October 15, 2009

**RBF** urban design studio

CONSULTING

Mr. Tom Ford, AICP
Chair, Grants Committee
Urban Design and Preservation Division
American Planning Association

The Office of Tom Ford
729 Heinz Avenue, Suite 7
Berkeley, California 94710

Subject: APA Urban Design and Preservation Division's Grant Program

Dear Mr. Ford:

I am pleased to submit this proposal for the APA Urban Design and Preservation Division's grant program. This project proposes using high-definition laser scanning (LiDAR) to produce as-built drawings of the Boathouses in Encinitas, California. I am confident that this project can serve as a demonstration of an innovative technology of interest to Division Members, and that it will also promote the importance of preservation as an act of urban design.
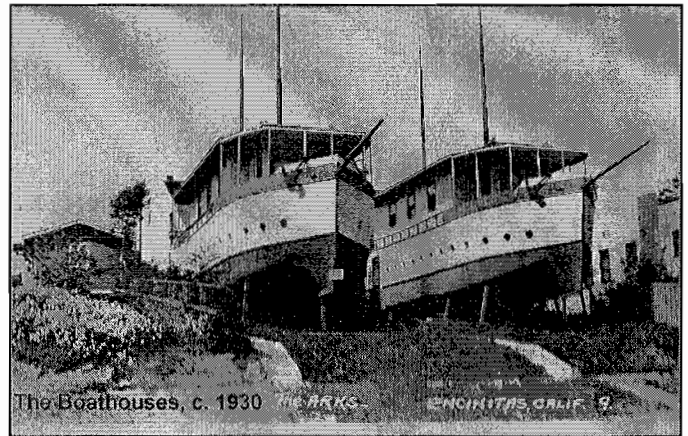
Furthermore, this project will support an on-going effort to preserve the historic Boathouses. Rather than boats that function as houses ("house boats"), or buildings that store boats ("boat houses"), the Boathouses are authentic architectural representations of boats. However, no architectural drawings of the Boathouses were required when the Boathouses were built;

The Boathouses, c. 1930

and, given their irregular shape, measurements that have been taken after their completion are approximate at best. LiDAR technology is ideal for measurement of the Boathouses since it uses high-speed pulsed laser light to collect massive numbers of data points from signals reflected off of surfaces and, therefore, can easily and accurately measure the Boathouses.

The data collected from the LiDAR scan would be used to produce as-built drawings that will support the nomination of the Boathouses to the National Register of Historic Places. I have recently completed my Professional Report (i.e. thesis), which documented the history of the Boathouses and identified their historic characteristics. The Professional Report was completed as part of the requirements to receive my Master's of Urban and Regional Planning degree from the University of California, Irvine, and I am currently working to complete a draft Registration Form that will be used to formally nominate the Boathouses to the National Register of Historic Places.

While I will be serving as project coordinator, the project will be carried-out under the supervision of Larry Truman, PLS, Vice President of Surveying Geomatics at RBF Consulting. I acknowledge the obligations of the grant award and would enthusiastically present a summary of the process and outcome to other planning professionals and the general public. If you have any questions regarding the grant proposal or the Boathouses please contact me by email at mgelbman@rbf.com or at (949) 330-4158.

Sincerely,

Matthew Gelbman
Community Planner
RBF Consulting's Urban Design Studio

PROJECT DESCRIPTION

This project proposes using high-definition laser scanning using terrestrial Light Detection and Ranging (LiDAR) technology to collect spatial data (x, y, z coordinates) that depict accurate existing conditions of the Boathouses. The data will be cleaned and compiled to produce a model representing the buildings, and to produce two-dimensional (2D) as-built drawings of the exterior of both of the Boathouses. With further refinement of the data collected from the scan, a three-dimensional (3D) digital model could potentially be produced in the future. Project work will include the following tasks:

TASK 1 - HIGH-DEFINITION LASER SCANNING
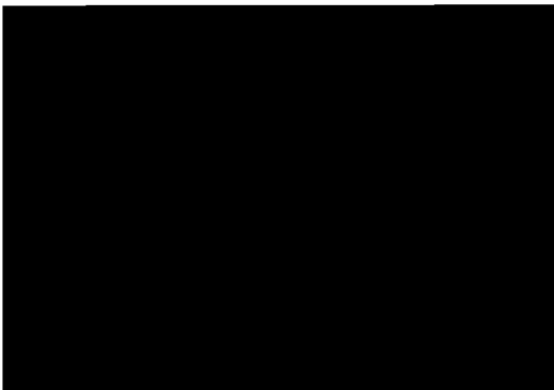
Terrestrial LiDAR scanning uses high-speed pulsed laser light to collect massive numbers of data points from signals reflected off of surface features. When processed, each of the millions of data points includes north, east and elevation coordinates (x,y,z values), and reflection intensity. The resulting "point cloud" data appears similar to a black and white photograph, with the added value that each of the image points is represented in its true horizontal and vertical position and will accurately reflect the Boathouses. The 3D point cloud data is typically accurate to within +/- 3mm.

TASK 2 - CAD MODELING
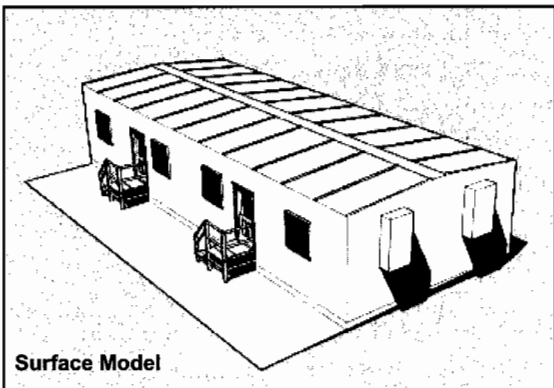
Surface Model

Collected point cloud data will be edited and modeled using computer aided design (CAD) software to develop surfaces representing the exterior building shell, fenestration, and architectural features. Outlying data points recorded during the scan (i.e., noise) and miscellaneous objects near the buildings that are recorded (i.e., artifacts) will be removed. After the data is cleaned and only those points that represent the buildings remain, a digital model will be developed.

TASK 3 - PRODUCE AS-BULT DRAWINGS

EAST ELEVATION
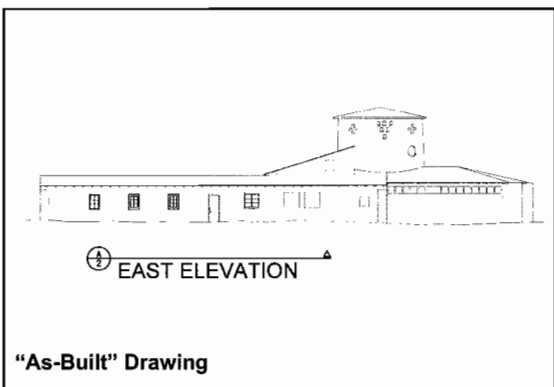
"As-Built" Drawing

The finished model of existing conditions will be provided in raw and modeled formats. To-scale elevations of the buildings' exterior ("as-built drawings") will be produced as two-dimensional (2D) line drawings extracted from the digital model and formatted in National Park Service CAD standards. The as-built drawings will be used as part of the application to formally nominate the Boathouses to the National Register of Historic Places. The as-built drawings will also be provided to the Encinitas Preservation Association for use on their website, and for inclusion in presentations about the Boathouses to the Encinitas City Council and the California State Historic Resource Commission (which will make a formal recommendation concerning the eligibility of the Boathouses for the National Register).

BUDGET AND TIMELINE

RBF Consulting will provide donate time and resources required to complete Task 1 and is seeking funding for Tasks 2 and 3 through this grant. This process is not to exceed a six-month time frame, beginning upon notification grant award and execution of contract with the Division.

TASK 1 - High-Definition Laser Scanning (Pro-bono)	$ 0
TASK 2 - Three-Dimensional CADD Modeling	$ 3,000
TASK 3 - Produce As-built Drawings	$ 1,000
TOTAL VALUE OF SERVICES:	**$ 4,000**