

MODULAR WELLPAD FACILITY DESIGN

FULL SERVICE ENGINEERING DESIGN OF MODULAR
WELLPAD PROGRAM

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ADVANTAGES

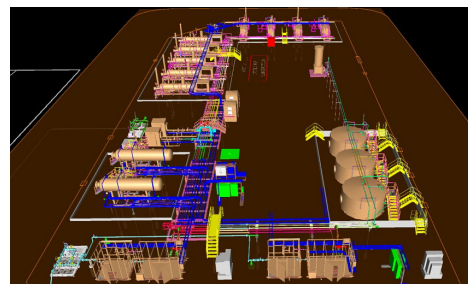
A successful modular wellpad design program takes proper design, engineering, planning, and execution. ZAP has experience collaborating with producers to design a modular well-pad program and then executing that program on a multi-year large volume well-pad campaign.

DESIGN AND ENGINEERING

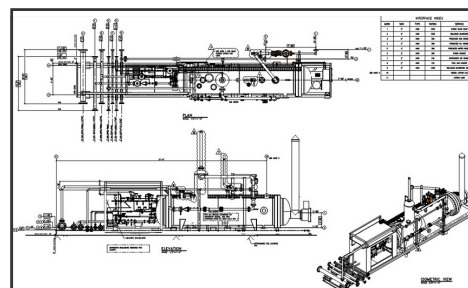
ZAP utilizes 3D modeling and experience to collaborate with producers to develop a modular well-pad plan that accounts for:

- Planning flexibility - variations site to site in well fluid, rates, geometry of available land, number of wells, phased well programs (future capacity/additions)
- Construction efficiencies
- Operations needs and considerations balancing CAPEX spending vs Operations spending
- Manufacturability by multiple vendors, inspection considerations
- Logistics and inventory management
- Streamlining engineering documentation creation for repeatability

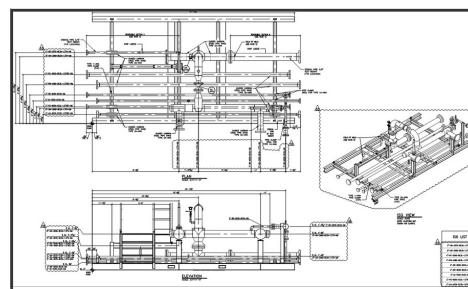
- Reduced Construction Time
- Reduced Construction Schedule Variability
- Cookie Cutter Design Reduces Engineering Cost per Well
- Consistent Designs for Ease of Operation
- Modular Packages for Bulk Buys and Easier Inventory Planning
- Improved Safety
- Environmental Compliance Integrated Design



3D Model Facility



Modular Equipment
Bid Package



Modular Piping
Bid Package

PREVIOUS EXPERIENCE

ZAP designed a well-pad program for sites between four to 24 wells. Typical stick-built underground piping sites were taking six months to construct. The updated modular/aboveground design went to two months construction, with half that time being insulation and heat trace installation. Most sites were fully set and bolted mechanically in two days.

ZAP has developed equipment bid packages allowing clients to bid and award are the same piece of equipment to multiple vendors. The packages are so explicit that equipment built by different vendors can be used right next to each other on-site. To keep up with demand, a client is having seven different vendors build the same piece of equipment. ZAP's experience with balancing and specifying every detail allows each vendor to build in the most efficient way thus reducing costs.

PREVIOUS EXPERIENCE

In a currently running well pad program on its one hundredth site of the modular program, ZAP is producing fully documented engineering packages for \$40K per site in engineering costs. These packages include ~1000 deliverables per site, including:

- Design Basis Documentation
- Foundation and Steel Drawings
- Datasheets and Index For All Instrumentation
- Full Electrical Drawing Package (IFP, IFC, As-built), including: Area Class, Schedules, One-line, Heat Trace Plan, Arc Flash Study, Cable Tray BOM
- P&IDs (IFC and As-Built)
- Piping documentation: 3D Model, Loose Material BOM, Equipment List, Plot Plan, Assembly Plan, Valve and Line List, Pipe and Valve Specs
- Datasheets and Calculations For All Relief Devices

ZAP has completed IFC packages for more than 150 well-pad sites as part of the program.

ZAP has produced IFC packages for up to four sites per week while averaging a typical rate of one site per week. ZAP has worked on this program for three generations in one basin and two generations in a second basin, totaling five years of work.

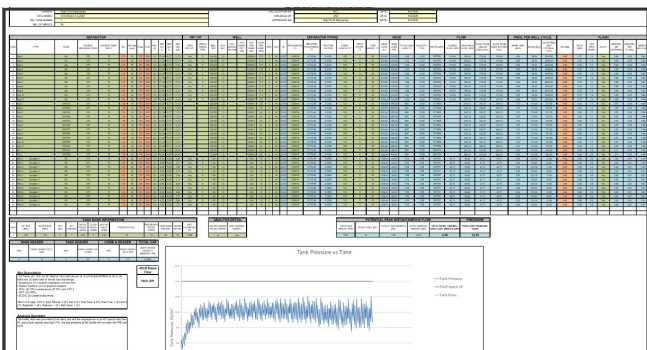
REPEATABLE, EFFICIENT ENGINEERING DOCUMENTATION CREATION

In order to perform efficient and repeatable engineering, ZAP has developed engineering processes much like a manufacturing engineer would. A few of those engineering processes include:

- P&ID templates allow each sites P&ID creation in less than 8 hours of total design and engineering
- P&ID Database usage makes, line, valve and instrument Index creation less than an hour per site
- Templates of job books allows job book creation with all the categories, except for a few specific drawings, in less than 8 hours of time
- BOM templates for mechanical loose fittings bolts & gaskets, and cable tray allow ZAP to create BOMs in 5 mins per site.

DESIGN COULD INCLUDE VAPOR CAPTURE COMPLIANCE

- Analysis & Mitigation
- Closed Loop Vapor Capture Design
- Tank Pressure Monitoring Design



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