

Leica Geosystems **TruStory**

Creating a 3D model of an estate using Leica Zeno 10



A former farm estate in Aglientu, Northern Sardinia has been brought back to life, using versatile Leica Zeno 10 solutions in an innovative workflow designed to produce a 3D digital model of the site. The project, to 'reactivate' the 20 hectare estate of Lu Naracheddu, was undertaken by two students from the Vienna University of Technology as part of their studies to gain the prestigious Diploma in Architecture (DI).

During the research phase the priority for Nora Heinzle and Lukas Pankraz Mähr was to collect 3D field data of the existing area and its previously named assets. The Zeno 10 handheld was used as a point collection tool for data that could be imported into Zeno Office and then exported as files compatible with CAD software.

The goal was to create a 3D model that could then be printed in 3D.

Aiming high

Nora Heinzle explains why it was necessary to create a model of the terrain.

"The collection of data from the field was not just to illustrate the actual reality of the site. A 3D model helped to better explain our vision which is based on eco-friendly principles that are sympathetic to the landscape and respectful of the native flora and fauna."

"We were aiming to achieve the highest possible standards with our work processes. The support we received from Leica Geosystems in using sophisticated Leica Zeno solutions in that endeavor was critical to us achieving our goals in the allocated time frame."

■ **Institution**

TU Vienna
(www.tuwien.ac.at)

■ **Challenge**

Create a three dimensional model of the 20 hectare farm estate Lu Naracheddu

■ **Objective**

- Use point measurement to collect 3D field data of the area and assets
- Transfer the data to CAD software

■ **Location**

Aglientu, Northern Sardinia, Italy



■ **Deliverable**

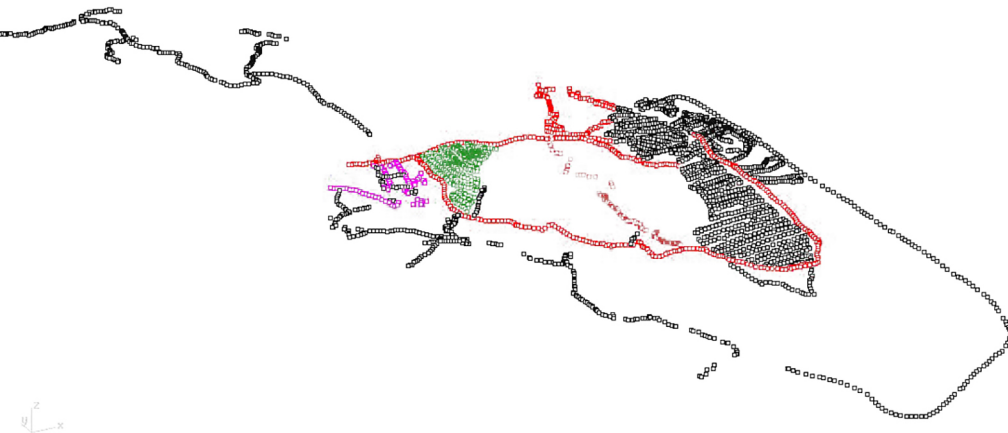
GIS-based landscape and asset inventory including all existing buildings, roads, rivers, major trees and distinctive agricultural features

■ **Key Tasks**

- Collect point and asset field data using the Leica Zeno 10
- Download data into Zeno Office
- Export to CAD and produce a 3D terrain model

■ **Hardware and Software**

- Leica Zeno 10
- Leica Zeno Field software
- Leica Zeno Office
- Rhino3D CAD Software



■ Benefits

- Fast and easy data collection
- Portable and power efficient
- Adaptable workflow and versatile solution
- Easy to use for non-surveyors, while having ambitious requirements and accuracy needs
- High reliability in tough environments (IP67)
- Reliable positions (accuracy)
- Easy workflow between Zeno Field and Zeno Office for data processing
- Easy export to 3rd party software for final analysis

Fast and adaptable

Leica Zeno 10 offers a variety of ways to format the collected data so it is compatible with 3D modelling software. Points with XYZ values were collected and then imported into the Zeno Office software using the "EasyIn" transfer routine. In this case the data was exported in DWG files, compatible with Rhino 3D software. Later on data could easily be exchanged between the field device and the office PC.

The speed of operation, portability and durability of the Leica Zeno handheld allowed the operators to capture landscape and asset information at a greater speed than anticipated. Typically, they covered a distance of 5- 10 hectares per day, working with a theoretical grid of 5m x 5m in order to achieve the accuracy they needed.

Using GPS and integrated real-time, the Zeno10 achieved an accuracy ranging between 0.8m and 3.5 m, depending on the quality of reception, but with a tendency towards the higher accuracy.

Equal to the task

A database set up in Zeno Office featured layers based on point, polygon and polyline surveying. The point layer was used to save landscape data, the polygon layer for road inventory and the polyline layer for further asset information, comprising mainly buildings and mature trees. After experimenting with the export of data to CAD, they found that they needed to reduce the layers to achieve the accuracy range to create a landscape model. Lukas Pankraz Mähr added, "Using the Leica Zeno data logger was a really helpful way to acquire the data we needed to produce a digital model of the terrain. It is light, portable and the battery power is sufficient for a full day's work."

"We were aware that as architects our priorities for functionality were different to those of a land surveyor. It was informative and encouraging to know that Leica Geosystems products and solutions are adaptable enough to support the ambitions of budding built environment



professionals that may want to use them in non-traditional ways."