

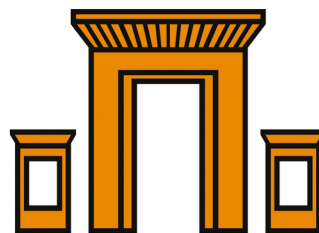


# PARS GEOMETRY CONSULTANTS (P.G.C)

Oil and Gas & Refineries Engineering

Ports And Marine Engineering

Infrastructures Engineering



Pars Geometry Consultants  
P.G.C



*In The Name of GOD*

## COMPANY OVERVIEW

Pars Geometry Consultants (PGC) specializes in diverse areas of civil engineering and provides full range of services based upon expertise and lifelong experience of its founders as well as professional and broad abilities of its management and expert team and is able to deliver study and integrated engineering services for projects demanding multi-discipline specialties. Services provided by PGC are within the following areas of expertise.

## AREAS OF EXPERTISE

Our areas of expertise encompass the following:

- Port Facilities and Marine Structures
- Oil and Gas Refineries as well as Petrochemical Plants
- Infrastructure Engineering



It should be noted that each of the above mentioned items is organized within the framework of specific management departments of PGC.

## TYPES OF SERVICES

▪ Conceptual Design	▪ Preparation of Master Plan
▪ Feasibility Studies	▪ Purchase and Procurement Engineering
▪ Basic and Detailed Design	▪ Construction Engineering and Management
▪ Consultancy and Strategic Project Management	▪ Site Engineering
▪ Project Finance Studies	▪ Site and Overall Supervision
▪ Value Engineering and Assessment of Plans	▪ Preparation of Documents and Tendering for Clients
▪ Preparation of Proposal and Design for Contractors during the Tender Process	▪ Pre-commissioning and Commissioning of the Project

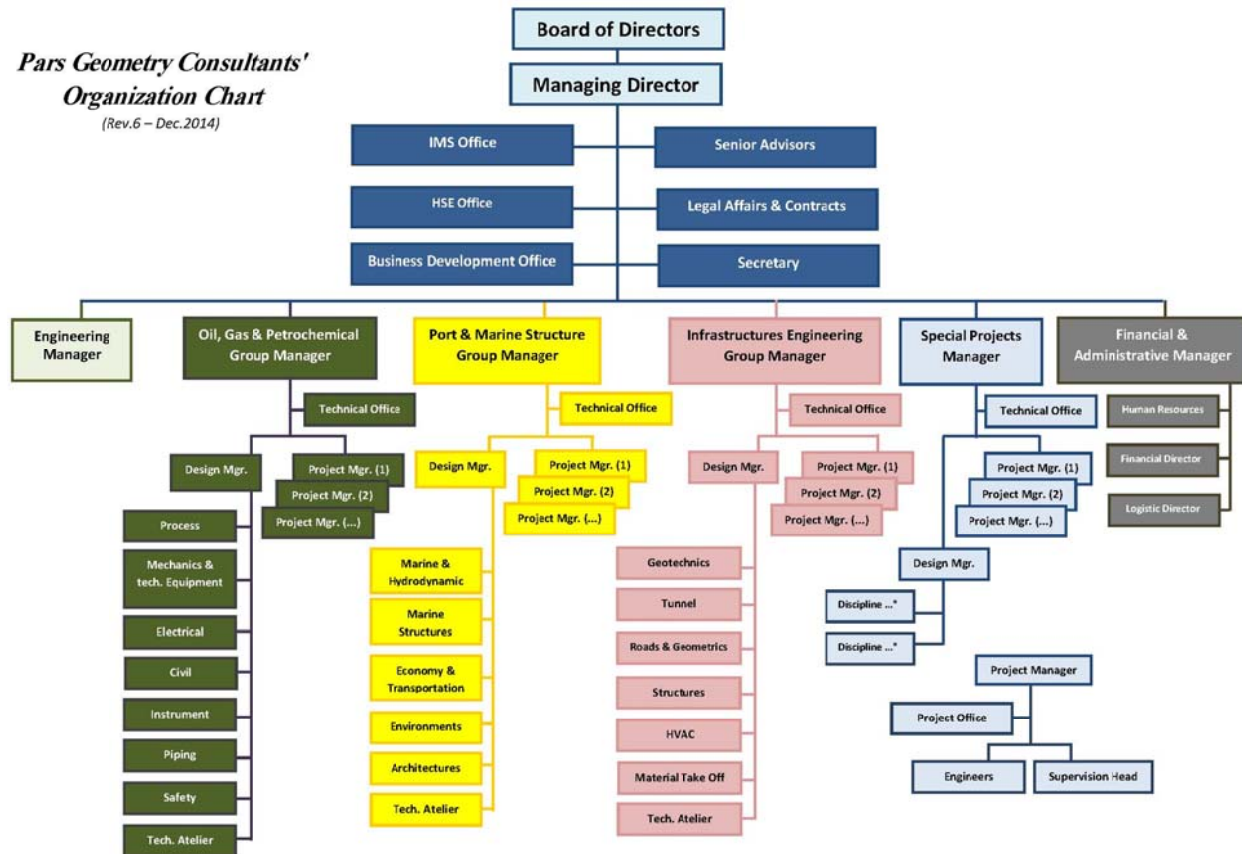


## TECHNICAL DISCIPLINES

Working collaboratively to provide services with various specialties for our projects, our technical disciplines are ready to render particular services with specific specialties for the projects of other companies. These disciplines comprise a supervisor, senior consultants and experts in different levels. Below is a list of these disciplines:

- |   |                              |
|---|------------------------------|
| ▪ Chemical Engineering/Process            | ▪ Tunnel                     |
| ▪ Mechanics of Fixed and Rotary Devices   | ▪ Geotechnics                |
| ▪ Electricity and Telecommunications      | ▪ Marine and Hydrodynamics   |
| ▪ Electrical and Mechanical Installations | ▪ Marine Structures          |
| ▪ Instrument                              | ▪ Civil and Landscaping      |
| ▪ Pipelines (Piping Engineering)          | ▪ Architecture               |
| ▪ Construction Engineering and Management | ▪ Safety and Fire-Fighting   |
| ▪ Structures                              | ▪ Environment                |
| ▪ Road and Highway Geometric Design       | ▪ Economy and Transportation |

*Pars Geometry Consultants'*  
**Organization Chart**  
(Rev.6 – Dec.2014)



IMS MD CH 01 06



## STAFF

Expert and efficient staff are considered the most valuable asset of Pars Geometry Consultants. PGC's strength is based upon its highly motivated staff and keeping up their morale as well as their growth and promotion has always been one of the greatest concerns of the company managers who spend plenty of time to employ leading experts and elite graduates from domestic and International universities. Currently, PGC benefits from part-time and full-time experts as well as senior consultants, and with respect to the project requirements, manpower organization would be carried out.

## EQUIPMENT

Equipment provided in the offices of this company can be noted in several sections as follows:

### 1) Working Space

At present, the company possesses an area about 1000 m<sup>2</sup> as its working space. The office is wholly equipped with adequate facilities.

### 2) Computer and Peripheral Devices

Each expert, technician and employee is provided with a computer in the company. All computers are connected to the internet and internal network of the company which can facilitate teamwork. All correspondences are done through official automation system and the staff can receive referred tasks from anywhere in the world by having access to internet. Computer peripheral devices such as printer, plotter, scanner and etc. are available in PGC within the required number.

### 3) Software

Optimal utilization of computers entails applying general and technical software. Technical and general software are at staff's disposal as tools to implement their tasks. The software has been provided from accredited resources and their accuracy is checked prior to applying them.

The most notable technical software being used in PGC's projects are as follows:

List of Technical Software

ABAQUS	SAP	ABAQUS	WATER JAMES
SURFER	ETABS	AUTO PIPE	ANSYS
ZSOIL	SUPER SAP	ANSYS	BREAK WAT
TOPOCAD	AUTODESK CIVIL DESIGN	CARRIER 2 (HVAC)	CIVIL TECH
COM 624	Autodesk AUTICAD Architecture	CAD PIPE	CORMIX
GEO SLOP	Floor Plan 3D	CAESAR II	CRESS
FOUNDATION 3D	Sketch Up Pro	EPANET	HEC 1
FLAC 2D	FLOOR PLAN 3D	FLOOR PLAN 3D	HEC-RAS
FLAC 3D	3D Home Architect	PIPE PHASE	MIKE 2007
MSEEP	AUTODESK 3D MAX	PDMS	PROSTEEL
PLAXIS 2D	CIVIL 3D	PVELIT	SAP 2000
PDA	NISA	PROSTEEL	SEEP
PLAXIS 3D TUNNEL	STRESS	TANK	SACS
QUICK SIZE	FEPP	HTFS	SIMPHONY
STABLE	SAFE	TOPOCAD	STAAD-III
SHAKE	WATER HAMMER	ABAQUS	UCONFIG





#### 4) Library

A rich and up-to-date library is one of the main facilities of Consulting Engineering Firms. In this respect, since the foundation of PGC, a library was established and today, this library serves as a precious resource for the staff including more than 1,500 technical and professional Books, Codes & Standards, Handbooks as well as subscription of more than 20 Technical Magazines.



#### QUALITY MANAGEMENT

PGC has set out to implement and establish Integrated Management System (IMS) in accordance with the following standards so that to regularize and promote qualitative level of its activities as well as ensuring Assurance Procedures and Quality Control of projects execution. Accordingly, this company has succeeded in obtaining the following certifications from TUV NORD, Germany:

- ✓ ***Quality Management System-ISO 9001:2008***
- ✓ ***Environmental Management System-ISO 14001***
- ✓ ***Occupational Health and Safety Management System- OHSAS 18001***
- ✓ ***Health, Safety and Management System (HSE)***





## COMPANY RANKING

PGC has been ranked by Iranian Vice-Presidency for Strategic Planning and Supervision in the following fields:

- ✓ *Port Facilities and Marine Structures*
- ✓ *Oil & Gas Refineries and Petrochemical Plants*
- ✓ *Structure*
- ✓ *Environment*



## MEMBERSHIPS

- ✓ *Iranian Society of Consulting Engineers (FIDIC Iranian Member Association)*
- ✓ *Iranian Association of Naval Architecture and Marine Engineering*
- ✓ *Iranian Concrete Institute*
- ✓ *Iranian Hydraulic Association*
- ✓ *International Society of Soil Mechanics and Geotechnical Engineering*
- ✓ *Iranian Geo-synthetics Society*
- ✓ *Iranian Coastal and Marine Structural Engineering Association*





## OFFICES AND BRANCHES

PGC established offices at the jobsite of all its projects, requiring inspection to carry out this task. Data transfer between these offices and the head office is online and done by means of Web-based Automation System.



Site Supervision Office, Kish Commercial Sea Port

In line with long-term strategic objectives of the managers to employ technical expertise of staff in execution of International Projects, an International Branch of the company was established in Canada in 2010 which has been registered as “**International Geometry Consultants (IGC)**” in Canada Business Corporation.

Furthermore, **Pars Geometry Probing Consulting Engineers (PGP)** aiming to provide high quality services to perform Geotechnical Investigations and establish the laboratory units of Soil and Rock Mechanics as well as Material Quality Control, was founded in 2011. Being equipped with all facilities required for drilling bore-holes and performing tests has enabled this company to carry out all field and experimental operations necessary for Geotechnical Investigations.





## PREVIOUS CLIENTS

PGC has managed to provide Engineering Services for the following clients so far:

- ✓ *Tehran Engineering and Technical Consultant Organization*
- ✓ *National Iranian Oil Products Distribution Company*
- ✓ *Iran Marine Industrial Company*
- ✓ *Iranian Port and Maritime Organization*
- ✓ *Tehran Municipality- Region 2*
- ✓ *Petrochemical Special Economic Zone*
- ✓ *Persian Gulf Star Oil Company*
- ✓ *Kish Free zone Organization*
- ✓ *Persian Gulf KEYVAN Energy Company*
- ✓ *HORMOZGAN Port and Maritime Administration*
- ✓ *Oil Industries' Engineering and Construction (OIEC)*
- ✓ *BANA GOSTAR KARANEH Company*
- ✓ *Kish Investment and Development Company*
- ✓ *Bandar-e-ABBAS Water Desalination Construction and Operation Company*
- ✓ *Iran Civilization and Road Construction Company*
- ✓ *KARANDARYA Company*
- ✓ *Industrial Projects Management of Iran*
- ✓ *BAHONAR Port and Maritime Administration*
- ✓ *Iranian Offshore Engineering and Construction Company (IOEC)*
- ✓ *Kish Port and Airport Development and Investment Company*
- ✓ *Sahel Consulting Engineers*
- ✓ *SADAF Institute*
- ✓ *Deep Offshore Technology*
- ✓ *BONYAD BARANDAZ Company*
- ✓ *Pars Mine and Industry Construction Company*
- ✓ *Iran Fisheries Organization*
- ✓ *OMRAN SANAT Institute*
- ✓ *TEHRAN-BOSTON Consulting Engineers*
- ✓ *AMOOD PAYA Company*
- ✓ *Iran Ministry of Health and Medical education*
- ✓ *BITA Innovative Design Engineering Company*
- ✓ *FARASAKOU ASALUYEH Company*
- ✓ *JAHAD TOSSE'E KHADAMAT ZIRBANAEI Company*
- ✓ *DELTA Offshore Technology*
- ✓ *Iran PANAHSAZ Engineering Company*
- ✓ *Petro FARAYAND Energy Engineering Company*
- ✓ *PARS POOLAD Shipyard Company*
- ✓ *Transportation Research Institute*
- ✓ *JAHAN KOWSAR Company*





- ✓ **HORMOZGAN Province Industrial Estates Company**
- ✓ **TWI Company**
- ✓ **ARVAND SOBHAN Group Investment Company**
- ✓ **AMOOD Consulting Engineers**
- ✓ **SATA Company**
- ✓ **NAMAVARAN DELVAR Company**
- ✓ **ISOICO Company**
- ✓ **Parham Construction Company**
- ✓ **PARDIS Petrochemical Company**
- ✓ **CHAKAD Darya Company**
- ✓ **PASARGAD NOOR Asia Company**
- ✓ **JAHAD Darya Company**
- ✓ **Qeshm Movalled Co.**





## SOME OF TESTIMONIALS AND CERTIFICATES





## PROJECT TITLE

### Basic and Detailed Engineering of MAHSHAR Oil Terminal- Onshore Section



## PROJECT OVERVIEW

Bandar-e-MAHSHAR is an ancient city and port in KHUZESTAN Province, southwestern Iran. This port is one of the most important ones in Iran, exporting oil products whose renovation and development have been of concern in this project.

## SERVICES PROVIDED BY PGC

### Basic Engineering

- Checking and Approving the existing Basic Design
- Performing Supplementary Basic Engineering Services
- Applying all Changes related to Process Engineering
- Changing the Service of Specified Tanks and their Feeders
- Completing the Process Basic Design as per Review of the Existing Basic Design
- Designing Water (Freshwater) Supply System for the Port Area
- Completing Piping Basic Design as per Review of the Existing Basic Design
- Completing Basic Design of Telecommunication Systems as per Review of the Existing Basic Design
- Conducting Basic Design of 11 KW Double-Circuit Overhead or Terrestrial Transmission Line from 132.11 KW dedicated Sub-station to MAHSHAHR Port
- Evaluation of the Conditions of Existing Buildings and Civil Installations
- Transportation Building with an area of 200 m<sup>2</sup> Office Room and 250 m<sup>2</sup> Roofed Parking including all Amenities and Administrative Facilities
- Preparation of the Basics to design Fire and Safety Equipment including Water, Foam and etc. based upon Safety and Environmental Standards







- Applying Safety Codes and Standards for Conducting Basic Design and Calculations
- Basic Design of Five New Tanks with Capacity of 100,000 Barrels
- Completing Basic Design of Fixed and Rotary Mechanical Equipment in Accordance with the Results of Existing Basic Design Review

#### Detailed Engineering

- Preparation of Executive Drawings of Tanks and Required Equipment including the following items:
  - ✓ Oil Products Storage Tanks
  - ✓ Pump Stations
  - ✓ Measurement Stations
  - ✓ Pipelines connecting the Products
  - ✓ Heating System for Products with High Viscosity
  - ✓ Control and Instrument System
  - ✓ Fire Alarm and Suppression System
  - ✓ Electricity Distribution Network
  - ✓ Telecommunication Network
  - ✓ Cathodic Protection System
- Providing Procurement Engineering Services as follows:
  - ✓ Preparation of Technical Data Sheets related to Project Systems and Equipment
  - ✓ Technical Assessment of Manufacturers' Data and Recommendations
  - ✓ Applying Required Changes to Design Documents
  - ✓ Preparation of Pre-commissioning, Commissioning and Operation Instructions







- Adjustment of Development Plan to Existing Former Facilities
- Construction of Onshore Facilities in Soft and Settlement-Prone Ground
- Adjustment of Offshore and Onshore Designs and Equipments

- Main Client: National Iranian Oil Engineering and Construction Company (NIOEC)
- Direct Client: MACHINE SAZI ARAK Company (EPC Contractor)

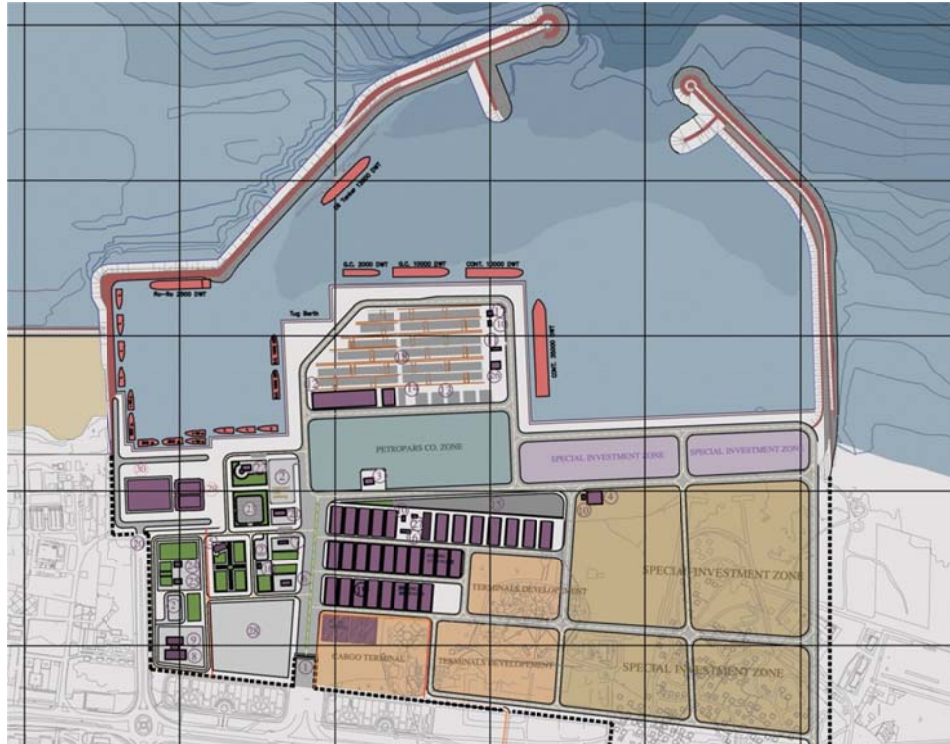
- 2007 (Basic Engineering) and 2008 (Detailed Engineering)
- Cooperation with Contractor as Site Engineering (2009 to 2013)





## PROJECT TITLE

# Studies and Review of Master Plan and Detailed Design of Kish Commercial Port



## PROJECT DESCRIPTION

Kish Commercial Port is situated in northeast of Kish Island which is connected to the network of the Island Roads through a large boulevard. This port includes Basin (Western, Central and Eastern) and a back-beach with approximate area of 110 hectares. Ongoing advancements of Kish Island at the National and Regional levels and consideration of Kish Commercial Port as one of the principal infrastructural utilities of the island, led to creating a master plan for the port. Accordingly, master plan of Kish Commercial Port has been codified. In this regard, berths 15 to 17 with draft of -9.5 mCD are dedicated to general cargo and container vessels with maximum capacity of 12,000 DWT in the Central Basin. In addition, berthing post 18 with draft of 12.5 mCD will be operated within the final phase of development in eastern basin. Container ships with maximum capacity of 35,000 DWT berths at this pier. As per capabilities of Kish Island in the region, there might be great opportunities for particular and specific Investment in this Island. For this reason, 650 meter long pier with possibility of constructing berths with draft of -14mCD and back-beach have been devoted to the investment. Moreover, in order to fulfill infrastructural demands of active terminals, buildings with different applications such as General Cargo and Container Warehouse, Passenger Terminal, Marine Traffic Control Tower, Payer Room, Clinic as well as Administrative Buildings have been considered in the Onshore Section.

## SERVICES PROVIDED BY PGC

- Market Research Studies
- Studies related to Support Services and Procurement of Oil Companies



- Investigating and conducting Studies to determine Potentials for providing Services, Support and Regional Trade including Oil and Non-Oil Products
- Investigating and determining the role of current position of Kish Port and forecasting its Future Position
- Investigating and conducting Required Studies relevant to Review Studies of Iranian Commercial Ports Master Plan
- Investigating and analyzing the Current Situation of Kish Commercial Port
- Investigating Current Situation of Offshore and Onshore Sections of the Port including Marine Structures, Breakwaters, Turning Basins, Implemented Dredging, Available Lands, Support Buildings of Warehouses and Approach Roads
- Investigating the Port Performance and Methods of Loading and Unloading as wells as Operating the Facilities and Equipment
- Investigating the Harbor Infrastructures including Gas, Electricity, Water, Telecommunication and Sewage
- Collecting, Investigating and Completing the Hydrological and Meteorological Studies and Data
- Collecting, Investigating and Completing Studies and Data related to Hydrodynamic, Wave and Sediment
- Collecting, Investigating and Completing Geotechnical Studies
- Collecting, Investigating and Completing Hydrographic and Topographic Studies
- Collecting, Investigating and Completing Seismic Studies







#### ✚ MAJOR FEATURES

- Carrying out studies pertained to the Market and Load Absorption by Kish Port due to being Located in an Island and not resting on the area of Iranian Commercial Ports
- Adjusting phases of Port Development Plan to actual growth of Kish Island and amount of Loads
- Combining Passenger and Tourist Demands with Criteria of carrying Container, Bulk and General Cargo

#### ✚ CLIENT

- Kish Free Zone Organization

#### ✚ PROJECT TIME AND DURATION

- 2006, 6 months







#### PROJECT TITLE

### **Engineering Services to Conduct Studies and Design of Intake Basin, Pipelines and Wastewater Discharge for Persian Gulf Star Oil Company**



#### PROJECT DESCRIPTION

Persian Gulf Star Oil Company has taken measures to construct a large refinery in Bandar-e-ABBAS City. In order to provide required water for cooling the equipment, Engineering Services relevant to construction of Intake Basin, Pipelines and Wastewater Discharge of this refinery adjacent to SHAHID RAJAEI Port were awarded to PGC.

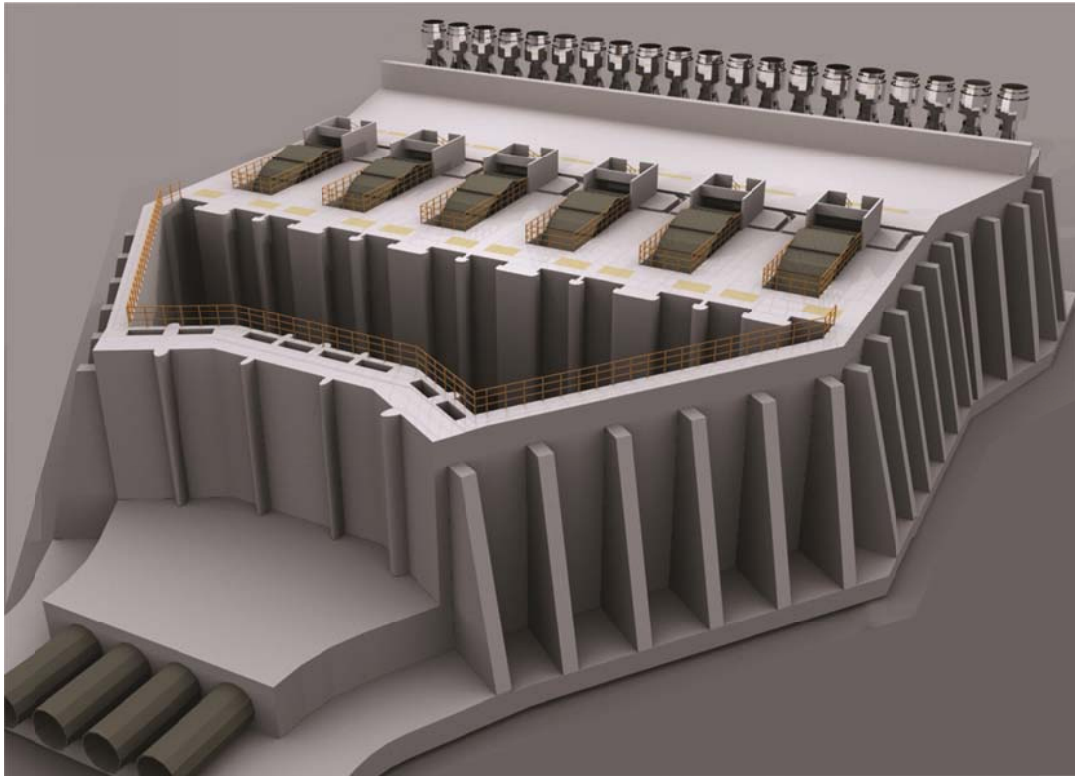
#### SERVICES PROVIDED BY PGC

- Environmental Studies and Evaluation of Thermal Effects related to warm wastewater discharge into the sea and intake location
- Civil Design of Pump Station Basin with Capacity of 200,000 m<sup>3</sup>/h
- Design of Pressure Cool Water Pipelines with Capacity of 75,000 m<sup>3</sup>/h
- Design of Warm Water Return Channel with Capacity of 75,000 m<sup>3</sup>/h and Length of 6 Km as well as Wastewater Discharge Structure
- Site Civil Design including Roads, Landscaping, Collection of Runoff Waters, Sewage and Water Supply System





- Architectural, Structural, Mechanical Equipments and HVAC Design of all Buildings including Control Room, Electrical Substation as well as Guard and Chlorination Buildings
- Foundation Design for all Equipments such as Tanks and Pumps
- Design of Fire Suppression System



#### ✚ MAJOR FEATURES

Working as SADRA Company's Joint Venture, PGC has made comprehensive efforts to simplify the task of construction and reduce execution time as well as project costs in addition to paying careful attention to the demands of the main client and complying with International Standards. The most important features of this project are as follows:

- Design of a 100m × 100m pit with depth of 15m located 50 meters away from the sea and determination of excavation support and intake systems to construct pump basins which were done within the lowest costs and least possible time.
- 3-D Modeling and analyzing the very complex structure of pump basin by means of ABAQUS Software and optimizing the basin design by eliminating the anchors at the bottom leading to a technically practical and cost-effective design.
- Preparation of Design Programs and basin executive drawings (with more than 25,000 m<sup>3</sup> concrete and 3,500 tons of reinforcement) which was done within the least possible time and without disruptions in the process of project implementation
- Conducting Complex studies of heat distribution and offering an appropriate pattern for wastewater discharge leading to proposing a quick and cost-effective method to discharge warm wastewater to the sea while satisfying technical and environmental criteria





- Optimum design of wastewater discharge channel with length of 6 Km and its installations including:
  1. Numerous siphons that were considered in the location of levies such as oil & gas pipelines, highway, railway and watercourse
  2. Pressure pipelines form refinery to Weir Structure at the connection of pressure pipelines and channel
  3. Drop Structure
  4. Water Discharge Structure

As the client's criteria varied during the implementation, PGC took measures to review the project based upon new information about local interferences with pipeline routes and relevant to the contractor's equipment and facilities in order to accelerate the Project Execution.

#### CLIENT

- Main Client: Persian Gulf Oil Star Oil Company
- EPC Contractor of Intake Basin Construction: Iran Marine Industrial Company
- EPC Contractor of Intake Pipelines and Wastewater Discharge: Deep Offshore Technology (DOT)

#### PROJECT TIME AND DURATION

- 2008 & 2009, 14 months

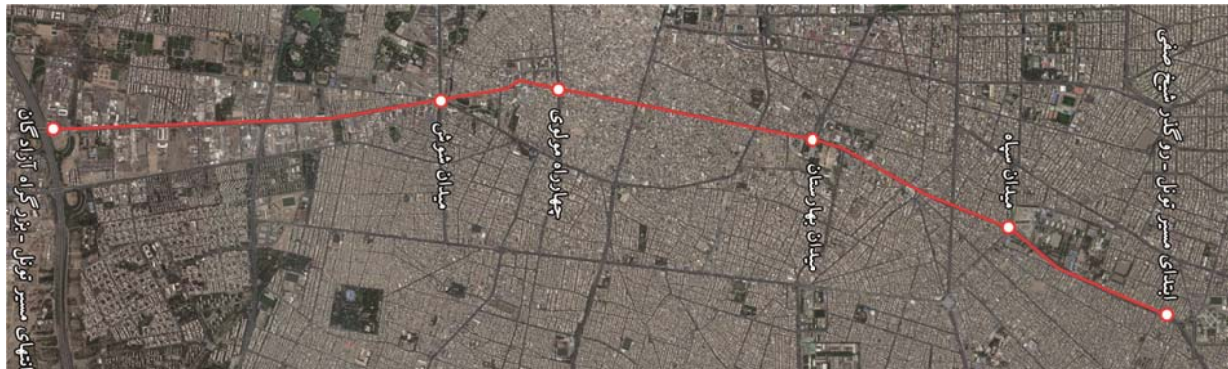






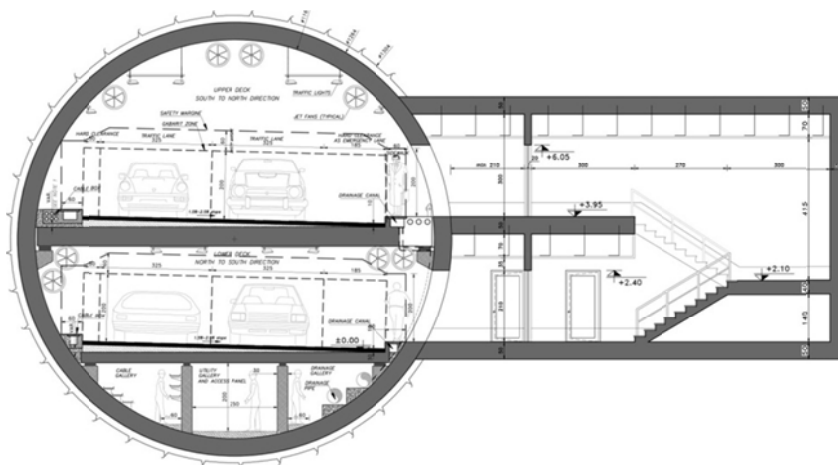
## PROJECT TITLE

# Supplementary Feasibility and Advanced First Phase Studies of SHAHID SAYYAD SHIRAZI Tunnel



## PROJECT DESCRIPTION

Feasibility Studies related to Construction of the Tunnel Continuation of SHAHID SAYYAD SHIRAZI Highway from SEPAH to SHOOSH Square in 2009 has been carried out by PGC. Tehran Municipality intends to award construction of the tunnel to the contractor as a Design Build Project. Thus, PGC was appointed to undertake conducting Supplementary Feasibility and advanced first phase studies of the Tunnel from north of SEPAH Square to BESAT Expressway. According to the new urban Master Plan, turning the application of SHOOSH axis to highway necessitates the connection of SHAHID SAYYAD SHIRAZI to the highway network. In this project, PGC performed Technical and Economic Feasibility Studies of Tunnel Extension to BESAT Expressway or AZADEGAN Freeway. Moreover, constructability of underground multi-storey car parks at the important centers capable of absorbing travel was investigated Technically, Economically and Executively.



## SERVICES PROVIDED BY PGC:

- Supplementary Traffic Studies
- Specifying Tunnel Geometrical Characteristics in the proposed Choices





- Social, Economic and Environmental Evaluations
- Geological & Geotechnical Studies
- Geo-hydrological Studies
- Seismicity and Engineering Seismological Studies
- Depot and Borrow Pit Studies
- Specifying starting and end points of Tunnel as well as entry and exit Ramps
- Geometric Design of Plan and Interchange Profile along the Route
- Geometric Design of Tunnel Route
- Geometric Design of Emergency Car Parks inside Tunnel and Escape Galleries
- Stability Analysis of the Main Tunnel in different sections of the Route
- Monitoring during Construction
- Design of Entry and Exit Shaft for TBM
- Design of the Bridge to enter and exit the Tunnel in two-storey Tunnel Choice
- Selection of Segment Type and Preliminary Design of its Geometry
- Structural Design of Tunnel permanent Lining ( Segment in the Mechanized Section or In-Situ Concrete Lining in Conventional Section)
- Preliminary Design of Segment Factory
- Selection of Boring Machine in Mechanized Section (TBM)
- Design of HVAC System of Operating Time
- Design of Lighting Equipment
- Design of Telecommunication Equipment of Operating Time
- Design of Fire and Safety Equipment for Operating Time
- Design of Mechanical equipment such as Escalators and Elevators
- Estimation of Volumes and Unit Rates



#### MAJOR FEATURES

Great length of this urban tunnel founded in fairly considerable depth and subsequent problems can be counted as major features of this project in which it was essential to carefully investigate them in the studies and design.

It is noteworthy that case of two-storey tunnel which was of significant attention, is considered a special choice.

#### CLIENT

- Tehran Engineering and Technical Consultant Organization-Tehran Municipality



#### PROJECT TITLE

### **Reconstruction and Renovation of C1 and C5 Oil Jetties of SHAHID BAHONAR Port**



C1 and C5 Oil Jetties are located in HORMOZGAN Province being applied by National Iranian Oil Products Distribution Company to exchange Oil Products. Engineering Services for Development, Renovation and Reconstruction of these jetties were awarded to PGC within a contract in 2007.

#### SERVICES PROVIDED BY PGC

- Specifying the Criteria and Objectives of the Project
- Preparation of the Services required for Field Operations (Geotechnics, Surveying and Hydrography, Materials and As-built Drawings of the Existing Jetties)
- Studies pertained to Meteorology and Hydrology, Hydro-dynamic, Geology and Geotechnics, Navigation, Borrow Pits and required Building Materials, Corrosion and Material Endurance
- Preparation of the Criteria and Principles related to design of Jetties and Facilities
- Design of Structural Elements as well as Berthing & Mooring Systems of Jetties, Installations (Lighting, Water Supply and Fire Suppression), Transmission Equipments of Oil Products and Control Room



- Preparing Drawings of the Executive Phase, Structural Elements and Berthing Equipments of the jetties, Lighting as well as Electricity and Water Supply Installations, Equipments using to transmit and load Oil Products (Pipelines)
- Preparing Technical Specifications of Structural Elements, Painting, Cathodic Protection, Electrical and Lighting Equipments, Water Supply, Transfer and Loading Oil Products, Repair and Rehabilitation Methods



#### MAJOR FEATURES

- Changing the Plan of Entire Destruction of Oil Jetties Approved by The Client to a Repairing Design Leading to Reduction in Time and Costs of the Executive Phase of the Project
- Engagement of a number of Technical Disciplines in the Project and their Coordination
- Continuous Operation of the Jetties during Construction
- Advanced Technical Concrete Tests and Special Design to Repair Concrete Piles







#### CLIENT

- Main Client: National Iranian Oil Products Distribution Company (NIOPDC)
- EPC Contractor: KARANDARYA Company

#### PROJECT TIME AND DURATION

- 2007, 14 months

Receiving Statement of Appreciations for the Premier Concrete Design in 2010 from Iranian Concrete Institute (ICI) because of developing a Novel Approach to retrofit the piers against earthquake and rehabilitate the existing Concrete Members.





## PROJECT TITLE

# Providing Consultancy Services for Investment Projects of SHAHID RAJAEI Port Complex



## PROJECT DESCRIPTION

SHAHID RAJAEI Port Complex is located 23 Km away from west of Bandar ABBAS and in the north of QESHM Island and Strait of Hormuz undertaking nearly half of Iranian Trade Exchange due to having Marine interactions and Goods Transit with 80 famous International Ports. Owing to the diversity of investment applicants and participation of more than 40 operating companies, investigation, control and supervision of investment projects of special economic complex of SHAHID RAJAEI Port from preliminary phases of investigating the investor's proposals to final phases of civil operations and project openings, are carried out by experienced experts of PGC in process, civil and structural, mechanical and rotary equipments, piping, electrical, instrument, economy, architectural, metallurgy and transportation disciplines.







#### ✚ SERVICES PROVIDED BY PGC

- Economical and Technical Investigation of Investor's Proposals
- Coordinating the Proposals and Executive Operation of Investors with Master Development Plan of SHAHID RAJAEI Port Complex
- Cooperating with HORMOZGAN Province Port and Maritime Administration within different Phases of Contract Conclusion with Investors
- Investigating and Controlling the Time Schedule provided by Investors
- Supervising the Safety Measures and Standards undertook by Investors
- Comparing the Advancement of Executive Operation with Time Schedule undertook by Investors
- Controlling and Implementing the Investor's Environmental Reports
- Updating the Land Use Maps of SHAHID RAJAEI Port Complex based upon the last condition of Investor's Establishment

#### ✚ MAJOR FEATURES

- Variety of the investor's projects in the port and sensibilities taken to deal with them can be counted as the most important features of this project. Besides, simultaneous technical and economical investigations are of great importance in this project.

#### ✚ CLIENT

- HORMOZGAN Province Port and Maritime Administration

#### ✚ PROJECT TIME AND DURATION

- 2009 up to the end of 2011







#### PROJECT TITLE

### Basic and Detailed Engineering for Off-shore Section of Persian Gulf Port - Land Use Change Project



#### PROJECT DESCRIPTION

Persian Gulf Port is located in close proximity to SHAHID RAJAEI Port in west of Bandar ABBAS. The project concerning change in land use of Persian Gulf Port was awarded to PGC within a contract.

#### SERVICES PROVIDED BY PGC

##### *First Phase Studies & Design*

- Feasibility Study and Conceptual Design
- First Phase Design
- Launching Training Programs - “Project Implementation with EPC Method”

##### *Second Phase Studies and Design*

- Designing the Second Phase Drawings of Piers
- Designing and Preparing the Executive Drawings of Dredging Project
- Preparing a Booklet for Technical-Executive Specifications
- Quantity Surveying of the Construction Operation
- Design (Architectural, Structural and HVAC)





#### MAJOR FEATURES

Major features of this project can be classified within the following items:

- Utilization of the Maximum Capacity of the Existing Basin
- Plan pertained to increasing Capacity of two 5,000 DWT Piers to one 10,000 DWT Pier in Short-term
- Construction of a pier for Vessels with maximum Capacity of 20,000 DWT in Mid-term
- Modifying the Port Entrance and Phasing the Dredging Operation in compliance with Design Vessel and Port Development, respectively

#### CLIENT

- HORMOZGAN Province Port and Maritime Administration

#### PROJECT TIME AND DURATION

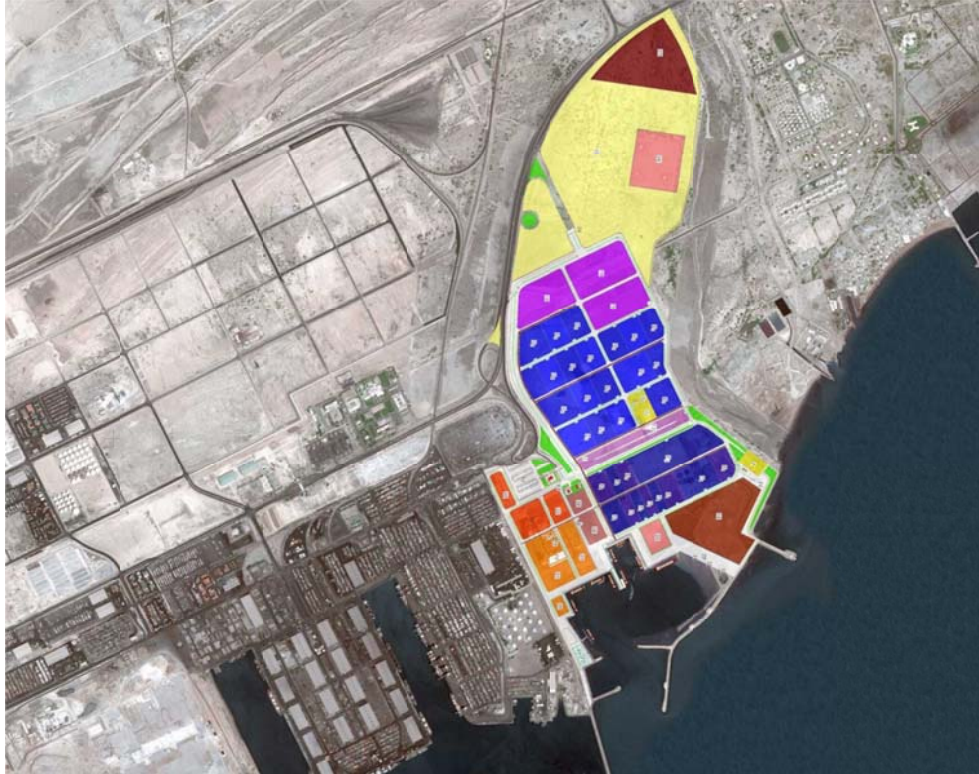
- 2006
- Duration of First Phase Studies and Design : 5 Months
- Duration of Second Phase Studies and Design : 4 Months





## PROJECT TITLE

### Persian Gulf Port Master Plan



## PROJECT DESCRIPTION

Persian Gulf Port (Coastal Traffic) is located in Special Economic Zone of SHAHID RAJAEI Port. According to the appropriate facilities and infrastructures in this port and obligations of the Port and Maritime Organization to provide infrastructures required for private sector investors active in export and transit of oil products, Bulk and General Cargo, Master Plan Studies of the port was set onto the agenda.

## SERVICES PROVIDED BY PGC

- Codifying the Development Strategies and Estimating Load Demands within 5, 10 and 15-year phases
- Planning and Adjusting layout of Oil as well as Bulk and General Cargo Terminals
- First Phase Design of the Infrastructural Installations related to Mechanics, Electricity, Oil Pipeline, Civil and Roads, Safety and Fire Services
- Environmental Assessment
- Executive Programming, Economical Assessment and Organization of the Port Manpower







### MAJOR FEATURES

In order to change the initial use of the port, its master plan from preliminary phases of market prediction and load absorption to basic design of structures and infrastructural facilities and equipments were prepared. Since PGC undertook to lead and supervise the project as the main consultant after preparing the Port Master Plan, possibility raised to accurately compare predictions and actual conditions.

### CLIENT

- HORMOZGAN Province Port and Maritime Administration

### PROJECT TIME AND DURATION

- Winter 2006, 9 months





#### PROJECT TITLE

## Detailed Design and Supervision for Construction of the 2nd Passenger Terminal of Kish Port



#### PROJECT DESCRIPTION

With respect to the increasing number of passengers travelling to Kish by Sea and inabilities of the old terminal to meet the passengers' demands, design and construction for 2nd passenger terminal of Kish Commercial Port in 2007 was planned. Terminal building is constructed in the port having an area of 11.000 m<sup>2</sup> and divided into different parts such as waiting lounge for the passengers, baggage storage, passport, restaurant, prayer room and shopping store. In ideal and urgent circumstances, this terminal has the capacity of 3,500 and 7,000 passengers, respectively.

#### SERVICES PROVIDED BY PGC

- Architectural Design
- Structural Design
- Design of Mechanical Installations
- Design of Electrical Installations
- Quantity Surveying
- Preparing Tender Documents and holding the Project Construction and Supervision Tender

#### MAJOR FEATURES

- Curved shape and exposed 3-D truss roof can be outlined as the significant features of this project.

#### CLIENT

- Kish Free Zone Organization

#### CONTRACTOR

- LADIZ and SEAPORT Construction Companies

#### PROJECT TIME AND DURATION

- Studies 2007, 6 months - beginning of construction, April of 2008      Opening, February of 2012



#### PROJECT TITLE

### **Second Phase Design and Supervision for Construction of Persian Gulf Infrastructural Facilities**



#### PROJECT TITLE

Following the preparation of Persian Gulf master plan and completion of first phase studies, HORMOZGAN Province Port and Maritime Administration assigned PGC to conduct detail design studies of Persian Gulf infrastructural facilities. Performed designs include design of water supply network, green area irrigation, run-off waters and sewage collection, firefighting water network and related pump station, electricity supply network, IT, area and roads. Preparation of executive drawings, technical specifications, estimation of volumes and construction costs are some of the tasks done in this project.





#### SERVICES PROVIDED BY PGC

*Second Phase Design of the following Items:*

- Safety, Alarm and Fire Suppression Systems
- Electricity and Telecommunication Installations
- Installations related to Water Supply, Run-off Collection and Sewage as well as Irrigation of Green Space
- Area and Roads

*Construction Supervision*

#### MAJOR FEATURES

Designing the infrastructural facilities in Persian Gulf Port having an operating area of nearly 200 hectares in sections pertained to oil terminal, bulk and general cargo, demands precise coordination among different technical disciplines. Necessity for careful attention to the requirements of different terminals and adaptation of the condition of existing infrastructural facilities to the designs can be regarded another major feature of this project.

#### CLIENT

- HORMOZGAN Province Port and Maritime Administration

#### CONTRACTOR

- TARA Company

#### PROJECT TIME AND DURATION

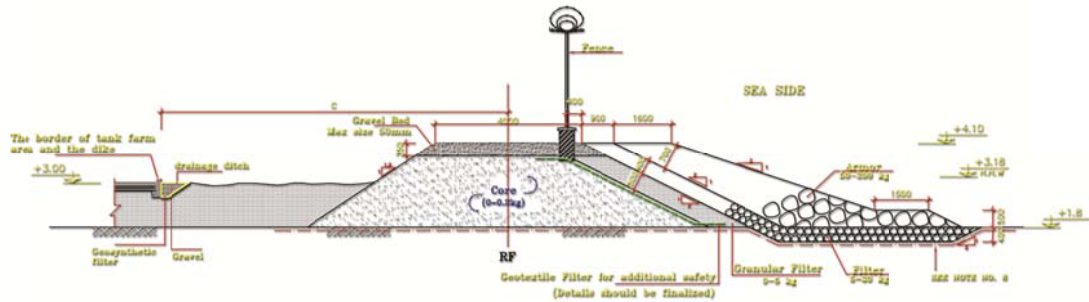
- Design:2008, 6 months                      Site Supervision:2013, 2 years





## PROJECT TITLE

### Land Reclamation and Improvement in MAHSHAHR Oil Terminal



## PROJECT DESCRIPTION

Development plan of MAHSHAHR Oil Terminal has been taken into consideration by National Iranian Oil Refining and Distribution Company. As the land for construction of this project lay in MAHSHAHR estuary, first, about 35 hectares of the land was required to be reclaimed from the sea and then improved due to the inadequate geotechnical conditions. Providing engineering services for preparation of basic and detailed design as well as site engineering services to construct peripheral dike of the reclaimed area, backfilling and improvement of the ground in this area have been of concern in this project.

## SERVICES PROVIDED BY PGC

- Preparation of Services Description for Required Geotechnical Investigations and Interpretation of Geotechnical Data
- Investigation of Loads and allowable Settlement of Oil Tanks and Buildings
- Preparation of the Detail Design of the Peripheral Dike including Hydrodynamic, Geotechnical and Executive Controls
- Preparation of the Detail Design for Ground Improvement Method
- Proposing the type of Oil Tanks, Pump Stations, Buildings and their Corresponding Detail Design
- Proposing Quality Control Method for the Operation of Ground Improvement during Implementation and after its Completion
- Site Engineering in order to Resolve ambiguities and apply Changes in Documents during the Construction

## MAJOR FEATURES

- Great size of steel tanks (diameter and height of 60 and 14 meters, respectively) and softness of the underlying soil up to the depth of 30m can be outlined as the significant features of this project.
- Innovative design of pre-loading the soil underlying tanks by water was executed in this project.

## CLIENT

- Main Client: National Iranian Oil Engineering and Construction Company
- EPC Contractor: Machine SAZI ARAK Company



#### PROJECT TITLE

### **Engineering Services and Site Supervision for IRAN ZAMIN Trench**



SATSA investment Company has planned to construct a 37 storey building with 5 parking stories in IRAN ZAMIN Street, SHAHRAK-e-GHARB. This structure is architecturally unique equipped with facilities such as commercial, leisure and shopping center, 5-star hotel and aquarium. It should be noted that the main investment of this project has been made by SORINET Holding. As per the collapse of the trench in 2013, PGC was invited to cooperate in this project.

#### SERVICES PROVIDED BY PGC

- Providing Engineering Services to control Calculations related to the Pit Stabilization including Monitoring, trench Volume Analysis, Preparation of Computer Models
- Performing the Required Supplementary Geotechnical Investigations
- Providing Consultancy Services pertained to Overall and Site Supervision based upon Management Institute's Statement
- Importance of the trench because of the Urbanity, Geological Conditions and inappropriate Drains of underground and runoff waters

#### MAJOR FEATURES

- 40m Depth of the trench and 90 Ton Tensile force developed in the Anchors
- Urbanity of the Project and necessity to account for different Principles such as Social, Political and Technical Issues

#### CLIENT

- SATSA Company

#### PROJECT TIME AND DURATION

- 2013, 36 months





## PROJECT TITLE

# Consultancy Services to Design Marine Pipelines for Water Intake and Wastewater Disposal - ASALUYEH, Phase 12 of South PARS Gas Field Development Project



## PROJECT DESCRIPTION

PGC was awarded to conduct Consultancy Services to design Marine Pipelines for Water and Wastewater Disposal - ASALUYEH, Phase 12 by DELTA Offshore Technology (EPC Contractor of the Project). Design principles to design pipelines before and after sinking, method to construct and execute these lines as well as structural design of suction chamber were provided. Geotechnical services including design of the dredging trench and backfilling on the pipeline were carried out by PGC as well.

## SERVICES PROVIDED BY PGC

- Specifying Design Criteria and Principles
- Providing a method to Construct and Execute Marine Pipelines and Preparing the respective Report and Drawings
- Preparing Drawings for pipeline Construction Yard in Land
- Structural Analysis of Marine Pipelines before and after sinking
- Stability Analysis of the Pipeline after sinking at Operating Time and Providing Technical Specification of Pipelines
- Structural Design of Suction Chamber and Preparing respective Report and Drawings
- Design of Dredging Trench and Preparing Technical Specifications of the Material to be backfilled on the Pipelines
- Designing the Method to Implement Chlorination Pipelines of Suction Chamber
- Estimation of the Volumes of Construction Operation and Installation of Marine Pipelines



### MAJOR FEATURES

According to the highly corrosive environment and economic issues, polyethylene pipes with internal diameter of 2 meters were applied in this project. Furthermore, low weight of these pipes for sinking and keeping their stability necessitated taking special measures. As there are holes on the pipe wall having circular shape and spirally twisted around the pipe circumference, additional weight to sink the pipes was provided by means of injecting into the holes so that to fill them. Stability analysis of the pipe resting on seabed before and after being buried indicated that these pipelines require more weight to keep their stability under the action of wave force. In this regard, horse shoe shaped concrete blocks were considered to be placed over them for providing their stability. The techniques applied to move the pipelines in land and their placement on the launching line as well as analysis of the pipes within launching conditions to determine suitable geometry of the pipes movement ramp are the other noteworthy issues of this project.



### CLIENT

- Main Client: Pars Oil & Gas Company

### CONTRACTOR

- Delta Offshore Technology





#### PROJECT TITLE

## Project Management Services for Special Projects of the Islamic Republic of Iran - Ministry of Petroleum



#### PROJECT DESCRIPTION

Ministry of Petroleum took actions to form headquarters for special Projects so that to monitor their progress. After obtaining his edict and on behalf of the reverent minister, the head of the headquarters set out to make necessary organizations and conclude contracts with competent companies. In line with these strategies, PGC was appointed as consultant to provide project management services for technical workgroup of oil and gas in order to undertake and pursue related projects. Following this, PGC applied inter-firm organization leading to pursuing and completing some of the national projects such as SARVESTAN and SAADAT ABAD Oil projects and resolving their environmental problems as well as completing WEST Ethylene pipeline and ILAM plant.

#### SERVICES PROVIDED BY PGC

Providing project management services aiming to identify, investigate and analyze problems and barriers ahead of the Ministry of Petroleum projects and propose executive, engineered and administrative solutions and continuous pursuit of them to accelerate their progress.

#### MAJOR FEATURES

- Monitoring special projects of the Ministry of Petroleum in the fields of petrochemical and oil with the objective of resolving their technical-economical problems.

#### PROJECT TIME AND DURATION

- 2012, 17 months





#### PROJECT TITLE

### **Consultancy Services to Design Marine Pipelines for Water Intake and Wastewater Disposal - ASALUYEH, Phase 19 of South PARS Gas Field Development Project**



#### PROJECT DESCRIPTION

POGC Company as the main client of Phase 19 of ASALUYEH project, construction of the water intake of this phase with capacity of  $20 \text{ m}^3$  awarded to PETRO PARS Company as a design-build project and subsequently, this company assigned Delta Offshore Technology (DOT) to design and execute marine pipelines for water intake and wastewater disposal. PGC carried out some parts of the first and second phase studies as well as design of the method to install marine pipelines for water intake and wastewater disposal of the intake project of phase 19 for Delta Offshore Technology.



#### SERVICES PROVIDED BY PGC

- Specifying Design Criteria and Principles
- Hydrodynamic and Heat Distribution Analysis
- Selection of the Route for Marine Pipeline
- Basic and Detailed Design of the Pipeline
- Basic and Detailed Design of Suction Chamber
- Design of the Seabed Trench
- Estimation of the Volumes of Construction Operation and Installation of Marine Pipelines
- Providing a method to Construct and Execute Marine Pipelines





## MAJOR FEATURES

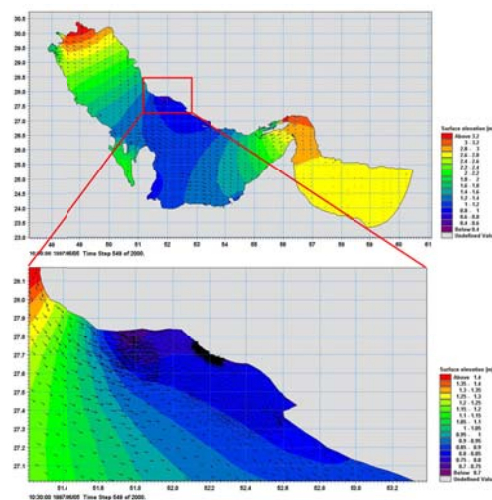
- As per investigation of sea condition, the best area for water intake was specified. Afterwards, by means of heat distribution analysis and investigating its environmental effects, the most appropriate area to discharge return warm water was also adjusted and accordingly, the best route for the pipelines and optimum diameter of pipes were determined using hydraulic analysis. Similar to the phase 12 of ASALUYEH intake project, polyethylene pipes have been utilized in this project as well.

## CLIENT

- Main Client: Pars Oil and Gas Company

## CONTRACTOR

- Delta Offshore Technology





#### PROJECT TITLE

### **Construction of Oil Terminal for PASARGAD NOOR ASIA Company (Unit 55) in IMAM KHOMEINI Port**



#### PROJECT DESCRIPTION

Providing services to conduct investigations, supervision and technical inspection for construction of oil terminal of IMAM KHOMEINI Port Complex

#### SERVICES PROVIDED BY PGC

- Checking and Approving the Drawings and Prepared Documents by Project Designer
- Site and Overall Supervision
- Technical Inspection including inspection of Materials, Welding and Paint as well as Construction of rotary Equipments

#### MAJOR FEATURES

This project is performed in the area of reclaimed lands by the private investor and owing to the ground conditions; piling method has been adopted for preparing the ground to construct foundation of tanks.

#### CLIENT

- PASARGAD NOOR ASIA Company

#### CONTRACTOR

- IVAN PARSHAN Company

#### PROJECT TIME AND DURATION

- 2013, 12 months







#### **PROJECT TITLE**

### **Construction of Oil Terminal for SINA Port & Maritime Company (Unit 55) in IMAM KHOMEINI Port**



#### **PROJECT DESCRIPTION**

Oil terminal in IMAM KHOMEINI Port including site of the tanks (unit 57), two oil berthing posts with capacity of 42.000 Tons and shared transmission pipelines as well as related installations

#### **SERVICES PROVIDED BY PGC**

- Overall and Site Supervision as well as Technical Inspection

#### **MAJOR FEATURES**

- Construction of the joint transmission pipeline as well as two dolphins to transmit products of all investors under the management of SINA Company

#### **CLIENT**

- SINA Port & Maritime Company

#### **CONTRACTOR**

- PETRO HEXAN, VIAMETER and PARS SAMAN SAHEL Companies

#### **PROJECT TIME AND DURATION**

- 2012, 18 months



#### PROJECT TITLE

### Construction of Oil Terminal for Persian Gulf KEYVAN Energy Company (Unit 66b) in IMAM KHOMEINI Port



#### PROJECT DESCRIPTION

Construction of facilities to store light and heavy oil products with capacity of 33.000 m<sup>3</sup>

#### SERVICES PROVIDED BY PGC

Site and overall supervision as well as technical inspection services for construction of the oil terminal as follows:

- Supervision and Control of Earthworks, Land Grading, Piping, Installation of Mechanical and Electrical Equipments as well as Steel and Concrete Works
- Supervising the Welding Operation and Welders
- Supervising the Launching Operation of Project Installations
- Checking and Approving As-Built Drawings
- Providing Inspection for Materials, Equipments, Welding and Paint

#### MAJOR FEATURES

- Investing in the project by a company from Iraqi Kurdistan in IMAM KHOMEINI Port which is highly remarkable as an important potential in the region.

#### CLIENT

- Persian Gulf KEYVAN Energy Company

#### CONTRACTOR

- PETRO HEXAN and GOSTARESH KWARMOOT Energy Consortiums

#### PROJECT TIME AND DURATION

- 2011, 15 months





## ✚ PROJECT TITLE

# Studies and Detailed Design for Corridors A & B of Persian Gulf Port's Pipelines



## ✚ PROJECT DESCRIPTION

In accordance with the master plan of Persian Gulf Oil Port, transmission of oil products from investor's tanks to the berths and vice versa would be done using shared pipelines. In this regard, with respect to the zonation of lands and general plan of Persian Gulf Oil Port, the mentioned pipelines are conducted to the berths through special routes (energy corridors).

## ✚ SERVICES PROVIDED BY PGC

- Checking, Revising and Approving the Report of Preliminary Engineering Services by Oil & Gas Discipline (i.e. process, mechanic, piping, instrument, safety and electricity units)
- Checking, Revising and Approving the Report of Preliminary Engineering Services by Civil, Geotechnics and Structure Disciplines
- Design and Detailed Engineering Services by Oil & Gas Discipline ((i.e. process, mechanic, piping, instrument, safety and electricity units)
- Providing Booklets containing Instructions for Commissioning and Conducting Projects
- Preparation of Technical Specifications
- Preparation of the Preliminary Estimates
- Preparing Tender Documents to choose the Contractor based upon Current and Special Rules and Regulations of Iran and Port and Maritime Organization

## ✚ MAJOR FEATURES

- Revising the Functional Volumes of the Berths and Comparing them with Previous Anticipations
- Presenting our Proposals to promote Marine Capacity of the Berths
- Designing the Shared Pipelines for transmission of Oil Products which was not already common in the ports.

## ✚ CLIENT

- HORMOZGAN Province Port and Maritime Administration

## ✚ PROJECT TIME AND DURATION

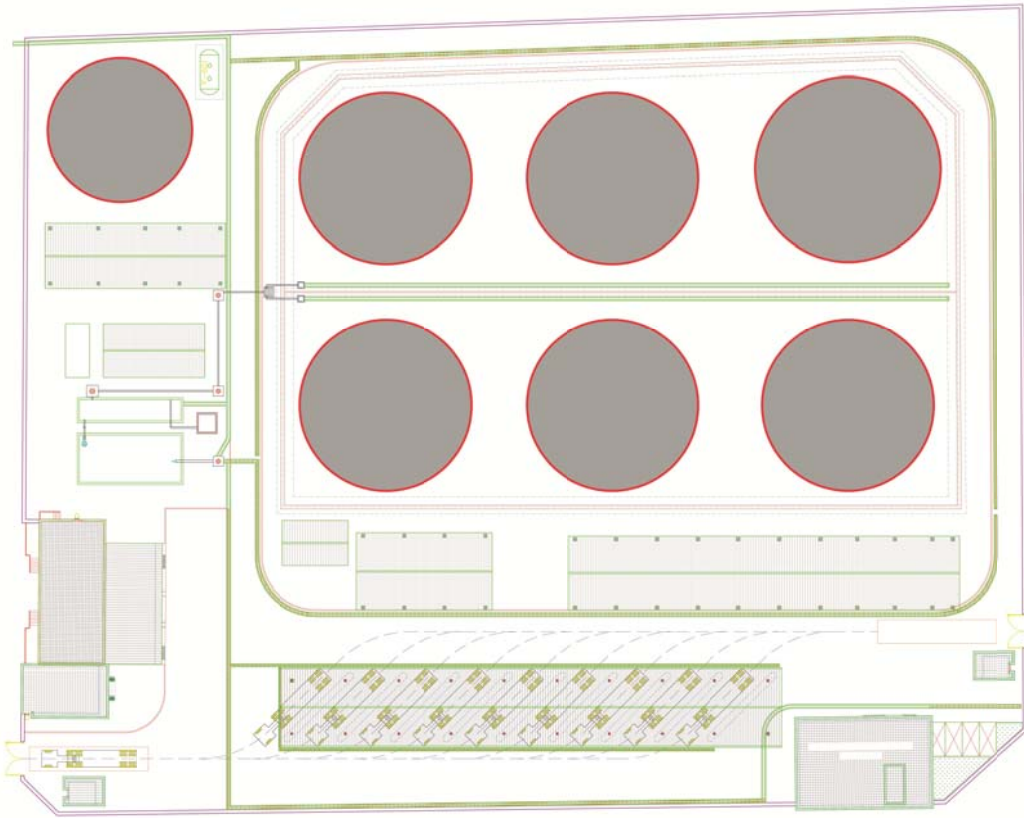
- 2013, 5 months





#### PROJECT TITLE

### Construction of Oil Terminal for JAHAD DARYA Company (Unit 59a) in IMAM KHOMEINI Port



#### PROJECT DESCRIPTION

Construction of installation to store light and heavy oil products with capacity of 30.000 m<sup>3</sup>

#### SERVICES PROVIDED BY PGC

- Revising the Basic Design and Performing Detailed Design for Oil Installations

#### MAJOR FEATURES

- This project is being executed in reclaimed and loose lands of IMAM Port

#### CLIENT

- JAHAD DARYA Company





#### PROJECT TITLE

### Engineering Services of Small Ports in Southern coasts of Iranian Coasts



#### PROJECT OVERVIEW

Following the objectives of the government of Islamic republic of Iran to promote justice and development within the deprived areas of Southern Coasts of IRAN, the construction of breakwaters was planned. These multi-purpose breakwaters not only create suitable infrastructures leading to generating the local employment, but also play a significant role in social relations and eradication of deprivation in the region.

#### SERVICES PROVIDED BY PGC

- Field visit in order to adjust the Locations for Construction of the Breakwaters
- Wave Hydrodynamic Studies and Extraction of Deepwater and Near-structure Design Waves as well as Wave Rose of the Port Entrance
- Sediment and Morphology Studies
- Specifying the Criteria for Layout of the Harbor Basin and Conducting Layout Studies
- First and Second Phase Design of Breakwater

#### MAJOR FEATURES

- Technical Studies to calculate the Length of Vessels' Parking Line
- Technical Studies to calculate the Overall Area of the Port Calm Basin
- Technical Studies to adjust the Location of the Port Entrance within the average depth
- Technical Studies to calculate the Applicable Area of the Port

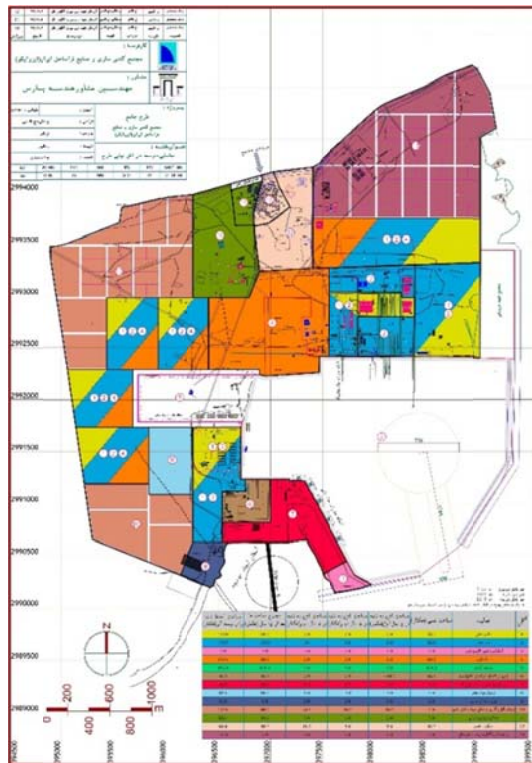
#### CLIENT

- Main Client: Iranian Port and Maritime Organization
- Direct Client: KHATAM Construction Group (SAHEL Consulting Engineers)



## PROJECT TITLE

# Master Plan of Iran Shipbuilding & Offshore Industries Complex Company (ISOICO)



## PROJECT DESCRIPTION

Iran Shipbuilding & Offshore Industries Complex Company (ISOICO) is an Iranian ship yard, located in south of HORMOZGAN Province and proximate to QESHM Island. In autumn of 2013, PGC was appointed to codify master plan of this complex. Proximity of this complex to Strait of Hormuz, high traffic of ships in this area, adjacency to the major centers of industrial and Oil products as well as goods transit, have made ISOICO to a suitable place for building and repairing different types of vessels. Along with the ideas and experiences of ISOICO management team, development of offshore and coastal capacities as well as utmost utilization of the outstanding location in the special economic zone have been accounted for in the codified plan. On this basis, long-term strategies to absorb private sector investment and develop industries associated with ship building and maintenance, construction of offshore structures and also engagement in other tasks such as bulk and oil terminals, production of water and electricity and etc. have been provided in our plan.







#### ✚ SERVICES PROVIDED BY PGC

- Investigation of the Current Situation of Iran Shipbuilding & Offshore Industries Complex Company (ISOICO) including performance of the complex, current situation of offshore and onshore facilities, analysis of offshore capacity, investigation of the condition of similar activities in the region and Iran, conducting studies to investigate development plans of similar successful complexes
- Conducting studies to investigate plans and high level documents affecting the activities of ISOICO
- Conducting Studies to Investigate and Assess Development Potentials and Market Capacity
- Codifying the Development Strategic Planning in 5, 10 and 15 year intervals and thereafter
- Presenting Physical- Framed planning and Proposing Layout Plan
- Presenting Economical Analysis and Calculating the Internal Rate of Return for the entire Complex and each of Divisions
- Specifying the Outline of Studies and Future Non-Physical Planning
- 



#### ✚ SIGNIFICANT FEATURES

- Iran Shipbuilding & Offshore Industries Complex Company (ISOICO) is the largest Iranian shipyard to carry out construction and maintenance of vessels.
- ISOICO is capable of being in a prominent and valuable position in the economy of Iran and the region by having back-beach land and calm basin with areas of more than 1100 and 415 hectares, respectively as well as broad infrastructural and operational facilities.
- ISOICO is able to benefit from the privileges of being located in the special industrial and economic zone.

#### ✚ CLIENT

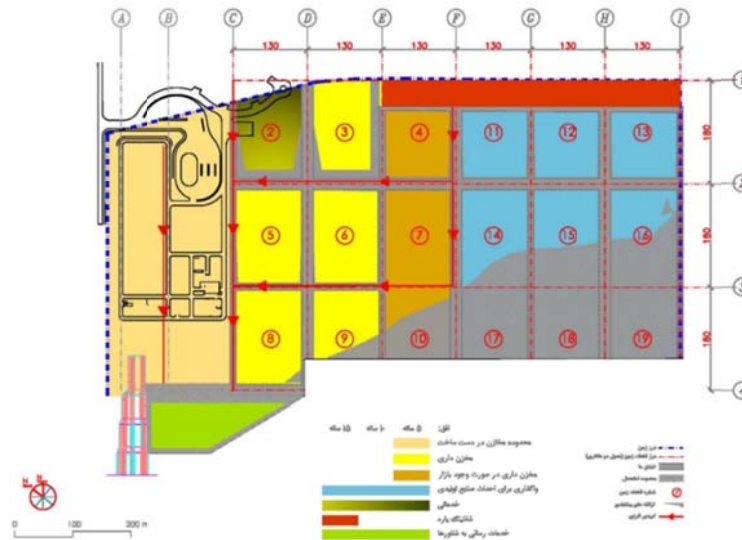
- Iran Shipbuilding & Offshore Industries Complex Company (ISOICO)

#### ✚ PROJECT TIME AND DURATION

- Autumn of 2013, 9 months

## PROJECT TITLE

### Master Plan for FARASAKOU ASSALUYEH Port



## PROJECT DESCRIPTION

FARASAKOU ASSALUYEH Company which is one of the affiliates of OPIC planned the construction and development of FARASAKOU Port in Pars Energy Economic Zone. Concurrent with executive operations such as completion of breakwater and two berthing posts, storage facilities including tanks, piping, system of discharge and pumping to the berths, ships and etc, studies to prepare master plan of the port development was awarded to PGC. After a number of meetings with the officials and managing directors of FARASAKOU to obtain required information and swap viewpoints concerning existing potentials, codification of the master plan was finalized.

## SERVICES PROVIDED BY PGC

- Economical Investigations (1) Export Terminal (2) bunkering (3) Gasoline Distribution of Offshore and Onshore Sections (4) Development of Tanks with the Objective of boosting Storage Capacities and Variety of Oil Products (5) Providing Infrastructural Facilities and Platform-building Yard (6) Construction of units to produce Oil Products and Small Refineries
- Conducting Market Studies to direct main activities of FARASAKOU Port and estimate Reimbursable Share of the Company
- Comparing Different Choices and Codifying a General Strategy for Development
- Conceptual Design to achieve Objectives specified in the Strategy
- Investigation of the Infrastructures required for development
- Layout of the Plan Components in Compliance with the Codified Strategy



#### MAJOR FEATURES

- Utmost use of the existing buildings has been taken into account while codifying the plan.
- ASSALUYEH FARASAKOU Port is the first one whose equipments including storage facilities, port, berths and etc are owned by a nongovernmental company.
- Suitable geographical position in relation to ASSALUYEH area and petrochemical production centers as well as neighbor countries, have brought a lot of advantages to FARASAKOU Port.

#### CLIENT

- ASSALUYEH FARASAKOU Company

#### PROJECT TIME AND DURATION

- Winter of 2012, 10 months







#### PROJECT TITLE

### **Studies and Detailed Design for Shunting Yard, Process Equipments and Respective Facilities of Persian Gulf Port**



#### PROJECT DESCRIPTION

As per studies carried out for master plan of Persian Gulf Oil Terminal, railway system is one of the methods for transmission of oil products to the port. To this end, firstly, it is required to develop existing railways and extend them into the Port. Afterwards, transmission of oil products from tank train to the investor's tanks and vice versa will be carried out by means of building unloading station and rail loading.

#### SERVICES PROVIDED BY PGC

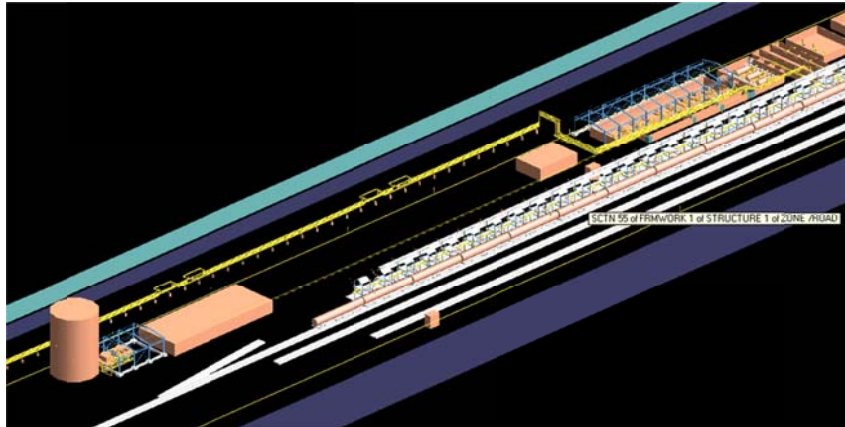
- Investigating, Revising and Approving Report of Preliminary Engineering Studies by Rail Discipline
- Investigating, Revising and Approving Report of Preliminary Engineering Studies by Oil & Gas Discipline (i.e. process, mechanic, piping, instrument, safety and electricity)
- Investigating, Revising and Approving Report of Preliminary Engineering Studies by Architecture, Civil, Structural and Geotechnical Disciplines
- Design Services and Project Detailed Engineering by Rail Discipline
- Design Services and Project Detailed Engineering by Oil Discipline (i.e. process, mechanic, piping, instrument, safety and electricity)
- Design Services and Project Detailed Engineering by Architectural, Civil, Structural and Geotechnical Disciplines
- Providing Booklets containing Instructions for Commissioning and Conducting Projects
- Preparation of technical Specifications and preliminary Estimation
- Preparing Tender Documents to choose the Contractor based upon Current and Special Rules and Regulations of Iran and Port and Maritime Organization





#### ✚ MAJOR FEATURES

- Complexity in design of the railway of connection zone to main lines of the port and internal area of unloading and loading station.
- Design of oil pipelines and respective equipments including unloading and loading arms, pump stations in order to transmit oil products to the investor's tanks which is a unique job in Iranian ports.
- Design of other buildings such as oil terminal office, inter-line platforms, canopy structure in the station and etc.



#### ✚ CLIENT

- HORMOZGAN Province Port & Maritime Administration

#### ✚ PROJECT TIME AND DURATION

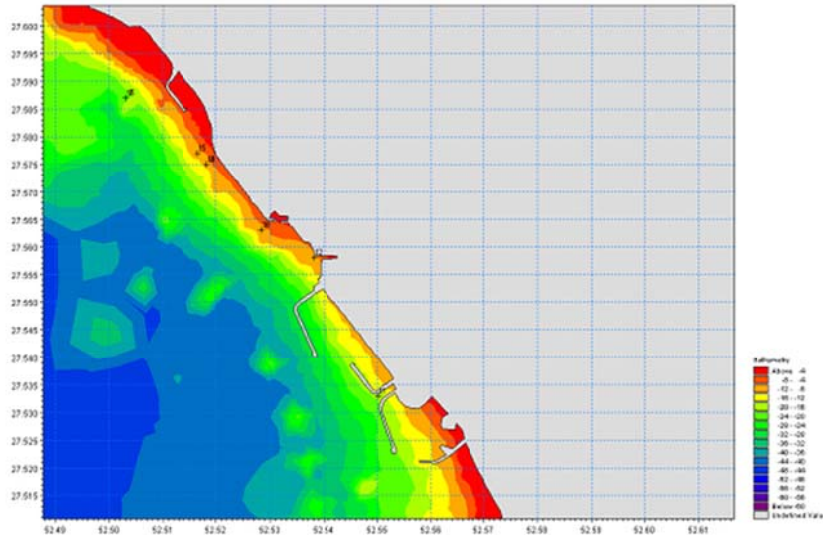
- 2013, 5 months





#### PROJECT TITLE

### Heat Distribution Studies - ASSALUYEH Intake Project, Phase 2 of South PARS Gas Field Development Project



#### PROJECT DESCRIPTION

Iran Marine Industrial Company has been obliged to carry out studies and execution for the second phase of MOBIN intake located in ASSALUYEH area. Required capacity of this intake is approximately 800.000 m<sup>3</sup>/h. This intake is intended to provide required water for cooling the industrial facilities. In this type of offshore intakes, heat distribution studies are performed to fulfill the following objectives:

- To keep locations of cool water intake from the sea and warm water return to the sea sufficiently far from one another
- To adjust the depth such that the water taken from the sea would be cool enough
- To adjust the area being affected by environmental impacts of the thermal wastewater within an acceptable range

#### SERVICES PROVIDED BY PGC

- Hydrodynamic Modeling using MIKE Software
- Heat Distribution Modeling by means of CORMIX & MIKE Software
- Investigation of Mutual Effect of MOBIN 1 Intake and other Intakes existing in the Region on MOBIN 2 Intake
- Drawing conclusions regarding the location of cool water intake and warm water discharge

#### MAJOR FEATURES

- Rigorous study of heat distribution with respect to high flow of thermal wastewater
- Investigation of the effects of other intakes and wastewaters existing in the region

#### CLIENT

- Main Client: Iranian National Petrochemical Company
- Direct Client: Iran Marine Industrial Company

#### PROJECT TIME AND DURATION

- 2007, 4 months





## PROJECT TITLE

# Studies for the Project of Subway Tunnel passing through SHAHID DASTJERDI Underpass (SOFFEH Station -ISFAHAN Urban Train)



## PROJECT DESCRIPTION

In the north side of SOFFEH Station of ISFAHAN Urban train, a concrete culvert related to SHAHID DASTJERDI Highway intersects with the route of urban train such that construction of tunnel with typical horseshoe shaped cross section from beneath of this culvert has not been possible. In the intersection area, the section had to be box-shaped. In order to continue the project, it was required to investigate whether it is practicable to pass the subway tunnel with box-shaped crosses section from beneath of the culvert. Accordingly, PGC was appointed to investigate the constructability, perform calculations and present the executive plan for this intersection.

## SERVICES PROVIDED BY PGC

- Obtaining and Investigating the Project Information as well as Design Criteria and Principles
- Evaluating the Damages likely to be incurred by Concrete Culvert to the Tunnel, Nearby Highway, Pedestrian Bridge adjacent to The Tunnel and other Buildings
- Investigating and Comparing various Choices of Implementation and Maintenance during Construction and Operation
- Drawing Conclusions to investigate Whether Tunnel can pass from beneath of the Existing Tunnel
- Specifying Stress and Deformation Limits
- Analysis of Stresses and Deformations developed in Rock, Culvert and adjacent Structures
- Presenting the Reports and Basic Design Drawings relevant to the Best Choice



#### MAJOR FEATURES

- Importance of adjacent structures, simultaneous control of vertical and horizontal deformations as well as numerical modeling of deformations using finite element software can be marked as the significant features of this project.

#### CLIENT

- Main Client: ISFAHAN Urban Train Organization

#### CONTRACTOR

- JAHAN KOWSAR Company

#### PROJECT TIME AND DURATION

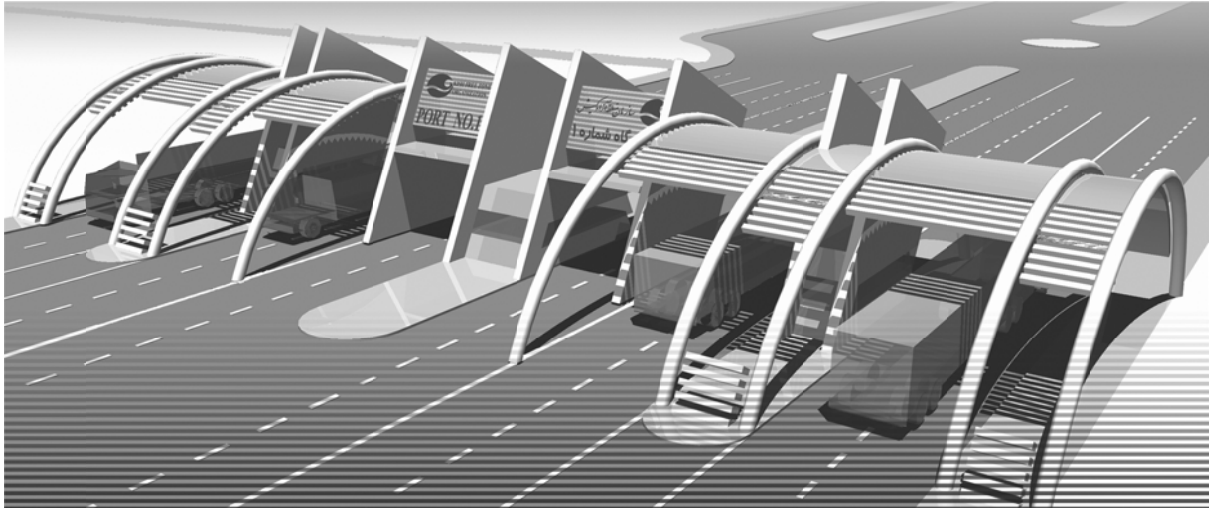
- Winter of 2006, 3 months





## ✚ PROJECT TITLE

# Supervision for Construction of the Portal and Surrounding Walls of KISH Commercial Port



## ✚ PROJECT DESCRIPTION

Construction of the portal for main entrance of Kish Commercial Port (designed based upon inspiration from sea waves) and surrounding walls with length of 660m was planned. This project not only leads to surrounding the port area as well as accelerating and organizing vehicles traffic, but also beautifies the port. Volume of the executive operation of this project is as follows:

- Heavy Steel Operation: 120.000 Kg
- Light Steel Operation: 7.300 Kg
- Concrete Operation: 700 m<sup>3</sup>
- Earthworks: 1.300 m<sup>3</sup>

## ✚ SERVICES PROVIDED BY PGC

- Overall Supervision
- Site Supervision

## ✚ MAJOR FEATURES

This portal is comprised of 8 steel frames as well as 8 concrete walls with the respective electrical installations in which rigorous techniques have been utilized to implement large arches with tubular cross sections.

## ✚ CLIENT

- Kish Port and Airport Development and Investment Company

## ✚ PROJECT TIME AND DURATION

- 2007, 12 months





#### PROJECT TITLE

### **Investigations and Feasibility Studies to Construct Oil Berths in QESHM, KHARK, HORMUZ, HENGAM, LARAK & Greater Tunb Islands**

#### PROJECT DESCRIPTION

PGC was awarded to conduct studies concerning construction of oil berths in the six Islands of Persian Gulf aimed to facilitate transmission of oil products from southern coasts of Iran to these Islands. In this regard, after conducting phase 0 studies, tender documents related to construction of oil berths as well as respective facilities and installations were prepared to be assigned to the authorized contractor as EPC contract.

#### SERVICES PROVIDED BY PGC

- Environmental Studies and Field Investigations
  - ✓ Investigation of the Current Situation of Installations
  - ✓ Investigation and Analysis of Environmental Data
  - ✓ Forecasting the Rate of Product Consumption within a 20-year Horizon
  - ✓ Specifying the Optimum Capacity of Oil Berths
- Investigations and Feasibility Studies of Berth Construction
  - ✓ Wave & Wind Statistical Studies
  - ✓ Navigation Studies
  - ✓ Preparation and Presentation of the Map and Technical Specifications
- Offshore and Onshore Layout Maps
  - ✓ Preparation of Technical Specifications related to Piping, Process, Mechanics, Cathodic Protection, Instrument, Structure and Civil
  - ✓ Preparation of Tender Documents and Scope of Works for EPC Contractor

#### MAJOR FEATURES

- Incorporation of Issues related to Design of Marine and Coastal Structures with the Storage Sites of Oil Products
- Exploring the best Place to Construct the Berth for Unloading and Loading Oil Products in each Islands
- Various Hydrodynamic Conditions due to Location of the mentioned Islands in different Parts of Persian Gulf
- Necessity of Collaboration among different Technical Disciplines such as Marine Structures, Geotechnics, Structure, Process, Piping, Mechanics, Electricity and Instrument

#### CLIENT

- National Iranian Oil Products Distribution Company

#### PROJECT TIME AND DURATION

- 2009, 6 months



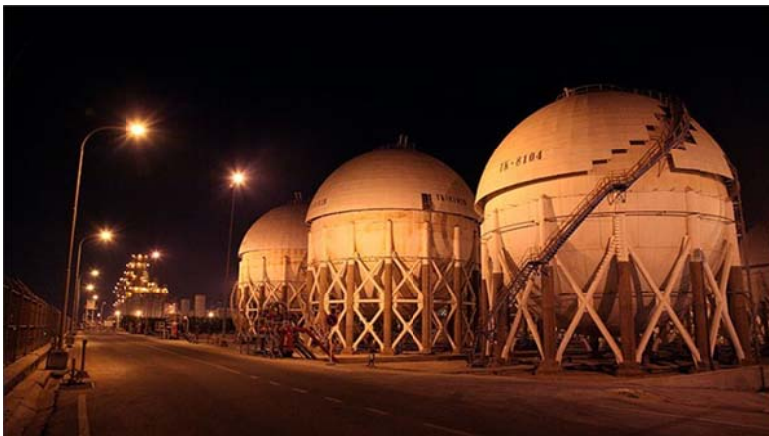


## PROJECT TITLE

# Design and Site Engineering Services for Land Reclamation and Design of ASALUYEH Spherical Tanks

## PROJECT DESCRIPTION

Constructing a number of spherical tanks adjacent to PARS Service Port was intended by National Iranian Oil Products Distribution Company which was awarded to MACHINE SAZI ARAK Company within an EPC contract. These tanks will be constructed on the land reclaimed from the sea. In this project, PGC cooperated with the contractor and provided engineering services regarding ground improvement and design of the tanks foundations.



## SERVICES PROVIDED BY PGC

- Specifying the Backfill Material and Land Reclamation form the Sea
- Selection of the Best Soil Improvement Method
- Technical Specifications of Improvement Method
- Preparation of the Required Geotechnical Exploration Services and their Interpretation
- Selection of the Best Type of Foundation for Tanks (Pile or Mat Foundation)
- Basic and Detailed Design of the Tanks Foundations (Geotechnical and Structural Design)
- Providing Drawings and Technical Specifications of Foundation Materials

## MAJOR FEATURES

- Significant Susceptibility of Spherical Tanks to Settlement
- Project Land which was reclaimed from the Sea

## CLIENT

- Main Client: National Iranian Oil Products Distribution Company (NIOPDC)
- Direct Client: MACHINE SAZI ARAK Company (EPC Contractor)



#### PROJECT TITLE

### **Control and Optimization of Steel Structures in Phases 17 & 18 of South PARS Gas Field Development Project**



#### PROJECT DESCRIPTION

This project included control and review for design of steel structures built in phases 17 and 18 of South PARS Gas Field Development Project. As samples, three pipe racks designed for this project were controlled and reviewed. According to the great scale of south PARS Gas Field Development Project, the obtained results led to a cost-effective design in addition to achieving up-to-date technical and engineering criteria required for the client.

#### SERVICES PROVIDED BY PGC

- Review of the High Level Documents including Feed Documents as well as Criteria affecting the Structural Design
- Review of Documents pertained to the three pipe racks including Modeling, Calculation Reports, Drawings, etc.
- Presenting Modification and Optimization Approaches for Design of the mentioned Structures and Preparing a new Design

#### MAJOR FEATURES

- Observing engineering provisions and criteria of the structures related to oil industries, modern/novel seismic design criteria were also taken into account to design steel structures of this project. Moreover, close collaboration of structural and piping engineering disciplines can be marked as another significant feature of this project.

#### CLIENT

- Main Client: PARS Oil and Gas Company (POGC)
- Direct Client: Oil Industries' Engineering and Construction (OIEC)

#### PROJECT TIME AND DURATION

- 2009, 3 months







#### ✚ PROJECT TITLE

### **Brief and Detailed Environmental Evaluation - Phase 2 MOBIN Intake – ASSALUYEH**



#### ✚ PROJECT DESCRIPTION

Iran Marine Industrial Company (SADRA Co) was obliged to carry out studies and implement phase 2 of MOBIN 2 intake located in ASSALUYEH. This intake is intended to take water from the sea and transmit it so that to cool industrial facilities and lastly, warm water will be returned to the sea. With respect to the environmental sensitivities of ASSALUYEH area and importance of the project, brief evaluation studies and subsequent detailed environmental assessment of this intake was awarded to PGC within two contracts. In this project, after providing sampling and test methods by PGC, SADRA took samples of water and sediment as well as other related tests in a laboratory, authorized by the Iranian Department of Environment.

#### ✚ SERVICES PROVIDED BY PGC

- Description of Present Environmental Condition of the Area
- Prediction of the Project Impacts on Physical-Chemical, Biological, Economical-Social and Cultural Environments
- Environmental assessment of Possible Choices for the Project
- Presentation of a Plan to mitigate adverse and important effects
- Presentation of Environmental Management Plans

#### ✚ MAJOR FEATURES

- Proximity of the project to the NAYBAND marine national park, interference of a large number of industrial facilities in the area and great scale of this intake are remarkable features of this project.

#### ✚ CLIENT

- Main Client: Iranian National Petrochemical Company
- Direct Client: Iran Marine Industrial Company (SADRA)

#### ✚ PROJECT TIME AND DURATION

- 2007, three and a half months



#### PROJECT TITLE

### **Preparation of Technical Specifications to Obtain Permit for Operating Shipbuilding and Repair Yard**



PARS POOLAD Shipyard Company (Ltd) possesses operating permit to build ten ships per year. This company required to obtain operation permit from Iranian port and maritime organization in order to be able to continue its activities and utilize a portion of BANDAR ABBAS coast as dry dock to carry out construction and maintenance works of ships with draft of less than 2 meters. For this purpose, OGC was appointed to investigate the activities and provide solutions for resolving the problems and defects.

#### SERVICES PROVIDED BY PGC

- Investigation of the Performable Activities in the Shipbuilding and Repair Yard
- Specifying the Problems and Defects and Providing Solutions to Resolve them
- Participation in the respective Meetings to Obtain Permit and Investigation of the Plan in Port and Maritime Organization

#### MAJOR FEATURES

- Investigating the requirements of a construction yard with regard to the characteristics of the dry dock as well as studying various solutions and selecting the best choice in terms of technical and economic aspects can be considered major features of this project.

#### CLIENT

- PARS POOLAD Shipyard Company

#### PROJECT TIME AND DURATION

- 2007, 3 months





## PROJECT TITLE

### The Study of 9.5-Kilometer Long Tunnel - SHAHID MAHALATI Highway



Rapid growth of population in megacities is inevitable and owing to the wide spread of population and buildings in large cities; quick access to different urban and suburban areas is in major demand. Nowadays, the vicinities of large cities are not solely restricted to the ground or the space above it, but also plans have been arranged to employ subsurface areas by means of underground structures. Construction of long tunnels is one of these plans in order to apply underground areas for building access routes. One of the east-west axes of Tehran is SHAHID MAHALATI Highway currently being operated with highway function between BASIJ Highway and 17<sup>th</sup> SHAHRIVAR Intersection. As studies pertained to the continuation of this route to the east of BASIJ Highway up to its auxiliary axis have been set onto the agenda and with regard to the incompleteness and shortcomings of Tehran Highway network within east-west axes, it was decided to carry out feasibility studies for continuation of this highway between 17<sup>th</sup> SHAHRIVAR Intersection to FATH Square with a length of about 9.5 kilometers.

## SERVICES PROVIDED BY PGC

- Following up, Collecting, Receiving and Investigating g the Documents and Data required for the project (Surveying, Geotechnics, Subsurface Waters, amount of Traffic)
- Investigating the Local Conditions as well as Executive Limitations lying in the Study Area and their effects on Studying different Choices and Proposing the Final Choice
- Executive Proposal
- Technical, Economical, Environmental and Social Justification of the Project

## MAJOR FEATURES

- Great length of this urban tunnel (9.5 Km) has made it to an outstanding project worldwide. Problems pertained to HVAC and Safety is counted as the main challenges of this project.

## CLIENT

- Tehran Engineering and Technical Consultant Organization

## PROJECT TIME AND DURATION

- 2008, 9 months





#### PROJECT TITLE

### **Site Supervision Services for Construction of Four Tanks and Ancillary Facilities - BANDAR ABBAS Oil Warehouse**



#### PROJECT DESCRIPTION

Construction of four tanks with capacity of 6000 m<sup>3</sup> and their respective facilities was intended by the Client in this project.

#### SERVICES PROVIDED BY PGC

- Instructions Control and Investigation of Materials and Equipments Quality
- Investigation of Technical Inspection Methods and Comprehensive Program of Work Quality Control
- Supervision of Earthworks, Land Grading, Plumbing, welding, Installation of Mechanical and Electrical Equipments as well as Instrumentation of Concrete and Steel Works
- Supervising the Installation of Fixes and Rotary Installations such as Pumps, Strainers, Tanks and etc.
- Supervision of the launching Procedure of High, Medium and Low Voltage Power Cables as well as Installation of Electrical and Instrument Equipments and Respective Connections
- Supervising the Installation of High, Medium and Low Voltage Switchgears and Process Control Panel
- Supervising the Execution of Above and Underground as well as Fire Suppression Pipes
- Supervising the Conduct of all Destructive and Hydrostatic Tests related to Oil Warehouse Construction Project
- Supervising the Construction of Warehouse Cathodic Protection Systems and Conduct of the related Tests as well as Running the System
- Supervising the Test Operation and Running the Project Facilities
- Investigating and Approving the As-Built Drawings as per the Subjected Contract

#### MAJOR FEATURES

- Importance of the tanks and their construction in the mentioned area and necessity of applying safety standards resulted in a rigorously supervised construction.

#### CLIENT

- National Iranian Oil Products Distribution Company (NIOPDC)

#### CONTRACTOR

- KARANEH BANAGOSTAR Company

#### PROJECT TIME AND DURATION

- 2009, 12 months





## PROJECT TITLE

# Documents Preparation and Qualitative, Economical and Technical Assessment of Investment Proposals related to Collect, Process and Dispose Wastes of Vessels operation and Investor Absorption



## PROJECT DESCRIPTION

Iran ratified and accessed MARPOL convention and this ratification entails running facilities required for receiving and processing wastes related to the vessels in southern and northern coasts. Based on the policies adopted by Port and Maritime Organization, running and operating the facilities to receive and process the wastes should be carried out by absorbing investors. PGC is assigned to negotiate, choose and conclude contract with investors.

## SERVICES PROVIDED BY PGC

- Extraction of Market, Investment, Financial and Operational Indexes as well as Technical and Executive Records taking MARPEL Convention into account
- Formulating and Determining Sensitivity and Correlation of Selected Qualitative, Technical and Financial Indexes to choose the Best Proposal
- Preparation and Codification of Contract Give-Over Model
- Preparation and Codification of Documents, Format, Tables and the Framework required for collecting the information pertained to the approved Indexes from Applicants in forms of Separate Sections and related Pockets
- Preparation and Codification of the Process for Collecting Information and Investigating the Proposals based on the Indexes and Classified Documents
- Investigation and Assessment of Technical-Economical Plan Investment Proposals
- Preparing and Codifying the Contract Sample of Assigning the affairs related to provide Facilities of Receiving, Processing and Disposing Wastes to the Investor

## MAJOR FEATURES

- None of the northern or southern countries neighboring Iran has managed to fulfill their obligations according to MARPOL convention in the mentioned field. Hence, obtaining successful results in this project would be a national honor.

## CLIENT

- Iranian Port & Maritime Organization



#### PROJECT TITLE

### **Preparation of Guidelines for Conducting Field Operation in Iranian Marine Geotechnical Projects**



#### PROJECT DESCRIPTION

Increasing development of industrial activities in the ports and coasts such as building port and coastal structures, pipelines as well as offshore works like construction of platforms to extract underground resources, enhances demands for explorations operations and underwater investigations. In this project, guidelines for geotechnical explorations in relation to the Iranian local and executive conditions were prepared.

#### SERVICES PROVIDED BY PGC

Guidelines for conducting field operation of Iranian marine geotechnical projects with the following outlines were prepared.

- Planning the Geotechnical Investigations in the Sea
- Sampling Methods from Seabed Materials
- Establishment Methods of Drilling Equipments in the Sea
- Field Experiments in the Sea
- Exploration of Special Soils in Iranian Marine Areas

#### MAJOR FEATURES

- Guidelines for geotechnical explorations can be applied by all practitioners involved in execution of marine projects including clients and consultants to prepare scope of services and operation control and also contractors can employ these guidelines to accurately carry out the explorations. Conformation of these guidelines with Iranian conditions can be counted as a major feature.

#### CLIENT

- Transportation Research Institute

#### PROJECT TIME AND DURATION

- Summer of 2009, 10 months







## PROJECT TITLE

# Supervision Services of Pre-loading and Ground Consolidation Operation- MAHSHAHR Oil Warehouse Construction Project



## PROJECT DESCRIPTION

MAHSHAHR oil warehouse construction project includes fuel storage tanks as well as facilities and nearby buildings. Due to the poor geotechnical conditions, ground of the project site needs to be improved. Providing site engineering services for ground improvement is one of the project objectives.

## SERVICES PROVIDED BY PGC

- Controlling the Vertical Drains Specifications (P.V.D), Borrow Materials to provide Surcharge, Horizontal Drains Materials and Instrument Technical Specifications.
- Supervising the Preloading and Ground Consolidation Operation including Supervision of Ground Preparation to execute Horizontal and Vertical Drains, Implementing the Installation Location of Vertical Drains, Implementing Peripheral Channels for Drainage, Execution of Horizontal and Vertical Drains, Instrument Installation Operation and Controlling their Installation Locations
- Supervising the Height, Execution Speed and Time Intervals between each Stage of Earth-filling
- Supervising the Unloading Operation including Unloading Speed, Work Stages and Schedule, Ground Preparation after Preloading Operation and Conducting Control Tests after Preloading Operation Completion.
- Reading the Instrument and Presenting the Results
- Providing the Essential Solutions in Encountering Technical and executive Problems

## MAJOR FEATURES

- Application of Preloading Method to Improve Soil for Large Tanks
- Application of Prefabricated Vertical drains (PVD) to accelerate Soil Improvement Process
- Monitoring Soil Behavior by means of Geotechnical Instrumentation and Applying Modifications during Implementation

## CLIENT

- Main Client: National Iranian Oil Products Distribution Company

## CONTRACTOR

- KHATAM Construction Group-SADAF Institute

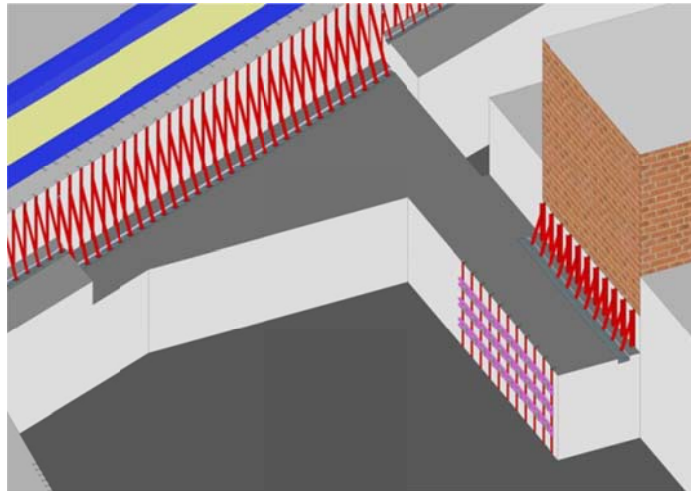
## PROJECT TIME AND DURATION

- Summer of 2009, 6 months



#### PROJECT TITLE

## Structural, Geotechnical, Excavation and Retaining Structure Design - SADEGHIEH Multi-purpose Complex Project



#### PROJECT DESCRIPTION

Tehran municipality intended to construct a complex with substructure area of 230000 m<sup>2</sup> including commercial, administrative, sport and leisure uses in a land with an area of nearly 27000 m<sup>2</sup> in collaboration with the private sector. Controls relating to the first phase, studies concerning the structure and foundation as well as executive drawings and also completion of excavation and retaining structures designs were carried out by PGC.

#### SERVICES PROVIDED BY PGC

- Studies and Structural Design Control
- Structural Building Materials Control
- Final Determination of the Appropriate Structural System
- Foundation Design Control according to the Building Settlement
- Controlling the Geotechnical Studies and Design as well as executive method, Calculation and Investigation of Underground Waters Condition, Effects of Excavation on Adjacent Structures, Excavation Support Method and Selection of an appropriate Retaining Structure

#### MAJOR FEATURES

- Each part of the project required its specific design for excavation because of the considerable area of the project land and variety in conditions of the adjacent structures. In addition, all designs had to be practicable by one contractor.
- Excavation problems caused by proximity of our project to the subway crossing structure and a high-rise building in two sides of the land can be counted as the significant challenges.

#### CLIENT

- Main Client: SHAHR ATIEH Company (Affiliated to Municipality)
- Direct Client and Architectural Consultant: AMOOD Consulting Engineers

#### PROJECT TIME AND DURATION

- 2009, 12 months





## PROJECT TITLE

### Supplementary Studies and Basic Design for First Phase of TIAB Port Development



## PROJECT DESCRIPTION

Coast of TIAB rural district located adjacent to MINAB city consists of a number of deltas, sand dunes and several estuaries. Existence of TIAB estuary has brought great opportunities for the residents to carry out commercial and fishery activities. Nevertheless, continual problems of estuaries such as insufficient depth for vessels traffic in many days of the year and lack of a safe and stable path have caused problems for vessels owners and the fishermen. In order to resolve these problems and optimize current situation of serving the vessels working in TIAB port, “feasibility studies of TIAB port development” were conducted by PGC and solutions provided for the problems. Port and Maritime Organization approved these solutions and subsequently, PGC was awarded to by SHAHID BAHONAR Port and Maritime Administration to carry out supplementary studies and basic design for first phase of TIAB port development as well as preparation of EPC tender documents.

## SERVICES PROVIDED BY PGC

Identification Studies, Field Investigations and Basic Studies as follows:

- Wind and Temperature, Wave and Water Stream, Tide and Ebb, Geology, Geo-technics, Seismicity, Hydro-graphy, Topography and Environment
- Preparation of Scope of Services for the following Operations: Surveying, Hydro-graphy, Geo-technics, Soil Mechanic Tests, Sediment Sampling and Environmental Experiments
- Required Supplementary Studies (Hydrodynamic, Navigation, Sediment and construction of sediment Excluder
- Dredging studies
- Environmental Evaluation
- Cost Estimation and Preparation of EPC Tender Documents

## MAJOR FEATURE

Sedimentation process at the entrance of TIAB estuary is very complex and rare in Persian Gulf. Comprehensive efforts made to perceive sedimentation mechanisms and optimum design of the sediment excluder are major features of this project. Furthermore, proximity of the project location to the environmental protected area of TIAB estuary was another challenged of this project.

## CLIENT

- HORMIZGAN Province Port and Maritime Administration- SHAHID BAHONAR Port

## PROJECT TIME AND DURATION

- Autumn of 2010, 4 months





#### PROJECT TITLE

### Design and Construction Supervision of 1,000 Ton Gantry Crane - SADRA Island



#### PROJECT DESCRIPTION

Iran Marine Industrial Company (SADRA Co) operates a dry-dock with length, width and depth of 300, 50 and 11.5m respectively so that to carry out construction and maintenance works pertained to any type of vessel in SADRA Island located in BUSHEHR Port. In order to fully operate the dock for building and repairing the vessels as well as assembly of the ship blocks and installation of its equipments, a gantry crane with capacity of 1000 Tons located on the dock or next to it moving on a row of piles, will be employed.

#### SERVICES PROVIDED BY PGC

- Geotechnical and Structural Design of the Crane Foundation
- Investigation of the Drainage System existing in the Dock and Structural Control of Dock for application of Crane Load
- Providing the Gantry Crane Specifications
- Site Engineering and Overall Supervision for Construction of the Crane Foundation

#### MAJOR FEATURES

- Considerable size and capacity, have led to greatness of the crane in the region. On the other hand, location of the projects rests on loose soil resulting in a challengeable project from the viewpoint of foundation engineering.

#### CLIENT

- Iran Marine Industrial Company (SADRA Co)

#### PROJECT TIME AND DURATION

- Design: 2009, 2 months                      Site Engineering: 2010, 12 months





## PROJECT TITLE

# Consultancy Engineering Services and Overall Supervision to Conduct Dry-Dock Excavation - Caspian Sea Complex located – NEKA



## PROJECT DESCRIPTION

Iran Marine Industrial Company (SADRA Co) intends to construct a dry-dock with length, width and depth of 250, 40 and 10.6m respectively to build and repair vessels in Caspian Sea Complex located in NEKA Port. PGC was appointed to carry out conceptual, geotechnical and structural design as well as providing documents and respective drawings in order to stabilize sheet-pile wall of the dry-dock during excavation and project construction as well as the 50-year operation period.

## SERVICES PROVIDED BY PGC

- Investigation of Geotechnical Explorations and the other Required Environmental Data in the Project Area
- Investigation of the Former Documents relevant to Sheet-Pile Structure and Excavation
- Modeling the Selected Stabilization Method for Excavating Stages
- Preparation of Executive Drawings
- Preparation of Guidelines to carry out Monitoring and Local Measurements of the Excavation and Retaining Structure during Construction
- Investigation and Process of the Data received from Monitoring Facilities and Presentation of Periodic reports
- Stability Analysis of the Excavation and Retaining Structure during Construction
- Investigating the Need to Test Anchors and Providing Test Instructions
- Supervising the Excavating Stages and Stabilizing

## MAJOR FEATURES

- The developed executive problems and efforts made in order to resolve them are considered major features of this project.

## CLIENT

- Iran Marine Industrial Company (SADRA Co)

## PROJECT TIME AND DURATION

- 2009, 18 months



## PROJECT TITLE

### **Preparation of Comprehensive Inspection Guide for Piers of Iranian Ports**

## PROJECT DESCRIPTION

In order to evaluate and ensure that piers performance is in conformity with the required performance during ordinary operation conditions and after the occurrence of special events (e.g. storm, earthquake or explosion), it is required to initially carry out data collection and inspection. Preparation of this guide tends to provide methods for collection of wharves and piers data and propose techniques and criteria for inspection of structural, electrical and mechanical systems and components of Iranian wharves and piers so as to evaluate their vulnerability. Vulnerability evaluation of wharves and piers aims to compare their performance level with the required performance level and if considered necessary, renovate and repair the structure to prevent accidents and disasters.

## SERVICES PROVIDED BY PGC

### *First Phase: Providing the Report concerning Study of Technical References*

- Studying the Conducted Researches about Inspection, Repair and Renovation of Wharves and Piers in Persian Gulf and Caspian Sea areas and the other Parts of the world
- Studying the Reported Damages in Wharves and Piers to identify Sensitive Structural and Geotechnical Parts
- Studying the Damages related to the Installations of Wharves and Piers (i.e. Water, Fire and Electricity network as well as Fuel Transmission Pipelines in Oil Berths and etc.)
- Studying the Damages incurred in Mooring and Berthing Equipments (i.e. Fender, Bollard, Quick Release and etc.)
- Studying the Damages incurred in Loading and Unloading Equipments (i.e. Cranes, Loading Arms, Conveyor Belts, Ship Loader and etc.)
- Inspection Methods for the Above Water Surface Components including: Visual Observations, Geometrical Measurements, Sampling and Experimental Tests
- Inspection Methods for the Under Water Surface Components including: Diving followed by Visual Observation, Photography, Sampling and Experimental Tests
- Investigation of Modern and Novel Approached for Inspection of Wharves and Piers and Providing their Summaries

### *Second Phase: Providing Methods to Collect Wharves and Piers Documents*

- Providing a Method to identify Independent Systems of Wharves and Piers in terms of Structural and Ancillary Equipments Issues
- Introduction of all types of Wharves and Piers and their Independent Systems

### *Third Phase: Providing Methods and Criteria for Basic Inspection of Wharves and Piers*

- Providing Inspection Method for Above and Under Water Surface Structural Components
- Providing a Method to inspect Mechanical and Electrical Components as well as Mooring, Berthing, Loading, Fire and Safety Equipments

## MAJOR FEATURES

- Collecting the technical references related to wharves and piers inspection and conforming them to Iranian conditions and broad range of specialties involved in this project including structure, geotechnics, Material, Mechanic, Electricity and Navigation, are counted as major features of this project.

## CLIENT

- Transportation Research Institute







#### ✚ PROJECT TITLE

### Consultancy Services and Supervision for Repair and Maintenance of Buildings and Facilities - SHAHID BAHONAR Port and Subsidiary Ports (SHAHID HAQANI, JASK & TIAB)



#### ✚ PROJECT DESCRIPTION

Buildings, facilities and installations of the mentioned ports are in demand of repair and permanent maintenance. In this respect, PGC was appointed to provide consultancy services and supervision within a one-year contract.

#### ✚ SERVICES PROVIDED BY PGC

- Consultancy Services related to Area Repair and Maintenance
- Supervising the Performance of Repair and Maintenance Contractors

#### ✚ MAJOR FEATURES

- Variety of activities and specialties can be regarded the significant feature of this project.

#### ✚ CLIENT

- HORMOZGAN Province Port and Maritime Administration, SHAHID BAHONAR Port

#### ✚ PROJECT TIME AND DURATION

- 2010, 12 months



#### PROJECT TITLE

### Project Engineering Services for Construction of Temporary Custom and Four Desalination Systems in KHARG Island



#### PROJECT DESCRIPTION

In line with strategies to mitigate environmental pollutions, generate employment and earn income through sale of gas condensations, Iranian ministry of petroleum has defined projects to collect the redundant gases emitted from oil extraction process. Accordingly, NGL factory project is one of the greatest ones in this respect whose set-up will result in income of 720 million dollars per year. In this project, PGC provided engineering services for temporary costume construction and designed four desalination systems, one with capacity of 100 m<sup>3</sup>/d and the other ones with capacity of 200 m<sup>3</sup>/d to produce sanitary water.

#### SERVICES PROVIDED BY PGC

All Engineering and Consultancy Services for Construction of Temporary Costume-House  
First and Second Phase Studies of the Desalination Systems as follows:

- Preparing the Equipments Configuration Drawings
- Conducting the Technical Calculations and Preparing the Executive Drawings
- Preparing the Executive Details and Providing the Respective Standards
- Preparing the Special Bill of Quantity, Works and Technical Specifications

#### MAJOR FEATURES

- Problems regarding traffic/transportation to KHARG Island and data collection are the most important features of this project. Moreover, conformation of the project to its respective limitations was of great significance for conducting the studies.

#### CLIENT

- Pars Mine and Industry Construction Company (PAMICCO)

#### PROJECT TIME AND DURATION

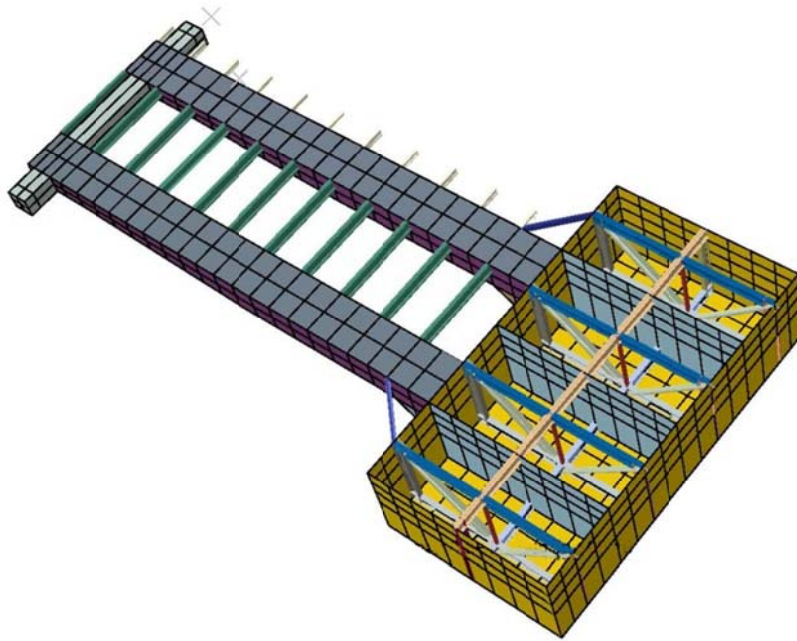
- 2010, 4 months





#### ✚ PROJECT TITLE

### Engineering Services for Design, Construction and Installation of RO -RO Pier (Pier No. 7) and related Ancillaries - SHAHID BAHONAR Port



#### ✚ PROJECT DESCRIPTION

RO-RO floating pier located in SHAHID BAHONAR Port, BANDAR ABBAS, is going to be executed within an EPC contract and PGC is assigned to cooperate in this project as engineering associate.

#### ✚ SERVICES PROVIDED BY PGC

- Engineering Services for Construction of Ro-Ro Floating Pier
- Preparing Detailed Drawings and Calculation Report for : Pier Structure, Berthing and Mooring Equipments (Bollards and Fenders) and Ancillaries
- Engineering Services to Launch and Carry Floating Pier to the Installation Location
- Conducting Required Analyses to Carry and Install the Structure and Providing the Related Calculation Report
- Providing Instructions to Carry and Install the Structure

#### ✚ MAJOR FEATURES

- Satisfying structural and hydrodynamic aspects, design of the floating pier was carried out and approved by the client's consultant as well as Iranian Classification Society. Short period of time spent for design, is considered the significant point of this project.

#### ✚ CLIENT

- Main Client: HORMOZGAN Province Port and Maritime Administration-SHAHID BAHONAR Port

#### ✚ CONTRACTOR

- KARAN DARYA Company

#### ✚ PROJECT TIME AND DURATION

- 2010, 3 months





#### PROJECT TITLE

### **Study Control and Conceptual Design of HAKIM Highway Tunnel - CHITGAR Park Area**



#### PROJECT DESCRIPTION

HAKIM Highway is counted as one of the most prominent routes of Tehran highway network with east-west direction making possible regional and local accesses from furthest west to the easternmost regions of the city. In eastern and western parts of Tehran, this highway is called RESALAT and HAKIM Highway, respectively. In region 22 of Tehran, between AZADEGAN Highway up to IRAN KHODRO intersection, a part of HAKIM Highway passes from CHITGAR Forest Park. Regarding the importance of CHITGAR Park functionality, HAKIM Highway should cause the least possible social and environmental impacts. To this end, construction of HAKIM tunnel starts from southeast of Persian Gulf lake and extends after passing from beneath of CHITGAR Forest Park to the length of 1000m and ends prior to IRAN KHODRO street. As client's consultant, PGC undertook to investigate and approve studies as well as conceptual and basic design of this project.

#### SERVICES PROVIDED BY PGC

Conducting Investigation, Control and Approval of Conceptual Studies and Basic Design as follows:

- Selection of the Optimum Choice
- Geotechnical and Geological Studies
- Civil and Structural Design
- Traffic, Pavement and Route Geometric Design
- HVAC, Safety, Electricity and lighting, Telecommunication and ITS Design
- Estimation of Volumes and Unit Rates
- Environmental Studies

#### CLIENT

- Tehran Engineering and Technical Consultant Organization

#### PROJECT TIME AND DURATION

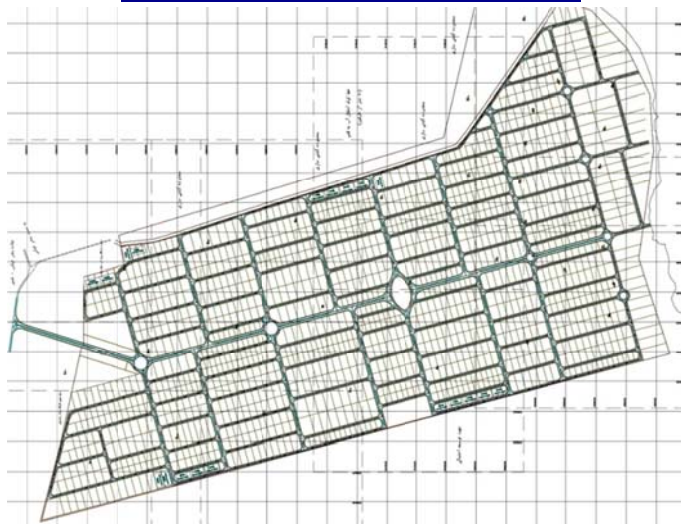
- 2013, 3 months





## PROJECT TITLE

# Review and Completion of Run-off Water Collection and Conveyance Project - Persian Gulf Industrial Park



## PROJECT DESCRIPTION

Persian Gulf Industrial Park is located adjacent to BANDAR-e ABBAS. Gentle slope of natural ground and sudden heavy rains led the former designs to encounter problems in construction phase. Consequently, the client decided to appoint PGC for providing solutions so as to resolve the problems.

## SERVICES PROVIDED BY PGC

First Phase Studies of Collection and Disposal Network for Runoff waters of Entire Persian Gulf Industrial Park Site

- Collecting the Data required for Design
- Providing Different Patterns for Embanking and Adjusting the Basins Location
- Comparing the Choices in terms of their Performance and Rating them based on Cost and Technical-Executive Criteria
- Providing Basic Drawings of the Final Choice

Second Phase Studies of Runoff Water Collection and Disposal Network

- Providing Detailed Drawings based on the Approved Basic Design
- Providing the Technical Specifications Notebook for Earthworks
- Conducting Design of Pumps and Providing Datasheet and Respective Technical Specifications
- Design of Hydraulic Structure Components

## MAJOR FEATURES

Slight slope of natural ground and intensity of sudden rainfalls result in a lot of problems for design and conveyance of runoff waters. Optimum and economical solutions for these problems demand experience and engineering accuracy which were applied by our experts.

## CLIENT

- HORMOZGAN Province Industrial Estates Company

## PROJECT TIME AND DURATION

- Winter of 2010, 2 months



#### PROJECT TITLE

### **Study, Investigation and Providing Structural Retrofit Plan for P5, P6 and P7 Piers - RAZI Petrochemical Plant**



#### PROJECT DESCRIPTION

P5, P6 and P7 piers of RAZI petrochemical plant are located in MAHSHAHR estuary and they have been operating for 50 years. Structure and berthing, mooring, loading and unloading equipments of these piers need to be upgraded. In this respect, PGC was assigned to conduct studies related to upgrading these structures.

#### SERVICES PROVIDED BY PGC

- Conducting Basic Studies
- Performing Inspections and Tests
- Investigating Current Situation of Structures
- Investigating the Effect of new Facilities and Equipments required for the Piers
- Preparing Detailed Report

#### MAJOR FEATURES

- Problems regarding Data Collection for These Old Piers
- Conduct of Material Tests and Structural Samplings in Difficult Conditions

#### CLIENT

- Petrochemical Special Economic Zone

#### PROJECT TIME AND DURATION

- Winter of 2010, 3 months





## PROJECT TITLE

# Design & Supervision for Fenders of Persian Gulf Port Piers and Preparation of Basic and Detailed Design for Upgrading and Standardization of Dolphin



## PROJECT DESCRIPTION

Persian Gulf Port currently has nine major piers with draft of -7.6 mCD dedicated to different uses. Fenders of these piers are in inadequate status and majority of them have failed. In this project, after designing the fenders of each pier, it was attempted to provide tender documents for construction, purchase and installation of them. In accordance with master plan studies of Persian Gulf Port (carried out by PGC within 2006 and 2007), pier No.1 (dolphin) was considered to serve as oil terminal which was not in acceptable and satisfactory condition in terms of safety and operational performance. In this project, not only structural defects of dolphin related to operational performance, safety, berthing and mooring equipments were specified, but also basic and detailed design and executive drawings were provided in order to achieve nominal capacity as well as safe and easy operation and also, tender documents were prepared so that to select the contractor.



#### **SERVICES PROVIDED BY PGC**

##### *Conducting Design for Fenders of Persian Gulf Port Piers*

- Investigating and Determining Tidal Elevations
- Determining the Smallest and Largest Vessel for each Pier
- Conducting Design including Type, Size, Performance Curve and Protection Coating for Pier Fenders (Piers No. 2 to 9)
- Providing fender Layout Map for each Pier
- Preparing and Providing Technical Specifications and Installation Instructions for Fenders

##### *Basic and Detailed Design for Retrofit and Standardization of Dolphin Pier (Pier No.1- Persian Gulf Port)*

- Pier Design in terms of Dimensions, Elevation and Area Required to Establish Loading and Unloading Equipments of Oil Products
- Design of Dolphin Piers as well as Berthing and Mooring Fenders
- Design of Access and Pipe Bridge
- Structural Design of Pier and Preparation of Executive Drawings
- Design of Quick Release Mooring Hooks
- Basic Design for Cathodic Protection and Protective Coating of Piers
- Quantity Surveying and Preparation of Tender Documents
- Construction Supervision



#### **MAJOR FEATURES**

- In general, it is more difficult and inconvenient to carry out marine upgrade projects than designing a project from its commencement. Design and new standards suitably conformed to the existing condition can be marked as significant features of this project.

#### **CLIENT**

- HORMOZGAN Province Port and Maritime Administration

#### **PROJECT TIME AND DURATION**

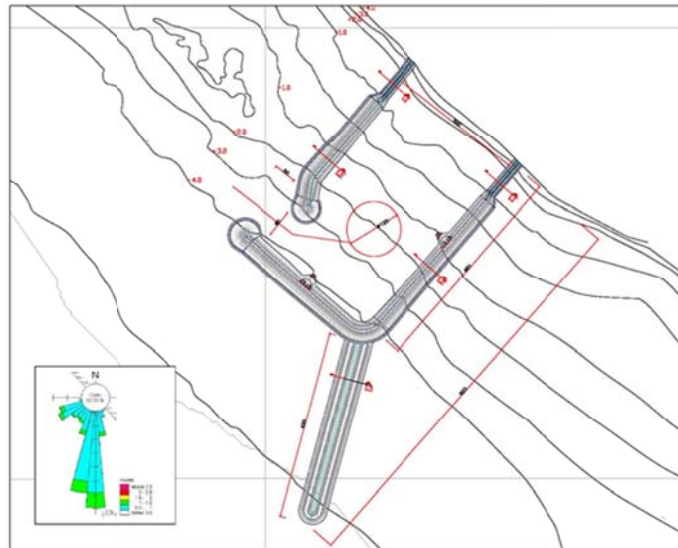
- Winter of 2010, 3 months





## PROJECT TITLE

# Design of Five Multi-Purpose Breakwaters in Southern Iranian Coasts (From JASK Port to GUATR Gulf)



## PROJECT DESCRIPTION

Port and Maritime Organization has set out to construct 300 small multipurpose ports in southern Iranian coasts. These ports with fishery and travel performances will have a significant role on employment generation and economic prosperity in southern Iranian coastal areas. Among them, several ports in southwestern coasts of Iran, located between JASK Port and GUATR Gulf were chosen. Construction of breakwaters for these ports will be carried out by Iran Civilization and Road Construction Company as EPC contractor. As contractor associate, PGC undertook to design breakwaters of five ports in the mentioned area.

## SERVICES PROVIDED BY PGC

### Basic Studies

- Finalizing the Breakwater Construction Location
- Investigating Borrow Mines and Resources
- Hydrodynamic Studies
- Sedimentation and Morphology Studies
- Geotechnical Studies

### First Phase design of Breakwater

- Port Plan Studies
- Breakwater Basic Design
- Second Phase Design of Breakwater

Management and Supervision for Geotechnical and Hydrographical Operations





#### MAJOR FEATURES

- Being located in a remote area and resulted problems to collect local data are worthy of notice. In addition, many limitations are applied to the project caused by the budget considered.

#### CLIENT

- Main Client: Port and Maritime Organization

#### CONTRACTOR

- Iran Civilization and Road Construction Company

#### PROJECT TIME AND DURATION

- Winter of 2010, 4 months





## PROJECT TITLE

# Consultancy Services for Earthworks - Gas Refinery / Onshore Site - Phase 14 of South PARS Gas Field Development Project



## PROJECT DESCRIPTION

Industrial Projects Management of Iran Company (IPMI Co) has commenced to carry out earthworks of gas refinery onshore site related to phase-14 of Pars special economic zone with embanking and excavating volumes of 6 and 8 million m<sup>3</sup> in 2010. The jobsite is located adjacent to the northern coast of Persian Gulf, 70 Km away from ASSALUYEH. PGC was assigned to provide earthworks technical specifications, construction instructions, guidelines for earthwork execution and material quality control, earthwork supervision, scope of services for geotechnical studies as well as supervising field investigations.

## SERVICES PROVIDED BY PGC

- Receiving and Evaluating the Latest Information pertained to Geotechnics and Earthworks
- Observing the Current Situation, Investigating Materials obtained from Excavation and Identifying Earthwork Executive Challenges
- Investigating the Jobsite Executive Limitations
- Preparing, Codifying and Updating Earthwork Technical Specifications and Execution Instructions
- Preparing, Codifying and Updating In-Situ and Experimental Tests to Control Execution and Materials Quality
- Preparing and Updating Scope of Services for Geotechnical Studies
- Preparing Scope of Services for the Contractor obliged to perform In-Situ and Experimental Tests
- Preparing and Updating the Acceptance Criteria for Borrow Materials prior to Embanking
- Preparing and Updating Instructions for In-Situ and Experimental Tests to Control of Embanking and Accept or Decline the Executed Works
- Preparing and Updating Instructions Needed to be Taken on the Excavated Ground to Control the Required Technical Specifications
- Technical Support and Earthwork Control as well as Field Studies pertained to Onshore Section of Phase 14 Refinery





- Resident Supervision for Earthworks and Geotechnical Investigations

#### MAJOR FEATURES

- Great volume of earthwork that must be carried within a short period of time, led the contractor to apply special executive methods. Moreover, shortage of soil and rock materials with regard to great volume of materials to be used in this project and other similar projects being executed simultaneously result in precise conformation of the materials technical specifications with project conditions.

#### CLIENT

- Industrial Projects Management of Iran Company (IPMI Co)

#### PROJECT TIME AND DURATION

- 2010, 10 months

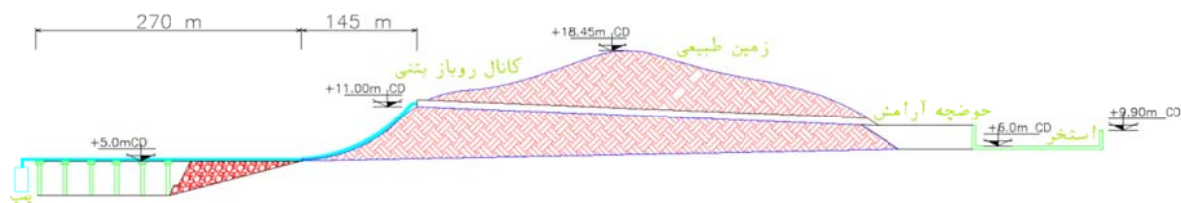






## PROJECT TITLE

### Sea Water Intake Studies for ROUDIK Shrimp Nurture Project



## PROJECT DESCRIPTION

PGC was awarded to carry out conceptual studies for construction of a seawater intake unit to take and transmit  $22 \text{ m}^3/\text{s}$  flow of water in order to provide water required for 1500 hectares of shrimp nurture lands in ROUDIK-CHABAHAR.

## SERVICES PROVIDED BY PGC

- Collecting, Investigation and Completing Environmental Data
- Conducting Hydrodynamic Studies to Adjust Intake Location
- Conducting Seawater Intake Systems Technically, Environmentally and Economically
- Selecting the Best Choice of Seawater Intake
- Providing Basic Engineering Documents for the Best Choice including Intake Layout, Pipeline Route and Equipments List
- Preliminary Design of Fire and Alarm Suppression System
- Preliminary Design of Technical Protection System
- Preliminary Design of Infrastructural Facilities

## MAJOR FEATURES

- A portion of the project has been already executed and the present design had to be in conformity with the previous works.
- Combination of marine, pipeline and geotechnical issues

## CLIENT

- Iran Fisheries Organization

## PROJECT TIME AND DURATION

- 2010, 4 months



#### PROJECT TITLE

### Basic and Detailed Engineering Services for TOMBAK Service Port



#### PROJECT DESCRIPTION

TOMBAK service port ( $52^{\circ}203'$  E  $27^{\circ}702'$  N) is located adjacent to TOMBAK village in northwest of Persian Gulf seashore, approximately 62 kilometers west of International Persian Gulf airport (ASSALUYEH) and 250kilometers southeast of BUSHEHR Port. In 2010, OMRAN SAHEL Institute undertook construction phase of this project. In order to adapt basic design to present executive requirements and localization of technical-executive experiences, OMRAN SAHEL Institute assigned PGC to review and adjust basic design of TOMBAK port breakwater with focus on former basic studies and conformation of these studies to current project requirements emphasizing on the use of caisson breakwater within great depths. TOMBAK Port has two LPG piers with capacity of 50000 Tons and one SULPHUR Export Pier with capacity of 50000 Tons.

#### SERVICES PROVIDED BY PGC

- Investigation and Control of Breakwater Basic Studies
- Hydrodynamic Studies
- Investigating and Presenting Applicable Choices for TOMBAK Port Breakwater (Berm and Caisson)
- Structural Design of Caisson Breakwater
- Investigation and Modification of the Port Offshore Section layout with respect to Dredging Considerations
- Basic and Detailed Design for LPG and SULPHUR Piers





### ✚ MAJOR FEATURES

- The most notable feature of this project can be successful conformation of the project status to the contractor's executive facilities with the aim of reducing project costs and duration. Short duration of the project necessitated employing various and experienced experts.

### ✚ CLIENT

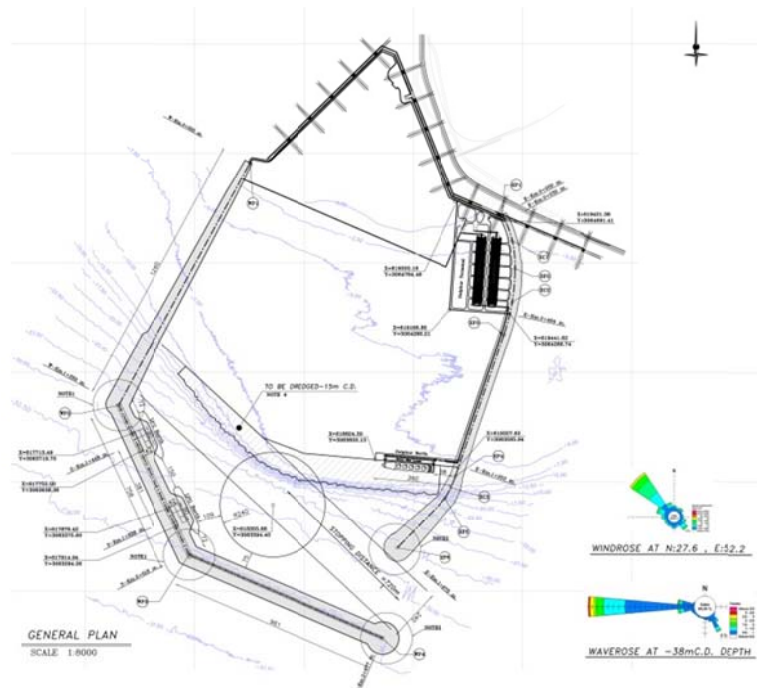
- PARS Oil and Gas Company (POGC)

### ✚ CONTRACTOR

- KHATAM Construction Group - GHORB NOOH - OMRAN SAHEL Institute

### ✚ PROJECT TIME AND DURATION

- 2011, 10 months







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#### ✚ PROJECT TITLE

### Design and Supervision - Stabilization of Soil Slops - FARAHZAD River Valley in NAHJOLBALAGHEH Park



#### ✚ PROJECT DESCRIPTION

NAHJOLBALAGHEH Park located in FARAHZAD Valley - Tehran, with an area of about 35 hectares, is constructed in recent years and currently being operated. In some parts of the park, soil slopes are suffering from instability. Consequently, the main objective of this project is to identify causes of these instabilities and provide solutions for stabilization of unstable slopes and supervise the executive operation.

#### ✚ SERVICES PROVIDED BY PGC

##### *Basic Design Studies for Soil Slope Stabilization*

- Collection of Existing Data and Drawings
- Site Visit and Recording the Present Condition
- Geotechnical Studies and Modeling
- Providing the Stabilization Solution
- Providing the Monitoring Plan
- Providing Scope of Services for Geotechnical Explorations and Supervising them

##### *Detailed Design Studies for Soil Slope Stabilization*

- Preparing Stabilization Detailed Plan for different Zones of the Park
- Preparing Technical Specifications for Stabilization Method
- Providing Supervision for Geotechnical Tests

##### *Site and Overall Supervision for Stabilization Operation*

#### ✚ MAJOR FEATURES

Great height of the slopes and complex interaction between geotechnical and hydraulic conditions of the site are counted as remarkable points of this project. Most importantly, concurrent operation with studies and execution has added to the significance of this project. Moreover, stabilization had to be carried out with the least possible destructions leading to impose limitations on the project execution. Implementing the stabilization operation on non-engineering embankments (i.e. disturbed soils) has increased the design and construction complexities.

#### ✚ CLIENT

- Tehran Municipality-Region 2

#### ✚ PROJECT TIME AND DURATION

- Design: 2011, 6 months      Site and Overall Supervision: 2012 to 2014

