ENTRY FORM

DVASE
2022 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:	Graduate Hospital Private Residence
Location of Project:	Philadelphia. PA
Date construction was completed (M/Y):	09/21
Structural Design Firm:	Orndorf & Associates, Inc.
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	JKRP Architects
General Contractor:	Fitler Construction Group

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 virtual presentation 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 private residence in the heart of the Graduate Hospital section of Philadelphia is the carriage unit of a new town home development. This luxurious home features 7,000 square feet of livable space, 5 bedrooms, 8 bathrooms, a 2-car garage, 3 roof decks, 2 kitchens, an elevator, and a large cantilevered deck on the first floor. A portion of the house is also framed over top of the drive aisle that provides access to parking for the tenants of the adjacent town home development. It's unique open floor plan, large spans, and many windows created structural challenges while maintaining the project's budget.

The first challenge to this project started with the gravity framing. Due to spans of 30'-60' and discontinuous partition walls, steel framing needed to be introduced at every story. However due to the open floor plan at the first floor level, with no columns and only one partition wall, the steel framing was anything but ordinary. With the apparent need for several transfer girders, cantilevered bay windows, and a staircase supported from above by a hanging column, this became a challenge to weave the steel through what little structure we had while also maintaining the architect's clean vision.

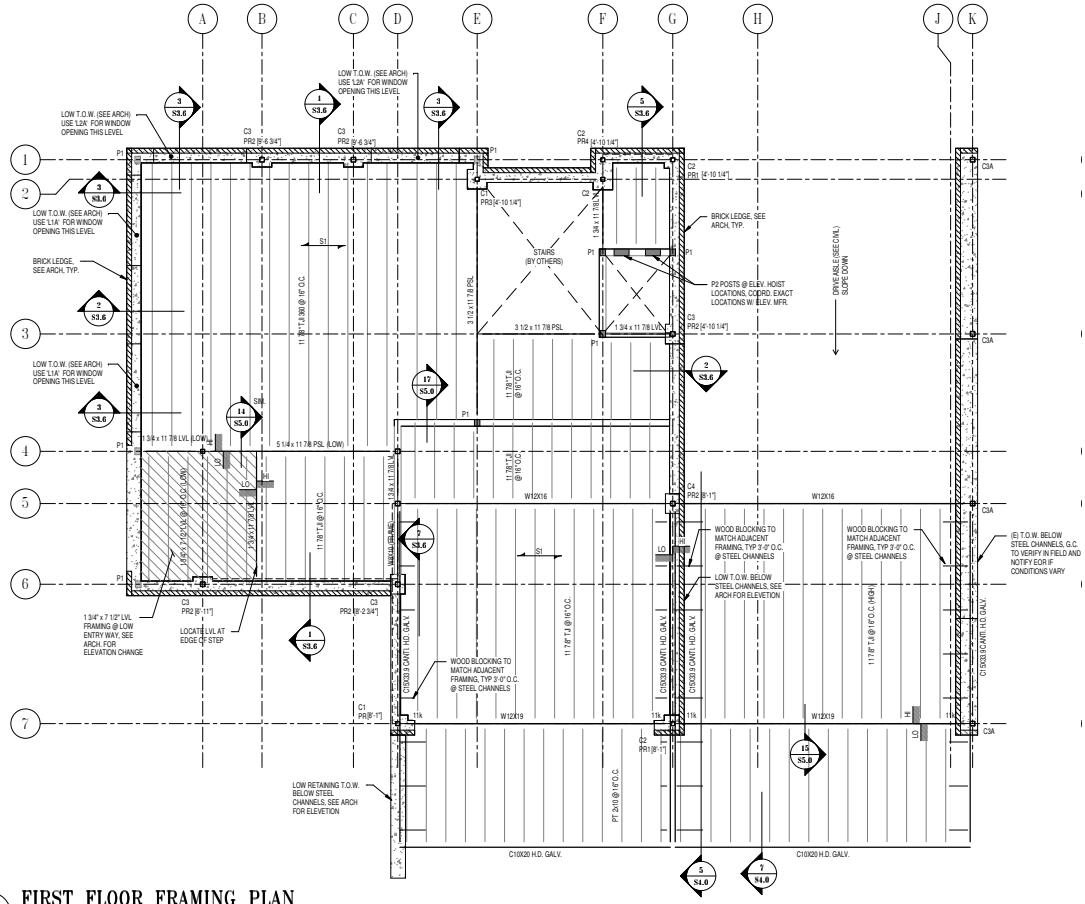
Another aspect of the gravity design that became an iterative process was the cantilevered deck on the first floor. This deck cantilevers 8', which seems manageable, however the deck is cantilevered over the drive aisle below, and we had strict headroom clearances to abide by. All of the standard industry options proved unsuccessful due to either the headroom below, significant deflection of shallow members, and a vibration analysis. In the end, we worked with the steel fabricator to detail a specific connection to satisfy all the architectural and serviceability requirements, which included two (2) C15x33.9 members through bolted through a structural HSS column.

To satisfy the architectural needs with the gravity design was tough, but to design the lateral system was even tougher. The preferred option of wood shear walls was eliminated due to the fact that only the exterior walls ran continuously to the foundation, and every exterior wall but one had significant openings that did not satisfy the aspect ratio of a perforated shear wall. Instead, we utilized four (4) multi-story steel braced frames that were carefully coordinated not to disrupt the architect's concept.

Lastly, this project presented significant construction engineering tasks at the zero-lot line locations. In the south west corner of the structure, the building is adjacent to the the neighbor's exterior concrete slab on grade patio. When the original structure was demolished, the shared CMU foundation wall that helps support the neighbor's patio was left remaining. However, a portion of this CMU wall was intruding on the new construction of the house and was unable to be used to support the braced frames above. In order to successfully construct the new concrete foundation walls, we needed to demolish the existing CMU wall without disturbing the neighboring patio. Our firm provided a sequential demolition and construction plan to achieve this which required the new foundation wall to be poured in segments, monolithically with the eccentric footing, all while not disturbing the soil which supports the adjacent concrete patio.

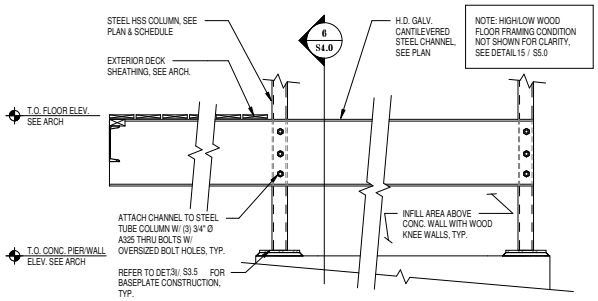
In the end, this house will be a staple for a brand new town home development that will redefine the neighborhood while providing the tenants with a wonderful, open home.

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



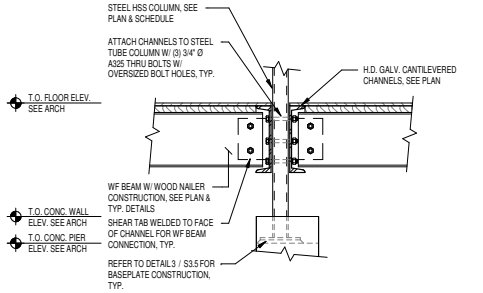
1 S2.0 FIRST FLOOR FRAMING PLAN

1/4" = 1'-0"



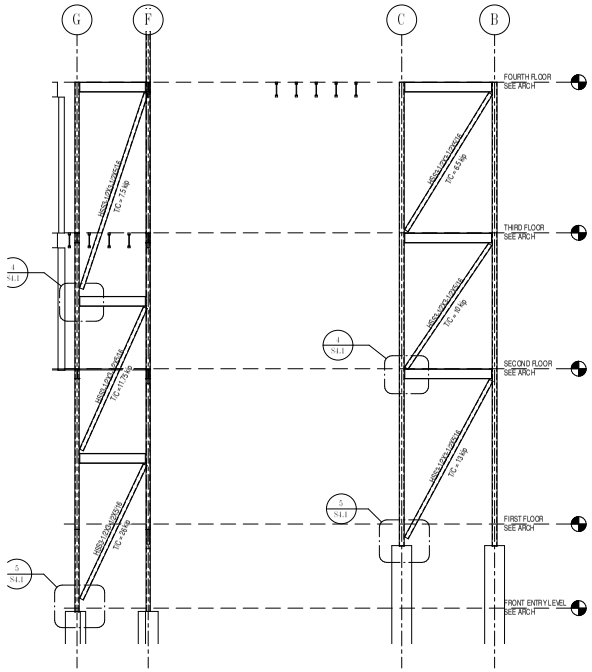
5 S4.0 CHANNEL TO COLUMN CONNECTION

3/4" = 1'-0"



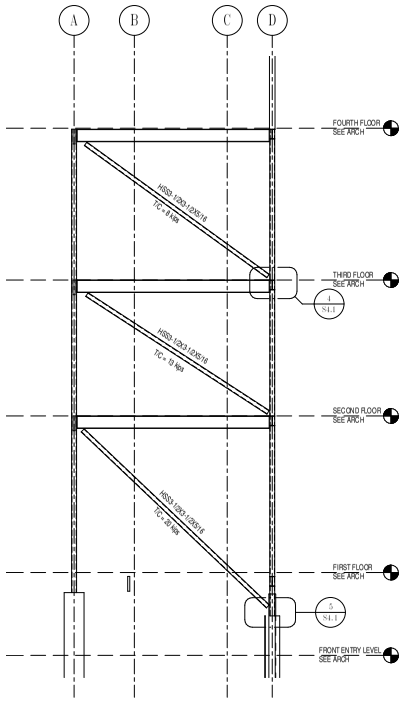
6 S4.0 CHANNEL TO COLUMN CONNECTION

3/4" = 1'-0"



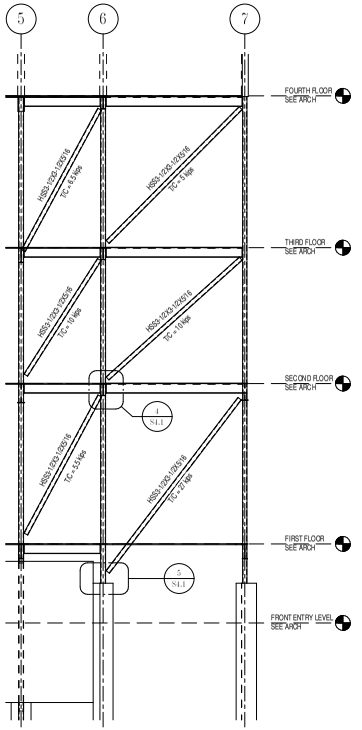
1 S4.1 STRUCTURAL ELEVATION

1/4" = 1'-0"



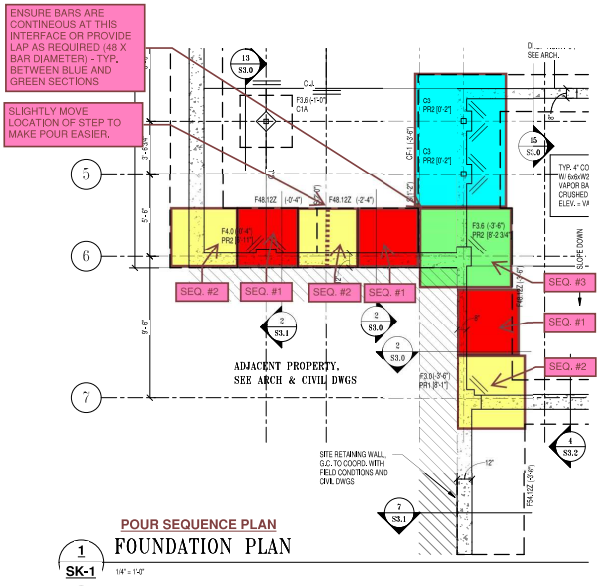
2 S4.1 STRUCTURAL ELEVATION

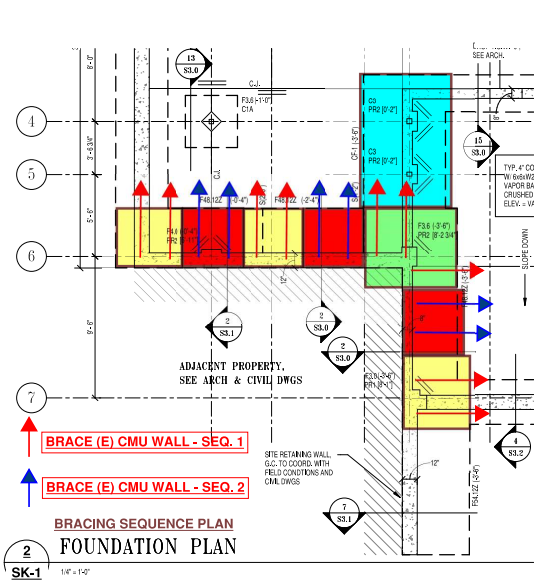
1/4" = 1'-0"



3 S4.1 STRUCTURAL ELEVATION

1/4" = 1'-0"





(E) CMU WALL BRACING, REMOVAL, AND NEW CONCRETE POUR SEQUENICNG NOTES:

1. BRACE (E) CMU WALL PORTIONS SHOWN IN YELLOW (SHOWN ON 1/SK-1) FIRST PRIOR TO ANY OTHER WORK. BRACE (E) WALL AT TOP AND AND AT BOTTOM. G.C. TO DETERMINE BRACING METHOD (MEANS AND METHODS) - REFER TO 1/SK-1 FOR RED AREAS OF WALL REMOVAL (NEXT STEP) AND RED ARROWS FOR BRACE LOCATIONS ON 2/SK-1

2. CAREFULLY REMOVE CMU WALL AT RED AREAS. MAXIMUM WIDTH OF REMOVAL SHALL BE 4'-0". NOTE THAT SOME BLOCK SIZES SHOWN HERE ARE PROVIDED IN ORDER TO ENSURE A SINGLE POUR AT INTEGRATED 'SPREAD FOUNDATIONS'. EX. AT COL. LINE 6A.

3. CONTRACTOR OPTION:

   A. POUR WALL AND FOUNDATION AS ONE POUR. WILL REQUIRE CONTRACTOR TO PROVIDE SUSPENDED WALL FORM. ALLOW MIN. 3 DAYS TO CURE.
   B. POUR FOUNDATIONS FIRST. ALLOW 3 DAYS TO CURE. POUR WALL SEQMENTS SECOND. ALLOW 3 DAYS TO CURE BEFORE MOVING TO NEXT STEP

4. BRACE NEWLY POURED CONCRETE WALL PORTIONS SHOWN IN BLUE (ARROWS ON 2/SK-1. BRACE SAID WALL AT TOP AND AND AT BOTTOM. G.C. TO DETERMINE BRACING METHOD (MEANS AND METHODS).

5. CAREFULLY REMOVE CMU WALLS AT PASTEL YELLOW AREAS ON 1/SK-1

6. CONTRACTOR OPTION:

   A. POUR WALL AND FOUNDATION AS ONE POUR. WILL REQUIRE CONTRACTOR TO PROVIDE SUSPENDED WALL FORM. ALLOW MIN. 3 DAYS TO CURE.
   B. POUR FOUNDATIONS FIRST. ALLOW 3 DAYS TO CURE. POUR WALL SEQMENTS SECOND. ALLOW 3 DAYS TO CURE BEFORE MOVING TO NEXT STEP

7. POUR CORNER PIECE SHOWN IN GREEN (SEQ. #3). IT IS HIGHLY SUGGESTED TO POUR THIS AREA IN TWO (2) POURS: FOUNDATION, THEN WALL AND PIER.

NOTE TO G.C.

1. ENSURE ALL NOTES ON SK-1 DRAWING ARE READ AND FULLY UNDERSTOOD. CONTACT ENGINEER FOR CLARITY.
2. REFER TO TYP. DETAILS FOR ALL NEW WALL / FOOTING DETAILS. AS WE ARE REMOVING THTE CMU WALL, NO NEW SECTIONS ARE CREATED.

Picture 2: Completed Foundation Wall After Demo Sequence

Picture 1: Sequential Demo of CMU Wall

Picture 4: Completed Project

Picture 3: Braced Frames During Construction

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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