ENTRY FORM

DVASE
2018 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:	$1.3 million
Name of Project:	Private Residence
Location of Project:	Longport, NJ
Date construction was completed (M/Y):	June 2015
Structural Design Firm:	Pennoni Associates
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	Michael Ryan Archtiects
General Contractor:	Jim Leeds Builders, Inc.

Company Logo (insert .jpg in box below)

Important Notes:

- Please .pdf your completed entry form and email to 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.

Pennoni Associates, Inc. (Pennoni) was tasked by Michael Ryan Architects (MRA) to assist with a private residence in Longport, NJ, specifically to serve as Structural Engineer of Record and provide the design for the foundations, floors and roof framing. Pennoni also provided coordination of steel and wood-frame during construction. This effort was unique due to complex requirements set in place by the property owners and new post-Sandy habitable space elevation requirements.

The property sits within 200 feet of the beach in Longport, just south of Atlantic City, NJ. In order to meet Code requirements for parking spaces per within the narrow 50 foot, lot while maximizing the available 2,025 GSF of developable land area, MRA decided to design a double-width drive aisle with sheltered parking provided by cantilevered portions of the house overhead. The cantilevered master bedroom over the driveway required the use of structural steel to support floor loads.

In addition, due to the complex geometry of the cantilevered floors and roof, Pennoni was forced to design a complex series of additional hangers and posts to satisfy the architectural layout. On the second floor, a large W30x90 beam supports the main weight of the eastern most perimeters bearing above with an approximately 18 foot cantilever and 12 foot back span. At the end of the cantilever, an HSS hanger was used to support a W16x31 beam on the first floor, which in turn supports approximately 26 feet of bearing wall on north perimeter of the building. The back span of the W30x90 girder on the second floor is supported by the cantilevered end of a W24x68 beam which supports most of the bearing walls on the south side of the residence. Together, the three beams (W16, W30 and W24) support 50% of the structure and are supported on a total of 4 columns. In order to reduce the architectural impact of the W30 beam, the steel member was upturned so that the bottom of the beam was flush with the 10-inch deep wood floor framing at the same level.

Given the large cantilever of the W30x90, with the back span also supported by a cantilever, deflections were a primary concern. In order to prevent excessive deflections, the column that supports the fulcrum of the W24 beam was fabricated ¼-inch lower than required, which created a negative camber at the cantilevered end of the beam due to geometry. In addition, the column supporting the fulcrum of the W30 beam was fabricated ¼-inch higher than required, which when combined with the negative camber effect of supporting W24 resulted in almost 1-inch of positive camber at the cantilevered end of the W30. It was decided, in conjunction with the builder, that “cambering” of the beams by manipulating the length of the columns would be more cost effective than providing an actual camber in the beam during fabrication.

The residence is supported on timber piles, cast-in-place concrete pile caps and 24-inch deep concrete grade beams. Additional features of the residence include a 5 foot deep pool on the second floor supported by wood joists and bearing walls and custom timber roof trusses whose bottom chords also support a loft space and observation deck. Lateral forces are resisted by strategically located wood shear walls.

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

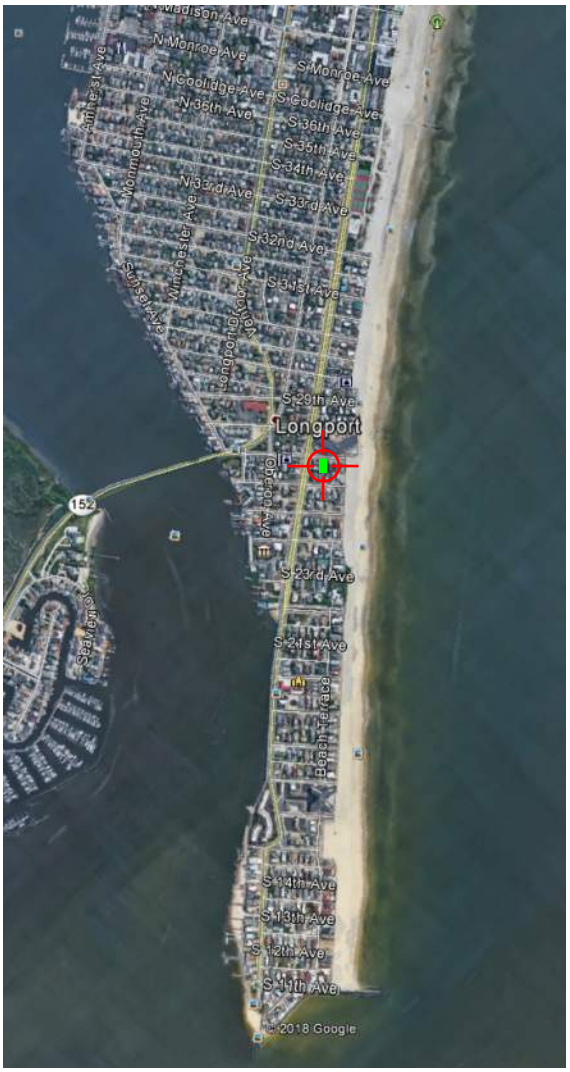


Exhibit A (Left): *Map of Longport, NJ with project location and proximity to the beach front highlighted.*

Exhibit B (Below): *Architectural elevation showing cantilevered portion, location of pool, roof elevation, and various levels.*

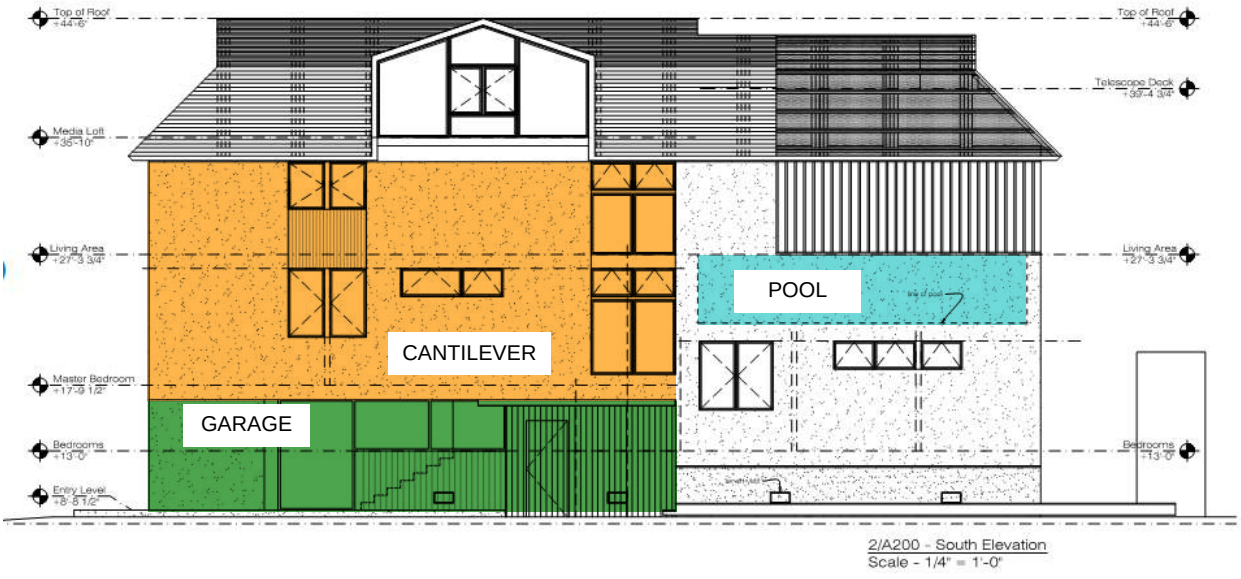


Exhibit C (Above): *Construction photo showing wood-frame cantilever over future garage space assisted by steel transfer girder and hanger support for 2nd floor.* ***Exhibit D (Below):*** *Construction photo with steel transfer frame highlighted with HSS hanger support for cantilevered floor.*

Exhibit E (Above): *Contractor checks level for WF beam for suspended floor support over garage space. Note that the transfer girder framing for the master bedroom is suspended by hanger from an additional transfer girder above. The far beam is a W24x62 supported by HSS columns.*

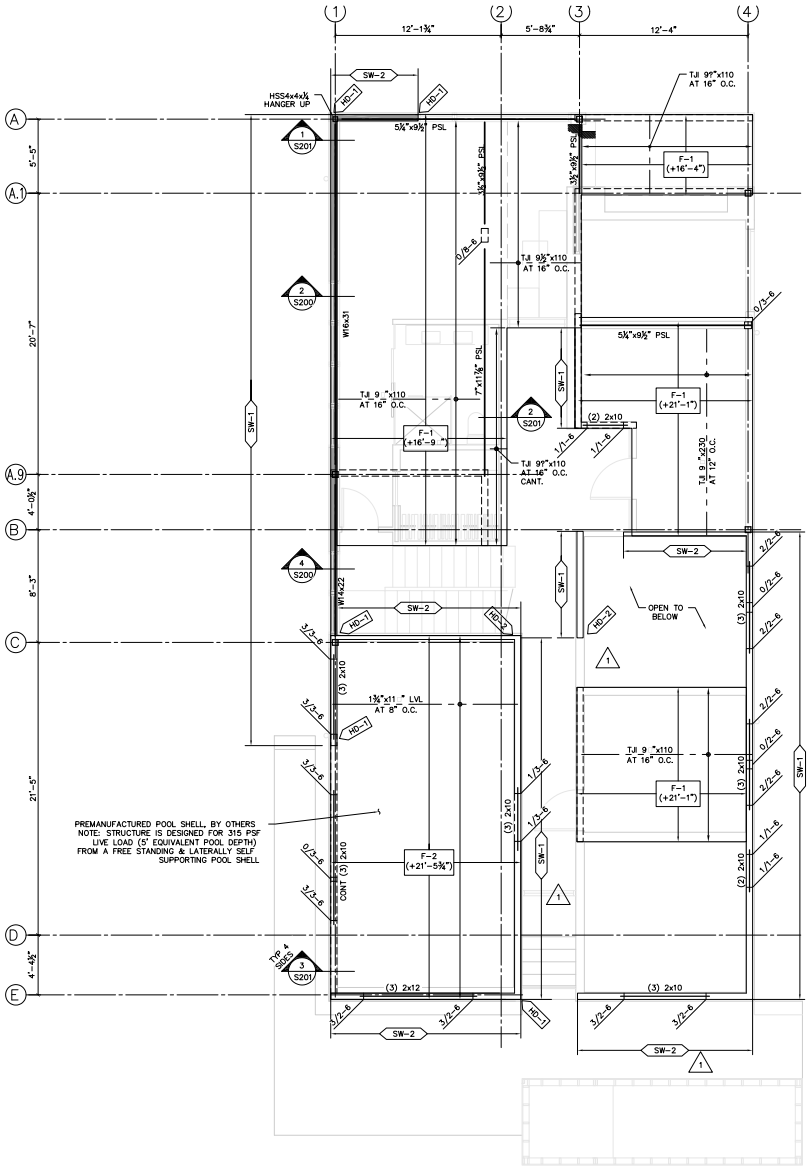
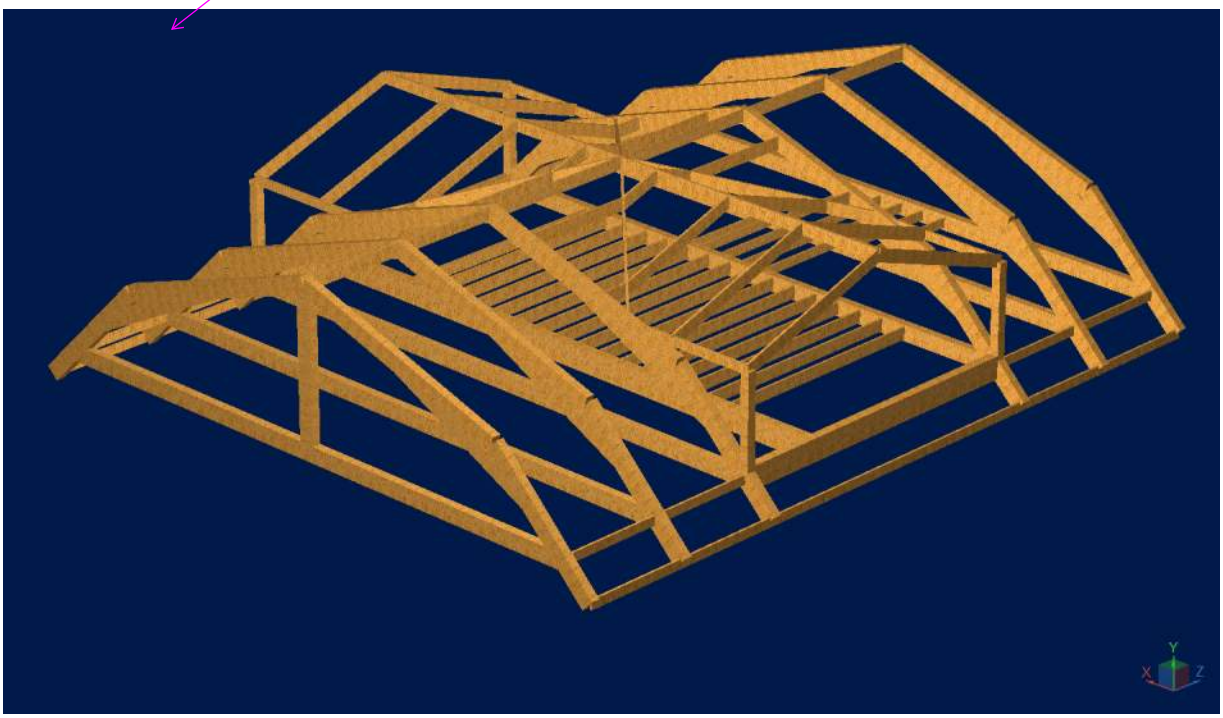


Exhibit F (Above): *Structural plan for 2nd Level showing Master Bedroom framing and pre-fabricated pool shell framing. Note location of HSS posts up to level and up from level to support cantilevered master bedroom.*

3d rendering of FEM model for custom designed roof trusses



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:

Print name:	**Signature:**	**Date:**
Ross Stuart		4/6/2018

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