

A Better Way to Build

Design. Bid. Build. For years, it's been the process industry's standard in construction projects. But, the earliest stages of a conventional design/bid/build (D/B/B) approach can be risky for process manufacturers. Plant designs generally are finalized at an early stage by engineering firms or on-staff engineers.

Oftentimes, the design does not cover the project's entire scope from the perspective of the owner's process needs. A holistic understanding of the owner's process needs is the key to creating the best, most-economical and constructible design for the new process-driven project in question.

It's time to re-examine how the process industry constructs and upgrades facilities. Maybe design/bid/build isn't the answer. Maybe traditional isn't the most effective delivery method. Maybe it's time to think differently and consider an integrated design-build approach focused on process-driven construction.

That's where the concept of process-driven design/build, such as Rudolph Libbe Group's GEM Process Solutions (GPS), comes in. GEM Inc., a member of RLG, is a specialty contractor with deep process design/build experience.

The process-driven design/build approach gives customers a single point of contact and a holistic viewpoint of the entire project from start to finish. Design/Build specialists either self-perform or manage sub-contractors, identifying potential design and construction roadblocks before they become costly problems and keep the job on time and on budget.



“ **This delivery method optimizes both design and construction for industrial process projects in a way that saves time and money,”** notes Brandon Gartee, business development manager for GPS. **“All aspects of this approach revolve around the owner's process needs.”** ”

UPFRONT PROBLEM SOLVING

The design/build method helps process manufacturers avoid some of the 'traps' of traditional D/B/B. For example, inaccurate budgeting can come from overlooking the specific process, or from minimal contractor input early in the preconstruction phase where opportunities for savings are the greatest. The design could be for a building that is too large or too small or lacks the proper infrastructure to support the process, causing delays and cost overruns.

The design-build approach optimizes communication among all the project stakeholders. It brings everyone involved in the planning, design and preconstruction together earlier rather than later.



Each member of the preconstruction team—which includes the owner, architect, engineers and design/build contractor—considers the following key questions to help optimize the project:

- › Can the existing process continue running throughout construction?
- › What sort of space profile and footprint does the building need to accommodate the process?
- › Can utility and other building infrastructure costs be minimized in the new design?
- › Does the design meet the owner’s process goals from the standpoint of budget, schedule and constructability? Or, are there better options?
- › Can building materials costs for process operations be reduced?

In a design-build model, the client, engineering firm, architect and contractor work together to identify project scope and needs. **They identify and discuss upfront any critical design changes needed to prevent or correct potential problems before they become “baked in” to the design. This communication mitigates the high risk of cost overruns and construction delays before they happen.**

“**By challenging design assumptions from the start, the GPS team generates savings by optimizing the project to fit the owner’s individual process,” Gartee says. “We differentiate ourselves by focusing on our owner needs and process goals. Everything else about the design evolves from there.**”



Such was the case when GEM partnered with an auto-battery-manufacturing plant in Holland, Ohio. **The company wanted to increase its production capacity for automotive Absorbent Glass Mat (AGM) batteries.** Doing so required a multi-phase construction project. The project required a new processing tower with relocation of the existing battery line as well as an oxide-phase expansion which included installation of new equipment.

The GPS specialists knew a traditional construction method wasn’t going to work. The design needed to be created around the customer’s process. Using GPS, the team worked together in careful preconstruction planning. They also adapted as equipment delivery issues arose – a key factor to the project being completed on time.

By working closely with the customer and tailoring the project to its process requirements, GEM helped the company increase production capacity to six million automotive AGM batteries at this facility. It was the first plant in North America to make them. Since then, the company has worked with GEM on oxide additions at two other plants located in Delaware and Missouri.



“It was a complex, schedule-driven project,” Gartee says. “Design/build was the best solution. By working exclusively with our team to get the project completed, they were able to realize the true value of GPS.”

STREAMLINED DESIGN/BUILD

In the traditional D/B/B process, architects and engineers complete 100 percent of the design before sending the project out to bid. Not until all bids are secured does construction start. This could result in months of potential lost production capability for plant owners, negatively affecting ROI and revenue.

The design/build approach breaks away from that. It helps process manufacturers start construction much earlier—before the design phase even is complete. This gets a production line back up and running and generating revenue months sooner—on time and on budget. And with the GPS solution, the customer gets a “Guaranteed Maximum Price (GMP).”

A GMP on process design/build projects enables owners to make informed decisions that satisfy cost, schedule and performance all at the same time.

In fact, a study from the Construction Industry Institute (CII) and Penn State, Comparison of U.S. Project Delivery Systems, examined 351 different projects in 37 states. Results showed that design/build programs, such as GPS, offered clients 6.1 percent lower costs than D/B/B. Construction and delivery speeds were 12 percent and 33.5 percent faster, respectively.



At Whirlpool Corp.'s Findlay, Ohio, dishwasher-manufacturing plant, company officials decided to add higher-efficiency cooling towers and pumps to help the plant increase control of utilities during high- and low-usage days.

GEM was consulted when the bids for the initial design came back too high. By using its GPS system, GEM specialists helped Whirlpool and its engineers reevaluate ways to make design more affordable and meet the facility's cooling capacity needs.

By reviewing the plant's daily process needs and the efficiency and location of the old cooling tower and pumps, GPS specialists worked with the customer to come up with new location possibilities which enabled the project to go forward and also provide for future expansion needs.



This process helped Whirlpool determine it could avoid undertaking major demolition for a new addition. They instead implemented a solution involving minimal demolition and construction. The final GMP fell below the original construction bid while still meeting the customer's process needs.

Whirlpool ultimately saved more than \$1.5 million using GPS. Because the project was completed under-budget, the company was able to purchase and fund new variable-frequency drives for all pump motors and also funded other plant projects.

The design-build delivery method also benefitted a food-grade powder processing facility in Defiance, Ohio. **Plant officials quickly learned how timely such an approach can be when it sought to add a processing line to accommodate a critical new product launch. The client required a short construction timeline based on its customer's market-driven schedule.**

The project's complex design, planning and equipment installation needs, if not handled expertly, could have easily thrown off the fast-track timeline. Delays were non-negotiable. Too often, in traditional D/B/B situations, completion delays can be inevitable because construction cannot start until design is 100 percent complete.

After an initial assessment, the client's engineering firm recommended GEM and the GPS design/build approach. With GPS, GEM is the single point of contact on any construction project. The team applied its preconstruction and on-site project management experience to minimize or eliminate delays.



We work upfront with our customers to minimize downtime allowing them to run as long as possible," Gartee says. "Our team is part of the conversation before the first drawing is done to ensure customers are able to operate at as full capacity as possible throughout construction.



GEM served as primary project manager assisting with design. These services provided by RLG companies included civil and sitework, structural steel erection, masonry, mechanical, machinery installation, electrical and mechanical insulation.

GPS specialists also tailored all work to the client's process needs and had on-site field managers who addressed challenges as they arose. In the end, they completed the project on schedule and on budget in roughly 10 months.

While design/bid/build remains a traditional delivery method, design-build continues to gain a stronghold in process manufacturing construction. Design-build specialists help clients understand every step in the construction timetable, while keeping a keen eye on the budget. They achieve this by delineating every aspect of the project before the design begins, from process needs to responsibilities and outlines of deliverables.



GPS is much more efficient than traditional design/bid/build," Gartee stresses. "Collaboration and transparency are key to project success. Starting early with the owner and considering the process needs first before the design is completed, enables construction to begin much earlier, getting production and revenue online much sooner.



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