ENTRY FORM

DVASE
2017 Excellence in Structural Engineering Awards Program

PROJECT CATEGORY (check one):

Buildings under $2M	X	Buildings Over $100M	
Buildings $2M-$10M		Other Structures Under $5M	
Buildings $10M - $30M		Other Structures Over $5M	
Buildings $30M - $100M		Single Family Home	

Approximate construction cost of facility submitted:	$700,000
Name of Project:	Harrison Commons 5 – Café
Location of Project:	Harrison, NJ
Date construction was completed (M/Y):	In Progress
Structural Design Firm:	Mulhern and Kulp Structural Engineering
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	Minno & Wasko Architects and Planners
General Contractor:	Fields Construction Company

Company Logo (insert .jpg in box below)

MULHERN+KULP
residential structural engineering

Important Notes:

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

The Café in Harrison, NJ is a 3000 square foot amenity building attached to a 250,000 square foot apartment building, Harrison Commons 5. It consists of a first floor café and eating area as well as a mezzanine level and small "greenhouse" space. The building will also function as a gathering place for special events. Future plans call for the opposite side of the building to be attached to an upcoming apartment building, Harrison Commons 6.

The overall aesthetic of the Café called for a house-like shape with thin walls and roof structure. It would have a gable roof with unbraced 15' tall walls. Additionally, the ends and interior of the building would be kept open for glass curtain walls to allow light into the space. This created complications with the structural design as typical gravity and lateral systems would not be possible.

To achieve the desired appearance, Mulhern & Kulp proposed the use of structural arches made from W-shape steel which would follow the gable shape of the building. These arches serve as both the main gravity and lateral system for the building. Connecting the arches are a series of x-braces and HSS beams. The x-bracing helps to stabilize the peak of the gable roof which would otherwise tend to lateral deflect under load. The HSS beams have a dual function as moment-resisting frames along the length of the building, and as support for the light gage curtain wall system that clads the building.

In addition to the main structural arches, there is a secondary structure within the envelope of the main building that supports the mezzanine floor and an interior architectural roof. The mezzanine structure consists of steel beams and columns along with wood I-joist floor framing. The smaller mezzanine follows the aesthetic of the Café and, as such, has a similar gable shape. In order to achieve this, several of the beams and columns are used as moment-resisting frames. However due to the mezzanine being within but not separate from the Café, the mezzanine framing also ties back to the main steel arches in several locations.

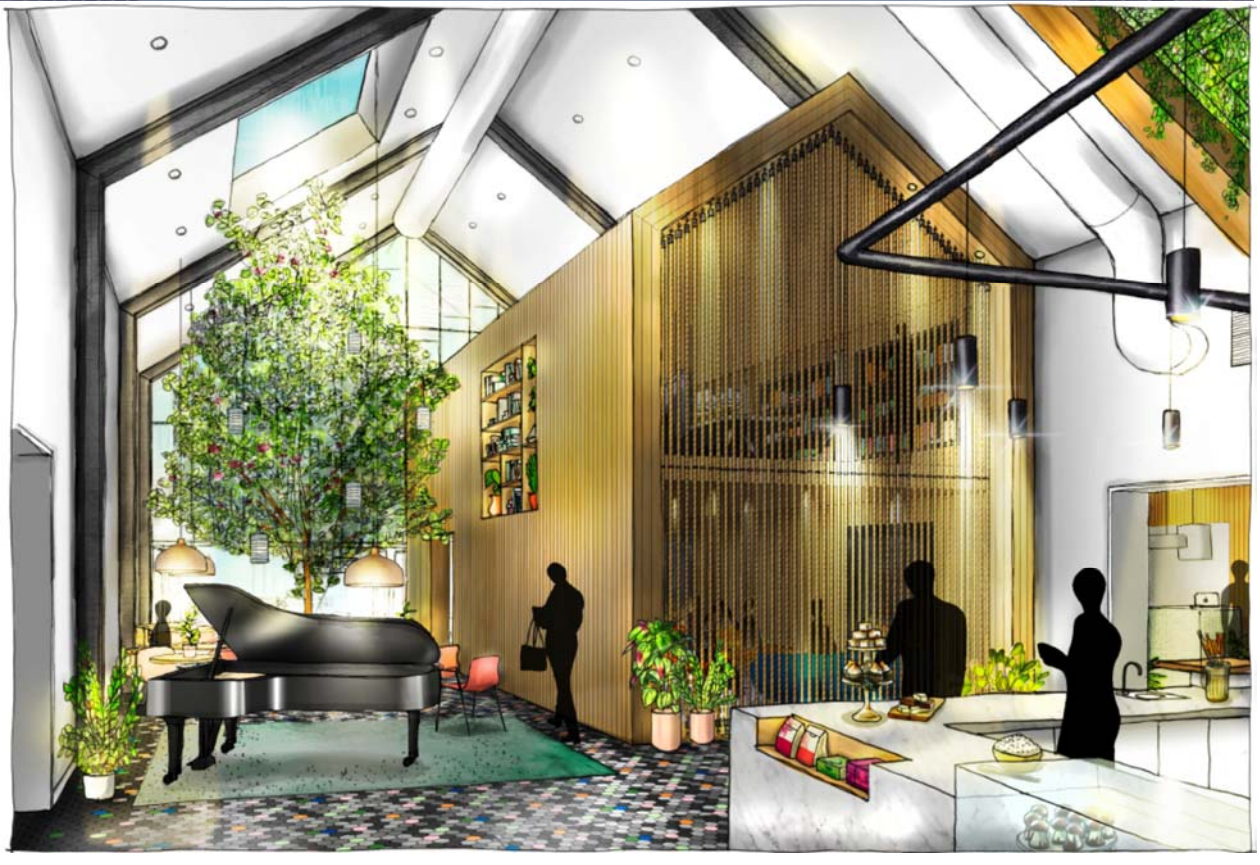
The most complex aspect of the Café structure proved to be the detailing required to meet architectural design requirements. The total depth of the roof structure as seen from the exterior of the building could not exceed 8" in depth and had to cantilever at both ends by roughly 5'. In order to achieve this while reducing costs, laminated veneer lumber (LVL) roof joists were chosen to span between the main arches. This allowed the roof thickness to stay within dimension requirements while also avoiding conflicts with interior structure and mechanical work that would be cause by dropping steel structure. Large skylights, 50 ft^2 to 80 ft^2 in size, were framed with HSS beams that fit within the depth of the LVL joists.

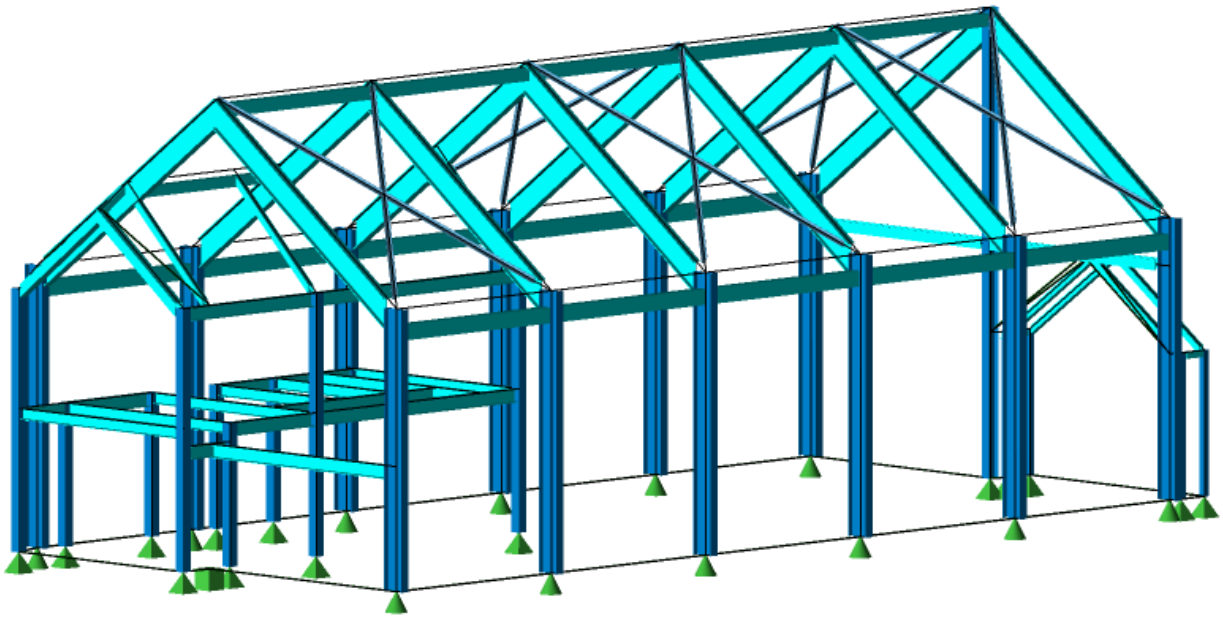
The glass curtain walls on either end of the building were considered the most important architectural aspect of the building. The owner desired there them to be as open and unobstructed as possible while spanning up to 27' vertically and 31' horizontally. To fully support the windows while maintaining an open look, a system of angle brackets and steel tube were attached to the side of the steel arches. These brackets allowed for a continuous steel support from which the curtain wall could hang. The total spans proved too large for the curtain wall to span when considering wind loads. Instead, Mulhern & Kulp designed several horizontal beams into the main structure that perfectly aligned with mullions in the curtain wall in order to visually hide the beams.

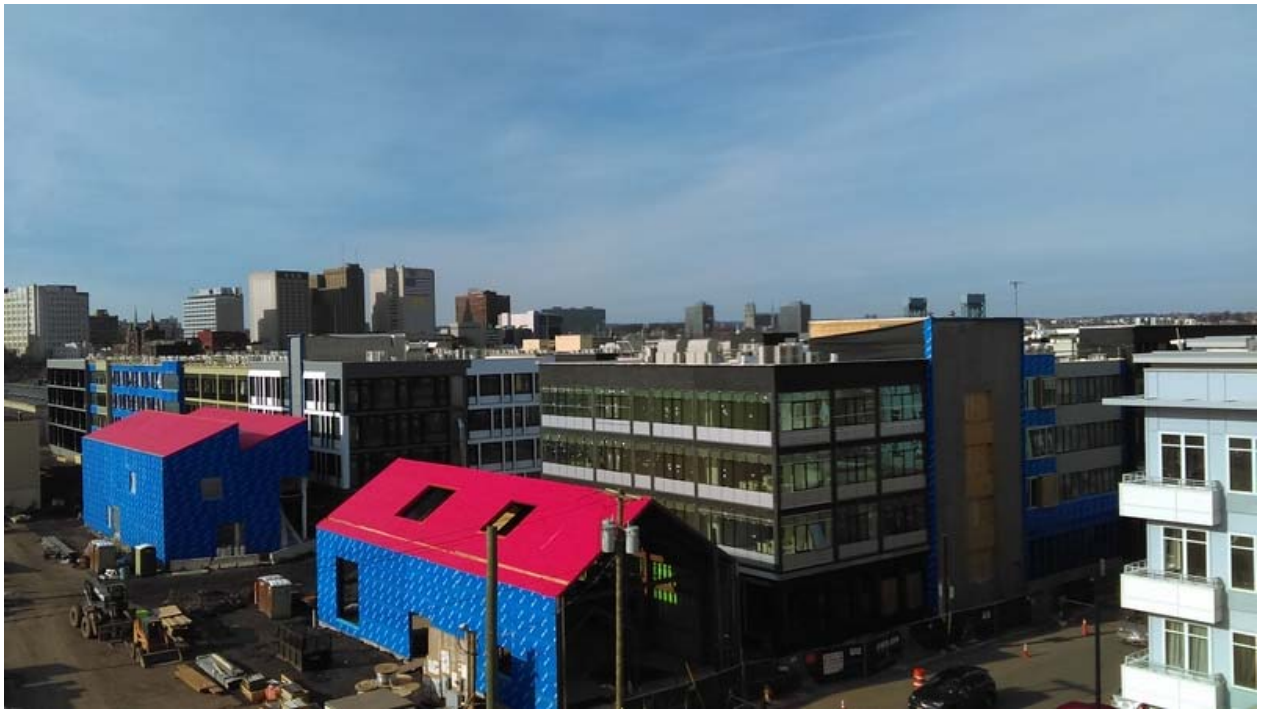
The underlying steel structure has also allowed for several architectural revisions to seamlessly take place during construction that would otherwise have required significant modifications. The ultimate result of the complex detailing and unique structural design is a building that closely matches the original architectural intent.

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

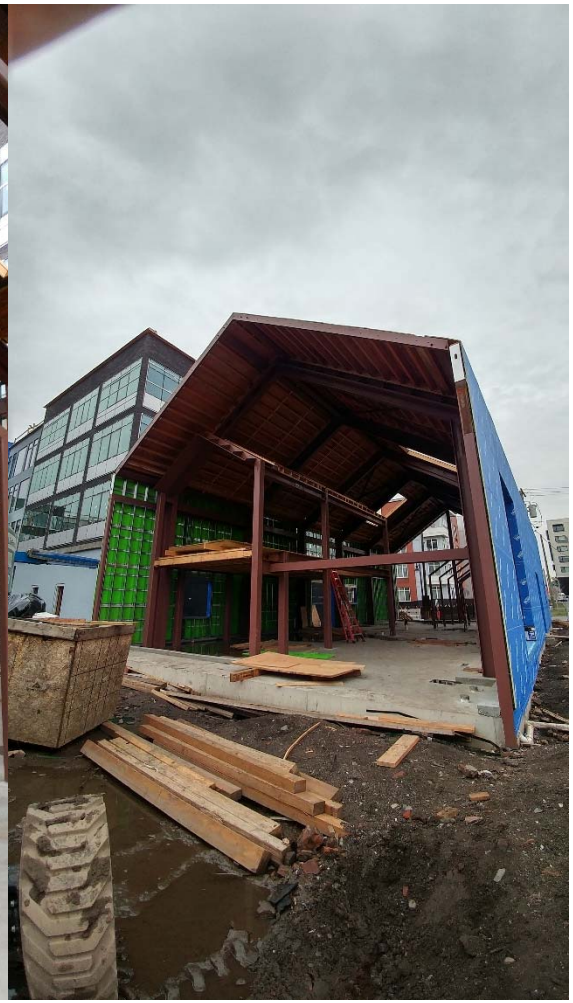
**Renderings courtesy of Minno & Wasko and Rearte Studios











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: Micah Milner, EIT	**Signature:** Micah Milner	**Date:** 4/10/17
Submitting Firm:	Mulhern & Kulp Structural Engineering	
Mailing address:	20 S. Maple St., Suite 150 Ambler, PA 19002	
Telephone: 215-646-8001	**Fax:** 215-646-8310	**Email:** mmilner@mulhernkulp.com