Point Files

Points are an integral part of a job file and may represent topographic information, control coordinates, "as-build" information, etc. 3D-Office can use points to generate linework, alignments, surfaces, and TINs.

Importing and Opening Point Files

3D-Office can read point records from several file types. Points in 3D-Office can be assigned to layers, exported to various file format types, edited, transformed, displayed, and printed.

3D-Office imports points into 3D Project files from four file types:

- 3D point files (*.pt3) on a computer
- 3D point files (*.pt3) on a Pocket-3D controller
- AutoCAD® files (*.dwg or *.dxf)
- Text files (*.txt)

Importing into a 3D Project or 3D Point File

Follow these steps to import points from a 3D Points file into a 3D Project file or 3D Points file.

- 1. With a 3D Project or 3D Points file open, click **Points → Import points → From 3D point file** (*.**pt3**).
- 2. Navigate to the location of the desired file, select it, and click **Open** (Figure 3-1 on page 3-2).



Figure 3-1. Open 3D Point File

The point data from the selected file is added to the 3D Project or 3D Points file.

Importing from Pocket-3D

Follow these steps to import a Pocket-3D controller points file into either a 3D Project file or a 3D Points file.

- 1. Connect the Pocket-3D controller to the computer and turn on the controller (see Appendix A for details). Run Pocket-3D on the controller.
- With a 3D Project or 3D Points file open, click Points > Import points > From Pocket-3D controller. 3D-Office connects with the Pocket-3D controller and retrieves *.pt3 files.
- 3. On the *Pocket-3D files* dialog box, select the file to import and click **Open** (Figure 3-2 on page 3-3). The file type is automatically selected.

Pocket-	X			
Name TEST SITE	(EX TOPO)	Size (kB) 101.8	Created Monday, Marc	sh 1st, 2004, 4:40PM
<				>
File name	TEST SIT	E (EX TOPO)		-
Files of type	Point files	(*.PT3)	•	Upen
				Cancel

Figure 3-2. Select and Open Pocket-3D Point File

The point data from the selected file is added to the 3D Project or 3D Points file.

Importing Points from an AutoCAD File

Follow these steps to import points from an AutoCAD dwg/dxf file into either a 3D Project file or a 3D Points file.

- With a 3D Project or 3D Points file open, click Points > Import points > From AutoCAD file.
- 2. Navigate to the location of the desired file, select it, and click **Open** (Figure 3-3).

Open		? 🛛
Look jn: 隘	PP_topo	• 🗄 🖆 📰 •
PP_topo_f	lov20_linework.dwg lov22-points.dwg	
File <u>n</u> ame:	pp_topo_Nov22-points.dwg	<u>Open</u>
Files of type:	Autocad DWG files (*.dwg)	Cancel

Figure 3-3. Open AutoCAD 3D Points File

The point data from the selected file is added to the 3D Project or 3D Points file.

Importing a Text File

Follow these steps to import points from a text file into either a 3D Project file or 3D Points file.

- With a 3D Project or 3D Points file open, click Points > Import points > From text file.
- On the Select custom format dialog box, select the format type and click Next (Figure 3-4). See "Creating Custom Import/ Export Formats for Text Files" on page 2-2 for details on creating or editing import formats.

Select custom format	
Formats ControlFlees NOTEPAD TXT Points	New format Edit Delete
< Back	Cancel

Figure 3-4. Select Format Type

- 3. Click **Browse**. Navigate to and select the desired *.txt file and click **Open**.
- 4. Enter a name for a new layer or select a current layer to add the points to. If the imported text file includes a layer field as part of its record definition, select *Layer specified as line item*.
- 5. Click **Finish** to import the points (Figure 3-5).

Import points from to	ext file	×
Text file and Settings\Amanda_H	all\Desktop\FROM\Kyle\PP_topo_Nov20.txt	Browse
 Create new layer 	NewLayer	
C Add to existing layer	GROUND	~
C Layer specified as line	e item	
	< Back Finish	Cancel

Figure 3-5. Open Point Text File

Opening a Points File

- 1. To open a 3D Points file click **File ▶ Open**.
- 2. On the *Open* dialog box, navigate to the location of the file, select the file type as Points (*.pt3), select the desired file, and click **Open** (Figure 3-6).

Open			? 🛛
Look jn: 🔎	PP_topo	- + 🗈	* 💷 •
PP_topo_N	lov20.pt3		
File <u>n</u> ame:	PP_topo_Nov20.pt3		<u>O</u> pen N
Files of type:	Topcon PT3 files (* pt3)		Cancel
, and or groot	Lindoout, Louisa (1969)	,	

Figure 3-6. Open 3D Points File

Opening a Pocket-3D Point File

If a Pocket-3D controller and the computer are connected, 3D-Office can open points files directly from the controller. Once opened, the file can be exported to other files or saved to the computer. See Appendix A for details on connecting a computer and controller.

- 1. Click File > Open Pocket-3D file.
- 2. On the *Pocket-3D files* dialog box, select the file type (*.pt3) and the desired file, then click **Open** (Figure 3-7).

Pocket-	3D file	s		X
Name TEST SITE	(EX TOPO)	Size (kB) 101.8	Created Monday, M	arch 1st, 2004, 4:40PM
<		1111		>
File name Files of type	Point files	E (EX TOPO) (*.PT3)	•	Open Cancel

Figure 3-7. Select File and Click Open

Opening an AutoCAD File

From a 3D Project file, 3D-Office can import points, linework, and text information from an AutoCAD (*.dwg or *.dxf) file.

- 1. Click File > Open AutoCAD drawing file.
- 2. On the *Open* dialog box, select the desired file and click **Open** (Figure 3-7). The AutoCAD entities are imported into 3D-Office.

Open		?	×
Look in: 🗀	PP_topo	- 🖬 📩 📼	
PP_topo_N	lov20_linework.dwg lov22-points.dwg		
File <u>n</u> ame:	pp_topo_Nov22-points.dwg	<u>Open</u>]
Files of type:	Autocad DWG files (*.dwg)	▼ Cancel	

Figure 3-8. Select File and Click Open

Viewing Information

Points are assigned three-dimensional coordinates in the project's coordinate system. 3D-Office provides an interface for viewing, editing, transforming, and printing points, and for saving points to a text file.

Point List View

To view a list of all points in the file, click **Points > Point list view**. The *point list* opens in separate window and displays the following information about all points in the file (except localization control points) (Figure 3-9 on page 3-7):

- Select indicates if the point is selected or selects a point
- Pt. # the number of the point
- Description an optional description of the point
- Layer the layer in which the point is located

- Northing (Y) the north coordinate of the point in the project system
- Easting (X) the east coordinate of the point in the project system
- Elevation (Z) the elevation of the point
- Created (local time) the date and time the point was collected, imported, or added

File	Edit View P	oints Window He	lp				_ 8 ;
. %	Pa 🖻 💡	,					
Select	Pt. #	Description	Layer	Northing	Easting	Elevation	Created (
	100	EL	GROUND	2065087.82	6178979.71	377.38	12/31/69
	101	EL	GROUND	2065110.19	6178980.22	376.41	12/31/69
	102	EL	GROUND	2065110.24	6178980.21	376.41	12/31/69
	103	EL	GROUND	2065133.06	6178963.97	376.49	12/31/69
	104	EL	GROUND	2065143.29	6178943.18	376.34	12/31/69
	105	EL	GROUND	2065148.33	6178910.91	376.08	12/31/69
	106	EL	GROUND	2065150.93	6178882.93	375.91'	12/31/69
	107	EL	GROUND	2065149.90'	6178854.44'	376.41	12/31/69
	108	FENCE	GROUND	2065162.34	6178864.41	376.63	12/31/69
	109	GATE	GROUND	2065153.89'	6178916.73	374.66'	12/31/69
	110	FENCE	GROUND	2065150.67	6178939.13	374.81	12/31/69
	111	FENCE	GROUND	2065145.46'	6178972.97	375.85	12/31/69
	112	FENCE COR	GROUND	2065140.35	6179004.37	377.47	12/31/69
	113	FENCE END	GROUND	2065126.11	6179000.18	376.95	12/31/69
	114	GROUND	GROUND	2065111.81	6178970.79	376.88	12/31/69
	115	GROUND	GROUND	2065116.79	6178946.28	377.16	12/31/69
	116	GROUND	GROUND	2065122.18	6178921.86	376.71	12/31/69
	117	GROUND	GROUND	2065127.61	6178897.10	376.44	12/31/69
	118	GROUND	GROUND	2065130.55	6178872.27	376.20	12/31/69
	119	GROUND	GROUND	2065106.54	6178865.17	376.76	12/31/69
	120	GROUND	GROUND	2065099.52	6178889.18	376.87	12/31/69
	121	GROUND	GROUND	2065092.87	6178917.59	377.32	12/31/69
	122	GROUND	GROUND	2065087.09	6178942.22	378.28'	12/31/69
							>

Figure 3-9. Point List

For the *point list* window, the toolbar is modified and provides only save, cut, copy, paste, and about buttons. See "Working with Points" on page 3-12 for details on adding, editing, and deleting points.

Any changes made in the point list are reflected in the plan view and the primary file.

Points selected in the list are also selected in the plan view, and vice versa. Click Window ► Cascade for side-by-side viewing of selected points in the point list and plan view.

Text File View

3D-Office can opens a text editor window for viewing data associated with the selected entities.

- 1. Select the entities (points, lines, TIN triangles) to view information on:
 - click the entities
 - use the select tool to select a group of entities
- 2. Click the activated **Information** button on the toolbar. A text editor window opens, displaying relevant information about the selected entities (Figure 3-10).

<u>File</u> <u>E</u> dit	
Selected entities	
Points (name, description, layer, coordinates)	
17, EL, GROUND, N 771062.17', E 1835466.64', Z 911.16'	
18, EL, GROUND, N 771072.62', E 1835433.09', Z 912.33'	
57, EL, GROUND, N 770960.69', E 1835435.59', Z 907.82'	
58, EL, GROUND, N 770974.49, E 1835467.37, Z 907.69	
59, EL, GROUND, N 770976.95, E 1635500.29, Z 907.62	
61 EL GROUND N 770970 63' E 1835560 53' 7 908 42'	
62, EL, GROLIND, N 770999.26', E 1835569.07', Z 909.10'	
63. EL. GROUND, N 771023.09', E 1835574.53', Z 909.58'	
64, EL, GROUND, N 771034.96', E 1835541.98', Z 909.73'	
65, EL, GROUND, N 771050.12, E 1835501.81, Z 910.37	
66, EL, GROUND, N 771014.36', E 1835431.54', Z 910.29'	
67, EL, GROUND, N 771015.46', E 1835467.19', Z 909.61'	
68, EL, GROUND, N 771012.09', E 1835502.45', Z 909.01'	
59, EL, GROUND, N 7/1004.99, E 1835529.48, Z 908.78	
70, EL, GROUND, N 770998.77, E 1835558.18, Z 909.21	
71, EL, GROUND, N 771039.35, E 1035432.99, Z 911.67	
<u> </u>	

Figure 3-10. Click Information Button and View Selected Entities

3. To save the information as a text file, click **File** ▶ **Save as**. On the *Save As* dialog box, type a name for the file or keep the default file name. Navigate to the location in which to save the file and click **Save**.

Managing Point Layers

Point files can be divided into layers of points, where each layer is assigned a name and color.

To view, add, or edit layers, click **Points > Layers**. The *View layers* dialog box displays each layer in the points file and it's display status on the Plan View (Figure 3-11 on page 3-9).

- The enable/disable box next to each layer name indicates whether or not it will be displayed on the Plan View.
- See the following sections for details on adding a layer, deleting a layer, setting layer colors, or setting point labels.
- Show all enables all layers for display on the Plan View.
- *Show none* disables all layers from being displayed on the Plan View.

View layers	×
Layers	
Nucleus Data Carata Diatta	
New layer Delete Set color Point labels	
Show all Show none	
OK 📐 Can	icel

Figure 3-11. View Point Layers

Adding Layers

Multiple layers are useful for distinguishing between the various land and project features.

- 1. On the *View layers* dialog box, click **New layer**. A new layer entry appears in the layer list.
- 2. Type a name for the layer (Figure 3-12) and press Enter.

When added, the new layer is "empty" until points are manually added or imported. See "Importing and Opening Point Files" on page 3-1 for importing points to a layer.

View layers				
Layers				
GROUND				
New layer.	Delete	Set color	Point labels	
Show all	Show none			
			ОК	Cancel

Figure 3-12. Add New Layer to Points

Setting a Layer's Color

Setting a unique color to individual layers helps to quickly differentiate between layers.

- 1. On the *View layers* dialog box, click the desired layer, then click **Set color**.
- Select a color from the *Color* dialog box and click OK (Figure 3-13 on page 3-11).

The color of the layer's name changes to the selected color and the layer's points on the Plan View will appear in this color.

Color 🛛 🛛 🔀	1
Basic colors:	
Custom colors:	
Define Custom Colors >>	
OK Cancel	

Figure 3-13. Select Layer's Color

3. To select a color not shown, click **Define Custom Colors**. Define the custom color and click **Add to Custom Colors**.

Setting a Layer's Point Labels

Displaying point labels can help to identify points based on their associated data.

- 1. On the *View layers* dialog box, click the desired layer, then click **Point labels**.
- 2. Enable the desired point labeling parameters for the layer (or for all layers) and click **OK** (Figure 3-14).



Figure 3-14. Select Point Labeling Parameters for Layer

Deleting Layers

Only delete a layer when the data it contains will never be needed again. If necessary, save a backup copy of the file before deleting layers.



Deleting a layer will also delete all of its contents.

- 1. On the *View layers* dialog box, click the desired layer, then click **Delete**.
- 2. On the confirmation dialog box, click **OK** (Figure 3-15).



Figure 3-15. Delete Layer

Working with Points

Points can be added, deleted, or edited from both the point list view and the plan view. Points can also be transformed from the plan view.



After making changes to a point file, save it as a version of the original to track progress.

Adding Points

- 1. To add a new point to the point file, click **Points ▶ New point**.
- 2. On the *Add/edit point* dialog box, enter the following information for the new point and click **OK** (Figure 3-16 on page 3-13):
 - Type a Number and Description (optional) for the point.
 - Select the Layer from the drop-down list.
 - Enter the North (X), East (Y), and Elev (Z) coordinates.

Add/edit	point	
Number	96	
Description		
EL1		
Layer		
GROUND		•
North	770896.35'	
East	1835167.05'	
Elev	910.01'	
	ок 📐	Cancel

Figure 3-16. Add New Point

Editing Points

- 1. To edit a point, select the desired point in the plan view or point list and click **Points ▶ Edit point**.
- 2. On the *Add/edit point* dialog box, edit the desired information and click **OK** (Figure 3-16).

Deleting Points

To delete points, select the desired point(s) in either the point list or plan view and click **Points > Delete points** or press **Delete** on the keyboard.

Click Edit > Undo delete entities to retrieve the deleted points.

Adjusting Point Elevations

The elevation adjustment is a translation along the vertical axis. Point elevations may need to be adjusted for various reasons, for example:

- The surveyor may have assigned an arbitrary elevation to the control points for the initial survey and later will want to translate the survey to a "true" or "known" elevation.
- A mistake may have been made in the height of the antenna, and the elevations will need to be corrected accordingly. If this occurred on one day of a multi-day survey, then only a subset of the data will need to be adjusted.



Use caution with this routine, especially when operating on a subset of the data.

- In the point list view or plan view, select the desired point(s) to adjust (press Ctrl+A to select all points) and click
 Points ▶ Transform coordinates ▶ Adjust elevations.
- On the *Adjust elevations* dialog box, type the number to add to or subtract from the current elevation and click **OK** (Figure 3-17). Use a minus sign to subtract an elevation value.



Figure 3-17. Enter Elevation Adjustment Number

30 0	fice - [Simp	sonTopoNov1	3_02.pt3:	2]							
File	Edit View P	oints Window H	telp					- 8 ×			
X	B 8 1	2							376.41		
elect	Pt. #	Description	Layer		Northing	Easting	Elevation	Creating (376 41		
	100	EL	GROU	ND	2065087.82	6170979.71	377.34	2,131,169	370.41		
	101	£1.	GROU	ND OIN	2065110.19	6179980.22	376.41	12/31/69	376 49		
	102	EL	GROU	ND	2065110.24	6170900.21	376.41	12/01/69	0/0/12		
	103	EL.	GROU	ND	2065133.06	6178963.97	376.49	12/31/69	376 34		
	104	EL	GROU	ND	2065143.29	6170943.10	376.34	12/31/69	0/0/01		
	105	EL	GROU	ND	2065148.33	6178910.91	376.08	12/31/69	376.08		
	106	EL	GROU	ND	2065150.93	6170002.93	375.91	12/31/69	010100		
	107	£1.	GROU	ND	2065149.90	6178854.44	376.41	12/31/69	375.91		
	108	FENCE	GROU	ND	2065162.34	6170064.41*	376.63	12/31/69	0.0171		
	109	GATE	GROU	ND	2065153.89	6178916.73	374.66	12/31/69	376.41		
	110	FENCE	GROU	ND	2065150.67	6178939.13	374.81	12/31/69	0.0111		
	333	FENCE	GROU	ND	2065145.46	6170972.97	375.05	12/31/69			
	112	FENCE COR	GROU	ND	2065140.35	6179004.37	377.47	12/31/69			
	113	FENCE END	GROU	ND	2065126.11	6179000.10	376.95	12/31/69			
	114	GROUND	GROU	ND	2065111.81	6178970.79	376.88	12/31/69			
	115	GROUND	GROU	ND.	2065116-79	6170946.20	377.16	12/31/69			
	116	GROUND	/# 30 01	fice - [Sim	psonTopoNov13	_02.pt3:2]					
	117	GROUND	File 1	Edd View	Points Window He	shin .				- 7 ×	
	118	GROUND		0.0	•					36	6 41'
	119	GROUND	M 9	160 II.S	Y						
	120	GROUND	Select	Pt. #	Description	Layer	Northing	Easting	Elevation	Creat (^ 36)	6 41'
	121	GROUND		100	D.	GROUND	2065087.82	6170979.71	367.38	2,01,69	5.41
	122	GROUND		101	EL.	GROUND	2065110.19	6178980.22	366.41	12/31/69 36/	6 49'
				102	D.	GROUND	2065110.24	6170900.21	366.41*	12/01/69	5115
idy .				103	EL.	GROUND	2065133.06	6178963.97	366.49	12/31/69 36/	6 34'
				104	D.	GROUND	2065143.29	6170943.10	366.34	12/31/69	5101
				105	EL	GROUND	2065148.33'	6178910.91	366.08"	12/31/69 361	6.08'
				106	E.	GROUND	2065150.93	6170002.93	365.91	12/31/69	5100
				107	EL	GROUND	2065149.90'	6178854.44	366.41	12/31/69 36	5.91'
				108	FENCE	GROUND	2065162.34	6170064.41	366.63	12/31/69	
				109	GATE	GROUND	2065153.89	6178916.73	364.66	12/31/69 364	6.41'
				110	FENCE	GROUND	2065150.67*	6178939.13	364.81	12/31/69	
				111	FENCE	GROUND	2065145.46	6170972.97	365.05	12/31/69	
				112	FENCE COR	GROUND	2065140.35	6179004.37	367.47	12/31/69	
				113	FENCE END	GROUND	2065126-11	6179000.18	366.95	12/31/69	
				114	GROUND	GROUND	2065111.81	6178970.79	366.88"	12/31/69	
				115	GROUND	GROUND	2065116.79	6170946-20	367.16	12/31/69	
				116	GROUND	GROUND	2065122.16	6178921.86	366.71	12/31/69	
				117	GROUND	GROUND	2065127.61	6170097.10	366.44	12/31/69	
				118	GROUND	GROUND	2065130.55"	6178872.27	366.20	12/31/69	
				119	GROUND	GROUND	2065106.54	6170065.17	366.76	12/31/69	
				120	GROUND	GROUND	2065099.52'	6178889.18	366.87	12/31/69	
				121	GROUND	GROUND	2065092.87	6170917.59	367.32	12/31/69	
				122	GROUND	GROUND	2065087.09	6178942.22	368.28	12/31/69 🛩	
			1							(N)	

Figure 3-18 shows before and after views of this process.

Figure 3-18. Before and After Adjust Elevation Process

Converting Coordinates to Feet or Meters

Rather than simply changing the linear unit displayed in the project, the convert coordinates to feet/meters function changes the units associated with the numerical values of the coordinates. For example, this function is used to change a coordinate value of 3.000 m to 3.000 feet, or vise versa. This might be necessary, for example, when a text file with point data in units of meters is imported into 3D-Office when the units in 3D-Office are set to feet. In this case, the units associated with the coordinate values are in error and must be corrected.



Use caution with this routine, especially when operating on a subset of the data.

- In the point list view or plan view, select the desired point(s) to convert and click Points > Transform coordinates > Feet/ meters conversion. Press Ctrl+A to select all points.
- 2. On the *Convert feet/meters* dialog box, select the desired new units from the drop-down list and click **OK**. For *Custom scale factor*, enter the scale factor and click **OK** (Figure 3-19).

Convert feet/meters	Convert feet/meters
Current display units US Survey feet 🖵	Current display units US Survey feet
Convert all coordinates to Meters	Convert all coordinates to Custom scale factor
Effective scale factor 3.2808333	Effective scale factor .8579
OK Cancel	OK Cancel

Figure 3-19. Select Conversion Type

						20651	10.19'	61	78980.22'	376.41'
3D O1	fice - (Sime	senTopeNev	3 02.et	3:21		20651	10.24	61	78980.21'	376.41'
File 1	Edit. View Pr	oints Window	Help			20651	33.06	61	78963.97'	376.49
1 2	B 8 9					00454	40.00		70040 40	074.04
lect	Pt. #	Description	Lay	ér	Norma	Easts 20651	143.29	61	78943.18	375.34
	100	E.	GRO	OUND	Demonstration	20451	40.00	61	79010-01	276.09
	101	EL	GRO	OUND	2065110.19	6178 20031	170.33	0.	/0910.91	370.00
	102	E.	GRO	OUND	2065110.24	6178900.21	376.41	12/31/69 16:00		
	103	EL	GRO	OUND	2065133.06	6178963.97	376.49	12/31/69 16:00		
	104	0.	GRO	OUND	2065143.29	6178943.18	376.34	12/31/69 16:00		
- 3-	105	EL	GRO	OUND	2065148.33	6178930.92	376.08	12/31/69 16:00		
H.	106	0.	GRO	OUND	2065150.90	6170002.90	375.91	12/31/69 16:00		
H	107	EL	GRI CDU	OUND	2065149.90	6170054.44	376.41	12/31/69 16:00		
Η-	109	GATE	(20)	N ND	2000102-34	6170004.42	376.65	12/31/69 16:00	1	
H	110	EENCE	100	NAD	2048180.47	4170030.17	274.01	12/21/40 14-00	1	
H	111	FINCE	GR (NND	2005145.46	4178972.97	375.05	12/11/69 16:00	1	
H	112	FENCE COR	(2)	OUND	2065140.35	6179004.37	377.47	12/31/69 16:00	1	
Ħ	113	FINCT IND	GRO	N.ND	2065126.11	6179000.18	376.95	12/31/69 16:00		
Π_	114	GROUND	GRO	OUND	2065111.81	6178970.79	376.88'	12/31/69 16:00		
Ħ.	115	GROUND	GRO	OUND	2065116.79	6178946.28	377.16	12/31/69 16:00		
	116	CROUND.	100		2008122.00.107	C170031 841	996 997	122124 00 16 00		
	117	into de 🕽	ce - [Simp	sonTopeNev13	02.pt3:2]					
	118	👺 File Ed	t View P	vints Window H	elp				- 8 ×	
	119		hole	•						
Ц.	120		66 R.S. 8		1.		1.5.0		1	
н-	121	Select	11.0	Description	Layer	Northing	Easting	Elevation	Created (local t	
ш.,	122		100	n.	GROUND	2005087-82	4170070.71	597.58	12/31/69 16:00	
			101	EL	GROUND	6775282.29	20272204.06	1234.92	12/31/69 16:00	
đγ			102	0	CECURD	6775062.44	20072204705	1234.92	12/31/69 16:00	
			104		CROKED	6775390.87	20222082 54	1234 20	12/31/69 16-00	
			105	£.	GROUND	6775407.41	20271926.66	1233.65	12/31/69 16:00	
			106	E.	GROUND	2065150.97	6170002.937	375.91	12/31/69 16:00	
		H	107	£1.	GROUND	2065149.90	6178854.44	10.11	12/31/69 16:00	
			108	FENCE	GROUND	2065162.34	6170064.41	376.63	12/31/69 16:00	
			109	GATE	GROUND	2065153.89	6120106.73	374.66	12/31/69 16:00	
			110	FENCE	GROUND	2065150.67	6178939.13	374.81	12/31/69 16:00	
			333	FENCE	GROUND	2065145.46				
				EE	10/10/0	2065140.35*	5775282.29'		20272204.06	1234.92
			112	PENCE COR	- and one					
		8	112 113	FENCE COR	GROUND	2065126-11			00070004 051	1001.001
			112 113 114	FENCE DND GROUND	GROUND	2065126-11' 2065111.81'	6775282.44		20272204.05	1234.92
			112 113 114 115	FENCE END GROUND GROUND	GROUND GROUND GROUND	2065126-11 2065111.81 2065116-79	6775282.44		20272204.05	1234.92
			112 113 114 115 116	PENCE COR PENCE DND GROUND GROUND GROUND	GROUND GROUND GROUND GROUND	2065126-11 2065111.81 2065116-79 2065122-18	6775282.44' 6775357.31'		20272204.05' 20272150.74'	1234.92' 1235.19'
			112 113 114 115 116 117	PENCE COR PENCE DAD GROUND GROUND GROUND GROUND	GROUND GROUND GROUND GROUND GROUND	2065126.11' 2065111.81' 2065116.79' 2065122.18' 2065127.61'	6775282.44' 6775357.31'		20272204.05' 20272150.74'	1234.92' 1235.19'
			112 113 114 115 116 117 118	PENCE COR FENCE END GROUND GROUND GROUND GROUND GROUND	GROUND GROUND GROUND GROUND GROUND GROUND	2065126-11' 2065111.81' 2065116.79' 2065122.16' 2065127.61' 2065130.55'	6775282.44' 6775357.31' 6775390.87'		20272204.05' 20272150.74' 20272082.56'	1234.92' 1235.19' 1234.70'
			112 113 114 115 116 117 118 119	PENCE COR PENCE END GROUND GROUND GROUND GROUND GROUND GROUND	GROUND GROUND GROUND GROUND GROUND GROUND GROUND	2005126.11 2005111.81 2005116.79 2005122.18 2005127.61 2005130.59 2005106.74	6775282.44 6775357.31 6775390.87		20272204.05' 20272150.74' 20272082.56' 20271976.64'	1234.92' 1235.19' 1234.70' 1233.85'
			112 113 114 115 116 117 118 119 120	PENCE COR PENCE END GROUND GROUND GROUND GROUND GROUND GROUND GROUND	GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND	2005126.11 2005111.81 2005116.79 2005127.01 2005127.01 2005130.55 2005106.54 2005090.52	6775282.44' 6775357.31' 6775390.87' 6775407.41'	1	20272204.05' 20272150.74' 20272082.56' 20271976.66'	1234.92' 1235.19' 1234.70' 1233.85'
			112 113 114 115 116 117 118 119 120 121	PENCE COR PENCE END GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND	GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND	2065126.11 206511.6.79 206512.16 2065122.16 2065127.61 2065106.54 2065096.52	6775282.44' 6775357.31' 6775390.87' 6775407.41'		20272204.05' 20272150.74' 20272082.56' 20271976.66'	1234.92' 1235.19' 1234.70' 1233.85'

Figure 3-20 shows before and after views of this process.

Figure 3-20. Before and After Coordinate Conversion Process

Translating Point Coordinates

Point translations are shifts along the three respective coordinate axes; that is, along the X (East), Y (North), and Z (Elevation) axes. Typically, point translations are done on the entire data set, if at all, rather than on a subset of points.



Use caution with this routine, especially when operating on a subset of the data; data will be permanently changed.

 In the point list view or plan view, select the desired point(s) to translate and click Points > Transform coordinates > Translate in XYZ. Press Ctrl+A to select all points. 2. On the *Translation* dialog box, enter the desired *North*, *East*, and *Elev* translation values and click **OK** (Figure 3-21).





Figure 3-22 shows before and after views of this process.

					2065110	0.19'	6178	980.22	376.41
					2065110).24'	6178	980.21'	376.41'
					2065133	3.06'	6178	963.97'	376.49'
3D OI	lfice - [Sim	npsonTopoNov13	_02.pt3:2]		2065143	3.29'	6178	943.18'	376.34'
File 1	Edit View	Points Window H	elp		2065148	3.33'	6178	910.91	376.08
	100 IC	Y Description	Laver	Nothing	Fasting	Flevation	Created Div	10.0	
1	100	D.	GROUND	2011007.02	6178979.71	377.36	12/31/69 16	00	
	101	EL.	GROUND	2065110.19	6178980.22	376.41	12/31/69 16	oc	
	102	E.	GROUND	2065110.24	6178900.21	376.41	12/31/69 16	00	
	103	EL.	GROUND	2065133.06	6178963.97	376.49	12/31/69 16	00	
	104	E.	GROUND	2065143.29	6178943.18	376.34'	12/31/69 16	00	
	105	EL.	GROUND	2065148.33	6178910.91	376.08'	12/31/69 16	00	
	106	E.	GROUND	2065150.93	6178882.93	375.91	12/31/69 16	00	
1	107	EL.	GROUND	2065149.90'	6178854.44	376.41	12/31/69 16	00	
1	100	FENCE	GROUND	206516234	6178864.41	376.63	12/31/69 16	00	
1	109	GATE	GROUND	2065153.89	6178916.73	374.66	12/31/69 16	0C	
	110	FENCE	GROUND	2065150.67	6178939.13	374.81	12/31/69 16	00	
	111	HILL'F	COCUMP	South and	4130033.07	278.00	150100014		
4	112 /-	3D Office - [Sim	ipsonTopoNov13,	_02.pt3:2]					
	113 22	File Edit View	Points Window He	de.				- # x	
-				¢.					
1	114		8	¢					
	114		? Description	Lawr	Nething	Fadiru	Figurity	Control Dealt A	
	114 115 116 Se 117	elect Pt. #	P Description	Layer	Northing	Easting	Elevation	Created (local t	
	114 115 116 117 118	elect Pt. #	Description EL E	Layer GROUND GROUND	Northing 2065007.02	Easting 6178979.71' 6178990.22'	Elevation 377.38'	Created (local t * 12/31/69 16-00 12/31/69 16-00	
	114 115 116 Se 117 118 119	siect Pt. #	Description EL D	Layer GROUND GROUND GROUND	Northing 2065087-82' 2065115-19' 2065115-24'	Easting 6178979.73' 6178990.22' 6178990.21'	Elevation 377.38' 382.41' 382.41'	Created (local t * 12/31/69 16.00	
	114 115 116 58 117 118 119 120	elect Pt. # 100 101 102 103	P Description EL EL EL EL	Layer GROUND GROUND GROUND GROUND GROUND	Northing 2065087-82' 2065115-19' 2065115-24' 2065138-06'	Easting 6478979.73' 6178990.22' 6478990.21' 6478973.97'	Elevation 377.387 382.417 382.417 382.497	Created (local t * 12/11/49 16-0C 12/13/69 16-0C 12/13/69 16-0C	
	114 115 116 58 117 118 119 120 121	elect Ft. # 100 101 102 103 104	Cescription E. E. E. E. E.	Layer GROUND GROUND GROUND GROUND GROUND	Northing 2065007-02' 2065115-19' 2065115-24' 2065138-06' 2065140-29'	Easting 4478979.73' 6478990.22' 6478990.21' 6478973.97' 6478953.18'	Elevation 377.36 382.41' 382.41' 382.49' 382.49' 382.34'	Created (local t * 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00	
	114 115 116 117 118 119 120 121 122	elect Pt. # 100 101 102 103 104 105	Description E E E E E E E E E E E	GROUND GROUND GROUND GROUND GROUND GROUND	Northing 2065087.82' 2065115.19' 2065115.24' 2065138.06' 2065140.29' 2065153.33'	Easting 6178979.73' 6378990.22' 6478990.21' 6478990.21' 6478953.18' 6478953.18'	Elevation 377.38 382.43 382.43 382.49 382.49 302.34 382.09	Created (Bcall t 12/31/69 16-0C 12/31/69 16-0C 12/31/69 16-0C 12/31/69 16-0C 12/31/69 16-0C	
	114 115 116 117 118 119 120 121 122	K Ra R. Inc. Inc.	Description Description D E E E E E E E E E E E E E E E	GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND	Northing 2005007.02' 2005115.19' 2005115.24' 2005140.29' 2005140.29' 2005153.33' 2015153.33'	Easting 6178979.731 6178979.721 6178970.227 6178970.231 6178973.97 6178953.187 6178953.187 6178952.937	Elevation 377.38' 382.41' 382.41' 382.49' 302.34' 382.09' 375.91'	Created (local t ~ 12/31/69 16-00 12/31/69 16-00 12/31/69 16-00 12/31/69 16-00 12/31/69 16-00 12/31/69 16-00 12/31/69 16-00	
	114 115 116 117 118 119 120 121 122	elect Pt. # 100 102 102 103 104 105 106 107	Cescription Description D C	Layer GROUND	Northing 2065087.82' 2065115.19' 2065115.24' 2065158.06' 2065140.29' 2065153.33' 2055153.39' 2055159.90'	Easting 61219295.73' 6178990.22' 6178990.21' 6178993.97' 6121953.18' 6129520.92' 61278554.44'	Elevation 277.30' 582.41' 382.41' 382.49' 382.49' 382.06' 275.91' 375.91' 375.41'	Created (local t 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00 12/31/69 16:00	
	114 115 116 117 118 119 120 121 122	elect Pt. # 100 101 102 103 104 105 106 106 100		Layer GROUND	Restling 2065007.02' 2065115.19' 2065115.24' 2065130.06' 2065140.29' 2055153.39' 2055153.39' 2055153.39' 2055150.99'	Easting 43.20979.73' 47.20979.22' 47.20979.21' 47.20979.20' 47.20979.20' 47.20979.20' 47.20979.20' 47.20979.20' 47.2097	Elevation 277.36' 382.41' 382.49' 382.69' 382.68' 375.41' 375.41' 376.43'	Created (local t = 12/31/06 16.0C 12/31/06 16.0C 12/31/06 16.0C 12/31/06 16.0C 12/31/06 16.0C 12/31/06 16.0C 12/31/06 16.0C 12/31/06 16.0C	
	114 115 116 117 118 119 120 121 122	elect Pt. # 100 101 102 103 104 105 106 106 109	Description D. EL FDKZE GATE	CROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND	Northing 2045007.82' 2065115.19' 2065115.24' 2065138.06' 2065140.29' 2055153.37' 2055150.93' 2055150.93' 2055153.4' 2065153.4'	Easting 6428979.73' 6778990.22' 6778970.23' 6278973.97' 6278973.97' 6278973.97' 6278952.91' 6278052.91' 6278052.91' 6278054.44' 6378054.44'	Elevation 277.387 382.41' 382.49' 382.49' 382.68' 375.91' 376.41' 376.41'	Created (local t ~ 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C 12/31/06 16:0C	000 44
	114 115 116 117 119 120 121 122	elect Pr 100 101 102 103 104 105 106 106 107 100 109 110	Description D. EL EL EL EL EL EL EL EL FL EL FL EL FL FL <tr< td=""><td>Layer GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND</td><td>Northing 2005007.02' 2005115.19' 2005115.24' 2005138.06' 2005153.07' 2005153.09' 200516.09' 200516.09' 2005153.0 200</td><td>Easting 4:229279.73' 4:279970.22' 4:279970.22' 4:279970.21' 4:279970.21' 4:279902.51' 4:279902.51' 4:279902.52' 4:279902.52' 4:279902.51' 5:27902.51' 5:2</td><td>Elevation 277.367 382.447 382.447 382.497 382.697 382.697 382.697 375.647 375.647 376.437</td><td>Created Boolt * 1233469 16:00 1233469 16:00</td><td>382.41'</td></tr<>	Layer GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND GROUND	Northing 2005007.02' 2005115.19' 2005115.24' 2005138.06' 2005153.07' 2005153.09' 200516.09' 200516.09' 2005153.0 200	Easting 4:229279.73' 4:279970.22' 4:279970.22' 4:279970.21' 4:279970.21' 4:279902.51' 4:279902.51' 4:279902.52' 4:279902.52' 4:279902.51' 5:27902.51' 5:2	Elevation 277.367 382.447 382.447 382.497 382.697 382.697 382.697 375.647 375.647 376.437	Created Boolt * 1233469 16:00 1233469 16:00	382.41'
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	114 115 116 117 118 119 120 121 122	elect Pt. # elect Pt. # 100 100 102 103 104 105 106 106 107 100 109 110 111 112	Description D. D. <tr< td=""><td>Layer COUD COU</td><td>Nexthing 2005007.02 2005115.19 2005115.20 2005115.20 2005193.30 2005193.37 2005193.09 2005193.09 2005193.0 2005190.0 2005100.0 20051000000000000000000000000000000000</td><td>Easting 4379979,72" 4379990,22" 4379990,21" 4379973,97" 4379973,97" 4379973,97" 4379920,97" 4379200,97" 4379200,</td><td>Elevation 277.367 382.447 382.497 382.497 382.697 392.667 375.597 375.547 375.447 375.637</td><td>Control (Bool 1) 123214/9 1000 123214/9 10000 123214/9 10000 123214/9 1000 12000 12000 10</td><td>382.41' 382.41'</td></tr<>	Layer COUD COU	Nexthing 2005007.02 2005115.19 2005115.20 2005115.20 2005193.30 2005193.37 2005193.09 2005193.09 2005193.0 2005190.0 2005100.0 20051000000000000000000000000000000000	Easting 4379979,72" 4379990,22" 4379990,21" 4379973,97" 4379973,97" 4379973,97" 4379920,97" 4379200,97" 4379200,	Elevation 277.367 382.447 382.497 382.497 382.697 392.667 375.597 375.547 375.447 375.637	Control (Bool 1) 123214/9 1000 123214/9 10000 123214/9 10000 123214/9 1000 12000 12000 10	382.41' 382.41'
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	114 115 116 ≤ 117 118 119 120 121 122	elect PL # 100 100 100 104 106 106 107 100 100 100 100 100 100 100	Description D.	Layer GROND	Nerthing 2005007.02 2005115.19 2005115.39 2005115.39 2005116.39 2005116.37 2005116.37 2005153.4 2005153.4 2005154.5 20051554.5 2005154.5 2005154.5 2005154.5 2005154.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 2005164.5 20051654.5 20051654.5 20051654.5 20051654.5 20051654.5 20051654.5 20051654.5 200516554.5 200516554.5 200516554.5 2005165554.5 2005165554.5 2005165554.5 2005165554.5 2005165554.5 2005165554.5 20051655554.5 20051655554.5 200516555554.5 2005165555555555555555555555555555555555	Exerceg 4278979.21' 6378996.22' 6379996.22' 6379996.22' 6379965.39' 6379965.39' 6379965.49' 657855.49' 655115.19' 655115.24' 655138.06'	Elevation 377.387 382.41' 382.49' 382.49' 382.49' 382.69' 375.61' 375.61' 375.64'	Control (1997) 1223/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/49/16/07 1233/19/16/07 1	382.41' 382.41' 382.49'
	114 115 116 117 117 118 117 120 121 122	elect PL # 100 101 102 103 104 106 106 106 106 106 107 100 100 110 111 112 113 114 114 114 114 114 114 114 114 114	Description D. Description D. E. E. E. E. E. E. E. E. FUNCE	Layer GROUND	Nerthing 2005017.62 2005115.17 2005115.17 2005115.07 2005119.07 2005119.07 2005119.07 2005119.07 2005119.07 2005119.07 2005119.0 2005119.0 2005119.0 2005119.0 2005119.0 2005119.1 2005119.0 2005119.1 2005119.0 2005110	Eastrog 4179976.27 6179990.27 6179990.27 6179990.27 6179905.27 6179905.27 6179905.27 6179905.17 6179905.17 6179905.17 617995.17 617995.17 617951.19' 65115.24' 651138.06' 65138.06'	Elevation 377.387 382.457 382.457 382.667 382.667 375.997 375.457 376.457	Constant Constant 12731/09 16 00 12731/09 16 00 10 00 100000000	382.41' 382.41' 382.49' 282.24'
	114 115 116 117 118 119 120 121 122 122 122	elect PL # 100 100 102 105 106 106 107 100 100 109 100 100 100 100 100 100 100	Description D. D. E. D. PONCE	Layer Council Council Co	Nettling 2060007.021 2060115.19 2060115.24 2060115.34 2060115.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.34 2060110.3 2060110.4 2060110.4 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2 2060110.2	Exerce 4179976-27 6179996-27 6179996-27 6179996-27 6179996-27 6179996-27 6179996-27 6179965-17 6179965-17 6179965-47 617996-47 655115.19' 655115.24' 655138.06' 655148.29'	Elevation 277-367 382-41 382-47 382-59 382-547 382-567 375-597 375-597 375-637	Content Boost 1 1273/4/9 16:00 1273/4/9 16:0	382.41' 382.41' 382.49' 382.34'
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	114 115 116 117 118 119 120 120 122	eiect Pr. # 100 102 103 104 105 106 106 106 106 106 106 106 106	Pescreption Descreption E	Layer Ground Ground	Nerthing 2005017 0/2 2005115.37 2005115.37 2005115.37 2005115.37 2005153.47 2005153.47 2005153.47 2005153.4 2005153.4 2005153.4 2005153.4 2005153.4 2005153.4 2005153.4 2005153.4 2005153.4 2005153.2 20051553.2 20051553.2 200515555.2 200515555.2 200515555.2 200515555.2 200515555.2 20051555555.2 20051555555555555555555555555555555555	Eastrog 4379975.27 4379995.27 4379995.27 4379995.27 4379955.39 4379955.39 4379955.39 4379955.39 4379955.47 4379954.47 4379854457 437985447 4379857 437985757 437985757 4379857577 4379757777 437977777777777777	Elevation 377-387 382-447 382-447 382-347 382-347 382-347 375-547 375-547 275-557	Control (1994) 12271499 5600 12271499 5600 12271499 5600 12271499 5600 12271499 5600 1227149 5600 127149 127149 12715 127149 12715	382.41' 382.41' 382.49' 382.34' 382.08'
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	114 115 116 117 118 119 120 122 122	X Base enext FL# 100 100 101 100 102 100 103 100 104 100 105 100 106 100 100 100 100 100 110 110 111 112 112 114 114 116 116 116 118 119 120 120	Perception E. GATE GATE GOLND GOLND GOLND GOLND GOLND GOLND GOLND	Layer Layer Log Counce	Netting 2000007.02 2000115.19 2000115.19 2000115.19 2000115.29 2000115.00 2000110.07 2000110.07 2000110.07 2000110.07 2000110.0 2000110.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200010.1 200000.1 200000.1 200000.1 200000.1 200000.1 2000000.1 2000000.1 2000000.1 20000000.1 20000000000	Eastrog 4379979.27 4379990.27 4379990.27 4379990.27 4379990.27 4379920.37 4379920.37 4379920.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200.47 43799200	Develop 277.267 362.417 362.417 362.417 362.417 362.417 362.617 362.617 375.417 375.417 375.417 376.427 376.427 376.427	Contest Bank Contest Bank 122189 Hard 122189 Hard 122	382.41' 382.41' 382.49' 382.34' 382.08'
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Figure 3-22. Before and After XYZ Translation Process

Setting Unit Options

The *Project options* dialog box sets the type of units to use for the various project quantities. See "Setting Project Units" on page 2-15 for details on the *Units* tab.

Exporting Points

3D-Office exports points from a 3D Point file or 3D Project file to point files (*.pt3) and text files, as well as a Pocket-3D controller.

Exporting Points to a Point File

Use this process to keep copies of files or track progress.

- 1. Select the points to export and click **Points ▶ Export selected points ▶ To 3D point file (*.pt3)**.
- 2. On the *Save As* dialog box, do one of the following (Figure 3-23):
 - To export to another point file, navigate to the location of the file and select it, then click **Save**,
 - To save to a new file, navigate to the desired folder, type a name for the new file, and click **Save**.



Figure 3-23. Save Point File

The selected points are added to the existing or new 3D point file.

Exporting Points to a Pocket-3D Controller

- 1. Connect the Pocket-3D controller to the computer and turn on the controller. See Appendix A for details.
- 2. Select the points to export and click **Points ► Export selected points ► To Pocket-3D controller**. 3D-Office connects with the Pocket-3D controller.
- 3. On the *Pocket-3D files* dialog box, do one of the following and click **Save** (Figure 3-24):
 - Select a file to overwrite.
 - Enter a new file name or keep the default file name to save a new file to the controller's memory.

The file type is automatically selected.

Pocket-3D	files				
Name		Size (kB)	Created		
File name Files of type	PP_topo	o_Nov20 es (*.PT3)	7]	Save Cancel

Figure 3-24. Save File to Pocket-3D Controller

The selected points data is saved in the specified folder on the Pocket-3D controller.

Exporting Points to a Text File

- 1. Select the points to export and click **Points ▶ Export selected points ▶ To text file**.
- 2. Select the format type and click **Next** (Figure 3-25). See "Creating Custom Import/Export Formats for Text Files" on page 2-2 for creating new or editing current formats (Figure 3-25).

Select custom format	×
Formats NOTEPAD TXT Test	New format Edit Delete
< Back	Cancel

Figure 3-25. Select Custom Format

- 3. Click **Browse**. Navigate to the desired location in which to save the file, select a current file to replace or type a name for a new file. Click **Save**.
- 4. Enable the view results box to automatically open the text file when the export completes. If needed, select the desired *Viewer*.
- 5. Click **Finish** to export the selected points to a text file (Figure 3-26).

Export points to text file							
Text file	Desure						
Append to existing file	Browse						
View results when export complete	View results when export complete						
Viewer C:\WINDOWS\NotePad.exe							
< Back Finish	Cancel						

Figure 3-26. Exporting Points to Text File

If the view results box was checked, the selected text editor opens and displays the exported points (Figure 3-27).

PP_topo_Nov22.TXT - Note	pad		×
Eile Edit Format View Help			
771058.071 1835466.058 771058.071 1835280.216 770993.387 1835305.266 770993.387 1835353.749 770989.141 1835277.033 770911.001 1835244.333 770921.461 183528.305 770922.787 1833365.677 770936.526 1833349.432 770960.692 1833435.592 770960.48183449.135 770950.18183445.135 770950.18183461.193 771051.486 1833409.978 771051.48183540.9978 77105.211 1835388.170 771005.211 1835387.158 771005.211 1835387.158 771005.211 1835387.158 771005.211 1835387.158 771005.211 1835387.158	911.161 912.788 912.559 912.562 912.668 907.638 907.928 907.928 907.928 907.928 907.928 907.928 907.928 907.928 910.286 910.286 911.675 912.451 912.917 912.917 912.917 912.917 912.917 912.917 912.917 912.758 912.760		
<		>	:

Figure 3-27. Exported Points in Viewer

Linework Files

Linework files contain layers comprised of polyline entities, where each layer is assigned a name and color. A polyline is a series of continuous line segments that may represent features or objects within the project, such as building pads, curbs and sidewalks, top and toes of slopes, or the boundary of the project. With 3D-Office, linework can be transformed into points and alignments.

Importing and Opening Linework

3D-Office can read linework files from several formats. Linework in 3D-Office can be assigned to layers, draped onto TINs, converted to alignments, edited, deleted, and exported to various file format types.

3D-Office recognizes linework from three file types:

- 3D linework files (*.ln3)
- Pocket-3D controller files See "Importing Linework from Pocket-3D" on page 4-2 for import details.
- AutoCAD® files See "Importing from an AutoCAD File" on page 4-3 for import details.

Importing Linework into a 3D Project File

Follow these steps to import linework from a 3D Linework file into a 3D Project file.

- 1. With a 3D Project file open, click Linework ▶ Import linework ▶ From 3D linework file (*.ln3).
- 2. On the *Open* dialog box, navigate to the location of the desired file, select it, and click **Open** (Figure 4-1).

Open			? 🛛
Look in: 🔎	PP_topo		r 🖬 🕈
PP_topo_N	lov20.ln3		
File <u>n</u> ame:	PP_topo_Nov20.In3		Open 📐
Files of type:	Linework (*.ln3)	•	Cancel

Figure 4-1. Open 3D Linework File

Importing Linework from Pocket-3D

Follow these steps to import a Pocket-3D controller linework file into a 3D Project file.

- 1. Connect the Pocket-3D controller to the computer and turn on the controller (see Appendix A for details). Run Pocket-3D on the controller.
- With a 3D Project file open, click Linework ▶ Import linework ▶ From Pocket-3D controller.
 3D-Office connects with the Pocket-3D controller and retrieves

3D-Office connects with the Pocket-3D controller and retrieves *.ln3 linework files.

3. On the *Pocket-3D files* dialog box, select the file to import and click **Open** (Figure 4-2 on page 4-3). The file type is automatically selected.

Pocket-3	BD files	}		X
Name TEST SITE (L	INEWORK)	Size (kB) 7.8	Created Monday, March	i 1st, 2004, 4:40PM
File name Files of type	TEST SITE (Linework file	LINEWORK) s (*.LN3)	•	Open Cancel

Figure 4-2. Open Pocket-3D Linework File

Importing from an AutoCAD File

Follow these steps to import linework from an AutoCAD (dwg or dxf) file into either a 3D Project file or a 3D Linework file. All associated layers defined in the AutoCAD file will be imported.

- 1. With a 3D Project or 3D Linework file open, click Linework ▶ Import linework ▶ From AutoCAD file.
- 2. On the Open dialog box, navigate to the location of the desired file, select it, and click Open (Figure 4-3).



Figure 4-3. Open AutoCAD 3D Linework File

Opening a Linework File

- 1. To open a 3D linework file, click **File ▶ Open**.
- On the *Open* dialog box, navigate to the location of the file, select the file type as Linework (*.ln3), select the desired file, and click **Open** (Figure 4-4).



Figure 4-4. Open 3D Linework File

Opening a Pocket-3D Linework File

If a Pocket-3D controller and the computer are connected, 3D-Office can open linework files directly from the controller. Once opened, the file can be exported to other files or saved to the computer. See Appendix A for details on connecting a computer and controller.

- 1. Click File > Open Pocket-3D file.
- 2. On the *Pocket-3D files* dialog box, select the file type (*.ln3) and the desired file, then click **Open** (Figure 4-5).

Pocket-	3D files			X
Name TEST SITE (LINEWORK)	Size (kB) 7.8	Created Monday, Ma	arch 1st, 2004, 4:40PM
File name	TEST SITE	LINEWORK) s (*.LN3)	•	0pen

Figure 4-5. Select File and Click Open

Creating Linework

The polygon selection tool can be used to create polylines in a 3D Project file. With 3D-Office, linework can be transformed into points and alignments.

- 1. To add a new polyline to the file, click the polygon selection tool, then click on the screen to begin the polyline. Click at subsequent locations to create the end point or corner points (Figure 4-6).
- 2. Click once at the end-point, then do one of the following:
 - right click and click **New polyline** on the pop-up menu (Figure 4-6)



• click Linework > New polyline

Figure 4-6. Trace New Polyline with Polygon Tool and Add to File

3. On the *Polyline* dialog box, select the layer in which to enter the new polyline and enter an elevation for the polyline, then click **OK** (Figure 4-7).



Figure 4-7. Enter new polyline parameters

The new polyline is stored as linework in the file. The elevation entered in the dialog box is assigned to all vertices of the new polyline.

Draping Polylines onto TIN

The drape polyline to TIN function allows a polyline to be created across the current TIN model. Using this function, the elevations of the polyline vertices are derived from the TIN model. Thus, the polyline is "draped onto the TIN model".

- 1. After drawing a polyline in the plan view, use the Selection tool to select the new polyline. Click Linework ▶ Drape polyline(s) onto TIN.
- 2. Click **OK** to create new TIN vertices (Figure 4-8).



Figure 4-8. Create New Vertices at Triangle Edges

3D Office will redraw the portion of the TIN surface that changed, adding vertices to the TIN surface along the new polyline.

Deleting Polylines

- 1. To delete polylines from the file, use the Selection tool and click the desired polylines.
- 2. Press **Delete** or click **Linework** > **Delete polyline(s)**.

Viewing Linework Information

Linework information can be viewed using a text editor, displaying the layer the linework resides in, the number of vertices in the linework, and the coordinates for the vertices of the selected linework. This information can be saved as a text file for later reference.

- 1. Select the linework to view information on:
 - click the individual linework
 - use the select tool to select a group of linework
- 2. Click the activated **Information** button on the toolbar. A text file opens, displaying linework information. (Figure 4-9).

>	# PP_topo_Nov20.tp3:2 -		×
	<u>Eile Edit</u>		
	Selected entities Polylines (layer, # vertices) Default, 6		^
	Vertices (coords, curve radius, curve direction) X 1835278.63', Y 771120.62', Z 912.97' X 1835309.40', Y 771100.34', Z 912.42' X 1835337.44', Y 771079.00', Z 912.30'		ш
	X 1835362,90', Y 771060.04', Z 911.96' X 1835387.66', Y 77108.07', Z 911.57' X 1835408.25', Y 771012.95', Z 910.68'		
	Default, 11 Vertices (coords, curve radius, curve direction) X1835259.61', Y 771102.51', Z 912.88' X1835256.73', Y 77102.74', Z 912.92' X1835256.4', Y 771052.16', Z 912.92'		~
		>	:

Figure 4-9. Click Information Button and View Selected Entities

3. To save the information as a text file, click **File → Save as**. On the *Save As* dialog box, type a name for the file or keep the default file name. Navigate to the location in which to save the file and click **Save**.

Managing Linework Layers

To view, add, or edit layers, click **Linework** ▶ **Layers**. The *View layers* dialog box displays each layer in the linework file.

- The enable/disable box next to each layer name indicates whether or not it displays on the Plan View.
- See the following sections for details on adding a layer, deleting a layer, setting layer colors, or setting point labels.
- Show all enables all layers for display on the Plan View.
- *Show none* disables all layers from being displayed on the Plan View.

For details on using the *Layer* dialog box, see "Managing Layers" on page 2-5.

Setting Unit Options

The *Project options* dialog box sets the type of units to use for the various quantities used in the 3D Linework file.

To set unit options in a Linework file, click **View > Options**. The dialog box that displays has the same fields as for 3D Project files. See "Setting Project Units" on page 2-15 for details on the *Units* tab.

Exporting Linework

If you made changes to a linework file, you can export the changed file to a new linework file, or replace a current file with the new information.



Exporting Linework to a File

The following steps describe exporting linework to a 3D Linework file (*.ln3).

- 1. Select the linework to export and click Linework ▶ Export selected linework ▶ To 3D linework file.
- 2. On the *Save As* dialog box, type a name for the new linework file or select a linework file to replace. Click **OK** to export the file (Figure 4-10).

Save As	? 🔀
Savejn: 🗀	PP_topo 💽 🗲 🖻 📅
PP_topo_N	ov20.ln3
File <u>n</u> ame:	PP_topo_Nov22
Save as type:	Topcon LN3 file (*.In3)

Figure 4-10. Save Linework File

Exporting Linework to a Pocket-3D Controller

To use the linework file in the field, export it to a Pocket-3D controller.

- 1. Connect the Pocket-3D controller to the computer and turn on the controller (see Appendix A for details). Run Pocket-3D on the controller.
- 2. Select the linework to export and click Linework ▶ Export selected linework ▶ To Pocket-3D controller.
- 3. On the *Pocket-3D files* dialog box, do one of the following and click **Save** (Figure 4-11):
 - Select an existing file to replace.
 - Enter a new file name or keep the default file name.



Figure 4-11. Save Linework File to Pocket-3D Controller

TIN Files

A TIN (Triangulated Irregular Network) model can be used to represent an irregular land surface. The model is derived from a set of points and edges (optional). 3D-Office can generate a TIN from existing point/line data, or it can read an existing TIN model from an outside source, such as an AutoCAD® file. A TIN model of the existing ground can be used to display cut and fill information and earth volume quantities with respect to a design surface.

Importing and Opening a TIN Surface

3D-Office opens/imports a TIN model for displaying, editing, exporting, and comparing to other surfaces. TIN options can also be set in 3D-Office.

3D-Office recognizes TIN surfaces from four file types:

- 3D TIN files (*.tn3)
- Pocket-3D controller files See "Importing from Pocket-3D" on page 5-2 for import details.
- AutoCAD files See "Importing from an AutoCAD File" on page 5-3 for import details.
- REB triangle files See "Importing an REB Triangle File" on page 5-4 for import details.

Importing a TIN Surface

Follow these steps to import a TIN surface from a 3D TIN file into a 3D Project file.

- 1. With a 3D Project open, click **Project** ▶ **Import TIN** ▶ **From 3D TIN file (*.tn3)**.
- 2. On the *Open* dialog box, navigate to the location of the desired file, select it, and click **Open** (Figure 5-1). The TIN surface from the selected file is added to the 3D Project file.

Open			? 🛛
Look jn: 🔎	PP_topo		* 💷 •
Pp_topo_n	ov4.tn3		
File <u>n</u> ame:	pp_topo_nov4.tn3		Open
Files of type:	TIN surface (*.tn3)	•	Cancel

Figure 5-1. Open 3D TIN File

Importing from Pocket-3D

Follow these steps to import a Pocket-3D controller TIN file into a 3D Project file.

- 1. Connect the Pocket-3D controller to the computer and turn on the controller (see Appendix A for details). Run Pocket-3D on the controller.
- 2. With a 3D Project open, click **TIN** → **Import alignment** → **From Pocket-3D controller**. 3D-Office connects with the Pocket-3D controller.
- On the *Pocket-3D files* dialog box, select the file to import and click **Open** (Figure 5-2 on page 5-3). The file type is automatically selected.

Pocket-	3D files			X
Name		Size (kB)	Created	
TEST SITE 1	TIN (SUPER)	85.4	Monday, March 1	st, 2004, 4:43PM
				>
File name	TEST SITE T	IN (SUPER)		
Files of type	TIN surface f	iles (* TN3)	-	Open
	1	,		Cancel

Figure 5-2. Select and Open Pocket-3D TIN File

The information from the selected file is added to the 3D Project file.

Importing from an AutoCAD File

Follow these steps to import a TIN surface from an AutoCAD dwg/ dxf file into a 3D Project file.

- 1. With a 3D Project file open, click **TIN** ▶ **Import TIN** ▶ **From** AutoCAD file.
- 2. On the *Open* dialog box, navigate to the location of the desired file, select it, and click **Open** (Figure 5-3). The information from the selected file is added to the 3D Project file.



Figure 5-3. Open AutoCAD 3D TIN File

Importing an REB Triangle File

Follow these steps to import a TIN surface from an REB triangle file (*.reb) into a 3D Project file.

- 1. With a 3D Project file open, click **TIN** ▶ **Import TIN** ▶ **From REB triangle file**.
- 2. On the *Open* dialog box, navigate to the location of the desired file, select it, and click **Open** (Figure 5-4). The information from the selected file is added to the 3D Project file.

Open		? 🛛
Look jn: 🔎	3dmc	- 🗧 🖆 📰 -
MachineFile	25 126	
File <u>n</u> ame:	EYL_OSS.REB	<u>Open</u>
Files of type:	REB triangle files (*.reb)	Cancel

Figure 5-4. Open REB Triangle File

Opening a TIN Surface

- 1. To open a 3D TIN surface file, click **File ▶ Open**.
- 2. On the *Open* dialog box, navigate to the location of the file, select the file type as TIN surface (*.tn3), select the desired file, and click **Open** (Figure 5-5).

Open					? 🗙
Look jn: 🔎	PP_topo	•	•	a 📰	•
Pp_topo_n	ov4.tn3				
File <u>n</u> ame:	pp_topo_nov4.tn3			<u>0</u>	oen N
Files of type:	TIN surface (*.tn3)		•	Ca	ncel

Figure 5-5. Open 3D TIN Surface File

Opening a Pocket-3D TIN File

If a Pocket-3D controller is connected to the computer, 3D-Office can open TIN surface files directly from the controller. Once opened, the file can be exported to other files or saved to the computer. See Appendix A for details on connecting a computer and controller.

- 1. Click File > Open Pocket-3D file.
- 2. On the *Pocket-3D files* dialog box, select the file type (*.tn3) and the desired file, then click **Open** (Figure 5-6).

Pocket-	3D files			X
Name TEST SITE	TIN (SUPER)	Size (kB) 85.4	Created Monday, Marc	h 1st, 2004, 4:43PM
<				>
File name Files of type	TEST SITE	TIN (SUPER) files (*.TN3)	•	Open Cancel

Figure 5-6. Select File and Click Open

Creating a TIN Surface

In many applications, an elevation of the terrain or a cut/fill to a design surface is needed at an arbitrary location within the project. 3D-Office can provide this information based on a TIN model generated from the project point-data. A design surface TIN is useful for stakeout and grading, and is an essential model for 3DMC.

TIN surfaces can only be created in 3D Project files, not 3D TIN files.

Creating a TIN Surface From a 3D Alignment

3D-Office offers a powerful tool to generate a TIN model from a 3D Alignment. This is useful for comparing the existing terrain surface to a road design surface, thus providing a means to compute cut and fill volume quantities.

- From a 3D Project file that contains both a horizontal and vertical alignment, click Alignment > Generate TIN from 3D alignment.
- 2. On the *Generate TIN model* dialog box, select the desired generation parameter, and click **OK** (Figure 5-7 on page 5-7).
 - *Generate points using regular sampling interval* generates a TIN having more uniformly shaped triangles. This option may take longer to generate the TIN. Enter the sampling interval in the project's units.
 - *Generate points only where necessary* may reduce the size of the TIN file. Triangle vertices will be generated at the alignment definition points and as necessary to maintain the break lines implied in the alignment definition.
 - *Maximum arc/chord separation* sets the maximum separation distance between the straight side of the triangle and the arc of a curve. A smaller separation value will create triangle edges that will more closely approximate the curve (but this will also create more, and smaller, triangles).

3D-Office generates a TIN model from the points of the alignment.

Generate TIN model	
Generate points using regular sampling interval Sampling interval (along CL) 10.00* Generate points only where necessary Maximum arc/chord separation 0.00*	Generate TIN model Image: Comparison of the system Image: Comparison of the system Generate points only where necessary Maximum arc/chord separation 0.00*
OK 💦 Car	Cancel

Figure 5-7. Select TIN Generation Parameters and Generate TIN Model

Creating a TIN Surface From Selected Points/Linework

3D-Office permits graphical selection of point and line data for TIN generation. This is very useful for generating a TIN model from an imported data set, for example, survey data. All selected points become vertices of the TIN mesh, and all selected lines appear as edges in the mesh. Thus the selected lines function as "breaklines;" that is, they will not be crossed by any other edges in the TIN mesh. The default boundary of the TIN is the so-called convex hull, a unique mathematical boundary for any point set. See "Creating a TIN Surface Clipped to the Selection Polygon" on page 5-8 for an alternate way to define the TIN boundary.

- From a 3D Project file that contains points and/or linework, use the selection tool to select the elements from which to generate the TIN model. Press Ctrl+A to select all elements in the 3D Project.
- 2. Click **TIN** > Generate new **TIN** surface > From selected points/linework.

3D-Office generates a TIN model from the selected points and/or linework.

Creating a TIN Surface Clipped to the Selection Polygon

Rather than using the convex hull of the point set to define the TIN boundary, this function will clip the TIN model to the perimeter defined using the selection polygon. This provides an easy way to customize the boundary of the TIN model.

- 1. From a 3D Project file that contains points and/or linework, use the selection tool to select the elements from which to generate the TIN model. Press **Ctrl+A** to select all elements in the 3D Project.
- 2. Click **TIN** > Generate new **TIN** surface > Clipped to selection boundary.

3D-Office generates a TIN model from the selected points and/or linework, clipped to the selection polygon.

Creating a TIN Surface From Selected Triangles

3D-Office permits graphical selection of triangle data for TIN generation. This is useful for creating a TIN surface that is a subset of an existing TIN surface.

- 1. From a 3D Project file that contains triangles, use the selection tool to select the triangles from which to generate the TIN model.
- 2. Click **TIN** → **Generate new TIN surface** → **From selected triangles**.

3D-Office generates a TIN model from the selected triangles.

Viewing Triangle Information

TIN (Triangulated Irregular Network) surface files are comprised of a mesh of non-overlapping triangles computed from irregularly spaced points with x, y coordinates. 3D-Office opens a text file for viewing TIN triangle information.

- 1. Select the TIN triangles to view information on:
 - click the individual triangle(s)
 - use the select tool to select a group of triangles
- 2. Click the activated **Information** button on the toolbar. A text editor window opens, displaying the coordinates for the three points of each selected triangle (Figure 5-8).

belected entities		
N 770906, 77/E 1835287, 06/2 800, 19' N 770915, 68/E 1835374, 61/2 800, 06' N 770915, 68/E 1835374, 61/2 801, 06' N 770952, 29/E 1835374, 56/2 801, 36' N 770940, 52/E 1835374, 36/2 801, 36' N 770940, 52/E 1835374, 36/2 801, 36' N 770950, 26/E 1835439, 77/2 800, 13' N 770952, 29/E 1835374, 56/2, 2801, 36' N 770952, 27/E 1835574, 56/2, 2801, 36' N 770950, 06/E 1835439, 77/2 800, 15' N 770960, 06/E 1835439, 77/2 801, 97'	N 770916-67, E 1835374-21, 2 600.05 N 770915-67, E 1835374-21, 2 600.05 N 770943-02, E 1835374-21, 2 600.05 N 770943-02, E 1835349.09, 2 601.30 N 770945.22, E 1835349.09, 2 601.30 N 770945.23, E 1835341, 36, 2 601.35 N 770965-04, 1 835541, 2 601.35 N 770965-04, 1 835541, 2 601.35 N 770965-04, 1 835541, 2 601.35 N 770952, 2 1 835374, 2 601.35 N 770952, 2 1 835374, 2 601.35 N 771009, 2 1 835482, 0 1, 2 601.37 N 771009, 2 1, 1 835482, 0 1, 2 601.37	N 770933 67, E 1855316, 25, 2 601, 24 N 770963, 77, E 1855287, 062, 2 601, 97 N 770963, 67, E 1855287, 062, 2 601, 97 N 770961, 064, E 185547, 24, 2 600, 06 N 770961, 064, E 185547, 24, 2 600, 05 N 770941, 02, E 185543, 94, 200, 15 N 770943, 02, E 185543, 94, 09, 2 601, 15 N 770406, 24, E 1855443, 92, 2 601, 15 N 771060, 24, E 1835443, 92, 201, 15 N 771066, 62, E 1835471, 43, 2 603, 52

Figure 5-8. Click Information Button and View Selected Entities

3. To save the information as a text file, click **File** ▶ **Save as**. On the *Save As* dialog box, type a name for the file or keep the default file name. Navigate to the location in which to save the file and click **Save**.

Viewing and Editing TIN Surfaces

Viewing the TIN model may be helpful for getting a feel of how the point and line data are used to represent the physical land surface. The view can also be used to select triangles to delete. Triangles might be deleted in order to trim the model along its perimeter or to otherwise reduce the model size. Long, narrow triangles can also be removed if desired.

To view the 3D Project's TIN surfaces, click **TIN ▶ TIN surfaces**. The *TIN surfaces* dialog box displays the following information about the selected TIN surface (Figure 5-9 on page 5-11):

- TIN surfaces a listing of all TIN surfaces in the 3D Project file.
- Name the name of the selected/current TIN surface.
- Layer the layer in which the TIN surface exists. Click the dropdown box to change the layer for the currently selected TIN surface.
- Visible whether or not the triangles, perimeter, and contours of the TIN surface are visible, or if these element are visible by layer.
- TIN element color boxes the color of the TIN element (triangle, perimeter, and contour). Click the button to change the element's color.
- Number of triangles the number of triangles on the TIN model.
- Number of points the number of points in the TIN model.
- Number of regions the number of regions in the TIN model.
- Number of holes the number of holes in the TIN model.
- Surface area the surface area of the TIN model in the project's unit.

TIN surfaces						
Wednesday, Novembe	Wednesday, November 13th, 2002,					
Copy D	elete					
Selected surface						
Name :	Wednesday, November 13th, 2002,					
Layer :	<no layer=""></no>					
Visible :	Yes Triangles Perimeter Contours					
Number of triangles :	757 Number of regions : 1					
Number of points :	435 Number of holes : 0					
Surface area : 8.0	2ac					
·	OK Cancel Apply					

Figure 5-9. TIN Surfaces

Editing a TIN Surface

- On the *TIN surfaces* dialog box (in a 3D project file, click TIN ▶ Tins surfaces), select the TIN surface to edit (Figure 5-9).
- 2. Change or edit the following parameters as needed:
 - The name of the TIN surface.
 - The layer in which the TIN surface exists.
 - If the elements of the TIN surface are visible, not visible, or visible by position in a layer.
 - The color of the triangles, perimeter, or contours of the TIN surface (click the element's button and select a new color).
- 3. Click **OK** to save the changes and apply then to the selected surface.

Copying a TIN Surface

The copy function provides a way to produce multiple versions of a TIN surface, which may be useful for reducing an existing TIN into one or more sub-regions. Selecting a TIN surface and clicking **OK** will display the TIN in the design view.

- 1. On the *TIN surfaces* dialog box, select the TIN surface to copy and click **Copy** (Figure 5-10).
- 2. Type a unique name for the new TIN surface and press **Enter** (Figure 5-10).

TIN surfaces		
Wednesday, Novemb	er 13th, 2002,	
		TIN surfaces 🛛 🗙
		Wednesday, November 13th, 2002, Wednesday, November 28th, 2002, [j]
Copy C	elete	
Selected surface		
Name :	Wednesday, November 1	CopyDelete
Layer:	<no layer=""></no>	- Selected surface
Visible :	Yes Triang	Name : Wednesday, November 28th, 2002,
		Layer : <no layer=""></no>
Number of triangles :	757 Number	Visible : Yes Triangles Perimeter Contours
Number of points :	435 Number	
Surface area : 8.0	l2ac	Number of triangles : 757 Number of regions : 1
		Number of points : 435 Number of holes : 0
	OK C	Surface area : 8.02ac
		OK Cancel Apply

Figure 5-10. Copy and Name TIN Surface

- 3. Make any desired changes as described in "Editing a TIN Surface" on page 5-11.
- 4. To view or edit the copied TIN, select it and click OK.

From here, you can make changes to the TIN surface, then export it for use in another file. See "Working with TIN Surfaces" on page 5-14 for editing the TIN surface.

Deleting a TIN Surface

Only delete a surface when the data it contains will never be needed again. If necessary, save a backup copy of the file before deleting surfaces.



Deleting a surface will also delete all of its contents.

- 1. On the *TIN surfaces* dialog box, select the TIN surface to delete and click **Delete**.
- 2. Click **OK** to confirm the deletion (Figure 5-11).



Figure 5-11. Delete TIN Surface

To undo the deletion, click **Edit → Undo edit TIN surfaces** or press **Ctrl+Z**.

Working with TIN Surfaces

3D-Office provides the power to easily view, edit, and import/export TIN surfaces. The following sections describe the TIN editing functions.

Deleting Triangles with Long Sides

Before deleting information, make a backup copy of the file. This function affects the current TIN surface. If deleted triangles fall within the interior of the mesh, a red border replaces the outer edge of the deleted triangles, indicating a boundary around the "hole" left by deleted triangles.

- 1. If needed, select the desired TIN surface (click **TIN ▶ TIN surfaces**, select the surface and click **OK**).
- 2. Click **TIN** > **Delete triangles** > With long sides.
- 3. Type a length to delete triangles with at least one edge greater than the entered value (Figure 5-12). 3D-Office deletes all triangles that have at least one edge as long as the length.



Figure 5-12. Delete Triangles with an Edge Greater Than...

3D-Office automatically regenerates the surface.



Figure 5-13 shows before and after screen shots of this process.

Figure 5-13. Before and After Deleting Triangles with Long Sides

Deleting Selected Triangles

If deleting interior triangles, a red border replaces the outer edge of the deleted triangles, indicating a boundary around the "hole" left by deleted triangles.

This function affects the current TIN surface.

- 1. Using the select tool, click or draw a rectangle around the triangles to delete.
- Click TIN ➤ Delete triangles ➤ Selected or press Delete on the keyboard. 3D-Office deletes the selected triangles.

3D-Office automatically regenerates the surface.



Figure 5-14 shows before and after screen shots of this process.

Figure 5-14. Before and After Deleting Selected Triangles

Consolidating Duplicate TIN Points

Some data sets may contain points that are so close to their neighbors that they can be considered duplicates and unnecessary. Such points will cause small or narrow triangles in the TIN mesh. The consolidate duplicate points function removes one of the "duplicate" points.

The consolidate duplicate TIN points option is only available in 3D Project files, not 3D TIN files. This function affects the current TIN surface.

- 1. From a 3D Project with a TIN model, click **TIN → Consolidate duplicate TIN points**.
- 2. Enter the tolerance value and click **OK** (Figure 5-15). The tolerance value specifies the 3D distance used to consider two point to be duplicates. 3D-Office consolidates duplicate points (removing one of them from the TIN data set) and regenerates the TIN model.



Figure 5-15. Enter the Duplicate Tolerance of Points

Viewing a 3D Simulation of the TIN Surface

The 3D-views in 3D-Office use lines and colors to give a threedimensional perception of a field or pad on a two-dimensional screen. Using the 3D view can help to visualize what the topography or design surface looks like.

To view a simulation of the TIN surface, click **TIN** ▶ **View 3D simulation**. A new window opens displaying an interactive, 3-dimensional simulation of the TIN surface (Figure 5-16 on page 5-18).

- Click and hold on the screen to have the pointer rotate the view.
- The arrow keys on the keyboard control the motion of the machine: up arrow is forward, down arrow is backward, left and right arrows rotate the "ground" accordingly.
- On a mouse with a scroll wheel, the scroll wheel zooms in/out.
- See "3D-view and Profile View Menu Bars" on page 1-13 for details on the menus and menu items.
- See "3D-view and Profile View Toolbars" on page 1-14 for details on the 3D-view toolbar.

To play a machine log file, click **Motion ▶ Playback from log file** and select the machine log file (*.ml3) for the job. The machine on the 3D-view will move as the machine at the jobsite moved.



Figure 5-16. TIN Simulation

Viewing a Profile of the TIN Surface

The profile view is a powerful tool for visualizing cut and fill heights along a line through the TIN model and can be used for the following:

- to check clearances between the design surface and existing gas lines, or other utility lines, of known depth
- to determine the grade of the design or existing surface along a line

The profile can be viewed statically or dynamically by dragging the profile line across the field.

- 1. To view a profile of the field, click **TIN** ► **View profile**. A check mark displays next to the menu option.
- In the Plan View, click a location at which to begin the profile. Stretch the line across the field and click once to end it (Figure 5-17 on page 5-19).



Figure 5-17. Select Area to View in Profile

The Profile View displays (Figure 5-18) the following information:

- elevation tic marks on the left of the view window
- a cross section of the current TIN
- a pop-up box showing XY point coordinates, TIN Z coordinates, and grade at the point of the crosshair
- a horizontal scale bar
- cross hair coordinates in the status bar

The vertical exaggeration is shown as a ratio next to the elevation in the status bar on the far right.



Figure 5-18. Profile View

- 3. On the *View* dialog box (Figure 5-18), use the toolbar to manipulate the view. See "3D-view and Profile View Toolbars" on page 1-14 for information on the toolbar buttons.
- 4. To change the position of the profile view, click in the Plan View, then click, "grab" and "drag" the start or end point of the profile line in the Design View to a new position. The "grabbed" point is green while being moved. The Profile View changes accordingly.

Or, you can "grab" the line and shift it without changing its direction or length.



Closing the Profile View quits the profile function. Repeat steps 1 through 3 to display the profile view again.

5. To quit this function, press Esc.

Comparing Surfaces

When 3D-Office compares two surfaces, it computes the volume of cut and fill between the surfaces, the area of intersection between the surfaces, and the maximum and minimum cut and fill heights between the surfaces. Such information is useful for documenting excavation progress on a job.

Comparing Surfaces in 3D Project Files

The 3D Project file must have a TIN surface and at least one other surface (TIN, plane, or alignment) for this option to be available.

- 1. With a 3D Project file open, click **TIN** ▶ **Compare current TIN** surface ▶ With 3D surface file.
- 2. Select the *Surface of type* to compare with from the drop-down list (Figure 5-19 on page 5-21).
- 3. If more that one surface of the surface type exists, select the desired surface from the surface list.

4. Click **OK**. 3D-Office compares the two surfaces and opens a cut/ fill view.

Surfaces		X	
Surfaces of type	Plane surface	•	-
Monday, December 9th,	2002, 11:2		
r Thursday, May 8th, 200.	3, 2:56PM	Plane surface TIN surface Road alignment sur Plane surface	face
Surface details			
Name : Number of triangles : Number of points :	Monday, December 9th,	2002, 11:2	
		OK Lancer	3

Figure 5-19. Compare Surfaces in 3D Project File

Comparing 3D Surface Files

- With a TIN surface file or 3D Project file open, click TIN ► Compare TIN surface ► With 3D surface file or TIN ► Compare current TIN surface ► With 3D surface file.
- 2. On the *Open* dialog box, navigate to the location of the desired file, select the file type (either TIN, Plane, or RD3/alignment), and click **Open** (Figure 5-20).

Open		? 🛛		
Look jn: 障	PP_topo	- 🗄 🖆 🖅		
₩pp_topo_nov4.pl3				
File <u>n</u> ame:	pp_topo_nov4.pl3	<u>Open</u>		
Files of type:	Topcon PL3 files (*.pl3)	Cancel		

Figure 5-20. Open File to Compare With

3D-Office compares the two surface and opens a cut/fill view displaying the compared information (Figure 5-21).



Figure 5-21. Cut/fill File for Compared Surfaces

- 3. View the cut/fill information. See "Cut/Fill Files" on page 10-1 for details on cut/fill surface files.
 - If needed, re-compare the surfaces after making changes tot he original surfaces (for example, changing plane parameters or deleting triangles in a TIN file).
 - Save the cut/fill file. Click **File** ► **Save as**, navigate to the desired located, type a name for the file, and click **Save**.

Setting TIN Surface View Options

The *TIN options* dialog box sets plan view parameters and TIN computation parameters.

- 1. Click **TIN ▶ TIN options**.
- 2. On the *Plan view* tab, select the desired parameters (Figure 5-22 on page 5-24).
 - Enable or disable the *Show triangle edges*, *Show boundaries*, and *Show point elevations* as needed.
 - Enable *Show contours* to display the contours of the TIN surface.
 - Enable *Use colors* to display the contour lines as colors associated with an elevation as shown in the color chart.
- 3. Click the *Triangulation* tab and select the desired parameters (Figure 5-22 on page 5-24).
 - Select either "Divide and conquer" or "Incremental" for the *Triangulation algorithm*. The default "Divide and conquer" selection is usually sufficient.
 - Enable *Ok to generate and add interpolated points to data set* as needed. Use this function if the length of linework segments included in the TIN model were generally longer than the length of the typical triangle edge. Otherwise, long line segments included in the TIN might cause long, narrow triangles along the linework. If enabling this parameter, select the desired sub-parameters.
- 4. Click **OK** to apply the view and triangulation options to the TIN file.

	TIN options	
	Plan view Triangulation	
	 ✓ Show triangle edges ✓ Show boundaries ✓ Show point elevations 	Show contours Contour interval Use colors
TIN options	×	>= 807.00' 806.00' 805.00'
Plan view Triangulation	804.00' 803.00'	
Triangulation algorithm Divide and	801.00' 801.00'	
 OK to generate and add interpolated p OK to add interpolated points along t 	0K Cancel	
Avoid creating triangles with angles less than 20'00'00''		
Avoid creating triangles with area greater		
	OK Cancel	

Figure 5-22. Set Plan View and Triangulation Options

Setting Unit Options

The *Project options* dialog box sets the type of units to use for the various quantities used in the 3D Project.

To set unit options in a TIN file, click **View** > **Options**. The dialog box that displays has the same fields as for 3D Project files. See "Setting Project Units" on page 2-15 for details on the *Units* tab.

Exporting a TIN Surface

If you made changes to a TIN surface, you can export the changed surface to a new TIN file, or replace an existing file with the new information.



Export versions of the file to track progress.

Exporting a TIN Surface to a TIN Surface File

- 1. Select TIN ▶ Export current TIN surface ▶ To 3D TIN file (*.tn3).
- 2. On the *Save As* dialog box, do one of the following (Figure 5-23):
 - To export to an existing TIN file, navigate to the location of the file and select it, then click **Save** (the contents of the existing file are replaced).
 - To save to a new file, navigate to the desired folder, type a name for the new file, and click **Save**.



Figure 5-23. Save TIN Surface File

The selected TIN surface overwrites the existing file or creates a new 3D TIN surface file.

Exporting a TIN Surface to Pocket-3D

To use the TIN surface file in the field, export it to a Pocket-3D controller.

- 1. Connect the Pocket-3D controller to the computer and turn on the controller (see Appendix A for details). Run Pocket-3D on the controller.
- With a TIN surface file or 3D Project open, click TIN ▶ Export TIN surface ▶ To Pocket-3D controller or TIN ▶ Export current TIN surface ▶ To Pocket-3D controller.
- 3. On the *Pocket-3D files* dialog box, do one of the following and click **Save** (Figure 5-24):
 - Select an existing file to replace.
 - Enter a new file name or keep the default file name.



Figure 5-24. Save TIN Surface File to Pocket-3D Controller