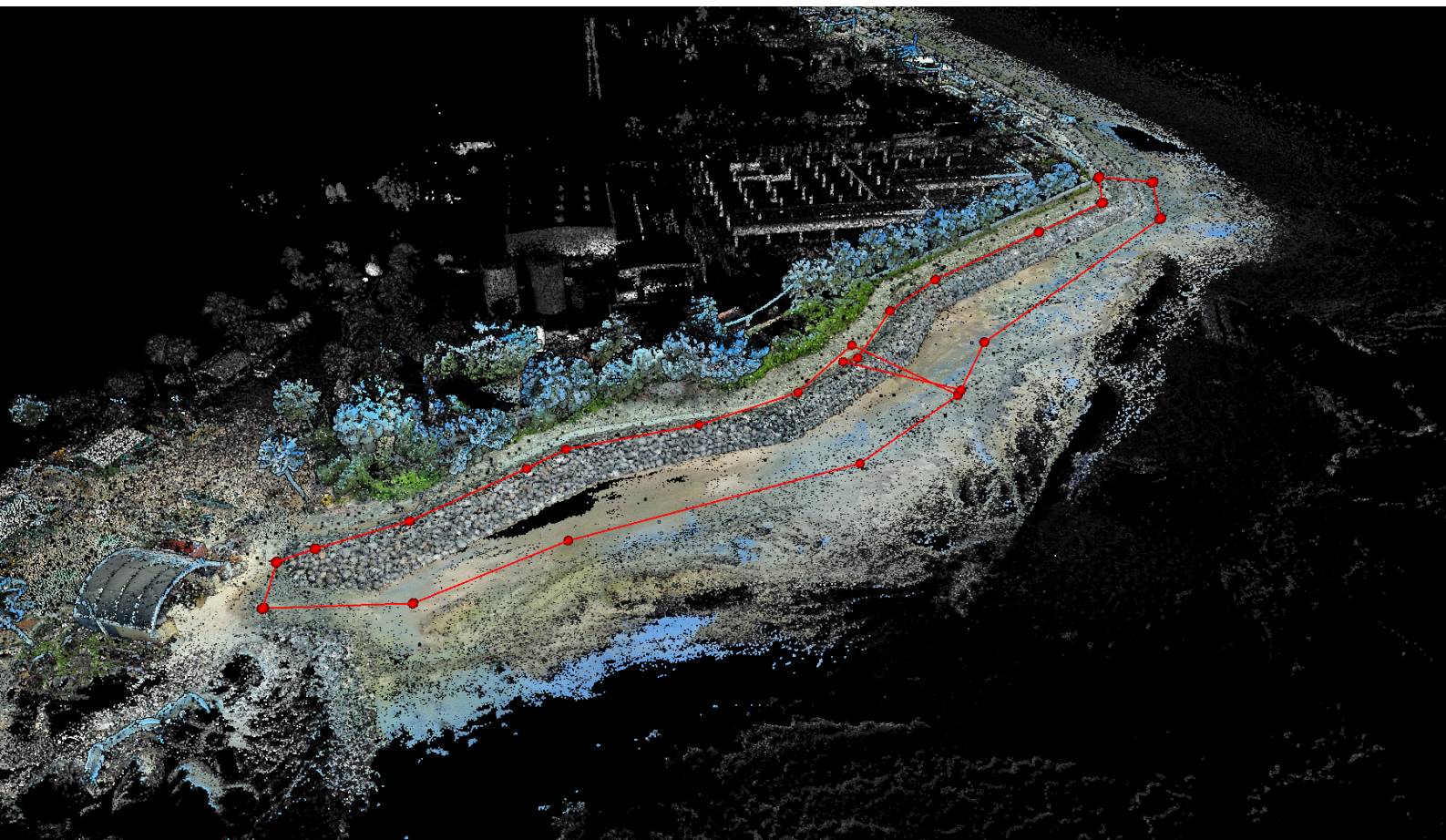


MEASURED SURFACES. DEFINED BASES. MEANINGFUL VOLUMES.

Orbis

Volumetrics.

Draw the boundary. Choose the base. Calculate volume in the context of your point cloud.



Orbis viewer capture from atlas_seam_four_recordings_20260912. Only vectra_denoised is visible; red outlines are saved measurement boundaries.

Define the footprint

Follow the shape of a pile, earthwork or selected surface with a polygon fence.

Choose the reference

Use a perimeter drape, a fitted perimeter plane or a fixed elevation.

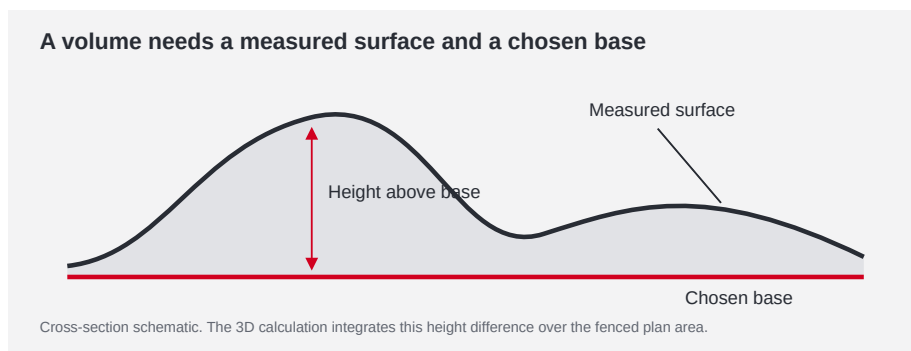
Understand the result

Interpret net volume with its base, coverage and calculation context.

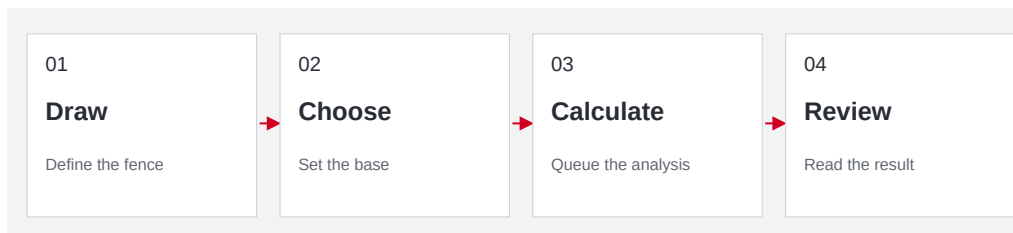
01 / THE WORKFLOW

From a point cloud to a volume.

The fence defines where to measure. The base defines what the measured surface is compared with.



Surface-minus-base illustration. A point cloud captures the visible surface; the material's buried underside must be represented by the chosen base.



The main volumetrics workflow in Orbis.

Start in the 3D scene

Open the recording and use the **Volume** tool in the analytics toolbar. Place vertices around the area of interest and finish the fence with at least three distinct points.

Orbit or use an elevated view to inspect the boundary against the captured terrain. The visible fence and its edge lengths help you see what is included.

Calculate against a base

Zoom in to reveal the contextual **Base** selector. Choose the appropriate reference surface, then use the volume calculation prompt to queue processing.

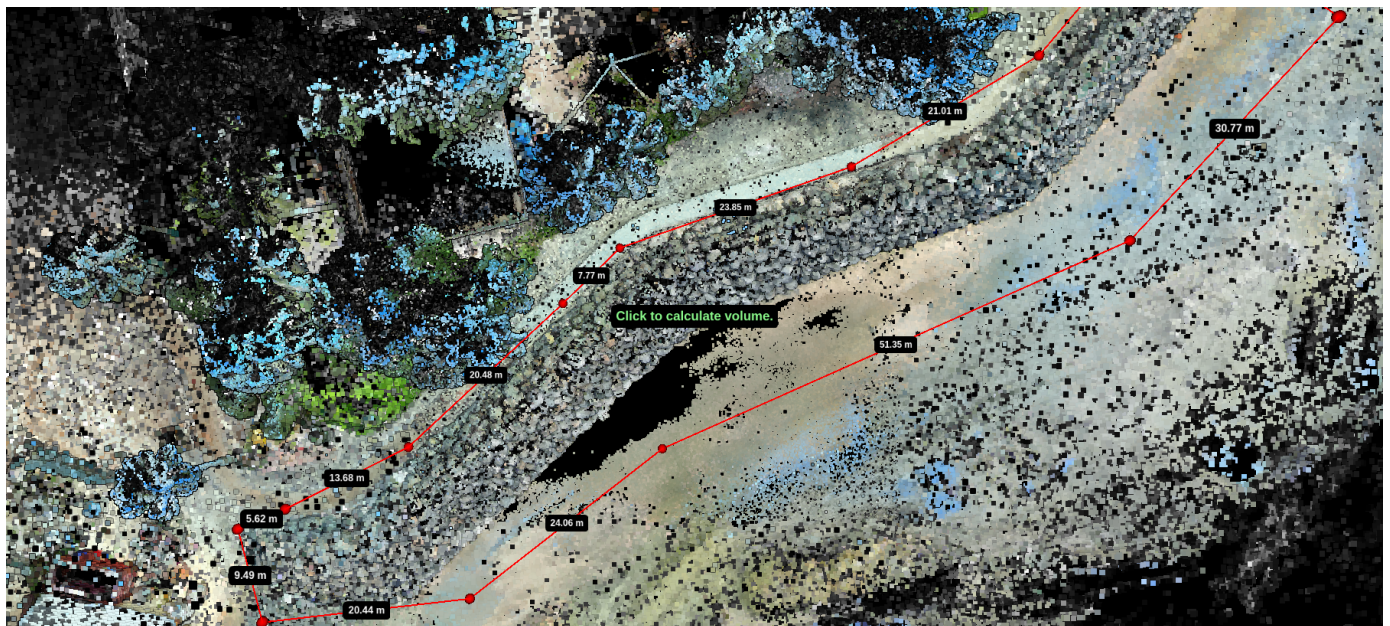
The viewer reports progress through its calculation state and loads the resulting value when the server stores it. Interpret the value with the base and survey context.

A clear-looking display is not a source-selection control. The server selects the analysis PLY through its recording-source logic; verify that input when you need the calculation to use a particular derivative.

02 / DEFINE THE BOUNDARY

Follow the footprint. Inspect the edges.

A polygon fence lets the measurement follow an irregular area rather than a simple rectangular box.



Native boundary display with vertex handles, edge lengths and a ready-to-calculate prompt. The prompt is a local demonstration; no calculated value is shown.

Place a meaningful perimeter

Trace the area you intend to assess. For a pile measured against perimeter ground, position the fence around its toe so the inside edge contains representative ground returns.

Use enough vertices to follow changes in direction. Avoid crossing edges, collapsed polygons and accidental inclusion of unrelated terrain.

Keep the shape you draw

The engine clips its grid cells to the fence in plan view. Concave areas remain concave; the measurement is not replaced with the polygon's convex hull.

Review in more than one view

A plan view makes the footprint clear. An oblique view reveals slopes, abrupt height changes and structures near the boundary.

Edge labels show distances between placed vertices. They help review the fence but are not a volume result or an estimate of calculation accuracy.

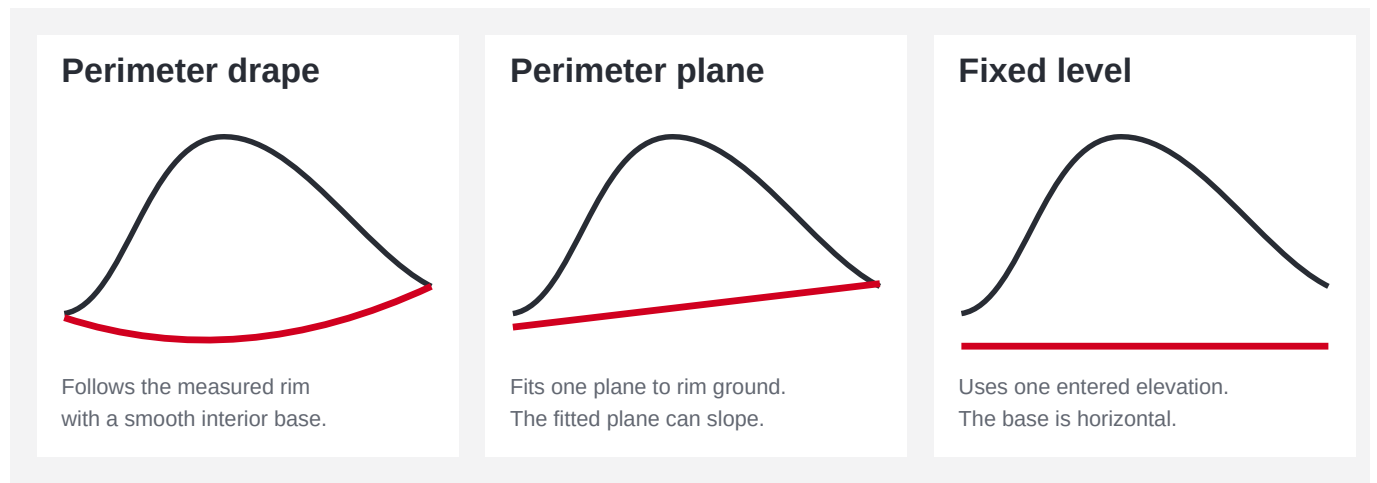
Separate the geometry from the base

Fence vertices carry 3D coordinates, but the crop footprint is defined in X/Y. The selected base model determines the reference beneath the included surface.

03 / CHOOSE THE BASE

Three ways to define the reference surface.

The same fence and the same cloud can produce different volumes when the reference surface changes.



Conceptual cross-sections. Dark line: measured surface. Red line: selected base. None is a measured profile from the recording.

Base option	How it is constructed	When it is useful
Perimeter drape Default	A robust rim plane plus a smooth correction that follows the measured inside rim across the interior.	Ground around the footprint changes elevation or shape and a single plane is too restrictive.
Perimeter plane	One robust plane fitted through usable ground cells just inside the boundary. The plane can be tilted.	The footprint sits on a broadly planar pad or slope, and you want one consistent fitted plane.
Fixed level	A horizontal base at an elevation entered in the viewer's coordinate frame.	You have a known reference level or need an explicit horizontal assessment level.

Match the base to the question

Choose the model that represents the surface beneath the material you intend to measure. A convenient number is not a reason to change the reference.

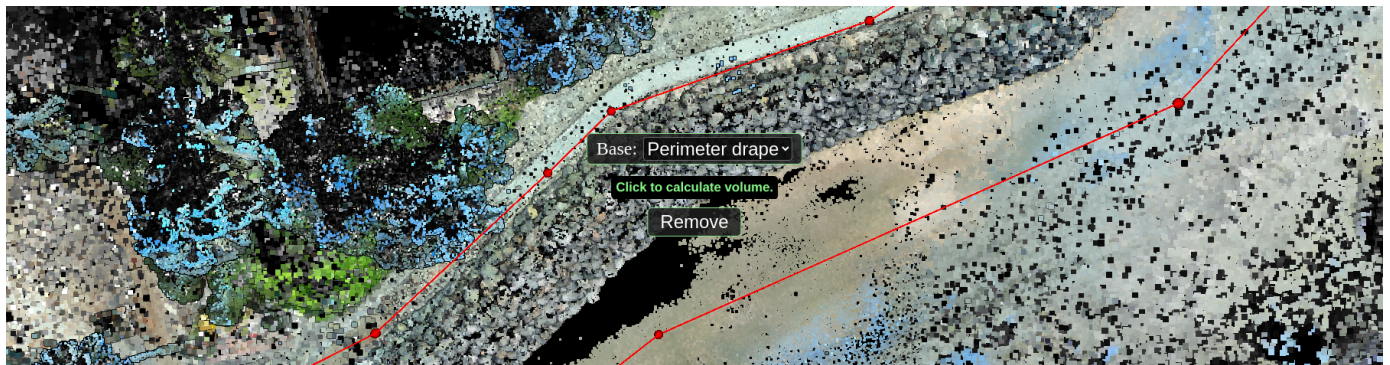
Record the choice

Retain the mode and any entered level with your assessment. The current saved fence/value format does not restore the base selection as calculation metadata.

04 / PERIMETER MODELS

Use the ground around the fence.

Perimeter modes infer a base from measured cells just inside the boundary.



Perimeter drape selected in the native Orbis control. Only vectra_denoised is displayed; the visible prompt is a ready state.

Perimeter drape

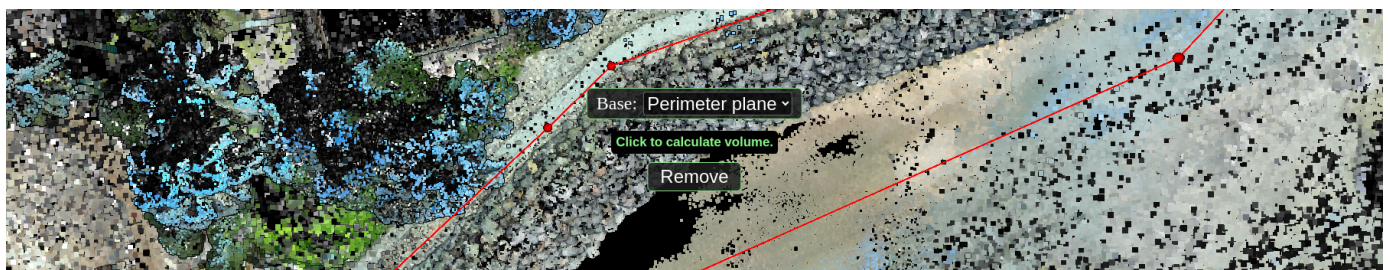
The engine fits a robust plane to the rim, then smoothly extends the rim's departures from that plane across the interior. On a planar rim, the correction tends to zero and the drape reduces to the fitted plane.

This lets the base follow non-planar ground around the footprint without treating the scanned pile top as its own underside.

Perimeter plane

The engine fits one robust plane through the rim cells. It keeps that plane across the entire footprint, including any slope inferred from the ground samples.

Use it when the ground model should remain planar. The interface's "plane" does not mean a horizontal elevation; that is the Fixed level option.



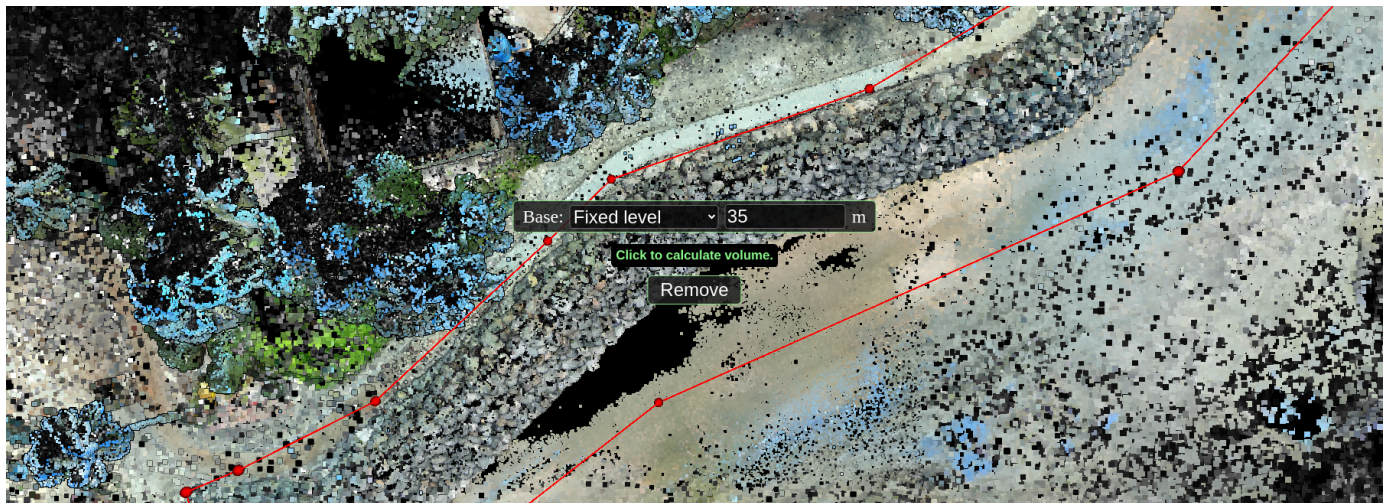
The same saved boundary with Perimeter plane selected locally. Changing the base requires a new calculation; these screenshots are not before/after results.

The rim must represent the intended base. A fence on the pile, a wall crest or unrelated terrain can produce an inappropriate reference. Robust fitting does not establish what lies beneath unseen material.

05 / FIXED LEVEL

Set an explicit reference elevation.

Use a horizontal datum when your assessment calls for one known level.



Fixed level control showing its automatic 35 m starting value for this fence. This is the lowest-vertex suggestion, not an approved survey datum or a calculated result.

Enter the level in the right frame

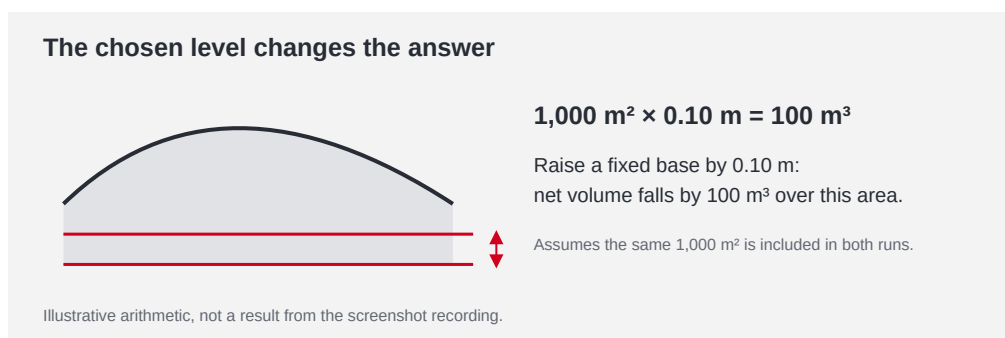
The numeric field uses metres and the same elevation frame as the displayed coordinates. Confirm that an external design or reference level uses that frame before entering it.

Until you type a value, the control suggests the lowest fence-vertex elevation. It provides a recognisable starting point; it does not determine the correct base for you.

Recalculate after a change

A new level changes the reference for every included cell. Changing the base or its level releases the previous calculation state so you can submit another run.

Keep the fence, source and included area consistent when assessing the effect of a level change. The resulting difference is meaningful only in that shared context.



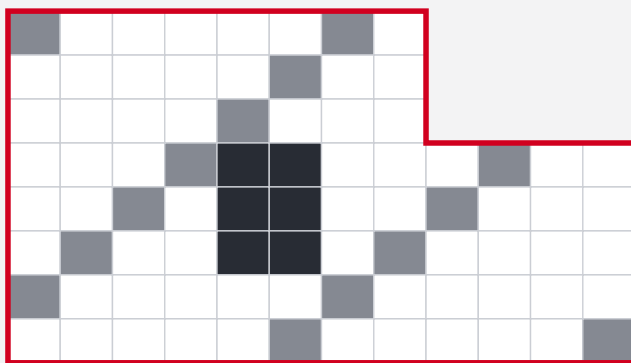
Base sensitivity illustration. The arithmetic explains the effect of a uniform level shift and does not claim survey accuracy.

06 / INSIDE THE ENGINE

How the surface becomes a volume.

The active calculation is a 2.5D surface-minus-base integration over the fenced plan area.

Resolve the surface in plan-view cells



- ☐ **Measured**
Supported by captured points.
- ☐ **Interpolated**
Local gaps filled within the permitted reach.
- ☐ **Unmeasured**
Larger gaps are excluded from the integral.

Schematic only. Real boundary cells use their clipped in-fence area; a concave fence stays concave.

Illustrative grid showing measured, interpolated and unmeasured cells. Colours are explanatory and are not a current viewer overlay.

1. Crop and clean

The engine reads the analysis PLY and keeps finite points inside the polygon. Where applicable, it transforms the fence from viewer coordinates into the map's local frame.

A spatial-neighbour outlier filter removes isolated returns before surface measurement, without moving the retained surveyed coordinates.

2. Choose the grid

Automatic cell sizing responds to point density and spacing. It uses a discrete size ladder and can coarsen large grids to keep the analysis practical.

3. Resolve the height

Each included cell receives one representative surface height, using robust statistics. Where two separated height populations exist, a supported lower population can be selected.

4. Build the base and integrate

The chosen base is evaluated over the same grid. Each cell contributes its in-fence area multiplied by surface height minus base height.

Boundary cells use their clipped polygon area. Cells excluded as unmeasured do not contribute, and the total is not automatically scaled up to cover them.

07 / COVERAGE AND CONFIDENCE

Know what was measured. Know what was inferred.

The engine applies explicit gates before publishing a numerical result.

80%

Minimum coverage

Measured plus interpolated area must cover at least this fraction of the fence by default.

3 m

Local gap reach

Default interpolation reach from measured data. Larger unsupported areas remain excluded.

10%

Unresolved split limit

Default maximum fraction of measured cells with unresolved separated height populations.

These are reviewed engine defaults, not an accuracy specification or ordinary viewer controls. Coverage includes interpolated area.

Condition	What the calculation does
Small interior gaps	Interpolates the surface within the permitted reach and includes those cells in the volume and coverage.
Larger voids	Leaves them unmeasured and excludes them. A result can still pass the coverage gate with part of the fence unmeasured.
Overhead returns	Can resolve a sufficiently supported lower height population. It is a geometric rule, not object recognition or a universal vegetation filter.
Ambiguous surfaces	Rejects the result when unresolved separated populations exceed the configured fraction.
Invalid base or geometry	Reports an unavailable measurement when it cannot establish a usable grid, fit the required rim base or complete the numerical checks.

Inspect the data first

Review occlusions, water, sparse returns, vegetation and structures inside the fence. A sharp image cannot supply a surface that the scan did not capture.

Review the diagnostics

For a disputed or unexpected value, use the engine logs to examine the selected datum, cell size, coverage and unresolved-height counts.

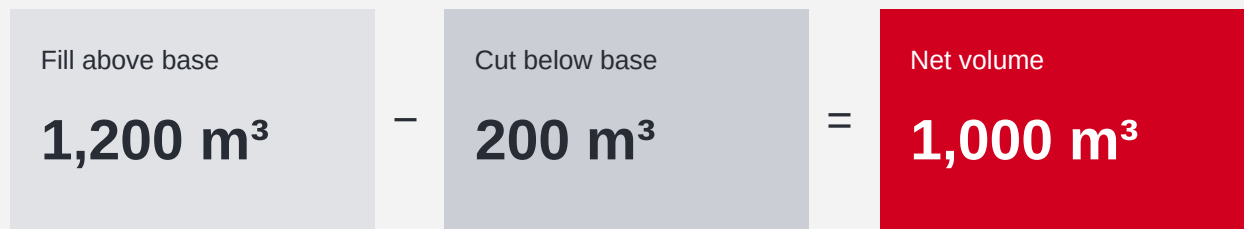
A reported value with 80% coverage is not "80% accurate". Coverage describes the included footprint; accuracy also depends on the scan, surface model, base and boundary.

08 / INTERPRET THE NUMBER

Read net volume with its sign and base.

Orbis reports the signed difference between the measured surface and the selected reference.

The reported volume is net: fill minus cut



Illustrative values. A negative net value can represent an excavation below the chosen base.

Illustrative calculation. These values are not measurements of atlas_seam_four_recordings_20260912.

Fill, cut and net

Fill is the positive volume above the base. **Cut** is the positive magnitude below it. **Net = fill – cut**, so a pit can legitimately have a negative result.

A zero net value may mean the surface coincides with the base, or that fill and cut balance. It is different from “Volume unavailable”.

Units and display precision

Volume is expressed in cubic metres. The reviewed server rounds the stored result to two decimal places. Decimal precision is not a statement of measurement accuracy.

What appears in the viewer

The measurement label presents the stored net value. The calculation state indicates work in progress; an unavailable state indicates that a valid number was not produced.

What remains in the diagnostics

The engine logs fill and cut separately, along with datum mode, rim hold-out statistics where available, cell size, fence area, coverage and ambiguous-cell counts.

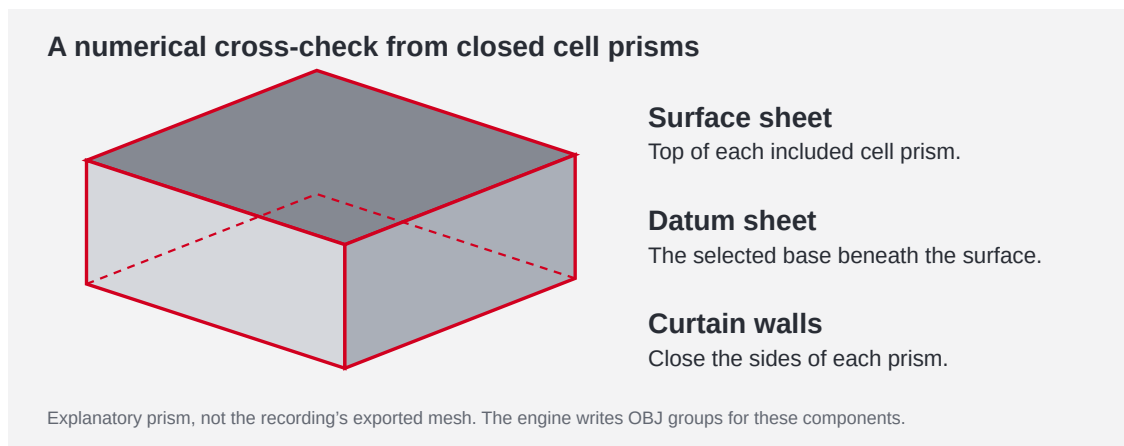
These diagnostics support technical review. The current UI does not present them as a full volumetrics dashboard or a downloadable measurement report.

Record the complete context. Keep the source recording, analysis file, fence, base mode, fixed level if used, date, net result and relevant diagnostics together.

09 / NUMERICAL OUTPUTS

A solid representation behind the calculation.

The engine checks the integrated result against a closed-prism representation of the included cells.



Conceptual solid components. The actual engine output contains one closed prism per contributing cell, not a detailed watertight model of the scanned object.

Grouped OBJ output

Successful engine processing writes a `_volumetric.obj` file beside the analysis source. Its groups separate the measured surface, datum surface and connecting curtain walls.

The mesh uses the map's coordinate frame. It is a numerical representation of the selected grid/base model, not an independently surveyed buried surface.

Cross-check before publication

The engine compares the mesh's signed volume with the prism integral and refuses a result if they disagree. A temporary output is renamed only after the check succeeds.

Band decomposition

The module also partitions the signed integral into horizontal bands and checks that those contributions sum back to the reported total.

This is an internal calculation capability. The reviewed viewer does not expose a stage-volume curve, band selector or band export workflow.

Retain outputs deliberately

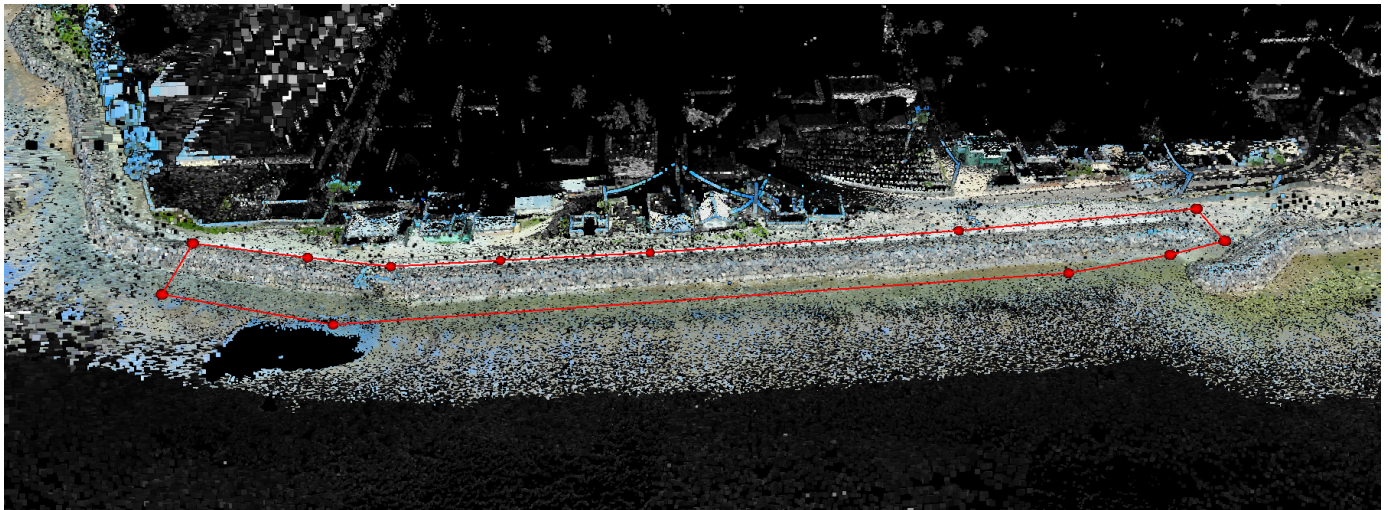
The OBJ filename is based on the source file, rather than a unique fence or revision. Preserve a copy with your assessment before another run replaces that file.

The numerical checks test consistency within the model. They do not validate the survey coverage, identify material type or convert cubic metres into mass.

10 / MANAGE THE MEASUREMENT

Refine, recalculate and keep the context.

The fence, base and result are linked by the assessment you perform.



A further saved boundary viewed obliquely on vectra_denoised. The scene remains a boundary demonstration, with no numerical result substituted.

Refine the footprint

Review individual vertices and adjust the perimeter where it includes the wrong terrain. Finish an active run before moving its fence. Boundary or base changes require a new calculation before treating the result as current.

When comparing alternatives, change one assumption at a time and retain the original settings with the comparison.

Reopen saved measurements

Orbis stores boundary coordinates and the result text against the recording and restores those entries into the viewer. Multiple fenced measurements can coexist.

Remove an unwanted measurement

Zoom in until the contextual **Remove** button is visible. The first click arms removal; a second click within four seconds confirms it. Moving out of view disarms the control.

The client writes the change before removing the fence from the scene. If the write fails, the fence stays visible.

Keep the base separately

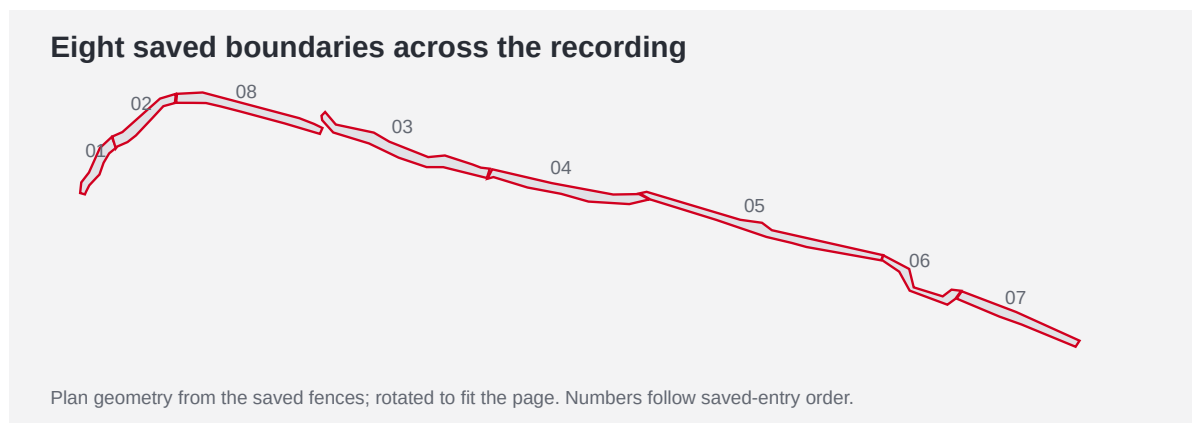
The current saved entry does not preserve the selected datum mode and fixed level as metadata. Record them explicitly; reopening a result is not a complete reconstruction of its settings.

When reopening a saved fence, confirm its base settings before calculating again. Retain the original measurement notes whenever you compare results.

11 / THE EXAMPLE RECORDING

Eight boundaries. One visible point cloud.

This edition uses atlas_seam_four_recordings_20260912 throughout.



Geometry derived from the eight saved Volume entries. This is a plan illustration of the boundaries, not a second point cloud.

The requested view

Every screenshot was captured with **vectra_denoised** as the only loaded and visible point cloud. The original point colours are retained; point rendering and camera position were adjusted for legibility.

Red polygons and handles are measurement geometry. They do not indicate a clash, a failing measurement or a cut/fill colour scale.

The saved state

At capture time the recording contained eight volume boundaries with blank result fields. The brochure shows their geometry and locally selected base controls, without inventing calculated values.

Use the examples appropriately

The pictured boundaries follow parts of the coastal rockwork and surrounding terrain. They demonstrate the interface and assessment footprint; they do not establish the correct buried base for that material.

Ready-to-calculate prompts and base selections were staged locally for the screenshots. No production calculation, result overwrite or fence deletion was submitted.

Evidence behind the description

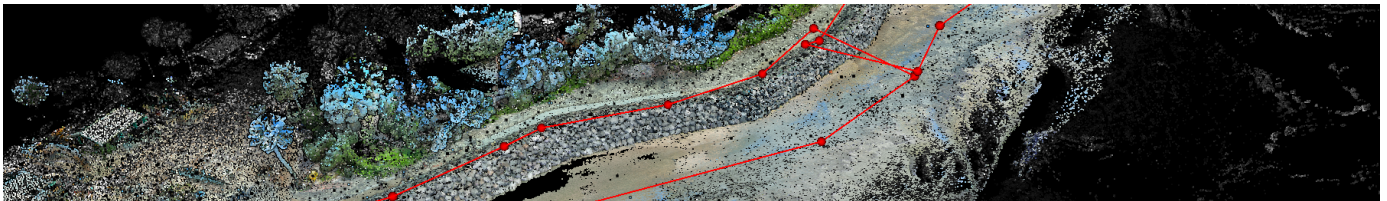
The current fenced-volume analytical suite was compiled and run during this review: all **164 checks passed**. This verifies tested numerical cases, not the volume of the pictured areas.

Choose the footprint and reference deliberately. Read the number in the context of both.

12 / PUT IT TO WORK

Bring the measurement and the evidence together.

Use volumetrics to assess suitable stockpiles, earthworks and selected surfaces against an explicit reference.



Orbis volumetric boundaries over vectra_denoised in the requested recording.

Prepare the assessment

Confirm the scan's age, coverage, coordinate frame and the source file selected for analysis. Define what material or surface the measurement is intended to represent.

Choose a meaningful fence and base, then calculate and review the net result alongside any available diagnostics.

Compare consistently

For repeat assessments, use comparable boundaries, bases and source conditions. A volume difference alone does not establish why material changed.

Share a reviewable record

Retain the recording identity, fence coordinates, selected base and level, result, analysis date and supporting views. Preserve technical output files when they are needed for review.

Mass conversion requires a separately justified material density. Full 3D overhangs, enclosed cavities and buried geometry are outside the single-surface model used here.

Explore Orbis volumetrics

Discuss your scan, material and reference surface with AutoMap.

sales@automap.io · 0438 753 678

automap.io/contact

Prepared from the GeoFuse, Fuse and OrbisFuseEngine implementations reviewed on 13 September 2026. Native viewer captures use the requested recording and cloud. Illustrations explain the model; they are not measured outcomes. Source references, implementation findings and capture provenance accompany the editable master.