LAB 8 - Exporting the Fieldbook

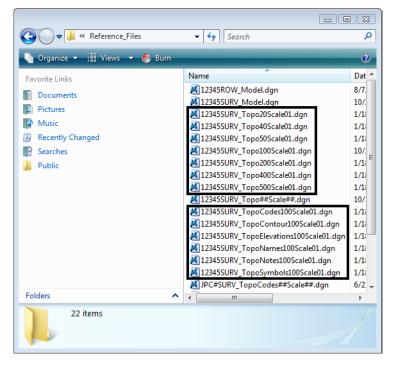
Lab 8.1 - Exporting Survey Data to Graphics

Managing Drawings in the Reference Files folder

The files in the Reference Files folder are for other disciplines to reference. Other disciplines are to reference in the 01 model file. There are already 01 files in the Reference Files folder that are out of date. The new Survey Fieldbook that is exported will become the new 01 file.

Section Objectives:

- Create a new design file to write survey data to graphics.
- Run the CDOT Stratify Survey tool from the CDOT Menu.
- 1. Open Windows Explorer.
- 2. Navigate to the folder C:\Projects\12345\ROW_Survey\Drawings\Reference_Files\



3. Rename each file *12345SURV_Topo** with a *01* counter and rename it to *02*.

Note: The next steps will create these model files with an updated InRoads Survey fieldbook.

Creating new 01 design files.

- 4. From the MicroStation pull down menu select **File > Open** the Open dialog will appear.
- 5. In the MicroStation Manager dialog path to the directory: C:\Projects\12345\ROW_Survey\Drawings\Reference_Files\
- 6. Select the file *12345SURV_Topo##Scale##.dgn* from the *Open* dialog.

Look in:	Reference_	Files	- 🗿 🗇 📂 🛄-	"L) 🔁 🗈	3D - V8 DGN
a.	Name	*	Date modified	Туре 🔺	
	📕 12345ROW	/_Model.dgn	8/7/2009 1:38 PM	Bentley N	
ent Places	🕺 12345SUR\	/_Model.dgn	10/27/2009 10:31	Bentley N	
	🕺 12345SUR\	/_Topo20Scale02.dgn	1/18/2008 7:16 AM	Bentley N ≡	
	🕺 12345SUR\	/_Topo40Scale02.dgn	1/18/2008 7:16 AM	Bentley N	
)esktop	🛃 12345SUR\	/_Topo50Scale02.dgn	1/18/2008 7:17 AM	Bentley N	
	🛃 12345SUR\	/_Topo100Scale02.dgn	10/29/2009 7:47 AM	Bentley N	
	🕺 12345SUR\	/_Topo200Scale02.dgn	1/18/2008 7:16 AM	Bentley N	
OT CDOT	12345SUR 12345SUR	/_Topo400Scale02.dgn	1/18/2008 7:17 AM	Bentley N	
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		/_Topo##Scale##.dgn	10/30/2009 11:37	Bentley N	
omputer	12345SUR	/_TopoCodes100Scale02.dgn	1/18/2008 7:17 AM	Bentley N 👻	
	•	III		F	
Jetwork	File name:	12345SURV_Topo##Scale##.	dgn 👻	Open	User: CDOT User
NELWORK	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)		Cancel	Project: 12345
		Open as read-only		Options	Interface: CDOT

- **Note:** The purpose of the files with "##" symbols are for creating new files with the correct naming convention.
- 7. **<D>** the **Open** button MicroStation Manager dialog will close and open the file.
- 8. From the MicroStation pull down menu select **File > Save As** the *Save As* dialog will appear.

 Replace the ## symbols with 100 scale and 01 model. Type in File name: 12345SURV_Topo100Scale01.dgn

Save in:	🖟 Reference_Files 🗸 🗸	🎯 🤌 📂 🛄 -	*	3D - V8 DGN
(And	Name	Date modified	Туре 🔺	
and the second s	🛃 12345ROW_Model.dgn	8/7/2009 1:38 PM	Bentley N	
ecent Places	🛃 12345SURV_Model.dgn	10/27/2009 10:31	Bentley N	
	12345SURV_Topo20Scale02.dgn	1/18/2008 7:16 AM	Bentley N =	
· · · · ·	🔊 12345SURV_Topo40Scale02.dgn	1/18/2008 7:16 AM	Bentley N	
Desktop	12345SURV_Topo50Scale02.dgn	1/18/2008 7:17 AM	Bentley N	
	12345SURV_Topo100Scale02.dgn	10/29/2009 7:47 AM	Bentley N	
	12345SURV_Topo200Scale02.dgn	1/18/2008 7:16 AM	Bentley N	
DOT CDOT	12345SURV_Topo400Scale02.dgn	1/18/2008 7:17 AM	Bentley N	
	12345SURV_Topo500Scale02.dgn	1/18/2008 7:17 AM	Bentley N	
	12345SURV_Topo##Scale##.dgn	10/30/2009 11:37	Bentley N	
Computer	12345SURV_TopoCodes100Scale02.dgn	1/18/2008 7:17 AM	Bentley N	
	12345SURV_TopoContour100Scale02.dgn	1/18/2008 7:16 AM	Bentley N	
	M 12345SURV TopoElevations100Scale02.don	1/18/2008 7:17 AM	Bentlev N	
Network				
	File name: 12345SURV_Topo100Scale01.d	gn 🔻	Save	
	Save as type: MicroStation V8 DGN Files (*.dgn		Cancel	

- <D> the Save button the Save As dialog will close and MicroStation will open the file 12345SURV_Topo100Scale01.dgn
- 11. Verify the *12345SURVFieldbook01* survey fieldbook is active. You can tell which fieldbook is active by the red box around the fieldbook button.

- To modify the scale as it relates to cells, text, and linestyles go to Tools > Survey Options > [General]. The Survey Options dialog will appear.
- 13. Set the Scales for *Cell*, *Text*, and *Line* as shown below.
 - ◆ Cell Scale: **100**
 - ◆ Text Scale: 20
 - ◆ Line Scale: **100**

Survey Options			23
General Units S	ymbology Correc	tions Observation Standa	rd Deviation
Chord Height:	0.010000		
Point Seed:	1		Help
Figure Seed:	1		
Cell Scale:	100.00		
Text Scale:	20.00	Fieldbook Audit Trail File N	lame:
Line Scale:	100.00	C:\Projects\12345\ROW	_Survey\Ini
File Options	Errors	Save Computed Coord	inates
Log Code Error	5	📝 Add/Edit Audit Trail	
Convert Numer	ic Codes to Corres	ponding Alpha Codes on Im	port
View Options			
Automatic Refr	esh	V Segregate Text by Syn	bology Level
Automatic Upd	ate of Surface		
Planimetric Setting			
Use Custom Op	perations	📝 Attach Default Tags	
Use Symbols		📝 Attach Attribute Tags	
Use Cells			
Include Custom	Operations, Symb	ools and Cells in Single Cell	
	OK Pret	ferences Cancel	

- **Note:** Segregate Text by Feature Level, should be checked on, this will save the symbols, point names, codes, notes, errors, and elevations to the same level as the survey feature.
- 14. **<D>** the **OK** button the *Survey Options* dialog will close.

15. From the InRoads pull down menu select, Survey > View Survey Data > Write Survey Data to Graphics... the Write Survey Data to Graphics dialog will open.

🔢 Write Survey Data	to Grap 🗖 🖻 🖾
Include: Planimetr Symbols 1.2 Names Recodes	Filter
Elevation Errors III	Select All
Planarize Elevation:	0.00
Curve Stroking Mode:	Horizontal and Vertical 💌

- **Note:** By default if you had dynamic graphics still toggled on, those same components would be toggled on in the Write Survey Data to Graphics dialog.
- 16. Check ON the Select All box.

🔣 Write Su	urvey Data to Gr	ap 🗖 🗉 🖾
	Planimetrics Symbols Names Codes Elevations Errors	Apply Filter Close Help
Planarize Elevati	•	Select All
Curve Strok	ing Mode: Horiz	zontal Only 🗾

- 17. From the drop down list for *Curve Stroking*: Horizontal Only
- <D> the Apply then Close button. The Survey fieldbook planimetrics has been written to graphics.
- 19. Verify all View Survey Data buttons are toggled display off.

View Survey Dat			×
L∰ + 1 ₂ A	P 🛆 🕫	🌣 💆 牆 📽 🛛	8 •

- 20. From the MicroStation view border Fit the design file.
- 21. Review your results.
- 22. From the CDOT Menu pull-down select **CDOT Tools > Stratify Survey**. The *Stratify Survey* dialog will appear.
- 23. Type in the Scale: 20

ratify Survey Da	ita	Σ
JPC: 12345	Scale: 20	Sheet Number: 01
 Existing Files Append 	C Overwrite All	C Overwrite None
Process	metrics	
Symbols	12345SURV_TopoSym	bols20Scale01.dgn
Names	12345SURV_TopoNam	nes20Scale01.dgn
Codes	12345SURV_TopoCod	es20Scale01.dgn
✓ Elevations	12345SURV_TopoElev	ations20Scale01.dgn
Errors	12345SURV_TopoErro	ors20Scale01.dgn
✓ Notes	12345SURV_TopoNote	es20Scale01.dgn
□ Network	12345SURV_TopoErro	ors20Scale01.dgn
Contours File Name: 12	345SURV_TopoContour	100Scale2_10.dgn
	ОКС	ancel

Note:

- Under Existing Files, the Append option will add or merge the new data into an existing file. A new file will be created if the file does not already exist.
- Under Existing Files, the Overwrite All option will create a new file, deleting any previously existing file.
- Under Existing Files, the Overwrite None option will disable the processing option for a file if the file already exists.
- The Process option Adjust Planimetrics will resize the planimetrics text (if necessary) and convert the grouped text strings to view independent cells in order to allow for viewing this text in any 3D view.
- 24. Verify the JPC, Scale, and Sheet Number entries are correct. Altering any of those values will automatically alter the output file names. If the Attach check box in the Contours section is grayed out, the contour file does not exist. You may edit the name specified in the File Name field to enter the name of an existing contour file.
- 25. **<D> OK** button to start the process.

26. As the data is being moved to the appropriate reference file a Processing Status dialog provides an update on the progress. You may Cancel at any time to stop the processing, if necessary.

Processing St	atus	23
Planimetrics Symbols Names Codes Elevations Errors Notes Network	Completed (0 elements processed) Completed (6179 elements processed) <i>working</i>	
Contours		
	Cancel	

27. When completed, a Processing Completed message is displayed. **<D> OK** to exit the program.

StratifySurvey	X
Processing Completed	
OK	

28. The fieldbook data has now been stratified into separate reference files. The planimetrics will be in the master design file with all of the symbols, names, codes, etc., attached as reference files. To view these attachments select File > Reference from the MicroStation pull down menu.

<u>T</u> ools	<u>S</u> ettings												
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Slot	P File Nan	ne			Model		Description	Logical	Presentation	٠	2	۲	A
1	12345S	URV_Top	oSymbols20So	ale01.dgn	CDOT	Default	Fieldbook Data	20ScaleSymbols	Wireframe	\checkmark	\checkmark	\checkmark	
2	12345S	URV_Top	oNames20Sca	ale01.dgn	CDOT	Default	Fieldbook Data	20ScaleNames	Wireframe	\checkmark	\checkmark	\checkmark	
3	12345S	URV_Top	oCodes20Sca	le01.dgn	CDOT	Default	Fieldbook Data	20ScaleCodes	Wireframe	\checkmark	\checkmark	\checkmark	
4	12345S	URV_Top	oElevations20	Scale01.dgn	CDOT	Default	Fieldbook Data	20ScaleElevations	Wireframe	\checkmark	\checkmark	\checkmark	
5	12345S	URV_Top	oErrors20Scal	e01.dgn	CDOT	Default	Fieldbook Data	20ScaleErrors	Wireframe	\checkmark	\checkmark	\checkmark	
6	12345S	URV_Top	oNotes20Scal	e01.dgn	CDOT	Default	Fieldbook Data	20ScaleNotes	Wireframe	\checkmark	\checkmark	\checkmark	
S <u>c</u> ale	1.000000		: 1.0000	00		Orientati	on Top	Rotation 0	°0'0'']			
Offect)	K -178956.9	71	Y -178	3956.971		7 .1	78956.971						

Lab 8.2 - Exporting Survey Data to Surface

Managing Drawings in the Reference Files folder

The files in the Reference Files folder are for other disciplines to reference. Other disciplines are to reference in the contour model file. There is already a contour file in the Reference Files folder that is out of date. The new Survey Fieldbook that is exported will become the new contour file.

Section Objectives:

- Create a new design file to create the surface display graphics.
- Export the survey data to a surface file for a final deliverable.
- Use the delete triangle command to constrain the triangles to the survey points collected in the field.
- View the new surface perimeter.
- Import new perimeter into the surface as an exterior boundary.
- 1. From the MicroStation pull down menu select **File > New**. The *New* dialog will appear.
- 2. Navigate to the file folder *Reference_Files* by double clicking the directory folders.
- 3. At the bottom of the dialog box verify that the seed file is set to *Roadway_Design_3D.dgn*.
- 4. Key in the file to be created 12345SURVContour100Scale2_10.dgn
- <D> the OK button in the New dialog. The New dialog will close and the file 12345SURVContour100Scale2_10.dgn will open.

Save in:	Reference_Fil	es 🔻	G 🤌 📂 🛄 🕇	🔁 🖹
(Pa)	Name	*	Date modified	Туре
-	812345SURV_1	Fopo20Scale02.dgn	1/18/2008 7:16 AM	Bentley N_
Recent Places	🔏 12345SURV_1	Fopo40Scale02.dgn	1/18/2008 7:16 AM	Bentley N
	🔏 12345SURV_1	Fopo50Scale02.dgn	1/18/2008 7:17 AM	Bentley N
	🕺 12345SURV_1	Fopo100Scale01.dgn	12/7/2009 12:38 PM	Bentley N ;
Desktop	🕺 12345SURV_1	Fopo100Scale02.dgn	10/29/2009 7:47 AM	Bentley N
1000	🔏 12345SURV_1	Fopo200Scale02.dgn	1/18/2008 7:16 AM	Bentley N
	🕺 12345SURV_1	Fopo400Scale02.dgn	1/18/2008 7:17 AM	Bentley N
CDOT CDOT	🔊 12345SURV_1	Fopo500Scale02.dgn	1/18/2008 7:17 AM	Bentley N
	🕺 12345SURV_1	Fopo##Scale##.dgn	10/30/2009 11:37	Bentley N
	🕺 12345SURV_1	FopoCodes100Scale02.dgn	1/18/2008 7:17 AM	Bentley N
Computer	🔏 12345SURV_1	FopoContour100Scale02.dgn	1/18/2008 7:16 AM	Bentley N
	🕺 12345SURV_1	FopoElevations100Scale02.dgn	1/18/2008 7:17 AM	Bentley N
	X12345SURV	TopoNames100Scale02.don	1/18/2008 7:17 AM	Bentlev N
Network	•			4
	File name:	12345SURVContour100Scale2_1	10.dgn 👻	Save
	Save as type:	MicroStation DGN Files (*.dgn)	•	Cancel
	Seed:	ds-Global\MicroStation\seed\3D-	Seed CDOT day	Browse

6. From the MicroStation menu pull down select Settings > Drawing Scale the Drawing Scale dialog will appear.

7. In the *Annotation* drop down list select **1**" = **1**'

Drawing Scale	X
Survey Feet Survey Inches	• •
<u></u>	•]
CUSTOM ACS	

- 8. From the MicroStation pull down menu select **File > Save Settings**.
- **Note:** The reason annotation scale needs to be set to 1"=1' is so that the linestyles will be displayed correctly from InRoads Survey.
- 9. Verify the *12345SURVFieldbook01* fieldbook is active. You can tell which fieldbook is active by the red box around the fieldbook button.

Survey Data to Surface

- 10. From the InRoads pull down menu, select **File > New**. The *New* dialog will appear.
- 11. **<D>** the **Surface** tab.
- 12. From the drop down list select *Type*: Existing
- 13. Key in the surface Name: 12345SURVSurface01
- 14. Key in the *Description: CDOT Surface Final*
- **Note:** Key in any additional file information in the Description field of the dialog, such as Date, User, and Design file name. You have up to 34 characters even though you may not see all the characters in the Description field.
- 15. Keep the *Maximum Length* set to *O*
- 16. From the drop down list Preference: Existing 10' Mjr 2' Minor

Surface Geometry	Supray Data		
Geometry	Survey Data		
Туре:	Existing	•	Apply
Name:	12345SURVSurfac	e01	Help
Description:	CDOT Surface Fina	al	
Maximum Length:	0.00		
Preference:			
Freierence.	Existing 10' Mjr - 2'	Mina 🔻	
Fleielence.	Existing 10' Mjr - 2'	Mina 🔻	
Name		Minc 🔻	1
			1
Name			1
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Name			1
Name			1

17. **<D>** the **Apply** then **Close** buttons.

 From the pull down menu Survey > Survey Data to Surface. The Survey Data to Surface dialog will appear.

🔛 Survey Data To Surface	1	X
Surface Name:	12345SURVSurface01 -	ОК
Parent Name:		Cancel
Description:	Use Style Description	Filter
Tolerance:	0.00	Preferences
Maximum Segment Length:	0.00	
Curve Stroking Mode:	Horizontal and Vertical 💌	Help
Always Use:	Alpha Code 🔹 🔻	
Triangulate Surface		
Empty Surface		
Duplicate Names:		

- 19. From the drop down list *Surface Name:* 12345SURVSurface01
- 20. Type in the Parent Name: Survey Fieldbook Export
- 21. From the drop down list Description: Use Style Description
- 22. Keep the *Tolerance* and *Maximum Segment Length* set to *0.00*
- 23. From the drop down list Curve Stroking Mode: Horizontal Only
- 24. Check ON Always Use: Style
- 25. Check ON Triangulate Surface

🔢 Survey Data To Surface	:	23
Surface Name:	12345SURVSurface01 -	ОК
Parent Name:	Survey Fieldbook Export	Cancel
Description:	Use Style Description	Filter
Tolerance:	0.00	Preferences
Maximum Segment Length:	0.00	
Curve Stroking Mode:	Horizontal Only -	Help
V Always Use:	Style 🔹	
☑ Triangulate Surface		
Empty Surface		
Duplicate Names:		

26. **<D>** the **OK** button the *Triangulate Surface* dialog will appear.

27. Leave all settings unchecked. *Maximum Length* should be set to *0.00*.

🔣 Triangulate Su	urface		
Surface:	12345SURVSurface01	•	Apply
Description:	CDOT Surface Final		Close
Maximum Length:	0.00	+	Help
Extended Data	Checks	Lock Triangulation	
Features	a. 1.	Results	
Load Tagged	Graphics	Number of Points:	
Delete Surfac	e Contents	Number of Triangles:	
Filter Toleranc	e: 0.00	Elapsed Time (Secon	ds):
			More

28. **<D>** the **Apply** button. The Results section of the dialog should look similar to the image below.

🔣 Triangulate Su	Inface		
Surface:	12345SURVSurface01	•	Apply
Description:	CDOT Surface Final		Close
Maximum Length:	0.00	+	Help
Extended Data	Checks	Lock Triangulation	<u> </u>
Features		Results	
Load Tagged	Graphics	Number of Points:	7630
Delete Surfac	e Contents	Number of Triangles:	14537
Filter Toleranc	e: 0.00	Elapsed Time (Secon	ds): 0
			More

29. **<D>** the **More** button. The *Surface Properties* dialog will appear.

ain Advanced							
Surface:	12345SUF	RVSurface 🔻					Report
Name:	12345SUF	VSurface01					Help
Description:	CDOT Sur	ace Final					
Maximum Length:	0.00						
Preference:	Existing 10	' Mjr - 2' N 🔻					
Гуре:	Existing		-Data Totals-	Active	Features	Deleted	Total
Use Extended	Data Check	s	Random:	1001	90	501	1502
Lock Triangula	tion		Breakline:	6629	451	0	6629
Data Range			Contour:	0	0	0	0
Point Type:	Total	•	Inferred:	0		0	0
Northing: 1	Minimum 531966.21	Maximum 1558577.52	Interior:	0	0	0	0
Easting: 3	236901.35	3303597.87	Exterior:	0	0	0	0
Elevation:	6348.55	6795.73	All Points:	7630	581	501	8131
			Triangles:	14537		53	14590

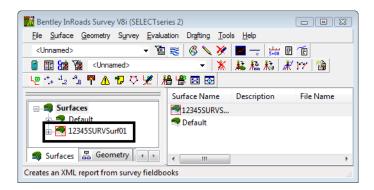
- 30. Verify you are working with the correct surface 12345SURVSurface01.
- 31. Review the section for *Data Range*. The Northing, Easting, and Elevation values should fall within the project limits.

32. On the Advanced tab choose *Cross Sections - Symbology:* T_Existing_Ground

33. On the Advanced tab choose *Profiles - Symbology:* T_Existing_Ground

lain	Advanced						
Surfac	e: 1234	5SURVSurface 🔻					
	Sections						Help
Symbo	ology: T_Exi	isting_Ground		•	Use Fe	eatures Only	noip
- Profile					I look 9	Symbologies	
	1_00	isting_Ground	Color	Offset			Color
Unset 1:	Distance 0.00	Symbology Default		9:	Distance 0.00	Symbology Default	Color
		(
2:	0.00	Default	-	10:	0.00	Default	-
3:	0.00	Default	-	11:	0.00	Default	-
4:	0.00	Default	•	12:	0.00	Default	•
5:	0.00	Default	•	13:	0.00	Default	•
6:	0.00	Default	•	14:	0.00	Default	•
7:	0.00	Default	•	15:	0.00	Default	•
8:	0.00	Default	•	16:	0.00	Default	•
		_					

- 34. **<D> Apply** then **Close** in the *Surface Properties* dialog.
- 35. **<D>** the **Close** button in the *Triangulate Surface* dialog.
- 36. Use the Workspace bar scroll arrows to view the Surfaces tab.



- 37. Verify 12345SURVSurface01 is the active surface.
- **Note:** You can change the active surface from the pull-down menu Surface > Active Surface; highlight the surface name and <D> the Apply button.

- 38. From the InRoads pull down File > Save > Surface. The Save As dialog will appear with the Save as type: Surfaces (*.dtm).
- 39. Verify you are in the correct project directory. *C:\Projects\12345\ROW_Survey\InRoads\DTM*

Save As							Ļ
Save in:	🐌 DTM		•	G	1 10	•	
(Ha	Name	Date modified	Туре	Size			
Recent Places	and the second se	<pre>IV_Surface_Drainag IV_Surface_Existing</pre>					
Computer		1004501101/0	6 04 b				-
Network	File name:	12345SURVSu	a here a series		•	_ L	Save
	Save as type:	Surfaces (*.dtm)			-		Cancel
	Jave as type.						
	Jave as type.						Help

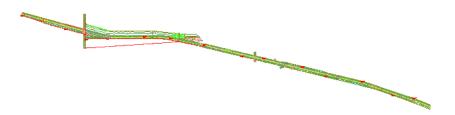
- 40. The file name should match the Active name at the bottom of the Save As dialog. If necessary, use the drop down arrow in the Active field and reselect the desired name to ensure the saved file name will match the surface name.
- **Note:** Ensuring that the saved Surface name in the project folder matches the Surface name displayed in InRoads explorer will minimize any confusion.
- 41. **<D>** the **Save** then **Cancel** button. The file will be saved to disk and the *Save As* dialog will close.

Lab 8.3 - Exterior Boundary

Errant triangles can be eliminated by controlling the maximum triangle length. However this can cause problems in areas of the DTM where data density varies. A more refined method is to add an exterior boundary that constrains the triangles to fall within the limit of the exterior boundary.

Section Objectives:

- Delete unwanted triangles from the design file.
- Display the perimeter of the model (active triangle limits).
- Import the displayed perimeter into the DTM as an exterior feature.
- Verify the results.
- 1. Open the MicroStation file 12345SURVContour100Scale2_10.dgn
- 2. Open the InRoads Survey Fieldbook file 12345SURVFieldbook01.fwd
- 3. Open the InRoads Survey Surface file 12345SURVSurface01.dtm
- 4. Using MicroStation **Delete**. Delete all graphics from the design file.
- 5. Using MicroStation **Window Area** button center the survey fieldbook dynamic display planimetric graphics to *View 1 Top rotation*.

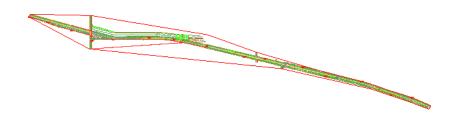


6. From the pull down menu select, **Surface > View Surface > Perimeter**. The *View Perimeter* dialog will appear.

📓 View Perimete	r	23
Surface: 123455	SURVSurface 🔻	Apply
		Close
		Preferences
Symbology:		Help
Object	Name	
Perimeter		BYL

- 7. **<D>** the **Preferences...** button. The Preferences dialog will appear.
- 8. Select **CDOT** from the Preferences dialog
- 9. **<D>** the **Load** then **Close** buttons in the Preferences dialog.
- 10. **<D>** the **Apply** button in the *View Perimeter* dialog.

11. Review your results.



12. Close the View Perimeter dialog.

Note: The perimeter will be used as a reference line as triangles are deleted.

- 13. Redisplay the triangles **Surface > View Surface > Triangles**. The *View Triangles* dialog will appear.
- 14. Load the Existing Preferece for View Triangles.

🔀 View Triangles	;		X
Surface:	123459	SURVSurface 👻	Apply
Fence Mode:	Ignore	-	Close
Colored Model			Preferences
Symbology:			Help
Object		Name	
Triangles		DTM_Ex_Triang	les BYL

15. **<D>** the **Apply** button in the *View Triangles* dialog.

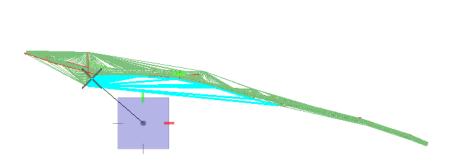


16. From the InRoads pull down menu select, Surface > Edit Surface > Delete Triangle. The Delete Triangle dialog will appear.

🔣 Delete	Triangle [
Surface:	12345SURVSurface 💌	Apply
		Close
		Help

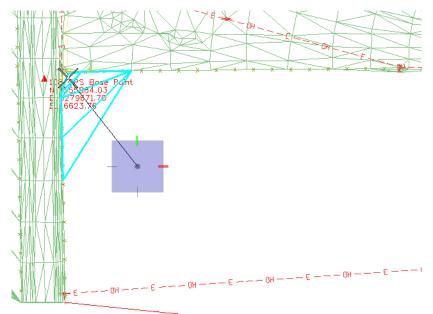
17. **<D>** the **Apply** button. The *Delete Triangle* dialog will minimize allowing you to select a point in the view.

- 18. **<D>** a point in the MicroStation view off to the side of the surface limits.
 - There is no need to hold down on the Left mouse button.



- 19. Move the cursor, a line will be displayed
- 20. Sweep the cursor over the surface model to dynamically highlight surface triangles
- **Note:** The line highlights triangles as they are crossed. Highlighted triangles will be removed from the surface model once a data point <D> is given to establish the endpoint of the line (selection).
- 21. **<D>** a second point to define the line at the point shown above.
- 22. **<D>** a point in the view to accept and delete the triangles.
- 23. Continue drawing lines to remove undesirable triangles from other areas of the surface.
- 24. **<R>** when you have completed deleting triangles from this zoom ratio. The *Delete Triangle* dialog will reappear.
- **Note:** You can write triangles to the display as MicroStation graphics at any time. Do not retriangulate the surface before defining an exterior boundary as deleted triangles will be re-established.
- **Note:** If the triangles are redisplayed, keep in mind, displayed triangles are a reflection of what InRoads has in memory at a specific point in time. If triangles are deleted (from memory) the MicroStation graphics displayed will not reflect this change until the triangles written to graphics are redisplayed (refreshed).

- 25. Use MicroStation to view **Window** into an area of the survey.
- 26. From the *View Survey* toolbar toggle display **ON** for **Symbols**
 - If your symbols are not displaying make sure the level is turned on.



- **Note:** Triangles should only span between known (collected) points. The above graphic shows a group of triangles that should be eliminated.
- 27. Continue to **Pan** along the file and deleting triangles. Don't be concerned that the model may not be perfect for this training.

When you have finished:

- 28. **<D>** the **Close** button in the *Delete Triangle* dialog.
- 29. From the *View Survey* toolbar toggle display **OFF** for **Symbols**

- 30. Redisplay the perimeter **Surface > View Surface > Perimeter**. The *View Perimeter* dialog will appear.
- 31. **<D>** the **Apply** button in the *View Perimeter* dialog.
- 32. Review your results.



- **Note:** This closed shape represents the edge of the surface (triangles) spatially correct (location and elevation). Importing this shape into the DTM will act as an exterior boundary to constrain the triangulation process.
- 33. From the InRoads pull down menu select, **File > Import > Surface**. The *Import Surface* dialog will appear.

(mar.m.)					
Import Surface					
From Graphics					
Surface:	12345SURVS	urface01 👻	Apply		
Load From:	Single Elemen	t 🔻	Filter		
Level:	ALG_COGO_F	Points 👻	Results		
Elevations:	Use Element B	Elevations 👻			
Intercept Surface:	Default	T	Preferences		
Drape Vertices On	ly		Help		
Thin Surface					
Tolerance:	5.00				
Features	phics Informatio	'n			
Seed Name:		4335	→ +		
Feature Style:			•		
Point Type:		Random	•		
Maximum Seg	ment Length:	0.00			
Point Density	Interval:	0.00			
Duplicate Names:					
Exclude from Tria	angulation				
		lose			

34. Set the following dialog items:

- Surface: 12345SURVSurface01
- ♦ Load From: Single Element
- *Elevations:* Use Element Elevations
- ♦ Key-in Seed Name: Exterior1
- Feature Style: T_Exterior Boundary
- *Point Type:* Exterior

Surface:	12345SURVS	urface01 👻	Apply	_
Load From:	Single Elemen	t v	Filter	_
Level:	ALG_COGO_F			
Elevations:	Use Element E	Elevations 🔻	Results	_
Intercept Surface:	Default		Preferences	s
Drape Vertices O	inly		Help	
Thin Surface				
Tolerance:	5.00			
Features	aphics Informatio	n		
Seed Name:		Exterior1	• +	
Feature Style:		T_Exterior Bou	undary 🔻	
Point Type:		Exterior	•	
Maximum Se	gment Length:	0.00		
Point Density	y Interval:	0.00		
Duplicate Names:	Replace (Rename		
Exclude from Tr	iangulation			

- 35. **<D>** the **Apply** button. The *Import Surface* dialog will minimize allowing you to select the perimeter element.
- 36. **<D>** on the surface *Perimeter graphics* displayed in MicroStation View 1.



- 37. **<D>** again to accept this element. The *Import Surface* dialog will reappear.
- 38. **<D>** the **Close** button in the *Import Surface* dialog.

From the pull down menu select, Surface > Triangulate Surface. The *Triangulate Surface* dialog will appear.

Triangulate Surf	face		
Surface:	12345SURVSurface01	•	Apply
Description: C	DOT Surface Final		Close
Maximum Length: (0.00	+	Help
Extended Data C	hecks	Lock Triangulation	
Features	iraphics	Results Number of Points:	8080
Delete Surface	Contents	Number of Triangles:	14089
Filter Tolerance:	0.00	Elapsed Time (Secon	ids): 0
			More

40. **<D>** the **Apply** button in the *Triangulate Surface* dialog.

🔣 Triangulate Su	Irface		
Surface:	12345SURVSurface01	•	Apply
Description:	CDOT Surface Final		Close
Maximum Length:	0.00	+	Help
Extended Data	Checks	Lock Triangulation	
Features		Results	
Load Tagged	Graphics	Number of Points:	8080
Delete Surfac	e Contents	Number of Triangles:	14089
Filter Tolerand	e: 0.00	Elapsed Time (Second	ds): O
			More

41. **<D>** the **More** button on the *Triangulate Surface dialog*. The *Surface Properties* dialog will appear.

🧱 Triangulate Su	urface		
Surface:	12345SURVSurface01	•	Apply
Description:	CDOT Surface Final		Close
Maximum Length:	0.00	+	Help
Extended Data	Checks	Lock Triangulation	
Features	Graphics	Results Number of Points:	8080
🔲 Delete Surfac	e Contents	Number of Triangles:	14089
Filter Tolerand	e: 0.00	Elapsed Time (Second	ds): O
			More

42. Review your results.

🔣 Surface Propert	ties					C	
Main Advanced	ł						
Surface:	12345SUF	RVSurface 🔻					Report
Name:	12345SUF	VSurface01					Help
Description:	CDOT Surf	ace Final					
Maximum Length:	0.00						
Preference:	Existing 10	' Mjr - 2' N 🔻					
Type:	Existing		Data Totals	Active	Features	Deleted	Total
Use Extended	Data Checks	s	Random:	953	87	649	1602
🔲 Lock Triangula	ation		Breakline:	6629	451	0	6629
Data Range			Contour:	0	0	0	0
Point Type:	Total	•	Inferred:	0		0	0
Northing: 1	Minimum 531966.21	Maximum 1558577.52	Interior:	0	0	0	0
	236901.35	3303597.87	Exterior:	498	1	0	498
Elevation:	6348.55	6795.73	All Points:	8080	582	649	8729
Elevelon.	00-0.00	0/00.70	Triangles:	14089		501	14590
		A	pply (lose			

Note: The surface now has Exterior point data, your numbers will not match exactly.

- 43. **<D>** the **Close** button in the *Surface Properties* dialog.
- 44. **<D>** the **Close** button in the *Triangulate Surface* dialog.

- 45. Redisplay the triangles **Surface > View Surface > Triangles**. The *View Triangles* dialog will appear.
- 46. **<D>** the **Apply** button in the *View Triangles* dialog.
- 47. Review your results.



48. In the Workspace bar Surface tab **<R>** on *12345SURVSurface01* select **Save** from the shortcut menu.

Contour Files

Contour information will be saved to separate files for ease of referencing and level control. Each scale and contour interval will have a unique name.

- 49. From the pull-down menu select, **File> Project Options**. The InRoads *Options* dialog will appear.
- 50. **<D>** the **Factors** tab.

Dptions		
Precision Genera		Geometry
Tolerances Factors	Abbreviations Rail	Sight Distance
Text Scale Factor:	20.0000	Help
Cell Scale Factor:	100.0000	
Line Style Scale Factor:	100.0000	
		•
Apply	Preferences C	ose

- **Note:** The values shown here will be applied to all commands that display text, cells, or linestyles.
- 51. Verify the Scale Factors
 - ◆ Text: 20
 - ♦ Cell: 100
 - ♦ Linestyle: 100
- 52. **<D>** the **Apply** then **Close** buttons.

53. From the pull-down menu select, **Surface > View Surface > Contours**. The *View Contours* dialog will appear.

🔣 View Contours			
Main Advanced L	abels.		
Surface:	1234550	JRVSurface 🔻 He	lp
Fence Mode:	Ignore	-	
Interval:	2.00		
Minors per Major:	4	-	
Symbology:			
Object		Name	
Major Contours		DTM_Ex_Contour_Major DTM_Ex_Contour_Minor	
Major Labels		DTM_Ex_Contour_Text	
Minor Labels		DTM_Ex_Contour_Text	BYL
Major Depression	Co	DTM_Ex_Contour_Major	BYL
Minor Depression	Co	DTM_Ex_Contour_Minor	BYL
Apply	Prefer	ences Close	

- 54. Verify the active *Surface*: 12345SURVSurface01
- 55. **<D>** the **Preferences** button.

Preferences	23
Name:	Close
CDOT	
Default	Load
Existing	
Existing 1' Mir - 0.2 Minor	Save
Existing 10' Mjr - 2' Minor	
Existing 100° Mjr - 20° Minor	Save As
Existing 5' Mjr - 1' Minor	
Proposed	Delete
Proposed 1' Mjr - 0.2' Minor	Delete
Proposed 10' Mir - 2' Minor	
	Help

- 56. Select the preference Existing 10' Mjr 2' Minor
- 57. **<D>** the **Load** then **Close** buttons.

58. **<D>** the **Apply** button. The View Contours dialog will temporarily minimize as the surface is processed and the contours are generated the dialog will reappear when the contours have been generated.

View Contours				
Main Advanced	Labels			
Surface:	123455	URVSurface 🔻	Hel	p
Fence Mode:	Ignore	-		
Interval:	2.00			
Minors per Major:	4	* *		
Symbology:				
Object		Name		
Major Contours		DTM_Ex_Conto	our_Minor	BYL BYL
Major Labels		DTM_Ex_Conto DTM_Ex_Conto	_	BYL
Major Depressio		DTM_Ex_Conto	our_Major	BYL
Minor Depressio	n Co	DTM_Ex_Conto	our_Minor	BYL
Apply	Prefe	rences	Close]

59. Review your results.

-

Lab 8.4 - Exporting Survey Data to Geometry - FINAL

Section Objectives:

- Export survey data to a Geometry Project for a final deliverable.
- 1. Verify the *12345SURVFieldbook01* fieldbook you want to export is active. You can tell which fieldbook is active by the red box around the fieldbook button.
- 2. From the InRoads pull down menu, select **File > New**. The *New* dialog will appear.
- 3. Select the **Geometry** tab.

	etry Survey Data	
Туре:	Geometry Project	 Apply
Name:		Help
Description:		
Style:		~
Curve Definition	:	*
Name	Description	
Name Default	Description	
	Description	
	Description	

- 4. From the type pick list verify the *Type*: Geometry Project
- 5. Key in the geometry Name: 12345SURVGeometry01
- 6. Key in the *Description*: *CDOT Geometry Final*
- **Note:** Key in any additional file information in the Description field of the dialog, such as Date, User, and Design file name. You have up to 34 characters even though you may not see all the characters in the Description field.

7. **<D>** the **Apply** and **Close** buttons.

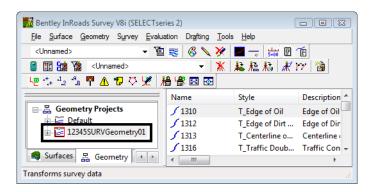
Type: Geometry Project Apply Name: 12345SURVGeometry01 Help Description: CDOT Geometry Final Style: Style:	Surface Geometr	ry Survey Data	
Name Description	Туре:	Geometry Project	Apply
Style: Curve Definition: Name Description	Name:	12345SURVGeometry01	Help
Curve Definition: Vame Description	Description:	CDOT Geometry Final	
Name Description	Style:		-
Default	Curve Definition:		-
		Description	
	Name	Description	
	Name	Description	
	Name	Description	

- 8. From the InRoads pull down menu, select **Survey > Survey Data to Geometry**. The *Survey Data to Geometry* dialog will appear.
- 9. From the drop down list select *Project Name*: 12345SURVGeometry01
- 10. Set the *Description*: Use Style Description
- 11. Set the *Curve Stroking:* Horizontal Only

🔣 Survey Data t	o Geometry			8
Project Name:	12345SURVGeometry01	•	A	oply
Description:	Use Style Description	•	a	ose
Curve Stroking:	Horizontal Only	•	Fil	ter
Duplicate Names	🔿 Replace		Prefer	ences
Empty Project	Rename		H	lelp
Build Extended	Description			
Attribute Name Attribute Value Code Note		5		p 🖵
Extended Descr	iption:			
				*
				-
•				•

12. **<D>** the **Apply** then **Close** button.

13. Use the Workspace pane scroll arrows to view the Geometry tab.



- 14. Verify 12345SURVGeometry01 is the active Geometry Project.
- 15. From the InRoads pull down select File > Save > Geometry Project. The Save As dialog will appear with the Save as type: Geometry (*.alg).
- Verify you are in the correct project directory. C:\Projects\12345\ROW_Survey\InRoads\Geometry

🔀 Save As						×
Save in:	Geometry		•	G 🤌 📁	•	
Recent Places Desktop CDOT CDOT	12345_DESIG 12345_ROW_ 12345ROW_I 12345ROW_S	.alg	Туре	Size		
Network	File name: Save as type: Active:	12345SURVGeon Geometry Projects 12345SURVGeom	: (*.alg)	•		p

- 17. The file name should match the Active name at the bottom of the Save As dialog. If necessary, use the drop-down arrow in the Active field and reselect the desired name to ensure the saved file name will match the surface name.
- **Note:** Ensuring that the saved Geometry name in the project folder matches the Geometry name displayed in InRoads explorer will minimize any confusion.
- 18. **<D>** the **Save** and then the **Cancel** button. The file will be saved to disk and the *Save As* dialog will close.

Lab 8.5 - Saving an InRoads Project file RWK

Project file stores the location of multiple InRoads files. RWK files allow the user to open just one RWK which could load a survey, surface, and geometry project. The RWK can be opened and edited in Notepad incase there are changes in the directory structure.

Section Objectives:

- Create a new Project file that will autoload the survey fieldbook file and final deliverable.
- 1. From the pull down menu, select File > Save > Project. The Save As dialog will appear.
- 2. Key-in the *File name: 12345Project.rwk*

Save As					23
Save in:	🔒 InRoads			👻 🕝 🥩 🖻	•
œ	Name	Date modified	Type	Size	
Recent Places Desktop CDOT CDOT	DTM Field_Boo Geometr Legals Reports				
Network	File name: Save as type:	12345Project.rv Projects (*.rwk)	vk		Save Cancel
		(10)5000 (1100)			Help
					Options

3. **<D>** the **Options...** button. The *Project Options* dialog will appear.

Surfaces	Geometr	y Project XIN Prefe	erences Survey	
				More Options
				Help
Add Up	date	Surface Name	File Name	
		Default 12345SURVSurfa	C:\Projects\12345\RO\	W_Survey\InRoads\DTI

4. From the **Surfaces** tab check the **Add** and **Update** boxes for Surface Name *12345SURVSurface01*.

Project Op	eometry Project	XIN Prefere	cons C. mar	1	X
Junaces	eometry Project	Ain Prefere	nces Survey		More Options Help
Add Upd	late Surface	Name F	ile Name		
	Default 123455		:\Projects\12	845\ROW_Surv	ey\InRoads\DT!
File Name:					
		ОК	Canc	el	

5. From the **Geometry Project** tab check the **Add** and **Update** boxes for Geometry Name *12345SURVGeometry01*.

Project Options			X
Surfaces Geometry	Project XIN Preferences	Survey	
		N	lore Options
			Help
Add Update	Geometry Name	File Name	
\boxtimes	12345SURVGeometry01	C:\Projects\12345\ROW_9	ourvey\InRoads
	Default		
•			•
File Name:			
	ОК	Cancel	

6. From the **Survey** tab check only the **Add** box for Survey Name *12345SURVFieldbook01*.

Project Options		(X
Surfaces Geometry	Project XIN Preferences	Survey	
		Help	٦l
		· · ·	41
Add Update	Survey Data	File Name	
	Book 1		
	12345SURVFieldbook01	C:\Projects\12345\ROW_Survey\InRoa	ds
			11
•	III		·
File Name:			
C:\Projects\12345	\ROW_Survey\InRoads\Fie	eld_Books\12345SURVFieldbook01.fwc	
	ОК	Cancel	
		Cancer	

- **Note:** By only selecting the Add check box for the Survey tab the file will act as read only when opened and saved with the RWK file in the future.
- 7. **<D>** the **OK** button. The *Project Options* dialog will close.

Project Options			83
Surfaces Geometry	Project XIN Preferences	Survey	
			Help
Add Update	Survey Data	File Name	
	Book 1		
	12345SURVFieldbook01	C:\Projects\12345\ROW_	Survey\InRoads
•	III		•
File Name:			
C:\Projects\12345	\ROW_Survey\InRoads\Fie	eld_Books\12345SURVField	book01.fwc 🛄
	ОК	Cancel	

8. **<D>** the **Save** then **Cancel** buttons. The *Save As* dialog will close.

Save in:	🔒 InRoads			-	G 🗊	P	
(Ala)	Name	Date modif	Type	Size			
Desktop	DTM Field_Boo Geometry Legals Reports	,					
Computer							
<u>.</u>	File name:	12345Projec	t.rwk			•	Save
Computer Eventer Network	File name: Save as type:	12345Project Projects (*.rv				•	Save

Lab 8.6 - Directory Clean up

- 1. Open Windows Explorer Windows + E
- 2. Navigate to the folder C:\Projects\12345\ROW_Survey\Working
- 3. Delete any old or duplicated files for the Working directory.

Gereichten werden w	rking 👻 🛃 Search	م
🌗 Organize 🔻 🏢 Views 🔻 🔞 Burn		•
Favorite Links	Name	Date modifie
Documents	12345SURV_Topo100Scale01.dgn	12/4/2009 4:
Pictures	All 12345SurveyTopo100Scale01.dgn	11/30/2009 4
Music	12345SURVGeometry01.alg	11/25/2009 1
	12345SURVSurface01.dtm	12/2/2009 4:
Recently Changed	KBM_12345SURV_Topo100Scale01_2009-11-04.dgn	11/17/2009 4
P Searches		
Public		
Folders	< III	
	•	
5 items		

Section Summary:

- ♦ In Lab 8.1 -Exporting Survey Data to Graphics the survey fieldbook was exported to graphics including the point names, codes, etc. The file was then stratified using the custom application CDOT Stratify Survey to create multiple survey files and reference the files appropriately.
- In *Lab 8.2 -Exporting Survey Data to Surface* the survey fieldbook was exported to the final surface file.
- In *Lab 8.3 -Exterior Boundary* the surface was then cleaned up by deleting errant triangles and a new exterior boundary was created.
- ♦ In Lab 8.4 -Exporting Survey Data to Geometry FINAL the survey fieldbook file was exported as a final geometry project.
- In *Lab 8.5 -Saving an InRoads Project file RWK* the final deliverable survey files were used to create a Project file to help the user load multiple files.
- ♦ In Lab 8.6 -Directory Clean up the working directory was cleaned up to make sure all files that were no longer needed were removed from the folder.