

Poster Proposal for 2012 3D Digital Documentation Summit, Presidio, San Francisco, California

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Recording Structure and Process: HAER 3D Digital Documentation Methods

The Heritage Documentation Programs proposes to present five posters that speak to the oral presentation. The posters will describe the steps from data acquisition at the site to the various post-processing methods employed to generate models in CAD. Our data collection efforts are guided by our need to unearth not only dimensional data, but also interpretive data that reflect history, significance, and patterns of use and construction. In examining various projects from each of our three programs, (the Historic American Buildings Survey, the Historic American Engineering Record, and the Historic American Landscapes Survey), we intend to show several different approaches to incorporating laser scan data into the creation of an archival record that meets the Secretary of the Interior's Standards. These workflows vary based on the type and scale of historic resource being documented. In these processes it is often necessary to supplement point clouds with other data--some collected by hand, some derived from other resources and independent research. The post-processing of point clouds presents its own challenges. Software used may excel at certain tasks, while falling short at others. Sometimes this can be remedied by hardware upgrades, but often times the sheer size of the datasets (point clouds) is just too burdensome for the software itself. Educated choices must be made in both the collection and processing of laser scan data when producing documentation to the Secretary's standards.

For many historic engineering works the structure's historical significance is based on its structural design. This is especially true for bridges. By understanding the structural composition of bridge trusses we learn how American engineers solved transportation challenges using available materials and a variety of engineering solutions. HD scanning has greatly enhanced the Historic American Engineering Record's (HAER) ability to record structures and create accurate drawings that reveal structural design. However, we find that scanning must be accompanied by other documentation methods. In the field, scanning must be accompanied by hands-on investigation, field notes, and measurements. After completion of field work it is necessary to process scan data into a more readable end-product. Within our workflow, we consider scan data a powerful field-note that informs and guides the creation of 3D models and 2D drawings. We find it is necessary for pointclouds to be sifted through and edited considerably make the best use of its data. This data is used in conjunction with other information gathered in the field as well as consultation with historians and other experts. The goal of our documentation, as stated in the Secretary of the Interior's Standards for Architectural and Engineering Documentation, Standard I, is to convey "the historic significance of the building, site, structure or object" to future and present generations of "scholars, researchers, preservationists, architects, engineers and others interested in preserving and understanding historic properties." We find that scan data alone simply does not contain sufficient information to adequately understand an engineering structure. This poster will illustrate the ways HAER uses scan data and 3D modeling to create exploded isometrics, process drawings, connection details, and drawings that convey the historic significance of engineering works.

