Mainstay
ENGINEERING GROUP, INC.

CONFIDENTIAL MEDICAL DEVICE CLIENT NEW CONTACT LENS MANUFACTURING

Prepared for: DVASE

2017 Excellence in Structural Engineering Awards Program

04.10.17

Corporate Headquarters
212 N. Main Street, Suite 300
North Wales, PA 19454
(P) 215-646-5595
(F) 215-857-0540

New Jersey Office
1415 Marlton Pike East, Suite 312
Cherry Hill, NJ 08034
(P) 732-868-8636
(F) 732-868-8638

PHARMACEUTICAL/BIOPHARMACEUTICAL
EDUCATION
COMMERCIAL/RETAIL
REFINERY/PETROCHEMICAL
HEALTHCARE
GOVERNMENT/MILITARY
MANUFACTURING/WAREHOUSING

CIVIL ENGINEERING | STRUCTURAL ENGINEERING | PROJECT MANAGEMENT

ENTRY FORM

DVASE
2017 Excellence in Structural Engineering Awards Program

PROJECT CATEGORY (check one):

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

Approximate construction cost of facility submitted:	$45,600,000.00
Name of Project:	Confidential Medical Device Client Pegasus New Contact Lens Manufacturing
Location of Project:	Northeast, USA
Date construction was completed (M/Y):	06/2016
Structural Design Firm:	Mainstay Engineering Group, Inc.
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	Genesis
General Contractor:	LeChase Construction Services, Inc.

Company Logo (insert .jpg in box below)

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.

A Confidential Medical Device Client had projected a need to expand its contact lens manufacturing capabilities due to its growth in the market and their development of a new contact lens. Their current manufacturing facility, in the Northeast, was identified as the most economical and feasible site to house this expansion. The $45 million dollar project included the renovation of the existing two-story 700,000 SF reinforced concrete building. Renovations involved a dock addition, two minor and one major screened utility yards, a stair tower addition, and an indoor tank farm with an access platform and truck containment area. The project was designed and constructed in phases with design starting in early 2014 and completion of construction in mid 2016.

An economically feasible solution was provided to minimize disruption of the operational facility and helped reduce the construction time frame so that the phasing approach would allow for earlier validation and implementation of each production line. The project scope included modifications to the slab-on-grade including depressions and sump pits for equipment installation, cut and infill of the elevated slab, roof reinforcing for HVAC curb mounted equipment, screened mechanical equipment yards, a new stair tower and a dock addition. Additional scope included the renovation of an additional building on the site which included the partial demolition of the second floor for the installation of large storage tanks with an access platform and hoists, interior containment areas and exterior delivery truck containment.

The existing current manufacturing building is a two-story plus penthouse structure, approximately 67 years old, which was previously occupied by a clothing manufacturer. The construction is a reinforced concrete structure with two-way flat slabs, round concrete columns with capitals and shear drop panels, and 24’-6” by 25’-x6” typical bays. The foundations consist of grade beams supported on piles. The building perimeter and exterior enclosure consists of reinforced concrete beams supporting masonry and windows. Complete sets of structural documents were not available for the buildings.

The building renovations were a challenge due to the clients desire to not interrupt current manufacturing operations in adjacent areas. The column bay spacing was a challenge to the layout particularly for the equipment which required slab depressions and pits. The design team was able to maximize the interior space fit-out and minimize the conflicts with the building foundations where pits and depressions were required. Elevated level scope, including new slab opening reinforcing and infill were kept to a minimum in order to limit disruption below.

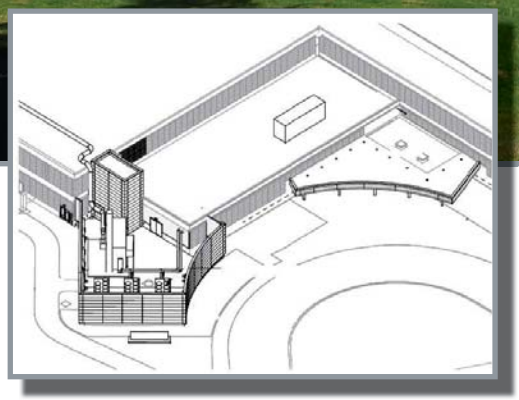
The project production line layout was developed to maximize manufacturing space which resulted in the need for additional space for storage, shipping, chemical storage, and mechanical equipment. A 12,000 SF single-story high bay steel structure addition was located where a smaller lean-to dock was demolished. The dock was designed using steel joist girders and joist infill framing supporting a light weight concrete roof and a combination of reinforced concrete grade beams. Perimeter reverse retaining wall foundations were determined to be the most economical construction that allowed for large open flexible space. There were numerous dock areas with dock levelers and one on-grade drive-in garage area. The concrete roof and special joist designs were required due to the extensive snow loads and snow drifts for this area.

Mechanical equipment needed to support the manufacturing process was relocated outdoors in utility yards. Equipment was supported on concrete piers and dunnage framing or on concrete equipment pads. The utility yards were screened with metal panels that were supported by steel framing and drilled piers. The large utility yard was located in the proximity of the last manufacturing line which unfortunately was next to the main front entry of the building. In order to maintain the visual aesthetics of the entry and to reduce the acoustics of the equipment from the yard the screen wall was designed using reinforced concrete retaining wall foundations, masonry walls and piers which supported metal panel and sound absorbing acoustical panels. A new masonry bearing wall egress stair tower addition to the main building, located within the large utility yard, was required since the interior stair was demolished and the floor area infilled in order to maximize manufacturing space.

Due to the manufacturing process requiring the use of large quantities of chemicals, a small, vacant, two-story steel framed building on site, adjacent to the main manufacturing building, was determined to be a feasible location to house the large tanks. Furthermore, this site had ample exterior access and area to provide a full size tanker truck containment delivery location. A partial area of the second floor was demolished to allow the installation of the tanks on concrete pads inside a concrete containment area. Access to the tanks was provided by an independent steel framed, fiberglass grated platform with hoist beams above the tank access ports.

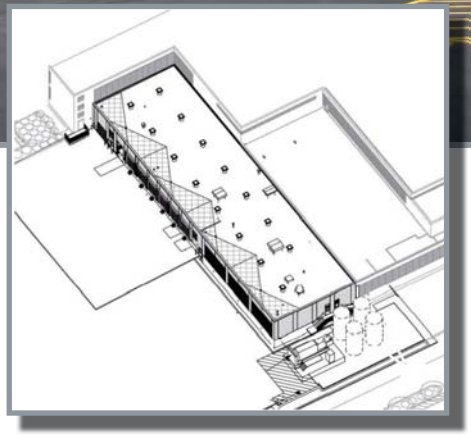
CONFIDENTIAL MEDICAL DEVICE CLIENT | NEW CONTACT LENS MANUFACTURING

COMPLETED | UTILITY YARD & ENTRY



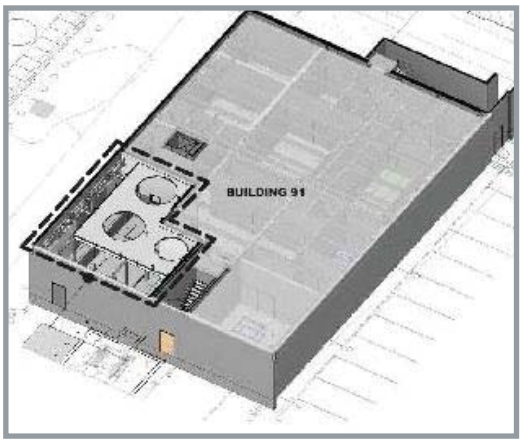
3D RENDERING

COMPLETED | DOCK ADDITION

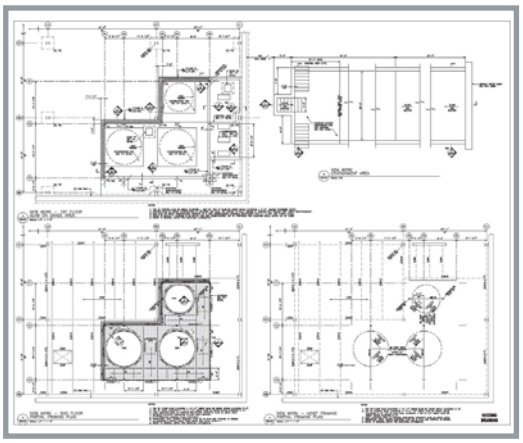


3D RENDERING

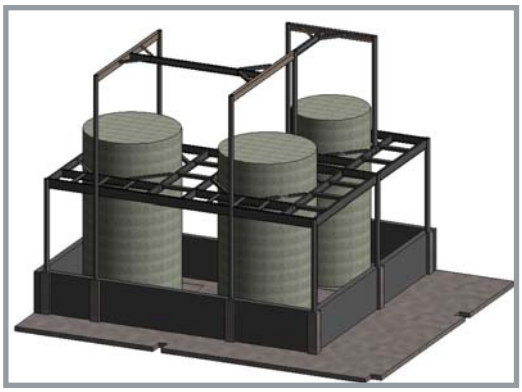
CHEMICAL STORAGE ACCESS PLATFORM



ARCHITECTURAL RENDERING



STRUCTURAL DRAWING



STRUCTURAL RENDERING

PLATFORM FRAMING

PLATFORM FRAMING

PLATFORM DECK

INTERIOR CONTAINMENT AREA

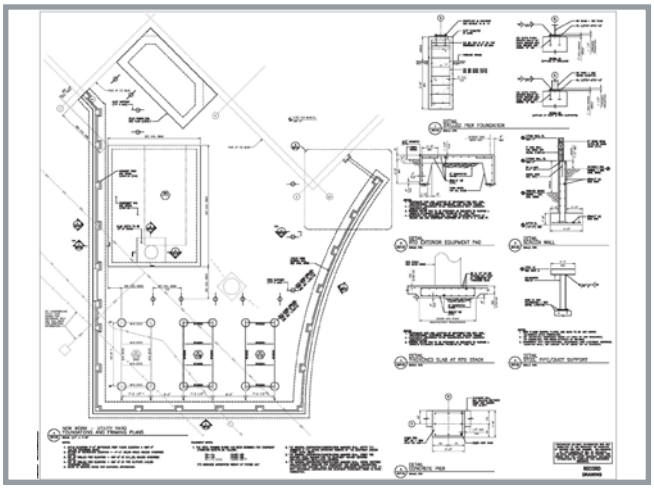
TRUCK CONTAINMENT AREA

CONFIDENTIAL MEDICAL DEVICE CLIENT | NEW CONTACT LENS MANUFACTURING

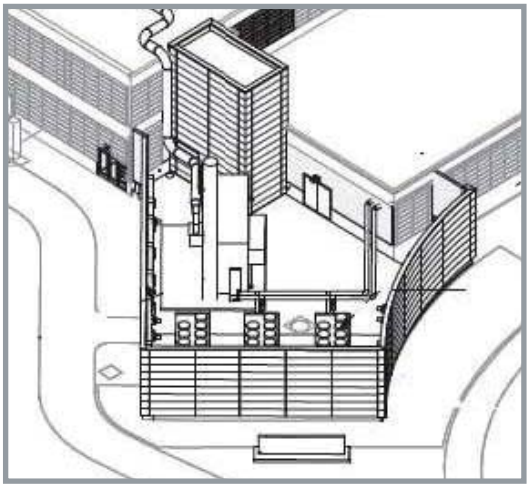
BEFORE CONSTRUCTION | UTILITY YARD & ENTRY

PROPOSED UTILITY YARD AREA

FRONT ENTRY



STRUCTURAL DOCUMENT



ARCHITECTURAL UTILITY YARD & STAIR RENDERING

DURING CONSTRUCTION

SCREEN WALL FOUNDATIONS

SCREEN WALL CONSTRUCTION

EQUIPMENT FOUNDATIONS

CONFIDENTIAL MEDICAL DEVICE CLIENT | NEW CONTACT LENS MANUFACTURING

DURING CONSTRUCTION | UTILITY YARD & ENTRY CONT.

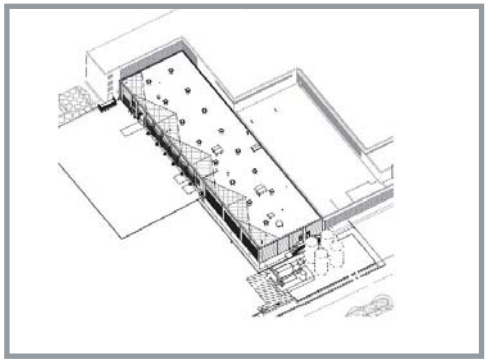
STAIR TOWER

AFTER CONSTRUCTION | UTILITY YARD & ENTRY

NEW UTILITY YARD & ENTRY

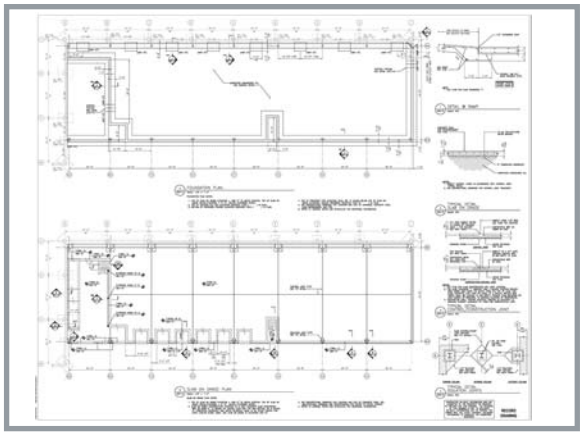
BEFORE CONSTRUCTION | DOCK ADDITION

PROPOSED DOCK ADDITION AREA

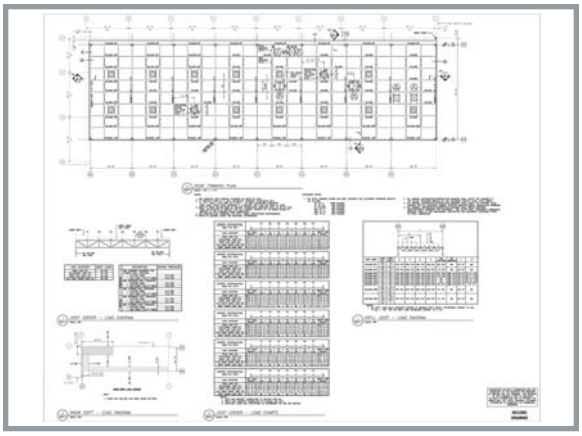


ARCHITECTURAL DOCK ADDITION RENDERING

STRUCTURAL RENDERING



STRUCTURAL DOCUMENT 1



STRUCTURAL DOCUMENT 2

DURING CONSTRUCTION | DOCK ADDITION

FOUNDATIONS

REVERSE RETAINING WALL FOUNDATIONS

STEEL FRAME

STEEL FRAME

STEEL FRAME

STEEL FRAME

AFTER CONSTRUCTION | DOCK ADDITION

DOCK ADDITION

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:**
Pamela Assenmacher		04.10.17

Submitting Firm:	Mainstay Engineering Group, Inc.	
Mailing address:	212 North Main Street, Suite 300, North Wales, PA 19454	
Telephone:	**Fax:**	**Email:**
215-646-5595 x105	215-857-0540	passenmacher@megr.com