



GE  **MAX**

TUTORIAL

**From GFD to Surfaces, Volumes
and Reports calculation**

From GFD to Surfaces, Volumes & Reports



DESCRIPTION

- Use Survey data to create surfaces, volumes and manage reports information

GOAL

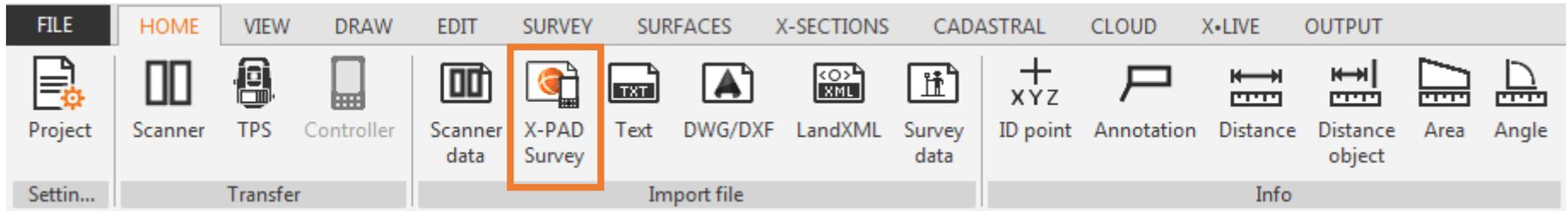
- How to use survey data to create surfaces
- How to use survey data for volumes calculation
- How to create reports

DATA

- Terracina.gfd



Import SURVEY data

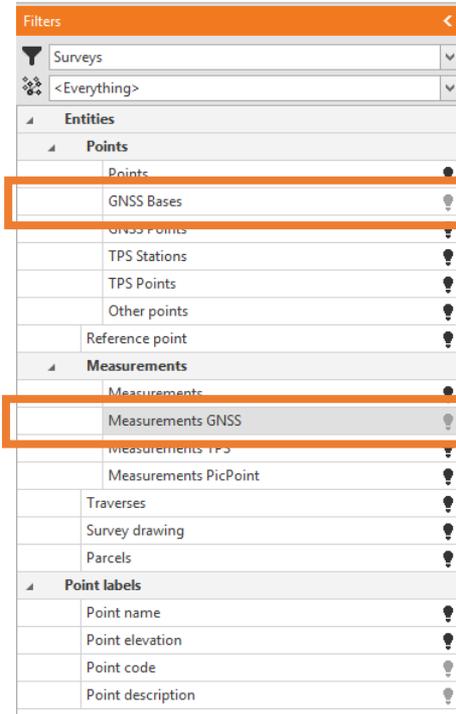
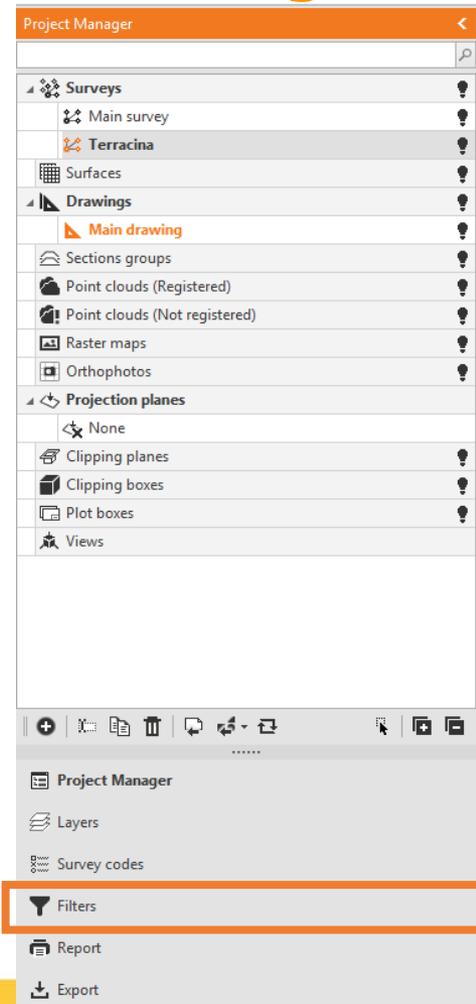


IMPORT FILE bar are the toolbar where find all the features related to data importation

Select **X-PAD Survey** to import survey file recorded in field with X-PAD Field software and select the job from the relative folder.



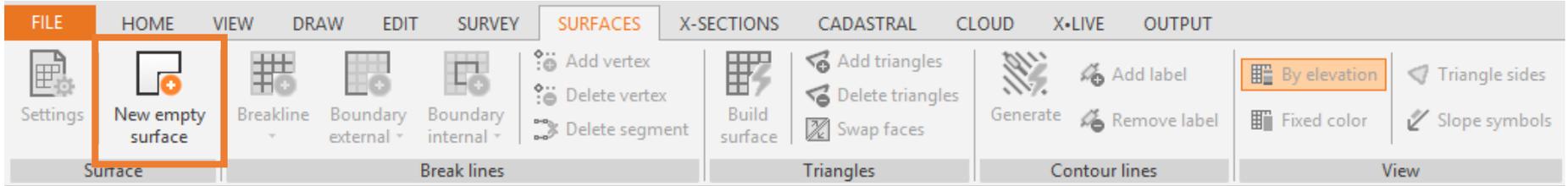
Survey data FILTERS



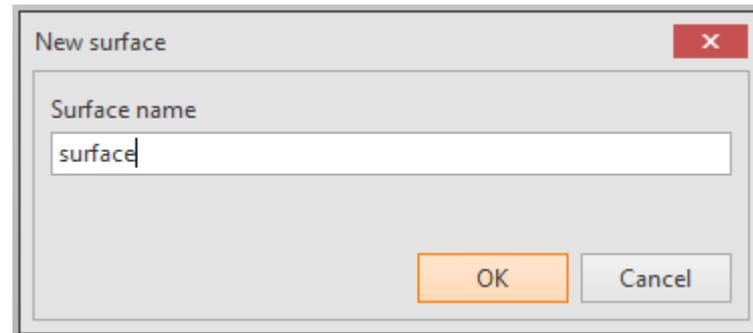
From the **PROJECT MANAGER** select **FILTERS**, from entities deselect GNSS Bases and Measurements GNSS to hide this entities



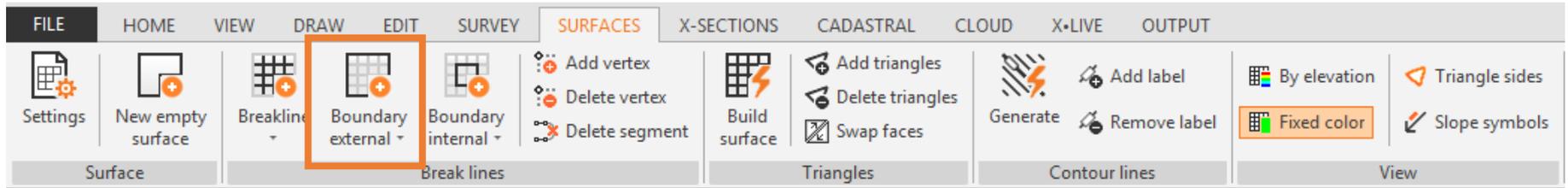
New Surface



From the **SURFACES** menu select New empty surface and insert the name of the new surface.



New Surface – BREAK LINES



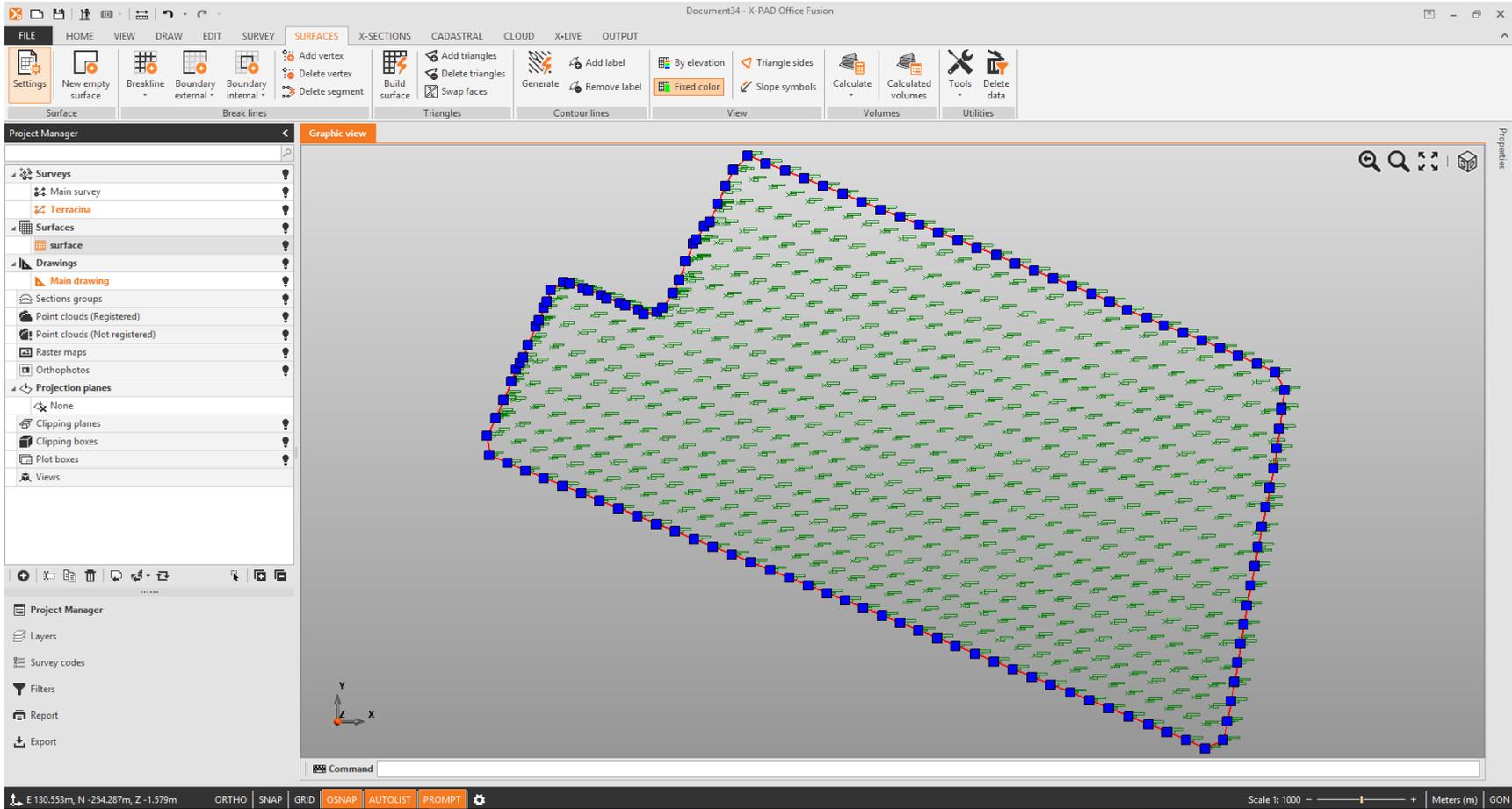
From ***SURFACES*** menu it is possible to select Breakline or Boundary line contorno to be used in creating a surface.

It is possible to use an existing polyline or create new elements directly on the points of the current survey.

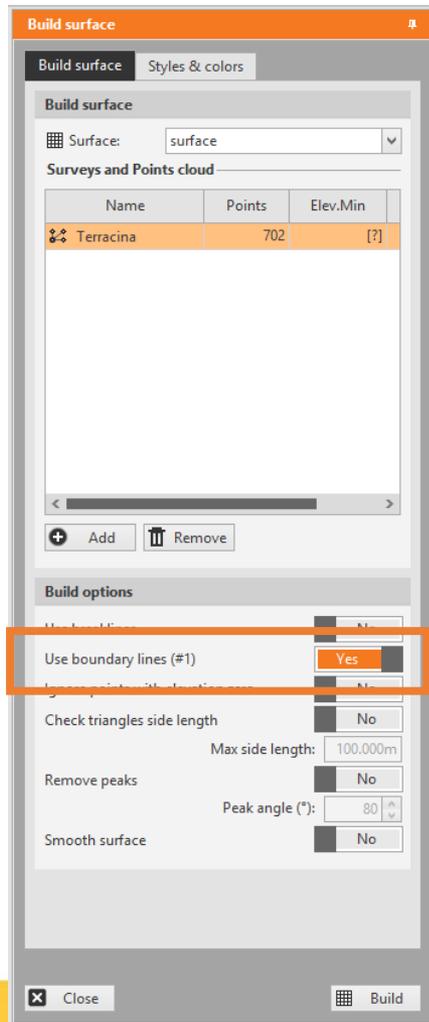
Select ***Boundary external*** to draw a contour line directly on the points of the current survey.



New Surface – Break Line



Build a new SURFACE



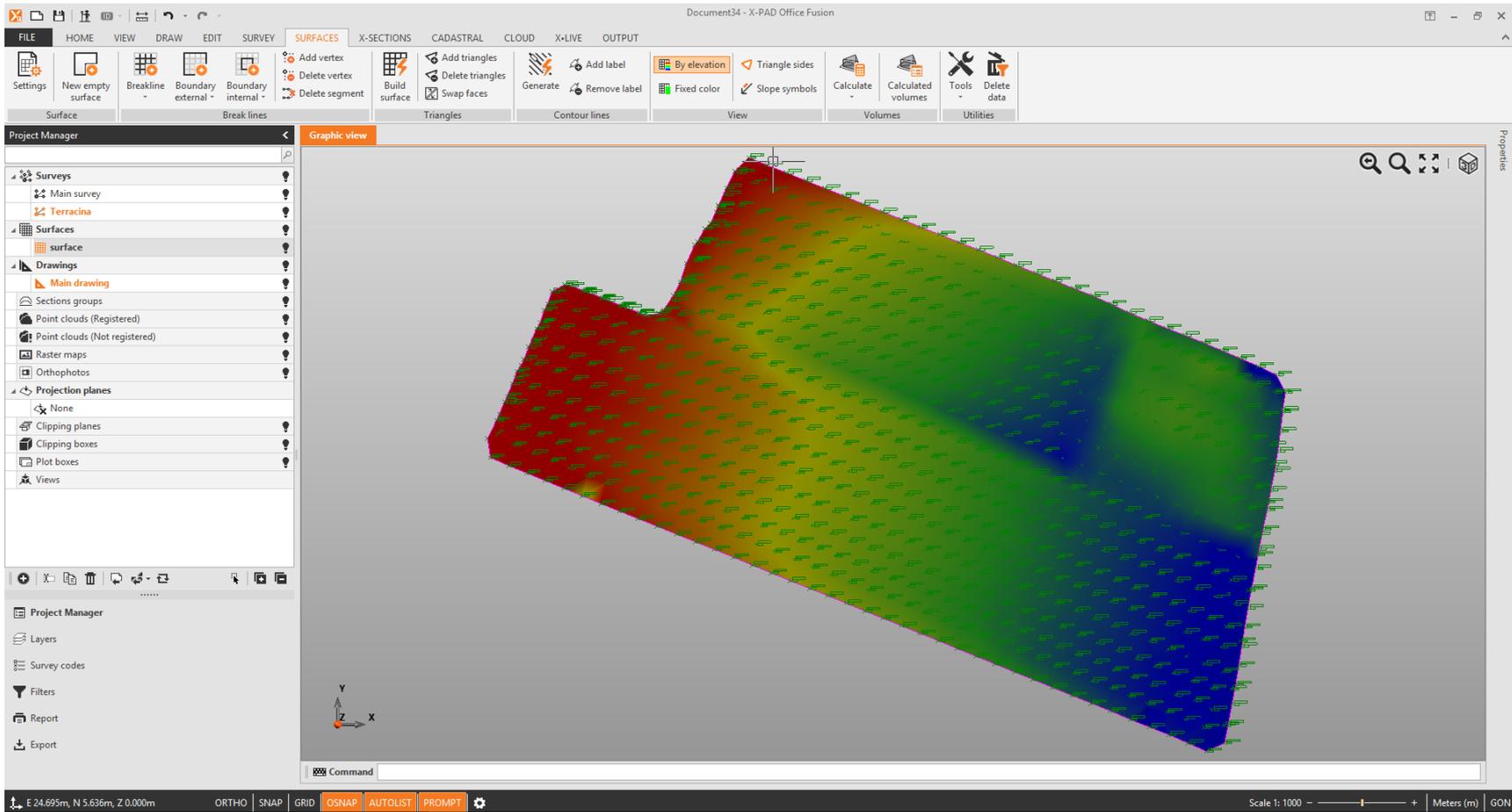
From **BUILD SURFACE** menu it is possible to select:

- Survey data to be used, in this case only the current survey **Terracina** will be visible.
- Breaklines or Boundary lines
- Check for the maximum triangles side length
- Remove peaks
- Smooth surface

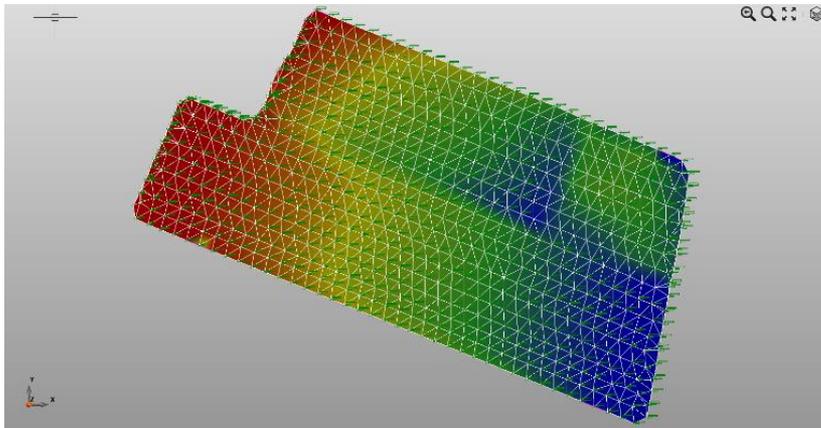
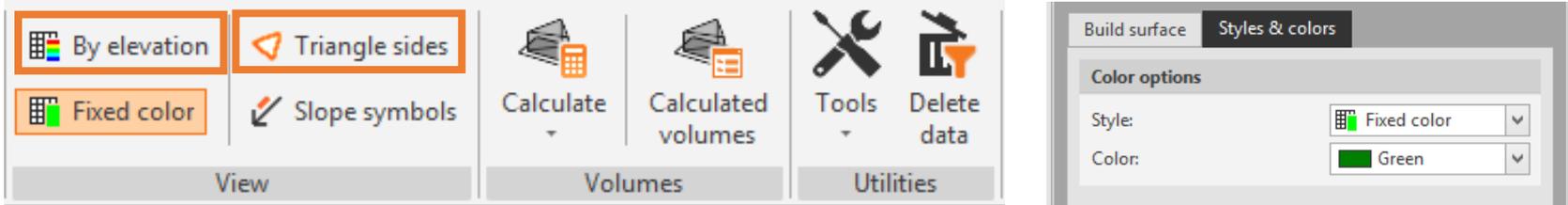
Select boundary lines and **BUILD**



New Surface



New SURFACE - View

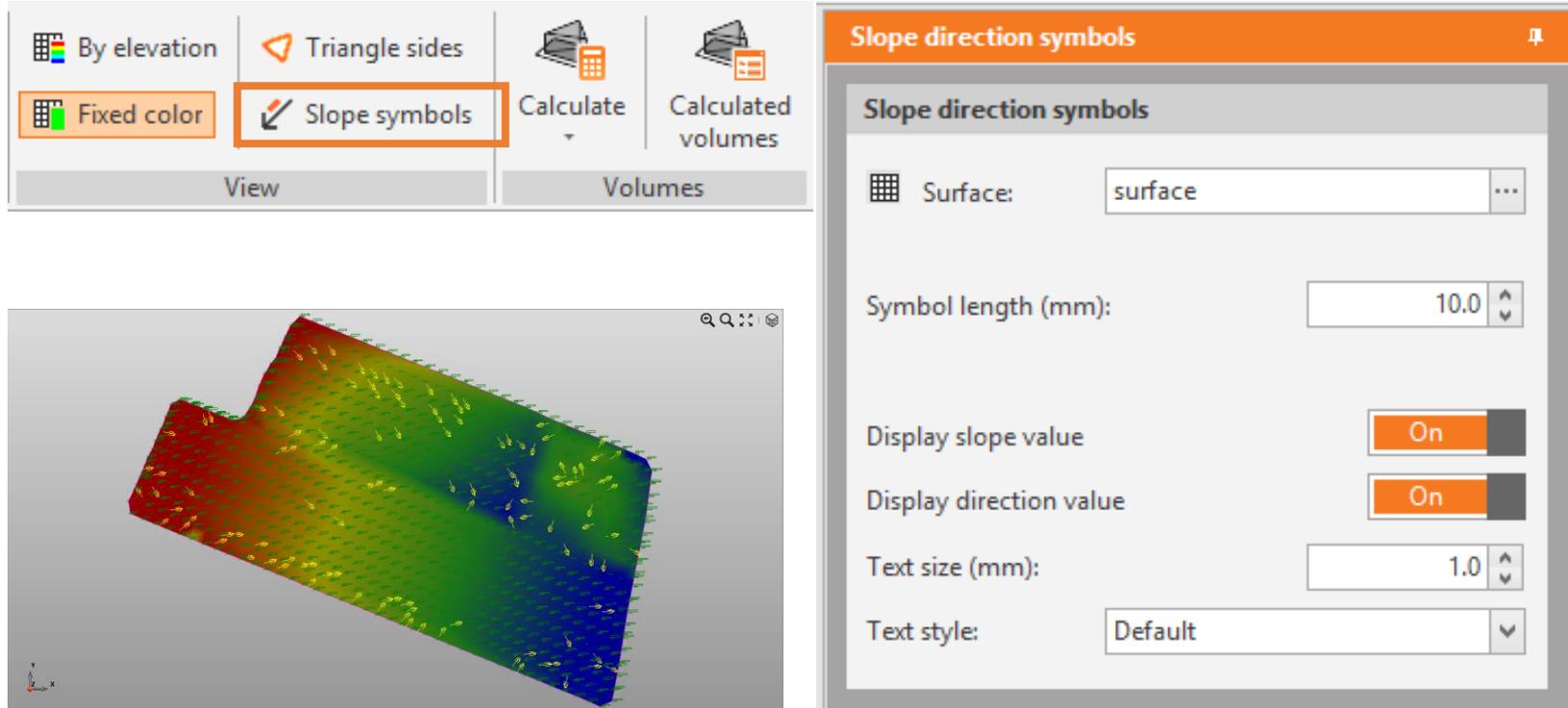


From the **VIEW** panel of the **SURFACES** menu it is possible to select:

- Color options of the surface, the option can also be selected during the built of the surface
- Triangle sides, to show the sides of the triangles of the surface
- Slop symbols



New SURFACE - View



The screenshot displays the software interface for surface analysis. In the top-left 'View' menu, the 'Slope symbols' option is selected. To the right, the 'Slope direction symbols' dialog box is open, showing the following settings:

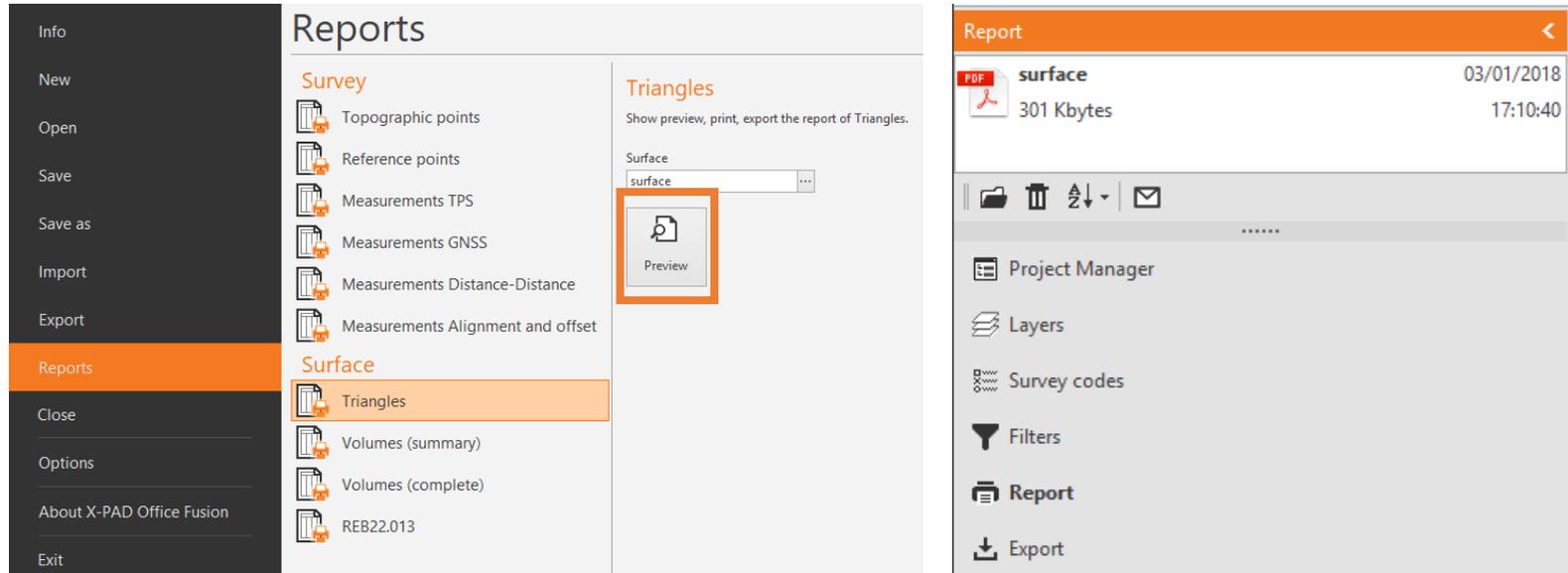
- Surface: surface
- Symbol length (mm): 10.0
- Display slope value: On
- Display direction value: On
- Text size (mm): 1.0
- Text style: Default

Below the menu, a 3D surface model is shown with a color gradient from red (steepest) to blue (shallowest) and small arrows indicating the slope direction.

Selecting ***Slope symbols*** it is possible to show the value of the slopes of the surface with the relative slope direction



SURFACE Report



From **FILE** menu it is possible to select **REPORTS** to open the **REPORT MANAGER** and create reports related to:

- **SURVEY**
- **SURFACE**

All the REPORT can be viewed from the PROJECT MANAGER



SURFACE Report

Report Manager

Main

Store report Options Print PDF File XLSX file Other export - Send as Scale Margins Orientation Size First page Previous page Next page Last page Find Page width Whole page Close

Templates

Triangles

Triangles													
First vertex			Second vertex			Third vertex			Area 2D		Area 3D		
E	N	Z	E	N	Z	E	N	Z	m ²	m ³	m ²	m ³	
-80.260	-187.223	-1.100	-70.727	-171.274	-0.127	-88.347	-160.992	-0.238	55.78	55.02			
-87.075	-152.896	-0.131	-99.246	-159.415	0.012	-89.646	-183.973	-0.064	55.38	55.38			
-80.260	-187.223	-1.100	-77.720	-156.810	-0.172	-89.646	-183.973	-0.064	55.72	54.15			
-88.347	-180.282	-0.288	-77.720	-156.810	-0.172	-80.260	-187.223	-1.100	53.82	53.82			
-70.727	-171.274	-0.127	-59.028	-164.997	-0.317	-88.347	-160.992	-0.238	54.54	54.54			
-86.626	-188.690	-0.374	-51.647	-179.384	-0.388	-99.867	-172.488	-0.487	56.07	56.07			
-81.562	-175.198	-0.274	-46.626	-168.420	-0.374	-99.028	-164.997	-0.317	54.12	54.12			
-86.626	-188.690	-0.374	-61.362	-173.198	-0.274	-91.647	-179.384	-0.388	55.15	55.15			
-88.347	-180.282	-0.288	-99.028	-164.997	-0.317	-95.374	-155.915	-0.354	49.63	49.64			
-81.562	-175.198	-0.274	-99.028	-164.997	-0.317	-70.727	-171.274	-0.127	54.95	54.96			
-86.626	-188.690	-0.374	-96.344	-163.260	-0.501	-86.211	-159.391	-0.409	50.01	50.02			
-86.211	-159.391	-0.409	-99.028	-164.997	-0.317	-89.626	-188.460	-0.374	49.42	49.42			
-99.246	-159.415	0.012	-96.344	-149.051	-0.085	-108.370	-155.489	0.071	53.82	53.82			
-99.246	-159.415	0.012	-87.075	-152.896	-0.131	-96.344	-149.051	-0.085	53.63	53.63			
-115.247	-140.992	0.074	-127.071	-147.458	0.141	-117.844	-151.658	0.183	54.40	54.47			
-108.370	-155.489	0.071	-108.891	-145.199	-0.013	-117.844	-151.658	0.183	53.23	53.24			
-108.370	-155.489	0.071	-96.369	-140.261	-0.085	-105.691	-145.199	-0.013	53.52	53.52			
-96.369	-140.261	-0.085	-87.075	-152.896	-0.131	-83.791	-142.900	-0.162	48.10	48.10			
-95.374	-155.915	-0.354	-64.844	-151.659	-0.279	-88.347	-160.992	-0.238	48.18	48.18			
-87.075	-152.896	-0.131	-89.646	-183.973	-0.064	-77.720	-156.810	-0.172	54.04	54.04			
-95.374	-155.915	-0.354	-46.011	-159.391	-0.406	-86.432	-146.997	-0.389	53.48	53.48			
-88.347	-180.282	-0.288	-64.844	-151.659	-0.279	-77.720	-156.810	-0.172	48.38	48.38			
-87.452	-158.648	-0.227	-74.980	-147.828	-0.246	-64.844	-151.659	-0.279	55.15	55.15			
-86.844	-151.659	-0.279	-74.980	-147.828	-0.246	-77.720	-156.810	-0.172	49.19	49.19			
-95.374	-155.915	-0.354	-97.898	-142.900	-0.162	-64.844	-151.659	-0.279	54.37	54.37			
-74.980	-147.828	-0.246	-83.791	-142.900	-0.162	-87.075	-152.896	-0.131	48.78	48.78			
-86.011	-159.391	-0.406	-99.071	-150.796	-0.471	-86.432	-146.997	-0.389	53.64	53.64			
-77.720	-156.810	-0.172	-74.980	-147.828	-0.246	-87.075	-152.896	-0.131	48.95	48.95			
-86.011	-159.391	-0.406	-93.374	-153.515	-0.544	-99.028	-164.997	-0.317	48.80	48.80			
-95.374	-155.915	-0.354	-84.402	-146.997	-0.389	-97.898	-142.900	-0.162	54.12	54.12			
-99.867	-172.488	-0.487	-91.647	-179.384	-0.388	-81.945	-183.046	-0.366	55.49	55.44			
-92.203	-187.062	-0.483	-92.495	-191.040	-0.521	-90.697	-180.342	-0.587	55.96	55.97			
-92.203	-187.062	-0.483	-99.867	-172.488	-0.487	-81.945	-183.046	-0.366	54.80	54.81			
-90.251	-176.284	-0.517	-92.203	-187.062	-0.483	-90.697	-180.342	-0.587	55.72	55.73			
-17.531	-171.274	-0.127	-90.251	-176.284	-0.517	-90.697	-180.342	-0.587	50.20	50.20			
-92.203	-187.062	-0.483	-88.867	-174.488	-0.487	-92.251	-176.284	-0.517	49.31	49.31			
-92.495	-191.040	-0.521	-10.921	-184.049	-0.653	-90.697	-180.342	-0.587	55.52	55.52			
-92.251	-176.284	-0.517	-81.945	-183.046	-0.366	-92.203	-187.062	-0.483	54.52	54.52			
-12.783	-184.875	-0.609	-9.077	-188.963	-0.675	-1.308	-188.233	-0.721	55.61	55.61			
1.385	-178.904	-0.761	-1.308	-188.233	-0.721	10.882	-182.860	-0.827	49.49	49.49			
-15.783	-184.875	-0.609	1.308	-188.233	-0.721	-10.882	-184.049	-0.623	56.41	56.41			
-10.921	-184.049	-0.623	1.385	-178.904	-0.761	-8.089	-175.027	-0.700	48.17	48.17			
1.385	-178.904	-0.761	-10.921	-184.049	-0.623	-1.308	-188.233	-0.721	50.47	50.48			
8.089	-175.027	-0.700	1.385	-178.904	-0.761	-2.886	-186.670	-0.718	51.37	51.37			
-10.921	-184.049	-0.623	-8.089	-175.027	-0.700	-90.697	-180.342	-0.587	48.16	48.17			
-11.028	-189.233	-0.761	-10.921	-184.049	-0.623	8.089	-182.264	-0.818	56.40	56.40			
-12.783	-184.875	-0.609	-10.921	-184.049	-0.623	-92.495	-191.040	-0.521	56.72	56.72			
-8.089	-175.027	-0.700	-17.531	-171.274	-0.127	-90.697	-180.342	-0.587	48.17	48.17			
-16.544	-183.260	-0.521	-97.898	-142.900	-0.162	-92.495	-191.040	-0.521	54.64	54.64			
-16.544	-183.260	-0.521	-99.867	-172.488	-0.487	-92.093	-187.251	-0.567	49.31	49.31			

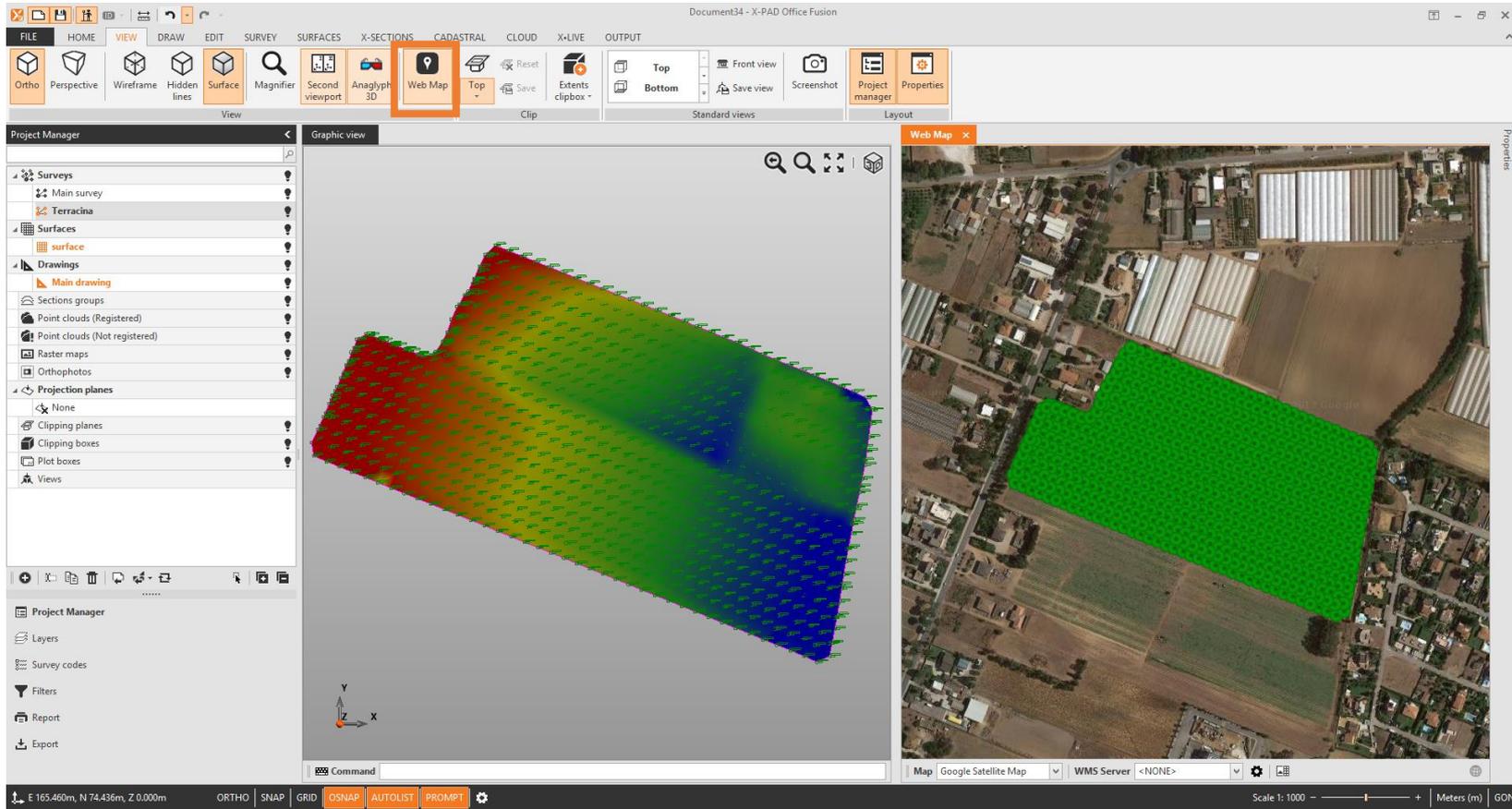
Documents: surface Date: 2018-10-28 Page: 1/28

HPAD Office Fusion

Page 1 of 26 | A4 (210mm x 297mm) | 72%



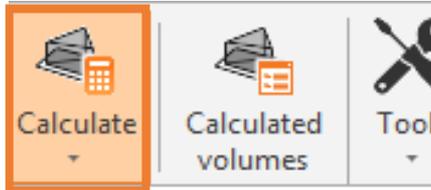
SURFACE on Web Map



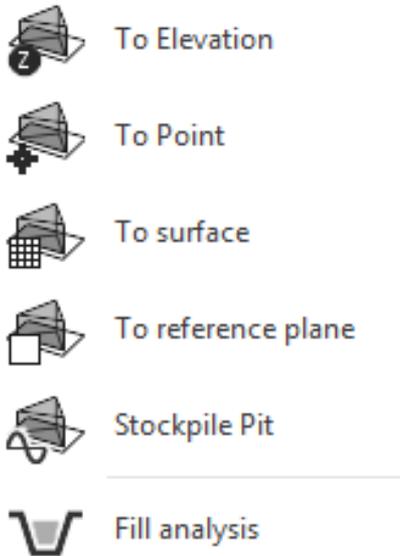
From **VIEW** menu it is possible to select **WEB MAP** to show the surface on web map



VOLUME Calculation



From ***SURFACES*** menu it is possible to select ***CALCULATE*** for the volume calculation, selecting from:



- **To Elevation:** calculate the surface volume according to an elevation
- **To Point:** calculate the surface volume according to the elevation of a topographic point
- **To Surface:** calculate the surface volume between two different surface
- **Reference plane:** calculate the surface volume according to a reference plane
- **Stockpile Pit:** calculate the volume between the surface and the perimeter surface



VOLUME Calculation

Volume calculation
⌵

Calculation settings

Stockpile/Pit

Surface: ...

Min elevation:

Max elevation:

Direction: ▼

Calculation options

Calculation mode: ▼

Cut swell factor:

Calculate weight: Yes

Weight (t/m³):

Selecting for example **Stockpile Pit** it is possible to select:

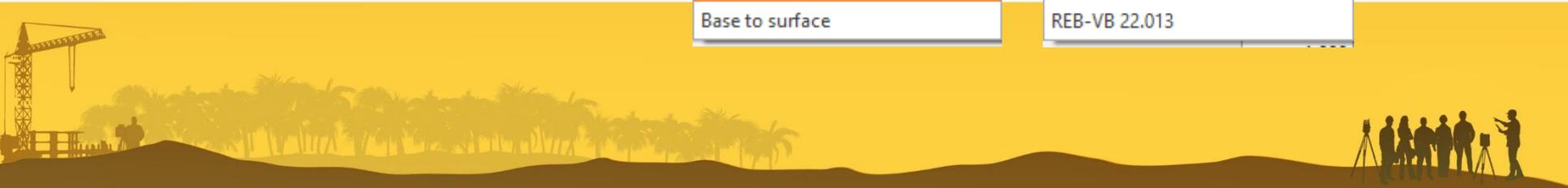
Direction:

- Surface to base
- Base to surface

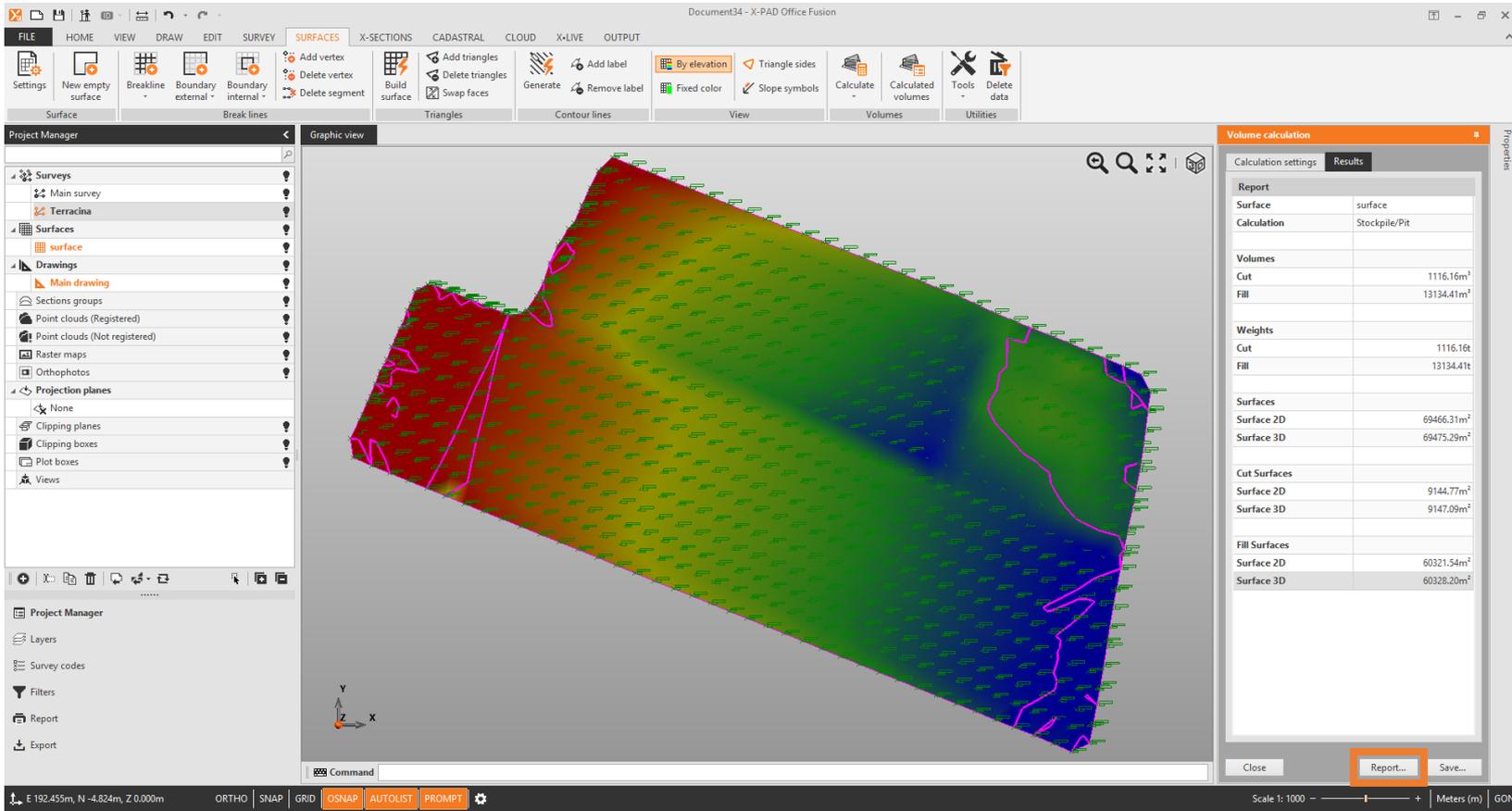
Calculation Mode

- By triangles
- By regular grid
- REB-VB 22.013

Cut swell factor and Weight



VOLUME Calculation



Document34 - X-PAD Office Fusion

FILE HOME VIEW DRAW EDIT SURVEY SURFACES X-SECTIONS CADASTRAL CLOUD X-LIVE OUTPUT

Settings New empty surface Breakline Boundary external Boundary internal Add vertex Delete vertex Delete segment Build surface Add triangles Delete triangles Generate Add label Remove label Fixed color Triangle sides Slope symbols Calculate Calculated volumes Tools Delete data

Surface Break lines Triangles Contour lines View Volumes Utilities

Project Manager

Graphic view

Volume calculation

Calculation settings Results

Report	
Surface	surface
Calculation	Stockpile/Pit
Volumes	
Cut	1116.16m ³
Fill	13134.41m ³
Weights	
Cut	1116.16t
Fill	13134.41t
Surfaces	
Surface 2D	69466.31m ²
Surface 3D	69475.29m ²
Cut Surfaces	
Surface 2D	9144.77m ²
Surface 3D	9147.09m ²
Fill Surfaces	
Surface 2D	60321.54m ²
Surface 3D	60328.20m ²

Close Report... Save...

Scale 1: 1000 Meters (m) GON

From **REPORT** button you can access to the **REPORT MANAGER**



VOLUME Calculation

Save volume calculation

Save volume calculation
Enter a name to the calculation of volume and a description.

Volume name:

Description:

Next > Cancel

Save volume calculation

Save volume calculation
Specify if save the reference surface and the elevation difference surface.

Create elevation difference surface Yes

Surface name:

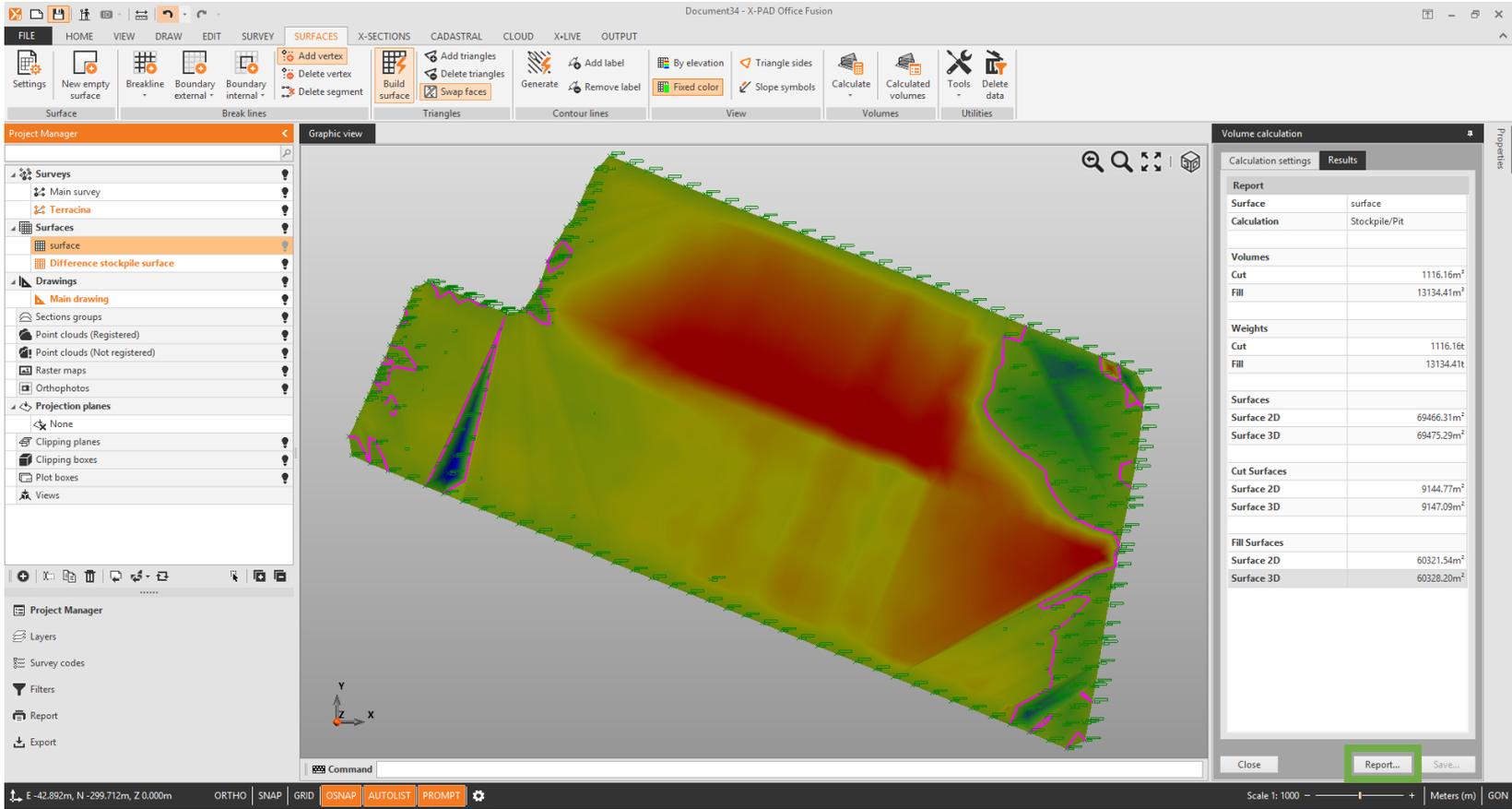
Create reference surface No

< Back OK Cancel

From **SAVE** button it is possible to access to Save Volume Calculation menu, where it is possible to insert **name**, create a **elevation different surface** or **reference surface**



VOLUME Calculation



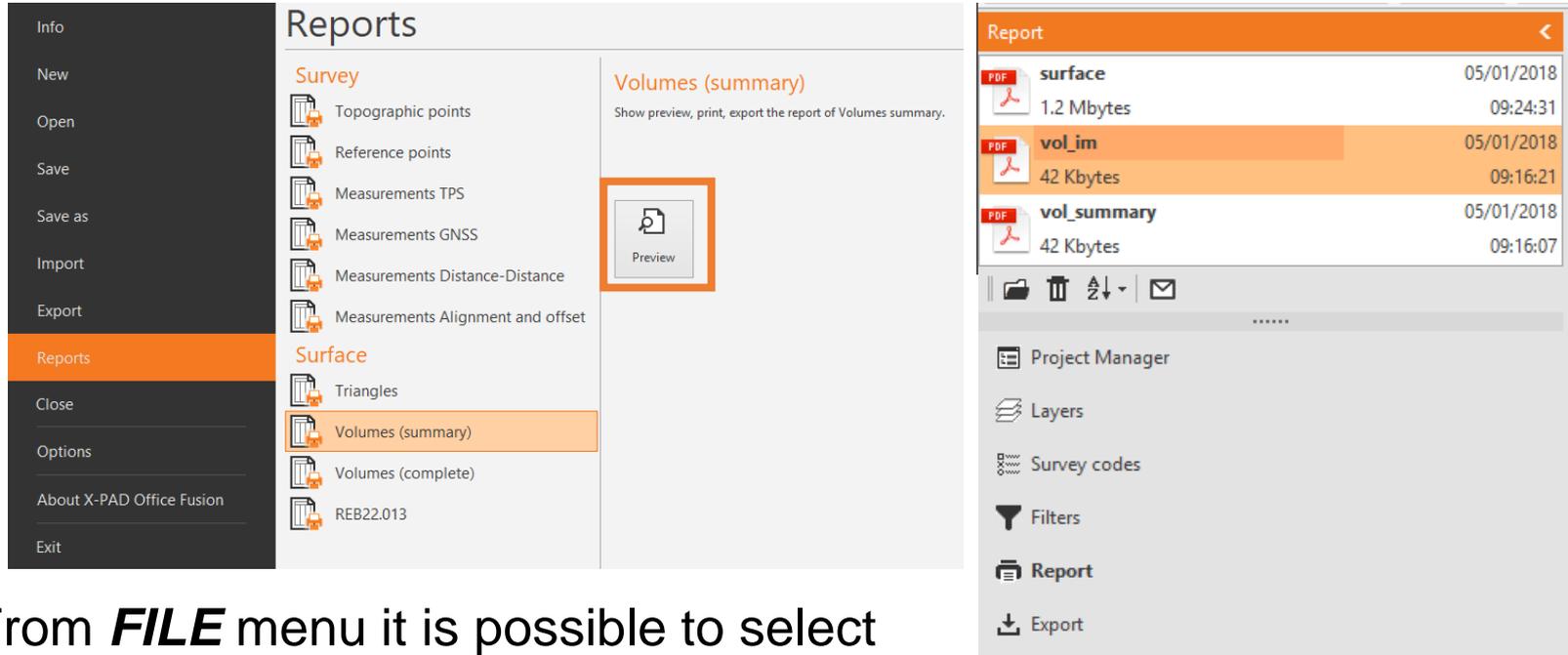
The screenshot displays the GEOMAX software interface for volume calculation. The main window shows a 3D topographic model with a stockpile surface highlighted in red. The 'Volume calculation' panel on the right provides a detailed report of the calculation results.

Report	
Surface	surface
Calculation	Stockpile/Pit
Volumes	
Cut	1116.16m ³
Fill	13134.41m ³
Weights	
Cut	1116.16t
Fill	13134.41t
Surfaces	
Surface 2D	69466.31m ²
Surface 3D	69475.29m ²
Cut Surfaces	
Surface 2D	9144.77m ²
Surface 3D	9147.09m ²
Fill Surfaces	
Surface 2D	60321.54m ²
Surface 3D	60328.20m ²

At the bottom of the interface, the status bar shows the coordinate system: E -42.892m, N -299.712m, Z 0.000m. The scale is set to 1:1000, and the units are in Meters (m).



VOLUME Reports



The screenshot shows the software interface with the 'Reports' menu open. The 'Reports' menu is highlighted in orange, and the 'Volumes (summary)' option is selected. The 'Report Manager' window is also open, showing a list of reports:

Report	Date	Time
surface	05/01/2018	09:24:31
vol_im	05/01/2018	09:16:21
vol_summary	05/01/2018	09:16:07

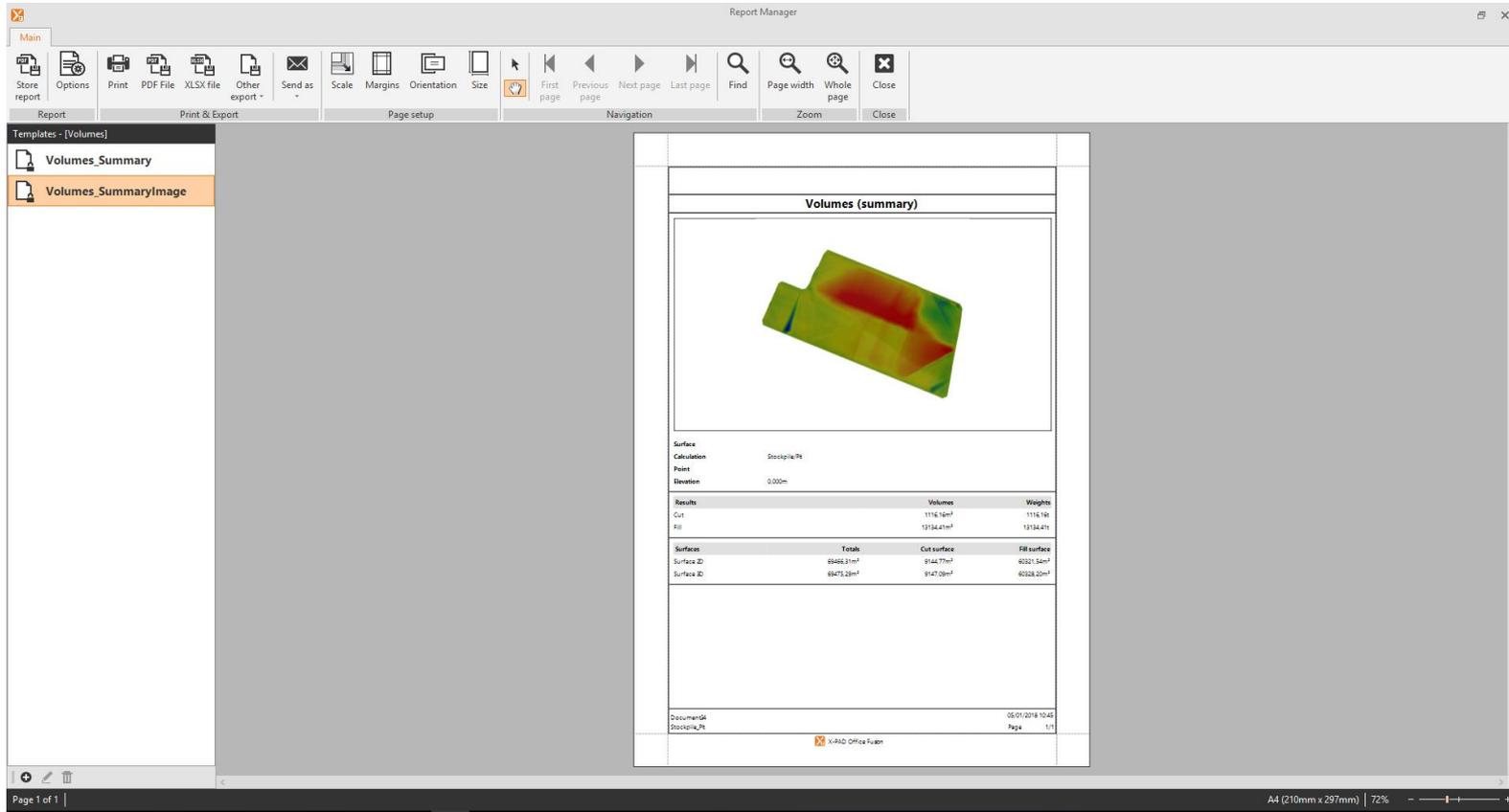
From **FILE** menu it is possible to select **REPORTS** to open the **REPORT MANAGER** and create reports for

- **Volumes (summary)**
- **Volumes (complete)**

With the possibility of including an image related to the surface



VOLUMES (summary) Reports



The screenshot displays the 'Report Manager' application window. The main content area shows a report titled 'Volumes (summary)'. The report features a 3D visualization of a volume, a table of results, and a table of surface areas.

Results	Volumes	Weights
Cut	1116.16m ³	1116.16t
Fill	13736.41m ³	13736.41t

Surfaces	Totals	Cut surface	Fill surface
Surface ID	69466.91m ²	9144.77m ²	60322.14m ²
Surface ID	69475.28m ²	9147.08m ²	60328.20m ²

DocumentID: Stockpile_PK | 05/01/2018 10:43
Page: 1/1



VOLUMES (complete) Reports

Report Manager

Main

Store report Options Print PDF File XLSX File Other report Send as Scale Margins Orientation Size First page Previous page Next page Last page Find Page width Whole page Close

Report Print & Export Page setup Navigation Zoom Close

Templates - [Volumes calculation]

- Volumes_Complete
- Volumes_Completeimage

Volumes (complete)																	
First vertex				Second vertex				Third vertex				Areas				Volumes	
E	N	Z 1	Z 2	E	N	Z 1	Z 2	E	N	Z 1	Z 2	Area Cut 2D	Area Cut 3D	Area Fill 2D	Area Fill 3D	Vol. Cut	Vol. Fill
m	m	m	m	m	m	m	m	m	m	m	m	m ²	m ²	m ²	m ²	m ³	m ³
-70.727	-171.274	-0.157	-0.157	-68.347	-160.592	-0.238	-0.167	-80.269	-167.223	-1.100	-1.100			55.78	56.02		1.32
-92.291	-155.690	-0.070	-0.049	-93.139	-156.144	-0.060	-0.047	-89.646	-163.373	-0.064	-0.064			3.86	3.86		0.04
-92.019	-155.544	-0.073	-0.045	-89.646	-163.373	-0.064	-0.064	-87.075	-152.896	-0.131	-0.065			22.50	22.50		0.71
-92.019	-155.544	-0.073	-0.045	-92.291	-155.690	-0.070	0.049	-89.646	-163.373	-0.064	-0.064			1.24	1.24		0.02
-93.139	-156.144	-0.060	-0.047	-99.246	-159.415	0.012	0.012	-89.646	-163.373	-0.064	-0.064			27.79	27.79		0.12
-80.269	-167.223	-1.100	-1.100	-77.720	-156.810	-0.172	-0.899	-89.646	-163.373	-0.064	-0.064	53.73	54.15			13.02	0.10
-68.347	-160.592	-0.238	-0.167	-80.269	-167.223	-1.100	-1.100	-69.016	-160.322	-0.233	-0.233			3.83	3.84		
-80.269	-167.223	-1.100	-1.100	-80.269	-167.223	-1.100	-1.100	-69.016	-160.322	-0.233	-0.233						
-80.269	-167.223	-1.100	-1.100	-76.809	-157.177	-0.179	-1.000	-69.016	-160.322	-0.233	-0.233	44.59	44.75			12.20	
-76.809	-157.177	-0.179	-1.000	-77.720	-156.810	-0.172	-0.899	-80.269	-167.223	-1.100	-1.100	5.21	5.23			2.69	
-68.258	-160.630	-0.238	-0.158	-68.347	-160.592	-0.238	-0.167	-70.727	-171.274	-0.157	-0.157			0.52	0.52		0.03
-59.958	-165.128	-0.304	-0.263	-59.028	-164.597	-0.317	-0.264	-59.844	-164.246	-0.310	-0.262			0.38	0.38		0.02
-70.727	-171.274	-0.157	-0.157	-59.958	-165.128	-0.304	-0.263	-59.844	-164.246	-0.310	-0.262			4.40	4.40		0.13
-70.727	-171.274	-0.157	-0.157	-59.844	-164.246	-0.310	-0.262	-68.258	-160.630	-0.238	-0.158			49.24	49.25		2.10
-41.895	-173.607	-0.453	-0.352	-39.867	-172.466	-0.487	-0.373	-41.894	-171.633	-0.464	-0.349			2.00	2.00		0.22
-51.647	-179.084	-0.288	-0.288	-41.895	-173.607	-0.453	-0.352	-41.894	-171.633	-0.464	-0.349			9.60	9.60		0.69
-51.647	-179.084	-0.288	-0.288	-41.884	-171.633	-0.464	-0.349	-49.626	-168.430	-0.374	-0.286			44.48	44.48		3.01
-51.327	-169.419	-0.359	-0.277	-50.674	-169.040	-0.365	-0.279	-50.577	-168.042	-0.368	-0.279			0.31	0.31		0.02
-51.327	-169.419	-0.359	-0.277	-50.577	-168.042	-0.368	-0.279	-51.272	-167.759	-0.364	-0.275			0.58	0.58		0.05
-61.262	-175.198	-0.274	-0.274	-51.327	-169.419	-0.359	-0.277	-51.272	-167.759	-0.364	-0.275			8.09	8.09		0.46
-61.262	-175.198	-0.274	-0.274	-51.272	-167.759	-0.364	-0.275	-59.028	-164.597	-0.317	-0.264			44.64	44.64		2.11
-50.674	-169.040	-0.365	-0.279	-49.626	-168.430	-0.374	-0.286	-50.577	-168.042	-0.368	-0.279			0.49	0.49		0.04
-50.674	-169.040	-0.365	-0.279	-51.327	-169.419	-0.359	-0.277	-51.647	-179.084	-0.288	-0.288			3.09	3.10		0.17
-51.327	-169.419	-0.359	-0.277	-61.262	-175.198	-0.274	-0.274	-51.647	-179.084	-0.288	-0.288			47.09	47.09		1.28
-50.674	-169.040	-0.365	-0.279	-51.647	-179.084	-0.288	-0.288	-49.626	-168.430	-0.374	-0.286			4.97	4.97		0.29
-68.258	-160.630	-0.238	-0.158	-68.239	-160.549	-0.239	-0.158	-68.347	-160.592	-0.238	-0.167						
-59.844	-164.246	-0.310	-0.262	-59.028	-164.597	-0.317	-0.264	-55.374	-155.515	-0.354	-0.256			4.35	4.35		0.29
-59.844	-164.246	-0.310	-0.262	-55.374	-155.515	-0.354	-0.256	-58.892	-156.892	-0.322	-0.255			12.28	12.28		0.88

Document#4
Stockpile_P#

05/01/2018 10:48
Page 1/212

X-PAD Office Fusion

Page 1 of 212 | A4 (297mm x 210mm) | 101%

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