

# SURVEY AND MAPPING



TARGET 432.  
Device #11486



TARGET 432.1  
Device #11486  
Coordinates    Coordinates  
Load: 713    Load: 702

# About ESBAAR

ESBAAR is an Oman-based drone services provider offering an end-to-end solution for both hardware and software products. ESBAAR differentiates itself from others by delivering cutting-edge drone services, costumed AI-powered solutions, and data management/analysis solutions. We offer drone-based inspections, monitoring, surveillance, surveying and mapping solutions for our clients. ESBAAR is the first Omani company to be recognized by the Civil Aviation Authority in the UK as a commercial drone service provider.

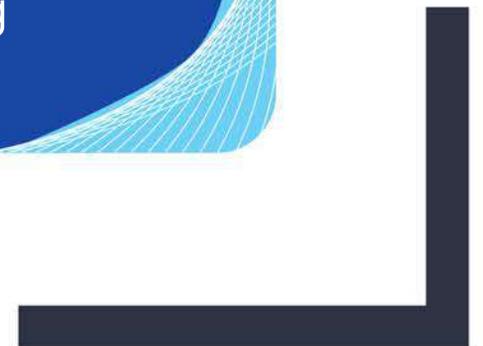


ESBAAR's unconventional capabilities in surveying and aerial mapping are powered by high-tech industrial drones coupled with an efficient and accurate AI-assisted analysis. Combining high-performance drones with advanced software, the end result is increased efficiency, productivity, and accuracy while minimizing the conventional cost. ESBAAR's end-to-end surveying and mapping solutions help your company to stay competitive, save time in post-processing the collected data and be more efficient.

## ESBAAR's Smart Solutions for Survey

- 2D Maps & 3D Modeling
- Digital Terrain Model (DTM)  
& Digital Surface Model (DSM)
- Vegetation analysis

- Point cloud models
- Volume and stockpile  
measurement
- LiDAR mapping

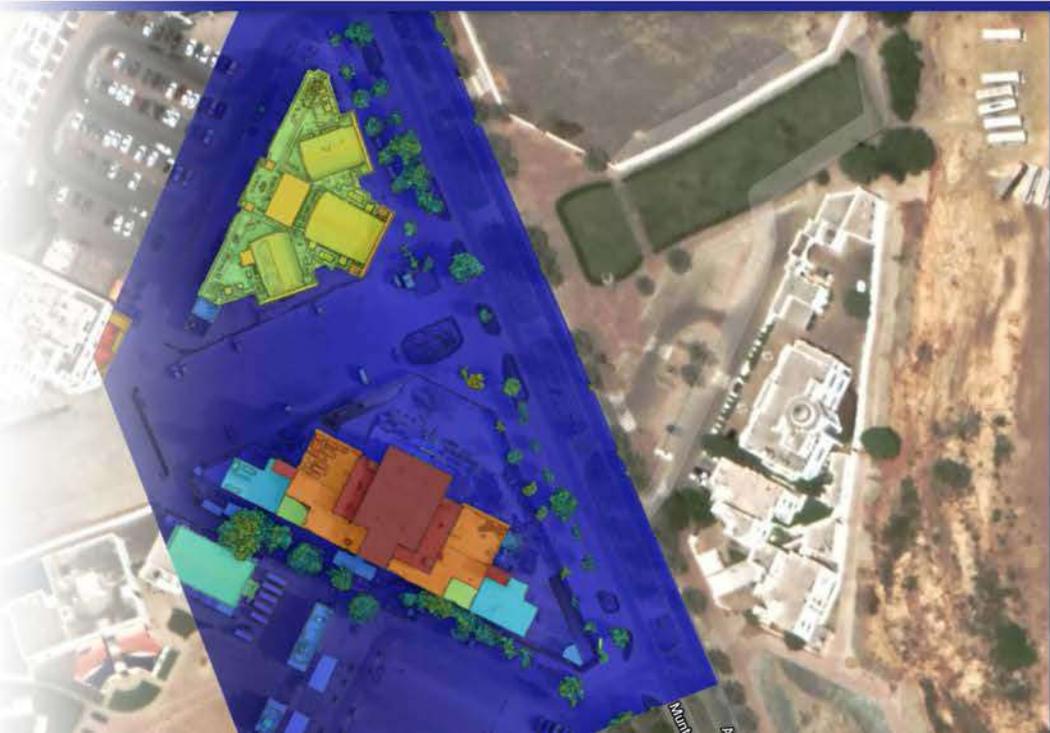


# 2D Maps & 3D Models

Both 2D Maps and 3D Models are the biggest utilization of drone technology. Our AI-assisted mapping platform uses drone imagery to generate high-resolution 2D maps and 3D models. Once the route is defined, the drones capture the images, then those images are uploaded to the processing software to generate 2D maps and 3D models. These can be used to measure distance, volume, and area.

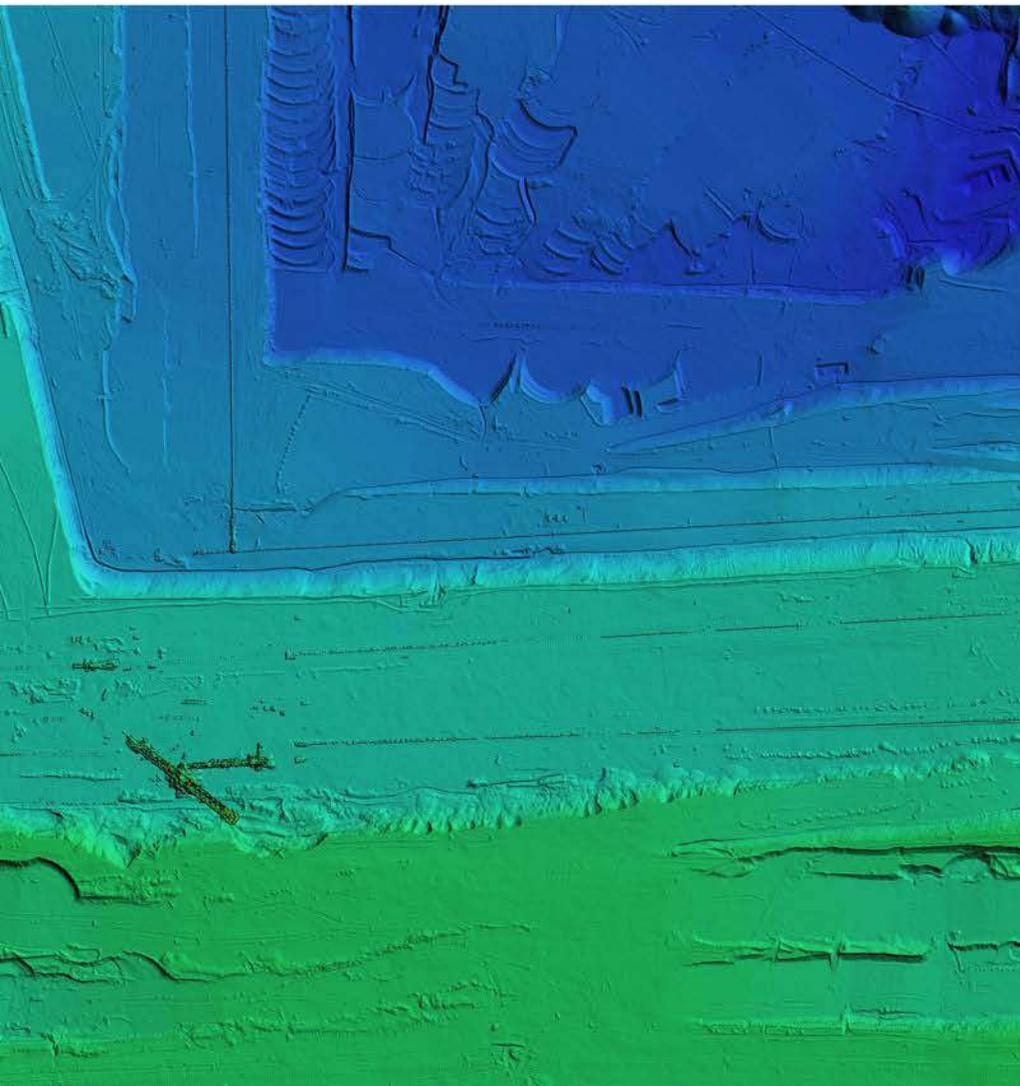
The 2D maps are ortho-rectified to compensate for lens distortion, topographic relief, camera tilt, and perspective.

For 3D models, the drone captures several aerial images of the site at different angles. These images are processed using advanced software to generate a highly accurate 3D model showing exact landscape contours and detailed topography.



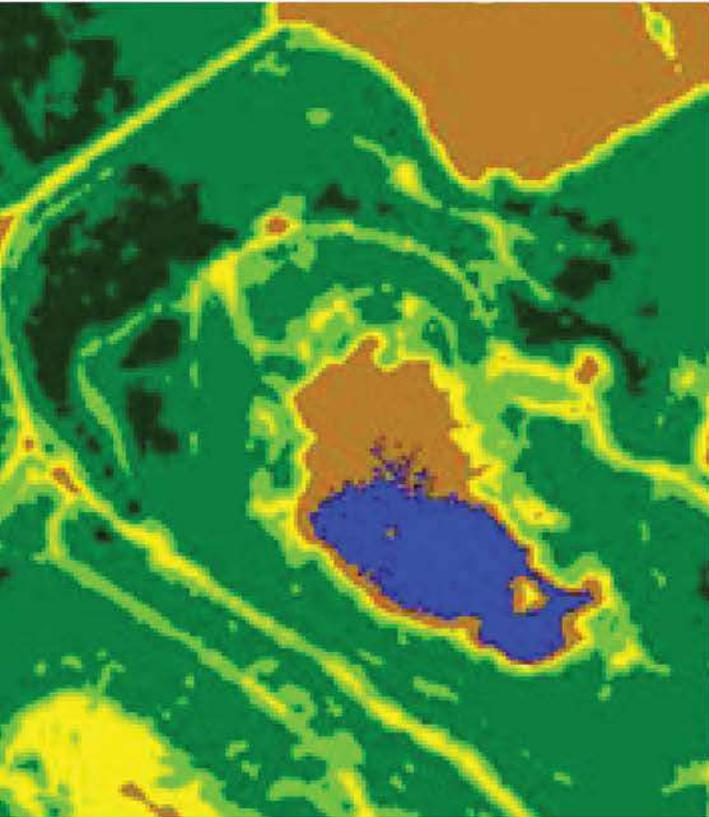
# DTM & DSM

We provide drone service to generate digital terrain models (DTM) and digital surface models (DSM) for land use planning, urban planning, aviation planning, infrastructural project management, volume measurement, and similar others. During a single flight, the drone generates thousands of points which are used to generate bare-earth surface representations or include natural and man-made features such as buildings, treetops, and other objects. The photogrammetry generated by our drones allows the generation of accurate (DSM) and (DTM). Combining these with CAD and GIS tools provides terrain profiles, surfaces, volumes, and movements in the event of a landslide.



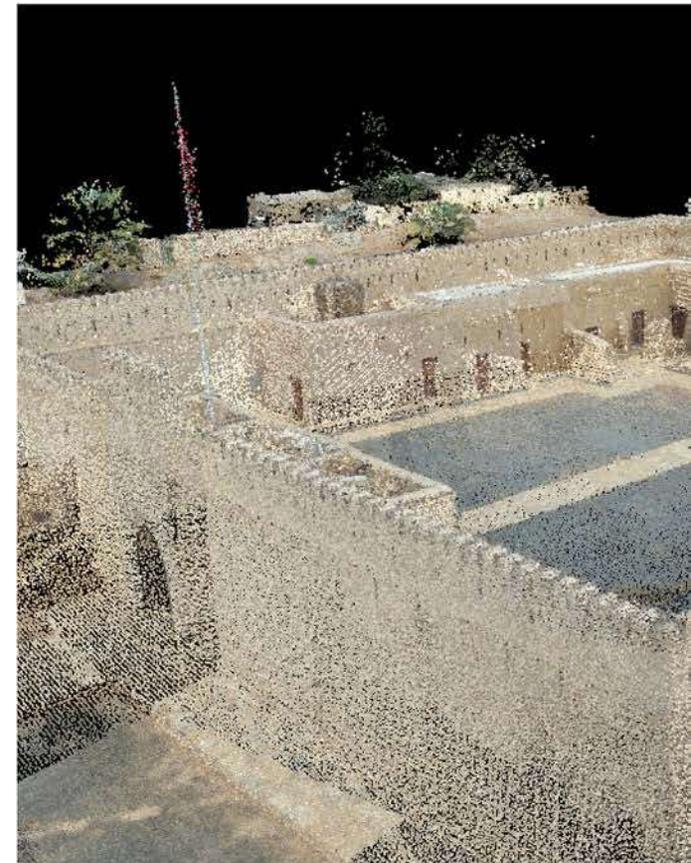
## Vegetation Analysis

We deploy multispectral high precision drones to facilitate vegetation analysis such as vegetation mapping, forest damage assessments, invasive weed surveys, crop status, farm surveillance, and alike. Our drones have made vegetation survey simple and more efficient. The images obtained from drones are analyzed using machine learning algorithms with accuracy above 98%. These algorithms are capable to generate several indices such as NDVI, NDRE, NGRDI, VIDVI, and others. These indices clearly indicate the vegetation areas. With the use of drones, the associated offset costs of mapping are significantly reduced.

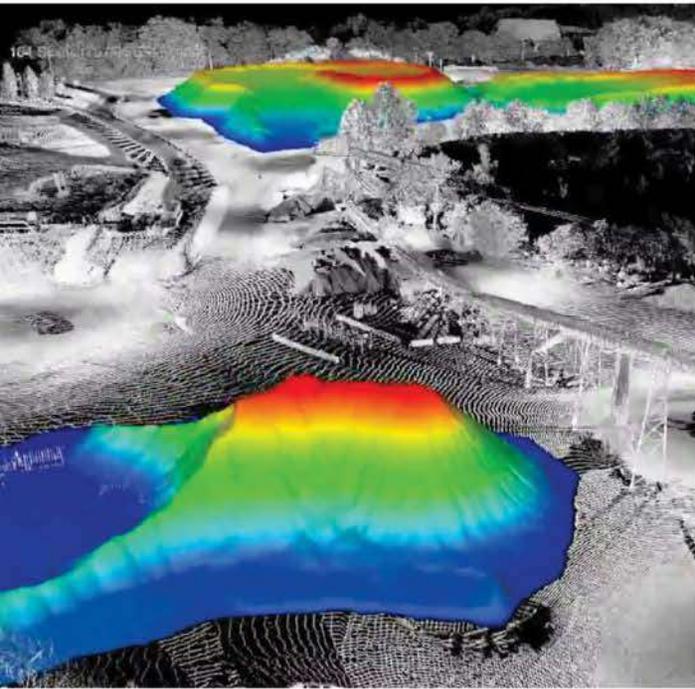


## Point Cloud Models

ESBAAR's commercial drone imagery coupled with highly accurate geospatial data generates thousands of connected points to form a three-dimensional model (point cloud model). The importance of the point cloud model is evident from its applications in finding the object's elevation, depth, shape, location, and geometry in the space. Higher density point cloud models can also be generated using our drones. Point cloud models are the raw output that is processed by AI-powered software to generate interactive 3D models. Our drones take high-definition images along with the location data. The location of a feature of interest is measured using triangulation.



# Volume & Stockpile Measurement



Volume and stockpile measurement is a necessary process in almost every construction worksite and mining industry. Accurate measurement is very important for better decision-making about inventory as well as generating detailed financial forecasts. Volume measurement using ESBAAR's drones is extremely accurate, fast, and cost-effective. We provide our customers with a leading approach for accurate volume and stockpile measurement using drones and highly capable machine learning algorithms. The benefits include lower costs, increased frequency of data collection, and faster results.

## LiDAR Mapping

LiDAR mapping finds its applications in the generation of high-resolution maps for purposes such as surveying, seismology, geomatics, and others. The industries which benefit from the LiDAR survey include environmental planners, forest management, land surveying, powerline inspection industry, road, and rail, etc. ESBAAR provides LiDAR (a standard industrial practice) for site mapping using an unconventional drone equipped with a higher resolution LiDAR sensor. The data collected by drones produce high fidelity topographical maps which can be used to generate point cloud and 3D models of manmade structures as well as natural terrain.





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