



APPLICATION NOTE / AEC

Capturing Beauty: The “Out Of The Blue Capsis Elite Resort” 3D Documentation Project

Overview

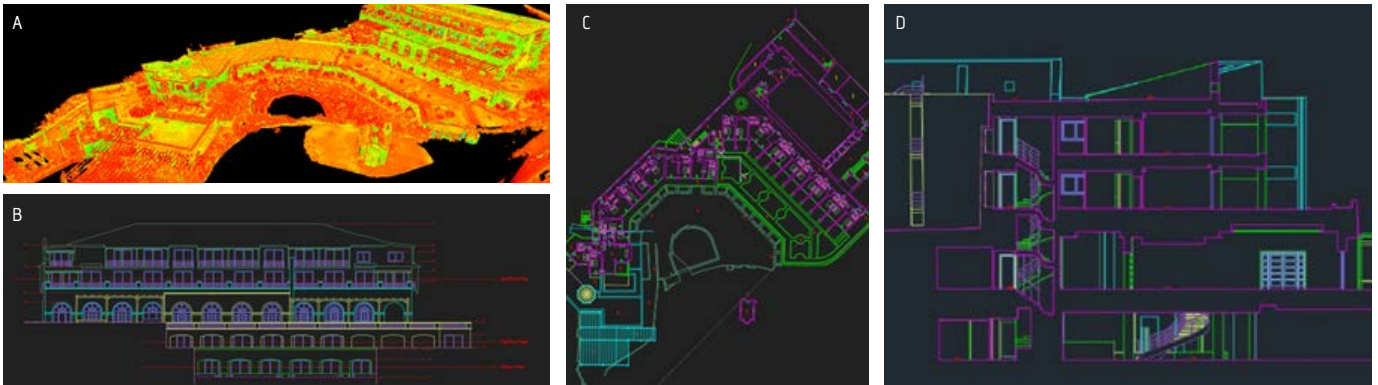
Embarking on a captivating journey of precision and innovation, we invite you to delve into the realm of architectural artistry with this project. Located in the enchanting landscapes of Agia Pelagia, Crete, the Capsis Resort stands as a testament to refined elegance and grandeur. Our mission was to immortalize this magnificent resort meticulously, and we employed a range of cutting-edge tools to achieve this goal. We used different kinds of instrumentation, from the handheld Leica BLK2GO laser scanner to the terrestrial Leica RTC360 laser scanner, the Leica TS16 1" geodetic station, and the unmanned aerial vehicle Phantom 4 DJI. The collected data, a combination of point clouds and aerial imagery, were processed with specialized software such as Leica Cyclone, Leica Cloudworx, and Agisoft Metashape Professional. Our fieldwork was a dance of precision. Employing a blend of terrestrial instruments – laser scanners, a geodetic station, and the Phantom 4 DJI drone, the result was a symphony of intricate scans capturing every nook and cranny. We embraced scanning resolutions of 6 mm/10m and 3 mm/10m, ensuring that even the tiniest details were etched into our digital canvas.

Challenges

- Material reflectiveness & Weather conditions
- The vast number of surfaces, details and architectural objects that needed to be captured
- The high amount of vegetation in the area that caused the cache of important details of the buildings
- The height and the curviness of the building complex

Benefits

- Efficiency at Its Best
- Budget-Friendly
- Guaranteed Precision
- Supercharged Productivity
- Accurate documentation



A. Final point cloud of the total complex B. 2D Drawing of the front view of a building (indicative delivery item) C. 2D Drawing of the floor plan of a building (indicative delivery item) D. 2D Drawing of a longitudinal section (indicative delivery item)

Methodology

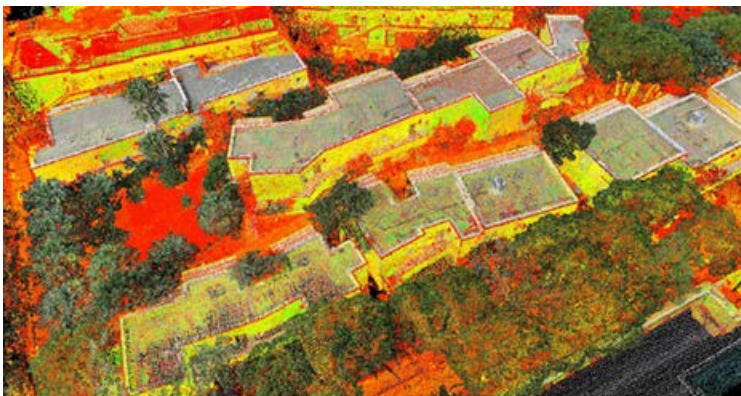
In the quest to capture the diversity of 32 different buildings of the resort, including villas, restaurants, bungalows and auxiliary spaces, our team utilized the power of state-of-the-art laser scanners, each serving a distinct purpose. For the 3D scanning of the exteriors and selected interior spaces, we turned to the Leica RTC360 laser scanner. Capable of capturing up to 2 million points per second, this technological marvel was complemented by a High Dynamic Range (HDR) camera, imbuing our scans with true colour tones, ensuring that every detail was faithfully reproduced.

However, precision and efficiency were paramount regarding buildings' interiors. That's where the Leica BLK2GO laser scanner came into play, boasting an indoor accuracy of +/-10 mm. Its swift operation reduced field time without compromising the project's standards. To capture the extensive exterior spaces, including the rooftops, we enlisted the power of the Phantom 4 DJI drone.

A local geodetic network was established and used for our project's geodetic support and georeferencing needs. To achieve this, we employed the precision of the Leica TS16 total station, achieving an angular accuracy of ±1" and a range extending up to 300m to any surface. This geodetic network ensured all buildings were georeferenced within the same reference system, forging a solid foundation for the project's success. Our network was solved using Leica Infinity Survey and Spatial Analyzer software.

After extensive fieldwork, the scan data from the laser scanners were registered into a unified database through the seamless integration of Leica Cyclone Register 360 Software. Simultaneously, the drone-acquired data underwent transformation and extraction using Agisoft Metashape Professional, using the leverage of image-based processing.

For the final 2D drawings, we masterfully attached the unified point cloud data to AutoCAD, thanks to the Leica Cloudworx plugin.



Final fused point cloud of a part of the complex

Instrumentation / software

- Leica RTC360 | Leica BLK2GO
- Total Station Leica TS16
- Phantom 4 DJI
- Leica Cyclone | Leica Cloudworx
- Autodesk AutoCAD | Leica Infinity Survey
- Spatial Analyzer | Agisoft Metashape Professional

Deliverables

- 2D as-built drawings of the building.
- Merged point cloud in .lqs file format.