High Definition Survey
Applications of 3D Laser Scanning at Nu’alolo Kai, Kaua’i

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Goals of Project

A) High Definition Survey of 3 sites within Nu’alolo Kai complex.

B) Coordinate 3D scan with existing survey control.

C) Provide for a record of survey prior to anticipated reconstruction activities.
Project sites

Multiple Platforms and Lua Wai at the main complex

“Canoe Shed” and structure makai side of main complex

Site 196 - “House Platforms”
Anticipated Deliverables

- A High Definition Survey with registered 3D scans of each of the three project sites.
- A 3D data set of present conditions
- Model views prepared for easy viewing of plan and profiles of each site
Nu’alolo Kai – A world unto it’s own
Mobilization to the Site

The 3D scanning equipment is rather sensitive and preferred to be transported by air to the site rather than risking a wet and wild Zodiac ride.
Survey Central – with UH and D. Wellman enough survey equipment was not a problem. Even lugging it around wasn’t too bad either.
Main Platform Complex

Work began by scanning the main complex.
WATCHING PAINT DRY?

18 minutes for each 3D scan allows ample opportunity for discussion, contemplation, and breaks.
Preparation of the scene before scanning provides for optimum data collection. What you see is what the laser scanner gets.
Keeping track of targets, scenes, and scan angles can get challenging.

Main Platform Complex
Nu’alolo Kai - 2006
By scanning from different angles the “scan clouds” can be registered together to provide a complete 3D model without shadows.
Survey Coordination

Project survey control established by UH survey teams was used to coordinate all high definition 3D scan data to the same x,y,z survey datum.

Nu’alolo Kai - 2006
Data Analysis Tool

A High Definition Survey with 3D Laser Scanning provides complete and accurate measurements for use in analysis:

- Size, and distance calculations
- Volume calculations (thus weight)
- Stylistic attribute comparisons in 3D
- Functional attribute comparisons in 3D
Site 196
Nu’alolo Kai
Kaua’i

Once the entire scene is scanned data can be shared with a number of allied professionals.

Measurements not taken in the field can be performed at leisure back at the office or lab.

2006
Site 196
Nu’alolo Kai

The 3D scan data is registered to survey data and presents a true scale 3D computer model of the scene. Compare the close up of the scan cloud with the scene photo.
Site 196
Nu’alolo Kai
Kaua’i

3D scan data can be manipulated to produce a cross section view for analysis or inclusion into a report.
“Canoe Shed”
Nu’alolo Kai

The 3D scan data is registered to survey data and presented as a plan view, ready for mapping and analysis.
Analysis from one rock to an entire rock wall is now available with a 3D high definition survey.
With a high definition 3D laser scan your survey and mapping data is complete, accurate, and comprehensive resulting in fewer costly mapping trips to the site and allowing for more time performing on site analysis activities.
CYRAX 3D Scanning
High Definition Surveying

- Time of flight eye safe pulsed laser
- The laser scans on a predetermined grid
- Single point accuracy of +/- 4mm from 1.5 to 100m – model accuracy is better yet
- Generates an x,y,z “point cloud”
- Registration of multiple scan clouds
Leica 2500 Equipment Setup

Scanner

Target System

Laptop/Data Collector

Battery
3D Scanning for your next project?

- A registered scan provides for 3D viewing, modeling, and measurements
- Ready output for 3rd party software such as AutoCAD or Microstation
- Data output can be used for surfacing, replication, and volume calculations
Is a high definition survey with 3D scanning on your horizon?

Surveying
your high definition survey specialist.