is not known for ANWR, the rate is probably lower at ANWR than at Prudhoe Bay since Prudhoe Bay has NO_2 emission sources and ANWR does not. Therefore, there would be less impact on vegetation from nitrogen deposition at ANWR than at Prudhoe Bay. Based upon this information, emissions generated from Project operation would not cause inhibited growth or injury to vegetation at ANWR.

10.0
SUMMARY AND CONCLUSIONS

This Final OCS Air Permit Application is submitted to comply with the new EPA CFR Part 55 Outer Continental Shelf (OCS) Air Regulations, Section 55.6(e)(2)(B). Regulatory authority for OCS permitting has not yet been delegated to the State of Alaska, therefore EPA has direct jurisdiction. A summary of this Application follows:

- The Application serves as the Final Permit Application filed subsequent to the Transitional Permit Application (TPA) which was submitted to EPA Region IX on October 5, 1992.

- The Application proposes a 5-year permit term to conduct exploratory operations in the Beaufort Sea, Alaska.

- A modeling domain has been established and used for the purpose of identifying near-term source locations and documenting their worst case ambient air quality impact.

- Exploratory operations conducted outside the modeling domain would be subject to special conditions (see Appendix H).

- The Application has been designed so that substitution of floating drilling vessels, bottom-founded drilling units, ice management vessels, and other support vessels, during the term of the permit, can occur without increasing emissions. This flexibility was achieved by surveying the range of alternative drilling vessels, drilling units, and support vessels and determining the highest emitters.

- The highest emitting sources were modeled using a number of extreme worst-case assumptions. These assumptions include:

  - Full-time operation of all sources.

- Maximum load for all sources.

- Placement of two drilling vessels in worst-cast locations for modeling offshore and onshore impacts.

- Placement of two floating vessels at the same location for assessing risk to Kaktovik.

- Use of worst case onshore modeling results in the Air Quality Related Values (AQRV) assessment.

Modeling results using these extreme worst-case assumptions do not reflect the most likely, actual emission rates that would occur with typical seasonal operation and partial loads. Therefore, impacts quantified by this Application are clearly overestimated. Even with these overestimations:

- Emissions from the Project will not cause an exceedance of the National or State Ambient Air Quality Standards.

- Emissions from the Project will not cause an exceedance of the PSD increments.

- Emissions from the Project will not cause a significant adverse risk to human health at Kaktovik.

- Emissions from the Project will not cause an adverse effect to air quality related values (AQRV). In particular, the Project will not cause injury or damage to vegetation at the Arctic National Wildlife Refuge.

11.0
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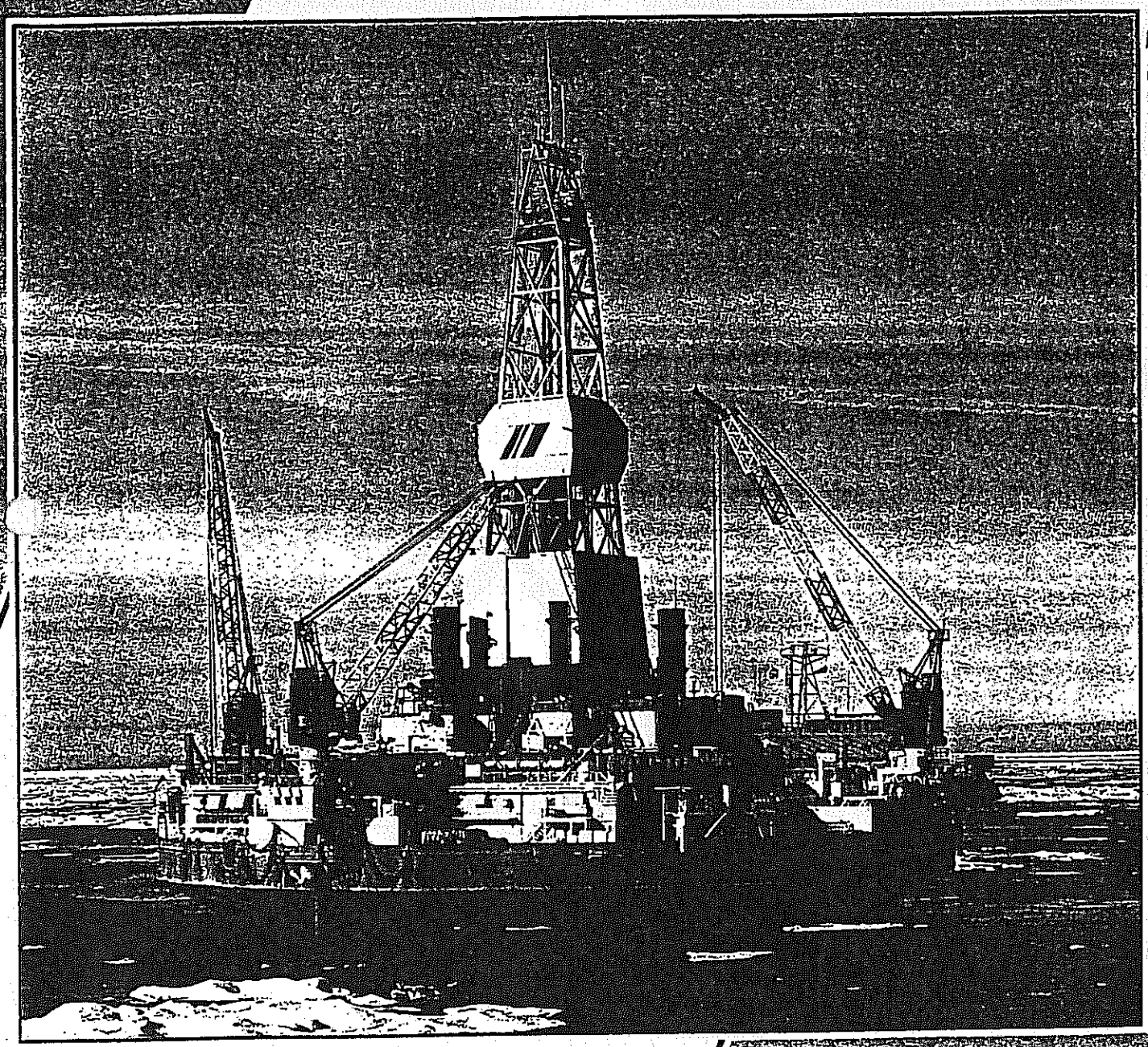
APPENDIX A
DRILLING RIG AND SUPPORT VESSELS BROCHURES

BeauDril

Kulluk

Conical Drilling Unit



- ARCTIC FLOATING DRILLING UNIT
- CONICALLY SHAPED DOUBLE HULL
- UNIQUE 12 POINT MOORING SYSTEM
- LARGE VARIABLE DECK LOAD

BeauDril

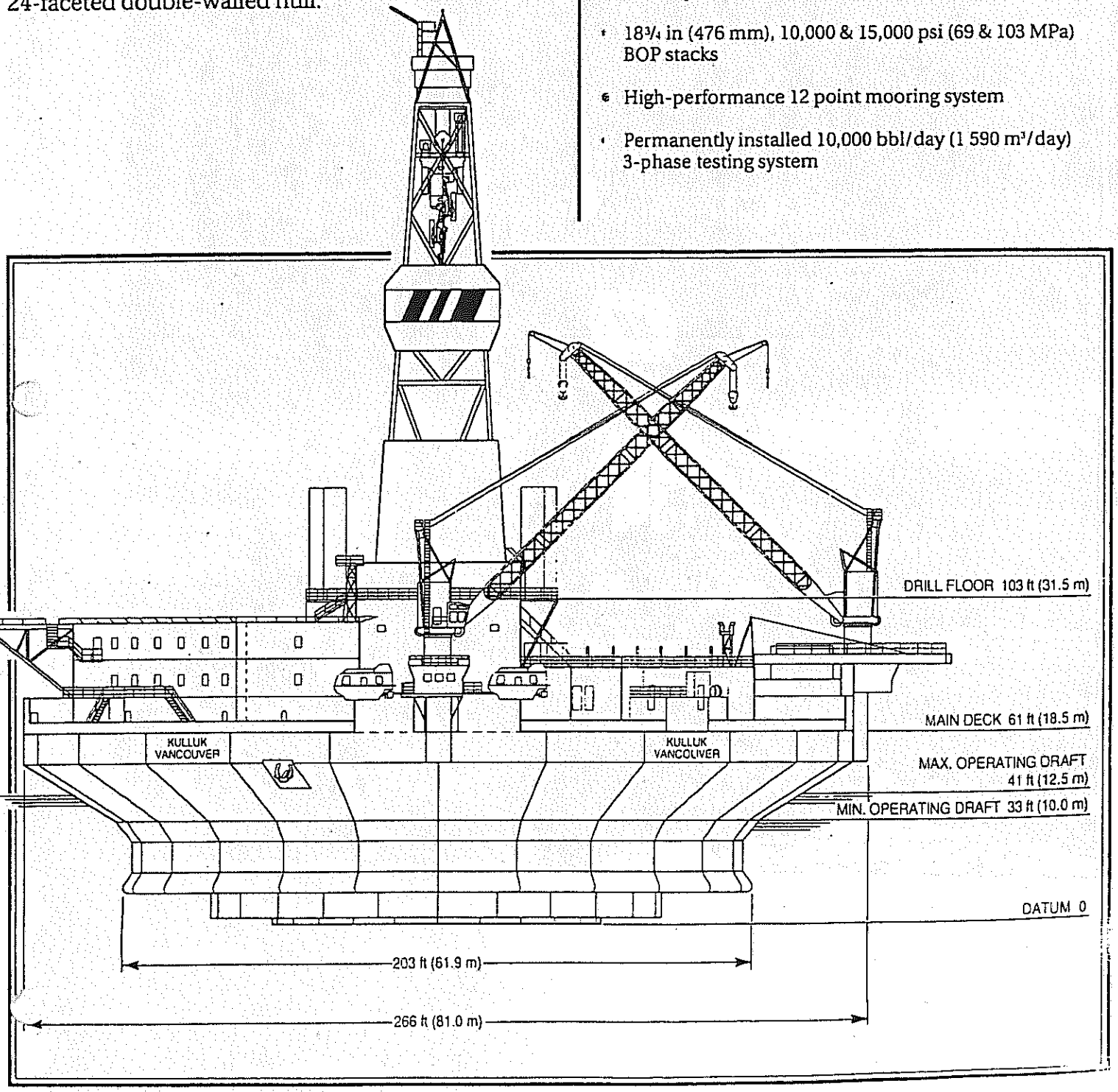
Kulluk

Kulluk is the first floating drilling vessel designed and constructed for extended season drilling operations in deep Arctic waters.

An improvement on the floating drillship concept, Kulluk is a conically shaped, ice strengthened floating drilling unit with a 24-faceted double-walled hull.

Key Features

- Unique, purpose-built conical Arctic Class IV hull design
- Operating water depth 60 to 600 ft (18.3 to 183 m), drilling depth up to 20,000 ft (6 096 m)
- Electrically driven Varco top drive drilling system
- 24 ft (7.3 m) diameter glory hole bit capable of drilling and setting a steel caisson 40 ft (12.2 m) into the seabed for ice scour protection
- Partially enclosed derrick
- 18¾ in (476 mm), 10,000 & 15,000 psi (69 & 103 MPa) BOP stacks
- High-performance 12 point mooring system
- Permanently installed 10,000 bbl/day (1 590 m³/day) 3-phase testing system



Classification

The unit has been designated as Arctic Class IV (by the Canadian Coast Guard) under Canadian Arctic Shipping Pollution Prevention Regulations, and as Ice Class 1AA by the American Bureau of Shipping.

Specifications

Owner:	BeauDril Limited
Flag:	Canadian
Rig Type:	Conical Drilling Unit (CDU)
Delivered:	1983
Rig Design:	Earl & Wright - Lavalin
Built By:	Mitsui Engineering and Shipbuilding, Japan

Dimensions

Diameter at main deck:	266 ft (81.0 m)
Diameter at pump deck:	196 ft (59.7 m)
Hull Depth:	61 ft (18.5 m)

Operations

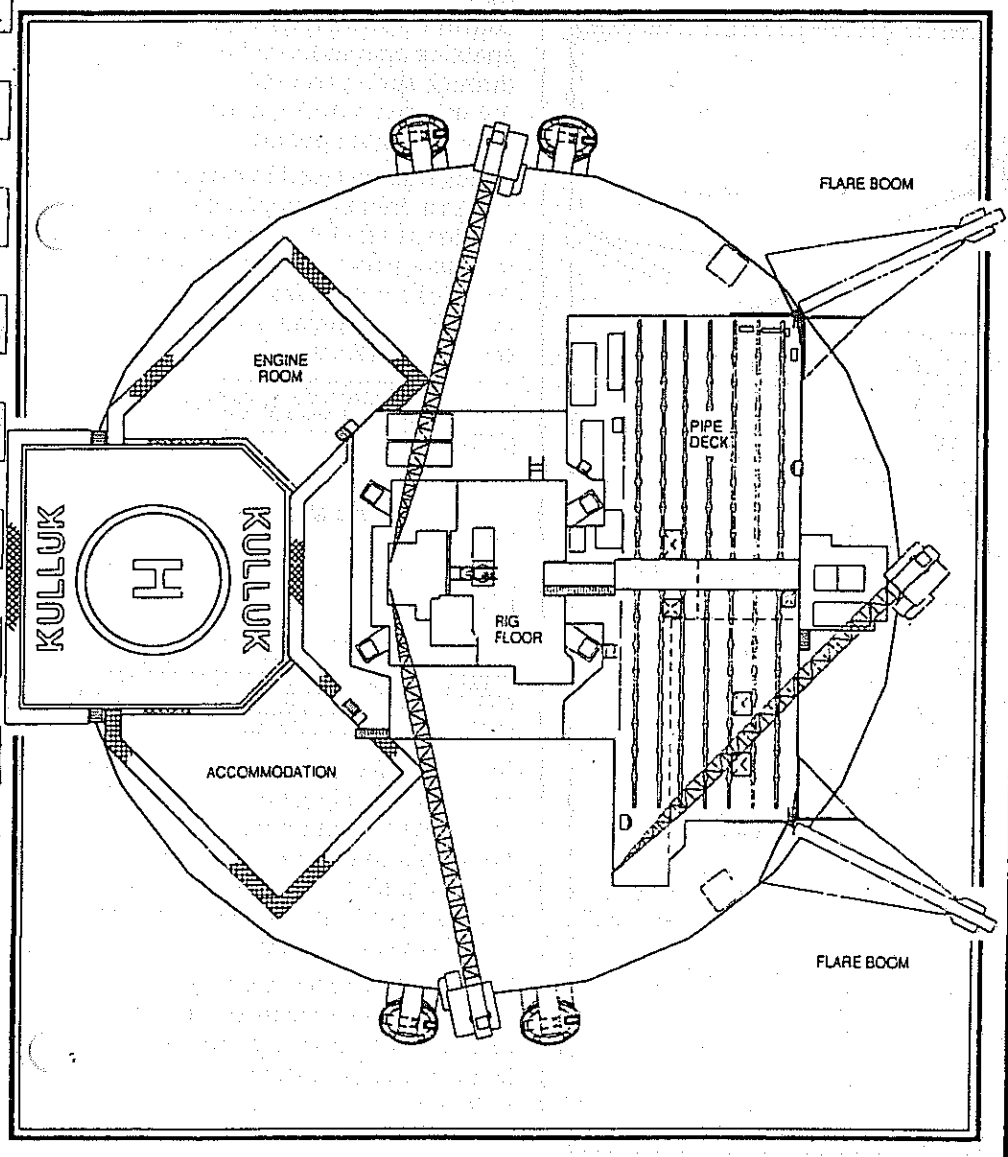
Draft (max. operating):	41 ft (12.5 m)
Draft (min. operating):	33 ft (10.0 m)
Draft (light ship):	26 ft (8.0 m)
Light Ship Displacement:	19,300 tons (17 510 tonnes)
Maximum Drilling Depth:	20,000 ft (6 096 m)
Operating Water Depth:	60 to 600 ft (18.3 to 183 m)

Variable Load

7,717 tons (7 000 tonnes)

Storage Capacities

Barite & cement bulk:	21,471 cf (608 m³)
Liquid mud:	2,605 bbl (414 m³)
Drill water:	4,227 bbl (672 m³)
Fuel:	10,085 bbl (1 603 m³)
Potable water:	1,961 bbl (312 m³)
Ballast:	35,928 bbl (5 712 m³)
Pipe & casing (pipe deck):	1,543 tons (1 400 tonnes)
Brine:	2,010 bbl (320 m³)

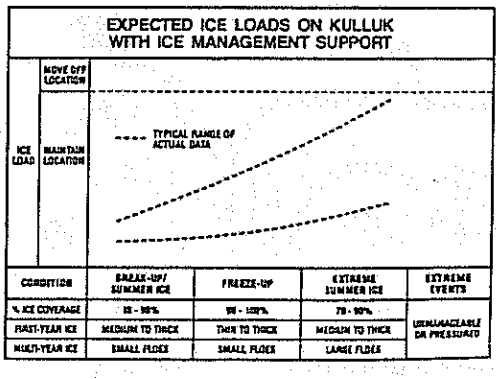


Operational Limits

Stationkeeping Conditions

Kulluk was built to operate in the ice infested waters of the Arctic offshore. The unit was developed to extend the drilling season available to more conventional floating vessels by enabling operations to be carried out through spring breakup conditions, the summer months, and well into the early winter period.

Kulluk was designed to maintain location in a drilling mode in moving first-year ice of 4 ft (1.2 m) thickness. With ice management support provided by BeauDril's Arctic Class IV icebreakers, the unit can maintain location in more severe conditions as shown below.



In terms of Kulluk's open water performance, the drilling unit was designed to maintain location in storm conditions associated with maximum wave heights of 18 ft (5.5 m) while drilling and 40 ft (12.2 m) while disconnected (assumed storm duration of 24 hrs).

If ice or open water storm conditions become more severe than those indicated, the unit's mooring system, which incorporates acoustic release devices, is disconnected from the anchors and the unit moves off location.

Classification

The unit has been designated as Arctic Class IV (by the Canadian Coast Guard) under Canadian Arctic Shipping Pollution Prevention Regulations, and as Ice Class 1AA by the American Bureau of Shipping.

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Liquid mud:	2,605 bbl (414 m³)
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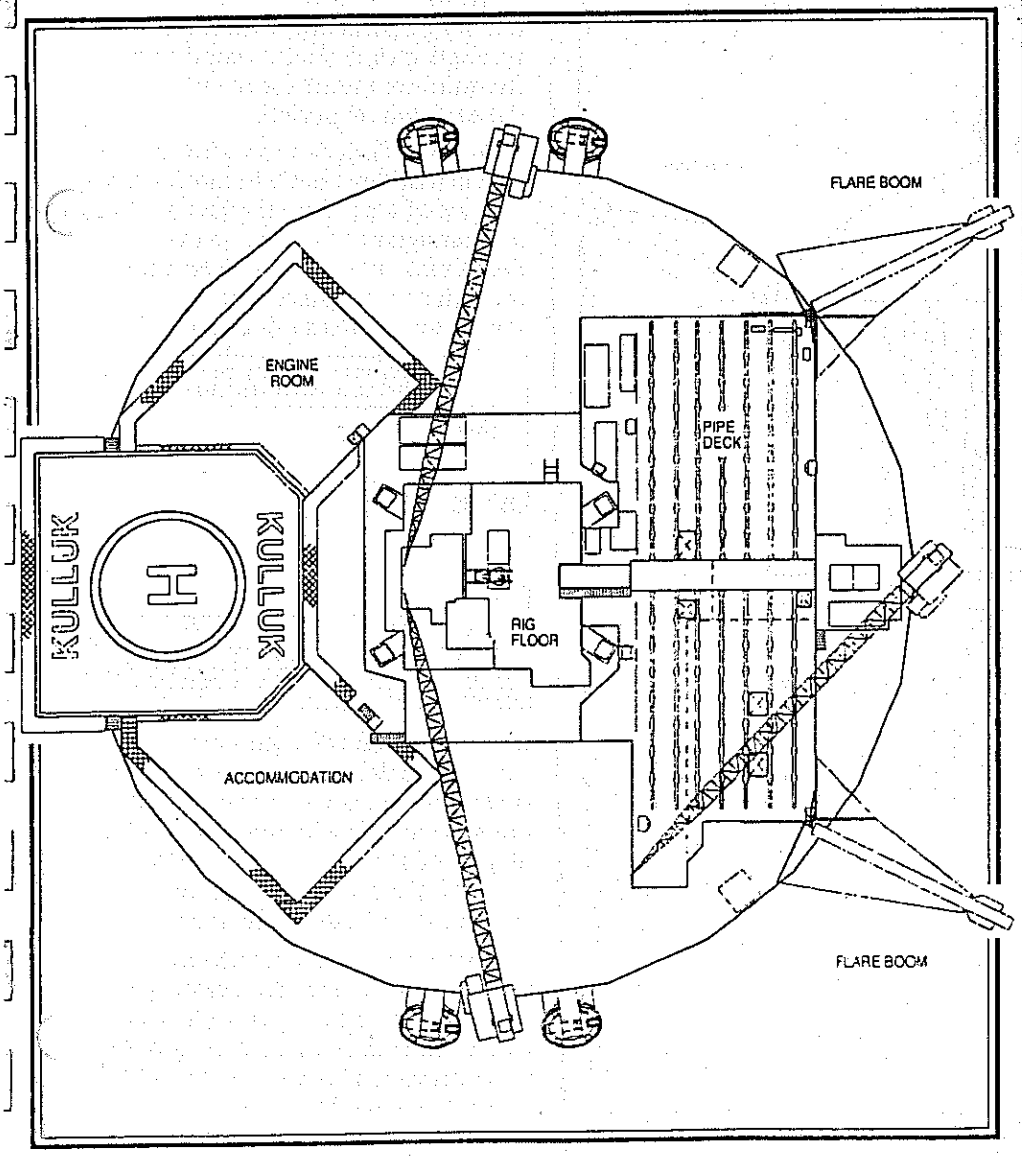
Ballast:	35,928 bbl (5 712 m³)
Pipe & casing (pipe deck):	1,543 tons (1 400 tonnes)
Brine:	2,010 bbl (320 m³)



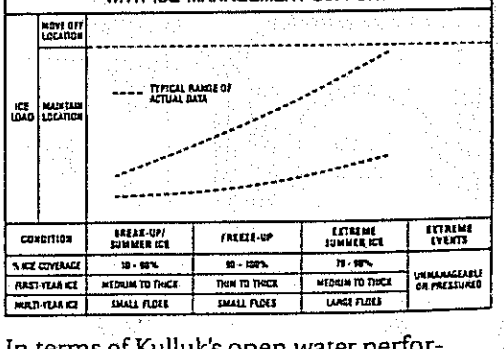
Operational Limits

Stationkeeping Conditions

Kulluk was built to operate in the ice infested waters of the Arctic offshore. The unit was developed to extend the drilling season available to more conventional floating vessels by enabling operations to be carried out through spring breakup conditions, the summer months, and well into the early winter period.

Kulluk was designed to maintain location in a drilling mode in moving first-year ice of 4 ft (1.2 m) thickness. With ice management support provided by BeauDril's Arctic Class IV icebreakers, the unit can maintain location in more severe conditions as shown below.

EXPECTED ICE LOADS ON KULLUK WITH ICE MANAGEMENT SUPPORT



CONDITION	BREAK-UP/ SUMMER ICE	FREEZE-UP	EXTREME SUMMER ICE	EXTREME EVENTS
% ICE COVERAGE	10 - 90%	90 - 100%	70 - 90%	UNMANAGEABLE OR PRESSURED
FIRST-YEAR ICE	MEDIUM TO THICK	THIN TO THICK	MEDIUM TO THICK	
MULTI-YEAR ICE	SMALL FLOES	SMALL FLOES	LARGE FLOES	

In terms of Kulluk's open water performance, the drilling unit was designed to maintain location in storm conditions associated with maximum wave heights of 18 ft (5.5 m) while drilling and 40 ft (12.2 m) while disconnected (assumed storm duration of 24 hrs).

If ice or open water storm conditions become more severe than those indicated, the unit's mooring system, which incorporates acoustic release devices, is disconnected from the anchors and the unit moves off location.

Equipment

Drilling Equipment

Derrick
160 ft (44.8 m) Dreco dynamic with a 40 ft x 40 ft (12.2 m x 12.2 m) base, rated at 1,400,000 lb (623 000 daN) with 14 lines

Racking platform has capacity to hold 23,340 ft (7 115 m) of 5 in (127 mm) drill pipe plus bottom hole assembly

Drawworks
Ideco E-3000 electric drawworks complete with sand reel, Elmago model 7838 Baylor auxiliary brake, spinning and breakout catheads and three GE model 752 motors each rated at 1,000 hp (746 kW) continuous

Travelling Block
McKissick model 686, 650 ton (590 tonne) capacity with 7 sheaves grooved for 1⅝ in (41.3 mm) drilling line

Swivel
Ideco TL-500, 500 ton (454 tonne) capacity

Drill Pipe
20,000 ft (6 096 m) x 5 in (127 mm), 19.5 lb/ft (29 kg/m) with 4½ IF connections

Top Drive
Varco TDS-3 with one GE model 752 motor rated at 1,000 hp (746 kW) continuous and a 500 ton (454 tonne) hoisting capacity

Rotary Table
Ideco LR-495, 49.5 in (1 257 mm) driven by one GE model 752 motor, rated at 1,000 hp (746 kW) continuous, coupled to a two speed transmission

Drill String Compensator
NL Shaffer 18 ft (5.5 m) stroke 400,000 lb (178 000 daN) compensating capacity or a 1,000,000 lb (444 800 daN) locked capacity

Tensioner System
4 x 80,000 lb (35 600 daN) Western Gear riser tensioners, 48 ft (14.6 m) wireline travel with 1¾ in (44.5 mm) wire rope

6 x 16,000 lb (7 100 daN) Western Gear guideline/pod tensioners, 40 ft (12.2 m) wireline travel with ¾ in (19.1 mm) wire rope

Mud Pumps
2 x Ideco T1600 triplex, each driven by two GE model 752 motors rated at 1,000 hp (746 kW) continuous

Cementing Unit
Dowell owned R717 twin triplex powered by two GE model 752 motors each rated at 1,000 hp (746 kW) continuous, with 7,500 psi (52 MPa) and 10,500 psi (72 MPa) fluid ends

Rig Floor Pipe Handling System
Varco Iron Roughneck model IR-2000
Range: 2⅞ to 8 in (73 to 203 mm)

Mud Logging Room

Designed to accommodate equipment from any of the major mud logging companies. This room is an integral part of the rig and contains complete lab facilities

Testing Equipment

Complete testing system with a 10,000 BOPD (1 590 m³/day) capacity consisting of: data header, choke manifold, steam heater, 3-phase separator, surge tank, water degasser, transfer pumps, and flare booms

Mud Conditioning Equipment

4 x Thule United VSM-120 shale shakers
1 x Brandt SR-3 desander
1 x Brandt SE-24 desilter
1 x Thule VSM-200 mud cleaner
1 x Wagner Sigma-100 centrifuge
1 x Sharples DM 40 000 centrifuge
2 x Burgess Magna-Vac vacuum degassers
2 x Alfa-Laval AX30 mud coolers

Subsea Equipment

BOP System
1 x NL Shaffer 18¾ in (476 mm), 10,000 psi (69 MPa) BOP stack with annular, 4 ram type preventors, and Vetco H-4 E connector

1 x NL Shaffer 18¾ in (476 mm), 15,000 psi (103 MPa) BOP stack with annular rated at 10,000 psi (69 MPa), 4 ram type preventors, and Vetco H-4 E x F connector

Lower Marine Riser Packages
2 x 18¾ in (476 mm) with 10,000 psi (69 MPa) Shaffer annular, Regan 24 in (610 mm) CR-1 pressure compensated lower ball joint and Vetco H-4E connector

BOP Cranes
2 x Hepburn main bridge cranes, 85 ton (77 tonne) capacity each with 10 ton (9.1 tonne) auxiliary hoists

30 in (762 mm) Marine Riser System
3 x hydraulic pin connectors; 2 x 36 in (914 mm) Cameron and 1 x 30 in (762 mm) Dril-Quip

1 x Regan 28 in (711 mm) CR-1 pressure compensated lower ball joint

30 in (762 mm) riser consisting of 1 in (25.4 mm) wall casing with Hunting Lynx 52S connectors

1 x Regan 28 in (711 mm) telescoping riser joint with 45 ft (13.7 m) stroke

1 x Regan 28 in (711 mm) DR-1 upper ball joint

1 x Regan KFDS 28 in (711 mm) diverter

21¼ in (540 mm) Marine Riser System
21¼ in (540 mm) Cameron RCK riser with 10,000 psi (69 MPa) choke and kill lines

2 x Cameron telescoping riser joints, 1 x 40 ft (12.2 m), and 1 x 50 ft (15.2 m) stroke

1 x Regan 24 in (610 mm) DR-1 upper ball joint

1 x Regan KFDS 24 in (610 mm) diverter

Glory Hole Bit
1 x Brown Tornado, 24 ft (7.3 m) diameter hydraulically operated with airlift discharge. Capable of drilling a glory hole 40 ft (12.2 m) into the seabed for ice scour protection

Power Generation

Prime Movers:
3 x Electro-Motive Diesel rated at 2,817 hp (2 100 kW) each

Emergency Power:
1 x GM Detroit diesel rated 873 hp (651 kW)

Cranes

3 x Liebherr, BOS 65/850, rated at 72 ton (65 tonne) at 30 ft (9.1 m)

Safety Equipment

4 x Whittaker 54-person survival craft; two on port, two on starboard

1 x Hurricane Model 700-D emergency rescue boat

2 x RFD inflatable escape slides

Helideck

Capacity for Sikorsky 61 or similar with fueling station

Accommodation

Bunks for 108 people, recreation room, sauna, galley with seating for 36, offices, and hospital

Kulluk Mooring System

The Kulluk's mooring system consists of twelve Hepburn winches located on the outboard side of the main deck. Anchor wires lead off the bottom of each winch drum inboard for approximately 55 ft (17 m). The wire is then redirected by a sheave, down through a hawse pipe to an underwater, ice protected, swivel fairlead. The wire travels from the fairlead directly under the hull to the anchor system on the seafloor.

Specifications

Anchor Winch
12 x Hepburn single-drum winches with a 287 ton (260 tonne) operating tension

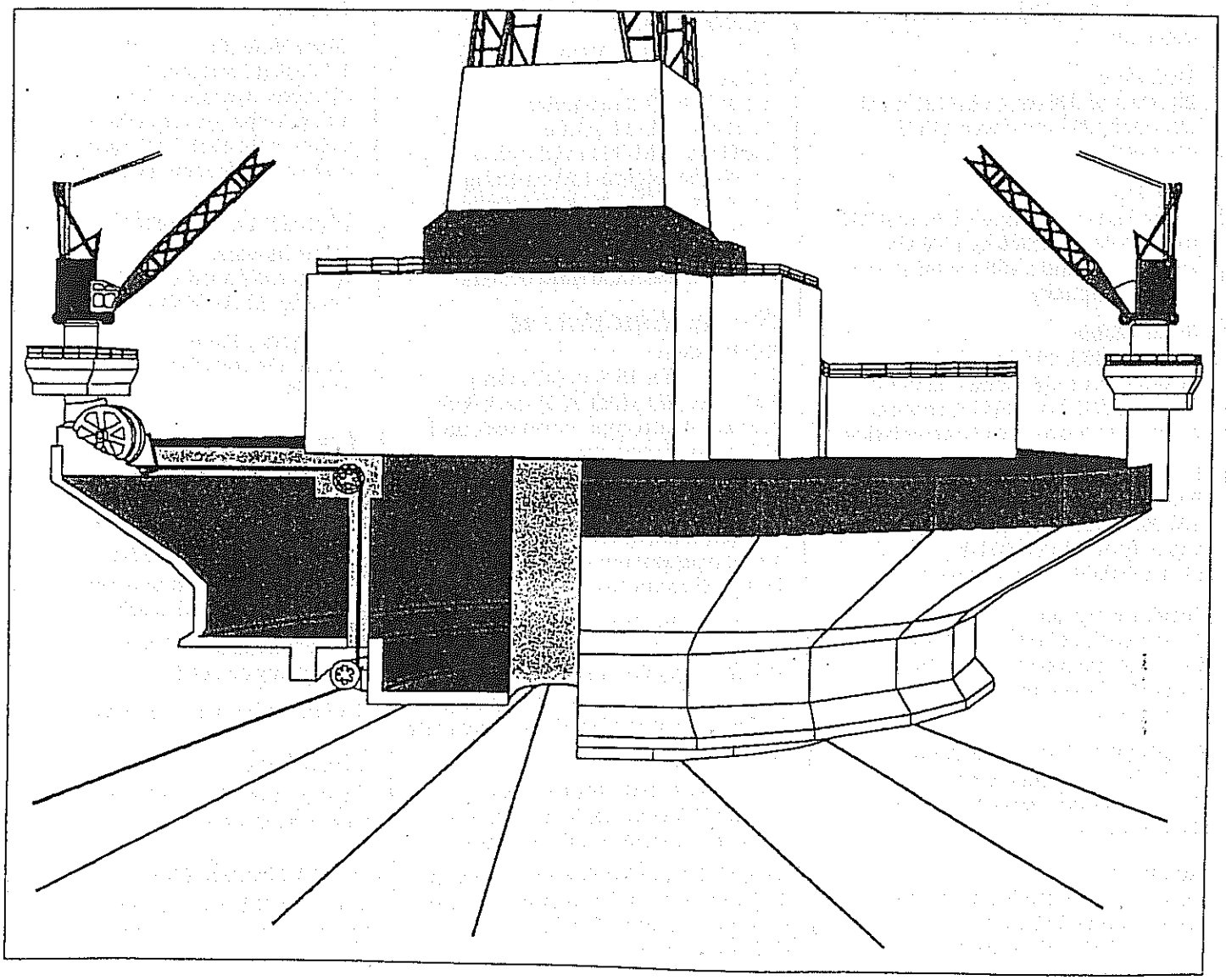
Mooring Wires and Anchors

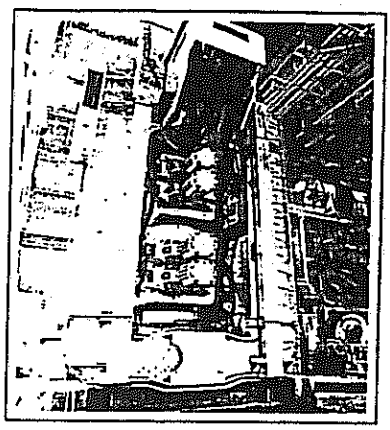
Anchors:
Various sizes & quantities of anchors are available for use. Exact anchor configuration to be provided once location and seafloor conditions are specified

Wire ropes:
Each winch drum has capacity for 3,763 ft (1 147 m) of 3 1/2 in (88.9 mm), 573 ton (520 tonne) breaking strength wireline

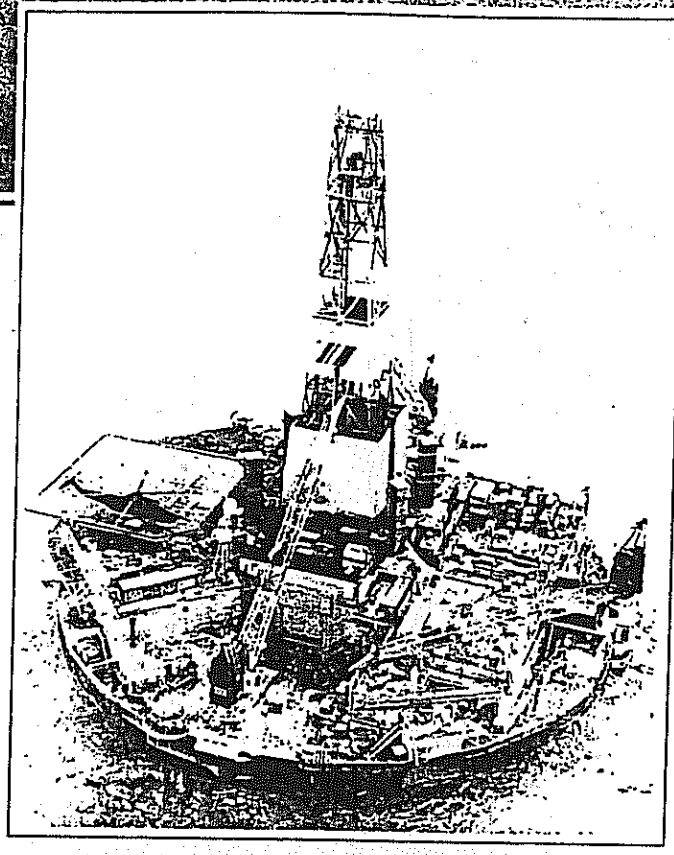
Anchor Release:
Each anchor wire contains a remote acoustic release (RAR) unit

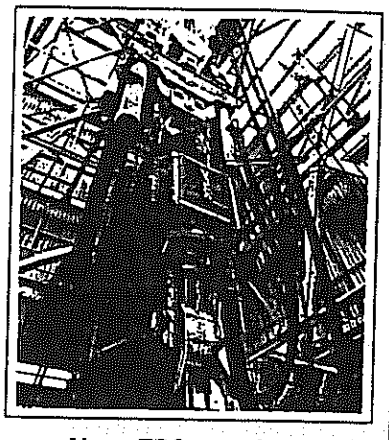
FOR MORE INFORMATION ABOUT KULLUK, CONTACT MANAGER, BEAUDRIL AT (403) 233-3030.



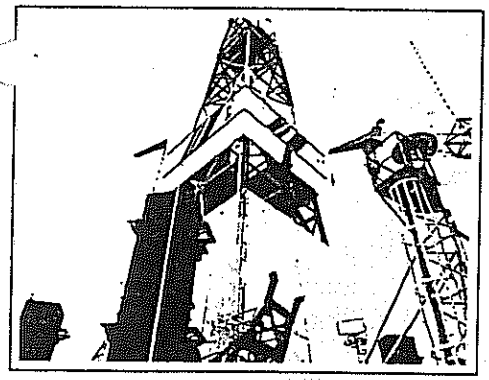


Two complete BOP systems

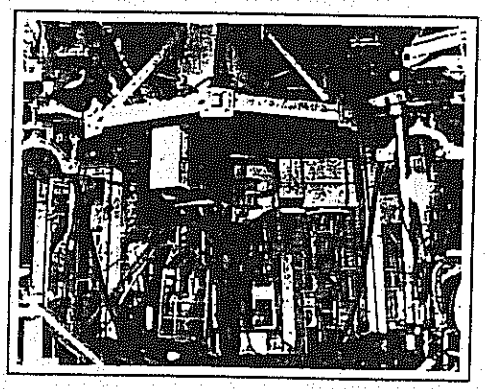




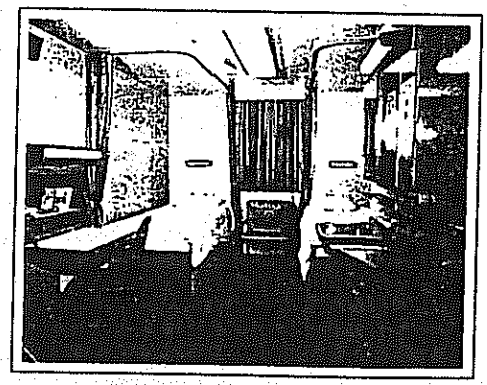
Varco TDS-3 top drive drilling system



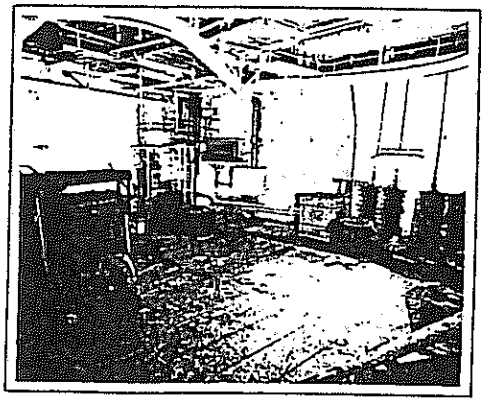
Derrick enclosed to A-frame for harsh Arctic environment



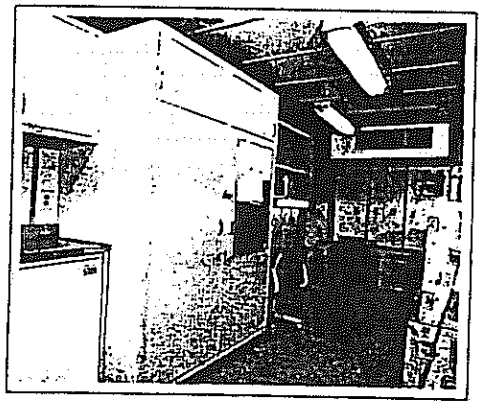
24 ft (7.3 m) diameter glory hole bit



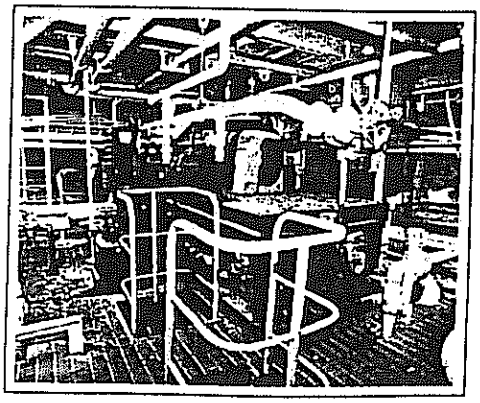
Typical two man room in 108 man accommodation



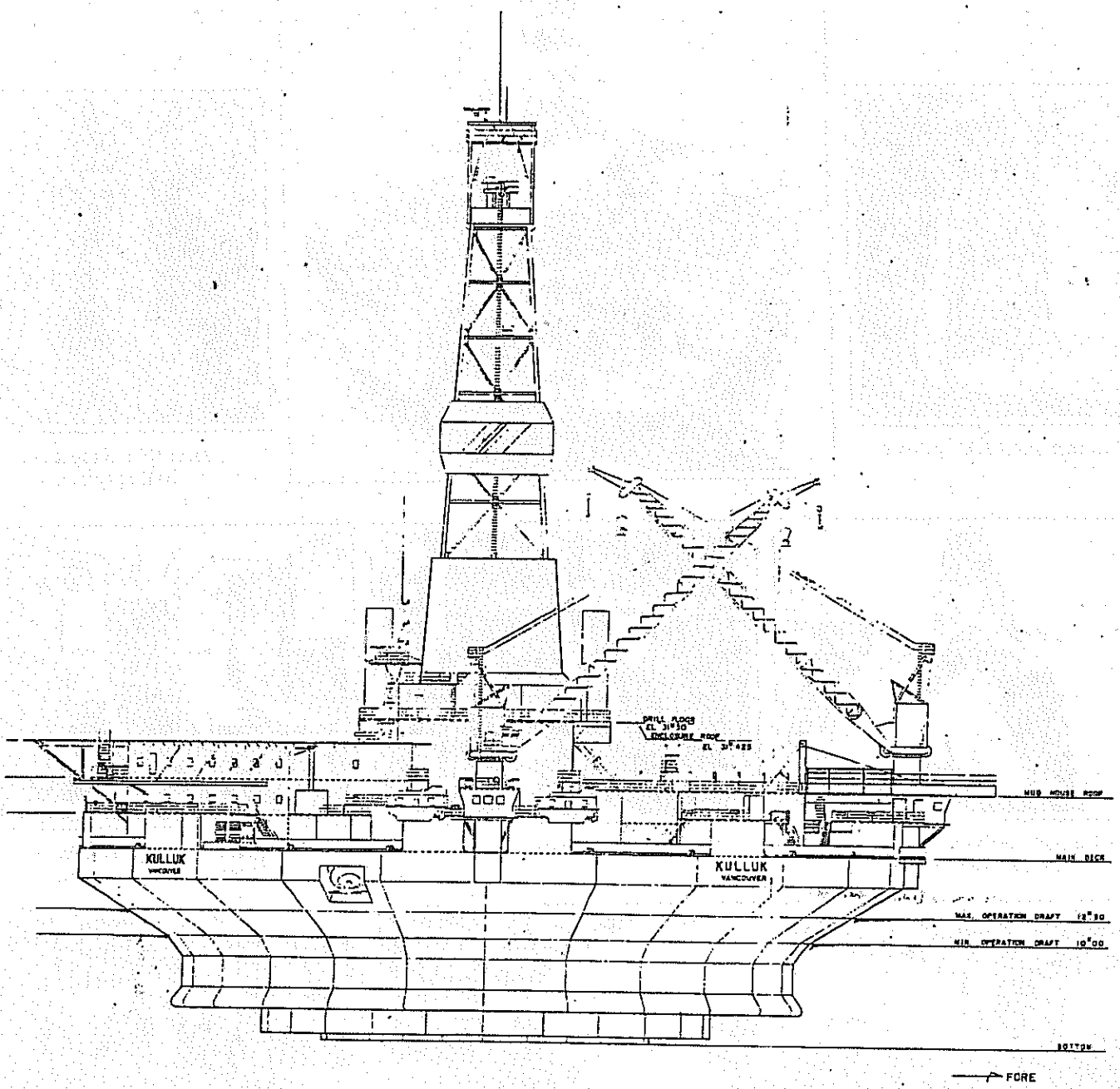
ıside storage for drilling and rental tools



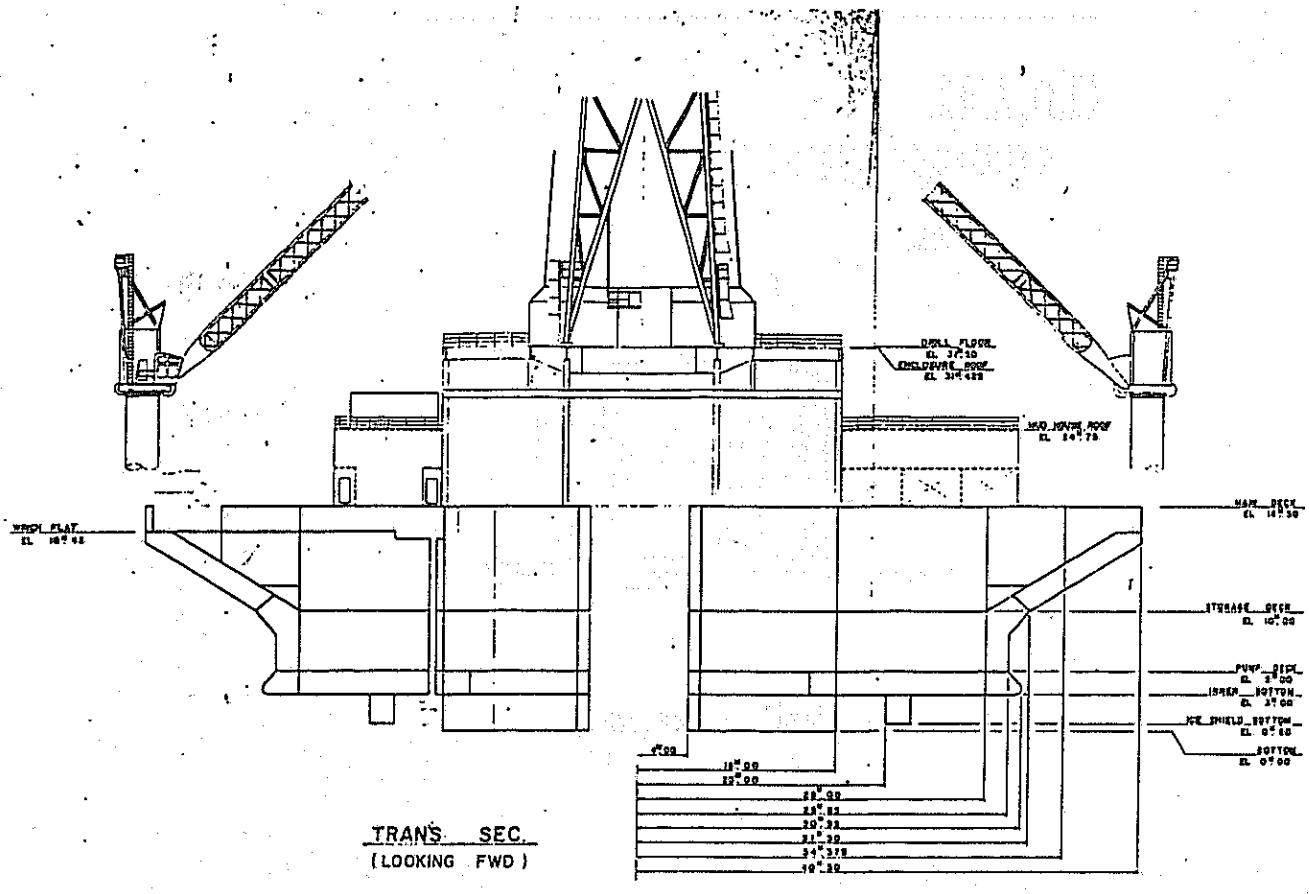
Pressurized mud logging room



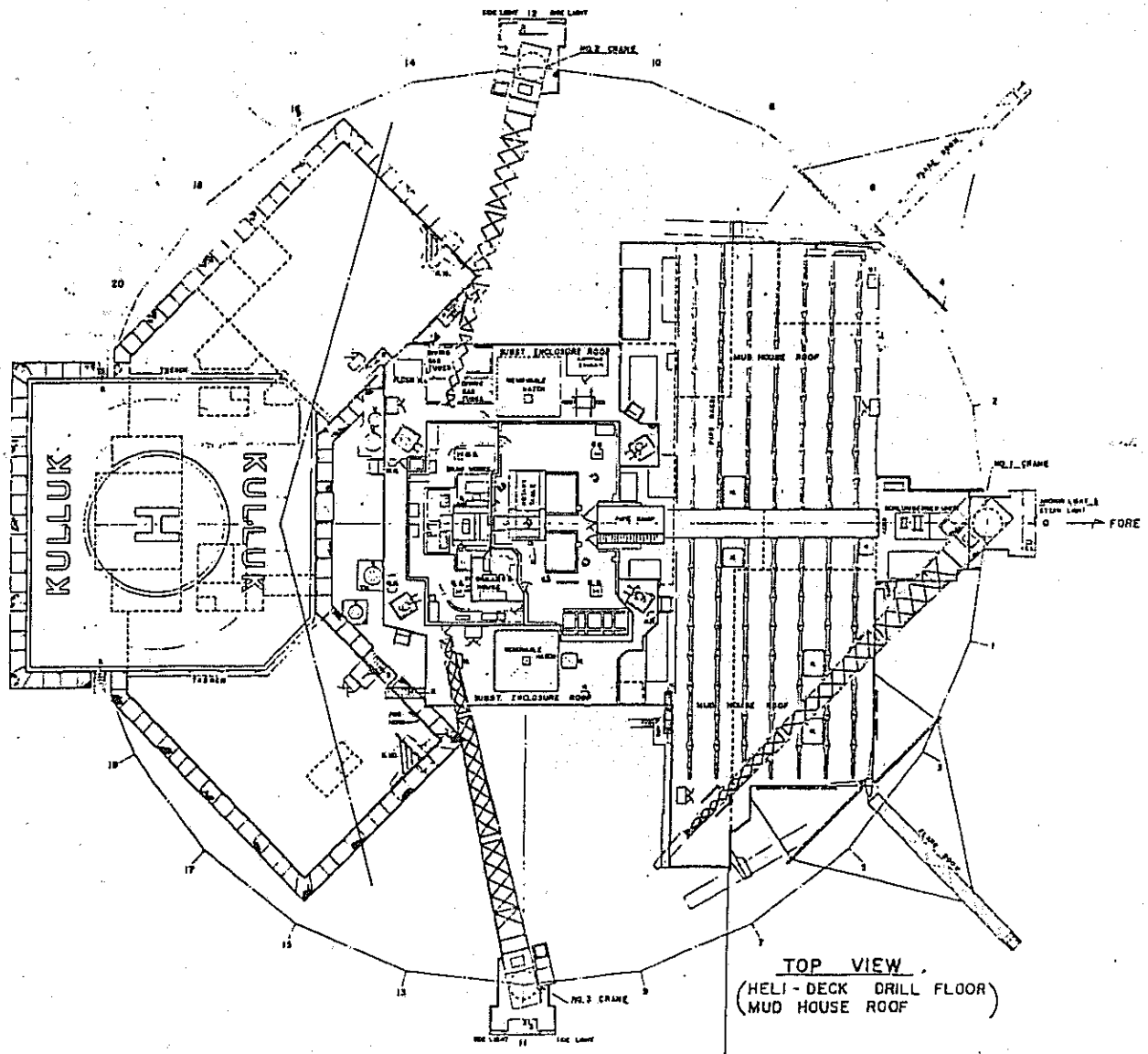
Dual purpose barite recovery/solids control centrifuge


KULLUK
VANCOUVER
KULLUK
VANCOUVER
MUD HOUSE ROOF
MAIN DECK
MAX. OPERATION DRAFT
MIN. OPERATION DRAFT
BOTTOM
FORE

PROFILE



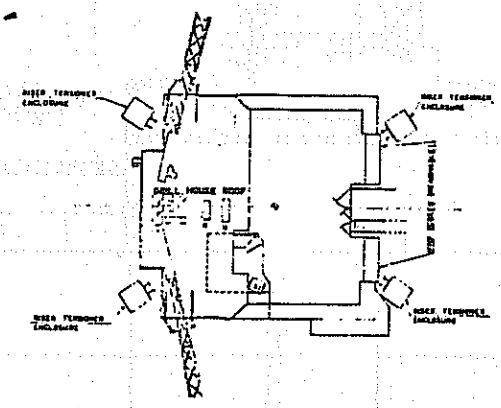
TRANS SEC.
(LOOKING FWD)



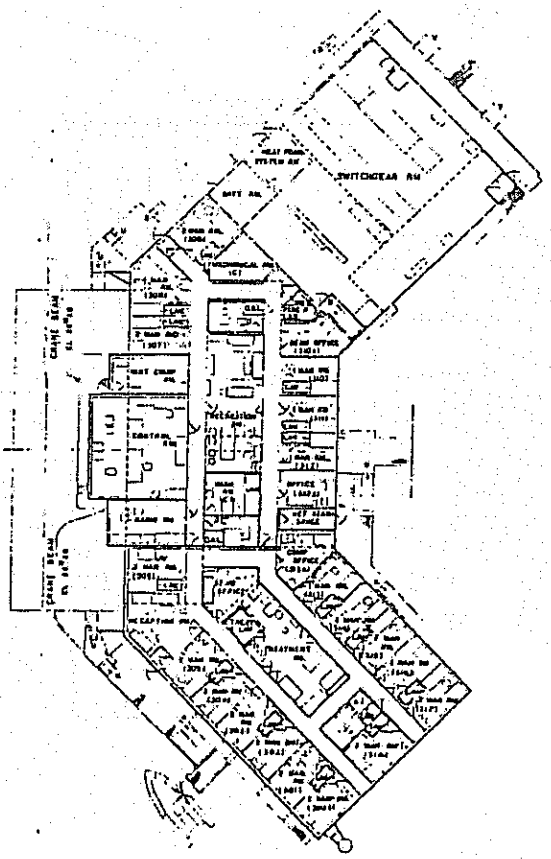
TOP VIEW
(HELI-DECK DRILL FLOOR)
(MUD HOUSE ROOF)

KULLUK
ARRANGEMENT

SCALE 1 : 200



DRILL HOUSE ROOF



3 RD. DECK

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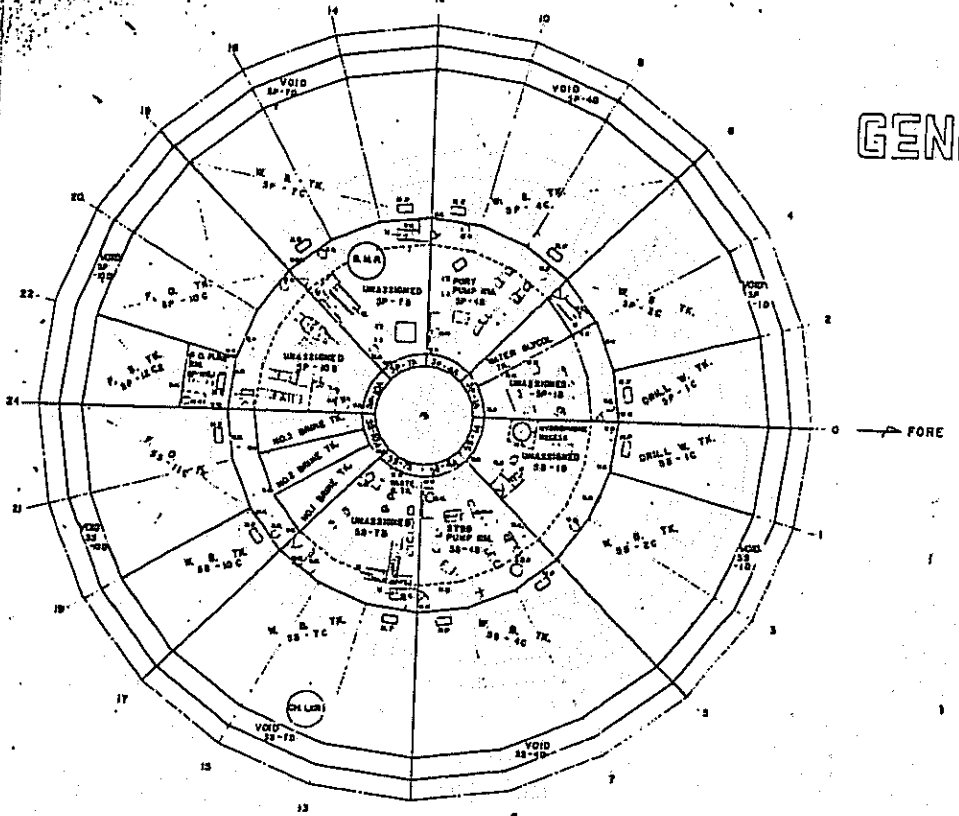
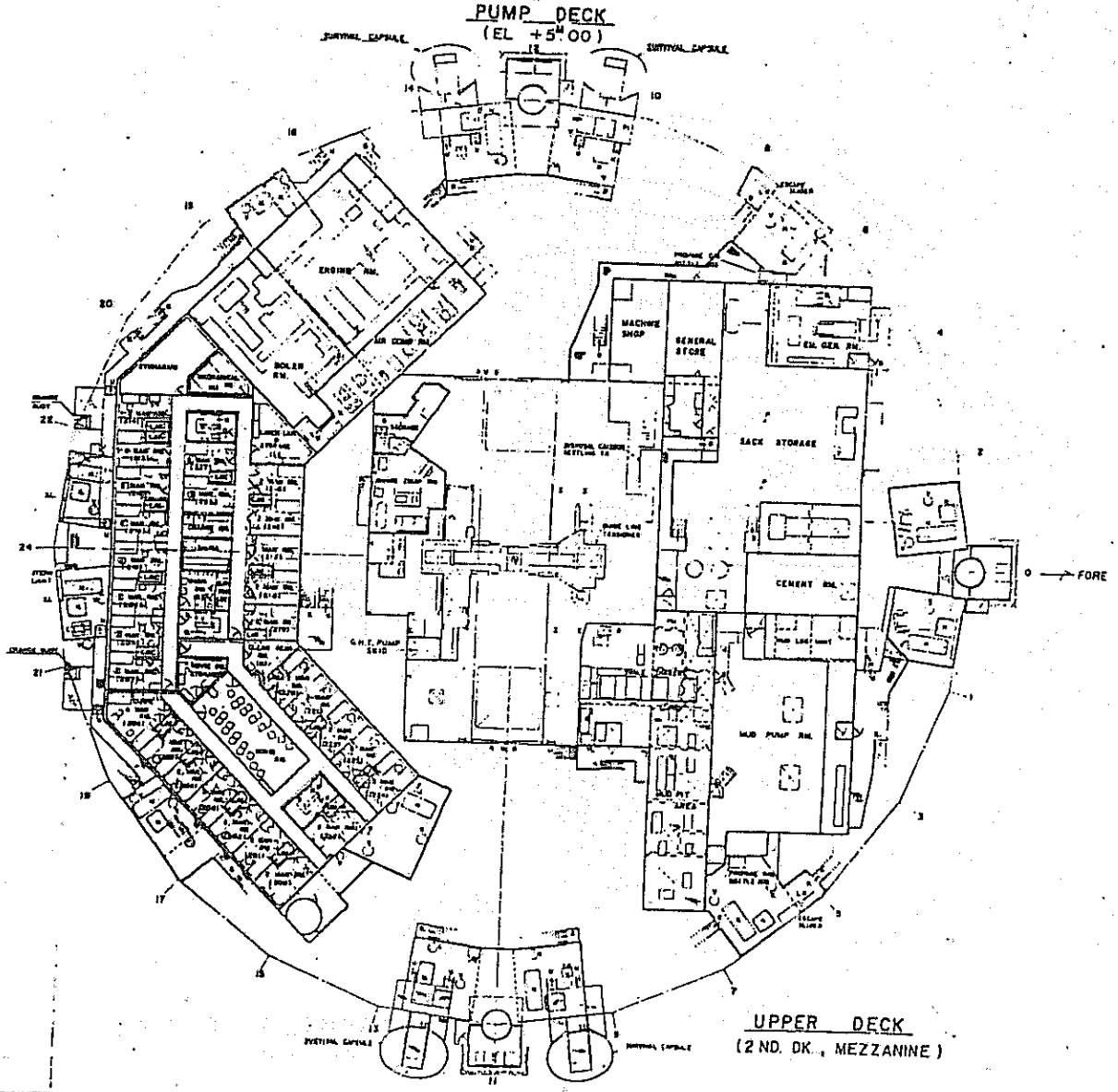
GENERAL

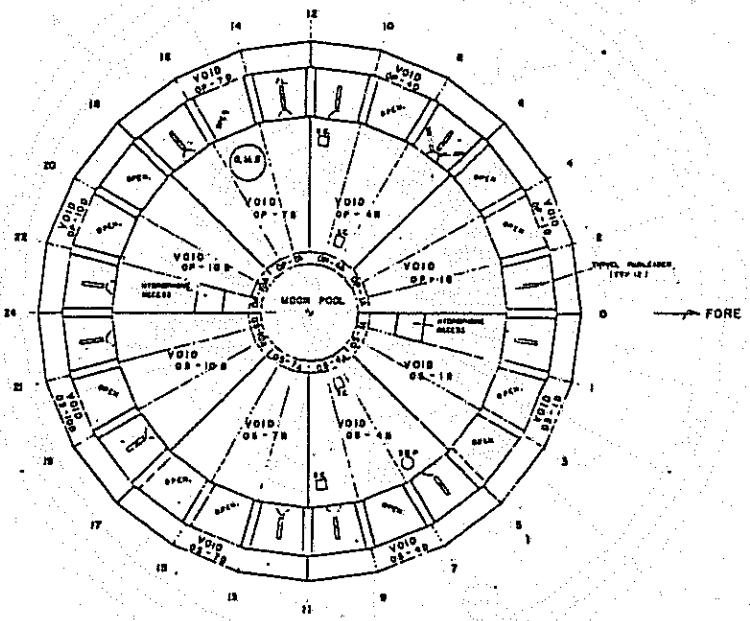
SCA



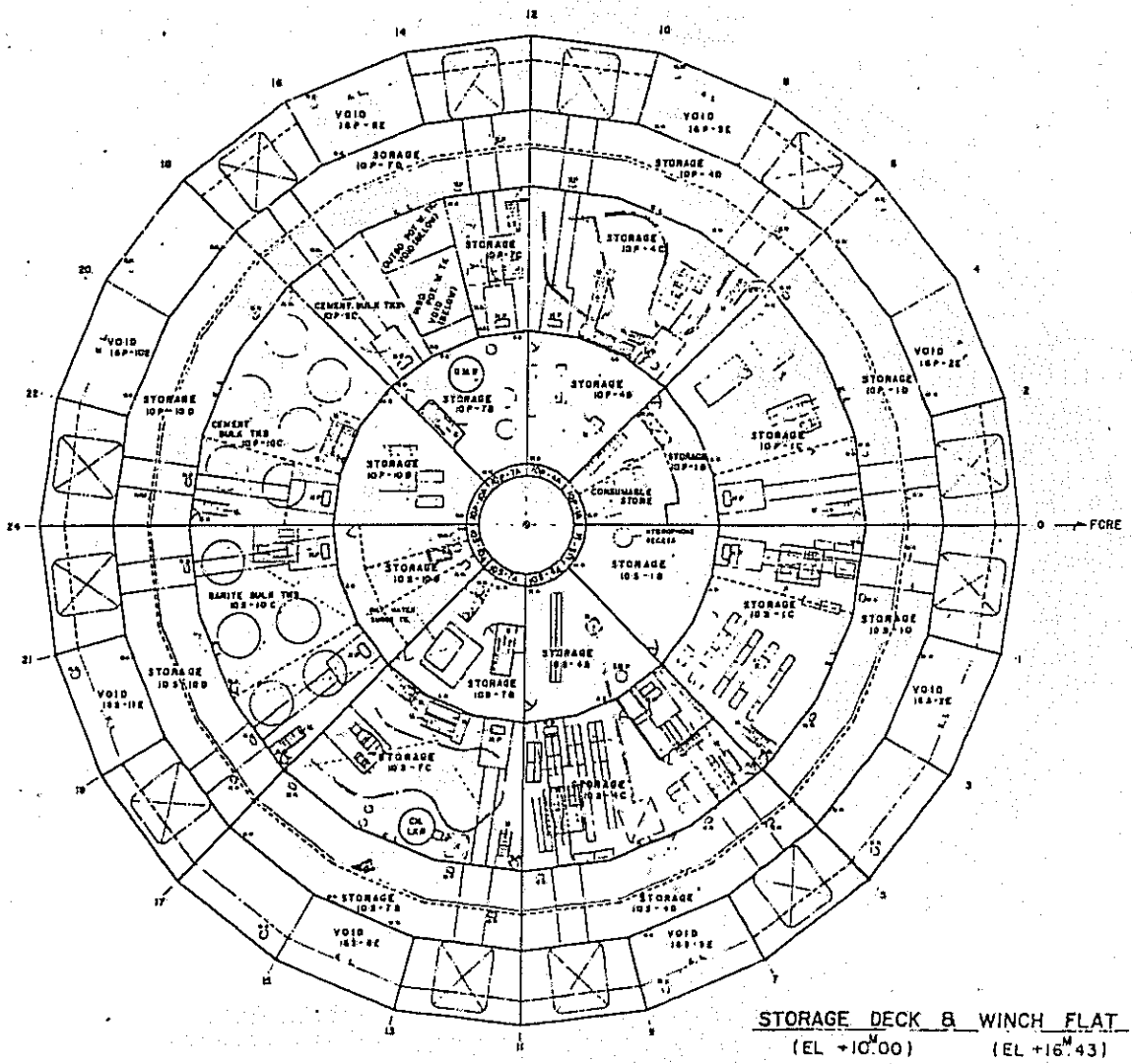
PUMP DECK
(EL +5M 00)



UPPER DECK
(2 ND. DK., MEZZANINE)



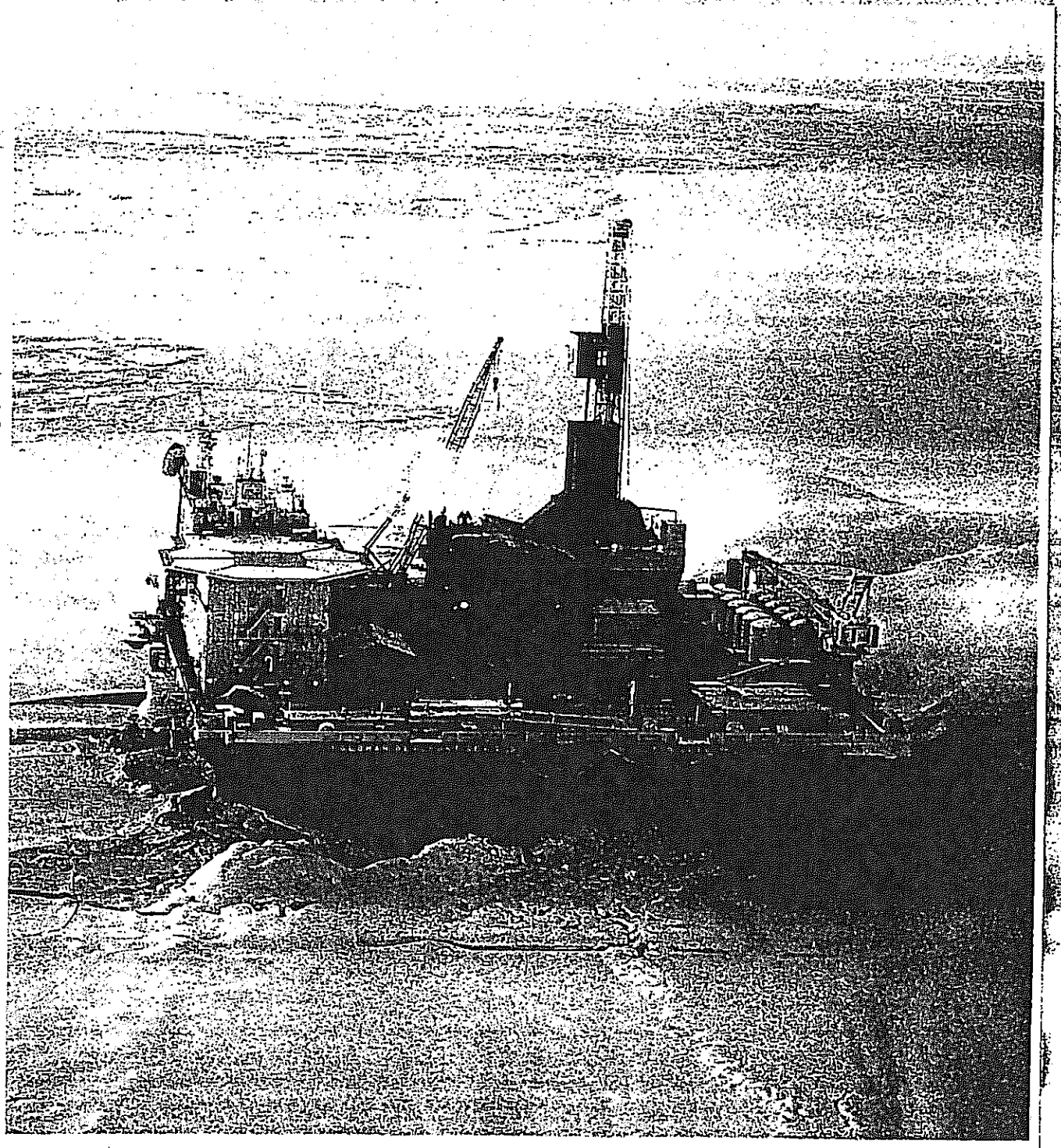
BOTTOM
(EL +0.M00)



STORAGE DECK & WINCH FLAT
(EL +10.M00) (EL +16.M43)

GLOMAR BEAUFORT SEA I

GLOBAL MARINE DRILLING COMPANY



GENERAL DESCRIPTION

The GLOMAR BEAUFORT SEA I is a mobile offshore drilling unit designed specifically for year-round exploratory drilling in the harsh offshore arctic environments in water depths ranging from 35 to 55 feet. The drilling unit is classified by the American Bureau of Shipping as a ✠ A1 caisson drilling unit and is completely certified by the United States Coast Guard.

The GLOMAR BEAUFORT SEA I consists of six structural modules: a steel mud base, a center structure of honeycomb concrete referred to as the "Brick," two steel deck storage barges, the quarters unit and the drilling rig. Combined, these modules form a drilling unit which can be towed to, and ballasted down at, the drill site. When required, the unit can be deballasted, refloated and towed to another drill site. The deballasting and refloating operation can be accomplished within approximately 72 hours under normal conditions.

Modular Components

The steel mud base consists of a series of large tanks which can be flooded with sea water thereby providing ballast control during the lowering or refloating of the platform. Once on the bottom, the tanks are completely filled to obtain the maximum gravity load. The mud base is the means by which the ice loads are transmitted from the Brick to the foundation soil. A five foot deep grid, which extends beneath the base, penetrates the soils to provide further resistance to sliding.

The concrete Brick, connected to the steel mud base, is the main structural element which resists the large ice forces prevalent in the arctic. A Rubble Generation System utilizing high pressure "water cannons" provides additional protection against advancing ice. The system provides a high volume spray which produces a grounded ice berm around the platform creating passive protection from the ices forces. The Brick supports the two deck storage barges. Combined, the two deck barges provide a total of more than 79,000 square feet of deck space as well as internal areas for machinery spaces and storage for fuel and consumables.

The rig is completely self supporting and can operate without the resupply of major drilling consumables for periods of up to ten months. This freedom from resupply permits continuous drilling operations throughout the year in remote arctic regions.

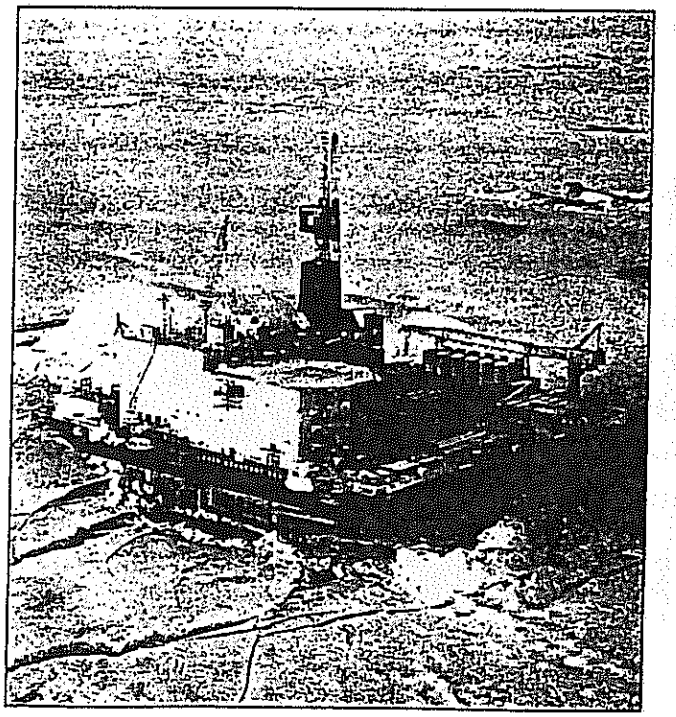
The starboard barge houses a survival shelter which is outfitted to support all crew members for a period of up to three days in the event of a major on-board emergency. The quarters are installed on the starboard barge. The drill rig and all drilling support equipment are located on the port barge.

Both the drill well located in the port barge and the service well located in the starboard barge run vertically through the barges, Brick and base. Multiple wells can be drilled at a single platform location.

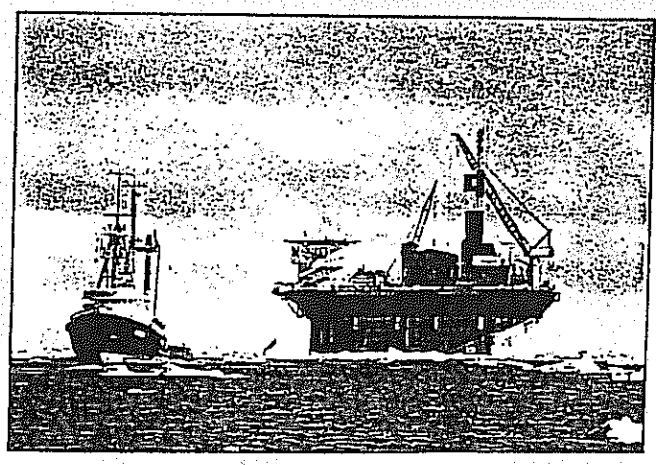
The five story quarters structure can accommodate up to 92 personnel. The quarters structure also houses the machinery spaces on the main deck, three floors of staterooms, mess hall and recreational facilities. The control and communications rooms are located in the fifth level. The helicopter landing facility is located on top of the fifth level.

The drilling rig presently on board is a standard 2,000 horsepower land rig which has been modified to meet the USCG MODU regulations for offshore operations. The rig, located on the port barge, is complete with a power generation system independent from the power system which supplies the quarters, marine systems and survival shelter. The drilling rig is equipped to comply with environmental regulations.

Engineered to withstand the arctic environment and designed to drill multiple wells without resupply, the mobile GLOMAR BEAUFORT SEA I can accommodate drilling programs in the arctic regions in a cost effective and efficient manner.



On location in the Beaufort Sea



The GLOMAR BEAUFORT SEA I being towed to location.

PRINCIPAL CHARACTERISTICS

Vessel Information

CLASSIFICATION: Certified by the USCG as a Mobile Offshore Drilling Unit (MODU). By ABS as a ✠ A1 caisson drilling unit.

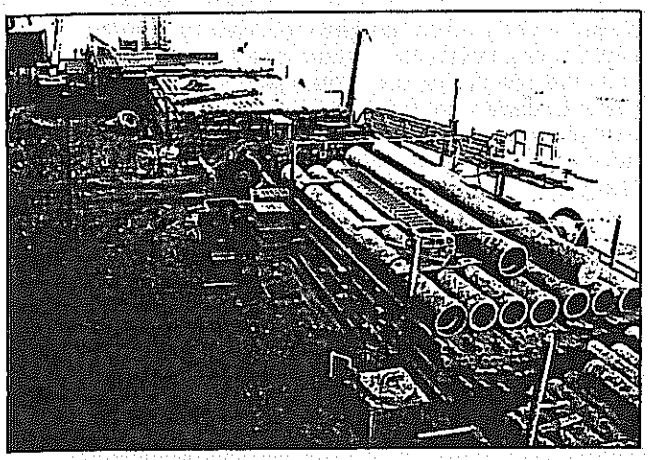
DECK BARGES:
- LENGTH OVERALL: ..... 290 ft. 6 in.
- WIDTH (for two barges): ..... 274 ft.
- HEIGHT: ..... 26 ft.

BRICK:
- LENGTH OVERALL: ..... 234 ft.
- WIDTH: ..... 234 ft.
- HEIGHT: ..... 44 ft.

BASE:
- LENGTH OVERALL: ..... 312 ft. 6 in.
- WIDTH: ..... 295 ft.
- HEIGHT (not including 5 ft. skirts): ..... 25 ft.

OVERALL DIMENSIONS:
- FROM BASELINE TO MAIN DECK: ..... 95 ft.

HELIPORT: ..... 73 ft. x 73 ft.
Designed to support an S-61 helicopter in accordance with USCG specifications.
ACCOMMODATIONS: Quarters for 92 personnel. Seven-bed Hospital. Galley, mess and recreational facilities.
DRILLING DEPTH: ..... 25,000 ft.
OPERATING WATER DEPTH:
- MAXIMUM: ..... 55 ft.
- MINIMUM: ..... 35 ft.



Tubular storage area

Storage Capacities

SACKED MATERIALS: ..... 2,000 sacks
BULK CEMENT: ..... 9,000 cu. ft.
DRY BULK MUD: ..... 27,000 cu. ft.
LIQUID MUD: ..... 4,190 bbls.
DRILL WATER: ..... 34,736 bbls.
FUEL OIL: ..... 48,712 bbls.
CUTTINGS STORAGE: ..... 4,000 bbls.
POTABLE WATER: ..... 730 bbls.
TUBULAR STORAGE: ..... Three 10,000 ft. wells
SALTWATER BALLAST: ..... 116,925 s. tons

Loading and Towing Data

OPEN OCEAN TOWS: Average Towing Speed 3.6 knots with two 22,000 IHP oceangoing tugs. Towing Draft: 32 feet (Navigational).
LOCATION TOWS: Equipment for location to location moves are site dependent.

Starboard Barge Power System

Provides power for quarters, marine systems and survival shelter.

Power Generation

Three CAT D379 diesel engines driving three 400 kw, Kato 480 volt AC generators.

Power Conversion

Two 1,000 kva, 480 volt/120 volt transformers. Three 480 volt motor control centers and distribution panels.

Port Barge Power System

Provides power for the drilling rig and drilling support equipment.

Power Generation

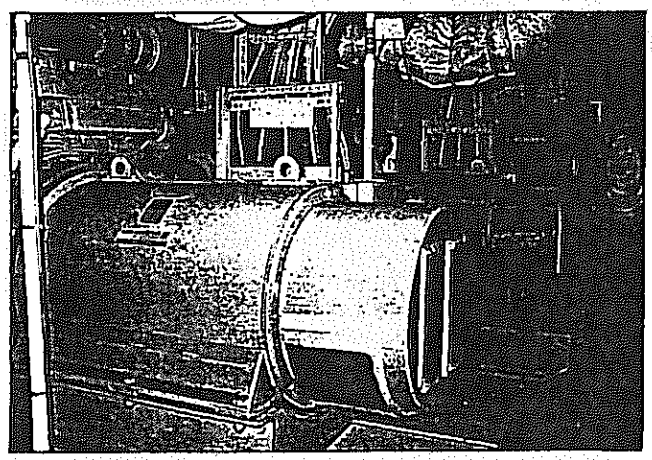
Four CAT D399 diesel engines driving four Kato 1,050 kw AC generators.

Power Conversion

Four Ross Hill SCR power conversion units.

Emergency Power

One CAT D379 diesel engine driving one Kato 400 kw generator.

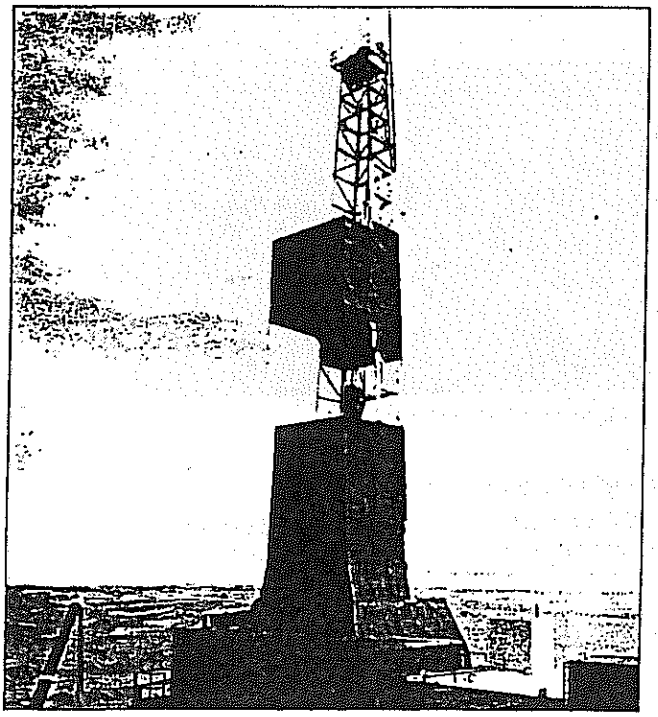


Kato generator

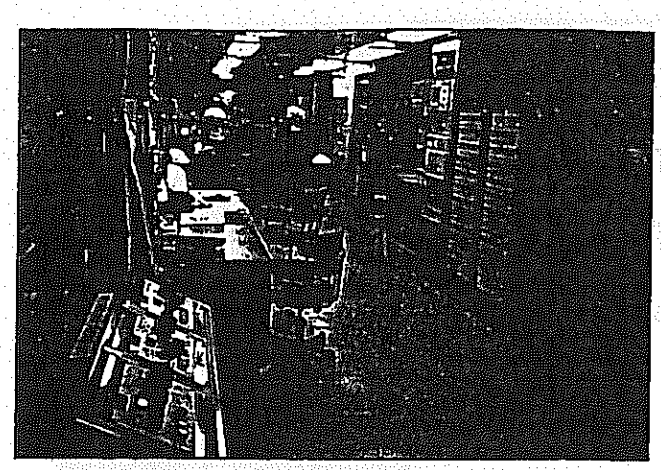
DRILLING SYSTEMS

Drilling Equipment *

DRAWWORKS: OIME 2000E complete with Baylor-Elmagco 7838 electric auxiliary brake.
DRILLING LINE: 1-1/2 in. 6 x 19 extra improved plow IWRC 7,500 ft. arctic lube.
SANDLINE: 9/16 in. 6 x 7 20,000 ft.
DERRICK: Parco cantilevered mast with a hook load capacity of 1,250,000 lbs.
CROWN BLOCK: Parco crown block grooved for 1-1/2 in. line with 60 in. sheaves.
TRAVELING BLOCK AND HOOK: Ideco 535 ton block with 6 sheaves and Ideco 535 ton hook.
SWIVEL: Continental Emsco LB 400.
ROTARY TABLE: 37-1/2 in. Oilwell rotary table with 650-ton capacity.
KELLY SPINNER: International Tool A-6C.
WEIGHT INDICATOR: Martin-Decker E.
DRILL PIPE: 16,000 ft. 5 in. OD grade E and G; 1,085 ft. 5 in. OD hevi-wate.
DRILL COLLARS: Eighteen 6-1/2 in. OD and eighteen 8 in. OD.
IRON ROUGHNECK: Varco 2000.
MUD PUMPS: Two National Supply 12-P-160 triplex pumps.
MUD MIXING: Two Mission Magnum centrifugal pumps driven by 100-hp electric motors.
SHALE SHAKER: Dual tandem Brandt shakers mounted on sandtrap.
DESANDER: Two Brandt SRS-2 rated at 1,000 gpm each.
MUD CLEANER: Two Brandt mud cleaners rated at 400 gpm each.
DEGASSER: Swaco degasser rated at 1,000 gpm.
CEMENTING UNIT: Cementing unit with two diesel engines.



Winterized derrick



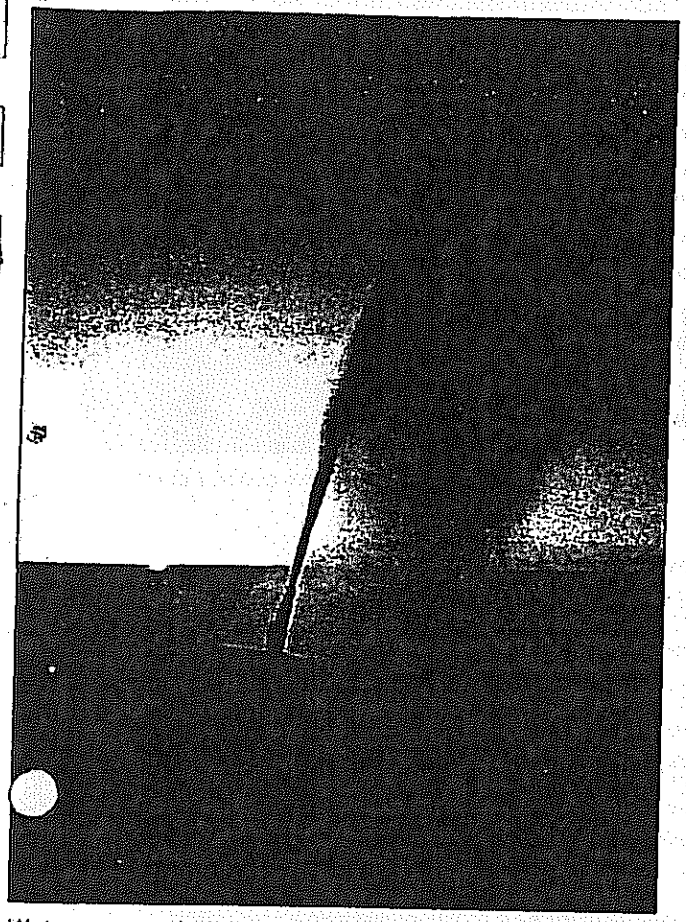
Control Room showing water cannon control console

Blowout Preventer Equipment *

BOP SYSTEM: Certified for H_2S service.
STACK SIZE/RATING: 13-5/8 in. 10,000 psi wp.
ANNULAR PREVENTER: One Cameron 13-5/8 in. 5,000 psi wp annular preventer.
RAM PREVENTERS: One Cameron single U ram preventer 13-5/8 in. and one Cameron double U 13-5/8 in. 10,000 psi wp ram preventer.
CHOKE AND KILL VALVES: Two 3-1/16 x 10,000 psi wp opening gate valves. One 3-1/16 x 10,000 psi check valve. One 3-1/16 x 10,000 psi hydraulic full opening gate valve. One 3-1/16 x 10,000 psi full opening gate valve.
BOP CONTROL SYSTEM: NL Shaffer 3,000 psi accumulator with electric hydraulic triplex pump, two air operated hydraulic pumps, hydraulic pump control panel on drill floor, one removed from drill floor and proper manifolding valves and regulators for functioning BOPs, HCR valve and diverter control.
CHOKE AND KILL MANIFOLD: 10,000 psi wp with two 3-1/16 hydraulic chokes with remote panels, one manual adjustable choke, full control opening 4 in. bypass.
DIVERTER SYSTEM: One 21-1/4 in. 2,000 psi wp annular diverter with one 21-1/4 in. 2,000 psi wp drill spool with two 10 in. outlets. Two 10 in. 300 psi wp hydraulic diverter ball valves and two 10 in. diverter lines.

** Rig is currently equipped with this drilling and blowout preventer equipment.*

SUPPORT SYSTEMS



Water cannon building ice berm

Water Spray System

One Gould deepwell turbine pump, 880 rpm, 21,500 gpm, 110 TDH driven by a CAT D399 diesel engine. Two Gould centrifugal pumps, 16 x 18, 10,600 gpm, driven by a CAT D399 diesel engine. Svenska skumslackning water cannons, 2,400 M^3 per hour, electric remote control operators, heated for long term arctic operations.

Brick Instrumentation

188 Altech strain gauges embedded in the concrete Brick. Two Validyne strain gauge readout panels.

Mooring System

Four-point mooring system with four 20,000 lb. anchors and four 3,000 foot 2-1/4 in., 6 x 37 IPS, IWRC wire lines.

Firefighting and Safety Equipment

Fire Main with 38 external and 34 internal stations. Halon system in engine room, paint locker, pump rooms, and water spray pump room. Deluge system and portable dry chemical and CO_2 fire extinguishers. Complete first aid facilities. Helicopter deck is equipped with foam fire fighting system, fuel tank jettisoning and rescue equipment.

Survival System

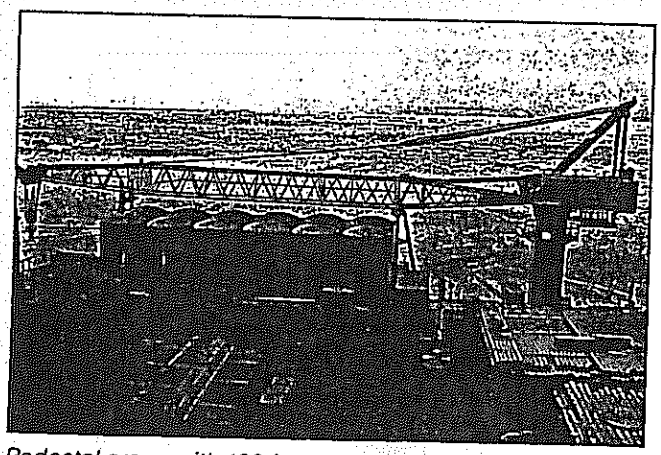
Two 54-man Whittaker, USCG approved, arctic capsules with launch system and four USCG approved arctic life rafts sufficient to accommodate all on-board personnel. Sufficient arctic survival suits and sleeping bags to supply all personnel. Integral survival shelter outfitted with arctic survival gear and provisions to support the entire crew for up to 3 days.

Communications Equipment

Single side band radio telephone; VHF marine radio telephone; VHF aircraft radio; sound-powered telephone system; helicopter homing beacon; listen/talk amplified PA system; dial telephone system; INMARSAT.

Auxiliary Equipment

WATER DISTILLATION SYSTEM: One 15,000 gpd reverse osmosis and three 2,400 gpd waste heat distillers.
WASTE TREATMENT: One Omnipure System certified to accommodate 100 persons and one Vent-O-Matic waste incinerator unit.
AIR COMPRESSORS: Two 60 cfm, Ingersoll-Rand 125 psi electric air compressors and one Ingersoll-Rand 17 cfm 125 psi diesel air compressor.
WELDING EQUIPMENT: One 400-amp Lincoln electric unit and one 300-amp portable diesel electric unit.
CRANES: One crawler crane with 120 ft. boom, rated at 100 tons, one wheeled crane with 91 ft. extended boom, rated at 18 tons and one pedestal crane with a 120 ft. boom rated at 100 tons.



Pedestal crane with 120 foot boom

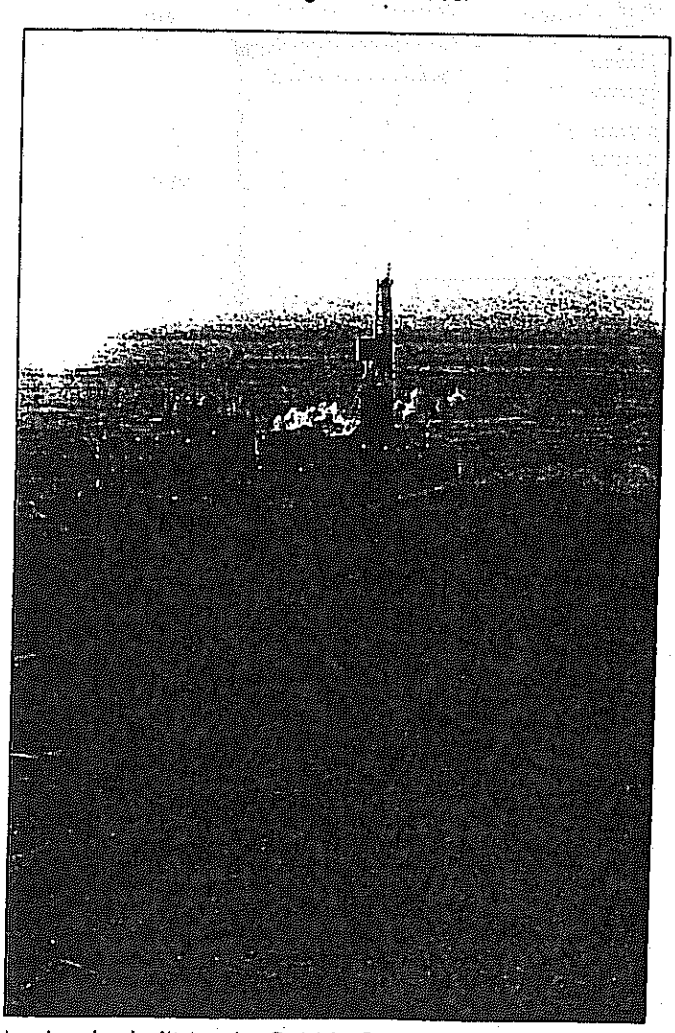
Environmental Control Equipment

DRAIN SYSTEM: Every drain system can be diverted to the oily water separators to comply with environmental regulations.
OILY WATER SEPARATOR AND RECOVERY SYSTEM: Two Facet separators, 10 gpm capacity with fluid analyzer.
CUTTINGS TANKS: Four tanks with total storage capacity of 4,000 bbls.

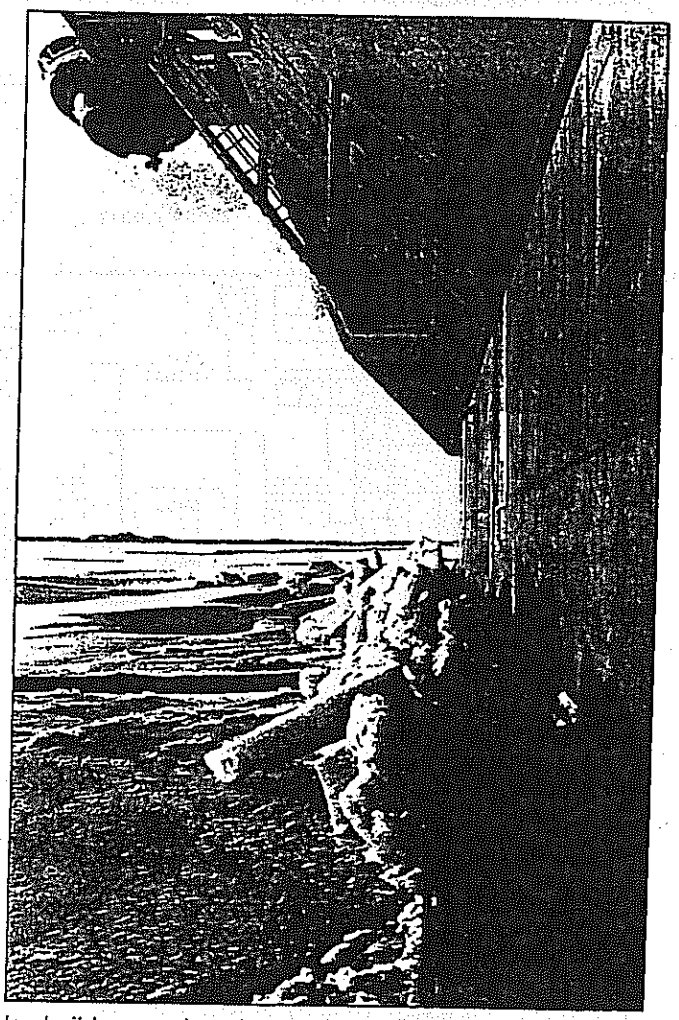
ENVIRONMENTAL DESIGN CRITERIA

The GLOMAR BEAUFORT SEA I is engineered to withstand the ice forces expected in the arctic without sustaining detrimental structural damage. The unit is also designed to resist sliding on the ocean floor. For additional protection against the arctic ice floes, the platform has been fitted with a Rubble Generation System (RGS) which produces a grounded rubble field. The ice barrier which is created around the platform provides passive protection from the advancing ice. The ice barrier is built by the water cannons spraying a water stream between 250 and 300 feet from the platform. As the water is sprayed, the droplets freeze in air and fall to the surface forming a grounded ice barrier which protects the rig.

The deck barges and the mud base of the GLOMAR BEAUFORT SEA I are constructed of steel. These components are not exposed to the severe ice loads. Concrete was used where ice loads do act against the structure. The concrete Brick provides the necessary strength and durability for minimum structure weight per unit of enclosed volume. The honeycomb design, particularly, contributes to the optimum strength to weight ratio required of a mobile rig capable of withstanding the ice loads.



Ice barrier built by the Rubble Generation System

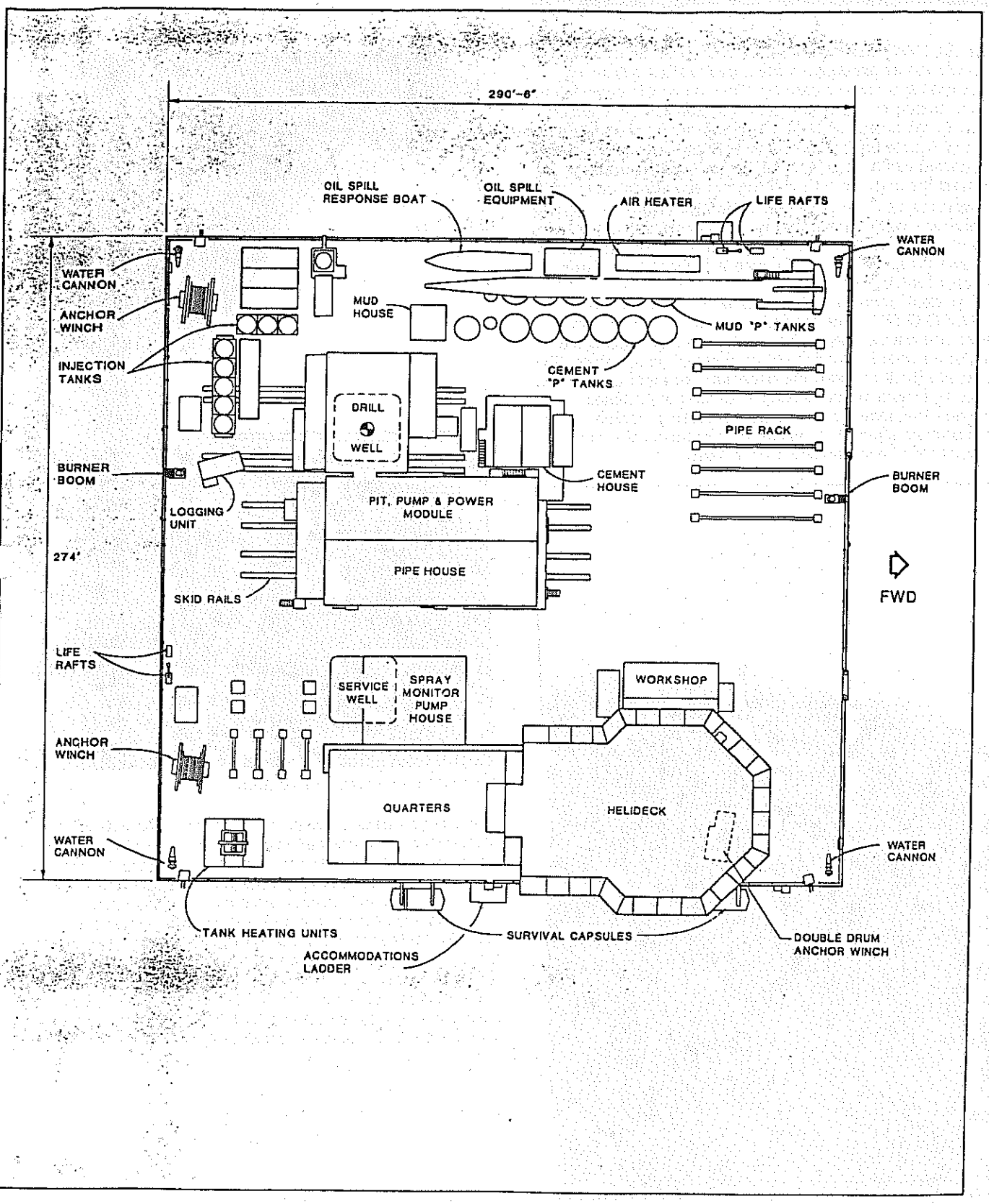


Ice build-up against side of Brick

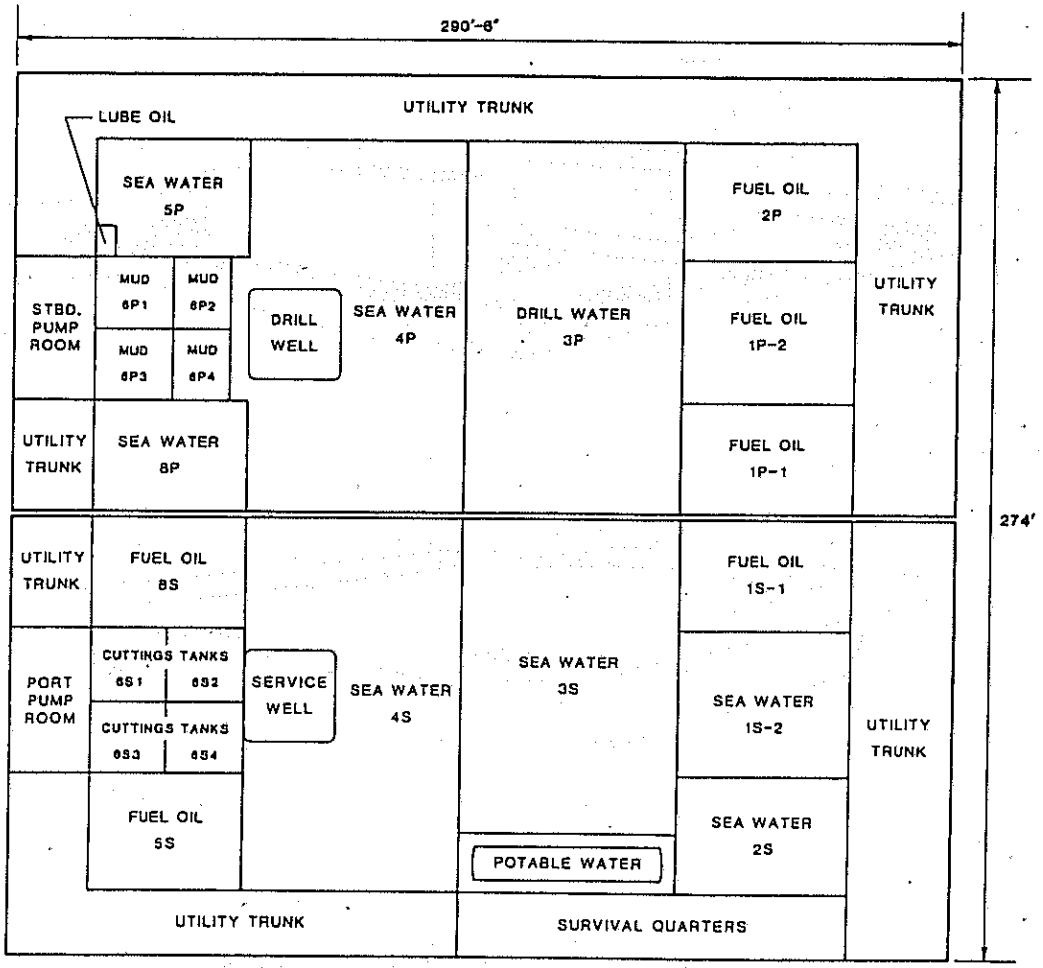
The concrete Brick consists of a field of honeycomb silos surrounded by an internal wall, a series of shear walls and an external wall. The silos are joined to each other by interconnecting walls. Thus the forces imposed on the structure by the ice are evenly distributed throughout the structure. The walls and silos are sandwiched between top and bottom slabs for additional structural stiffness thus forming internal tanks. Like the base, the tanks in the Brick are used solely for sea water ballast.

The design ice load for the GLOMAR BEAUFORT SEA I is as follows: global is 460 kips/foot and the local, acting over a 5 foot by 5 foot area, is 900 psi.

MAIN DECK LAYOUT

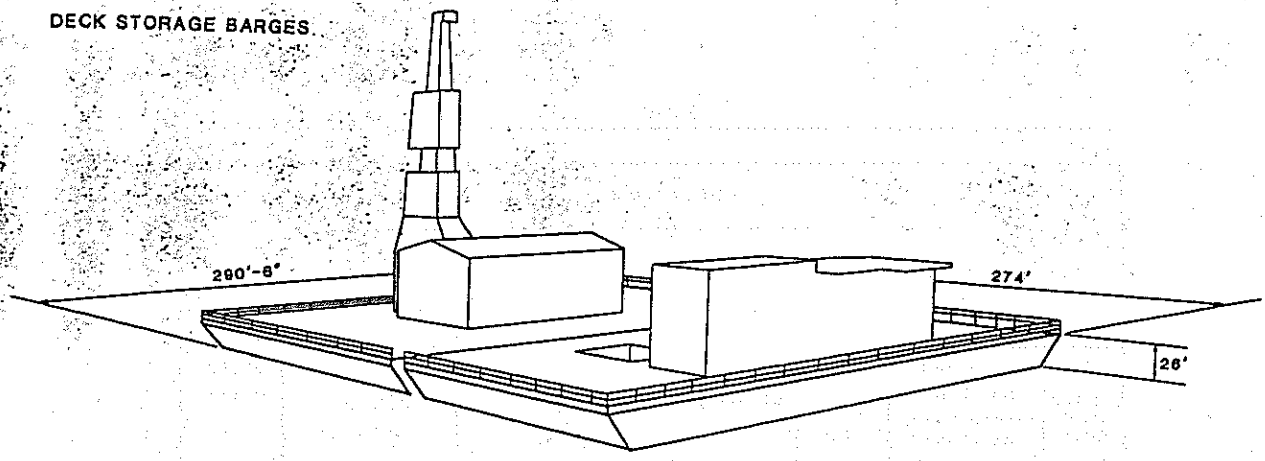


BARGE TANK LAYOUT

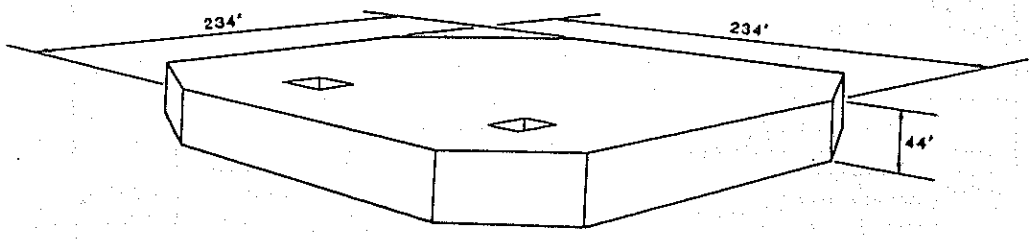


BASIC ELEMENTS

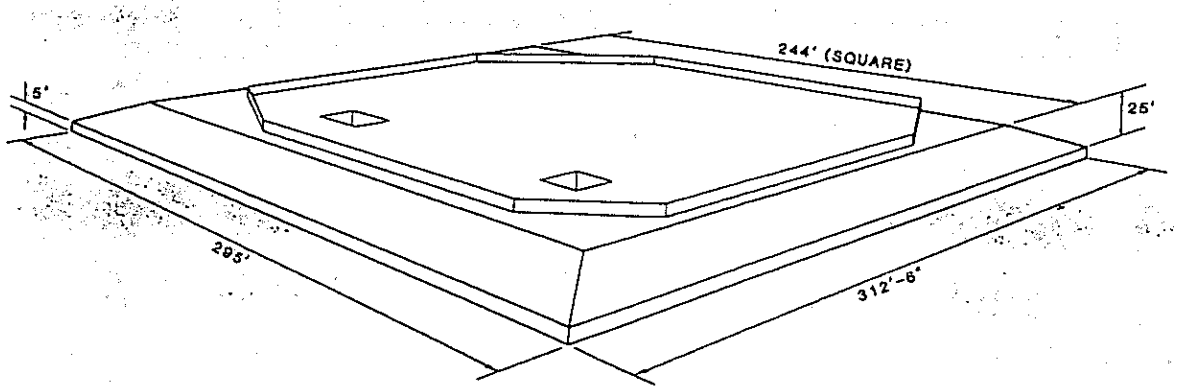
DECK STORAGE BARGES

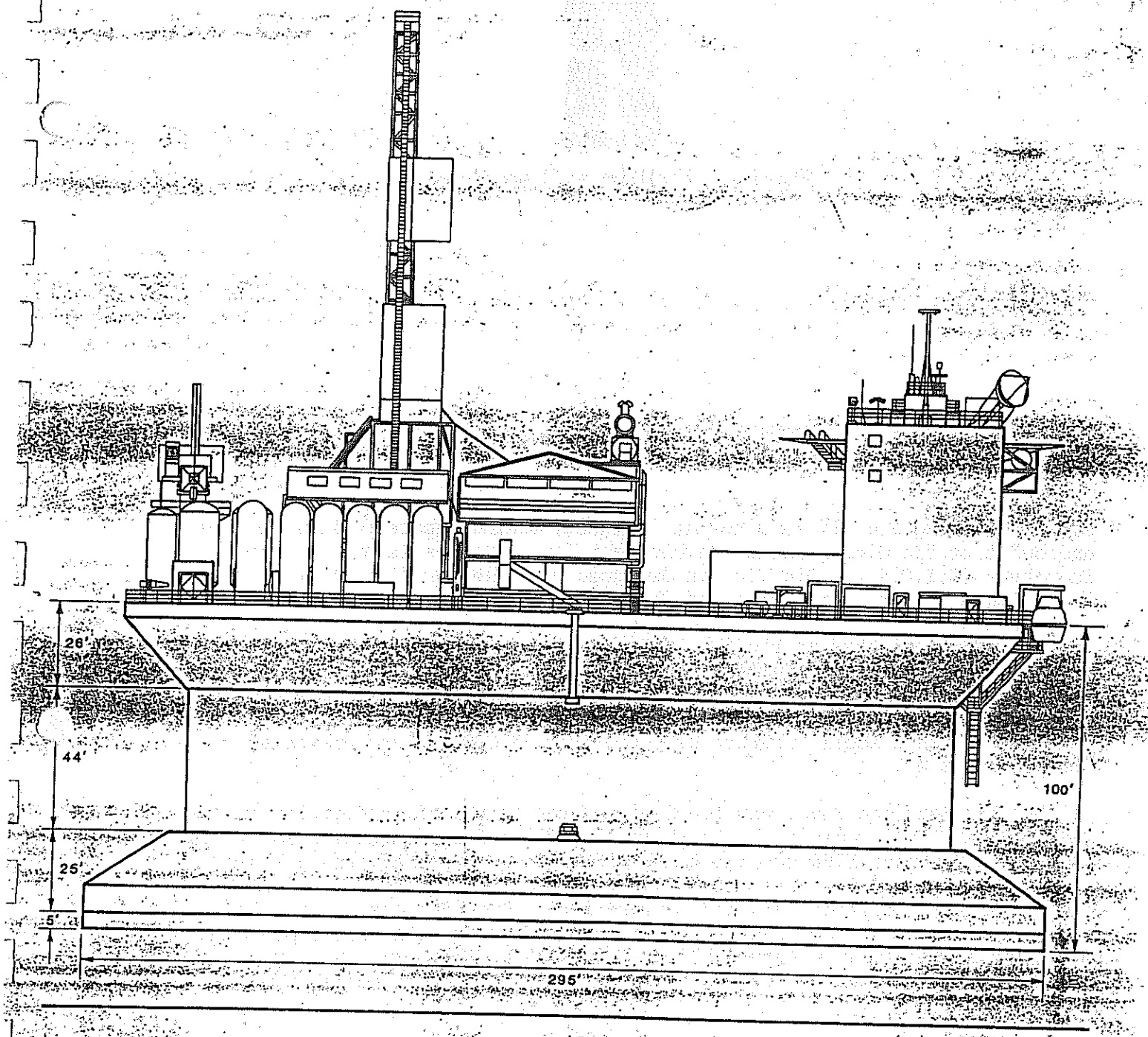


CONCRETE BRICK



STEEL MUD BASE





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Parker Drilling Company

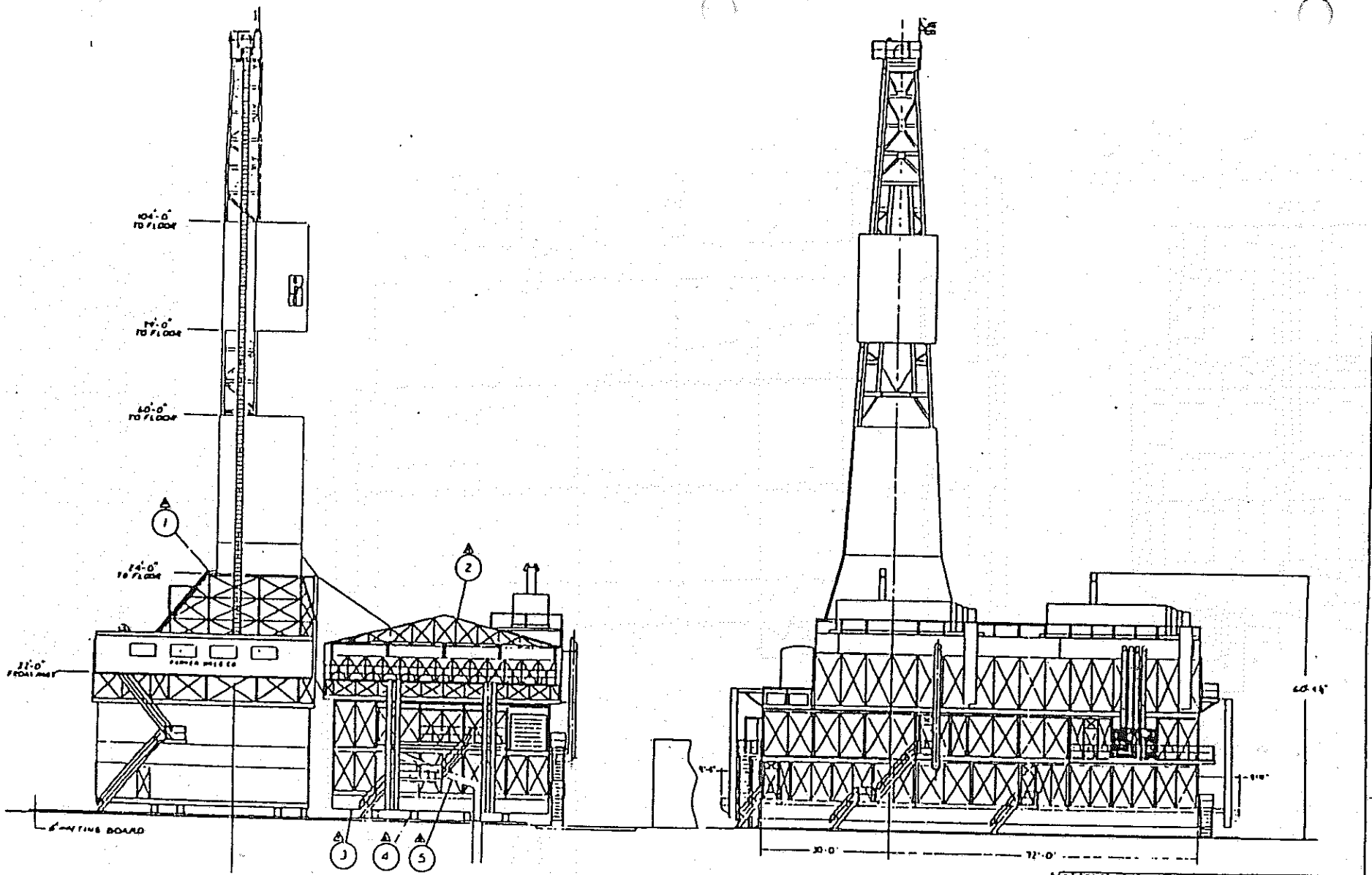
CONCRETE ISLAND DRILLING STRUCTURE

Parker Drilling Rig 217 is a custom designed, minimum space package designed and built to fit Global Marine Development Inc. Concrete Island Drilling Structure (C.I.D.S.). Rig 217 was designed by Parker Drilling to meet U.S. Coast Guard and American Bureau of Shipping Standards.

Rig 217 was fabricated at the Nippon Kokan Yards in Yokohama and Shimizu, Japan. Fabrication was started in December 1983 and completed in June 1984. In June 1984 the units were loaded on barges and taken to a third Nippon Kokan Yard in Tsu, Japan. In Tsu, Rig 217 was loaded on board the C.I.D.S. and commissioned as a Mobil Offshore Drilling Unit (M.O.D.U.) and was named "Beaufort Sea I".

In July the Beaufort Sea I was towed from Japan to its first location in the Beaufort Sea. From this first location, Rig 217 drilled Antares I and II for Exxon from November 1984 through April 1985. In August 1985, Rig 217 was towed to its second Exxon location. From this location, the Orion Well was drilled between December 1985 and January 1986. Drilling operations were suspended in January 1986 and the rig was warm stacked with Parker personnel remaining on board until August 1986. The Beaufort Sea I was then again towed, this time to its present location and prepared for extended storage.

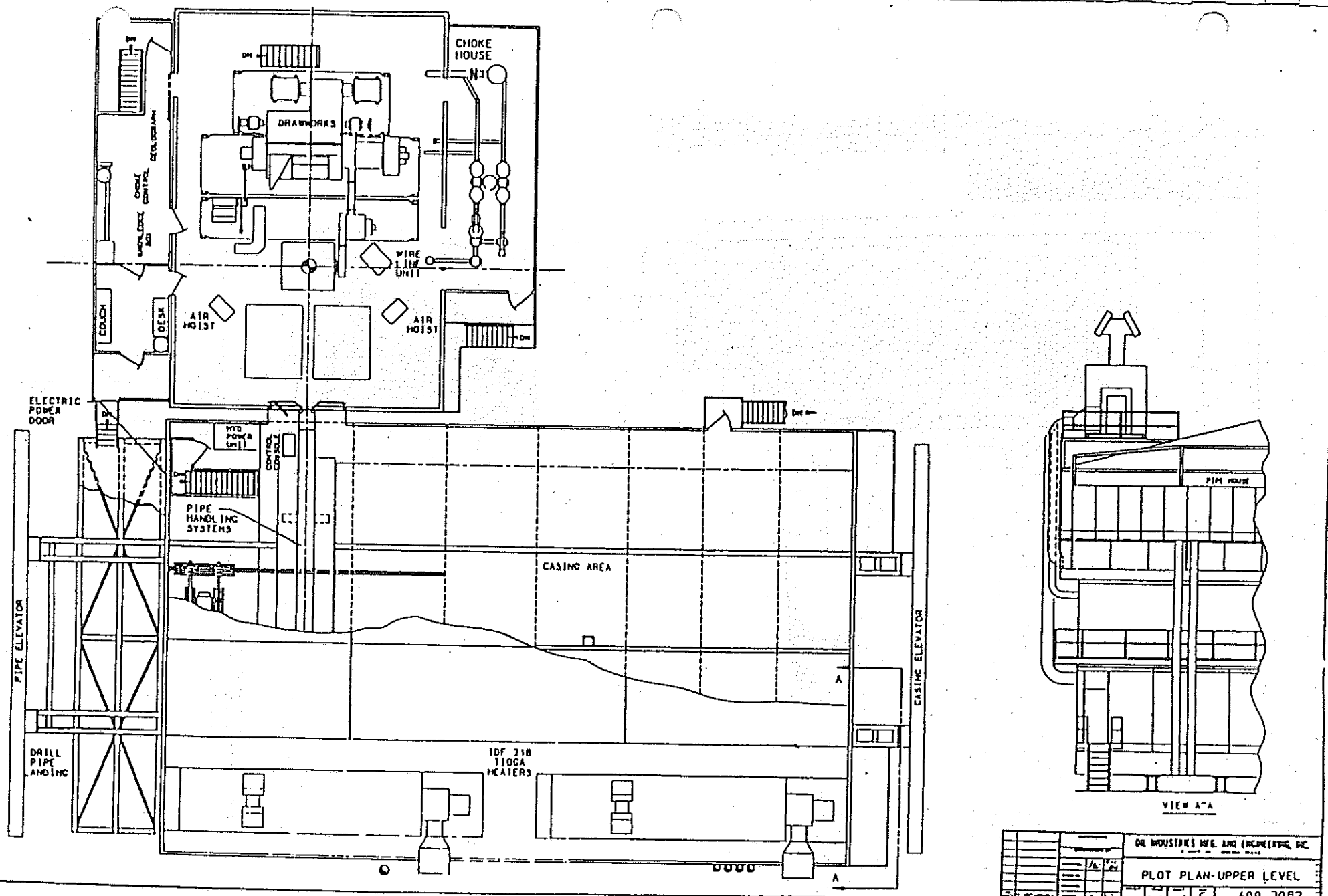
10560 OLD SEWARD HIGHWAY P.O. BOX 455 ANCHORAGE ALASKA 995

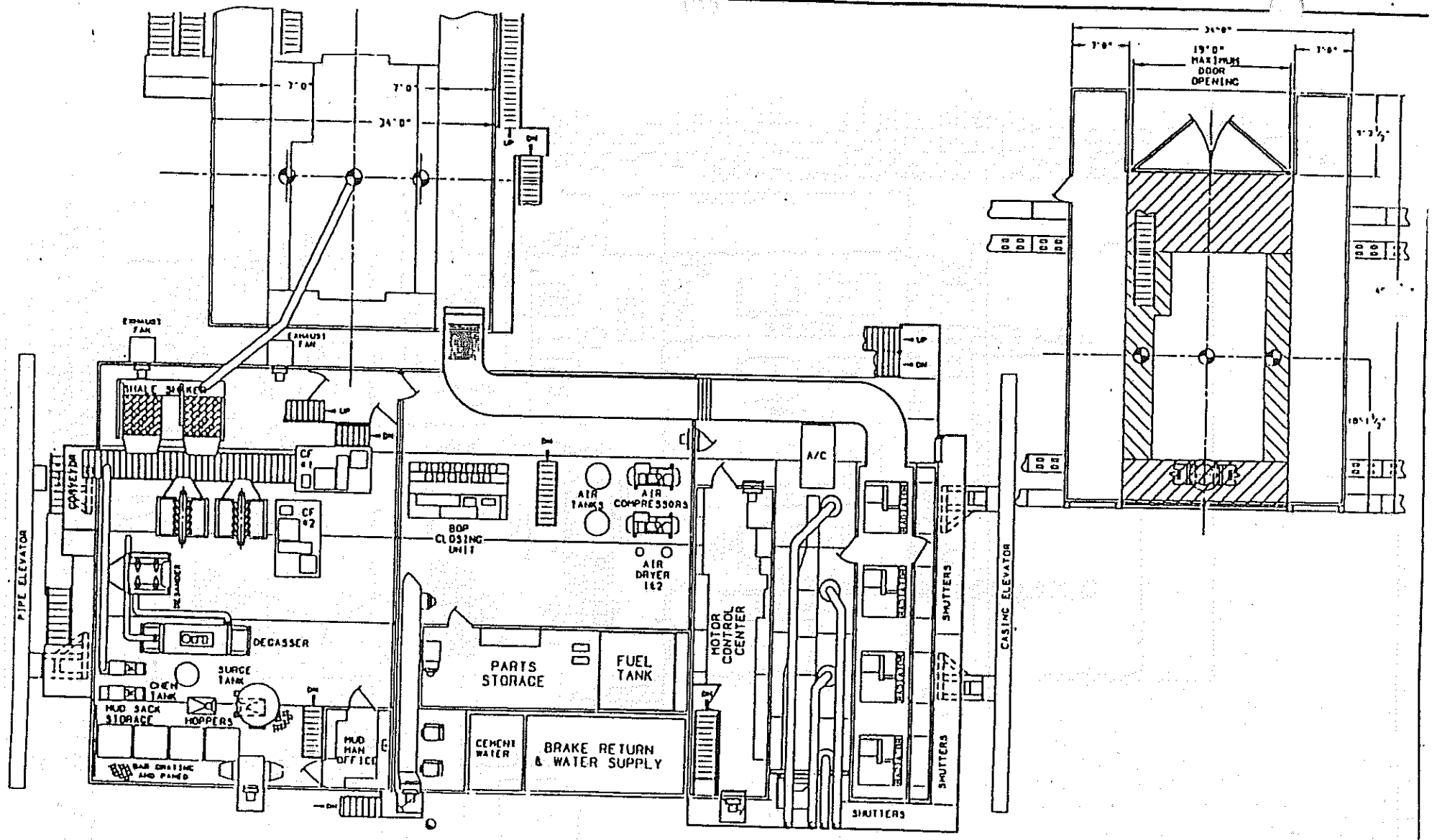


5	500 3116	1	DRILL CUTTINGS DISPOSAL ASSY
4	500 3340	1	SKID RAILS / JACKING SYSTEM INSTALLATION
3	500 3402	1	MAIN FRAME SUPPORT ASSY
2	400 3700	1	GENERAL ARRANGEMENT, DRILLING MODELS
1	500 3564	1	MAST / SUBSTRUCTURE ASSY

LEFT LAYOUT PARKER

500 3134


CHOKE HOUSE
DRAWWORKS
WIRE LINE UNIT
AIR HOIST
AIR HOIST
COUCH
DESK
ELECTRIC POWER DOOR
PIPE HANDLING SYSTEMS
CASING AREA
PIPE ELEVATOR
CASING ELEVATOR
DRILL PIPE LANDING
10F 218 TIOGA HEATERS
A
A
PIPE HOUSE
VIEW A^A
PLOT PLAN-UPPER LEVEL
400.3082



OIME, INC.

PLOT PLAN-MIDDLE LEVEL

400.3002

8'0"
8'0"
36'0"
18'0"
HYD POWER UNIT
SAND TRAP
TRIP TANK
TRIP TANK
DECAS PIT
SUCTION PIT
SUCTION PIT
PILL PIT
MIX PIT
72'6"
50'0"
PIPE ELEVATOR
150 H.P. BOILER
150 H.P. BOILER
SCR HOUSE
COLD START UNIT
1050 KATO
CAT D-399
1050 KATO
CAT D-399
1050 KATO
CAT D-399
1050 KATO
CAT D-399
CASING ELEVATOR
PIT MODULE
PUMP MODULE
POWER MODULE
OIME, INC.
PLOT PLAN-LOWER LEVEL
400.3012

PARKER RIG 217 SCR ROTARY

I Drilling Equipment:

(A) Power: 4 - Catepillar Model #D-399 turbo charged after cooled diesel engine.

4 - Kato brushless generators, 1050 KW.

(B) Drawworks: OIME 2000 E, 2000 HP complete with Baylor Elmagco, Model 7838 electric auxilliary brake.

(C) Crown-O-Matic: Duo-matic crown block installed.

(D) Drill Line: 1 1/2" 6 x 19 extra improved plow IWRC 7500' arctic lube.

(E) Wire Line Anchor: National type EB.

(F) Sand Line: 9/16" 6 x 7 - 20,000'.

(G) Derrick: Static hook load capacity 1,250,000# strung with 12 lines, 650,000# set back capacity, racking platform capacity 25,000 foot of 5" drill pipe. Leveling shims and jack.

(H) Mud Pumps: 2 - National 12-P-160 Tri-plex pumps, 1600 HP with pulsation and suction dampners.

(I) Rotary Table: 37 1/2" oilwell rotary table

(J) Crown Block: Parco crown block, grooved for 1 1/2" line, 60" sheaves with 72" fast line sheave.

(K) Traveling Blocks & Hook: Ideco, 575 ton, with 6 sheaves and Ideco 525 ton hook.

(L) Swivel: Continental Emsco LB 400, 6 5/8" Reg. tool joint pin.

(M) Rotary Hose: One 3 1/2" ID x 60', 5000 psi working pressure with 4" connections.

(N) Weight Indicator: Martin Decker Hercules type "E".

(O) Kelly: 5 1/4" Hex x 46' foot, 6 5/8" LHR box x 4 1/2" IF pin.

(P) Kelly Spinner: International Tool, Model A-6C.

(Q) Wire Line Survey: Mathey electric drive surveyer II with 15 HP motor with 20,000' .092" steel line with circulation lead and stuffing box.

(R) Pipe Handling Equipment: Iron roughneck, Model 2000 "Big Foot".

(S) 6 Pen Drilling Recorder: Totco.

(T) Automatic Driller: Bear Industries.

II Drill String:

(A) Drill Pipe: (1) 16,000' grade E and G to be able to maintain 100,000# overpull.

(2) 1085 5" OD, hevi-wate drill pipe.

(3) Two pup joints, 5" OD x 5'.

(4) Two pup joints, 5" OD x 10'.

(B) Drill Collars: (1) 18 - 8" OD zip grooved with stress relief grooved in box and pin. 6 5/8" Reg connections.

(2) 18 - 6 1/2" OD zip grooved with stress relief grooved in box and pin. 4 1/2" XH connections.

(C) Subs: Suficient for Parker furnished drill pipe, drill collars, and drill tools including Kellys.

(D) Savor Subs: Yes

(E) Drill Pipe Wipers: Two for 5" drill pipe, one for 3 1/2" drill pipe.

(F) Bit Breakers: Yes

III Blowout Preventers:

(A) Diverter System: (1) One - 21 1/4" 2000 psi WP annular diverter with spare element on location.

(2) One - 2 1/4" 2000 psi WP drilling spool with two 10" outlets.

(3) Two 10" - 300 psi WP hydraulically operated dirverter ball valves.

(4) Two 10" dirverter lines.

(B) 13 5/8" x 10,000 psi WP blowout preventer system:

(1) One single 13 5/8" x 10,000 psi type U Cameron blowout preventer with H2S trim.

(2) One double 13 5/8" x 10,000 psi type U Cameron blowout preventer with H2S trim.

(3) One 13 5/8" x 5,000 psi Cameron Type "D" anular preventer with companion flange to bell nipple.

(4) Blowout preventers are certified for H2S.

(5) Blowout preventer landing system.

(6) Drilling spool - 13 5/8" x 10,000 psi WP.

(7) Drill pipe test joints.

(8) Ram blocks - 4 sets 3 1/2" x 10,000 psi
3 sets 5" x 10,000 psi
2 sets blinds

(9) Annular Element: One spare.

(C) BOP Choke and Kill Line System: 10,000 psi

(1) Kill Line: Two 3 1/16 " x 10,000 psi full opening gate valves, One 3 1/16" x 10,000 psi check valve.

(2) Choke Line: One 3 1/16" x 10,000 psi hydraulic full opening gate valeve, One 3 1/16" x 10,000 psi full opening gate valve.

(D) Blowout Preventer Control System:

NL Sheaffer 3000 psi accumulator, Model T2016035 with electric hydraulic Tri-plex pump, two air operated hydraulic pumps, hydraulic pump control panel on drill floor, one removed from drill floor and proper manifolding valves and regulators for functioning BOP's, HCR valve, diverter control.

(E) Choke Manifold: 10,000 psi WP, H2S trim with two 3 1/16" hydraulic chokes with remote control panels, full opening 4" bypass.

(F) Spare parts for rubber components of BOP system.

(G) Casing and tubing rams for 9 5/8", 7" and 3 1/2" pipe.

(H) Trip tank with two 40 BBL. minimum compartments.

(I) BOP Test Pump: 10,000 psi Tri-plex.

IV Downhole Tools and Equipment:

(A) Casing Protector: 324 7 1/4" x 5" Bettis Antelope.

(B) Control Valves: Upper kelly cocks, lower kelly cocks, safety valves, inside blowout preventers float valves, numbers and types or equivalents as stated in Exhibit C of Invitation to Bid

(C) Fishing Tools: Overshots, packoffs, extensions and grapples to fish subcontractors drill pipe and drill collars.

(1) One 10 3/4" OD full strength series "150" Bowen releasing and circulating overshot with complete accessories to include packoffs, extensions and grapples.

(2) One 8 1/2" OD full strength series "150" Bowen releasing and circulating overshot with complete accessories to include packoffs, extensions and grapples.

(3) Taper taps with proper OD's to fit ID's of subcontractors drill pipe and drill collars.

(4) One 8" OD x 20" stroke Bowen fishing bumper sub, with 3 1/2" ID circulating hole.

(5) One 6 1/2" OD x 20" stroke Bowen fishing bumper sub, with 2 1/4" ID circulation hole.

(D) Crossover Subs: Bit subs, XO subs and handling subs to fit all subcontractor's drill pipe and drill collars.

V Drill String Handling Tools:

(A) Drill Pipe Slips: 2 sets Varco 5x5 drill pipe slips, one set air operated Varco PS15 slips with accessories.

(B) Drill Collar Slips: 2 sets for 6 1/2" drill collars, 2 sets for 8" drill collars.

(C) Drill Pipe Elevators: 2 sets 350 ton 5".

(D) Zip Lift Elevators.

(E) Elevator Links: 1 set 2 3/4" x 132" 350 ton links, 1 set 3 1/2" x 144" 500 ton links.

(F) Drill Pipe Tongs: Wooleys super B with lug jaws and hinge jaw spares.

(G) Drill Collar Safety Clamps.

(H) 2 KUL-5 Ingersol Rand Air Tuggers.

(I) Mud Bucket and Drain.

(J) Tong-Torque indicator on each set of tongs.

(K) Drill pipe lay down machine with manual back-up operation provided.

VI Utilities:

(A) One lot of greases, lubricants, pipe dope, drill collar dope, oil filters and air cleaners.

VII Mud Facilities and Equipment:

(A) Liquid facilities and equipment.

(1) Active tank, compartmented with sand trap, slugging pit with 1,100 BBL. volume.

(B) Flow line from bell nipple to shale shaker

(C) Dual tandem Brandt shakers mounted on sand trap.

(D) Two Brandt SRS-2, 3 cone desanders at 1,000 gallon each.

(E) Two Brandt mud cleaners or equivalent, capable of 400 GPM each.

(F) Mud Agitators:

(1) Each mud pit to have individual bottom mud guns.

(2) Each mud pit to have individual agitators.

(G) OIME Mud Gas Seperator: Will submit specifications prior to Contract signing for Exxon's/Global approval.

(H) Degasser: Swaco, capable of handling 1,000 GPM with independent pump and explosion - proof motor.

(I) Mud Testing Facilities: Baroid kit.

(J) Two mud mixing pumps driven 100 HP electric motors 5" x 6" x 11" Mission Magnum.

(K) Gas Detection System: Fixed combustible four-point monitor gas detection system complete with control modules, general alarms and sensors; one each sensor located at central ventilation inlet for air ducts, on bell nipple, shaker-pits and on drill floor to comply with regulatory requirements.

(L) Two Centrifuges, equivalent to Pioneer Mark I.

(M) Three Methods of disposal of cuttings:

(1) Deliver to storage holds in CIDS for later disposal by company.

(2) Overboard discharge diluted 10.1 minimum with seawater supplied from CIDS.

(3) Overboard discharge of undiluted cuttings.

(N) Flo-Sho on flow line with Alarm or recorder.

(O) One catepillar 966-C front end loader with bucket and forks. ✓

(P) Surge tank to receive bulk barite and gel from CIDS P-tanks.

VIII Casing And Related Tools:

(A) Master casing bushing with split type insert bowls for 20", 13 3/8" and 95/8".

(B) Air impactor wrench with adjustable torque to fit all nuts on well heads and BOP's.

Special Service and Equipment:

(A) Cementing manifold on rig floor with line to cementing unit.

(B) Totco drift indicators 0-8 degrees and 0-16 degrees for subcontractor furnished equipment.

(C) 1 lot of spare parts and operating supplies for subcontractors equipment.

(D) Electric and oxygen, acetylene welding supplies.

IX Miscellaneous:

Shorebase Support in Deadhorse

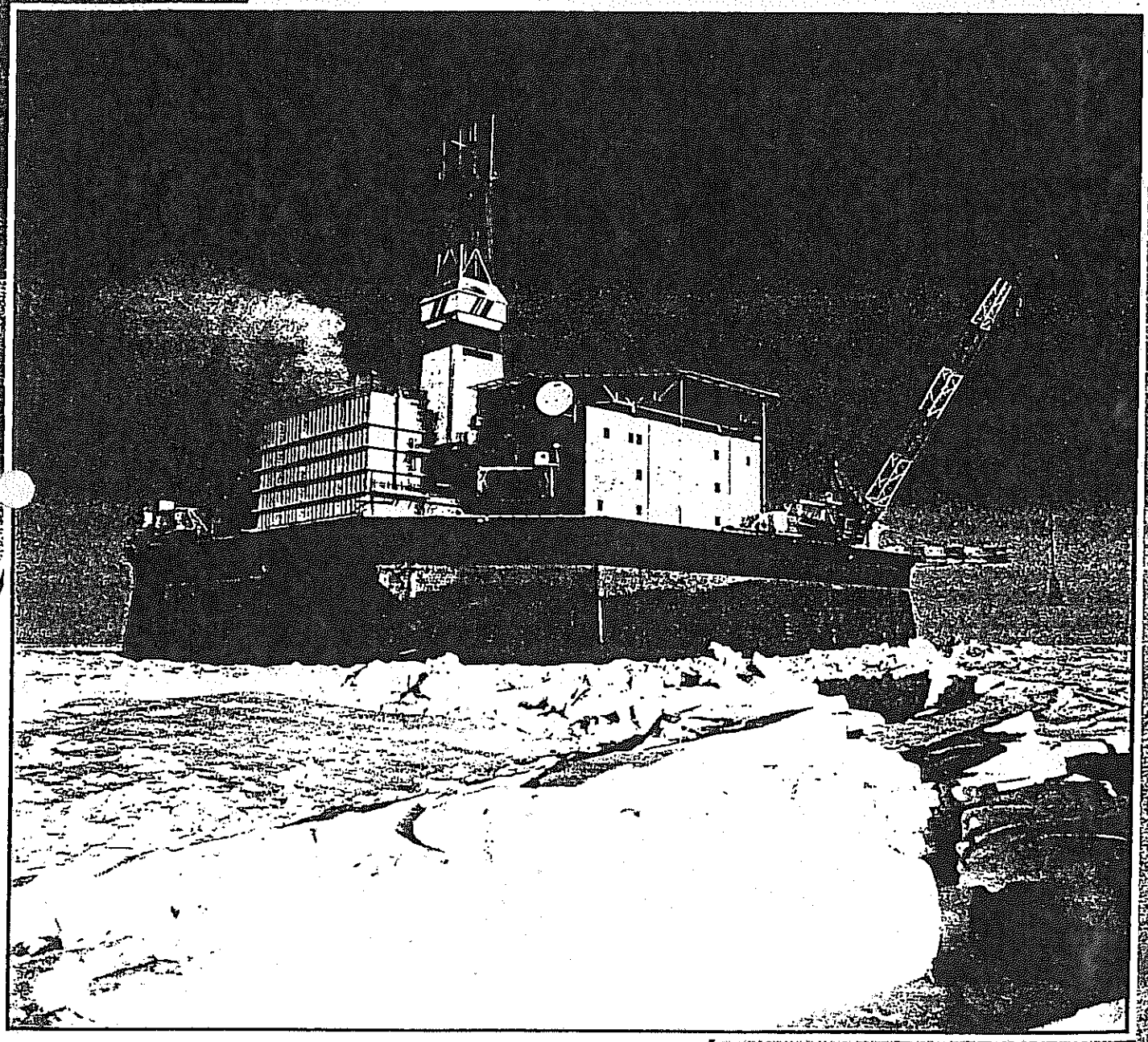
(A) Parker maintains a support facility in Deadhorse. This facility has camp facilities for twelve (12) men, offices for field superintendents, 13,000 square feet of shop and warehouse area. We have the capabilities of tire repair to major drawworks overhaul. The building was constructed with a full length 10 ton bridge crane in July 1982 and sets on a seven acre gravel pad.

(B) Wooden matting boards will be provided for subcontractors drilling equipment.

BeauDril

Molikpaq

Mobile Arctic Caisson



- ARCTIC DRILLING CAISSON
- YEAR-ROUND OPERATION
- MULTIPLE WELL CAPABILITY
- EXTENSIVE DECK STORAGE

Molikpaq

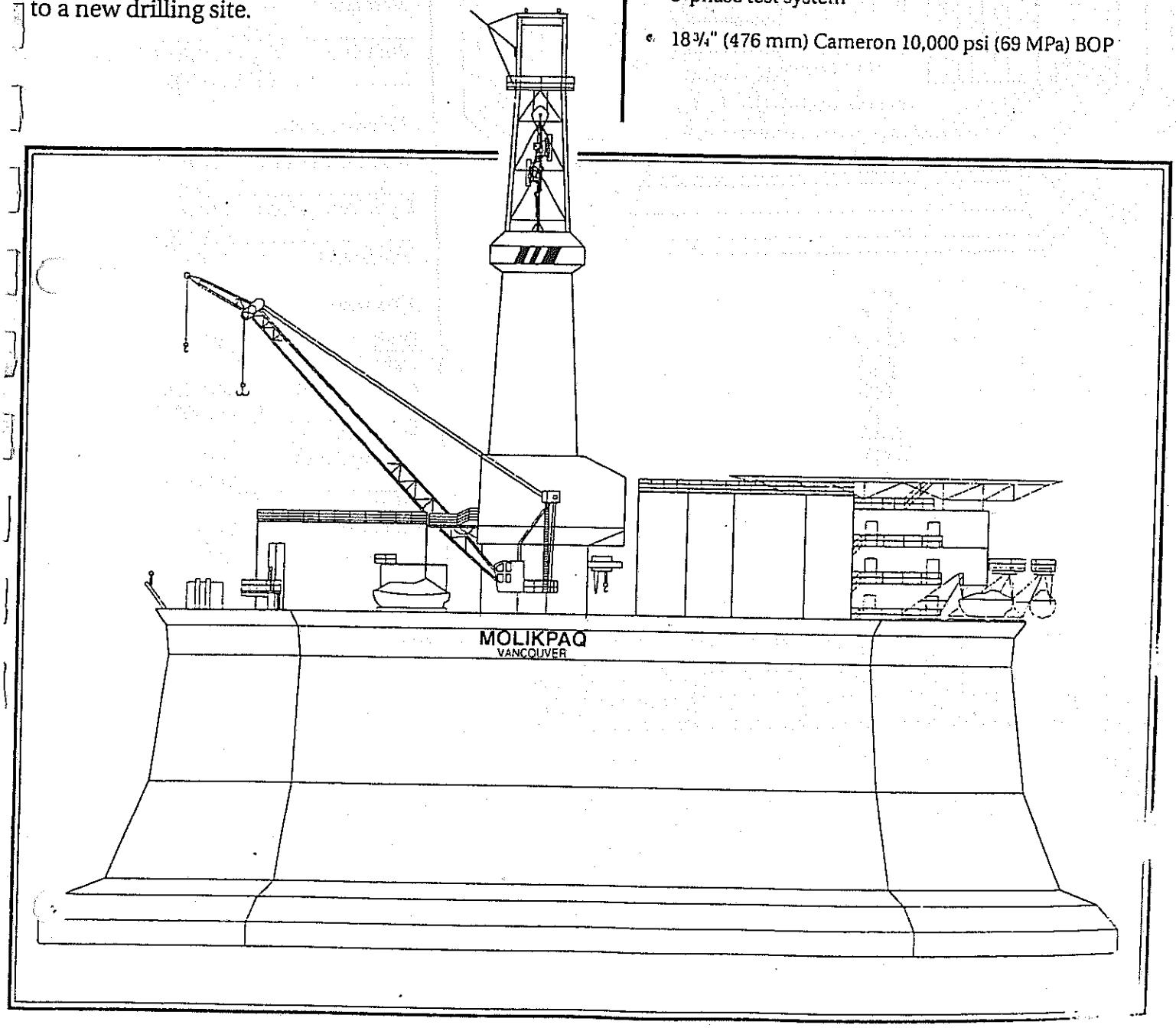
PeauDril

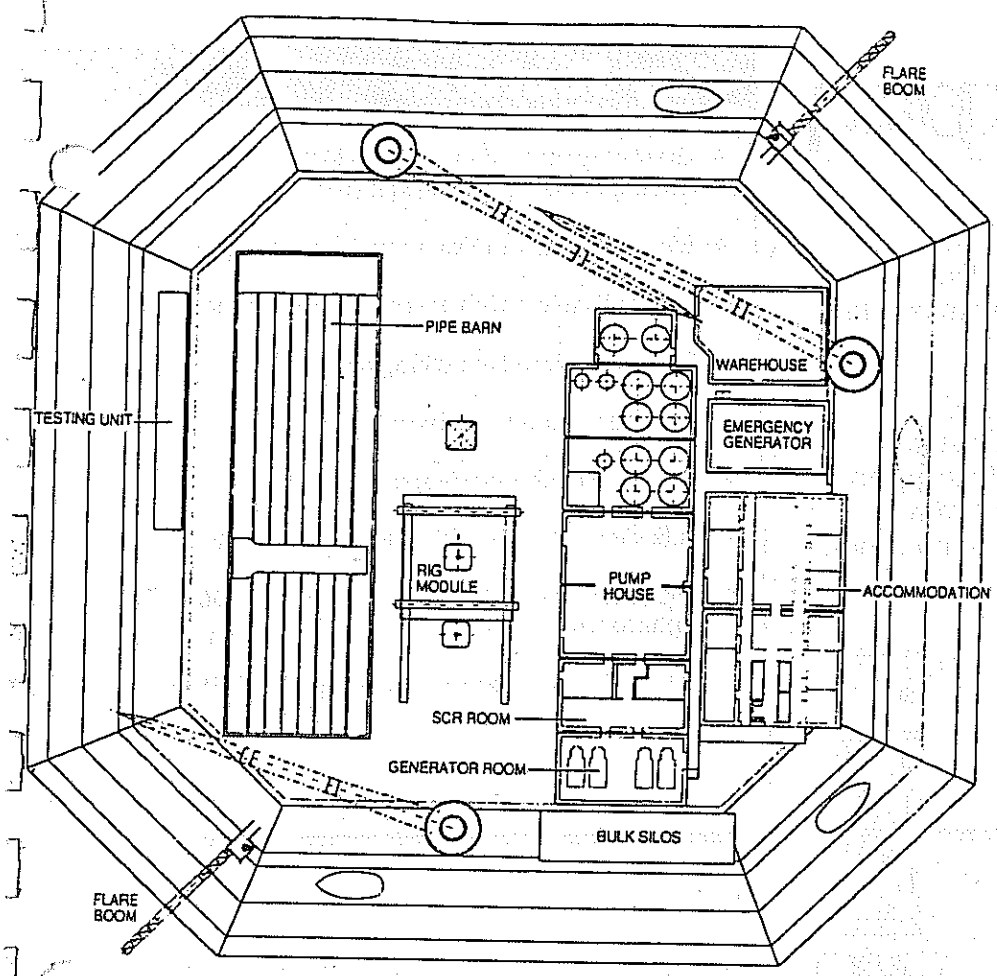
Molikpaq is the first single piece deep water caisson vessel designed and constructed for bottom founded year round drilling operations in Arctic waters.

An extension of the caisson retained island concept, Molikpaq is designed to be ballasted down for drilling operations. The drill rig, support facilities, pipe barn and accommodations are supported on top of the operations deck in modules. Molikpaq is easily refloated after completion of one or more wells at a location, and towed to a new drilling site.

Key Features

- Operating water depth 26 to 130 ft (7.9 to 39.6 m), drilling depth up to 20,000 ft (6 096 m)
- Electrically driven Varco top drive drilling system
- Two drill cellars with space for four wells total
- Derrick enclosed to racking platform
- Enclosed heated pipe barn
- Extensive deck storage area
- Bulk silos with 59,000 ft³ (1 671 m³) capacity
- Permanently installed 10,000 bbl/day (1 590 m³/day) 3-phase test system
- 18¾" (476 mm) Cameron 10,000 psi (69 MPa) BOP





Classification

The unit is classified by the American Bureau of Shipping as Ice Class 1AA. The ice belt in the caisson was designed to withstand local ice pressures of 1,000 psi (6 895 kPa).

Specifications

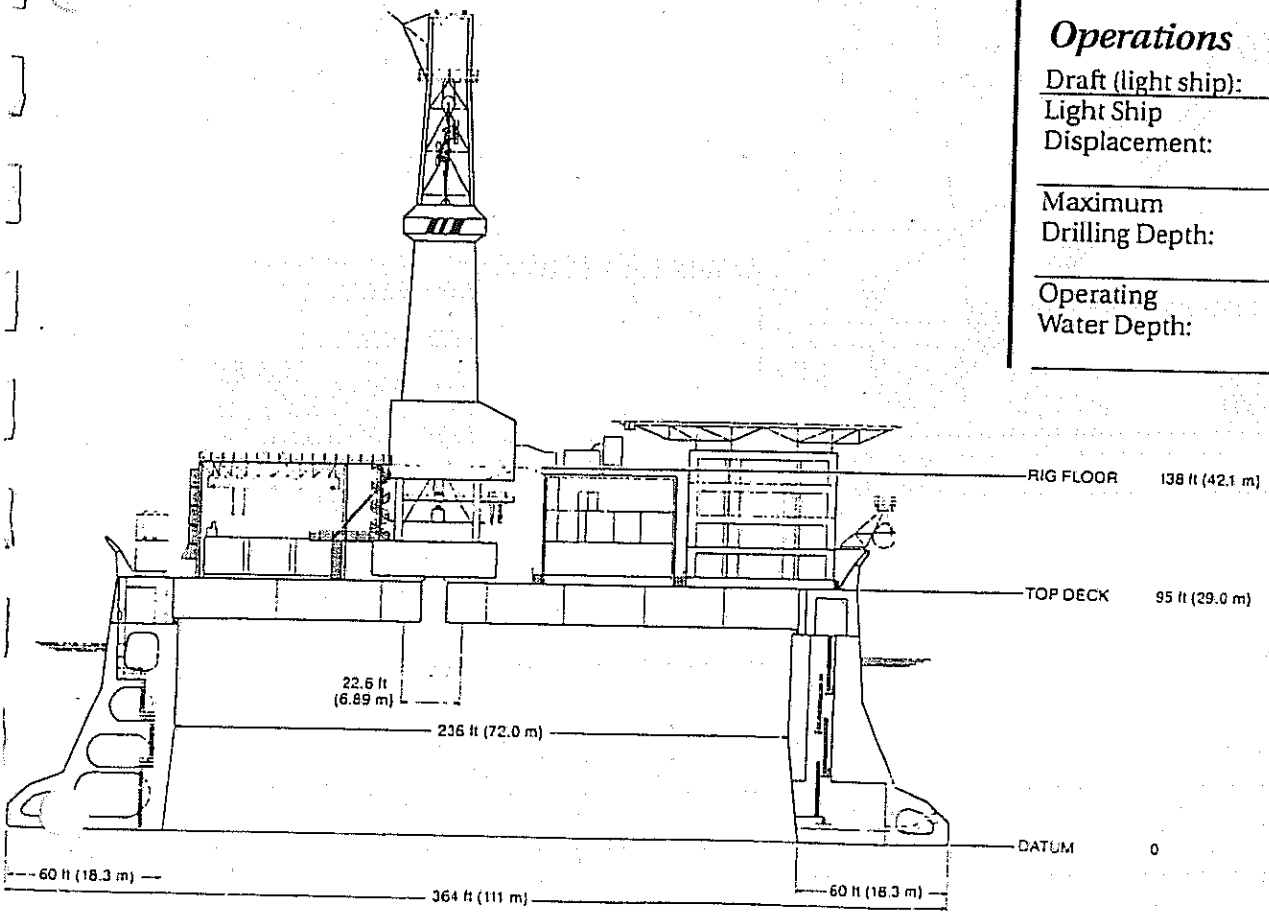
Owner:	BeauDril Limited
Flag:	Canadian
Rig Type:	Mobile Arctic Caisson (MAC)
Delivered:	Sept. 1984
Rig Design:	
Caisson:	Swan Wooster Engineering, Vancouver
Modules:	Tri-Ocean Engineering, Calgary
Built By:	IHI, Japan & Dominion Bridge, Canada

Dimensions

Base Dimensions:	364 ft x 364 ft (111 m x 111 m)
Deck Dimensions:	240 ft x 240 ft (73.1 m x 73.1 m)
Hull Depth:	95 ft (29.0 m)

Operations

Draft (light ship):	17 ft (5.2 m)
Light Ship Displacement:	34,172 tons (31 000 tonnes)
Maximum Drilling Depth:	20,000 ft (6 096 m)
Operating Water Depth:	26 to 130 ft (7.9 to 39.6 m)



Equipment

Drilling Equipment

Derrick
147 ft (44.8 m) Dreco dynamic with a 30 ft x 30 ft (9.1 m x 9.1 m) base, rated at 1,000,000 lb (445 000 daN) with 12 lines

Racking platform has capacity to hold 19,845 ft (6 049 m) of 5 in (127 mm) drill pipe plus bottom hole assembly

Drawworks
Ideco E-3000 electric drawworks complete with sand reel and Elmago model 7838 Baylor auxiliary brake, spinning and breakout catheads and two GE model 752 motors each rated at 1,000 hp (746 kW) continuous

Travelling Block
Emsco model RA-60-6 unitized, 650 ton (590 tonne) capacity

Swivel
Ideco TL-500, 500 ton (454 tonne) capacity

Drill Pipe
20,000 ft (6096 m) x 5 in (127 mm), 19.5 lb/ft (29 kg/m) with 4 1/2 IF connections

Catwalk Pipe Handling System
Hydraulically operated pick-up/lay-down trough, 4.5 ton (4.1 tonne) x 20 in (508 mm) capacity

Top Drive
Varco TDS-3 with one GE model 752 motor rated at 1,000 hp (746 kW) continuous and a 500 ton (454 tonne) hoisting capacity

Rotary Table
Ideco LR-495, 49 1/2 in (1 257 mm) driven by one GE model 752 motor, rated at 1,000 hp (746 kW) continuous, coupled to a two speed transmission

Mud Pumps
2 x Ideco T1600 triplex, each pump driven by two GE model 752 motors rated at 1,000 hp (746 kW) continuous

Cementing Unit
Dowell owned R624 diesel powered twin triplex with 10,500 psi (72 MPa) and 7,500 psi (52 MPa) fluid ends

Rig Floor Pipe Handling System
Varco Iron Roughneck model IR 2000
Range: 2 7/8 to 8 in (73 to 203 mm)

Enclosed Pipe Barn
56 ft (17.1 m) x 187 ft (57.0 m) x 44 ft (13.4 m) high enclosed heated space with 10 ton (9.1 tonne) overhead crane

Testing Equipment

Complete testing system with a 10,000 BOPD (1 590 m³/day) capacity consisting of: data header, choke manifold, diesel heater, 3-phase separator, surge tank, water degasser, transfer pumps, and flare booms

Mud Conditioning Equipment

4 x Thule United VSM-120 shale shakers
1 x Brandt SR-3 desander
1 x Brandt SE-24 desilter
1 x Thule VSM-200 mud cleaner
1 x Wagner Sigma-100 centrifuge
1 x Swaco vacuum degasser
2 x Alfa-Laval AM20 mud coolers

BOP Equipment

BOP System
1 x Cameron 18 3/4 in (476 mm), 10,000 psi (69 MPa) BOP stack with type "D" annular and 2 x "Double U" ram type preventors

Diverter
1 x Regan KFDJ 27 1/2 in (699 mm) through bore

BOP Cranes
2 x 50 ton (45 tonne) Olympic cranes

Ballasting

6 x Peacock Desmi centrifugal pumps rated at 2,860 bbl/hr (455 m³/hr) at 43 psi (296 kPa)

Core Filling & Removal Equipment

The core is filled by a dredge through a 30 in (762 mm) floating hose

The core material is removed using a submersible pump.

Power Generation

Prime Movers:
4 x Caterpillar D399, 1,250 hp (930 kW) each

Emergency Power:
1 x Caterpillar D399, 1,115 hp (831 kW)

Cranes

3 x Liebherr BOS 65/850, 72 tons (65 tonnes) at 30 ft (9.1 m)

Safety Equipment

4 x Watercraft 50-person survival craft

1 x Hurricane Model 700-D emergency rescue boat

2 x RFD inflatable escape slides

Helideck

Capacity for Sikorsky 61 or similar with fueling station

Accommodation

Bunks for 104 people, recreation room, galley with seating for 30, offices, and hospital

Operational Limits

This monolithic caisson structure was designed to withstand the forces from both first and multi-year ice interactions. Molikpaq's deployment design is tailored to the ice and sea floor conditions at specific locations in either landfast or moving ice zones. The unit can withstand local ice pressures of 1,000 psi (6 895 kPa) and has been deployed in configurations to sustain global ice loads as high as 134,840 tons (1 200 MN).

In terms of Molikpaq's open water performance, the unit has been designed to operate with no constraints from wave overtopping or spray in storm conditions associated with maximum wave heights of 40 ft (12.2 m).

Variable Load

14,065 tons (12 760 tonnes)

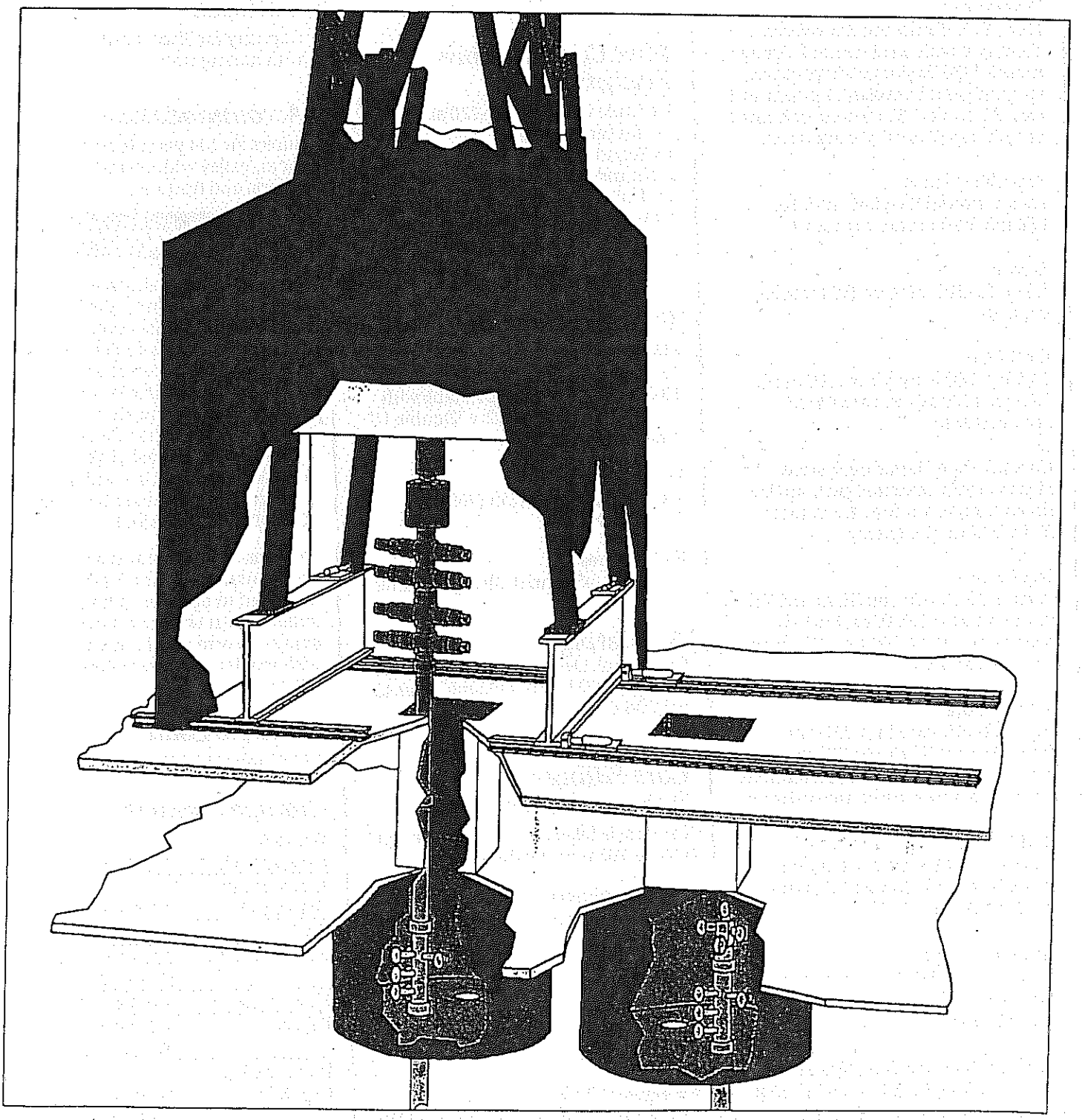
Storage Capacities

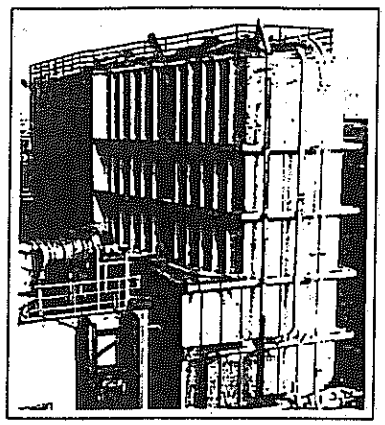
Barite & cement bulk:	75,965 cf (2 151 m³)
Liquid mud: (90% cap.)	2,209 bbl (351 m³)
Drill water:	451 bbl (71.7 m³)
Fuel (90% cap.):	32,399 bbl (5 151 m³)
Potable water:	500 bbl (79.5 m³)
Ballast:	504,060 bbl (80 138 m³)
Pipe & casing (pipebarn):	2,485 tons (2 254 tonnes)

Molikpaq Rig Skidding System

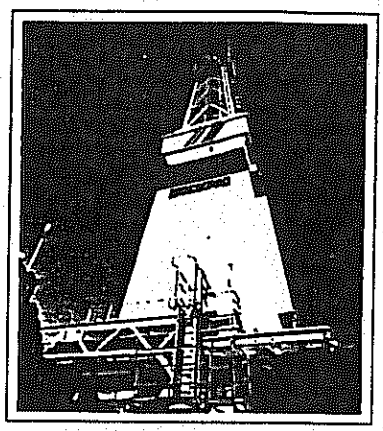
Once Molikpaq is set down, drilling operations can begin in one of two moonpools which penetrate the operations and box girder decks to provide access to the drill cellars below. Two wells can be drilled diagonally opposite one another in each drill cellar. The rig can be skidded using four 150 ton (136 tonne) hydraulic jacks to facilitate movement to the four drilling slots.

FOR MORE INFORMATION ABOUT MOLIKPAQ, CONTACT MANAGER, BEAUDRIL AT (403) 233-3030.

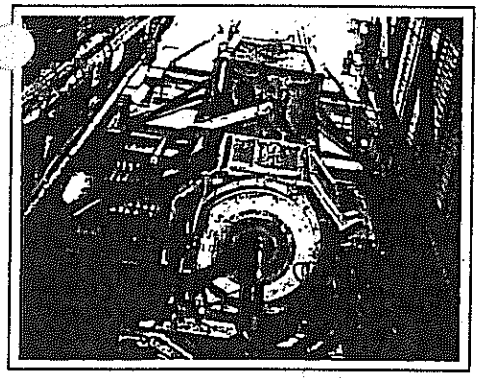




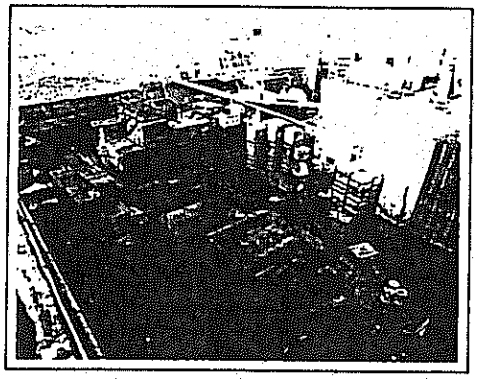
Bulk silos with 59,000 cf (1 671 m³) capacity



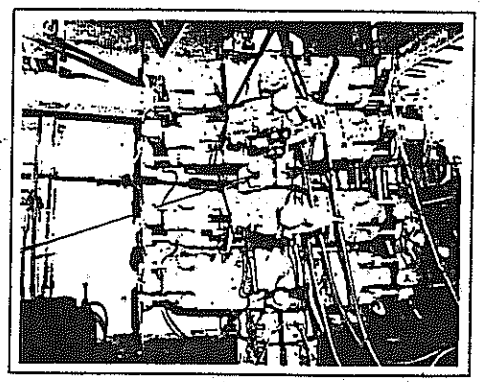
Enclosed derrick for harsh Arctic environment



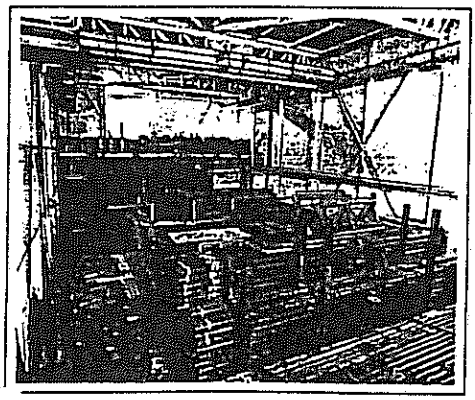
Varco TDS-3 top drive drilling system



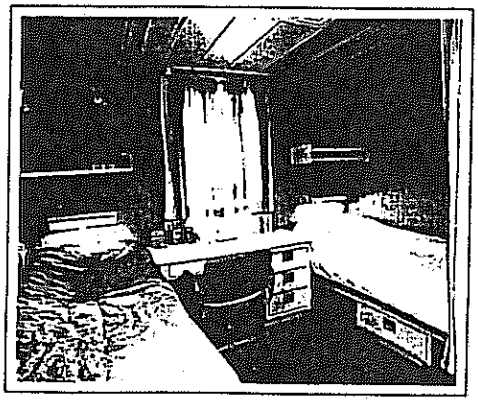
Extensive deck storage area outside pipe barn



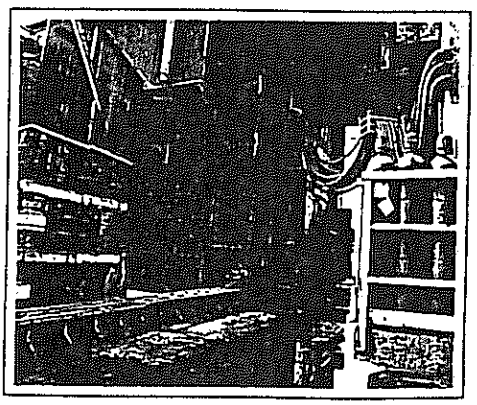
18¾ in (476 mm) x 10,000 psi (69 MPa) one stack system



Enclosed pipe barn



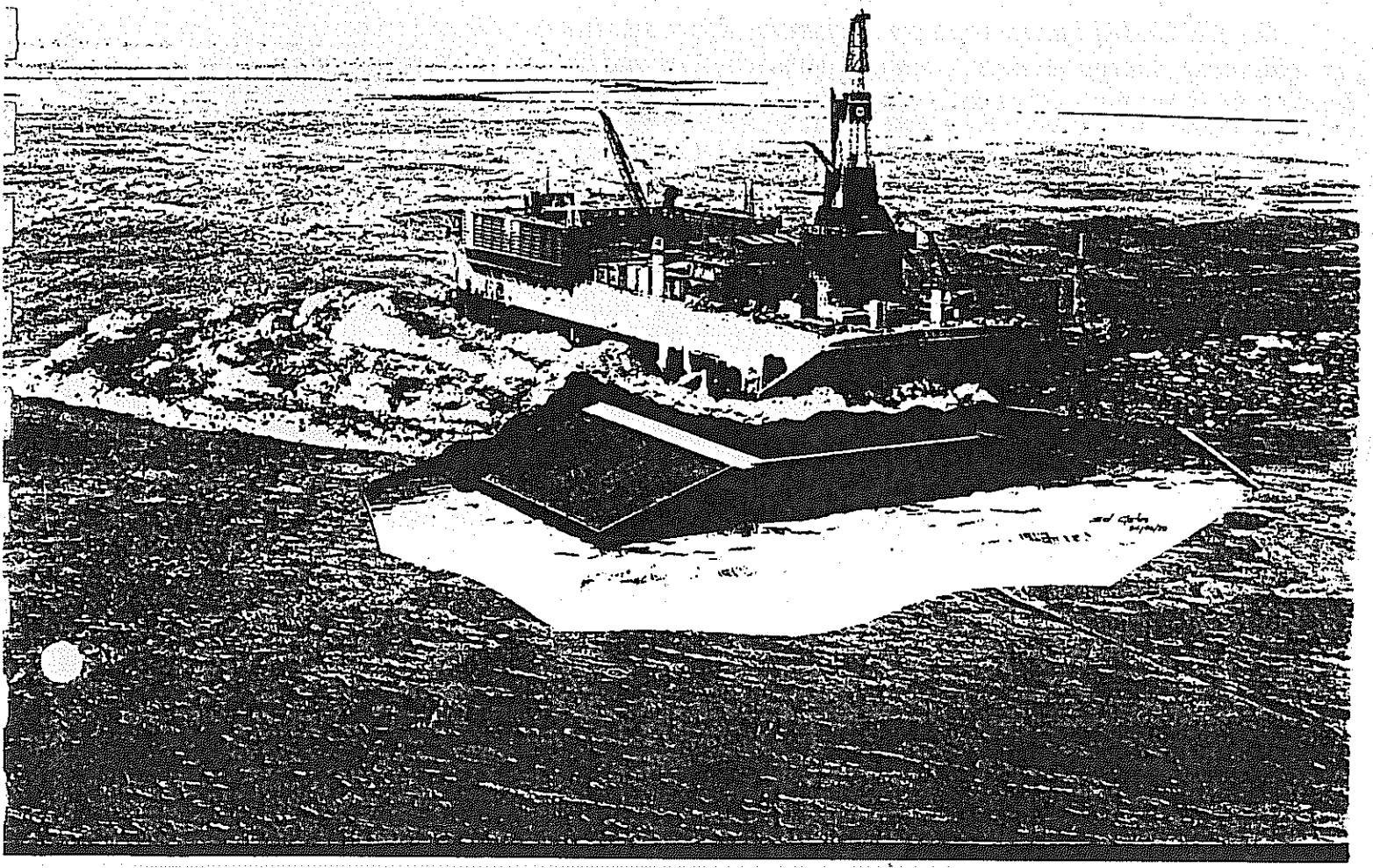
Typical two man room in 104 man accommodation



Skiddable rig package for access to two drill cellars

SSDC/MAT

Experience and Achievement in the Arena Offshore



The SSDC/MAT is an ice-strengthened, bottom-founded, mobile offshore drilling unit designed and constructed to operate year-round in both open water and ice conditions. The unit is classified by ABS and meets IMO MODU codes.

The SSDC/MAT embodies the existing SSDC drilling unit, which operated successfully on different drill sites for two seasons in the Canadian Beaufort Sea, and the MAT which was constructed and mated to the SSDC in 1986. Incorporating Canmar's arctic experience, the MAT was designed to extend the water depth range of the SSDC, and eliminate the need for a dredged berm or site preparation. The SSDC/MAT has since proven itself in operations in the U.S. Beaufort Sea. The SSDC/MAT is thus capable of operating year-round over a water depth range of 25 feet to 80 feet in soil conditions ranging from soft to hard clays and in granular soils.

The extensive storage capability provided by bulk storage tanks and a deck area over 100,000 sq. ft. allows the drilling unit to store adequate bulk materials, tubulars and other operating supplies to permit operation throughout the long periods when ice conditions restrict re-supply. The storage for consumables and supplies is adequate for two 16,000 foot wells without the need for re-supply. The drilling rig is rated at 25,000 feet and features an efficient arctic layout as well as an automatically controlled waste heat recovery system. The drilling mast and substructure have a rated capacity of 1.3 million pounds, and can readily be skidded to drill through any one of four moon pools.

The base of the SSDC/MAT is fitted with a specially designed 6.6 foot deep box-girder skirt system. The purpose of the skirts is to improve resistance to sliding in the weak clays common in many arctic offshore regions.

The SSDC/MAT incorporates comprehensive safety, survival and oil spill containment and clean-up equipment. A large helideck, complete with refuelling and fire fighting system, provides adequate landing facilities for a Sikorsky S-61N helicopter.

Other special features included with the SSDC/MAT are an on-board computer system for data monitoring and collection, accommodation for up to 118 operating personnel, fresh water generating facilities, and a moon pool forward of the accommodation structure providing contingency relief well capability utilizing a heli-rig.

Length overall	715'-6" (218.1m)
Length on waterline	551'-2" (168.0m)
Breadth overall	360'-11" (110.0m)
Depth	128'-7" (39.2m)
Design Draft	25'-80' (7.6m-24.4m)
SSDC Topsides:	
Length	663'-11" (202.4m)
Breadth	173'-11" (53.0m)

Bulk barite (14 silos)	141,000 ft³ (3 990m³)
Bulk Cement	
- Permafrost (4 silos)	40,300 ft³ (1 140m³)
- Class "G" (2 silos)	20,100 ft³ (570m³)
Sack Storage area	8,660 ft² (805m²)
Liquid mud	2,100 bbls. (334m³)
Fuel	1,446,500 U.S. gal. (5 475m³)
Heli-fuel	6,000 U.S. gal. (22.7m³)
Potable water	29,000 U.S. gal. (110m³)
Drill water	482,000 U.S. gal. (1 825m³)
Casing	2,750 tons (2 500 tonnes)
Drill Pipe	275 tons (250 tonnes)

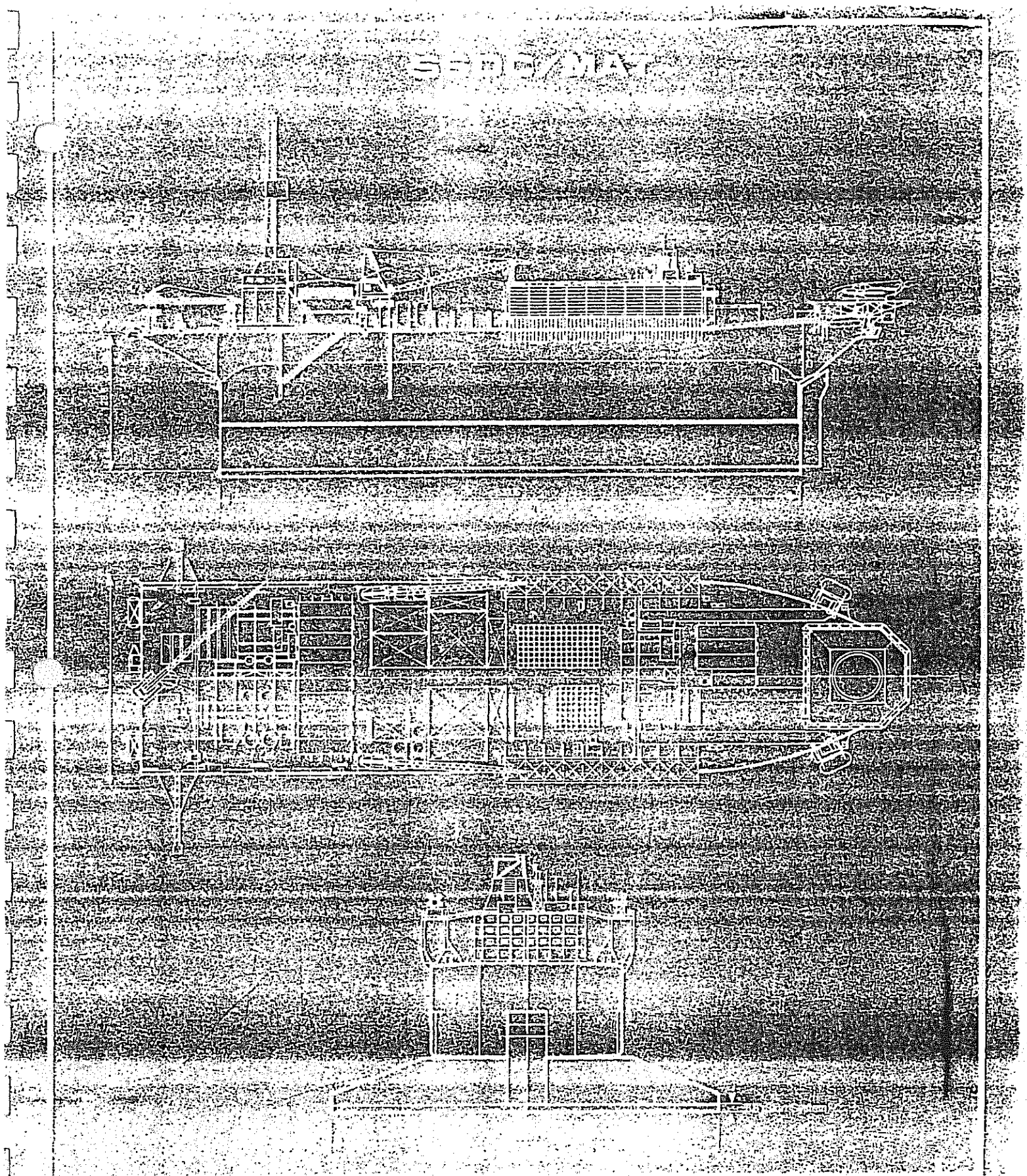
Main Engines	6 *Caterpillar* D-399 JWAC 746kW (1,000 HP)
AC Generators	6 *Kato* 6P5-3150, 1,050 kW-1,500 KVA-600 VAC
DC Conversion	4 *Ross Hill* SCR's 2,000 AMP @ 750VDC
Emergency Power	1 *Caterpillar* D-399 JWAC (1,000 HP) 746 kW 600 VAC

Mast	*Dreco* cantilever, 147' (44.8m) clear working height, 34' (10.36m) leg spread 650 tons (590 tonnes) gross nominal capacity
Drawworks	*National Supply* model 1625-DE 3,000 HP (2,240 kW), driven by: 2-GE752-R DC motors with *Elmagco* Model 7838 brake
Rotary Table	*National Supply* Model C-495 49½" dia. (1 257mm) with independent gear drive driven by GE 752-R DC motors
Mud Pumps	2 *National Supply* 12-P-160 triplex pumps rated at 1,600 HP (1,200kW) each driven by 2-GE 752-R DC motors
Solids Control	*Brandt* triple tandem shale shaker *Brandt* model S3-12 desander *Shiffner* tandem mud cleaner *Wagner* Sigma 150 centrifuge *Burgess* Magna-Vac degasser Cuttings cleaning system
Drill String	22,000' (6 700m) 5" (127mm) Grade G drill pipe

Low Pressure System	1 *Hydril* 20¾" (527mm) double ram, 3,000 psi (20.7 MPa) 1 *Hydril* 21¼" (540mm) annular preventer, 2,000 psi (13.8 MPa) WP *Vetco* LS riser system 24" (610mm) O.D.
High Pressure System	3 *Hydril* 13⅝" (346mm) single rams, 10,000 psi (69.0 MPa) 1 *Hydril* 13⅝" (346mm) annular preventer, 5,000 psi (34.5 MPa) *Vetco* MRF Riser System 18" (457mm) O.D. 10,000 psi (69.0 MPa)
Diverter	*Regan* KFDJ-500 system with 16" (406mm) duel vent lines
Accumulator	*Hydril* Valvcon 240 gal. (908 litre) capacity
Choke Manifold	10,000 psi (69.0 MPa) with *Wagner* auto choke

Bulk Transfer	2 low pressure air blowers 3 *Airconvey* Vack II model 36
Pipe Handling	1 *Mereco* model 33 lay down machine. Handles all sizes up to 42" (1 067mm) casing
Cranes and Forklift	2 *FMC* Link Belt 1500, max. capacity 62 tons (57 tonnes), 120' (36.6m) 1 *FMC* Link Belt 238A, max. capacity 35 tons (32 tonnes), 120' (36.6m) 1 *FMC* Link Belt HSP-8022, 22 tons (20 tonnes) mobile crane 1 *Caterpillar* Model 930 forklift 2 - 25 ton (22.8 tonne) B.O.P. cranes

Ice Reinforcement	SSDC reinforced with 3.3' (1m) thick concrete and extra supports
Skirt System	6-6' (2m) long box type skirts covering the total base of the system to provide sliding resistance in all directions
Instrumentation	Complete instrumentation for weather, ice and geotechnical information
Multi-well Drilling	Substructure can be skidded to drill from any 1 of the 4 moon pools available
Drilling Services	Dual pumping systems for water supply, fuel supply and ballast systems
Welding/Garage Facilities	Totally enclosed steel shop 41'-0" x 25'-0" x 15'-9" (12.5m x 7.6m x 4.8m)
Waste Incineration	2 *Atlas* type Maxi-50-S
Helideck	Suitable for *Sikorsky* S-61N c/w fire fighting and refueling system
Accommodation	Quarters for 93 persons and 25 emergency beds, recreation room, dining room, offices and a hospital



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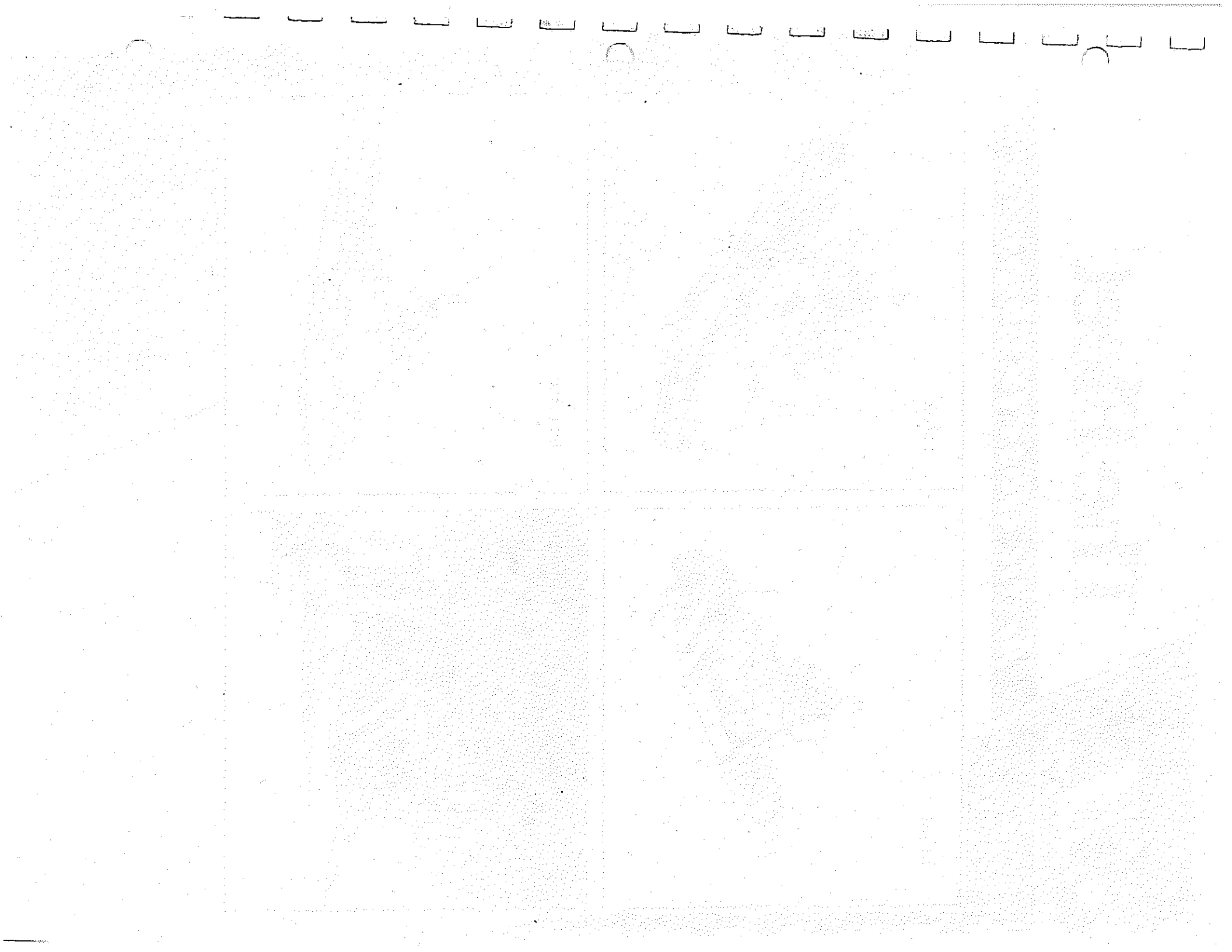
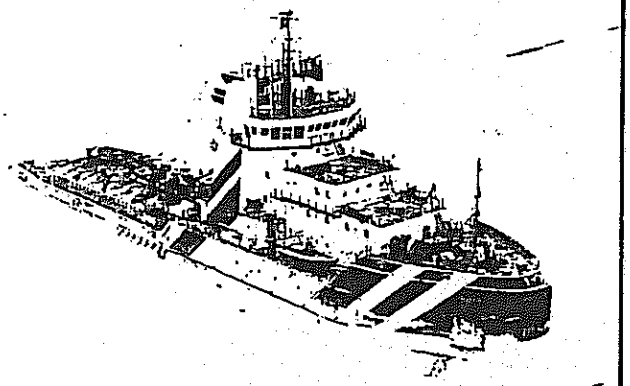


BeauDril

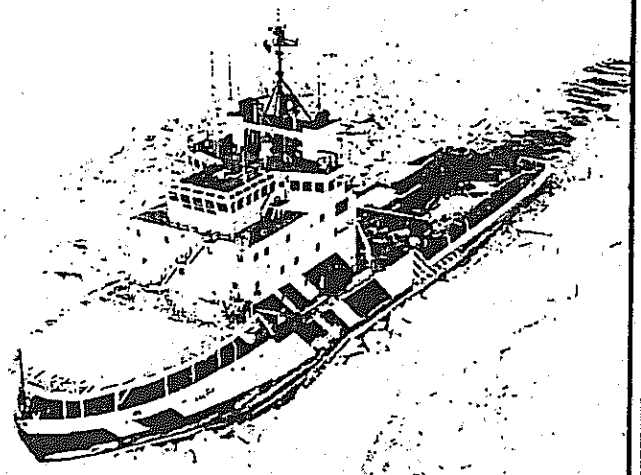
The Fleet

Arctic Class IV Ships

Ikaluk

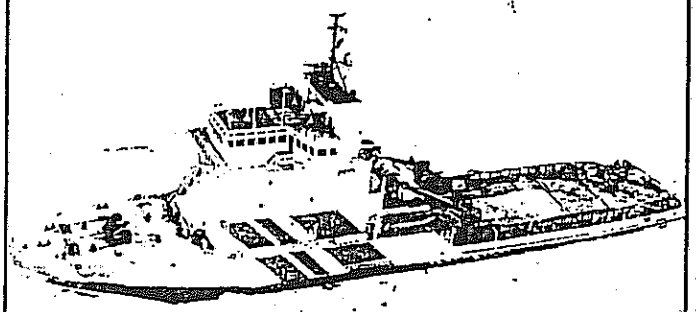


Kalvik



Miscaroo

Terry Fox



- ICEBREAKING
- TOWING
- RESUPPLYING
- ANCHOR HANDLING