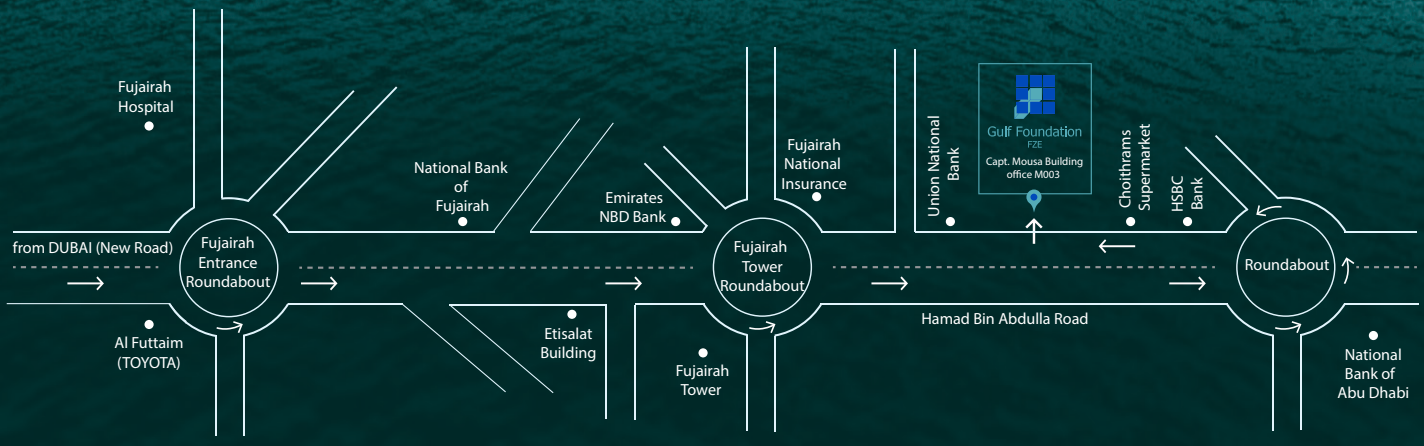



# ALL TYPES OF FOUNDATIONS

Gulf Foundation
FZE

Capt. Mousa Building, Office M-001,
Hamad Bin Abdulla Rd.–Fujairah, UAE
P.O. Box 9160 – Fujairah, UAE
Tel: +971 92239954 Fax : +971 92232006
Email: gdfc@gdfc.ae Website : www.gdfc.ae

## Location Map



# About Us

Gulf Foundation is a civil contracting company specialized in onshore as well as offshore foundation works & large scale maritime projects. Gulf Foundation originates from the Dutch piling company Nederlands Heibedrijf ( NHB ) and Gulf Dutch Foundation Company in the United Arab Emirates. Gulf Foundation is active in the Middle East in general and the United Arab Emirates in particular since 2010.

The Dutch mother company's history dates back to 1960 & has been a pioneer and one of the major construction companies involved in execution & design of deep foundation works in the Netherlands, Europe and abroad. Gulf Foundation emphases on specialized foundation activities such as pile foundations, sheet pile walls, drilling and grouting but also designs and builds maritime structures.

Gulf Foundation, through its specialists trained in the Netherlands and experienced local international staff, has built up a dedicated & committed cadre of engineers & technicians in various disciplines. Gulf Foundation has state of the art custom made construction equipment & accessories to meet the requirements of specific projects.

# Mission

Our mission is to design and realize all types of economical, high quality and technically sound foundation & civil-marine solutions for infrastructure related construction projects in the Gulf Region.

# Vision

We strive to perform projects in close co-operation with our customers which may be project employer or contractors and always at a competitive price.

Our aim as a construction partner is to provide tailor made foundation solutions and know-how. Quality assurance, achieving safe working conditions and safeguarding environmental values are a primary aim in our approach.

# Quality, Health, Safety & Environment

Our management system is ISO 9001, ISO 14001 and OHSAS 18001 certified, which means that our systems are continuously assessed for safety, health & environment. We achieve quality by:

- Documenting all business processes in a management system and a range of manuals in accordance with ISO 9001;
- Complying with all local applicable standards and assessment guidelines;
- Updating and improving business processes, production methods & products through internal & external audits.
- Ensuring that all personnel and equipment are third party certified.

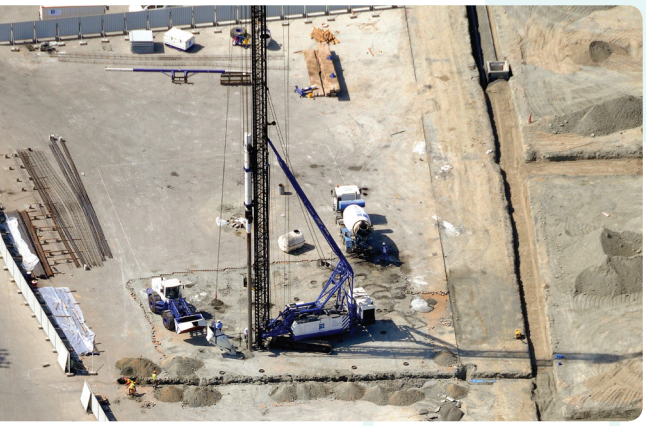
Gulf Foundation gained a reputation in the market as a reliable partner with a sense of responsibility for safety and environment.

Our management team is committed to ensuring that all employees, including subcontractors, understand & implement the QHSE policy.

# Activities

## Foundations :

Gulf Foundation is specialised in all foundation works. We always have custom and tailor made solutions for both shallow and deep foundations for all types of structures and fields.



### 1. Driven Cast In-Situ Piles

Vibro Piles are cast in place displacement piles installed with Hydrohammers, where the pile is reinforced over the full length. In granular soils the bearing capacity of the pile improves by compaction of the surrounding soil due to the vibratory action of the casing that is used to install the pile. Vibro Piles can withstand compressive & tensile forces. It is a 100% displacement piling system with a high bearing capacity. Vibro piles are equally suitable for building projects that require either long or heavy piles as well as for lighter foundations. The vibro pile is ideal for areas with highly variable driving depths.

### 2. Bored Concrete Piles

Gulf Foundation employs several bored piling systems. The most appropriate type is determined for each individual situation, where the relevant factors include variations in the degree of soil displacement, bearing capacity and price. The two widely known types are Bored Displacement Piles and Bored Displacement Piles with Permanent Casing.

This type of pile installation is used to replace soil removed by drilling rather than occupying the space of displaced soil as in driven piles and thus, it mostly relies on end-bearing capacity of the earth layer at the drilled depth. Bored piles can provide large pile dimensions and thus high load bearing capacities.

One method of installation is to drill a shaft using a continuous auger with a hollow stem at its center, which is later used to grout the drilled shaft. This method is known as Continuous Flight Auger (CFA). Another technique is to drill the shaft, insert the reinforcement steel cage (if required) & then pour concrete under pressure to fill the entire shaft space. The shaft is drilled using an auger in dry land conditions and a drilling bucket in wet land conditions. When shaft wall support is required, the drilling process takes place inside a steel casing or with the aid of drilling slurry such as Bentonite Steel pipe piles.

## 3. Prefabricated Concrete Piles

Prefabricated Concrete Piles are one of the oldest foundation techniques. This type of piles is used for small as well as large foundation projects. Gulf Foundation has built up profound experience in the design & installation of Prefabricated Concrete Piles in Benelux and Europe, where they are probably the most familiar and commonly applied pile types.

Being prefabricated, correct procedure requires prior knowledge of the bearing capacity of the soil. Verification of depth against the penetration resistance curve is possible by monitoring the driving progress.

The rectangular precast pre-stressed concrete pile is a soil displacement system that can be used almost anywhere where driving is possible and where vibrations & noise are unlikely to cause nuisance. Whenever possible, Gulf Foundation uses the latest environmentally friendly hydraulic hammers. We resort to diesel hammers (type Delmag) only for extremely heavy pile driving work or very large pile dimensions.

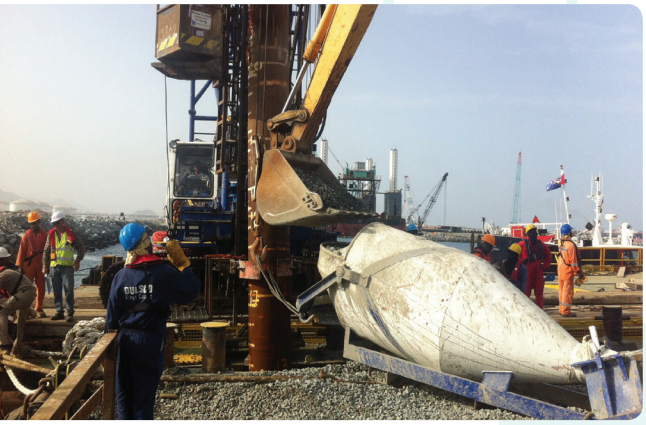
## 4. Vibro-Combi Piles

This system combines the benefits of Prefabricated Concrete Piles and Vibro Piles. The large tensile force that a precast concrete pile can withstand in the shaft is combined with the rougher wall and larger cross-section of a vibro pile, thus enhancing the tensile performance through soil friction.

The system is used for tunnels and basements, often together with an underwater concrete floor. This type of piles is often corrugated at the top (ribbed pile) to key in well with the floor that is to be poured.

## 5. Steel Tubular Piles

Steel Tubular Piles are mainly used in marine projects & in environments with a limited working area or limited height. The suitable tube diameter and wall thickness can be determined depending on the application and the required load-bearing capacity. For additional tip bearing capacity, the tube can be outfitted with a base plate.



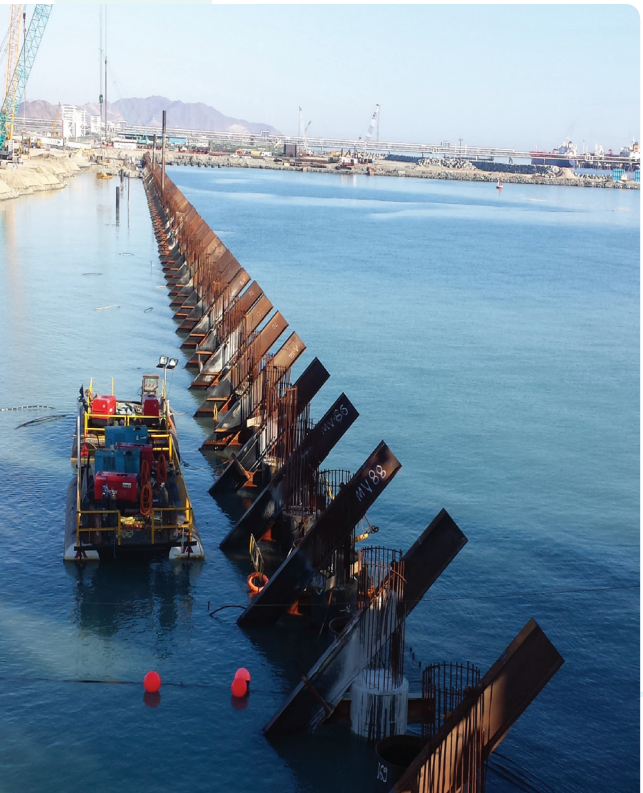
## 6. Vibro Replacement

Vibro replacement is a ground improvement method that constructs dense aggregate columns, known as Stone Columns. Stone Columns are usually used to increase the bearing capacity and reduce settlement.

## 7. Rapid Impact Compaction

Rapid Impact Compaction is a soil improvement method based on hydraulic piling hammer technology. It is used to increase the density of loose soils and improve their bearing capacities.

# Marine Works :



Gulf Foundation capabilities and experience include the design and construction of a wide range of maritime structures. These structures are generally jetties and other mooring facilities for small and large size vessels. Although the point of gravity of our maritime activities lays within the realization of piled earth retaining and platform jetty structures, we also bear the experience to execute gravity type structures. Gulf Foundation has the capability to carry out marine piling and anchoring works on barges and floating pontoons to realize near shore maritime structures such as loading platforms, breasting and mooring dolphins, quay walls and offshore foundations.

### 1. Tubular Piles

Large diameter open tubular piles are used when there is a need for both high bending stiffness & vertical bearing capacity. They are used as standalone piles (mooring posts and bollards), or in conjunction with steel sheet piles to form the widely known combi-wall structure. The open tubular piles in a combi-wall contribute to a high bending stiffness.

### 2. Sheet Piles

Sheet piles are made in many types and sizes. Gulf Foundation specializes in supplying and installing custom hot and cold rolled steel sheet piles and combined piles systems.

We have many cranes suitable for installing sheet piles and combi piles from both, land and water.

## Anchoring Systems :

Gulf Foundation is one of the few piling contractors in the market with the know-how, experience and equipment required to fabricate and install different types of anchoring systems.

### 1. Bored Grout Anchors

Bored Grout Anchors are slender foundation elements that can be installed inclined or vertical. They can transfer both compressive and tensile forces to the ground, which makes them ideal as vertical anchors for basements and tunnels. Anchor piles are able to adapt to the variable loading situations that occur in the construction and use phases of constructions of this kind.

## 2. MV Piles

MV Piles are steel anchors suitable for large tensile forces. They are usually made of steel H-beams or tubular pipes and driven by impact hammers with a continuous grout flow, which eases the driving process and ensures adhesion of piles in the soil. The piles can then withstand substantial tensile stresses. They are accordingly used for quay wall anchorage and as vertical tie bars.

Gulf Foundation has introduced and installed the first MV pile in the Middle East and is one of the few piling contractors in the market with the know-how, experience and equipment required to manufacture and install MV piles with lengths up to 50m.

## 3. Strutting

A strutting frame is a relatively inexpensive solution, and therefore an excellent alternative for stabilizing construction pit walls. The solution is subject to a limited span of the tubes above the construction pit. A combination of a strutting frame and ground anchors may then be an outstanding solution, because details such as corners may be difficult to stabilize adequately. Strutting frames are generally removed in a later construction phase, but are sometimes incorporated into the construction.

Gulf Foundation has a considerable experience in the engineering and implementation of strutting frames. We use our experience for design optimization, taking into consideration the opportunities presented by our extensive stock of steel beams and tubes.

# Land Reclamation & Coastal Protection Works :

Gulf Foundation is actively involved in land reclamation and coastal protection projects where these include transport of fill material, spreading, compaction works and rock placing for revetment and breakwaters.

We also protect land and port infrastructures by constructing breakwaters and revetments. We have experience in large scale breakwater and revetment construction in shallow as well as deep water conditions using our land based and marine (offshore) equipment.

## Shoring Works :

We do all shoring works with sheet piles which are made in many types and sizes. Gulf Foundation specializes in supplying and installing custom hot and cold rolled steel sheet piles.

We have many cranes suitable for installing sheet piles from land for retaining of soil during excavation works for different underground works such as pipelines, culverts and building foundations. We provide both anchored and free-standing shoring walls, depending on the design and excavation depth. In addition, we also stiffen our shoring walls with waling beams.

We also have custom made single frames as guides for sheet piles installation, or we have the capability to fabricate special frames for the different types of sheet piles.

## Concrete Structures :

Gulf Foundation is specialised in the installation of precast concrete products: shallow foundations, ground floors, retaining walls, basements and pedestal footings. Construction using precast concrete brings efficiency and time savings as well as bringing benefits in terms of consistency of quality in the end product. In addition to the precast concrete works, we also specialise in design and installation of cast in-situ reinforced concrete works (including underwater concreting), where it involves fabrication and placement of reinforcement cages, form works and finally in-situ concrete casting. These works include crown walls, retaining walls, drainage channels, underground pits, capping beams, building foundations & floors.

# In-House Testing

Gulf Foundation has the knowhow, facilities and experience to execute dynamic and static pile and ground anchor compression and tension tests as well as bearing capacity of soil tests and to perform the interpretation of test results.

## 1. Static Axial Compressive Load Tests

Test loading is the most definitive method of determining load capacity of a pile. This method is applicable to all types of deep foundations such as piles, regardless of the installation method. The test load is defined based on the resulting axial pile load determined in the detailed pile design.

## 2. Large Scale Plate Load Tests

The Large Scale Plate Load Test is a test method used to estimate or determine the bearing capacity of soil by applying a fixed known load. It also determines the subsidence of soil after applying a specified pressure, depending on the design proof load.

The tests are executed according to the provisions described in ASTM D1194-94 “Standard test method for Bearing Capacity of Soil for Static Load and Spread Footings”.

## 3. Static Axial Tensile Load Tests

The objective of Static Axial Tensile Load Tests is to verify the behaviour of tension piles:

- Verification of the tensile capacity
- Verification of the axial stiffness

The test load is defined based on the resulting anchor loads determined in the detailed design of the anchored structure.

## 4. Pile Lateral Load Tests

Pile lateral load test is usually conducted in order to estimate the lateral capacity of a pile. Piles are generally used to transmit vertical loads to the surrounding soil. However, they are also sometimes subject to lateral loads due to wind pressure, water pressure, earth pressure, earthquakes, etc... When the horizontal component of the load is small in comparison to the vertical load, it is generally assumed to be carried by vertical piles and no special provision for lateral load is made. Piles that are used under tall chimneys, towers, high rise buildings, high retaining walls, bridges & other concrete elevated structures are normally subjected to high lateral loads. These piles should resist not only to vertical loads but also to lateral loads. The interpretation of the test measures:

- Efficiency of the pile loads
- Lateral soil stiffness
- Lateral pile response
- Pile deflection and soil response
- Ultimate lateral resistance

## 5. Sonic Integrity Testing of Piles

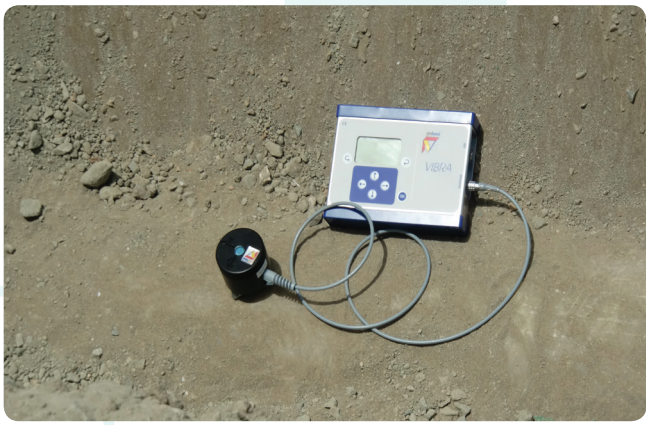
This non-destructive test method is a quick method to evaluate the shaft integrity of concrete piles. The testis able to provide information on:

- Pile continuity
- Consistency of material
- Location of defect
- Degree of defect

The test method is performed with a hand held hammer, a sensitive accelerometer and the Pile Integrity Tester.

### 6. Vibration Testing

Gulf Foundation has the equipment and experience to determine the vibration intensity in and around a working site, which is usually produced as a result of engaged impact or vibratory hammers during piling works.



## Engineering & Design

Gulf Foundation has the capability to perform its own in house detailed design for the foundation and maritime projects in which it is engaged. In addition to the "geotechnical" design of the foundation, Gulf Foundation can provide the basic structural design of the building for which the foundation is required to find the most cost effective foundation solution.

In general our approach can be characterised as value engineering in which we use innovative techniques to reach the most cost effective solutions. Gulf Foundation engineering capabilities include the following:

- Foundation design
- Geotechnical engineering
- Maritime design
- Structural design

# Projects

We have developed strong relations with many companies and organizations from both the governmental and private sectors. With our proven record of success, we strive to establish our global presence in the Oil & Gas and Allied Industries, through our commitment to fulfilling our Clients' needs.

In the last decade, played numerous roles on some of the iconic projects and can refer amongst others to the following projects:

## Port of Fujairah – OT2
## Phase 2 – Berths 08 & 09

Client : Port of Fujairah
Main Contractor : Athena SA
Location : Port of Fujairah, Fujairah – UAE
Description : Installation of 830m long Combi-Wall with a retaining height of 23m and MV Piles for a new expansion of the Port of Fujairah.

## New Northern Breakwater for POF - Phase 1 & 2

Client : Port of Fujairah
Main Contractor : Fujairah Rock & Aggregate Co.
Location : Port of Fujairah, Fujairah – UAE
Description : Construction of a 2900m long breakwater in deep waters.

## Fujairah Northern Land Reclamation Project - Phase 2

Client : Govt. of Fujairah– Fujairah Municipality
Main Contractor : Fujairah Rock & Aggregate Co.
Location : Al Sudha Area, Fujairah – UAE
Description : Land reclamation and coastal protection of approximately 150ha of new land in the sea including compaction and levelling works.

## Sheet Piling Works for IPTT Jetty Lines

Client : IL&FS Prime Terminals FZC

Main Contractor : IL&FS Eng. & Construction Co. Ltd.

Location : IPTT Terminal – UAE

Description : Shoring works of approximately 2km to enable construction of underground oil pipelines.

## Fixed Boat Landing Upper Zakum Project

Client : Abu Dhabi National Oil Co.(ADNOC)

Main Contractor : National Marine Dredging Co.(NMDC)

Location : Upper Zakum Artificial Islands

Description : Marine installation of 129 large diameter steel piles, driven in rock for boat landings in Upper Zakum Artificial Islands.

## Fujairah Oil Terminal

Client : Fujairah Oil Terminal FZC

Main Contractor : Rotary Engineering Limited

Location : Fujairah – UAE

Description : Installation of 574 casing driven cast in place piles as foundations for oil storage tanks and terminal buildings.

## Sabah Al Ahmad Sea City -Phase A4 R285 Bridges

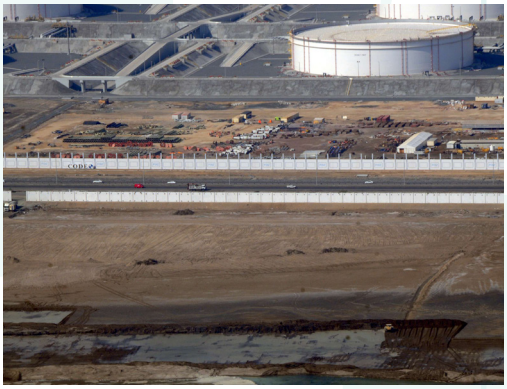
Client : La'ala Al-Kuwait Real Estate Co. KSC

Main Contractor : La'ala Al-Kuwait Real Estate Co. KSC

Location : Kuwait

Description : Installation of 392 casing driven cast in place piles (vertical and inclined) as foundations for a bridge.

## Construction of Safety Wall Structure in FOIZ



Client : UAE Armed Forces –Command of Military Works

Main Contractor : Code Contracting Company LLC

Location : FOIZ – UAE

Description : Installation of 1800 casing driven cast in place pile as foundations for Oil Terminal safety wall.

## POF Control Tower Foundation

Client : Port of Fujairah

Main Contractor : Fujairah National Construction & Transport Co. (FNCT)

Location : Port of Fujairah, Fujairah – UAE

Description : Installation of 35 casing driven cast in place piles as foundations for Port of Fujairah's new control tower.

## Zakum Load Out Jetty in NMDC Yard

Client : National Marine Dredging Company(NMDC)

Location : NMDC Base, Mussafah – Abu Dhabi

Description : Construction of a 350m long marine jetty with a retaining height of 9m using driven anchored steel sheet pile wall.

## Al Sadr Port Extension

Client : UAE Armed Forces – Command of Military Works

Main Contractor : Athena Emirates LLC

Location : Al Sadr, Abu Dhabi – UAE

Description : Construction of a 600m long marine jetty with a retaining height of 9.5m using driven anchored steel sheet pile wall.

## Strategic Grain Reserve in Fujairah

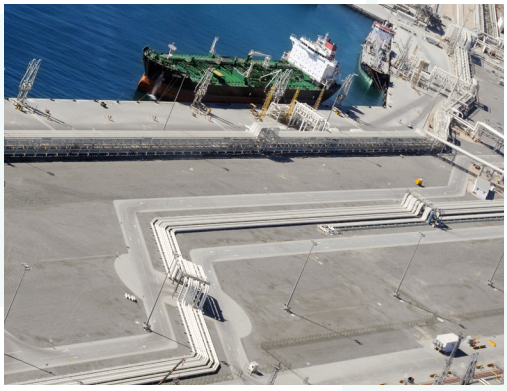
Client : Strategic Projects Real Estate Development Co. LLC
Main Contractor : China Harbour Engineering Co. LLC
Location : Port of Fujairah, Fujairah – UAE
Description : Installation of 300 casing driven cast in place pile as foundation for grain conveyor belt structure.

## VTTI Cooling Water Outfall Culvert

Client : Government of Fujairah – Fujairah Municipality
Main Contractor : Fujairah Rock & Aggregate Co.
Location : VTTI Terminal – UAE
Description : Construction of a 1.5km long reinforced concrete culvert for a refinery cooling water outfall.

## Piled Foundation for Pipe-Rack System for POF

Client : Port of Fujairah
Main Contractor : FujSeng Construction LLC
Location : Port of Fujairah, Fujairah – UAE
Description : Installation of 200 casing driven cast in place pile as foundation for oil pipe rack structure.



## GPS Chemoil Shoring Works for Main Oily Water Pit

Client : GPS Chemoil LLC FZC
Main Contractor : Topaz Engineering
Location : UAE
Description : Shoring works of 290m for a building pit using driven sheet piles.

# Services

Gulf Foundation offers a wide range of services for a wide range of industries including the Oil and Gas industry. Services are, but not limited to:

1. Offshore lifting operations
   (rental of barge with 200ton lattice boom crawler crane).
2. All types of steel structures (onshore and offshore).
3. Selling used and brand new sheet piles.
4. Rental of sheet piles.


**Gulf Foundation FZE**

Capt. Mousa Building, Office M-001,
Hamad Bin Abdulla Rd.–Fujairah, UAE
P.O. Box 9160 – Fujairah, UAE
Tel : +971 92239954
Fax : +971 92232006
Email : gdfc@gdfc.ae
Website: www.gdfc.ae

Designed and printed by VERNON GREG LLC.