Friede & Goldman L-780 design Independent leg Cantilever Jackup Drilling Rig

Built 1981, Class ABS
Accommodation for 86 persons
Helideck for Sikorsky S

**Principal Rig Characteristics and Dimensions**

- Length Overall 180’ 0"
- Width of Hull 175’ 0"
- Depth of Hull 25’ 0"
- Number of Legs 3 legs
- Overall Length of Legs and Spud Cans 401’ 8”
- Longitudinal Leg Center 115’ 0”
- Transverse Leg Center 120’ 0”
- Spud Can Diameter (across flats) 39’10”
- Spud Can Height 14’ 6”
- Preload Spud Can Load 8,591 kips/can
- Spud Can Area 1,117 sq. ft./can
- Loadline draft 15’ 0”
- Jack House Leg Length Requirement 41’ 0”
- Top of Rotary to Bottom of Hull 51’ 0”

**Principal Cantilever and Drill Floor Dimensions and Load Limits**

- Max. Cantilever reach (out) from aft edge of rig (transom) 40’ 0”
- Min. Cantilever reach (in) from aft edge of rig (transom) 15’ 0”
- Max. Transverse reach from rig centerline (Port / Starboard) 10’ 0”
- Cantilever Pipe Rack Size (L x W) 50’ x 55’
- Main Deck Pipe Rack Size (L x W) 40’ x 40’
- Max. Hook Load 1,000 kips
- Max. Rotary Load 1,000 kips
- Max. Set back Load 450 kips
- Drive Pipe Tensioner 120 kips
- Cantilever and Main Deck Pipe Rack Load Limit 540 lbs./ft.
- Typical Main Deck Load Limit 425 lbs./ft.

**DRILLING EQUIPMENT**

1. Drawworks - Mid-Continent U-1220 EB, driven by two (2) GE 752 AR 1,000 hp DC motors. Drawworks complete with Lebus grooving for 1-3/8” wire line, Crown-O-Matic device, positive clutch and master control.
   - One (1) Eelmago Model 7838 electric brake.

2. Derrick - DRECO 160’ x 30’ x 30’, 1,000,000 lbs. static hook load capacity with 12 lines. The derrick is complete with all standard accessories, which include:
   - The racking platform to accommodate 15,000’ of 5” drill pipe (160 stands) and bottom hole assembly, complete with safe catwalk and windbreak.
   - One (1) adjustable casing stabbing platform (26’ to 46’ above derrick floor) complete with air hoist and safety lines.
- One (1) Dreco crown block (583 tons) with seven (7) 50" sheaves grooved for 1-3/8" drill line, complete with sandline sheave grooved with 9/16" wire.
- Crown safety platform complete with safe handrail.
- Derrick is complete with Class 1 Division 1 explosion proof fluorescent fixtures, all with safety chains.

3. Traveling equipment consisting of:
Varco TDS-3 Top Drive driven by a GE752 Shunt Wound Motor, rated for 500 tons, Maximum Continuous Torque 26,400 Ft.-Lbs. at a maximum speed of 195 RPM. Accessories include: air cooled, Dual Crank I-BOP, Raised Back-up system, PH-60 equipped to handle 5" & 3-1/2” drill pipe with tool joints from 6" to 7" OD & 4" to 5" OD respectively.
- One (1) Oilwell block, Model A-500 (500 tons) with six (6) 60" sheaves grooved for 1-3/8" drill line.
- One (1) BJ Dynaplex 5500 (500 ton) hook.
- One (1) Continental-Emsco LB-650 Swivel rated for 650 ton static load (471 ton rotating load).

4. One (1) National Type EB deadline anchor for 1-3/8" drill line rated for 100,000 single line pull.

5. Rotary - One (1) 37-1/2” Oilwell rotary table driven by a GE 752 (900 hp) DC motor (load+ - One (1) Oilwell RT 20100 two speed rotary transmission.
- One (1) Airflex rotary brake.
- Rotary complete with MPCH No. 6600 hinged pin master bushings and Varco HDP pin type kelly drive bushings.

6. One (1) Mathey wire line measuring unit fitted with 20,000’ of .108” wire line, line guide, and depth indicator, driven by a hydraulic motor.

7. One (1) Eastman deviation recorder with non-directional drift indicator with one (1) 0-6’ clock and one (1) 0-12° clock.

8. Standard drill floor instrumentation consisting of Driller’s console with weight indicator and related indicators for mud pump pressure and speed, mud pit volumes, mud flow, mud gain/loss, rotary and torque and rpm.

9. Air winches consisting of:
- Three (3) on drill floor
- Five (5) on cellar deck
- One (1) in derrick to act as a “mule” for derrickman

**MUD SYSTEM AND EQUIPMENT**

1. Two (2) Gardner-Denver PZ-11 triplex mud pumps, each pump chain driven by two GE 752AR, 800 hp DC motors each pump. Pumps are outfitted with discharge and suction pulsation dampeners and Cameron Type “B” 3' reset relief valves. Mud pump discharge lines - 4.063 ID x 5,000 psi WP, complete with 5” x 5,000 psi WP valves run from pumps to Standpipe Manifold.

2. Mud service pumps consisting of:
- Two (2) Mission Magnum 6 x 8 centrifugal supercharging pumps driven by 50 hp AC motors.
Two (2) Mission Magnum 6 x 8 centrifugal mud mix pumps, driven by 100 hp AC motors.
Three (3) Mission Magnum 6 x 8 centrifugal mud cleaning pumps driven by 100-hp AC motor.

3. Mud cleaning equipment consisting of:
   -Three (3) Brandt LCM-2D/CM2 Cascading Shale Shakers
   -One (1) Swaco Horizontal Tank Vacuum De-Gasser
   -One (1) Fluid Systems desander with three (3) 10" cones
   -One (1) Brandt King cobra 16/0 Mud conditioner. 16 cone desilter.

4. Liquid mud pits consisting of:
   -Active pits 450 bbls each
   -Reserve pits 400 bbls each
   -Slugging pit 80 bbls
   -Sand traps 40 bbls
   -Trip tank 47 bbls
   Total 1,867 bbls

5. Four (4) Brandt Mud Agitators Model MA25 (25 hp). One (1) for each active and reserve mud pit.

6. Two (2) Brandt Mud Agitators Model MA2 (2 hp) in the Slugging Pit

7. Pneumatic bulk and cement storage transfer system consisting of:
   -Four (4) 860 Ft.3 bulk mud storage P-tanks (Below Deck - 3440 cu. ft. total capacity).
   -Four (4) 860 Ft.3 bulk cement storage P-tanks (Below Deck - 3440 Ft.3 total capacity).
   -Two (2) 1050 Ft.3 bulk cement storage P-tanks provided by Dowell (Above Deck - 2,100 Ft.3 total capacity).
   -One (1) 80 Ft.3 pressurized surge tank for use in mud mix area.
   -One (1) Quincy Model QSLP100 low pressure bulk air compressor with a refrigerated air dryer outfitted with a pre-filter and auto timed drain.
   -One (1) removable crossover line that allows bulk mud or cement to be stored in any below deck P-tank. Cement can be transferred between below & above deck P-tanks in any fashion.
   -Backup low pressure bulk system air furnished by rig air compressor through a 125/40 psi regulating station.

8. Sack storage area located near the mud pits and mixing hoppers. Capacity approximately 500 sacks below deck and 2,000 sacks above deck.

9. Two (2) Demco 612 "B" low pressure mud hoppers, one (1) sack fed and one (1) surge tank or sack fed.

10. One (1) set basic mud testing equipment consisting of mud balance scale, viscosity funnel/cup, and sand content equipment, complete with sink and cabinet.

11. One (1) 5" dual standpipe manifold, 5,000 psi WP with 4.063 ID. standpipes. Multiple Fig. 1502 outlets are available for pressure gauges, sensors and transducers. A crossover line is hard piped to the choke manifold.

12. Two (2) rotary hoses, 3" ID x 75', 5,000 psi WP with 4" Weco end connections (10,000 psi test).

13. One (1) 50 BBL trip tank, continuous fill-up of well bore is accomplished via one (1) 3 x 4 Mission Magnum centrifugal transfer pump driven by a 20 hp explosion proof AC motor.
D. WELL CONTROL EQUIPMENT

1. Blowout preventers (H2S rated) consisting of:
   - One (1) 13-5/8 in. - 10,000 psi WP Cameron, Type “U” double ram blowout preventer with manual locks, four (4) 4-1/16 in. x 10,000 psi WP flanged outlets and flanged 10,000 psi WP connections top and bottom.
   - One (1) 13-5/8 in. - 10,000 psi WP Cameron, Type “U” single ram blowout preventer with manual locks, two (2) 4-1/16 in. x 10,000 psi WP flanged outlets and flanged 10,000 psi WP connections top and bottom.
   - BOP outfitted with two (2) sets 5” pipe rams and one (1) set blind/shear rams
   - One (1) 13-5/8” x 5,000 psi WP N.L. Shaffer spherical annular preventer with 10,000 psi WP flanged bottom connection and 5,000 psi WP flanged top connection. (BX-160 ring groove)
   - Two (2) 4-1/16” x 10,000 psi WP hydraulic operated BOP stack valves. (BX-155 ring groove)
   - Two (2) 3” x 50’ 10,000 psi WP Coflexip hoses.

   ♦ Note: Coflexip hoses currently installed are not compatible with zinc bromide. Use of zinc bromide will require changing of hoses.

2. Diverter System consisting of:
   - One (1) 21-1/4” x 2K Shaffer Rucker Annular BOP - 2,000 psi WP MSP flange bottom (RX-73 ring groove) by stud top (RX-73 ring groove) annular type BOP bored to 21-1/4” ID.
   - 21-1/4” 2,000 T/U Model 6012 Double Ram BOP .211/4 Bore. Flanged top and flanged bottom connections with Stainless lined R-73 ring grooves.
   - 4 ea 4-1/16” 5,000 flanged outlets with stainless steel lined R-39 Grooves. Manufactured to API -16A Temp. Class TO HRS.
   - One (1) 21-1/4” Drilling Spool flange by flange (RX-73 SS ring grooves), two (2) 12” flange RTJ outlets (R-57 SS ring grooves) and one (1) 3-1/16” flanged outlet (BX-154) ring groove).
   - Diverter System consisting of:
     - One (1) T3MSP 29-1/2” 500 psi Diverter
     - Two (2) 12” ANSI Class 900, Demco ball valves, 2,000 psi WOG, flange by flange (RX-57 ring groove). Each valve complete with Helac RHMH-180K Hydraulic Actuators.
     - One (1) 3-1/16 10,000 psi WP Hydraulic Actuated, gate valve for circulation to C&K manifold or pumping from the stand pipe manifold.
     - Two (2) Vent spools with 12” ANSI class 900 RTJ flanges. Each 8 ft. in length for discharge below the hull.
     - One (1) Diverter control system which provides automatic opening of port and starboard vent lines upon closing of diverter package.

3. Ross-Hill BOP and Diverter Control System consisting of one (1) 3,000 psi WP automatic pump accumulator unit complete with the following:
   - Accumulator capacity 180-gallon total made up of 12-15 gallon bottles charged with nitrogen at 1,000 psi.
   - Two (2) 35:1 ratio air driven pumps with manifold and pressure switch.
   - One (1) Ross Hill TX-10 triplex pump driven by a 20 hp AC motor.
   - One (1) 324 gallon mixed fluid reservoir.
   - One (1) Model RP 6AZR remote control panel.
   - One (1) backup air supply consisting of three (3) bottles of nitrogen, regulated and plumbed into rig air supply in case of loss of rig air.
   - Seven (7) 1” four (4) way three (3) position selection valves.
-One (1) annular regulator.
-One (1) manifold (BOP) regulator.

4. One (1) 10,000 psi WP H2S rated choke manifold, complete with the following:
-One (1) CIW 3-1/16" x 10,000 psi WP manual adjustable choke.

-One (1) SWACO 3-1/16" x 10,000 psi WP remote adjustable chokes.
-Ten (10) CIW 3-1/16" x 10,000 psi WP valves.
-Six (6) 3-1/8 x 5,000 psi WP valves.
-Two (2) 8" buffer chambers.

5. One (1) 120,000 lb. constant hydraulic drive pipe support system balanced with 30 gallons of accumulator capacity for drive pipe movement.

6. One (1) Diamond Offshore Standard mud/gas separator (MGS), 36" x 15' tall atmospheric type with 8" OD gas vent line extending to top of derrick and 8" x 15' tall liquid leg.

7. One (1) BOP / Diverter Handling System consisting of two (2) Ingersol-Rand Beebe Herculink Model BH550MA6-30-30-55 hoists. Each winch is rated for 25 ton. Winches and trolley powered by radial piston air motors.

E. DRILL STRING AND HANDLING TOOLS

1. Drill pipe consisting of:
-15,000' of 5" OD 19.50 lb./ft. Grade "G" Range 2 drill pipe internal upset with 6-1/2" OD x 3-1/4" ID 18° taper tool joints with 4-1/2" IF (NC-50) connections with flush inlaid fine particle hardbanding. Pipe internally coated.
-Thirty (30) joints of 5" OD, 49.5 lb./ft. Hevi-Wate Drill Pipe with 4-1/2 IF (NC-50) connections.
-Three (3) each 5" OD, 19.50 lb/ft Grade S-135 pup joints with 4-1/2" IF (NC-50) connections, 5', 10' and 15' long

2. Drill Collars:
-Eighteen (18) 8" OD x 2-13/16" ID x 31' long (Spiraled) with 6-5/8" Reg. connections. Slips and elevators recesses.
-Eighteen (18) 6-1/2" OD x 2-13/16" ID x 31' long (Spiraled) with 4-1/2" IF (NC-50) connections slips and elevator recesses.


4. Subs - one lot of subs and crossovers to fit Contractor’s tubulars.

5. Thread protectors to fit all of contractor’s tubulars.

6. Kelly valves consisting of:
-Two (2) lower I-BOP (TDS) (10,000 psi WP) with 4-1/2” IF (NC-50) connections.
-Two (2) upper I-BOP (TDS) (10,000 psi WP - Dual Crank) with 6-5/8” REG connections.
-Two (2) inside BOP valve (float type) (10,000 psi WP) with 4-1/2” IF (NC-50) connections.

7. Drill pipe and drill collar elevators consisting of:
-One (1) center latch elevator Type “GG” (350 ton) for 5" OD 18° taper drill pipe
-One (1) center latch elevator Type “BNC” (350 ton) for 5” OD 18° taper drill pipe.

8. Elevator links consisting of:
-One (1) set - 2-3/4" x 156” (350 ton)
-One (1) set - 3-1/2" x 180” (500 ton)
9. Two (2) Type SDD manual tongs with lug jaw assemblies for pipe sizes 4’ to 12’.

10. One (1) Hawk 550-H drill pipe spinner wrench to handle pipe sizes 3-1/2” to 5”.

11. Slips consisting of:
   - Two (2) sets Type SDXL for 5” drill pipe.
   - Two (2) sets Type “C-1” for 8” to 6-1/2” drill collar.
     Two sets Type WTW for 9 ½” to 4 ¾” drill collar.

12. One (1) Type MRP drill collar safety clamp for drill collars.
13. One (1) mud saver bucket
14. Drill pipe wipers for 5” drill pipe.
15. One (1) Drilco Type "I" "Ezy-Torq" hydraulic cathead.
16. One (1) Varco Model AR-3200 Automated Roughneck outfitted for 3-1/2” to 9-3/4” tubulars.

**AUXILIARY EQUIPMENT**

1. Diesel electric rig power system consisting of:
   - Four (4) Caterpillar Model D399 turbocharged after cooled diesel engines, each driving one (1) GE 930 kw, 600 volt AC generator, Diesel engines cooled by four (4) remote mounted radiators.
   - One (1) Caterpillar Model 3412 emergency generator set 350 kw 480 vac 60 hz, battery electric start, radiator cooled.
   - One (1) Tech Power SCR system and DC controls.

2. Compressors consisting of:
   - Two (2) Quincy Model QS1500 rig air compressors.
   - One (1) Quincy Model QSLP100 bulk air compressor.
   - One (1) Gardner Denver Model ADS two stage air compressor driven by Lister Model ST 2A diesel engine for emergency "cold start" service.
   - One (1) Pioneer Model RA1000A refrigerated rig air dryer.
   - One (1) Pioneer Model RA1000A bulk air dryer.

3. Pedestal cranes consisting of:
Two (2) SeaTrax Model 6020 cranes with 110’ booms rated at 60 tons. Load rating at 20’ radius with 4-part line is 124,000 lbs. Load rating at 35’ radius with 4-part line is 118,000 lbs.

4. One (1) personnel transfer nets.
5. One (1) lot of certified slings, bridles and lifting gear necessary for the loading and offloading of equipment and supplies.
6. One (1) set of mooring lines and cargo transfer hoses on port side of rig.
7. Two (2) 400 amp rectifier-type welding machines.
8. Two (2) Alfa-Laval/Nirex Model JWP-26-C80 watermakers.
9. One (1) oil/water separator system with required drip pans, drain lines and collection tanks to meet MMS requirements.

10. **Firefighting and life saving equipment to meet ABS and USCG requirements which includes, but not limited to:**
   - Individual life preservers
   - Fire extinguishers
- Station bill
- General alarms
- Identification signs
- Equipment guards
- Pollution pans
- Imperial exposure suits for 150% of drilling unit personnel capacity
- Two (2) 44 man fully enclosed Watercraft survival craft with launch and recovery system
- Four (4) 25-man davit launched inflatable life raft
- One (1) foam system for heliport area (150 gallon)
- One semi-portable 150 lb dry chem. & one semi-portable CO2, 177 lb units for heliport area
- Fixed CO2
- Engine air intakes
- SCR room
- Air compressor room
- Paint Locker
- Fixed 2516 Kidde dry chemical system for (galley hood)
- Two complete fireman lockers
- Two (2) Mission 3 x 4 fire pumps
- Electronic Fire Detection system for living quarters
- Fixed foam system in Engine Room

11. Ships service pumps consisting of:
- Drill water pump. Two (2) 3 x 4 x 12-3/8" Mission Magnum centrifugal pump driven by 25 hp AC motor.
- Saltwater pumps. Three (3) vertical turbine submersible pumps driven by 75 hp AC motors.
- Bilge pumps. Two (2) Gorman Rupp centrifugal pump 3" x 3" driven by 15 hp AC motor.
- Fuel pumps. One (1) Roper Model 2AM21 gear pump driven by 3-hp AC motor.
- Fuel oil centrifuge. Two (2) Alfa-Laval Model MAB-104.

12. One (1) Gaitronics paging system with stations fixed throughout the rig.

13. Communication equipment consisting of:
- IWL Satellite Telephone system for Diamond Offshore use (Primary)
- Coastal Cellular Telephone (Back-up system)
- VHF radios
- Fax Machine & photo copier
- Sailor Compact GMDSS Safety Communications System

14. One (1) Omnipure Model 12M sewage treatment plant, 125-man unit with one back-up tank with pump.

**THIRD PARTY EQUIPMENT**
One (1) Dowell CPS 361 Double Pump Skid Cementing Unit consisting of:
Two (2) Detroit Diesel 8V71 (340 Hp each)
Two (2) Triplex pumps : Downhole - 10.3 Bbl/min @ 5,500 psi; Pressure - 5.3 Bbl/min @ 10,000 psi
CBS 250 Mixing Package (Slurry Chief) recirculating mixer for continuous mixing through a 25 Bbl blender
- Liquid Additive System