

ENTRY FORM



DVASE 2016 Excellence in Structural Engineering Awards Program

PROJECT CATEGORY (check one):

Buildings under \$2M		Buildings Over \$100M	
Buildings \$2M-\$10M		Other Structures Under \$5M	X
Buildings \$10M - \$30M		Other Structures Over \$5M	
Buildings \$30M - \$100M		Single Family Home	

Approximate construction cost of facility submitted:	\$100,000
Entry Fee:	FREE
Name of Project:	George Washington's Tent Support Structure, Museum of the American Revolution
Location of Project:	Philadelphia, PA
Date construction was completed (M/Y):	March 2014
Structural Design Firm:	Keast & Hood Philadelphia, PA
Affiliation:	All entries must be submitted by DVASE member firms or members.
Project Manager:	Dan Bosin Associates
General Contractor:	Maltbie

Company Logo (insert .jpg in box below)



Important Notes:

- Please .pdf your completed entry form and email to bkoroncai@barrpino.com.
- Please also email separately 2-3 of the best .jpg images of your project, for the slide presentation at the May dinner and for the DVASE website. Include a brief (approx. 4 sentences) summary of the project for the DVASE Awards Presentation with this separate email.

- Provide a concise project description in the following box (one page maximum). Include the significant aspects of the project and their relationship to the judging criteria.

George Washington's Tent Support Structure | Museum of the American Revolution
Philadelphia, PA

George Washington's marquee war tent (c. 1777) will be on the display at the Museum of the American Revolution, thanks to an innovative umbrella-like structure that supports the artifact without inducing stress in the delicate fabric.

The 400-sf war tent, which served as Washington's home and command center for eight years during the Revolutionary War, will be one of the centerpiece exhibits in the forthcoming Museum of the American Revolution. Originally, the tent was erected with two main standards and encircling taut ropes through grommets to tension the tent's roof membrane.

Keast & Hood worked with a team of conservators, historians, and craftsmen to design an aluminum supporting structure for display of the artifact. A three-dimensional computer model was produced as a tool to communicate ideas to the design team throughout multiple iterations. The structure provides adjustability to account for uncertainties in the tent's dimensions while allowing it to drape naturally. A canvas sub-tent membrane stretched over the structure supports the artifact. Any evidence of the umbrella structure is invisible to viewers so that the tent imitates its original appearance. The ropes that originally tensioned the tent are now purely aesthetic and representative of the earlier form. The replica tent shown in these photos was sewn by craftspeople from Colonial Williamsburg and was utilized to test the tent structure.

One of the major challenges of the project was designing a structure without credible dimensions available for the tent itself. In such a fragile state, the tent could not be measured. Therefore, the substructure had to be designed to provide adjustability in many directions. The umbrella structure is comprised of many ribs which permit horizontal, vertical, and rotational adjustment. Each rib can extend in and out and rotate along two axes, which was critical during installation due to the tent's unique shape. The vertical pole supports (standards) also allowed vertical adjustment since the height of the tent was unknown until it was erected in March 2014.

The Museum of the American Revolution will open in 2017 at Third and Chestnut Streets in Philadelphia. Keast & Hood is the structural engineer of record for the museum, which is being designed by Robert A. M. Stern Architects.

- The following 5 pages (maximum) can be used to portray your project to the awards committee through photos, renderings, sketches, plans, etc...



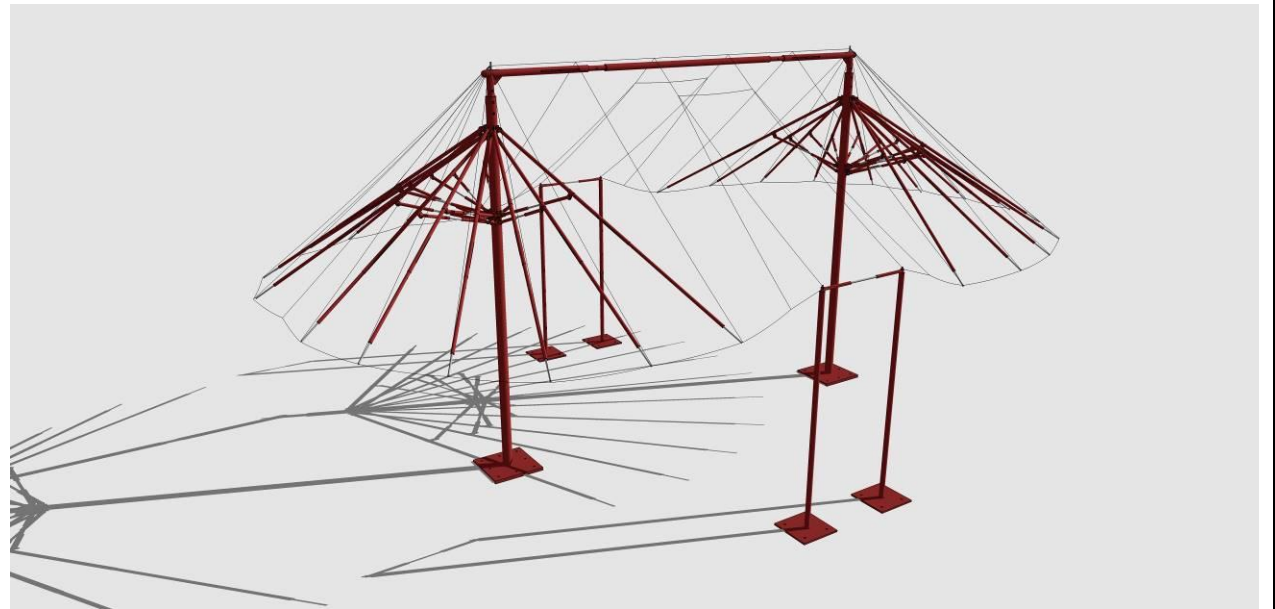
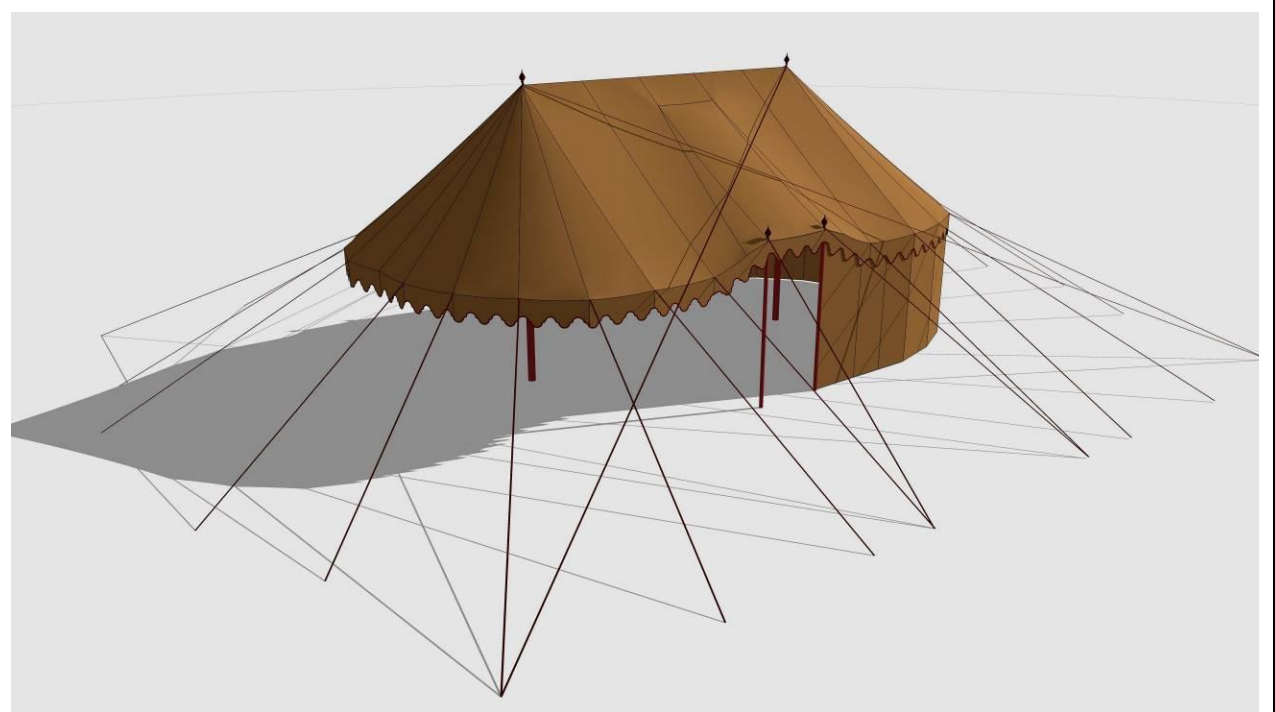
George Washington's Tent with hidden support structure was erected temporarily in March 2014, in the future space of the Museum of the American Revolution. (photo © Keast & Hood)



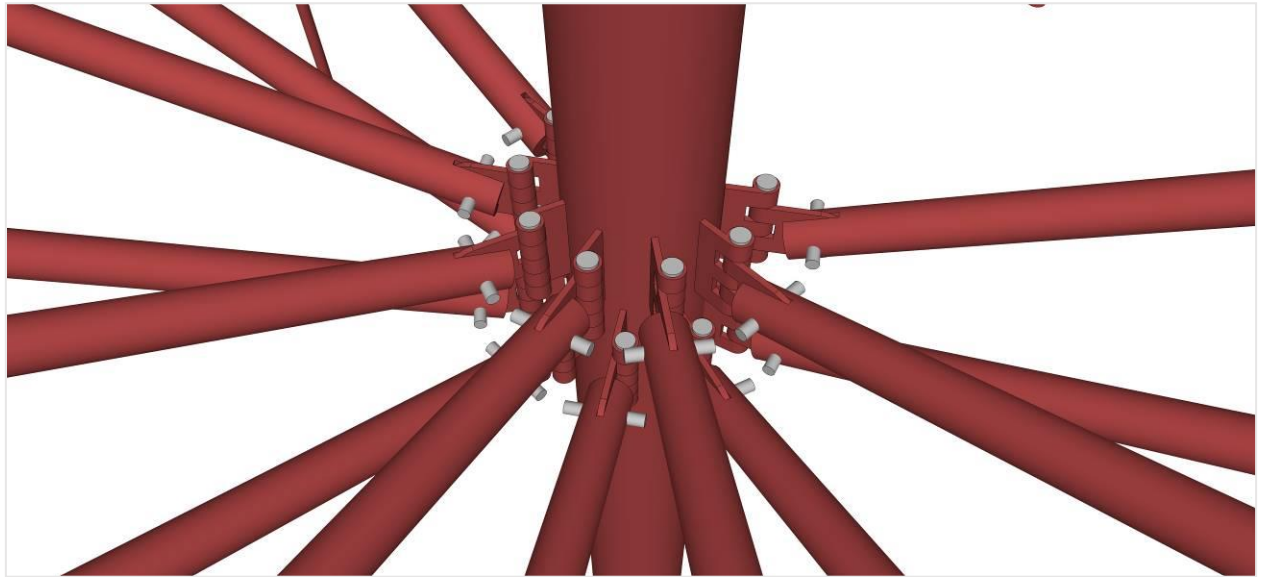
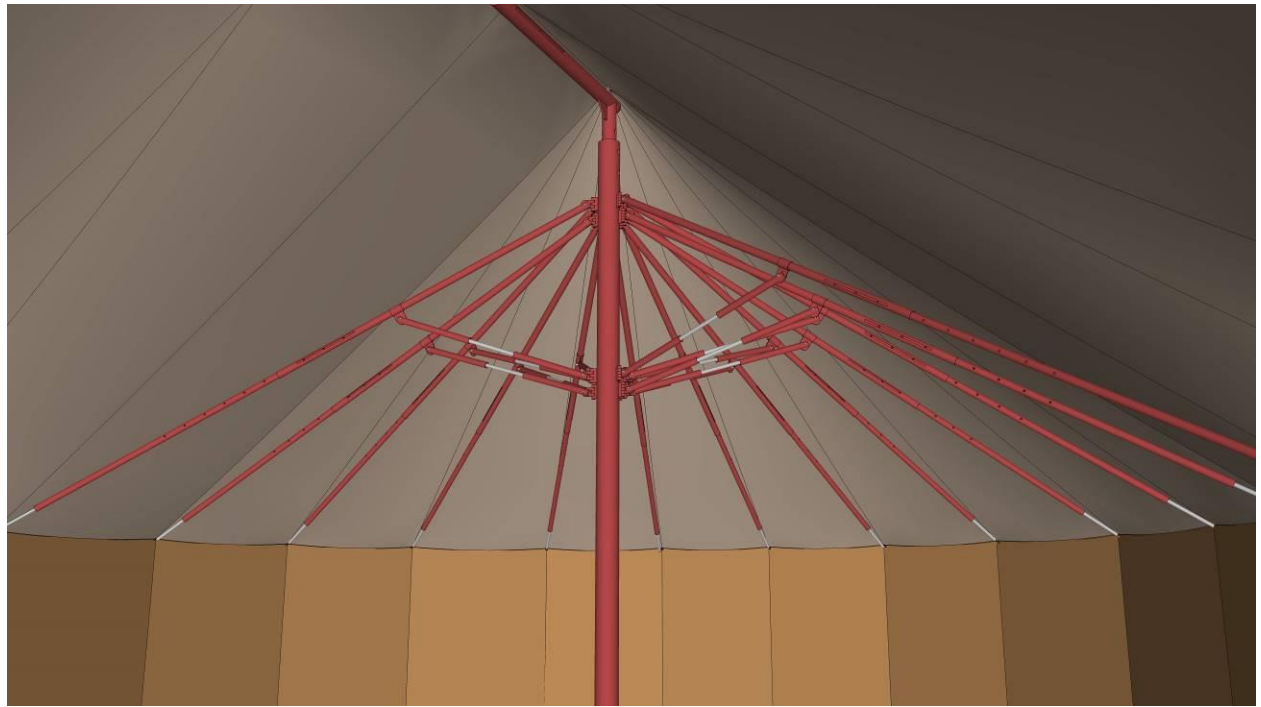
A view from the inside of the tent exhibits the structure's ribs and subtent. (photo © Keast & Hood)



Keast & Hood designer Alex Stadel adjusts the support structure. (photos © Keast & Hood)



Three dimensional computer models assisted the design team throughout multiple iterations. (images © Keast & Hood)



Details of the three dimensional computer models convey the adjustable capabilities of the support structure. (images © Keast & Hood)

By signing, signatory agrees to the following and represents that he or she is authorized to sign for the structural design firm of record:

All entries become the property of DVASE and will not be returned. By entering, the entrant grants a royalty-free license to DVASE to use any copyrighted material submitted.

Submitted by:

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