

# ENGINEERING TIMES

## Engineering Tidbits:

- FEMA requires an 18" separation between the 100- year flood elevation and the finished floor of new construction.
- The City of Philadelphia requires special inspections of all projects requiring structural design.
- The NPDES application has been updated to impact all sites greater than 1 acre of disturbance.

## Milestones:

- Dumack Engineering has been retained by Boise Cascade to assist in their support of the "All-Joist" product lines across the United States.
- The employees of Dumack Engineering have collective licensure in 29 states across the United States & Quebec province of Canada.
- Our office recently relocated to Penns Park, PA from Levittown, PA.

## DUMACK ENGINEERING, P.C.

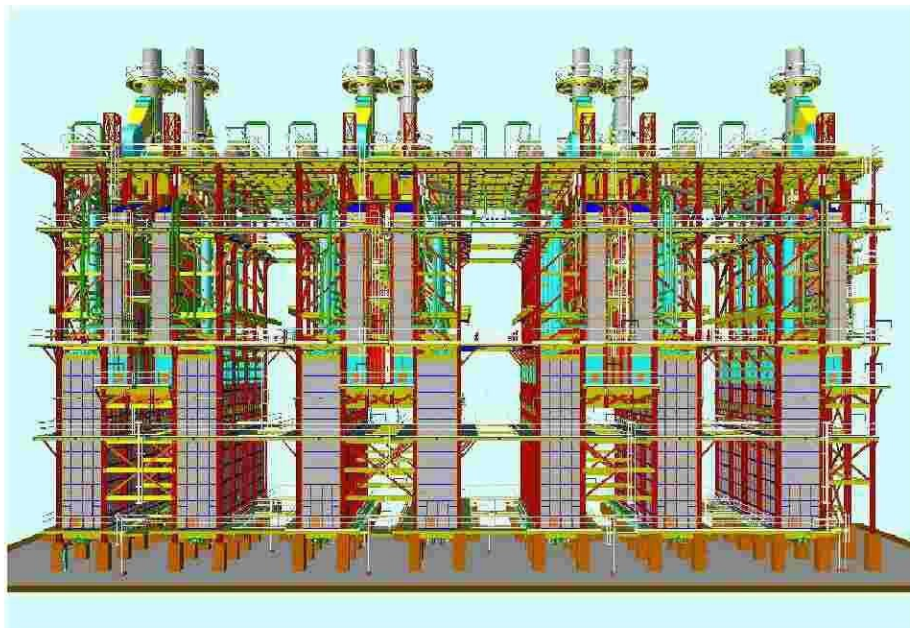
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## SELAS FLUID—FURNACE RETROFIT

### Studies to retrofit existing furnaces bear fruit



Selas Fluid Processing Corporation brought in Dumack Engineering, P.C. to assist in the rehabilitation of a processing plant located in Kerteh, Malaysia. The plant management wanted to develop a more efficient system for removing 42 foot tall radiant coils from their ethylene cracking furnaces. The coils are grouped in bunches, with four bunches per furnace, encompassing seven furnaces. The coil groups weigh four thousand pounds each. The furnaces themselves are about 56 feet by 46 feet and 102 feet tall, framed with rigid steel frames and steel diaphragm wall panels to contend with large lateral loads.

The removal of the coils from the furnace required revisions to the steel structures as well as the creation of removable sections of wall panels, platforms, and railings. To determine the feasibility, Dumack Engineering created 3-D computer models of the coils and furnaces. These models illustrated different modifications to the furnaces, which would be required. Analysis and design of the steel structure was completed for each study. Three possible modifications were developed.

One system included the expansion of an access door, which required the modification of structural panels to accom-

modate the new opening. A second scenario involved the removal of beams in the structural floor. The floor had to be modified to create removable sections that would allow the coil groups to pass through the floor system. The final study incorporated trolley beam intended to carry the coils through a side panel. The entire side wall diaphragm needed to be redesigned to incorporate a removable wall panel that needed to be approximately 5 feet wide by 44 feet tall. A braced trolley rail system was also designed to transport the coil groups in and out of the furnace.