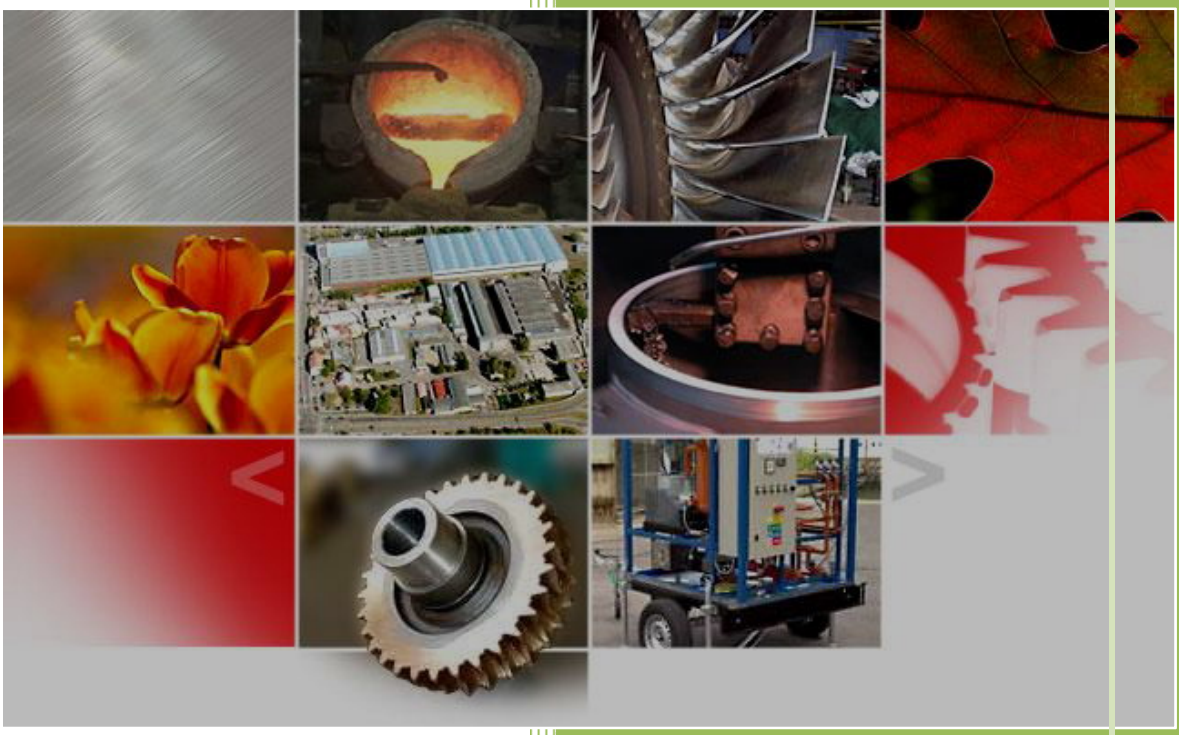
2009

SIMPLY ENGINEERING



ASIM J. UPPAL

Managing.Director@pfaet.com

7/24/2009

Why choose Pakistan Foundation for the Advancement of Engineering & Technology **Engineering Services?**

Employing Services Engineering is your guarantee that your building will work just the way you want it to. We allow the right amount of time for each trade to complete their work in the given time frame by providing:

- Adequate design development time
- Dedicated managers and integrated specialist teams
- Proven CAD software using the latest technology

Full responsibility and control over high-quality services installation

PFAET Services Engineering offers a unique alternative to the traditional M&E(Mechanical and Electrical) procurement routes and their inherent challenges.

We substitute the conventional M&E contractor with a series of smaller individual package contractors, and we manage the complete process from the procurement of the services and equipment, through to their installation and commissioning.

This provides us with both the right installation specialists and direct control of the M&E workforce from beginning to end.

Thus, the risk,the responsibility and the control of services installation remain with PFAET enabling us to guarantee cost efficiencies, quality and timely delivery.

Customer benefits

Our solution has proven success on over 150 projects and offers real benefits to our customers that consistently result in repeat business.

- Our extensive on- and off-site resources have been developed since 1994.
- We directly employ over 60 specialist personnel dedicated to the success of each project.
- An open book or lump sum tender process can be offered for all packages.
- PFAET operates a preferred supply chain system with numerous CAT1 specialistsubcontractors who we know have the resources, capability and staff availability tocomplete the project to high standards. We utilise local subcontractors where possible.
- Our early involvement and active liaison throughout every job ensures each team member has a deep understanding of project requirements.
- Specialist managers are appointed from the outset of the project and work closely witheach other, the project manager and site teams.
- A complete design review early on identifies areas where we can add value.
- Our use of the latest technology including 3D computer-modelling software means weprovide fully co-ordinated and fully-dimensioned drawings that avoid on-site clashes.
- Tight pre-construction and on-site scheduling allows the right amount of time for each

We've been saving our customers thousands of dollars with their custom design projects. We can do the same for you.

Fulfilling the needs of companies, both large and small, with their design and manufacturing issues since 1970's, PFAET

has quickly earned a reputation as an innovative problem solver.

PFAET Design Division Design takes an intimate and systematic approach in solving your design issues. It is our belief that a thorough understanding of our customers' immediate needs and future goals, the utilization of state-of-the-art design tools, and keeping up with today's technology is vital to achieving the best possible solution.

Structural Engineering

" Architecture is the art which so disposes and adorns the edifices raised by man for whatsoever uses, that the sight of them contributes to his mental health, power and pleasure."

- John Ruskin, *The Seven Lamps of Architecture*

Structural engineering is the science of applying the principles of engineering to building structures so the buildings are safe, functional and efficient. This requires an understanding of the forces of nature.

The art of structural engineering developed over history. At the beginning of recorded time, structures were simple.
Nomads moved about the desert, transporting their shelters which were made of animal skins framed by poles. Cave dwellers developed more permanent structures. In time, structures were built from bricks made with mud, water and straw. They were held together by tar.

Bricks were the staple of building construction up until the end of the 19th century. In Boston, for example, most of the buildings were made from masonry materials,
with some variations. Roofs were made from timbers because they were lighter and could span longer distances. At the end of the 19th century, steel and cement were the primary building materials.

PFAET Engineering Division is a leader in structural engineering. Our experienced staff of licensed engineers and engineering professionals can accommodate all of our clients' engineering needs. We work in partnership with our customers and are proud of our performance record.

The structural engineering services offered by PFAET Engineering Division include:

Structural Analysis & Design - developing skeleton that meets all of a structure's requirements; analyzing design plans to ensure they meet all code requirements.

Foundation Engineering - Analyzing foundation plans to ensure they will support the building load.

Building Renovation and Rehabilitation - Analysis of plans to make improvements to existing buildings
so they meet present day building code requirements in all statutory areas.

Historical Structures - Maintaining the integrity and historical significance of structures more than 50 years old, while meeting all building code requirements.

Code Compliance Issues - Analysis of every aspect of a building plan to determine compliance with federal, state and local building ordinances.

Project Planning & Feasibility

- In addition to waterfront projects inherent in our name, the majority of PFAET's Engineering's work is inland from the beach.
- Starting with feasibility studies, PFAET provides clients with engineering and environmental analysis to determine the scope and viability of a potential land development project.
- Preliminary layouts, permitting inventories, timeline scheduling and cost estimates provide the client with the basic information necessary to make informed land development decisions.
- We have extensive experience in both residential and commercial markets, as well as with municipal, state and federal projects.

Site Analysis, Development, & Design

- More advanced stages of the development process include detailed land surveys with particular attention paid to significant features, both natural and manmade, that can affect the success of the design. Plans are then prepared for submittal to a variety of permitting authorities - local, state, and federal, depending upon the complexity and scope of the project.
- After the permitting phase, plans and specifications are refined for more accurate costing before the start of construction**.**
- Throughout the process, PFAET's Engineering's Project Manager communicates closely with the client to ensure the continuity and efficiency of the design process.
- Typical Projects Include:
- Shopping Centers, Commercial Office Buildings, Communications Towers, Cluster Subdivisions, Multifamily Residences, Assisted Living Developments, Custom Homes, Golf Course Facilities, Recreation Facilities, Marine and Coastal Structures, Landfills, Historic Sites**.**

Road Design

- We design roads, and know that a properly designed and constructed road provides a means of getting from one point to another. We also know that roadway location, design, and construction can greatly affect people and property in direct and indirect ways.
- While proper access to and through a piece of property is essential, a road design must address the impacts on the property owner and the property. The cost of construction of a subdivision roadway can be enormous, but the value of maintaining marketable natural landscape is priceless.
- PFAET Engineering utilizes the accumulation of field data and testing with years of road design experience to serve our clients' needs. We understand the fundamental principles of good road design: safe and functional access, for example, is critical to existing or future properties to prevent an existing roadway from becoming obsolete. In designing roads, our engineering and land surveying team addresses safety issues, regulatory requirements, stormwater management, economic value, and Yankee common sense**.**
- Whether a project involves a state highway, town road, private road, subdivision or driveway, a client wants the road designed and built properly. PFAET provides a degree of plan detail and specificity, in addition to professional support, to assure that the road design will be clearly understood and implemented as intended. Our staff has experience with road design conditions throughout the Northeast, Southeast and the Great Northwest. We can provide road design solutions to meet any challenge. Often topography, wetlands, soil conditions and erosion concerns are major factors in development of an appropriate road design. The diverse experience of our staff has the clients' needs and interests at heart at all times

Water Issues: Drainage, Wastewater, and Water Supply

- PFAET is a leader in the design of alternative, on-site wastewater treatment systems that have addressed serious environmental concerns facing our region. These environmentally sensitive system solutions become even more important as we enter the 21st Century.
- Our experienced staff - licensed engineers, staff engineers, soil evaluators, hydrogeologists and environmental specialists - provides full site consultation, plans, documents and contract administration for both private clients and public agencies. Coastal maintains in-house survey, computer-aided design/drafting and environmental permitting services.
- Our years of experience in addressing environmental issues and interacting with regulatory agencies helps us provide the right guidance and recommendations if unforeseen circumstances arise.
- PFAET is proud of its commitment to work in partnership with its clients.
  We look forward to a partnership with you**.**

Storm water Drainage Design

- PFAET Engineering's staff has the specialized knowledge and experience necessary to bring your project into compliance with the Massachusetts Storm water Management Policy.
- In the past, stormwater management was limited to containing and disposing of runoff to prevent flooding in the vicinity of the project site. Recent awareness and concerns about the impacts of untreated stormwater upon groundwater and down stream receiving waters has led to the development of state and federal regulations.
  These regulations require commercial and larger residential projects - that may have an adverse affect on ground or surface waters - to address and mitigate environmental issues. Certain projects that require the filing
  of a Notice of Intent under the Massachusetts Wetlands Protection Act may now be required to comply with the Massachusetts Stormwater Management Policy. Some communities also have adopted more stringent stormwater management regulations under their local wetland bylaws.
- An integral component of any Stormwater Management Plan is the preparation of an Operation and Maintenance Manual for stormwater facilities. The manual includes the implementation of Best Management
  Practices(BMP) to control the source of pollutants that could be transported by stormwater runoff, and the execution of a spill response plan. PFAET staff has experience in the drafting of Stormwater Management Plans for residential, commercial and municipal projects. The staff utilizes state-of-the-art stormwater modeling and computer aided design software to efficiently engineer a stormwater system in compliance with the applicable regulations.
- Our experience allows us to better serve our clients by implementing the innovative designs and measures necessary to comply with the BMP regulatory requirements**.**

Wastewater Treatment

- PFAET Engineering has extensive experience in all aspects of wastewater treatment and disposal system design and permitting. Whether designing a conventional subsurface disposal system or a large wastewater treatment facility, our engineers create "value engineered" systems. We do this by combining our complete understanding of the codes and regulations that govern system design with our knowledge of construction logistics and costs.
- We are constantly searching for better and less costly wastewater treatment solutions. We pride ourselves on having obtained permits for the first two Innovative Alternative (I/A) wastewater treatment facilities in Massachusetts, nearly three years before the new state sanitary code promoted the use of I/A technologies. As new technologies emerge, we continue to evaluate their cost and performance for possible use at our clients' facilities**.** Because of this forward vision**,** we have been able to provide our clients with wastewater treatment and disposal system designs that provide the required level of treatment at costs significantly below conventional system costs**.**
- The permitting process associated with large wastewater systems can be quite complicated. By bringing together expertise in engineering, hydrogeology, and permitting, we are able to streamline the design-permitting process. This benefits PFAET's Engineering's clients by maintaining quality control, providing more efficient coordination, and monitoring costs.
- PFAET Engineering would like to put its experience to work for you to create an appropriate solution to your wastewater treatment and disposal needs. Typical areas of expertise include:
  - Title 5 Systems (subsurface disposal)
  - Wastewater Treatment Plants
  - Innovative/Alternative (I/A) Systems
  - Industrial Waste Holding Tanks
  - Hydrogeological Impact Studies

Water Supply & Hydrogeology

- PFAET Engineering is actively involved with all aspects of hydrogeologic investigations and groundwater assessment. PFAET provides integrated technical and regulatory expertise to perform many types of hydrogeologic studies including:
  - Aquifer testing for water supply and wastewater disposal
  - Computer modeling for mounding potential and groundwater flow characteristics
  - Groundwater aquifer evaluation and water quality assessments.
- Civil and environmental engineering projects frequently require hydrogeologic characterizations as a basis for engineering design and/or to fulfill environmental regulatory requirements. The design and outcome of many projects depends on technically sound groundwater data collection and its evaluation. Only when the data is properly evaluated can informed, effective decisions be made and actions undertaken. In all cases, PFAET develops and implements hydrogeologic evaluations, which concentrate on factors to be integrated into the engineering design or environmental planning and permitting activities.
- At PFAET Engineering Division, we provide the following hydrogeologic services:
  - Groundwater monitoring well design and installation
  - Onsite soil and groundwater sampling
  - Soil profiling and characterization
  - Aquifer pump testing and slug testing
  - Groundwater impact analysis
  - Hydrogeological characterization for engineering design and permitting
  - Characterization of groundwater contaminated sites
  - Water supply exploration and development

Soil Evaluation & Geotechnical Analysis

Soil evaluations, more commonly associated with percolation tests, are required to determine if a site is suitable for the disposal of subsurface wastewater. Soil evaluations describe in detail the soil profile characteristics, site features, and groundwater determination, which affect the selection of a wastewater disposal location and size.

Soil evaluation is needed by the design engineer prior to creating a subsurface sewage disposal system and by prospective landowners before a real estate transfer of a vacant lot.

PFAET Engineering provides soil evaluations for residential, municipal, and commercial projects.
We have dealt with varied and difficult sites in assisting clients with their individual needs. PFAET also provides hydric soils evaluations for the purpose of delineating wetlands as well as qualification in the locating of stormwater discharge

PFAET Geotechnical group provides geotechnical services in support of our Structural Engineering Department in evaluating soil strength and stability for many of our building structure projects.

We conduct field testing, including soil borings, standard penetration tests and soil characterization to provide the basis for foundation and engineering design.

In addition, we perform sieve analysis on soil samples in our soils lab for grain size characterization. This information is utilized in many of our projects to ensure grain size compatibility and to meet engineering specfications for fill and aggregate mix.

Structural Steel Detailing

Categories

Industrial:

Heavy, medium, and light building framing and bracing.

Pipe racks, rectangular platforms, circular platforms, and odd structures.

Stairs, handrails, ladders, and grating.

Commercial:

Heavy, medium, and light building framing and bracing.

Anchor bolt plans and details.

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Detailing services

Fabrication details per your shop standards using AutoCAD 14 and 3rd Party Software.

Bills of Material per your standard piece and template marking system.

Erection drawings complete with required field welds and assembly details.

Mill order, advanced take-off, and material tracking.

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Blue prints and sepias for approval and construction.

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Innovative/Alternative (I/A) Systems

Industrial Waste Holding Tanks

Hydrogeological Impact Studies

Water Supply & Hydrogeology

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Aquifer testing for water supply and wastewater disposal

Computer modeling for mounding potential and groundwater flow characteristics

Groundwater aquifer evaluation and water quality assessments.

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At PFAET Engineering Division, we provide the following hydrogeologic services:

Groundwater monitoring well design and installation

Onsite soil and groundwater sampling

Soil profiling and characterization

Aquifer pump testing and slug testing

Groundwater impact analysis

Hydrogeological characterization for engineering design and permitting

Characterization of groundwater contaminated sites

Water supply exploration and development

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Soil Evaluation & Geotechnical Analysis

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Structural Steel Detailing

Categories

Industrial:

Heavy, medium, and light building framing and bracing.

Pipe racks, rectangular platforms, circular platforms, and odd structures.

Stairs, handrails, ladders, and grating.

Commercial:

Heavy, medium, and light building framing and bracing.

Anchor bolt plans and details.

Stairs, handrails, ladders, and grating.

Lintels and embedded items.

Detailing services

Fabrication details per your shop standards using AutoCAD 14 and 3rd Party Software.

Bills of Material per your standard piece and template marking system.

Erection drawings complete with required field welds and assembly details.

Mill order, advanced take-off, and material tracking.

Checking, scrubbing, and back checking to ensure field fit-up.

Bolt placement lists.

Blue prints and sepias for approval and construction.

Electronic drawing transfers (zipped .DWG format) via Internet email attachment.

Miscellaneous

Connection designs by P.E. (Texas and Louisiana).

Scanning and copying services.

Offshore Design Drafting

Services

Semi-submersible pontoon design and detailing
Cantilevered support structures (lifeboats, etc.)
Sub-sea tie-ins
Alignment drawings
Piping plans
Hot tap details
Platform riser plans and elevations
Riser bending and pipe clamp details
Jacket piling details
Platform jacket leg geometry and joint can details

Naval Architecture/Marine Engineering

Categories

Barges (Ocean, Rivers, Lakes, Bays, and Sounds)
Double-skin tank barges
Hopper barges
Crane barges
Flat-deck work barges
LPG barges
Tugboats
Towboats
Carbon or alloy construction

Detailing Services

Fabrication details generated to your standards using Windows 98 and AutoCAD 14
Rake, mid-body, stern, trunk, pump deck, corrugated bulkheads
Foundations, deck boxes, signs, markings, outfitting, etc.
Piping plans, isometrics, spools, and materials (full ASTM and ANSI designations)
Erection placement drawings and field welding requirements
Shop bills, material requisitions, etc.
Plate nesting
DXF files for CNC

Design Services

Form definition
Lines and offsets
Rudders and fins
Full-scale lofting

Structural Design

Hull and decks
Crane and winch foundations
Engine and equipment foundations
King posts, boom rests, etc.

Arrangements

General
Deck outfitting
Interior
Hazardous areas

On-Board Systems

Piping (cargo, vapor, ballast, hot oil, steam, stripping)
Electrical and instrumentation diagrams

Calculations

Structural
Stability
Hydrostatic
Power

Miscellaneous

Bid packages (general arrangements, specifications, etc.)
Loading and off loading sequence diagrams