# Labs for ROW Geometry

**Colorado Department of Transportation** 

CADD and Engineering Innovation Updated April 4, 2011 Version V8i Select Series 2



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### **Software Versions**

The software products referred to in this publication are furnished under a license and may only be used in accordance with the terms of such license. This document intended for use with the following software versions:

MicroStation® version 08.11.07.443 InRoads® version 08.11.07.428 CDOT Configuration Version 05.00.00

## **Document Conventions**

There are several conventions that are used throughout this document to indicate actions to be taken or to highlight important information. The conventions are as follows:

ltem	Meaning
View Perimeter	a command name or a file that you are to select
Tools > Options	a command path that you are to select – usually from the pull-down menus
Document Name	the name of a document that is not hyperlinked
Emphasis	style used when referring to important word or phrases
<u>Hyperlink</u>	style used when you have a direct link to another document on the web
Key in	entering data with the keyboard
Quote	style used to indicate an external source quotation
<i>Note:</i> text	information about a command or process that you should pay particular attention to
1. Numbered Steps	actions that you are to perform as part of the lab activities
<d> or Data</d>	press the data button on the mouse
< <b>R</b> > or Reset	press the reset button on the mouse
<t> or Tentative</t>	press the tentative button on the mouse

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## LAB 1 - Getting Started in ROW Geometry and Plans

This lab demonstrates starting InRoads and InRoads Survey. If you are new user to InRoads it is recommended to check the setup to verify the correct standard resources are being used.

### **Chapter Objectives:**

- To launch the applications InRoads and InRoads Survey
- To be able to set Project Defaults for working with the ROW Survey group

## Lab 1.1 - Opening InRoads and Launching InRoads Survey

- 1. There are three main methods to Start InRoads: choose one of the followoing methods
  - Choose Start > All Programs > Bentley > InRoads Group V89 (SELECTseries
     2) > InRoads. MicroStation will open allowing you to choose the design file; once the design file opens InRoads will start
  - Choose the Desktop icon for InRoads if one is available on your machine. MicroStation will open allowing you to choose the design file; once the design file opens InRoads will start
  - If you already have MicroStation open, you can choose the InRoads icon from the MicroStation main toolbar
- 2. In the MicroStation Manager dialog box, go to the Workspace group section and change the User field to **CDOT USER**, the Project field to **12345** and the Interface field to **CDOT**.

This workspace setup should load the correct MicroStation environment (including toolbars) when the selected MicroStation file is opened.

3. Navigate to the ROW\_Survey\Drawings\Reference\_Files directory and **<D>** the filename *12345ROW\_Model.dgn* 

4. **<D> Open** to open the file.

📕 MicroStation N	Manager - C:\Pro	ojects\12345\ROW_	Survey\Drawing	js\Referer	nce_F	iles\					×
Look in:	Neference_	Files	•	G 💋	Þ	···· •	ľ	<b>3</b> 🖹		3D - V8 DGN	
Look in: Recent Places Desktop CDOT CDOT	Name 12345ROW 12345SURV 12345SURV 12345SURV 12345SURV 12345SURV 12345SURV 12345SURV 12345SURV 12345SURV 12345SURV	Date modified _Model.dgn	gn Ign Ign Ign Ign	G 🕽						3D - V8 DGN	
	_	_TopoCodes100Sc	2					-			
Network	File name: Files of type:	12345ROW_Mod MicroStation DGN	- N Files (*.dgn)		•		Oper Canco Option	el	User: Project: Interface:		•
											н

- **Note:** InRoads was used to enter the CAD file. Using InRoads vs. InRoads Survey allows access to the full range of geometry commands available. By itself, InRoads Survey does provide somewhat limited geometry functions. By enabling InRoads initially, the full range of geometry functions is available to the user. Additionally, the functions of InRoads Survey are also required because a fieldbook will be used to export survey data to a geometry project. This data will serve as a foundation for establishing existing property and land lines. Once the electronic fieldbook has been exported, InRoads Survey will no longer be necessary.
- 5. Verify InRoads and InRoads Survey are both operating.

🖌 Bentley InRoads XM Edition 📃 🗉 🔀
<u>File Surface Geometry Drainage</u> Survey Evaluation Modeler Drafting Tools <u>H</u> elp
<unnamed> 🗸 🚡 📚 🚳 🔪 🏏 🧱 🖃</unnamed>
Book Name
Book 1
Book1
🛱 Corridors 🔊 Survey
Toggles the Feature Filter Lock

**Note:** The title bar for the InRoads interface is labeled: Bentley InRoads V8i (SELECTseries 2) denoting that InRoads is running. Additionally, if enabled, the functions of InRoads Survey are apparent in the menu and workspace bars.

 If Either InRoads or InRoads Survey needs to be enabled select Tools > Product Add-Ins, and enable the appropriate application by selecting the application and <D> OK.

Product Add-Ins	8
Available: Bentley InRoads Bridge V& (SELECTseries 2) Bentley InRoads Storm and Santary V& (SELEC Bentley InRoads Survey V& (SELECTseries 2) Bentley Rail Track V& (SELECTseries 2)	OK Cancel Help
Description Bentley InRoads Survey enables users to transfer data f fieldbooks to the MicroStation or AutoCAD environment data editing capabilities.	
Persist Product Add-Ins on Exit	

**Note:** From this point forward, unless specifically instructed to use MicroStation commands, all references to the selection of icons, tools, or menu pull-downs, refer to the InRoads interface.

## Lab 1.2 - Project Defaults

### Introduction

Defined default locations for both general InRoads resource files and project specific data files make it easier to conform to graphics standards and assist in navigating to the correct project directories when loading or saving data files.

## Setting project defaults

1. From the pull down menu select File > Project Defaults.

The CDOT environment is configured to read MicroStation variables defined when the project creation utility is run. These variables are automatically read when MicroStation is launched. Selecting the appropriate 'Project' in the MicroStation Manager dialog identifies the specific project folder referred to by the variable \$(MS\_DEF).

2. Select CDOT ROW\_Survey Discipline from the drop-down Configuration Name: list.

3. **<D> Apply** and then **<D> Close**.

Set Project Defaults		
Configuration Name:	CDOT ROW_Survey Discipline	Apply
Default Preferences		Close
		New
Preferences (* xin):	\$(CDOT_PREF)\CDOT_Civil xin	Copy
Tumouts (*.txt):		Rename
Drainage Structures (*.dat):		Delete
Rainfall Data (*.idf):		Browse
Bridge Sections (*.bt):		Import
Drafting Notes (*.dft):	\$(CDOT_WKSP)\Standards-Global\InRoads\Notes\CDOT-Notes.c	Export
Pay Items (*.mdb):		Help
Site Modeler Options (*.spf):		Theip
Default Directory Paths		
ProjectWise Directory:		
Project Default Directory:	\$(MS_DEF)\ROW_Survey\	
Report Directory:	\$(MS_DEF)ROW_Survey\InRoads\Reports\	
Projects (*.rwk):	\$(MS_DEF)ROW_Survey\InRoads\	
Surfaces (*.dtm):	\$(MS_DEF)ROW_Survey\InRoads\DTM\	
Geometry Projects (*.alg):	\$(MS_DEF)ROW_Survey\InRoads\Geometry\	
Template Libraries (*.itl):	\$(MS_DEF)	
Roadway Design (*.ird):	\$(MS_DEF)	
Survey Data (*.fwd):	\$(MS_DEF)ROW_Survey\InRoads\Field_Books\	
Drainage (*.sdb):	\$(MS_DEF)	
Style Sheet (*xsl):	C:\Workspace\Workspace-CDOT_V8i\Standards-Global\InRoads\XML	Style Sheets\
Quantity Manager (*.mdb):	\$(MS_DEF)ROW_Survey\InRoads\Reports\	
Site Modeler Projects (*.gsf):		
Default Grid Factor	Export Preferred Preference	
Grid Factor: 1.0000	Active Only Name: CDOT - CDO	T

**Note:** Choosing the appropriate discipline from the Configuration Name selection list will modify directory paths as configured by CDOT. If necessary, <D> the Import button and select the file: C:\Projects\12345\Project\_Configuration\CDOT\_Disciplines.reg to populate the Configuration Name drop-down list.

## LAB 2 - Working with Survey Data

This lab demonstrates working with survey data as a foundation for our initial geometry. Exporting the survey field book to an InRoads geometry project will generate alignments along linear items and Cogo points at all survey shot locations.

### **Chapter Objectives:**

- Load existing completed survey data
- Filter survey data to select only points and alignments that will be needed
- Exporting filtered survey data to a Geometry Project as cogo points and horizontal and vertical alignments

## Lab 2.1 - Load Project Data

The goal of this exercise is to export observations from an InRoads Survey fieldbook to a Geometry Project creating Cogo points and alignments.

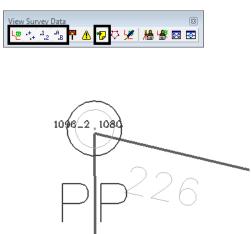
The fieldbook for this project, 12345SURV\_Fieldbook.fwd contains control monuments, found monuments, and general topography observations. While this is all valid information, it is desirable to work with a subset of the survey information such as pavement centerlines, control lines, or other specific entities by excluding terrain strings and other topographic information that does not relate to the development of ROW geometry. Working with a subset of the information increases efficiency by working with a smaller data set and freeing-up additional resources for other operations. Exporting a portion of a survey fieldbook can be accomplished by using Survey Feature Filters when creating the InRoads geometry project.

- 1. From the pull down menu select **File > Open** the Open dialog appears.
- 2. Select the fieldbook file C:\Projects\12345\ROW\_Survey\InRoads\Field\_Books\12345SURV\_Fieldbook.fwd.
- <D> Open button then <D> the Cancel button the file will be opened in InRoads Survey and the *Open* dialog will close.

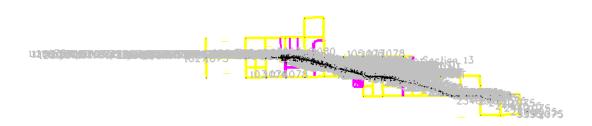
🙀 Open									×
Look in:	Field_Books		•	0	٩	Þ	•		
Recent Places	12345SURV_F	Pate modif Type Fieldbook.fwd Fieldbook_Bridge.fwd	Size						
<b>Desktop</b>									
CDOT User									
Computer									
Network	File name: Files of type:	12345SURV_Fieldbook.fwd InRoads Files (*.rwk;*.dtm;*		*.ird;*.	sdb;*	▼ f ▼		Oper Canc Help	el

Once the fieldbook has loaded, InRoads will automatically fit the extents of the fieldbook to the MicroStation screen.

4. From the pull down menu or View Survey Data toolbar toggle on Survey > View Survey Data > Planametrics | Point Names | Symbols | Codes | Notes.



5. Use the MicroStation **Fit View** command to get an indication of the survey information contained in the fieldbook.



- 6. Take a few minutes to zoom in and navigate around the MicroStation screen to investigate the survey data displayed as it relates to the project layout.
  - **Note:** Fieldbook information is displayed dynamically in the MicroStation file. To adjust the size of the information displayed **Tools > Survey Options [Symbology]**. Select a category under *Symbology* and **<D> Edit View** to adjust text or symbol size.
  - **Note:** Take notice of the various survey control, ROW and property monuments. Pavement shots, and general topography shots are seen representing terrain breaks, signs, culvert ends, and other features. It is desirable to filter unrelated topography information from our electronic fieldbook prior to exporting it to the right of way geometry project.

## Lab 2.2 - Filtering the Survey Data

The goal is to write only the information important to establishing ownership and right of way parcels to a geometry project. The use of Survey feature filters will assist in sorting the data. When a Survey feature filter is activated, the displayed contents of the electronic fieldbook will update along with the associated graphics display. The dynamic graphics display can be used as a preview of the data being written to graphics, a DTM, or to the geometry project.

A survey feature filter affects commands for:

- Electronic fieldbook data
- Survey data to surface
- Survey data to geometry
- Survey data to graphics
- Viewing of dynamic survey data
- 1. Use MicroStation view commands to display any portion of the project area. This display can be used as a preview of our Fieldbook filter.
- 2. From the pull down menu select **Survey > Fieldbook Data** the *Fieldbook Data* dialog will appear.

🕌 Fieldbook 🛙	)ata - 12345	SURV_Field	book				x
Stations:	<u>-≭</u> + [	Duplicates	Only		-	Help	
Station Name	Northi	ing Eastin	g Eleva	tion C	ode Sta	tus 🔺 .	÷
CO RD 33							
GAP 27_33						-	
•						P.	
Chainage: K Observations: Point Name	< 1078	Easting	▼ ≥	≥ Code	Status	Hc ^	+
106	1558562.8	.3282329.6	.6505.88	1078	FA		
107	1555920.9	.3282335.4	.6545.91	1078	FA		
2070	1555976.4	.3281511.3	.6574.93	1075	F		
105	1558527.8	.3279643.1	.6585.79	1077	FAN		
2050		.3280349.7		1075	F		
108		.3279671.7		1078	FA		
2140		.3285275.5		1075	F	-	
2160	1555022.2	2286464 2	EVV / EV	1075	F		
•						•	

3. From the Fieldbook Data dialog **<D>** on the **Survey Style Filter** icon the Survey Style Filter dialog will appear.

📲 Fieldbook 🛛	Jata - 12345	SORV_FIEIdi	DOOK				
😿 🏹 🗐 🏠	± + E	Duplicates	Only		-	H	elp
Stations:							
Station Name	Northi	ng Eastin	ng Eleva	tion C	ode S	Status	<u>+</u>
CO RD 33							
GAP 27_33							-
•	111					•	
Chainage: 🔀 Observations:	< 1078		• >	×			
-	< 1078		• >	×			
Observations: Point Name	Northing	Easting	Elevation	Code	Status	e Ho	<u>+</u>
Observations: Point Name 106	Northing 1558562.8	.3282329.6	Elevation 6505.88	Code 1078	FA	: Ho	<u>+</u>
Observations: Point Name 106 107	Northing 1558562.8 1555920.9	.3282329.6 .3282335.4	Elevation .6505.88 .6545.91	Code 1078 1078	FA FA	s Ho	<u>+</u>
Observations: Point Name 106 107 2070	Northing 1558562.8 1555920.9 1555976.4	.3282329.6 .3282335.4 .3281511.3	Elevation .6505.88 .6545.91 .6574.93	Code 1078 1078 1075	FA FA F	e Ho	<u>+</u>
Observations: Point Name 106 107	Northing 1558562.8 1555920.9 1555976.4	.3282329.6 .3282335.4	Elevation .6505.88 .6545.91 .6574.93	Code 1078 1078	FA FA	s Ho	<u>+</u>
Observations: Point Name 106 107 2070	Northing 1558562.8 1555920.9 1555976.4 1558527.8	.3282329.6 .3282335.4 .3281511.3	Elevation .6505.88 .6545.91 .6574.93 .6585.79	Code 1078 1078 1075	FA FA F	e Ho	<u>+</u>
Observations: Point Name 106 107 2070 105	Northing 1558562.8 1555920.9 1555976.4 1558527.8 1555913.3	.3282329.6 .3282335.4 .3281511.3 .3279643.1	Elevation .6505.88 .6545.91 .6574.93 .6585.79 .6608.33	Code 1078 1078 1075 1077	FA FA F FAN	e Ho	•
Observations: Point Name 106 107 2070 105 2050	Northing 1558562.8 1555920.9 1555976.4 1558527.8 1555913.3 1555884.0	3282329.6 3282335.4 3281511.3 3279643.1 3280349.7	Elevation .6505.88 .6545.91 .6574.93 .6585.79 .6608.33 .6623.76	Code 1078 1078 1075 1077 1075	FA FA FAN F	: Ho	•
Observations: Point Name 106 107 2070 105 2050 108	Northing 1558562.8 1555920.9 1555976.4 1558527.8 1555913.3 1555884.0	3282329.6. 3282335.4. 3281511.3. 3279643.1. 3280349.7. 3279671.7. 3285275.5.	Elevation .6505.88 .6545.91 .6574.93 .6585.79 .6608.33 .6623.76	Code 1078 1078 1075 1077 1075 1078	FA FA FAN F FA	s Ho	• +

### Create the Roadway Centerlines survey feature filter

1. In the Survey Style Filter dialog, **<D> Save As** 

Survey Style Filter	- • •
Filter Name:	ОК
Start With:	Cancel
Build Selection	Save
Properties: Description	Save As
Value:	Delete
Mode:      Include     Exclude	Values
Add Rule Replace Rule	Help
Rules:	
Include All Codes	Move Up
	Move Down
	Delete Rule
	Clear All

2. In the Save Filter As dialog, enter Roadway Centerlines

Save Filter As	23
Name:	ОК
Roadway Centerlines	Cancel
	Help

3. **<D> OK** button the *Save Filter As* dialog will close.

- 4. Toggle None for the *Start With* option.
- 5. From the *Properties* drop down menu select Numeric Code.
- 6. In the *Value* field enter a value of *1313*.
- 7. Toggle **Include** for the *Mode* option.
- 8. **<D>** the **Add Rule** button the rule will be added to the list.

🔛 Survey S	tyle Filter		- • •
Filter Name:	Roadway Cen	terlines	• ОК
Start With:	o Ai	None	Cancel
-Build Sele	ction		Save
	Numeric Code	•	Save As
Value:	1313		Delete
Mode:	Include	© Exclude	Values
	Add Rule	Replace Rule	Help
Rules:			
Exclude All	Codes meric Code = 13	313	Move Up
			Move Down
			Delete Rule
			Clear All

- 9. Back in the *Value* field enter a value of **1316**. Keep the rest of the settings the same.
- 10. **<D>** the **Add Rule** button the rule will be added to the list.

Survey Style Filter	
Filter Name: Roadway Centerlines 🔹	ОК
Start With: O All O None	Cancel
Build Selection	Save
Properties: Numeric Code	Save As
Value: 1316	Delete
Mode:      Include     Exclude	Values
Add Rule Replace Rule	Help
Rules:	
Exclude All Codes Include Numeric Code = 1313	Move Up
Include Numeric Code = 1316	Move Down
	Delete Rule
	Clear All

11. Continue this process to add the following Rules:

♦ 1317-1326, 1332, and 1335

Survey Style Filter	
Filter Name: Roadway Centerlines	ОК
Start With: O All O None	Cancel
Build Selection	Save
Properties: Numeric Code	Save As
Value: 1335	Delete
Mode:      Include     Exclude	Values
Add Rule Replace Rule	Help
Rules:	
Exclude All Codes Include Numeric Code = 1313	Move Up
Include Numeric Code = 1316 Include Numeric Code = 1317-1326	Move Down
Include Numeric Code = 1332 Include Numeric Code = 1335	Delete Rule
	Clear All

12. From the *Survey Style Filter* dialog <D> Save then <D> the OK button the dialog will close and the new filter will be saved.

Market Survey Style Filter	- • ×
Filter Name: Roadway Centerlines 🔹	ОК
Start With: O All O None	Cancel
Build Selection	Save
Properties: Numeric Code	Save As
Value: 1335	Delete
Mode:  Include     Control	Values
Add Rule Replace Rule	Help
Rules:	
Exclude All Codes Include Numeric Code = 1313	Move Up
Include Numeric Code = 1316 Include Numeric Code = 1317-1326	Move Down
Include Numeric Code = 1332 Include Numeric Code = 1335	Delete Rule
	Clear All

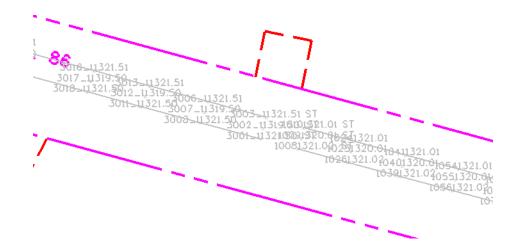
13. From the InRoads Locks toolbar, Toggle ON the Feature Filter Lock



14. Open the *Fieldbook Data* dialog if it is not already opened. The Fieldbook Data will update to display only the data that passes the survey style filter.

📲 Fieldbook L	Data - 1234	550KV_HE						
<u> 7 7 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 </u>	<b>*</b>	Duplicate	es Only		-	H	Help	
Stations:								
Station Name	North	ning Eas	ting Ele	vation	Code	Status		ŧ
CO RD 33								
GAP 27_33								
	111						•	
							,	
		2		সস			,	
		2	•	> >			,	
Chainage: K Observations:	< [1321.:					Status		+
Chainage: K Observations: Point Name	C 1321.	Easting	Elevation	n Cod		Status		+
Chainage: K Observations: Point Name 1008	Northing 1556661.7	Easting	Elevation 66632.56	n Cod 1321	.02 ST	Status F F		+
Chainage: K Observations: Point Name	Northing 1556661.7 1556672.6	Easting	Elevatior 66632.56 36632.81	n Cod 1321 1320		F		+
Chainage: 💽 Observations: Point Name 1008 1009	Northing 1556661.7 1556672.6 1556684.0	Easting 3277686. 3277690.	Elevatior 66632.56 36632.81 66632.64	n Cod 1321 1320	.02 ST .01 ST .01 ST	F		+
Chainage: K Observations: Point Name 1008 1009 1010	Northing 1556661.7 1556672.6 1556684.0 1556669.8	Easting 3277686. 3277690. 3277692.	Elevation 66632.56 36632.61 66632.64 06632.56	n Cod 1321 1320 1321	.02 ST .01 ST .01 ST .01 ST .01	F		+
Chainage: Observations: Point Name 1008 1009 1010 1024	Northing 1556661.7 1556672.6 1556684.0 1556658.7	Easting 3277686. 3277690. 3277692. 3277745.	Elevatior 66632.56 36632.81 66632.64 06632.56 16632.70	n Cod 1321 1320 1321 1321	.02 ST .01 ST .01 ST .01 ST .01	F		+

15. View the MicroStation graphics displayed. The display graphics reflect the current contents of the fieldbook.



**Note:** The graphics automatically refresh by default, Automatic Refresh is toggled on under Tools > Survey Options. If it is not toggled on the graphics can be regenerated manually from the InRoads pull down menu Survey > Regenerate Graphics.

#### Create the Right of Way survey feature filter.

When a fieldbook is exported to graphics, geometry, or a DTM, only the survey shots that pass the filter will be exported. In this case, additional information is desired for the development of right-of-way. 1. Reopen the *Survey Style Filter* dialog from the pull down menu select **Survey > Survey Style Filter**.

🖌 Survey Style Filter	- • •
Filter Name: Roadway Centerlines 🔹	ОК
Start With: 💿 All 💿 None	Cancel
Build Selection	Save
Properties: Numeric Code	Save As
Value: 1335	Delete
Mode:      Include     Exclude	Values
Add Rule Replace Rule	Help
Rules:	
Exclude All Codes Include Numeric Code = 1313	Move Up
Include Numeric Code = 1316 Include Numeric Code = 1317-1326	Move Down
Include Numeric Code = 1332 Include Numeric Code = 1335	Delete Rule
	Clear All
	//

- 2. From the Survey Style Filter dialog make sure the Roadway Centerlines filter is selected.
- 3. In the *Survey Style Filter* dialog, <D> the Save As button the *Save Filter As* dialog will appear.
- 4. In the Save Filter As dialog, enter Right of Way.

🖌 Save Filter As	8
Name:	ОК
Right of Way	Cancel
	Help

- 5. **<D>** the **OK** button the dialog will close and Right of Way will be the active Survey Style Filter.
- 6. Toggle **None** for the *Start With* option.
- 7. From the *Properties* drop down menu select Alpha Code.
- 8. In the *Value* field enter a value of *5??*.
- *Note:* The "??" in the key-in value is used as a wild card value when searching for data. The value of "5??" will return the range of codes 500-599.
- 9. Toggle **Include** for the *Mode* option.

Filter Name: Right of Way		▼ OK
Start With: 🔘 All	None	Cano
Build Selection		Sav
Properties: Alpha Code		Save /
Value: 5??		Delet
Mode:  Include	Exclude	Value
Add Rule	Replace Rule	Help
Rules:		
Exclude All Codes Include Numeric Code = 13	12	Move
Include Numeric Code = 13	16	Move D
Include Numeric Code = 13		Delete
Include Numeric Code = 13		

10. **<D>** the **Add Rule** button the rule will be added to the list.

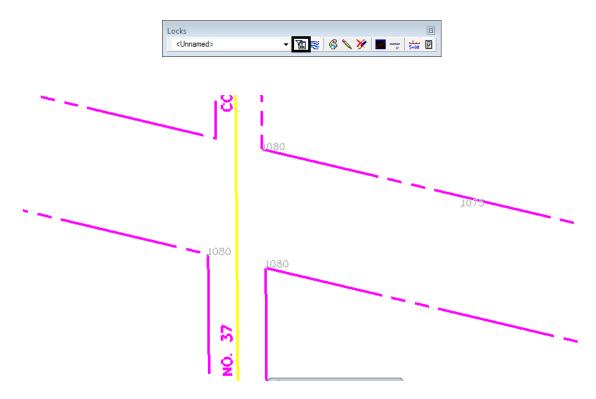
- 11. Back in the *Value* field enter a value of *10??* Keep the rest of the settings the same.
- 12. **<D>** the **Add Rule** button the rule will be added to the list.

Survey Style Filter	
Filter Name: Right of Way	ОК
Start With: O All O None	Cancel
Build Selection	Save
Properties: Alpha Code	Save As
Value: 10??	Delete
Mode:      Include     Exclude	Values
Add Rule Replace Rule	Help
Rules:	
Exclude All Codes Include Numeric Code = 1313	Move Up
Include Numeric Code = 1316 Include Numeric Code = 1317-1326	Move Down
Include Numeric Code = 1332 Include Numeric Code = 1332	Delete Rule
Include Alpha Code = 5?? Include Alpha Code = 5??	Clear All
	1

13. From the *Survey Style Filter* dialog <D> Save then <D> the OK button the dialog will close and the new filter will be saved.

🚰 Survey Style Filter	
Filter Name: Right of Way	OK
Start With: O All O None	Cancel
Build Selection	Save
Properties: Alpha Code 🔹	Save As
Value: 10??	Delete
Mode:      Include     Exclude	Values
Add Rule Replace Rule	Help
Rules:	
Exclude All Codes Include Numeric Code = 1313	Move Up
Include Numeric Code = 1316 Include Numeric Code = 1317-1326	Move Down
Include Numeric Code = 1332 Include Numeric Code = 1335	Delete Rule
Include Alpha Code = 5?? Include Alpha Code = 10??	Clear All

14. The *Feature Filter Lock* should still be toggled **ON**. The MicroStation display updates to display only the survey codes that pass the active filter.



**Note:** The filter Right of Way includes codes for both property information and roadway centerline information. Now that a Survey Style Filter is active, it will be applied when exporting survey data to geometry.

# Lab 2.3 - Exporting a Filtered InRoads Survey Fieldbook to Geometry

When exporting a Fieldbook to graphics, a DTM, or to a geometry project, only the items active in the Fieldbook are exported. Using a Survey Feature filter allows control of which survey data gets exported.

- 1. From the pull down menu select **Survey > Fieldbook Data** the Fieldbook Data dialog will appear.
- 2. From the *Fieldbook Data* dialog select the Survey Style Filter icon.

Fieldbook	Data - 12345	SURV_Field	book					
2 🔞 🗐 🕈	<b>**</b> + •	Duplicates	Only		-		Help	
Stations:								
Station Name	e Northi	ing Eastin	ng Eleva	tion (	Code	Statu	IS 🔺	+
CO RD 33								
GAP 27_33							-	
•							F	
Chainage: 💽 Observations:	(1078		• >	K				
- @		Easting	▼ >	≥  Code	Statu	JS	Hc ^	-
Observations: Point Name	Northing	Easting 3282329 6	Elevation		Statu	JS	Hc 🔦	+
Observations:	Northing 1558562.8	Easting .3282329.6. .3282335.4.	Elevation 6505.88	Code		JS	Hc 🍝	+
Observations: Point Name 106	Northing 1558562.8 1555920.9	3282329.6	Elevation 6505.88 6545.91	Code 1078	FA	JS	Hc ^	-+
Observations: Point Name 106 107	Northing 1558562.8 1555920.9 1555976.4	3282329.6 3282335.4	Elevation 6505.88 6545.91 6574.93	Code 1078 1078	FA FA	JS	Hc ^	-
Observations: Point Name 106 107 2070	Northing 1558562.8 1555920.9 1555976.4 1558527.8	.3282329.6. .3282335.4. .3281511.3.	Elevation 6505.88 6545.91 6574.93 6585.79	Code 1078 1078 1075	FA FA F	ŝL	Hc 🍝	-
Observations: Point Name 106 107 2070 105	Northing 1558562.8 1555920.9 1555976.4 1558527.8 1555913.3	.3282329.6. .3282335.4. .3281511.3. .3279643.1.	Elevation .6505.88 .6545.91 .6574.93 .6585.79 .6608.33	Code 1078 1078 1075 1077	FA FA F FAN	ß	Hc ^	+
Observations: Point Name 106 107 2070 105 2050	Northing 1558562.8 1555920.9 1555976.4 1558527.8 1555913.3 1555844.0	.3282329.6 .3282335.4 .3281511.3 .3279643.1 .3280349.7	Elevation .6505.88 .6545.91 .6574.93 .6585.79 .6608.33 .6623.76	Code 1078 1078 1075 1077 1075	FA FA FAN F	SL	Hc A	<u>+</u>

- 3. From the Survey Style Filter dialog select the filter name Right of Way
- 4. **<D>** the **OK** button. The Right of Way filter will be active and the Survey Style Filter dialog will close.

Include Numeric Code = 1317-1326	
Build Selection Properties: Apha Code Value: 10?? Mode:  Include Code Add Rule Replace Rule Rules: Exclude All Codes Include Numeric Code = 1313 Include Numeric Code = 1317-1326 Include Numeric Code = 1332	ОК
Properties: Alpha Code Value: 10?? Mode:  Include  Exclude Add Rule Replace Rule Rules: Exclude All Codes Include Numeric Code = 1313 Include Numeric Code = 1317-1326 Include Numeric Code = 1322	Cancel
Name code       Value:     10??       Mode: <ul> <li>Include</li> <li>Exclude</li> <li>Add Rule</li> <li>Replace Rule</li> </ul> Rules: <ul> <li>Exclude All Codes</li> <li>Include Numeric Code = 1313</li> <li>Include Numeric Code = 1317-1326</li> <li>Include Numeric Code = 1332</li> </ul>	Save
Mode: <ul> <li>Include</li> <li>Exclude</li> </ul> Rules:           Exclude All Codes           Include Numeric Code = 1313           Include Numeric Code = 1317-1326           Include Numeric Code = 1332	Save As
Add Rule     Replace Rule       Rules:     Exclude All Codes       Include Numeric Code = 1313     Include Numeric Code = 1316       Include Numeric Code = 1317-1326     Include Numeric Code = 1332	Delete
Rules: Exclude All Codes Include Numeric Code = 1313 Include Numeric Code = 1317-1326 Include Numeric Code = 1332	Values
Exclude All Codes Include Numeric Code = 1313 Include Numeric Code = 1316 Include Numeric Code = 1317-1326 Include Numeric Code = 1332	Help
Include Numeric Code = 1313 Include Numeric Code = 1316 Include Numeric Code = 1317-1326 Include Numeric Code = 1332	
Include Numeric Code = 1317-1326 Include Numeric Code = 1332	Move Up
Include Numeric Code = 1332	Move Down
	Delete Rule
Include Alpha Code = 5?? Include Alpha Code = 10??	Clear All

5. From the Locks toolbar toggle **ON** the InRoads **Feature Filter lock**.

- 6. From the pull down menu select **Survey > Survey Data to Geometry**. The Survey Data to Geometry dialog will appear.
- In the *Project Name* field key-in the Geometry Project Name *12345\_ROW*. A new Geometry Project will be created by that name.
- 8. From the *Description* drop down menu select Use Style Description.
- 9. From the *Curve Stroking* drop down menu select Horizontal and Vertical.
- 10. From the *Duplicate Names* section select the radio button Rename.
- 11. **<D>** the **Filter** button the Survey Style Filter dialog will appear. Review the filters rules prior to exporting.

🕌 Survey Data to	o Geometry		83
Project Name:	12345_ROW	•	Apply
Description:	Use Style Description	•	Close
Curve Stroking:	Horizontal and Vertical	•	Filter
Duplicate Names:	Replace	•	Preferences
Empty Project	Rename		Help
Build Extended I Insert: Attribute Name Attribute Value Code Note Extended Descri		2	
	Juon.		•

- 12. **<D> OK** to close the *Survey Style Filter* dialog as it was used for review and is not required to be open.
- 13. **<D> Apply** on the *Survey Data to Geometry* dialog. The geometry project is created, the Cogo points are created, and horizontal and vertical alignments are generated.

🕌 Survey Data to	Geometry	23
Project Name:	12345_ROW -	Apply
Description:	Use Style Description	Close
Curve Stroking:	Horizontal and Vertical 🔹	Filter
Duplicate Names:	Replace	Preferences
Empty Project	Rename	Help

File Surface Geometry	<u>D</u> rainage Su	rvey <u>E</u> valua	ition <u>M</u> odeler Site	Modeler Drafting	Quantities Tool	s <u>F</u>
<unnamed></unnamed>	- ¥	i 🧝   🚳 '	🔪 💥 🔿 🚽			
L∰ ++ <sup>1</sup> 2 <sup>0</sup> B 🏴 🛆 9	D 🌣 💆	樯 📽 🖾	<b></b>			
		Name	Northing	Easting	Description	St
🖻 🔛 12345_ROW	*	20,80	1556131.46	3279726.88	Profile of R	T_
E Cogo Buff	er 📄	102	1558430.90	3266629.98	Control Mo	Τ_
i 1313		103	1555770.83	3266639.57	Control Mo	T_
i∃… ∫ 13137		:: 104	1555781.53	3269304.03	Control Mo	T_
1316		105	1558527.87	3279643.18	Control Mo	Τ_
131618		:::106	1558562.81	3282329.69	Control Mo	Τ_
131625		::107	1555920.99	3282335.45	Control Mo	T_
13165	-	:::108	1555884.03	3279671.70	Control Mo	Τ_
品 Geometry M Prefe		113	1556247.10	3279252.22	Traffic Con	T.

14. Examine InRoads Explorer to verify geometry data was created.

15. The survey fieldbook is no longer needed, go to the *Survey Workspace* tab and <R> *12345SURV\_Fieldbook* and choose Close from the fly-out list. This will remove it from memory, saving the file should not be necessary.

e <u>S</u> urface <u>G</u> eometry <u>D</u> rainage	Survey Evaluation M	lodeler Site	Modeler Drafting	Quantities To	ols H
	1 🗟 🚳 🔪 🎽	-			013 <u>11</u>
		Northing	Easting	Elevation	
□	Save	.556464 556210	3278275.96 3279015.79	6631.56 6633.64	
12345AAAIR	Save As	.556045	3279624.56	6620.15	
	Import	.556045 555913	3279624.56 3280349.74	6620.15 6608.33	
12345BBBIR	Export	.555913	3280349.74	6608.33	
	Set Active	.555976	3281511.31	6574.93	
2050	Edit	.555825	3282538.40	6547.98	
Survey	Close	555711	5205590.00	0321.03	Þ
Survey	Close Empty	555711	3283390.56	6531.03	

16. From the InRoads Locks toolbar toggle OFF the InRoads Feature Filter lock.

Locks	
<unnamed></unnamed>	- 👔 😴 🚳 🔪 🏏 🔛 🗉

### Lab 2.4 - Saving a Geometry Project

InRoads is Memory based, not Disk based. The file(s) seen in the InRoads Workspace pane are copies from the disk drive and reside in the computer's memory. Any changes to these files (or creation of new data files) require saving back to the disk drive.

- 1. From the Geometry Workspace Pane <**R**> on the Geometry Project *12345\_ROW* and select *Save As* from the fly-out menu the Save As dialog will appear.
- 2. Select the drop-down list for the Active: field and select 12345\_ROW from the list.

3. Verify the same name is populating the *File Name: 12345\_ROW*.

#### **Note:** By default it should be saved to the folder:

*C:\Projects\12345\ROW\_Survey\InRoads\Geometry\* as this was the path for geometry files defined in the Project Defaults configuration file.

4. **<D>** on the *Save in: Geometry* to verify the folder location.

Nove As						8
Save in:	🔒 Geometry			· 🗿 🥬	• 🔝 👏	
Recent Places Desktop CDOT User CDOT User Computer	12345ROV	Date modified SIGN.alg V_ROW.alg V_SummitBP.alg V_Fieldbook.alg	Туре	Size		
Network	File name: Save as type: Active:	12345_ROW.alg Geometry Project 12345_ROW			•	Save Cancel Help Options

5. After the correct folder location is identified, <D> Save then <D> the Cancel buttons.

Save As						[
Save in:	Geometry		•	G	1 🖻	<del>.</del>
æ.	Name	Date modified	Туре	Size		
Recent Places		SIGN.alg W_ROW.alg W_SummitBP.alg				
Desktop	12345SUF	V_Fieldbook.alg				
CDOT User						
Computer						
Network	File name:	12345_ROW.al	9		Ŧ	Save
Network	File name: Save as type:	12345_ROW.al			•	Save Cancel
Network	100.000					

- When the Geometry Project is saved to the hard drive it takes on an extension of .alg
- The directory folder for geometry already contains four geometry projects. 12345\_DESIGN.alg contains design centerline information and will be used to facilitate development of the right of way plans.

- The Geometry Styles associated with the exported fieldbook are derived from the Survey Feature Style definition at the time geometry is exported from InRoads Survey.
- Geometry styles can be assigned (or reassigned) to alignments in the Geometry > Copy Geometry dialog. No equivalent command exists for Cogo Points. However, a Geometry Style can be assigned to alignments or Cogo points when using the horizontal annotation command to view geometry information.

## LAB 3 - Geometry Projects

This lab demonstrates opening and viewing Geometry Projects in MicroStation. Geometry data such as a horizontal alignment will be copied from one Geometry Project to another.

### **Chapter Objectives:**

- Open an existing Geometry Project
- View the data stored in the Geometry Project such as the horizontal alignments and Cogo points
- Managing and copying Geometry Project data between files

### Lab 3.1 - Opening and Viewing Geometry Projects

- Open the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_ROW.alg that was created in the earlier lab.
- 3. From the MicroStation pull down menu select **Utilities > Saved Views** the Saved Views dialog will appear.

🖂 Save	d Views	- View	1		•
E Act	ive File	- 🖧	🖫 🎙   🚰	🗙 🤌 🚔 🖒 ≻	
Туре	Show	Status	Name	Description	S.
		1	ROW Reference	Reference Informatio	n
			Geometry Verify		
			start		
			second view		
4					•

 From the *Saved Views* dialog select the saved view name *Geometry Verify* then <D> in MicroStation view 1. This will make it easier to verify the geometry project information by turning off all the ROW\_\* levels.

🖂 Save	d Views	- View	1		
Reg Act	tive File	<del>-</del> 🖓	🖫 🏹   🚰	🗙 🌮 📲   🕨	
Туре	Show	Status	Name	Description	
		8	ROW Reference	Reference Information	Í
		1	Geometry Verify		
2			start		
			second view		
•			III	4	

- 5. Dismiss the *Saved View* dialog box.
  - **Note:** When we need to see the ROW information in later steps, we will recall it using a different Saved View named *ROW Reference*.

6. From the InRoads pull down menu select **Geometry > View Geometry > Horizontal Annotation** the View Horizontal Annotation dialog will appear.

ain Tabling Sty	es				
Apply Style Assigned (	Active	Overw	ite		Filter
Horizontal Alignmen	t ALG EXIS	TING		-	Help
Cogo Points:	[nea_exit	TING		· · ·	
oogo r oints.	Default			Ŧ	
Horizontal Alignmen	ts	C	go Point	ts	
nclude:		_⊕ In	lude:		+
Selected:			elected	:	
Name					
	Descri	St.	lame	Descri	Style
< III Display	Descri		An	notate	Style
۲۱۱۱ د ۱۱۱ Display			An		Style
< Ⅲ Display ✔ Points	Event	•	An	notate Points	Style
< Ⅲ Display ✓ Points ✓ On-Alignment	Event	Points	An	notate Points Elements	
<ul> <li>III</li> <li>Display</li> <li>Points</li> <li>On-Alignment</li> <li>Off-Alignment</li> </ul>	Event	Points n Equations	An	notate Points Elements Duplicates	sions
<ul> <li>✓ III</li> <li>Display</li> <li>✓ Points</li> <li>✓ On-Alignment</li> <li>✓ Off-Alignment</li> <li>✓ Elements</li> </ul>	Event Station	Points n Equations	An	notate Points Elements Duplicates Dual Dimens	sions 9 Styles

7. Select the *Main* tab in the *View Horizontal Annotation* dialog.

8. In the *Include* field for *Horizontal Alignments* key-in an asterisk \*(wild-card) then *Tab* key to identify all horizontal alignments.

lain Tabling Styles	
Apply Style     Overw     Assigned     Active     Overw     Horizontal Alignment:     ALC EXISTING	rite Filter
Horizontal Alignment:         ALG_EXISTING           Cogo Points:         Default	* *
	ogo Points
т. т	clude:
Name Style	Name Descri Style
1319     TreT_Traffic No Pass       1320     TreT_Traffic No Pass       1221     T_CT_Traffic No Pass       ✓     III       ✓     Display As Complex Linestring	
Display V Points	Annotate
On-Alignment     Event Points	✓ Elements
Off-Alignment     Station Equations	Duplicates
Elements	Dual Dimensions
Radials Tangents	Try Alternate Styles
Chords Subtangents	Extend Beyond Element
Planarize	

9. **<D>** the **Preferences** button at the bottom of the dialog the Preferences dialog will appear.

ain Tabling Style Apply Style Assigned ( Horizontal Alignment Cogo Points:	Active Overwri	e v
Horizontal Alignment Include: • Selected:	+ Inc	go Points lude:
Name 13103 13107 13205 13214 12216 ✓ Ⅲ	Descri N Edge of Edge of Traffic Co Traffic Co	ame Descri Style
Display Points On-Alignment	Event Points	Annotate Points Elements
Off-Alignment Elements Radials Chords	Station Equations Tangents Subtangents	Duplicates Dual Dimensions Try Atemate Styles Extend Beyond Element
Display As Complex	k Linestring	Planarize

- 10. Select the preference name CDOT.
- 11. **<D>** the **Load** then **<D>** the **Close** buttons. The Preferences dialog will close and the default CDOT preference will be loaded.

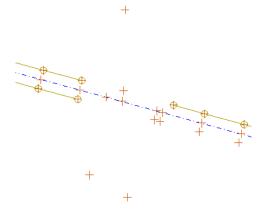
Preferences	X
Name:	Close
Default	Load
	Save
	Save As
	Delete
	Help
Active Preference: CDOT	

- 12. In the *Apply Style* section of the *Main* tab select the **Active** radio button.
- 13. From the *Horizontal Alignment* drop down list select ALG\_Existing.
- 14. In the Annotate section of the Main tab uncheck Elements.
- 15. **<D>** the **Apply** button the selected horizontal alignments and alignment points will be displayed in the MicroStation view.
- 16. In the *Include* field for *Cogo Points* key-in an asterisk \*(wild-card) then *Tab* key to identify all horizontal alignments.

17. **<D>** the **Apply** button the selected horizontal alignments, alignment points and Cogo points will be displayed in the MicroStation view.

Apply Style Assigned	Active Overv	Filter
Horizontal Alignment	ALG_EXISTING	
Cogo Points:	Default	•
Horizontal Alignment		ogo Points
Include:	<b>T</b>	clude: • -
Selected:		Selected:
Name	Descri St	Name Descri Style
		Annotate
< III Display		Annotate
< Ⅲ Display ♥ Points	4	Annotate Points Elements
<ul> <li>✓ III</li> <li>Display</li> <li>✓ Points</li> <li>✓ On-Alignment</li> </ul>	Event Points	Annotate Points Elements
<ul> <li>III</li> <li>Display</li> <li>Points</li> <li>On-Alignment</li> <li>Off-Alignment</li> </ul>	Event Points	Annotate Points Elements Duplicates
<ul> <li>✓ III</li> <li>Display</li> <li>✓ Points</li> <li>✓ On-Alignment</li> <li>✓ Off-Alignment</li> <li>✓ Elements</li> </ul>	Event Points Station Equations	Annotate Points Elements Duplicates Dual Dimensions

18. Use MicroStation view commands to zoom into the graphics to review the display of alignments and Cogo points.



## Lab 3.2 - Copying Geometry data

The current geometry project contains only information exported from the fieldbook. Another geometry project, 12345\_DESIGN contains the design centerline alignment and is needed for development of right of way for this project.

The design section has developed a horizontal alignment representing the construction reference line for this project. Multiple geometry projects can be loaded into memory simultaneously and be accessed as needed. However, it is much easier (and sometimes necessary) to have the appropriate geometry information contained in a single geometry project. To that end, copy the design reference line from the geometry project 12345\_DESIGN to the geometry project 12345\_ROW. In order to copy geometry from one project to another, they must both be loaded into memory.

- 1. From the menu pull down select **File > Open** the Open dialog will appear.
- Path to the file and folder C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_DESIGN.alg

🙀 Open					X
Look in:	Geometry		• 3	ø 🖻 🖽	•
Recent Places Desktop CDOT CDOT COMPUTER	12345_DESIG 12345_ROW.a 12345ROW_R 12345ROW_S	alg	Size		
Network	File name: Files of type:	12345_DESIGN.alg InRoads Files (*.rwk;*.dtr	n;*.alg;*.itl;*.ird;*.se	▼ db;*f ▼	Open Cancel Help

3. **<D>** the **Open** the **<D>** the **Cancel** buttons. The file will be loaded into memory and the dialog will be dismissed.

Open								2
Look in:	Geometry			्र	G 🗊	P		
æ.	Name	Date modif	Туре	Size				
2	12345_D	ESIGN.alg						
lecent Places	12345_R	OW.alg						
	12345RC	W_ROW.alg						
Desktop		W_SummitBP.al	-					
Desktop	12345SU	RV_Fieldbook.alg	1					
CDOT CDOT								
Computer								
-								
2	File name:	12345_DES	IGN.alg			•	E	Open
Network	Class of burns						- 12	
	Files of type:	InRoads File	s ( .rwk; .atn	n; .alg; .tti;	.ird; .sdb;	1 🖌	100	Cancel

There is a single horizontal alignment needed from the 12345\_DESIGN geometry project. It is named C\_Centerline

4. From the pull down menu select **Geometry > Copy Geometry** the Copy Geometry dialog will appear.

ojects Horizontals	Verticals Cogo Points	
From Geometry Project:	12345_DESIGN	Apply
		Help
Name	Description	
12345_DESIGN	SH 86 Design ge	
Default 12345_ROW		
То		
To Geometry Project:	12345_DESIGN	
	12345_DESIGN SH 86 Design geometry	

- 5. In the Copy Geometry dialog select the Horizontals tab.
- 6. In the *From* section select the *Geometry Project:* 12345\_DESIGN.
- 7. In the list of horizontals select the name **C\_Centerline**.
- 8. In the *To* section, set the *Geometry Project:* 12345\_ROW.

	12345_DESIG	iN	<b>•</b>	
				Help
Name	Description	Style	+	
C_Centerline	Reference Line	ALG_PRO		
🖉 Include All Chil	ldran			
V Include All Chil	ldren			
✓ Include All Chil	ldren			
			-	
То	12345_ROW		•	
To Geometry Project:	12345_ROW		<b>•</b>	
To Geometry Project: Horizontal Alignme	12345_ROW ent: C_Centerline		<b>T</b>	
To Geometry Project:	12345_ROW	e		

9. **<D>** the **Apply** then **<D>** the **Close** buttons. The horizontal alignment will be copied and the dialog will be dismissed.

ojects Horizontals	Verticals Cogo P	oints			
Geometry Project:	12345_DESIGN	N	•		Apply
					Help
Name	Description	Style	-	<del>ф</del> -	
C_Centerline R	leference Line	ALG_PRO			
Include All Children	1				
✓ Include All Children To Geometry Project:	12345_ROW		<b>•</b>		
То			<b>•</b>		
To Geometry Project:	12345_ROW		<b>_</b>		

- **Note:** The dialog is divided into 2 sections. The top half of the dialog being the geometry project being copied from, with the lower half being the geometry project being copied to. Alignments being copied can be assigned a new name, description, or style during the copy process.
- 10. From the Geometry Workspace pane <**R**> the Geometry Project *12345\_DESIGN* and select **Close** from the fly out list. InRoads may ask to save the file select no.
  - **Note:** The geometry project 12345\_ROW should be the active geometry project. By default any geometry viewing or creation commands operate on the active geometry project. The active geometry project is indicated by a red box next to the name. Deleting the active project leaves InRoads in the state of no active project being defined.
- 11. From the Geometry Workspace pane <**R**> on the Geometry Project name *12345\_ROW* and select **Set Active** from the fly-out menu.
- 12. Expand the display tree of active Geometry Project by selecting the plus sign.
- 13. **<R>** the Horizontal Alignment *C\_Centerline* and select **Set Active** from the fly out list.

For orientation purposes, display the graphics and stationing for alignment *C\_Centerline* 

- 14. From the pull down menu select Geometry > View Geometry > Active Horizontal
- 15. From the pull down menu select Geometry > View Geometry > Stationing
  - **Note:** The global scale factor and selected preference influence the display of geometry and stationing.

16. In the InRoads Explorer pane, <**R**> on the Geometry Project *13245\_ROW* and select **Save** from the fly-out menu.

# LAB 4 - Creating Cogo Points

This lab demonstrates creating cogo points a number of different ways. The Cogo points will then be displayed in the MicroStation view.

#### Chapter Objectives:

- Enabling the Cogo audit trail
- Creating Cogo points graphically
- Creating Cogo points by coordinate input
- Writing geometry vertices to the Cogo buffer
- Geometry Snaps review only
- Cogo point intersection commands
- Create alignments with Cogo Points
- Create parallel and offset alignments
- Create parcels

### Lab 4.1 - Recording coordinate geometry results

Enabling the Cogo audit trail allows the InRoads user to record edits made to the geometry project. The edits are written to a text file sharing the location and name of the geometry project with the exception of the filename extension is defined as \*. atf.

- 1. **Open** the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project
   C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_ROW.alg that was created in the earlier lab.
- 3. From the InRoads Locks toolbar, *enable* the Cogo audit trail.



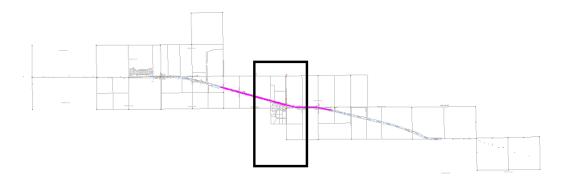
- **Note:** Activate the Cogo audit trail only after a geometry project has been written to disk. Doing so allows the \*.atf to track filename and directory location. The audit trail file can not be executed to reconstruct geometry but tracks geometry results similar to results shown if the report lock is enabled.
- 4. The Cogo audit trail file, \*.atf file, can be opened at anytime with a text editor such as notepad.

## Lab 4.2 - Cogo point creation by graphic input

Prior to generating the proposed right-of-way geometry, the public land survey lines (section lines), existing right-of way, and existing parcels will be developed. Additionally the reference line alignment vertices will be sent to the Cogo buffer.

5. Use the MicroStation Fit View command to view the extents of the project.

- 6. From the pull down menu select **Utilities > Saved Views** the Saved Views dialog will appear.
- 7. On the view named *ROW Reference* <D><D> and then <D> in the MicroStation view 1. This exercise will be working in the Summit Business Park area outlined below.

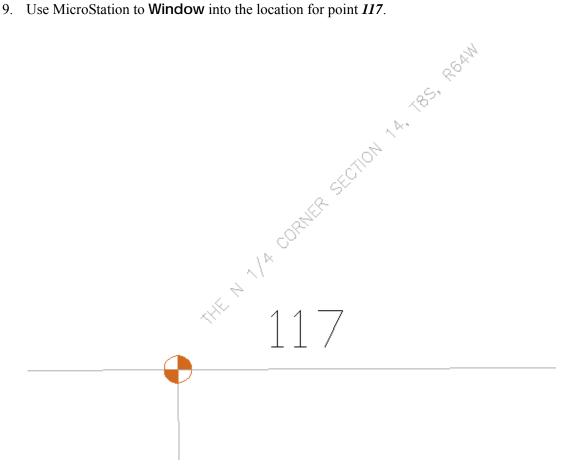


8. Use the MicroStation Window command to zoom into this area.



**Note:** Cogo point 105 was created by the fieldbook export. The locations marked as 117 & 120 are required to establish section lines that are necessary for the development of right of way. These 2 Cogo points will be created in the following exercises.

9. Use MicroStation to Window into the location for point 117.



10. From the pull down menu select Geometry > Cogo Points > New the New Cogo Point dialog will appear.

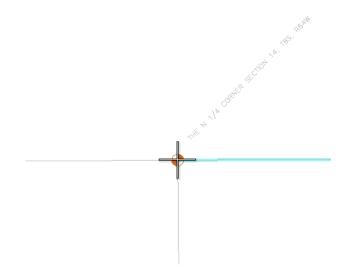
🕌 New Cogo Point		
Define By:	Northing/Easting -	Apply
Name:		Close
Northing:	0.00	Help
Easting:	0.00	+
Elevation:	0.00	
Horizontal Alignment:	C_Centerline 🔹	- <del>ф</del> -
Station:	0+00.00	
Offset:	0.00	-ф-
Elevation:	0.00	
Description:		
Style:	Default 🔹	

11. In the Name field key-in 117.

12. **<D>** the Northing Easting Elevation **Target** button to interactively define the coordinates. The New Cogo Point dialog will temporarily minimize to allow for more of the MicroStation view to be available.

🕌 New Cogo Point			
Define By:	Northing/Easting		Apply
Name:	117		Close
Northing:	0.00		Help
Easting:	0.00	+	
Elevation:	0.00		
Horizontal Alignment:	C_Centerline -	+	
Station:	0+00.00		
Offset:	0.00		
Elevation:	0.00		
Description:			
Style:	Default 🔹		

13. <T> then <D> to the CAD graphics at the section corner. The New Cogo Point dialog will reappear with the coordinates applied.



14. In the *Description* field key-in *N* 1/4 Cor Section 14.

🕌 New Cogo Point		[	
Define By:	Northing/Easting -		Apply
Name:	117		Close
Northing:	1558514.31		Help
Easting:	3277056.40	÷	Tiop
Elevation:	0.00		
Horizontal Alignment:	C_Centerline 🔹	ф-	
Station:	A 396+19.48		
Offset:	-1609.99	+	
Elevation:	0.00		
Description:	N 1/4 Cor Section 14		
Style:	RW_Working-exist 🔹		

15. From the *Style* drop down list select the **RW\_Working-exist**.

16. **<D> Apply** then **<D>** the **Close** buttons. The Cogo point is created and displayed to the MicroStation screen.

🐂 New Cogo Point		(	
Define By:	Northing/Easting -		Apply
Name:	117		Close
Northing:	1558514.31		Help
Easting:	3277056.40	÷	Liop
Elevation:	0.00		
Horizontal Alignment:	C_Centerline -	-ф-	
Station:	A 396+19.48		
Offset:	-1609.99	-ф-	
Elevation:	0.00		
Description:	N 1/4 Cor Section 14		
Style:	RW_Working-exist		

If Report lock is ON, a Results dialog opens.

<unnamed></unnamed>	😸 🚳 🔪 🏏 🗖 🚽 💷 🔳	
Results		
Create Cogo Point 117	15585 [	Close Save As Append
	(	Display
< <u> </u>		Help

17. **<D>** the **Close** button in the Results dialog.

### Lab 4.3 - Cogo point creation by coordinate input

In the New Cogo Point dialog, define Cogo point 120 which is located south of Summit Business Park

- 1. In the *Name* field key-in *120*.
  - **Note:** When entering subsequent Cogo points the Name field automatically increments to the next unused point identifier. Also when entering coordinates do not input commas, they are shown here for readability purposes.
- 2. From another source, the SE Corner of Section 14 (future point 120) has been determined as having the coordinate values of:
  - North = 1,553,239.97
  - ♦ East = *3,279,699.86*
- 3. In the *Description* field key-in *SE Cor Section 14*
- 4. From the Style drop down list select RW\_Working-exist

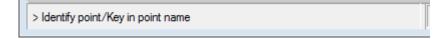
🐂 New Cogo Point			
Define By:	Northing/Easting		Apply
Name:	120		Close
Northing:	1553239.97		Help
Easting:	3279699.86	÷	
Elevation:	0.00		
Horizontal Alignment:	C_Centerline •	÷	
Station:	B 434+44.66		
Offset:	2787.36	+	
Elevation:	0.00		
Description:	SE Cor Section 14		
Style:	RW_Working-exist 🔻		

5. **<D> Apply** then **<D>** the **Close** buttons. The Cogo point is created and displayed to the MicroStation screen.

🕌 New Cogo Point			
Define By:	Northing/Easting -		Apply
Name:	120		Close
Northing:	1553239.97		Help
Easting:	3279699.86	ŧ	
Elevation:	0.00		
Horizontal Alignment:	C_Centerline 💌	+	
Station:	B 434+44.66		
Offset:	2787.36	+	
Elevation:	0.00		
Description:	SE Cor Section 14		
Style:	RW_Working-exist -		

### Lab 4.4 - Centering a MicroStation View on a Cogo Point

1. From the pull down menu select **Geometry** > **Cogo Points** > **Center Point** the Micro-Station status bar prompts you to *Identify point/Key in point name*.



2. In the MicroStation Key-in window, key-in 120 <Enter>

🙀 Key-in	8
120	• 🛱 🕰 •

- 3. If more then one view is opened you are prompted to Select a View.
- 4. **<D>** in any MicroStation **View** the MicroStation view is repositioned to center the specified Cogo point.

**Note:** The above command will not change the display volume of the MicroStation screen. You may be required to zoom in or out to achieve desirable results.

- 5. Continue to **Center** other cogo points *105* and *117*.
- 6. Open the Cogo Audit trail file to view results.

12345ROW_ROW.atf - Notepad			2 23
File Edit Format View Help			
*** *** Modified by brysr on 3/28/2011 3:28:13 PM			*
Create Cogo Point 117 0.00	1558514.31	3277056.40	
Create Cogo Point 120 0.00	1558514.31	3277056.40	
Point deleted: 120 1 cogo point(s) deleted Create Cogo Point			
120 0.00	1553239.97	3279699.86	-

## LAB 5 - Alignment to Cogo Buffer

This lab demonstrates that alignment cogo point naming can be defined by the user or assigned by InRoads using a user specified seed name. While the overall alignment must be assigned a unique name, the vertices (PI's, PC's, PT's, etc) of said alignments can exist in three states, as: cogo points, named points, or unnamed points.

#### **Chapter Objectives:**

- Create cogo points from a horizontal alignment
- Review cogo points stored in the Cogo Buffer
- Open the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project
   C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345ROW.alg that was created in the earlier lab.
- 3. From the Geometry Workspace pane <**R**> on the Geometry Project name *12345\_ROW* and select **Set Active** from the fly-out menu.
- 4. Expand the display tree of active Geometry Project by selecting the plus sign.
- 5. **<R>** the Horizontal Alignment *C\_Centerline* and select **Set Active** from the fly out list.
- 6. From the pull down menu select **Geometry > Review Horizontal** the Review Horizontal Alignment dialog will appear with *C\_Centerline* as the active alignment.

eometry Project:	12345_ROW -	Mode	Alignment	Close
Iorizontal Alignment:	C_Centerline -	) +		Save As
	Project Name: 1 Description:	2345_ROW		Append
Horizontal Al	ignment Name: C Description: R	eference Line		Display
	Style: A	LG_PRO STATION	NORTHING	Print
Element: Lire	ar			Help
E	POB ( ) PC ( ) gent Direction:	314+56.59 331+59.51 N 89^25'49" E	1558452.21 1558469.14	Select
	angent Length:	1702.92		
Element: Circ	cular			First
	PC ( ) PI ( ) CC ( )	331+59.51 334+74.30	1558469.14 1558472.27	<pre></pre>
	PT ( )	337+86.58	1555604.28 1558406.98	Next >
	Radius:	2865.00		Last

As they relate to the Cogo buffer, InRoads reserves geometry point names. These are reserved as Cogo point ID's in the event the named geometry points are written to the Cogo buffer. If the alignment containing the named geometry points is written to the Cogo buffer, the naming between geometry points and cogo points is synchronized.

**Note:** The information in parenthesis shows the identifier of the vertices either as Cogo points or as named or unnamed geometry points. In this case, the alignment *C\_Centerline* was created as *unnamed* geometry points.

The assignment of geometry names at time of creation (or editing) is controlled by: File > Project Options [Geometry] tab.

🐂 Project Opt	tions	
Tolerances Precision	Factors Abb General	Units and Format Geometry
Plotting Heigh	nt:	0.00 Help
Seed Alignme	ent Name:	1
Seed Point N	ame:	1
Curve Defin	nition	
Horizontal:	Arc	<ul> <li>Always Confirm</li> </ul>
Vertical:	Parabolic	<ul> <li>Always Confirm</li> </ul>
Measure:	Along Arc	Along Chord
Degree of C	urve Length:	100.00
Unit Station	Length:	100.00
Define Transi	tions By:	Length
Spiral Definition	on:	Clothoid 👻
Cubic Parabo	la Definition Is:	New South Wales 👻
.ICS Coordina	te Sequence:	Northing/Easting -
Vertical Angle	Reference:	Zenith
Angular Mode	e:	Bearings 👻
Point Names	During Edits:	Do Not Assign 👻
🔲 On Horizo	ntal Edits Reco	mpute Vertical Alignments
Default Acc		ead-Only Read-Write
Horizontal A	lignments:	•
Cogo Buffer	:	•
A	Apply Pr	eferences

Write the vertices for alignment C\_Centerline to the Cogo buffer. Doing so will facilitate the generation of additional geometry for the development of the project.

7. Select Geometry > Horizontal Curve Set > Events the Horizontal Events dialog opens.

Horizontal Ev Define By: (			٦.		
Add As Station and C	d As Locate By Station and Offset Name: 0.00		-+	Apply Close Help	
Alignment Po Seed Name: Description: Style: Defau	lt	Station Start: 314+56.5 Stop: C 560+91 Vertical Alignmer	9	+ 0ffse First: 0.00 \$ecc + 0.00	- <del>d-</del>
M Station	Offset	Northing	Easting	Elevation	Style
			Edit	Delete	Report

- 8. **<D>** the radio button for Alignment Point to Cogo
  - **Note:** The seed name field only applies to unnamed geometry points. If names are already assigned to the alignment, the assigned names will be used regardless of input into the Seed Name field. The active alignment C\_Centerline does not have geometry point names assigned so input here is desired. If no seed name is defined here, the next available Cogo point number would be used and incrementally increased.

Reviewing the Cogo buffer indicates that the range of number from 121-1007 are unused. For simplicity, set point number 200 as the initial Cogo point ID to assign to the alignment vertices (more on reviewing the Cogo buffer in the following lab).

- 9. Key-in *200* as the Seed Name
- 10. Key-in *Design Ref line* in the Description field

- Horizontal Events Define By: Single Point + Apply Add As Locate By Close Station and Offset Name: Help Northing and Easting Northing: 0.00 Cogo Point Easting: 0.00 Alignment Point to Cogo Seed Name: 200 Station Offsets Description: Design Ref line 314+56.59 + 0.00 + Style: ALG\_PRO Second: C 560+91.01 + 0.00 + Add Vertical Event Points Compute Elevation from Active Vertical Alignment Events M Station Offset Northing Easting Elevation Style Edit. Delete Report.
- 11. Select ALG\_PRO as the geometry style to assign to the new Cogo points

- 12. **<D> Apply** then **<D>** the **Close** buttons the points will be added to the cogo buffer and the dialog will be dismissed.
- 13. In the Geometry Workspace pane review the Cogo Buffer to verify the results by **<D>** on the *Cogo Buffer* then reviewing the *Feedback pane*.

<u>File Surface Geometry</u>		and the second	ation <u>M</u> odeler Site		<u>Quantities</u> <u>T</u> ools <u>H</u> elp	
	and the second se	∼ v		5+00 E		
°⊂ .+ .2 .8 T ( <u>1</u> )		Name	Northing	Easting	Description	Style
13216	*	:: 146	1556123.32	3279706.62	Traffic Control Doub	T_Traffic Dou
13218		: 200	1558452.21	3268628.62	Design Ref line	ALG_PRO
i 1335		201	1558469.14	3270331.45	Design Ref line	ALG_PRO
⊞ ∫ 13352		::: 202	1555604.28	3270359.94	Design Ref line	ALG_PRO
⊞ ∫ 13353		203	1558406.98	3270954.17	Design Ref line	ALG_PRO
13354		::: 204	1558084.24	3272476.39	Design Ref line	ALG_PRO
C_Centerlin		::: 205	1552478.84	3271287.92	Design Ref line	ALG_PRO
🗄 🔅 Cogo Buffe	er	206	1558007.42	3272793.82	Design Ref line	ALG_PRO
몲 Geometry 😭 Prefe	Line and the second sec	207	1557661.45	3274063.98	Design Ref line	ALG_PRO

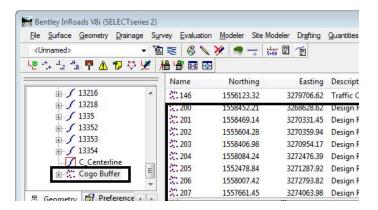
14. <R> on the Geometry Project name 12345\_ROW from the pop up menu <D> Save

## LAB 6 - Reviewing Cogo Points

This lab demonstrates that Cogo points can be reviewed in the InRoads feedback pane and then exported to a text file.

#### **Chapter Objectives:**

- Review Cogo points in the feedback pane of the InRoads interface
- Save Cogo points stored in the Geometry Project to a simple text file
- Open the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_ROW.alg that was created in the earlier lab.
- 3. From the Geometry Workspace pane <**R**> on the Geometry Project name *12345\_ROW* and select **Set Active** from the fly-out menu.
- 4. In the Geometry Workspace pane review the Cogo Buffer to verify the results by <D> on the *Cogo Buffer* then reviewing the *Feedback pane*.



- **Note:** Cogo points can be assigned either numbers or names. When alpha characters are used, names are case sensitive; RL\_10 is not the same point as rl\_10.
- 5. **<D>** on the *column* headers **Name** | **Northing** to sort the cogo points in ascending and descending order.
- 6. **<D> hold and drag** a column header to reorder the columns.

7. From the pull down menu select **Geometry > Review Geometry Points** the Review Geometry Points dialog will appear.

🚔 Review Geon	netry Points
Mode: 🔘 Alignm	ent: C_Centerline
All Poi	nts Close
Point	
Name:	5907 • Report
Description:	Centerline of Dirt Road Help
Style:	T_Centerline of Dirt I 👻
Northing:	1555586.76
Easting:	3279672.91
Elevation:	6627.59
Synchronize S	hared Point Elevations 📝 Center in View
Shared Points	
Point Type	Alignment
POE COGO	1313
First	< Previous Next > Last

8. In the *Name* field key-in *200* then the *Tab* key the dialog will display the cogo point information.

🕌 Review Geon	netry Points		
Mode: 🔘 Alignn	nent: C_Centerline	-	Apply
All Poi	ints		Close
Point			Report
Name:	200	+	пероп
Description:	Design Ref line		Help
Style:	ALG_PRO -		
Northing:	1558452.21		
Easting:	3268628.62		
Elevation:	0.00		
Synchronize S	Shared Point Elevations		
Shared Points			
Point Type	Alignment		
COGO			
First	< Previous Next :	>	Last

- **Note:** This dialog can be used to evaluate individual Cogo points (or named geometry points) by navigating with the provided buttons. Also if Center in View is enabled, the MicroStation view will center on the point selected.
- 9. **<D>** the **Next** | **Previous** | **First** | **Last** buttons to navigate the cogo points stored in the cogo buffer.

Report Result	S		<u>^</u>	Close
POINT NAME	NORTHING	EASTING	F	Save As
100	1558457.41	3269295.23	-	( A 1
102	1558430.90	3266629.98		Append
103	1555770.83	3266639.57		Dil
104	1555781.53	3269304.03		Display
105	1558527.87	3279643.18		_
106	1558562.81	3282329.69		Print
107	1555920.99	3282335.45		C
108	1555884.03	3279671.70	*	Help

10. **<D>** the **Report** button the Results dialog will appear with all the cogo points listed.

- **Note:** This Results dialog will list both Cogo points and named geometry points (named alignment vertices not stored as Cogo points). This is signified by the name of the command used to generate this report Review Geometry Points, not Cogo points. Named geometry points are not written to the Cogo buffer automatically. However they are reserved.
- 11. **<D>** the **Save As** button the Save As dialog will appear.
- 12. Path to the folder *InRoads*\*Geometry*
- 13. Key-in the file name *GeoPoints.txt*
- 14. **<D>** the **Save** button the file will be stored and the dialog will be dismissed.
- 15. <R> on the Geometry Project name 12345\_ROW from the pop up menu <D> Save

## LAB 7 - Geometry Snaps

This lab demonstrates InRoads geometry snaps which allow the user added functions to ensure geometry point locations and direction criteria are selected at defined geometry locations. In this lab the geometry inverse command is used for illustration. Geometry snaps can be applied when creating alignments, using traverse commands or almost any geometry related command. Using geometry snaps will ensure specific locations are selected.

InRoads geometry snaps are analogous to MicroStation snaps such as the keypoint snap. When enabled, the software only allows selection at specific locations.

#### **Chapter Objectives:**

- Use both No Snap and Point Snap from the Locks toolbar
- Use the Inverse Direction tool on Cogo points
- Open the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project
   C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_ROW.alg
   that was created in
   the earlier lab.
- 3. From the Geometry Workspace pane <**R**> on the Geometry Project name *12345\_ROW* and select **Set Active** from the fly-out menu.
- 4. Make sure the locks toolbar is open from the pull down menu select **Tools > Locks > Toolbar** dock the toolbar into the InRoads interface.

Locks		×
<unnamed></unnamed>	- 📔 😹   🚳 🔪 🎉 🚔 🚽 🐜 🗉 🧉	Ē

5. **<D>** on the **Element Snap Lock** icon in the InRoads Locks toolbar.



- 6. **<D>** on the **Element Snap Lock** icon a second time to cycle through the three geometry snap modes:
  - No Snap Element snap off
  - Point snap locks to Cogo points or alignment vertices
  - Element snap select tangents for direction definition

7. Window the MicroStation view as shown below.



- **Note:** To explore the Element Point snap use the inverse command to report distance and direction between cursor locations.
- 8. Set the *Element Snap Lock* OFF
- 9. From the pull down menu select **Geometry > Utilities > Inverse Direction** the Inverse Direction dialog will appear.
- 10. **<D>** the **Inverse** tab the **<D>** the **Interactive** button. After selecting the Interactive button you are prompted in the MicroStation status bar to Identify Initial Point/Key in Initial Point.

🖬 Inv	erse	Directi	on		
Inver	se	Radial	Tangent Offset	Minimum	Annotate
Poin	t:				Interactive
					Reset
					Help
			Preferences	Close	



11. **<D>** near Cogo point **117** and then **<D>** near Cogo point **105**.

Dynamic graphics will appear and both the MicroStation and InRoads command fields will report the results. A question mark indicates that a specific Cogo point has not been selected. In this case, the bearing and distance readout reflects the values between the data <D> points given. Not between defined geometry points.

> Identify next point/Key in next point ? to ? N 89^26'16'' E 2615.54

- 12. Toggle ON the Geometry Point Snap Lock to select defined geometry.
- 13. From the pull down menu select **Geometry > Utilities > Inverse Direction** the Inverse Direction dialog will appear.
- 14. **<D>** the **Inverse** tab the **<D>** the **Interactive** button. After selecting the Interactive button you are prompted to Identify Initial Point/Key in Initial Point.

	Inverse	e Directi	on		
In	verse	Radial	Tangent Offset	Minimum	Annotate
F	<sup>o</sup> oint:				Interactive
					Reset
					Help
			Preferences	Close	

15. **<D>** near Cogo Point **117** and then **<D>** near Cogo point **105**. InRoads reports the bearing and distance between points 117 and 105.

> Identify next point/Key in next point 117 to 105 N 89^41'59'' E 2586.82

- 16. Move the cursor around the MicroStation view. Note how the cursor 'snaps' between specific geometry vertices.
- 17. Toggle Geometry Snap Lock OFF.

**Note:** Geometry snaps, if enabled, operate whether the related graphics are visible or not.

After initializing the Inverse Direction command, point numbers can also be keyed into the Inverse Direction tab Point key-in field.

- 18. From the pull down menu select **Geometry > Utilities > Inverse Direction** the Inverse Direction dialog will appear.
- 19.  $\langle D \rangle$  the **Inverse** tab.
- 20. In the Point field key-in **117** then **Tab** key.
- 21. In the Point field key-in **120** then **Tab** key the results dialog will appear with the distance and direction displayed.

Inverse 117	Direction		15585	Close
120	S 26^37'11" E	5899.71	15532	Save As.
120			13332	Append
				<u>D</u> isplay
				<u>P</u> rint
				Help

Note: The geometry snap element will be covered in following exercises.

22. <R> on the Geometry Project name 12345\_ROW from the pop up menu <D> Save

## LAB 8 - Cogo Point by Traverse

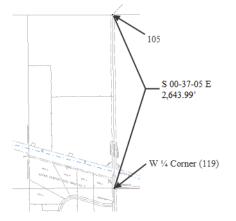
This lab demonstrates the use of the Traverse command to establish the West <sup>1</sup>/<sub>4</sub> corner from Cogo point 105. Development of the right of way for the project requires the establishment of the West <sup>1</sup>/<sub>4</sub> corner for Section 13 which lies South of the project reference line near the Northeast corner of the Summit Business Park development.

#### **Chapter Objectives:**

- Create Cogo points using direction and bearings key-ins
- Open the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_ROW.alg that was created in the earlier lab.
- 3. From the Geometry Workspace pane <**R**> on the Geometry Project name *12345\_ROW* and select **Set Active** from the fly-out menu.

The West <sup>1</sup>/<sub>4</sub> corner has been determined to lie south of the NW corner of section 13 (Cogo point 105) at:

- ◆ S 00-37-05 E
- ◆ 2,643.99 feet



4. From the pull down menu select **Geometry** > **Traverse** the Traverse dialog will appear.

Traverse			
Method:  Angle  Direction  Curve	Insert Point Mode		Apply
Backsight	To Cogo Buffer		Close
Point:     -+	Before Alignment		Ciuse
⑦ Direction: N 0^0'00'' E -+-	O After Alignment		Undo
	Radial		Help
Occupied Point			
Name:	Course		
Northing: 0.00	Angle 🔹	0^00'00''	+
Easting: 0.00	Horizontal Distance 💌	0.00	- <del>4</del> -
Elevation: 0.00	Radius 💌	0.00	
Instrument Ht.: 0.00	Radius 💌	0.00	
Foresight Point	Zenith Angle 🔹	90^00'00''	- <del>ф</del> -
Name: 1	Rod Height:	0.00	
Description:	Offset:	0.00	+
Style: Default 💌	Clos	e Traverse	

- 5. From the *Method* radio button select Direction.
- 6. From the Insert Point Mode radio button select To Cogo Buffer
- 7. In the *Occupied Point* section of the dialog key-in the *Name:* **105** then **Tab** key. The coordinates for point 105 will display.
- 8. In the *Course* section of the dialog key-in the *Direction:* **SO 37 05 E**
- 9. In the *Course* section of the dialog key-in the *Horizontal Distance: 2643.99*
- 10. In the Foresight Point section of the dialog key-in the Name: 119
- 11. In the Foresight Point section of the dialog key-in the Description: W 1/4 Cor Sec 13
- 12. In the *Foresight Point* section of the dialog select the *Style* RW\_Working-exist from the drop down list.

Traverse				_	, • 🔀
Method: 🔘 A	Angle  O Direction	Curve	Insert Point Mode		Apply
Backsight			To Cogo Buffer		Close
Point:		+	Before Alignment		Close
O Direction:	N 0^00'00'' E	+	O After Alignment		Undo
			Radial		Help
Occupied Poi	int	_			
Name:	105		Course		
Northing:	1558527.87	+	Direction	S 0^37'05" E	+
Easting:	3279643.18	] "	Horizontal Distance	2643.99	+
Elevation:	6585.79		Radius	r 0.00	
Instrument Ht.	: 0.00		Radius	r 0.00	
Forestald Date			Vertical Distance	• 0.00	-+-
-Foresight Poir Name:	π 119		Rod Height:	0.00	
Description:	W 1/4 Cor Sec 13		Offset:	0.00	-+-
Style:			G	ose Traverse	
	RW_Working-exist	<u> </u>	Ľ	use maverse	

- 13. **<D>** the **Apply** button the point 119 will be created and become the occupied point. The foresight point will automatically increment to the next available number.
  - **Note:** If point 119 would have already existed, the next available point number would be used and 119 would not have been overwritten.

From the newly created point 119, traverse to the east establishing point 121 on the South right-of-way line of S.H. No. 86. Said point lying at N  $89^12'18''$  E, a distance of 30' (RW width) + 660.53' (ROW length).

- 14. From the *Method* radio button select Direction.
- 15. From the Insert Point Mode radio button select To Cogo Buffer
- 16. Verify the *Occupied Point* is the *Name: 119*.
- 17. In the *Course* section of the dialog key-in the *Direction:* **N 89 12 18 E**
- 18. In the Course section of the dialog key-in the Horizontal Distance: 30+660.53 < Tab>
- 19. Verify the *Foresight Point* is the *Name: 121*
- 20. In the Foresight Point section of the dialog key-in the Description: South ROW point
- 21. In the *Foresight Point* section of the dialog select the *Style* RW\_Working-exist from the drop down list.

Traverse						- (	• ×
Method: O A Backsight O Point: Direction:	ngle  Direction  C	+	Insert Point Mode <ul> <li>To Cogo Buffer</li> <li>Before Alignment</li> <li>After Alignment</li> </ul>				oply ose ndo
Occupied Poir	N 0^00'00" E	<u>+</u>	Arter Augmment     Radial     Course			Н	elp
Northing: Easting:	115 1556815.09 3277607.55	] +	Direction Horizontal Distance	•	N 89^12'18" E 30 + 660.53		+ +
Elevation: Instrument Ht.:	6628.14 0.00		Radius Length	•	0.00		+ +
Foresight Poin Name: Description:	t 121 South ROW point		Vertical Distance Rod Height: Offset:	•	0.00 0.00 0.00		+
Style:	RW_Working-exist	•]	(	Clos	e Traverse		

- 22. **<D>** the **Apply** button the point 121 will be created and become the occupied point.
  - **Note:** Notice the previous foresight point has become the occupied point. Also note math operations can be used in the input fields. Once you [tab] from the field, the math operation computes. Experiment using +, -, \*, /
- 23. Close traverse dialog box.
- 24. **<R>** on the Geometry Project name **12345\_ROW** from the pop up menu **<D> Save**.

## LAB 9 - Horizontal Alignments from Cogo Points

This lab will expand on previous training to create alignments by chaining Cogo points together. This methodology, commonly referred to as the "PI Method" and will utilize the *Geometry* > *Horizontal Curve Set* tools.

### **Chapter Objectives:**

- Become more familiar with the Geometry Point Snap Lock
- Create an alignment using Cogo points

### Lab 9.1 - Generate Alignment using Cogo points

- Open the MicroStation design file C:\Projects\12345\ROW\_Survey\Drawings\Reference\_Files\12345ROW\_Model.dgn
- Open the Geometry Project
   C:\Projects\12345\ROW\_Survey\InRoads\Geometry\12345\_ROW.alg that was created in the earlier lab.
- 3. From the Geometry Workspace pane <**R**> on the Geometry Project name *12345\_ROW* and select **Set Active** from the fly-out menu.

Connect the 3 Cogo points 120, 119, and 105 established along the west line of Section 13 to form an alignment that represents the center line of County Road 303. Once established, this alignment can be used for establishing the right of way limits for said road.

4. Set the MicroStation View to show the subject area.



5. **<D>** Geometry Point Snap Lock ON.

6. From the pull down menu select

**Geometry > Utilities > Create/Edit Alignment by Cogo Points**. A warning message may appear which indicates that the active alignment may have illegal (unassigned) point names.



Recall that the alignment C\_Centerline was created with unnamed geometry points (you can verify this with Geometry > Review Horizontal). In a previous exercise the alignment points were written to the Cogo buffer. Doing so created Cogo points for the alignment vertices but did not associate the created Cogo points back to the alignment. You are presented with two options:

- Selecting *No*: The identified alignment continues to exist using unnamed geometry points, which is OK and the Create/Edit Alignment by Cogo Points dialog will open.
- Selecting *Yes*: InRoads will associate the Cogo points created back to the alignment vertices. Either solution is OK, ultimately it is at your discretion which to choose.
- 7. **<D>** the **Yes** button. The *Create/Edit Alignment by Cogo Points* dialog will open.

Create/E	dit Alignment by Cogo Points	
Name:	C_Centerline 👻 🔶	Apply
Description:	Reference Line	Close
Style:	ALG_PRO -	Help
Alignment De	efinition:	
212 C213L	102R 203 204 C205R 206 207 208 2 214 215 216 C217R 218 219 C220 5 C226R 227 228 <u>C229R</u> 230 231 <u>C</u>	R 221 222
		· ·
Graphical I	nput	Clear
	Start Stop	
Center Po	pint Left Point Ce	nter Point Right
	Curve Midpoint Spiral F	1

**Note:** The alignment C\_Centerline is defined as having Cogo point numbers assigned at its vertices. The letter C indicates the Cogo point identified is the Center of a curve. The letters R or L indicate the curve direction (Right or Left).

- 8. In the Name field key-in *West Line of Sec 13* and then the <Tab> key. The dialog will clear and allow the creation of a new alignment
- 9. In the Description field key-in CL CR 303and then the Tab key.
- 10. From the Style drop down list select RW\_Sec-Line\_ex

M Create/I	dit Alignment by Cogo F	Points	
Name:	West Line of Sec 13	<b>+</b> +	Apply
Description:	CL CR 303		Close
Style:	RW_Sec-Line_ex	<b>→</b>	Help
Alignment D	efinition:		Thep
			*
		ſ	Clear
Graphical	Start	Stop Cent Spiral PI	er Point Right

**Note:** In this instance CL CR stands for Center Line of County Road 303. Do not confuse the L and R used in the description with the L and R used to indicate the curve direction, as described on the previous page.

Name:			
	West Line of Sec 13	• +	Apply
Description:	CL CR 303		Close
Style:	RW_Sec-Line_ex	-	Help
Alignment De	efinition:		<u> </u>
			-
Gradial			Clear
Graphical I		0	Clear
Graphical I	nput Start	Stop	Clear
Graphical I	Start		
	Start		Clear

11. **<D>** the **Start** button the dialog will collapse and you are prompted to Identify Point.

- 12. **<D>** near the points on the screen starting on the south end. Continue to graphically select points to define the alignment. Graphics will display showing the alignment location. By default, the alignment will pass through the existing geometry points nearest the data point because the geometry point snap is enabled.
- 13. **<R>** when finished selecting points graphically, the *Create/Edit Alignment by Cogo Points* dialog will redisplay.

14. **<D>** Stop button the *Create/Edit Alignment by Cogo Points* dialog will show the selected points in the Alignment Definition.

🕍 Create/E	dit Alignment by Cogo Points 🛛 🗖	
Name:	West Line of Sec 13 🔹 🔶	Apply
Description:	CL CR 303	Close
Style:	RW_Sec-Line_ex	Help
Alignment De	efinition:	
120 1855	105	~
		-
Graphical I	Input Start Stop	Clear

**Note:**Cogo points can be deleted, inserted, cleared, or edited directly in the Alignment definition section of the Create/Edit Alignment by Cogo Points dialog. If desired, the entire definition can be input through the use of the keyboard. If any points were selected by mistake, they can be edited. Using the cursor and keyboard, simply replace the accidental input(s).

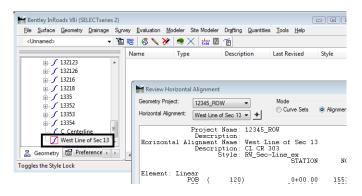
15. In the *Alignment Definition* area key-in **119** for the second point.

Create/E	Edit Alignment by Cogo Points 🛛 🗖 🗐	8
Name:	West Line of Sec 13 - + Apply	
Description:	CL CR 303 Close	
Style:	RW_Sec-Line_ex	5
Alignment De		
120 119 1	105	*
Graphical	Input	
	Start Stop	
Center Po	oint Left Point Center Point Ri	aht
	Curve Midpoint Spiral PI	

16. **<D> Apply** the horizontal alignment is created and displayed.

#### Note:

- Alignments are direction based. If the above workflow was followed, the created alignment runs South to North. This becomes important when offsetting the alignment to either the left or right (left is input as a negative number)
- Alignment direction can be ascertained by: reviewing the alignment, by tracking, or by displaying stationing
- Alignment direction can be 'reversed' by using the Geometry > Transpose command
- Alignments created by chaining Cogo points can be edited using the Geometry > Horizontal Curve Set tools
- 17. In the InRoads explorer pane, verify the alignment was created
- 18. <R> the alignment name West Line of Sec 13 from the pop up menu <D> Review



19. <R> the Geometry Project name 12345\_ROW from the pop up menu <D> Save

## LAB 10 - Cogo Intersection Commands

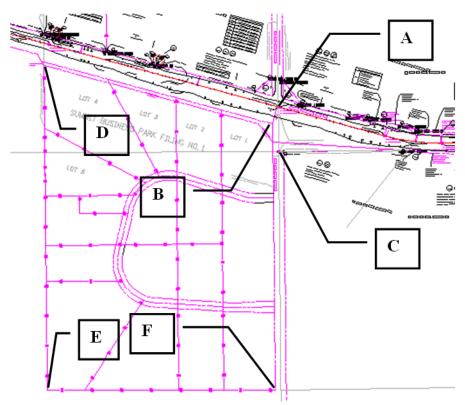
Development of right of way information can be facilitated using Cogo intersection commands. These Cogo points can then in-turn be used to define alignments (parcels). While this is a potential workflow, it is not necessary to first create Cogo points. It is simply one solution to establish required geometry information.

#### **Chapter Objectives:**

- Create Cogo points through various Intersection Commands
- Generate Alignments from Cogo Points

In order, create Cogo points for:

- A) The intersection of the design reference line and the west line of section 13, "*Lab* 10.1 Alignment-Alignment Intersection"
- B) The NE corner of Summit Business Park, "Lab 10.2 Alignment Alignment Intersection using Offsets"
- C) A right of way point on the east side of County Road 303, "Lab 10.3 Direction Alignment Intersection"
- D) The NW corner of Summit Business Park, "Lab 10.4 Station & Offset"
- E) The SW corner of Summit business Park, "Lab 10.5 Traversing"
- F) The SE corner of Summit business Park, "Lab 10.6 Direction Direction Intersection"



### Lab 10.1 - Alignment-Alignment Intersection

Grouping Cogo point numbers together is desired. All Cogo points for these exercises are to start with point number 300 and automatically increment. Establish a Cogo point at the intersection of the project reference line with the west line of section 13. Two alignments exist representing these features: *C\_Centerline & West Line Sec 13* 

- 1. Select File > Project Options > [Geometry]
  - Input a *Seed Point Name* of *300*
- 2. **<D> Apply**
- 3. **<D> Close**

Tolerances	Factors A	bbreviations	Rail	Sight Distance
Precision	General	Units and	Format	Geometry
Plotting Heig	ht:	0.00	1	Help
Seed Alignme	ent Name:	1	1	
Seed Point N	lame:	300	1	
Curve Defin	nition			
Horizontal:	Arc	-	📃 Alwa	ays Confirm
Vertical:	Parabolic	•	Alwa	ays Confirm
Measure:	Along And	c 🔘 Along Cł	nord	
Degree of C	Curve Length:	100.00		
Unit Station	Length:	100.00		
Define Trans Spiral Definiti	on:	Clothoid	0	Constant
Cubic Parabo	ola Definition I	s: New South	Wales	•
ICS Coordina	ate Sequence	: Northing/E	asting	•
Vertical Angle	e Reference:	Zenith		•
Angular Mod	e:	Bearings		•
Point Names	During Edits:	Do Not Ass	sign	-
🔲 On Horizo	ontal Edits Rec	compute Vertica	al Alignm	ents
Default Ac	cess Modes -	Read-Only	Read-W	'nte
Horizontal A	Nignments:	$\odot$	۲	
Cogo Buffe	r:	$\bigcirc$	۲	

4. Select Geometry > Locate > Intersection

The Intersection dialog opens. The *Type* selection list defines typical Cogo intersection commands.

- intersection - • • Type: Alignment/Alignment Apply Alignment Close Name: Default ÷ Help Offset: 0.00 ÷ Alignment 2 Name: Default ÷ Offset: 0.00 ŧ Extend to Intersection Intersect All Alignments
- 5. Select Type: Alignment/Alignment

6. Complete the dialog as shown below.

M Intersect	ion	
Type:	Alignment/Alignment	Apply
Alignment Name: Offset:	C_Centerline	Close       +       Help
Alignment Name: Offset:	2 West Line of Sec 13 ▼ 0.00	<u>+</u> +
Extend to	Intersection 🔲 Intersec	t All Alignments

- **Note:** In addition to selecting the alignments to intersect, offsets can be defined. A negative sign (-) indicates an offset to the left.
- 7. **<D> Apply**, a results dialog opens if report lock is enabled. Also if Cogo Audit Trail is still enabled from a previous lab, the results are written to the \*.atf

8. Key-in a *Description*, and choose a *Style* as shown.

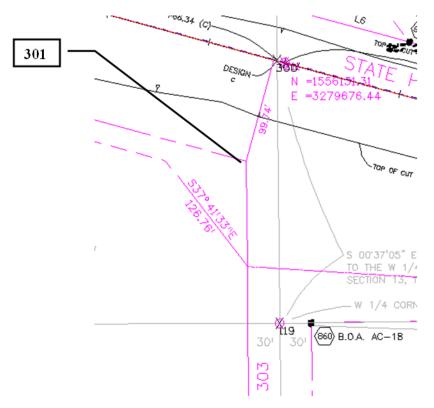
🕌 Locate Res	ults		
Seed Name:	300		Accept
Description:	CL & West L	ine Sec 13	Reject
Style:	RW_Workin	ig-exist 🔻	Cancel
Elevation:	0.00		Help
Northing		Easting	
1556133.34		3279669.01	

- **Note:** If it is possible for the intersection command to provide another solution, selecting the Reject button will display the alternative results. Results are shown numerically in the dialog and dynamically on in the MicroStation screen.
- 9. **<D> Accept -** the new Cogo point is created at the intersection.



### Lab 10.2 - Alignment - Alignment Intersection using Offsets

Use the intersection command to establish point 301 at the intersection of the south right of way of S.H. 86 and the west right of way of CR 303.



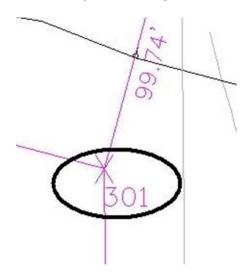
- 1. Select Geometry > Locate > Intersection
- 2. Complete the dialog as shown.

intersecti	on	
Type: Alignment 1 Name: Offset:	Alignment/Alignment       C_Centerline       99.74	Apply Close Help
Alignment 2 Name: Offset:	West Line of Sec 13 ▼ -30.00 +	
Extend to	Intersection 🔲 Intersect Al	l Alignments

- **Note:** Notice the negative offset defined for Alignment 2. The alignment representing the west line of section 13 runs south to north. A negative offset indicates a distance to the left.
- 3. **<D> Apply**
- 4. In the Location Results dialog, Key-in:
  - ◆ Seed Name: 301
  - Description: Existing RW @ CR 303
  - Style: RW\_ROW-Line\_Exist

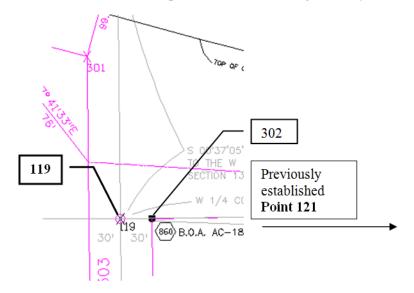
Geed Name:	301		Accept
escription:	Existing RW @ CR 303		Reject
<u>ityle:</u>			Cancel
Elevation:	0.00		Help
Northing		Easting	
1556037.8	6	3279640 04	1

5. **<D> Accept** - to create point 301.



# Lab 10.3 - Direction - Alignment Intersection

Use the intersection command to establish point 302 on the east right of way of county road 303.



### 1. Geometry > Locate > Intersection

- 2. Complete the dialog as shown below:
  - Type: Direction/Alignment
  - Name: 119 (origin point)
  - *Direction: a 119 121* <tab> (computes the bearing from point 119 to 121)
  - Alignment: West Line of Section 13
  - *Offset: 30.00* (to the right positive)

Thtersect	ion		
Туре:	Direction/Alignment	-	Apply
Direction - Name:	119		Close
Northing:	1555884.03	•	Help
Easting:	3279671.70		
Direction:	a 119 121	+	
Offset:	0.00	+	
Alignment			
Name:	West Line of Sec 13 🔻	+	
Offset:	30.00	+	
Extend to	Intersection 🔲 Inters	ect All	Alignments

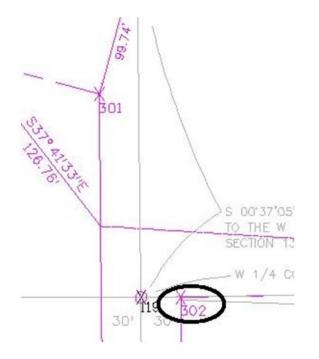
3. **<D> Apply** 

The Locate Results dialog appears.

4. Seed name should reflect 302, if not, key it and a description in, and select a style.

Seed Name:	302		Accept
Description:	Existing RW	@ CR 303	Reject
Style:	RW_ROW-	Line_ex 🔻	Cancel
Elevation:	0.00		Help
Northing		Easting	
1555884 4	5	3279701 70	ר

5. **<D> Accept** - to create cogo point 302.

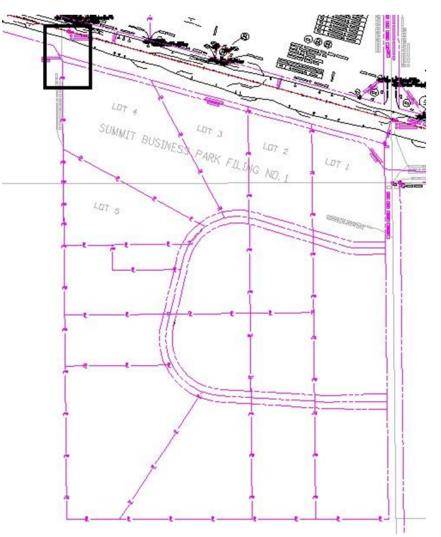


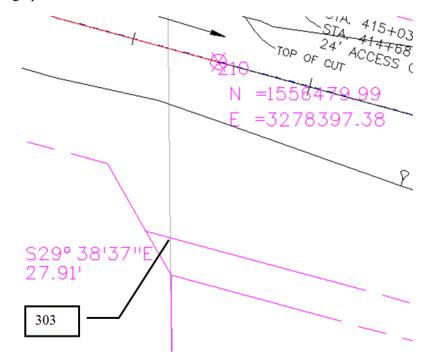
The limits of the adjacent subdivision, Summit Business Park, will be established. We had previously defined the NE corner of the plat at Cogo point 301.

- Establishing the plat boundaries will be done in the following order:
- Establish the NW corner by Station and offset
- Establish the SW corner by bearing & distance
- Establish the SE corner by intersection
- Create an alignment representing the subdivision boundary

# Lab 10.4 - Station & Offset

Use MicroStation to view the NW corner of the subdivision





Establish a Cogo point at the NW corner of the subdivision.

A Cogo point is necessary at station A 414+48.30, 100.09' RT

The stationing for establishing point 303 is relative to the reference line C\_Centerline. The letter 'A' indicates this location falls within a station equation range.

1. Set **C\_Centerline** as the *active* horizontal alignment.

Bentley InRoads XM Edition	- 78 😴 🚳 🎙	× 🗖	<u></u>		X
File Surface Geometry Drainage					
🗠 🗛 🖷 👘 🐼 🕼 🤘			2000 200		
	Name	Туре	Description	By Whom	
□··器 Geometry Projects	*				
🕘 📴 Default					
🛱 🔛 12345 DESIGN					
C_Centerline					
→ J West Line of Sec 1:	3 ≡				
West Line of Sec 1:     ⊕ ∴ Cogo Buffer	3 ≡				
	3 =				
🕀 🔆 Cogo Buffer	3 ≡				
⊕- 🔆 Cogo Buffer 🖌 13354	3 =				
<ul> <li>⊕- Cogo Buffer</li> <li>↓ 13354</li> <li>↓ 13218</li> </ul>	3 III				
B→ Cogo Buffer - ∫ 13354 - ∫ 13218 - ∫ 13216 - ∫ 13215	•				
<ul> <li>B→ Cogo Buffer</li> <li>J 13354</li> <li>J 13218</li> <li>J 13216</li> </ul>	•				

2. Select Geometry > Horizontal Curve Set > Events

The Horizontal Events dialog is multi-functional; it provides the ability to enter:

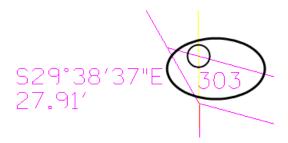
- Event points relative to a horizontal alignment
- Generates points in the Cogo buffer
- Generates Cogo Points based on alignment vertices

- 3. In the Add As section: radio button on Cogo Point
- 4. Set Define By to: Single Station
  - Single Station defines a location by station, offset definition
  - Single Point defines locations by coordinate values
  - Multiple Stations defines locations at a specified intervals and offsets
- 5. Key-in a Seed Name: 303
- 6. Enter a *Description* and select a *Style* as shown.
- 7. Key-in *Station: A 414+48.30*
- 8. Key-in Offset 100.09
- 9. **<D> Apply -** to create the Cogo point.

0	and Offset and Easting vint		Station: Offset:	A 414+48.30 100.09	+	Help
Seed Na Descript Style: F	nt Point to Cog ame: 303 ion: NW Cor IW_Property-F tical Event Po Elevation from	SBP Bindry- ▼	Station Start: 314+56.5 Stop: C 560+91	.01 +	Secon	
Events M N	Station	Offset	Northing		Elevation	Style

10. **<D> Close** to close the Horizontal Events dialog.

The cogo point is created.



## **Alternative Solution**

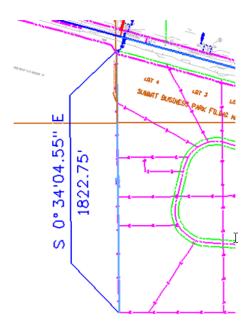
1. Select Geometry > Cogo Points > New

The Define By field can be toggled between Northing/Easting and Station/Offset.

🐂 New Cogo Point			- 0 🛃
Define By:	Station/Offset -		Apply
Name:	303		Close
Northing:	1558514.31		Help
Easting:	3277056.40	-ф-	Thop
Elevation:	0.00		
Horizontal Alignment:	C_Centerline -	÷	
Station:	A 414+48.30		
Offset:	100.09	÷	
Elevation:	0.00		
Description:	NW Cor S BP		
Style:	RW ROW-Line ex		

# Lab 10.5 - Traversing

Create a Cogo point to establish the SW corner of Summit Business Park by bearing and distance. The corner lies S 0° 34' 04.55" E, 1822.75 feet south of the NW corner of the plat.

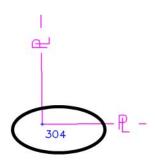


1. Select Geometry > Traverse

2. *Input* the data values as shown below.

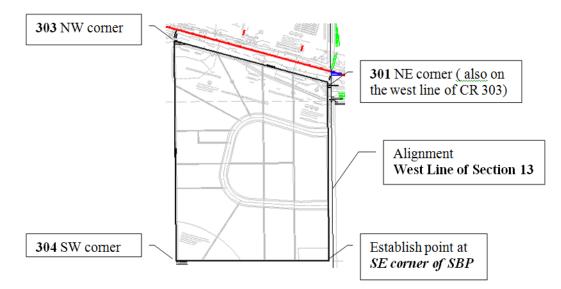
Traverse			
Method: 🔘 A	ngle 💿 Direction 🔘 Curve	Insert Point Mode	Apply
Backsight		To Cogo Buffer	Close
O Point:	105 -+-	Before Alignment	
O Direction:	N 0^00'00'' E	O After Alignment	Undo
		Radial	Help
Occupied Poi	nt		
Name:	303	Course	
Northing:	1556383.43	Direction - S 0^34'05'	"E 🛉
Easting:	3278371.05	Horizontal Distance 🔻 1822.75	-
Elevation:	0.00	Radius 👻 0.00	-#
Instrument Ht.	0.00	Length v 0.00	-
I. B		Vertical Distance 🔻 0.00	+
Foresight Poin Name:	304	Rod Height: 0.00	
Deservations		Offset: 0.00	+
Description:	SW Cor SBP	0.00	<u> </u>
Style:	RW Property-Bndry-	Close Traverse	

3. **<D> Apply -** to create a Cogo point at the Southwest corner of the plat.



# Lab 10.6 - Direction - Direction Intersection

Three of the four corners for the plat Summit Business Park are created. Only the SE corner remains. Establish the SE corner by intersection.



Criteria for establishing the SE corner:

- The south line of the plat bears N 89 55 40.5 E
- The east line of the plat is parallel to the west line of Section 13
- 1. Select Geometry > Locate > Intersection
- 2. Set Type: Direction/Direction

### Direction 1

- Name: 304
- Direction: Key-in N 89 55 40.5 E

Note: The selection button on the dialog can be used to populate the Name (coordinate) fields. To select Cogo points the point snap must be toggled on. X. Turn this lock off after use.

ype:	Direction/Direction	-	Apply
Direction 1	6		Close
Name:	304		
Northing:	1554560.77	+	Help
Easting:	3278389.12		
Direction:	N 89^55'41" E	+	
Offset:	0.00	+	
Direction 2			
Name:	301		
Northing:	1556037.86	+	
Easting:	3279640.04		
Direction:	N 0^36'37" E	+	
Offset:	0.00	-	

#### **Direction 2**

- Name: 301
- *Direction:* Key-in *S O 36 36.66 E* (SE or NW will both work)
- Note: The Angular Precision set by Tools > Options > [Precision] affects the display of Direction input fields throughout *InRoads*. CDOT Preferences set the Angular Precision to 0, therefore an input of N 0 36 36.66 W will be reformatted by *InRoads* as N 0 36 37 W. The actual input will be used in the calculation.

ype:	Direction/Direction	-	Apply
Direction 1	í.		Close
Name:	304		
Northing:	1554560.77	+	Help
Easting:	3278389.12		
Direction:	N 89^55'41" E	+	
Offset:	0.00	-	
Direction 2			
Name:	301		
Northing:	1556037.86	+	
Easting:	3279640.04		
	S 0^36'37" E	+	
Direction:	S 0 30 37 E		

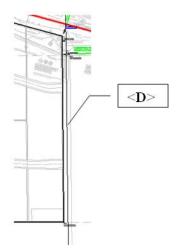
*Note:* The selection button on the dialog can be used to populate the Direction field.

The required direction is parallel to the west line of section 13

To use the selection button for direction definition:

Name:	301	
Northing:	1556037.86	+
Easting:	3279640.04	
Direction:	N 0^36'37" E	+
Offset:	0.00	+

- Toggle on the Element lock  $\stackrel{\textstyle{\times}}{\vdash}$
- **<D>** on the selection button
- <D> on the west line of the SW <sup>1</sup>/<sub>4</sub> of Section 13



The direction of the identified geometry line populates the dialog.

ype:	Direction/Direction	-	Apply
Direction 1	6		Close
Name:	304		
Northing:	1554560.77	+	Help
Easting:	3278389.12		
Direction:	N 89^55'41" E	+	
Offset:	0.00	+	
Direction 2 Name:	301		
Northing:	1556037.86	-	
	3279640.04		
Easting:		+1	
Easting: Direction:	S 0^36'37" E	Ψ	

- 1. Make sure both offsets are set to zero
- 2. **<D> Apply**

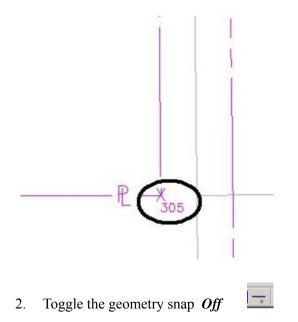
The Locate Results dialog appears.

Enter:

- Seed Name: 305
- Description: SE Cor SBP @ CR 303
- Style: RW\_ROW-Line\_ex

Seed Name:	305		Accept
Description:	SE Cor SBP	@ CR 303	Reject
Style:	RW_ROW-	Line_ex 🔻	Cancel
Elevation:	0.00		Help
Northing		Easting	
		3279655.75	

1. **<D> Accept -** to create the final Cogo point at the Southeast corner of the plat.



*Note:* It is good practice to leave geometry snaps off except when explicitly required.

# LAB 11 - Creating a Closed Alignment

## **Chapter Objectives:**

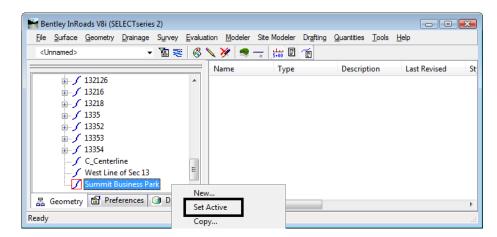
- Create Cogo points through various Intersection Commands
- Generate Alignments from Cogo Points

The plat of Summit Business Park has the 4 corners defined by Cogo points. Creating a closed alignment using the PI Method to represent the boundary of the plat will facilitate right of way creation.

Create a new horizontal alignment named Summit Business Park.

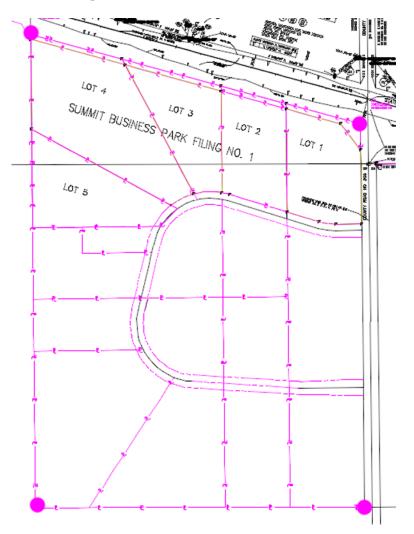
- 1. Select File > New > [Geometry]
- 2. Type: Horizontal Alignment
- 3. Name: Summit Business Park
- 4. Description: SW of int. of RL & CR 303
- 5. Style: RW\_Property-Bndry-Line\_ex
- 6. Curve Definition: Arc
- 7. **<D> Apply**

New		
Surface Geomet	try Survey Data Site Modeler	
Туре:	Horizontal Alignment	y
Name:	Summit Business Park	,
Description:	SW of RL & CR 303	
Style:	RW_Property-Bndry-Lin -	
Curve Definition:	Arc 👻	
	140	
Name	Description Style	*
Name 132115		
132115 132121	Description Style Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single	
132115 132121 132123	Description Style Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single	
132115 132121 132123 132126	Description Style Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single	
132115 132121 132123	Description Style Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single Traffic Control Sing T_Traffic Single	



8. Set the active horizontal alignment: Summit Business Park

- 9. Select Geometry > Horizontal Curve Set > Add PI
- 10. You are Prompted to: Identify Alignment End



- 11. Toggle *On* the geometry Point snap
- 12. Select the plat corners in a counter-clockwise direction
- 13. **<D>** near the *SW* corner of the plat (defines the POB)
- 14. **<D>** near the *SE* corner of the plat
- 15. **<D>** near the *NE* corner of the plat
- 16. **<D>** near the *NW* corner of the Plat
- 17. **<D>** near the *SW* corner of the plat (defines the POE)
- 18. <R> to cancel point selection, <R> to terminate the command
- 19. Toggle *Off* the geometry point snap
- 20. Select Geometry > Review Horizontal to verify the contents of the alignment.

🐂 Review Horizontal Alignment		
Geometry Project: 12345_ROW  Horizontal Alignment: Summit Business Par  Curve Set	ts 💿 Alignment 🔘 Element	Close Save As
Project Name: 12345_ROW Description: Horizontal Alignment Name: Summit Business Description: SV of Int. RL & Style: RW_Property-Bndm	CR 303 ry-Line_ex	Append Display Print
Element: Linear POB PI Tangent Length: 1266 STAT 0+00 0+00 12+66 N 89^55'41 Tangent Length: 1266	0.00 1554560.77 3278389.12 5.63 1554562.36 3279655.75 "E	Help
Element: Linear PI ( ) 12+66 PI ( ) 27+44 Tangent Direction: N 0^36'33 Tangent Length: 1475	5.63 1554562.36 3279655.75 2.21 1556037.86 3279640.04 "W	First < Previous Next >
Element: Linear PI () 27+42 PI () 40+57 Tangent Direction: N 74^45'55 Tangent Length: 1315	7.41 1556383.43 3278371.05 9"W	Last
Element: Linear PI ( ) 40+57 POE ( ) 58+80 Tangent Direction: S 0^34'05 Tangent Length: 1822	).16 1554560.77 3278389.12 5" E	
Area: 2087810.46 sq.feet 47.9295 a	acres	
<	•	

- **Note:** Notice the lack of point names (or Cogo numbers) in the parentheses. Also note the parcel area information is displayed and the alignment is dynamically highlighted on the screen.
- 21. Close the Review Horizontal Alignment dialog

olerances	Factors A	bbreviations Rail	Sight Distance
Precision	General	Units and Form	Geometry
Plotting Heigh	ht:	0.00	Help
Seed Alignme	ent Name:	1	
Seed Point N	lame:	300	
Curve Defir	nition		
		Alway	vs Confirm
Horizontal:	Arc	•	
Vertical:	Parabolic	•	
Measure:	Along Arc	Along Chord	
Degree of C	Curve Length:	100.00	
Unit Station	Length:	100.00	
Define Trans	tions By:	Length	Constant
Spiral Definiti	on:	Clothoid	•
ICS Coordina	ate Sequence:	Northing/Eastin	g <b>-</b>
Vertical Angle	e Reference:	Zenith	•
Angular Mode	e:	Bearings	•
Point Names	During Edits:	Do Not Assign	<b>-</b>
Default Acc	cess Modes	Do Not Assign	
		Re: Assign	
Horizontal A	Nignments:	0	0
Cogo Buffer	r.	0	0

The population of the name/number field is contingent on the settings under File > Project Options [Geometry] at time of geometry creation.

## **Geometry Verification**

As seen above, the Cogo points selected to define the alignment are not necessarily a part of the definition of the alignment. To rectify this, 2 possible solutions exist. Firstly, the Create/Edit Alignment by Cogo Points command could have been used to generate the alignment initially. Secondly, this same command can be used to assign and verify the alignment.

1. Select Geometry > Utilities > Create/Edit Alignment by Cogo Points



2. **<D>Yes** 

Name:	Summit Busin	less Park	•	+	Apply	
Description:	SW of Int. RI	L & CR 303		ſ	Close	
Style:	RW_Property	y-Bndry-Line	e_e ▼	ſ	Help	-
Alignment De	efinition:			L		_
Graphical	nput Start		Sto	P	Clear	
Graphical Center Po	Start	Point	Sto		Clear er Point Rig	ght

The alignment is associated with the selected Cogo Points.

- 3. Edit points as necessary.
- 4. **<D> Apply** verify results by reviewing the alignment.

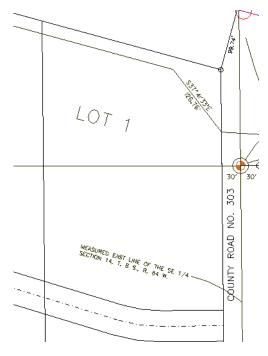
eometry Project:	12345_ROW	•	Mode			Close
lorizontal Alignment:	Summit Busine	ss Pai 👻 🔶		Alignment O Element	nt	Save As
	Project N. Descript		5_ROW			Append
Horizontal Al	ignment N	ame: Summ	it Business Par f RL & CR 303	k		Display
	Ŝt	yle: RW_P	roperty-Bndry-L STATION		EASTING	Print
Element: Line	ar					Help
Tang	OB ( PI ( ent Direc angent Le		0+00.00 12+66.64 N 89^55'41" E 1266.64	1554562.36		Select
I Element: Line		ng cn .	1200.04			First
Tang	PI ( PI ( pent Direc angent Le		12+66.64 27+42.21 N 0^36'37" W 1475.58	1556037.85	3279655.76 3279640.04 ≡	< Previous
	ear PI ( PI ( jent Direc `angent Le:		27+42.21 40+57.41 N 74^45'59" W 1315.20	1556383.43	3279640.04 3278371.05	Last
Element: Line F		303) 304)	40+57.41 58+80.16 S 0^34'05" E	1556383.43 1554560.77	3278371.05 3278389.12	
Ī	angent Le 13.38 sg.	ngth:	1822.75 47.9296 acre			
Area. 2007c	13.30 SQ.		47.5256 acre	2		

# LAB 12 - Parcel Creation by Deed

Lot number 1 lies at the Northeast corner of the Summit Business Park plat. Right of way acquisition will occur along the northerly limits of the plat. A parcel needs to be created from the deed information for lot 1.

## **Chapter Objectives:**

- Create a closed parcel
- Use Traverse Edit Add-In application



To create the parcel (closed alignment) for lot 1, the InRoads command **Geometry** > **Traverse** could be used. Another solution is to use the Traverse Edit command. Traverse Edit is an Application ADD-In command and must be enabled. In addition to allowing traversing, the traverse edit command reports on parcel closure and provides adjustment commands. Additionally a Mets and Bounds command could be used.

- 1. Using *InRoads*, select: Tools > Application ADD-Ins...
- 2. Toggle On the Traverse Edit Add-in

3. **<D>OK** 

Application Add-ins		
Available: Sight Visibility Add-In Thin Random Points Add-In Translate Leica DBX Add-In Viraverse Edit Add-In Uplotate Design Add-In Uplotad Trimble Add-In		OK Cancel Help
Variable Manager Add-In View Bathymetric Elevation Add-In View Drainage as Solids Add-In	E	
Description The Traverse Edit command uses deed/plat to a horizontal alignment. The command may horizontal alignment (maintaining colinearity be transition spirals.	also be used to create an	actual
Command		
Geometry>Utilities>Traverse Edit Geometry>Utilities>Metes and Bounds Geometry>Utilities>Traverse Adjustments		
	•	<i>i</i> ,

**Note:** When enabling the Traverse Edit Add-In, the Metes & Bounds and Traverse Adjustments command are also enabled.

Metes &	Bounds					Trave	rse Edit					- • •
Name Description: Style: Starting Po Name: Northing: Easting: Elements:	304	• Ma	iintain Tangency gular Tolerance: ale Factor:	0^00'10''	Apply Close Undo Help		AOW         I Alignment:           Business Park         International State           Point         304           IS54560.77         International State	•	Closure Result Northing Error: Easting Error: Closing Directio Closing Distanc Closed Area: Perimeter: Precision:	0.00 0.00 n: N 0^0	6	Apply Cancel Adjustments Map Check Report Help
Type	Direction	Angle	Distance	Radius	Length	Travers	e					
Linear	N 89^55'41" E	-90^32'17''	1266.64			Туре	Direction	Angle	Distance	Radius	Length	
Linear	N 0^36'37" W	-74^09'23"	1475.58	_		Linear	N 89^55'41" E	-90^32'17'	1266.64			
Linear	N 74^45'59" W S 0^34'05" E	-105^48'05"	1315.20	_			N 0^36'37" W	-74^09'23'				
Linear	3 0 3403 E		1022.73				N 74^45'59" W S 0^34'05" E	-105^48'05	5" 1315.20 1822.75			Add Before Add After Edit Delete
						Main	tain Tangency 📃	Maintain Angl	es			

These commands provide similar functions. The Metes & Bounds dialog is presented in a table format and edits can be accomplished directly in the dialog. Traverse adjustment can be accomplished by selecting Geometry > Utilities > Traverse adjustment. The Traverse edit dialog provides input, edits, and adjustment in a single dialog.

**Note:** The Traverse edit command will be used in this lab and requires an alignment to exist prior to populating the alignment. The Metes & Bounds dialog allows creation of an alignment in the dialog.

Create an alignment to store Lot number 1.

- 4. File > New > [Geometry], Select the Geometry tab and input:
- 5. Type: Horizontal Alignment

- 6. Name: Summit BP Lot 1
- 7. Description: Lot 1 of Summit Business Park
- 8. Style: RW\_Property-Bndry-Line\_ex
- 9. **<D> Apply**

Type:	<u></u>	AL: .	
	Horizontal	Alignment 🔹	Apply
Name:	Summit BP	Lot 1	Help
Description:			
Style:	RW_Prop	erty-Bndry-Lin 🔻	
Curve Definition:			
curve Denniuon:	Arc	•	
Name	Arc	▼ Description	Style
Name	Arc	Description     Traffic Control Sin	Style ^
	Arc	Description     Traffic Control Sing     Reference Line	
Name 132126		Traffic Control Sing	gT_Traffi ALG_PF
Name 132126 C_Centerline	Park	Traffic Control Sin Reference Line	gT_Traffi ALG_PF

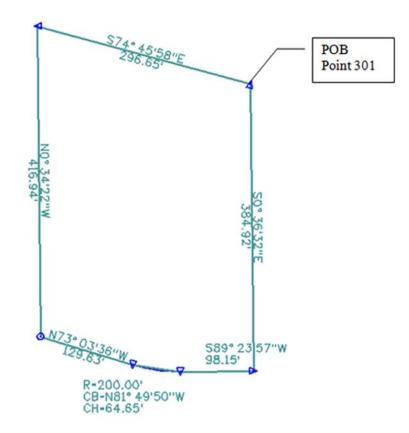
- 10. Select Geometry > Utilities > Traverse Edit to open the Traverse Edit dialog box.
- 11. Set the fields for the *Geometry Project* and *Horizontal Alignment*.
- 12. Key-in: **301** for the *Starting Point* (Cogo point 301 is located at the NE corner of lot 1).

🐂 Traverse	e Edit					- 0 🔀
Geometry P	•	•	Closure Results Northing Error:	0.00		Apply
Horizontal A	Nignment:		Easting Error:	0.00		Cancel
Summit BP	Lot 1	• •	Closing Direction	: N 0^00'00'' E		Adjustments
Starting P	oint		Closing Distance	: 0.00		Map Check
Name:	301		Closed Area:	0.00		Report
Northing:	1556037.86	+	Perimeter:	0.00		Help
Easting:	3279640.04		Precision:	0.00		
Traverse	Direction	Dist	ance F	adius	Length	
1,000	Direction	2130		00100	Conga	
						=
4						-
Maint	ain Tangency					
	Add Before	Add Aft	er Edit	. Delete	e	

### 13. Lot 1 is described as:

Commencing at the West <sup>1</sup>/<sub>4</sub> corner of Section 13, Township 8 South., Range 64 West. Thence along said section line N 0-37-05 W, 154.14 feet. Thence departing from said section line S 89-22-55 W, 30.00 feet to the westerly right-of-way line of County Road 33 and the Point of Beginning.

- 1. Thence S 0-36-32 E, to the northerly right of way line of Summit Business Park Road, 384.92 feet.
- 2. Thence along said right of way line, S 89-23-57 W, 98.15 to a point of curvature.
- 3. Thence N 81-49-50 W, 64.65 feet along the chord of said curve, having a 200.00' radius to the right.
- 4. Thence N 73-03-36"W, 129.63 feet. Thence departing from Summit Business Park Road, N 0-34-22 W to the southerly right of way line of S.H. 86, 416.94 feet.
- 5. Thence along said right of way line, S 74-45-58 E, 296.65 to the point of beginning.



- 14. **<D>** the **Add After** button on the Traverse Edit dialog.
- 15. Set Type: Linear

16. Input the **Direction** and **Distance** for the first course as shown.

Type:	Linear	-	Apply
Linear Direction:	S 0^36'32" E	+1	Cancel
Distance:	384.92	+ +	Help
Circular F	arameter	Valu	e
Chord Dire	ection 💌	N 0^00'00'' B	÷
Radius	-	0.00	+
Length		0.00	-

17. **<D> Apply -** the course is added to the alignment.

	Direction	Distance	Radius	Length	^
Linear	S 0^36'32" E	384.92			E
					-

18. *Input* the second Course.

ype:	Linear	<b></b>	Apply
Linear			Cancel
	S 89^23'57" W	<u>+</u>	Help
Distance:	98.15	<u>+</u>	
Circular			
F	Parameter	Valu	e
Chord Dire	ection 💌	N 0^00'00'' E	÷
Radius	-	0.00	ф-
Length		0.00	+

19. **<D> Apply -** the second course is added to the alignment.

Туре	Direction	Distance	Radius	Length
inear	S 0^36'32" E	384.92		
inear	S 89^23'57" W	98.15		

20. *Input* the third course – change *Type:* Circular

ype:	Circular	•	Apply
Linear			Cancel
Direction:	S 89^23'57" W	-ф-	Cancer
Distance:	0.00	-	Help
Circular			
F	Parameter	Valu	e
F Chord Dire		Valu N 81^49'50"	
· · ·		S	

Traverse Edit						0
Geometry Project: 12345_ROW	•	Closure Results Northing Error:	-376.6	8		pply
lorizontal Alignment:		Easting Error:	-157.7	7	Ca	ancel
Summit BP Lot 1	• +	Closing Direction	n: N 22^4	43'34'' E	Adjus	tments
Starting Point		Closing Distance	e: 408.39		Map	Check.
Name:		Closed Area:	31718	.83	Re	port
Northing: 1556037.85	+	Perimeter:	547.62	2		Help
Easting: 3279640.04		Precision:	1.34			icih.
Traverse Type Direction	Angle	Distance	Radius	Length		
Linear S 0^36'32'' E Linear S 89^23'57'' W	90^00'29" 8^46'13"	384.82 98.15		_		
Circul N 81^49'50'' W	0 40 13	64.37	200.00	64.65	Add Be	fore
					Add A	fter
					Edi	t
					Del	ete
Maintain Tangency	Maintain Angle	es				

21. **<D> Apply -** the third course is added to the alignment.

*Note:* As courses are entered, the parent dialog displays closure results.

22. *Input* the fourth course and **<D> Apply** 

ype:	Linear	•	Apply
Linear Direction:	N 73 <sup>03'36"</sup> W	+	Cancel
Distance:	129.63	+	Help
Circular	Parameter	Valu	e
Chord Dir	ection 💌	N 0^00'00" 8	E
Radius	-	0.00	+
Length	*	0.00	+

23. *Input* the fifth course and **<D> Apply** 

Гуре:	Linear	•	Apply
Linear Direction:	N 0^34'22" W	+	Cancel
Distance:		+	Help
<b>Circular</b>	arameter	Value	
Chord Dire	ection 💌	N 0^00'00" E	+
Radius		0.00	+
		0.00	

24. *Input* the sixth and final course and **<D> Apply** 

🐂 Add Eler	ment After				• 🔀
Type:	Linear		-	A	pply
Linear				Ca	ancel
Direction:	S 74^45'58" E		+		
Distance:	296.65		+	L F	lelp
Angle:	0^00'00''				
Circular					
F	arameter		V	alue	
Chord Dire	ection	-	N 0^00'00	)" E	+
Radius		-	0.00		+
Length		-	0.00		-

2345_RO	metry Project: 345_ROW  v		Closure Results Northing Error: 0.06			Apply
orizontal A	lignment:		Easting Error:	0.28		Cancel
iummit BP	mmit BP Lot 1 🔹 🔶		Closing Directio	tion: S 77^45'41" W		Adjustments
Starting P	oint		Closing Distance	e: 0.29		Map Check
Name:			Closed Area:	11751	8.56	Report
Northing:	1556037.85 +		Perimeter:	1390.8	34	Help
Easting:	3279640.04		Precision:	4823.0	38	Help
Traverse		)(				_
Туре	Direction	Angle	Distance	Radius	Length	
	0^36'32" E 89^23'57" W	90^00'29'' 8^46'13''	384.82 98.15			
Circul N	1 81^49'50" W	8^46'14"	64.37	200.00	64.65	Add Before
	1 73^03'36" W	72^29'14"	129.63			Add After
	1 0^34'22'' W	105^48'24"	416.94			Add Atter
Linear N			296.65			Edit
Linear N	74^45'58" E					

25. Review Closure Results in the parent dialog.

- 26. **<D> Apply** to create the alignment.
  - **Note:** The Report button on the dialog can be used to summarize the alignment. The report can be written to a text file.

The Adjustments button on the Traverse Edit dialog is dithered. If the alignment contains circular elements, adjustments are not enabled.

### Challenge Lab:

- Edit the record containing the curve by **<D>** on it and selecting **Edit**
- Change the record type to Linear
- Input the chord Direction and an the chord distance (which is incorrect) <D> Apply

ype:	Linear	<b></b>	Apply
Linear Direction:	N 81^49'50" W	+	Cancel
Distance:	64.37		Help
Circular F	Parameter	Valu	e
Chord Dire	ection 💌	N 81^49'50"	W
Radius	-	200.00	+
Length	~	64.93	-

- Close the *Edit Element* dialog
- ◆ <D> on the *Adjustments* button

🖌 Adjustments								
Method:  Ocm	pass 🔘 Cran	ndall 💿 Transit		Angular A	djustment			ОК
				Angle:	0^00'00''	-#	-	Cancel
Unadj. Direction	Unadj. Di	Adj. Direction	Adj. Dista	Latitude	Departure	Delta Nor	Delta Easting	Report
S 0^36'32" E	384.92	S 0^35'50" E	384.91	-384.89	4.01	0.01	-0.08	
S 89^23'57" W	98.15	S 89^24'03" W	98.17	-1.03	-98.16	0.01	-0.10	Help
N 81^49'50" W	64.37	N 81^49'50" W	64.38	9.15	-63.73	0.02	-0.11	
N 73^03'36" W	129.63	N 73^03'43" W	129.66	37.77	-124.03	0.02	-0.14	
N 0^34'22" W	416.94	N 0^35'04" W	416.95	416.93	-4.25	0.03	-0.22	
S 74^45'58'' E	296.65	S 74^45'53" E	296.59	-77.94	286.17	0.04	-0.28	
								-
•								·

*Select* the appropriate Method

<D> OK to apply the selected adjustment

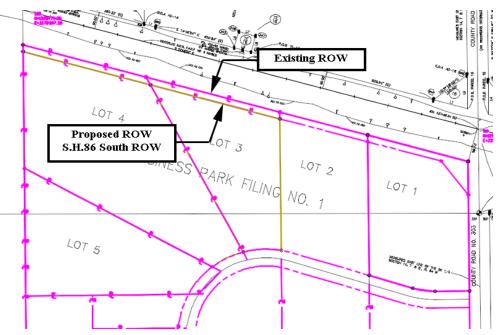
**Note:** The columns for Unadjusted and Adjusted values. As the various radio buttons for method are selected, the adjusted values update providing a preview of potential solutions.

# LAB 13 - Right of Way Parcels

InRoads has a utility to create additional parcels (closed alignments) from existing parcels and crossing alignments. As illustrated below, lots 1-4 have been created and the proposed right of way indicates required right of way acquisition along the northerly limits of the lots.

## **Chapter Objectives:**

• Create a closed alignment from existing alignments



The command used for this exercise is another application ADD-In and is added to the **Geometry > Utilities** menu. The **Create Right-of-Way** menu item is a subset of the Lot Creation application.

Geometry Drainage Evaluation	Mod	leler Dr <u>a</u> fting <u>T</u> oo	ols <u>H</u> elp		
View <u>G</u> eometry <u>Fit</u> Alignment	,	Proj Descripti	on	File Name	
Horizontal Curve <u>S</u> et V <u>e</u> rtical Curve Set	, ,	treate/ <u>E</u> dit Ali	gnment by	Cogo Points	
Hori <u>z</u> ontal Element Vertical Ele <u>m</u> ent	, ,	<ul> <li>ℬ Traverse Edit</li> <li>ℬ Join</li> <li>ℱ Irim Alignment</li> </ul>			
Superelevation	•				
Lot Layout	•	🕺 Partial Delete /	Alignment		
Review Horizontal		Multicenter Cu			
Review Geometry Points			f- <u>W</u> ay		
Cogo <u>P</u> oints <u>L</u> ocate		Parallel Horizon Parallel Vertical	-		

If you do not see the Create Right-of-Way option, go to Tools > Applications Add-Ins and activate Lot Layout Add-In.

Application Add-ins	
Available:	ОК
Import SRV Add-In	
Import Subsurface Add-In	Cancel
Italian Extensions Add-In	Help
🔀 Lot Layout Add-In	Нер
Multiple Horizontal Element Regression Analysis Add-In	
Multiple Vertical Element Regression Analysis Add-In	1
Named Symbology Tools Add-In	1
Remove User Data Add-In	
SDMS Translator Add-In  Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way.	nipulation of lots,
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way.	nipulation of lots,
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way. Command	
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way. Command Geometry>Lot Layout>Create Lots	nipulation of lots,
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way. Command	
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way. Command Geometry>Lot Layout>Create Lots	
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way. Command Geometry>Lot Layout>Create Lots Geometry>Lot Layout>Insert Point	
Description The Lot Layout Add-In provides commands for the creation and ma setbacks and rights-of-way. Command Geometry>Lot Layout>Create Lots Geometry>Lot Layout>Insert Point Geometry>Lot Layout>Move Point	

Parcels have been created for Lots 1-4 and stored in the Geometry Project **12345\_SummitBP**. Load this geometry project from the folder: *C:\Projects\12345\ROW Survey\InRoads\Geometry* 

1. File > Open – Open the Geometry folder noted above.

(**1**11)

Look in:	: 📙 Geometry			- 6	) 🧊 🖻	۶ 🛄 ד			
(Arm)	Name	Date taken	Tags	Size	R	ating			
2	12345 RO	W.alg	_						
Recent Places		V_SummitBP.al	g						
	S.H. No. 8	6.alg							
Desktop									
Desktop									
CDOT User									
Computer									
- <b></b>	File name:	12345ROV	V_SummitBP.alg	)		- 0	pen		
Network	Files of type:	InRoads Fil	es (* rwk :* dtm :	*alo:*itl:*ird:*	sdb >	-) Ca	ancel		
Network	Files of type:	InRoads Fil	es (*.rwk;*.dtm;	*.alg;*.itl;*.ird;*	.sdb; ຳ				
Network	Files of type:	InRoads Fil	es (*.rwk;*.dtm;	*.alg;*.itl;*.ird;*	.sdb; > ¬		ancel Ielp		
Network	Files of type:	InRoads Fil	les (*.rwk;*.dtm;	*.alg;*.itl;*.ird;*	י ג*;sdb				
			ies (*.rwk;*.dtm;	*.alg;*.itl;*.ird;*	*.sdb;*) •				
Bentley InRo	ads V8i (SELECT	series 2)					lelp	-	
Bentley InRo <u>File S</u> urface		iseries 2) nage S <u>u</u> rvey	Evaluation Mo	odeler Site N	Modeler	Drafting Quar	lelp	-	
Bentley InRo	ads V8i (SELECT	series 2)		odeler Site N	Modeler		lelp	-	0
Bentley InRo <u>File S</u> urface <unnamed></unnamed>	ads V8i (SELECT <u>G</u> eometry <u>D</u> rain	iseries 2) nage S <u>u</u> rvey	Evaluation Mo	odeler Site M	Modeler	Drafting Quar	tities I	-	
역 Bentley InRo File Surface <unnamed></unnamed>	ads V8i (SELECT Geometry Drair etry Projects	iseries 2) nage S <u>u</u> rvey	Evaluation Mr S Name J C_1	odeler Site M Site M	Modeler	Drafting Quar	telp	ools <u>H</u> elp	
Bentley InRo File Surface <unnamed></unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault	iseries 2) nage S <u>u</u> rvey	Evaluation Ma S Name Col Col	odeler Site №	Modeler 노나나 말	Drafting Quar Ē Style ALG_PRO	itities Ic	Description	
Bentley InRo Elle Suface <unnamed> Bentley Engle Def Engle 123</unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault 445 ROW	iseries 2) nage S <u>u</u> rvey	Evaluation Mc S Name Co S.F	odeler Site M Centerline Igo Buffer 1.83 South R	Modeler	Drafting Quar E Style ALG_PRO RW_Line_p	tities Ic	Description Reference line Proposed RW	at CR303
Bentley InRo Elle Suface <unnamed> Bentley InRo Control Suface Def Eller Def Eller 123</unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault	iseries 2) nage S <u>u</u> rvey	Evaluation Mc Name Co S.I- Suite	odeler Site M	Modeler	Drafting Quar E Style ALG_PRO RW_Line_p RW_Proper	tities Ia file final file for file ty l	Description Reference line Proposed RW Lot 1 of Sumn	at CR303 nit Busines
Bentley InRo Elle Suface <unnamed> Bentley InRo Control Suface Def Eller Def Eller 123</unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault 445 ROW	iseries 2) nage S <u>u</u> rvey	Evaluation Mc S Name C Co Sul Sul Sul Sul	odeler Site II Centerline go Buffer <u>1.83 South R</u> mmit BP Lot mmit BP Lot	Modeler 5000 2000 11 12	Drafting Quar E Style ALG_PRO RW_Line_p RW_Proper RW_OWN_	tities Ir f f ro f ty L Pro L	Description Reference line Proposed RW Lot 1 of Sumn Lot 2 of Sumn	at CR303 nit Busines nit Busines
Bentley InRo Elle Suface <unnamed> Bentley InRo Control Suface Def Eller Def Eller 123</unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault 445 ROW	iseries 2) nage S <u>u</u> rvey	Evaluation Mc Solution Mc Name Co Solution Sul Sul Sul Sul Sul Sul	odeler Site M Centerline go Buffer 1.83 South R mmit BP Lot mmit BP Lot	Modeler <u> Store</u> <u> Store</u>	Drafting Quar E Style ALG_PRO RW_Line_p RW_Proper RW_OWN_ RW_OWN_	tities Ir ro F ty I Pro I Pro I	Description Reference line Proposed RW Lot 1 of Sumn Lot 2 of Sumn Lot 3 of Sumn	at CR303 nit Busines nit Busines nit Busines
Bentley InRo Elle Suface <unnamed> Bentley InRo Control Suface Def Eller Def Eller 123</unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault 445 ROW	iseries 2) nage S <u>u</u> rvey	Evaluation Mc Solution Mc Name Co Solution Sul Sul Sul Sul Sul Sul Sul	odeler Site II Centerline go Buffer <u>1.83 South R</u> mmit BP Lot mmit BP Lot	Modeler 5000 2000 11 12 13 14	Drafting Quar E Style ALG_PRO RW_Line_p RW_Proper RW_OWN_	tities I ro F ty I Pro I Pro I Pro I	Description Reference line Proposed RW Lot 1 of Sumn Lot 2 of Sumn	at CR303 hit Busines hit Busines hit Busines hit Busines
Bentley InRo Elle Suface <unnamed> Bentley InRo Control Suface Def Eller Def Eller 123</unnamed>	ads V8i (SELECT Geometry Drain etry Projects fault 445 ROW	iseries 2) nage S <u>u</u> rvey	Evaluation Mr Name Co Su Su Su Su Su Su Su Su Su	odeler Site N	Modeler Stool II 2 2 3 4 4 ess Park	Drafting Quar E Style ALG_PRO RW_Line_p RW_Proper RW_OWN_ RW_OWN_ RW_OWN_	tities I ro F ty I Pro I Pro I Pro I ty S	Description Reference line Proposed RW Lot 1 of Sumn Lot 2 of Sumn Lot 3 of Sumn	at CR303 hit Busines hit Busines hit Busines hit Busines

2. *Load* the **12345\_SummitBP.alg** file.

3. Select Geometry > Utilities > Create Right-of-Way

**Dialog Settings:** 

- Alignment (selected) Original parcels impacted by ROW acquisition
- *Cogo Points* If enabled, will create Cogo points at the intersection of the proposed right of way and existing lot lines
- *Right of Way* If enabled, creates parcels representing the acquisition area
- *Remainder* If enabled, creates parcels representing the remainder of the selected lots

Nignment: +	Cogo Points	Points	Apply
Selected:	Seed Name:	SBP_pRW_01	Close
Name Descr Style	Description:	SBP_Sec-Line_pr	Filter
	Style:	RW_Sec-Line_pr	Help
	opecify	Name:  From C Prefix:	Driginal © Specify Suffix:
Prefix: Suffix: Description:		Description:	

4. Complete the *Cogo Points* section as shown.

5. Complete the *Right-of-Way* section as shown.

lignment:	Cogo Points	Deinte	Apply
Selected:	Seed Name:		Close
Name Descr Style	Description:	SBP_pRW_01 SBP_Sec-Line_pro	Filter
	Style:	RW_Sec-Line_pro	▼ Help
Create Right-of-Way Alignme Name:  From Original Prefix: Suffi Description: RW_acqu Style: RW_prop	Specify K: Aquire	Create Remainder A Name:  From Ori Prefix: Description: Syle:	

Nignment:	Cogo Points	Points	Apply
Selected:	Seed Name:	SBP_pRW_01	Close
Name Descr Style	Description: Style:	SBP_Sec-Line_	Filter
Right-of-Way Create Right-of-Way Alignme Name:  From Original	ent 🔽	emainder ]Create Remainde Name:	Original 🔘 Specify
	X: Aquire	Prefix: Description:	Suffix: Rem
	erty-Bndry-	Style:	Parcel Remainder           RW_Property-Bndry- ▼

6. Complete the *Remainder* section as shown.

7. **<D>** in the Alignment field and then **<D>** on the *Filter* button.

Nignment:	Cogo Points -⊕ ☑ Create Cogo	Points	Apply
elected:	Seed Name	RW_01م SBP	Close
Name Descr Style	Description: Style:	SBP_Sec-Line_ RW_Sec-Line_	Help
Right-of-Way Create Right-of-Way Align Name:  From Original Prefix: Su		Remainder Create Remaind Name:	
~	quisition operty-Bndry- 🔻	Description: Style:	Parcel Remainder

- 8. Under the Available column, select Summit BP Lots 1-4.
- 9. **<D>** the **Add** button.

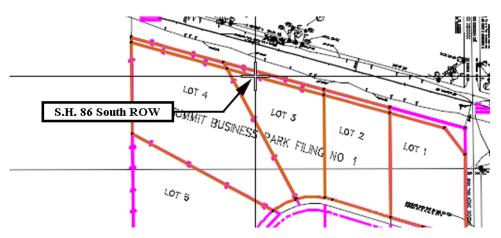
#### 10. <D> OK

Name:	Include	ed 🔻	•				ОК
Description:	Include	ed 💌	•				Cancel
Style:	Include	ed 💌	•				Preferences.
Fence Mode:	Ignore	*					
Available:					Selected:		Help
Name		Description	Style ^	Add ->	Name	Description	Style
S.H. 83 South	ROW	Proposed RW at	CRW_	<- Remove			
Summit BP Lo	t 1	Lot 1 of Summit	BuRW_	C TIONETO			
Summit BP Lo	t 2	Lot 2 of Summit I	BuRW_	<- Swap ->			
Summit BP Lo	t3	Lot 3 of Summit I	BuRW_	All	1		
Summit BP Lo	t 4	Lot 4 of Summit	BuRW_				
Summit Busine	ess Park	SW int of RL & C		None			
West Line of S	Sec 13	CL CR 303	RW_				
4							

11. The parcels are added to the list.

🕌 Create Right-of-Way			
Alignment:	Cogo Points Create Cogo	o Points	Apply
Selected:	Seed Name:	SBP_oRW_01	Close
Name Descr Style 🔺	Description:	SBP Pro lot corners	Filter
Summit Lot 1 of RW_P	Style:	RW_Calc_Pnt-pro	Help
Right-of-Way ☑ Create Right-of-Way Alignment	-	Remainder 7 Create Remainder Alignm	ent
Name: 💿 From Original 💿 S	pecify	Name: 💿 From Original	Specify
Prefix: Suffix:	Acquire	Prefix: S	uffix: Rem
Description: Parcel Acquis	sition	Description: Parcel	Remainder
Style: RW_Property	r-Bndry- ▼	Style: RW_P	roperty-Bndry- 💌

12. **<D> Apply -** you are prompted to identify the Right of Way Alignment.



13. <D> on the alignment S.H. 86 South ROW - parcel previews will highlight

14. **<D>** inside any acquisition parcel to define which side of the identified alignment the acquisition parcels lay - the parcels and Cogo points are then created.

	valuation Modeler Site Mo		ntities <u>T</u> ools	<del></del>		
	Name	Northing	Easting	Description	Style	
C_Centerline	SBP_pRW_2	1555937.88	3279641.10	SBP Pro lot corners	RW_Calc_Pnt	
S.H. 83 South ROW	SBP_pRW_3	1556164.03	3279103.31	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 1	SBP_pRW_4	1556095.69	3279354.30	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 2	SBP_pRW_5	1556264.48	3278734.40	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 3	SBP_pRW_6	1556164.03	3279103.31	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 4	SBP_pRW_7	1556363.35	3278371.26	SBP Pro lot corners	RW_Calc_Pnt	
	SBP_pRW_8	1556264.48	3278734.40	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 1Acquire	SBP_pRW_9	1556095.77	3279354.01	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 2Acquire	SBP_pRW_10	1555937.88	3279641.10	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 3Acquire	SBP_pRW_11	1556164.03	3279103.31	SBP Pro lot corners	RW_Calc_Pnt	
	SBP_pRW_12	1556095.69	3279354.30	SBP Pro lot corners	RW_Calc_Pnt	
	SBP_pRW_13	1556264.48	3278734.40	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 2Rem	SBP_pRW_14	1556164.03	3279103.31	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 3Rem	SBP_pRW_15	1556363.35	3278371.26	SBP Pro lot corners	RW_Calc_Pnt	
Summit BP Lot 4Rem	SBP_pRW_16	1556264.48	3278734.40	SBP Pro lot corners	RW_Calc_Pnt	
🖁 Geometry 📸 Preferences 🎯 Dra 🧃			III			

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# LAB 14 - Annotation of Closed Parcels

Parcel information can be annotated in the MicroStation drawing using InRoads geometry commands.

### **Chapter Objectives:**

• Annotate traverse information

The InRoads command used for this exercise is located on the **Geometry** > **View Geometry** menu.

- 1. Select Geometry > View Geometry > Closed Areas
- 2. **<D>** the **Preferences** button.
- 3. Load the settings for proposed parcels.

lame:	Close
CDOT CDOT Property-Existing CDOT Property-Proposed	Load
Default	Save
	Save As
	Delete
	Help

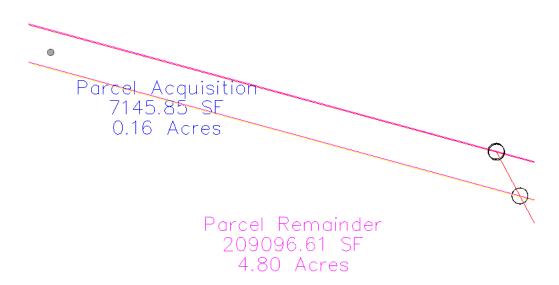
4. Define the acquisition parcels for annotation. Use the filter the select the alignments. Enter a data point in the *alignment* field and the filter button activates.

View Closed Areas	Alignment: <b><d></d></b> Selected:	Alignment: <d> +</d>					
Annotation	Name	Description Style					
	Summit BP Lot 4Acquire	Parcel Acquisiti RW_Pro					
	Summit BP Lot 3Acquire	Parcel Acquisiti RW_Pro					
	Summit BP Lot 2Acquire	Parcel Acquisiti RW_Pro					
	Summit BP Lot 1Acquire	Parcel Acquisiti RW_Pr					
		4					

5.

- Yiew Closed Areas 🔄 View Closed Areas Data: Object Prefix Suffix Precision Name General Annotation Text Name Description Area in Square Feet SF 0.12 Area in Acres Acres 0.12 Perimeter in Feet 0.12 Area in Square Meters 0.12 Area in Hectares 0.12 Perimeter in Meters 0.12 Apply Preferences... Close Help
- 6. Toggle *On* the desired information in the *Annotate* section, *<D> Apply*

7. Repeat steps 2-5 for the Remainder parcels using the Property-Existing Preference.



8. Toggle on *all* the Annotate radio buttons, <D> Apply - the graphics refresh.

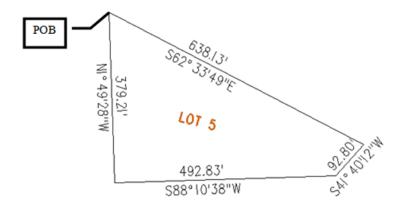
Summit BP Lot 4Rem Parcel Remainder 209096.61 SF 4.80 Acres 1995.10 Perimeter

#### Note:

- There are saved preferences in the **View Closed Area** dialog for existing vs. proposed annotation
- The number of decimal places, prefix, and Suffix annotation can be input by the user.

### Challenge Exercise – Transforming a parcel

Use the **TravEdit** command to generate a parcel (alignment) for lot 5 of Summit Business Park. The graphic below shows the required courses to create said parcel. Once created, use the **Transform** command to move and rotate the parcel so that the NE line of Lot 5 coincides with the SW line of Lot 4.



Create a Horizontal Alignment to store Lot 5.

1. Select File > New > [Geometry] - Horizontal Alignment

Type: Horiz		tal Alignment 👻	Apply	
Name:	Summit	BP Lot 5	Help	
Description:	Lot 5 of			
Style:	RW_Pr	operty-Bndry-Lin 💌		
Curve Definition:	Arc	RW_Property-Bn	drv-Line p	
Name		Description	Style	
Name S.H. 83 South R0	DW		Style	
	ow	Description	Style CALG_E)	
S.H. 83 South RO	w	Description Proposed RW at 0	Style C ALG_E) P RW_Prr	
S.H. 83 South RO Summit BP Lot 1	ow	Description Proposed RW at 0 Summit Business	Style C ALG_E) P RW_Pr u RW_OV	

2. Select Geometry > Utilities > Traverse Edit

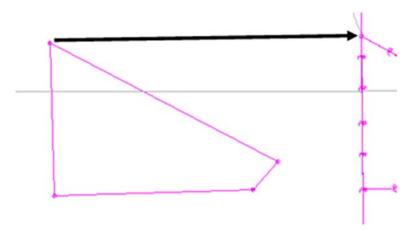
Assume a starting location (this may be based on a call-out, existing geometry point, or an assumed location).

### Key-in a Starting Point of: - DO NOT INPUT COMMAS N = 1,556,000.00 E = 3,277,600.00

Enter clockwise courses beginning with the NW corner of Lot 5.

2345_Summit BP       Northing Error:       0.00       Cancel         orizontal Alignment:       Easting Error:       0.00       Cancel         ummit BP Lot 5       •       •       Closing Direction:       N 0^00'00" E       Adjustment         Starting Point       Closing Distance:       0.00       Map Chec         Northing:       1556000.00       •       Perimeter:       0.00       Help         Easting:       3277600.00       •       Precision:       0.00       Help	eometry P	roject:		Closure Results		Apply
orizontal Alignment:       Easting Error:       0.00         fummit BP Lot 5       •       •         Starting Point       Closing Direction:       N 0^00'00'' E         Name:       Closing Distance:       0.00         Northing:       1556000.00       •         Easting:       3277600.00       •         Traverse       Fraverse	2345_Sur	mmitBP	-	Northing Error:	0.00	
Starting Point     Closing Distance: 0.00     Map Check       Name:     Closed Area: 0.0000     Report       Northing:     1556000.00     Primeter: 0.00     Help       Easting:     3277600.00     Precision: 0.00     Traverse	Starting Point		- 6	Easting Error:	0.00	Cancel
Name:         Closed Area:         0.0000         Report           Northing:         1556000.00         +         Perimeter:         0.00         Help           Easting:         3277600.00         +         Precision:         0.00         Help			• +	Closing Direction:	N 0^00'00'' E	Adjustment
Northing:         1556000.00         +         Closed Area:         0.0000         Report           Basting:         3277600.00         +         Perimeter:         0.00         Help			nt		nt Clo	
Easting: 3277600.00 Precision: 0.00 Help	Name:			Closed Area:	0.0000	Report
Easting: 3277600.00 Precision: 0.00	Northing:	1556000.00	+	Perimeter:	0.00	Help
an ann an tharmann and tharmann and tharmann and tharmann and that an	Easting:	3277600.00		Precision:	0.00	
	Туре	Direction	Dis	tance Ra	adius	Length
	Mainta	ain Tangency				
Maintain Tangency						

 Select Add After and input: *S 62-33-49 E, 638.13 S 41-40-12 W, 92.80 S 88-10-38 W, 492.83 N 01-49-28 W, 379.21* 4. **<D> Apply** to create the parcel once all courses have been entered and verified by reviewing the closure results.



The parcel is created to the west of the true location. It also has a slight rotation.

Use the Transform command to relocate and rotate the parcel. Do so in 2 steps. First move the parcel, and then rotate it to align with Lot 4.

- -Transform Geometry

5.	Select Geometry > Utilities > Transform

Points/Alig Include:		Selected:			Apply
0	Alignments	Name	Descri	p Style	Close
Transform:		Summit BP Lo	ot 5 Lot 5 of	S ALG_E	Filter
Summit BP	Lot 5 🔶 🔶				Undo
Transfo	m Entire Project	•	III	•	Least Squares
Method:	Custom	•			Preferences.
Rotation					Help
Mode:	By Angle	-	Scale		
Angle:	0^00'00''	+	Horizontal:	1.0000	
			Vertical:	1.0000	
Original Po	int		Destination	n Point	
Name:			Name:		
Northing:	1556000.00		Northing:	1556017.24	
Easting:	3277600.00	+	Easting:	3278374.80	+
Elevation:	0.00		Elevation:	0.00	

- 6. *Identify* the Alignment to transform
- 7. Identify the coordinate values for both the Original & Destination Points

8. <D> Apply

The parcel is relocated but a rotation is evident.

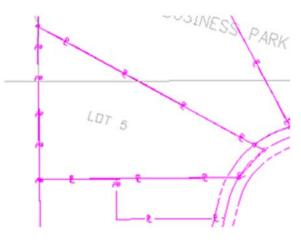
Continuing to use the transform dialog.

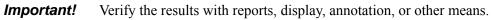
- 9. Set the Original Point and Destination Point to the same value (the point to rotate about)
- 10. *Identify* the *value of rotation required* by key-in or by using the selection icon to graphically pick points A, B, & C shown above to define the rotation angle.

- Points/Alig	nments	Selected:			Apply
<ul> <li>Alignme</li> </ul>	nta	Summit BP	Lot 5		Close
Transform:	ans				Filter
Summit BP	Lot 5 🔶				Undo
Transfo	rm Entire Project				Least Square
Method:	Custom	•			Help
Rotation Mode: Angle:	By Angle 1^14'59.66''	+	- Scale Horizontal:	1.0000	
Original Po	int		Vertical:	1.0000 n Point	
Name:			Name:	[	
Northing:	1556017.24		Northing:	1556017.2	24
Easting:	3278374.79		Easting:	3278374.7	
Elevation:	6699.18		Elevation:	6699.18	

#### 11. <D> Apply

The parcel (alignment) is transformed.





**Note:** Relocating and rotating the parcel could have been accomplished in a single operation if so desired

# **LAB 15 - Parcel Descriptions**

The InRoads Report Browser allows the user to view reports using a reporting utility based on the eXtensible Markup Language or more commonly referred to as XML. Like the HTML language used for web development, XML reporting is based on tags and attributes which delineate elements of data. Formatting of XML data is accomplished through the use of XSL, or style sheets and displays in a web browser page.

## **Chapter Objectives:**

- Create a parcel legal description
- 1. Select the **Tools > XML Reports** menu item to check the available menu items.

Bentley InRoads V8i (SELECTseries 2)		- • •	
Elle Surface Geometry Drainage Survey Evalu <unnamed> → Ta ≋ 6</unnamed>	ation Modeler Site Modeler Drafting Quan	Itities         Image: Tools         Help           XML Reports         XML Reports	Geometry     Station Base
C_Centerline S.H. 83 South ROW Summit BP Lot 1 Summit BP Lot 2 C Summit BP Lot 3	Name         Northing           &::SBP_pRW_2         155937.88           ::SBP_pRW_3         1556164.03           ::SBP_pRW_4         1556095.69           :::SBP_pRW_5         1556264.48	Tracking 27 Manual Symbology Manager 27 Style Manager 27 Style Manager 27 Copy Preferences	Eg. Station gase       Image: Station gaset <tr< td=""></tr<>
Beining of cores     Image: Cores       Image:	SBP_pRW_6 1556164.03	327 Highlight All Pencil Highlight All Ink Highlight All Ink I Convert Pencil to Ink	Intersecting Alignment Stations     Point Validation     Surfaces     Surface Check

- 2. Select Legal Description
- 3. **<D>** the *Filter* button and add *Summit BP Lot 1Acquire* as a *selected* alignment.

🚔 Geometry	Selection F	ilter					x
Name:	Included	•	•			ОК	
Description:	Included	•	•			Cance	
Style:	Included	•	•			Preference	es
Fence Mode:	Ignore					Help	
Available:				_	Selected:	Theip	
Name		Description	S ^	Add ->	Name	Description	Sty
Summit BP Lo Summit BP Lo	t 1Rem t 2Acquire t 2Rem t 3Acquire t 3Rem t 4Acquire t 4Rem	Lot 4 of Sumr Parcel Remai Parcel Acquis Parcel Remai Parcel Acquis Parcel Remai Parcel Acquis Parcel Remai	nder RV ittion RV nder RV ittion RV ittion RV nder RV nder RV	<- Remove <- Swap -> All None	Summit BP Lot 1Acquire	Parcel Acquisition	RW
•	III		•		•		

- 4. **<D>OK**
- 5. **<D> Apply**

6.

An XML file and a report is created with format and display from an InRoads default style sheet.

Bentley Civil Report Browser - C:\Users\brysr\App     File Tools Help	Data\Local\Temp\RPTB514.xml
C:\Workspace\Workspace-CDOT_V8\Standards  Bridge Cant CDOT CDOT	Property Description Report Created: 3/29/2011
Clearance Cross Slope Optimization Custom DataCollection Evaluation Geometry ICS Images IntersectingAlignment Stations LegalDescription A: HorizontalAlignmentLegalDescription xs	Time: 1:49pm Project: 12345_SummitBP Description: Lab 18 File Name: C:\Projects\12345 KOW_Survey\InRoads\Geometry\12345ROW_SummitBP.alg Last brysr 3/29/2011 1:06:47 PM Revised: Input Grid 1.0000000 Note: All units in this report are in feet unless specified feactor:
A) HorizontalAlignmentLegalDescriptionRe     A) HorizontalAlignmentLegalDescriptionRe     A) ParcelLayoutFromReference xsl     A) PropertyDescriptionExtended xsl     A) PropertyDescriptionExtended2xsl     A) PropertyDescriptionLongNames xsl     A) RightOfWayTakes xsl     UightRailManufacturing     MapCheck     Milling     Obsolete     RoadwavDesinn     V	Alignment Name: Summit BP Lot 1Acquire Alignment Description: Parcel Acquisition Beginning at a point thence N 0°34'22.3" W a distance of 20.04 feet thence S 74°45'58.4" E a distance of 296.65 feet thence S 0°36'31.8" E a distance of 99.99 feet thence N 37°35'26.5" W a distance of 127.29 feet thence N 74° 46'06.7" W a distance of 217.06 feet and the POINT OF BEGINNING. The above described parcel contains ± 0.20 acres (8779.96 sq. ft.)

- 7. **<D>** on the various report styles (\*.xsl) displayed in the left panel and notice the change to the format and contents of the displayed report.
- 8. In the Report display, select **Tools > Format Options**

Format Options						- <u>×</u>
	Mode		Precisi	on	Format	Close
Northing/Easting:			0.12	•		
Elevation:			0.12	-		Help
Angular:	Degrees	•	0	-	ddd^mm'ss.s" 🖵 Inclu	ide Angular Suffix
Slope:			0.123	-	50% -	
Use Alternate Slope if	Slope Exceeds:		0.000%			
Alternate Slope:			0	-	2.0:1	
Linear:			0.12	•		
Station:			0.12	-	\$\$+\$\$.\$\$	
Acres/Hectares:			0.1234	•		
Area Units:			0.1	•		
Cubic Units:			0.1	-	Convert to Cubic Yards	
Direction:	Bearings	•	0	•	ddd^mm'ss.s" 💌	
Face:	Right Face	-				
Vertical Observation:	Zenith	-				

9. **<D> Acres/Hectares:** Set to 5 decimal places - the report updates.

The above described parcel contains = 2.69878 acres (117559.0 sq. ft.)

- 10. *Change* any of the fields in the *Format Options* dialog and notice the report interactively updates.
- 11. <D> on the CDOT folder and select the various formats.

	EXHIBIT "A"	_
Bridge		
Cant	DDO JECT NUMPED: 12245. SummitDD	
CDOT	PROJECT NUMBER: 12345_SummitBP	
A CDOT A-line Description xsl	PARCEL NUMBER: Summit BP Lot 1Acquire	
CDOT Air Rights Easement Description	PROJECT CODE: Lab 18	
A: CDOT Fee Parcel Description xsl	DATE: March 29, 2011	
CDOT Permanent Easement Descriptic	DESCRIPTION	
A: CDOT Slope Easement Description xsl		1
CDOT Temporary Easement Descriptio		
CDOT Utility Easement Description xsl	A tract or parcel of land No. Summit BP Lot 1Acquire of the	
A CDOT_ListCoordinates xsl	Department of Transportation, State of Colorado Project No.	
CDOT_Monumentation_Clearance.xsl	12345 SummitBP containing 8,780 sq. ft. (0.202 acres), more or	
CDOT_Monumentation_ListCoordinate	less, in Section XX, Township X X, Range X X, of the X Principal	
Clearance	Meridian, in X County, Colorado, said tract or parcel being more	
Cross Slope Optimization	particularly described as follows:	
Custom		
DataCollection Evaluation	Commencing at a point, whence XXXX, said point also being the	
	TRUE POINT OF BEGINNING;	
Geometry ICS		
	1. Thence N. 00°34'22.3" W., a distance of 20.04 feet:	
Images IntersectingAlignmentStations		
Intersecting Alignment Stations Legal Description		
Legal Description Light Rail Manufacturing	2. Thence S. 74°45'58.4" E., a distance of 296.65 feet:	
uynichailmanufactunng	2. mence 3. 74 4530.4 E., a distance of 250.05 feet,	

12. In the **Report** display, select **File > Save As...** 

Save As:

```
Path: C:\Projects\12345\ROW_Survey\InRoads\Reports
```

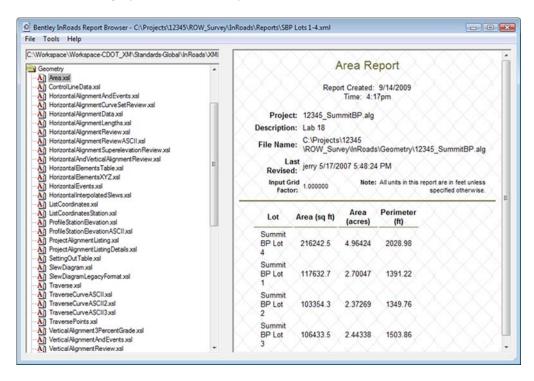
File Name: SBP Lot 1Acquistion.xml

13. <D> Save

Save As							8
Save in:	📔 Reports			•	← 🗈	💣 🎰	
Carl.	Name	Date modif	Туре	Size			
Recent Places	SBP Lot 14	Acquistion.xml -4.xml					
Ron Brys							
Network	File name:	SBP Lot 1Ac	quistion xml			•	Save
	Save as type:	XML File (* x	ml)			•	Cancel Help

Reports can also be recalled for reformatting, etc.

- 14. Select Tools > View XML Reports
- 15. From the report browser **File > Open**
- 16. Open the SBP Lots 1-4.xml file from the folder: C:\Projects\12345\ROW\_Survey\InRoads\Reports\
- 17. Select the folder and style sheet to apply to the XML data.
- 18. **<D>** on the category *Geometry* and style sheet *Area.xsl*



**Note:** Lot areas and perimeter distances are reported.

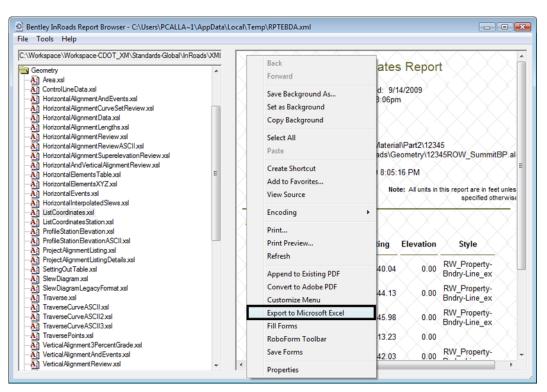
### 19. In the category *CDOT*, access style sheet *List Coordinates*

ile Tools Help	- / /					
C:\Workspace\Workspace-CDOT_V8i\Standards-Global\			•			
Bridge			DO	T		
Cant CDOT						
A: CDOT A-line Description xsl			$ \rightarrow $	$\sim$		
A: CDOT Air Rights Easement Description xsl						:
A CDOT Fee Parcel Description xsl		List	Coordinates	Report		
CDOT Permanent Easement Description xsl						
CDOT Slope Easement Description xsl		Re	eport Created: 3/2	29/2011		
CDOT Temporary Easement Description xsl			. Time: 2:02pr	n		
CDOT Utility Easement Description xsl      CDOT ListCoordinates xsl						
A: CDOT_ListCoordinates xsi	Proje	ct: 12345 Summit	BP.alg			
A: CDOT Monumentation ListCoordinates xsl	Descriptio	on: Lab 18	-			
Clearance		C:\Projects\123	246			
Cross Slope Optimization	File Nan	ne: ROW Survey	InRoads\Geometr	12345 Sum	nitBP alo	
Custom			in todas to comet	y 112040_00111	incor .urg	
DataCollection	Revise	.ast jerry 5/17/2007	5:48:24 PM			
Evaluation Geometry	Revise	su.				
	Alignment Na	me: Summit BP Lo	ot 4			
IntersectingAlignmentStations	POINT	NORTH	5 A OT (0)	E1 E1 ( 10)	DEADDIDTION	
LegalDescription	NAME	NORTH (ft)	EAST (ft)	ELEV (ft)	DESCRIPTION	
LightRailManufacturing		1556287 884	3278721,916	0.000		_
MapCheck Milling		1000201.001				
Obsolete		1555768.378	3278999.069	0.000		
RoadwayDesign		1555755.210	3278950.294	0.000		
Schemae T						

The report is redisplayed to display alignment coordinates.

20. While viewing the xml report, **<R>** in the area of the screen listing the coordinates. A flyout menu appears.

### 21. <D> on Export to Microsoft Excel



Excel will launch Excel.

0		u) - (u - ) =	Book	L - Microso	ft Excel		- 0	x
0	Hon	ne Insert Page	L Formu Data	Reviev V	/iew Add-Ir Pr	ojed Acroba	<ul> <li>•</li> </ul>	x
1 P	*	Calibri	- 11 - =	= =	<b>1</b> %		Σ - Δ	7-
Ļ		BIU	A A =	= =			🗐 - A	4-
Pa	ste 🦪		<u>A</u> -	*** ***	Number	Styles Cells	2-	
Clip	boa 🖻	Font	Ta j	Alignment	Tis .		Editin	g
	T	4 🔻	( fx					×
	А	В	С	D	E	F	G	E
1	POINT	NORTH (ft)	EAST (ft)	ELEV (ft)	DESCRIPTION			
2	NAME							
3		1556287.884	3278721.916	0				=
4		1555768.378	3278999.069	0				
5		1555755.21	3278950.294	0				
6		1555527.02	3279064.231	0				
7		1555724.135	3278910.46	0				
8		1556017.237	3278374.795	0				
9		1556383.434	3278371.051	0				
10		1556287.884	3278721.916	0				
11		Sheet1 She	et? Sheet3	192	14	ш		T
Rea		SHOULY SHE	ore / Directo		100%	0		

To view the source information the xml report was generated from:

22. In the Report browser, select **Raw-xml.xsl** in the left panel

C:Workspace-Workspace-CDOT_V8I\Standards-Global\ MapCheck Milling Obsolete RoadwayDesign Schemas StationOffset Superelevation Surfaces Survey Tabling TemplateLibrary Tumouts XIN Themes A] codofformat xsl A] format xsl A] format xsl A] format xsl A] forwarl xsl A] ShowAll xsl	<pre><?xml version="1.0" encoding="iso-8859-1" ?> - <inroads angularunits="Degrees" equilibriumconstant="4.650000" gauge="4.708333" inputgridscalefactor="1.000000" linearunits="Imperial" outputgridscalefactor="1.000000"> - </inroads></pre>
---	---

What you see are the xml tags and attributes which define the report contents. Formatting of this data for display is accomplished through the use of xsl, or style sheets. Style sheets can be developed by the user for customized reports or formats.

Other formats:

In the category DataCollection access style sheet ListCoordinatesSDR32InternationalFoot

Workspace Workspace CDOT_XM\Standards- A) Horizontal Elements SDR33Metric xsl A) Horizontal Elements SDR33US survey Foot xs A) Horizontal Onf Alignment Points xsl A) List Coordinates Leica 16 xsl A) List Coordinates Leica 16 xsl A) List Coordinates SDR33Metric xsl List Coordinates SDR33Metric xsl A) List Coordinates SDR33Metric xsl A) SINSFormat xsl A) Sinple List Coordinates xsl A) Stakeout SDR20 xsl A) Stakeout SDR33 xsl A) Station Equations Leica 16 xsl A) Station Equations Leica 8 xsl	•	08KI 1555652.95 08KI 1555651.92 08KI 1555851.85 08KI 1555661.11 08KI 1555698.86 08KI 1555698.86	
StationEquationsLeica 16 xsl			

Experiment with other style sheets such as HorizontalElementsSDR33 as well as other style sheets in the Geometry category.

# LAB 16 - Importing Cogo Points

## Chapter Objectives:

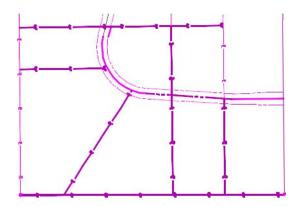
- Import Cogo Points from graphics
- Import Cogo Points from ICS

## Lab 16.1 - Importing Cogo Points from Graphics

Graphic elements can be imported to generate geometry. Some of the valid element types are: lines, linestrings, cells, text, shapes, etc. Refer to the InRoads help topic Import Geometry

To import Cogo points from a graphics file;

1. Identify graphics using a selection set or a MicroStation fence



rom Graphics	ICS V	ertical from Surface		
Type:	Cogo Poir	nts	•	Apply
Geometry				
Name:	SBP Lot L	ines 700		
Description:	Cogo Poir	nts from line segment	s	
Style:	RW_Prop	erty-Bndry-Line_ex	•	Help
Horizontal Cu	irve Definitio	on: Arc	¥	
Vertical Curve	e Definition:	Parabolic	*	
Horizontal Ali	gnment: 1	321	Ŧ	
	nts 🕅 No I	olve Gaps and Nont Duplicate Cogo Poin Added to Single Aligr	ts	
Attribute Tag	s			
🔲 Use Tag I	Data			
Project:	A	ctive	v	
	nflicts: N	o Overwrite	~	
Name Lor				

2. Select File > Import > Geometry > [From Graphics] Type - Cogo Points

- 3. **<D> Apply**
- 4. Verify the results

<unnamed> -</unnamed>		🧝   🚳 🔪 🎽 📕 🗙	. <u>ببل</u>		
<u>File Surface Geometry Drainage</u>	<u>E</u> valu	ation <u>M</u> odeler Dr <u>a</u> fting	<u>F</u> ools <u>H</u> elp		
너 ʰA ୱ 🛗 🖼 🐼 🖾 🔛	비				
	=	Name	Description	Style	
□ \[ \] \] \] Geometry Projects	*	3878_1	Property Pin	T_Property Pi	i
🔠 📴 12345_SummitBP		SBP Lot Lines 700	Cogo Points from line segments	RW_Property	
🕀 崖 Default		SBP Lot Lines 701	Cogo Points from line segments	RW_Property	
TRAINRow_ROW		SBP Lot Lines 702	Cogo Points from line segments	RW_Property	
🖃 🔛 12345_ROW		SBP Lot Lines 703	Cogo Points from line segments	RW_Property	
Cogo Buffer		SBP Lot Lines 704	Cogo Points from line segments	RW_Property	
105		SBP Lot Lines 705	Cogo Points from line segments	RW_Property	
3878 1		SBP Lot Lines 706	Cogo Points from line segments	RW_Property	
1095_2		SBP Lot Lines 707	Cogo Points from line segments	RW_Property	
1097_2		SBP Lot Lines 708	Cogo Points from line segments	RW_Property	
1096_2		SBP Lot Lines 709	Cogo Points from line segments	RW_Property	ĺ
	-	SBP Lot Lines 710	Cogo Points from line segments	RW_Property	ſ
🖁 Geometry 🔊 Preferences 4	•	SBP Lot Lines 711	Cogo Points from line segments	RW_Property ▶	

## Lab 16.2 - Importing Cogo Point from ICS

*From the CDOT manual: Roadway Design Using InRoads* – Importing Geometry from text files

Text files may be imported from several formats, the easiest of which to create is an *.ics* file. (Interactive Coordinate geometry Subsystem) This file type was first used with a product of the same name many years ago, but is still in use with InRoads today. It is basically a list of cogo commands along with the input for those commands.

If you have a text file of coordinates, you can create an .ics file by adding a **Store** command at the top and formatting the file similar to the one shown below.

File         Edit         Format         View         Help           Example.ics         file           Coordinates         of retaining wal           STORE         1         934399.33         1836109.02           2         934234.94         1836247.39           3         934234.94         1836247.39           4         934143.68         1836320.34           5         932352.65         1833973.84           6         934050.02         183686.24	x		🔄 Untitled - Notepad 📃
Coordinates of retaining wal STORE 1 934399.33 1836109.02			File Edit Format View Help
STORE 1 934399.33 1836109.02	^		Example.ics file
1 934399.33 1836109.02	ш		Coordinates of retaining wal
	_		
2         934234.94         1836247.39           3         934234.94         1836247.39           4         934143.68         1836320.34           5         932352.65         1833973.84           6         934050.02         183686.24			
3         934234.94         1836247.39           4         934143.68         1836320.34           5         932352.65         1833973.84           6         934050.02         183686.24			2 934234.94 1836247.3
4 934143.68 1836320.34 5 932352.65 1833973.84 6 934050.02 183686.24			3 934234.94 1836247.3
5 932352.65 1833973.84 6 934050.02 183686.24			4 934143.68 1836320.3
6 934050.02 183686.24			5 932352.65 1833973.8
			6 934050.02 183686.24
	-		
۰		+	۲ III

1. Choose File > Import > Geometry > [ICS]

2. Browse to find the file then choose Apply.

Import Geometry	
From Graphics ICS Vertical from Surface	
File Name:	Apply
C:\Projects\12345\Design\InRoads\sample.ics	
	Browse
	Preview
	Help
Close	

The cogo points will be added to the active geometry project. You may then use **Geometry** > **Utilities** > **Create/Edit Alignment** to join the points, forming an Alignment and **Geometry** > **Horizontal Curve Sets** > **Define Curves** to add curves to the alignment. You can also accomplish these same tasks within the .ics file. See the Bentley Help topic *Alpha Cogo* 

# LAB 17 - Geometry Options

## **Chapter Objectives:**

• Setup project parameters

Project geometry parameters are defined by the user.

1. Select File > Project Options > [Geometry]

Tolerances	Factors	Abb	reviations	Rail	Sight Distance
Precision	Gener	al	Units and Format		Geometry
Plotting Heig	ht:		0.00		Help
Seed Alignme	ent Name:		1		
Seed Point N	lame:		1	1	
Curve Defin	nition				
				Always Co	nfim
Horizontal:	Arc		-		
Vertical:	Parabolio	c	•		
Measure:	Along	Arc	O Along (	Chord	
Degree of C	Curve Leng	th:	100.00		
Unit Station	Length:		100.00		
Define Trans	itions By:		Length	© Ca	onstant
Spiral Definiti	on:		Clothoid		•
ICS Coordina	ate Sequer	nce:	Northing/	Easting	•
Vertical Angle	e Referenc	e:	Zenith		•
Angular Mod	e:		Bearings		•
Point Names	During Edi	ts:	Do Not A	ssign	•
Default Acc	cess Mode	-			
			ad-Only	Read-Wri	te
Horizontal A	-		0	۲	
Cogo Buffe	r:		0	۲	

### **Geometry Defaults**

- **Plotting Height** default elevation assigned to geometry points. Defines the elevation at which annotation will be placed in a 3D file.
- Seed Alignment Name initial name assigned to alignments
- Seed Point Name initial Cogo point name or alignment vertices name
- Curve Definition arc, chord, length of curve definitions
- Angular Mode Bearings or Azimuth settings
- Point Names During Edits horizontal alignment vertices
- Do not assign creates *unnamed* points

- Assign creates sequential alignment vertices names based on the seed point name
- **Note:** Alignment vertices defined with alphanumeric characters are not entered into the Cogo buffer by default. The Horizontal Event Point command can be used to send alignment key points to the Cogo buffer.
- 2. <D> Units and Format

	Factors	Abbre	viations	Rail	Sight Distance
Precision	Gener	al	Units and	Format	Geometry
Units					Help
Linear:	Imperia	al	•		Thop
Angular:	Degree	es	•		
Format					
Station:	SS+SS.5	s	•		
Angular:	ddd^m	m'ss.s"	•		
Slope:	50%		•		
Aspect:	ddd.dd	d	•		

InRoads does not recognize or use the unit definition associated with the host MicroStation file. The units defined under the *units and format* tab define the units of measure for InRoads data. For commands that utilize distance or area parameters, InRoads looks to the settings in this dialog to determine if the distance or area defined is imperial or metric units.

- Units Linear Imperial or Metric
- Units Angular Degrees, Grads, or Radians
- Format Angular Degrees, Minutes, Seconds or Decimal Degrees

### 3. <D> Precision

	the state of the state of the	reviations	Rail	Sight Distan
Precision	General	Units and	Format	Geometry
Northing/Easting	g: 0.12		•	Help
Elevation:	0.12		•	
Angular:	0		•	
Aspect:	0.12		•	
Slope:	0.12		•	
Linear:	0.12		•	
Station:	0.12		•	
Acres/Hectares	0.1234		•	
Area Units:	0.1234		•	
Cubic Units:	0.1234		•	
Scale:	0.1234		-	

The *precision* tab defines the number of decimal places displayed in dialogs. It also defines the number of decimal places displayed when posting information to the MicroStation screen or when writing data to an ASCII file.

**Note:** The settings in the precision tab only effect display settings. It does not define computational parameters.

# LAB 18 - Horizontal Regression Analysis

Regression analysis can be used to facilitate the development of horizontal alignments by creating a 'best-fit' alignment through defined points.

## **Chapter Objectives:**

• Setup horizontal regression analysis project parameters

Regression analysis setup.

- 1. Create a horizontal alignment to store the results in.
- 2. Select **Tools > Application Add-ins** to enable the command.

Main Application Add-ins		- • •
Available:		OK
I ot Lavout Add-In		
Multiple Horizontal Element Regression Analysis Add-In		Cancel
		Help
Named Symbology Tools Add-In		nop
Place Cell/Block Add-In	*	
Description		
The Multiple Horizontal Element Regression Analysis Add-In provides commands for creation and editing with the inclusion of regression by least squares analysis.	horizont	al alignment

3. Select Geometry > Horizontal Regression > Add Regression Point The Add Horizontal Regression Points dialog will appear.

🔣 Add Horizontal R	egression Points	- • • ×
Main Advanced		
Source:    Points		Filter
Alignn	nents	Help
Include:		
Selected:		<u>+</u>
Name	Description	Style
First Point:	Ŧ	-
Second Point:	Ŧ	- <del>ф</del> -
Apply	Preferences	. Close

4. **<D>** in the *Include* field so the **Filter** button becomes activated.

	Regression Points	
Main Advanced	i	
Source: () Poi	nts	Filter
🔘 Alig	Inments	Help
Include:		
		+
Selected:	Desister	0.1
Name	Description	Style
First Point:		+

5. **<D>** the **Filter** button. The *Geometry Selection Filter* dialog will appear.

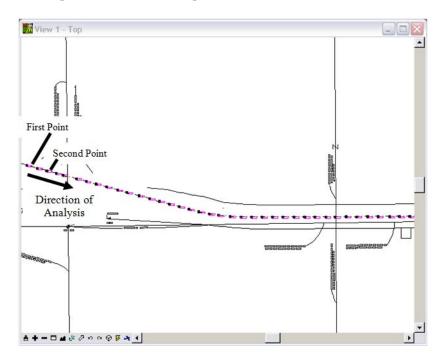
Name:	Included	•				ОК
Description:	Included	•				Cancel
Style:	Included	•				Preferences
Fence Mode	Ignore	-				
Available:					Selected:	Help
Name	Description	Style	-	Add ->	Name Desc	ription Style
105	Section Corner	T_Section (	Cor	<- Remove		
100	Section Comer	T_Section (	Cor			
3878_1	Property Pin	T_Property	Pin	<- Swap ->		
1095_2	Property Pin	T_Property	Pin			
1097_2	Property Pin	T_Property	Pin	All		
1096_2	Property Pin	T_Property	Pin	None		
1091 2	Property Pin	T Property	Pin			
1099 2	Property Pin	T Property	Dia			

6. Create a selection of centerline points to be used for analysis.

Name:	Included	•	•				ОК
Description:	Included	•	•				Cancel
Style:	Included	•	T_Traffic*				Preferences
Fence Mode:	Ignore	*					Help
Available:					Selected:		нер
Name	Descripti	Style		Add ->	Name	Description	Style
				<- Remove	5008 5026	Traffic Control Sin Traffic Control Sin	
				<- Swap ->	5020	Traffic Control Sin	
				All	5056 5072	Traffic Control Sin Traffic Control Sin	
				None	5090	Traffic Control Sin	
					5103	Traffic Control Sin	
					5120	Traffic Control Sin	. T_Traffic Singl *

- Add Horizontal Regression Points Main Advanced Source: 
   Points Filter Alignments Help Include ÷ Selected Name Style Description 5008 Traffic Control Singl... T\_Traffic Single 5026 Traffic Control Singl... T\_Traffic Single 5039 Traffic Control Singl... T\_Traffic Single Traffic Control Singl... T\_Traffic Single 5056 Traffic Control Singl... T\_Traffic Single 5072 EUOU First Point: 5104 - + Second Point: 5119 • + Close Apply Preferences...
- 7. **<D>** the **OK** button in the *Geometry Selection Filter* dialog.

8. **<D>** the **selection** button. Use the combination box or graphically define the first and second points to define initial point and direction for evaluation.



- 9. **<D>** the first point in the MicroStation view and **<D>** second point in the view to define the *direction of the analysis*.
- 10. **<D>** the **Apply** & **Close** buttons.

11. Select Geometry > Horizontal Regression > Edit/Review Regression Points. The Edit / Review Horizontal Regression Points dialog will appear.

Regression	Points:	The second second		The second second				_	Close
Name	Northing	Easting	Style	Include in	Status	Offset	Weight	^	Select Only
5104	1556584.8.	3278013.6.	T_Traffic	No	Normal	0.00	0.01		Select Only
5119	1556570.3.		T_Traffic	No	Normal	0.00	0.01		Select & Regress
5135	1556556.0.		T_Traffic	No	Normal	0.00	0.01		0.11
5152	1556541.3.	3278175.1.	T_Traffic	No	Normal	0.00	0.01		Quick
5153	1556534.4.	3278199.3.	T_Traffic	No	Normal	0.00	0.01		Report
5169	1556526.1.	3278227.5.	T_Traffic	No	Normal	0.00	0.01		
5184	1556511.4.	3278280.9.	T_Traffic	No	Normal	0.00	0.01	-	Help

- 12. Refine the selection of points to be used for analysis by using the Ctrl and Shift keys or using the Select button to define a selection area. Alternatively a fence can be placed around the points to be included in the regression. If a fence is used, a <Shift> <D> on the Select Only button will include fenced points in the regression analysis.
  - **Note:** Additional information can be access by selecting the Help button found in all dialogs.

Regression	Close								
Name	Northing	Easting	Style	Include in Analysis	Status	Offset	W	-	Select Only
5104	1556584.8.	.3278013.6.	T_Traffic	Yes	Nomal	0.00	0.0		Select Only
5119	1556570.3.	3278068.2.	T_Traffic	Yes	Normal		0.0		Select & Regress
5135	1556556.0.	.3278120.1.	T_Traffic	Yes	Nomal		0.0		0.11
	1556541.3.	.3278175.1.	T_Traffic	Yes	Normal		0.0		Quick
	1556534.4.	.3278199.3.	T_Traffic	Yes	Normal		0.0		Report
	1556526.1.	.3278227.5.	T_Traffic	Yes	Normal	0.00	0.0		
5184	1556511.4.	.3278280.9.	T_Traffic	Yes	Normal	0.00	0.0	-	Help

- 13. <R> on points and select Edit from the fly-out menu to edit. The Edit Horizontal Regression Point dialog will appear.
- 14. **<D>** the radio button **Yes** to **Include in Analysis**.

🔣 Edit Horizon	tal Regression Point	- • •
Include in Analys	sis: 💿 Yes 💿 No	Apply
Status:	Fixed	Close
	Normal	Help
	Ignored	
Offset:	0.00	+
Weight:	0.01	
First	< Previous Next	> Last

- 15. **<D> Apply** to effect any changes then **Close**.
  - **Note:** The Offset value show above regresses through a point at the defined offset from the selected point. To define a regression bandwidth, select the Quick button on the Edit/Review dialog. Tolerance defines only points that are offset less than or equal to the tolerance defined.

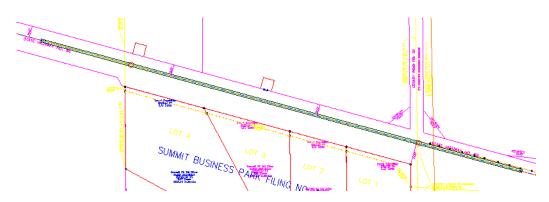
- 16. Select Geometry > Horizontal Regression > Single Element Regression Analysis The Single Horizontal Element dialog will appear.
- 17. Select **Geometry > Horizontal Regression > View Regression Point** to display symbology for the selected points.

ata:						Apply		
Object	Prefix	Suffix	Precision	Name				
Fixed Symbol				Default		Close		
Fixed Text				Default		Preferences		
Normal Symbol						Therefore the state		
🛛 Normal Text						Help		
Ignored Symbol								
Ignored Text								
Other Symbol								
Other Text							$ \sim $	
Unacceptable Symbol								
Unacceptable Text								
Sorted Line				Default				7
Name								
Horizontal Slew			0.12					
Vertical Slew			0.12					
Slew Indicator								
Acceptable Slew: 0.2	5		Annotate a	as: 💿 Single	Line			
Scale: 1.0	000			Multiple	e Lines			
Mirror Right to Left			Annotate i	n: Feet		•		

18. Select Element Type: Linear or Circle

Single Horizontal Eleme	
Element Type Circle	Compute
	Close
Save Order	Save
Before Selected Element	
After Selected Element	Report
Last Element	Help
Results	
Least Squares Error:	
Standard Deviation:	
Maximum Offset:	

19. **<D> Compute** to view the results in the MicroStation view.



- 20. **<D> Save** to create the alignment element.
- 21. **<D>** the **Report** button to view a summary.

orizontal Regression Report			*	Close Save As
lement: Linear POB ( ) POE ( )	0+00.00 21+88.14	1556584.71 1556009.14	E	Append Display
Tangent Direction: Tangent Length:	S 74 <sup>^</sup> 44'58" E 2188.14			Print
5104 0+00.00 5119 0+56.42	-0.12 <   -0.51 <		 _	Help
5135 1+10.28	-0.31 <			
5152 1+67.26	-0.61 <			
5153 1+92.31	-0.36 <			
5169 2+21.74	0.25	>		
5184 2+77.15	0.35 0.16	>		
5199 3+32.10 5250 3+83.32	-0.28 <	>		
5250 3+83.32	-0.12			
5293 4+93.79	-0.12 (			
5320 5+48.80	0.00			
5339 6+04.93	-0.10 <		+	

22. Review the results.

ometry Project:	12345_ROW	•	Mode Curve Sets	Alignment 🔘 Eleme	et.	Close
rizontal Alignment:	Regression Alignmer	• +	Curve Sets			Save As
	Project Name: Description:	12345_R0	)W			Append
orizontal Al	ignment Name: Description:	Regressi	on Alignment.			Display
	Style:	ALG_EXIS	STING STATION	NORTHING	EASTING	Print
lement: Line	ar					Help
P	POB ( POE (	)	0+00.00 21+88.14	1556584.71 1556009.14	3278013.66 3280124.75	
	ent Direction angent Length		74^44'58" E 2188.14			Select
						First
						< Previous
						Next >
						Last

**Note:** Additional curves and tangents would have to be regressed to complete the alignment. Once created, regressed elements could be managed using the advanced geometry Horizontal Element commands.

# LAB 19 - Placing cells

Standard sheets have been provided to facilitate plan development. These sheet require customization for specific projects

## **Chapter Objectives:**

- Open MicroStation Title Sheet using CDOT User workspace
- Place RLS Stamp at correct scale for Title Sheet
- In the MicroStation Manager dialog box, go to the *Workspace* group section and change the User field to *CDOT USER*, the Project field to *12345* and the Interface field to *CDOT*.

Look in:	12345			- 🗿 🌶 📂 💷 - 🛅 🚰 🍙			5 💽			
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cent Places	🍌 Constructio	n		9/10	0/2009 7:24 AM					
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2	🍶 Design			9/10	0/2009 7:24 AM					
Desktop	Hydraulics			9/10/2009 7:24 AM			Е			
57	Landscape_Environme			9/10	0/2009 7:24 AM					
<b>18</b>	Materials_Geotechnical			9/10	0/2009 7:24 AM					
DOT User	🍌 Miscellaneous			9/10	0/2009 7:24 AM					
-	🔒 Planning			9/10	0/2009 7:24 AM			1.		
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Computer	Project_Configuration			9/10	0/2009 7:24 AM					
-	Project_Mai	nager		9/10	0/2009 7:24 AM					
<u>.</u>	🍌 Redline				2009 10:29 AM					
Network	ROW_Surve	ey .		9/10	0/2009 7:24 AM		*	r	0.4	_
	File name:	name:			•			User:	CDOT User	
	Files of type: All Files (*.*)		•		Cancel		Project:	12345		
		Open as read-only				Options		Interface:	CDOT	

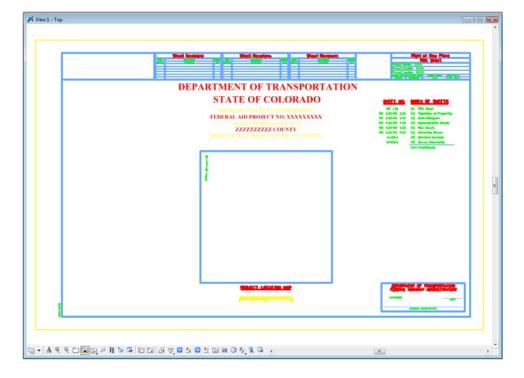
This workspace setup should load the correct MicroStation environment (including toolbars) when the selected MicroStation file is opened.

- 2. Navigate to the folder **ROW\_Survey\Drawings**
- 3. **<D>** on file *12345ROW\_TitleSht.dgn*

📕 MicroStation I	Manager - C:\Proj	ects\12345\ROW_Sun	vey\Drawings\					<b>—</b>
Look in:	)) Drawings		- 3	• 🖽 对	- 	۲	3D - V8 DGN	
An	Name	^	Date modified	Туре	Siz ^			_
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CDOT_User	12345SURV_	MonRcrd##.dgn	1/18/2008 8:15	MicroStation	n D =			
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	File name:	12345ROW_TitleSht	dgn	-	Open	User:	CDOT User	-
	Files of type:	All Files (*.*)		•	Cancel	Project:	12345	•
		Open as read-only				Interface:	CDOT	•
						-		

4. **<D> Open** in the *MicroStation Manager* dialog box to open the file.

Your graphics window should appear as shown.



**Note:** The file names and directory structure used in this course are based on current information. As the CDOT configuration develops and directory structure and file naming conventions are standardized, these may change.

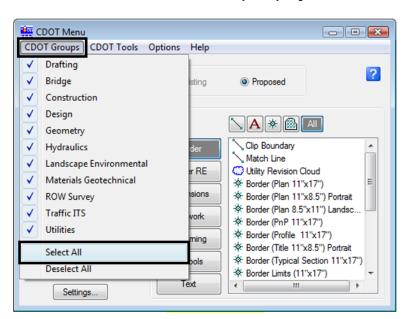
The default Model scale for CDOT plan sheets is 1:100. For sheets that are text based such as title sheets, and tabulation sheets, the Model scale is set to 1:1. Using the annotation scale lock synchronizes both graphics and text placed in the drawing. For drawings at other scales, the model properties will require modification. See the instructor if additional information is required.

Insert the Region, Designer information in the upper-left corner of the sheet.

5. The *CDOT Menu* should open by default when MicroStation is launched. If for any reason the *CDOT Menu* is not open, you can open it from the Main Task menu.

Tasks	Ψ×
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🕌 Colorado DOT	
<b>*</b>	

6. From the CDOT Menu <D> on Group Display>Select All.



- 7. Select ROW Survey in Group Display
- 8. Set the *Status* to **Proposed**
- 9. Select Borders PLS

10. Select the Survey Supervisor Kevin Williams

CDOT Menu CDOT Groups CDOT Tools	Options Help	
Drafting Bridge Construction	Status © Existing	?
Design Geometry Hydraulics Landscape Environmental	ROW Survey	All
Materials Geotechnical     ROW Survey     Irattic IIS	Border Border PLS ☆ Dave Mantyc ☆ Dave Stewart ☆ Jack Messen	
Utilities	Easement ☆ Jeffry Eickelm ☆ John Willis	an
	Government (PLSS) Kevin Williams Kevin Williams Kevin Williams	g
	Miscellaneous Pattem Miscellaneous Miscellaneous Miscellaneous Template	
	Property Ownership	
Settings	ROW	

 In the Active Settings dialog box set Active Scale to 1.00 and Active Angle to 0.00

Active Settin	ngs	- • •
Active Scale:	1.00	Apply
Active Angle:	0.00	Close

- 12. <D> Apply
- 13. <D> Close
- 14. *Place* the **cell** at the upper-left corner of the sheet as shown



### Challenge Exercises

• Verify the coordinates at the lower left corner of the sheet (tentative snap). Should be at 0,0,0

		\$PLDT_INFD	
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- Determine the length and height of sheet (measure tools or AccuDraw). Should be 11 x 17
- Investigate the levels the graphics are on (level display, element information, or pop-up information)

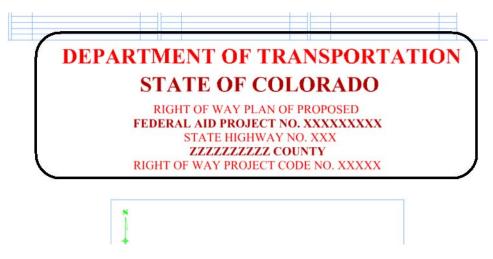
# LAB 20 - Editing Text

## **Chapter Objectives:**

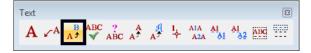
- Edit existing text
- Add additional text

Formatting has been defined for standard sheets. Text fields indicated with an 'X' indicates the user needs to input project or sheet specific information.

- 1. Navigate to the ROW\_Survey\Drawings\ directory and open the filename *12345ROW\_TitleSht.dgn*
- 2. *Window* into the top center of the title sheet.



3. Select the Edit Text command.



- 4. **<D>** on the FEDERAL AID PROJECT NO. XXXXXXXX text string.
- In the Text Editor dialog box, correct the project identifier text and change to STA 086A 039 as shown.



6. **<D>** on the MicroStation screen to execute the edit.

## DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

RIGHT OF WAY PLAN OF PROPOSED FEDERAL AID PROJECT NO. STA 086A - 039 STATE HIGHWAY NO. XXX ZZZZZZZZZ COUNTY RIGHT OF WAY PROJECT CODE NO. XXXXX

7. Optional – complete edits to the other project identification text.

**Challenge Exercises** 

• Add another line of text that matches both the text and symbology of the existing text

#### DEPARTMENT OF TRANSPORTATION STATE OF COLORADO RIGHT OF WAY PLAN OF PROPOSED FEDERAL AID PROJECT NO. STA 086A - 039 STATE HIGHWAY NO. 86 ELBERT COUNTY CONSTRUCTION PROJECT CODE NO. 14072 M.P. 18.10 TO 21.00 RIGHT OF WAY

• Complete the upper right-hand corner of the sheet as shown

Right of Way Plans								
Title Sheet								
Project Number: STA 086A-039								
Project Location: State Highway No. 86 Corridor PE								
Project Location: County Rd. 25 & 27 & 33								
Project Code:	Last Mod. Date	Subset Sheets	Sheet No.					
12345	07-26-09		RW 1.01					

• Use the Edit Text command to complete the scale bar



PROJECT LOCATION MAP

# LAB 21 - Vicinity Map - Vector

Vicinity maps can be referenced to the title sheet. These maps can be in the form of vector files (CADD elements) or raster files (images).

The CDOT standard procedure is to use county maps that have been translated from GIS information, these maps can be found on the shared drive at: \\public\CADD County Maps\. The county of interest should be copied to your project location drawings folder and can be attached as a reference file to the Title Map. The local map can be edited as desired without affecting the original.

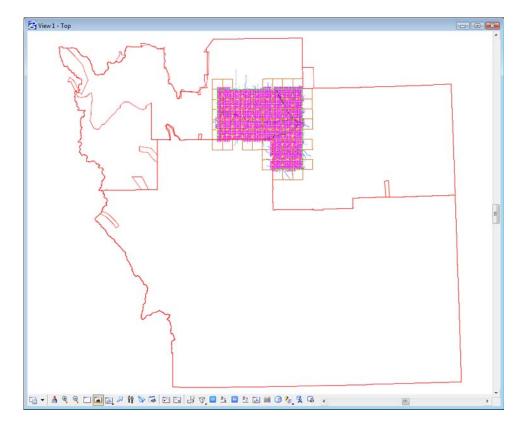
## **Chapter Objectives:**

- Reference CADD County Map into Title Sheet
- Trim Vicinity Map reference file

For training purposes, a vicinity map has been stored in the *References* folder.

Review the vicinity map.

1. *Open* the MicroStation file Elbert.dgn this file is located in: C:\Projects\12345\Design\Drawings\Reference\_Files



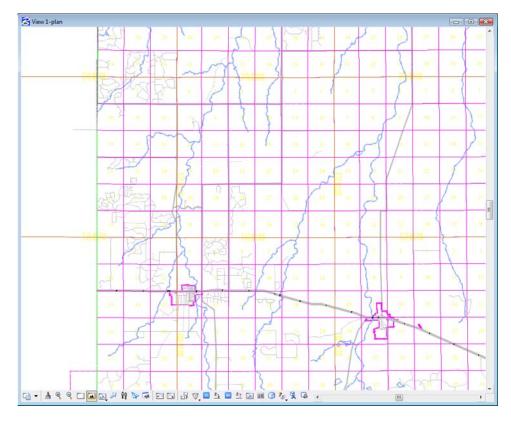
This file contains a Saved View to assist in attaching it as a reference file.

- 2. Select **Utilities > Saved Views** from the MicroStation pull-down menu.
- 3. **<D>** on the saved view by the name of *plan*

4. **<D>** in the MicroStation view

Туре	tive File Show	Status		P × 🖉 🚽 🕞 Description
	~		plan	
			pian	

The MicroStation view updates to the limits of the saved view.



5. Use other MicroStation view commands to investigate the contents of the drawing.

Open the MicroStation Level Display dialog to investigate level stratification by choosing, Settings > Level > Display. Note all information resides on GIS\_\* levels.

Level Display			
Bibert.dgn			
Name	Logical	Used 🔻	^
GIS_Bridges			E
GIS_Cities			
GIS_County-Lines			
GIS_Engineering-Regions			
GIS_Milepoints		•	
GIS_ROADS-Local			
GIS_ROADS-Major			
GIS_ROADS-Ramps-Frontage			

6. Turn level displays on and off to verify data stratification, then Close the Level Display dialog.

#### Attaching a vicinity map as a reference file

Attach the vicinity file as a reference file to the title sheet. Once attached, move, scale, and constrain the display limits.

Reopen the title sheet: 12345ROW\_TitleSht.dgn. Once open:

- 1. Select File > References from the MicroStation menu bar.
- 2. In the References dialog box, select **Tools > Attach**

⇒ (+ D ( <sup>+</sup> 1 )	9 70 Å P O	💥 <u>H</u> ilite Mode:	Boundaries	•
Model	Description		Logical	Preser
				÷
	Orientation	Rotation		+
	Orientation	Rotation		+
	Model			Image: Second

- 3. **<D>** the file *Elbert.dgn* from the ....*Design\Drawings\Reference\_Files* directory.
- 4. **<D> Open**

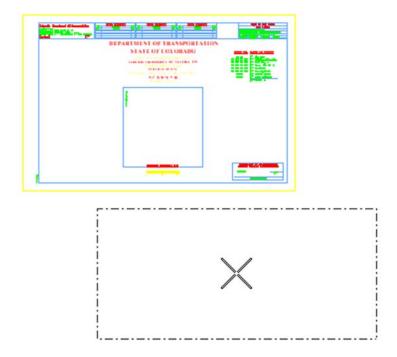
😤 Attach Referer	nce - C:\Projects\1	2345\Design\Drawi	ngs\Reference_	Files	١			
Look in:	Reference_Fil	es	•	0	🏂 📂 🛄 🕇		<b>S</b> 🖲	3D - V8 DGN
C.	Name	^	Date taken		Tags	Size 1,355 KE	Rating	
Recent Places	Elbert.agn					1,555 Kt	3 27 27	
Desktop								
CDOT_User								
								Attachment Method
Computer								Interactive
<u>.</u>								
Network								
	•		III	-			F	
	File name:	Elbert.dgn				- <u> </u>	Open	
	Files of type:	CAD Files (*.dgn;*.d	wg;*.dxf)			•	Cancel	
	•	Save Relative Pa	th			0	ptions	

- 5. Key-in the Logical Name: *Vicinity*
- 6. Key-in the Description: GIS locator map for title sheet
- 7. Select the *Saved View > plan* option in the *Orientation* section of the dialog box.
- 8. GIS maps have been designed to be inserted at a scale factor of 1:*5280* (Master : Reference). Enter that value for the Scale option.

#### 9. **<D>OK**

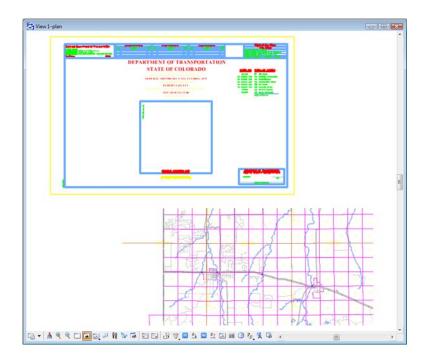
😤 Reference Attachme	ent Settings for Elbert.dgn	23
<u>Fi</u> le Name: Elber Full Path:\12 <u>M</u> odel: CDO	345\Design\Drawings\Reference_Files\Elbert.dgn	-
Logical Name: Vicini	·	
Description: GIS l	ocator map for title sheet	
Orientation:		
View	Description	
Coincident	Aligned with Master File	
Coincident - World	Global Origin aligned with Master File	=
Standard Views		
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Scale (Master:Ref)	1.000000 : 5280.000000	
Scale (Master. Her)	1.000000	
Named Group:	· · · · · · · · · · · · · · · · · · ·	
Revision:		
Clip Boundary Element:	Copy To Master	
Level:		
Nested Attachments:	No Nesting Depth: 1	
Display Overrides:	Allow	
New Level Display:	Use MS_REF_NEWLEVELDI*	
Global LineStyle Scale:	Master	
	<u>Q</u> K Cancel	

In the MicroStation view window, the limits of the saved view dynamically display relative to the location of the cursor.



- 10. **<D>** in the MicroStation view window area to attach and display the contents of the reference file.

11. Select the MicroStation *Fit* command.

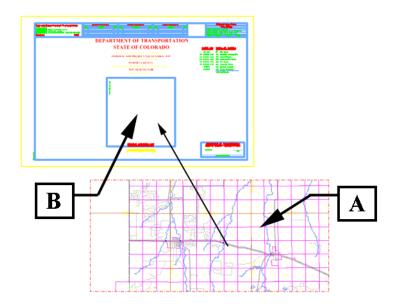


Move the reference file to align with the title sheet.

12. Select **Tools > Move** in the **References** dialog.

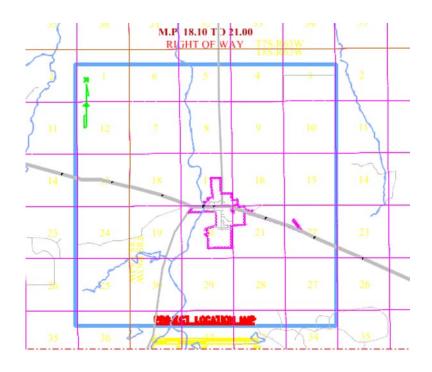
ools <u>S</u> ettings			
Attach	🖙 😓 🔁 🎦 🔂 🛃 🐔 🛱 🚰 🚇 🗙 🖽 Ma	ode Boundaries	•
Detach	Model Description	Logical	Present
De <u>t</u> ach All R <u>e</u> load Reload A <u>l</u> l	CDOT default GIS locator map for title sheet	Vicinity	Wirefran
Exchange			
E <u>x</u> change Open in New Session			,
The second second	III         Orientation         Top         Botation	0°0'0''	ŀ

13. **<D>** at point **A** and then **<D>** at point **B** to move the attached reference file.



Execute additional move commands to reposition the reference file as necessary.

- 14. **<R>** to exit the Move References command.
- 15. Zoom into the Project Location Map area of the Title Sheet.

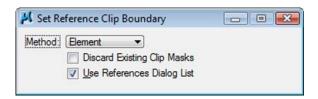


Constrain the display limits of the reference file (clip boundary)

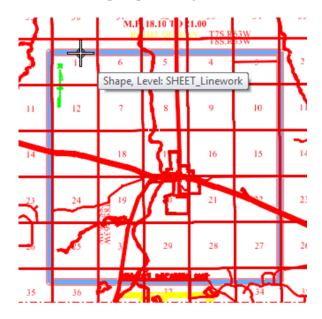
16. Select **Tools > Clip Boundary** from the Reference File dialog.

SReferences (1 of 1 unique,	1 displayed)	- • 🔀
<u>Tools</u> <u>Settings</u> <u>Attach</u> <u>Detach</u> De <u>t</u> ach All Reload Reload A <u>ll</u> <u>Ex</u> change Open in New Session	Model       Description         CDOT default       GIS locator map for title sheet	Boundaries Logical F Vicinity V
Move Copy Scale Rotate Merge Into Master Make Direct Attachment	III       III         : 5280.000000       Orientation       Top       Rotation       0°0'0         Y       -181659.497       Z       -178956.970         ♥ III       INo       No       No       No       No         able ▼          Depth:       1	
Mirror <u>H</u> orizontal Mirror <u>V</u> ertical		
Clip <u>B</u> oundary Clip Mas <u>k</u> Delete Clip Clip <u>F</u> ront Cli <u>p</u> Back		

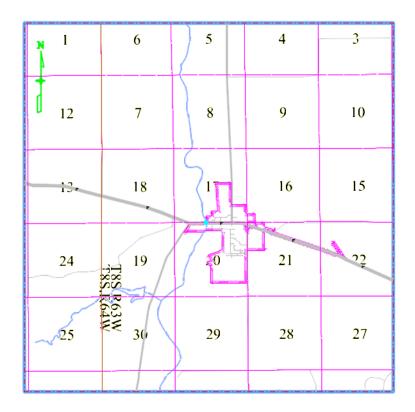
17. In the *Tool Settings* dialog. Set method to Element



18. **<D>** on the shape representing the limits of the location map display.



19. **<D>** a second time (anywhere on the screen) to accept the displayed solution.



20. Use the MicroStation command *Modify Element* command to resize the shape identified to define the clip boundary.

Modify								
🛃 🖄 💥	1	×	ン井	‡9	∋∗	]*	٦.	$\searrow$

The reference file clip boundary will reconfigure with the shape modifications.

**Note:** The exercise just completed used an existing MicroStation shape to define reference file clipping boundaries. The same process can be followed by using a MicroStation Fence to define (and redefine) the reference file clip boundary.

#### Challenge Exercises:

- Move the shape used to define the reference file limits. What happens to the graphics limits displayed?
- Use the References dialog to move the vicinity map after it has been clipped.
- Delete the shape used to define the reference file limits. What happens? (select undo, to restore the shape)
- Turn levels on and off for the reference file attachment
- Constrain the reference file display using a fence block
- Try using a circular fence to define the clipping limits
- Define a clip mask within the reference file limits

• Modify elements in the file Elbert.dgn, what happens to the graphics displayed in the vicinity map?

# LAB 22 - Locator Map – Raster Reference File

## Chapter Objectives:

- Reference locator map into Title Sheet
- Trim locator map reference file

Attach a raster reference file for the locator map. Once attached, move, scale, and constrain the display limits.

In the CADD file for the title sheet:

1. Remove the reference file (Elbert.dgn) from the previous exercise by selecting **Tools** > **Detach** from the References dialog box.

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	DEPARTMENT OF TRANSPORTATIO STATE OF COLORADO RIGHT OF WAY PLAN OF PROPOSED FEDERAL ALD PROJECT NO. STA 086A - 039 STATE HIGHWAY NO. 86 ELBERT COUNTY CONSTRUCTION PROJECT CODE NO. 14072 M.P. RIGHT OF WAY	Section         Mills of section           NE (a)         0           NE (a) <td< td=""></td<>
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		Mar old Thereico

- 2. Select File > Raster Manager from the MicroStation menu bar.
- 3. Select File > Attach > Raster in the Raster Manager dialog.

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<u>D</u> etach Detach All R <u>e</u> load			Geo Priority	Model	Display Gami Print Gamma Stati	
Sa <u>v</u> e As	-					
Import +						

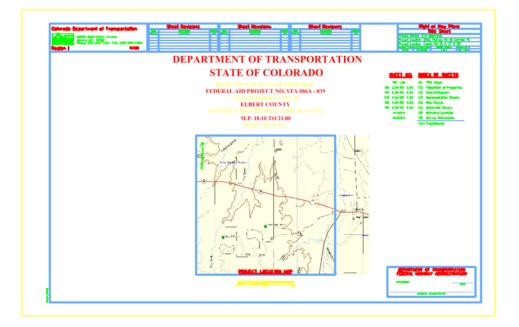
- 4. Browse to the ...\*ROW\_Survey\Drawings\Reference\_File* folder and select the file Raster locator map.jpg
- 5. *Key-in* the Logical Name *Locator*

- 6. *Key-in* the Description *Raster location map*
- 7. <D> OK

Look in:	Reference_File	es		- 3 🗊 🕑		S 🖲 🕅
ecent Places	Name	r map.jpg	Date taken	Tags	Size 114 KB	Preview Attachment
CDOT_User			111			
Network	File name: Files of type:	raster locator	map.jpg	•	Open	
	Attachement Sett			V Place Inter		

8. As in the previous lab, **<D>** to define the lower left and upper right corners that define the desired limits for the reference file.

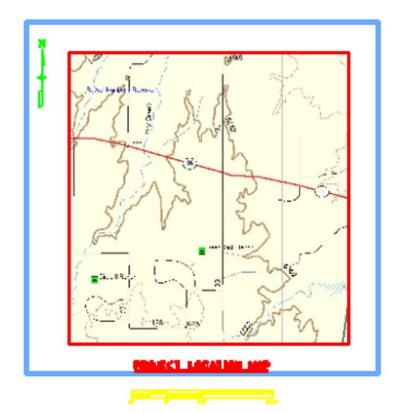
The raster reference file is attached to the title sheet



9. In the Raster Manager dialog, select Edit > Clip



10. Follow the MicroStation prompts to *define* the clip of the raster so it appears approximately as shown.



## LAB 23 - Annotation

## **Chapter Objectives:**

• Annotate using the Place Note command

Annotate the locator map using the MicroStation place note command. First select the correct symbology using the CDOT Menu.

- 1. Activate the **Drafting** Group Display.
- 2. **<D>** Text button in Drafting area.
- 3. Set the <u>Title</u> Text Type (button labeled **T** in *Drafting* area).
- 4. Set the Justification to *Left Top*
- 5. Select .14" 100% Place Note as shown.

CDOT Groups CDOT Tools	Status		6
Bridge Construction	Existing	Proposed	?
Design     Geometry     Hydraulics     Landscape Environmental     Materials Geotechnical     ROW Survey     Traffic ITS     Utilities	Drafting	S M AII	
	Border	Justification:	
	Border RE	Left Top	•
	Dimensions	A .10" 80% Title A .10" 80% Title Mono	^
	Linework	✓ <sup>A</sup> .10" 100% Place Note A.10" 100% Title	
	Patterning	A .10" 100% Title Mono A .14" 80% Title	E
	Symbols	A .14" 80% Title Mono ✓ <sup>A</sup> .14" 100% Place Note	-1
	Text	A .14" 100% Title A .14" 100% Title Mono	
		A .30" 80% Title	-

The correct settings and symbology are now set and the MicroStation Place Note command should automatically execute with the correct Text Style specified in the Place Note dialog.

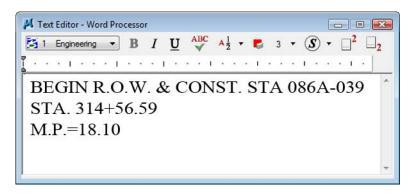
6. Select the Dimension Style CDOT 1

📕 Place Note	- • 💌	
	×A A	
<u>T</u> ext Style:	🖙 .14" ENG-100 🔻 🥄 💩	
Dimension Style:	🗂 CDOT 1 🚽 🥄 🎝	
Text <u>R</u> otation:	Horizontal 💌	
T <u>ex</u> t Frame:	None	
Height:	0.140	
Width:	0.140	Expands or contracts
🗸 Ap	oply <u>c</u> hanges to all text	the dialog
	ଚ	
	0	

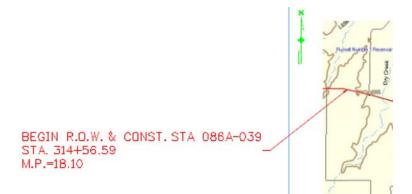
7. **Expand** the Place Note dialog and note the available options. Make sure the options selected match those shown below.

📕 Place Note	
	$\checkmark^{A}$ (A)
Text Style:	🛜 .14" ENG-100 🔻 🭳 🌛
Dimension Style:	🗂 CDOT 1 🔹 🤍 🎝
Text Rotation:	Horizontal 💌
Text Frame:	None
Height:	0.140
Width:	0.140
🔽 Ap	oply <u>c</u> hanges to all text
Location:	(Manual 🔻
Leader Type:	Line
Start At:	Terminator
Horizontal <u>Attachment:</u>	Auto 💌

8. **Key-in** the required text as shown.



9. *Follow the MicroStation prompts* to place the leader line and text (the first <D> will define the location of the arrow).

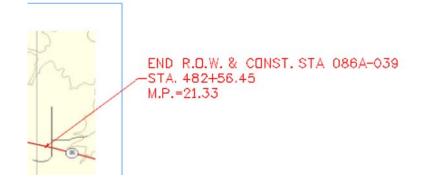


*Repeat* for the end of project information.

10. Key-in the required text as shown.

📕 Text Editor - Word Processor	×
<b>I</b> Engineering ▼ <b>B</b> $I$ $\underline{U}$ $\checkmark$ $A_{\frac{1}{2}}$ ▼ <b>B</b> $3$ ▼ $\underline{S}$ ▼ $\underline{-}^2$	2
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END R.O.W. & CONST. STA 086A-039	~
STA. 482+56.45	
M.P.=21.33	
	Ψ.

Follow the MicroStation prompts to place the leader line and text



11. Select File > Save Settings

#### Challenge Exercises:

- Insert a scale bar cell and/or north arrow (General.cel)
- Input a basis of bearing note
- Replace the information in the top-left corner of the sheet (ROW.cel)



## LAB 24 - Land Survey Control Diagram Plan Sheet

## Chapter Objectives:

• Import XML data into a MicroStation file

In this sheet, coordinate information will be input in a tabular format.

1. Select File > Open (if MicroStation is currently open).

Look in:	Drawings		- (	) 🏚 📂 💷 🕈	Õ	S 🖹		3D - V8 DGN	
A.	Name	*	Date modified	Туре	Size	•			
Recent Places	312345ROW	/_Cnty-24x18_##.dgn /_Cnty-24x36_##.dgn	1/18/2008 8:15 1/18/2008 8:15	i MicroStation D.			P	-	-
		_Ownership##.dgn	1/18/2008 8:15 1/18/2008 8:15	MicroStation D.					
Desktop		/_TabProp01.dgn	1/18/2008 8:15 1/18/2008 8:15	i MicroStation D.					
CDOT_User	12345ROW	/_TabProp02.dgn /_TabProp03.dgn	1/18/2008 8:15 1/18/2008 8:15	i MicroStation D.		-			
	12345ROW	/_TabProp04.dgn /_TabProp##.dgn	1/18/2008 8:1 1/18/2008 8:1	MicroStation D.					
Computer		/_MonRcrd##.dgn	9/25/2009 8:11 1/18/2008 8:15	MicroStation D.		_			
2	And a state of the	/_PlanLSCD##.dgn /_PlanPCD##.dgn	1/18/2008 8:15 1/18/2008 8:15		**************				
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	•		m			+			
	File name:	12345SURV_PlanLS	CD##.dgn	•	Ope	n	User:	CDOT User	
	Files of type:	All Files (*.*)		•	Cano	cel	Project:	12345	
		Open as read-only			Optio	ns	Interface:	CDOT	

- 2. **<D>** the filename *12345SURV\_PlanLSCD##.dgn*
- 3. Select File > Save As from the MicroStation Manger dialog.
- 4. Key-in 12345SURV\_PlanLSCD3B.dgn

#### 5. **<D> Save**

📕 Save As - C:\P	rojects\12345\RO\	V_Survey\Drawings	١						X
Save in:	) Drawings		•	G 💋	b 📂 🛄 🕇				
Recent Places Desktop CDOT_User Computer		nty-24x18_##.dgn nty-24x36_##.dgn lon##.dgn wmership##.dgn ahProp01.dgn abProp02.dgn abProp03.dgn abProp04.dgn abProp04.dgn lteSht.dgn	Date modii 123455UR\ 123455UR\ 123455UR\ 123455UR\	/_PlanL /_PlanP /_TitleL	CD##.dgn SCD##.dgn		»		
Network	File name: Save as type:	12345SURV_PlanL MicroStation V8 DG	-		•	Save Cance Option	3		

- 6. **Zoom/Window** into the upper-right corner of the sheet.
- 7. Edit the text as shown using Edit Text command.

Land Survey ControlDiagram								
Plan Sheet								
Project Number: STA 086A-039								
Project Location: SH 86 CORRIDOR PE								
Project Location: COUNTY RD. 25 & 27 & 33								
Project Code: Last Mod. Date Subset Sheets Sheet No.								
12345 09-25-09 3 of X.XX 3B								

8. Use the MicroStation Fit command to view the entire sheet.



In this sheet, place coordinate information representing a Project Coordinate Summary Table. This coordinate information will be extracted from InRoads using the reporting utility XML.

### Using XML to report on Coordinates

Use InRoads and XML reporting to insert a Project Coordinate Summary Table. Report on points 100-120.

<unnamed> -</unnamed>	Ta 📚 🚳 🔪 🌶	? 🗾 🔀 🔛		
File Surface Geometry Drainage	Survey Evaluation	<u>M</u> odeler Dr <u>a</u> fting <u>T</u> ools <u>H</u> elp		
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	Name	Description	Style	No
E-A Geometry Projects	100	Section Corner	T_Section Cor	1558
Default	:: 102	Quarter Section Corner	T_Quarter Sect	1558
□ 🚰 12345_ROW	103	Quarter Section Corner	T_Quarter Sect	1555
Cogo Buffer	:: 104	Quarter Section Corner	T_Quarter Sect	1555
105	105	Section Corner	T_Section Cor	1558
3878 1	106	Quarter Section Corner	T_Quarter Sect	1558
1095 2	107	Quarter Section Corner	T_Quarter Sect	1555
	:::108	Quarter Section Corner	T_Quarter Sect	1555
😂 Surfaces 🐰 Geometry 💽	•			•

- 9. If not already running and loaded:
  - Launch InRoads & Load the Geometry Project 12345\_ROW.alg from C:\Projects\12345\ROW\_Survey\InRoads\Geometry
- 10. Select Tools > XML Reports > Geometry from the InRoads interface.
- 11. In the XML Reports dialog, **<D>** the Geometry folder and identify Cogo points **100-120**

🖌 Geometry Report		
Horizontal Alignments Include:	Cogo Points Include: 100-120 +	Apply
Selected:	Selected:	Close
Name Description Style	Name       Style         100       T_Section Comer         102       T_Quarter Section Co         103       T_Quarter Section Co         104       T_Quarter Section Co         105       T_Section Comer         106       T_Quarter Section Co         107       T_Quarter Section Co         107       T_Quarter Section Co         107       T_Quarter Section Co	Filter Preferences Help
All Active     Include Cant Alignments     All Active     Include Vertical Event Points     Include Horizontal Event Points	Limits  Station  Start: 0+00.00  ♦	

- 12. **<D> Apply**. The report browser will open to a default report style.
- 13. **<D>** the CDOT Folder.

14. **<D>** the **CDOT\_ListCoordinates.xsl** style sheet.

le Tools Help							
Workspace Workspace CDOT_XMVStandards/Global/UnRoads' Bridge Cort CDOT Ar Rights Easement Description xal A) CDOT Fee Parcel Description xal A) CDOT Fee Parcel Description xal A) CDOT Stope Easement Description xal A) CDOT Temporary Easement Description xal A) CDOT Temporary Easement Description xal A) CDOT Temporary Easement Description xal A) CDOT Utily Easement Description xal A) CDOT Utily Easement Description xal A) CDOT Monumentation_Clearance xal A) CDOT_Monumentation_Clearance xal Cortion DetaCollection Evaluation Geometry ICS	E	Descrip File Na Revi	ject: 12345_R tion: c:\Projec ROW_S Last	OW ts\12345	ed: 9/25/200 12:32pm		
Images IntersectingAlgnmentStations LegalDescription UghtRailManufacturing		Cogo Points POINT NAME	NORTH (ft)	EAST (ft)	ELEV (ft)	DESCRIPTION	
MapCheck Obsolete		100	1558457.41	3269295.23	6654.37	Section Corner	
RoadwayDesign		102	1558430.90	3266629.98	6654.37	Quarter Section Corn	er

- 15. Select File > Save As
- 16. Navigate to the 12345\ROW\_Survey\InRoads\Reports folder and input the file name 12345\_PCST01.xml

Save in:	Reports	🕌 Reports 🔹 🗲 🔁						
Ca.	Name	Date modif	Туре	Size	Tags			
Recent Places	SBP Lot 1							
Computer								
Computer Computer Network	File name:	12345_PCS	T01.xml		<u> </u>	Save		
<u></u>	File name: Save as type:	12345_PCS XML File (*x	and the second s		• •	Save		

17. **<D> Save** to save the file.

### Excel in MicroStation

Tables can be created in MicroStation by linking information that is contained in an Excel spreadsheet. There are several advantages to using the linked spreadsheet method. Some of these are:

- Text formatting in the spreadsheet is retained by MicroStation
- Graphics (borders, girds, etc) are retained from the Excel file

• Updates to the Excel file are reflected in the MicroStation file

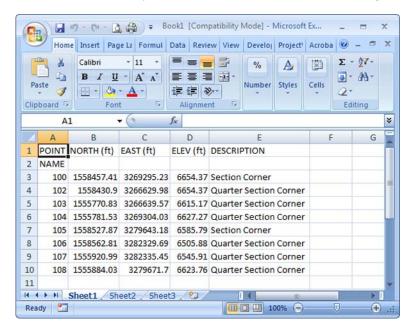
In the Bentley InRoads Report Browser:

18. **<R>** on the report in the coordinate list area as shown. A fly out menu will appear.

:\Workspace\Workspace-CDOT_XM\Standards-Global\InRoads\XMI			-	
CDOT CDOT Aring Description xal CDOT Aringhts Essement Description xal CDOT For Parch Description xal CDOT The Parce Description xal CDOT Temporary Essement Description xal CDOT Temporary Essement Description xal CDOT Utility Essement Description xal CDOT Utility Essement Description xal CDOT Utility Casement Description xal CDOT Temporary Essement Description xal CDOT Temporary Essement Description xal CDOT Utility Casement Description xal CDOT Temporary Essement Description xal CDOT Utility Casement Description xal CDOT Temporary Essement Description xal CDOT Utility Casement Description xal CDOT Temporary Essement Description xal CDOT Temporary Essement Description xal CDOT Utility Casement Description xal CDOT Temporary Essement Comporary Essement Essement xal CDOT Temporary Essement Essement Xal CDOT Temporary Essement Essement Essement Xal CDOT Temporary Essement Xal CDOT Tempor	D	Back Forward Save Background As Set as Background Copy Background Copy Background Select All Paste Create Shortcut Add to Favorites View Source Encoding	ates Report d: 9/25/2009 2:39pm eometry\12345_ROW.alg 0:21 PM	
LegalDescription LightRalManufacturing MapCheck Obsolete ReadwayObegin Schemas Stakout StationOffset	Cogo P N	Print Preview Refresh Append to Existing PDF Convert to Adobe PDF Customize Menu Export to Microsoft Excel Fill Forms RoboForm Toolbar Save Forms	ELEV (ft) DESCRIPTION 6654.37 Section Corner 6654.37 Quarter Section Corner	

19. Place the cursor over the coordinates (the bottom half of report) and select **Export to Microsoft Excel** from the fly-out menu.

Excel should automatically launch if it is installed on the PC being used.



20. Make changes to the data or add formatting.

	А	В	С	D	E						
1	PROJECT COORDINATE SUMMARY TABLE										
2	POINT NAME	PROJECT COO	RDINATES	ELE ((4))	DESCRIPTION						
3		NORTH (ft)	EAST (ft)	ELEV (ft)	DESCRIPTION						
4	100	1558457.41	3269295.23	6654.37	Section Corner						
5	102	1558430.9	3266629.98	6654.37	Quarter Section Corner						
6	103	1555770.83	3266639.57	6615.17	Quarter Section Corner						
7	104	1555781.53	3269304.03	6627.27	Quarter Section Corner						
8	105	1558527.87	3279643.18	6585.79	Section Corner						
9	106	1558562.81	3282329.69	6505.88	Quarter Section Corner						
10	107	1555920.99	3282335.45	6545.91	Quarter Section Corner						
11	108	1555884.03	3279671.7	6623.76	Quarter Section Corner						
12											

21. and save the spreadsheet to the ... \ROW\_Survey \InRoads \Reports \ directory.

Save As								1	×
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File name:	Project Coordinate Sun	nma	iry						•
Save as type:	Excel 97-2003 Workboo	k (*.:	xls)						•
Authors: (			Tags	: Add a tag					
Hide Folders	Save Thumbnail				Tools	•	Save	Cancel	

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	Calibu aste oboard	$\begin{array}{c c} \mathbf{r} & \mathbf{r} & 11 & \mathbf{r} \\ \mathbf{Z} & \mathbf{U} & \mathbf{A}^{*} & \mathbf{A}^{*} \\ \hline \mathbf{Q} & \mathbf{A}^{*} & \mathbf{A}^{*} \\ \hline \mathbf{Font} & \mathbf{G} \end{array}$	■ <del>■</del> ■ 律律 ≫			6 A D Σ · 27 · mber Styles Cells 2 · A3 · Editing				
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	A	В	С		B	I 🗐 🗄 • 🦄 • 🗛 • 號 👯				
1		PROJECT	COORDINATE S	UMM		TADIC				
2	POINT NAME	PROJECT COO	RDINATES		x	Cu <u>t</u>				
3		NORTH (ft)	EAST (ft)	ELE	b	Copy				
4	100	1558457.41	3269295.23	6	8	Paste				
5	102	1558430.9	3266629.98	6		Paste Special				
6	103	1555770.83	3266639.57	6		Insert				
7	104	1555781.53	3269304.03	6		Delete				
8	105	1558527.87	3279643.18	6						
9	106	1558562.81	3282329.69	6						
10	107	1555920.99	3282335.45	6		Filter				
11	108	1555884.03	3279671.7	6		Sort				
12	United the	A	eet3 🖉 🖓			Insert Comment Format Cells				
A	verage: 1209588.5.	23 Count: 47	Sum: 38706832.72	2		Pick From Drop-down List				

22. Select the range of information to be displayed in the MicroStation file.

23. **<R>** on the spreadsheet data and select **Copy** from the fly-out menu.

### RETURN TO MICROSTATION

24. Select **Edit > Paste Special** from the MicroStation menu bar.



- 25. <D> the Linked Microsoft Office Excel 2003 Worksheet option.
- 26. <D> Paste
  - **Note:** By choosing linked, updates made to the Excel file can be passed back to the MicroStation file through updating. Selecting embedded does not provide this dynamic ability.

27. In the Paste OLE dialog box, set Paste as to *Link*, Method to *By Size*, and input a Scale of *10* 

📕 Paste OLE Object 🛛 🗖 🖷	×
Object: Microsoft Office Excel 2003 Work Paste as: Link Method: By Size	
Display as icon Transparent Background Rotate With View Scale: 10.0000 Size: (42.917, 20.927) "	
Size: (42.917 x 20.937) "	

**Note:** At this time, we do not fully understand the correlation between the scale and resulting text size. For this example, 10 seemed to produce reasonable results. Once placed, the text height can be measured and the bounding shape of the linked Excel table can be scaled up or down accordingly to achieve required text size.

POINT	NORTH (ft)	EAST (ft)	ELEV (ft)	DESCRIPTION
102	1,558,430.90	3,266,629.98	6,654.37	Control Monument-Project
103	1,555,770.83	3,266,639.57	6,615.17	Control Monument-Project
104	1,555,781.53	3,269,304.03	6,627.27	Control Monument-Project
105	1,558,527.87	3,279,643.18	6,585.79	Control Monument-Project
106	1,558,562.81	3,282,329.69	6,505.88	Control Monument-Project
107	1,555,920.99	3,282,335.45	6,545.91	Control Monument-Project
108	1,555,884.03	3,279,671.70	6,623.76	Control Monument-Project
113	1,556,247.10	3,279,252.22	6,624.10	Traffic Control Double Yellow
117	1,558,514.31	3,277,056.40	-	N 1/4 Cor Section 14
119	1,555,884.03	3,279,671.70	6,585.79	W 1/4 Cor Sec 13
120	1,553,239.97	3,279,699.86	-	SE Cor Section 14

- **Note:** Hatching on the MicroStation representation of the linked Excel data indicates the spreadsheet is currently open for editing.
- 28. Close Excel and note the hatching is eliminated from the display.

Activating the Element Selection tool and entering a  $\langle D \rangle \langle D \rangle$  on the border of the linked table in MicroStation will launch the Excel application. If the Excel file is initialized from MicroStation the linked data will automatically update when the Excel file is saved and closed.

29. Use the MicroStation Element Selection Tool and <D><D> on the border of the linked data.



30. Make an edit to the spreadsheet data or formatting.

POIN	IT NORTH	EAST	ELEV	DESCRIPTION		
1	1,558,430.90	3,266,629.98	6,654.37	Control Monument-Project		
1	103 1,555,770.83 3,266,639		6,615.17	Control Monument-Project		
1	1,555,781.53	3,269,304.03	6,627.27	Control Monument-Project		
1	<b>05</b> 1,558,527.87	3,279,643.18	6,585.79	Control Monument-Project		
1	06 1,558,562.81	3,282,329.69	6,505.88	Control Monument-Project		
1	1,555,920.99	3,282,335.45	6,545.91	Control Monument-Project		
10	08 1,555,884.03	3,279,671.70	6,623.76	Control Monument-Project		
1	13 1,556,247.10	3,279,252.22	6,624.10	Traffic Control Double Yellow		
1	17 1,558,514.31	3,277,056.40	N/A	North 1/4 Cor Section 14		

31. Save and Close the Excel file. Note the linked data in the MicroStation file updates.

If the linked data is edited by launching the application outside of MicroStation, a manual update command must be executed. Select **Edit** > **Update Links** from the MicroStation menu bar to refresh the linked MicroStation graphics.

The linked data can be moved, scaled, or otherwise manipulated with MicroStation commands by selecting the border of the linked object.

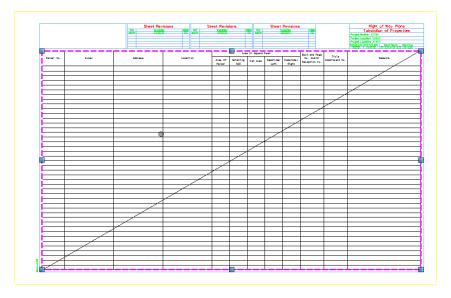
# LAB 25 - Tabulation Properties Sheet

## **Chapter Objectives:**

- Edit Microsoft Excel information from within MicroStation In this sheet, information will be updated using Microsoft Excel. Return to the MicroStation manager dialog.
- 1. Select File > Open

Look in:	)) Drawings		👻 🌀 💋	▼ 🛄 对	🗋 活 🖲	3D - V8 DGN
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	12345ROW_	Cnty-24x18_##.dgn	32 K	в		
		Cnty-24x36_##.dgn	33 K	в	E	
Desktop	12345ROW		59 K	в		
100	212345ROW_	Ownership##.dgn	34 K	в		
1	212345ROW_	Plan##.dgn	34 K	в		
CDOT_User	12345ROW	41 K	В			
	<b>12345ROW</b>	TabProp02.dgn	39 K	В	I	
	<b>12345ROW</b>	TabProp03.dgn	40 K	40 KB		
Computer	<b>12345</b> ROW_	TabProp04.dgn	39 K	В		
	<b>212345</b> ROW_	TabProp##.dgn	35 K	В	-	
	File name:	12245DOW Tab Pres 01 day		-	0	
Network	rile name:	12345ROW_TabProp01.dgn			Open	
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)			Cancel	

- 2. <D> the filename 12345ROW\_TabProp01.dgn
- 3. **<D> Open**



4. **<D> <D>** on the outline of linked data to open up XLS link in Excel.

**Note:** When a linked excel file is opened for editing in Excel a hatched pattern displays in your MicroStation view. This is to indicate that the file is being accessed from an external program.

	Home	Insert Page Layout	Formulas Data Review	View Developer Pr	ojectWise	Acrobat			🥹 – 🖻	
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	A3		arcel No.							
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5. Insert data into Excel. (sample data is provided below)

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	A	в	С	D	E	F	G	н —				
1	Sheet 1 - Tabulation of Prop											
3						Are	a In Square	Feet				
4	Parcel No.	Owner	Address	Location	Area Of Parcel	Existing ROV	Net Area	Remaind Left				
5	1	Dianne M. McNamara & Ronald Eggleton	5937 Highway 86	SE 1/4 Sec 9	20,995.000	0	20,995.000					
6		0	Elizabeth, CO 80107				1					
7												
8												
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1		2.01 RW 2.02 RW 2.03	/ RW 2.04 / 💭 /	14								
Re	ady 🎦					75%						

Parcel No: 1 Owner: Dianne M. McNamara & Ronald Eggleston Address: 5937 Highway 86 Elizabeth, CO 80107 Location: SE 1/ 4 Sec 9 Area of Parcel: 20,995 s.f. (0.51 acre) Net Area: 20,995 s.f. (0.51 acre)

			Sheet Re				one		
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		Γ						Are	a In Square J
Parcel No.	Omer		Address	Location			Area Of Parcel	Existing	Net Area
1	Manne N. McManara & Ronald Eggleton	5237 Righway 56		51 1/4 Sec 9			20,995.000		20,995.000
		E111	mbeth, CD 50107						

6. Save and Exit in Excel; the MicroStation file will update.

7. To update MicroStation without exiting Excel: Save edited Excel data. Then select **Edit>Update Links** from the MicroStation pull-down.

# LAB 26 - Reference Files for Plan Sheets

# Chapter Objectives:

- Create plan sheets referencing in files
- Clipping reference files
- Rotate reference files

Two approaches can be used to assemble plan sheets. In the first part of this chapter the 'manual' method of attaching reference files will be used. This is followed by using the InRoads sheet generation command known as the Plan and Profile Generator.

The contents of the reference files are not important to this process and may not accurately reflect the contents and layout of a final plan sheet.

This lab will relocate the border sheet to align with the design graphics.

# Moving border sheets to align with design information

In a previous exercise graphics (locator map) were moved to align with the title sheet. This may suffice for information that is not coordinate dependent but is not an acceptable practice in the generation of engineering drawings. The following workflow will result in a product that conforms to CDOT standards.

This first lab uses the 'manual' method for designing a plan set layout and assembling the plan sheets. A following lab will use the InRoads Plan and Profile generator command to 'automate' the process.

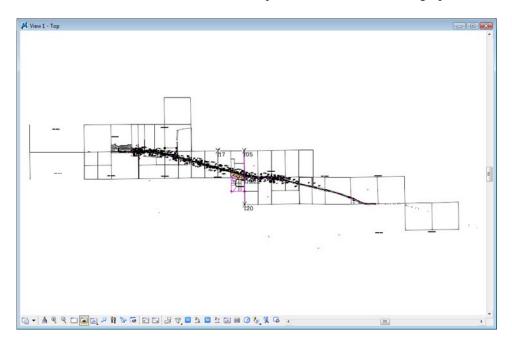
The process for this lab is:

- Define the plan sheet limits, rotation, and size(s)
- Create a sheet file containing a border for each plan sheet
- Attach the appropriate reference files
- Rotate sheets normal to the MicroStation view for ease of use
- Define reference file clip boundaries

📕 MicroStation	Manager - C:\Pro	jects\12345\ROW_Survey\Drawing	js\Referer	nce_Files\				<b>X</b>
Look in:	Reference_F	Files 🗸	G 🤌	• 🖽 🥙	id 🔁	۲	3D - V8 DGN	
œ.	Name	*	Size		-			-
~ <u>~</u>	12345ROW	Model.dgn		697 KB				
Recent Places	<b>12345ROW</b>	Model2.dgn		822 KB				
	12345ROW	Model-TG.dgn		793 KB		E		-
-	212345SURV	_Model.dgn		27 KB	E			
Desktop	212345SURV	_Topo50Scale01.dgn		30 KB				
100	12345SURV	_Topo##Scale##.dgn		26 KB				
	12345SURV	_TopoCodes100Scale01.dgn		737 KB				
CDOT_User	12345SURV	_TopoElevations100Scale01.dgn		750 KB				
	12345SURV	_TopoNames100Scale01.dgn		699 KB		1		
	12345SURV	_TopoNotes100Scale01.dgn		131 KB				
Computer	12345SURV	_TopoSymbols100Scale01.dgn		570 KB				
	SURV_	TopoCodes##Scale##.dgn		27 KB	-			
- <u>-</u>	File name:	12345ROW_Model.dgn		-	Open		User: CDOT User	•
Network	Files of type:	All Files (*.*)		-	Cancel	]	Project: 12345	•
		Open as read-only		(	Options	In	terface: CDOT	•
								н

1. Open the MicroStation file 12345ROW\_Model.dgn

2. Select the MicroStation Fit command to expand the view to show all graphics.



 Select Element > Cells to verify the *ROW* cell library is attached. If not, select File > Attach from the Cell Library dialog and attach ROW.cel from the cell library list.

<u>U</u> se Shared Cells <u>D</u> is	play All Cells In Path	Display: Wireframe
Name ^	Description ^	
ROW_XSEC-Temporary-Easement	CDOT XSEC Temporary Easement Propo	
ROW_XSEC-Township-Monument-ex		
ROW_XSEC-Utility-Easement-ex	CDOT XSEC Utility Easement Existing	2
ROW_XSEC-Utility-Easement-pro	CDOT XSEC Utility Easement Proposed	
ROW_XSEC-Virgin-Access-Ctrl-pro	CDOT XSEC Virgin Access Contol Propo	
RWPL Cuts	EDWTRAFESHeetginburketsess Contol Propo	
SHEET_ROW-County-recording SHEET Region-Dave-Mantych	County recording information for title shee ROW Sheet Regional Dave Mantych	
SHEET_Region-Dave-Stewart	ROW Sheet Regional Dave Mantych ROW Sheet Regional Dave Stewart	
SHEET_Region-Jack-Messenger	ROW Sheet Regional Jack Messenger	1
•	•	
Active Cells		
Placement RWPL Cuts	Point Flement	Edit Delete
RWPL Cuts	Point Element	<u>E</u> ur Delete
Terminator NONE	Pattern NONE	Create Share

- 4. **<D><D>** rapidly on the cell name *RWPL Cuts* to identify this as the 'Placement' cell and activate the place cell command.
- 5. In the **Place Active Cell** dialog, set the X and Y scale to **300**, and **Active Angle** to **0**. A Z scale of **1.0** should be used. An X and Y scale of 300 is used because this reflects the scale the survey control diagram sheets will be developed at.

ዞ Place Activ	/e Cell	- • •
Active Cell:	RWPL Cuts	۹,
Active Angle:	0°0'0.00''	
X Scale:	300.000000	
Y Scale:	300.000000	4
Z Scale:	1.000000	
		•

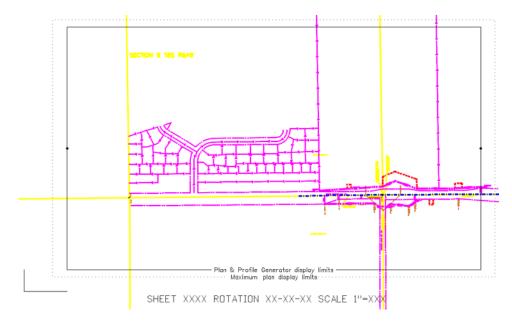


SHEET XXXX ROTATION XX-XX-XX SCALE 1"=XXX

#### About this cell:

This cell was created to facilitate the planning of eventual sheets. It contains text characters that can be edited to indicate sheet name, rotation, & scale. The outer line-work depicts the maximum display limits for graphics as it relates to the border sheet. The inside shape reflects  $\frac{1}{2}$  inch inside this maximum limit. It also reflects the maximum limits that would be displayed if the sheet was created with the Plan and Profile generator command within InRoads. The 'dots' in the vertical lines represent  $\frac{1}{2}$  of the sheet height and assist in centering planimetrics information on the sheet. All information is written to the MicroStation level **DRAFT\_INFO\_No-Plot**.

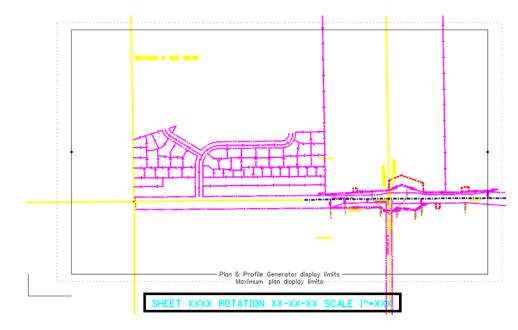
6. **<D>** to place the cell in the MicroStation file, move as necessary. These graphics will define the limits for the plan sheet when referenced back to the border.



The above graphics approximately represent the required limits for the first sheet. Position the sheet limit cell as you see fit.

7. Use the **Edit Text** command to complete the text at the bottom of the sheet. This will assist in managing the sheets as reference files.





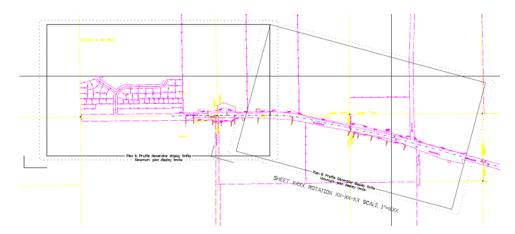
8. **<D>** on the text at the bottom of the layout sheet.

 Replace the appropriate sheet information in the *Text Editor* as follows: *LSCD03C 00-00-00*

1	Engineering	•	B 1	U	ABC	A <sup>1</sup> / <sub>2</sub> → [	6	• S	• 🖓² 🖓₂					
•	$\cdot + \cdot \cdot$	• 1		1 +	•••		• •	• i •	$(1,1) \in \{1,2\}$	$1 \rightarrow \infty$	• 1 • • • 1	$\cdot$ $\cdot$ $\cdot$ $1$		
	SHEE	Т	LSC	DO	30	ROT	ATI	ON	00-00	-00	SCALE	1"=30	00'	

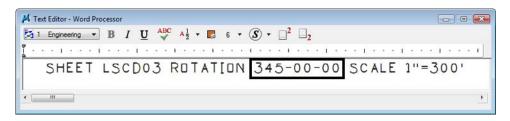
- 10. **<D>** anywhere to accept the change.
- 11. Use the MicroStation **Copy** command to duplicate the graphics for the second sheet.

12. Use the MicroStation **Rotate** command to align the graphics for the second sheet (345 degrees, -15 also works).



*Replace* the appropriate sheet information at the bottom of the copied sheet.

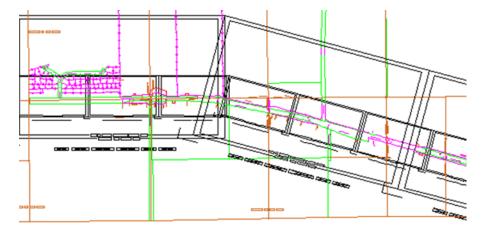
13. In the Text Editor enter: *345-00-00* 



14. Continue planning the sheet layout for the remainder of the project.



Complete a few sheets to understand the concept. It is not the intention of this lab to complete the layout for the entire project.



**Note:** Sheets at other scales could also be laid-out at this time. For instance, monumentation or right of way plan sheets at a scale of 1"=100'

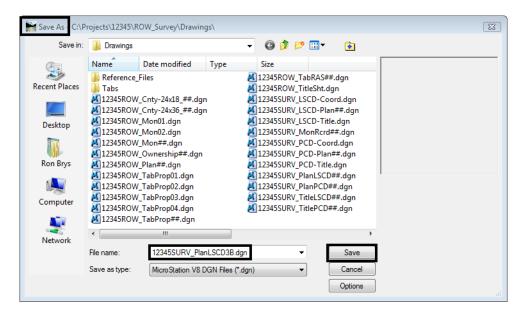
A major benefit of this workflow is that the eventual limits and orientation of sheets are determined early in the process. These sheet limits can be used to identify proper positioning, size, and rotation of text and tables. This is in addition to acting as a guide for attaching the planimetrics to the border sheets.

# Assembling the plan sheets

15. *Open* the MicroStation file ....ROW\_Survey\Drawings\ 12345SURV\_PlanLSCD##.dgn

Look in:	Drawings		•	G 🗊 🖻	• • • • • • • • • • • • • • • • • • • •	03	*	3D - V8 DGN
(Pa)	Name	Date modified	Туре	Size				
ecent Places	12345ROV     12345SUR     12345SUR	V_TabRAS##.dgn V_TitleSht.dgn V_LSCD-Coord.dgn V_LSCD-Plan##.dgn V_LSCD-Title.dgn V_PCD-Coord.dgn V_PCD-Coord.dgn V_PCD-Plan##.dgn V_PCD-Title.dgn V_PlanLSCD##.dgn V_TitlePCD##.dgn V_TitlePCD##.dgn						
<u>.</u>				m			•	
Network	File name:	12345SURV_Pla	anLSCD##.dgn	-		Open		
	Files of type:	CAD Files (*.dgn	* dura * duft)		a Ē	Cancel		

16. File > Save the MicroStation file as ....ROW\_Survey\Drawings\ 12345SURV\_PlanLSCD3B.dgn the new file is written to disk and opened.



This file will be used to assemble drawing 4 of the plan subset. This will be accomplished by aligning a cell representing the border with the planimetrics. The current graphics will not be used.

17. *Delete* the border sheet graphics contained in the MicroStation file.

This sheet will be developed at a scale of 1:300. The MicroStation model properties require modification so that the annotation scale matches the plot scale.

18. Open the Models dialog.



19. **<D>** the Edit Model Properties icon.

En Acti	ve File	- 🗅 🖥 🚰	× 🤌 🗆 ≻
Туре	2D/3D	Name	Description
٦	Ũ	CDOT Default	Master Model

20. <D> the drop-down list and select *CUSTOM*, then input *300:1* 

Model Properties	
Iype: Design ▼ 3D ▼ <u>N</u> ame: CDOT Default Description: Master Model	Custom Scale
Ref Logical:       Line Style Scale:	Design:         Paper:           300         :         1.00000           QK         Cancel
Update Fields Automatically Cell Properties Can be placed as a cell Cell Type: Graphic  Can be placed as an annotation cell OK Cancel	

21. Set the *Line Style Scale* to Annotation Scale.

# 22. **<D> OK**

📕 Aler	t	8
?	Do you want to propagate existing annotations?	e the new annotation scale to
-	Yes	No

- 23. Attach the file used in the geometry training portion of this course from the ...\ROW\_Survey\Drawings\Reference\_Files folder;
  - ◆ 12345ROW\_Model.dgn
- 24. Select File > References

Look in:	Reference	Files	- (	) 😰 📂	··· •	8	۲	3D - V8 DGN
(Fin	Name	*		Size				
	12345ROV	_Model.dgn		670	КВ			
Recent Places	<b>12345ROV</b>	_Model2.dgn		822	KB			
	<b>12345ROV</b>	_Model##.dgn		698	КВ			
~	<b>12345</b> ROV	_Model-TG.dgn		793	КВ			
Desktop	212345SUR	/_Model.dgn		27	KB			
100	12345SUR	/_Topo50Scale01.dgn		30	КВ			
160 - C	12345SUR	/_Topo##Scale##.dgn		26	КВ			
CDOT_User	212345SUR	_TopoCodes100Scale01.dgn		737	КВ			
	12345SUR	/_TopoElevations100Scale01.d	lgn	750	КВ			Attachment Method
	12345SUR	/_TopoNames100Scale01.dgn		699	КВ			
Computer		_TopoNotes100Scale01.dgn		131				Interactive
		_TopoSymbols100Scale01.dg	n	570	KB			
		_TopoCodes##Scale##.dgn		27				
Network		_TopoContour##Scale##.dgn		27				
		_TopoElevations##Scale##.dg	In	27				
		_TopoNames##Scale##.dgn		27				
		_TopoNotes##Scale##.dgn		27				
	SURV 3 JPC#SURV	_TopoSymbols##Scale##.dgn		27	КВ			
	File name:	12345ROW_Model.dgn		•		Open		
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)				Cance	-	
	Tiles of type. ▼	Save Relative Path		•		Option	_	

25. From the **References** menu select **Tools > Attach** 

26. Highlight the file *12345ROW\_Model.dgn* and **<D> Open**.

The Reference Attachment Settings dialog appears for the 12345ROW\_Model.dgn file.

Die Neuer 1004	
-	5ROW_Model.dgn rawings\Reference_Files\12345ROW_Model.dgn
Model: CDOT	
_	
Logical Name: ROW	
Description: new l	ROW intersection
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views	
Named Fences (non	ne)
Toggles:	<b>□</b>
Toggles: Sc <u>al</u> e (Master:Ref)	
Sc <u>a</u> le (Master:Ref)	
Sc <u>a</u> le (Master:Ref) Named Grou <u>p</u> ;	1.000000 : 1.000000 ~ ~ ~
Sc <u>al</u> e (Master:Ref) Named Grou <u>p</u> ; Revision:	1.000000 : 1.000000 ~ ~ ~
Sc <u>a</u> le (Master:Ref) Named Grou <u>p</u> ; Revision: Clip Boundary Element:	1.000000 : 1.000000
Scale (Master:Ref) Named Group; Revision: Clip Boundary Element: Level:	1.000000       :       1.000000         •       •       •         Copy To Master       •       •         •       •       •         No Nesting       •       Depth:       1
Scale (Master:Ref) Named Group: Revision: Clip Boundary Element: Level: <u>N</u> ested Attachments: Display Overides:	1.000000       :       1.000000         •       •       •         Copy To Master       •       •         •       •       •         No Nesting       •       Depth:       1
Scale (Master:Ref) Named Group: Revision: Clip Boundary Element: Level: <u>N</u> ested Attachments: Display Overides:	1.000000       :       1.000000         ▼       ▼         Copy To Master       ▼         ▼       ▼         No Nesting       ▼         Allow       ▼         Use MS_REF_NEWLEVELDIF
Scale (Master:Ref) Named Group: Revision: Clip Boundary Element: Level: Mested Attachments: Display Overides: New Level Display:	1.000000       :       1.000000         ▼       ▼         Copy To Master       ▼         ▼       ▼         No Nesting       ▼         Allow       ▼         Use MS_REF_NEWLEVELDIF

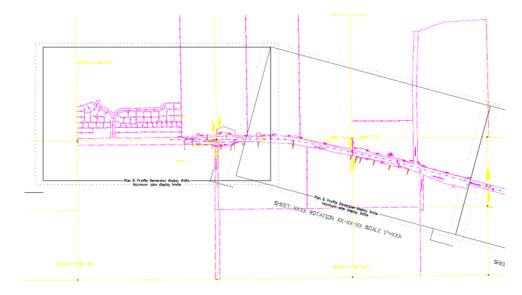
27. Enter a Logical Name and Description as shown.

# 28. **<D> OK**

The file is now attached.

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<u>T</u> ools	Settings									
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Slot 8	₱ File Name		Model	D	escription				Logical	P
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Scale	1.000000	: 1. Y		Ori			1	Rotation	0*0'0''	]
Scale		Ľ	.000000		-178956	971		Rotation ▼ Depth		]

- 29. Close the References dialog.
- 30. Select the MicroStation Fit command.



31. Window or Zoom into the beginning of the project.

Note the graphics placed previously to indicate sheet limits.

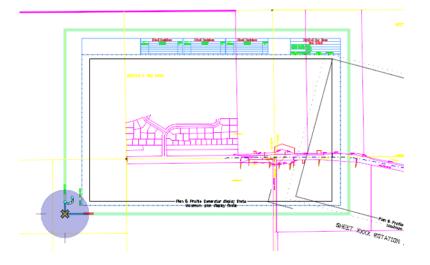
32. Place the *cell* called ROW Plan border **sheet** from the CDOT Menu.

DOT Groups CDOT To	ols Options Help		
Drafting Bridge Construction Design	Status © Existing	Proposed	?
Design Geometry Hydraulics Landscape Environmenta	ROW Survey		I
Materials Geotechnical ROW Survey	Border	<ul> <li>✤ Border (PCD Title-S</li> <li>✤ Border (Plan Limits</li> </ul>	
⊡ Traffic ITS Utilities	Border PLS	<ul> <li>✤ Border (ROW Coun</li> <li>✤ Border (ROW Coun</li> </ul>	-
	Easement	* Border (ROW Monu	mentatio
	Government (PLSS)	<ul> <li>☆ Border (ROW Monu</li> <li>☆ Border (ROW Owned)</li> </ul>	
	Miscellaneous	* Border (ROW Plan- * Border (ROW Tab	ALL
	Pattern	* Border (ROW Tab-	
	Property Ownership	※ Border (ROW Title- ※ Border (SURV Mon ※ Stamp ROWPR	
Settings	ROW	< III	•

33. <D> Settings to and change the Active Scale to *300* and <D> Apply

🚆 Active Settir	ngs	
Active Scale:	300.00	Apply
Active Angle:	0.00	Close

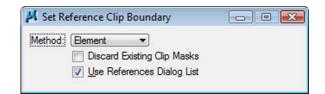
34. Place the sheet border cell so the lower-left corner coincides with the corner indicated on the sheet limits cell placed previously.



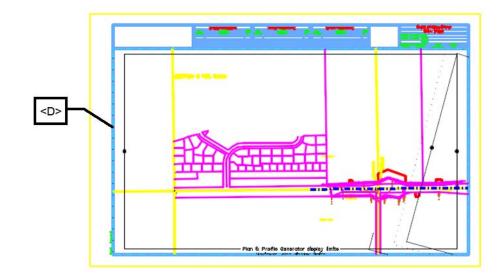
35. In the Reference dialog, identify the reference file and select Tools > Clip Boundary

Detach All All Reload All	an	Model	Description						
R <u>e</u> load dy	an		Description		Logical	Presentation	•	لک	*
Exchange Open in New Session		CDOT Default	new ROW int	ersection	ROW	Wireframe	~	1	4
<u>M</u> ove <u>C</u> opy <u>S</u> cale <u>R</u> otate Merge <u>I</u> nto Master Make Direct Attachme <u>n</u> t									
Mirror <u>H</u> orizontal Mirror <u>V</u> ertical									
Clip Boundary									
Clip Mas <u>k</u> Delete Clip				1					

36. In the Set Reference Clip Boundary dialog, select the *Element* Method.



37. **<D>** on the shape inset  $\frac{1}{2}$  inch from the border.

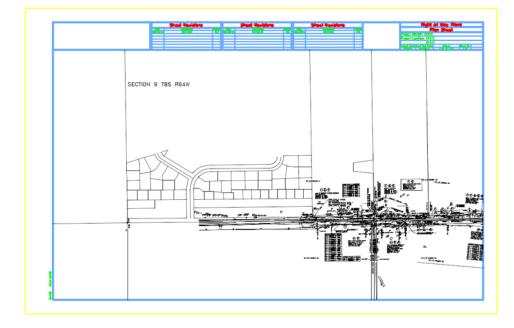


38. **<D>** anywhere to accept the clip.

The plan sheet display limits are now constrained to a desirable limit.

39. *Turn off* level *DRAFT\_INFO\_No-Plot* in the reference file *12345ROW\_Model.dgn* to turn off the sheet lay-outs (Select Settings > Level Display).

📕 Level Display		- • •
1 2 3 4 5 6 7 8 View Displa	ay 🔻	
None) 🔻 Levels	s 🛃 🕶	
□-12345SURV_PlanLSCD3B.dg L M ROW, 12345ROW_Model		
Name	Logical	Used 🔻
Default		•
DES TEMP InRoads Misc		•
DRAFT_INFO_No-Plot		•
DRAFT_LC-Center_WT-3		
ROW_EASEMENT_Temporary-L ROW_LINE_Existing	u	
ROW_LINE_Existing-Calc-Pts		
ROW_LINE_Proposed		
ROW LINE Proposed-Text		
ROW_MONUMENT_Section-Lin	ı	•
ROW_NO_Plot-proposed		•
ROW_OWNRSHIP_Property-Lin	۱	•
SURV_MONUMENT_GLO-Lot-L	i	•



Make appropriate edits to the title block and add any sheet specific information necessary.

Using the tentative (snap) button <T> to query coordinate values that correctly reflect project coordinates. Additionally an InRoads command, such as tracking, will verify the graphics are coordinately correct.

Once the first sheet is complete subsequent sheets are much easier. The reason being is the sheet file can be duplicated with the reference files already attached. Moving the border sheet and redefining the clipping boundaries will define subsequent sheets.

Save in:	Drawings		- 1	0 Ø 🖻	• 🖽 🕶		3D - V8 DGN
(And	Name	~	Size				
2	Reference_	Files					
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100	312345ROW	_Cnty-24x18_##.dgn		32 KB			
<u></u>	312345ROW	_Cnty-24x36_##.dgn		33 KB			Streement S
Desktop	12345ROW	_Mon##.dgn		59 KB			
5	312345ROW	_Ownership##.dgn		34 KB			
644	<b>12345ROW</b>	_Plan##.dgn		34 KB			
CDOT User	12345ROW	_TabProp01.dgn		45 KB			
-	312345ROW	_TabProp02.dgn		39 KB			1
	S12345ROW	_TabProp03.dgn		40 KB		E	
Computer	12345ROW	_TabProp04.dgn		39 KB			
	S12345ROW	_TabProp##.dgn		35 KB			
	312345ROW	_TitleSht.dgn		79 KB			
Network	312345ROW	SURVPlanSheetLSCD3D.dgn		69 KB			
	312345SURV	/_MonRcrd##.dgn		41 KB			
	312345SURV	PlanLSCD03.dgn		37 KB			
	12345SURV	/_PlanLSCD3B.dgn		69 KB			
	312345SURV	/_PlanLSCD##.dgn		33 KB			
	312345SURV	/_PlanPCD##.dgn		33 KB			
	12345SURV	/_PlanSheetLSCD3D.dgn		69 KB		1.07.0	
	312345SURV	/_TitleLSCD##.dgn		34 KB		-	
	File name:	12345ROWSURVPlanSheet	LSCD3D	.dgn	•	Save	
	Save as type:	MicroStation V8 DGN Files (*.	.dgn)		•	Cancel	

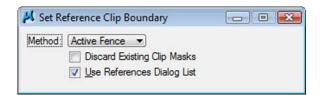
40. Select File > Save as, input name *12345ROWSURVPLIanSheetLSCD3D.dgn* 

#### 41. **<D> Save**.

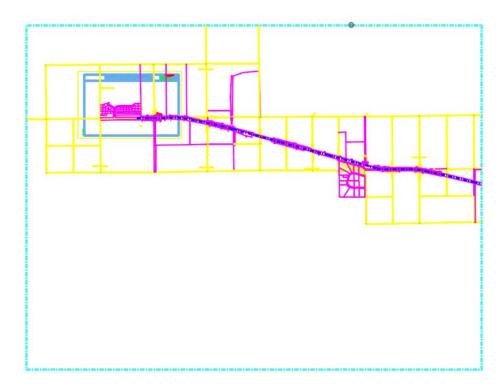
- **Note:** The Save As command will automatically save the current drawing to the hard drive, then copy and rename to the specified file name and open the new drawing.
- 42. Place a MicroStation *fence* over an area that would encompass the next sheet in the set.

1
FENCE -

- 43. In the **References** dialog, identify the **12345ROW\_Model.dgn** file and Select **Tools** > **Clip Boundary**
- 44. In the Set Reference Clip Boundary dialog, select the Fence Method.



45. **<D>** on the MicroStation screen to accept the new clip boundary.



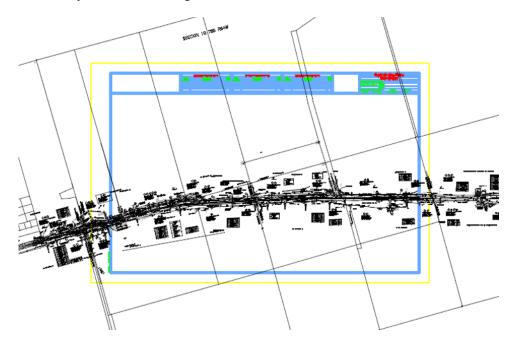
46. Turn On the level *DRAFT\_INFO\_No-Plot* in the reference file *12345ROW\_Model.dgn* to turn the sheet lay-outs back on.

- 47. Use the MicroStation **Move** command to relocate the border sheet. Also **Rotate** the border sheet to align with the predefined sheet limits.

*Rotate* the MicroStation view so that the sheet is normal to the view.

- 48. Key-in *rv=0,0,15* (rotate view = X,Y, Z) for this **3D** file *rv=15* if in a *2D* file.
- 49. **<D>** on the MicroStation screen to initialize the rotation.

**Note:** The above key-ins vary based on the dimension of the MicroStation file, 2D or 3D. When working in a 3D file, the key-in is: rv=0,0,15 (rotate view=x-value, y-value, z-value). Rotation is specified in relative to the Z axis as that is the axis perpendicular to the view. Also, rotating a MicroStation view simply rotates the viewing of the graphics. The coordinate system is still relative to the graphics and any coordinate or alignment information extracted will be correct.

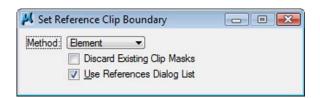


Define a reference clip boundary, as you did earlier.

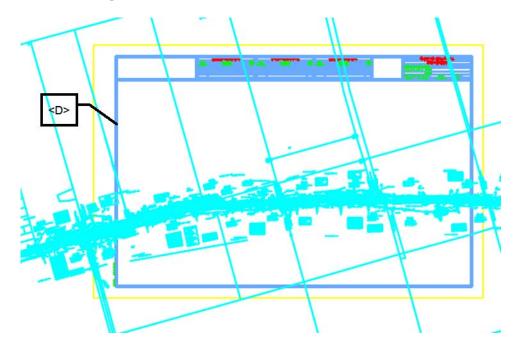
50. In the Reference dialog, identify the reference file and select **Tools > Clip Boundary** 

Attach		🖻 🗗 😭	🔁 🕫 🛱	P D	X Hite Mode:	Boundaries -	•				
Detach		Model	Description			Logical	Presentation	•	لك	۲	C
De <u>t</u> ach All R <u>e</u> load Reload A <u>l</u> l	dgn	CDOT Default	new ROW int	ersection		ROW	Wireframe	~	~	1	
Exchange Open in New Session											
Move											
Copy											
Scale											
Rotate											
Merge Into Master											
Make Direct Attachment											
Mirror Horizontal	1										
Mirror Vertical											
Clip Boundary	1										
Clip Mask	<b>I</b>										
and there			11							_	

51. In the Set Reference Clip Boundary dialog, select the *Element* Method.



52. **<D>** on the shape inset  $\frac{1}{2}$  inch from the border.



- 53. **<D>** anywhere to accept the clip.
- 54. Update information in the title block of the sheet as necessary.
- 55. Select File > Save Settings

This same procedure can be repeated to complete the remainder of the sheets.

# LAB 27 - Project Specific Plan Sheets

The following exercise will step through creating a full plan view depicting right of way plan sheets (sheet subset 5) at a scale of 1"100". The plan sheets will be centered along the design alignment for the project S.H. 86.

# **Chapter Objectives:**

- Create plan sheets using InRoads Plan and Proflile Generator
- Edit reference clip boundary
- Open the MicroStation file 12345ROW\_Model.dgn from the ...\Survey\_ROW\Drawings\Reference\_Files folder.
  - **Note:** The MicroStation file opened is immaterial and only acts as an interface to InRoads. New plan sheets will be created and the open drawing will not be impacted.
- 2. Load the geometry project 12345\_ROW if not already in memory
- 3. Select **Tools > Options** [*Factors*] and set the global scale factors to **100** then **<D>** Close to dismiss the **Options** dialog box.
- 4. **<R>** on the alignment **C\_Centerline** and select **Set Active** from the fly-out list.

🕌 Bentley InRoads XM Ed	dition						×
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<u>File</u> <u>S</u> urface <u>G</u> eometry	<u>D</u> rainage <u>E</u> val	uation <u>M</u> odele	er Dr <u>a</u> fting	<u>T</u> ools <u>H</u> elp			
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Junin	Emoto						

5. Select **Drafting > Plan and Profile Generator**... from the InRoads interface.

By default, the dialog will populate with the CDOT preferences (100 horiontal scale by 1x vertical exageration Plan & Profile sheet).

- **Note:** Drafting notes is an InRoads Application Add-In. If the Drafting category is not shown in the InRoads menu bar, select Tools > Application Add-Ins and enable Drafting Production Add-In.
- 6. Select the **Preferences** button (at the bottom of the **Plan and Profile Generator** dialog).
- 7. Select the preference named 100 Scale ROW Plan Sheet
- 8. **<D> Load**

9. <D> Close

Name:		Close
100 Scale Full Profile 5x		
100 Scale P&P (1x Vert)		Load
100 Scale P&P (2x Vert)		
100 Scale P&P (5x Vert)	-	Save
100 Scale ROW Plan Sheet		
20 Scale Full Plan Sheet		Save As
200 Scale Double Plan		
200 Scale Double Profile 10x 200 Scale Double Profile 1x		Delete
200 Scale Double Profile IX	-	
		Help

Preferences developed for ROW are:

• 100, 200, and 300 scale full plan view ROW Sheets

#### Main Tab

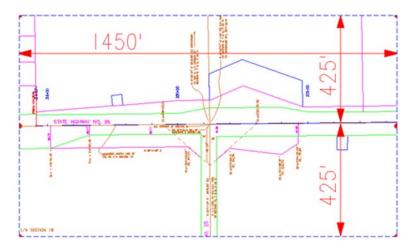
By default, the active horizontal alignment and the begin/end station limts for said alignment will populate the dialog.

Border and	Title	Symbo	ls and Details	Match	Lines	Sheet Index
Main	Plan Cor	ntrols	Profile Contro	ls Shee	t Layout	View Layout
Method Plan Only			Horizontal A	-	+	Edit
<ul> <li>Plan and</li> <li>Profile Or</li> </ul>			Geometry Pr	ojects in this VDF	:	
Plan Views O Use Plan	Views					Help
Use Stati     Profile Views     Use Profil	}				noted,	Unless otherwise all measurements command are in units.
-			Stop:	its 114+56.59 3 450+00 450.00	+ 314	ault 4+56.59 60+91.01
Plan Views:				rofile Views:		Total: 0
In	Name	Start	Stop	Name	Start	Stop
•	III		۱.			

- 10. Load the appropriate *Preference* (if not done in step 6)
- 11. **Select** the appropriate *Horizontal Alignment* (the sheet will be centered on the defined alignment).
- 12. Redefine start and stop station limits to:

- Start: 314+56.59
- Stop: B 450+00.00
  - **Note:** The 'B' in the 'stop' station defined above is required as it indicates the stop station falls within a station-equation range.

*Length* defines the length along the alignment that will fit in a plan view. 1450 feet is the default for a 100 scale 11" x 17" plotted sheet.



# Changing Scale:

A 200 scale plot will display 2,900 feet along the alignment in plan view, a 300 scale plot will display 4,350 feet.

If something other than 100 scale is desired, the user must proportionally change:

- Main tab modify Length
- Plan Controls tab modify Width Left, & Width Right
- View Layout tab modify Scale
- Symbols and Details modify Scale

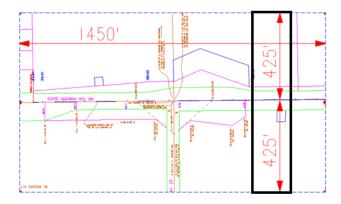
# Plan Controls tab

- 13. Select the **Model Files** button to pick the Drawing files (references) for display in plan view.
- 14. Select the file **12345ROWModel01.dgn** in the Open Model File dialog.

# 15. <D> Open

🙀 Open Model I	File			×
Look in:	\mu Reference_File	es 🔻	G 🤌 📂 🛄	-
(Pa)	Name	*	Size	
	612345ROW_N	1odel.dgn	671 KB	
Recent Places	212345ROW_N	lodel2.dgn	795 KB	
	212345ROW_N	1odel##.dgn	698 KB	
	212345ROW_N	lodel-TG.dgn	793 KB	=
Desktop	12345SURV_N	1odel.dgn	27 KB	
100	212345SURV_T	opo50Scale01.dgn	30 KB	
Call.	212345SURV_T	opo##Scale##.dgn	26 KB	
CDOT User	12345SURV_T	opoCodes100Scale01.dgn	737 KB	
	12345SURV_T	opoElevations100Scale01.dgn	750 KB	
	212345SURV_T	opoNames100Scale01.dgn	699 KB	
Computer	12345SURV_T	opoNotes100Scale01.dgn	131 KB	
	12345SURV_T	opoSymbols100Scale01.dgn	570 KB	-
Network	File name:	12345ROW_Model.dgn	-	Open
	Files of type:	MicroStation Design Files (*.dgn)	•	Cancel
				Help

Border and Tit	e Svm	ools and Details	Match Lines	Sheet Index
Main	Plan Controls	Profile Controls	Sheet Layout	View Layout
Geed View Name:	STA			Model Files
Vidth Left:	-425.00	- <del>0</del> -		
/idth Right:	425.00	<del>.</del>		
ventap:	0.00	<del>.</del>		Help
oundary Chords:	1			Неір
c. anojecis (1234	15\ROW_Survey\L	Drawings\Reference_Fil	es\123	
	III	Drawings\Reference_Fil	▶	
		)rawings\Reference_Fil		



Width Left and Width Right define plan view limits perpendicular from the reference line (left is negative).

The **Boundary Chords** setting will create a clipping limit that will fit the extents of the plan window area. This reference file clipping edge should be considered a "first pass limit" and may have to be edited on curved portions of the corridor path in locations where the desired limits extend beyond this "calculated" clipping limit. This plan limit editing, along with any shifting of the plan window position, is accomplished on the **Sheet Index** tab after the sheets have been created or through the use of the MicroStation references dialog.

#### Model Files & Levels

The Model files selected will be attached as reference files. The attached files will have all levels turned on that contain data. If additional data (levels) are added to the referenced files after the sheets are created, the user is required to turn on the appropriate levels through the use of the references dialog box.

Additionally, the files referenced will have the design file 'Default' model attached. The user should not use any model space other than 'Default'.

# Profile Controls tab

No action required

# Sheet Layout tab

Border and Title		bols and Details	Match Line		Sheet Index
Main Pla	an Controls	Profile Controls	Sheet La	yout	View Layout
Sheet Number: 1	Name:	1	Host File Cont	ent	
Host File: .Draw	ings\12345RO	W_Plan01.dgn	Single Sheet	et Each	
Seed Host File: Statio	n\Seed\3D-Se	ed_CDOT.dgn	All Sheets in	n One	Edit Symbology
Sheet Location					
Layout along Alig	nment 🔘 La	ayout in Grid			Help
Round To Neare	st: Degree	•			
Alternate Plan an			Horizontal Spa	-	0.0.1.1.1.6
Profile Sheet	Deat		Ceft to Left		Right to Left
			Distance:	100.	00
First Sheet Location X:	`				
	0.00		Vertical Spacin	-	
Y:	0.00		Bottom to B	ottom	Top to Bottom
Sheets per Column:	1		Distance:	100.	00
Clipping Boundary			Example		
Level:	SHEET_	Clip-Boundary			
Symbology:	SHEET	Clip-Bounda 💌			
Unique Level for	Each Sheet				
Level Step:	1				
Lover Step.	1				

16. **<D>** the ... button next to **Host File** to identify the path and initial sheet name for the new drawing set. The **Host File** refers to the new MicroStation plan drawings that will be created by this tool. The last number, "1", will be automatically incremented as each new sheet is created. Set to the project directory, i.e.

.....ROW\_Survey\Drawings\ 12345ROW\_Plan01.dgn

17. **<D>** Save in the Save As dialog.

🙀 Save As				<b>X</b>
Save in:	🔒 Drawings		- G 👂 🖻	۶ 🛄 🛨
Save in: Recent Places Desktop CDOT_User Computer	Name Reference_Fil Tabs 12345ROW_C 12345ROW_C 12345ROW_N	nty-24x18_##.dgn inty-24x36_##.dgn Mon##.dgn Wwnership##.dgn lan##.dgn abProp01.dgn abProp02.dgn abProp02.dgn abProp03.dgn	<ul> <li>Size</li> <li>32 KB</li> <li>33 KB</li> <li>59 KB</li> <li>34 KB</li> <li>34 KB</li> <li>34 KB</li> <li>34 KB</li> <li>34 KB</li> <li>34 KB</li> <li>35 KB</li> </ul>	♥▼
Network	Save as type:	MicroStation Design Files (*.dgr	n) •	Cancel
				Help

18. The **Seed Host File** is the 'prototype' file used to create the Host files and should be set to:

C:\Program Files\Workspace-CDOT\Standards-Global\MicroStation\Seed\3D-Seed\_CDOT.dgn

19. Make sure the **Level** and **Symbology** options in the *Clipping Boundary* section display *SHEET\_Clip-Boundary*.

#### View Layout tab

This tab sets location (origin) for the plan views relative to the border sheet. No user input is required in this dialog.

Border and	d Title	Symbols	and Details	Match Lines	Sheet Index
Main	Plan Contr	ols	Profile Controls	Sheet Layout	View Layout
Views					
Number:		1			
Distance bet	ween Plans:	0.00			
Distance bet	ween Profiles:	0.00			
Location (Pa	n or Linža)				Help
Location (Fa	X	Y			
Plan: 1.50	l	5.00			
Profile: 1.75	j	1.75			
cale: 1 00	=	100.00			
icale: 1.00	-	100.00			

**Note:** The Location of the Plan position is computed from the outside edge of the border sheet in paper (plotted) units.

# Border and Title tab

The only user input on this tab is to ensure the correct cell is specified for the border sheet. No other user input is required in this dialog unless creating sheets at a scale other than  $1^{"}=100^{"}$ .

Source cell library: C:\Program Files\Workspace-CDOT\Standards-Global\MicroStation\cells\General.cel

Cell Placed:

20.	Verify C	Cell Name:	SHEET_	ROW-Plan-Sheet
-----	----------	------------	--------	----------------

Main       Plan Controls       Profile Controls       Sheet Layout       View Layout         Border and Title       Symbols and Details       Match Lines       Sheet Index         Border       © Cell       © Reference File Name:       Browse         Name:       SHEET_ROW-PI       ©       Reference File Name:       Browse         © Retain Cell Levels for Each Sheet       © Custom Width:       16.00       Help         © Same Level for Each Sheet       © Custom Height:       10.50       Title Block Data File Name:       Help         Scale:       100.00       Edit       Edit       Stat Station       Stat Station       Stat Station       Station <th>Plan and Profi</th> <th>ile Generator</th> <th></th> <th></th> <th></th>	Plan and Profi	ile Generator			
Border     Order Index            © Cell           © Reference File Name:             © Retain Cell Levels for Each Sheet           © C:\Program Files\Workspace-CDOT             © Same Level for Each Sheet           © Custom Width:             © Unique Level for Each Sheet           © Custom Width:             © Unique Level for Each Sheet           © Custom Height:             Same Level:         1               Scale:           100.00             Symbology:               Object           Name             Stant Station               Stant Station           Station Format:             Station Format:           Station Format:             View Name           Station Format:			Profile Controls	Sheet Layout	View Layout
	Border and	Title	Symbols and Details	Match Lines	Sheet Index
Name   Same Level for Each Sheet     Sheet Size:     B (11 x 17)     Custom Width:   16.00   Unique Level for Each Sheet     Sheet Level:   1   Level Step:   1   Scale:   100.00     Symbology:     Location in Paper Units:   X:   0.00   Y:   0.00 <td< th=""><th></th><th></th><th>Reference File</th><th>Name:</th><th>Browse</th></td<>			Reference File	Name:	Browse
Retain Cell Levels for Each Sheet     Same Level for Each Sheet     Outingue Level for Each Sheet     Custom Width:     16.00     Help     Weter Step:     1     Level Step:     1     Scale:     100.00     Edit     Symbology:     Location in Paper Units:     X:     0.00     Y:     0.00     Y:     Location in Paper Units:     X:     Location in Paper Units:     X:     0.00     Y:     Units:     View Name     Name     Location in Paper Units:     X:     0.00     Y:     Units:     Location in Paper Units:     X:   0.00   Y:   View Name <th>Name:</th> <td>SHEET_ROW-</td> <td>PI -</td> <td></td> <td></td>	Name:	SHEET_ROW-	PI -		
Outlingue Level for Each Sheet       Custom Height: 10.50         Sheet Level:       1         Level Step:       1         Scale:       100.00         Symbology:       Edit         Object       Name         Horizontal Alignment       E         Start Station       Y: 0.00         Stop Station       Horizontal Alignment         Stop Station       Station Format:         Scale       Station Format:         Station       Y + sss.ss	0		custom Width:		Help
Sheet Level: 1   Level Step: 1   Scale: 100.00     Symbology:     Object   Name   Object   Name     Start Station   Start Station   Stap Station   State Number   Total Sheets   Scale   View Name   Rotation     Station	0		Custom Height	10.50	Lich
Scale:       100.00         Symbology:       Edit         Object       Name         Horizontal Alignment       Image: Constraint of the symbol of th	Sheet Level:	1	Title Block Dat	a File Name:	
Symbology:         Object       Name         Hoizontal Alignment       Image: Statistation         Stat Station       Image: Statistation         Stop Station       Image: Statistation         Total Sheets       Image: Statistation         Total Sheets       Image: Statistation         Scale       Image: Statistation         Wew Name       Image: Statistation         Rotation       Image: Statistation		·		Edit	
Ubject     Name       Horizontal Alignment     Image: Constraint of the system of the	Symbology:			Leastien in Paner I	J
V Use Sneet Level	Horizontal A Start Station Stop Station Sheet Numi Total Sheet Scale View Name	Nignment n ber ts		X: 0.00 Y: 0.00 User Text: Station Format:	·

# Symbols and Details tab

No user input is required in this dialog unless modifications to the stored preference are required.

Main	Plan Contro	le	Profile Controls	Sheet Layout	View Layout
Border and			nd Details	Match Lines	Sheet Index
North Arrow					
Attach					
Cell Name:	SHEET_North	n-Arrow 🔻			
Retain Cel	Levels for Eac	h Sheet			Help
Use Sheet	Level				Нер
Same Lev	el for Each She	et			
Level:	1				
Scale:	100.00				
Location in Pa	aper Units				
X:	15.95				
Y:	8.90				
ProjectWise 1	Title Block				
Attach					
Cell Name:	Advisory-Rad	io 🔻			
	r anosiy nau				
		Apply	Preferences	Close	

The **North Arrow** position set by the **Location in Paper Units** and is set to the upper right corner of the sheet. This is a rough placement and will likely have to be moved for clarity and conflicts on many sheets. Once the sheets are constructed each sheet should be checked for optimum cell position.

#### Match Lines tab

No user input is required in this dialog. Match lines are not being used for ROW sheets.

🕌 Plan and Pro	ofile Generat	or				
Main	Plan Cor	ntrols	Profile Contro		Sheet Lavout	View Layout
Border and	d Title	Symb	ols and Details	M	latch Lines	Sheet Index
Symbology:		Nam			Extend To Clipping B	Help
Plan Line			T_Match-Line	BYL BYL	Oistance from	n Origin
Plan Stan		SHEE	T_Match-Line	BYL E	Distance Left:	-180.00
Plan Prev					Distance Right:	180.00
Plan Next					Station Format:	
Profile Sta	art Station				S+SSS.SS	•
Profile Sto	p Station			_ <b>-</b> -	Use Sheet Lev	
					Use Sneet Lev	ei
		Apply	Preferenc	es	Close	

#### **Executing the Plan & Profile Command**

Once the Apply command is executed, the workflow process for this command follows the following sequence:

- Plan view reference limits are established.
- New drawing files are created based on the host file name.
- Each new drawing file has 3 items generated.
  - Plan views
  - Border sheet placed as a cell in each generated drawing
  - North arrow placed on each sheet
- The Plan and Profile dialog (sheet index tab) will populate with sheets created and sheet limits.

#### Sheet Index tab

Nothing is required by the user on this tab prior to executing the PnP command. A summary of sheets created is displayed after successful execution of the command.

21. **<D> Apply**, the routine will run and MicroStation will cycle through the sheets as they are created – be patient and wait for the command to complete.

Main	Plan (	Controls	Profile Controls	Sheet Layout	View Lavout
Borde	er and Title	Symt	ools and Details	Match Lines	Sheet Index
VDF File - Show S				New	Open
Clipping	Boundary Mode	e: 🔘 Calcu	ilate 💿 Use Existin	g	Save
Sheet Inc	lex:				Save As
Sheet	Sheet Name		Host File	Sheet Rotation 🔺	Help
1	1	C:\Projects	12345\ROW_Survey	\Dr 89^00'00'' ≡	Create Plot Set
2	2	C:\Projects	\12345\ROW_Survey	\Dr 90^00'00''	
3	3	C:\Projects	12345\ROW_Survey	\Dr 101^00'00''	
4	4	C:\Projects	12345\ROW_Survey	\Dr 103^00'00''	All
5	5	C:\Projects	12345\ROW_Survey	\Dr 105^00'00'' 🛛 👻	
٠ -			III	•	None
Sheet Vie	Delete Sh	Re	generate Sheet	Show Sheet	
Sheet	View T	ype	View Name	Anchor X	Anchor Y
1	Plan	S	TA 314+56.59	1.50	5.00
					Edit

The Sheet Index tab will display a list of sheets created and MicroStation will display the last sheet created.

- 22. Select **Save As** from the Sheet Index tab to store a project specific *View Definition File* (VDF). A VDF file allows sheet definitions to be recalled and modified in subsequent MicroStation/InRoads sessions if necessary.
- 23. Name the file *100 scale ROW plan sheets.vdf*
- 24. **<D> Save**

Save VDF File			_			_
Save in:	Drawings		•	G 👂	• 💷 🕈	•
(Ang	Name	^	Siz	e		
Recent Places	Reference_ Tabs	Files				
Desktop						
CDOT_User						
Computer						
Network	File name:	100 scale ROW plan sheets.vd	ff		•	Save
	Save as type:	VDF Files (*.vdf)			•	Cancel
		0.				Help

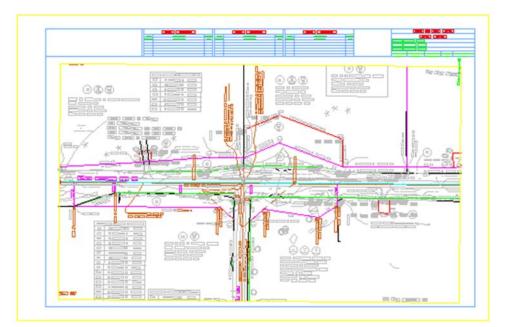
# **Displaying sheets**

By highlighting a specific sheet in the Sheet Index tab and selecting Show Sheet, MicroStation will open the selected drawing.

25. Identify *Sheet 1* and *<*D*>* Show Sheet

Main	Plan C	ontrols	Profile Controls	Sheet Layout	View Lavout
Borde	er and Title	Symbo	ols and Details	Match Lines	Sheet Index
		ects\12345\F	ROW_Survey\Drawin	gs\101 New	Open
- Show S Clipping	Sheet Boundary Mode	: O Calcula	ate 💿 Use Existi	ng	Save
Sheet Ind	lex:				Save As
Sheet	Sheet Name		Host File	Sheet Rotation ^	Help
1 2	1		12345\ROW_Survey 12345\ROW_Survey		Create Plot Set.
3	3		12345\ROW_Survey		
4	4		12345\ROW_Survey		All
5	5	C:\Projects\	12345\ROW_Surve	/\Dr 105 '00'00'' +	None
	Delete She	Reg	enerate Sheet	Show Sheet	
Sheet Vie					
Sheet Vie Sheet	View Ty	pe	View Name	Anchor X	Anchor Y
	View Ty Plan		View Name A 314+56.59	Anchor X 1.50	Anchor Y 5.00

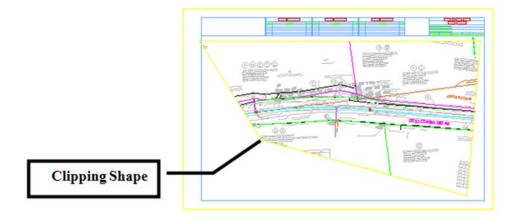
#### MicroStation opens the identified sheet



26. Identify *Sheet 2* and *<D>* Show Sheet

27. Use the MicroStation **Modify** command to adjust the clipping shape to any new location.

28. **<D> Show Sheet** to redefine the clipping limits after modifying the clipping shape.

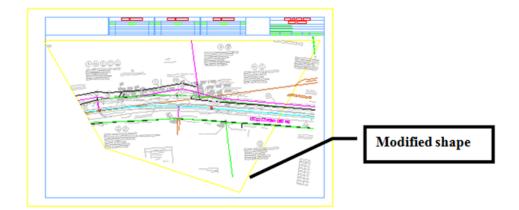


*Note:* Other modification tools such as insert vertex and delete vertex can be used also.



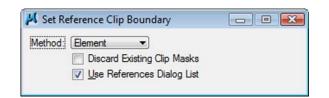
Standard MicroStation References commands can also be applied.

29. Use the MicroStation Modify command to adjust the clipping shape to any new location.

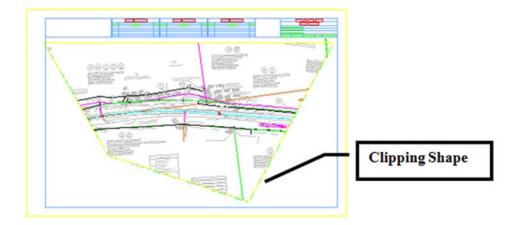


- 30. Select File > References from the MicroStation menu bar.
- 31. *Highlight* the **12345ROW\_Model.dgn** file.

32. Select **Tools > Clip Boundary** from the **References** dialog.



- 33. Set the Method to Element
- 34. **<D>** on the modified clipping shape in the MicroStation view.
- 35.  $\langle D \rangle$  to accept the command.



#### Notes:

- The clipping boundary is now defined by the identified shape. Using any MicroStation command to modify this shape will automatically update the reference file clipping boundary. This shape is on the level GEN\_SHEET\_Clip-Boundary. This level is configured as a non-plotting level.
- Deleting the clipping boundary shape will result in the reference file display limits reverting to the initial limits defined by the PnP command.
- Regenerating a sheet from the PnP Sheet Index tab will also cause the sheet to revert to the reference file display limits initially defined by the PnP command.

After the Plan and Profile Generator has been run, each sheet should be reviewed for:

- North Arrow position (move the cell using MicroStation move command)
- Plan view Clipping limits
- Title block information

# Main tab - After running the P&P command

Once the command has been run, the Geometry Project field will populate and the Plan and Profile view limits display.

Plan and Pro	file Generat	or					
Border and	Title	Symbols	and Details		Match Lir	nes	Sheet Index
Main	Plan Cor	ntrols	Profile Con	trols	Sheet	Layout	View Layout
Method	•		Horizontal	Alignmen	t:		Edit
Plan Only			C_Center	line	▼ 4	<b>+</b>	
Plan and F	Profile		Geometry	Projects in	n this VDF:		
Profile Only	y		12345_D	ESIGN			
Plan Views							Help
O Use Plan	/iews						
Use Statio	n Limits						Unless otherwise all measurements
Profile Views	Views					for this	, all measurements s command are in units.
Use Statio	n Limits		- Station L	imits			fault
Sheets			Start:	314+56	59		4+56.59
Generate	Sheets		Stop:				560+91.01
VDF In	formation On	ly		B 450+			00401.01
VDF In	formation an	d Host Files	Length:	1450.00	)	+	
Plan Views:		Т	otal: 0	Profile V	iews:		Total: 0
ln	Name	Start	Stc ^	Name		Start	Stop
1 STA 3	14+56.59	314+56.59	319+				
	19+00.00	319+00.00					
	22±50 00	333 <sup>*</sup> 20 UU	2/12.				
		Apply	Prefere	nces	Close		

Double clicking on a specific Plan View sheet opens an Edit Plan View dialog. Sheet limits can be modified numerically and reference files can be added or removed.

new rvame.	STA 319+00.00			Apply
Start:	319+00.00	Stop:	333+50.00	Close
Rotation:	90^00'00''	Overlap:	0.00	Model Files
Width Left	-425.00	Width Right:	425.00	< Previous
Force Re	ectangular Boundary B	oundary Chords:	1	
Model Files:				Next >
C:\Project	s\12345\ROW_Survey\	Drawings\12345	ROW_Plan##2.dgn	Help

Challenge Exercises:

- Modify the last sheet to add 500' to the stop station
- Modify any sheet to change the left and/or right offsets
- Add or subtract from the model file list
- Modify the station limits on the first sheets and 'adjust' adjacent sheet

Index