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:	< $5 MIL.
Name of Project:	PRIVATE WATERFRONT HANGING RESIDENCE
Location of Project:	PHILADELPHIA, PA
Date construction was completed (M/Y):	03/2019
Structural Design Firm:	ORNDORF & ASSOCIATES INC. (O&A)
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	HECKENDORN SHILES
General Contractor:	C. RAYMOND DAVIS

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.

At the South East corner of one of Philadelphia's premier residential piers along Delaware Avenue, three existing side-by-side condos were structurally and architecturally transformed into one 6,000 square foot home. The structural transformations at this historic Philadelphia waterfront building provided the required canvas for the architectural vision of this home to be realized.
The new home spans over two existing floor levels. The nature of the original superstructure and the subsequent adaptive re-use design (1980s) created unique structural challenges yet budgetary concerns required elegant and practical solutions. In the adaptive re-use design of this structure in the 80s, additional floor levels were added to this building by the way of hanging new structural steel framing from existing available floor/roof framing which were originally design for much heavier live loads. The 1980s design created new multi-spliced wide flange girders, hung from the original structure, creating new floor plates using open-web steel joists at close spacing, supporting metal form deck and concrete topping slab. Multiple structural surveys, gathering of historical and existing building data and drawings, and creating a model of all existing conditions was performed at the initial phase of design.

Our firm had to modify this already hanging structure which still carried load in other areas of the building not in scope of our work. To achieve this, we had to account for the hanging floor's global stability, stiffness and strength while attaching new framing members to both the 1980s and the original 1920s framing and create multiple new off-set levels, all the while ensuring that all the new work was also supported from above (hung) and not from below (post downs). Various floor levels were removed (and at some areas expanded) in varying geometries to provide double height spaces at the kitchen and dining areas. The architectural design now would allow for an operable 30 foot long partition that completely opened the kitchen area to the waterfront deck, while the modifications at the window wall had to be coordinated with Philadelphia Historic Commission in order to preserve the building's original facade.

The architect's grand design vision mostly cleared out the existing 2nd floor level to create a master suite at the main entrance floor. Floating structural stairs, hanging and cantilevering platforms, and exposed structural elements created a design to "celebrate the floor-to-floor relationship to the home and to open up views within the interior spaces as well as the outside" – As noted by the Architect. A massive and heavy curve-a-linear wood ceiling, seeming continuously and uninterrupted, rises from the kitchen walls and forms ceiling geometry that mimic the movement of the water on the river just outside. The ceiling is in itself an architectural and structural statement.

Unique Analysis and Design Aspects:

1.Threading the needle with an Hss14x10, designed to stringent deflection criteria in both x-x and y-y axes, resisting high winds coming from the river, and supporting a 30 ft long nanawall. End support connections to a vertical 'ledger column' and to an already busy existing connection were detailed and reviewed with special consideration.

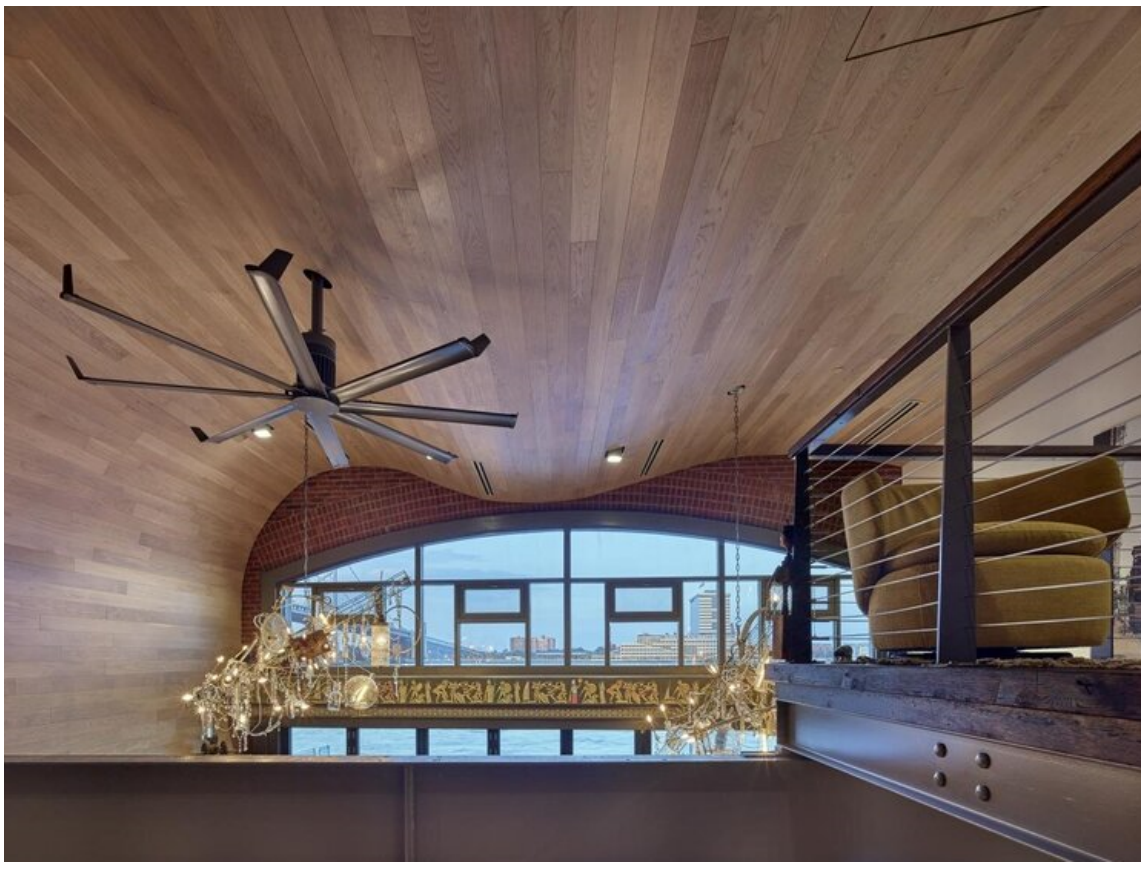
2.Overall stability design considerations due to modification of existing hanging floor plate and limited architectural spatial availability for required bracing forced us to provide localized reinforcement of existing framing and designing for stiffness of any and all new framing members to provide required stability bracing.

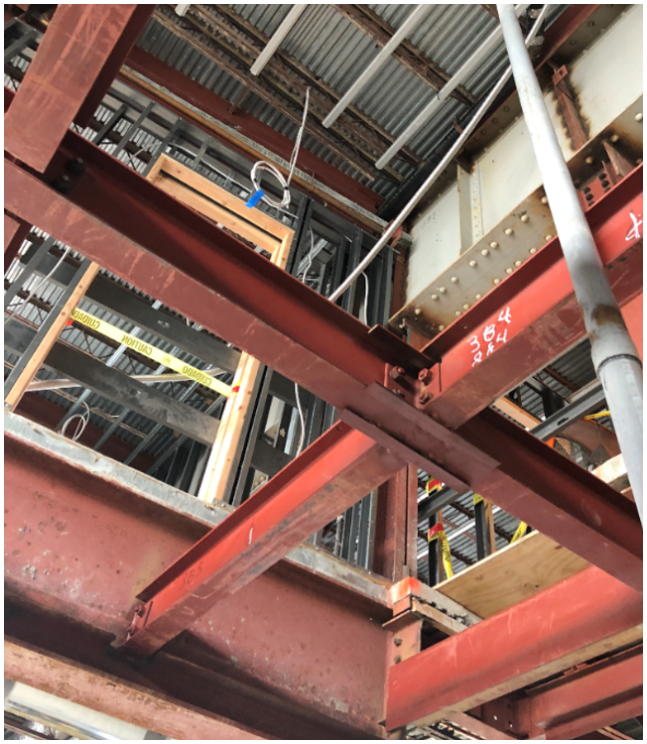
3.Modification of existing joists (reinforcement, span reduction, joist seat design, etc…), hung WF members, and providing new girder supports / infill framing elements to create multi-level zones, with almost no deflection or additional depth tolerances, required in depth analysis of existing member, even considering elevational placement of new loads with respect to the depth of a new/existing member.

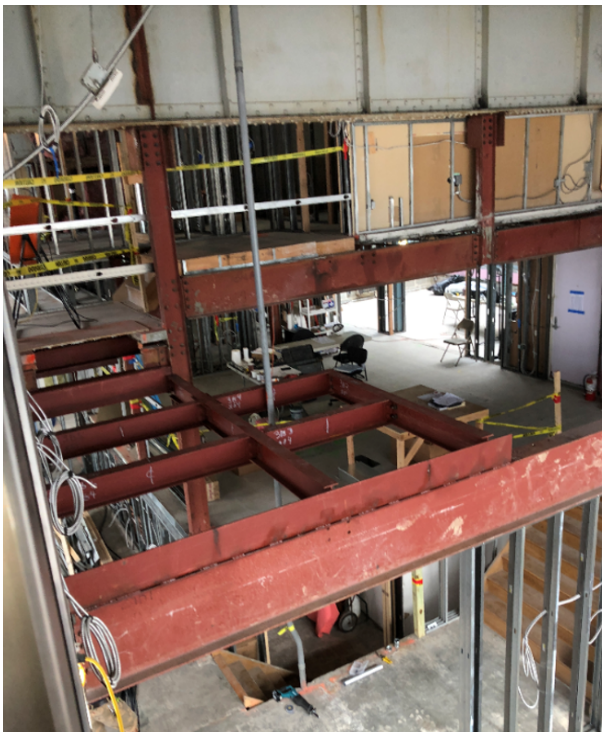
4.Design of two partition walls supporting a CFMF floor expansion area as strapped braced walls to not only provide lateral stiffness to the expanded diaphragm, but to also carry the stiffness to the edges of the modified hung diaphragm through careful detailing.

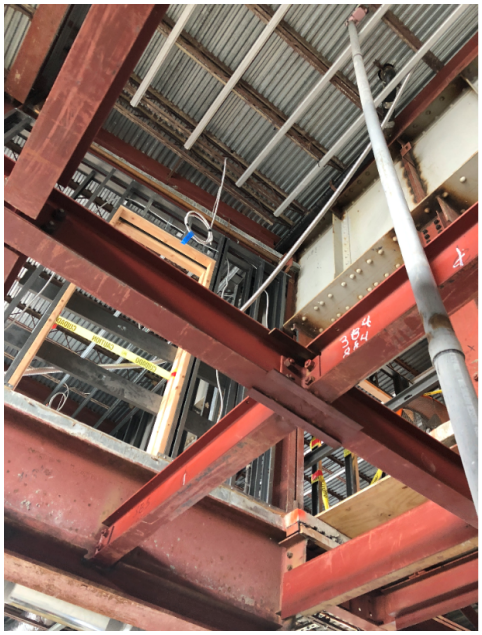
5.The hung curve-a-linear ceiling methodology was carefully coordinated with the design team. At the highest level, vertical threaded rod hanger spacings were chosen in a manner that reduced reinforcement requirements of existing framing above. The placement of the hangers in desired spacing and location was achieved with Unistrut framing between the existing framing members. To create the curvature, heavy gauged CFM tracks were utilized. In order to provide continuity in the tracks, their flanges could not be cut in order to create the curvature. Rather specialized equipment was used to crimp the legs of the tracks and the final capacity of the tracks were calculated. Bending of the track flanges were also calculated as the rods attach to one flange and the ceiling to the other.

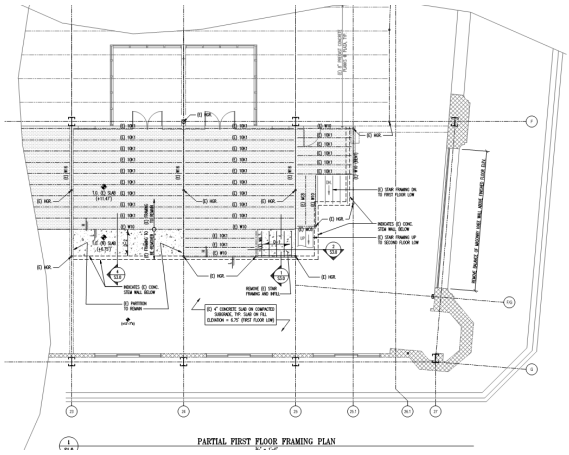
- The following 5 pages (maximum) can be used to portray your project to the awards committee through photos, renderings, sketches, plans, etc…



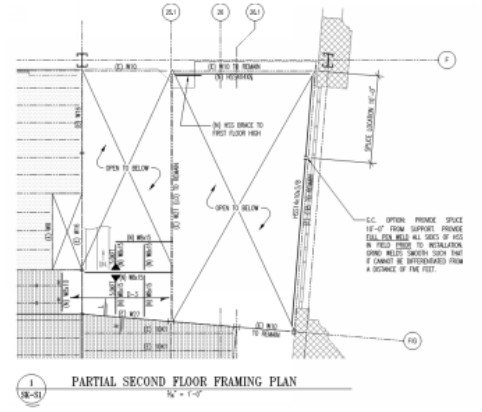




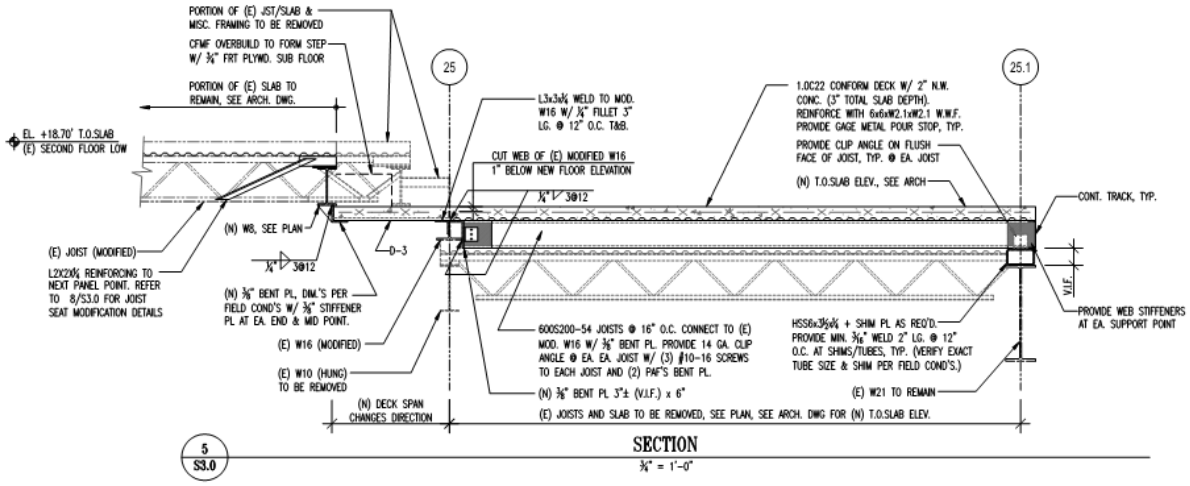




PARTIAL FIRST FLOOR FRAMING PLAN



PARTIAL SECOND FLOOR FRAMING PLAN


PORTION OF (E) JST/SLAB & MISC. FRAMING TO BE REMOVED
CFMF OVERBUILD TO FORM STEP W/ ¾" FRT PLYWD. SUB FLOOR
PORTION OF (E) SLAB TO REMAIN, SEE ARCH. DWG.
EL. +18.70' T.O.SLAB
(E) SECOND FLOOR LOW
(E) JOIST (MODIFIED)
L2X2X¼ REINFORCING TO NEXT PANEL POINT. REFER TO 8/S3.0 FOR JOIST SEAT MODIFICATION DETAILS
(N) W8, SEE PLAN
¼" 3@12
(N) ⅜" BENT PL, DIM.'S PER FIELD COND'S W/ ⅜" STIFFENER PL AT EA. END & MID POINT.
(E) W16 (MODIFIED)
(E) W10 (HUNG) TO BE REMOVED
(N) DECK SPAN CHANGES DIRECTION
25
L3x3x¼ WELD TO MOD. W16 W/ ¼" FILLET 3" LG. @ 12" O.C. T&B.
CUT WEB OF (E) MODIFIED W16 1" BELOW NEW FLOOR ELEVATION
¼" 3@12
D-3
600S200-54 JOISTS @ 16" O.C. CONNECT TO (E) MOD. W16 W/ ⅜" BENT PL. PROVIDE 14 GA. CLIP ANGLE @ EA. JOIST W/ (3) #10-16 SCREWS TO EACH JOIST AND (2) PAF'S BENT PL.
(N) ⅜" BENT PL 3"± (V.I.F.) x 6"
(E) JOISTS AND SLAB TO BE REMOVED, SEE PLAN, SEE ARCH. DWG FOR (N) T.O.SLAB ELEV.
25.1
1.0C22 CONFORM DECK W/ 2" N.W. CONC. (3" TOTAL SLAB DEPTH). REINFORCE WITH 6x6xW2.1xW2.1 W.W.F. PROVIDE GAGE METAL POUR STOP, TYP.
PROVIDE CLIP ANGLE ON FLUSH FACE OF JOIST, TYP. @ EA. JOIST
(N) T.O.SLAB ELEV., SEE ARCH
CONT. TRACK, TYP.
V.I.F.
PROVIDE WEB STIFFENERS AT EA. SUPPORT POINT
HSS6x3½x¼ + SHIM PL AS REQ'D. PROVIDE MIN. 3/16" WELD 2" LG. @ 12" O.C. AT SHIMS/TUBES, TYP. (VERIFY EXACT TUBE SIZE & SHIM PER FIELD COND'S.)
(E) W21 TO REMAIN
5
S3.0
SECTION
¾" = 1'-0"

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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