ENTRY FORM

DVASE
2020 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:	Undisclosed
Name of Project:	Heron Drive Bayside Residence
Location of Project:	Avalon, NJ 08202
Date construction was completed (M/Y):	12/2019
Structural Design Firm:	Orndorf & Associates, Inc.
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	Moger Mehrhof Architectcs
General Contractor:	Spectracon - Great Estates Inc.

Company Logo (insert .jpg in box below)

ORNDORF & ASSOCIATES, INC.
STRUCTURAL ENGINEERS

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 annual 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.

The Bayside Residence is a 14,000 SF single family beach house with every modern convenience puzzled into a double lot along the Avalon bay. This included space for 7 bedrooms, 11 bathrooms, a two car garage, personal gym, office, and two kitchens. The design of this house was a practice in maximizing what could be done with the least amount of apparent structure. Many times the structural elements had to be woven around window openings, operable curtain walls, tray ceilings, and mechanical systems. This resulted in unobstructed views of the waterfront and grand cathedral like spaces.

The residence is only 28 feet from the bay bulkhead and was supported on 132 timber piles. These piles varied in length to help economize the design and allow for net uplift loads at some skinny (narrow aspect ratio) braced frames. Flood loading was equalized with venting to prevent net hydrostatic forces.

This split-level residence is divided into two primary wings: a three-story bedroom wing, and a two-story living wing. It was a challenge to fit three occupied levels into the bedroom wing due to FEMA flood elevations and city height restrictions; therefore, the structural floor plate had to be just 8 inches thick for the 30ft wide bedroom wing. This required frequent changes in span direction, flush framed steel beams, posts on outriggers, and a deck cantilever moment connection made through a column with a vertical offset (to allow for a waterproofing edge).

DD level drawings were provided for pricing, including alternates for: CLT, precast concrete, CFMF, and concrete over metal deck. However, due to vibration (CLT), deflection, lead time (precast), and the builder's familiarity with wood framing; a steel post-beam system was selected with stick framing infill. This design choice allowed for field cutting of members which later became critical as the 8 inch structural plate had to include interwoven mechanical ductwork. This required coordination of 11 duct penetrations through steel beams. Also, since columns and ducts were hidden in the same walls, some girders had to be shifted off center so that ductwork could run vertically from floor to floor.

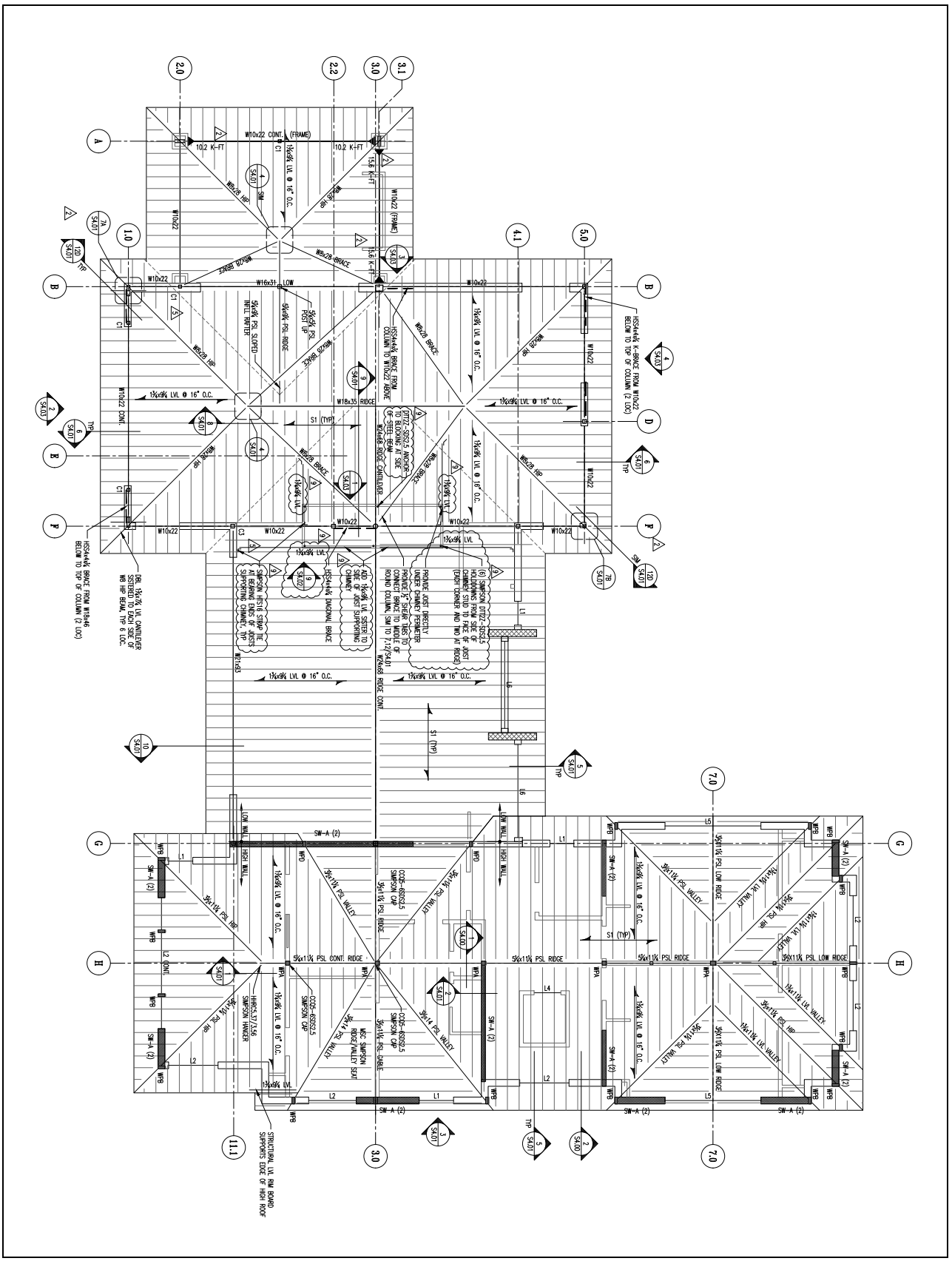
The living wing of the residence is a two-level structure made up primarily of two columnless rooms measuring 26'x51' and 36'x32'. The smaller room had a 27ft opening on one side leading out to a 36'x16' deck. This was made possible with a W21x93 'header' and a W24x68 ridge beam clear spanning 36 feet. Extending this ridge beam into the larger room as a continuous span helped with deflection and economy, but complicated the design.

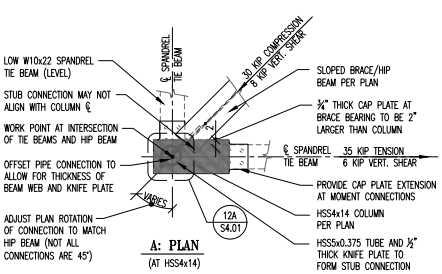
The larger room incorporated a hip roof with a cathedral tray ceiling. Our best solution to accommodate the open space and 14ft ceilings was to use a 'double pyramid' steel frame. This utilized two four-sided pyramids that were connected by a ridge beam at the apex. This entire steel structure was hidden inside the planes of the hip roof to allow for seamless architectural lines. The thrust forces at the base of these pyramids were resisted by leaning against each other and by a perimeter tension ring (that was also part of the lateral system). As a final complication, the ridge beam of the smaller room tied into the ridge between the two pyramids.

With such large open spaces, there were few walls that aligned for a lateral system. In the open living wing we implemented a combination of moment and braced frames, one of which had to be offset in-plane to allow for a window. HSS14x4x½ columns were used at the moment frames to fit inside exterior walls. These had to hold to the most stringent tolerances because track deflection could prevent sliding glass walls from opening. This included a 42 lineal foot glass wall that was fully operable and included a columnless glass corner.

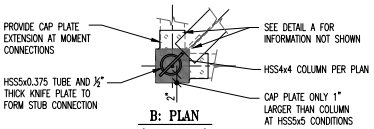
This residence also included a cabana measuring 44'x14' that was supported by only four columns, had a hip roof with tray ceiling, and a 14 ft cantilever at each end. This was an exciting but challenging project to work on and will stand out as a structural statement and a resort like retreat.

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



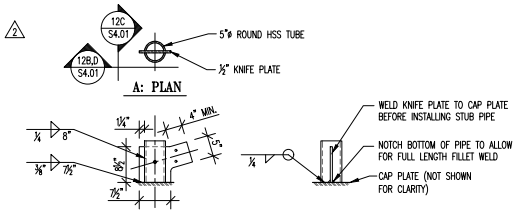


A: PLAN
(AT HSS4x14)



B: PLAN
(AT HSS4x4 COL)
(HSS5x5 SIM)

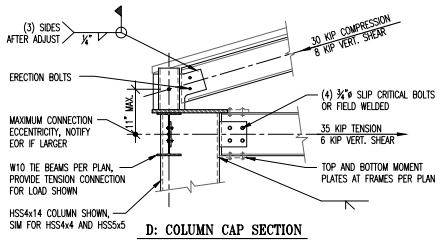
7 S4.01 BRACE BEAM BEARING
¾" = 1'-0"



A: PLAN

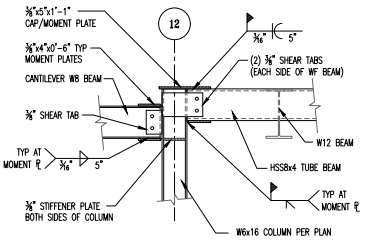
B: SECTION

C: SECTION

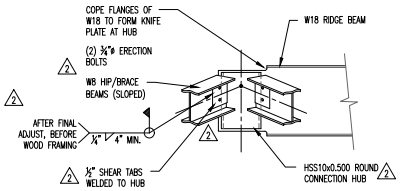


D: COLUMN CAP SECTION

12 S4.01 BRACE BEAM CONNECTION SECTION
¾" = 1'-0"

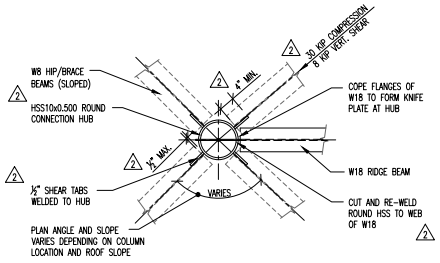


8 S4.02 CANTILEVER DECK SECTION
¾" = 1'-0"

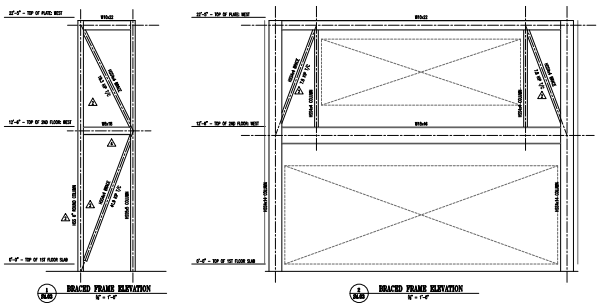


ERECTION BOLTS TO BE USED AS TEMPORARY SUPPORT, PROVIDE FULL WELDED CONNECTIONS BEFORE THE START OF WOOD ROOF FRAMING

8 S4.01 SECTION AT PYRAMID HUB
¾" = 1'-0"



4 S4.01 STEEL PYRAMID CONNECTION
¾" = 1'-0"


BRACED FRAME ELEVATION
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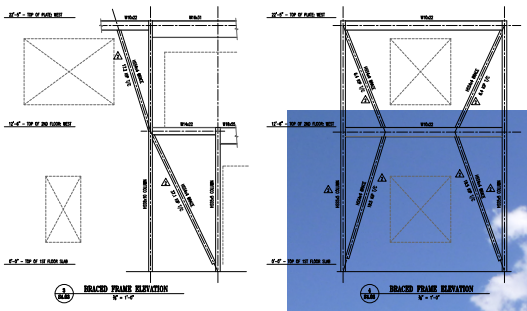
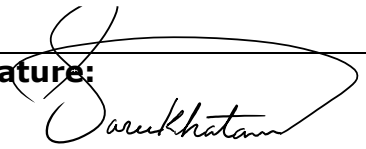

BRACED FRAME ELEVATION
BRACED FRAME ELEVATION

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:**
RAMTIN SANEEKHATAM, P.E.		05/20/2020

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