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	X	Single Family Home	

Approximate construction cost of facility submitted:	$94.75M
Name of Project:	Confidential Client
Location of Project:	Ohio
Date construction was completed (M/Y):	New Building: Jan. 2020 Existing Fitout: Est Dec. 2020
Structural Design Firm:	Mainstay Engineering Group, Inc.
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	IPS - Integrated Project Services, LLC
General Contractor:	Turner Construction Company

Company Logo (insert .jpg in box below)

Mainstay
ENGINEERING GROUP, INC.
CIVIL & STRUCTURAL ENGINEERS
1750 WALTON ROAD, BLUE BELL, PA 19422
215.646.5595 www.megr.com

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 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.

A confidential pharmaceutical manufacturing client required the expansion of their operations across the country to meet their growing product demands. In order to accomplish this the client developed a master plan to expand their operations at select locations across the country. The first phase of this master plan was to increase their pharmaceutical manufacturing and distribution capacity in the Midwest region by constructing a new multi-functional building in conjunction with the renovation of their current facility.

The new 130,000 sf building addition consists of a two story steel framed structure with a one story steel framed corridor connecting it with the existing buildings. The new addition will also incorporate two areas of high bay warehouses. The new structure employs a system of concentrically framed diagonal bracing as the main lateral forces resisting system.

Exterior cladding is comprised of a combination of insulated metal panels supported by steel channel girts, curtain walls and concrete masonry at the loading docks areas. Other features include an 8 ft high cantilevered roof screen around the perimeter of the main roof, a cantilevered L-shaped steel frame supporting the entrance canopy as well as isolated interior stair and elevator structures.

The first floor is comprised of four main spaces: utility, material warehouse, packaging / inspection and (2) finished product warehouses plus cold storage vaults. Housed within the new building is a central utility plant located adjacent to the North warehouse. This two story facility houses heavy equipment on both the slab on grade and second floor. Design challenges posed in this area included designing the first and second floors for heavy industrial floor loading as well as to ensure that equipment vibrations were isolated from the rest of the structure.

The second floor contains two major program components – an office and a lab area, which are interwoven between the north and south high bay warehouses. In addition, an employee cafeteria and lounge area are located between these spaces.

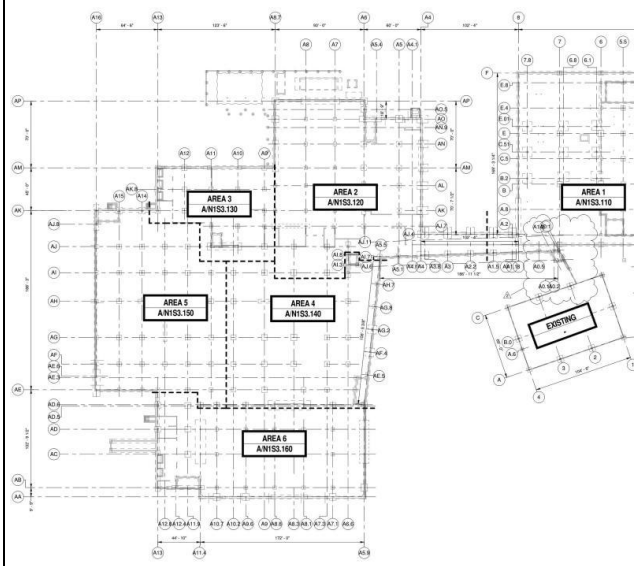
One challenge faced when considering foundation systems was the realization of heavy column and foundation loads supported by unsuitable virgin soils. In order to increase the allowable bearing pressure for the shallow foundation system, ground improvements in the form of rammed aggregate piers were used to increase the site wide bearing pressure from under 3000 psf to 7500 psf. This greatly decreased the sizing of foundations necessary to support the heavy column reactions and slab on grade bearing requirements.

As previously mentioned, the new building houses two finished product warehouses which are 45 ft high and employ a very narrow aisle storage configuration. In order the properly facilitate the laser guided forklift equipment at this height, the slabs on grade in these areas were required to meet floor flatness tolerances of FF=100. This further required specialty design and construction methods to ensure the tolerances were met. The slabs were poured in 15 ft wide x 180 ft strips without transverse cut joints.

The fit-out phase of the existing building will provide clean room and material processing areas. This will include the integration of numerous mechanical and process systems, along with an independently framed dunnage structure situated above the roof to support numerous pieces of mechanical equipment. The new steel framed dunnage consists of a wide flange beam construction with a combination of knee bracing and steel moment frames comprising the lateral force resisting system.

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 softwares, 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…



A OVERALL NEW WORK PLAN - FOUNDATIONS

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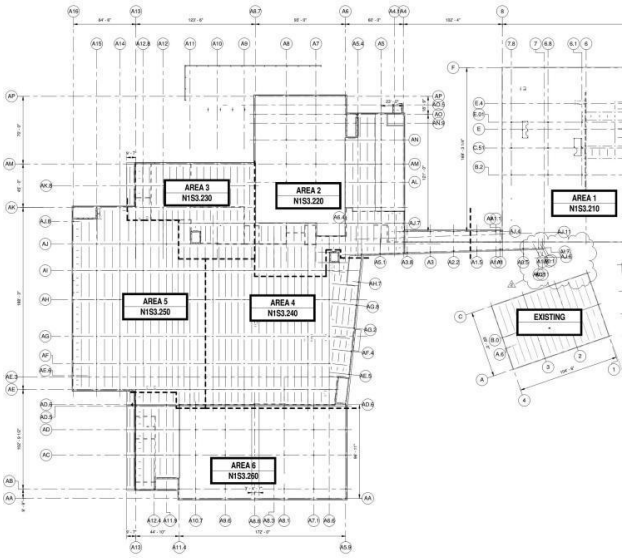

A OVERALL NEW WORK PLAN - SECOND FLOOR FRAMING

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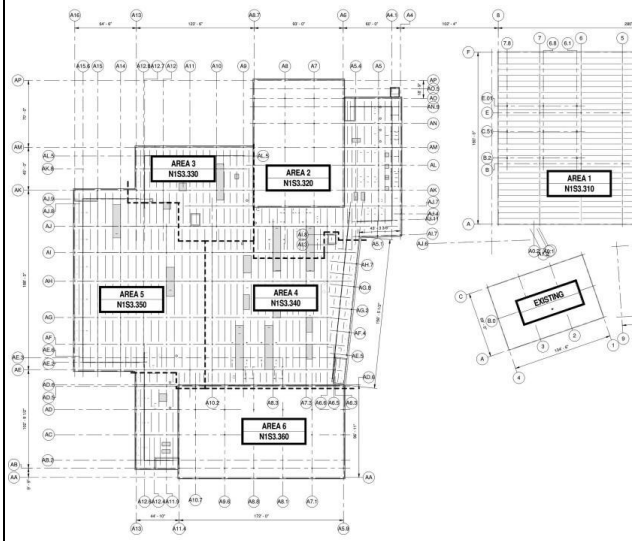

A OVERALL NEW WORK PLAN - MAIN ROOF FRAMING

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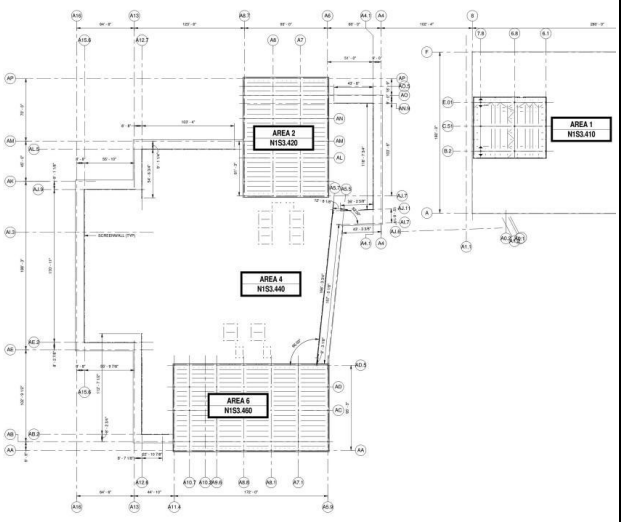
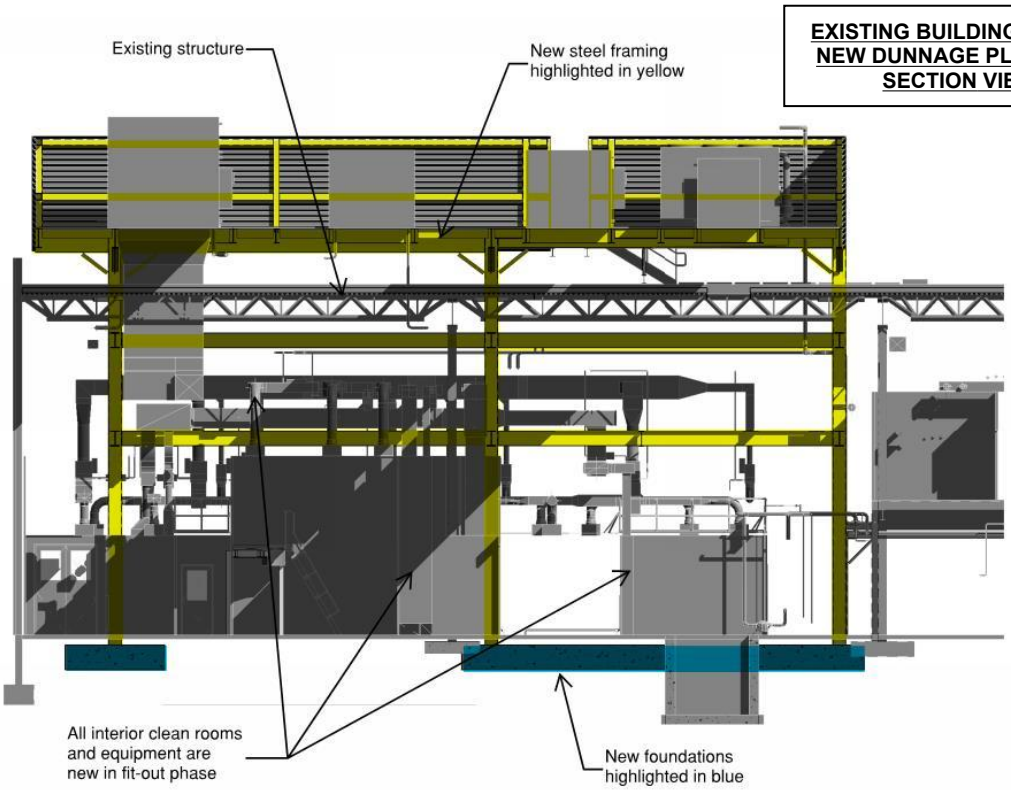


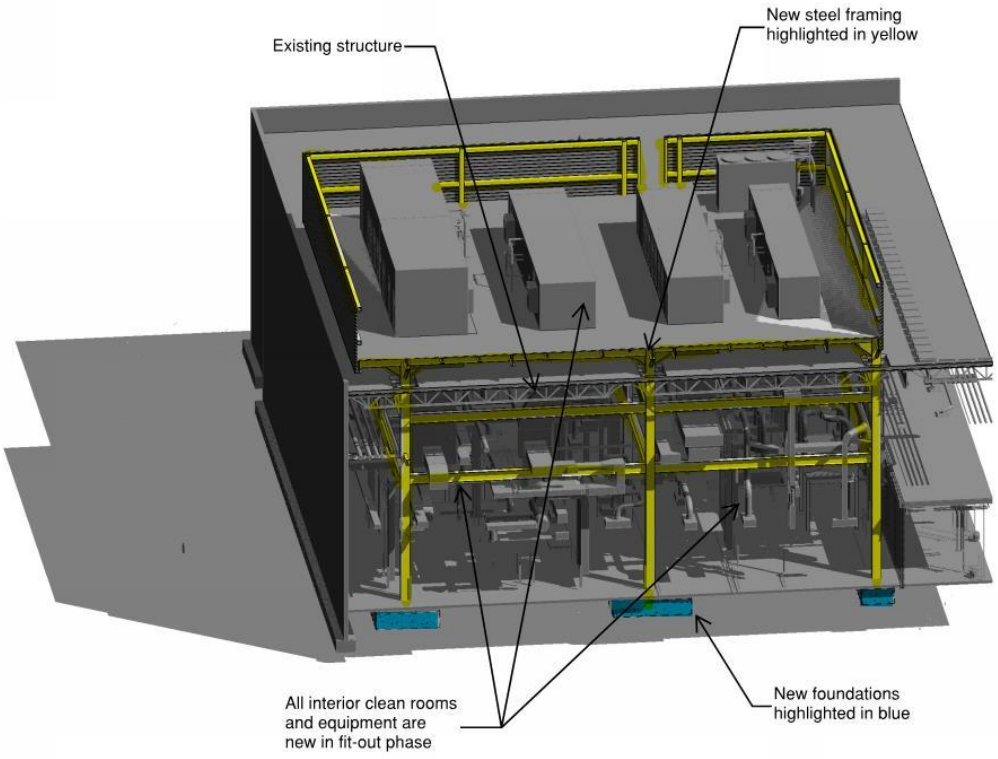
A OVERALL NEW WORK PLAN - HIGH ROOF FRAMING

OVERALL NEW WORK PLAN - HIGH ROOF FRAMING

EXISTING BUILDING FIT-OUT
NEW DUNNAGE PLATFORM
SECTION VIEW



EXISTING BUILDING FIT-OUT
NEW DUNNAGE PLATFORM
ISOMETRIC VIEW



NEW BUILDING - FOUNDATION CONSTRUCTION

NEW BUILDING - FOUNDATION AND STEEL CONSTRUCTION

NEW BUILDING - STEEL CONSTRUCTION

NEW BUILDING - STEEL CONSTRUCTION

NEW BUILDING - COMPLETED CONSTRUCTION

OVERALL SITE LAYOUT

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:**
Justin T. Ruby, P.E.		05/26/20

Submitting Firm:	Mainstay Engineering Group, Inc.	
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Telephone: 215-646-5595	**Fax:**	**Email:** jruby@megr.com