RECONSTRUCTION AND ABS RECERTIFIED/CLASS 2014
400 FOOT JACK UP DRILLING RIG
(WITH 520’ LEGS)
# TABLE OF CONTENTS

**SECTION 1000 – ND4500 DRILLING MAST** ........................................................................................................... 6

**1001 - MAST ND4500 I BEAM** .......................................................................................................................... 6

MANUFACTURED FOR OPERATION IN AREAS WITH MODERATE CLIMATE, CATEGORY 1 AS PER GOST 15150-69 (-54°C TO +54°C) ON FIELDS WITH HYDROGEN SULFIDE CONTENT OF AT LEAST 6% ..................................................................................................................................................... 6

1001:1 - OVERALL .................................................................................................................................................. 7
1001:2 – SPECIFICATIONS .................................................................................................................................. 7
1001:3 - BASE SECTION ...................................................................................................................................... 8
1001:4 - LOWER SECTIONS ................................................................................................................................. 8
1001:5 - UPPER SECTION .................................................................................................................................. 8
1002:1 – CROWN BLOCK .................................................................................................................................... 8
1003:1 - RACKING BOARD ................................................................................................................................... 8
1003:2- CASING STABBING BOARD .................................................................................................................... 9
1003:3- INERTIA ESCAPE DEVICE ................................................................................................................... 9
1003:4- TUGGER UNITS .................................................................................................................................... 9
1003:4- TUGGER SHEAVE UNITS ...................................................................................................................... 9
1003:3 – MAN RIDER WINCH TWO ................................................................................................................... 9
1004:4 – DEADLINE ANCHOR ............................................................................................................................ 10
1004:5 - SUBSTRUCTURE SYSTEM DESCRIPTION ............................................................................................. 10
1004:6 - SUBSTRUCTURE SPECIFICATIONS .................................................................................................... 10
1004:7 - SUBSTRUCTURE ADDITIONAL EQUIPMENT ...................................................................................... 11
1005:1 – MAN RIDER WINCH and CRADLE LIFTS ............................................................................................ 11
1007:1 – EZY TORQUE SYSTEM ........................................................................................................................ 11
1008:1 - AUXILIARY WINCHES ......................................................................................................................... 12
1009:1 – AFM AUTOMATED PIPE HANDLING SYSTEM ................................................................................... 12
1011:1 – Cameron Torq-system ......................................................................................................................... 13

**SECTION 1000 –Top Drive Canrig 1275AC 681** ..................................................................................................... 15

1000:01 Top Drive Model 1275AC-681 ................................................................................................................ 15

**SECTION 1400 - DRAWWORKS AND ACCESSORIES** ....................................................................................... 16

**1400:1 – DRAWWORKS RATED 4500 HP** ...................................................................................................... 16

1400:1 – HYDRAULIC DRILL LINE SPOOLER SYSTEM ......................................................................................... 19
1501:1 – CCTV SYSTEM ...................................................................................................................................... 20
1600:1 – 37.5” ROTARY TABLE .......................................................................................................................... 20
1700:1 – INDEPENDENT ROTARY DRIVE ........................................................................................................ 21
1701:1 - TRAVELING BLOCK ............................................................................................................................ 21
1702:1 - SWIVEL .................................................................................................................................................. 21

**SECTION 1800 – MUD PUMPS** ....................................................................................................................... 22
2001 – TWO (2) GARDNER DENVER® PZ-2400 DRILLING MUD PUMP ............................................. 22
SUPERCHARGING MCM® 200 PUMP .................................................................................................. 22
2003 – PUMP UNITIZATION .......................................................................................................... 23
   2003:1 – PUMP UNITIZATION DESCRIPTION .............................................................................. 23
   2003:2 – ELECTRIC MOTOR DRIVE ARRANGEMENT .............................................................. 23
2004 – PULSATION DAMPNER ......................................................................................................... 23
2005 – OTECO-TYPE SHEAR RESET RELIEF VALVE .................................................................. 23
2006 – PRESSURE GAUGE ............................................................................................................ 24
2007 – DISCHARGE STRAINER BLOCK ASSEMBLY .................................................................. 24
2008 – STANDPIPE ASSEMBLY .................................................................................................... 24
CEMENTING STANDPIPE ................................................................................................................ 25
SECTION 1803 – MODULAR MUD SYSTEM ............................................................................. 25
   1803 - CUSTOM BUILT MUD SYSTEM .................................................................................... 25
   1803:1 MUD TANK BBL CAPACITIES ..................................................................................... 25
   1803:2 SOLIDS CONTROL .......................................................................................................... 25
   1803:3 POWER SPECIFICATIONS ............................................................................................ 26
   1807:1 - TONG CIRCUIT ............................................................................................................ 27
SECTION 1900 – POWER UTILITY HOUSE ........................................................................ 27
   1900:1 - Prime Mover Drive ...................................................................................................... 35
   Typical Operator Chair with Controls ...................................................................................... 35
   1901:2 - Prime Movers ............................................................................................................. 36
2000:1 – HYDRAULIC POWER UNIT(S) ................................................................................ 39
2008:2 – AIR SYSTEM .................................................................................................................. 39
2008:3 – FUEL TANKS .................................................................................................................. 39
2008:4 – LIGHTING SYSTEM ...................................................................................................... 39
2008:5 – CENTRIFUGAL PUMPS .................................................................................................. 40
2008:8 – AVIATION LIGHTING .................................................................................................... 40
2009 – DRILLING RIG COMPONENTS .................................................................................. 40
   2009:1– GUIDE AND DRILL LINE ............................................................................................ 40
   2009:2 – MWD HOUSE ............................................................................................................. 40
2009:3 – TWIN CEMENTER OFFSHORE UNIT ........................................................................ 40
2010 – Fabrication ...................................................................................................................... 42
2010:1 – THE VESSEL .................................................................................................................. 42
2011- Hospital .............................................................................................................................. 42
2008:9 –LIFEBOAT ....................................................................................................................... 44
2011 - Rig up Items ...................................................................................................................... 45
Cement Line ................................................................................................................................. 46
7000 - RIG DELIVERY & COMMISSIONING ....................................................................... 48
7000:1 - PRE-DELIVERY INSPECTION
7000:2 – PACKAGING
7000:3 - RIG SHIPPING

7000:4 – PIPE AND TOOLS SECTIONS 8300-100005
7000:1 - FLOATS - NON PORTED

7900 – PIPE AND TOOLS SECTIONS 8300-100005
7900:1 - FLOATS - NON PORTED

7950 DRILLING RIG FLOOR EQUIPMENT
7950:1 - STANDARD DRILL PIPE LELVATORS
7950:2 - STANDARD MANUAL SLIPS (Access Oil Tools or equivalent)
7950:3 - DRILL PIPE, DRILL COLLARS, & CASING TONGS
7950:4 - PNEUMATIC COLLAR CLAMPS
7950:5 - BIT BREAKERS
7950:6 - MUD SAVER BUCKET
7950:7 - CASING FILL - UP LINE

8000 - DRILL STRING
8000:1 – G105 DRILL PIPE
8000:2 – S135 DRILL PIPE
8000:4 - HW DRILL PIPE
8000:5 – DRILL COLLARS

8100 - CROSS-OVER, LIFTING / HANDLING, AND BIT SUBS
8100:1 - CROSS-OVERS
8100:2 - LIFTING SUBS & HANDLING PLUGS
8100:3 - BIT SUBS
8100:4 - CIRCULATING SUBS - 15,000 PSI
8100:5 - SIDE ENTRY SUBS - 15,000 PSI
8100:6 - CUP TESTERS

8200 - OVERSHOTS

9000 – Well Control
9000:1 - 13-5/8  15,000 psi WP BLOW OUT PREVENTER
9000:2 - DRILLING SPOOLS AND DIVERTER VALVES
9000:3 - ADAPTOR SPOOLS AND DSA S
9000:4 - CHOKE MANIFOLD
Choke Manifold – 4-1/16  x 3-1/16  15K Choke Manifold
9000:5 - KILL LINES
9000:6 - COMBINATION KILL/CHOKE LINES
9000:7 - CHOKE CONTROL AND DISPLAYS
9000:8 - GLYCOL INJECTION

9500 - WELL CONTROL AND BLOWOUT PREVENTION
9500:1 - RISER / BELL NIPPLES
9500:2 - BOP TEST UNIT
9500:3 - ACCUMULATOR PRESSURE CONTROL UNIT
9500:4 - MUD DEGASSING
## SECTION 10000 - Handling Tools

- **10001:1 - Kelly Spinner** ................................................................. 63
- **10001:2 - KELLYS** ........................................................................... 63
- **10001:3 - H2S SAFETY VALVES** ................................................... 63
- **10001:4 - KELLY COCKS** ................................................................. 63

## 10002 - SPINNER ............................................................................. 64

- **10002:1 - Drill Pipe Spinner** .......................................................... 64

## 10003 - MANUAL TONGS AND CASING ............................................. 64

- **10003:1 - Manual Tongs and Casing** ............................................. 64

## 10005 - TONGS .................................................................................. 65

- **10005:1 - Hydraulic casing tongs** .................................................. 65
- **10005:2 - TUBING TONG** ............................................................... 65
- **10005:3 - Tubing spider** ................................................................. 65

## SECTION 15000 - LOT1 OPTIONAL EQUIPMENT ................................. 66

- **15000:1 – MUD TANKS** ................................................................. 66
- **15200:1 – RESERVE OIL TANK** .................................................... 66
- **15200:2 – POTABLE WATER TANK** ............................................. 66
SECTION 1000 – ND4500 DRILL

LING MAST 1001 - MAST ND4500 I BEAM

MANUFACTURED FOR OPERATION IN AREAS WITH MODERATE CLIMATE, CATEGORY 1 AS PER GOST 15150-69 (-54°C TO +54°C) ON FIELDS WITH HYDROGEN SULFIDE CONTENT OF AT LEAST 6%
An open face derrick design, manufactured to API 4-F specifications.

The open face design utilizes a structural design, which allows for maximum block clearance.

DERRICK INCLUDES:
- Ladder from rig floor to crown
- Traveling block/TDS cradle for transport
- Twin, Class I, Div I aviation lights mounted to crown

NO. OF LINES TO BLOCK: 14
API CAPACITY: 2,250,000 LBS (582.75)
DRILLING SIZE: 2 IN. (50.80 MM) RACKING BOARD HEIGHT: 85-88FT. (25.9-26.8 M)
RACKING BOARD CAPACITY:
- 379 STANDS OF 5" OR /5-1/2" D.P. TRIPLES
- 8 STANDS OF 7"/8" D.C.
**1001:3 - BASE SECTION**

18 in. x 106 lbs. (475 mm x 48 kg) I-Beam Base Section with pad eyes for pinning to the substructure and lower section. Provisions for transporting assembled mast on dolly to be made.

**1001:4 - LOWER SECTIONS**

18 in. x 106 lbs. (475 mm x 48 kg) I-Beam Main Legs, with 6 in. x 77 lbs. (152.4 mm x 34 kg) I-Beam "C" BRACES. Lower sections of mast pin to both the base section and the upper section.

**1001:5 - UPPER SECTION**

18 in. x 106 lbs. (475 mm x 48 kg) I-Beam Main Legs, with 6 in. x 77 lbs. (152.4 mm x 34 kg) I-Beam "C" BRACES. Upper section of mast pins to the lower sections and has crown permanently installed on the top with guide line clevis points.

**1002:1 - CROWN BLOCK**

Crown block having one (1) 60" diameter fabricated steel fast-line sheave and seven (7) 60" diameters fabricated steel working sheaves. All sheaves are mounted on tapered roller bearings with grease points for easy service and long life.

**1003:1 - RACKING BOARD**

The derrick includes an all welded racking board.

The racking board deploys with hydraulic cylinders after the derrick is raised. Racking board is raised and lowered from operator's console. Racking board can accommodate a minimum of 379 stands of 5"/5-1/2" triples. Board is complete with locks at each finger end, safety chains, air winch, OSHA guard rails, and space for drill collars.

Racking board winch is Ingersoll Rand 3CPD4 pneumatic winch rated at 1000 lb.
1003:2- CASING STABBING BOARD

AFM's mast mounted casing stabbing board features a folding handrail equipped platform, compact control console, and hydraulic check valves in case of hose rupture. This system moves both in the horizontal and vertical positions to allow the stabber to locate a safe and efficient work area.

1003:3- INERTIA ESCAPE DEVICE

INERTIA ESCAPE DEVICE, 3 PCS, AFM PART #S100059

1003:4- TUGGER UNITS

THREE (3) TUGGER PEDESTALS FOR SUPPORTING TUGGERS

1003:4- TUGGER SHEAVE UNITS

14" BRONZE BUS(ED S(EAVESGROOVED FOR 5/8 WIRELINE.TUGGER SHEAVES MOUNTED UNDER THE CROWN FRAME. LOCATION TO BE SPECIFIED AT TIME OF ORDER. S(EAVE UN)T W)T( 20" SHEAVES MOUNTED ON TAPERED ROLLER BEARINGS AND GROOVED FOR 9/16 WIRELINE. CORELINE UNIT IS A SWIVEL MOUNTED BELOW THE CROWN FRAME. CATLINE UNIT WITH 14" S(EAVES MOUNTED ON TAPERED ROLLER BEARINGS AND GROOVED FOR 5/8 WIRELINE. CATLINE UNIT IS A SWIVEL MOUNTED AS A SWIVEL UNIT.

FOR WIRELINE OPERATIONS THERE WILL BE A SHEAVE AND PAD EYE (55000LBS )ST RIG FLOOR LEVEL, ONE SHEAVE AND PADEYE (55000LBS) BELOW THE MONKEYBOARD (DRILLERS SIDE) FOUR (4) TONG POSTS COUNTER WEIGHTS, INCLUDES BUCKETS, GUIDELINES AND POSTS. TWO (2) TONG BACK UP POSTS BOLTED TO FLOOR10" VENT LINE WITH PILOT LINE TO EXTEND 8 ABOVE T(E CROWN
1003:3 – MAN RIDER WINCH TWO

ULTRA-RIDER COMPLETE PACKAGE (FLOOR) INCLUDES:
(2-McKISSICK MANRIDER BLOCKS, 2-PADEYES, 2-HANDHELD)
THE ULTRA-RIDER PERSONNEL HOISTING DEVICE COMES COMPLETE WITH: XA301P TRACTEL OILPATCH HOIST, 400' OF 32X7 TEUFELBERGER WIRE ROPE, CROSBY 1.5 TON AS-7 SWIVELS, MOUNTING STAND, PINCH GUARD CAGE, MACHINED COUNTERWEIGHT FOR RAISING AND LOWERING WITH SAFETY LANYARD, HETRONIC RADIO REMOTE CONTROL, DRILL TEMPLATES, TROUBLE SHOOTING MANUALS, PROOF TESTCERTIFICATIONS

1004:4 - DEADLINE ANCHOR

Deadline anchor is designed and manufactured in accordance with API specifications and rated for a 550,000-lbs. maximum deadline load. Anchor is fully equipped with line clamp and compression type load cell weight indicator. Anchor is located on non-operators side of substructure floor.

1004:5 - SUBSTRUCTURE SYSTEM DESCRIPTION

The substructure is an offshore system, and is manufactured from heavy I-beam. The unit is designed for permanent installation on the barge, but can be disassembled for service.

The substructure includes: v-door, stairs to pipe racks and rig floor, drip pan for catching fluids, and BOP trolley system.

The substructure is manufactured in accordance with all applicable API specifications and criteria.

Substructure is designed to accommodate supplied rotary table.

1004:6 - SUBSTRUCTURE SPECIFICATIONS

Substructure Height 45 ft
Space under Rotary Beams 40 ft
Setback Capacity 2,500,000 lbs. (808.33 mt)
Working Floor Size 1600 ft² (111.5 m²)
1004:7 - SUBSTRUCTURE ADDITIONAL EQUIPMENT

This is the rebuild of the existing substructure all of the following is new (3) Stair cases with handrails from rig floor to ground. Cases include 3 ft. x 3 ft. Offshoring midpoint on stair case on non-operators side of rig.

Full OSHA guardrails with toe kicks around work floor are standard equipment.

(1) BOP Trolley system air operated for installation of BOP stack and removal from front of sub. Includes: rails, trolley, and chain falls

(1) Rat Whole Opening 30"

(1) Mouse Whole Opening 30"

Wood Planks for Setback Area

(1) Removable Snubbing Post located near V-door.

(1) Removable V-door/ V-door are 6 ft. wide. Connected to Cat walk hydraulically and four swing out pipe arms controlled hydraulically with screw jacks on end of extensions for stability.

(4) Four "A" style Pipe racks included which are 30 feet long

1005:1 – MAN RIDER WINCH and CRADLE LIFTS

Ingersoll-Rand Model LS2-150 pneumatic man rider winch complete with all safety accessories. Two cradle lifts for personnel hoisting ONLY are included.

1007:1 – EZY TORQUE SYSTEM

Ezy-Torque™ Hydraulic Cathead

The Ezy-Torque Hydraulic Cathead provides smooth, constantly increasing make-up loads ranging from 40,000 to 150,000 ft.-lbs of torque, utilizing either an independent power source or a rig source. This smooth application of line pull force to the rig tongs ensures proper make-up of large, rotary shouldered connections. When the Ezy-Torque Hydraulic Cathead is to be used on connections that require less than 40,000 ft.-lbs of torque, the unit should be used in conjunction with a calibrated load cell. The Ezy-Torque Hydraulic Cathead is available in two systems: The Ezy-Torque Model E Type I consists of a cylinder assembly and a self-contained hydraulic power supply that can be temporarily or permanently installed on the drilling rig, preferably on the rig floor. The Ezy-Torque Model
D Type II consists of a cylinder assembly, auxiliary hydraulic control unit, remote control module (and hoses) for the control unit and remote control module. The auxiliary control unit plumbs (conversion fittings are not supplied) into an existing rig hydraulic supply such as the accumulator portion of the blow out preventer system.

Model E Type I Features and Benefits

- Remote control module enables pressure regulation and cylinder operation from a convenient location on the rig
- Hydraulic operation of the remote control module eliminates electrical hazards
- Provides a simple hydraulic circuit for trouble-free performance
- A positive displacement tandem pump provides efficient, steady hydraulic energy
- The cylinder assembly produces the high line pulls necessary to develop make-up torques to 150,000 ft.-lbs (203, 400 N•m). It is a key component to both the Model D and Model E Systems. The cylinder assembly includes wireline for connection to the rig tongs.
- Do not exceed the torque rating of the rig tongs.

### Cylinder Assembly

<table>
<thead>
<tr>
<th>Min. Flow Rate</th>
<th>4 gpm</th>
<th>18.9 lpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Flow Rate</td>
<td>35 gpm</td>
<td>132.5 lpm</td>
</tr>
<tr>
<td>Max. Test Pressure</td>
<td>3,000 psi</td>
<td>20.68 MPa</td>
</tr>
<tr>
<td>Max. Working Pressure</td>
<td>2,500 psi</td>
<td>17.2 MPa</td>
</tr>
<tr>
<td>Stroke Length</td>
<td>22.5 in.</td>
<td>571.5 mm</td>
</tr>
<tr>
<td>Line Pull</td>
<td>32,900 lbs.</td>
<td>146,000 N</td>
</tr>
<tr>
<td>Torque Range</td>
<td>40,000 - 150,000 ft.-lbs</td>
<td>54,240 - 203,400 N•m</td>
</tr>
</tbody>
</table>

### Power Data

<table>
<thead>
<tr>
<th>Motor, Three-phase</th>
<th>10 hp - 1,750 rpm</th>
<th>7 1/2 hp - 1,450 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (Hz)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Amps (Approx.) 230V</td>
<td>25.4</td>
<td>n/a</td>
</tr>
<tr>
<td>Amps (Approx.) 460V</td>
<td>12.7</td>
<td>n/a</td>
</tr>
<tr>
<td>Amps (Approx.) 220V</td>
<td>n/a</td>
<td>23.4</td>
</tr>
<tr>
<td>Amps (Approx.) 380V</td>
<td>n/a</td>
<td>11.7</td>
</tr>
<tr>
<td>Cylinder Time Power Stroke (Seconds)</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Cylinder Time Return Stroke (Seconds)</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

### Electrical:

- Ezy-Torque Model E Type I
- Cycles of power source: 50 Hz or 60 Hz
- Voltage the motor should be wired for. The following are available: 60 Hz – 230V or 460V and 50 Hz – 220V or 380V. Other voltages are available upon special order.
1008:1 - AUXILIARY WINCHES

Two (2) each pneumatic hoists mounted on the rig deck. Hoist capacity is 25,000 lbs. (6.8 MT) and comes with pneumatic controls, internal braking system, and 350 (76 m) of 9-1/16" In. wire line. Recommended mounted behind the mast with sheaves in the crown. Braden winch model BA3A.

1009:1 – AFM AUTOMATED PIPE HANDLING SYSTEM

The **4500 Series Electric Catwalk** is built with safety designs. Based on the original 2200 model, this catwalk machine reaches rig floor heights over 25 feet. This Catwalk improves the transfer of tubulars from the horizontal position to the rig floor via a v-trough while removing (as much as possible) human intervention in the process. This v-trough utilizes a robust system that when energized moves the trough to the rig floor near the well center. Due to the unique design of each drilling rig, measurements from the well center to the mouse hole and from the well center to the edge of the v-door are required to provide the optimal stopping point for the v-trough. Once the v-trough reaches the optimal stopping point, a skate is activated to transfer the tubular to the appropriate position. After latching the elevators, the tubular is hoisted by the drawworks and can be pushed by the skate until the tubular is clear of the v-trough. The v-trough is returned to the catwalk base and the cycle begins again.

When laying down tubulars, the cycle is reversed where the pin in of the tubular is placed on the v-trough and lowered by the drawworks. Once it is fully lowered. The elevators are released and the v-trough is returned to the base. Once there, the *kickers* eject the tubular out of the trough (left or right depending on the area of laydown) and then the trough is cycled back to the rig floor to repeat the process.

*Gull Wings* aid the process of loading and unloading the tubulars to the v-trough. *Gull Wings* are hydraulically activated pipe racks that allow tubulars to be loaded onto them and tilted toward the Catwalk. Once tilted, the *indexers* load one tubular at a time into the v-trough. A series of pins are adjusted on the catwalk that allows only one tubular to be loaded at a time.

During the laydown process of tubulars, the gull wings are tilted away from the catwalk via hydraulic cylinders and then as the tubulars are ejected out of the v-trough, the tubulars roll away from the catwalk toward the end of the gull wings.

During the running of casing, a set of casing *indexers* are utilized, typically on the opposite side of the gull wings, which allow casing to be picked up from existing pipe racks. These *indexers* will extend to as low as 18 inches and will pick up tubulars up to 20 inch and load it into the v-trough on standard models.
Note: A special Skate Shovel is included with each Catwalk to allow tubulars that do not have a sufficient angle to slide on the Catwalk Trough to be pulled back away from the well center during the laydown process.

**1011:1 – Cameron Torq-system**

Fully Automated Floor Wrench set the standard for performance and reliability. The combination of the articulated arm, PLC control and a remote control function provides the optimum in personnel safety and operational efficiency while simultaneously enhancing drill pipe life.

<table>
<thead>
<tr>
<th>Automated Floor Wrench</th>
<th>Cameron 120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Range</td>
<td>2 7/8” to 11 1/2”</td>
</tr>
<tr>
<td>Torque Make Up</td>
<td>100,000 ft. lbs</td>
</tr>
<tr>
<td>Torque Break out</td>
<td>120,000 ft. lbs</td>
</tr>
<tr>
<td>Delivery</td>
<td>16</td>
</tr>
<tr>
<td>Vertical Travel</td>
<td>6</td>
</tr>
<tr>
<td>Rotation (Auto Hydraulic)</td>
<td>15 seconds (joint dependent)</td>
</tr>
<tr>
<td>(Spin In and Make-Up)</td>
<td></td>
</tr>
<tr>
<td>Specification</td>
<td>Details</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Spinner OD Capacity</td>
<td>2 7/8” to 11 1/2”</td>
</tr>
<tr>
<td>Spinner Torque</td>
<td>5,500 ft. lbs.</td>
</tr>
<tr>
<td>Roller Speed</td>
<td>100 rpm</td>
</tr>
<tr>
<td>Max. Hydraulic Pressure</td>
<td>2000 Nominal 5000 Peak</td>
</tr>
<tr>
<td>Drillers Console Control</td>
<td>Yes</td>
</tr>
<tr>
<td>Wireless Remote Control</td>
<td>Optional</td>
</tr>
<tr>
<td>Horizontal Dimension</td>
<td>52” retracted</td>
</tr>
<tr>
<td>Hole to Base (center to center)</td>
<td>15 extended</td>
</tr>
<tr>
<td>Envelope dimensions</td>
<td>73” L x 68” W x 126” H</td>
</tr>
</tbody>
</table>

**SECTION 1000 – Top Drive Canrig 1275AC 681**

**1000:01 Top Drive Model 1275AC-681**

**SPECIFICATIONS**

- **Static Hoist Rating**
  - Elevator Load Path: 750 Tons / 680 Tonnes
  - Quill Load Path: 750 Tons / 680 Tonnes

- **Electric Motor**: GE B20 AC

- **Output Power**: Continuous
  - 1 150 HP / 860 KW
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear Ratio</td>
<td>6.808:1</td>
</tr>
<tr>
<td>Continuous Torque Rating</td>
<td>51,400 ft-lb (69,700 Nm) @ 120 RPM</td>
</tr>
<tr>
<td>Maximum Speed Rating</td>
<td>23,500 ft-lb (24,900 Nm) @ 265 RPM</td>
</tr>
<tr>
<td>Brake Capacity</td>
<td>50,000 ft-lb</td>
</tr>
<tr>
<td>Maximum Electric Motor Torque</td>
<td>71,000 ft-lb</td>
</tr>
<tr>
<td>(Make-Up Limit is operator adjustable.)</td>
<td></td>
</tr>
<tr>
<td>Torque Boost Torque</td>
<td></td>
</tr>
<tr>
<td>Make-Up</td>
<td>24,000 ft-lb</td>
</tr>
<tr>
<td></td>
<td>32,500 Nm</td>
</tr>
<tr>
<td>Break Out</td>
<td>37,500 ft-lb</td>
</tr>
<tr>
<td></td>
<td>50,800 Nm</td>
</tr>
<tr>
<td>Maximum Connection B/O Torque</td>
<td>95,000 ft-lb</td>
</tr>
<tr>
<td>(Make-Up Limit is operator adjustable.)</td>
<td></td>
</tr>
<tr>
<td>Pipe Handler Orientation</td>
<td>Unlimited, remote controlled</td>
</tr>
<tr>
<td>Pipe Handler Lock</td>
<td>418 positions, remote controlled</td>
</tr>
<tr>
<td>Back-up Wrench Gripper Diameter Range</td>
<td>5.75 to 9.0 inches</td>
</tr>
<tr>
<td>Back-Up Wrench Maximum Travel</td>
<td>43.25 inches</td>
</tr>
<tr>
<td>Quill Connection</td>
<td>7-5/8 Reg.</td>
</tr>
<tr>
<td>Water Course Diameter</td>
<td>3.0 inches</td>
</tr>
<tr>
<td>Circulating Pressure Rating - Standard</td>
<td>5000 PSI</td>
</tr>
<tr>
<td></td>
<td>34,500 KPa</td>
</tr>
<tr>
<td>Circulating Pressure Rating - Optional</td>
<td>7,500 PSI</td>
</tr>
<tr>
<td></td>
<td>51,700 KPa</td>
</tr>
<tr>
<td>Floating Quill Travel</td>
<td>8.0 inches</td>
</tr>
<tr>
<td></td>
<td>20 cm</td>
</tr>
<tr>
<td>Link Counterbalance Travel</td>
<td>8.0 inches</td>
</tr>
<tr>
<td></td>
<td>20 cm</td>
</tr>
<tr>
<td>Cooling System</td>
<td>STANDARD: Local Blower (11 KW, 80 m3/min)flow</td>
</tr>
<tr>
<td></td>
<td>15 HP, 2,800 scfm flow</td>
</tr>
<tr>
<td>Lubrication System</td>
<td>2 HP, 4 GPM flow</td>
</tr>
<tr>
<td></td>
<td>1.5 KW, 15 l/min flow</td>
</tr>
<tr>
<td>Hydraulic Requirement</td>
<td>12 GPM flow</td>
</tr>
<tr>
<td></td>
<td>45 l/min flow</td>
</tr>
<tr>
<td></td>
<td>2,350 PSI</td>
</tr>
<tr>
<td></td>
<td>16,200 KPa</td>
</tr>
<tr>
<td></td>
<td>Pressure compensated control</td>
</tr>
<tr>
<td></td>
<td>(see HPU Specifications)</td>
</tr>
<tr>
<td>Electrical Power</td>
<td>GE B20 AC Motor</td>
</tr>
</tbody>
</table>
**Max. Continuous armature current** | 1060 Amps  
**Max. Intermittent armature current** | 1470 Amps  
**Max. armature voltage** | 575 VAC  
**Field Supply** | 0 - 140 Hz  
**Weight (without blocks)** | 30 000 lb  

**SECTION 1400 - DRAWWORKS AND ACCESSORIES**

**1400:1 – DRAWWORKS RATED 4500 HP**

**Drawworks, Model AFM 1500k**
Direct Gear Drive, for use with three (3) OEM™ AC Motors.

**HOISTING CAPACITY:** 2,000,000 lbs. on 12, **2.0” dia.** Drilling Lines

**POWER:** Three (3) each OEM™ TT1500 AC Vector Motors; Continuous rating of each motor is 1,500 HP and intermittent rating for drawworks duty is 4,450 HP. Supply voltage: 575 VAC, 3 phase, 40 Hz base speed, 6 pole, max speed of
2300 rpm. Includes 20 HP, 460 V, 60 Hz, 3 Ph, 40 °C ambient electric blower motor

**MAIN DRUM:** Bare tube is 30" dia. x 56-1/4" long; Lebus shell provides grooving for 2.0" dia. wireline. The drill line clamp is located in the off-driller's side drum flange. Rubber turn-back rollers are provided on each drum cover.

**BRAKING SYSTEM:** This drawworks is designed to raise, lower and hold the hook load with the three electric drive motors. The motors provide sufficient torque capacity to control rated loads at rated speeds without overheating during normal pipe and casing handling operations. Friction disc brakes are supplied for emergency stopping should the motor power fail. The emergency brakes should not be used to stop or hold the load in normal operation.

The disc brake system consists of two (2) heavy duty solid discs manufactured from abrasion resistant steel, securely attached to its hoisting drum flange with high strength steel bolts, and four (4) spring applied, air released brake calipers with two (2) calipers on each disc.

Air pressure of 105 psi is sufficient to completely release the calipers. Two calipers will hold the maximum rated load capability of the drawworks. This provides a safety factor of 2 for the disc braking system. This safety factor is in line with the requirements of internationally known certification authorities.

Operating levers connect the actuator to the brake shoes. This separates the actuator from the heat of the disc and brake shoes. An adjustable clevis on the actuator adjusts the clearance between the disc and the brake shoes. Proper adjustment compensates for brake shoe wear and maintains the capability of the caliper.

The shoes are guided by sliding surfaces to ensure they do not drag when released. Centering bolts are used to equalize or shift the air gap. When set, the shoes freely float on guide pins to ensure equal lining wear.

The actuators and the levers are connected via a toggle link which compensates for reduced spring forces.

**MAIN DYNAMIC BRAKING** is accomplished by the AC Motors through dynamic braking resistors powered through the AC Drive System (supplied by others).

**EMERGENCY BRAKING** is provided by caliper type disc brakes operating on two (2) air cooled discs. The brake discs are mounted on each end of the main drum. Four (4) caliper disc brakes are provided for emergency stopping, parking and holding of a suspended load. The calipers are spring applied and
air released. The brake discs are air cooled and are not satisfactory for continuous dynamic duty.

When proper control is furnished by others, the brakes may be used as a crown and floor saver for emergency stopping during the hoisting and lowering operations.

1400:1 – HYDRAULIC DRILL LINE SPOOLER SYSTEM

**Tulsa Power Model TUAF-30-DLS Electric/Hydraulic X-Proof Powered Drill Line Spooler**

**Capacity:**
- **Material:** 2.0" Diameter Wire Rope
- **Material Length:** 7,500 ft.
- **Drive:** Electric/Hydraulic

**Includes:**
- **Construction:** Heavy-duty oil field steel I-beam base and tubing frame and uprights.
- **Frame:** Includes 4 point lifting eyes and forklift pockets.
- **Shaft:** Includes heavy-duty drive arm with solid shaft.
- **Bearings:** Oil impregnated bronze bearing material shaft supports with grease nipples and grease paths.

- **Hydraulic Powerpac** – An explosion proof motor and enclosure with on-board closed loop hydraulic system. Controls include start/stop switch and indicator light. Pump, 30 gallon reservoir, hydraulic filter and pressure gauge included. Standard power requirement is 460V/60HZ/3ph (Other voltages available at customer request). **Control:** Dual directional modulating hand valve with pressure gauge provides speed and direction control. Controls include SS labels.
- **Brakes:** Hydraulic operated brake with caliper and brake pads to provide hold back tension. This will provide safety and ease of operation for the rig hands that are reeling in drill line slack. Regulator provided.
- **Guards:** Guards to protect drive components and controls.
- **Paint:** Shot blast, primer, and two coat epoxy.
- **Components:** All components are American Branded. No substitutes.
- **Operating Manuals** - Two (2) sets of Installation, Operating and Maintenance Manuals shipped with each system (Additional copies available upon request).

**Operators Control Area:**
Operator's control panel includes the following controls:
- Counter-clockwise / clockwise spooling control lever.

**1501:1 – CCTV SYSTEM**

CCTV system complete with the following: Six (6) explosion-proof cameras with pan/tilt/zoom features, 15” explosion-proof monitor located at operator's console, and wiring and explosion-proof connectors for installation. – Camera locations: Driller's Console / Rig Floor / Mud Tanks - Solids Control area / Mud Pumps / BOPs under Sub

**1600:1 – 37.5” ROTARY TABLE**

AMERICAN BLOCK, 37.5” ROTARY TABLE (OR EQUIVALENT) FEATURES:

**Rectangular Housing and Cover**

Housing and cover are both rectangular. This makes it easier to position rig flooring whether the rotary top is flush with the floor or higher.

**Unitized Gear Table Assembly**

The table bearing is utilized with the gear table and gear. Thus, highly accurate bearing adjustment can be made before the assembly is installed in the housing. The gear and table assembly is balanced and mounted on a double-row ball thrust bearing. Design of this bearing assures that upper and lower ball tracks are exactly parallel and concentric.

**Cartridge-type pinion shaft assembly**

The pinion shaft and pinion bearings are enclosed in a cylindrical cartridge which inserts in to the main housing. The pinion is shrunk on the inner end of the pinion shaft. The shaft has a tapered extension at the outer end to accept a sprocket for chain drive or a coupling hub for shaft drive.

**Selective Direct Table Locks**
Two independently operated ratcheting lock pawls are arranged to engage slots in the rim of the table assembly. Via the lock pawls, the gear table can be locked in a single direction or both directions. Lock pawls are grease-lubricated.

**Oil-lubricated Pinion, Gear and Bearing**

Pinion and gear, pinion shaft bearings and gear table bearings are all cascade-lubricated from a large, central oil reservoir. Oil is added and the oil level checked at one easily accessible location.

**Effective Mud and Oil Sealing**

At the top of the gear table enclosure, a double tongue-and-groove labyrinth between gear and housing helps prevent loss of oil and entrance of mud. At the bottom of the gear table, a lip stops oil loss and a slinger helps prevent mud entrance. In the pinion shaft housing, a dual seal effectively keeps oil in and mud out.

**Includes:**
- Soft torque device.
- One (1) MPCH master bushing.
- One (1) No 1 insert bowl for 12.0 to 13-3/8 tubulars.
- One (1) No 2 insert bowl for 9-5/8 to 10-3/4 tubulars.
- One (1) No 3 insert bowl for 2-3/8 to 7-5/8 tubulars.
- One (1) casing bushing for 37-1/2 rotary table, for 18-5/8 to 22 casings.

**1700:1 – INDEPENDENT ROTARY DRIVE**

Rotary Table is driven by a single Joliet® HTM1230 AC electric motor.

**1701:1 - TRAVELING BLOCK**

750-ton traveling block with sheaves grooved for 2" wire line complete with removable hook for top drive attachment. Traveling block is made in USA, National® or equivalent.

**1702:1 - SWIVEL**

750 ton capacity American Block 750 swivel or equivalent with 5-1/2" REG LH Box Down connections
SECTION 1800 – MUD PUMPS

2001 – TWO (2) GARDNER DENVER® PZ-2400 DRILLING MUD PUMP

THE PZ-2400 OFFSHORE DRILLING PUMP

Compared to competitors, the new Gardner Denver PZ-2400 offshore drilling pump has a footprint that’s 20% smaller, allowing it to fit into a compact 1600 HP pump space. Built using Gardner Denver’s proven design and quality materials, it delivers more performance power in less space.

- Saves on rig space
- Rugged cast frame
- Saves on auxiliary equipment

The new PZ-2400 marks a new era in offshore pump package design and flexibility. It’s 30% lighter than the nearest competitor, maximizing horsepower to weight ratio and providing greater deck load savings. Lightweight but tough, the PZ-2400 incorporates the reliability of the PZ pump family into a compact footprint and allows rig designers more flexibility in component placement.

- Less deck load
- Maximize power density
- More versatile application

SUPERCHARGING MCM® 200 PUMP

1. -2 EACH MCM® 200 6"X8"X1-7/8" SUPERCARGING PUMP
MOUNTED ON AN OILFIELD BASE WITH COUPLING

OSHA COUPLING GUARD

ONE (1) 100 HP, 1800 RPM, 480 VOLT, 3-PHASE, 60
HZ AC MOTOR

2003 – PUMP UNITIZATION
2003:1 – PUMP UNITIZATION DESCRIPTION

2. -2 EACH PUMP UNITIZATION COMPLETE WITH:

STRUCTURAL STEEL THREE-RUNNER SKID

TWO (2) V-BELT DRIVES WITH BELTS AND 8V
SHEAVES

STRUCTURAL STEEL MOTOR SUBBASE
WITH TWO (2) ADJUSTABLE MOTOR BASE PLATES

2003:2 – ELECTRIC MOTOR DRIVE ARRANGEMENT

3. -2 EACH ELECTRIC MOTOR DRIVE
ARRANGEMENT
WITH TWO (2) Joliet® HTM1230 SERIES WOUND
TRACTION MOTORS.

EACH MOTOR TO INCLUDE:
ONE (1) 7.5 HP BLOWER WITH LOCKOUT SWITCH
AND JUNCTION BOX

2004 – PULSATION DAMPNER

4. -2 EACH PULSATION DAMPNER

15,000 PSI MAXIMUM SERVICE PRESSURE
20-GALLONS SURGE CAPACITY
4” AP) 5,000 RING JOINT CONNECTION

2005 – OTECO-TYPE SHEAR RESET RELIEF VALVE

5. 1 EACH RELIEF VALVE, OTECO-TYPE, SHEAR RESET,
2000-10000 PSI WITH THREADED CONNECTIONS.
**2006 – PRESSURE GAUGE**

6. 4 EACH PRESSURE GAUGE, 0-10000 psi RANGE W/T( 2" LINE PIPE FEMALE CONNECTION

**2007 – DISCHARGE STRAINER BLOCK ASSEMBLY**

7. 1 EACH DISCHARGE STRAINER BLOCK ASSEMBLY COMPLETE WITH SUPPORT 4" AP) 7500 lb. FLANGED TOP TWO (2) 5" AP) 10000 lb. STUDED OUTLETS ONE (1) 5" AP) 10000 lb. BLIND FLANGE

**2008 – STANDPIPE ASSEMBLY**

1 EACH 5-1/2" x 10,000 psi - pipe material double wall 5-1/2" cor-valch4 heavy duty pipe seamless 5" x 10,000 psi - pipe material double wall 5" cor-valch4 heavy duty pipe, seamless

Additional equipment includes:

8. One (1) 5-1/2" x 10,000 PSI inlet line from mud pump

9. One (1) 5-1/2" x 10,000 PSI gate valve from mud pump to stand pipe

10. Two (2) 5" x 10,000 PSI c/w union hammer Fig.1502 discharge line to kill line & floor circulating line

11. Two (2) 5" x 10,000 PSI c/w unions hammer Fig.1502 for pressure gauge 0-10,000 reading and sensor port

12. TWO (2) single 5" x 10,000 stand pipe, c/w 160 deg 5" goose neck, lower section at bottom manifold connection to 5" Fig.1003 and goose neck connections. fig. 1002 male

<table>
<thead>
<tr>
<th>Item #</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>5&quot; 7500 psi WP MUD VALVE</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>2&quot; FIG 1502 PRESSURE SENSOR</td>
</tr>
</tbody>
</table>
CEMENTING STANDPIPE

1 each x 2" (igh Pressure Cementing Line from Rig Floor to gooseneck at approximately 100 ft. in mast. Complete with 2" Coflexip hose (w/ WECO 1502 hammer union) from mast back to rig floor area. Complete with manifold valving for isolation and clean out of line.

SECTION 1803 – MODULAR MUD SYSTEM

1803 - CUSTOM BUILT MUD SYSTEM

This quotation describes the minimum requirements for the Re fabrication of one 2500 bbl mud system including equipment, paint, electrical and assembly.

1803:1 MUD TANK BBL CAPACITIES

1. Active volume: 1500 bbl (3 modules)
2. Active/Reserve volume: 500 bbl (1 module)
3. Reserve volume: 500 bbl (1 modules)
4. Water Tank: 300 bbl (1 module)
5. Integrated trip tank: 150 bbl
6. Solids control trough with auger system and 160 bbl slug pit
7. 125 bbl chemical/mud pill mixing tank

1803:2 SOLIDS CONTROL

Semi-permanent mud modules will be built to support additional structures above tanks. All tanks are fully grated and outfitted with agitators, centrifugal pumps, and OSHA approved guard rails. Each tank will have one mounted staircase and shaker tank will come with a mud trough to transport mud to desilt, desand, and carryover to
suction tank; terminating at slug pit. Shaker tank will have manual overflow to each compartment, and backside of tank system will come with a 10" BFV cleanouts. All tanks have 10" BFV as equalizer valve between all pits, and BFV to have a handle w/ extension to enable open / close operations from top of mud tank area.

EQUIPMENT SUPPLIED WILL BE:

- Four (4) Derrick® DP600 dual-panel, high "g" shaker, linear motion
- Four (4) MCM® 6x8x14 100hp over/under centrifuge pumps, sheaved for 1150 rpm
- One (1) Vertical mounted vacuum degasser, 1250 gpm capacity
- One (1) Derrick® DE-1000 FHD Centrifuge
- One (1) Derrick 1000 gpm, two (2) cone x 12" dia. Desander
- One (1) Derrick 1250 gpm, twelve (12) cone x 4” dia. Desilter
- Three (3) high shear, low pressure mud hopper c/w Venturi, funnel, nozzle, and 6” outlet
- Three (3) 10hp low profile agitators c/w shafts and impellors
- Three (3) Mud guns c/w 3” hose
- One (1) 48” diameter "Poor Boy" degasser ASME certified and tested to 200 psi WP, c/w 8” 150# RF flange inlet and 12" 150# flange outlet, 1200 gpm capacity
- Electrical runs, trays, clips, receptacle mounts, and plug mounts included on tanks as necessary per below information
- Two (2) 20hp CI, DII submersible cellar pump

1803:3 POWER SPECIFICATIONS

- All motors shall be terminated for 480 VACS
- All feeder cables for control house shall be terminated to respective device and 100 cable measured from suction porch less plug
- All lighting shall be terminated for 220-240 VACS 1 ph
- All lighting is based on 30 amp feeder from control house
- All lights shall have pigtail with 20 amp plug and receptacle for ease of rig down and/or repair
- All skids shall include Yz” stud at each corner for grounding skid to skid and control house
**1807:1 - TONG CIRCUIT**

Rig hydraulic system provides a 2500 PSI / 40 GPM tong circuit as this is the maximum recommended for the selected equipment.

The system includes:
- Quick-Connectors w/dust covers
- Pressure & Return Lines
- Pressure Gauge
- Directional Flow Valve
- Pressure Regulator Valve

NOTE: Tongs are not included as standard equipment.

**SECTION 1900 – POWER UTILITY HOUSE**

**1900:1 - Prime Mover Drive**

One (1) Offshore rig 8 VFD PCR. In general, this proposal includes the following equipment:

- 50ft L x 12ft H x 10ft W VFD house (dimensions approximate)
- 1x 1250kVA 600:480V transformers (VFD duty)
- 112.5kVA 600:220/127V lighting transformer
- 5x Generator control cubicle
• 1x Synchronization cubicle
• MCC sections
• PLC section with touch screen
• 15 ton HVAC system
• Lighting panel
• Plug panel
• 480V Feeder/Main-tie-main cubicles
• 600V Feeders
• 3x 1230A continuous mud pump VFD cubicles (for use with VFD rated AC motors)
• 3x 1558A continuous drawworks VFD cubicle (for use with VFD rated AC motor)
• 1x 1150A continuous top drive VFD cubicle (for use with VFD rated AC motor)
• 1x 1448A continuous rotary table VFD cubicle (for use with VFD rated AC motors)
• Driller’s cabin
• Resistor bank skid
• 1x 900kW resistor bank

The items listed above will be designed to work with the following customer supplied mechanical equipment:

• Two 2400HP mud pumps, each powered by TWO 1230hp, 575V motors
• One 4500HP drawworks, powered by two (3) 1558hp, 575V motor
• One 1150HP rotary table, powered by one (1) 1150hp, 575V motor
• One 1150HP Top Drive, powered by one (1) 1150hp, 575V motor
• 5 Caterpillar® 3516, 1850HP, 2500 KVA engine generator sets

**VFD House**

The VFD house exterior walls will be constructed of structural steel plates, and the supports will be made of 2” steel tubulars. Exterior will be sandblasted and painted based on customer specification (which has not yet been supplied).

The interior floor will include a sub-floor with removable coverings for access. All walls and the ceiling will be insulated. Cable trays will be provided.

Two doors with a minimum width of 3ft will be provided along with door hardware. Doors will be equipped with panic hardware for ease of exit during an emergency and will open toward the exterior (push to open).

Grounding pads will be included on the exterior of the building.

Fluorescent lighting will be provided inside and outside of the building, and 120Vac receptacles will be located inside the building.
A split HVAC system with two (2) HVACs with a capacity of 10 tons each will be supplied. They will be 440V, 60hz and will be wall mounted.

A plug panel for all power control and signal wiring to remote areas will be included. Plugs and receptacles will be provided along with bus stabs where needed. Additional plug panels and service panels may be required and will be agreed upon during approval stage.

A smoke and detection system and general alarm will be installed inside the PCR and provide visible and auditory indication in the event of an alarm.

**General Construction**

All cabinets are painted ANSI 61 grey and with hinged doors, latches, & handles. Each drive cabinet is 86 Yz"( x 31 Yz"W x 31 Yz"D. Main bussing will consist of 2 pieces of tinned copper bussing each being 3/8" x 8" and has a total rating of 5250A continuous.

All power cabling internal to the building will be made using Exane (or equivalent) type cable. Cable will be of the low smoke, zero halogen type. Communication wiring to be carried out through use of twisted shielded cables.

**Transformers**

One power transformers will be mounted on the exterior of the PCR house and located on a covered porch. The transformers will have the following specifications:

- 600/480Vac, 3p, 60hz
- 1750kVA
- Delta primary/wye secondary
- Dry type
- Type H insulation
- VFD duty
- Suitable for parallel operation

One (1) lighting distribution transformer is to be supplied with the following characteristics:

- 480/208-120Vac, 3p, 60hz
- 112.5kVA
- Continuous duty
- Delta primary/wye secondary
- Class H insulation
- Dry type

**MCCs**
AFM will provide and install 10 sections of MCC for distribution of 480V motor and feeder loads. Each section will include 1930A vertical bus and 1500A horizontal bus. Each bucket will include a solid state relay and be rated to interrupt a 47kA fault.

The MCC manufacturer will be agreed upon during approval stage. MCC sizing is based upon motor load data that must be submitted within 2 weeks of receipt of order in order to avoid delivery delays.

**Drilling Power System:**

- 5 ea. Generator Control Cubicles including all control components required by current applicable ABS offshore governing and controlling documents. The controls will interface with Customer Chosen Engine Generator manufacturer controller requirements.
- 1 ea. 5,000 amp, 600V plated copper thru-bus with bus tie links as required by offshore regulations.
- 9 ea. Siemens or Converteam, 6 pulse, liquid cooled, AC Inverter drives. (Sizes and capabilities below)
- 1 ea. Drive Liquid Cooling and recirculation system.
- 1 ea. 1000KVA 600/120-208V Lighting and Quarters power transformer, Copper Wound, ABS Marine Duty.
- 1 ea. 1923 KVA 600/480V Motor Control Console transformer, Copper Wound, ABS Marine Duty.
- 1 ea. 480V Distribution Switchboard.
- 20 ea. Vertical sections of Siemens TIASTAR Motor Control Center with up to 100 480V motor starters or MCC Feeders.
- 1ea. 150 plug distribution feeder plug panel with plug receptacles. (Size mix to be determined.)
- 1 ea. top lift "E House" built to ABS offshore standards for construction. (Includes Air Conditioning system, Dropped Ceiling, Interior lighting, Insulated walls, floor, and ceiling.)
- 1 ea. Conventional Driller Console constructed of 316 Stainless, Set up for purge system, complete with drill function throttles, console meters, status indicator lamps, and selections switches.

**Engine Generator Controls**

The engine generator controls use a Woodward controller for synchronizing, load sharing, monitoring, and protection. Each generator controller includes the following components and features:

- 2500AF, ABB E-3, Disconnecting breaker with under-voltage release trip, Micrologic Trip, electronic closing coil, and shunt trip unit
- Door mounted Woodward controller with diagnostic screen and keypad
- Basler or Marathon DVR2000E Voltage Regulator
- Current Transformers
- Potential Transformers
- Control Power Transformer and Power Supply
- Speed Raise/Lower Switches
- Voltage Raise/Lower Switches
- Breaker Trip Switch
- Idle / Run Switch
- Voltmeter
- Frequency Meter
- Generator running lamp
- Breaker open & closed lamps
- Reverse power, over-current, over-voltage, and over-speed protection

Each generator control cabinet is 86 Yz" x 24"W x 32"D

**Synchronizing Components**

1 synchronizing systems will be provided with the following components.
- Sync-check relay
- Synchroscope
- Sync lamps
- Generator select switch
- Bus potential transformer

The scheme for the generators will be set up for both manual and auto synchronizing.

**Drilling VFD Descriptions and Ratings**

Each VFD is supplied as a stand-alone drive with an incoming section, rectifier, DC link, and inverter. The rectifier modules, inverter (IGBT) modules, the controllers are Sinamics S120 or Converteam Delta 3000 series Drive components.

Each incoming section includes:
- Disconnect switches with under-voltage release trips
- Semiconductor fuses with blown-fuse switches
- Digital controller with parameter based operation
- Termination panel
- Door mounted HMI for setup, monitoring, and diagnostics
- Indication lamps
- Control components

Each rectifier includes:
- 9 pulse AC/DC rectifier bridge
- pre-charge circuit
- cooling fans
- DC link capacitors

The Drawworks and Rotary Inverters include:
- Inverter IGBT bridge
- Cooling fans
- DC link capacitors
- Chopper modules for dynamic braking
- Output sharing reactors

The VFDs have the following ratings & specifications.

<table>
<thead>
<tr>
<th></th>
<th>Drawworks</th>
<th>Rotary</th>
<th>Mud Pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor HP</td>
<td>4500</td>
<td>1150</td>
<td>2400</td>
</tr>
<tr>
<td>Motor Voltage</td>
<td>575/600</td>
<td>575/600</td>
<td>575/600</td>
</tr>
<tr>
<td>Motor Current Continuous</td>
<td>Up to 3500A total drive</td>
<td>Name Plate &lt; 810A</td>
<td>Up to 2500A total drive</td>
</tr>
<tr>
<td>Overload Rating</td>
<td>110% 60s, 150% 10s</td>
<td>110% 60s, 150% 10s</td>
<td>110% 60s, 150% 10s</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>600V</td>
<td>600V</td>
<td>600V</td>
</tr>
<tr>
<td>Supply Frequency</td>
<td>60Hz</td>
<td>60Hz</td>
<td>60Hz</td>
</tr>
<tr>
<td>Cooling</td>
<td>Water</td>
<td>Water</td>
<td>Water</td>
</tr>
<tr>
<td>Preliminary Dimensions</td>
<td>88&quot;W x 32&quot;D x 90&quot;H</td>
<td>64&quot;W x 32&quot;D x 90&quot;H</td>
<td>100&quot;W x 32&quot;D x 90&quot;H</td>
</tr>
</tbody>
</table>

**Braking Resistors**
Dynamic braking resistors and chopper modules will be provided for the Drawworks, Top Drive, and Rotary table. The resistors are stainless steel, grid style resistors, housed in stainless steel enclosures. The resistors will be mounted on the electrical building porch along with the transformers and air conditioners. The chopper modules will be built into the VFD enclosures. The braking resistor values need to be verified with the supplier of the Drawworks, top drive, and rotary table. This quotation is based on the following typical values for a rig of this size.

<table>
<thead>
<tr>
<th>Application</th>
<th>Resistor Continuous Power</th>
<th>Resistor Instantaneous Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawworks</td>
<td>3461kW</td>
<td>3846 kW</td>
</tr>
<tr>
<td>Rotary Table</td>
<td>35kW</td>
<td>120kW</td>
</tr>
</tbody>
</table>

**Cooling System for VFDs**
2 drive cooling systems will be supplied featuring a redundant circulating pump arrangement which allows continuation of operation even with the loss of 1 pump. Each drive cabinet will be part of a closed loop system with one primary pump, a standby pump, make-up water tanks, strainers, cold temperature bypass (TEV), check valves, disconnects, and water-to-water heat exchangers. Stainless steel piping and hoses will be used to interconnect cooling components and for connecting the drive modules. Quick disconnect
fittings and hoses will connect the modules to the manifolds. The cooling medium is 50% tap water and 50% ethylene glycol.

**600V Switchboard**
The 600V Switchboard will be consist of Generator Controls and Incomer breakers, 600V feeders to drives, and feeders for 600V primary fed transformers (600/480V and 600/120-208V). It will be manufactured with plated copper thru-bus rated at 5000A continuous at 50 deg C., and braced to 85KAIC as a minimum. All cabinets and components will be constructed in accordance with the current ABS rules for class, and will be inspected and witness tested by ABS Surveyors.

**Ground Fault Monitoring**
The rig is intended to be an ungrounded power system. Two ground fault monitoring systems will be included in the stationary building. The ground fault systems will have three lights to indicate the presence of a ground fault on the system and identify which phase is grounded. 1 system will be fitted to the 600V Switchboard and 1 system will be fitted to the 480V Switchboard.

**480V Switchboard**
The 480V Switchboard will consist of Feeders for the 480V loads. The Switchboard will be constructed in accordance with the current ABS rules for class, and will be inspected and witness tested by ABS Surveyors.

The Switchboard will be manufactured with copper thru-bus rated at 1800A continuous at 50 deg C., and braced to 42KAIC as a minimum.

**Motor Control Centers:**
The Motor Control Center consists of 20 vertical sections Siemens TIASTAR MCC. The horizontal bus will be plated copper rated at 1800A with the vertical sections rated at 600A ea. The MCC will be braced at 42KAIC as a minimum. (The Starter and Breaker configuration will be determined from the Customer provided load list.)

**TRANSFORMERS:**
The Transformers (480V and 120-208V) Will Marine duty copper wound and will be constructed in accordance with current requirements for ABS class rules.

1- **Operator Console:**

American Fabrication and Machine proposes to supply Drilling Control Console equipped with the necessary hardware and software to control the Drilling Tools. The Control Console will be connected to the Central processing unit which will intern control the Variable Frequency Drives to control the Drilling Tools.
Portable Drilling Console with Swing Arm
**Typical Operator Chair with Controls**

Operator Drilling Chair that provides ergonomic seating and ease of access to Drilling Controls that is suited for long Operating hours.

**Driller Console**

- **AFM - Main Driller's Display Console and Electronics**
  - The AFM 2000 is designed for the rig floor environment. Featuring the same stainless steel display unit/junction box as the AFM Mud Data and Dril Data monitors, it can be surface or yoke mounted. The AFM 2000 monitor tracks and records a wide array of drilling parameters such as rotary RPM, top drive RPM, standpipe/pump pressure, annulus pressure, depth/ROP/pipe velocity, hook load/WOB, rotary torque, and top drive torque. Monitored fluid parameters include mud pit levels (up to 8 pits), pump strokes, mud flow, fill strokes, mud weight, and mud temperature. It can also monitor mud gas measurement information with AFM's hydrocarbon gas detector. The AFM monitor incorporates three types of operator screens and a security setup screen/menu. All screens have 8 lines of information. The three screens are: 1) DRILLING SCREEN: depth, ROP, hook load/WOB, standpipe/pump pressure, casing pressure, rotary RPM, torque, and hydrocarbon gas in the flow returns. 2) OFF BOTTOM/CIRCULATION SCREEN: When the bit is picked up off bottom, this screen automatically displays valuable off-bottom data: bit location; peak hook load; peak pipe velocity. This information, together with all other data displayed on the screen, is indispensable for early detection of whole difficulties and is invaluable in the control of potentially damaging surge/swab pressures and other related problems. 3) TRIP/PIT SCREEN: Selected by the driller immediately prior to making a trip, this screen displays vital trip parameters: bit location; hook load; peak hook load; pipe velocity; peak pipe velocity per pull; hole fill up (choice of pump or trip tank); accurate PVT and trip tank measurements. Included are two additional high mounted screens for complete camera observation around the rig above and below for operation safety.

Driller's station in built into the Dog house with full window observation front, V-door and Monkey board. Windows are armored with steel frame for operator's safety. One door to the drill floor and two doors at each end to 4 ft. porches and stairs to the ground.

**Automation**

The control system will be PLC and PC based and includes the following functionality.

- automatically start the auxiliary motors for the mud pumps and drawworks
- perform interlocking of the mud pumps and drawworks
- Perform power limiting if the engines become overloaded
• auto-drilling control for the drawworks including controlling the weight on the bit and the rate of penetration
• Drawworks protection including torque limiting and high speeds, free-fall detection, and crown/floor savers
• Check current balance on each mud pump
• Annunciate faults and alarms to the driller

A log of rig events will be stored and be available for diagnostic purposes. A touch screen will be provided for diagnostics and metering of the rig electrical system.

**Electrical Equipment House:**
The "E House" will be constructed so as to be top lifted via Pad Eyes by an overhead crane. The House will be constructed per regulatory requirements in accordance with current ABS rules. All construction drawings will be submitted for review and approval prior to construction. The E-House will be constructed to shelter all of the 600V Generator and Distribution switchgear, the 480V Distribution switchgear, AC Drives, and MCC’s. The enclosure will include Access Doors, Air Conditioning, Lighting, and a 150 plug count plug panel with Receptacles for classed area use. (If required)

**1901:2 - Prime Movers**

**Engine/Generator Package**
Engine/Generators – 5 Each Caterpillar® Model 3516C with Direct Injection Turbocharged and Separate Circuit after cooled Offshore Electric Diesel Engines. Rated @ 2576 H.P. at 1200 R.P.M. 2007 EPA Non-Road Emission Certified, with the following standard attachments as listed below:

• Air Inlet System
  ▪ Aftercooler core, corrosion resistant
  ▪ Air cleaner, regular duty, with soot filter
  ▪ Service indicators

• Control System
  ▪ ADEM II or US Equivalent Electronic engine control, left hand.
  ▪ Requires 24V DC 10 AMP continuous, 20 AMP intermittent, clean electrical power.

• Ocean cooled 55 C Ambient Temperature:
  ▪ Outlet controlled thermostat and housing
  ▪ Jacket water pump gear driven
  ▪ Dual outlet
  ▪ Aftercooler water cooling pump (SCAC), gear driven centrifugal.
  ▪ SCAC pump circuit contains a thermostat to keep the aftercooler coolant from falling below 30 deg C (85 F).

• Exhaust System
- Exhaust fittings, flexible, 305 mm (12 in) Pancake type inside house.
- Adapter, 305 MM (12 in) to 356 MM (14 in)
- Exhaust flange, weldable, 356 mm (14 in)
- Exhaust manifolds, dry
- Dual turbochargers with w/c bearings

- **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, cooldown 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) 643L or equivalent

- **Mounting System**
  - Rails, mounting, floor type, 254 mm (10 in)

- **Power Take-Offs**
  - Accessory Drives
  - Upper RH, Lower left-hand Front (available for PTO usage)
  - Front Housing, Two-sided

- **Protection System**
  - ADEM II or Equivalent monitoring system provides engine de-
    ration, alarm, 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, and aftercooler temperature
  - 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
- Generator – KATO 2530 KVA, two bearing, 1923 KW, 867 frame, .7 PF, 600 volt complete with Stator RTD s, Space heater, Bus bar and cable access box
- Radiators – Updraft Split Core Radiator (56 sq. ft.) with two circuits for engine jacket water and after cooler. Includes: Up-draft ducting, 78" suction fan, fan drive with extension, fan pulleys, belt guard, fan guard, fuel cooler and water connections. This Radiator with no antifreeze is good for 140 deg. F (60 deg. C) ambient
• Master Skids – Three-runner oilfield type skids (40 x 10'-0" x 18'') with loading hitches on both ends for tail boarding. Skids to consist of the following:
  i. Completely covered with 4" check plate
  ii. Drilled and tapped plates for removal of engine pony skid

• Roofs – Removable arched type roofs (38'-0" x 10'-0" x 12''). Roofs to consist of the following:
  i. Six (6) each T.S. 4" x 4" x 4" support legs with bolt hole patterns to fit tapped holes on skids. Leg supports complete with square tubing diagonal supports for stabilization.
  ii. Two (2) hinged channel running the length of the roof to prevent rain runoff. Channels cut in 5'-0" sections for easy handling

2000:1 – HYDRAULIC POWER UNIT(S)

One (1) each electric and diesel engine driven hydraulic power units are built in house at AFM. These units can be custom manufactured to be compact, versatile, and powerful. Power units will be built into the substructure to reduce floor space requirements.

Electric motor driven unit to be powered from generator sets, and will include electrical controls and specified length of wire for connection. Motor driven unit will provide sufficient capacity to power both Iron Roughneck and casing power tongs.

Hydraulic system incorporates a 500-gallon hydraulic tank with filters, suction strainer, and main tank shutoff. Also includes: cooler with electric fans, connections for electric power, and hydraulic supply and return lines.

2008:2 - AIR SYSTEM

• Two (2) rotary screw, 185 cfm, Atlas Copco® or equivalent diesel powered air compressors.
• One (1) Cold-start, gasoline powered air compressor.
• Large vertical air dryer.

2008:3 - FUEL TANKS

1 EACH
3779 LBS, two hull compartment tank:

2008:4 - LIGHTING SYSTEM

Explosion proof lighting system for complete rig system. Class I Div I & II. Stainless steel casings. Complete rig lighting system includes:
All hazard lighting, Class I DIV II
Stainless steel casings
Mast lights
Mud tank lights
Substructure lights top and bottom
Staircase and walkway lighting

2008:5 – CENTRIFUGAL PUMPS
See mud pump specifications for centrifugal pump information.

2008:8 – AVIATION LIGHTING
Provided as specified, two (2) each mounted and wired to crown.

2009 – DRILLING RIG COMPONENTS

2009:1 – GUIDE AND DRILL LINE
Wire line package consisting 7500 ft. of 2.0" drilling line. All guide lines included in package, not covered in warranty.

2009:2 – MWD HOUSE
1 EACH 10 wide x 30 long on a three (3) runner oilfield skid 30 long with:
One (1) sliding personnel door, facing drawworks
One (1) window with Plexiglas panes
One (1) knowledge box
One (1) floor tool box 8 ft. long
Four (4) corner-lifting eyes
Doghouse sits level with rig floor

2009:3 – TWIN CEMENTER OFFSHORE UNIT

1:1 – CEMENT UNIT
THE CEMENT UNIT IS A FULLY COMPUTERIZED UNIT ON A THREE-RAIL SLED STYLE. COMPLETE 4 POINT LIFTING HOOK SYSTEM INSTALLED

1:2 – HIGH PRESSURE PUMPING SYSTEM
THE HIGH PRESSURE PUMPING SYSTEM CONSISTS OF TWO (2) NEW AMERIMEX AC MOTORS AND TWO (2) NEW TRIPLEX PUMPS. THE 100 HP AC ELECTRIC MOTOR SHALL POWER THE HYDRAULIC SYSTEM VIA A POWER TAKE-OFF ASSEMBLY.
1:3 – TRIPLEX PUMPS
THE PUMPS ARE HORIZONTAL TRIPLEX SINGLE-ACTING PLUNGER SPM 600S PUMPS AND CONSIST OF A FLUID END AND POWER END. IT IS CHARACTERIZED BY ITS COMPACTNESS, LIGHTWEIGHT, HIGH EFFICIENCY AND EASE OF MAINTENANCE. THE POWER END HAS A WELDED HOUSING MADE OF ALLOY STEEL PLATES. THE FLUID END IS MADE OF ALLOY STEEL. THE PUMP IS EQUIPPED WITH HARD SURFACE PLUNGERS AND IS RECOMMENDED FOR PUMPING CEMENT, ACID, WATER, DRILLING FLUIDS AND OTHER FLUIDS.

1:4 – MIXING SYSTEM
THE FLUID HANDLING SYSTEM INCLUDES A TWO-TANK 32-BARREL TOTAL CAPACITY (16-BARREL EACH TANK) CALIBRATED HOLDING TANK WITH FILL, LOAD, SUCTION MANIFOLDS, AND THREE CENTRIFUGAL PUMPS.

A HIGH-ENERGY JET MIXING SYSTEM CONSISTS OF AN ADC AUTOMATED DENSITY CONTROLLED CEMENT BLENDING SYSTEM THAT IS FULLY DENSITY CONTROLLED BY COMPUTER AND INCLUDES REMOTE OPERATION CAPABILITIES.

2 – ENVIRONMENT PARAMETERS – CEMENT UNIT

OPERATING TEMPERATURE 0-50 DEGREES C (122 DEGREES F)
HUMIDITY RELATIVE <90%
MAXIMUM SHOCK 1G

3 – OPERATIONAL PERFORMANCE – CEMENT UNIT

3:1 – JOB LOCATIONS
OFFSHORE PLATFORM.
THIS QUOTATION IS FOR AN OFFSHORE SYSTEM.

3:2 – COMPONENT SIZE
LENGTH 8.0 M
WIDTH <2.7M
HEIGHT <4.0M

3:3 – PRESSURE RANGE
MAXIMUM WORKING PRESSURE 15,000 PSI
3:4 – FLOW RATE

MAXIMUM FLOW RATE 16.1 BPM
FLOW RATE AT RATED WP 1.76 BPM @ 10,400 PSI
FLOW RATE AT MAXIMUM PRESSURE 0.89 BPM @ 15,000 PSI

3:5 – DENSITY RATE OF SLURRY

MAXIMUM SLURRY RATE 1.0 – 2.7 G/CM4 (8.33-22.6LB/GAL)

3:6 – SLURRY MIXING CAPACITY RANGE

MIXING RANGE 0 – 23.3 M3 / MIN (0 – 14.4 BPM)

2010 - Fabrication

a) **Pipe Racks** – Material and labor to fabricate six (6) Pipe racks. Racks (30 x 18” x 18”) to have a triangular construction and fabricated out of schedule 80 pipe.

b) **Rotary Hose**
One (1) 4 ½” x 95’, 7,500 psi wipe. with 5” welded connections. Complete with safety clamps, chains and hammer unions on each end.

c) **Surveyor Unit**
Five Star surveyor wire line unit with 15 HP, 1800 rpm, 480 volt, 3-phase, 60 HZ Explosion proof motor, complete with one (1) line guard, counter and 30,000’ of .108” wire line.

2010:1 – THE VESSEL

a) Crew quarters for 96 people Approximately 16 x 47 top deck 3/16 sides 1/4 bottom 1/8 deck All steel 3’ walkway all around spud wells Bunk room sleeps 72 People, 1 Main Bathrooms 16 bedrooms, full Galley-stove, walk-in freezer and refrigerators, microwaves all hot water heater with fresh water system a/c central air, and ship sewer treatment system

b) The jack and level system will be upgraded according to repairs needed and VFD conversion.

2011- Hospital

**ENGINEERING** – We will provide structural design and calculations to meet steel modular building construction on vessels (OSV) for ABS review and approval. All discipline drawings and details will be provided for building for regulatory review/approval.

**Note:** Engineering, design and review/approval/inspection cost for ABS of construction and installation of modules will be by others.
ABS Review and Approval for Hospital Module
ABS Field Inspections and Documentation

INTERIOR WALLS: Interior divisional walls to be Thermax or equal with matching corner and divisional trim profiles. Interior doors to be mild steel painted C-class with lever type privacy and passage locksets.

CEILING: Suspended ceiling system consist of USCG approved Chicago Metallic grid with 2’x2” Ceramguard lay in tiles.

EXTERIOR DOORS: 3’-0”x 6’-8” JRJ Alumafab or equal mild steel painted A-60 rated USCG approved doors with HD closer, stainless steel hardware, and 3-dog latch.

PLUMBING: Potable hot and cold water lines to be hard drawn type “L” copper. Sea water, if applicable to be type “L” copper. Black and gray sewer system drain, waste, and vent piping to be mild steel welded, blasted, and painted. Showers to be stainless steel, steeping tub and faucets included. Lavatory and toilet to be Gerber vitreous with Gerber faucets. Water heater is State with 100 PSI T&P valves as per USCG requirements.

LIGHTING: Interior lighting to be Pauluhn 2’x4’ lay in ceiling troffers, bunk lights, and vanity lights. Exterior lighting over doors to be Pauluhn. Lighting to be non-classified.

ELECTRICAL: Electrical sub panel to be Square D NQD (or equal) with bolt on breakers, wiring to be IEEE 45 marine shipboard cable. Receptacles and light switches to be Leviton HD grade. Bulkhead penetrations for HVAC and electrical to be Brattberg USCG approved and exterior junction box to be stainless steel weather tight. Fire and gas, PA/GA, and telecom to be prewired to exterior stainless junction box; all end devices to be provided and installed by others. Electrical is non-classified.

FURNISHINGS –
(2) Legget and Platte steel bunk units with ladder and rail
(2) Legget and Platte Single beds
(6) Pillow top mattresses
(6) 18”x18”x72” Single tier Lyons steel lockers
(2) 10# Amerex ABC Fire Extinguishers
(1) Steel Medical Storage cabinet with shelves and glass doors
(1) Mirror above lavatory
(2) Towel hooks adjacent shower and tub
(1) Toilet paper holders
(1) 40 gallon State water heaters
(1) Vent fans in bath areas
(1) Elongated Toilets,
(1) 32" Showers,
(1) 60" FG Bathtub w/Gerber faucets and spray
(2) White vitreous china lavatories with Gerber faucets
(1) Duali-zone 3-ton HVAC split system with heat
(1) Nurses station custom desktop with qty (4) 2-drawer file cabinets and overhead shelves.
(4) Black vinyl desk chairs
* Surgical area unfurnished due to lack of information

**2008:9 -LIFEBOAT**

(Two) Lifeboats for 110 people each SSI brand, totally enclosed self-righting, self-propelled, with supplies according to International Regulations and SOLAS latest edition as amended, the Code International Life-Saving Appliance (LSA) and the current technical Guide to the acquisition and use of totally enclosed bowls in PEMEX Exploration and Production.

The totally enclosed lifeboats are able to operate in conditions by meteorological seaway according to IDS, with electric start system ° and hydraulic starting system, independent of one another, which are rechargeable, have manual stop, come inside, with signaling and operating instructions in Spanish and English languages. They have the ability to go forward and back, with full allocation of people, at a pace of 6 knots, for a period of 24 hours.

76. - Inflatable rafts according to International Regulations and SOLAS amendments thereto.

76. - 5 (Five) Inflatable rafts, according to the International SOLAS Regulations and their amendments

77.-According to international standards and PEP, are required to have on board the platform with enough life jackets for 150% of crew members, which must meet the requirements of the International Code of Life-Saving Appliances (C6cligo IDS), the regulations of SOLAS Norma NOM-006-SCT4-2006,

77. - 196 (One hundred ninety-six) life jackets. According to international standards and of PEP, is counted on the platform with at least 150% of the occupation, which meet the requirements of the International Code of Life-Saving Appliances (LSA Code), the SOLAS and Mexican Official NO 106 – 162

http://www.survivalsystemsinternational.com/video-lifeboat-boarding/ Load into your Browser
2011 - Rig up Items

A. High Pressure Piping
   a. Material and labor to fabrication dual high-pressure piping. All piping to be 5" schedule 160 and all unions to be weld type 1502. High pressure piping complete as per the following:
      i. Standpipe
         1. Standpipe to be located on the Off-Driller's Side.
         2. Standpipe to have hammer union breaks at mast sections so it can be transported without being taken off the mast.
         3. Cement Line attached to stand pipe
      ii. Standpipe Manifold
         1. The standpipe manifold will be complete with manifold type tee with two 2" outlets. Outlets to have hammered union connections only.
         2. The 5" outlets to have a 5" gate valve on the top of the cross.
         3. Cement Line attached to stand pipe
      iii. High Pressure Line
         1. The high-pressure line will run from the bottom of the standpipe manifold to the side of the mud boat
2. The cellar line will be mounted to the mast support beam.
3. There will be hammer unions at break of the substructures for transportation.

**Cement Line**

2" x 10,000 psi - pipe material double wall 2" cor-valch4 heavy duty pipe, seamless construction.

Two (2) 2" x 7500 psi c/w hammer union Fig.1502 discharge line to kill line & floor circulating line.
Two (2) 2" x 7500 psi c/w hammer union Fig.1502 for pressure gauge 0-6000 reading and sensor port
Two (2) single 4”x 7500 stand pipe, c/w 160 deg 4” goose neck, lower section at bottom manifold connection to 4” Fig 1003 and goose neck connection Fig. 1002 male.

| 2" SCH XXH LONG RADIUS BUTT WELD 4 ELBOW |
| 2" FIG 1502 PRESSURE SENSOR |
| 2" FIG 1502 BUTT WELD UNION THREAD 2 HALF |
| 2" SCH XXH LONG RADIUS BUTT WELD 4 ELBOW |
| 2" SCH XXH BUTT WELD TEE 2 |
| 2" FIG 1502 PRESSURE GAUGE 0-6000 PSI 2" FIG 1502 BUTT WELD UNION WING 2 |
| 2" SCH XXH BUTT WELD TEE |

B. **Structural set and assemble:**
   a. Mast and Substructure
      i. Mast accessories and Top drive rails and accessories!
      ii. Install flooring, handrails, v-door, stairs, etc.
   C. **Set and align**
      a. Rotary Table
      b. Drawworks
      c. Doghouse
      d. Utility house control panel and foot drawworks console.
      e. Mud Pumps
      f. Mud System
      g. Brake Water/Trip Tank
      h. Water Tank/Fuel Tank
      i. Catwalks and Pipe Racks
j. Cable Trays
k. KOOMEY/Junk Basket

D. **Piping, Fittings, hoses, valves, etc.**

a. Water Supply
   i. To Mud system and mixing system
   ii. Rig Floor
   iii. Brake water system
   iv. Feed and return lines from brake water tank to drawworks drum and brake.
   v. Fuel System
      1. To feed and return lines from duel tank to generator set.
   vi. Air System
      1. Air Supply for accumulator unit and rig floor
      2. Hose connections from rig floor air manifold to drawworks control console, air hoist and other floor tools
         a. To generator set engine starters
   vii. Miscellaneous
      1. One (1) mouse hole
      2. Vibrator hoses.
   viii. Electrical Rig Up
   ix. Testing
      1. Fill mud tanks with water
      2. Provide lube products to all machinery.
      3. Provide Fuel for testing
      4. Circulate water through mud system
      5. Run air compressors.
      6. Pressure test all high pressure lines and connections to working pressure
      7. Run all sulfa control equipment.
      8. Load test generators
      9. Test all SCR/VFD assignments.
      10. Load test top drive if one exists
   x. Rig Down
      1. Rig down and assist in load out on waterway.
7000 - RIG DELIVERY & COMMISSIONING

7000:1 - PRE-DELIVERY INSPECTION

Seller will conduct a standard pre-delivery systems test. These tests check function and operation of rig and associated components.

Customer is provided copy of inspection report.

The unit is at no time tested with destructive testing methods such as load, dynamometer, or other tests. We supply certificates, warranties, and all documentation.

7000:2 - PACKAGING

No packaging is included in this quotation.

7000:3 - RIG SHIPPING

Rig can be quoted for delivery from USA to Location when finished from manufacturer's factory.

7900 - PIPE AND TOOLS  SECTIONS 8300-100005

7900:1 - FLOATS - NON PORTED

- Two (2) each Baker Model G-5F-6R float valves for 6-5/8" regular and 7-5/8" regular bit subs.
- Two (2) each Baker Model G-2F-3R float valves for 3-1/2" regular bit sub
- Two (2) each Baker Model G-4R float valves for 4-1/2" regular bit sub.
- Four (4) each float subs for 6" hole, 4-3/4 OD w/ 3-1/2 IF PIN X BOX (C/O # 13).
- Four (4) each float subs for 12-1/4" hole, 8" OD w/ 6-5/8" Reg PIN X BOX (C/O #14).

7950 DRILLING RIG FLOOR EQUIPMENT

7950:1 - STANDARD DRILL PIPE ELEVATORS

- Two (2) 5-1/2" Varco/BJ (or equivalent) Type GG 350 Ton.
- Two (2) 4" Varco/BJ (or equivalent) Type GG 350 Ton
• Two (2) 3-1/2 Varco/BJ (or equivalent) Type GG 350 Ton

7950:2 - STANDARD MANUAL SLIPS (Access Oil Tools or equivalent)
• Two (2) 5-1/2 DP slip
• Two (2) 5 DP slip
• Two (2) 4 DP slips.
• Two (2) 3-1/2 DP Slips
• Two (2) 4-3/4” DC slips
• Two (2) 6-1/4” DC slips
• Two (2) 8-1/4” DC slips
• Two (2) 9-1/2” DC slips
• One (1) Access Oil Tool "BackSaver" air operated slip puller with inserts and dies for
• 5-1/2”, 5” and 4” Drill Pipe.

7950:3 - DRILL PIPE, DRILL COLLARS, & CASING TONGS
• One (1) Set 2 each Varco HT-1 00 (or equivalent) rotary tongs with jaws for 3-1/2" to 14” sizes.
• One (1) Set 2 each Varco HT-65 (or equivalent) rotary tongs with jaws for
  - 3-1/2 DP
  - 4 DP
  - 5” DP
  - 5-1/2”DP
  - 4-3/4” to 8-1/4” drill collars
• Two (2) Pragma Torq-Matic TM-120 (or equivalent)
• Two (2) Grey Model 3570 Pipe Spinner (or equivalent)

7950:4 - PNEUMATIC COLLAR CLAMPS
• One (1) each for 4-3/4” to 6-1/4” DCs (with one manual backup)
• One (1) each for 7-3/8” to 9-1/2” DCs (with one manual backup)

Complete with steel storage box, wrench, spare pins and segments.

7950:5 - BIT BREAKERS
• One (1) each for 26” tri-cone bit
• One (1) each for 17-1/2” tri-cone bit
• One (1) each for 12-1/4’ tri-cone bit
• One (1) each for 8-1/2” tri-cone bit
• One (1) each for 6” tri-cone bit.
• One (1) each for 5-1/4” tri-cone bits
7950:6 - MUD SAVER BUCKET

- Two (2) mud bucket with seals for 5-1/2", 5", and 4" drill pipe.

7950:7 - CASING FILL - UP LINE

- One (1) 3" low pressure mud line from the low pressure charging system (Note: manifolding will also allow fill up of the casing from the trip tank) to the rig floor with 3" hose rigged with counter weight and quick opening valve for rapid fill up of casing.

8000 - DRILL STRING

8000:1 – G105 DRILL PIPE

- 12,000 ft 5" – 19.5 lb/ft, Grade G-105, XT-39 connection, 7" x 4" TJ, TCS-8000 (or) TCS titanium hard banding, Tubescope TK-34 internal plastic coated.
- Two (2) each 5’ pup joints.
- Two (2) each 10’ pup joints.
- Two (2) each 15’ pup joints.

8000:2 – S135 DRILL PIPE

- 7,000 ft 5" -19.5 lb/ft, Grade S-135, XT-39 connection, 7" x 4" TJ, TCS-8000 (or) TCS titanium hard banding, Tubescope TK-34 internal plastic coated.
- Two (2) each 5’ pup joints.
- Two (2) each 10’ pup joints.
- Two (2) each 15’ pup joints.

8000:4 - HW DRILL PIPE

- Fifty (50) joints 5-1/2" Heavy-weight drill pipe, 61.6 lb/ft w/ TJ and Tube, HT-55 connection, 7-1/4" x 3-1/4" TJ, Armacor-M (or) TCS-8000 (or) TCS-titanium hard banding.

8000:5 – DRILL COLLARS

- Twelve (12) each spiral 9-1/2" O.D. x 3" I.D. drill collars, with 7-5/8" API regular box, bored back and stress relief connections, slip and elevator recessed, cast steel thread protectors.
- Eighteen (18) each spiral 8" O.D. x 3" I.D. drill collars, with 6-5/8" API regular box, bored back and stress relief connections, slip and elevator recessed, cast steel thread protectors.
• Thirty (30) each spiral 6-3/4" O.D x 2-13/16" drill collars, with 4-1/2" IF (NC50) box, bored back and stress relief connections, slip and elevator recessed, cast steel thread protectors.

• Twenty-Four (24) each spiral 4-3/4" O.D x 2-13/16" drill collars, with 4-1/2" IF (NC50) box, bored back and stress relief connections, slip and elevator recessed, cast steel thread protectors.

8100 - CROSS-OVER, LIFTING / HANDLING, AND BIT SUBS

8100:1 - CROSS-OVERS

All crossovers to have stress relief grooves on pins and borebacks on boxes.

• Two (2) Bottleneck X-over 9-1/2" O.D. - 3 1/4" ID, with 7-5/8" API Reg. stressed relief grooved pin -x- 7"
  • O.D x 3 1/4" ID with HT55 bore back box, 36" long.
  • Two (2) Bottleneck X-over 8 1/4" O.D. - 2-13/16" I.D., with 6-5/8" API Reg. stressed relief grooved pin -x-
  • 7" OD x 2-13/16" ID, with HT55. Bore back box, 36" long.
  • Two (2) Bottleneck X-over 7" OD x 2-13/16" ID with HT55 box up by 6 1/4" OD x 2-13/16" ID with 4-1/2
  • IF pin down, 36" long.
  • Two (2) Bottleneck X-over 7" OD x 2-13/16" ID with HT55 box up by 4-3/4" OD x 1-3/4" ID with 3-1/2" IF pin down, 36" long.
  • Two (2) 7-5/8" Reg Pin x 6-5/8" Reg Box x 8-1/4" OD x 3-1/2" ID x 3 ft long.
  • Two (2) 6-5/8" Reg Pin x NC-50 Box x 8-1/4" OD x 3 1/2" ID x 3 ft long.
  • Two (2) 4 –1/2 )F (NC-50) Pin x 3-1/2" IF (NC-38) Box x 7-5/8 OD x 3 1/2" D x 3 ft. long.
  • One (1) 4-1/2" Reg Box x XT 39 Box x 6" OD x 3-1/2" ID x 3 ft long.
  • One (1) 3-1/2" Reg Pin x 3-1/2" IF Pin.
  • One (1) 6 5/8" Reg Box x HT 55 Box x 8-1/4 OD x 3 1/2" ID x 3 ft long.
  • One (1) 7 5/8" Reg Box x HT 55 Box x 9-1/2 OD x 3 1/2" ID x 3 ft. long.
  • One (1) 4-1/2" IF Box x 7-5/8" Reg Pin.
  • Two (2) XT-39 Box x 3-1/2" IF Pin.
  • Two (2) XT-39 Box x 4-1/2" IF Pin.
  • Two (2) 3 1/2" IF Box x XT-39 Pin.
  • Two (2) 4-1/2" IF Box x XT-39 Pin.
  • Two (2) 4-1/2" IF Box x HT 55 Pin.
  • Two (2) 7-5/8" Reg Pin x 7 5/8" Reg Pin.
  • Two (2) 7-5/8" Reg. Box x 6-5/8" Reg. Pin.
  • Two (2) 6-5/8" Reg. Box x 4-1/2" IF Pin.
  • Two (2) 4-1/2""IF Box x 3-1/2" IF Pin.
  • Two (2) HT 55 Boxes x XT 39 Pin.
• One (1) HT 55 Pin x 4-1/2" IF Pin (X-Over for BOP Test Tool).
• One (1) XT 39 Pin x 4-1/2" IF Pin (X-Over for BOP Test Tool).
• Two (2) HT 55 Boxes x 7-5/8" Reg. Pin (X-Over to Safety Valves).
• Two (2) HT 55 Box x 6 5/8" Reg. Pin (X-Over to Safety Valves).
• Two (2) HT 55 Box x 4 1/2" IF Pin (X-Over to Safety Valves / BOP Test Tool).
• Two (2) XT 39 Box x 4-1/2" IF Pin (X-Over to Safety Valves / BOP Test Tool).
• Two (2) XT 39 Box x 3-1/2" IF Pin (X-Over to Safety Valves).
• As required for Contractors down whole rotary tubulars, cross-over, and bit subs to be complete with purpose fit pressed steel thread protectors.

8100:2 - LIFTING SUBS & HANDLING PLUGS
Six (6) each elevator lifting subs for 9-1/2" O.D. drill collars, 7-5/8" regular pin down by HT-55 box up to be used with 4" drill pipe elevators
Six (6) each elevator lifting subs for 8" OD drill collars, 6-5/8" regular pin down by HT-55 box up to be used with 5" drill pipe elevators.
• Ten (10) each elevator lifting subs for 6-3/4" OD drill collars, 4-1/2" IF pin down by HT-55 box up to be used with 5" drill pipe elevators.
• Seven (7) each elevator lifting subs for 4-3/4" OD drill collars, 3-1/2" IF pin down by HT-39 box up to be used with 4" drill pipe elevators.
• Two (2) sets of "Jip-Lift" elevators. Each set to come complete with 2 each x tapered elevators to fit each size DCs as stated above

8100:3 - BIT SUBS
• Two (2) each 9-1/2" bit subs - 8 5/8" Reg Box x 7-5/8" Reg. Box.
• Two (2) each 7-5/8" Reg. Box x 7-5/8" Reg. Box.
• Two (2) each 8-1/4" bit subs - 6-5/8" Reg. Box x 7-5/8" Reg. Box.
• Two (2) each 6-5/8" Reg Box x 6-5/8" Reg Box.
• Two (2) each 6-1/4" bit subs - 4-1/2" Reg. Box x 4-1/2" IF Box.
• Two (2) each 4-3/4" bit subs - 3-1/2" Reg. Box x 3-1/2" IF Box.
• Two (2) each 6-5/8" Reg Box x HT 55 box.
• Two (2) each 3 1/2" Reg. Box x XT 39 box.

All of the above bored for floats.
All bit subs to have stress relief grooves on pins and borebacks on boxes.

8100:4 - CIRCULATING SUBS - 15,000 PSI
• Two (2) HT 55 Pin by Weco 2" 1502 Thread
• Two (2) XT 39 Pin by Weco 2" 1502 Thread
• Two (2) HT 55 Box by Weco 2" 1502 Thread
• Two (2) XT 39 Box by Weco 2" 1502 Thread
8100:5 - SIDE ENTRY SUBS - 15,000 PSI
- Two (2) HT 55 Box by Pin with a Weco 2" 1502 Thread.

8100:6 - CUP TESTERS
- 13-3/8"x 72 ppf
- 9-7/8"x 62.8-67.3 ppf
- 9-5/8"x 47-54.5 ppf
- 7"x 26-32 ppf

8200 - OVERSHOTS
- One (1) - 11-1/4" OD Full Strength reversing and circulating overshot to work in a 12'-1/4" hole with:
  - 6 5/8" Reg. Box connection 36" extension, standard 11-1/2" - 12" oversize guide.
  - Grapples and packers for 9", 8-1/2", 6-1/2' drill collars and 5 1/2' drill pipe.
- One (1) x 7-7/8" OD Full Strength reversing and circulating overshot to work in an 8-1/2" hole with:
  - 4-1/2" IF Box connection, 36" extension, 8" - 8-1/2" standard oversize guide.
  - Grapples and packers for 6-1/2", and 4-3/4" drill collars and 4" & 3-1/2" drill pipe.
- One (1) x 5-3/4" OD SFS reversing and circulating overshot to work in 6-1/8" hole with:
  - 3-1/2" IF Box connection, 36" extension, 5-1/2" - 6" over size guide.
  - Grapples and packers for 4-3/4" drill collars and 4"drill pipe.
  - magnets, junk mills and junk subs for all tubular

9000 – Well Control
9000:1 - 13-5/8” 15,000 psi WP BLOW OUT PREVENTER
Annular Preventer
- One 15000psi x 13-5/8 (ydril or equivalent
Ram Type Preventers
- Four 15000psi x 13-5/8 Rams. (1x5", 1x5-1/2”, 1x3-1/2"-5VBR , 1x5 -7 VBR, 1xshear/blind.)

Drill Pipe Rams
- Two (2) sets 5-1/2 drill pipe rams.
- Two (2) sets 5 drill pipe rams
- Two (2) sets 4 drill pipe rams.
- One (1) set 5 – 7 VBR drill pipe rams.
- One (1) set 3-1/2 – 5 VBR drill pipe rams.
- One (1) set shearing blind rams (SBR) rams good for 5-1/2 21.9 ppf S-135.
All ram elastomers to be suitably rated for High Temp/POBM environment.

Casing Rams
- One (1) set 7" Casing rams.
- One (1) set 9-7/8" Casing rams.
- One (1) set 13-3/8" Casing rams.
Note: Manual hand wheels to be provided.

9000:2 - DRILLING SPOOLS AND DIVERTER VALVES
- One (1) diverter spool 30" 1,000 psi flange by flange with two (2) each 12" ANS class 600 outlet (R-57 RTJ)
- Two (2) each 12" ANS class 600 hydraulically controlled diverter ball valves.
- One (1) 30" diverter starting head (hot head), socket weld. Machine work required for reuse between wells to be charged back to operator on a reimbursable basis.

9000:3 - ADAPTOR SPOOLS AND DSA'S
- One (1) each spacer spool, approximately 36" tall, 13-5/8" x 15,000 psi flange top by 13-5/8" 15,000 psi
- Flange bottom.
- One (1) each DSA 1-5/8" c 15,000 psi studded top by 13-5/8" x 10,000 psi studded bottom.
- One (1) each DSA 13-5/8" x 15,000 psi studded top by 11" x 15,000 psi studded bottom.
- DSA as required to rig-up choke and kill lines to BOP stack.

9000:4 - CHOKE MANIFOLD
- 3-1/16" X 2-1/16" x 15k kill / choke Y-Manifold
- Adapter for 4-1/16" x 3-1/16" step down
- One (1) 2-1/16" 15k kill inlet from rig floor mud standpipe, equipped with check valve.
- One (1) 2-1/16" 15k kill inlet from cement standpipe, equipped with check valve.
- Two (2) 3-1/16" 15k choke line / kill line inlets from BOP stack.
- One (1) 4-1/16" 15k outlet to choke manifold.
- One (1) glycol injection port, 9/16" autoclave.

Choke Manifold - 4-1/16" x 3-1/16" 15K Choke Manifold
- Double block isolation valves required upstream of chokes. Refer figure 4.5 sections 4.7.2 EP 2002-1500 rev1.
- Downstream isolation valves to be 15K rated. Refer figure 4.5 sections 4.7.2 EP 2002-1500 rev1.
- Hydraulically operated valves upstream of chokes required on 15K choke manifolds. Refer section 4.7.2 EP
- 2002-1500 rev1.
- One (1) 4-1/16 15k straight gut line with one (1) 4-1/16 15k hydraulic gate valve.
- Two (2) 3-1/16 15k hydraulic choke 2 full opening.
- One (1) 3-1/16 15k manual choke 2 full opening.
- One (1) 7-1/16 10k buffer tank equipped with the following outlets:
  - Three (3) 3-1/16 10,000 psi outlets each outfitted with one (1) 3-1/16 10,000 psi hydraulic gate valve
  - And one (1) 3-1/16 10,000 psi manual gate valve.
  - Three (3) 3-1/16 10k side outlets outfitted with blind flanges. Two (2) 4-1/16 10k side outlets outfitted with blind flanges.
  - One (1) 2-1/16 10k side outlet for installation of sensor assembly.
- One (1) 5-way instrument assembly upstream of chokes, equipped with:
  - One (1) 2-1/16 15k isolation manual valve.
  - One (1) sensor block consisting of:
    - One (1) 2-1/16 15k blind flange / clean out.
    - One (1) 2-1/16 15k blind flange ported with 9/16 autoclave inlet.
    - One (1) 2-1/16 15k pressure gauge.
    - One (1) 2-1/16 15k flange x 2 1502 hammer union crossover c/w plug.
- One (1) 5-way instrument assembly downstream of chokes, equipped with:
  - One (1) 2-1/16 10k isolation manual gate valve.
  - One (1) sensor block consisting of:
    - One (1) 2-1/16 10k blind flange ported with 9/16 autoclave inlet.
    - One (1) 2-1/16 10k flange pressure gauge.
- Two (2) 2-1/6 10k flanges x 2 1502 hammer union crossover c/w plug.
- One (1) nominal x 2.5k SC( 80 (2.9 )D x 0.3 WT) line to mud/gas separator.
- One (1) nominal x 2.5k SC( 80 (2.9 )D x 0.3 WT) line to shaker tank.
- One (1) nominal x 2k SC( 80 (3.8 )D x 0.337 WT) relief line to burn pit one, 150 ft of line provided.
- One (1) nominal x 1k SC( 40 (6.0 )D x 0.28 WT) emergency relief line, 150 ft of line provided.
- No pressure sealing threaded connections permitted (other than 9/16" Autoclave). Refer section 4.2.1 EP

2002-1500 rev1. Also refer EP 2006-5393 rev4 section 5.1.3 for any hammer union TPW connections/fittings whereby pressure sealing threaded connection is not permitted > Yz".

9000:5 - KILL LINES
- One (1) nominal x 7,500 psi kill line from standpipe manifold to kill / choke Y-manifold.
- One (1) nominal x 15,000 psi kill line from cement manifold to kill / choke Y-manifold.
9000:6 - COMBINATION KILL/CHOKE LINES

- One (1) kill / choke line of each ram cavity for a total of four (4) lines outfitted as follows:
  - Each line has one (1) T3 3-1/16 15,000 psi hydraulic gate valve.
  - Each line has one (1) T3 3-1/16 15,000 psi manual gate valve.
- Spools block tees, and blind flanges to manifold the four (4) lines into the two (2) 3-1/16 15,000 psi lines to kill / choke Y-manifold.
- Two (2) 3 3/4 D x 15,000 psi AP 16C armoured Coflex choke hose from BOP stack to kill / choke Y manifold. 3-1/16 15,000 psi flanged each end. Test pressure of 22,500 psi.

9000:7 - CHOKE CONTROL AND DISPLAYS

- One (1) choke control panel, air over hydraulic, mounted at rig floor for control of two (2) each hydraulic chokes. Panel equipped with the following gauges:
  - Shut-in casing pressure (SICP)
  - Shut-in drillpipe pressure (SIDDP)
  - Downstream choke pressure (transmitter in buffer tank)
  - Upstream choke line temperature (transmitter upstream of choke)
  - Downstream choke line temperature (transmitter in buffer tank)
  - Three (3) each pump strokes
  - Three (3) each pump stroke totalizers
  - Two (2) each choke position indicators
  - Rig air pressure
  - Hydraulic system pressure
  - MGS pressure
- One (1) auxiliary choke display panel, mounted at choke manifold. Panel equipped with the following gauges:
  - Shut-in casing pressure (SICP)
  - Shut-in drillpipe pressure (SIDDP)
  - Downstream choke pressure (transmitter in buffer tank)
  - Upstream choke line temperature (transmitter upstream of choke)

HPHT pressure gauges with varying Pchoke ranges to accommodate accurate low range readings during HPHT well control situations.

9000:8 - GLYCOL INJECTION

- One (1) AGI Industries Injection System skid mounted 6.5 GPM, 15,000 – 20,000 psi with glycol reservoir equipped with the following:
  - Hydroplex HP-550 Triplex Plunger Pump
  - 100 HP, 1,800 RPM Electric Motor
  - Hydroplex HR2-20 Hand pressure regulator
  - Autoclave Suction and Discharge Ports
### 9500 - WELL CONTROL AND BLOWOUT PREVENTION

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 1/2&quot; 500 T3 MODEL 7012 ANNUAR:</td>
<td>T3 MODEL 500 PSI WP, 30&quot; MSS CLASS 300 RTJ (R-95) STUDDED TOP AND FLANGED BOTTOM CONNECTIONS 316 STAINLESS STEEL LINED RING GROOVES. MANUFACTURED AND TESTED TO API-16A REQUIREMENTS, TEMPERATURE CLASS T-20, H2S SERVICE AS PER NACE MR0175. COATING TO INCLUDE: ALL INTERNAL AND THROUGHBORE AREAS COATED WITH XYLAN AND EXTERNAL SURFACES PREPARED WITH THREE (3) COAT MARINE PAINT, SYSTEM COMPLETE WITH DATA PACKAGE.</td>
</tr>
<tr>
<td></td>
<td><strong>OUTLET CAN BE CHANGED AS NEEDED, HOWEVER THE PRICE MAY NEED TO BE ADJUSTED</strong></td>
</tr>
<tr>
<td>29 1/2&quot; 500 DRILLING SPOOL:</td>
<td>T3 29-1/2&quot;-500 PSI WP, FLANGED TOP AND FLANGED BOTTOM WITH TWO (2) 16&quot; FLANGED OUTLETS. WITH 316 STAINLESS STEEL LINED RING GROOVES. MANUFACTURED TO API-16A, TEMPERATURE CLASS T-20, H2S SERVICE AS PER NACE MR0175. SANDBLASTED AND PAINTED RED. COMPLETE WITH DATA PACKAGE</td>
</tr>
<tr>
<td>21 1/4&quot; 2,000 T3 MODEL 7082 ANNUAR, STUDDED TOP CONNECTION AND FLANGED BOTTOM, WITH 316 STAINLESS STEEL LINED R-73 RING GROOVES. MANUFACTURED TO API-6A TEMP. CLASS T-20. H2S SERVICE PER NACE MR0175. API MONOGRAMED NEW PACKING ELEMENT AND SEAL KIT INSTALLED. MANUFACTURED NEW</td>
<td></td>
</tr>
<tr>
<td>21 1/4&quot; 2,000 T3 MODEL 6012 DIAMOND SERIES</td>
<td>1 SINGLE RAM BOP. 20 3/4&quot; BORE. 3,000 PSI WP. FLANGE TOP AND FLANGED 20 3/4&quot; 3,000 BOTTOM CONNECTIONS WITH 316 STAINLESS STEEL LINED R-74 RING GROOVE. (2) 4 1/16&quot; 5,000 FLANGED OUTLET WITH 316 STAINLESS STEEL LINED R-39 RING GROOVE. MANUFACTURED TO API-16A TEMP. CLASS T-20. H2S SERVICE PER NACE MR0175. API MONOGRAMED. (1) SET OF STANDARD BONNETS, WITH MANUAL LOCKS. MANUFACTURED NEW. BOP WILL HAVE METAL FLANGE PROTECTOR WITH XYLAN COATING ON ALL WELLBORE WETTED AND HYDRAULIC SEAL SURFACES AND HARD CHROME PLATING ON ALL CYLINDER INTERNAL SEAL SURFACES AND RAM CHANGE ROD EXTERNAL SEAL SURFACES</td>
</tr>
</tbody>
</table>
| 21 1/4" 2,000 T3 MODEL 6012 DIAMOND SERIES | 1 SINGLE RAM BOP. 20 3/4" BORE. 3,000 PSI WP. FLANGE TOP AND FLANGED BOTTOM CONNECTIONS WITH 316 STAINLESS STEEL LINED R-74 RING GROOVE. (2) 4 1/16" 5,000 FLANGED OUTLETS WITH 316 STAINLESS STEEL LINED R-39 RING GROOVES. MANUFACTURED TO API-16A TEMP. CLASS T-20. H2S SERVICE PER NACE MR0175. API MONOGRAMED. (1) SET OF STANDARD BONNETS AND (1) SET OF LARGE BORE BONNETS AND TANDEM BOOSTERS, WITH MANUAL LOCKS.
LOCKS. MANUFACTURED NEW.
BOP WILL HAVE MEAL FLANGE PROTECTOR
WITH XYLAN COATING ON ALL WELLBORE WETTED AND HYDRAULIC SEAL SURFACES
AND HARD CHROME PLATING ON ALL CYLINDER INTERNAL SEAL SURFACES
AND RAM CHANGE ROD EXTERNAL SEAL SURFACES

21 1/4" 2,000 T3 MODEL 6012 RAM x 4" PIPE (ONE 2 BLOCK) HARDNESS INDUCTION FOR PIPE HANG OFF.
NEW PACKER AND TOP SEAL INSTALLED,
MANUFACTURED TO API 16A, TEMP CLASS T-20, API MONOGRAMED.
H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW
WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)

21 1/4" 2,000 T3 MODEL 6012 RAM x 5" PIPE (ONE 2 BLOCK) HARDNESS INDUCTION FOR PIPE HANG OFF.
NEW PACKER AND TOP SEAL INSTALLED,
MANUFACTURED TO API 16A, TEMP CLASS T-20, API MONOGRAMED.
H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW
WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)

13 5/8" 10,000 T3 MODEL 7072 ANNULAR BOP.
WEDGE COVER. 13 5/8" BORE. 10,000 PSI WP.
STUDDED TOP CONNECTION WITH 316 STAINLESS STEEL LINED BX-159 RING GROOVE. 15,000 FLANGED BOTTOM CONNECTION WITH A 316 STAINLESS STEEL LINED BX-159 RING GROOVE. MANUFACTURED TO API-16A TEMP. CLASS T-20. H2S SERVICE PER NACE MR0175. MANUFACTURED NEW.
WITH NEW PACKING ELEMENT AND SEAL KIT INSTALLED API MONOGRAMMED

13 5/8" 15,000 T3 MODEL 6012 DIAMOND SERIES 1 SINGLE RAM BOP. 13 5/8" BORE. 15,000 PSI WP.
FLANGED TOP AND FLANGED BOTTOM CONNECTIONS WITH 316 STAINLESS STEEL LINED BX-159 RING GROOVES. (2) 4 1/16 15,000 FLANGED OUTLETS WITH 316 STAINLESS STEEL LINED BX-155 RING GROOVES. MANUFACTURED TO IAW API-16A TEMP. CLASS T-20. H2S SERVICE PER NACE MR0175. (1) SET OF LARGE BORE BONNETS WITH TANDEM BOOSTER AND MANUAL LOCKS. MANUFACTURED NEW.
WITH XYLAN COATING ON ALL WELLBORE WETTED AND HYDRAULIC SEAL SURFACES AND HARD CHROME PLATING ON ALL CYLINDER INTERNAL SEAL SURFACES AND RAM CHANGE ROD EXTERNAL SEAL SURFACES API MONOGRAMMED

13 5/8" 15,000 T3 MODEL 6012 DIAMOND SERIES 1 DOUBLE RAM BOP. 13 5/8" BORE. 15,000 PSI WP.
FLANGED TOP AND FLANGED BOTTOM CONNECTIONS
WITH 316 STAINLESS STEEL LINED BX-159 RING GROOVES. (4) 4 1/16 15,000 FLANGED OUTLETS WITH 316 STAINLESS STEEL LINED BX-155 RING GROOVES. MANUFACTURED TO IAW API-16A TEMP. CLASS T-20. H2S SERVICE PER NACE MR0175. (1)

SET OF STANDARD BONNETS AND (1) SET OF LARGE BORE BONNETS WITH TANDEM BOOSTER AND MANUAL LOCKS. MANUFACTURED NEW.

WITH XYLAN COATING ON ALL WELLBORE WETTED AND HYDRAULIC SEAL SURFACES AND - HARD CHROME PLATING ON ALL CYLINDER INTERNAL SEAL SURFACES AND RAM CHANGE ROD EXTERNAL SEAL SURFACES API MONOGRAMMED

13 5/8” 15,000 T3 MODEL 6012 RAM x 2 7/8” PIPE 2 (ONE BLOCK) HARDNESS INDUCTION FOR PIPE HANG OFF. NEW PACKER AND TOP SEAL INSTALLED, MANUFACTURED TO API 16A, TEMP CLASS T-20, H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)

13 5/8” 15,000 T3 MODEL 6012 RAM x 3 1/2” PIPE 2 (ONE BLOCK) HARDNESS INDUCTION FOR PIPE HANG OFF. NEW PACKER AND TOP SEAL INSTALLED, MANUFACTURED TO API 16A, TEMP CLASS T-20, H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)

13 5/8” 15,000 T3 MODEL 6012 RAM x 5” PIPE 2 (ONE BLOCK) HARDNESS INDUCTION FOR PIPE HANG OFF. NEW PACKER AND TOP SEAL INSTALLED, MANUFACTURED TO API 16A, TEMP CLASS T-20, H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)

13 5/8” 15,000 T3 MODEL 6012 RAM x 7” PIPE 2 (ONE BLOCK) NEW PACKER AND TOP SEAL INSTALLED, MANUFACTURED TO API 16A, TEMP CLASS T-20, H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)

13 5/8” 15,000 T3 MODEL 6012 RAM x 9 5/8” 2 PIPE. (ONE BLOCK) NEW PACKER AND TOP SEAL INSTALLED, MANUFACTURED TO API 16A, TEMP CLASS T-20, H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW WITH COMPLETE DATA PACKAGE (TWO BLOCKS = ONE SET)
13 5/8" 15,000 T3 MODEL 6012 RAM x SHEAR BLIND 1
RAM (ONE BLOCK UPPER).  NEW PACKER AND TOP
SEAL INSTALLED, MANUFACTURED TO API 16A,
TEMP CLASS T-20, H2S SERVICES AS PER NACE MR0175,
MANUFACTURED NEW WITH COMPLETE DATA PACKAGE
(ONE SET = ONE UPPER AND ONE LOWER)

13 5/8" 15,000 T3 MODEL 6012 RAM x SHEAR BLIND 1
RAM (ONE BLOCK LOWER).  NEW PACKER AND TOP
SEAL INSTALLED, MANUFACTURED TO API 16A, TEMP CLASS T-20
H2S SERVICES AS PER NACE MR0175, MANUFACTURED NEW
WITH COMPLETE DATA PACKAGE
(ONE SET = ONE UPPER AND ONE LOWER)
BLIND FLANGE, 4 1/16" 15,000 WITH STAINLESS 6
STEEL LINED BX-155 RING GROOVE, MANUFACTURED TO API 6A PSL 2, H2S SERVICES AS PER NACE
MR-175, MANUFACTURED NEW WITH COMPLETE DATA
PACKAGE

1 4" X 30 COFLEXIP STAINLESS STEEL WRAPPED, HIGH PRESSURE HOSE 15,000 PSI
1 4" MANUAL (CR VALVE 15,000 PSI
1 4" (YDRAUL)C (CR VALVE 15,000 PSI.

DOUBLE STUDDED ADAPTOR :
13 5/8"-15,000 PSI X 13 5/8"-10,000 PSI WITH TIE DOWN SCREW .
13 5/8"-15,000 PSI X 11"-15,000 PSI WITH TIE DOWN SCREW.
13 5/8"-15,000 PSI X 13 5/8"-15,000 PSI WITH TIE DOWN SCREW
29-1/2"-2000 PSI X 29-1/2" 2000 PSI WITH TIE DOWN SCREW .

DRILLING SPOOL :
29-1/2"-2000 PSI X 29-1/2"-2000 PSI WITH 92" LONG, TWO OUTLETS 4 1/16"-10000 PSI
(OUTLETS SHOULD BE INSTALLED 10" UNDER TOP FLANGE).
SPACER SPOOL :
13 5/8"-15,000 PSI X 13 5/8"-15,000 PSI WITH 30" LONG.
13 5/8"-15,000 PSI X 13 5/8"-15,000 PSI WITH 30" LONG.
13 5/8"-15,000 PSI X 13 5/8"-15,000 PSI WITH 30" LONG.

8 COFLEXIP HOSES. STAINLESS STEEL WRAPPED, HIGH PRESSURE HOSE LINE
MINIMUM WP OF 10000 PSI, C/W CONNECTIONS TO CONNECT TO 3 EACH X BOP
RAMS (BOTH OPEN AND CLOSE SIDES OF EACH BOP RAM) AND TO ANNULAR
(BOTH OPEN AND CLOSE SIDES).
A PERMANENT BOP MANIFOLD (WITH EACH BOP RAM IDENTIFIED) TO BE
INSTALLED AT SUBSTRUCTURE TO ACCOMMODATE CONNECTING COFLEXIP BOP
HOSES FROM ACCUMULATOR TO BOPS.

3 SET, RAM ASSEMBLY. 13 5/8 "3/15M TYPE U X (ONE 2 7/8", ONE
3 1/2" AND ONE 4 1/2") COMPLETE WITH NEW AFTERMARKET RUBBER GOODS INSTALLED.

NITRILE PACKING ELEMENT AND SEAL KIT INSTALLED. NEW AT AN API 16 A FACILITY PER NACE SPECIFICATIONS, COMPLETE WITH DATA BOOK AND TEST CERTIFICATES. DIVERTER SYSTEM

BOP HANDLING SYSTEM IS BUILT INTO THE SUBSTRUCTURE AND HAS ADEQUATE CAPACITY TO SAFELY HANDLE COMPLETE BOP SYSTEM QUOTED.

1
4- 1/16" COFLEX)PRESSURE HOSE STAINLESS STEEL WRAPPED 10,000 PSI

1
4" MANUAL HCR VALVE 15,000 PSI. (WITH HANDLES)

1
4" (YDRAULIC HCR VALVE 15,000 PSI.

2
2" VALVES 15,000PSI. GATE VALVES FOR CHOKE LINE (WITH HANDLES)

1
2" BACK PRESSURE VALVE 15,000 PSI.,

9500:1 - RISER / BELL NIPPLES

• ONE (1) EACH NOMINAL BELL NIPPLE FOR 13-5/8 BOP, FLANGE BOTTOM X OPEN / BELLED TOP X 12 FLOW LINE PIPE.
• ONE (1) EACH SPARE 20 FT JOINT OF RAW PIPE FOR DRILLING NIPPLE REPAIRS.
• ONE (1) EACH BELL NIPPLE FOR DIVERTER, FLANGED BOTTOM X OPEN / BELLED TOP X 12 FLOW LINE PIPE.
• ONE (1) EACH BELL NIPPLE FOR 21- 1/4" BOP, FLANGED BOTTOM X OPEN / BELLED TOP X 12 FLOW LINE PIPE.
• ONE (1) EACH FLOW LINE. DESIGN TO BE FINALIZED BASED ON LAYOUT TAKING INTO ACCOUNT THE EKD SYSTEM.

9500:2 - BOP TEST UNIT

• ONE (1) AIR OPERATED BOP TEST UNIT, ZERO (0) TO 20,000 PSI, WITH 20,000 PSI AND 5,000 PSI CHART RECORDERS.

ALL FITTINGS & VALVES TO BE 15K RATED PRESSURE RELIEF VALVE TO BE PROVIDED TO PROTECT EQUIPMENT DURING PRESSURE TESTING.

9500:3 - ACCUMULATOR PRESSURE CONTROL UNIT

• One (1) CPC (Model no 14SE-21131-125-600-460), a 3,000 psi working pressure system c/w Twenty Eight (28) 15 Gallons Bottles:
- One (1) oil tank at least 600 gallons (2,300 litre), complete with two (2) 4 drain plugs, 2 air vent, internal baffles, sight glass gauge and four (4) 4 inspection port.
- Fourteen (14) station-closing units. One (1) four-way two position Hi-Lo pressure valve installed from a 3100 series regulator. Bypass manual pressure reducing and regulating valve, Annular valve supplied equipped with Fail-Safe operation.
- **Primary Pump System:** Two (2) Electric pump model number UET25-B, (14 GPM each @ 3,000 psi), a triplex plunger pump. Pump is to be unitized with two (2) 25 HP. Baldor or TECO Explosion proof flashing light, for low hydraulic and air pressure. A horn will sound in the event of low hydraulic fluid level.
- **Secondary Pump System:** Four super sixty 60: 1 air operated pumps (16 GPM "3,000 PSI with 125 psi air supply). One hydro-pneumatic pressure switches and bypasses assembly.
- Six (6 port) machined accumulator manifolds. Each manifold is equipped with: Isolation valve, Bleeder valve and Pressure gauge (0 – 6,000 psi). All bleeder lines constructed from stainless steel and vented into the tank.
- Two (2) fourteen-station remote control panel, a 20 x 20 x 6 , colour (M) operating interface, programmed for BOP control configuration. Backup power supply and motor starters incorporated into the control system on the unit. An electric over pneumatic solenoid PLC Control Panel, 24 x 36 x 10 , with integral Siemens PLC system to interface with the remote HMI control panel.
- Alarm System shall consist of: A flashing signal/horn located on the remote panel and auxiliary remote panel to alert the operator to Low Hydraulic, Air pressure and Low fluid level. A secondary alarm system is secured to the unit, utilizing a signal light and a sound horn.
- Test stump for all BOPs stack requires with adaptor flanges (c/w 5-1/2 test pup string).

### 9500:4 - MUD DEGASSING

- One (1) each Swaco Super Mud Gas Separator (SMUGS). Equipped as follows:
  - One (1) each 8 inlet
  - One (1) 12 gas vent line reduced to 8 at ground level
  - One (1) each 8 gas vent at ground level, 150 ft provide
  - One (1) each 12 mud return leg returning upstream of shale shakers

**Refer section 4.6.3 EP 2002-1500 rev1.**
- One (1) each +/-18 ft mud seal
- Ability to fill / circulate out mud leg
- Remote pressure and temperature readout

- One (1) each Swaco vacuum type degasser, powered by Mission Magnum 8 x 6 x 100 HP centrifugal pump.
  Degasser gas vent line tied into main mud gas separator gas vent line c/w check valve.
SECTION 10000 – Handling Tools

10001:1 - Kelly Spinner

1 EACH

MODEL A6C-2 INTERNATIONAL KELLY SPINNER
AIR OPERATED WITH TWO MOTORS FOR RIGHT OR
LEFT HAND ROTATION. COMPLETE WITH CONTROLS,
VALVES, FITTINGS AND HOSES. ASSEMBLY WITH 6
5/8" API REG. L.H. TOOL JOINT, MAXIMUM TORQUES
1200 FT-IBS AT 110 RPM FREE SPINNING.
BOX UP AND PIN DOWN. COMPLIES WITH API SPEC
8C

10001:2 - KELLYS

2 PIECES PER RIG OF AP) 5 4 NOMINAL SIZE HEXAGONAL KELLY, 47 FEET LONG WITH 3
4 BORE, 6 5/8" REG 7 % OD TOP CONNECTION, AND NC 50, 6 1/8 OD BOTTOM
CONNECTION.

10001:3 - H2S SAFETY VALVES

1 EACH  CLO252 (2S SAFETY VALVE 10" X 4" W/ 5 Yz" F CONNECTION, 10,000 LB
WP (FULL OPEN)

1 EACH  BL506091 (2S SAFETY VALVE 7 %" X 3 4" W)T( 4 Yz" AP )F
CONNECTION, 10,000 LB WORKING PRESSURE (FULL OPEN)

1 EACH  BL611262 H2S SAFETY VALVE 6-3/8" X 2-11/16" W)T( 3-1/2" AP )F
CONNECTION, 10,000 LB WORKING PRESSURE (FULL OPEN)

10001:4 - KELLY COCKS

2 EACH  CLO253 (2S KELLY VALVE 10" X 4" W)T( 5 Yz" F CONNECTION,
10,000 WP (FULL OPEN)
2 EACH  CL601453  (2S KELLY VALVE 7" X 2 %" W)T( 4 Yz" AP) )F CONNECTION, 10,000 WP

2 EACH  521443  H2S KELLY VALVE 6-3/8" X 2 %" W)T( 4 Yz" AP) )F CONNECTION, 10,000 WP

2 EACH  508618  (2S KELLY VALVE 5" X 2-1/8" W)T( 3 Yz" AP) )F CONNECTION, 10,000 WP

2 EACH  520207  (2S KELLY VALVE 5" X 2" W)T( 3 Yz" AP) )F CONNECTION, 10,000 WP

10002 - SPINNER
10002:1 - Drill Pipe Spinner
1 EACH  SPINMASTER MODEL 950-AN AIR OPERATED DRILL PIPE SPINNER SIZE RANGE 2 7/8"-9 1/2" COMPLETE WITH POWER PACK, 3 PC. HOSE SET, DUAL SPRING HANGER, CAHIN, AND OPERATIONS AND MAINTENANCE MANUAL.

10003 - MANUAL TONGS AND CASING
10003:1 - Manual Tongs and Casing

2 EACH  AS FOLLOWS:
30114  TYPE B MANUAL TONG; COMPLETE WITH LONG LEVER, LESS LUG JAWS

2 EACH  11765-1 LUG JAW 3 1/2"-5"

2 EACH  11196-3 LUG JAW 4 1/4 - 6 3/4"

2 EACH  11196-2 LUG JAW 6 5/8-9"

2 EACH  11297-1 LUG JAW 9"-10 3/4"
2 EACH  30791-2500 EXTENDED HEAD ASSY.
    13 3/8" - 25 1/2"

**10005 - TONGS**

**10005:1 - Hydraulic casing tongs**

1 EACH (REBUILT) WEATHERFORD MODEL 16000 HYDRAULIC CASING TONG COMPLETE WITH 3 3/8" ROTARY, SPRING HANGER, TORQUE GAUGE, AND JAWS FOR 7", 9 5/8" AND 13 3/8" CASING

1 EACH (NEW) 6912 DIESEL HYDRAULIC POWER UNIT COMPLETE WITH 6 CYL DEUTZ AIR COOLED ENGINE, ELECTRIC START, TANDEM GEAR PUMP, FOR TUBING/CASING TONG CIRCUIT, HYDRAULIC OIL COLLER, AND 90 GALLON RESERVOIR, GAUGE PACKAGE, BATTERY BOX WITH BATTERY, 30 GALLON FUEL TANK, AND 2 (50') HOSES, MOUNTED ON OILFIELD SKID WITH HOSE BASKET

**10005:2 - TUBING TONG**

1 EACH FARR HYDRAULIC TUBING TONG SIZE RANGE 1.050 TO 4 1/2" UNIT COMPLETE WITH SPRING HANGER. TORQUE RATING 6670 FT LBS @ 2000 PSI

1 EACH MANUAL BACK-UP ASSY. W/ LUG JAWS FOR 3 1/2" TO 4 1/2"

1 EACH 3 1/2" JAW SET

1 EACH 4 1/2" JAW SET

**10005:3 - Tubing spider**

1 EACH WESTCO MODEL CHD AIR OPERATED TUBING SPIDER, SIZE RANGE 1.315 TO 5 1/2". RATED CAPACITY 125 TONS.

1 EACH SLIP BODY 3 1/2' TO 4 1/2"
1 EACH INSERT SET FOR 3 1/2"
1 EACH INSERT SET FOR 4 1/2"
1 EACH FOOT CONTROL VALVE
3 EACH SUPPLY LINES WITH FITTINGS, 15'

SECTION 15000 - LOT1 OPTIONAL EQUIPMENT

15000:1 – MUD TANKS

4 EACH 300 bbl (47.7 m³) mud processing tanks to be setup as modular replacements for existing tanks. Additional tanks will be plumbed and equipped properly to be put into immediate service.

15200:1 – RESERVE OIL TANK

1 EACH 1000 bbl reserve oil tank provided on twin-runner oil field skid with pull bars. Complete with fittings, primer, and single color paint.

15200:2 – POTABLE WATER TANK

1 EACH 1000 bbl potable water tank provided on twin-runner oil field skid with pull bars. Complete with fittings, primer, and single color paint. Tank provided may be plastic construction as provider dictates.