

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	<input checked="" type="checkbox"/>	Single Family Home	

Approximate construction cost of facility submitted:	\$47 Million
Name of Project:	Penn State Innovation Hub
Location of Project:	Penn State, State College, PA
Date construction was completed (M/Y):	12/21
Structural Design Firm:	Keast & Hood Structural Engineers
Affiliation:	All entries must be submitted by DVASE member firms or members.
Architect:	Kieran Timberlake
General Contractor:	LF Driscoll

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 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.

The Penn State Innovation Hub is the cornerstone of the Universities entrepreneurial ecosystem, referred to as the "Invent Penn State Initiative." The project included the demolition of the existing James Building and its replacement with the construction of a new, six story, building that includes a one story below grade parking garage for 30 cars as well as a green roof. The top floor contains a large, column free, multipurpose and flexible events space while the rest of the building houses open and private offices, co-working and collaboration areas, as well as makerspaces.

The Penn State Innovation Hub is a 110,000 SF steel framed building with a central elevator core. The building's construction required careful consideration of the surrounding structures for the foundation and basement wall design, while accommodating the tight project site. Where the final design landed required engineers to utilize a combination of underpinning and site retention walls in order to protect the adjacent existing structures. In addition, the site was located in an area where bedrock was close to the surface of the existing grade. This required balancing the architectural desire for a deeper basement and managing the structural and MEP systems in order to reduce the amount of rock excavation. Working within the tight project site and working not to disturb the adjacent building's foundation was the first challenge on the project.

The second challenge was the requirement that the tower crane share the same foundation as the buildings central braced frame core. During design, Engineers had to check the central core's mat foundation for the crane loads in addition to the braced frame loads that would be present during construction. Engineers made sure to detail the coordination to accommodate the temporary use of the tower crane and then the final condition for elevator usage.

The third challenge was that the building's basement is larger than the rest of the building above grade. This required the main floor to have a thicker system and higher rated capacity in order to transfer the lateral diaphragm forces to the exterior concrete walls surrounding the garage space. In addition, portions of the floor are supporting the sidewalk outside of the building which required engineers to consider firetruck loading.

Another unique aspect of the building was that the sixth floor contained a well area for mechanical equipment. Engineers had to coordinate the structure's design to support the equipment loads in this area, as well as provide removable framing in select locations so that future equipment replacement is possible

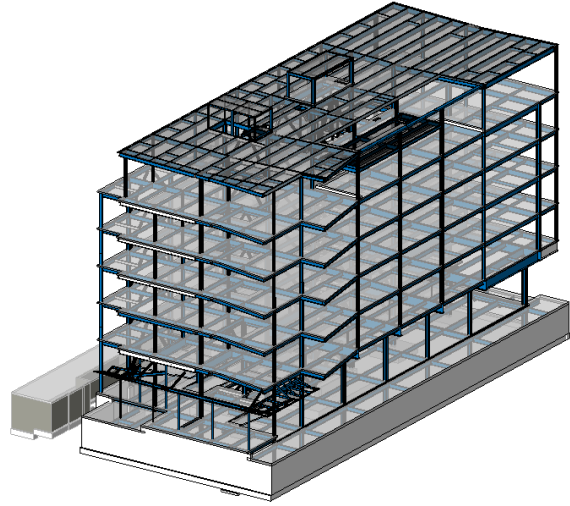
Design features that required creative structural design included the interior monumental stair in the atrium's two-story space, as well as the main architectural feature of the entry way canopy. The canopy utilized a large number of tapered members, and engineers focused on the thoughtful location of columns to align with mullions in the glazing system. Outstanding cantilevers beyond the vestibule, were all tapered and specialty fabricated shapes.

Sustainability was a consideration for this project as well. Once completed, Engineers used the Beacon Revit plug-in which is an embodied carbon measurement tool and the Penn State Innovation Hub fell at 219 kg-CO₂e/m², where the CLF 2017 Benchmark Median Value is 381 kg-CO₂e/m². So, once put into the SE2050 Chart, the building performed very well.

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

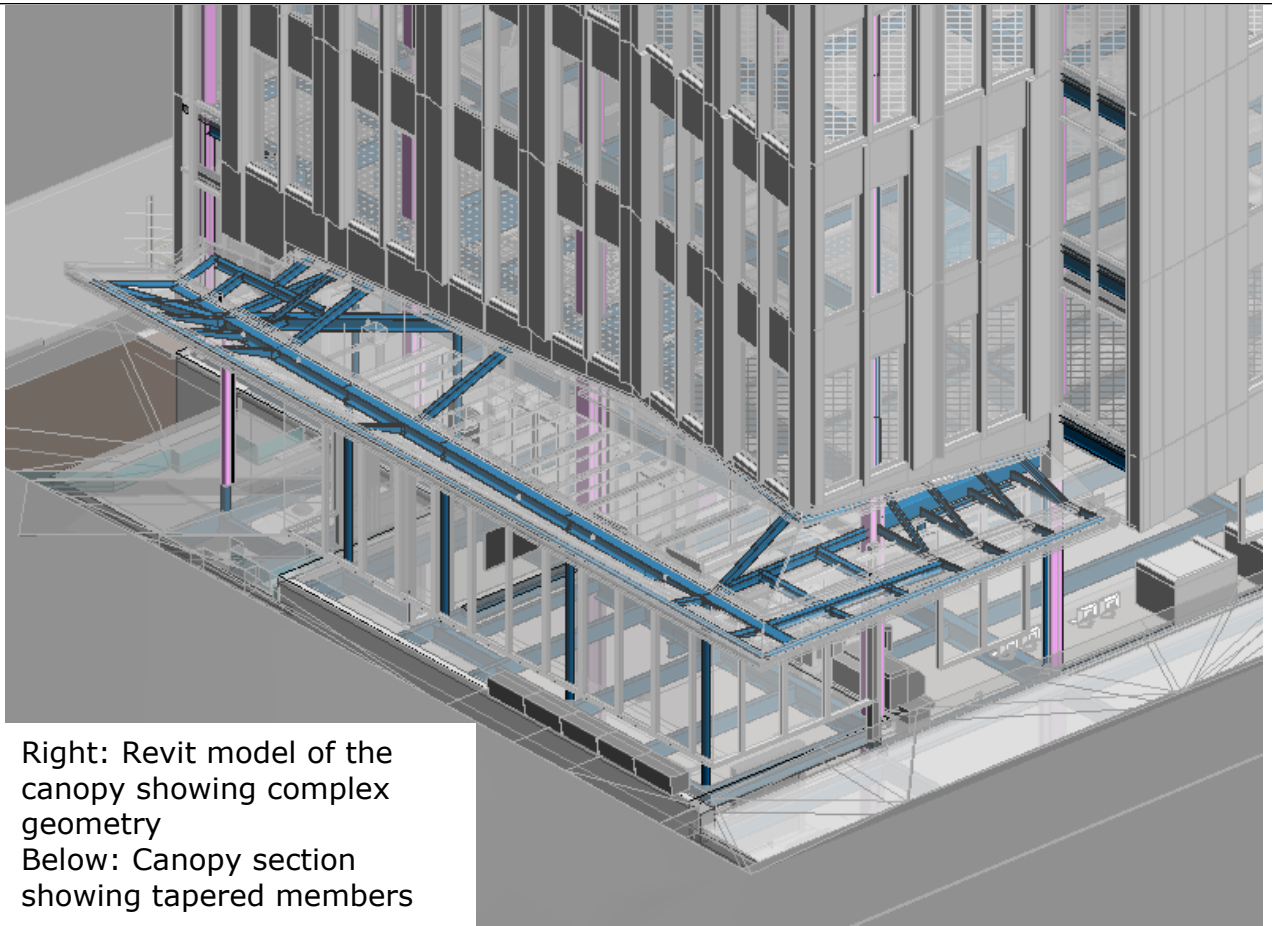


Left: The new 110,000 SF steel framed building houses the Penn State Innovation Hub.

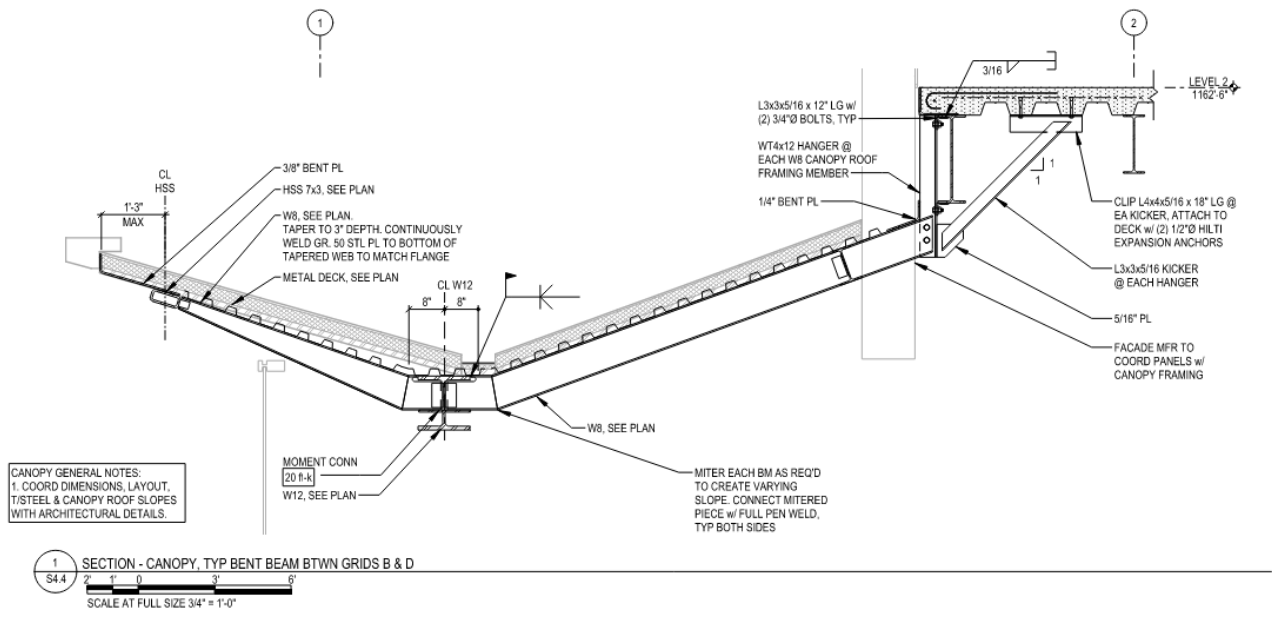


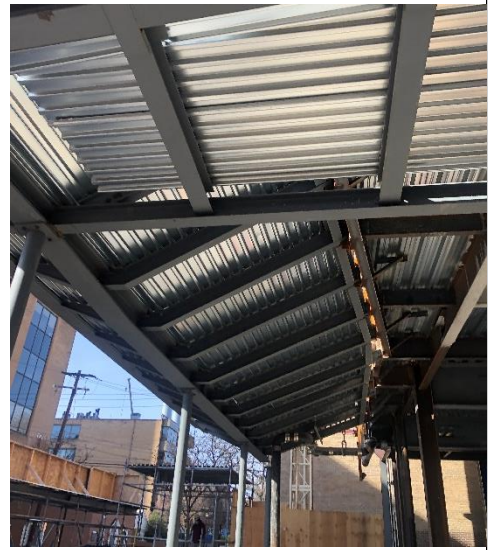
Above: Revit model of the building.
Below: View of the nearly complete building within its tight project site.





Right: Revit model of the canopy showing complex geometry
 Below: Canopy section showing tapered members





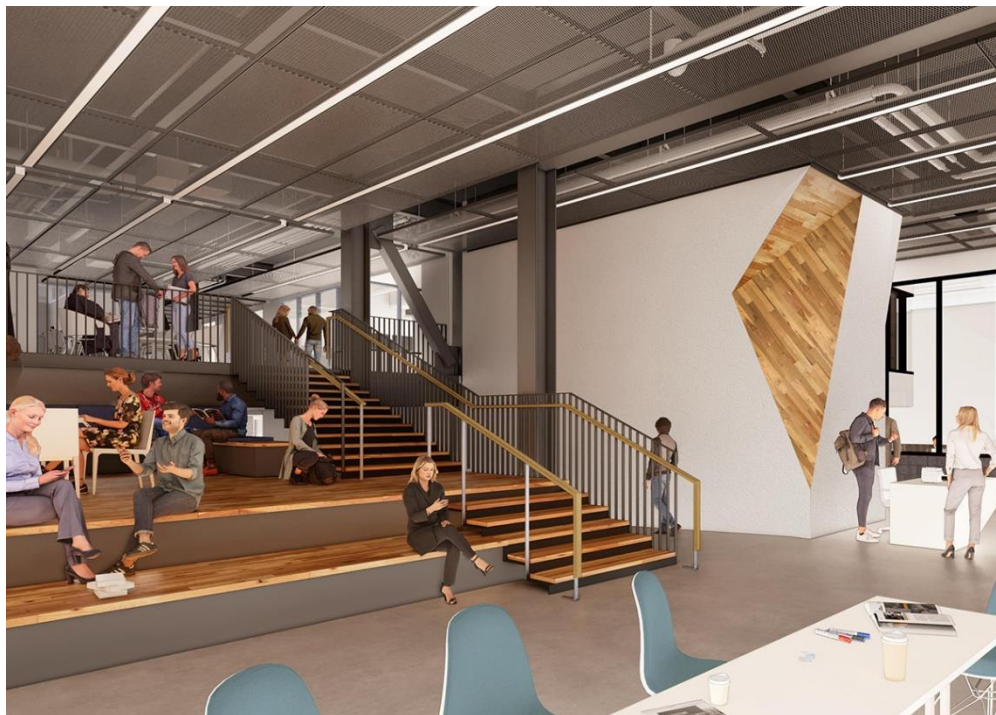
Above Left: Canopy in construction
Above Right: Canopy integration with main building structure



Above Left: Canopy moves from a "v" shaped profile to a more shallow tapered section with over framing
Above Right: Over framing as the canopy turns the corner around the building

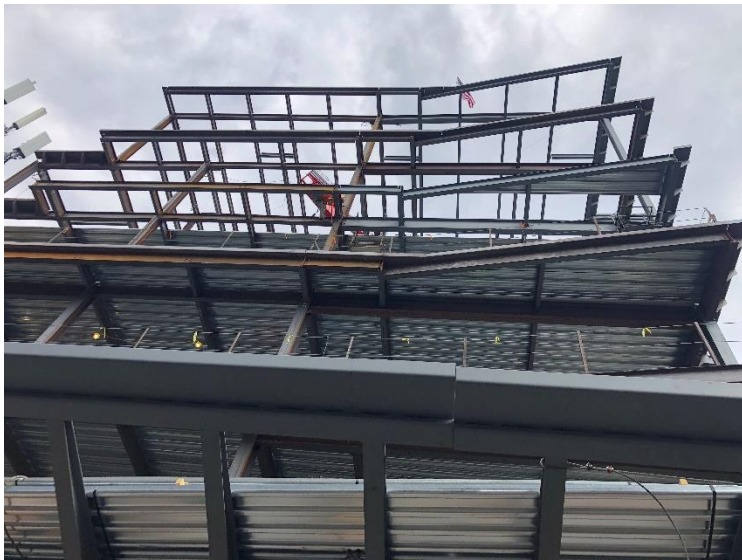


Renderings for the Penn State Innovation Hub showing the variety of uses and large meeting spaces available. The large, two story maker space and statement stair with gathering space. Exposed steel columns were also featured throughout portions of the interior.





The steel framed structure for the new building required close coordination with the façade systems that are angled at the main street 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:

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