From Survey Data to TIN Surfaces and Volume Calculations — A Complete Workflow

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We continue our sprint to discover the new features in BricsCAD V26. Today, we dig in a bit deeper and see how BricsCAD Civil Survey enables an integrated workflow.

Overview

Modern civil and infrastructure projects demand accuracy, speed, and reliable data continuity. In a recent webinar session, Dimitris Sapios (Technical Pre-Sales Manager, EMEA) demonstrated how BricsCAD Civil Survey enables an integrated workflow — from importing survey and GIS data to generating terrain models, designing gradings and corridors, and producing quantity take-offs for informed project decisions.

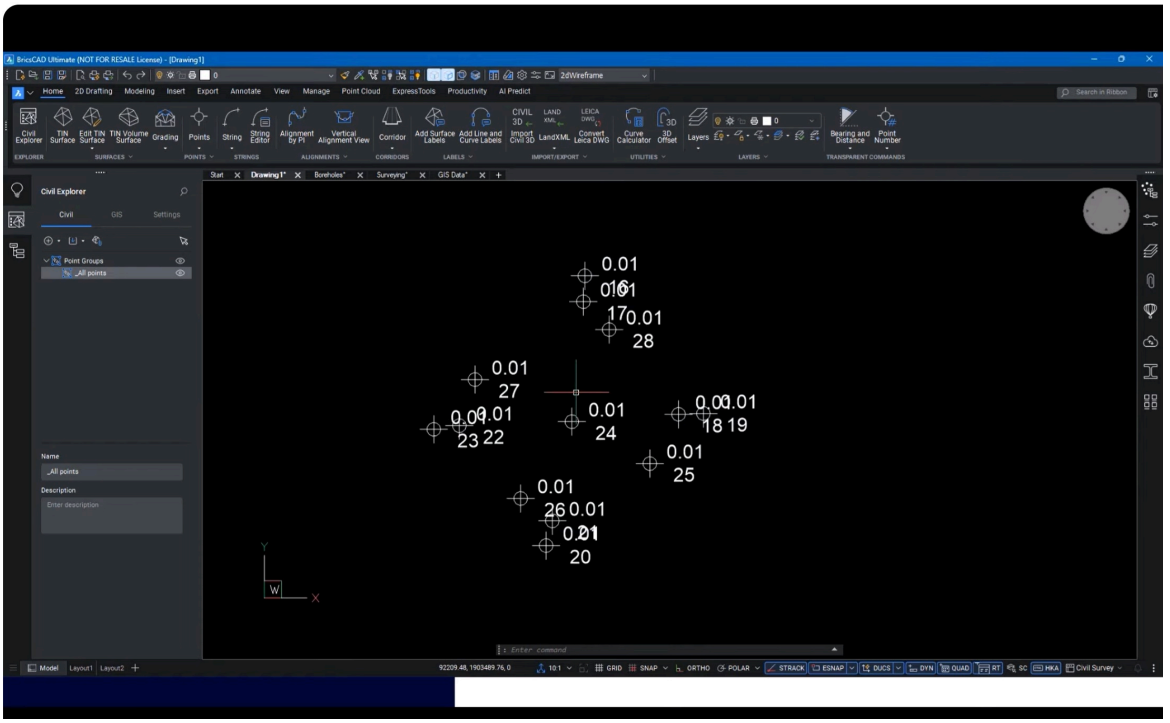
Key Capabilities Covered

1) Importing Survey Data and Civil Points

BricsCAD Civil Survey supports streamlined import of survey point data from CSV and text-based formats, including fields such as:

- Point number / ID
- Easting, Northing, Elevation
- Descriptions (e.g., boreholes, feature codes)

Imported points are organized through the Civil Explorer, enabling quick review, editing, grouping, and visualization styling—supporting the creation of accurate 2D survey deliverables directly in DWG.



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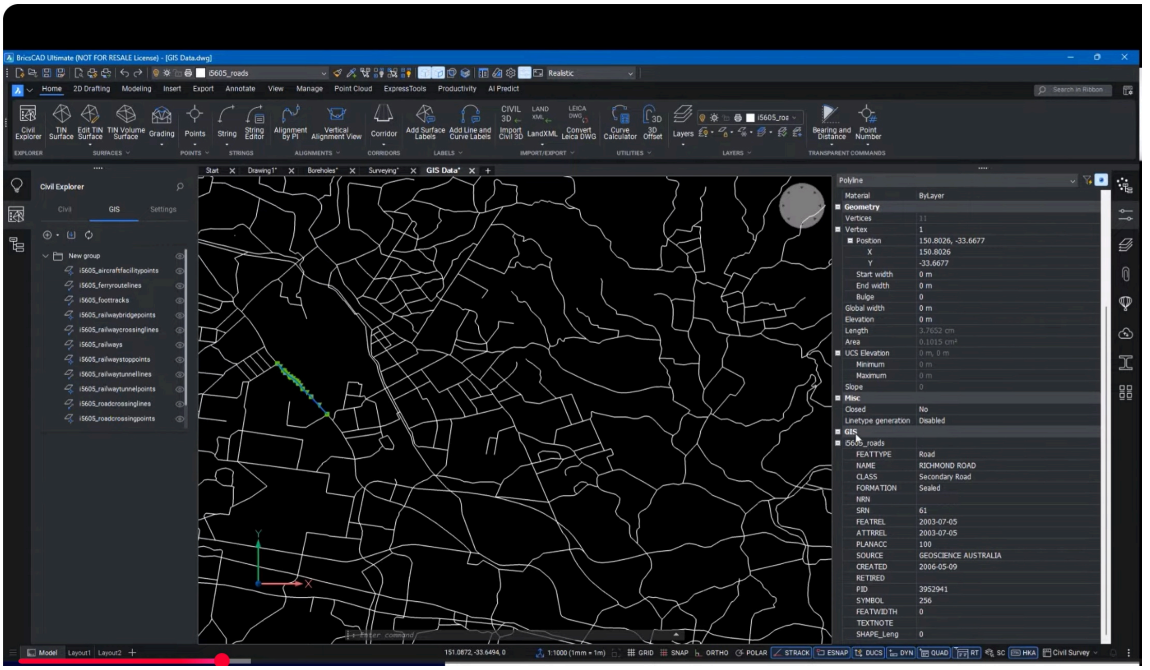
2) Importing and Working with GIS Data

BricsCAD Civil Survey supports GIS imports from:

- ESRI Shapefiles
- KML
- ESRI Geodatabase

Imported GIS entities (e.g., roads, railways, crossings) retain associated attributes, viewable and editable through the Properties panel and GIS layer tools—ensuring survey data remains information-rich and usable downstream.



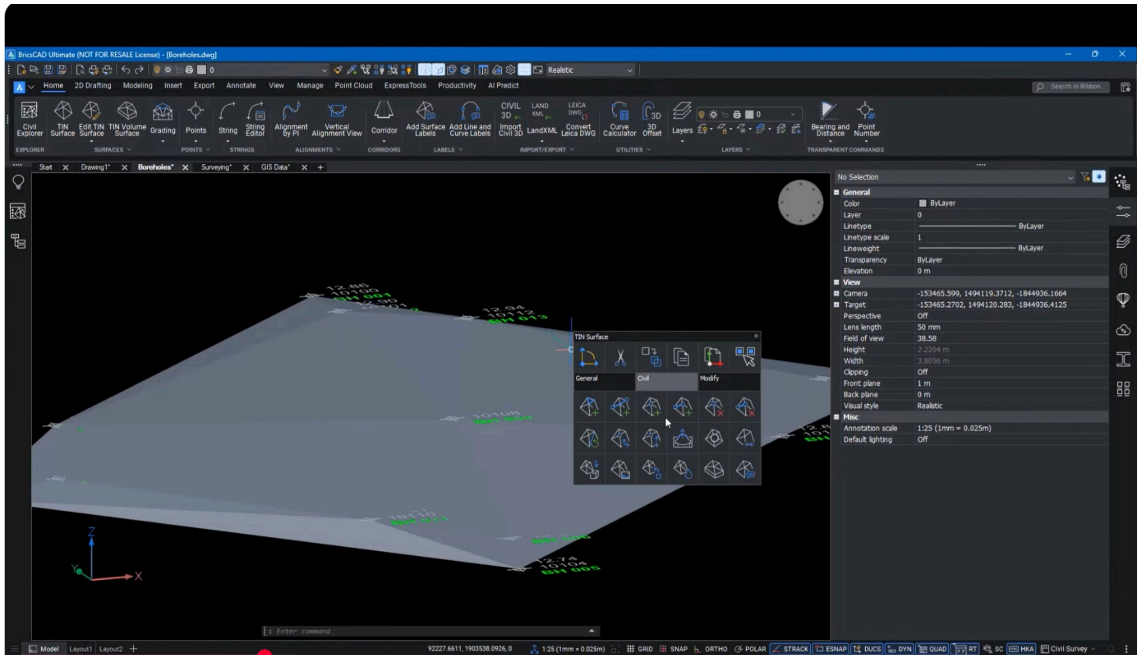
3) Creating TIN Surfaces (Digital Terrain Models)

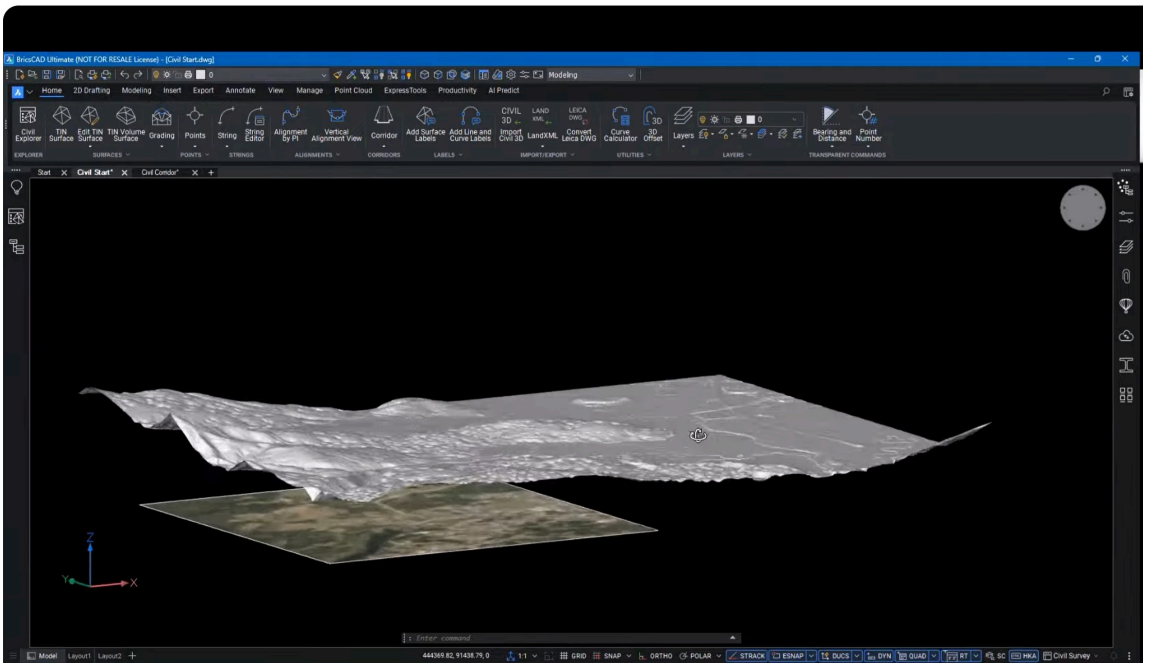
TIN surfaces can be created from:

- Civil points
- Contour lines / topographic polylines
- Text files containing coordinate data

Key workflow advantages include:

- Fast surface creation with minimal clicks
- Boundary trimming using polylines (with dynamic updates when boundaries change)
- Support for georeferenced imagery draped on surfaces
- Surface statistics (triangle count, elevation range) available in Civil Explorer



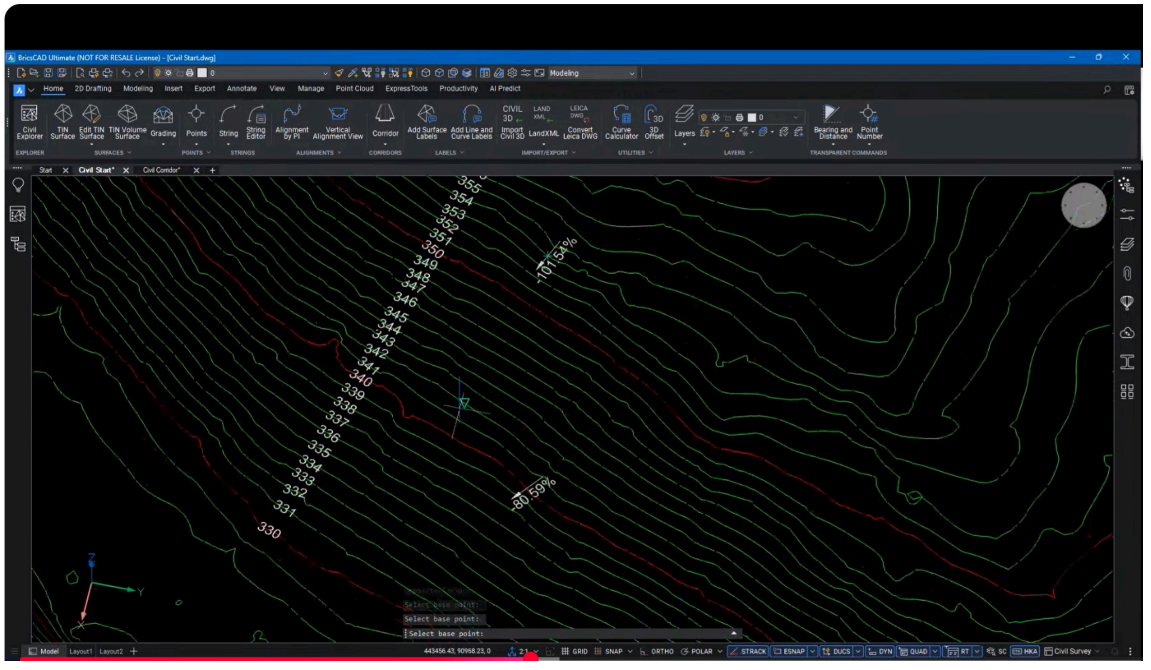


4) Surface Visualization, Analysis, and Labeling

BricsCAD provides practical terrain intelligence tools, including:

- Surface visualization modes (triangles, contours, styles)
- Surface smoothing to reduce jagged contour artifacts
- Water drop simulation for drainage direction understanding
- Labeling tools for:
  - Contour labels
  - Spot elevations
  - Slopes

These tools help convert terrain data into clear design-ready and presentation-ready outputs.



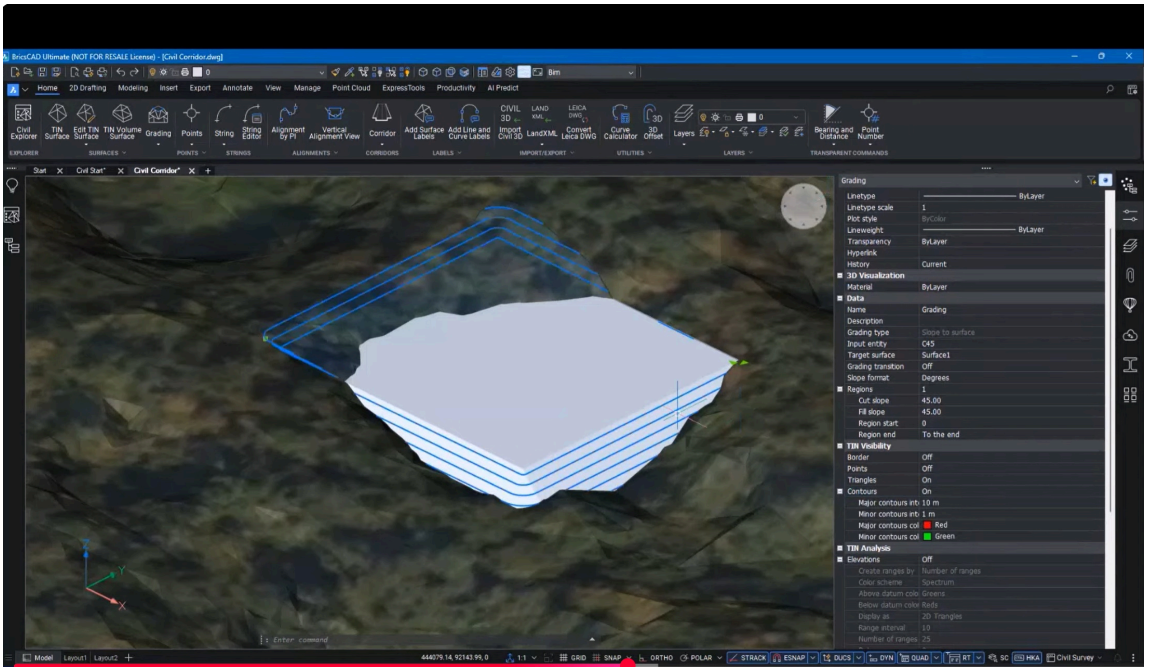
5) Grading Design with Cut/Fill Insights and Balancing

Gradings are generated using simple 2D/3D polylines as input, and remain dynamically linked to the geometry—supporting quick iteration.

BricsCAD reports grading quantities such as:

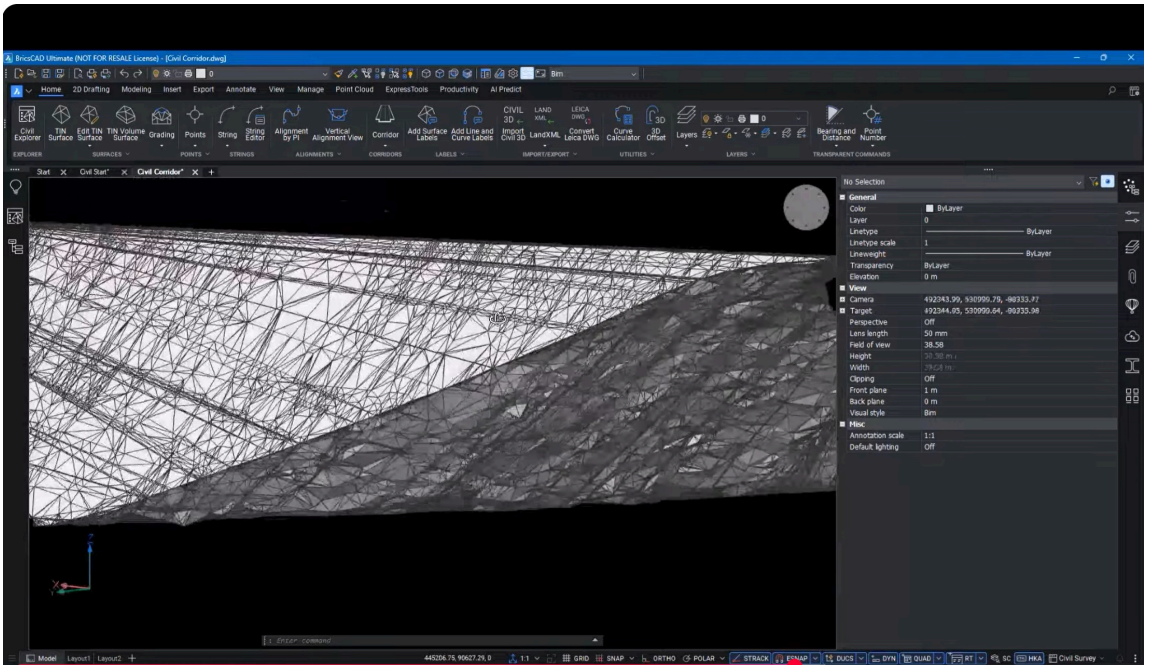
- Cut volume
- Fill volume
- Net volume

A notable feature is grading volume balancing, which adjusts grading elevation to target a net volume close to zero—reducing the need for importing/exporting excess soil and supporting cost-efficient earthworks planning.



6) Extracting Solids and Meshes for Volume Calculations

Using extraction tools, BricsCAD can generate 3D solids/meshes between surfaces to quantify material volumes. Volume values can be reviewed directly in the Properties panel, supporting quick take-offs for planning and execution.

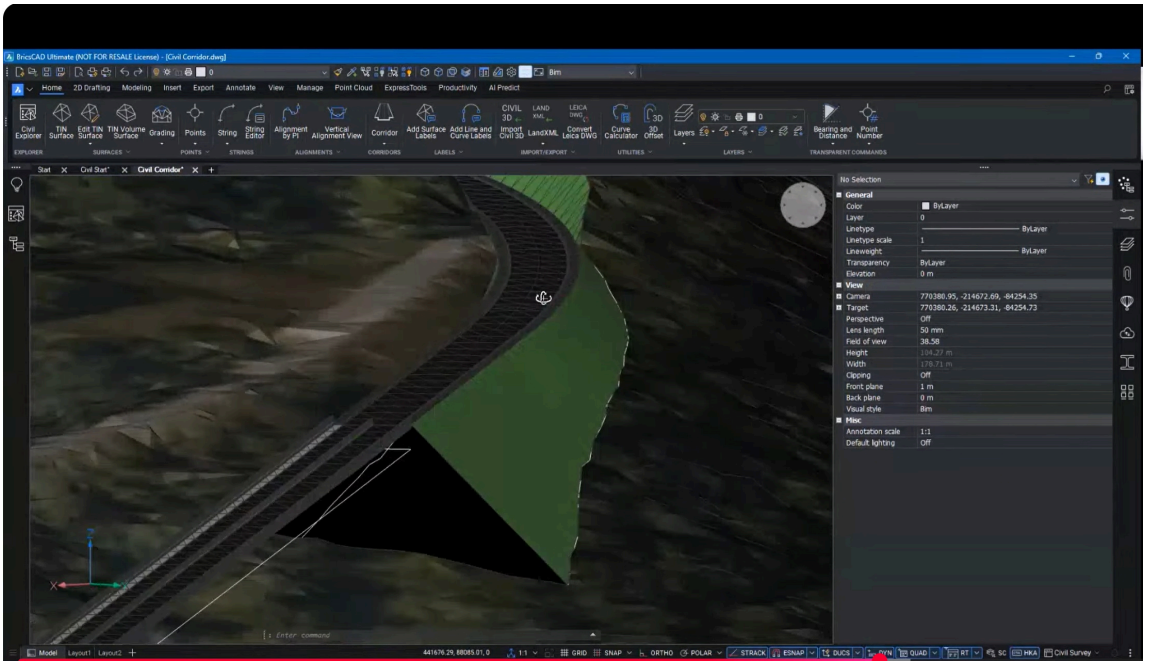


7) Corridor and Road Modeling with Templates and Alignments

BricsCAD enables corridor modeling through:

- Corridor templates created using basic CAD geometry (lines, polylines)
- 3D alignments derived from terrain context
- Editable vertical alignment control using PVI points with real-time updates

Materials (e.g., asphalt layers) can be defined, enabling downstream extraction of quantities per layer.

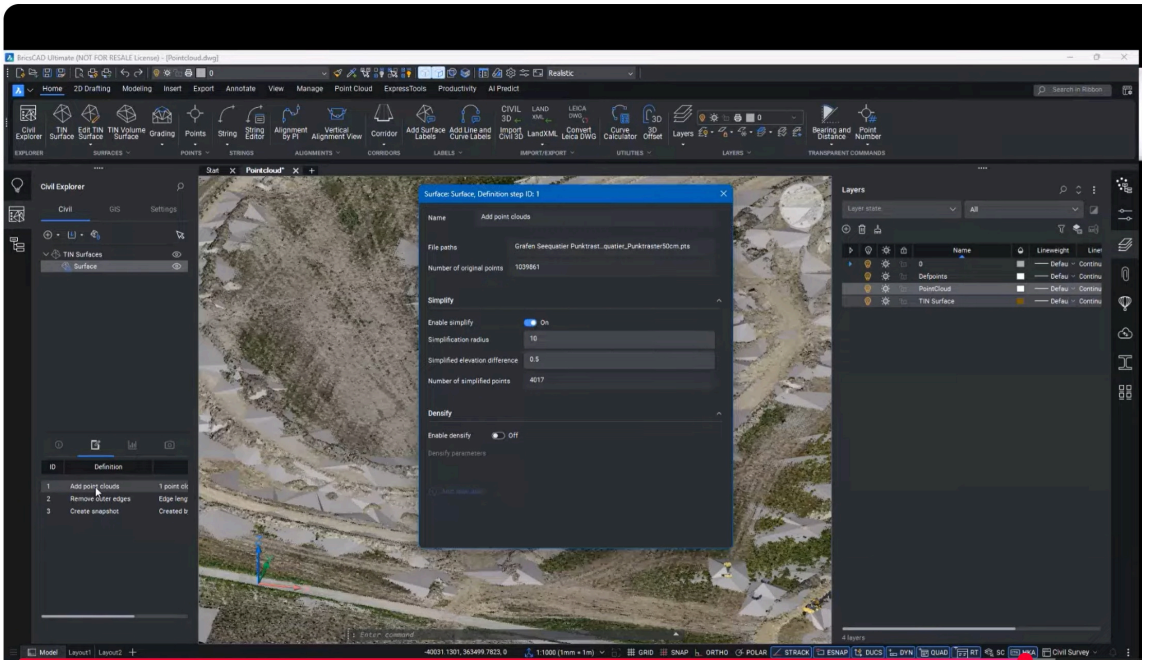


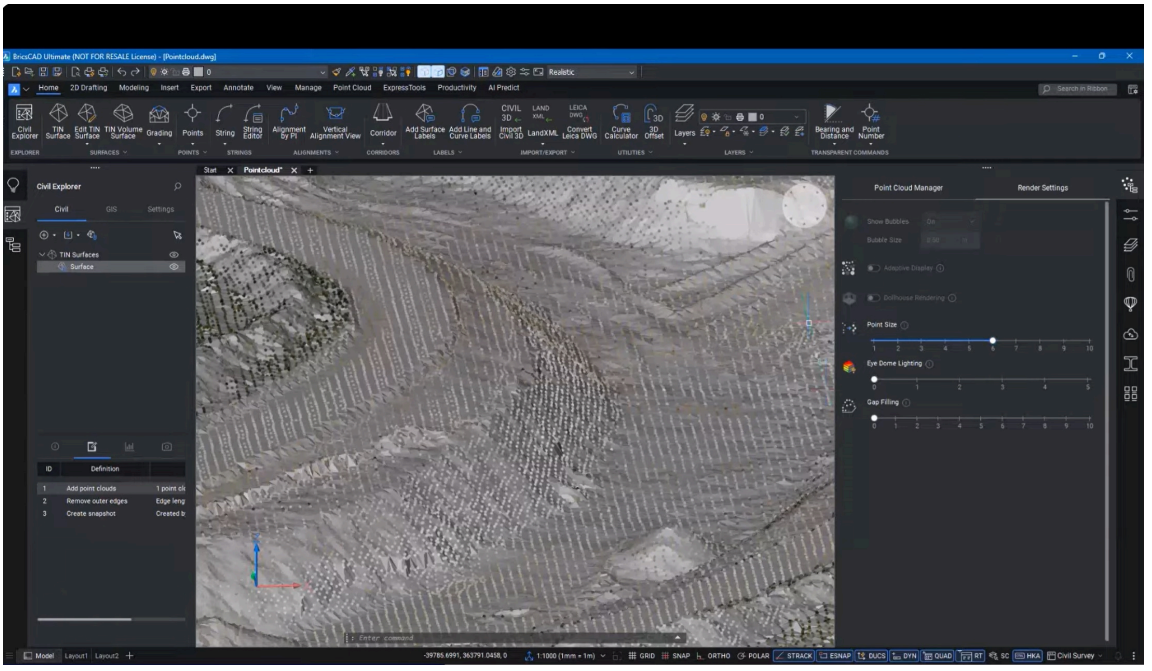
8) Point Clouds and Scan-to-TIN Workflows

BricsCAD supports point cloud workflows including:

- Importing common point cloud formats
- Pre-processing via the Point Cloud Reference Manager
- Creating TIN surfaces directly from point clouds
- Simplification/densification controls for performance and detail

For construction site datasets containing noise (vehicles, machinery), localized smoothing tools can be applied to improve surface usability for analysis and comparison.





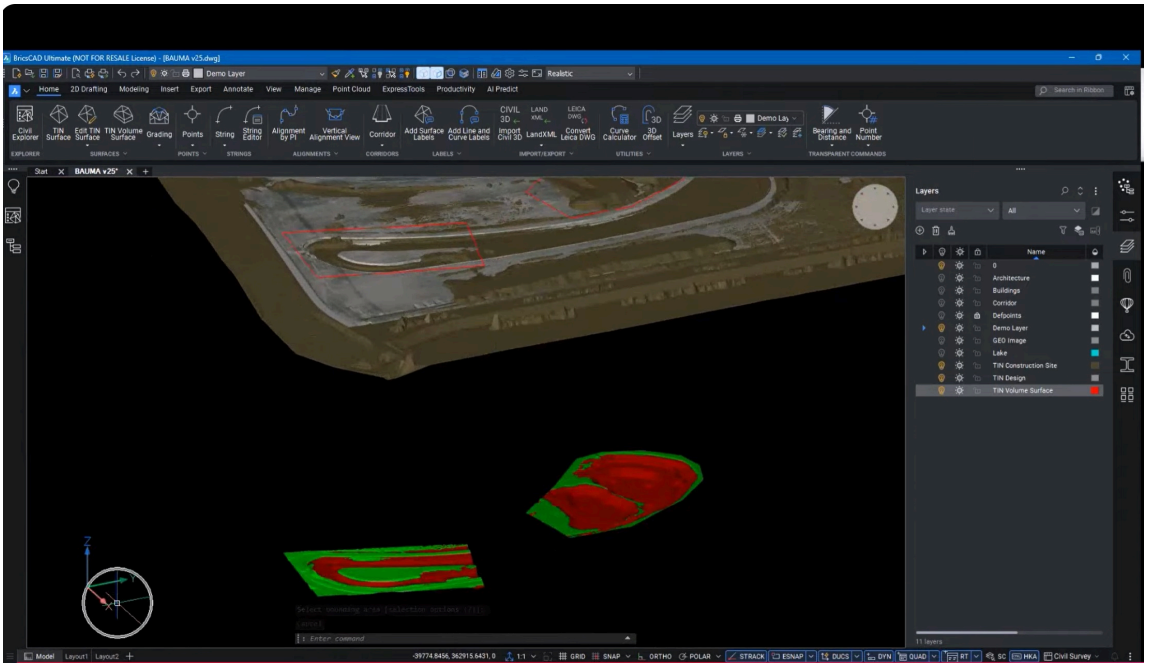
9) Comparing As-Built vs Design Using TIN Volume Surfaces

With TIN Volume Surface tools, BricsCAD enables:

- Visual identification of cut/fill zones
- Volume calculations within defined boundary areas (areas of interest)
- Direct access to cut and fill volumes within Properties

For reporting, BricsCAD's Data Extraction wizard can produce:

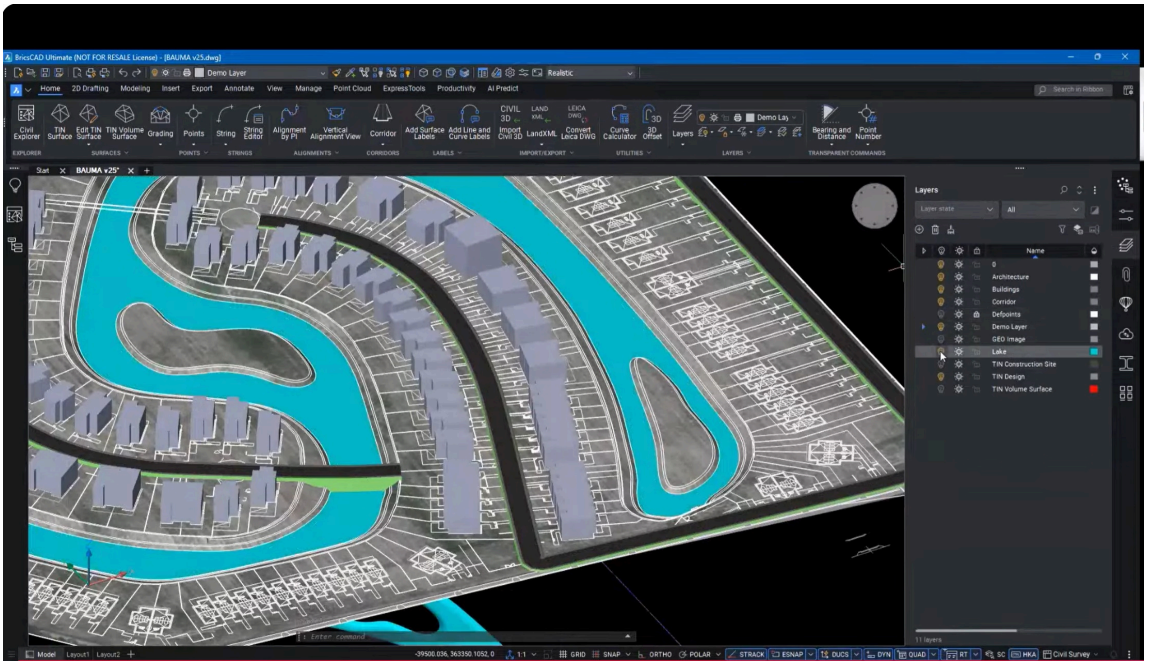
- Tables placed in the drawing (optionally data-linked)
- Exportable CSV outputs
  including properties such as surface name, triangle count, cut volume, and fill volume.



Final Deliverables Demonstrated

The complete workflow supports practical project deliverables including:

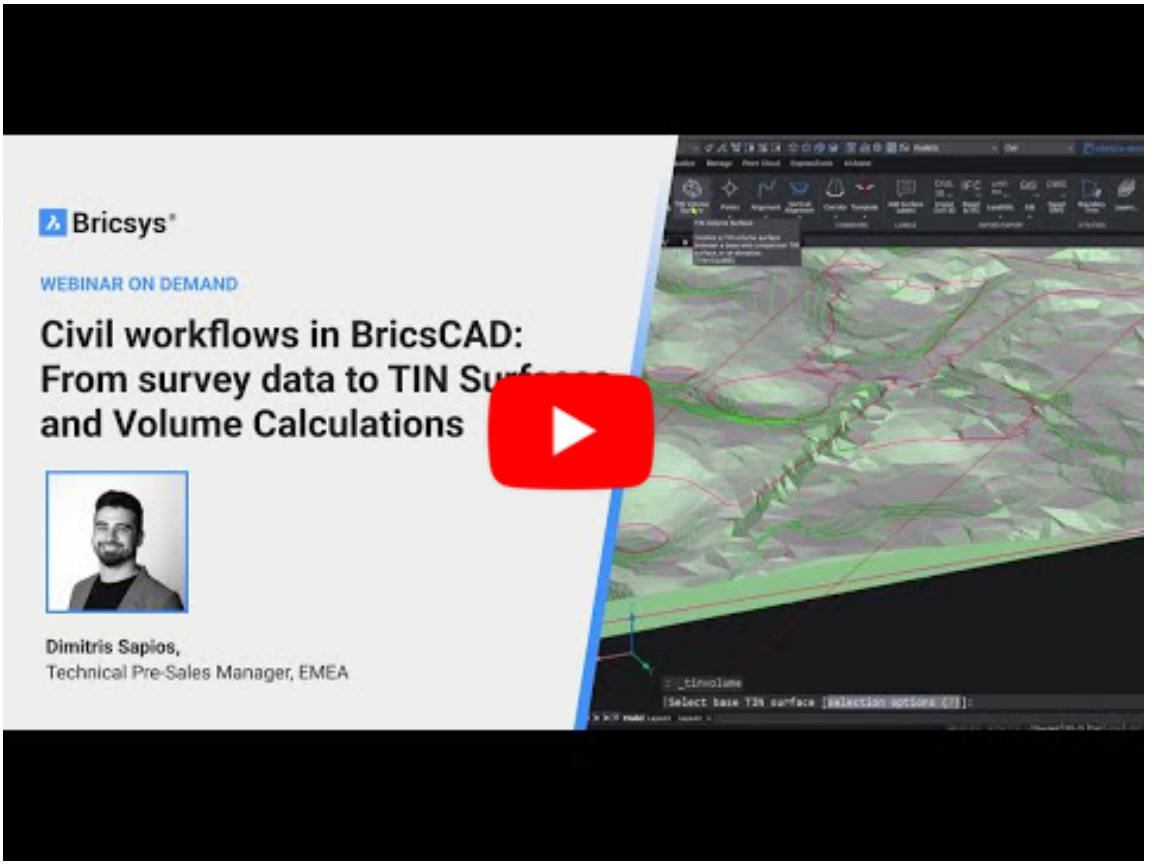
- Clean 2D survey plans and GIS-enabled drawings
- Terrain models (TIN surfaces) with intelligent labeling
- Grading and corridor designs with quantified materials
- Cut/fill analysis and volume reporting for estimation and coordination



Closing Note

BricsCAD Civil Survey enables a unified civil workflow—covering surveying inputs, terrain modeling, design development, and quantity take-offs—within a native DWG environment, helping teams reduce complexity while accelerating delivery.

Watch the original breakout session video by Dimitris Sapios



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