

900 Series Reactor Expansion Project

CLIENT: CONFIDENTIAL
MARKET: Consumer Goods
LOCATION: Mill Hall, PA
TAI SERVICES: • Project Management • Structural Engineering
• Building Mechanical Engineering • Process Mechanical Engineering
• Electrical Engineering • Construction Management and Start-Up Support
• Automation, Instrumentation and Process Controls • Engineering, Design and Bid Solicitation Services
COMPLETED: 2022
VALUE CLASS: <\$1.5 MM (Engineering) ; \$10 MM Total

ABOUT: *The Client is a materials science and manufacturing company specializing in the design and manufacture of a wide variety of labeling and functional materials. Their expertise and global scale enable them to deliver innovative, sustainable and intelligent solutions to customers all over the world.*

CHALLENGE

The Client wanted to add an additional production line to include multiple tanks, exchangers, pumps and ancillary equipment requiring a new stand-alone two story process building (95' by 80'). The client also needed to add a 500 sq. ft. addition to an existing bulk storage tank building to house pumps, piping and foundations for up to seven, 20,000-gallon storage tanks. The planned site for the new process building required the relocation of underground utilities for multiple electric lines, a fire water line, a potable water line, and a local stormwater drain line. In addition to the utility modifications, a 120' truss enclosed pipe bridge was needed between the new production building and the bulk storage building addition.

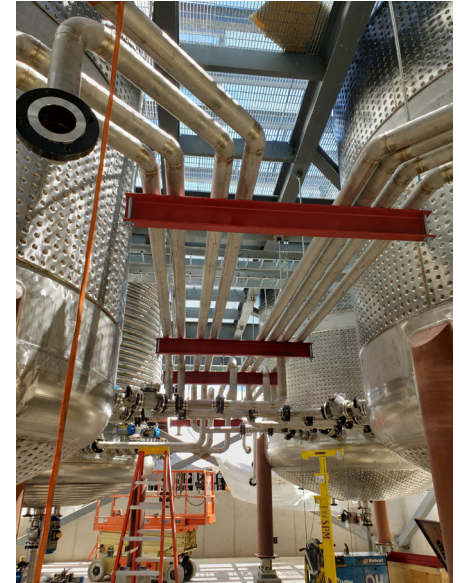
Design challenges included the facility location in a flood zone, a predefined maximum allowable footprint, two-phase relief design, processing and transfer of high viscosity materials and during construction the identification of contaminated soils.

SOLUTION

TAI delivered design, engineering and construction services to the client that included the following:

NEW PROCESS BUILDING:

- Finished floor elevations for the non-process areas above the flood zone with temporary flood panels used for the openings into the production area.
- Process equipment including a 12,000-gallon reactor and associated processing train consisting of 13 process tanks, heat exchangers, filters and pumps.
- Reserving space for and designing building features for installation for a future 12,000-gallon reactor, additional tanks, pumps, filters and heat exchangers.
- 2-Story Non-Process section of the building to house a control room; Restrooms, Server room, Utility Room and an Electrical room.
- A -lift elevator for moving bulk materials between floors.



- A roof-mounted cooling tower dedicated to this building and tied into the existing cooling water system for back-up services.
- The building designation is H2/H3 building.
- Process area to include electrically classified areas Class 1, Div. 1 and Div. 2.
- The building was designed to incorporate damage-limiting construction. One wall was designed for blowout panels.
- The production floor was universally designed to handle all initial and future foundation loads. A large slab design also addressed the potential buoyancy during plant flooding.
- A wet sprinkler system that utilizes existing fire water supply and a foam dosing system.
- Building pressurization was designed for non-production areas to be higher pressure than the production areas of the building.
- Ventilation systems for the office space and for both normal and emergency ventilation in the process area.

BULK STORAGE BUILDING AND PIPE BRIDGE

Pre-engineered building expansion

- Foundations, catwalk, pumps, filters and bulk storage tank building with foundations for up to seven 20,000-gallon storage tanks. Three storage tanks are installed in the building, initially with space and installation accommodation for the installation of four additional tanks in the future.
- 120' Truss pipe bridge that includes an insulated enclosure and electric heaters for winterization.

RESULTS

TAI supported this project by providing comprehensive project management, engineering, and design for the development of detailed design documents for three new buildings, with process equipment, supporting utilities, and maintenance activities to accommodate an expansion.