

HERITAGE DOCUMENTATION PROGRAMS

Historic American Buildings Survey
 Historic American Engineering Record
 Historic American Landscapes Survey
 Cultural Resources Geographic Information Systems

National Park Service
 U.S. Department of the Interior



High Definition Surveying (HDS): Indispensable Technology with Limitations

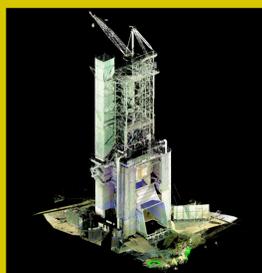


CONTEXT: The HABS, HAER, and HALS programs produce documentation consisting of measured drawings, large-format photographs and written histories of America's architectural, engineering, and landscape heritage that is accessible to the public through the Library of Congress. The documentation creates a lasting record while also providing baseline information for rehabilitation and interpretation. The drawings are intended to be understandable to the general public and to interpret industrial processes, cultural values, and patterns of use.

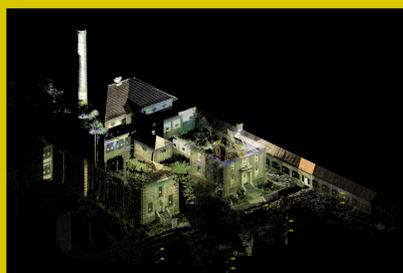
TOPIC: While laser scanning is gaining momentum in the field of recording, scans are only the tip of the iceberg when it comes to creating comprehensive documentation that is useful in efforts such as rehabilitation and historical investigation. HABS/HAER/HALS supplements the laser scans with hand-measuring, and after the scanning process, uses software to migrate the point clouds into AutoCAD to produce measured drawings to its standards. Laser scanning does not engage the recorder in the same manner that hand-measuring does, and thus it can undermine the hands-on experience advocated by HABS/HAER/HALS and others interested in the study and documentation of historic architecture.

PROS:

ABILITY TO MEASURE LARGE, INACCESSIBLE, NON-ORTHOGRAPHIC STRUCTURES AND SITES



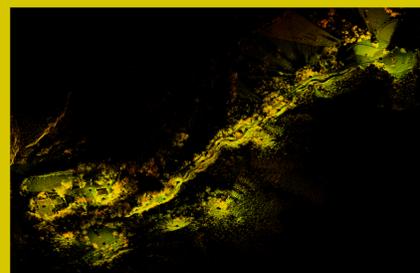
F1 Rocket Engine Test Stand



Powerhouse and Wards on Ellis Island



Pu'ukohola Heiau, Hawaii, HI

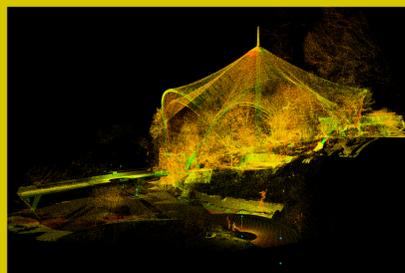


Tassi Ranch, Parashant Natl Monument

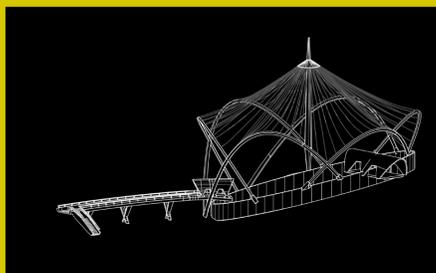


Hospital Corridors at Ellis Island

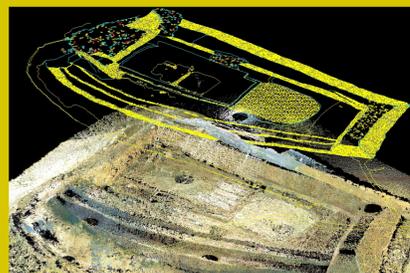
ABILITY TO POST-PROCESS THE SCAN DATA AND CREATE 2-D OR 3-D CAD DRAWINGS



Bird House, National Zoo



3-D Model, Bird House, National Zoo



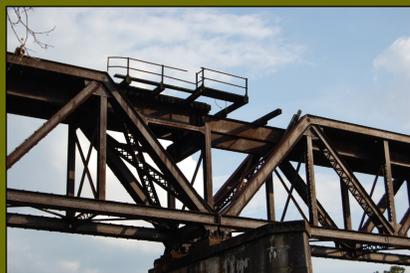
2-D Drawing of Pu'ukohola Heiau,



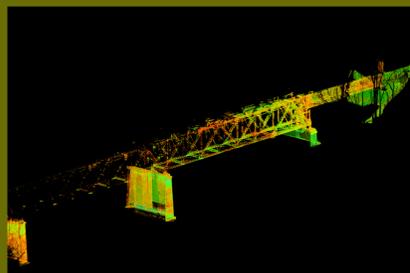
3-D Model of Test Stand, Santa Susana Field Lab

CONS:

DIFFICULT OPERATING CONDITIONS



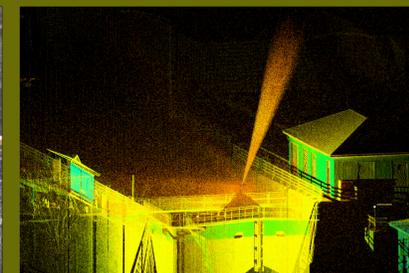
Dark Patina of Steel Does Not Scan Well



Missing Data Due to Color of Objects



Snow at Lockport, NY



Noise In Scan of Lockport Locks

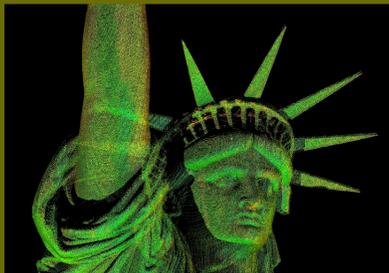


Precariously Perched on Loose Rocks

OBSTRUCTIONS OF THE SCANNER'S LINE OF SITE CAN OBSCURE VALUABLE DATA



Scanning From Below



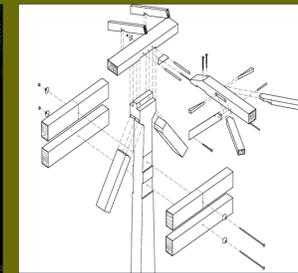
Point Cloud With Shadows



Surface Showing Missing Data



Gilpin Bridge Scan of Joint Detail



Drawing From Hand Measurements

CONCLUSION: High Definition Survey laser scans produce highly accurate yet incomplete documentation. Thus it should not be used for recording exclusively, but thoughtfully combined with hand-measuring and other tools to attain comprehensive and well informed documentation that is easily interpreted for use by architecture professionals, scholars, and the general public. The combined information is therefore used to produce measured drawings, which appear on mylar film or archival bond in order to guarantee the long-term permanence of the documentation required for the collection at the Library of Congress.