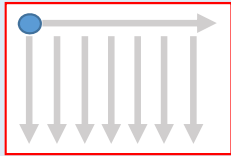


Ultra High Precision Surface 3D-Mapping

Using the Axiom1155 Walking Floor Profiler

Work Flow and Instructions for Volume Fill/Cut Calculations

Run Layout



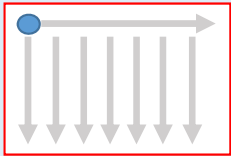
Collect Data



Process Data



Run Layout

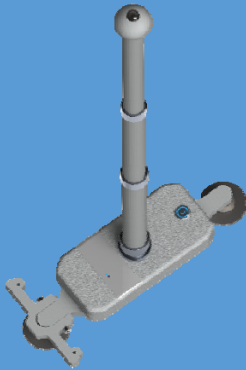


Start Point

Run Pattern

Run Spacing

Collect Data



Baseline Run

Begin at Start point

Mark Start Points
for Column Runs

Column Runs

Start on Marked
Points

Process Data



Import Data To Report Generator

Start New 3D-Map

Create 3D-Map

Start 3D-Map Creator

Select Runs

Specify Run Spacing

Specify Start Point Offset from
Datum

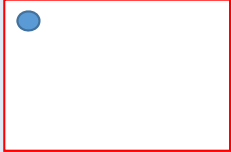
Specify Max and Min Elevation
Limits (OPTIONAL)

Review Results

Volume Calculations

Determine & Adjust Desired
Start Point Offset from Datum

Run Layout

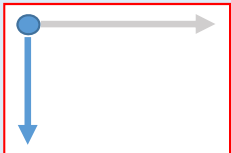


Start Point: Choose & mark a point at a corner of the surface being mapped

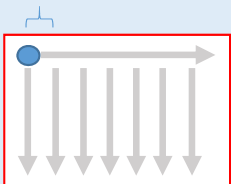
- This point will be the start point of the “Baseline run”
- This point will also be the start point of the first “Column Run”
- All of the elevation data will be referencing this point
- On the 3D-Map this will be the Top-Left Corner of the surface



Run Pattern: The “Baseline Run” will begin on the Start Point and follow a straight line parallel to the edge of the surface being mapped, this edge will be on the Left-Hand side while collecting data. On the 3D-Map the baseline run will be from left to right along the top of the surface.



The first “Column Run” will begin on the Start Point and follow a straight line parallel to the edge of the surface being mapped, this edge will be on the Right-Hand side while collecting data. On the 3D-Map this run will be from top to bottom along the left of the surface. All of the subsequent column runs should be taken parallel to the first Column Run and taken in order from left to right (On the 3D-Map). All of the Column Runs should start on a point on the Baseline run at intervals of the Run Spacing.



Run Spacing: Select a run spacing. The run spacing is how many “steps” will be between each “Column Run”. The smallest allowable spacing is 1, this will result in the most data being collected. A run spacing greater than 1 will reduce the amount of data collected however it will also reduce the amount of time required to survey the surface. On the 3-D map the data in the areas between the measured runs will be linearly interpolated from the measured column run data when the run spacing is greater than 1. The number steps in the Baseline run should be divisible by the run spacing value.

Collect Data Use the Axiom Free Run app to Collect Data. Axiom1155 App can be used if no run is less than 11 steps.

Baseline Run

Begin at Start point and collect surface profile data following the Baseline Run layout. This run will form “Top” edge of the 3D-Map when viewing on the Report Generator. The “Top” edge will be on your left side as you record this run.

Mark Start Points for Column Runs as you walk the Axiom for the Baseline Run, pause and circle the footpad using a temporary marking such as chalk. This will be done at intervals of the desired run spacing. Examples: If your run spacing is 1, mark every step. If your run spacing is 10 mark every 10th step.

Column Runs

Start on the Marked Points when beginning each Column Run. This will ensure that the data will accurately reference the Baseline Run for determining the elevations on the 3D-Map.

Process Data



Import Data To Report Generator

SURFACE 3D-MAPPING REPORT

Report Number: 123456
Service Date(s): 1/12, 1/14/2016
Report Date: 1/14/2016
Units: Standard

OFFICE PHONE: _____
K: _____
L: _____

ite zip: 123456789

START REPORT GENERATOR AIDE

NEXT >

Report Generator

INSTRUCTIONS | Client Info | Project Info | Report Details | Your Company Info

Report Details

Import/Replace Data File Current Job File: joint2.csv

Report Number: 123456
Service Date(s): 1/12, 1/14/2016
Report Date: 1/14/2016
Reviewer Name: Name
Reviewer Position: Position
Reviewer Phone: Phone

Distribution List:
(1) Organization, Contact Organization, Contact

Report Contents

- ☒ Inspection Report
- ☒ Surface Layout - Appendix A
- ☐ Table of Results - Appendix B
- ☒ Profile Plots - Appendix C
- ☒ Run Plots - Appendix D
- ☒ Measurement Data - Appendix E
- ☐ Straight Edge Test - Appendix F

Start New 3D-Map Select the 3D-Map tab, if you wish to add additional 3D-Maps click the “ADD NEW 3D-MAP” Button. This will start another 3D-Map on a different tab.

30
31
32
33
34
35
36
37
38
39
40
41

Data File: joint2.csv
Technician: Individual Name
Reported to: Individual Name
Contractor: Organization

Report Distribution:

Inspection Report 3D-Map Surfa

READY PAGE: 1 OF 1

3D-MAP 1

Units: Inches

Step spacing: 12 Inches
Run spacing: 5 step(s)
Start From Datum: 0.25 Inches

between the measured
arily interpolated from the
levation data, therefore, the
is may not be representative
urface elevation(s).

olated points excluded

Click to:

Return to First Page

< PREVIOUS NEXT >

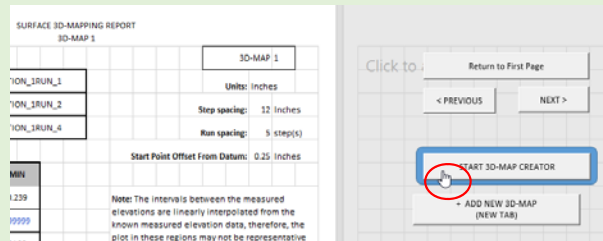
START 3D-MAP CREATOR

+ ADD NEW 3D-MAP (NEW TAB)



Create 3D-Map

Start 3D-Map Creator on the 3D-Map tab that you want to add the 3D-Map to.



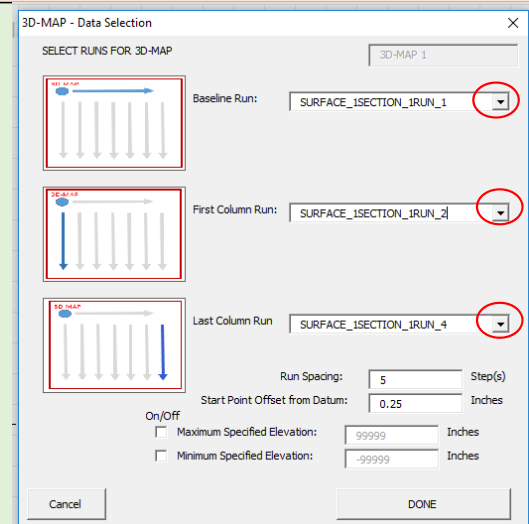
Select Runs

Select the Run Name for the Baseline Run

Select the Run Name for the **First** Column Run (Farthest Left)

Select the Run Name for the **Last** Column Run (Farthest Right)

Note: All of the Column runs should be in order Left to Right





Specify Run Spacing that was used when collecting data.
Remember: This is the interval, in steps, between Column runs.

- This should be an integer ≥ 1
- The total number of steps in the Baseline Run is to be divisible by the step spacing

Run Spacing: 5 Step(s)

Start Point Offset from Datum: 0.25 Inches

On/Off

☐ Maximum Specified Elevation: 99999 Inches

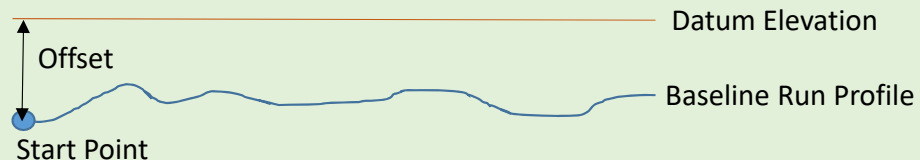
☐ Minimum Specified Elevation: -99999 Inches

Cancel DONE

Specify Start Point Offset from Datum

This is the difference in elevation of the Start Point (The beginning of the baseline run, Top Left Corner of the 3D-Map) and any predetermined Datum elevation. If none then enter 0 and all of the elevations will be shown with respect to the Start Point elevation, which will be 0.

Note: This can be useful for Volumetric Fill or Cut Calculations, which will be explained later.



Run Spacing: 5 Step(s)

Start Point Offset from Datum: 0.25 Inches

On/Off

☐ Maximum Specified Elevation: 99999 Inches

☐ Minimum Specified Elevation: -99999 Inches

Cancel DONE



Specify Max and Min Elevation Limits (OPTIONAL)

If no point on the surface is to be higher than a Specified limit, check the box enter that elevation in the maximum specified elevation.

If no point on the surface is to be lower than a Specified limit, check the box enter that elevation in the minimum specified elevation.

All of the measured value elevations will be compared with the specified limits, if any exceed the limit a “FAIL” will be shown and the total count number of measured values that are outside of the limits will be shown. Any interpolated points will not be counted.

ELEVATION RESULTS	MAX	MIN
Actual (measured)	0.937	0.239
Limit (specified)	0.8	0.3
Pass/Fail	FAIL	FAIL
QTY Failed*	37	2

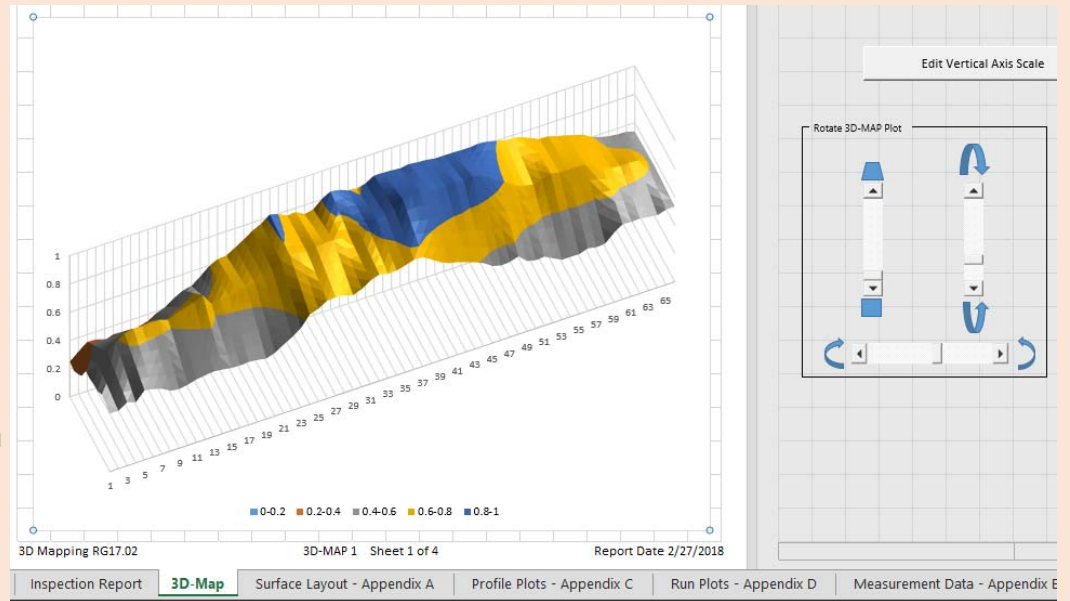


Review Results

The view of the 3D-Map can be Rotated and manipulated for a better Perspective.

Scroll down to view the color map Of the elevation values with respect To the datum.

The maximum and minimum elevation will be shown in the table.



3D Mapping RG17.02 3D-MAP 1 Sheet 1 of 4

SURFACE 3D-MAPPING REPORT
3D-MAP 1

Elevation Heatmap

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11
0.25	0.24	0.27	0.31	0.39	0.39	0.4	0.41	0.44	0.43	0.41
0.3	0.33	0.37	0.4	0.43	0.47	0.46	0.44	0.43	0.42	0.41
0.35	0.39	0.43	0.46	0.5	0.54	0.52	0.5	0.49	0.47	0.45
0.34	0.39	0.44	0.49	0.54	0.59	0.56	0.53	0.49	0.46	0.43
0.32	0.38	0.44	0.51	0.57	0.63	0.6	0.57	0.55	0.52	0.49
0.34	0.4	0.46	0.52	0.58	0.65	0.61	0.58	0.55	0.51	0.48
0.32	0.39	0.45	0.52	0.58	0.64	0.61	0.57	0.53	0.5	0.46
0.32	0.39	0.45	0.52	0.58	0.65	0.6	0.56	0.52	0.47	0.43
0.34	0.4	0.46	0.52	0.58	0.64	0.6	0.55	0.51	0.46	0.42
0.35	0.41	0.46	0.52	0.57	0.62	0.59	0.55	0.51	0.47	0.43
0.39	0.44	0.49	0.54	0.6	0.65	0.61	0.57	0.53	0.49	0.45

ELEVATION RESULTS	MAX	MIN
Actual (measured)	0.937	0.239
Limit (specified)	0.8	0.3
Pass/Fail	FAIL	FAIL
QTY Failed*	37	2



Volume Calculations

Fill: One can estimate the volume of material required to place on top of the surface, up to a specified thickness above the highest point on the floor

- 1) Identify the maximum elevation with respect to the Start Point by creating the 3D-map with datum offset as 0.

ELEVATION RESULTS	MAX	MIN
Actual (measured)	0.687	-0.011
Limit (specified)	99999	-99999
Pass/Fail	PASS	PASS
QTY Failed*	0	0

Last Column Run: SURFACE_1SECTION_1RUN_4

Run Spacing: 5 Step(s)

Start Point Offset from Datum: 0 Inches

On/Off: ☐ Maximum Specified Elevation: 99999 Inches

☐ Minimum Specified Elevation: -99999 Inches

Cancel DONE

- 2) Next Add that value to the desired fill thickness above the highest point. Example: if 1 inch minimum fill thickness is required, and the max elevation with respect to the start point is 0.687 inch → 1.687

- 3) Recreate the 3D-Map entering the negative of that value as the start point offset from datum.

- 4) Sum up all of the values in the heatmap and multiply by the step spacing twice,

The result will be the estimated volume of fill.

Example: 298.12 inches X 12 inches X 12 inches = 42,929.28 cubic inches → or 0.92 cubic yards

Last Column Run: SURFACE_1SECTION_1RUN_4

Run Spacing: 5 Step(s)

Start Point Offset from Datum: -1.687 Inches

On/Off: ☐ Maximum Specified Elevation: 99999 Inches

☐ Minimum Specified Elevation: -99999 Inches

Cancel DONE



Volume Calculations

Cut: One can estimate the volume of material required to remove from the surface, down to a specified elevation below the lowest point on the floor

- 1) Identify the minimum elevation with respect to the Start Point by creating the 3D-map with datum offset as 0.

ELEVATION RESULTS	MAX	MIN
Actual (measured)	0.687	-0.011
Limit (specified)	99999	-99999
Pass/Fail	PASS	PASS
QTY Failed*	0	0

Last Column Run: SURFACE_1SECTION_1RUN_4

Run Spacing: 5 Step(s)

Start Point Offset from Datum: 0 Inches

On/Off: ☐ Maximum Specified Elevation: 99999 Inches

☐ Minimum Specified Elevation: -99999 Inches

Cancel DONE

- 2) Next subtract that value from the desired depth below the lowest point. Example: if 1 inch depth is required, and the min elevation with respect to the start point is -0.011 inch → 1.011

- 3) Recreate the 3D-Map entering that value as the start point offset from datum.

- 4) Sum up all of the values in the heatmap and multiply by the step spacing twice,

The result will be the estimated volume of cut.

Last Column Run: SURFACE_1SECTION_1RUN_4

Run Spacing: 5 Step(s)

Start Point Offset from Datum: 1.011 Inches

On/Off: ☐ Maximum Specified Elevation: 99999 Inches

☐ Minimum Specified Elevation: -99999 Inches

Cancel DONE

Example: 298.12 inches X 12 inches X 12 inches = 42,929.28 cubic inches → or 0.92 cubic yards