Oil Well Site or Drill Site Construction (Road and Site Construction)

How to Build an Oil Field Site Construction and Road

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١. SUMMARY

General Information

a. Operator :
b. Number of wells :
c. Well location :
d. Well Coordinates :
e. Operation Period :
f. Expected Spud date :
g. Rig :
h. Supply base :

Well information

Elevation
Rotary table elevation from Surface :
Cellar depth :

Shall supply all supervision, services, labor, consumables, materials and equipment required to complete the works as specified in this Scope of Work (SOW).

Shall give due consideration to the remoteness of the Worksite and prevailing weather conditions and shall plan their performance of the work, infrastructure and logistic support accordingly in order to ensure a timely completion of the project.

This document covers the minimum requirements for all civil works necessary for the construction of drilling locations, camp sites, access roadsand security infrastructure. The Company expects that all Mob/Demob, maintenance, lubesand life support where applicable, shall be included in the rates unless specified otherwise. The Company expects that all equipment is readily available and can be mobilized immediately. Any long lead time items should be listed separately along with the expected mobilization time scale and included as part of the RFP submission.

Ensure that all supervisors on the project have a hard copy of the agreed SOW, a full set of printed drawings and fully understand what is required to ensure that the work scope is carried out in accordance with these documents and related specifications and standards.

This Scope of Work has been developed from best practices and from traditional regional civil works and Oil and Gas industry standards. This Scope is site specific and based on the respective Sarta Block for the onshore Kurdistan Region of Iraq.

Should submit a project execution schedule with “S” curve representing planned and actual, for progress measuring, detailing all works included in the SOW. The project is expected to take ١٢٠ days to fully complete the works. Ensure sufficient equipment and personnel will be assigned to this project to meet or exceed the proposed time schedule.

٢. SPECIFICATIONS

٢.١ SURVEY

Prior to the start of the civil works, a confirmation survey should be carried out to satisfy that Coordinates are correct. A quantity estimate to achieve ٠ levels on all sites to be constructed shall be submitted to complete with the associated survey report.

It is the responsibility to perform all required survey support throughout the construction phase of the project. This shall include but is not limited to, quantities measured, constructed pits, measured volumes, borrow pits, additional construction areas, boundaries, and the locations of all associated facilities related to the project. A qualified survey crew will be on location throughout the duration of the project and will perform daily tasks as required to ensure the work is carried out in an efficient manner.

Once the project is complete, it is the responsibility to provide with a complete set of “as built” drawings detailing the ground elevation change at well center, drill site, water pit/s, waste pit/s, cuttings pit/s, substructure pad and cellar, location roads, main camp site, OPF campsite, accesses, water wells, water supply system, septic system/s, and associated works, etc. An as built survey will include verification of quantities moved, removed, or in filled, facilities installed, and a final elevation of well center to top of sub structure pad (“٠” level).

٢.٢ EARTH WORKS

Associated Earth works may need to be carried out during the winter period. Should be aware of the ground conditions that may prevail at this time of year and make reasonable provisions to ensure that good construction practices are in place to minimize the impact of the weather. When reasonable, will also be expected to ensure that every effort is made to facilitate the drying out process of the work site. This will include but not be limited, pumping standing water, trenching to drain areas and working surface areas with equipment.

There may be days when due to weather conditions it is deemed unsafe to carry out work in a productive manner and these will be considered “rain days” and these lost days will extend the completion schedule accordingly.

Should confirm in writing as part of the RFP submission that the quantities of all Materials, such as Sub Base and crushed stone have been sourced and are secure in the volumes required. This is required so as not to cause any delays in the project’s time schedule due to non-availability of materials.

The volume and quantity of material required for construction activities will be identified and minimized wherever possible. The boundaries of the authorized excavation area will be clearly marked by means of stakes and recorded as a Topographic Survey Report.

a) Equipment/Tools

All Equipment shall be in good operating condition. All Equipment will have safety features in place such as Guards, Hand rails, ROP's canopy (roll over protection), back up alarms, and fire extinguishers. Equipment shall be free of any leaks such as Fuel, Oil or Hydraulics. All equipment must be inspected on a regular basis and the inspection documentation shall be provided to the Company before it is released for work. No equipment will be placed in service until deficiencies are corrected and accepted. Equipment deemed unsafe for use will be taken out of service until such time equipment is repaired or replaced. It is a requirement that equipment deemed unsafe will be replaced within a ٢٤ hour period.

No homemade tools or field manufactured modifications to equipment will be allowed on the work site. Only manufacturer's original unmodified equipment is acceptable. Equipment such as generators and electrical hand tools must have Circuit interrupters. All tires must have tread thickness of (٧/٣٢) or more, and be void of any defects. All lights and audio safety devices shall be in good operating condition. All braking systems must be in good working order. Any device (such as cranes) that has a limiter kill switch must be in proper working order. All Cranes must be certified and have valid certification documentation submitted prior to use on site. All lifting and rigging equipment must be in good operating order and possess valid current industry accredited certifications in accordance with its design limits. These valid certificates must also be submitted prior to us of the equipment on site. No chains will be used for lifting. Only certified lifting slings can be used. Operators will be qualified to operate equipment and possess proof of operator training certification and licenses which comply with local laws.

b) Material

Work, Material and procedures shall comply with minimum requirements of local and international standards including but not limited to:

- ACI ٣١٨ -٢٠٠٨ (Structural Concrete)
- SORB Iraq (Standard specifications for roads and bridges Latest edition)
- AWS D١.١ (structural steel welding)
- AISC ١٣th Edition (structural steel)

Material for the construction of Road, Drilling Locations and Camp Sites shall be approved. shall, prior to the starting of work, test the Materials by a recognized laboratory procedure and shall submit the testing analysis report for approval. Only good quality Type A, tested, base materials, will be acceptable for use, in any of the pad or road construction activity.

Fill shall be placed in layers not exceeding ٢٥ cm thickness. Layers of fill are to be watered and compacted to meet optimum dry density by a vibrating steel drum roller with a static drum weight of not less than ٧ tons. The steel drums are to contain fluid to achieve weight. Sheep foot type packer will also be used for initial start of compaction but will be finished with steel vibrating smooth drum roller.

The fill material prior to compaction shall be brought to moisture content within the range + ٢٪ of optimum max ٥٪.

During the compaction process, the fill material shall be maintained at the moisture content necessary to obtain the required density of not less than ٩٥٪ of optimum dry density.

If additional watering is required, it shall be supplied and carried out in such a manner as to ensure the even distribution of water throughout the layer to be compacted and the compaction operations will follow whilst the moisture content remains within the specified range.

It is the responsibility to complete compaction testing and supply the Company compaction testing results for approval on all finished works such as access construction, rig pad site, campsites and pit constructed embankments. Additional compaction testing may be required throughout the construction works to confirm fill areas are properly compacted.

٢.٣ EXPLOSIVES

When and only if hard rock is encountered and jack hammering is deem inefficient, explosives may be utilized. It is the responsibility to ensure that these activities are performed safely by competent personnel and that meets all licensing and procedural requirements of the Kurdistan Regional Government, or any other required affiliated offices.

a) Specific Responsibilities

١. Developing and implementing at minimum, a Job Safety analysis, a mitigated risk assessment, and a journey management plan to be approved by the Company before mobilization of any explosives associated with the project.
٢. Any required permits, licenses, escorts, bunkering, supervision, or any other liabilities associated with the transportation, storage and use of explosives related to the construction or reclamation in this scope of work.
٣. Shall at all times comply in all respects with, and is responsible for meeting the requirements, recommendations and procedures as stipulated by all applicable regulatory authorities.
٤. Shall at all times comply in all respects with the recommendations and procedures as set forth in its standard operating management systems or guide lines.
٥. Shall provide any and all offsite accommodations for all personnel associated with the management of explosives.
٦. Shall comply with acceptable International Safety and Environment standards and practices.
٧. Bunkering facilities will comply with all Kurdistan regulations and shall be located in an area that minimizes risk of harm to personnel and civilians or damage to equipment or structures in the area, if any.

b) Responsibility of the Oil Company

١. The Company shall provide background information for the surveyor's coordinates and the exact locations where the work is required and to ultimately be carried out.
٢. The Company will obtain MNR permissions to conduct approved construction operations at the referenced site.
٣. The company will perform demining activities to scan all work areas before construction begins and will supply a clearance letter

٢.٤ REPORTING

Should submit a Daily, Weekly and Monthly progress report. The format for the reports will be agreed.

Will update the Project baseline schedule and "S" curve show both planned and actual works on a weekly basis detailing works completed and the latest forecast for completion dates.

٢.٥ ACCESS ROADS

Shall conduct an independent survey of existing road infrastructure and shall advise on the optimum route to the drill site(s) utilizing the existing road network. The most direct route will not necessarily be considered optimum in every instance.May provide with surveyed alternate options including, but not limited to, the most direct route and the route requiring the minimum amount of new road construction whilst taking into consideration the intent to minimize impact on the local environment and or communities. Routes will not be considered outside the MNR assigned territory.

All routes and classification of the works required shall be agreed prior to commencement of construction operations. These shall also be noted and defined in the provided survey plan.

a) New Access Roads

The Roads shall be constructed to support frequent movement of transport vehicles with a total weight load of up to ٦٠ tons.

Shall prepare the access road Right of Way by removing vegetation, organic soil and cutting the hills down to an acceptable grade of ٦٪ not to exceed ١٠٪. The organic soils will be stored along the right-of-away next to the road inside the surveyed boundary. Where the material is suitable the access base will be built up by V ditching method, watered and compacted. The organic Material can be placed back in the V ditch to fill up to the designed depth. The remaining organic soil will be contoured as not to obstruct the drainage or farmer fields. Switch-back corners will be no greater than ٣٪ unless written agreement is made. This will allow trucks to travel the road without assistance from other equipment. The goal is to facilitate the safe, efficient movement of materials and equipment between locations with minimal long term environmental impact.

All ditches shall have a V shape minimum ٠.٥m deep. They will be considered inclusive to the lump sum and made part of the road details. Erosion control will be put in place to

prevent road wash out and minimize the impact to natural drainage. All ditches will be contoured and shaped to match the surrounding topography. Ditches will be free of all debris and back slopes will be at a ٢:١ ratio and shall be allowed to return to native vegetative growth.

All large fills over steep slopes or side slopes shall be properly keyed in at the base of the fill to eliminate possibility of slope subsidence. Soil stability of theses slopes or side slopes must also be ensured and taken into account while equipment works close to or against steep grades, cuts or varying terrain.

Shall ensure that the base of the access road shall be appropriately compacted and bladed smooth before the sub base material is placed. Smooth shall be defined when the approved material is leveled to a tolerance of +/-٢.٥ cm.

Then hydrate and lime where required the base and blade again working and packing the material to a point that the base does not rut as the trucks deliver and dump their loads of sub grade materials. This will be a continuous process as the constructs locations and roads.

After shaping and sufficient compacting of the base, Shall add layers of approved aggregate Type A Sub Base.Shall water and compact each of two layers (one layer is ١٥ cm thick) until a solid ٩٥٪ Compacted ٣٠ cm thickness is built in accordance with (Ref: item: CWQC-٠٠٣)

The final compacted running surface of the access roads shall be ٧m wide with ١m shoulders, ١١m in sharp bends with ١m shoulders. Road will be constructed so as to avoid blind crests, unnecessary and sharp bends, reverse cambers, uneven surfaces and other hazardous conditions.

Short sections of the road will have an additional ٤ m wide x ٣٠m long road widening close to the crest of the long hill cuts to facilitate adequate meeting areas for heavy traffic to wait or pass in the steep or blind sections of the road grade.as per survey design.

These sections will be marked on our survey road plan and also may require the addition of extra sections in other road portions as directed by the company and be constructed within the road specifications.

An additional ١٠cm layer of crushed stone ١.٥ inch to ٢ inch in size will be spread on the ٧.٠m top access road. This layer will require an acceptable mixture of crushed stone and fine material. This layer of crushed stone will be watered and compacted to meet no less than (٩٥٪) compaction.

Construct concrete box culvert bridges and box culverts as to survey and design. Various pipe installations may also be installed due to the volume of drainage crossings which will vary in size and length.

Culverts will be placed as specified by provided survey to facilitate natural drainage requirements. Their composition shall be of reinforced concrete construction and will be either box or cylindrical suitable for their site specific application. Will calculate the catchment area of the run off precipitation for the culvert design. Minimum culvert diameter of (٠.٦) m shall be used. In some cases steel pipe of the proper design and size could be used with concrete bedding underneath (٢٠ cm thickness RCC C/٢٥٠, ø١٢ mm/١٥ cm).

Culvert head and wing walls for both ends of the culvert are required so as to prevent wash out and will be included in the culvert drawing and specifications. Culverts in the main access roads will require the most stringent design. will supply full drawings and specification for each culvert to be installed for the project to be approved. Due to the number of culverts, and the impact to the schedule to complete the access, will submit a schedule and plan of said works

Survey crew will ensure all ditches are properly constructed so they drain to areas that will allow the rain water to shed away from the access. Will use Gabions for erosion control. It will not be acceptable to have standing water beside the access.

b) Limited Use Roads

Limited use roads are required for local traffic and access to guard towers. Roads are identified on the survey plan provided.

Shall shape existing and add required sub base, water and compact to a minimum of ٩٥٪ compaction. ٢٠cm of approved Type "A" sub base topping shall be applied watered and compacted to a minimum of ٩٥٪ compaction.

The compacted running surface of the access roads shall be no less than ٤m wide with ٠.٥m shoulders. All ditches shall have a V shape minimum ٠.٥m deep. Road will be constructed so as to avoid blind crests, unnecessary and sharp bends, reverse cambers, uneven surfaces, and other hazardous conditions.

As above an additional ١٠ cm layer of crushed stone ١.٥ inch to ٢ inch in size will be spread on the ٤m top access. This layer will require an acceptable mixture of crushed stone and fine material. This layer of crush stone will be watered and compacted to meet a minimum of ٩٥٪ compaction.

The installation of culverts and erosion control (Rock filled Gabions) are required to minimize erosion. Culverts will be sized to match the catchment area of the rain water and natural drainage. Steel culverts can be used in place of concrete if agreed to. All culverts will have head and wing walls installed on each end.

c) Upgrading Existing Access Roads

Where existing roads are required to be upgraded, Shall ensure that upgrading activities be carried out in such a way as to reduce unsafe conditions for other users, including the local communities. In particular, Contractor shall as part of the lump sum agreement perform the following:

١. Ensure adequate communication with Oil Company and other road users of construction activities.
٢. Utilize safe work practices which may include the deployment of Flagmen during daytime heavy traffic conditions and Safety signage that shall be conspicuously displayed throughout the duration of work activities.

٣. Provide adequate and clearly marked safe detours around work sites.
٤. Compacted running surface of the upgraded access roads shall be equal to the width of existing road or at a minimum of seven ٧m top with ١m shoulders if required or according to existing road with ١m shoulders. Where width exceeds ٧m a prorated schedule of materials.
٥. All pot holes and washboard sections in the road surface shall be repaired and filled with approved aggregate and also ensure drainage ditches are in place to prevent road wash out and minimize the impact to natural drainage.
٦. A layer ٢٠cm thick of approved sub base aggregate will be applied, and compacted to SOW specification. Section area to be defined on the provided Survey to be included in lump sum.
٧. ١٠ cm layer of crushed stone ١.٥ inch to ٢ inch in size will be spread on the ٧m top access. This layer will require an acceptable mixture of crushed stone and fine material. This layer of crushed stone will be watered and compacted to meet minimum (٩٥٪) compaction. Section area to be defined on the provided Survey. All ditches shall have a V shape minimum ٠.٥ m deep.
٨. Install Gabions where shown on provided survey plan.
٩. Install Culverts where defined on the provided Survey.

٢.٦ DRILLERS BASE CAMP SITE

The Scope of work for the Camp includes, but is not limited to the following:

a) Site Preparation

The selected camp location to be optimally located on high land if possible and min. of (٧٥٠) meters from the well center coordinates, including an equivalent distance from any sensitive sites (environmental, archaeological or socio-economic) identified in the Oil Company Environmental Impact Assessment (EIA), thereby reducing potential impacts on the identified sensitivities arising from the construction or operation of the camp facility. will provide an initial survey with a plan view of the location for the Base Camp. This will include:

١. Shall stake out the camp location as specified in the survey design. Camp Location will be subject to a pre-works survey of the area and the prevailing winds that are forecasted for the time of the year when the drilling works are scheduled.

٢. The areas selected for the main camp site has no organic material to be removed. The site will be leveled as to the survey design. Extra material will be hauled to be used for leveling of the main camp site area. Additional material will be required to place a security berm around all sites. Berm to be as to survey design and will be ٣m high above the leveled platforms. Berms will be straight and tops will be trimmed.

٣. The surface areas shall be sloped at a grade of (٠.٥ %/m) to achieve drainage towards the edge of the site. (Direction to be included in the location design to prevent standing water) The areas shall be covered with layers of approved sub base that is watered and compacted until (٣٠) cm thickness has been achieved.

٤. Site to consist of watered and compacted (١٠) cm layer of approved (١.٥) inch to (٢) inch crushed stone. Crushed material to have enough fine material mixed in to achieve a minimum of (٩٥٪) compaction.

٥. Provide and install triple (٣) overhead lighting stands ٤ m high for all sites and shall be identified on provided survey plan. Lighting fixture specification to be a minimum of (٤٠٠/w ١٠,٠٠٠/hrs.) exterior service type of comparable streetlight quality fixtures, (٢٢٠/v, ٥٠ Hz/٦٠ Hz, E٤٠ Max ٤٠٠/w) installed and wired internally to the base of a metal pole for final termination. All electrical work to be all weather and protected from the elements (junction boxes rated to IP ٦٥). Electrical cable to be of armored type. Photo censers will be installed so perimeter lighting will shut down during day light hours.

٦. Shall supply and install four (٤) windsocks, elevated nine (٩ m) and secured to poles. Poles to be securely installed in reinforced concrete. Pole base to be ١m x ١m x ١m deep. Pole to be designed as follows, First ٥m ٤ inch pipe, remaining ٥ m ٣ inch pipe. ٣ inch pipe to be inserted / welded in the ٤ inch and will run the length of ١٠ m. Pole cap to be designed to swivel for change in wind direction

b) Generator and Fuel Tank Containment area

Shall install an RCC generator and fuel containment area ٣٥m long x ٥m wide x ٢٠ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm complete with. ٧٥ cm high bund wall is RCC (١٥ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm); Bund walls will **not** be constructed by CMU block method. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will collect in one recessed corner which shall have a sump. Fire wall between the Generators and the fuel storage can be constructed using the CMU block method and plastered. The fire wall is to be ٢ m high and ٤.٧ m long. Two - ٣ inch pipes will be installed in the dividing wall at one end ٤٥ cm from the floor for the fuel line connection between the Generators and Fuel tank.

Shall install a second RCC generator and fuel containment area ١٠m long x ٥m wide x ٢٠ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm complete with, bund wall The ٤٥ cm high bund wall is RCC (١٥ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm), Bund walls will **not** be constructed by CMU block method. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will collect in one recessed corner which shall have a sump. Fire wall between the Generators and the fuel storage can be constructed using the CMU block method and plastered. The fire wall is to be ٢ m high and ٣.٧ m long. ٢ inch pipe will be installed in the dividing wall at one end ٤٥ cm from the floor for the fuel line connection between the Generators and Fuel tank.

All fuel containment areas will be required to be tested by filling the containment area with water for no less than ٢٤ hours.

c) Soak away pits

Soak away pits are required for each septic system installed unless the Oil Company specifically requests otherwise. Where possible and with Oil Company approval, pits can be combined if (١) or more septic systems are in proximity to each other.

١. Organic material is to be removed up to (٢٠) cm deep and stored for reclamation, so as to not be affected by the excavation.
٢. Excavated material to be piled surrounding the outside of the excavated pit area
٣. Main camp (٢٠ m x ٢٠ m x ٣m deep).
٤. OPF camp (٢٠ m x ٢٠ m x ٣ m deep).
٥. Drilling site minicamp (٢٠ m x ٢٠ m x ٣ m deep).
٦. Back up septic pit required in the event black water treatment system was to break down on both the rig site, main camp site and OPF camp site. Pit to be (١٠m x ١٠m x ٢m deep). Pit to be lined with HDPE liner as to same specifications as the water pits. Pit to be design so that vacuum trucks have access so they can dump. Pit to be fence as to water pit specifications with gate for access.
٧. ٦ inch PVC pipe will be installed to connect platforms with soak away pits.

It is required to fence all soak away pits as to the camp site fence specification. A ١m wide gate is required for each soak away pit. Back up septic pit requires ٥ m gate for truck access.

٢.٧ OPF Camp Site

Construct a fenced camp site location for the OPF as to the survey design. For the purpose of this proposal the Final grade, fencing, lighting, containments etc., will all be constructed with the specification to that of the Drilling Main Camp. See Company provided survey drawings for location of fencing, gates, lighting, etc.

a) Provide and install triple (٣) overhead lighting stands for all sites and shall be identified on provided survey plan. Light poles to be a minimum of ٤ m high. Lighting fixture specification to be a minimum of (٤٠٠/w ١٠,٠٠٠/hrs. exterior service type of comparable streetlight quality fixtures, (٢٢٠/v, ٥٠ Hz/٦٠ Hz, E٤٠ Max ٤٠٠/w) installed and wired internally to the base of a metal pole for final termination. Photo censers will be installed so perimeter lighting will shut down during day light hours. All electrical work to be all weather and protected from the elements. All Electrical wiring to be armored cable type.

b) Shall install RCC pad (٥.٠ m x ١٠.٠ m) (٢٠ cm thickness C/٢٥٠, ø١٢ mm/١٥ cm) with .٧٥ meter high sealed wall (١٥ cm thickness C/٢٥٠, ø١٢ mm/١٥ cm) for a Fuel Tank and generator containment area. Area will be large enough to hold up to (١٢٥٪) of the largest fuel tank volume. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will flow towards and collect in one recessed corner (sum pit ٤٠ cm x ٤٠ cm x ١٥ cm deep). The containment wall should be .٧٥ m high RCC (١٥ cm thickness c/٢٥٠, ø ١٢ mm/١٥ cm). Contactor will ensure the containment area is sealed and will not leak.

After curing time, the containment area must be filled by water for a (٢٤) hours period with (٠٪) leakage.

c) Construct concrete foundation (concrete base) (٣.٠ x ٦.٠ m) (٢٠ cm thickness C/٢٥٠, ø١٢ mm/١٥ cm) for Miranda Black water treatment unit

d) Construct concrete foundation (concrete base) (٣.٠ x ٥.٠ m) (٢٠ cm thickness C/٢٥٠, ø١٢ mm/١٥ cm) for Water storage Tank.

٢.٨ Security Infrastructure – ECP and Guard Towers

It is required to construct ١ ECP area. ECP will be constructed to the same specification as camp location and survey designs with one exception, Crushed stone to be replaced with round ¾ inch washed river stone. All lighting will be explosion proof and junction boxes rated to IP ٦٥.

١. Organic soil is to be stripped at ECP to minimum ٢٠ cm depth. Organic soil is to be piled on the outside boundaries of the area to be constructed to be used as a security bund wall. This location to be at or near the main road access area and orientation will be provided in the provided survey. Area will be designed to drain. Measures put in place so no natural drainage will be blocked. Site will be constructed to rig platform specification and survey design

٢. Install a septic system that will drain into a leach field for both ECP areas. design the system for up to ١٥ personnel. Leach field to consist of three- ٦ inch, ١٥ m runs of perforated HDPE pipes. Pipes to be buried ٦٠ cm below ground surface. Bottom of trench to be covered with ١٥ cm washed ¾ inch rock. Pipe to be surrounded and covered with ١٥ cm washed ¾ inch washed rock. Excavated soil from trench to be used to back fill the trench. Care must be taken to ensure no compaction of the back fill material. Septic tanks to be constructed of steel and must have separation to allow for solids to settle out. The septic tank is to be covered with steel lid to support minimum ٥٠٠lb weight. Tank lid to be fitted with ٢ curved vents and a .٧٥m x .٧٥ m hinged access door.

٣. The septic system shall be designed and warranted to cope with sewage produced from each facility identified herein for a minimum period of ٦ months.

٤. The ECP power supply will be from ٢ auxiliary ٣٠٠ KVA generators (by others) located on the drill site. will be required to supply and install armored cable, junction boxes rated to IP ٦٥ and electrify all perimeter lighting, search area canopy lighting, distribution panels, cabins and guard huts within the ECP. ٤ perimeter guard/posts at the main Rig site and ٥ Towers at the main camp site will also require armored cable supply, install and terminations. Perimeter lighting will be on a separate breaker so lights can be turned off during day light hours. Armored Electric cable can be tied to the perimeter fencing. Cable outside perimeter fences will be buried to a depth of ١m and will be buried next to constructed access roads

٥. The ECP search area will be constructed in accordance with the drawings supplied. The search area will be all inclusive of, Covered search area, inspection gantry, “T” walls, Texas barriers, lights, Light poles, and fencing.

٦. Provide and install triple (٣) overhead lighting stands, drawing attached for all sites and shall be identified on provided survey plan. Light poles to be a minimum of ٤ m high. Lighting fixture specification to be a minimum of ٢٢٠/v, ٥٠ Hz, E٤٠ Max. ٤٠٠ watt explosion proof installed and wired internally to the base of a metal pole for final termination. All electrical work to be all weather and protected from the elements. All electrical wiring to be armored cable type and IP٦٥ rated junction boxes. Photo sensors will be installed so perimeter lighting will shut down during day light hours.

٧. Construct, supply and install ٥ fully functional ٧m Horizontal Boom gate complete with a counterweight lifting system which shall be operable by a single person complete with locking capabilities - see typical drawing. This barrier should be painted with a safety Red and White alternating paint scheme.

٨. Construct a final denial barrier as to the survey plan and drawing supplied located at ECP locations.

٩. Install footings for all guard towers located at both the Rig site and camp site as to drawing supplied.

Bulletin Boards and Signs

Three (٣) roof Covered, two sided ١.٥m x ٢m water proof bulletin boards complete with hinged doors made with metal frame and Plexiglas inserts to be constructed for Company notification matters i.e. Notices, bulletins, Safety alerts, etc. See detailed drawings on requirements. These shall be appropriately placed at well site entrance, ECP and other designated areas.

Road and other miscellaneous signs, (Stop signs, speed limits signs, Rig direction signs, and turning signs, warning, alert etc.) will be supplied and erected as required and instructed. For the purpose of this scope (١٣٥٠) total signs will be included in the lump sum bid and rates for additional signs will be identified in the civil schedule of rates. All traffic roads signs will be design as to the Standard specifications for roads and bridges Latest edition (SORB) standards.

٢.٩ DRILLING SITE DETAILS

The Scope of work for the Drill Site includes, but is not limited to the following:

The selected drilling location shall be per the Oil Company’s determination and in accordance with the provided survey and in accordance with the H٢S dispersion model. The Drill Site is intended to be a significant distance equivalent to the dispersion model radius (approx. ٧٥٠M) away from any known sensitive sites (be it environmental, archaeological, or

socio-economic) as has been identified in the EIA. If at any time any of the above is discovered within the near proximity to the drill site construction area, shall immediately cease activity and bring the discovery to the attention of the Company.

a) Site Preparation

Shall construct the drill site location in accordance with the survey design provided. This will include but not limited to location platform, sub structure pad, mud pump pad, cuttings pit, mud reserve pit, ٣ flare pits, ٢ water pits ٦٠٠٠ m³ each, fuel tank and generator secondary containment areas, lights/poles and fencing.

Shall carry out **before Construction begins.** Geotechnical core drilling to establish material compositional deposits on each location. A minimum of ٥ holes will be drilled. Holes locations at a minimum will be drilled at well center, mud pump pad, cuttings pit, reserve pit and water pit location. The drill hole locations may change as to Oil Company direction. This data shall be analyzed to confirm the provided materials specifications in this document are sound for the areas of intended use. Samples will be collected, stored, and documented for every (١.٠) m of depth to a total depth of ٣٠ m. A full data report shall be submitted on completion of the Geotechnical drilling.

Organic material will be removed to a minimum depth of (٢٠.٠) cm and stored at the perimeter of the location. The organic soil is to be stored in a tidy (٣.٠) m high, by (٤.٠) m wide piles or berms just outside the location perimeter as directed. The organic soil will be stored autonomously so as not to be contaminated with other aspects of the location construction. Soil piles to have openings at all access gate locations. This soil will ultimately be replaced as top soil of the reclaimed area during the remediation process.

Location requires a (٣٦٠) degree compacted perimeter bund wall (١.٠ m high X ٢.٠ m wide). The bund wall is to be installed immediately on the outside boundaries of the rig pad site. Bund wall is to be trimmed and compacted in place and is not required in cut areas of the location. The purpose of this bund wall is to provide for a secondary environmental containment of the drill site location. A drainage ditch will be dug on the outside perimeter inside the compacted bund wall to allow rain runoff to collect and be directed to designated areas. Steel culverts will be installed at each access point on the location to ensure the drainage ditch will not be blocked. A containment drain system will be installed in the lowest corners. This should be functional in the open or closed position to be able to release clean collected rain water.

The Drill Site will then be leveled, watered and compacted using existing material or material hauled from approved borrow pits. Fill material will be placed in layers not to exceed (٢٥) cm thick, then watered and compacted. This process will continue until “O” level is achieved.

Once location is level, the areas shall be covered with layers of approved aggregate, type A, that are watered and compacted ٩٥٪ until ٣٠ cm thickness has been achieved. The surface of the site should be capable of withstanding the movement of trucks and equipment with loads up to (٦٠) tons.

The surface areas for the rig foot print will be level to a tolerance of max ± ٢ cm and the remaining site area shall be sloped at a grade of ٠.٥٪ to achieve drainage towards the outside edges of the site.

An additional ١٠ cm layer of crushed stone ١.٥ inch to ٢ inch in size will be spread and compacted over the drilling location. This layer will require an acceptable mixture of crushed stone and fine material. This layer of crushed stone will be watered and compacted to meet no less than ٩٥٪ compaction.

Supply and install ٦ – ٣ m long x ٣" diameter steel posts ٥٠٠m from w/c. Post will be cemented in place ١ m below surface leaving ٢ m above ground level. Post will be painted white with red strips for visibility.

Shall install an RCC pad ١٥m wide x ٢٠m long x ٢٠ cm thick c/٢٥٠, ø١٢ mm/١٥ cm for a Fuel Tank and barrel containment area. Area will be large enough to hold up to (١٢٥٪) of the largest fuel tank volume. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will collect in one recessed corner which shall have a sump. The containment wall shall be ٤٥ cm high is RCC (٢٠ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm). Once the concrete has cured, the containment area must be filled by water for a (٢٤) hours period with (٠٪) leakage. The final location on the drill site will be determined by the rig footprint.

Shall install an RCC auxiliary generator pad ١٠m long x ٥m wide x ٢٠ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm c/w bund wall The ٤٥ cm high bund wall is RCC (١٥ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm), Bund walls will **not** be constructed by CMU block method. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will collect in one recessed corner which shall have a sump. Fire wall between the Generators and the fuel storage can be constructed using the CMU block method and plastered. The fire wall is to be ٢ m high and ٣.٧ m long. ٢ inch pipe will be installed in the dividing wall at one end ٤٥ cm from the floor for the fuel line connection between the Generators and Fuel tank.

Shall install an RCC auxiliary generator pad ٣٥m long x ٥m wide x ٢٠ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm c/w. ٧٥ cm high bund wall is RCC (١٥ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm); Bund walls will not be constructed by CMU block method. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will collect in one recessed corner which shall have a sump. Fire wall between the Generators and the fuel storage shall be constructed using the CMU block method and plastered. The fire wall is to be ٢ m high and ٤.٧ m long. ٢ - ٣ inch pipes will be installed in the dividing wall at one end ٤٥ cm from the floor for the fuel line connection between the Generators and Fuel tank.

Shall install an RCC auxiliary generator pad (rig site minicamp) ٣٥m long x ٥m wide x ٢٠ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm c/w. ٧٥ cm high bund wall is RCC (١٥ cm thickness c/٢٥٠, ø١٢ mm/١٥ cm); Bund walls will **not** be constructed by CMU block method. Stairs with hand rails will be required to provide safe access into the enclosed area. Fuel Containment area to be designed so that all fluids will collect in one recessed corner which shall have a sump. Fire wall between the Generators and the fuel storage can be constructed using the CMU block method and plastered. The fire wall is to be ٢ m high and ٤.٧ m long. ٢ - ٣ inch pipes

will be installed in the dividing wall at one end ٤٥ cm from the floor for the fuel line connection between the Generators and Fuel tank.

Pour a ٢٧m long x ٢٠m wide x ٧٥ cm thick RCC pad for under the substructure c/٣٥٠, ٢ø ٢٥ mm/١٥ cm. Construct two compacted sub-base layers (٢٠ cm each), Plastic sheeting will be used on the top of the compacted sub base layers, (٥ cm) lean concrete to be used under reinforcement for sub structure. The position will be included in the provided survey details.

Pour a RCC mud pump pad ١٤m x ١١m x ٤٠ cm thick c/٣٥٠ ٢ø ١٦ mm/١٥ cm. Concrete ditches will be required around the mud pump pad, sub structure pad and will terminate in the cuttings pit. Ditches will also include steel grading and to be designed to be installed to the level of all cement pads. Once ditches are completed and cured they will be filled with clean sand to protect them during the Rig move. Refer to survey plan and typical drawings.

Provide and install triple (٣) overhead lighting stands ٤ m high as per provided drawings for all sites and shall be identified on provided survey plan. Lighting fixture specification to be a minimum of (٤٠٠/w ١٠,٠٠٠/hrs.) Class ll explosion proof exterior service type of comparable streetlight quality fixtures, (٢٢٠/v, ٥٠ Hz/٦٠ Hz, E٤٠ Max ٤٠٠/w) Class ll explosion Proof installed and wired internally to the base of a metal pole for final termination. All electrical work shall be all weather and protected from the elements (IP٦٥). Electrical cable to be of armored type and distribution boards will meet IP ٦٥ rating. Photo sensors will be installed so perimeter lighting will shut down during day light hours. This will be the same requirement for the Rig site, camp sites and ECP area.

Supply install one remote control boom gate at the entrance to the rig site. Boom gate will have a push button control installed in the badging cabin next to the entrance.

b) (٣٠") Conductor and Wellbore Cellar

Shall bore drill or auger as agreed with Oil Company, (٤٠") diameter hole ٣٠ m deep.

Thirty meters (٣٠m) of Conductor pipe will be supplied by the Oil Company. will be required to haul Conductor pipe to Rig site. Once installed conductor pipe will be capped with (¼") oversized steel plate attached with ٤ tack welds. The plate will have been appropriately engineered and load rated pad eye on top for the safe efficient removal.

c) Installation procedure:

Install provided (٣٠") ١٥٨ lbs./ft. Grade X- ٥٢ with (½") wall thickness Conductor pipe, to provided depth and not to exceed an estimated ٣٠m. Supply approved welding procedures and qualified welders to weld conductor pipe joints. It is expected there will be ٣ joints of conductor pipe and ٢ full encirclement ١٠٠٪ penetration butt welds. If there is a need to cut the ٣٠" conductor pipe, will supply gas cutting & Beveling equipment. Pipe will require to install ٢ appropriately engineered and load rated lifting pad eyes to be installed and the welds MPI inspected before any pipe is safely picked up. Any amount deeper or shallower will be adjusted accordingly based on the quantity per meter section. shall provide applicable welding procedures for the pipe's material composition and all welders' corresponding qualification record.

will be responsible for lifting and lowering in the ٣٠m long – ٥٢٠ pounds/meter conductor pipe. Crane, rigging and crane operator certification will be subject to inspection prior to proceeding with the lifting and lowering in operation. then grout and vibrate by means of a (٢") annular tubing string from surface to total depth. Ready mix screened concrete (Aggregate not to exceed ١") until annulus is full to ground level. A ٣ m deep cement plug will be placed on the inside the conductor. Samples shall be taken from each truck's slurry contents for verification.

It is responsible for warranting that the (٣٠") conductor's final state is in a perfect (٠) degree vertical position with complete circumferential cement bonding. A minimum of (٦) Centralizers or smooth tapered stabilizers with no sharp corners are required and will be welded to the conductor below ground level.

Note: A pour will not be made until the casing is completely framed in (boxed) and secured by H beams to ensure no movement during the grout process, once casing is deemed at vertical.

Shall construct and install a steel cellar box in accordance with the drawing supplied (٨ m L x ٤ m W x ٤.٥ m deep) - inside dimension, with a RCC (٣٠ cm thickness c/٣٥٠, ٢ ø١٦ mm/١٥ cm) walls and RCC floor (٥٠ cm thickness c/٣٥٠, ٢ø١٨ mm/١٥ cm). The cellar floor reinforcement bars will be welded to the conductor pipe to ensure permanent stability at (٠) degrees vertical. Cellar to be constructed as to design drawing supplied.

Excavating for the cellar box will be performed so as to minimize the ground disturbance beneath the substructure area. Soil testing will be considered for cellar design.

Precautions and care should be taken to ensure that the Conductor Casing is not disturbed by the civil works if the conductor is installed before the cellar excavation.

Shall install and maintain a high visibility physical barrier around the Conductor Casing prior to the commencement of site preparation and backfilling works.

At no time should personnel be allowed in the open excavation without a cave in protection device intact.

Shall build stairs as to typical drawing for the cellar, Stairs to have removable hand rails in ١ m sections cellar. A recessed drain sump (٠.٥ m x ٠.٥ m x ٠.٣ m deep For ESP) will be constructed in one corner nearest to the "V"-door end of the substructure.Weld square tubing pockets inside cellar wall to install removable railing. Pockets to be welded every ١ m. Build hand rails in one meter sections ١ m high to be installed around cellar when cellar cover is removed.

Construct a cellar (fall protection cover) complete with appropriately engineered and load rated lifting pad eyes, angle iron, and expanded metal or walkway grating. shall provide fabrication drawings and details. Fabrication design should encircle the wellhead so that it can easily be removed and reinstated manually. Multiple piece designs are acceptable. Two (٢) hinged wing style doors should be installed. One located over the egress ladder to allow for man entry and the other over the sump drain.

The design should be sufficiently strong and sized with braced angle iron to prevent the cover from falling below the top of cellar. The design should also consist of appropriately

engineered, (load rated, and inspected drilled lifting pad eyes) so that the installation/removal lift can be made in a balanced condition.

d) Miscellaneous Concrete pads

All other RCC pads such as fuel containment areas are to be (٢٠ cm thick c/٢٥٠, ⌀١٢ mm/١٥ cm spacing).

Concrete Pads are to be level with a tolerance of (± ٠.٥) cm.

e) Drilled Cuttings and U shape style Waste Pits

Drill waste pit-١ is designed to be (٣١٠٠ m³) cut at (٢:١) slopes. Opening at the end to waste pit -٢(- ٠.٥ m deep from G.L ٢.٠ m wide) island will be approximately (٨.٠ m wide).

Drill waste pit-٢ is (٩١٠٠ m³) cut with (٢:١) slopes. These two pits (waste pit-١ and waste pit-٢) are separated by a peninsula style island for cuttings retention time. The fill area at the spillover shall be approximately (٣.٥) m high or as directed by Company onsite.

Pits to be connected with ٣ (٦٠٠mm) steel pipes

Pit shall be lined with a ٤٠ Mil (١.٠ mm) HDPE liner. Geo-textile liner ٥mm thick, complete with stitched seams, is to be installed under the HDPE.

Contractor shall supply and install over the water type Safety Equipment for each pit constructed, including:

١. ٤ X Life Buoy Rings with ropes for retrieval.

٢. Elevated (٥/٨") rope (height-٠.٥ m) from corner to corner through the center of the pit and firmly secured at both ends. Drop ropes secured to the fence posts and dropped to the bottom of water pit will be placed every ٦ m. Knots will be tied in all ropes at (٣٠) cm intervals to allow for ease of grip.

   One meter high safety fence will be installed around the mud pits. Each mud pit is to have one man access gate one meter ١m wide. Mud reserve pit requires one ٦m gate or removable section. The type of fencing provided by Contractor shall be a galvanized or plastic coated wire mesh fencing of similar type to the 'Crusader", (chain link). The fence shall be supported with vertical galvanized stanchions, corner supports and other steelwork of a make and type acceptable to the Company. The vertical post shall be constructed of a galvanized steel material, ٢" diameter or larger, distance between poles not to exceed ٣.٠m. The tops should be capped to prevent pipe from filling with water. All corners shall be braced and all fencing pulled and secured. Chain link fence will be tied to the fence posts using heavy gauged wire.

f) Mud Storage Shelter

It is required to supply and install steel Mud storage shelter - ٣٥m long x ١٠m wide x ٦m high front and ٥.٥ m back wall. Corrugated metal sheeting will be installed on the roof and three sides leaving the front ٦m high area open for heavy equipment access. Building area is to be raised ٣٠cm above pad level. Material for raised area will consist of ٢٠ cm compacted approved aggregate, ١٠ cm compacter crushed stone. ٥ Explosion proof overhead lighting and switches will be required in this shelter. All junction boxes will be IP٦٥.

g) Water Pits

There will be two (the combined volume of ١٢,٠٠٠ m³) fenced water storage pits, with pit embankment walls cut at a (٢:١) slope. Pits are to be fenced as rig platform design. Each pit requires one ١.٥m x ٢m man access gate and an offloading area with ٦m wide access gate for trucks to access and offload. Pit bottoms are to be sloped towards rig side corner to minimize dead volume. Pits will be designed for gravity drainage and located as to the survey design. (٤") HDPE pipe will be installed in both pits and trenched to the location boundary. ٢- ٦٠m³ per hour electric transfer pumps to be supplied and installed. This will require the Contractor to provide an initial setup composed of a redundant system of water pit hosing complete with foot valves. A double Gate valve system is to be installed at the pipe end located at rig suction platform area. Refer to drawing. ٢٠٠m of ٤" buried HDPE pipe PN ٢٠ will be supplied and installed by the Contractor to tie the transfer pumps into the rig site day water tanks. A concrete pad will be installed to mount the pumps.

Pit interior is to be free of sharp objects. The water pit floor and walls are to be compacted using a steel drum packer. Geo-textile liner ٦mm thick c/w stitched seams is to be installed under the HDPE. the water pits may be constructed above ground with little or no excavation. Organic soil will be removed and stored. approved material will be hauled in if required, watered and compacted to build the pit walls. The offloading area will still be required for trucks to pull or dump liquids.

The water pit shall be lined with a HDPE liner [(٤٠ Mil) = (١.٠ mm)] in accordance with the Specifications for waste pits.

h) Flare Pit

Dig three (٣) flare pits on location as to the site survey and drawing supplied

i) Cement Wash out Pit

Dig a cement wash out pit (٢ m X ٣ m X ١.٥ m deep) ٩ m³. Pit to be lined with HDPE liner and keyed in. Pit will be fenced to ١ m high using specifications for Mud and Cuttings pit. Pit location will be identified when rig pad complete

j) Materials

Shall provide with a sample of the proposed Membrane Liner within (١٠) days of issuance of Notice to Proceed. In addition he shall provide manufacturer's literature confirming the physical and mechanical properties of the proposed Membrane Liner. If the material does not meet these specifications.

k) HDPE liners

High Density Polyethylene (HDPE), crystalline thermo plastics produced by the extrusion process.

Low Density Polyethylene will not be accepted as a substitute.

The HDPE Liners shall have a nominal thickness of ٤٠mil = ١.٠mm and shall be supplied in rolls with a width of no less than ٤ m.

The tensile strength of the HDPE Liner shall be in excess of (٢٠) KN/m measured in any direction.

A ٦mm geo-textile liner will be required to be laid under all HDPE lined pits. The seams of the geo-textile must be properly stitched.

l) Installation

Liner shall be protected from the sun and contamination from dirt, dust and other deleterious materials at all times during shipping/storage and handling.

The rolls of Liner shall be handled using slings or other multi point lifting equipment.

Temporary storage of Liner materials shall be on level, well-drained areas.

All surfaces against which Liner is to be placed shall be leveled and cleared of stones larger than ٥٠mm in diameter, sharp edged stones of any size and hard objects.

All rocky surfaces against which Liner is to be placed shall be free of abrupt steps, cracks or fissures. These shall be smoothed or sealed with compacted earth fill.

The Liner shall be laid out and installed under the supervision of the supplier's trained staff.

The sheets shall be placed in each pit or basin to permit termination at the top of each side slope with adequate provision for the anchor trench and for stretching under load. The liners will not be allowed to have a loose end on the top of any pit with sandbags or any other surface support feature. Only the trench and anchor system will be acceptable.

The layout of sheets shall be selected to minimize the number and length of field joints, as acceptable.

All seams shall be thoroughly cleaned and prepared prior to joining.

Any holes or tears in the Liner shall be repaired by applying an appropriate patch in accordance with the manufacturer's instructions.

m) Acceptance

Test welds shall be carried out and submitted prior to field joint welding on site. All field joints welded on the location will be tested and results to be witnessed.

Shall supply and install accessible over water Safety Equipment for each pit to include:

١. ٤ X Life Buoy Rings with retrieval ropes for each (٦٠٠٠) m³ pit

٢. Elevated (٥/٨") rope (height-٠.٥ m) from corner to corner through the center of the pit and firmly secured at both ends. Drops ropes secured to the fence posts and dropped to the bottom of water pit will be placed every ٦ m. Knots will be tied in (٣٠) cm intervals to allow for ease of grip.

٢.١٠ Fencing and Gates

Prior to commencement of fencing, the fence posts, gates, and installation drawings, shall be submitted.

Shall install perimeter fences and gates at the drilling location, driller's camp, offsite water pits, waste management area, ECP Points and OPF camp. Fencing shall be designed so that each of these sites can be secured and locked with a combination type lock.

The type of fencing shall be a galvanized or plastic coated wire mesh fencing of similar type to the 'Crusader", (chain link).

A minimum of two gates (٦ m wide) will be installed on opposite sides of each location with signage reading Muster point ("A") and Muster Point ("B"). ١ emergency egress gate will be required.

The finished fence shall be (٢.٠) m in height with angled (٣) strand barbwire or coiled razor wire on top.

The fence shall be supported with vertical galvanized stanchions, corner supports and other steelwork of a make and type acceptable. The vertical post shall be constructed of a galvanized steel material, (٢") in Diameter or larger, no used quality or rusty pipe, and set at a distance between poles not to exceed (٣.٠) m. The tops should be capped to prevent pipe from filling with water. All corners shall be braced and all fencing pulled and secured tight.

Fences shall be installed in such a way as to prevent access by people, domestic animals, or wild life. Gaps in or under the fence are to be avoided and where practical the bottom of the fence should be buried or otherwise securely anchored to the earth to prevent access beneath.

No Trespassing, DANGER! Authorized personnel only, signage should be affixed to every side at each fenced location. All signs built for the project shall be in (٢) separate languages, English and Kurdish (Lump sum requires (١٦) of these signs at this particular location)

Windsocks will be provided on an elevated secure pole by the Contractor at location selected by the Company. (Lump sum Requires ٨ wind socks, (٨) green Muster point ("A") signs, (٨) Red Muster point ("B") signs) Wind soaks to be approved.

٢.١١ EXCAVATIONS

a) General

The work shall be carried out in a careful manner to ensure that the exposed surfaces are as sound as the nature of the material permits and that no point shall protrude inside the lines as agreed.

Excavation shall be carried out to such lines, levels and profiles as the direct or approve.

Particular care shall be taken to maintain stability when excavating in close proximity to existing works or natural slopes.

Shall dispose of all material arising from excavations. If it is suitable it shall be placed directly in such Works or set aside for use as and when required in suitable approved dumps.

Shall be responsible for keeping all excavations free from water and debris from whatever cause arising, and shall provide such pumping capacity and other measures as may be necessary for this purpose.

Shall properly support the sides of excavations and shall be responsible for their safety.

Shall notify the Company without delay of any permeable strata, fissures or unusual ground conditions encountered during excavation.

b) Approval of Excavations

When approved excavations have been taken out accurately to the profiles or dimensions required for the work, shall inform the Oil Company so that he may carry out an inspection.

If, after its inspection requires additional excavation to be carried out, shall do so to such new profiles or dimensions.

Shall obtain approval of excavations prior to placing pavement layers, fill or concrete.

Shall maintain open excavations in an approved condition, and shall rectify the effects of deterioration due to weather.

All excavation areas will be reclaimed to a natural state. No straight wall cuts will be accepted and must be sloped (٢:١).

Supply and install safety fence for cut and fill areas greater than ٢m in height around the following areas: Rig site, Main camp site, OPF camp site and ECP areas. Fence to be constructed to Main fence specifications for installation and is to be ١m high.

٢.١٢ REINFORCED CONCRETE (RCC)

a) Concrete Material

Shall procure all materials and design the mixes to meet the job requirement and carry out all associated material testing for the Approval.Provide information so that they may visit the concrete facility for a QA/QC of materials. Retain the right to provide an alternate facility if the inspection identifies compromising flaws that will affect the quality of materials provided. Cement shall be (OPC) Ordinary Portland Construction type (١) Cement.

Shall note that Cement shall be delivered in bulk ready mix trucks. will not accept small batch mixing on site except in areas where slabs will be poured that are no larger than (½) a cube.

Any sand and aggregate used shall be subject to Approval.

b) Placement

Before constructing forms for concrete, the ground shall be compacted to (٩٥٪).

Placing of concrete shall not commence until the condition of reinforcement and items to be embedded are in place. The formwork will be inspected and verified. The rebar will be supported (blocked) off the ground and in the final pour position. All rebar will be properly tied and with no bar positioned any wider than is appropriate for the slab that is to be poured, make the final decision on what is an acceptable practice for each slab. The decision will be based on accepted best civil practices.

Ready Mix Concrete shall be transported by means which prevent contamination by dust or rain (etc.), segregation or loss of ingredients. Material shall be transported and placed without delay or dilution.

Concrete shall be placed directly in its final position without segregation or displacement of the reinforcement, embedded items and formwork. Concrete shall not be placed in water, except as may be specified in advance. Concrete shall not be dropped through a height greater than (١.٥) m.

Concrete and mortar must be placed and compacted within thirty (٣٠) minutes after water has been added to the mix or otherwise included via damp aggregates, unless admixtures are in use. Partially set concrete shall not be used in the Work.

Concrete shall be compacted during placement by approved internal vibrators.

Vibrators shall penetrate the full depth of the layer of concrete placed and just into the layer below, and shall be withdrawn slowly to avoid the formation of voids. Extra care shall be exercised to not over vibrate causing the concrete to separate.

Placing shall not take place in the open during storms or heavy rains. If such conditions are likely to occur, Contractor shall provide protection for the materials, plant and formwork so that the Work may proceed.

The temperature of concrete shall not exceed (٣٢°C) at the time of placing and the maximum concrete temperature after placing shall not exceed (٦٥°C).

In the case of freezing temperature the concrete poured shall be protected by covering and heated as required.

Unless otherwise specified, all finishes shall be Bull floated, Toweled smooth, and then fine brush finished for walking safety. No rough finish or protruding aggregate will be acceptable. In the case of large slab such as the foundation for the rig substructure, a power trowel will be required prior to the brush finish.

Trucks will only be allowed to wash up in the designated wash pit. Any wash up in an unauthorized location will be cleaned up.

Finish Workers will be provided any and all special required PPE, IE rubber boots, Rubber gloves, Safety glasses, etc. No worker will be allowed to work with placement Cement without the proper PPE.

All pours will be completed in the same day. No double pours on pads will be accepted. must plan the works so that and concrete pour will be completed in a timely fashion

c) Formwork

Formwork shall be constructed from materials of sufficient strength. Staking and Support is required to provide rigidity during concrete placement and compaction without discernible deflection. The Forms shall be designed to be removable without damage to the concrete.

- Shall obtain Approval of the formwork methods and materials proposed.
- Plastic sheeting will be used between the ground level and the concrete.
- Formwork shall provide concrete of the shape, lines and dimensions shown on the drawings.
- Forms to be properly braced so as to prevent collapsing
- Formwork shall be removed without damage to the concrete, but not until the concrete has sufficient strength to become self-supportive.
- External loading shall not be applied until the concrete has reached the (٢٨) Day characteristic strength. Required to barrier and support a means, whereby this requirement is maintained.
- Formwork shall not be removed without prior Approval.

d) Reinforcement

Reinforcement for use in reinforced concrete shall comply where appropriate with BS ٤٤٤٩, ٤٤٦٦, ٤٤٨٢, ٤٤٨٣ and BS ٨١١٠.

Tying wire shall be (١.٦) mm diameter soft annealed mild steel. Free ends shall not be left projecting into the cover concrete.

Steel reinforcement shall be stored in an approved manner above ground.

The location of reinforcement and nominal (target) dimensions of concrete cover shall be as shown on the drawings provided from time to time.

Reinforcement shall be located to nominal dimensions, within tolerances as specified.

When inspected in the forms, the cover to the reinforcement shall be the nominal cover within plus (١٠) mm and minus (٥) mm tolerances.

Concrete spacers shall be of similar concrete grade to the parent concrete and shall have non-metallic ties.

e) Curing

Concrete shall be wet cured for a period of seven (٧) days. Wet blankets are the preferable method for curing concrete. Any alternate method of curing shall be left to approval. If conditions deteriorate so that there is a chance that the cement could freeze, take all the necessary prevention steps to ensure that the slab temperature remains above the freeze pt. Have to supply external heat for a period of seven (٧) days if freezing conditions exist.

Waste Management:

- Establish boneyard/recycling area for waste metals, plastics, oil and wood.
- Communicate and establish waste management procedures onsite.
- Identify and establish general waste disposal streams.
- Hire garbage collectors for removal of general waste.
- Hire tractor and trailer for garbage collection.
- Provide water bottle & garbage cans for camp and construction site.
- Ensure septic waste tanks are located in suitable location.
- Must have a means to environmentally dispose of wet food wastes, cardboard/paper, plastics, metals and construction materials in an environmentally sound manner, utilizing all recycling avenues.

Environmental:

- Identify spill response equipment requirements onsite and at camp.
- Provide adequate spill response materials for both camp and Civil sites
- Ensure all fuel tanks and generators have bunding areas.
- Establish and designate chemical storage area.
- Establish and carry out water sampling routine/schedule and testing.

HSE MS:

- Compile and present onsite HSE orientation and inductions.
- Establish and carry out onsite audits and inspections.
- Implement HES procedures, routines at camp and construction site.
- Monitor compliance of HSE policies and procedures.
- Set up and initiate onsite HSE planners.
- Identify onsite training requirements.
- Set up and communicate site entry and clearing out process.

Power Generation:

- Ensure all generators have proper groundings fitted, ٦ gauge cable, proper rod and cable clamps.
- Each generator and associated tanks have proper bunding (١١٠٪ factor on all tank bunding).
- Ensure all fuel lines are galvanized steel or similar material, no plastic pipes or connections to be used in tank to generator fuel supply lines.
- Ensure all tank bunded areas are fitted with non-flammable impermeable membranes.
- Ensure gen-sets have adequate cover from the elements.
- Ensure adequate lighting is located at gen-sets areas.

Safety Equipment/Stores:

- Establish PPE inventory using min-max system (PPE must meet ANSI or EU standards).
- Arrange PPE storage unit to be onsite.
- Establish safety equipment required for both camp and construction site.

Signage*:*

- Identify road traffic signage required.
- Identify lease access control required.
- Identify emergency response required.
- Identify construction site and required
- Identify safety signs required.

Welfare:

- Ensure adequate toilets, hand basins, soap and towels are available on both construction and camp sites. Facilities must not be overburdened.
- Ensure there is an adequate supply of drinking water available on both camp and construction sites.
- Ensure each site has adequate and clean areas to rest and eat meals.
- Establish location for prayer pad at both locations.

٣. CWQC – ٠٠١ Drilling Location Details Quality Control

Well Name				
Coordinates	Easting	Northing	Latitude	Longitude

All Coordinates must be referenced to WGS ٨٤ UTM

Nearest operating well to new location		Kilometers
Prevailing Wind Direction		Records
Distance to Drillers Camp		Kilometers
Length of aggregate track required		Kilometers
Nearest water well		Kilometers
Length of water line required		Kilometers
Diameter of water line		Inches
Flow rate from water well		BPM
Rig heading		Degrees

Comments:

٤. CWQC – ٠٠٢ Drilling Platform Quality Control

Drilling Platform Quality Control	Date	Contractor Engineer	Well site Supervisor	Oil Company Civil Rep
Platform to be set out as per drawings				
Top soil salvaged				
Confirm cut and fill of platform is constructed to survey pegs (Level)				
Waste Mud pit is built to drawing and specification				
Water Pits are excavated and prepared in accordance with the specification.				
Water Pit Liner is installed in accordance with the specification				
Flare Pits as to specification				
All cut areas are slope ٢:١				
Ensure cut and fill areas are safe so as not to endanger rig personnel during the drilling operation				
Confirm ٣٠ cm layer of aggregate and ١٠ cm layer of crushed stone as to SOW				
Compaction density tests reports checked and approved.				

Confirm that final surface levels over rig working areas are within a (٢) cm tolerance				
Confirm location fenced and gates installed.				
Confirm all waste pits are fenced and gates installed				
Confirm water pit fenced and safety measures in place i.e. Cross ropes, life boy's, etc.				
Confirm Septic system for rig.				
Fuel, oil and generator containment areas				

Comments:

٥. CWQC – ٠٠٣ Access Road Quality Control

Access Road Quality Control	Date	Contractor Engineer	Well site Supervisor	Company Civil Rep
Access route scouted and marked with colored flags				
Road gradient does not exceed (١٠٪).				
Access road complete with approved material – (٧.٠) m top with (١.٠) m shoulders and compacted, graded, watered and rolled to obtain maximum compaction (+٩٥٪)				
Erosion Control and ditches as per access design				
Compaction density tests reports checked and approved.				
All necessary road signs erected				
Rig access road is safe for all users.				
Security infrastructure in place				

Comments:

٦. CWQC – ٠٠٤ Cellar Quality Control

Cellar Quality Control	Date	Contractor Engineer	Well site Supervisor	Co. Civil Rep
Cellar position set out by Surveyor in accordance with the drawings.				
Cellar dimensions checked to confirm fabrication in accordance with the drawings				
Cellar Excavation is marked out in accordance with the drawing.				
Cellar base level and compaction checked prior to installation.				
Cellar is constructed in final design position and centered around Conductor Pipe				
Mouse and rat holes boxed out and positions checked				
Cellar backfilled with approved material layers and compacted.				
Egress steps and cellar sump installed to drawing specification				

Comments:

٧. CWQC – ٠٠٥ Concrete Pads and Ditching Quality Control

Ditching Quality Control	Date	Contractor Engineer	Well site Supervisor	Co. Civil Rep
Ditching set out by Surveyor				
Ditching formwork dimensions and levels checked				
Reinforcement installed to specifications				
Cement pads as to specifications				
Levels checked after concrete works				

Comments:

٨. CWQC – ٠٠٦ Pads for Camp Site Quality Control

Well Pad – Quality Control	Date	Contractor Engineer	Well site Supervisor	Co. Civil Rep
Camp site as to drawing specification				
Topsoil salvaged and stored as tidy berm around location as to specification				
Camp site level with (١%) grade for drainage.				
Location covered with (٢٠) cm aggregate and compacted. (١٠) cm layer of crushed stone as to SOW				
Washed gravel walk ways installed in camp area.				
Concrete fuel storage containment				
Site Fenced and gates installed as to drawings and specifications.				
All security Infrastructure installed				
Septic system installed as per specifications				
Fuel, oil and generator containment areas				

Comments:

٩. CWQC – ٠٠٧ Restoration of Drilling Platform

Restoration of Drilling Platform Quality Control	Date	Contractor Engineer	Well site Supervisor	Co. Civil Rep
All ditches have been back filled and compacted and contoured to the surrounding grade level.				
Drilling Pit waste has been removed from the pits and processed to the Company's environmental requirements				
Drilling Pit plastic liner sheeting has been completely removed and stored for processing or disposal				
Dried drilling waste placed back into waste pit to be caped as to EIA				
Drilling Pit has been back filled and contoured to the surrounding grade.				
Water Storage Pit plastic liner has been removed and stored for processing or disposal				
Water Storage Pit has been back filled and contoured to the surrounding grade.				
Fuel Storage containment bund wall has been removed and the area contoured to the surrounding grade. All spills and residue cleaned up and disposed of.				
Reinforced Concrete ditching and well platform slabs have been demolished and the material removed to an approved disposal				

area				
Septic tank waste has been removed and disposed of at an approved facility				
Septic tank has been demolished and material removed and disposed of at an approved facility				
Septic tank excavation has been back filled and contoured to surrounding area.				
Septic Soak away pit has been back fill and contoured.				
Drilling Platform embankments have been graded and leveled to the natural contours of the surrounding area				
Organic soil salvage has be spread and contoured over the location.				
Security infrastructure has been removed. I.e. Fencing, gates, boom, lighting, cabins, bunkers and observation posts.				

Comments:

١٠. CWQC – ٠٠٨ Restoration of Drillers Camp Site

Restoration of Drilling Camp Site– Quality Control	Date	Contractor Engineer	Well site Supervisor	Co. Civil Rep
All ditches have been back filled and compacted and contoured to the surrounding grade level.				
Septic tank and Grease Trap waste has been removed and disposed of at an approved facility.				
Septic Tank and Grease trap have been demolished and the material removed to an approved disposal area				
Septic Tank Grease Trap excavations have been back filled and contoured to the surrounding grade level.				
Septic soak away pit back filled and contoured to surrounding area				
Diesel Storage containment bund wall has been removed and the area contoured to the surrounding grade.				
All Reinforced Concrete slabs have been demolished and the material removed to an approved disposal area				
Fuel Storage containment bund wall has been removed and the area contoured to the surrounding grade. All spills and residue cleaned up and removed to an approved				

disposal facility.				
Embankments have been graded and leveled to the natural contours of the surrounding area				
Security infrastructure i.e. Fencing, gates, boom, lighting, cabins, bunkers and observation posts.				

Definitions:

BS	British Standard
BS	British Standards
BBS	Behavior Based Safety
c /٢٥٠	Cement ٢٥٠ Kg per meter cub
c /٣٠٠	Cement ٣٠٠ Kg per meter cub
c / ٣٥٠	Cement ٣٥٠ Kg per meter cub
CHESM	Company / Contractor Health Environment Safety Management
C/W	Continuous Weld
CWQC	Quality Control Work Checklist
EIA	Environmental Impact Assessment
EPS	Environmental Performance Standards
ESP	Electronic Submersible Pump
GL	Ground Level
HA	Hazard Analysis
HDPE	High Density Polyethylene
HSE	Health Safety & Environment
IFO	Incident Free Operation

JSA	Job Safety Analysis
MNR	Ministry of Natural Resource
MSDS	Material Safety Data Sheet
OPC	Ordinary Portland Cement
OPF	Oil Protection Force
OSHA	Occupational Safety and Health Administration
P&A	Plug and Abandon Program
PCB	Polychlorinated Biphenyls
PGPA	Policy, Government and Public Affairs
PPE	Personal Protective Equipment
PTW	Permit to Work
PVC	Poly Vinyl Chloride
PAX	Occupant, Inhabitant
QC	Quality Assurance
QA	Quality Control
RCC	Reinforced Cement Concrete
RIH	Run in Hole (Steel Casing)
SIMOPS	Simultaneous Operations

SOP	Standard Operating Procedures
SOW	Scope of Work
SSE	Short Service Employee
SWA	Stop Work Authority
SWP	Safe Work Practices
TD	Total Depth
VSD	Variable Speed Drive
WGS ٨٤	World Geodetic System ٨٤
WOG	Water-Oil-Gas Type Ball Valves
ECP	Entry Control Point