Lufkin Rig Manufacturing

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1000hp Basic Drilling Rig
142' x 20' 550,000#

MAST

One (1) FULL CIRCLE On-Floor Cantilever Beam Leg Drilling Mast 142'-0" clear height x 18'-6" wide base three (3) section mast with a static hook load of 550,000 pounds on ten (10) lines to the traveling block and a 100 mph wind load capacity with pipe racked in the mast and 125 mph wind on bare mast. Mast to be raised with wireline conventional raising. Mast designed as per API 4F 3rd Edition and SSL E1-U1 Specifications.

Mast not designed to operate in cold or seismic conditions.

Mast to be complete with raising lines, mast and shoes with bolts, mast pins and bolts with off set platform, full height ladders and including the following accessories.

CROWN BLOCK

One (1) FULL CIRCLE Crown Block (flat face of traveling block faces derrickman) with five (5) 42" diameter cluster sheaves and one (1) 55" diameter fast line sheave to string ten (10) lines to the block. All sheaves furnished with two-row tapered roller bearings and grooved for 1-1/4" and mounted on crown frame with padeyes. Crown frame complete with wireline guard, bumper blocks and a crown safety platform with handrails, checkered plate flooring and toe plates. Deadline is on the off-driller's side.

The crown frame assembly shall be designed to be bolted to the top section of the mast and shall have lifting eyes for installation or removal while the mast is in the horizontal or vertical position. The bolts shall be provided in accordance with ASTM A325.

Travelling block bumper blocks shall be bolted to the underside of the crown frame. A safety cable of strap should be fastened along their full length with both ends secured to the mast.

RACKING PLATFORM

One (1) Racking Platform with a capacity of 150 stands of 5" diameter drill pipe, ten (10) stands of 5" HWDP, eight (8) stands of 6 1/2" drill collars; complete with access catwalk, diving board, hinged floor slabs over the fingers on the driller's side and 7' high windbreak handrails. Pipe fingers to have safety chains.

Two (2) 12 Ton Catline Sheave Units, 14" diameter bronze bushed sheave, grooved for 5/8" diameter wireline, swivel mounted.

One (1) 35 Ton for hang off for traveling block.

Set of Two (2) Counterweight Buckets, wireline and tong blocks.

One (1) Set of Standpipe Clamps for single 5" diameter standpipes for mounting on the off-driller's side.

The mast shall be designed to transport the Top Drive in the middle of the mast.

HYDRAULICALLY RAISED SUBSTRUCTURE

One (1) hydraulically raised substructure configured to support the above on floor mast, with a nominal base dimension at the mast shoes of 22'-0" and a static hook load of 550,000#.

The substructure is designed to allow for installing of the mast on the drill floor while the substructure is in the low position and raising the mast to its working position prior to raising the substructure.

Includes a parallelogram type, raising system powered by two (2) hydraulic winches operating two(2) sets of six (6) part raising lines, one (1) hydraulic power unit complete with remote control panel, gauges, hoses and fittings and two (2) hydraulic break-over rams.

All critical load-carrying members are fabricated form hi-strength steel (w/min. yield strength of 50 ksi).

All fabrication procedures/welding is performed in accordance with API 4F specifications incorporating AWS and AISC recommendations.

Nominal Dimensions:	Width:	24’
	Height:	22’
	Length:	40’
Capacities:	Dead Load of Mast:	142,000 lbs
	Casing Load:	550,000 lbs
	Setback Load:	412,000 lbs
	Wind Load (Bare Structure):	100 mph
	Wind Load (w/Full Setback):	73 mph

Floor Plate
Full Circle to provide additional weight flooring for Substructure Group as follows:

Working Floor Only
3/8” plate around rotary and ¼” other floor areas.

Set Back Area
Oak floor racking boards recessed flush with floor and rotary table.
18” drill pipe slide in center of setback area from V-door to mouse hole. Drainage into fluid containment system

NOTE: The rotary to be mounted flush with the rotary flooring.

Tong Back-Up Posts
Two (2) removable tong back-up posts located on well centerline on rig floor in side panels of mast.

Kelly Pull Back
Open side pulley attached to hydraulic winch stand. Assists manipulation of Kelly to rat hole.

Pipe Slide
½” plate construction, 5’ wide. (For use with 22’-0”” height catwalk and pipe racks).

V-Door Stairway
Stairway to be separate from V-Door at a minimum 5’ of distance.

V-Door Gate
Provide swinging gate on handrails at rig floor for V-door and tool slide openings. Hydraulic Lines for Hydraulic Systems
Full Circle to include permanently mounted steel lines with jumper hoses for hydraulic lines in substructure.

Covers for Rat Hole, Mouse Hole and Rotary Table Openings

Doghouse Support
Doghouse support for customer's doghouse. Support pins to substructure on driller's side. Top of doghouse skid is flush with floor level.

Paint
Full Circle standard system 1 consisting of a two (2) coat systems of Enamel and Top Coat Enamel to customers color. Surface to be sweep blasted, power tool or hand cleaned prior to application of the primer.

Custom Engineered Drive System:
One (1) ea: 3 X 4 GEN/SCR Control House System with Rig Control Software, 1000HP Drawworks.

SCR Drive House Design Criteria:
This system describes a Four (4) Modular drive bays, three (3) Generator Controls, Drillers Cabin, Control and Power interconnections for power drive units, distribution transformers, motor control center, and control house to operate:

- Two (2) Caterpillar D-3512C, 1200RPM, 1104KW with 1750KVA generator, 600VAC, 3 Phase, 3 Wire, 60Hz or Equivalent
- Drawworks:1,000 HP with Two (2) 752 DC Drive
- Top Drive:400 HP with Two (2) DC Motors
- Mud Pump #1:1.000 HP with One (1) 752 DC Motor, PZ 9, 1000hp
- Mud Pump #2:1,000 HP with One (1) 752 DC Motor, PZ 9, 1000hp

General Specifications:
- The following electrical equipment will be fabricated in accordance with sound engineering practices and all materials, equipment, and workmanship will be in compliance to the latest editions of ANSI C-37 for metal enclosed distribution switchgear, IEEE-45, NFPA, UL, and API as appropriate.
- The 600 SCR Generator Control and Distribution Switchboard shall be freestanding metal enclosed switchgear built in conformance with ANSI C-37 requirements.
- The equipment shall be front access only.
- The equipment shall be self-ventilating.
- The equipment is designed to control a diesel electric generator set rated at 600 SCR, three phase, three-wire, 60 Hz.
- The engine shall be supplied with an electronic governor and utilize a magnetic pickup mounted adjacent to the engine flywheel for frequency sensing.
- The Main bus bars shall be electrical grade tin-plated copper. All bus bars shall be rated for full continuous thermal load and shall be braced for the maximum short circuit fault level.
- The Generator control sections shall be factory wired to a connection panel providing quick, reliable connections of each engine / generator set to the power system. The connection panel shall be located on the edge of the control house.
- Each generator power circuit within the power system shall be connected with fully flexible copper cable and crimp type seamless copper lugs to copper stabs for extension to the generator skids.
- The exciter, space heater, magnetic pick-up, actuator, skid equipment, and lighting circuit shall be wired to a matching connector located on the connection panel.
- All wiring associated with electronic equipment shall be kept separate from power wiring.
- All wiring shall be terminated on or in screw-type terminal blocks / boards.
- All control wiring will utilize insulated ferrules for terminations to insure a positive and robust connection.
- Terminal blocks shall be rated to withstand the maximum continuous current rating and voltage rating of the connected conductors.
- All power cables used in connection with the control house shall be de-rated to a conductor temperature of 110 deg. Celsius with a voltage rating of 2KV.
- Ground fault monitoring system(s) will be provided for the 480 DC and 600 SCR Distribution System(s).

600 V Switchboard:
Two (2) Model 2400 Generator Control Cubicles complete and ready to use.
One (1) Power Distribution Transformer Feeder
One (1) Lighting Transformer Feeder
One (1) Interlocking and Synchronizing Device

Bus Bars:
Bus bars and droppers shall be manufactured from hard drawn, high conductivity copper and shall be phase marked clearly.

Barriers shall be provided to prevent arcs traveling from incoming cable terminations using lugs to the main bus bar and between adjacent compartments.

Circuit breakers shall be of the air break “trip free” type (UV trip and charging).

Breaker tripping shall be by means of an AC trip coil there shall also be a manual mechanical trip mechanism. Trip circuit monitoring facilities shall be provided to alarm faults in the protection circuit including cable and trip coils.

DRAWWORKS

Full Circle Electric Drawworks with the following
equipment: Input HP - Combined total = 1,000 hp
(1) GE752 DC motor (Option of 2 motors)

Drum Size - Diameter 26", Length - 49
Grooving - 1 1/4"

(2) 42” VC 1200

24” CB500 rotary clutch (if driven from drawworks)

4 Hoisting speeds: 2 rotary speeds

Braking: Mounted directly to drum shaft

(1) W36-OM-405 Total holding capacity is 2,383,800. (Note: Spring applied parking/emergency brake incorporated into working brakes)

All brakes are controlled by a single lever with additional control for auxiliary brake.

(2) Drum type hydraulic catheads, fully adjustable torque range:

- Torque sensor mounting brackets (load cells optional)
- Make-up and Break-out: identical in construction-allows for interchangeability of units; eliminates need for additional spares; can accept either 3/8" chain or 9/16" cable
- Controlled with variable speed controls and maximum torque is remotely controlled from the driller's console
- Single line pull is 10,000lbs at 3,000 psi - Hydraulic pressure
- Recommended HPU requirements 30-60GPM at 3,000psi

(1) Electric hydraulic power unit (HPU) to provide hydraulics to catheads: 60hp, 37gpm, 3000psi (optional)

Adjustable crown and floor protection and emergency stop

Dual independent oil system for each bearing and chain.
Chain lubrication system is designed to maximize chain life by flooding oil onto each chain

Instrumentation: (1) Weight Indicator, (2) Tong torque gauges, (1) Pump pressure gauge, with stainless steel instrument console (1) Electric rotary torque gauge, (1) Automatic driller (satellite) incorporated into the stainless steel driller's console
Driller's console complete with all valves, gauges and hoses for all operations

Total equipment dimensions:
Length 13'10", Width 18' 8 1/4", Height 7'

MUD PUMPS

Two (2) new Gardner Denver PZ 9 1000hp mud pumps powered by one (1) electric 752 motor each.

ELECTRICAL

SCR System including:
2 ea. C3512 Caterpillar Diesel Engine / Generator Sets: 1365 KW, 600/V, 3PH, 0.8PF, 1500 KVA.
1- 1000HP Drawworks with 2 ea. DC 750 HP rated Motors
2- 1000HP Mud pumps each with 1ea. DC 800 HP motor per
Pumps 1- 400HP Top Drive with DC 600 HP rated motor
1- Mechanical Rotary Table
1- 750KVA 600/480V MCC Transformer
1- 112.5KVA 600/120-208V Lighting Transformer
7- Vertical Elevation Sections of MCC (Minimum)
1- 42 Circuit Lighting Panel
1- Oilfield skidded, welded constructed SCR House

Generator Control Cabinet:

Each Control Cabinet will be fitted with the following items and connected with tin plated hard drawn copper thru-bus rated 4500 Amp continuous throughout:

- Engine Control and Load Bias via. Woodward EGCP-3 with automatic or
- manual synchronizing (Door Mounted.)
- Voltage Control and Excitation via. Basler Digital Series Voltage Regulators DESC-100 or equivalent
- Nema 1, welded construction 12 gauge steel frame with enclosure panels of 16 gauge steel. All metal parts - hot zinc galvanized.
- Draw out style main breaker -Siemens 1600 amp frame with Electronic LSI trip unit

SCR Cabinet:
Each Control Cabinet will be fitted with the following items:

- Nema 1, welded construction 12 gauge steel frame with enclosure panels of
- 16 gauge steel. All metal parts - hot zinc galvanized.
- Fixed Fused Emerson Disconnects each drive independent
- Main and Alternate Assignment DC contactors.

- Back pan mounted Digital SCR Controller rated for continuous output to DC motor.

Ethernet interface for communication to master PLC controller.
Door mounted interface and display device.

Feeder Breaker Cabinet:
1200AF, 800AT, ABB Feeder Circuit breaker for 750KVA MCC Transformer primary.

250AF, >100 AT, ABB Feeder breaker for 112.5KVA 120-208V Lighting
Transformer primary

Drawworks Braking Contactors

PLC Cabinet:
Ethernet Based WAGO PLC and I/O system.
Drawworks Reversing Contactors.

Motor Control Center:
Siemens Tiastar (or equivalent) MCC (7 vertical sections minimum) with WAGO Ethernet based I/O communications to the main PLC.

Air conditioners:
2ea. 10 ton, copper coil, "Packaged Unit" Air Conditioners with 15KW heaters.

Transformers:
1ea. Copper coil (Hammond or equivalent) 750KVA, 3 phase, outdoor enclosure, convection air cooled, 150deg C. rise transformer.

1ea. Copper Coil (Hammond or equivalent) 112.5KVA, 3 phase, outdoor enclosure, convection air cooled, 150deg C. rise transformer.

Oilfield SCR House (Enclosure)

3 Runner Skid, tailboard ready, all welded construction, with interlocking wall panels, insulating material fitted floor, walls, and ceiling.

Approximate SKID dimensions: 45 'L x 9.5'W x 10' H.
Exterior and Interior sand blasted, premiered, and painted with 2 part epoxy based paint.
Electrical Rig Up

AC Power to be from Two (2) Cat 3512 Engines each with One (1) 1365 KW 600 volt, 60 Hz Generator

DC power for the following loads:
1-1000 HP Drawworks with 2-750 HP DC Motors and 10 HP Blowers
2-1000 HP Mud Pumps each with 2-800 HP DC Motor and 10 HP Blower
1-Mechanical Rotary
1-400 HP Top Drive with1-400 HP DC Motor and 10 HP
Blower 1- PCR with MCC and transformer (internal of PCR)

Floor and mast thru ground tray and grasshopper tray (by others)
Cable to extend to Substructure from SCR max 150 ft

Mud Tanks (2) and Triplex Mud Pumps (2) thru ground tray (by others)
Receptacles to be standard rated Appleton or equivalent

2-75 HP Mud Mixers (Suction Tank)
2-75 HP Mud Cleaner/ Degasser (Shaker Tank)
2-100 HP Desander / Desilter (Shaker Tank)
2-75 HP Super Chargers
1-50 HPU Units
1-20 HP EZ Torque Unit or Wireline
Unit 2-25 HP Water Pumps
2-20 HP Trip Pumps
2-5 HP Fuel Pumps
1-Shaker Tank Feeder for 3-5 HP Dual Linear Shakers and 3-15 HP Mud
Agitators 1-Suction Tank Feeder with 3-15 HP Mud Agitators
1-30 HP BOP Unit
2-75 HP Air compressors

120/208 Volt Loads

2-100/2 Company trailers
1-100/3 Rig Floor Panel
1-60/3 Warehouse / Mechanics Shop
1-60/3 Electricians Shop
12-20/1 lighting and auxiliary loads

Lighting System to be 120/208 Volt 60 Hz

Mast 142 ft and a 22'.0" floor Height with 40' x 21' substructure

Lighting System
All fixtures will be provided with Class 1 Division 1 Explosion Proof receptacles and plugs. Each lighting string will be provided with receptacles and plugs as needed for rig moves.

Mast Lighting
Twelve (12) Class 1 Div 2 fluorescent fixtures for mounting on mast
Aircraft Obstruction lighting
Two (2) obstruction Class 1 Div 2 lights mounted on Crown and one additional near racking board.

Racking Board Lighting
Two (2) Class 1 Div 2 fluorescent fixtures for mounting on Racking Board.

Dog House Lighting
Three (3) Class 1 Div 1 fluorescent fixtures for mounting in Dog House/ Driller's Cabin.

Floor Lighting
Two (2) Class 1 Div 1 Explosion Proof fluorescent fixtures for mounting on Racking Board

Substructure Lighting
Four (4) Class 1 Div 1 Explosion Proof 400 Watt Mercury Vapor Floodlights fixtures mounting in corners of Substructure

Pipe Rack Lighting
Four (4) Class 1 Div 1 Explosion Proof 400 Watt Mercury Vapor Floodlights fixtures for Pipe Rack
Four (4) Class 1 Div 1 Explosion Proof 400 Watt Mercury Vapor Floodlights fixtures for Area Lighting

Rig Floor Nema 7 Panel Explosion Proof with the following circuits:
1-20/1 Circuit Breaker for Dog House 2-20/1 Circuit Breaker for Mast
Lighting 1-20/1 Circuit Breaker for Obstruction Lights (3)
1-20/1 Circuit Breaker for Substructure Lights
1-20/1 Circuit Breaker for Floor Lighting
1-20/1 Circuit Breaker for Pipe Rack Lighting
1-20/1 Circuit Breaker for Drawworks/ Area Lighting
2-30/3 Circuit Breakers for Spares (10 HP Max 208 Volt)

Generator Lighting (3) Skids
12- Twelve (12) Class 1 Div 2 fluorescent fixtures for mounting on roofs of 4 Generator Skids 3 per skid.

Water Tank Lighting (3) Tank
One (1) Class 1 Div 2 fluorescent fixtures with mounting stanchion 1 per tank

Fuel Tank Lighting (1) Tank
One (1) Class 1 Div 2 fluorescent fixtures with mounting stanchion 1 per tank

Koomey Unit / Air Compressor Lighting (1) Skid
Three (3) Class 1 Div 2 fluorescent fixtures roof mounted

Mud Tank Lighting (3) Tanks (Trip, Shaker, & Suction)
Ten (10) Class 1 Div 2 Metal Halide 400 watt floodlight fixtures with mounting stanchion 2 per tank

Mud Mix/ Desand-Desilt skid Lighting Porches (2)
One (1) Class 1 Div 1 Explosion Proof fluorescent fixtures (1 per porch)

Mud Pumps Lighting (2) Skids
Two (2) Class 1 Div 2 fluorescent fixtures with mounting stanchion 1 per skid

POWER

Two (2) 3512C / 1476 BHP / 1200 RPM / 867 Frame Generators
3512C LAND ELECTRIC DRILLING ENGINE
* 2006 EPA/CARB TIER 2 NON-ROAD EMISSIONS CERTIFIED *
Engine Rating = 1101 bkW (1476 BHP) @ 1200 RPM.

Includes one Caterpillar 12-cylinder, direct-injected, turbocharged, aftercooled diesel oilfield engine; 4 cycle, 170 mm bore x 191 mm stroke (6.7 in bore x 7.5 in stroke) with separate-circuit after-cooler and optimized for low emissions. Engine rotation is standard (counter-clockwise as viewed from flywheel end).

AIR INLET SYSTEM
Aftercooler core, corrosion resistant air cleaner, regular duty, with soot filter.
Service indicators.

CONTROL SYSTEM
Caterpillar ADEM A3 ECM, LEFT HAND.
Requires 24V DC 10-amp continuous, 20-amp intermittent, clean electrical power.

COOLING SYSTEM
In order to ensure compliance in use, optional or customer-supplied radiators must be capable of rejecting enough heat to allow proper operation at worst case site conditions, and also must supply 122 deg F (50 deg C) SCAC cooling water to the after-cooler inlet, with an SCAC flow rate of at least 100 GPM (379 l/m) with an ambient temperature of 86 deg F (30 deg C) and at-site conditions (including altitude considerations). Maximum allowable SCAC flow rate is 115 GPM (435 l/m).

RADIATOR COOLED LAND BASED:
Outlet controlled thermostat and housing.
Jacket water pump, gear driven.

Dual outlets:
88.9 mm O.D. (3.5 in) elbow hose connections.
After-cooler fresh water cooling pump (SCAC), gear driven centrifugal SCAC pump circuit contains a thermostat to keep the after-cooler coolant from falling below 30 deg C (85 F).

EXHAUST SYSTEM
Exhaust outlet:
292 mm I.D. (11.5 in).
12-10.5 mm dia holes EQ SP, 376 mm bolt hole dia.
Shipped loose:
Exhaust flexible fitting:
318 I.D. mm (12.5 in)
12-14 mm dia. holes EQ SP, 375 mm bolt hole dia.
306.6 mm tall with compressed gasket.
Exhaust adapter:
297 mm I.D. to 340 mm I.D. (11.7 in to 13.4 in).
12-10.5 mm dia. holes EQ SP, 376 mm bolt hole dia.
12-13.8 mm dia. holes EQ SP, 430 mm bolt hole dia.
158.5 mm tall with compressed gasket.
Weldable flange:
360 mm I.D. (14.2 in).
12-13.8 mm dia. holes EQ SP, 430 mm bolt hole dia.
17.4 mm wide with compressed gasket.
Exhaust manifolds, dry.
Dual turbochargers with w/c bearings.

FLYWHEELS & FLYWHEEL HOUSINGS
Flywheel, SAE No. 00
Flywheel housing, SAE No. 00
SAE standard rotation

FUEL SYSTEM
Fuel filter.
Fuel transfer pump

Flexible fuel lines
Fuel priming pump, LEFT HAND
Electronically-controlled unit injectors.

INSTRUMENTATION
Electronic instrument panel, LEFT HAND.
Analog gauges with digital display data for:
Engine oil pressure gauge.
Engine water temperature gauge.
Fuel pressure gauge.
System DC voltage gauge.
Air inlet restriction gauge.
Exhaust temperature (prior to turbochargers) gauge.
Fuel filter differential pressure gauge.
Oil filter differential pressure gauge.
Service meter (digital display only).
Tachometer (digital display only).
Instantaneous fuel consumption (digital display only).
Total fuel consumed (digital display only).

Engine start-stop (off, auto start, manual start, cool down timer).
LUBE SYSTEM
Crankcase breather
Oil cooler
Oil filter.
Shallow oil pan
Oil pan drain valve, 2' NPT female connection
Lubricating oil, SAE 10W30, Caterpillar DEO (CG4) 643 L.

MOUNTING SYSTEM
Rails, mounting, floor type, 254 mm (10 in).

POWER TAKE-OFFS
Accessory drive.
Lower LEFT HAND front (available for PTO usage).
Front housing, two-sided

PROTECTION SYSTEM
ADEM A3 ECM monitoring system provides engine de-ration, or shutdown
strategies to protect against adverse operating conditions. Selected parameters are customer-programmable. Status available on engine-mounted instrument panel and can be broadcast through the optional customer communications module or programmable relay control module(s). Initially set as follows:

Safety shutoff protection, electrical:
Oil pressure, water temperature, overspeed, crankcase pressure, aftercooler temperature. Includes air inlet shutoff, activated on overspeed or emergency stop.

Alarms, electrical:
ECM voltage, oil pressure, water temperature (low and high), overspeed, crankcase pressure, aftercooler temperature, low water level (sensor is optional attachment), air inlet restriction, exhaust stack temperature, filter differential pressure (oil and fuel).

Derate, electrical:
High water temperature, crankcase pressure, aftercooler temperature, air inlet restriction, altitude, exhaust temperature.

Emergency stop push button, located on instrument panel.
Alarm switches (oil pressure and water temperature), for connection to customer-supplied alarm panel. Unwired.

STARTING SYSTEM
Air starting motor, RIGHT HAND, 620 to 1034 kPa (90 to 150 psi), LEFT HAND control air silencer

GENERAL
Paint, Caterpillar Yellow
Vibration damper and guard
Lifting eyes

WITH THE FOLLOWING ADDITIONAL ACCESSORIES INCLUDED:

HEAVY DUTY AIR CLEANER:
For use in extreme sand or dust.

COUPLING HUB - 127 MM DIA MAX:
FOR USE WITH: 127 mm (5 in) diameter maximum shaft, 31.7 x 31.7 mm (1-1/4 x 1-1/4 in) key. Caterpillar SR4B.

GENERATOR 867 FRAME SELF EXCITED 2 BEARING:
TECHNICAL: 1750 kVA, 600 volt, 0.7 P.F., 1200 rpm. Generator Argt 158-6442. Form wound, VPI, Class H insulation. 80 deg temperature rise @ 50 deg ambient. Includes 1200 watt space heater, 10 ohm copper RTDs, bus bars, and coupling hub. (Does not include voltage regulator.)

TUBULAR SKID:
Tubular sub-base to accommodate engine and generator - includes three point mounting provisions to Master skid. Also includes labor to mount and align engine and generator. Mounting pads included.

SHOP LOAD TEST:
One (1) hour full load test at unity power factor.

IRON ROUGHNECK

ONE (1) ALCO SMART IRON ROUGHNECK
SYSTEM Specifications:
Tubular Range
88 mm to 292 mm (3 ½" to 11 ¾")

Torque and Clamping Force
Spin 0 to 2,200 Nm (16,00 ft-lbs)
Make Torque 0 to 74,570 Nm (0 to 55,000 ft lbs)
Break Out Torque 0 to 74,570 Nm (0 to 55,000 ft lbs)

Clamping Force 0 to 266,903 N (0 to 60,000 lbs)

Hydraulic Supply Required
150 liters at 17,200 Kpa (33 GPM at 2500 PSI)

Electrical Supply Required
110 Volt c/w ground, 60Hz

Roughneck Unit Specifications
Weight: 3,200 kg (7,000 lbs) Width:
80" to fit 27.5" rotary table Length
of track: 2.3 m (92 in.)
-Extends 0.25 m (10 in.) past well center
Height from base of track to top of spinner: 2.3 m (93 in.)
Depth to front of wrench to back of spinner: 1.5 m (61 in.)
Width overall: 1.8 m (72 in.)
Center to center of standard track: 1.5 m (60
in.) Stump height adjustment: 0.46 m (18 in.)

Unit comes completely assembled on tracks ready to be secured over rotary table. Plug in power supply to console and connect pressure and return hydraulic lines and perform test connection.

ONE (1) CONVENTIONAL CATWALK

The two piece 5' wide x 18" high x 52' long Catwalk is supplied complete with a lay down post and the V-Door pipe ramp is 5' wide complete with two (2) 4" rail pipes and a 3/8" flat plate on ramp.

ONE (1) ROTARY

27.5" Rotary table rigid box-type base cartridge type pinion shaft assembly with roller bearings turntable locking-dog with selection of permanent lock in both directions. Heat treated spiral bevel gear and pinion precision alloy-steel main table ball bearing and upper thrust ball bearing, centralized oil and grease lubrication.

One (1) Rotary Master Bushing

ONE (1) DEADLINE ANCHOR

One (1) deadline anchor for use with 1-1/4" wire rope, 50,000 lb. Deadline load.
Note: Deadline Anchor is mounted on the Mast leg.

TWELVE (12) PIPE RACKS

18" high x 28' long triangular pipe racks composed of 4" pipe with ¾" plate legs.

TWO (2) HYDRAULIC WINCH

Handling hoist with safety features mounted. Planetary type hydraulic winch, power in and power out. Automatic fail safe brake, winch controls, includes all piping for the handling winch and Block in Mast, 9/16" wireline, 335' wireline capacity, maximum pull 8300# means and 12000# bare drum.

Derrick Equipment Company

Derrick FLC-503 / 3-Panel High "G" Shaker (or equal)

Drawing # 15640-00-004, complete as follows:
Continuous 7.0 "G"-Force
- Providing increased capacity & superior solids conveyance
Single Side Tensioning System
- Allows one minute screen change per panel
Pyramid & Pyramid Plus Screen Technology
- Further increased capacities & finer screening Deck Angle Adjustment
- +5º uphill to -1º downhill / hand ratchet adjustable while drilling

Weir Feeder
Explosion-proof Electrics
- Super G™ SGX vibrating motors (sealed for life grease lubrication)
- 460/480 Volts, 3 Phase, 60 Cycle
Standard Hopper - for screen underflow Standard Green Paint
Max Dimensions / Weight: L 117 15/16 in / 2996 mm x W 64 3/4 / 1645 x H 73 3/8 / 1864 3550 lbs / 1610 kg

MUD SYSTEM

SHAKER PIT
47’ long x 12’ wide x 6’ high 500 bbl capacity with three (3) compartments; one (1) derrick agitator and fitted with Derrick 503FLC Shaker

SUCTION PIT
47’ long x 12’ wide x 6’high 500 bbl capacity with three (3) compartments w/slug pit or premix; three (3) derrick agitators; 10’ porch with Double Life hopper on top and two (2) electric derrick centrifugal 5x6 mud mixing pumps w/shed over porch.
*Pits are completely plumbed for suction and fresh water and equipped with guns for stirring; 1500 bbl total capacity. Three (3) Tanks 500 Ea. Round bottom.

Desander (Stand Alone Vertical) Model # DSV-10-2 (and or equal)
Complete as follows:
Drawing # 13645-00
Complete w/ Two 10" Cones
Rated at 1000 GPM with 75 ft. of head
Max Dims: 74 1/4" (L) x 37 3/4" (W) x 89 7/8" (H)
Weight: 1400 lbs

Desilter (Stand Alone Inline) Model # S-412-S (and or equal)
Complete as follows:
Drawing # 10770-00
Complete w/ Twelve 4" Cones
Rated at 960 GPM with 75 ft. of head
Max Dims: 54" (L) x 32" (W) x 57" (H)

Weight: 1100 lbs
Derrick Horizontal Agitator 10 - HP (and or equal)
Drawing # 15488-00
Features include:
-7.5 horsepower 1800 RPM Explosion proof C-Face
bolted to gear box
-Mounting plate
-Impeller and keyed shaft to specification
-Complete with necessary couplings and bushing
-(230/460 Volts, 60 Cycle, 3 Phase)

Derrick Horizontal Agitator 10 - HP (and or equal)
Drawing # 15488-00
Features include:
-10 horsepower 1800 RPM Explosion proof
C-Face bolted to gear box
-Mounting plate
-Impeller and keyed shaft to specification
-Complete with necessary couplings and bushing
-(230/460 Volts, 60 Cycle, 3 Phase)

Derrick 6x5x11 "Premium 250" Centrifugal Pump Package (and or equal)
Horizontal Skidded Package as follows:
Coupling with OSHA Type Guard
Derrick "Premium 250" 6x5x11 Centrifugal Pump
- 7.5'' impeller
- hard-iron fluid end
- replaceable fluid casing wear pad
- SKF premium bearings
- greased lubrication
- tungsten carbide mechanical seal
75 HP Electric Motor
Explosion-Proof - 230-460 Volt 1750 RPM, 60 HZ, 3
phase Primed and Painted
Does not include starter

Derrick® Vacu-Flo 1200 Degasser Drawing# 10310-00 (and or equal)
Complete as follows:
Vessel and Vacuum Pump Mounted to a Unitized Skid
Complete with Venturi and Eductor Rated at 1,200 GPM
(460 Volts, 60 Cycle, 3 Phase)
Max Dims: 87" (L) x 64 1/4" (W) x 79" (H)
Weight:2,700 lbs
W 64 1/4 in / 1632mm L 87 3/4 / 2229 H 75 / 1905 Weight 2,700LBS / 1225KG

Plus Other Equipment:

1. Two (2) 50 BBL day tanks
2. High Pressure piping from mud pumps through stand pipe manifold 5,000 psi pressure.

3. High Pressure piping standpipe, 5”diameter. Single complete with hammer unions and gooseneck.
4. All high pressure piping from Rig floor through the pumps.
   5,000 lb. choke manifold 3 1/16” with one (1) hydraulic and one (1) manual choke with 3,000 psi buffer chamber (certified).
5. Two (2) charging pumps, 6x5 with 75 hp motors, mounted on oilfield skid.
6. All electric wiring needed for rig including derrick lights and mud tank lights complete with floor lights.
7. One (1) house to house electric cable for transport and have under control for all components. 8’ high x 8’ wide x 20’-0” long, complete with (festoon) system to handle wire while skidding.
8. One (1) 7’-6” wide x 20’-0” long top doghouse with 4’-0“ porch extension, with knowledge box, four (4) lockers, bench storage, cabinets, and parts bins.
9. One (1) 7’-8” wide x 35’ long change / parts house bench storage cabinets.
10. One (1) 10’ wide x 35’-0” long mud house parts bin, fluorescent lights, skidded.
11. Catwalks 24” high x 4’-6” wide x 52’-0” long, 2-section steel catwalk with steps on one end inside with square tubing.
12. Pipe racks (6) – 24” high x 28’-0” long triangular pipe racks.
13. BOP handling system complete with two (2) beam rails extending from front of substructure to just behind center line of wall, with two (2) 12 ton trolley and hoist chains.
14. One (1) set 5,000 # BOP. One Shaffer or equal 11” double, 10,000 psi bottom flange. Two (2) Hydrill GK 11” 5,000 psi annular with 10,000 psi bottom flange.
15. Two (2) new 50HP Gardner Denver tank mounted electric screw compressors. One (1) cold start package, mounted air compressor and parts house. Emergency generator house 7’-10” x 30’-0” long.
16. Drilling recorder seven (7) pens.
17. All cable trays to house high pressure piping and electric cable from being on the ground and for easy handling.
18. One (1) 10’-6” diameter x 32’ long 500 BBL water tank. One (1) 10’-0” x 8’ high x 36’-0” long diesel tank with two (2) electric fuel transfer pumps skidded.

WALKING SYSTEM

One (1) set of four (4) Full Circle, Inc. 300 Ton yoke assemblies for use with HSI Hydraulic system. The set consists of four (4) rig walker units that are designed to pin to the end of any substructure. Complete with:

- 16 pins to connect rig walker to end of substructure (4 per yoke).
- Skids 3’-0” at a time
- Total lift capacity 2,400,000 lbs (600,000 each)
- Levels rig while drilling
- Walks the rig in 360◦
- Walks approximately 140 ft. in one (1) hour (if required)

Our skidding systems’ 2.4 million pound lift capacity gives the users the ability to not only skid but also transport a full setback. With no rig down, our walking system reduces the wear and tear on the structure and minimizes rig move time, which means more time spent drilling.

One (1) electrical control system
Four (4) – 300 ton equalizing
boxes One (1) Hose Kit
One (1) Cable set
One (1) Wireless Pendant
One (1) Hydraulic Power Unit
One (1) kit – 8’-5” bore skid cylinders, 4-300 ton lift cylinders, 4-adjustable feet c/w 300 ton Hillman Rollers.
Installation at Full Circle, Conroe, Texas.

MASTER BUSHING
Varco Mod. MSPC 27-1/2” With no. 3 Insert Bowl

PIPE SPINNER
International Type 30/JT Oil Field

KELLY BUSHING
Model 27-HDP Varco

CHARGING PUMPS
(2) Mission Model Magnum, 8 x 6 x 11 with 75hp Electric Motors, 230/460 Volt

DITCH MAGNETS (Included in base price)

MUD MIXING PUMPS
(2) Mission Model Magnum, 8 x 6 x 13 with 75hp Electric Motors, 230/460 Volt

WATER TANK
(1) Drinking water tank 300 bbl with (2) ea. transfer pumps 2” x 3” with 10 hp electric motors skid mounted on oilfield skid.

DIESEL TANK
(1) 300 bbl diesel tank with (2) ea. transfer pumps 1.5” x 2” with 5 hp electric motors skid mounted on oilfield skid.

CLOSING UNIT
Koomey, Type 80 Unit, 260 Gal. Capacity with 16 Bottle, 14 Outlets, And Auxiliary Air Remote control unit
(2) Air pumps and (1) triplex 3000 psi pump with 20 hp. motor. Dual Remote control panels

CHOKE AND KILL LINE
2 Ea: Gate Valve, 3-1/16" 10,000 PSI WP, Flocon type "BWH" flanged ends, BX-154, hydraulic operated, SSRG 2 Ea: Gate Valve, 3-1/16" 10,000 PSI WP, Flocon type "BWH" flanged ends, BX-154, hydraulic operated, SSRG 4 Ea: Gate Valve, 3-1/16" 10,000 PSI WP, Flocon type "BW" flanged ends, BX-154, handwheel operated, SSRG

KILL LINE, TOP
4 Ea: Gate Valve, 3-1/16" 10,000 PSI WP, Flocon type "BW" flanged ends, BX-154, handwheel operated, SSRG 4 Ea: Gate Valve, 3-1/16" 10,000 PSI WP, Flocon type "BWH" flanged ends, BX-154, hydraulic operated, SSRG 4 Ea: Check Valve, 3-1/16" 10,000 PSI, "Flocheck", flanged ends, BX-154, SSRG mc "EE"

KILL LINE, BOTTOM
8 Ea: Gate Valve, 3 -1/16" 10,000 PSI WP, Flocon type "BW" flanged ends, BX-154, handwheel operated, SSRG 8 Ea: Check Valve, 3-1/16" 10,000 PSI, "Flocheck", flanged ends, BX-154, SSRG mc "EE" BX-154, SSRG
4 Ea: Flanged Tee, 3-1/16" x 3-1/16" x 3-1/16", 10,000 PSI bx-154, SSRG
88 Ea: Sets (8 Pcs per set) stud with two hex nuts 1" x 7-1/4" ASTM A13/194, GRB7/GR2H, CAD plated
100 Ea: Ring Gasket, cad plated, bx-154

DOUBLE STUDDED ADAPTER
10 Ea: Adapter, double studded, 4-1/16" 10,000 (BX-155) x 3-1/16" 10,000 PSI (BX-154), SSRG

STAND PIPE MANIFOLD
4" dual stand pipe manifold with goose necks with Kelly hose connection (1) 55'ft.3.5
x 7500 psi rotary hose 5 ea. 4"in 5K mud gate valves 3 ea 2"mud gate valve out lets x 5K.

AIR COMPRESSOR
2 Quincy 50 hp units with air driers 125 PSI WP
(1) Cold start compressor with diesel engine with electric starter.

WIRE LINE UNIT
Hoist Driven By 15 HP Elec. Motor W/ 15,000' .092 OD Line with Depth Recorder

CATWALK
(2) ea. approximately 25 ft x 5 ft x 3 ft High

AIR TANKS
(2) ea. 200 gallon fitted in substructure (1) 200 gallon air tank in compressor house:

TOOL HOUSE
(1) Parts and Supply House 30' x 10' x 8'

DOGHOUSE (New)
(1) Doghouse 20' x 10' x 8'

DRILLING LINE:
5000'ft. drilling wire rope 1-1/4" WRC on steel reel, Union Wire Rope Co

RIG WIRING
All fixtures explosion proof within 50 ft of well bore

DRILLERS CONSOLE
Drilling / Mud watch system complete with gauges and recorders ,pressure , torque, mud volume, spm, rpm, weight, flow, drill rate , etc.

MAINTENANCE TOOLS
2 ea. Tool boxes for mechanics
2 ea. Tool boxes for electricians
2 ea. Sets hand tools for rig floor

DRILL PIPE AND DRILL COLLARS
8000 ft. 5" RG G-105 19.50 lb./ft. NC-50 HB and IPC 6-5/8 X 12" box 9" pin new Koppel steel USA pipe.
3000 ft 3-1/2" 13:30 lb per ft. grade S-135 HB and IPC New Smith Industries USA
30 ea Jloints 6-3/4" Drill Collars NC-46 Spiral. Slip recess only
40 ea Joints 5" Hevi-Wate Drill Pipe
30 ea Joints 4-3/4" Drill Collars NC-38 Spiral slip recess
only 30 ea Joints 3-1/2" Hevi-Wate Drill Pipe
9 ea Joints 8" Drill Collars 6-5/8" Reg. Spiral Slip recess only

TOP DRIVE

Top drive 275 ton CanRig 600 hp complete with all service loops guide rails, VFD controls built in SCR house to save extra load when moving, complete with drill pipe handling attachment, installed and test before leaving rig up yard.