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 parametes

Regression analysis setup.

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

E Application Add-ins		- • •
Available:		OK
VI of Lavout Add-In	*	
Multiple Horizontal Element Regression Analysis Add-In		Cancel
		Help
Rises Call / Plack Add In	-	<u> </u>
Description		
The Multiple Horizontal Element Regression Analysis Add-In provides commands for creation and editing with the inclusion of regression by least squares analysis.	r horizoni	tal 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	- ф -
Apply	Preferences	. Close

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

	Regression Points	- 0 🖻
Main Advance	d	
Source: Po	ints	Filter
Alig	gnments	Help
Include:		
Ι		+
Selected:		
Name	Description	Style
First Point: [Second Point: [*

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

🔣 Geometry	Selection Filter						
Name:	Included	•					ОК
Description:	Included	•					Cancel
Style:	Included	•					Preferences
Fence Mode:	Ignore	-					
Available:					Selected:		Help
Name	Description	Style	*	Add ->	Name	Description	Style
105	Section Comer	T_Section Cor		<- Remove			
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	Pronetty Pin	T Pronetty Pin					

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

🧱 Geometry	Selection Filter					×
Name:	Included -	•				ОК
Description:	Included 🔹	•				Cancel
Style:	Included 👻	•				Preferences
Fence Mode:	Ignore 👻					
Available:				Selected:		Неір
Name	Description	Styl 🔦	Add ->	Name	Description	Style ^
3112_1	Traffic Control No Pass Left	: Y T_Ti	<- Remove	1833	Traffic Control Dou	T_Traffic Doub
3117_1	Traffic Control No Pass Left	t Y T_Ti		2015	Traffic Control Dou	IT_Traffic Doub
3122_1	Traffic Control No Pass Left	t Y T_Ti	<- Swap ->	2290	Traffic Control Dou	IT_Traffic Doub
1169	Traffic Control No Pass Rig	ht T_Ti		2302	Traffic Control Dou	IT_Traffic Doub
1184	Traffic Control No Pass Rig	ht T_Ti	AI	2319	Traffic Control Dou	IT_Traffic Doub
1199	Traffic Control No Pass Rig	ht T_Ti	None	2397	Traffic Control Dou	IT_Traffic Doub
1274	Traffic Control No Pass Rig	ht T_Ti		2418	Traffic Control Dou	IT_Traffic Doub
1292	Traffic Control No Page Rid	ы тт. ^т ▶		 √ 	Traffic Control Dou III	T Traffic Doub
			1			

7. **<D>** the **OK** button in the *Geometry Selection Filter* dialog.

🛛 Add Horizonta	Regression Points	- 0 🗾
Main Advance	d	
Source: O Poi	ints	Filter
🔘 Alig	gnments	Help
Include:		Trop
		+
Selected:		
Name	Description	Style ^
1833	Traffic Control Dou.	T_Traffic Doubl
2015	Traffic Control Dou.	T_Traffic Doubl
2290	Traffic Control Dou.	T_Traffic Doubl
2302	Traffic Control Dou.	T_Traffic Doubl
2319	Traffic Control Dou.	T_Traffic Doubl
7207	Troffic Control Dou	T Teeffia Daubl
First Point:	1833 👻 -	+
Second Point:	2015 -	+
	_	
Арріу	Preferences	Close

8. **<D>** the **Apply** button. The dialog will minimize allowing you to graphically define the first and second points to define initial course 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*. The *Add Horizontal Regression Points* dialog will reappear.
- 10. $\langle D \rangle$ the Close button.

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

oints:									Close
Name	Northing	Easting	Style	Include	Status	Offset	Weight	-	Penet
1833	1556121.36	3279713.82	T_Traffic Do	No	Normal	0.00	0.01	Ξ	пероп
2015	1556108.45	3279761.23	T_Traffic Do	No	Normal	0.00	0.01		Help
2290	1556095.39	3279809.65	T_Traffic Do	No	Normal	0.00	0.01		
2302	1556080.40	3279863.71	T_Traffic Do	No	Normal	0.00	0.01		
2319	1556065.68	3279917.82	T_Traffic Do	No	Normal	0.00	0.01		
2397	1556053.00	3279964.70	T_Traffic Do	No	Normal	0.00	0.01		
2418	1556036.79	3280024.69	T_Traffic Do	No	Normal	0.00	0.01		
2433	1556022.37	3280076.78	T_Traffic Do	No	Normal	0.00	0.01	-	
· · ·	4550000 50	0000401.00	T T (0 D	••		0.00	• • •		

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.

roints:									Close
Name	Northing	Easting	Style	Include	Status	Offset	Weight	-	Penert
1833	1556121.36	3279713.82	T_Traffic Do	No	Normal	0.00	0.01	Ξ	Report
2015	1556108.45	3279761.23	T_Traffic Do	No	Normal	0.00	0.01		Help
2290	1556095.39	3279809.65	T_Traffic Do	No	Normal	0.00	0.01		
2302	1556080.40	3279863.71	T_Traffic Do	No	Normal	0.00	0.01		
2319	1556065.68	3279917.82	T_Traffic Do	No	Normal	0.00	0.01		
2397	1556053.00	3279964.70	T_Traffic Do	No	Normal	0.00	0.01		
2418	1556036.79	3280024.69	T_Traffic Do	No	Normal	0.00	0.01		
2433	1556022.37	3280076.78	T_Traffic Do	No	Normal	0.00	0.01	.	
∢ [4550000 50			••	•••••	0.00	1 1		

- 13. **<D>** the **Edit** button. The **Edit Horizontal Regression Point** dialog will appear.
- 14. **<D>** the radio button **Yes** to **Include in Analysis**.

🔣 Edit Horizonta	l Regressio	on Point	- • •
Include in Analysis:	Yes	No	Apply
Status:	Fixed	•	Close
	Norma	l -	Help
	Ignore	d	
Offset:	0.00		+
Weight:	0.01		
First	Previous	Next >	Last

- 15. <D> the Apply then Close buttons. Leave the Edit / Review Horizontal Regression Points open for further edits.
- 16. Select Geometry > Horizontal Regression > Single Element Regression Analysis The Single Horizontal Element dialog will appear.

17. Select Element Type: Linear or Circle

🔛 Single Horizontal Eleme	- • 💌
Element Type	Compute
	Close
Save Order	Save
O After Selected Element	Report
 Last Element 	Help
Results	
Least Squares Error:	
Standard Deviation:	
Maximum Offset:	

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



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

1833 0+00.00 2015 0+49.02 2290 0+99.13 2302 1+55.26 2319 2+11.41 2397 2+60.05 2418 3+22.29 2433 3+76.38 2464 4:06.14	2.73 -0.35 -2.93 -4.60 -5.68 -5.99 -5.45 -3.78	A	Close Save As Append Display
2470 4+76.53 2499 5+28.53 2525 5+77.06 2544 6+28.70 2561 6+28.04	0.45 3.66 7.34 11.32 13.71	-	Help

21. Review the results.

eometry Project:	12345_ROW	Mode	G Alexander C Eleme		Close
orizontal Alignment:	Regression Alignmer	+ Cuive sets	Alignment Cleme	S	ave As
I	Project Name:	12345_ROW	[<u>^</u>	ppend
Iorizontal Ali	ignment Name: Description:	Regression Alignment	t		Display
,	Style: Input Factor:	DEFAULT 1.0000			Print
-		STATION	NORTHING	=	Help
Element: Circu	lar				
F	PC ()	0+00.00	1556200.84		
E	PI () I	9+85.49	1555840.65		Select
(CC ()		1559937.74		
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	Radius:	4014.65	• •	_	
D (C	Delta:	27-35-00*	Lett	1	Previou
Degree of Cu	irvature(Arc):	1 25 38		_	
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	langent:	965.48		v —	