ZAP

Engineering & Construction Services, Inc.

CEMENT PLANT ENGINEERING

ENGINEERING SERVICES

Process • Mechanical • Structural • Electrical • Instrumentation • Controls • Civil

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ZAP Engineering is a full-service engineering company with a focus on providing high-quality, efficient, and timely engineering services to exceed our clients' expectations.

Experience

ZAP's focus on project solutions provides great value to our clients while considering safety and operability top priorities. Our core cement design team has worked in cement as production managers, process engineers, and project managers, so we know from experience what is necessary to have a safe, environmentally friendly, reliable and cost-competitive cement operation. Members of our team have had successful careers working for some of the top cement producers in the country. In these positions we have taken the late-night calls when the plant is down, we have helped our companies achieve NESHAP compliance, we have developed and managed budgets, and we have lead the teams necessary for a successful operation.

While working for cement producers, along with managing day-to-day operations, our team members successfully completed projects ranging in size from small yearly capital projects up to kiln line expansions, import terminals, and finish mill additions. As ZAP, we are focused on the full execution of small to medium size projects and balance-of-plant engineering for all sizes of projects. We have the capability and experience to provide process, mechanical, structural, civil, electrical, and controls design and engineering for cement manufacturing and distribution.

Efficiency & Quality

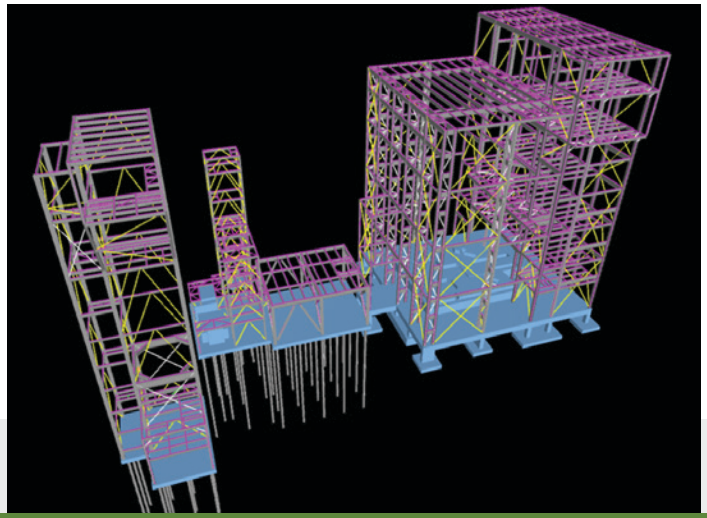
ZAP has the right size team to be able to execute a wide range of projects. We have enough man power to tackle large capital projects, yet are still small enough to efficiently execute smaller projects, meet tight deadlines, and change direction quickly when necessary. We emphasize efficiency and quality on every project and are always looking for ways to continually improve in these categories. Our culture allows us to execute projects at a lower cost while still producing the highest quality of designs.

Constructability

Engineering typically ranges from 5-10% of the total project cost. Our focus is to save our clients cost not only in engineering but also minimize the cost impact of our designs on the remaining work. We emphasize engineering with construction in mind and try to reduce construction costs as much as possible throughout our designs.

Relationships

The majority of our business comes from repeat clients. We pride ourselves on our ability to understand our clients' priorities and create a win-win partnership for all parties involved. The ZAP culture embraces a collaborative design process, with cooperative design reviews involving all project stakeholders to ensure a successful project.



Engineering Services

Process

ZAP has experience in processing cement from the quarry through the terminal. Our experience includes hands on, daily in-plant experience as well as detailed design. We have the ability to evaluate and audit process systems focusing on reliability, optimization, energy reduction, and emissions reduction.

Mechanical

ZAP's mechanical department has the ability to size and specify equipment including belt conveyors, bucket elevators, air gravity conveyors, screw conveyors, pneumatic conveying, material loading and unloading, dust collection, and HVAC equipment. ZAP utilizes 3D modeling for equipment layout and design including design of ductwork and chutes.

Structural

ZAP's Structural Department possesses extensive experience with industrial projects ranging in size from simple monorails to entire facility designs. Our engineers use RISA finite element software combined with ZAP proprietary programs to efficiently and accurately design all required structural components. Our construction background allows us to visualize how the structures are erected so we can tailor our designs for construction and reduce the overall cost of a project.

Electrical

ZAP's electrical department can handle projects from the substation throughout the power distribution in the plant. ZAP has the capability to complete substation design, transformer sizing, PDC/MCC specification and sizing, and wire and conduit routing to the end users. ZAP utilizes ETAP and SKM for arc flash, coordination, and relay studies.

Instrumentation & Controls

ZAP has the ability to provide automation solutions for the control of single pieces of equipment up to complete processing plants. We have design experience in Allen Bradley, Siemens, DeltaV, and Honeywell platforms including programming capabilities for Allen Bradley. We work with our clients to understand their philosophy and culture so we can provide consistent automation within a facility.

Project Management

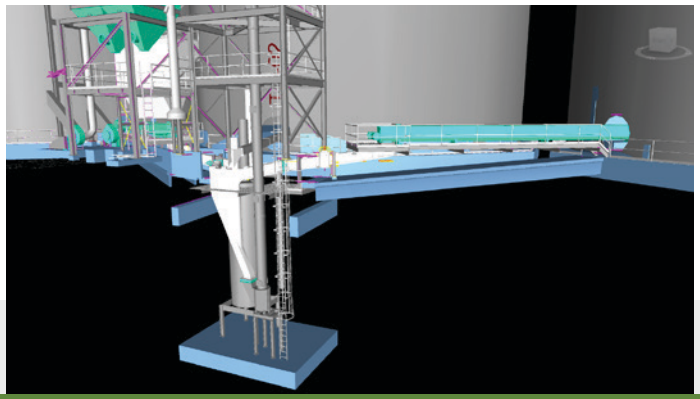
Our project managers are technically engaged. They are all engineers and have previously worked in design and/or operations. Possessing this technical knowledge and experience allows them to better control the scope, schedule, budget and quality of their projects because they understand the project execution process.

Procurement Management

We have the capability to manage the procurement process throughout the project cycle. Our procurement team works closely with clients, construction managers, and engineers to ensure all approval documents and orders are issued on time to maintain project schedule.

Field Services

ZAP has successfully completed turnkey engineering, project management, and construction management on multiple types of facility projects. Field services which we offer include construction management, trade inspection, safety management, quality assurance and control, scheduling, project/cost controls, and project commissioning.



ZAP executes projects with contracting strategies to best fit our clients' goals.

Design Build/Engineer, Procure, Construct (EPC)

ZAP can offer an EPC approach where the complete design, procurement and construction management process is executed by ZAP. Incentive structures for schedule and budget can result in shared risk for these project factors, reducing the risk for our clients and bringing certainty to project timing and economics.

Owners' Agent Engineering & Construction Management

ZAP can offer an open book approach where ZAP is reimbursed a management fee for executing the project. The project would be initiated with an engineering phase where project documents and drawings are generated, overall schedule is defined and a total installed cost estimate is developed. This estimate serves as the basis for the fee, and the cost target. ZAP's management fee would be subject to the risk of exceeding budget or missing schedule.

Design-Bid-Build (T&M or Fixed Price Engineering)

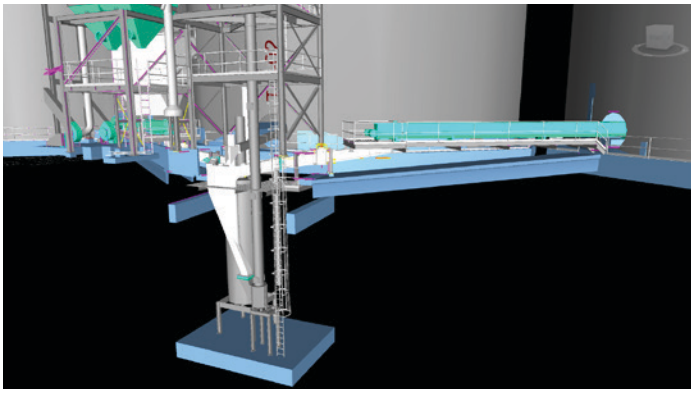
ZAP can offer a more traditional approach, working with the client to establish the design, assist in the bidding process, and support the final build out. In this approach ZAP would be able to provide project management, engineering/design, procurement services and construction management.

Project Experience

Our team members have completed projects using some the largest OEM's equipment, as well as smaller equipment manufacturers' products on projects ranging from waste-fuel addition, to emission reduction, to brownfield and greenfield pyro-processing and grinding projects. This broad range of experience with various types of equipment, as well as various manufacturers' equipment, gives ZAP the unique ability to work in sync with you to develop designs with the best combinations of capital cost, reliability, and constructability.

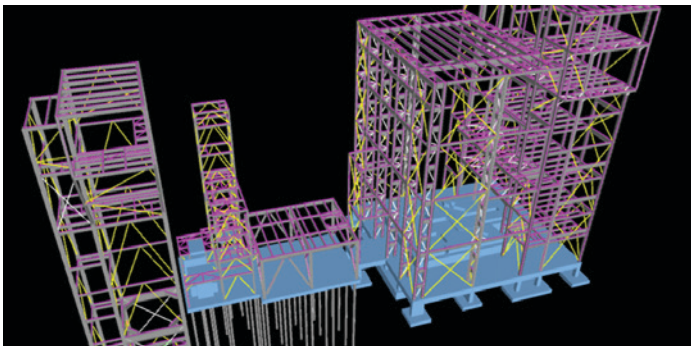
Clinker Cooler Upgrade Electrical Engineering

ZAP was contracted by our client to perform electrical and controls engineering for the installation of an FLSmidth Cross-Bar clinker cooler on an existing kiln line. Deliverables included motor control center (MCC) specification and design, one line diagrams, motor schematics, control loop diagrams, variable frequency drive (VFD) panel designs, arc flash study including relay settings, and the associated construction document package. ZAP used a combination of FLSmidth documentation, existing plant information, and auxiliary equipment information to successfully specify and integrate new MCC's and PLC's with the existing plant power and controls systems.



Cement Import and Distribution Terminal Material Handling Upgrades

ZAP was contracted to perform detailed engineering and design for the replacement of two belt conveyors with high capacity screw conveyors at a cement import and distribution terminal. The scope for the upgrades included new screw conveyor design, air gravity conveyor design, dust collection design and duct detailing, and all associated electrical and controls engineering. Interfaces with existing equipment systems were identified and optimized. The design was executed to suit existing site process and layout conditions to form a comprehensive construction document package.



Vertical Finish Mill Cost Estimate

ZAP provided preliminary engineering and design for a vertical cement mill grinding system. Preliminary design included interface with existing plant equipment and structures, layout of mill system and feed conveying equipment, maintenance access planning, and structural design for entire mill circuit and auxiliary equipment and buildings. Project deliverables included a total installed cost estimate and preliminary layout and structure drawings.

- Mill circuit design throughput of 200 tph.
- Existing cement plant facility required identification and management of interferences. Optimization of OEM equipment manufacturer's layout to suit existing equipment layout and site.
- Layout of new conveying equipment from existing mill feed clinker, gypsum, and additives to feed new mill circuit.
- Layout and routing of new pneumatic conveying line to convey cement product to existing storage silos.
- Preliminary engineering and design for new mill system structural steel and concrete to support total installed cost estimate.
- Equipment installation cost estimating including mill circuit and all balance of plant equipment.

Potassium Sulfate (SUPO) Plant Cost Estimate

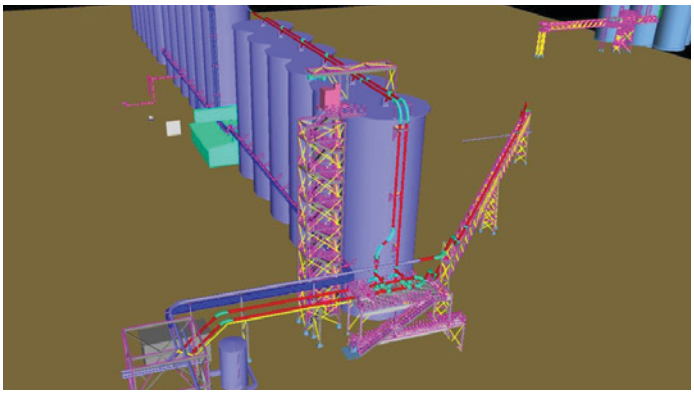
ZAP provided preliminary engineering and design for a potassium sulfate production plant. Preliminary design included interface with existing plant equipment and structures, layout of piping systems and product conveying equipment, maintenance access planning, and structural design for all process and auxiliary equipment and buildings. Project deliverables included a total installed cost estimate and preliminary layout and structure drawings.

- Production plant design throughput of 32,000 tons per year.
- Identification and management of existing interferences. Optimization of OEM equipment manufacturer's layout to suit existing equipment layout and site.
- Layout of new equipment from existing process plants and utilities to feed new processing plant.
- Layout and routing of new pneumatic conveying lines to convey product to storage silos.
- Preliminary engineering and design for new production plant structural steel and concrete to support total installed cost estimate.
- Equipment installation cost estimate including all process equipment.

Cement and Slag Import and Distribution Terminal

ZAP provided preliminary engineering and design for a cement and granulated blast furnace slag import and distribution terminal. Preliminary design included interface with existing terminal equipment and structures, layout of storage and conveying equipment, maintenance access planning, and structural design. Project included three 20,000 ton import silos and two 5,000 ton silos for barge loading distribution operations. Project deliverables included a total installed cost estimate and preliminary layout and structure drawings.

- Existing cement terminal facility required identification and management of equipment tie points and interferences.
- 3D model to support cost estimate.
- Layout of new conveying equipment from existing ship unloading system to new storage silos.
- Layout and routing of new air gravity conveyors and bucket elevators to convey cement and slag to new storage silos.
- Preliminary engineering and design for structural steel and concrete to support total installed cost estimate.
- Layout and design of new barge loading silos, conveying equipment, and dock improvements.
- Equipment installation cost estimating including new silos and all balance of plant equipment. ZAP optimized the equipment layout and accuracy of cost estimate by identifying feasibility and critical interferences early in the design.



Cement & Fly Ash Transport System

ZAP provided engineering and detailed design for a pneumatic conveying system upgrade and conveying line reroute. Civil and structural engineering included a new stair tower and personnel elevator to access existing cement storage silos. Project included relocation of an existing motor control center and associated structural engineering for new electrical room.

- Existing cement plant facility required identification and management of interferences.
- Equipment design included 14” and 10” pneumatic conveying lines and related valves.
- Structural design for new conveying piping trusses and support towers.
- Mechanical design including 3D modeling of existing structures to optimize routing and equipment placement.

CEO

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