

# ENTRY FORM



## DVASE 2019 Excellence in Structural Engineering Awards Program

### PROJECT CATEGORY (check one):

Buildings under \$5M		Buildings Over \$100M	
Buildings \$5M - \$15M		Other Structures Under \$1M	
Buildings \$15M - \$40M		Other Structures Over \$1M	
Buildings \$40M - \$100M		Single Family Home	X

Approximate construction cost of facility submitted:	\$20 M
Name of Project:	Polpis Road Residence
Location of Project:	250 Polpis Road, Nantucket, MA 02554
Date construction was completed (M/Y):	October 2018
Structural Design Firm:	Orndorf & Associates, Inc.
Affiliation:	<b>All entries must be submitted by DVASE member firms or members.</b>
Architect:	Moger Mehrhof Architects
General Contractor:	Cheney Brothers Building & Remodeling

Company Logo (insert .jpg in box below)



### Important Notes:

- Please .pdf your completed entry form and email to [bsagusti@barrhorstman.com](mailto:bsagusti@barrhorstman.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.

This complex of six buildings serves as a vacation retreat on the beautiful and historic island of Nantucket. Four of these structures were existing and two were new. Due to local setback restrictions, the shell of two of the buildings had to remain or they would be demolished. All of this was done while also preserving the classic Nantucket style.

**Main house** – This existing house was completely gutted and modernized inside while keeping the external façade. Due to the closeness to Polpis Harbor, there was a high water-table that consistently resulted in water in the basement. To ensure this would never happen again, the entire house was stabilized, lifted from the existing foundation walls, and moved 90ft. The existing foundations were demolished and a new dry-waterproofed basement was put in place and designed for hydrostatic forces. Due to time constraints, the interior renovations were started while the house was temporarily supported on steel girders and timber cribbing, and was later moved back to the new foundations.

Another challenge to the main house was to design a floating switchback stair. The intermediate landing was to have no support above, below, or to the side walls, so it relies purely on cantilevering tube stringers. Deflections were minimized by using an eccentric triangular truss that was formed by the two interior stringers. Unbalanced loads still resulted in high torsional loads, so overlapping moment splice plates were required to be hidden in an 8" thick structure. Field welding was eliminated everywhere except at the handrails to limit the possibility of fire in this open wood structure. Finally, tube girders were hidden in the existing joist profile of the floor structure around the stair opening.

**Guest House** – Instead of housing guests in one of the main bedrooms, an entire house was constructed so they could enjoy their own retreat, complete with their own pool. From outside, this house looks simple, but required complex structure. One area included a low roof ridge line spanning 30 ft that then supported a 2nd story wall at a perpendicular wing. This required that the ridge be detailed as offset from center since the two load paths did not align. Several windows below the ridge further complicated things requiring slender HSS3½x2½ transfer columns that could fit inside the window mullions and not obstruct views. These were braced by integrated lintels and were tied to the roof diaphragm for bracing against the high Nantucket winds.

**Boat House** – This small building is located deep within a flood velocity zone and was in a state of failure. The existing wood trusses were stabilized in place, the stud walls were braced, and helical foundations were specified. Since this area was classified as a wetland and no heavy equipment could be used, a hand operated helical drill was specified with a bracing outrigger arm.

**Pool house** – This building started as an old carriage garage, but it was converted into a pool building. This was the most critical structure to keep in place as it was located completely within the zoning setback. A grandfathering exception was granted as long as the shell was left in place. We detailed stud reinforcement and bracing at the base of the wall to allow for excavation of a 7ft deep mechanical basement where previously there was only crawlspace. The roof framing had to be converted from field fabricated trusses to a cathedral ceiling with a new ridge beam and joists, all done from inside of the building without disturbing the exterior shell.

**Garage** – Careful attention was needed to provide a new structure with a 30ftx23ft footprint, 17ft cathedral ceilings, and no interior columns. Lateral and uplift detailing was critical: using drag struts, collectors, and uplift connectors at interrupted load paths.

**Studio** – This building was also half located within a setback zone and needed to be preserved. Though there were only minor structural renovations, upon demolition there were several areas of deterioration that were discovered. Existing floor joists were removed and replaced, special attention was needed to attach new framing to existing rubble foundations, and unbraced framing was stabilized while still allowing for the maximum ceiling heights.

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



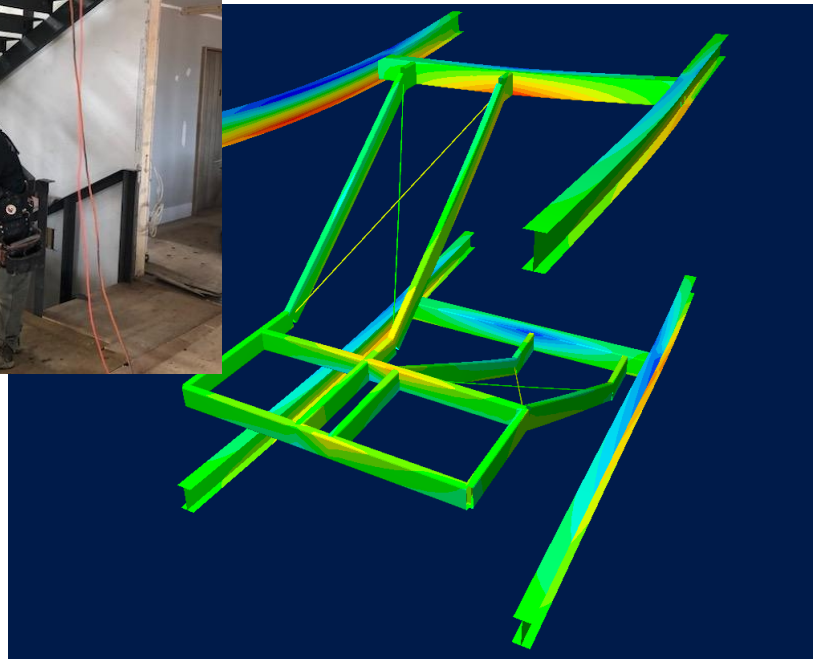
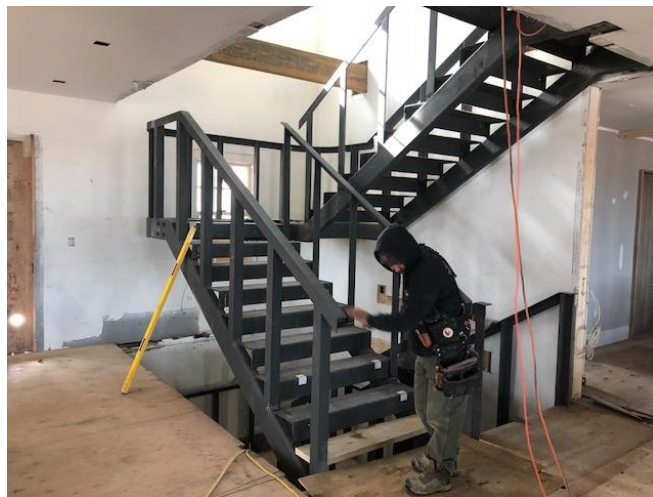
New foundations at main house



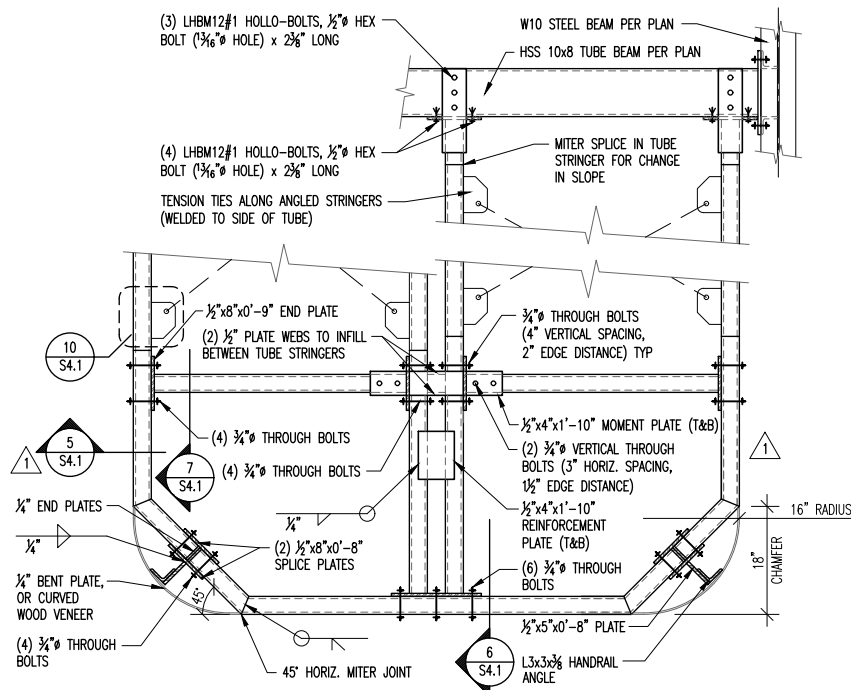


Gutted house and relocated shear and bearing walls for a new modern interior

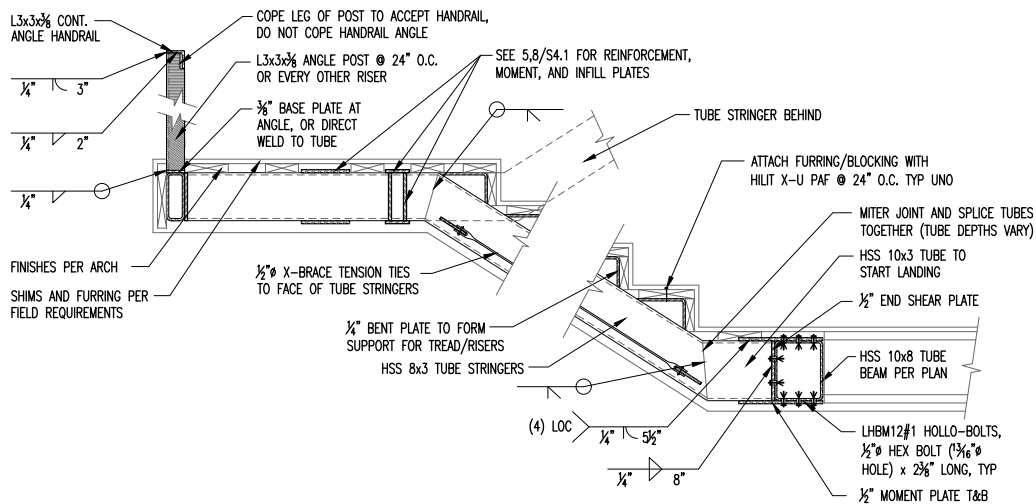




New floating switchback stair

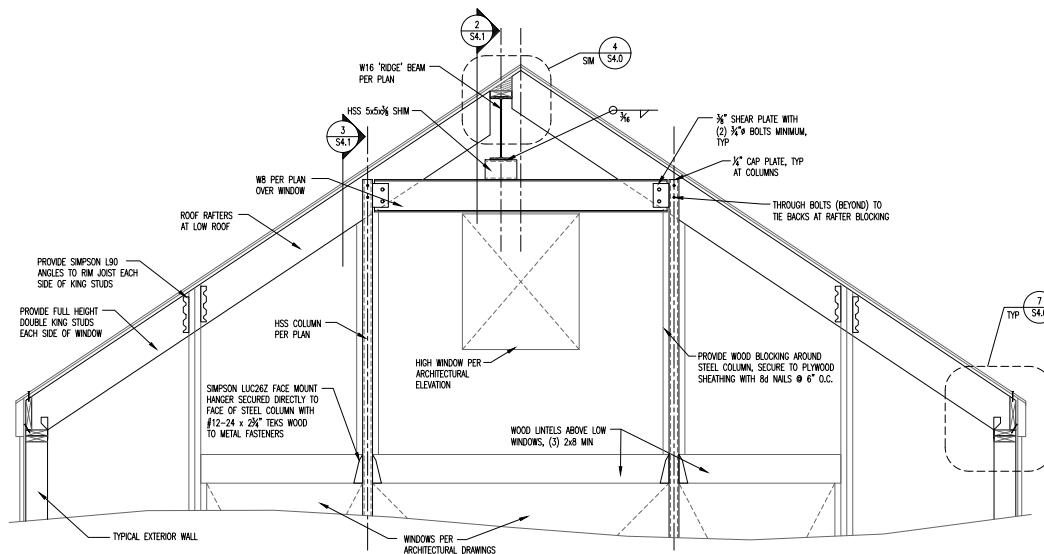


**8 STAIR LANDING PLAN DETAIL**  
 $\frac{3}{4}" = 1'-0"$



**6 STAIR SECTION ALONG STRINGER**  
 $\frac{3}{4}" = 1'-0"$





1 S4.1 STEEL RIDGE BEAM AND COLUMN SUPPORT  
3/4" = 1'-0"



Offset ridge beam and interrupted load path at guest house

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.*

*If selected as an award winner, you may be offered the opportunity to present your project at a DVASE breakfast seminar. Would you be willing to present to your colleagues?*    ☐ **YES**    ☒ **NO**

Submitted by:

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