TECHNICAL SPECIFICATION

From

DURGA TRACTORS

19,20 GIDC, ESTATE

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DIST. GANDHINAGAR

GUJARAT

INDIA.

For

1. DTH cum Rotary Drilling Rig Mounted on Truck Chassis

300 mtr. (1000 ft capacity)
SPECIFICATION FOR TRUCK MOUNTED DOWN THE HOLE – CUM ROTARY DRILLING RIG CAPABLE OF DRILLING 400 M DEEP TUBE WELLS:

The Rig should generally conform to the following specifications:

GENERAL:

Multipurpose, heavy duty TRUCK (S) mounted, all hydraulic, water well drilling rig capable of drilling with down the hole hammer / button bit in hard rock formations and direct rotary drilling with rock roller bits in soft formations using mud or foam or air or mud foam air combination as circulating medium.

All operations – such as rotation, pull down/pull back, feed, leveling, drill rod handling, winching water injection etc. should be hydraulically driven.

CAPACITY:

A. DTH DRILLING METHOD:

   165/150 mm dia. Holes (Regular) up to 500 m & 250/325 mm dia holes up to 200 M in Hard Rock formations like granite, gneisses, deccan trap, basalt schist etc.

B. DIRECT ROTARY DRILLING:

   500 mm dia. Hole up to a depth of 200 M in alluvial formation.

MAST:

Heavy – duty mast – all welded alloy steel construction to obtain maximum torsional, buckling and bending strength, under most rugged drilling conditions. The mast height should provide clear top head travel of at least 7.62 meters able to handle 6.09 meters long drill pipes/casings.

The mast shall be raised and lowered hydraulically. The mast raising cylinders should be cushioned to reduce shock loads. The controls should provide for reduction in the lifting speed in the final stages of raising. The mast should be provided with weather proof lighting arrangement for night operations.

TOP HEAD ROTARY DRIVE:

Ruggedly constructed, heavy duty, top head drive, designed for high torque and large diameter drilling should be provided. The top head drive shall derive its power from hydraulic motor(s) to provide minimum of 6000 N-m torque at 0 – 70 rpm. The motor(s) should be designed for variable speed operation controlled from the control panel.

The gear box construction should be of heavy – duty type, with suitable mud seals to prevent ingress of dirt in most dirty conditions. Control panel mounted valves for providing infinitely variable control of output torque and rotational speed should be provided rotary head.

PULL DOWN, PULL BACK AND FEED SYSTEM:

Heavy – duty pull down system to transmit force evenly to the drill pipe and on to bit while drilling. The feed systems provide a pull down and pull back force of 25000 kg, pull down should incorporate slow and rapid speeds, feed control to maintain proper pressure and hold back arrangement for controlling weight on the bit thus preventing excessive down pressure, feed and rotation should be independently controlled.
Hydraulic System:

An efficiently designed hydraulic system is provided. Pumps are of Gear type – of sufficient capacity and of reputed makes. The pumps and valves for rotation and rapid feed match the pump flow to the demand. Pumps for some minor uses are of fixed displacements type.

The system in corporate full return line filtration, in tank return and suction filters and a separate hydraulic oil cooler for efficient oil cooling hydraulic oil to obtain longer hydraulic oil/components life.

The hydraulic system includes necessary high pressure hydraulic hoses, control valves, relief valves, gauges etc for efficient operations. All the hoses are neatly laid out to prevent accidental damage. A hydraulic tank of adequate capacity is provided at a convenient location, and it shall always remain under pressure to prevent entry of dust particles.

COMPRESSOR:

Description:

Elgi 1100 CFM and 300 PSI with – NT 855 Cummins engine. Model Dy 23 0 44 (Ref. Detail literature Attached at Last)

PRIME MOVER:

Ashok Leyland 6x4 truck model 2516 having 25 GVW.

The entire drilling rig and hydraulic pumps should be driven by an truck engine through PTO as the power sources. The power unit should develop adequate horsepower to drive hydraulic system smoothly with adequate reserve power. The breakup of power requirement for individual components of the system and total power available from all the sources of power should be provided. The diesel engine(s) should be of latest design incorporating state of the art technology and of reputed make Ashok Leyland ALU 412 TC: The engine(s) shall be complete with required gauges and instruments, such as lube oil, fuel oil, temperature and pressure gauges, voltmeter, hour meter, start and shut off switch, etc all mounted at the control panel.

The engine should be further complete with low oil pressure, low coolant level, high coolant temperature safety controls, electric starting system complete with batteries, starter, alternator etc and a fuel tank of capacity for 8 hours of operation. The entire prime – movers should confirm to latest pollution control norms laid down by the government. The supplier will be required to supply necessary certificate on pollution norms from competent authority. (optional it can also be driven by DECK engine)

COOLING SYSTEM: (optional)

An efficiently designed cooling system for effective cooling of the compressor oil, engine coolant and hydraulic fluid should be provided. The system shall be designed for operation in tropical climate.

JIB BOOM & WINCH:

Hydraulically powered winch with approx. 25 – 30 m of wire rope having a minimum bare line pull of 1500 kg should be provided for handling auxiliary pipes, casings, heavy tools etc. the winch should be powered in a way to operate independent of other operations, during drilling. A jib boom having arrangements for lifting of loads from behind and from both sides of the rig should be provided.
**MUD PUMP: (optional for Rotary drilling)**

The rig should be fitted with a duplex double acting, high pressure mud pump, having minimum displacement of not less than 600 lpm at 17.50 kg/cm² (250 psi) for drilling by the direct rotary method. A hydraulic motor should power the pump. The prime mover for the mud pump (Hydraulic Pump) driven by the same engine driving the Rig Hydraulics. The mud pump should be complete with all accessories including surge chamber, piping, pressure gauge, relief valve, suction hose, discharge hose tools etc. It shall be conveniently mounted on truck chassis. Model 125. (5 x 6)

**WATER & FOAM INJECTION PUMP:**

A variable volume, hydraulic motor driven water/foam injection pumps providing variable water foam flow for hole cleaning should be provided. Flow control valve should be provided and the unit shall be complete with all necessary piping.

**CONTROL PANEL:**

It should be conveniently located on the rear of the rig to enable the operator to safely and efficiently control the operation. All controls should be in sight of the borehole. All levers, valves and gauges should be ergonomically designed and carefully / conveniently located. The panel should have lockable doors for access to the hoses, valves etc. a folding type of working platform should also be provided.

**CASING HANDLING:**

The rig should be capable of handling up to 273 mm dia. 6.2 m long casings to the desired depths. The system should have adequate capacity (factor of safety) to pull out casings / drill pipes.

**CARRIER: (optional)**

The whole unit should be mounted on 6 x 4 type truck of 5182 mm wheel base suitable for off high way use on difficult terrain fitted with turbo charge engine developing bhp 200 at 2200 rpm, having GVW of 25000 kg. (Truck can be loaded up to 26000 kg, however the vehicle can be registered under motor vehicle act up to 25000 kg. only.) AMW 2518

**LEVELLING JACKS:**

Four heavy – duty hydraulic jacks for quick three – point leveling of the rig should be provided. Dual lock check valves to hold the jacks in both the loading and transport positions should be provided. Two jacks near the drilling end is independently controller and rear two jacks located near the non drilling end are controlled with single control to enable for quick three points leveling of the rig.

**DUST CONTROL:**

Dust control should be provided with the rig. Details of dust control measures/devices provided on the rig should be given.

**SPARE PARTS:**

A list of recommended spares for 2 years normal operation of the main drill package, compressor, engine(s), mud pump, hammer etc should be quoted. Item wise prices should be furnished along with one set of parts catalogue to enable proper selection of items to be procured.
MISCELLANEOUS:

The rig should be providing with a heavy-duty tool kit having all necessary tools for maintenance of the various assemblies/components in the field.

The supplier may also offer any additional features/attachments/instruments, which they feel would improve the efficiency of drilling.

DRILL PIPE HANDLING:

The following should be included with the rig.

A. A hydraulic breakout wrench.
B. Hammer holder for storing hammers and bits.
C. Lockable tool box.
D. Pipe handling sling.
E. Breakout wrench spanner.
F. Centralizer fork chuck.
G. Grease gun.
H. Allen key set.
I. Rod loading sling etc.

WELDING MACHINE:

The machine should be hydraulically/pulley driven welding machine of capacity 350 AMP, installed at appropriate place on the rig.
Truck chassis for Mounting compressor Leyland 1613 16 GVW. Two wheeled drive.

Truck Chassis for Mounting Drilling Rig Leyland 2516 Taurus 6x4 25 ton.GVW.
Water Pump (Foam Pump) Triplex plunger type.

Hammer Button Bits