ENTRY FORM

DVASE
2022 Excellence in Structural Engineering Awards Program

PROJECT CATEGORY (check one):

Buildings under $5M		Buildings Over $100M	X
Buildings $5M - $15M		Other Structures Under $1M	
Buildings $15M - $40M		Other Structures Over $1M	
Buildings $40M - $100M		Single Family Home	

Approximate construction cost of facility submitted:	Approximately $130 Million
Name of Project:	B. Braun Medical Allentown Expansion
Location of Project:	Allentown, PA
Date construction was completed (M/Y):	Primary structure and shell Aug 2021, Interior Fitout Dec 2022
Structural Design Firm:	Mainstay Engineering Group, Inc.
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	Integrated Project Services, LLC (IPS)
General Contractor:	Alvin H. Butz, Inc.

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.

B. Braun Medical recognized the need for expansion of a medical device production facility to support its planned growth strategy. This need resulted in the client's Allentown, PA campus being chosen for the implementation of a new multi-function manufacturing facility. The approximately 320,000 sq. ft. building incorporates the key manufacturing functions of product extrusion, injection molding and component assembly in a clean GMP environment. In order to serve these important operations, the facility has integrated a new single-story warehouse, a large second story mechanical equipment level, a campus data center, a break room and cafeteria, corporate offices and administrative area, a personnel link to the existing campus facilities and a stand-alone maintenance building.

The project site is situated in an area of karst topography. Additionally, the building's overall height is restricted (65 ft maximum) by its close proximity to an airport. As a result, the floor plan distributed the facility's operations over an area of 210,000 at the ground level and 110,000 sq. ft. on the second and interstitial levels, which intertwine at varying elevations. Due to the length of the floor plate and it's interconnection with existing buildings, two building expansion joints were required.

The foundation system consist of a shallow spread footings system founded upon natural soils and or engineered fill with rammed aggregate pier ground improvements, which nearly doubled the existing soil bearing capacities of the in-situ soils. Due to the karst topography, sinkhole development was a concern, and reality of the project's foundation design and installation. Foundations were designed to absorb the impact of small to moderate diameter void formations. During construction numerous sinkholes developed on the site, and were mitigated with the use of pressure grouting. Two such sub grade voids were large enough that a re-design of portions of the connecting link and warehouse foundations was required and implemented localized concrete mat slabs. The Loading Dock/Mold Shop mat slab combined interior and exterior construction with foundation shear walls at braced bay combined foundations, at a depth of almost 10 feet below finished slab. Additional foundation challenges included the implementation of 20 ft deep depressed pump room within the extrusion space ground floor; which itself has 4ft deep process piping trenches throughout the slab on grade. The warehouse area includes a mat slab for the support of six 80,000 lb. storage tanks, adjacent to the exterior loading dock retaining walls.

The above ground portion of the facility is constructed from traditional wide flange steel framing supporting concrete on metal deck floors, and a metal deck roof. The lateral force resisting system consists of concentrically braced steel frames throughout a majority of the building, with the exception of the curtain wall enclosed connecting link which utilizes steel moment frames.

Multiple exterior cladding elements comprise the building's facade. Vertical insulated metal panels supported by a horizontal hollow section girt system, horizontal insulated metal panels supported by a vertical wide flange steel backup system and curtain walls spanning floor to roof were all incorporated in the design. All metal panel systems were integrated into a stick-built roof parapet system constructed prior to the facade elements. This allowed for installation of the roof prior to enclosing the building envelope

The ground floor Mold Injection manufacturing space wanted to be relatively open. As a result, the design converged on dividing the 136-foot-wide space into two 68 ft wide open bays. This allowed for each bay to be served by an overhead 10-ton capacity gantry crane. The second-floor framing above this space is comprised of a composite floor system consisting of long span deep wide flange beams and concrete on composite metal deck slab and shear studs. The framing in this space included shop applied cambers to limit the overall floor deflection due to the 150 psf live to accommodate mechanical equipment.

Adjacent elevated mechanical floors were supported by traditional concrete slab on metal deck and wide flange beam construction supporting anywhere from 250 psf to 400 psf live loads. The Northwest corner of the building houses three 22 ft high, 55,000lb cooling towers. A 15-foot-high braced steel platform, which was supported by the 2nd floor low roof framing, was created for the support of this equipment. The exposed elevated mechanical space is encased in a perforated steel screen supported on HSS girts which is vertically and horizontally braced to main structure. Due to placement geometry, one intermediate column required a steel buttress for deflection control.

The use of BIM technology played an important part in the overall design and construction processes. The design and construction teams utilized the latest BIM technologies, including Revit, Navisworks, 3D CAD and Bentley analysis software, to design and facilitate interdisciplinary coordination efforts. In addition, the structural analysis models were able to be interwoven with the documentation models which greatly aided the deign / modeling process as well as steel and concrete estimating efforts.

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

Rendering Courtesy of Integrated Project Services, LLC

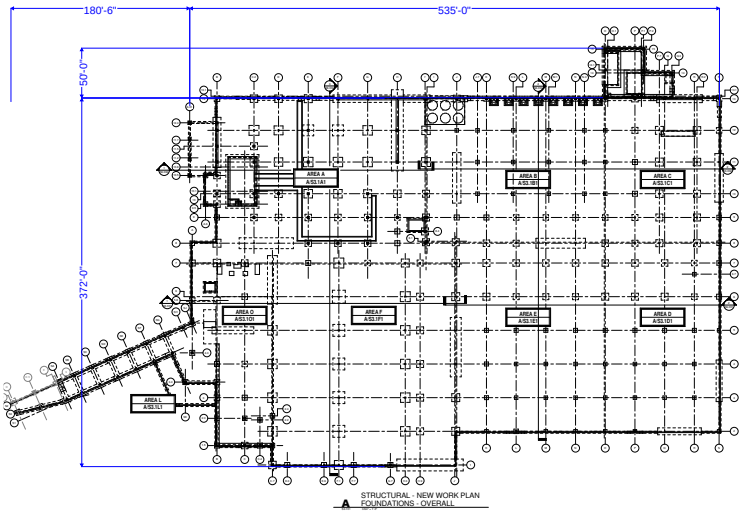
Rendering - Front View - Daytime

Rendering Courtesy of Integrated Project Services, LLC

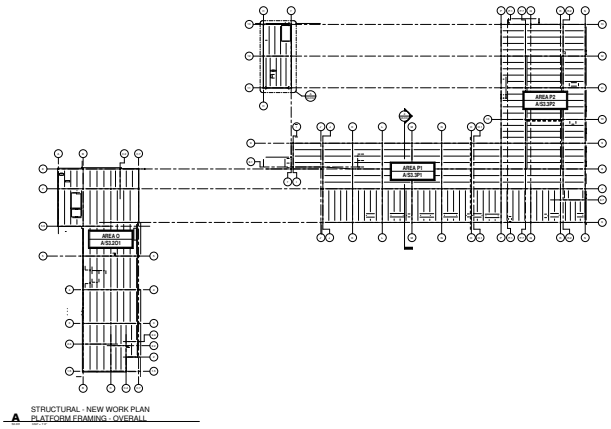
Rendering - Front View - Entrance - Nighttime

Rendering Courtesy of Integrated Project Services, LLC

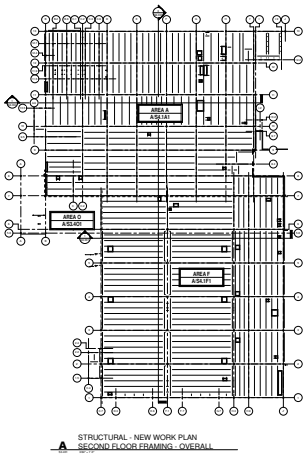
Rendering - Rear View - Nighttime



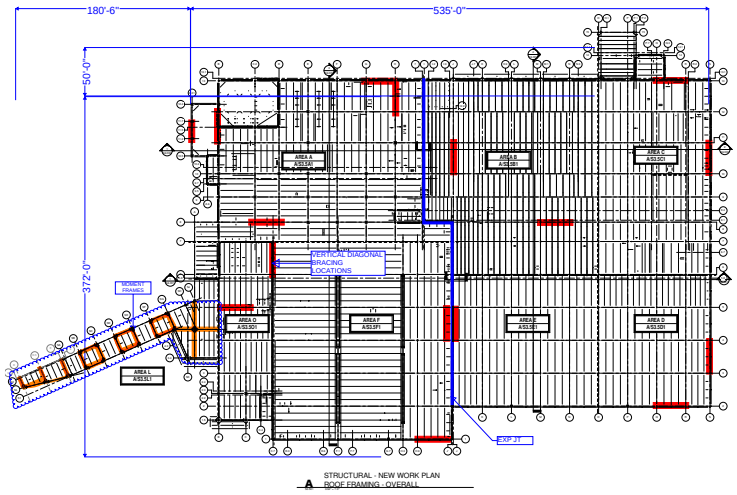
OVERALL
FOUNDATION PLAN



OVERALL PLATFORM
FRAMING PLAN



OVERALL SECOND
FLOOR FRAMING PLAN



OVERALL ROOF
FRAMING PLAN

SITE EXCAVATION VIEW FROM SW CORNER OF BLDG

CONSTRUCTION PROGRESS VIEW FROM SW CORNER OF BLDG

FOUNDATIONS - AREA A
DEPRESSED PUMP ROOM

FOUNDATIONS - AREA A
SLAB ON GRADE PROCESS TRENCHES

FOUNDATIONS - AREA B
PROCESS TANK MAT SLAB

FOUNDATIONS - AREA C
COMBINED FOUNDATIONS - MAT SLAB

CONNECTING LINK
CONSTRUCTION - SE VIEW

CONNECTING LINK
INTERIOR - SW VIEW

AREA F - STEEL CONSTRUCTION
LONG SPAN CRANE BAY 1

AREA F - FIT OUT
LONG SPAN CRANE BAY 1

AREA F - SECOND FLOOR ABV CRANES
COMPOSITE SLAB CONSTRUCTION

AREA B - VIEW TO PLATFORM AND
AREA A MECHANICAL LEVELS

AREA B - STEEL CONSTRUCTION
MECHANICAL PLATFORMS AND ROOF

EXTERIOR VIEW - AREA B
STEEL CONSTRUCTION AND TANKS

EXTERIOR VIEW - AREA A
STEEL CONSTRUCTION

EXTERIOR VIEW - AREA A
ELEVATED DUNNAGE PLATFORM

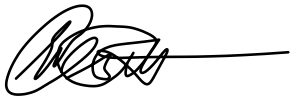
EXTERIOR FACADE CONSTRUCTION
VIEW FROM SE CORNER

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:**
Daniel R Wertz, P.E.		08-APR-2022

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