

NOVA WORKBENCH

Nova Geo

Real terrain · Cadastral boundaries · Aerial photos · True heights — inside SketchUp



User Guide — version 1.0

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1 · What Nova Geo does

Nova Geo pulls the real world into SketchUp. Give it a Norwegian property — municipality and parcel number (gnr/bnr) — and it fetches the official cadastral boundary, builds the true terrain from national elevation data, drapes the aerial photo over it, and reconstructs the neighbouring buildings as real 3D volumes with actual roof shapes. Everything lands correctly placed and correctly scaled, ready to design on.

- **Boundary** — official cadastral boundary with boundary-point markers, fetched straight from the land registry (matrikkelen).
- **Terrain** — Kartverket elevation data (NN2000) down to a 1-metre grid, as a clean SketchUp mesh.
- **Aerial photo** — draped over the terrain so the site looks like the site. A map-style drape (Kartverket topo) is also available.
- **Context** — neighbouring buildings in real 3D: footprints plus laser-measured roof shapes (gable, hip, shed, flat).
- **Heights** — elevation markers with true metres above sea level, slope analysis, and terrain sections.
- **Export** — georeferenced IFC out and in, so your model meets the consultants where they are.

Built for Norway. Boundaries, terrain and context use the official Norwegian services (Kartverket, matrikkelen). An internet connection is required while fetching.

2 · Installation

1. In SketchUp, open **Window** → **Extension Manager**.
2. Click **Install Extension** and select `nova-geo.rbz`.
3. Restart SketchUp. You will find **Nova Geo** in the Extensions menu and as a toolbar icon.

Requirements: SketchUp 2023 or newer, on Windows 10/11 or macOS 12+.

3 · One-time Python setup

The terrain engine uses Python for the heavy lifting (coordinate transforms and elevation rasters). This is a one-time setup:

1. Install Python 3 from `python.org/downloads` if you don't have it. On Windows, tick “**Add Python to PATH**” in the installer.
2. Run the setup script that ships with your download: `installer_python_pakker.bat` (Windows) or `installer_python_pakker_mac.command` (Mac). It installs two packages: `pyproj` and `pillow`.
3. Restart SketchUp.

Fast after the first call. Nova Geo keeps a warm worker running while SketchUp is open, so repeated fetches answer in milliseconds. It shuts itself down when you close SketchUp.

4 · Free trial & licence activation

Nova Geo includes a **free 7-day trial** — no licence needed. When the trial ends, the licence dialog opens by itself:

1. Buy Nova Geo at **novaworkbench.no**. You receive an e-mail with an **activation token**.
2. Open the plugin — the licence dialog appears. Paste the token and click **Activate on this computer**.
3. Restart SketchUp. Done — the licence is stored on this machine and works offline from then on.

The licence is locked to your computer. You get one free re-activation when you switch machines; beyond that, e-mail `post@nova-enginera.no`. If the computer running SketchUp is offline, use the manual fallback at `novaworkbench.no/activate` with the machine ID shown in the dialog.

5 · Quick start — from parcel number to site model

1. Open **Nova Geo** and go to the **Boundary** tab.
2. Search for the property (address or municipality + gnr/bnr) and fetch it. The boundary is drawn immediately and the model gets its **anchor** — the fixed point that keeps everything correctly placed.
3. Go to **Terrain**, choose grid size and area, and click **Fetch terrain**.
4. Click **Drape on terrain** with *Aerial photo* selected — the site now looks real.

5. Go to **Context** and fetch the surrounding buildings.

That's it: real boundary, real terrain, real photo, real neighbours — usually in under a minute.

6 · The Boundary tab

- **Property search** — by address or municipality + gnr/bnr. One click fetches the official cadastral boundary from the land registry.
- **Boundary points** — the registered boundary markers are placed as labelled points. The outline appears instantly; markers follow a moment later.
- **Multiple parcels** — properties with several parcels (teiger) are fetched completely.
- **Anchor** — the fetch locks a world anchor in the model, so terrain, photo and context all land in the same, correct position. You can align the model axes to the boundary from here.

7 · The Terrain tab

- **Fetch terrain** — builds the terrain mesh from Kartverket's national elevation model (NN2000 heights). Grid down to 1 m; choose the area size to fetch around the anchor.
- **Large context surface** — one click adds a wider landscape around the plot, detailed near the site and coarser further out, in a separate tag so it's easy to hide or render separately.
- **Drape on terrain** — drapes the chosen image source over the terrain: *Aerial photo* for a realistic look, or *Map* (Kartverket topo, with building outlines) for a site-plan look.

Tag discipline. Everything Nova Geo builds is grouped and tagged (Nova ... tags), so you can toggle terrain, photo and context independently.

8 · The Context tab

Fetches the neighbouring buildings as real 3D volumes — not grey boxes:

- Footprints from open map data, roof shapes measured from national laser scanning.
- Gable, hip, shed and flat roofs are reconstructed with crisp ridge lines; dormers are detected where the data supports it. Where the laser is uncertain, a typical Norwegian gable roof is used and marked as estimated.
- A whole neighbourhood (70–80 buildings) typically lands in a few seconds.

9 · The Elevation tab

- **Reference point** — set the datum for the model (for example the finished floor level).
- **Place markers** — click anywhere to place elevation markers showing true metres above sea level (m.a.s.l.), with an optional height suffix and per-scene visibility.

- Markers read from the real terrain data — the same heights the municipality and the surveyor use.

10 · The Slope and Section tabs

- **Slope** — colours the terrain by steepness so you see at a glance where the buildable, the steep and the difficult parts of the plot are.
- **Section** — cut a section line anywhere and get the true terrain profile with real heights, ready for drawings and applications.

11 · The Export tab (IFC georeferencing)

- **IFC out** — writes the georeference into your IFC export, so engineers open your model in the right place in the world, in the right coordinate system.
- **IFC in** — reads the georeference from incoming IFC files and places them correctly against your anchor.

12 · Aerial photo quality & API keys

The built-in aerial photo source works without any setup (about 0.5 m per pixel). For sharper photos you can use your own free key:

1. Create a free **ArcGIS Location Platform** account and copy your API key.
2. Paste it in Nova Geo's key field (Terrain tab) — the drape immediately uses the sharper service.

Keys are stored locally on your machine and never sent anywhere except to the map provider.

13 · Data sources, languages, troubleshooting

Languages

The panel has an **EN / NO** toggle at the top — every label and message switches between English and Norwegian instantly.

Data sources

Data	Source	Licence
Boundaries & parcels	Kartverket / matrikkelen	Open (CC-BY)
Terrain heights	Kartverket national elevation model	Open (CC-BY)
Building footprints	OpenStreetMap	ODbL
Aerial photo	Esri World Imagery (or your own key)	Esri terms
Map drape	Kartverket topo	Open (CC-BY)

Troubleshooting

Symptom	Fix
"Python not found" or terrain fetch fails	Run the Python setup script (chapter 3), then restart SketchUp.
Aerial photo looks blurry	Normal for small areas on the built-in source — add a free API key (chapter 12).
Fetch hangs or times out	Check your internet connection and firewall (SketchUp needs outgoing HTTPS). Try again — the services occasionally have slow moments.
New menu item missing after update	Restart SketchUp — menus are only built at startup.
Licence dialog says the licence doesn't cover this plugin	You activated a different product's token. Use the token from your Nova Geo purchase e-mail, or e-mail us.

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