FCR7	True	None	DEFAULT_PO		Contour	2		2009922.554	591832.152	131.765		
					Hole	2						
					Island	2						
					DetermineByFeature	2						

- ◆ Create as many surfaces as is needed.



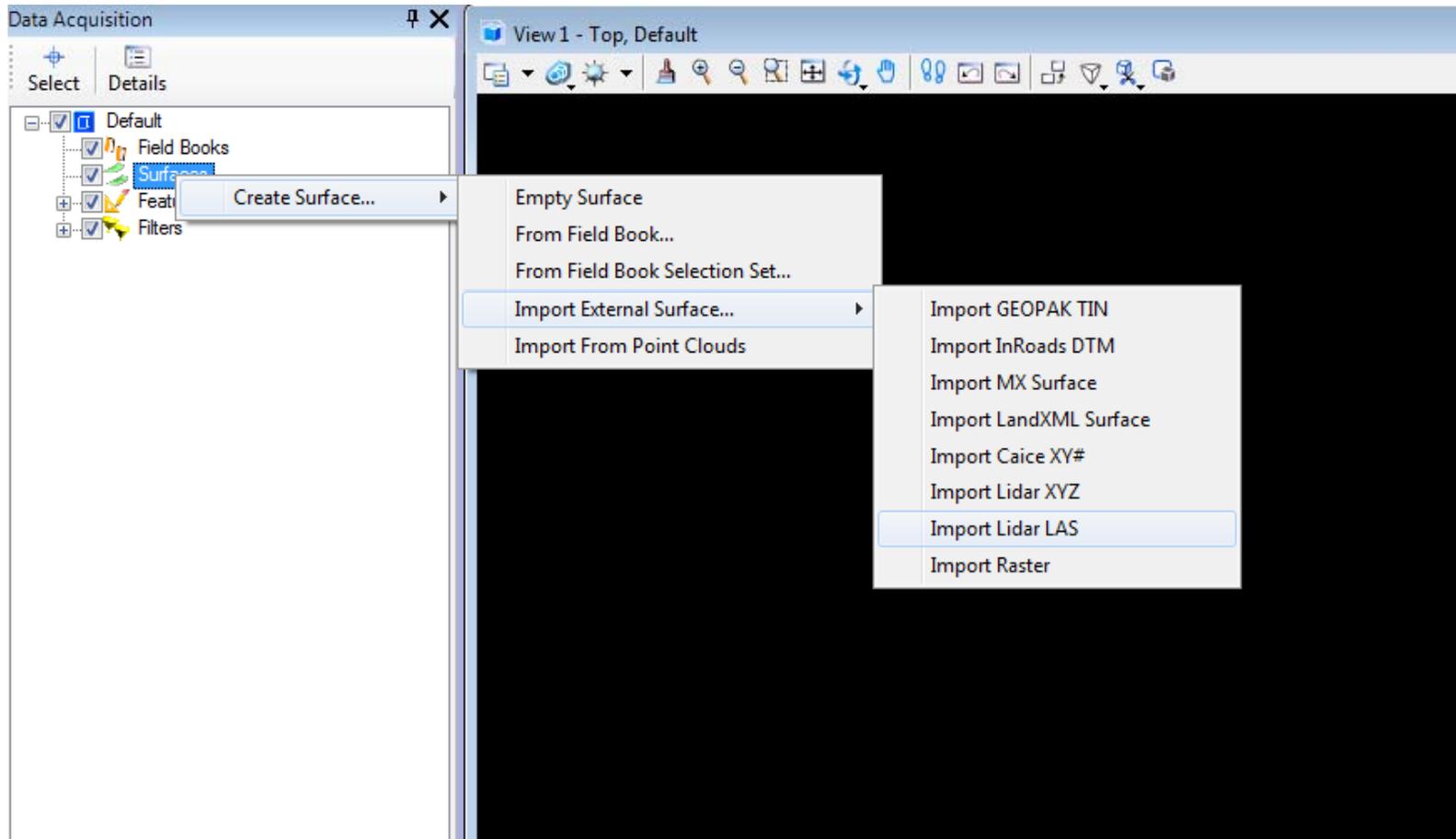
- ◆ A **GEOPAK TIN** file can be created by right clicking on the surface name and selecting **Export to...**



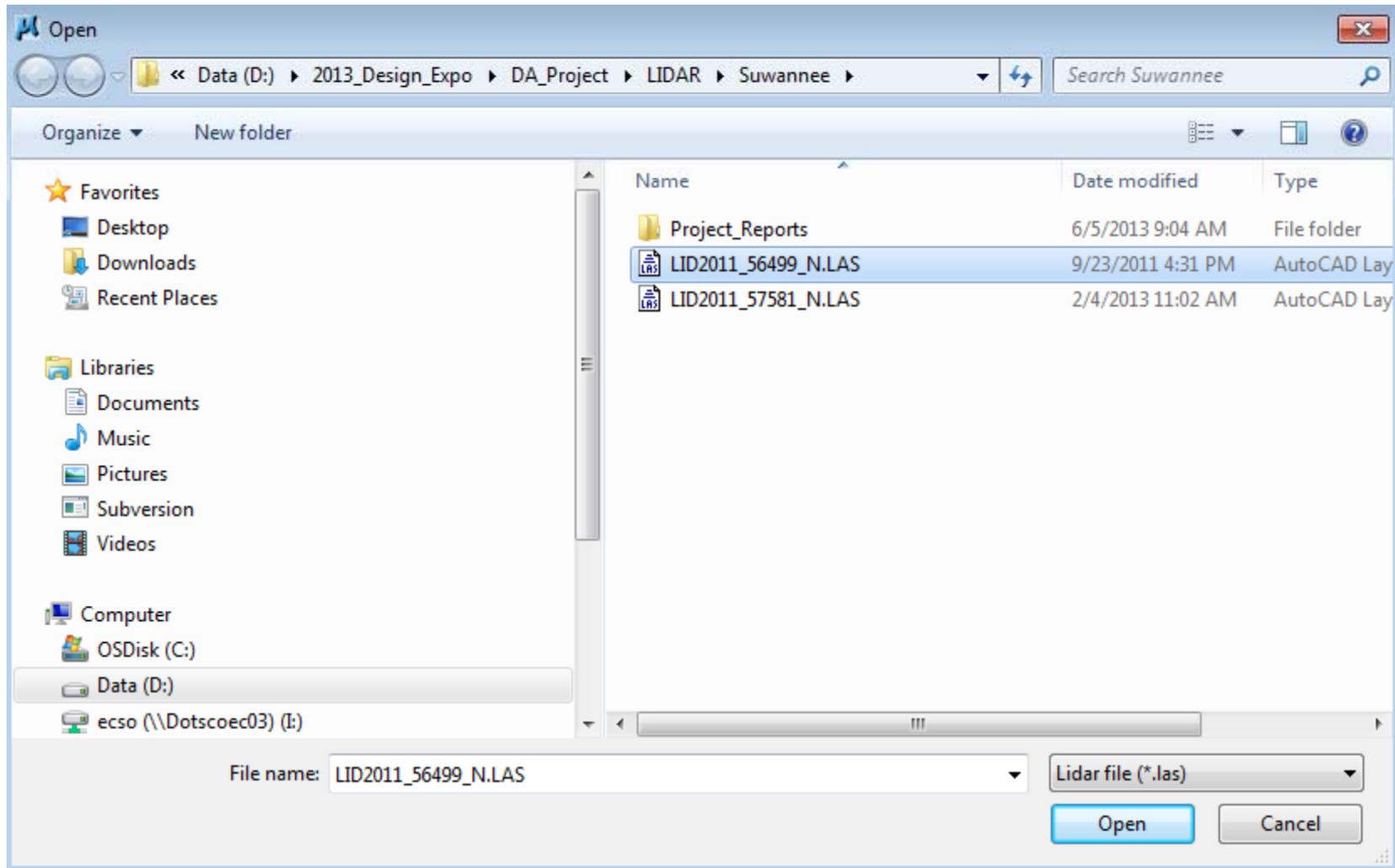
## *Creating Surfaces from LIDAR*

- ◆ At the request of the Missouri DOT, Bentley has come up with a specific workflow for creating a surface directly from a classified LIDAR LAS file using Data Acquisition
- ◆ In the D.A. tree, right click on “Surfaces”
  - ✓ Create Surface
  - ✓ Import External Surface...
  - ✓ Import LIDAR LAS

- ◆ Create a new surface by Importing a LIDAR LAS file



◆ Choose the LAS file to import



# *Creating Surfaces from LIDAR*

- ◆ The Lidar LAS import dialogue box is used to filter the LIDAR data
- ◆ Choose the appropriate classifications to create a surface
- ◆ Always use the “Tin Filter”
- ◆ Input the Z Tolerance
- ◆ Always use the “Coarse” option
- ◆ Always use “Reinsert Points” option

# Creating Surfaces from LIDAR

- ◆ What is the “Z Tolerance” ???
- ◆ Bentley defines the Z Tolerance as being  $\frac{1}{2}$  the acceptable vertical error for a project with vertical error being the vertical distance @ 95% confidence level of the maximum point spacing
- ◆ NSSDA on Vertical Accuracy: “If vertical error is normally distributed, the factor 1.9600 is applied to compute linear error at the 95% confidence level”
- ◆ Therefore NSSDA defines Vertical Accuracy =  $1.9600 \times$  Root Mean Square of the Elevation (RMSE)

FGDC-STD-007.3-1998



National Spatial Data Infrastructure

## Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy

Subcommittee for Base Cartographic Data  
Federal Geographic Data Committee

## 2. Vertical Accuracy

Let:

$$RMSE_z = \sqrt{\sum (z_{data\ i} - z_{check\ i})^2 / n}$$

where

$z_{data\ i}$  is the vertical coordinate of the  $i$ th check point in the dataset.

$z_{check\ i}$  is the vertical coordinate of the  $i$ th check point in the independent source of higher accuracy

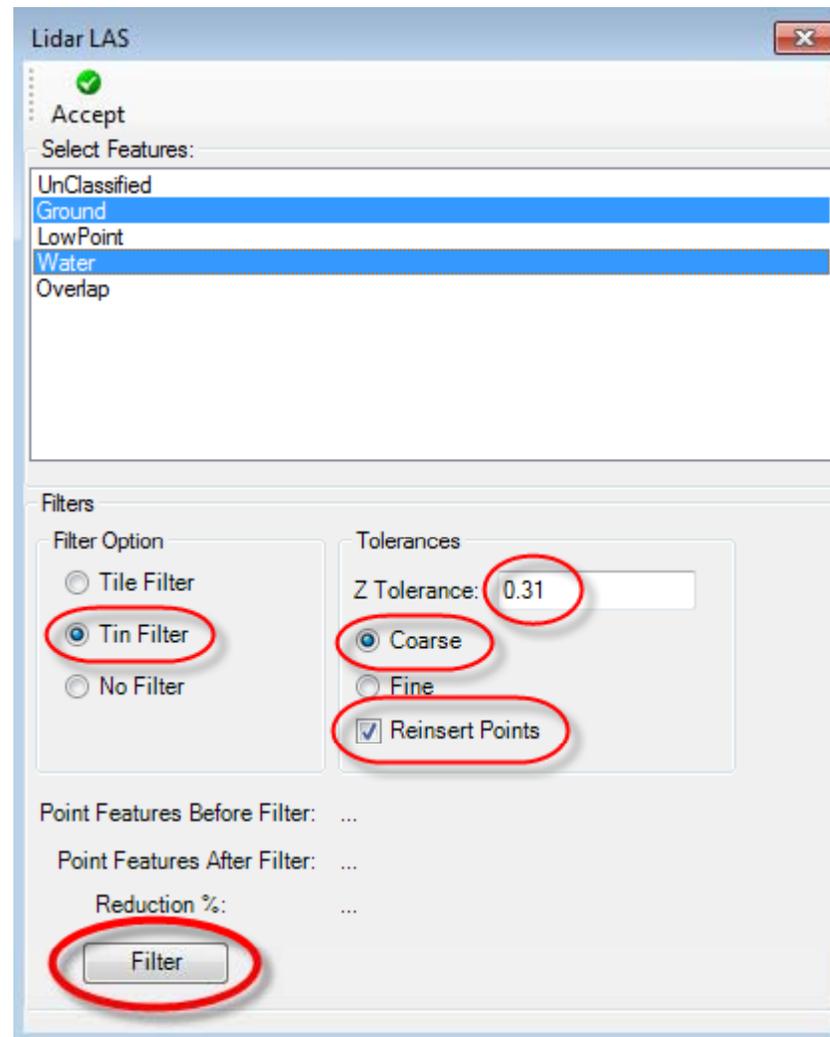
$n$  = the number of points being checked

$i$  is an integer from 1 to  $n$

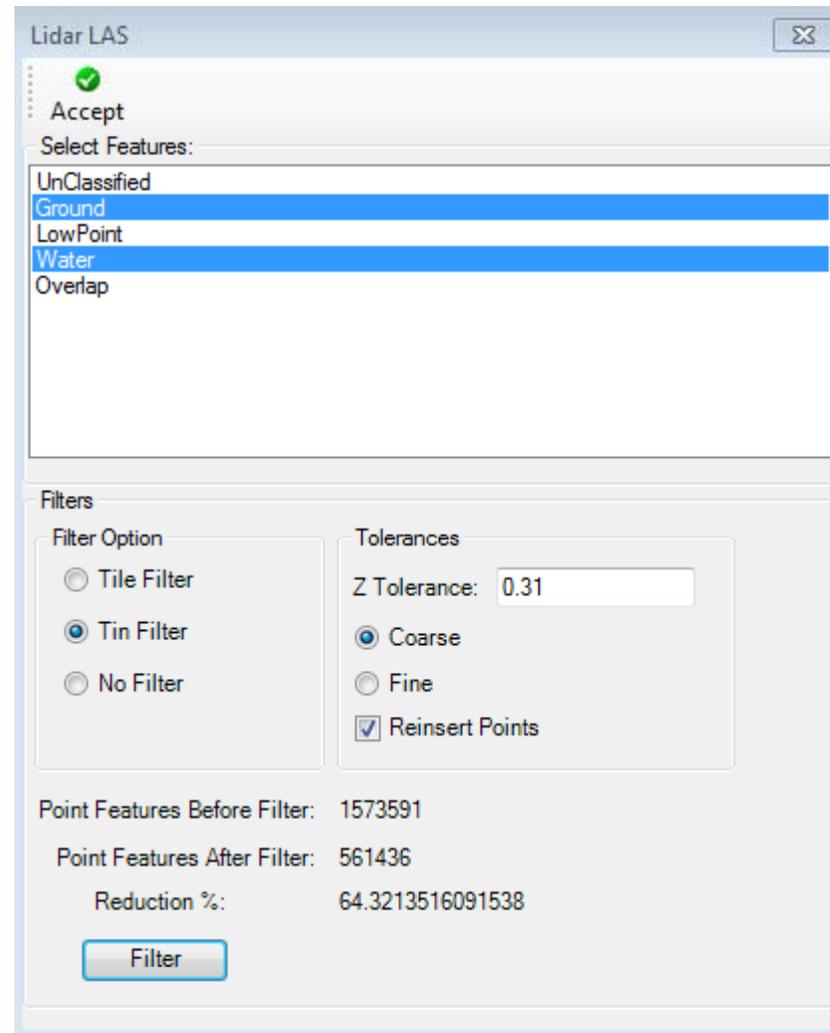
It is assumed that systematic errors have been eliminated as best as possible. If vertical error is normally distributed, the factor 1.9600 is applied to compute linear error at the 95% confidence level (Greenwalt and Schultz, 1968). Therefore, vertical accuracy,  $Accuracy_z$ , reported according to the NSSDA shall be computed by the following formula:

$$Accuracy_z = 1.9600 * RMSE_z.$$

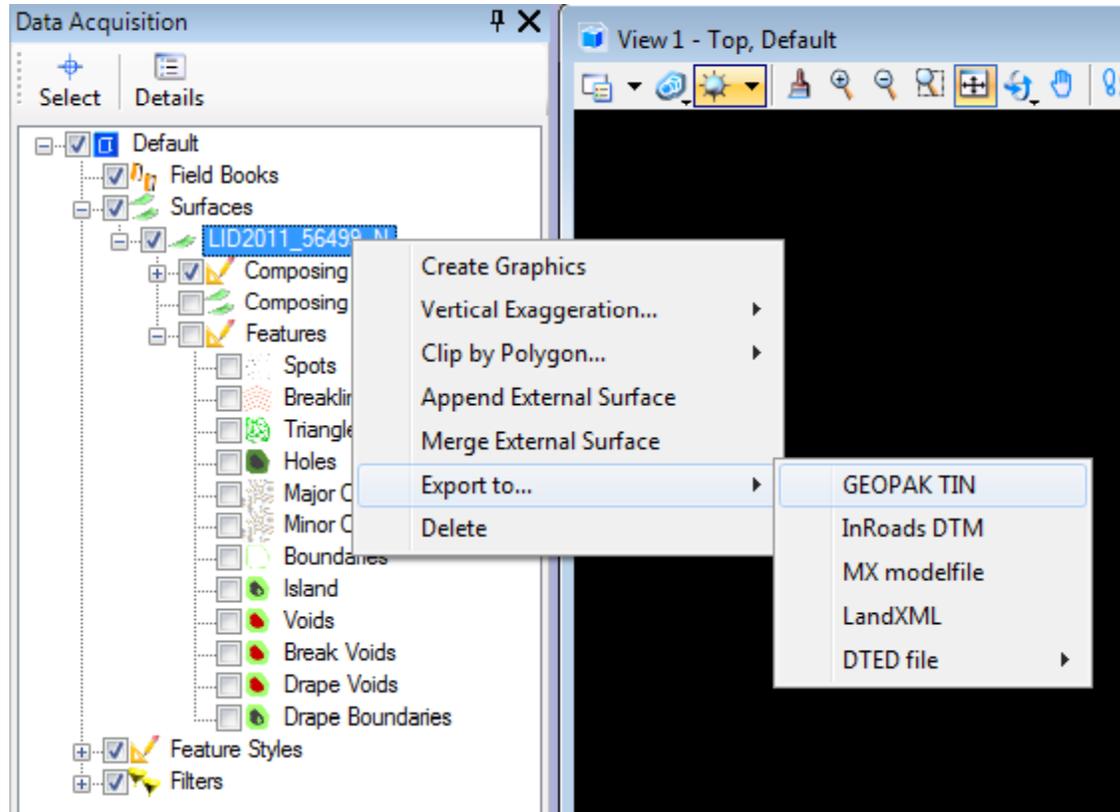
- ◆ Choose the LAS file to import, choose classifications, set settings, Z Tolerance and click the “Filter” button



- ◆ Point features are reduced by the filter. Click the “Accept” button to create the surface.



- ◆ Right click on the surface to Create Graphics or to export the surface to a GEOPAK TIN



# ***CREATING FDOT SURVEY DELIVERABLES***

- ◆ Creating the GDTMRD file can be done using GEOPAK and the TIN file created from D.A.
- ◆ Creating the DREXRD, TOPORD, and UTEXRD files can easily be done by “visualizing” the graphics using the level display filters
- ◆ Individual features can be visualized using the feature styles in the D.A. tree
- ◆ Check to visualize, uncheck to turn off visualization of groups or individual features

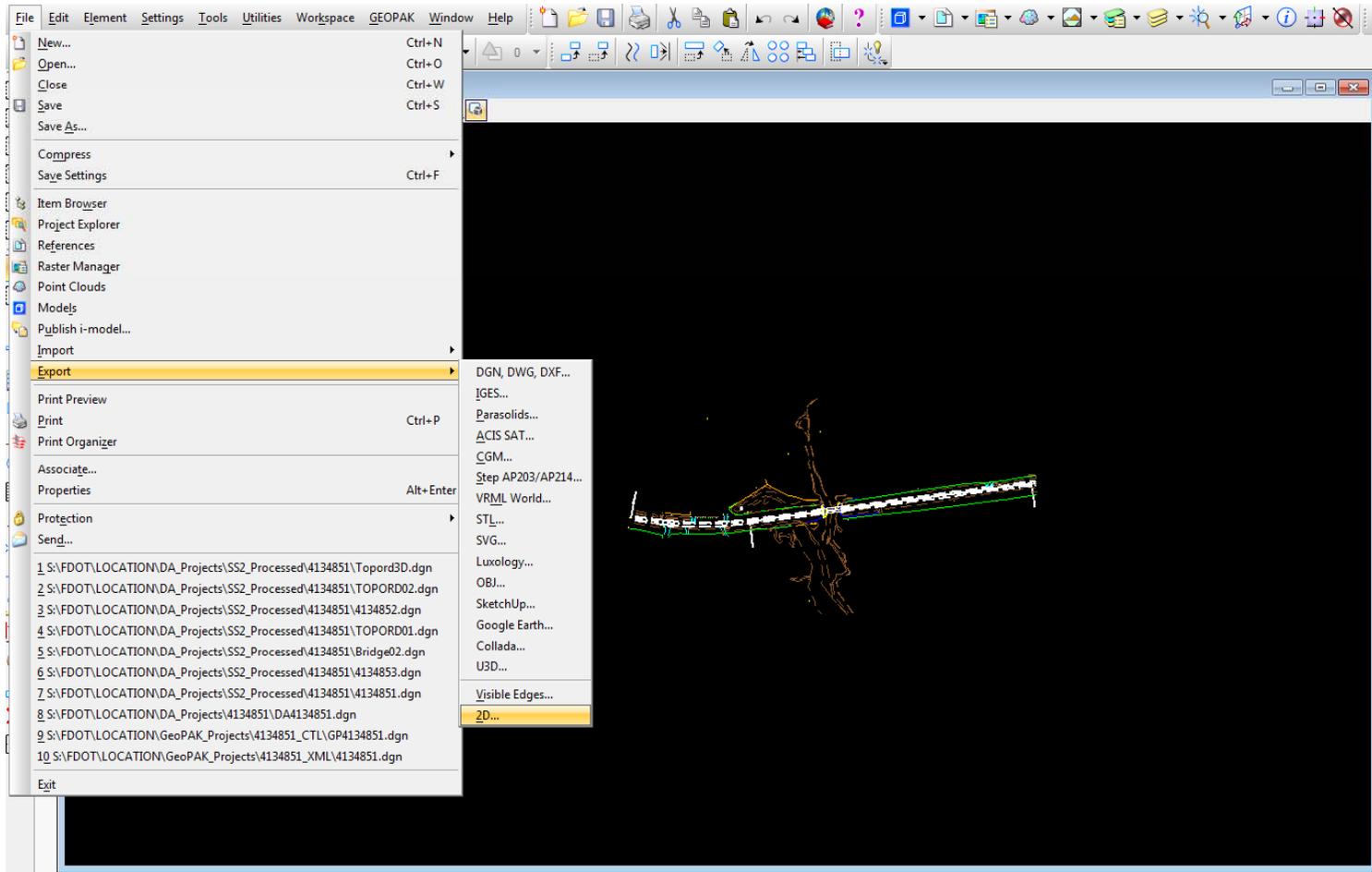
# ***CREATING FDOT SURVEY DELIVERABLES***

- ◆ 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 will be necessary to complete the deliverable for delivery to design

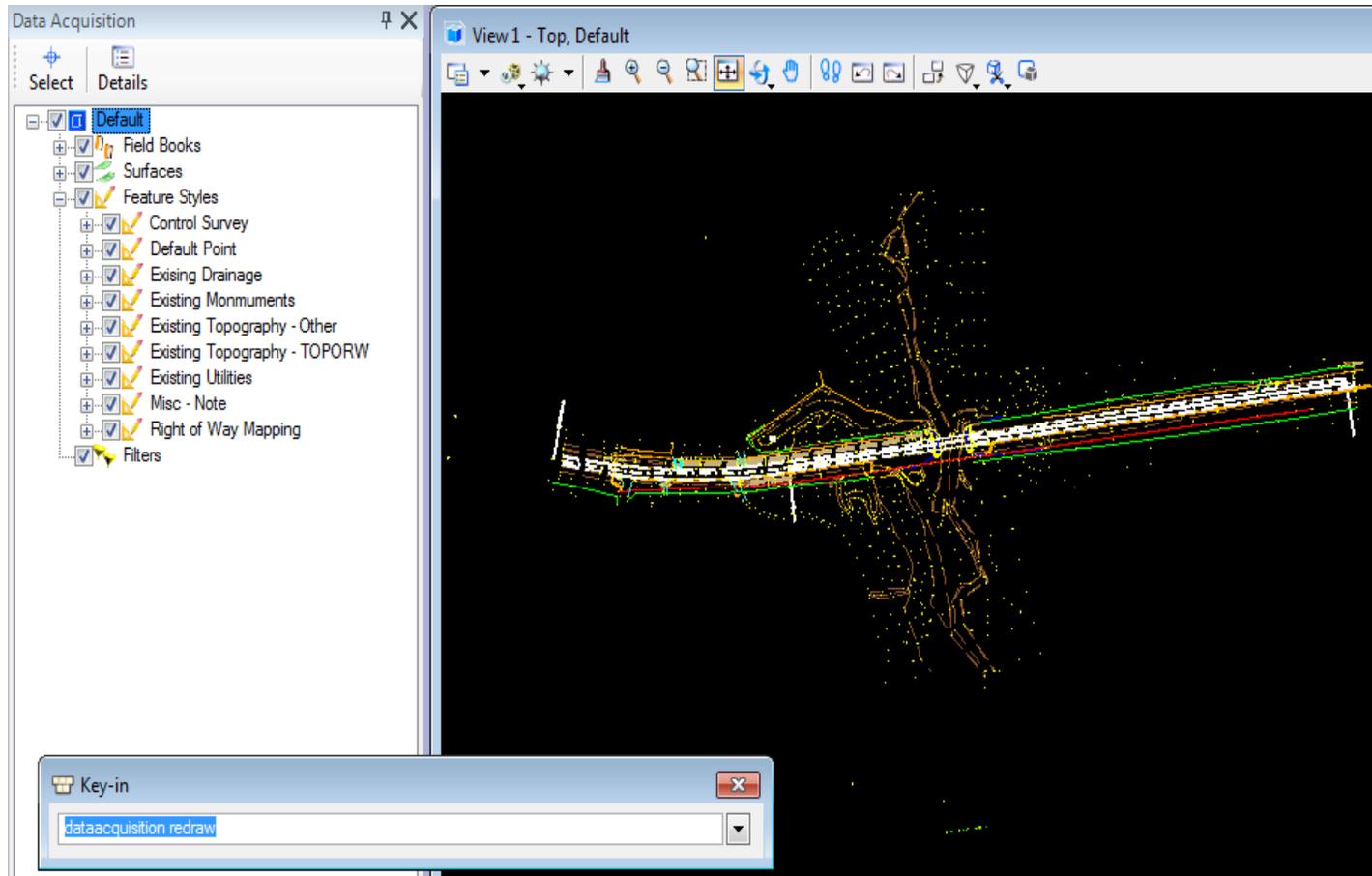
# CREATING FDOT SURVEY DELIVERABLES



# ***CREATING FDOT RIGHT OF WAY DELIVERABLES***

- ◆ In Data Acquisition there is no need to re-import or massage data to go from Surveying deliveries to Right of Way deliveries even though levels, cells, line styles and attributes are significantly different
- ◆ Change the FDOT Menu bar configuration from Roadway Design to Right of Way Mapping
- ◆ Re-open the DGN file and type into the Key-in box, “dataacquisition redraw”

- ◆ The R/W Style File is automatically attached. Type in the Key-in box “**dataacquisition redraw**”



# ***CREATING FDOT RIGHT OF WAY DELIVERABLES***

- ◆ The “**dataaquisition redraw**” Key-in will apply the current Style File features
- ◆ Note the differences are not immediately apparent however, they include:
  - R/W style monuments
  - Some cells have a mask
  - Many of the “dashed” lines for existing point features are now solid lines
  - Some custom line styles like railroad centerlines are different in right of way

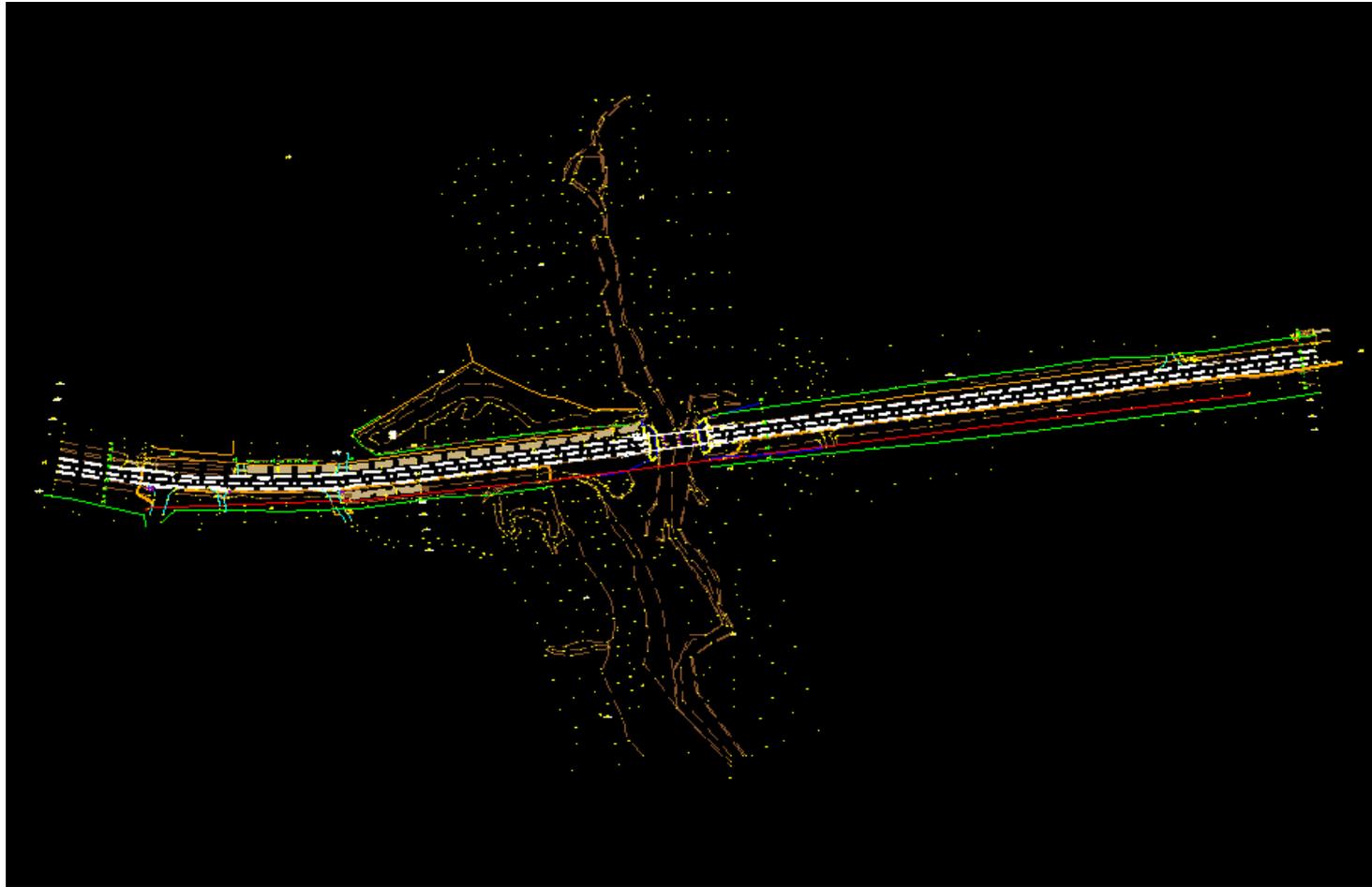
# *Creating The TOPORW File*

- ◆ Note the difference in Categories
- ◆ The TOPORW can be visualized by checking the categories in the D.A. tree structure
  - Check the box for Existing Topography
  - Check the box for Existing Monuments
  - All other boxes should be unchecked unless the feature is desired to be included in the TOPORW File
- ◆ The process for creating the TOPORW deliverable is identical to creating the TOPORD (Use “**fence file**” and then export to a 2D)

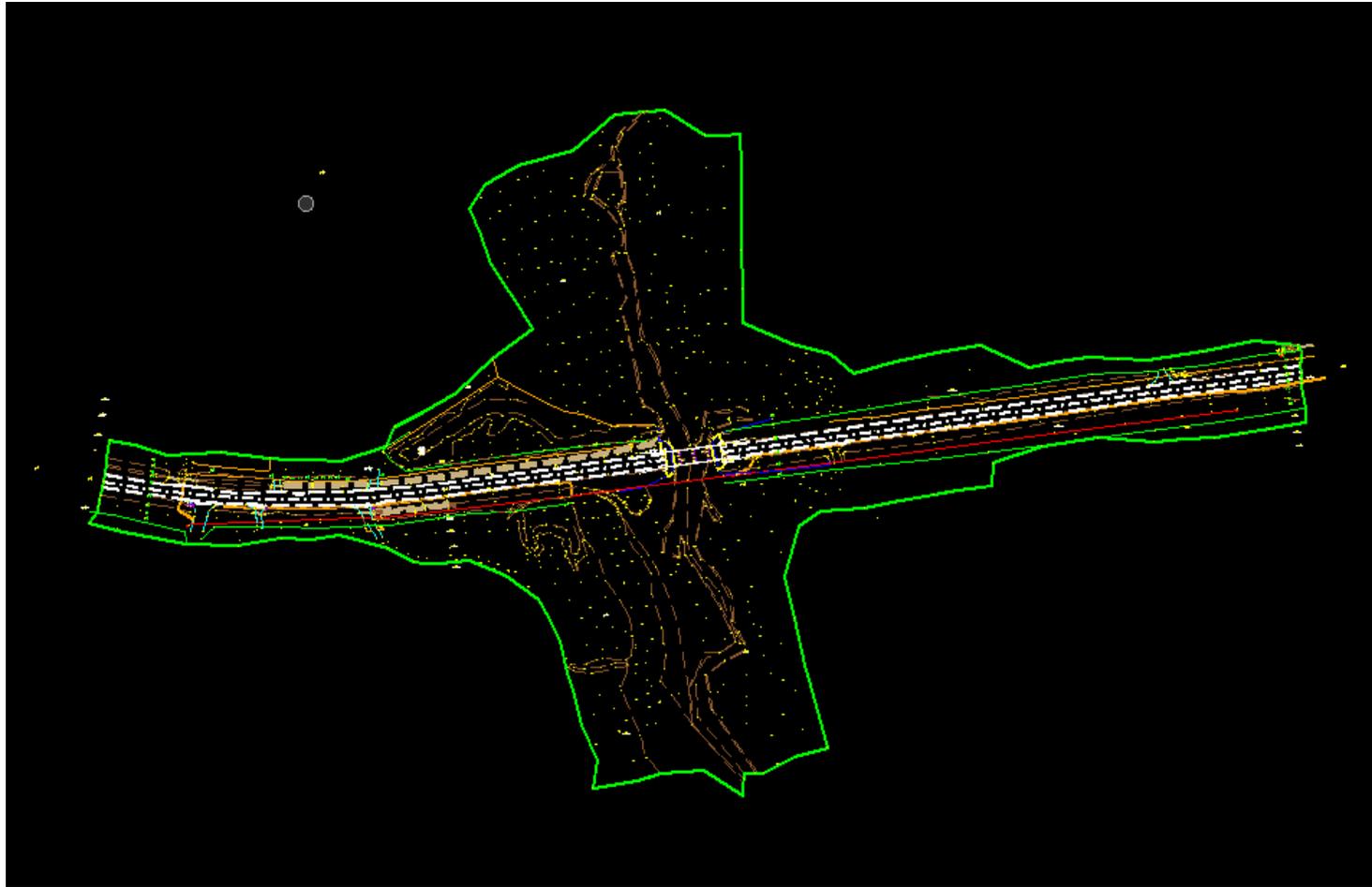
# ***IMPORTING CAiCE PROJECTS***

- ◆ Data Acquisition will accommodate importing CAiCE projects
  - Choose the appropriate configuration (Roadway or Right of Way)
  - Choose the appropriate seed file
  - Drag and drop the CAiCE PT4 file into Data Acquisition

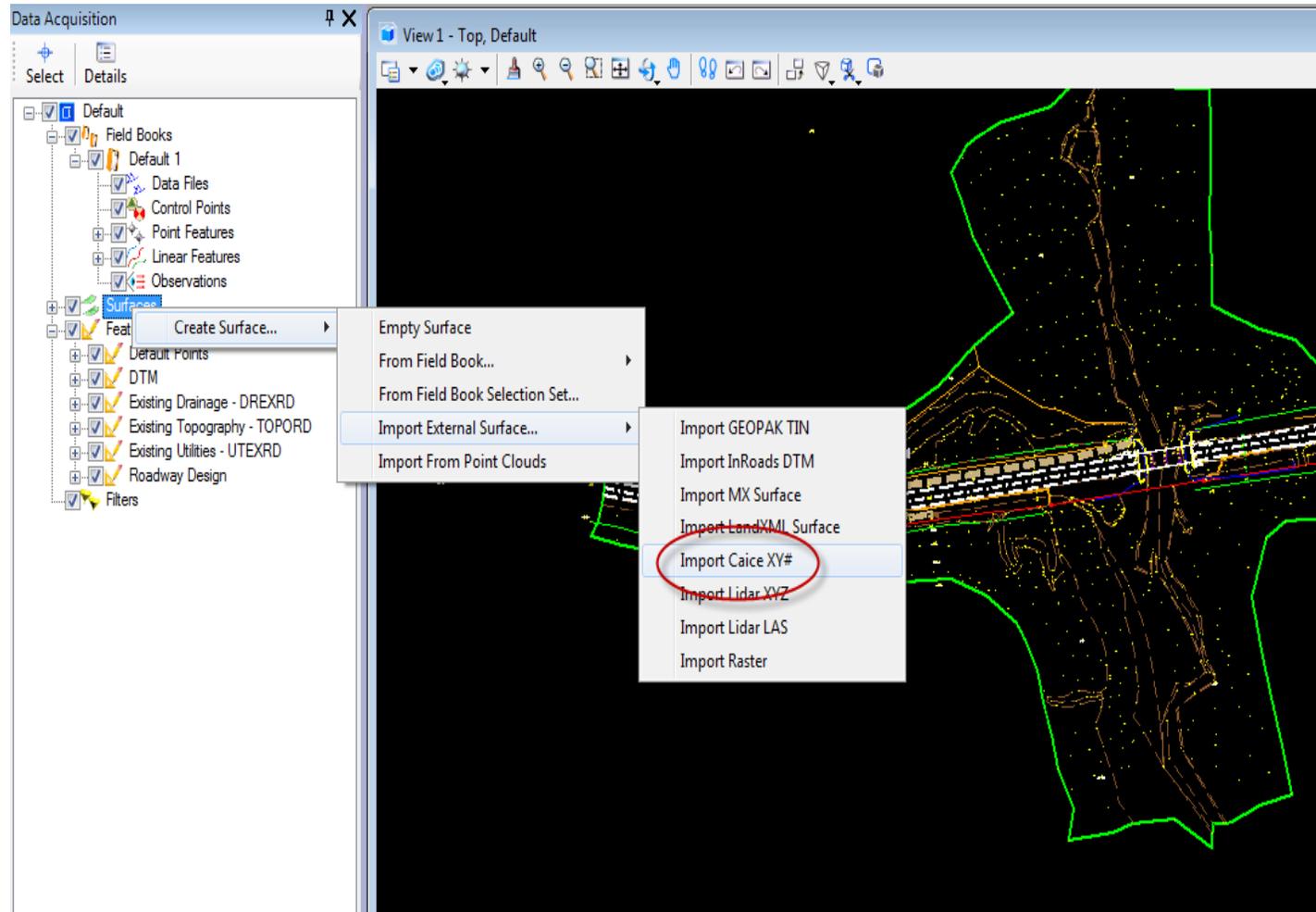
- ◆ All points and survey chains are imported into Data Acquisition



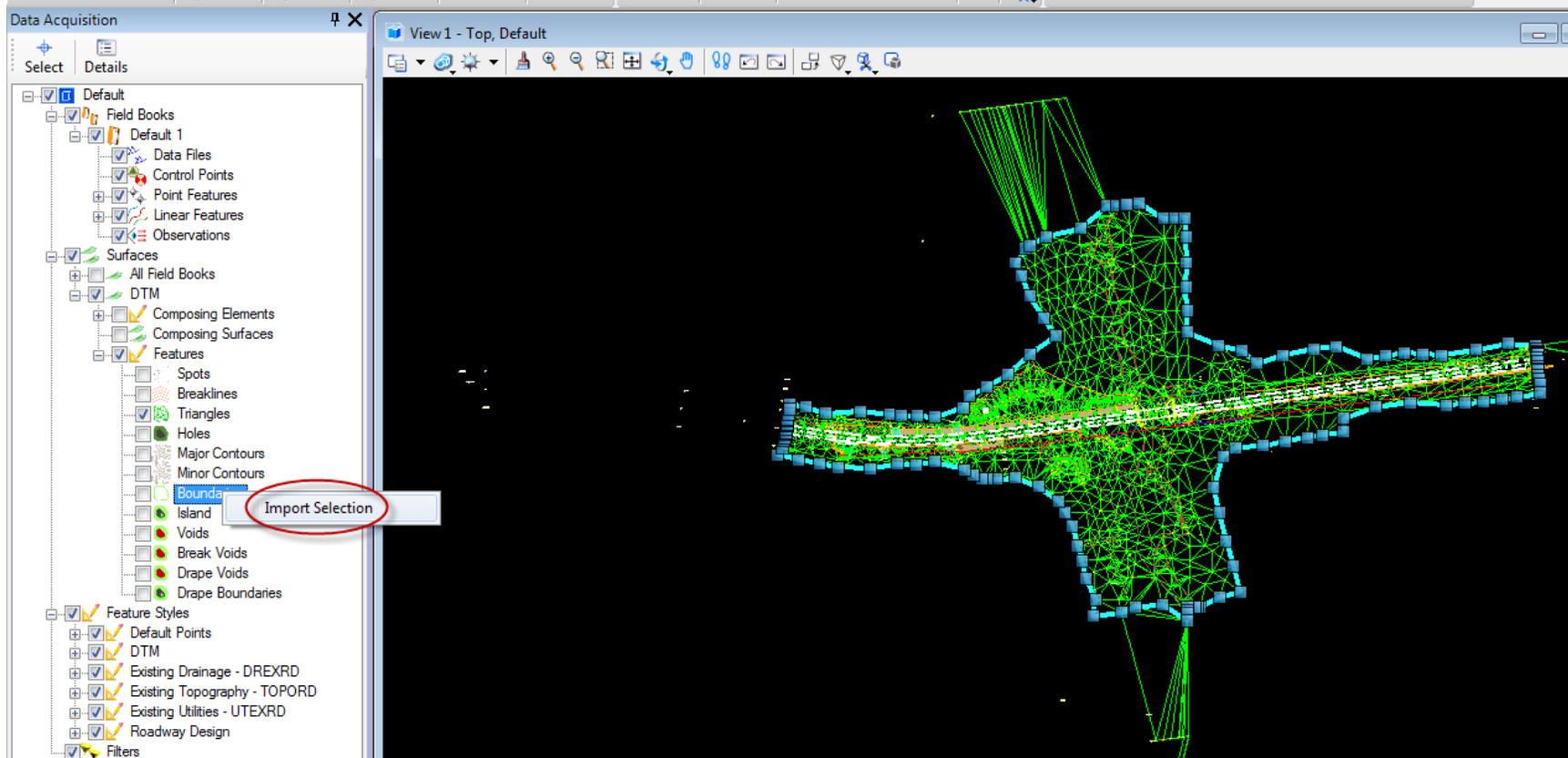
- ◆ Creating a boundary with a closed polygon will set limits to the DTM



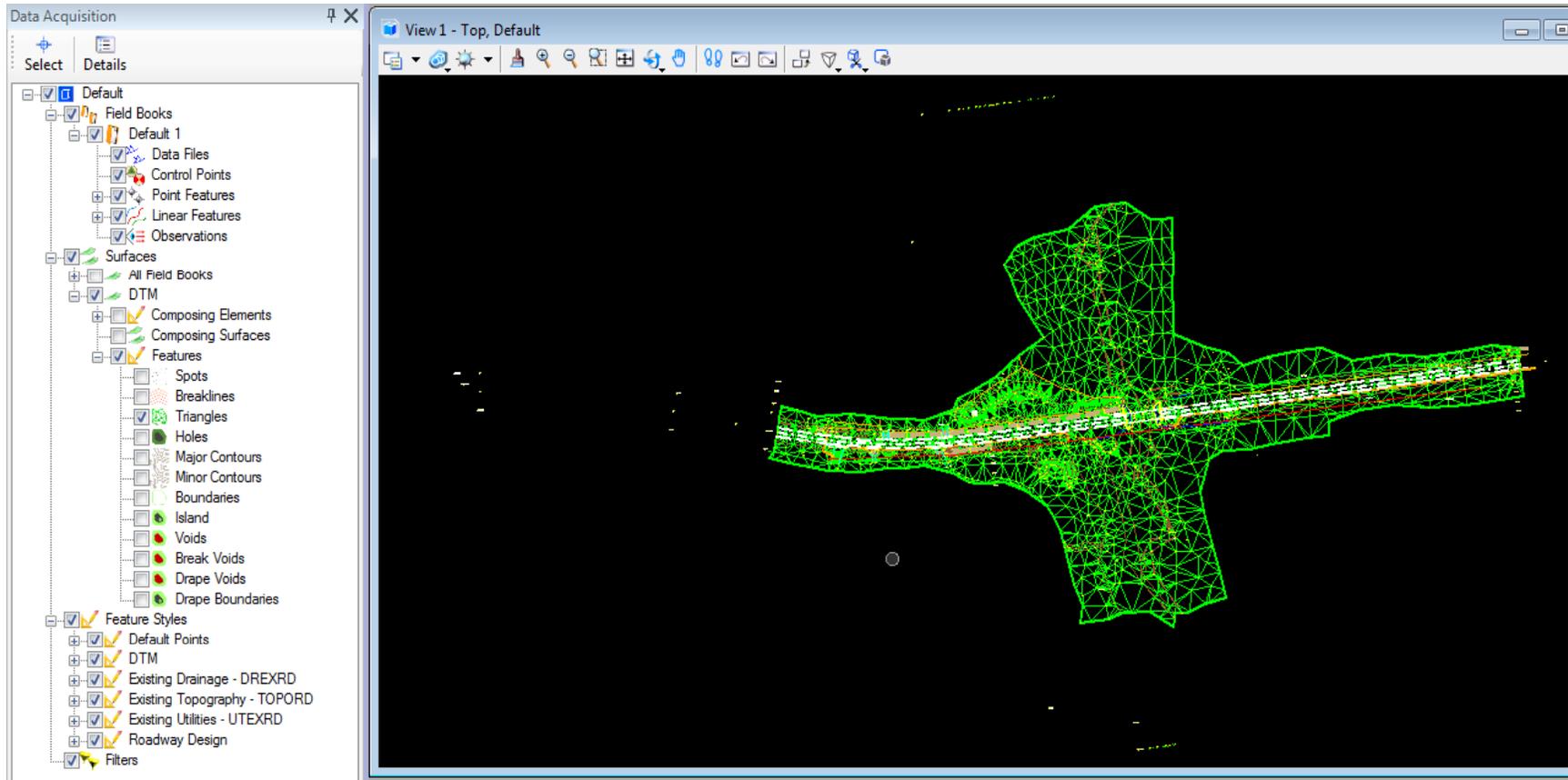
- ◆ To Import a CAiCE Surface, right click on Surfaces and Import the CAiCE XY# file



- ◆ Right click on Boundary in the surface tree and “**Import Selection**”



- ◆ The DTM is limited to the selected boundary



# ***EXPORTING POINTS AND CHAINS TO GEOPAK***

- ◆ Data Acquisition is a work in progress
- ◆ At some point a left turn must be made and data moved to GEOPAK
- ◆ SS3 will have improvements over SS2 and the left turn will be further down the road
- ◆ Eventually there may not be a need to use GEOPAK for surveying purposes

# ***EXPORTING POINTS AND CHAINS TO GEOPAK***

- ◆ Right Click on the Field Book in the D.A. tree and select “Export to>GEOPAK Format”
- ◆ The format is a GPK file
- ◆ Point and survey chain features along with descriptors will be included