

# DRILLING STRUCTURES INTERNATIONAL, INC.

2431 Kelly Lane  
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[Dsi45@aol.com](mailto:Dsi45@aol.com)

## Drilling Structures International Inc. 3000HP SCR Fast Move Rig Package

The Drilling Structures International Inc. 3000 H.P. Rig Package is designed to meet the demands of our customers for today's competitive market using the latest in technology. When designing rig packages we try to meet three simple goals. All rig components must:

1. Operate Properly.
2. Rig up quickly.
3. Transport in the fewest loads possible.

Using these principles, we have designed this rig package to meet or exceed all of our customers needs. Drilling Structures Int'l Inc. is pleased to submit the proposal for the following fabrication.

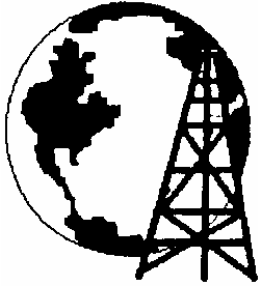
### **I. Hoisting Equipment**

The DSI 1,500,000 lb low lift cantilever mast and winch raising parallelogram substructure has a 3000 hp rating and can transport in less than 10 loads.

#### **A. DSI 1,500,000# Cantilever Type Mast**

152' X 30'-0" Base beam cantilever mast. Mast hook load capacity of 1,500,000 lb with 14 lines strung to traveling block. Mast designed per A.P.I. Specification 4F.

- Crown block complete with 7-60" fabricated cluster sheaves and 1-60" fabricated fast line sheave, tapered roller bearing. Shaft drilled for grease fittings, line guards, crown safety platform and handrails.
- Adjustable racking board with a capacity of 363 stands of 5" drill pipe and 12 stands of 9" drill collars, complete with working platform, floor slab and 7' high handrails. Racking board complete with Emergency escape.
- Full-length ladder assembly.
- Two (2) derrick boom kits designed to support 5,000 lb load, complete with boom, attachments, and 8" sheaves (2 per kit) grooved for 9/16" wire line.
- Set of tong counter weights (2 per set) complete with buckets, guide, blocks and lines.
- Raising line set complete with sling line equalizer.
- Set of standpipe clamps to accommodate 5 1/2" O.D. standpipes.
- Set of shim-type adjustable front and rear shoes, complete with shims



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- Leg mounted deadline anchor with 100,000# deadline load with brass for drill line size.
- Casing stabbing board complete with 20' of vertical travel, girt adapter brackets, adjustable hinged working platform with removable handrails, belly band and pad. Two (2) independent anti-fall safety devices and half-ton certified manrider air hoist to be included. All steel to be hot dipped galvanized.
- Set of assembly bolts and pins.

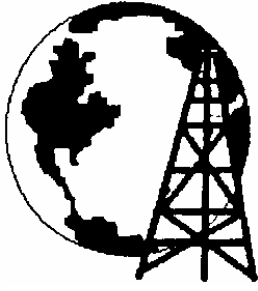
## B. "New" DSI 32'-0" Parallelogram Substructure

The substructure has a 32'-0" working floor height, a rotary capacity of 1,500,000 lb and a setback capacity of 1,000,000 lb. It is manufactured with a rigid box type design with four diagonal legs to insure stability.

- The substructure transports in three compact loads.
- Substructure to accommodate a cantilever type mast.
- Clear height under rotary beams to be approximately 27'-0".
- Rotary and Setback areas to have a containment system built into the center steel. Containment system designed to return excess fluids to the cellar area.
- Substructure complete with:
  - Diamond plate flooring on working floor area not covered by machinery or setback pad.
  - Flooring and handrails surround working floor.
  - Substructure accommodates a 37 1/2" rotary table with independent drive. The independent rotary table is built into the center steel and does not have to be removed during rig moves.

## C. Drawworks.

- Model – "Rebuilt" National 1625 UE
- Rated Horsepower – 3000
- Drilling Line – 1-5/8"
- Sand Line – Not Required
- Auxiliary Brake – Baylor 7838
- Crown Protection – Crown-0-Matic
- Power – Three (3) DC Motors GE 752 (1000 HP each intermittent, 750 HP continuous)
- Brake Radiator – Heat Exchangers & Brake
- EZ-Torque Type -1
- Circulation Tank
- Automatic Driller – Martin Decker Satellite



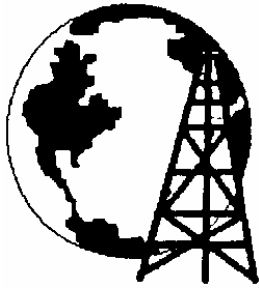
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## *D. Substructure Accessories*

- B.O.P Handling System – Tracking beams mounted in the substructure with two (2) Ingersol-Rand 25 Ton Air Hoists
- 32' Telescoping Headache Rack
- Rig Floor Slide/Escape
- Rig Floor Stairways – All stairs to meet OSHA standards with no slip grip strut stair treads.
  - Three (3) 32'-0" stairways from substructure floor to ground level. Stairs to be built on a 45-degree angle.
  - One (1) 23'-6" stairway from top of the substructure to top of trip tank. Stairs to be built on a 45 degree angle.
- V-Door Ramp – Ramp to be fabricated to work with a 32'-0" floor height substructure and a 42" catwalk. Ramp to be fabricated with ½" plate and 3" pipe guides.
- Doghouse – House to be fabricated on an oilfield type skid with loading hitches on both ends for tailboarding. House to have checker plated flooring, v-crimped wall construction, and an arched type roof. House complete with the following:
  - 4'-0" porch on both ends
  - 2'-0" walkway on the back side of the doghouse running to full length.
  - Handrails around house perimeter.
  - One sliding doorway to rig side.
  - Two swing type doorways on both ends with windows built in.
  - Two (2) windows on the back side wall
  - Knowledge box
  - Four compartment work bench
- SELF SUFFICIENT DIESEL ELECTRIC HYDRAULIC POWER UNIT  
– 70 GPM @ 3000 PSI CAPABLE
  - i. Heavy duty steel skid and frame (with 7' x 6' x 18" storage basket); lifting eyes, loading hitches (both ends), and fork pockets. Skid is 7'- 6" wide x 16' long x 86" tall.
  - ii. 450 gallon reservoir, clean out cover, sight level gauge, vent breather filter, and thermometer.

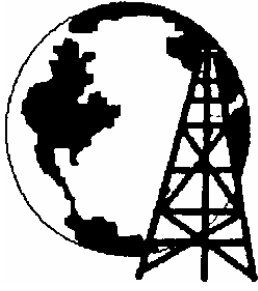


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- iii. 75 gallon diesel tank, clean out cover, vent breather filter. (Supply diesel engine)
- iv. 145 hp John Deere Diesel engine / 70 gpm pressure compensated piston pump. (Main pump backup)
- v. 125 hp – 1800 rpm – Electric motor / 70 gpm pressure compensated piston pump. (Main pump)
- vi. 20 gpm vane pump. (Filter / Heater circulation pump)
- vii. Heavy duty Nema 4 combination motor starter / disconnect and DC to DC converter for operating the valve controls. (100 hp)
- viii. Pressure – Return – and – Circulation Filters w/ visual indicator – 5 micron high efficiency synthetic elements.
- ix. 2 kw – 110 vac circulation heater.
- x. Suction ball valves / outlet check valves for pump isolation.
- xi. In line hydraulic flow meter and pressure gauges for diagnostics.
- xii. System safety relief valve.
- xiii. Circuit breaker panel for heater / valve stand operation.
- xiv. All hoses / fittings 3000 psi operating pressure rated.
- xv. Quick disconnect panel (utilizing Stucchi threaded style) for easy connection from HPU to Rig.
- xvi. SYSTEM IS PRE – RAN AND TESTED, WITH A DOCUMENTED CLEANLINESS LEVEL OF ISO 17/15/13 AS A MINIMUM.
- xvii. DESCRIPTION OF “Heavy Duty” WINCH UP RIG HYDRAULIC CONTROLS
  1. Custom valve stand (attached and integral to the HPU) with (2) station manifold and all associated valving for the following functions:
    - 1) (2) Substructure Raise / Lower (winch control with individual proportional speed adjust)
    - 2) (2) Supply and Return Connections for accessory functions.
    - 3) Electrical control panel w/ Power supply, and all other required electrical components.
    - 4) Radio remote control and hard wired selector switches for back-up control.
  2. Substructure will raise and lower level and system will allow for individual winch operation if they are out of level. Sub will raise in 12 - 15 minutes. All functions have adjustments for speed control, if a different speed is desired.



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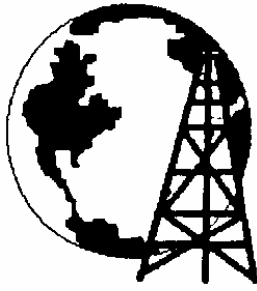
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- D. 750 Ton Traveling Block (as per API SPEC. 8A / 8C) \  
i. Canrig Model B-7-60-750.  
1. API load rating: 750 ton.  
2. Sheaves grooved for 1 ½” wire.  
3. Number of sheaves: 7  
4. Diameter of sheaves 60”.
- E. Drilling Line  
7500 ft of 1 5/8” class 6 x 19 EIPS-IWRC cable c/w hospel
- F. Drill Line Spool  
a. One (1) Air operated drill line spool complete with air motor, gear system and chain guard.

## II. Prime Mover Drive

- A. SCR System (5 Bay)  
One (1) International Electric Company SCR House. The I- Drive System will be manufactured by IEC Systems LLC and designed and equipped to control and power the following loads:
- Five (5) A/C Engine/generator sets
  - One (1) 3000 hp Drawworks, driven by three (3) x 1000 hp (Series) DC Motor
  - Three (3) x 1600 hp Mud Pumps, each driven by two (2) x 1000 hp (Series) DC Motors
  - One (1) 1000 HP Independent Rotary Drive
  - Top Drive Feeder
- B. Lighting System  
Heavy Duty explosion proof Fluorescent and Mercury Vapor Lightning System designed to use with Mast and Substructure, Mud System, complete with Plug, Receptacles, Cable, Cable Clamps and all necessary Leads and fitting. Lighting System consist of: Mast and Racking Platform, Substructure Lighting, Mud Tanks and Mud Pumps, and Utility House, including Battery emergency light at Driller’s console certified for Class 1 Division 2.
- C. Engine/Generator Package  
Engine/Generators – Five (5) New Mustang/Caterpillar Model 3512C or Equivalent (Cummins, Detroit, and Volvo) with Direct Injection Turbocharged and Separate Circuit After cooled Land Electric Diesel Engine, *Rated 1476 H.P. at 1200 R.P.M.*



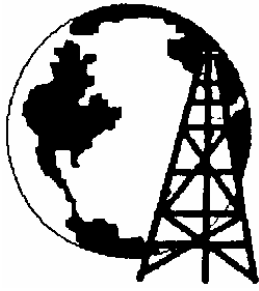
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*2007 EPA Non-Road Emission Certified*, with the following standard attachments as listed below:

- 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.
- Radiator Cooled Land Based:
  - Outlet controlled thermostat and housing
  - Jacket water pump gear driven
  - Dual outlet
  - Aftercooler fresh 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, 203 mm (8 in)
  - Exhaust flange, weldable, 356 mm (12 in)
  - Exhaust manifolds, dry
  - Dual turbochargers with w/c bearings
- Flywheels and Flywheel Housings
  - Flywheel, SAE No. 00
  - Flywheel housing, SAE No. 00
  - SAE standard rotation
- Fuel System
  - Fuel filter
  - Fuel transfer pump
  - Flexible fuel lines
  - Fuel priming pump, left hand
  - Electronically controlled unit injectors
- Instrumentation
  - Electronic Instrument Panel, left hand
  - Analog gauges with digital display data for:
    - Engine oil pressure gauge
    - Engine water temperature gauge
    - Fuel pressure gauge
    - System DC voltage gauge
    - Air inlet restriction gauge
    - Exhaust temperature (prior to turbochargers) gauge

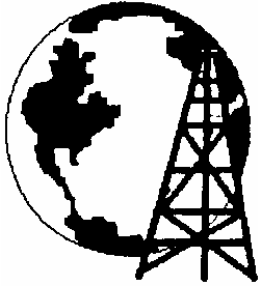


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- Fuel filter differential pressure gauge
- Oil filter differential pressure gauge
- Service meter (digital display only)
- Tachometer (digital display only)
- Instantaneous fuel consumption (digital display only)
- Total fuel consumed (digital display 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 modules(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.



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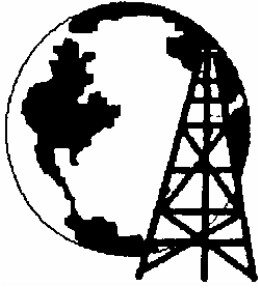
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- Starting System
  - Air starting motor, right hand, 620 to 1034 kPa (90 to 150 psi), left hand control.
  - Air silencer
- General
  - Paint, Caterpillar Yellow
  - Vibration damper and guard
  - Lifting eyes
- b.** Generator – Caterpillar SR4B 1750 KVA or Volvo generator, two bearing, 1225 KW, 867 frame, .7 PF, 600 volt complete with Stator RTD's, Space heater, Bus bar and cable access box.
- c.** Radiators – Conventional style Split Core Radiator (56 sq. ft.) with two circuits for engine jacket water and after-cooler. Includes: 78" Blower fan, fan drive, fan pulleys, belt guard, fan guard, fuel cooler and Water connections.
- d.** Master Skids – Five (5) 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:
  - Completely covered with ¼" check plate
  - Drilled and tapped plates for removable arched type roof connections.
  - Drilled and tapped plates for removal of engine pony skid.
- e.** Roofs – Removable arched type roofs (38'-0" x 10'-0" x 12"). Roofs to consist of the following:
  - Six (6) T.S. 4" x 4" x ¼" support legs with bolt hole patterns to fit tapped holes on skids. Leg supports complete with square tubing diagonal supports for stabilization.
  - Two (2) hinged channel running the length of the roof to prevent rain run off. Channels cut in 5'-0" sections for easy handling and located between each engine package.

### III. Rotating Equipment

#### A. "New" 37 ½" Rotary Table and Accessories

- i. American Block Model RK-375. Rotary table with 37 ½" table opening, Complete with:
  1. HMB Hinged Pin Drive Master Bushing assembly, complete with API No. 3 (33) insert bowl, bit breaker adapter plate and sling for 37 ½".
  2. No. 1 bowl for 13 3/8" and 11 ¾" pipe.



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3. No. 2 bowl for 10 3/4" & 9 5/8" pipe.
  4. 27 RPH Kelly Bushing complete with wrench less wiper assembly for 5 1/4" hex.
  5. 3 1/2" RPH/RSH square kelly roller assembly.
  6. 37 1/2" X 20 & 18 5/8" SCB split casing bushing for 37 1/2" .
  7. 20" CL casing slip complete with buttons.
  8. 13 3/8" CL casing slip complete with buttons.
  9. 9 5/8" CL casing slip complete with buttons.
  10. 5 1/2" RDL extra long rotary slip complete with inserts.
  11. 3 1/2" X 2 7/8" medium long rotary slip complete with inserts.
- ii. Independent Rotary Drive
1. National C-700 Transmission
  2. One (1) 752 Traction Motor
  3. Chain Driven
  4. Incorporated into the one-piece center steel.

## B. "New" Portable 750 TON AC Top Drive Drilling System

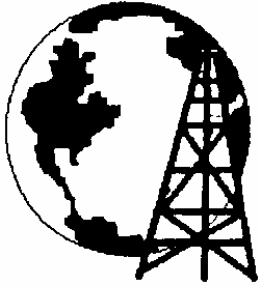
### Top Drive Unit – CanRig Model 1275AC

- Local Blower System
- Control Console *c/w* Advanced Diagnostic System
- TO Support Unit - Standard Compact - 150ft standard cable allowance
- Electrical Interface Materials for TDSU Applications
- TDSU Supply Cables - 100 ft standard
- Torque Guide - Folding
- Services, Self-Contained
- Interface Materials - Mechanical:
- Crown Hanger
- Note: CanRig to supply required hardware materials.
- Harpoon
- Torque Reaction Assembly
- Control Valve Configuration
- Tool Joint & Stabbing Guide Kit,
- Remote Actuated Lower Well Control Valve Assembly (4")
- Complete Assembly M&M Valve and Can rig Actuator

## IV. Circulating Systems

### A. Mud Pumps

- i. Three (3) "New" Gardner Denver PZ-11 Mud Pumps, 1600 HP, Liners 6 1/4" x 12", 643 gpm each @ 3200 psi driven by 6 each GE-752, 1000 hp traction motors, furnished with:



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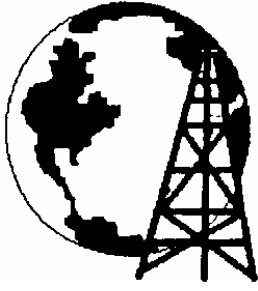
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1. Unitized on a two-runner oilfield type skid with loading hitches on both ends for tailboarding.
2. Steel traction motor subbase with two (2) adjustable motor base plates.
3. Two (2) "New" 752 Series wound DC traction motors. Each motor to include a 15 HP Blower and junction box with lock out switch.
4. High pressure pulsation dampener, 5000 psi.
5. 3" Relief Valve, manual reset, 1500-5000 PSI with flange connection.
6. SPM meter (0-200)
7. Pressure gauge, 0-5000 PSI range with flange connection.
8. Pressure and Suction Manifold
9. Discharge strainer block.
10. Suction Strainer.
11. Centrifugal charging pump 5 x 6 with mechanical seal and hard iron material, all mounted on a mission fabricated steel base with woods style coupling, OSHA type coupling guard and a 75 HP 1750 RPM, 3 PH, 230/460 Volt, 60 Hz explosion proof electric motor.

B. 2000 BBL Round Mud System(1000 Active System: 1000 BBL Reserve System)

- a.** 2000 bbl, Four (4) tank round bottom mud system with all piping valves and fittings for standard operation. Mud System complete with:
- Active and Reserve System
  - Mud Mixing System
  - Mud Lab
  - Interconnecting Piping for the Following Equipment:
    - Six (6) Mission Magnum 6 x 5 x 14 magnum with a 10.5 inch impeller, mechanical seal and hard iron material, all mounted on a mission fabricated steel base with woods style coupling, OSHA type coupling guard and a 75 HP 1750 RPM, 3 PH, 230/460 Volt, 60 Hz explosion proof electric motor.
    - Eleven (11) Derrick DE-AG-10 Agitators complete with 10 HP, 1800 RPM explosion proof C-face motor bolted to a gear box. Including shaft stabilizer, shaft and impeller.
    - Two (2) Derrick DE-AG-15 Agitators complete with 15 HP, 1800 RPM explosion proof C-face motor bolted to



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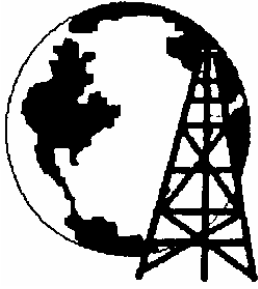
a gear box. Including shaft stabilizer, shaft and impeller.

- One (1) Derrick 503 Mud Cleaner complete with:
  - a. One (1) 3 cone desander
  - b. One (1) 20 cone desilter
- Two (2) Hopper with venturi.
- One (1) Derrick Vacuum degasser 1200 GPM. Skid mounted with heavy duty 3 HP explosion proof 230/460 volt, 60 Hz, 3 Ph, 1800 RPM motor and manual starter with heavy duty vacuum pump.
- Three (3) Derrick Flo-Line Cleaner 503 Shale Shakers with Weir Feed complete with three panel screen frame, support structure, and explosion proof electrics with the following options:
  - a. A.W.D. (+7 deg uphill to -1 deg downhill)
  - b. Standard Screen Underflow hopper
  - c. Weir Feed
  - d. Super G Vibrations Motors
  - e. Single side tensioning system

## C. Combo Skid

**a.** Combo skid to be fabricated on a three-runner oilfield type skid with loading hitches on both ends for tailboarding. Skid to include the following:

- Trip Tank – One (1) 100 bbl trip tank. Tank to include the following:
  - Galvanized grating on top of tank.
  - Skid porch with provisions for mounting:
  - One (1) 2 x 3 x 30 HP centrifugal pump
- Brake Water Tank – One (1) break water tank. Tank to have the following:
  - Tank bottoms to be 3/8" plate.
  - Tanks constructed with 1/4" v-crimp.
  - Tank rims to be 4" square tubing.
  - Top of tanks, overhead walkway, top of skid covered with 1/4" plate.
  - Cleanout, access ladder, and man way
  - Provisions to mount:
    - Two (2) 2 x 3 x 25 H.P. centrifugal pumps



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- Heat exchanger
- Safety alarm package.

- Choke Manifold Skid

Provisions to mount one choke manifold.

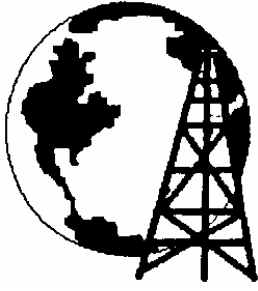
## D. 48" Mud Gas Separator

- Mud gas separator complete with:
  - 48" Pipe with weld caps on both ends.
  - Internal baffles.
  - All piping and pipe brackets.
  - Gas buster to elevate to working condition to allow operation under half full conditions.
  - Gas buster to be mounted in lay down position for transport and to be raised by truck for operation.

## V. Blow Out Preventer

### A. Choke and Kill Manifold

- Choke and Kill Manifold Assembly, Kill Line Valve Assembly, and Choke Line Valve Assembly
- (3) Gate Valve, 4-1/16" 10,000psi, Cameron Style, FC, Manual Operated.
- Gate Valve, 4-1/16" 10,000psi, Hydraulically Operated, DFC
- (9) Gate Valve, 2 1/16" 10,000psi, Cameron Style, Manually Operated, Flanged End
- Studded Cross, 2 X 2 X 2 X 2, 10,000psi
- Studded 5-Way Cross, 4-1/16" 10,000psi X 4-1/16" 10,000psi X 2-1/16" 10,000psi X 2-1/16" 10,000psi X 2-1/16" 10,000psi, with B7 Studs and Grade 2H Nuts.
- Spacer Spool, 2 1/16" 10,000psi Flanged x 2 1/16" 10,000psi flanged.
- Adapter Spool, 2-1/16" 10,000psi, Flanged End X 2-9/16" 10,000psi, Flanged End.
- Check Valve, 2-1/16" 10,000psi, DVI, Model R, DD Trim, Temperature Class P-U, PSL 2, PR1, Flanged End.
- Adjustable Choke, 2-1/16" 10,000psi, DVI, Model H2, Manually Operated, EE Trim, Temperature Class P-U, PSL 2, PR1, 2" Maximum Orifice, Flanged End, Stainless Steel Lined Ring Grooves.
- Double Studded Adapter, 2-9/16" 10,000psi X 2-1/16" 10,000psi, with B7 Studs and Grade 2H Nuts.
- Double Studded Adapter, 4-1/16" 10,000psi X 2-1/16" with B7 Studs and Grade 2H Nuts.



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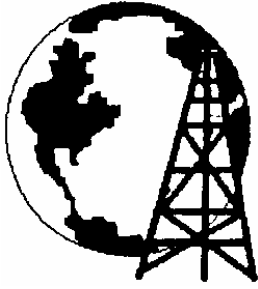
- m. Hydraulic Choke, 2-9/16" 10,000psi, SWACO Style, Super Choke, EE Trim , Temp Class P-U, Flanged End with Stainless Steel Lined Ring Grooves.
- n. Spacer Spool, 4-1/16" 10,000psi X 4-1/16" 10,000psi 12" Tall.
- o. Buffer Tank Assembly, Shell Test 15,000psi, Working Pressure 10,000psi, Main Tube 9" OD X 7" ID 4130 Mechanical Tubing, with two 4-1/16" 5,000psi Studded End Caps, two 2-1/16" 10,000psi. Flanged Inlets, One 4-1/16" 10,000psi Flanged Inlet connected to a 4-1/16" 5,000psi Flanged Outlet by utilizing 6" OD X 4" ID Tube that isolates this " Panic Line" from the remainder of the buffer tank, Two 2-1/16" 5,000psi Extended Flanged Outlet. Heat Treated.
- p. Flanged Mud Gauge, 2 1/16" 10,000psi, Cameron Style, Model F, Range 0-10,000psi.
- q. (2) Adapter Flange, 2-1/16", 10,000psi X 2" Figure 1502 Female Threaded Half with Seal.
- r. (2) Blind Flange, 4-1/16" 5,000psi.
- s. Blind Flange, 2-1/16" 10,000psi
- t. (2) Target Flange, 2-1/16" 5,000psi, Lead Filled.
- u. Blank-n Plug, 2-1/16" 10,000psi X 1502 Union, Male Half.
- v. Hammer Nut, 2" 1502 Union
- w. (5) Ring Gasket, BX155, Stainless Steel.
- x. (19) Ring Gasket BX152, Stainless Steel
- y. (2) Ring Gasket RX153
- z. (2) Ring Gasket R39 Stainless Steel
- aa. (88) Stud, 3/4" X 5-1/2" B7, w/ 2 Grade 2H Nuts Each, 2-1/16" 10M
- bb. (24) Stud, 1-1/8" X 8- 1/4", B7 w/ 2 Grade 2H Nuts Each, 4-1/16" 10M
- cc. (24) Stud, 7/8" X 6-1/4" B7, w/ 2 Grade 2H Nuts, 2-9/16" 10M, 2-1/16" 5M

**B. B.O.P. Stack (All items are rebuilt at an API certified facility. Data books and test charts included. These BOP are NON-H2S SERVICE)**

- a. 13 5/8" x 10M Shaffer SL Double with 4 x 4 1/16" outlets
- b. 13 5/8" x 10M Shaffer SL Single with 2 x 4 1/16" outlets
- c. 13 5/8" x 5M Shaffer spherical annular with 10M flanged bottom and studded top.

**C. Accumulator Unit - 7 station closing unit with 2 remotes, 1 each 150' and 1 each 60' umbilical for 10K Stack.**

- i. 24 each new 11 gallon accumulator
- ii. 3 each new 60:1 pneumatic pumps
- iii. 1 each new triplex pump with 1 1/4" plungers
- iv. 1 each new 30 HP Motor
- v. 1 each new Barksdale electric hydraulic pressure control switch.



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- vi. 2 each new 1500 PSI pressure regulators
- vii. 7 each new 1" Barksdale selector valves
- viii. 1 each new 1" Barksdale bypass valve (high/low pressure)
- ix. 8 each new 3 x 4 air cylinders (select valves)
  - x. 3 each new 6" glycerin filled pressure gauges (1 x 3000psi, 2 x 6000psi)
- xi. 1 each new pneumatic/hydraulic pressure switch
- xii. 3 each new directional check valves (1 x 1", 2 x 1/2")
- xiii. 2 each new 3500 psi pressure relief valves
- xiv. 1 each 16-function fixed plate
- xv. 5 each new 1" 3000 psi ball valves
  - 1 each new moisture separator and oiler (air inlet)

## VI. Utilities

### A. Air Compressor & Receiver

- a. Two (2) Gardner Denver, ST-50, Electra-Saver II, rotary screw air compressor, Model EBE99Q. 50 HP, 460 volts, 3 phase, 60 HZ, TEFC, with NEMA 4 Control Enclosure.
- b. Two (2) Steel Fab, 400 gallon, vertical air receivers with full skirt, 200 psi working pressure. Part # A12614. Unit is California Coded.
- c. One (1) Gardner Denver – 9 HP Cold Start.
- d. One (1) RNC250 air dryer for 250 CFM.

### B. Air Hoist – Two main rig hoists for rig floor.

- a. Ram Winch Model K10UL20MX1G – 10000lb Rig Winch
- b. Ram Winch Model K5UR50DML14AM1G – 5000 lb. Man Rider Winch.

### C. Derrick Board Winch

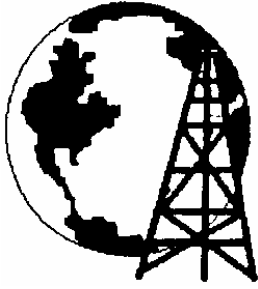
- a. Derrickman winch, 2500 lbs working capacity.

### D. BOP Handling System

- a. Ingersoll-Rand - 50 Ton BOP Handling System consisting of 2-25 Ton Air Hoists equipped with hand geared trolleys, 30' of lift.

## VII. Instrumentation

- A. Drift Indicator - Totco Double Recording Drift 0 to 8° and 0 to 14°. Clock complete with following:



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- i. 1 ea. Godevil Kit
- ii. 1 ea. Chart tool & Chart Reader
- iii. 1 ea. Tool Maintenance Box w/ Tool
- iv. 100 ea. Chart 0 to 8° and 0 to 14°
- v. 10 ea. Rubber Finger Stabilizer
- vi. Fishing Tool 7 rope sockets

B. Indicator/Gauge & Counter – EMS-2 Rotary Torque indicator, Weight indicator, Tong torque gauge, Circulating pressure gauge, two (2) ea. Pump stroke counter.

C. Drilling Recorder – EMS-2 Drilling recorder, 5 pen (weight, torque, penetration rate, pump pressure, rotary rpm). (ada di 103 dan kurang 6 buah Printed Circuit Board).

D. PVT – EMS-2 Pit volume totalizer, single channel with audio alarm and warning lights, four pit transmitters totalizing relay, gain and loss gauge with gauge zero device. Full digital instrumentations.

E. Flow-Shoe-Device – EMS-2 Device complete with recorder and alarm system.

## VIII. Fabrications

A. “New” Accumulator/Junk Box

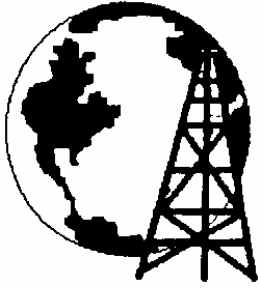
Material and labor to fabricate one (1) accumulator/pipe bend skid as per our conversations. DSII to fabricate a three runner oilfield type skid (40' x 10' x 12") covered with ¼" check plate. Pipe bend fabricated out of customer furnished drill pipe. Piping to be done during rig up. Skids complete with:

- b. One (1) arched type roof with T.S. 4"x4"x ¼" legs and gussets plates welded on roof and flooring for support

B. “New” Warehouse/Workshop

Material and labor to fabricate one (1) Warehouse/Workshop. Shop fabricated on oilfield type skids with loading hitches on both ends for tailboarding. Skid to be covered with ¼" check plate. Workshop complete with the following:

- c. Work Table
- d. Work Bench
- e. Storage Compartments
- f. Storage Shelves.



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C. Two (2) 500 bbl Water Tank

Material and labor to fabricate two (2) 500 bbl water tank as per our conversation. Tanks fabricated on oilfield type skids with loading hitches on both ends for tailboarding. Skid ends to be covered with ¼" check plate. Tanks complete with the following:

- Two (2) 3 x 2 x 11 Centrifugal pumps with 25 HP Motors
- Suction and Discharge Piping.
- Two (2) ladder rung to top of tank (In and Out)
- 4" Fill cap
- 2" Outlet
- 1" Drain

D. "New" Two (2) 12,000 Gallon Fuel Tank

Material and labor to fabricate two (2) 12,000 gallon fuel tank as per our conversation. Tanks fabricated on oilfield type skids with loading hitches on both ends for tailboarding. Skid ends to be covered with ¼" check plate. Tanks complete with the following:

- g. Two (2) fuel transfer pumps
- h. One (1) filter system. Raycor or equivalent
- i. Suction and Discharge Piping.
- j. Two (2) ladder rung to top of tank (In and Out)
- k. Top and Side man ways, 4" Fill cap, 2" Outlet, and 1 ½" Drain

E. "New" One (1) Catwalk

Material and labor to fabricate one (1) catwalk as per our conversations. DSII to fabricate catwalk (50' x 7'-0" x 18") with 18" channel main runners, 6" channel cross members, and covered with ½" plate. Catwalks complete with 3' drill pipe screwed in on one end.

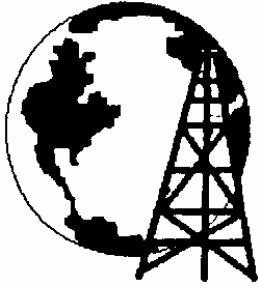
F. "New" Pipe Racks

- a. Material and labor to fabricate eight (8) pipe racks. Pipe rack (30' x 42"x42") to be fabricated out of Schedule 80 pipe.

G. "New" Cable Trays

Material and labor to fabricate one (1) lot of cable trays as per the following:  
Cable trays to be fabricated as follows:

- l. Two (1) 40'-0" sections from substructure to fuel tank
- m. One (1) 35'-0" section from mud tanks to main tray
- n. One (1) 20'-0" section from substructure to main stairs
- o. Cable trays complete with the following:



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- Hinged doors in 5'-0" sections with chain for each doorway
- Flat expanded metal running the length of each tray
- ½" round bar at each end of cable tray to provide protection when pulling wires.

## H. "New" Vibrator Hoses

- i. Four (4) 3 ½" x 12' long, 5000 psi wp with 4" welded connections. For connection of mud pumps to substructure high pressure line.

## I. "New" Rotary Hose

- ii. One (1) 3 ½" x 75', 5000 psi wp with 4" welded connections. Complete with safety clamps, chains and hammer unions on each end.

## J. "New" Wire Line Unit

- iii. Five Star surveyor wireline unit with 15 HP, 1800 rpm, 480 volt, 3-phase, 60 HZ Explosion proof motor, complete with one (1) line guard , counter and 20,000' of .108 wireline.

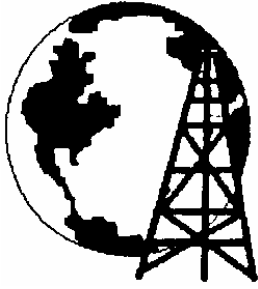
## **IX. Rig up and Testing**

### A. Structural set and assemble:

- a. Mast and Substructure
  - i. Mast accessories.
  - ii. Install flooring, handrails, v-door, stairs, etc.
  - iii. Fabricate and install flow line and bell nipple.
- b. Rotary Table and independent drive
- c. Drawworks
- d. Doghouse
- e. SCR control panel, foot pedal and drawworks console.
- f. Mud Pumps
- g. Brake water/trip tank
- h. Fuel Tanks
- i. Cable Trays
- j. Engine package.
- k. Accumulator/Junk basket

### B. Piping, Fittings, hoses, valves, etc.

- a. Water Supply
  - i. Rig Floor
  - ii. Brake water system

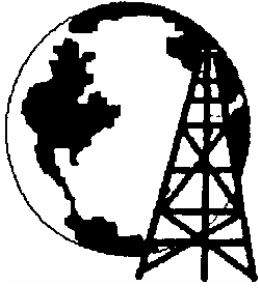


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- iii. Feed and return lines from brake water tank to drawworks drum and brake.
- b. Fuel System
  - i. Feed and return lines from tank to engine set.
- c. Air System
  - i. Air Supply for accumulator unit and rig floor
  - ii. Hose connections from rig floor air manifold to drawworks control console and air hoist.
  - iii. Miscellaneous
    - 1. Two (2) rig floor air hoists and stands.
- d. High Pressure piping.
  - i. Supply and Install dual standpipe, standpipe manifold and all necessary high-pressure lines and hoses.
  - ii. Cameron or equivalent 5000 psi wp dual stand pipe manifold complete with gate valves, pressure gauge of 5000 psi rating and other standard fittings.
  - iii. 5" x 5000 psi wp dual stand pipe of suitable length with clamps installed on the off-drillers side. Complete with gooseneck, hammer union or unbolt couplings for making up a rotary hose with the safety clamp attached. All weld type fittings.
  - iv. 5" x 5000 psi wp dual stand pipe manifold with connections for pressure gauge, kill line, cellar jet line with two (2) 2" x 5000# valves and one (1) 5000 psi pressure gauge. All welded type fittings.
  - v. Rig pump delivery manifold shall be connected to the vibrator hoses through a rigidly supported strainer cross.
  - vi. A 5000 psi working pressure gate valve on each mud delivery manifold. From each pump delivery manifold, a suitable bleed line and valve should be provided.
  - vii. Necessary anchoring arrangement of all high-pressure delivery lines to be provided.
- e. Electrical Rig Up
- f. Testing
  - i. FILL MUD TANKS WITH WATER.
  - ii. PROVIDE LUBE PRODUCTS TO ALL MACHINERY
  - iii. PROVIDE 1000 GALLONS DIESEL FUEL
  - iv. RUN DRAWWORKS
  - v. RUN ROTARY TABLE
  - vi. CIRCULATE WATER THROUGHOUT MUD SYSTEM
  - vii. RUN AIR COMPRESSORS AND PRESSURE TEST AIR MANIFOLD



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- viii. PRESSURE TEST ALL HIGH PRESSURE LINES AND CONNECTIONS TO WORKING PRESSURE
- ix. PRESSURE TEST ALL LOW PRESSURE LINES TO WORKING PRESSURE
- x. CIRCULATE THROUGH HIGH PRESSURE SYSTEM FOR MINIMUM OF FOUR (4) HOURS
- xi. RUN ALL SOLIDS CONTROL EQUIPMENT
- xii. LOAD TEST GENERATORS
- xiii. RUN ALL GENERATOR SETS IN PARALLEL
- xiv. TEST ALL SCR ASSIGNMENTS
- xv. RIG-DOWN AND LOAD-OUT ON CUSTOMER-FURNISHED TRUCKS.
- xvi. DRILLING RIG COMPONENTS TO BE BLASTED, PRIMED WITH EPOXY PRIMER AND TOP COATED Rig Down

## **X. Documentation, Manuals, Warranty Certificates, and API Certifications**

All manufacturers' warranties for each individual component will be included with the rig upon delivery.