EXPLORATION PLAN

HARRISON BAY AREA (NR5-4)
DIAPIR FIELD OCS LEASE SALES 71 & 87
BEAUFORT SEA, ALASKA

Serial Nos: OCS Y-0315, 0338, 0339, 0348, 0349
0811, 0812, 0813, 0814, 0815, 0816, 0817

Prepared By

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

Submitted to

Minerals Management Service
Alaska OCS Region
Anchorage, Alaska

January 29, 1985

EXPLORATION PLAN

TABLE OF CONTENTS

List of Tables

List of Figures

Appendices

A	Drilling Equipment
B	Critical Operations and Curtailment Plan*
C	Spill Prevention Control and Counter Measure Plan and Oil Spill Contingency Plan
D	Confidential Geological/Geophysical Information*
E	Platform Verification Plan*
F	Application for Permit to Drill*
G	Geohazards Report*

*These Appendices Contain Confidential Information for the Sole Use of The Minerals Management Service.

EXPLORATION PLAN REVISION

I. Introduction

On January 29, 1985, Tenneco Oil Company (Tenneco) submitted to the Minerals Management Service, Alaska OCS Region (MMS) its Exploration Plan[1] for twelve Federal OCS leases located in the Harrison Bay Area of the Alaskan Beaufort Sea. The Plan contemplated two types of drilling structures for the drilling of exploratory wells--first a Berm/SSDC system and second a gravel island structure. The Exploration Plan was approved by the MMS.[2]

Tenneco desires to amend the Exploration Plan to provide for a third type of drilling structure--SSDC/MAT system--and hereby submits in conformance with 30 CFR 250.34-1(j)(2) these revisions to the approved Exploration Plan. Reference is made to the original Exploration Plan. The headings of this submission indicate new information to be incorporated into the Plan. If no new material is presented below, the section in the original Plan is unchanged.

The SSDC/MAT consists of the existing SSDC (Single Steel Drilling Caisson) mated to a new-built, ice-strengthened steel foundation called the MAT (Figure 1). The SSDC/MAT is designed to carry out exploratory drilling under Arctic offshore conditions in water depths of 30-75 ft and generally will require no foundation preparation.

Tenneco intends to initiate exploratory drilling in the winter of 1986-87 by employing its first choice--the SSDC/MAT system--of the three drilling structures now addressed in the Plan. Construction of the subsea gravel berm described in the subject Exploration Plan will not be undertaken if the SSDC/MAT system is utilized. The MAT extends the water depth operational capability of the SSDC to allow deployment at the planned well locations without building up the seafloor elevation. Many of the unavoidable adverse environmental effects associated with the berm construction would be eliminated.

---

[1]Tenneco Oil Company, 1985, Exploration Plan, Harrison Bay Area NR5-4), Diapir Field OCS Lease Sales 71 and 87 Beaufort Sea, Alaska: Submitted to Minerals Management Service, Alaska OCS Region on January 29, 1985.

[2]Minerals Management Service, 1985, letter communication dated March 6, 1985, from Barry A. Boudreau, MMS, to Tenneco Oil Company.

II. Exploratory Drilling Plans and Schedule

A. Initial Well

Tenneco plans to initiate drilling operations using the SSDC/MAT system during the winter of 1986-87. The schedule of drilling operations as previously revised remains unchanged.[3] The initial well location has been moved slightly westward to the northeast corner of Block 284 (Y-0338) from the northwest corner of Block 285.

Well Location Coordinates

Lease Line Calls: 4000' FEL; 1000' FNL
UTM 6 Coordinates: X = 1,589,006: Y = 25,740,561
Latitude and Longitude: 70^{o} 43' 01.416"N; 150^{o} 25' 30.612"W

The water depth of the first location is approximately 60 ft. The initial well would be drilled as a straight hole to a depth of 9,500 ft. Drilling would begin about November 1, 1986 with field operations continuing for 90 days to accomplish all drilling and testing activities.

The SSDC/MAT system would be moved onto location of the initial well site during open water conditions in the summer of 1986. At the conclusion of the drilling operations, the structure would be maintained at location for the balance of the winter and would be removed during open water conditions of the summer of 1987.

3Tenneco Oil Company, 1985, letter communication, dated March 15, 1985, from Angus Mackay, Tenneco Oil Company, to Rodney Smith, MMS.

III. General Description of Drilling System

A(1). Berm/SSDC System

The heading identification has been changed to accommodate the following new section.

A(2). SSDC/MAT System

The SSDC/MAT system is designed to carry out exploratory year-round drilling under Arctic environmental conditions in water depths of 30-75 ft. The system has been designed for deployment without bottom preparation. The system will be installed on location of the initial test before 1986 freeze-up in accordance with procedures developed during previous deployments of the SSDC in Canadian operations.

1. The MAT

The MAT (Figure 2) is a new component of the system to be constructed of steel. It will be used to support the SSDC in lieu of a gravel subsea berm. It is anticipated to be built in a Far Eastern Shipyard under American Bureau of Shipping (ABS) standards and will be classed as an A-1 submersible barge. It is designed to transmit to the seabed the ice loads which will impinge on the SSDC when the unit is in deeper water, as well as withstand the ice loads which will directly impact on the MAT when in shallower water depths. The base of the MAT will have a system of skirts which will penetrate the seabed, thereby providing the necessary mechanism to transmit ice loads.

The MAT structure will be fabricated from low temperature steel and has been designed for well beyond the anticipated ice loads. The top of the MAT will be coated with a layer of urethane foam to provide a friction interface with the bottom of the SSDC which has a layer coating of shotcrete (cement, sand and latex). The mated materials have been designed and tested to provide the load transfer mechanism between the SSDC and the MAT. A permanent ice-strengthened tower on the forward end of the MAT will provide access from the SSDC to the ballast valves and deballast pumps which are located there. (Figure 2). Two removable towers on the aft end of the MAT will be used to accurately position the SSDC during mating operations.

a. Load Transfer Mechanism

During drilling operations with the SSDC/MAT structure sitting on the seafloor, the SSDC will be ballasted with water to reach a design downward gravity load. This gravity load is transferred through the foam interface, acting as a friction material, to the structure of the MAT. The load is then applied through the skirts of the MAT into the seabed.

2. Mobilization of the SSDC/MAT System

a. MAT Towing

The fully tested MAT will be towed from its construction site in the Far East to a transfer location off Point Barrow. Investigations are being carried out now to determine the preferred method of transport. The towing of the MAT from the builder's yard to the mating point will be contracted to an experienced towing organization. The MAT will be fitted out with all necessary internationally-approved navigation lights for its transit. Anticipated timing of the trans-Pacific crossing will permit the tow to reach Point Barrow by August 1, 1986. This will permit the maximum window of open water conditions for entry into the Beaufort Sea.

b. SSDC Towing

The SSDC will be towed from its winter 1985-86 location to the mating site in time to meet the MAT. Mating procedures will then commence. Canmar has established field procedures for transporting the SSDC that have been developed in prior drilling seasons since its initial mobilization in 1982.

c. Mating of SSDC to the MAT

The mating of the SSDC to the MAT is a one time only operation. Since Tenneco will likely be the first operator to use the combined system, the mating will be accomplished in the Harrison Bay area (or adjacent water depending on ice conditions) as close as practical to the initial well location now planned for Block 284.

The mating operation begins by gravity ballasting the MAT until it is lightly grounded in 25.5 m of water. The SSDC is then positioned above the MAT with a number of tugs until secured between the two temporary positioning towers and the control tower (Figure 2). At this point the clearance between the SSDC keel and the MAT foam deck is 0.9 m. The MAT is then deballasted to "mate" with the SSDC until a minimum contact force is reached. The final procedures of the operation are the hookup of all service connections to the SSDC (piping, power, communications and instrumentation) and the deballasting of the mated unit to a towing draft. The drilling unit consisting of the SSDC plus MAT is then towed to the first drill site, ballasted down, and prepared for drilling operations.

C. <u>Drilling System</u>

Under these revisions only the MAT is being substituted for the subsea gravel berm as the foundation upon which the SSDC is to rest. The drilling systems of the SSDC are the same as those described in the original Exploration Plan. No changes to this section are necessary.

D. <u>Platform Verification</u>

Each of the three types of drilling structures contemplated in this Plan --Berm/SSDC, SSDC/MAT or gravel island--will meet the appropriate requirements of the Platform Verification Program as specified in MMS OCS Order No. 8 or the requirements in MMS OCS Order No. 2 pertaining to Mobile Drilling Units.

Appendix E, Platform Verification Plan or other documentation as may be required by the MMS for the SSDC/MAT system (or for either of the two alternative structures if they are later chosen for drilling operations) will be submitted separately as a confidential document to the MMS at a later appropriate time. The Platform Verification Plan or related documentation will present a description of the structure, environmental loading conditions, soils stability analysis, and operating philosophy.

EXPLORATION PLAN

I. INTRODUCTION

Tenneco Oil Company (Tenneco), in conformance with 30 CFR 250.34 and NTL 80-2, submits this Exploration Plan for twelve Federal OCS leases located in the Harrison Bay area (Official Protraction Diagram NR5-4) of the Alaskan Beaufort Sea (Figure 1). These leases were acquired in the Outer Continental Shelf Diapir Field Oil and Gas Lease Sale 71 (October 13, 1982) and Sale 87 (August 22, 1984) and are owned either wholly by Tenneco or jointly with its partners Mobil Oil Corporation and/or Sohio Alaska Petroleum Company (Table 1).

Analyses of extensive geophysical and geological data collected in the Harrison Bay area, combined with the large quantity of subsurface geologic information obtained from wells drilled along the northern Alaskan coast, indicate that these leases may contain significant hydrocarbon accumulations. Tenneco plans to explore and evaluate this possibility according to the procedures outlined in this Exploration Plan.

Tenneco intends to initiate exploratory drilling in the winter of 1985/86 by employing the Single Steel Drilling Caisson (SSDC), a mobile arctic drilling system, owned and operated by Canadian Marine Drilling Ltd. (Canmar) of Calgary, Alberta, Canada. Drilling from the SSDC in the Alaskan Beaufort is feasible as this system has been successfully used to drill two exploratory wells

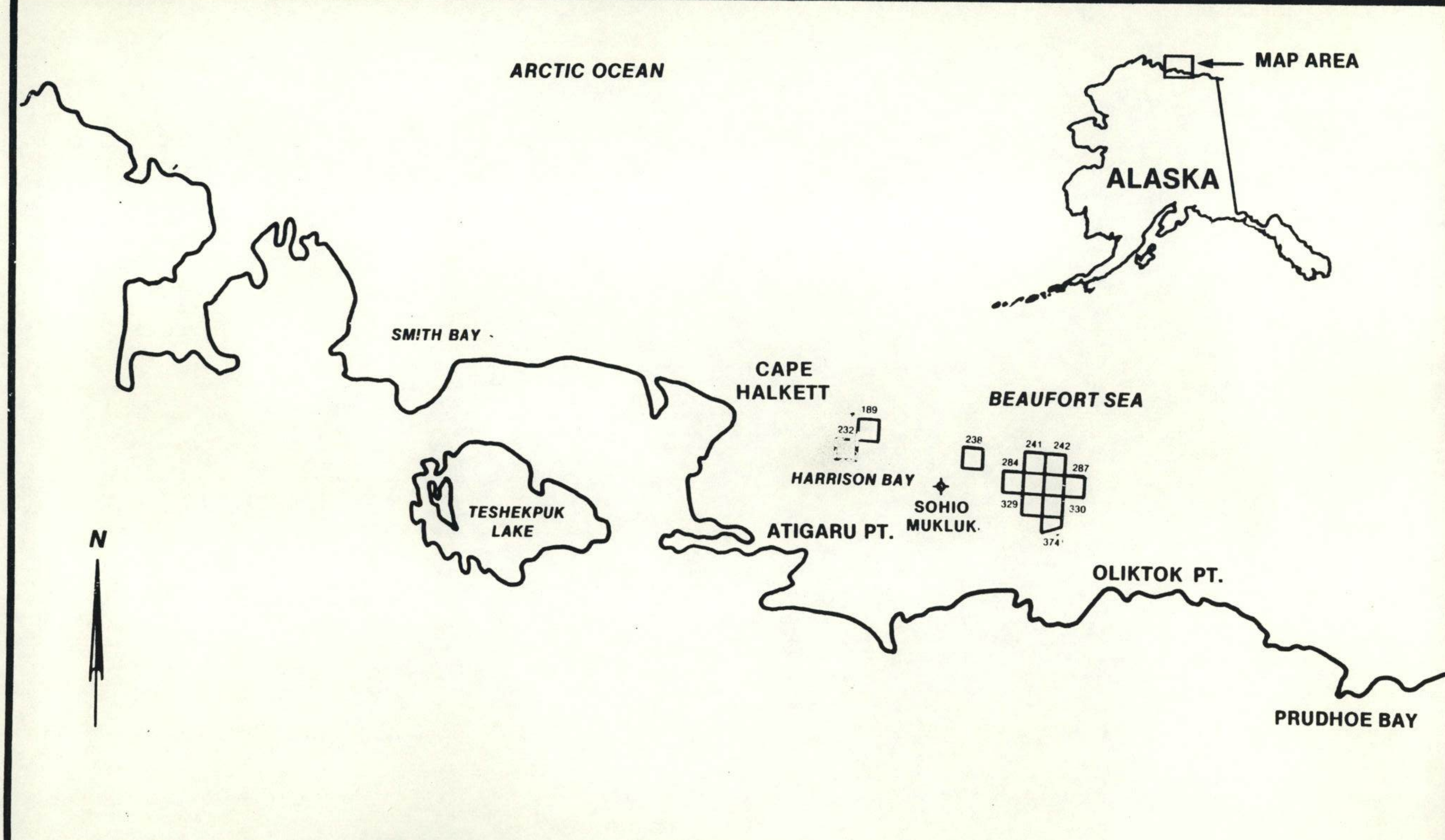


FIGURE 1

LOCATION MAP SHOWING LEASE BLOCKS IN THE HARRISON BAY.

0 6 12
MILES

Tenneco Oil Company
Harrison Bay Area (NR5-4)

Table 1

Lease Numbers, Block Numbers, and Ownership Interests

OCS Serial Number	Block Number*	Sale Number	Lessee	Ownership Interest (%)
Y-0315	189	71	Tenneco	100
Y-0811	232	87	Tenneco	100
Y-0812	238	87	Tenneco	100
Y-0813	241	87	Tenneco	100
Y-0814	242	87	Tenneco	100
Y-0338	284	71	Tenneco	80
			Mobil	20
Y-0339	285	71	Tenneco	33
			Mobil	42
			Sohio	25
Y-0815	286	87	Tenneco	100
Y-0816	287	87	Tenneco	100
Y-0348	329	71	Tenneco	12
			Mobil	88
Y-0349	330	71	Tenneco	100
Y-0817	374	87	Tenneco	100

*All blocks located on Official Protraction Diagram
Harrison Bay, NR5-4

in the Canadian sector of the Beaufort Sea. Both of these wells were drilled during the winter in environmental conditions similar to, or more severe than, those found in the Harrison Bay region, using operational procedures similar to those presented in this Exploration Plan.

The activity level attained under this Exploration Plan will necessarily vary depending on the success or failure of the initial and each succeeding well. A minimum activity level would be the drilling of one vertical well to approximately 9300 ft from a single drill site. However, the success of this initial test could lead to a maximum effort that would include the drilling of at least one vertical well from each of thirteen separate drill sites (Table 2). Drilling and testing of each well is expected to take approximately three months.

As stated above, Tenneco intends to utilize the SSDC during the winter of 1985/86. This Exploration Plan and accompanying documents are tailored for this specific purpose. If the drilling of the initial well is delayed and other drilling platforms and operational plans are considered, Tenneco will then submit the necessary revisions and documentation as may be required by the MMS.

Tenneco Oil Company
Harrison Bay Area (NR5-4)

Table 2

LIST OF POSSIBLE DRILL SITES

Location	Block No.	OCS Serial No.	Lease Line Calls	UTM 6 Coordinates* X	UTM 6 Coordinates* Y	Latitude	Longitude
1	285	Y-0339	2250'FWL; 2750'FNL	1,594,974'	25,738,563'	70°42'42.12"N	150°22'32.59"W
2	241	Y-0813	1000'FWL; 8000'FNL	1,594,261'	25,750,823'	70°44'42.68"N	150°22'56.09"W
3	241	Y-0813	5000'FEL; 2500'FNL	1,604,273'	25,754,270'	70°45'17.17"N	150°17'58.13"W
4	242	Y-0814	6200'FEL; 3600'FNL	1,618,570'	25,752,434'	70°44'59.68"N	150°10'51.53"W
5	287	Y-0816	4800'FWL; 3600'FNL	1,628,919'	25,736,040'	70°42'18.61"N	150°05'42.18"W
6	286	Y-0815	3100'FWL; 2300'FNL	1,611,603'	25,738,230'	70°42'39.67"N	150°14'17.63"W
7	284	Y-0338	6000'FEL; 5500'FSL	1,586,299'	25,731,537'	70°41'32.42"N	150°26'49.24"W
8	286	Y-0815	750'FWL; 1000'FSL	1,608,533'	25,725,970'	70°40'38.93"N	150°15'47.41"W
9	330	Y-0349	2900'FWL; 6000'FSL	1,610,293'	25,715,165'	70°38'52.73"N	150°14'53.81"W
10	330	Y-0349	6000'FEL; 2250'FSL	1,616,973'	25,711,018'	70°38'12.16"N	150°11'35.23"W
11	238	Y-0812	2300'FEL; 4900'FNL	1,559,605'	25,753,845'	70°45' 9.47"N	150°40'10.20"W
12	189	Y-0315	3700'FWL; 2300'FSL	1,818,957'	25,752,307'	70°44'37.36"N	151°31'17.40"W
13	232	Y-0811	5300'FWL; 4300'FSL	1,832,938'	25,765,948'	70°46'48.00"N	151°24'10.08"W

NOTE*: X and Y coordinates for locations 1 - 11 calculated using minus 150 Central Meridian.
X and Y coordinates for locations 12 - 13 calculated using minus 153 Central Meridian.

II. EXPLORATORY DRILLING PLANS AND SCHEDULE

Exploratory drilling plans and schedules must allow considerable flexibility so the plans can be adjusted as new data is obtained. The harsh arctic environment, restricting the time of year in which drilling can be accomplished, and the limited types of drilling structures that can be used, are additional factors that impact heavily on drilling plans. Tenneco plans to initiate drilling on Block 285 during the winter of 1985-86. The second and each subsequent exploratory well is largely dependent on the geological information and test results obtained in the preceding well. The well locations in Table 2 are not necessarily listed in the order in which the tests may be drilled.

A. Initial Well

The initial well in this Exploration Plan will be drilled on Block 285 at the location identified as number 1 on Table 2 and Figure 2a. However, an alternative location for the first test is possible although not anticipated at this time. The first test on Block 285 is planned as a straight hole to approximately 9300 ft (MD and TVD). The water depth at the first location is approximately 61 ft (Table 3). Drilling would begin on or about November 1, 1985. Field operations are estimated to require ninety days to accomplish all drilling and testing activities.

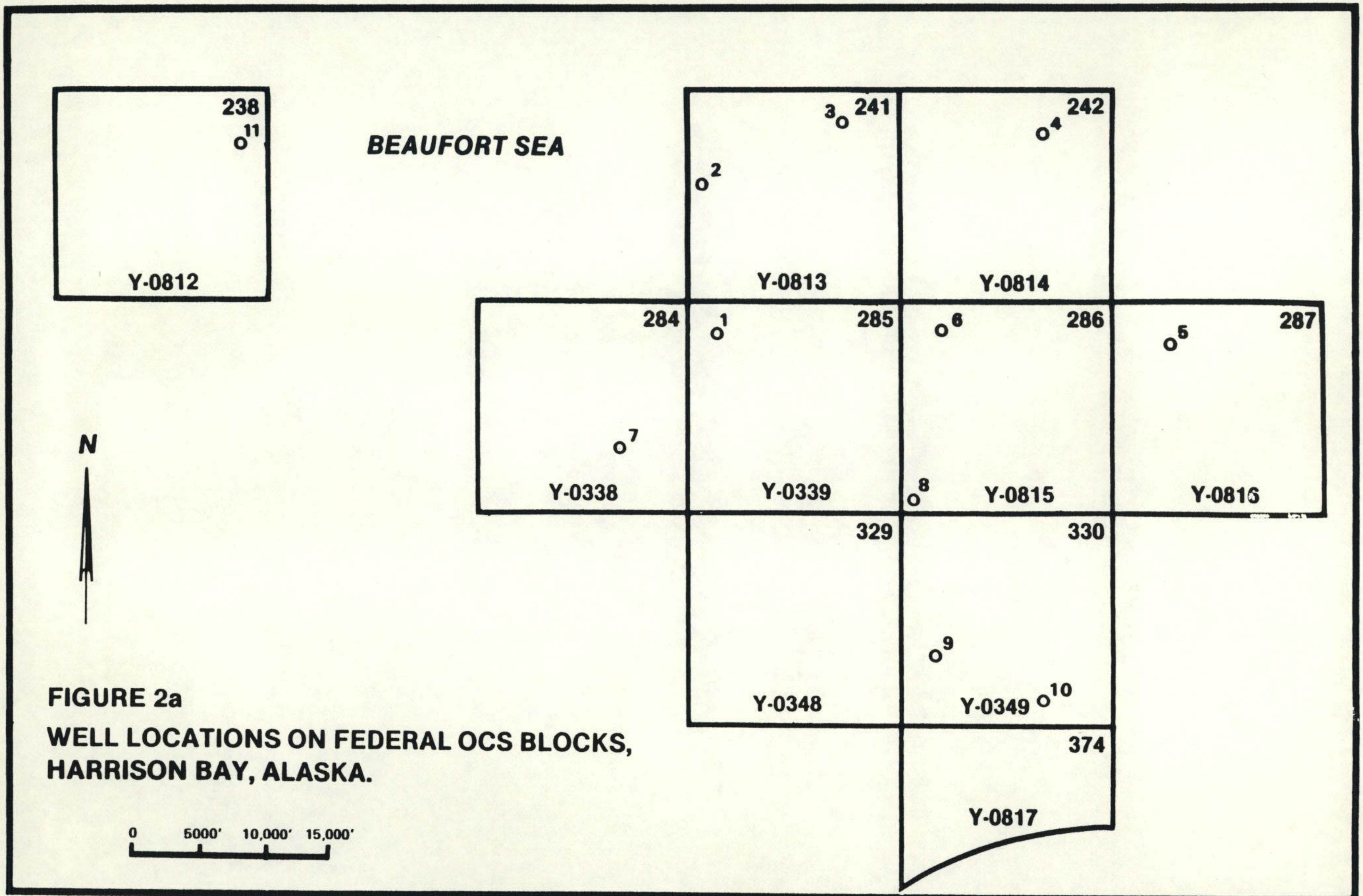


FIGURE 2a

WELL LOCATIONS ON FEDERAL OCS BLOCKS, HARRISON BAY, ALASKA.

Tenneco Oil Company
Harrison Bay Area (NR5-4)

Table 3

List of water depths and well TVD's.

WELL LOCATION	BLOCK NO.	WATER DEPTH (ft)	WELL TD (ft)
1	285	61 ft	9,300 ft
2	241	60 ft	9,900 ft
3	241	58 ft	9,700 ft
4	242	55 ft	10,350 ft
5	287	57 ft	10,000 ft
6	286	57 ft	10,350 ft
7	284	55 ft	9,800 ft
8	286	46 ft	9,500 ft
9	330	47 ft	9,800 ft
10	330	40 ft	9,800 ft
11	238	58 ft	9,825 ft
12	189	50 ft	9,000 ft
13	232	41 ft	9,600 ft

Upon obtaining appropriate approvals, the well location site will be prepared to receive the SSDC in the ensuing months. During March and April 1985, a subsea berm will be constructed to support the drilling unit. Appropriate fill material will be borrowed from a land source, trucked over an ice road both over land and the frozen Beaufort Sea to the location, for placement through the ice. The berm will be approximately 30 ft high with top dimensions of about 650 ft by 350 ft. Additional details of the construction of the ice road and the berm are provided elsewhere in this Exploration Plan and in the Environmental Report.

During open water conditions in the summer of 1985, the SSDC will be mobilized from Canadian waters and installed atop of the berm before freeze up. Drilling operations would commence on or about November 1, 1985 and continue for approximately three months. The SSDC would be maintained at location for the balance of the winter and would be demobilized during open water conditions of the summer of 1986.

As stated above, Tenneco intends to utilize the SSDC during the winter of 1985/86. This Exploration Plan and accompanying documents are tailored for this specific purpose. If the drilling of the initial well is delayed and other drilling platforms and operational plans are considered, Tenneco will then submit the necessary revisions and documentation as may be required by the MMS.

B. Subsequent Wells

It is possible that a second well would be directionally drilled from the same location during the 1985-86 winter drilling season. However, at this time such a deviated test is not planned. Additional tests would be drilled from one of the other 12 locations identified in Table 2 and Figures 2a and 2b. All wells listed in Table 3 are planned as straight holes to the true vertical depths shown. The water depth for each location is presented in Table 3.

In water depths ranging from 40 to 65 ft, it is more likely that a mobile drilling unit (MODU), like the SSDC, would be used as the drilling platform rather than an artificial island. Future operations will be influenced by the availability of appropriate drilling equipment, drilling season limitations, and appropriate MMS approvals.

Decisions of whether or not, where, and when to drill a subsequent well(s) will be made within a reasonable time following the evaluation of the geological data obtained from each preceding well. Information obtained from wells drilled by other companies in the area and from additional seismic programs will impact upon decisions on subsequent exploratory wells. The schedule for drilling subsequent wells will have to be established at later dates as such information becomes available.

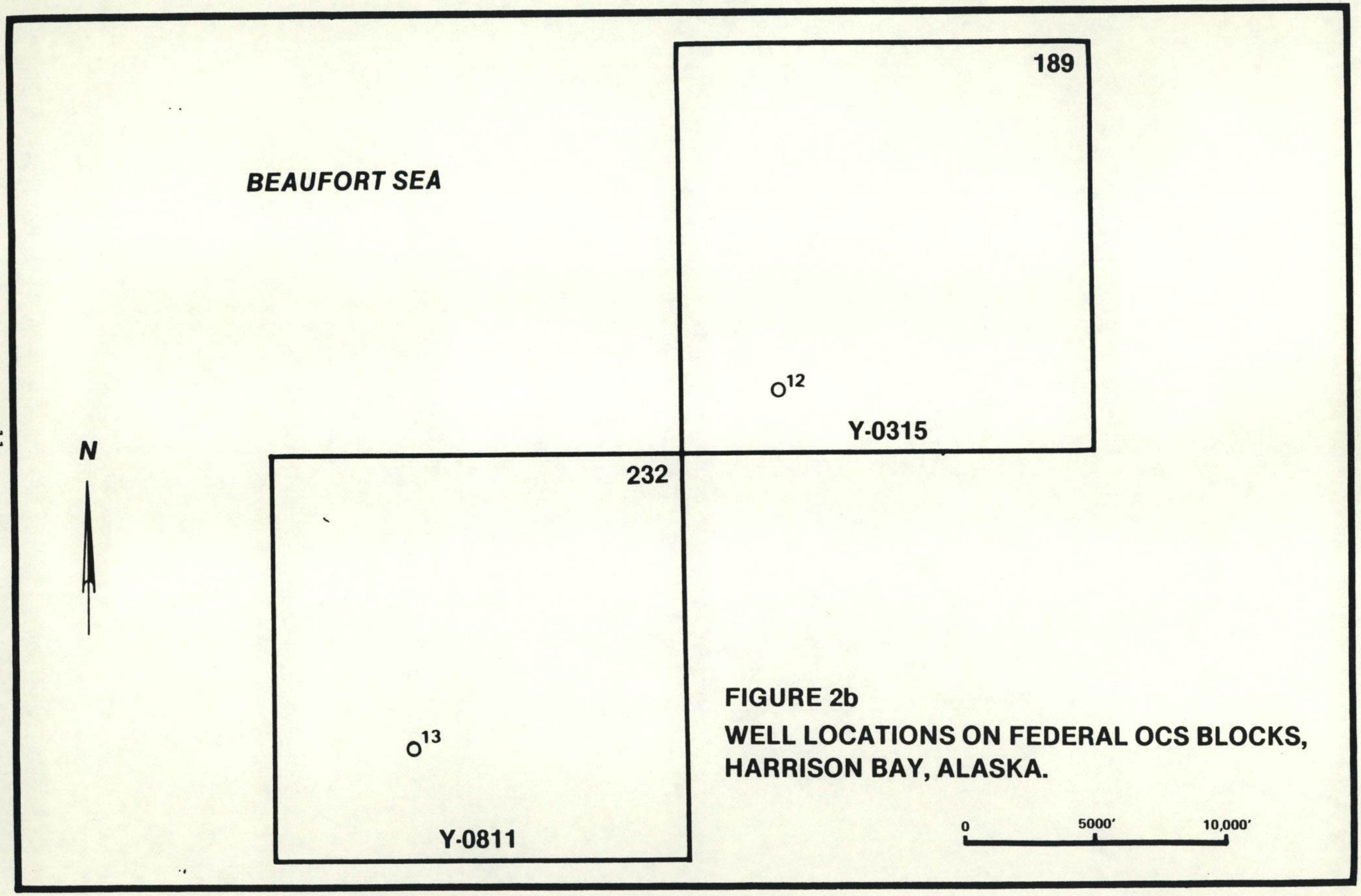


FIGURE 2b
WELL LOCATIONS ON FEDERAL OCS BLOCKS, HARRISON BAY, ALASKA.

III. GENERAL DESCRIPTION OF DRILLING SYSTEM

Drilling operations for the proposed location will be conducted from either an island constructed of fill material or a Berm/SSDC system. It is Tenneco's intention to drill the first well using the Berm/SSDC System. The gravel island scenario is presented as a contingency for the first and subsequent locations. Should the gravel island be utilized, a suitable drilling rig, appropriately equipped and suited for arctic conditions, will be acquired. Tenneco will submit the necessary revisions and documentation as may be required by the MMS should the gravel island scenario be pursued.

A. Berm/SSDC System

During the early winter of 1985, a subsea berm to support the drilling unit will be constructed using trucked placement of material borrowed from an approved land source, most likely the Ugnu Gravel Pit. The approximate route used to transport gravel to the drilling site is shown in Figure 3. For the three miles from the Ugnu Gravel Pit to an existing gravel road, a tundra ice road approximately 0.5 ft thick and 75 ft wide will be constructed by spraying freshwater over the snowpack. From the shoreline to the wellsite location, the ice road will be developed by pumping seawater onto the ice surface until the ice is either grounded or reaches a thickness of approximately 9 ft. A contingency gravel transport plan, which could be implemented if hazardous ice conditions occur, calls for stockpiling of gravel on Thetis Island

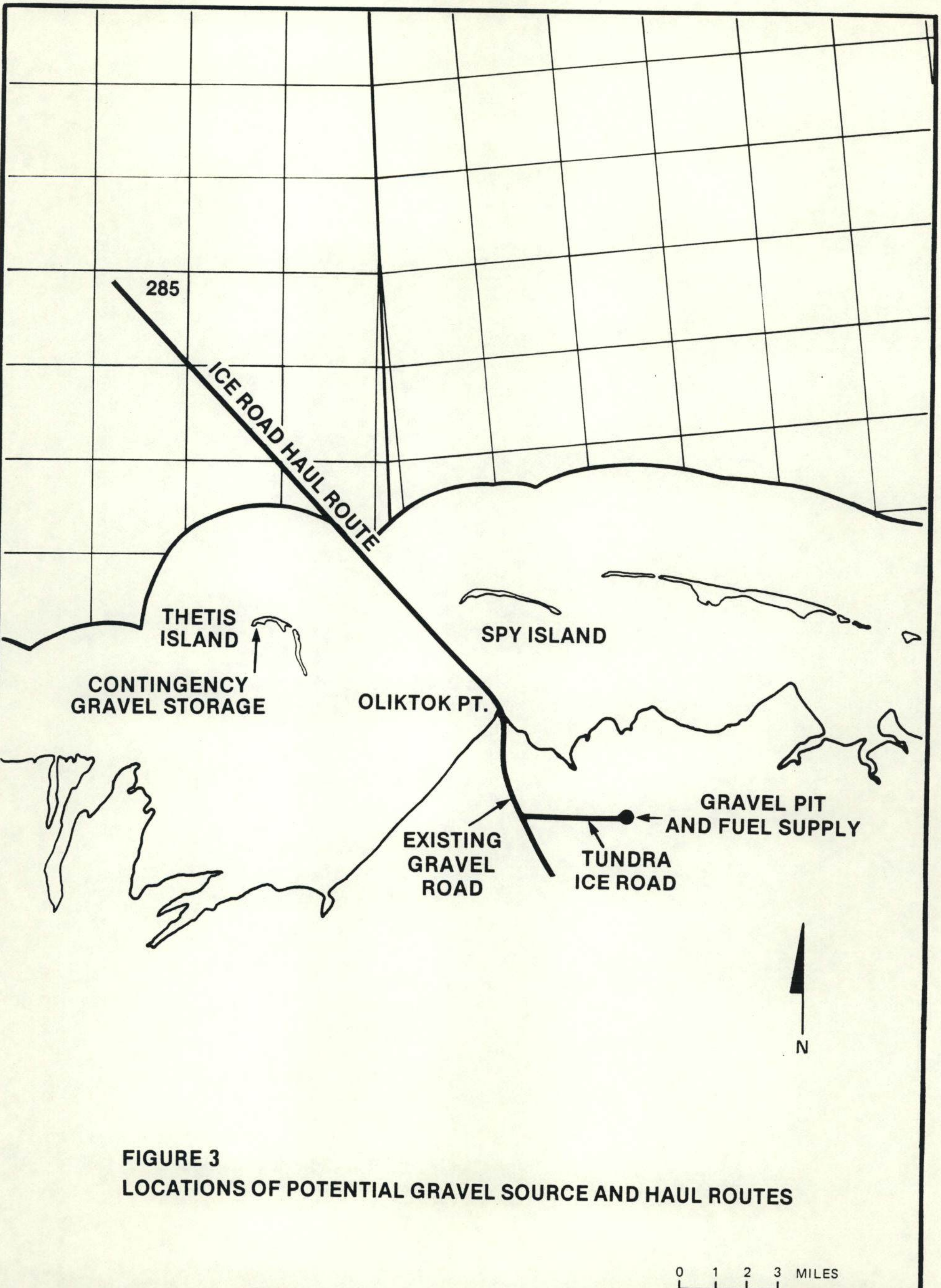


FIGURE 3
LOCATIONS OF POTENTIAL GRAVEL SOURCE AND HAUL ROUTES

during the winter. Construction of the berm during the summer 1985 open water season would utilize barges to transport the gravel. For the first proposed wellsite on Block 285, the ice road segment will be approximately 18 miles long if gravel is trucked directly to the site, and nine miles if hauled to Thetis Island.

The berm will be approximately 30 ft high with approximate top dimensions of 650 ft by 350 ft. Field inspection and quality control services will be provided during construction to ensure compliance with design specifications. Details about the berm design are presented in Appendix E, Platform Verification Plan.

The SSDC will be installed before 1985 freeze-up, in accordance with procedures developed during its previous deployments in Canadian operations. Construction of a surrounding ice pad will be initiated shortly thereafter to augment the naturally occurring ice rubble accumulation.

The SSDC was designed by Canmar in 1982 and an independent design check was performed by Swan Wooster Engineering Company. The drilling unit was constructed by modifying the forward section of an ocean-going, very large crude carrier ("VLCC"). The modifications were performed in the Hitachi Shipyards in Japan under the survey of Det Norske Veritas (" DNV"). The DNV classification for the SSDC is 1A1-Barge-Sub-Ice-Experimental. The main body of the structure is approximately 530 ft long, 175 ft wide, and 82 ft high. The deck has been cantilevered over the bow and stern to provide additional deck space. The stability of the system under ice loading is provided by water ballasting of the original cargo tanks. Shotcrete has been applied to the base of the unit to raise the coefficient of friction above that of steel on sand. The SSDC is currently registered in Canada and the U.S. Coast Guard has confirmed that the SSDC will be considered a MODU for certification purposes when it enters U.S. waters.

A review of the Canadian Coast Guard "Interim Standards Respecting MODU's 1984" has been carried out to determine what modifications are necessary to meet these regulations. Special attention is being given to safety systems, pollution prevention control, emergency generator capability, and fire fighting systems. The required modifications to obtain a Canadian Coast Guard certificate and a letter of compliance from U.S. Coast Guard will be executed prior to the commencement of operations in U.S. waters.

Included in Appendix E, Platform Verification Plan, is a confidential submission which reviews the SSDC's stability under environmental loads.

B. Gravel Island

Onshore gravel would be mined and then trucked over onshore and offshore ice roads to the proposed location (Figure 3). The gravel routes would be similar to those previously discussed. The construction method would involve dumping the gravel through the ice until the island top broke the surface of the water. Additional gravel would be deposited on the island and would be appropriately groomed to provide an island of sufficient surface diameter not less than 350 ft. The slopes of the island would be protected from environmental actions, monitored continuously and repaired where necessary, to ensure safe operations throughout its useful life.

The island design specification, construction, and monitoring would be in compliance with, and certified according to, the existing MMS Alaska Region OCS Orders.

C. Drilling System

Canmar's Single Steel Drilling Caisson will be used to drill the initial test well and possibly subsequent wells. The SSDC is designed and equipped to withstand and remain operational in adverse Arctic conditions.

The SSDC has successfully completed drilling and evaluation operations for two wells over two winters outside landfast ice in the Canadian Beaufort Sea. These two operating winters illustrate the SSDC's capability of operating in sub-freezing conditions. Arctic design features such as windwall enclosed heated drill floor and monkey board areas, an enclosed heated cellar deck, a drillpipe and casing storage barn, and a heated rig utilities package using generator waste heat and steam heat, have added to the operational efficiency of the drilling unit.

A summary of the drilling systems, including a detailed description of the rig equipment is provided in Appendix A.

1. Drill Rig Equipment

The SSDC is equipped with a modern drilling rig--the Canmar Beaufort Island Rig #2 (CBIR #2) built by DRECO in 1982, rated to 26,000 ft (8000 m). The derrick has a gross capacity of 650 tons (590 tonnes). The drawworks consist of a 3000 HP rated (2240 kW) National Model 1625-DE with electric brake. The capacity of the 49 1/2 in (1257 mm) rotary table is 800 tons (726 tonnes). The two National Model 12-P-160 triplex pumps are rated at 1600 HP (1200 kW) each. Liquid mud storage capacity is 1920 bbls (305 m^3) of which 410 bbls (65 m^3) is "kill mud reserve." Solids control equipment includes a triple tandem shale shaker, desander, tandem mud cleaner, and a high capacity centrifuge. Two 1200-gpm (4.5 m^3/min) mud coolers serve to reduce the mud temperature to avoid permafrost erosion and melting of gas hydrates.

2. BOP Systems

The blowout prevention equipment includes two stacks, a diverter system, a 240-gal (~~980~~ 908-litre) accumulator, and a 10,000-psi (69-MPa) choke manifold with a Wagner automatic choke. The 20 3/4 in (527-mm) low pressure stack is comprised of a 2000-psi (14-MPa) annular preventer, and a 3000-psi (21-MPa) double ram preventer. The 13 5/8 in (346 mm) high pressure stack is comprised of three 10,000-psi (69-MPa) single ram preventers and a 5000-psi (35-MPa) annular preventer. A 45 ton bridge crane is used to handle BOP stacks and either stack can be pressure tested in advance on a test stump.

3. Rig Utilities Package

The rig package consists of two levels of ten modules, each 49 ft x 12.8 ft x 13 ft (15.0 m x 4.0 m x 4.2 m), lined up side by side.

The lower level modules house two boilers; cementing unit, surge tank and air compressor unit; four generator units; two triplex mud pumps, charge pumps; mud tanks; and the auxiliary centrifugal pumps for the centrifuge, mud coolers, desilter, and desander.

The second level modules house the storeroom, mechanical and electrical workshops, seawater and fresh water tanks, air compressor and air dryer, fuel tanks, water and fuel pumps, SCR room, BOP accumulator, waste-heat recovery unit and circulating pumps, mud storage, and mud handling equipment, i.e., mixing hoppers, agitators, desander, desilter, degasser, centrifuge, mud coolers and shale shakers.

A major feature of the layout of this rig is that the enclosed and insulated pipe rack area is on top of the second level to allow for efficient casing and tubular handling in a protected environment. This and other features significantly reduce the overall drilling equipment area.

4. Consumable Storage Capacity

The SSDC is capable of storing all fuel and consumables needed for two 16,400-ft (5000-m) wells, making the drilling unit self-sufficient throughout the winter.

The SSDC is equipped with twenty bulk storage silos built onto the main deck, each having a capacity of 10,000 ft^3 (285 m^3). Fourteen silos are used for barite storage, providing a capacity of 9470 tons. The remaining bulk silos are used for cement storage: four silos for permafrost cement, and two for Oilwell 'G', providing capacities of 1570 tons permafrost and 950 tons Oilwell 'G'.

Fuel requirements are considerable in arctic operations. Despite the use of effective heat recovery systems, the daily consumption of diesel fuel is approximately 5280 gal/day (20 m^3/day) during full drilling operations. The bulk diesel tanks on the SSDC have a total capacity of 45,911 bbls, providing fuel for approximately 365 days.

Other consumables are stored on deck in designated areas. Allowing for deck load rating, storage space is provided for over 1000 pallets; a total weight of 2200 tons.

Casing is racked on either side of the main deck aisle with a rated storage capacity of 2750 tons. Casing racks are capable of accepting all sizes and weights of casing which may be needed.

5. Accommodations

The accommodations on the SSDC consist of 91 beds with provision for 35 emergency beds. The SSDC is equipped with a medical room, galley and mess room to seat 50, recreation room, theatre, conference room, and offices. A separate package incorporates generators which can be connected, if necessary, as a backup to supply the rig package water makers, and sewage treatment facilities.

D. Platform Verification

The berm or gravel island will meet the requirements of the Platform Verification Program as specified in MMS OCS Order No. 8. Submitted under separate cover in Appendix E, Platform Verification Plan, is a confidential presentation including the following:

1. Design Report
2. SSDC/Ice Loads
3. Figures
4. Construction Specifications
5. Operating Philosophy.

E. Environmental Design Criteria

Design environmental loading conditions for the SSDC at this site include earthquakes, waves, and ice. Earthquake loading is not a significant factor because of the tectonic stability of the site, and the wave environment does not merit major consideration in "long-term" geotechnical design because of the exclusive winter operation mandate for the structure. Ice is therefore the controlling loading mechanism.

1. Oceanographic

Extreme wave loading conditions of the SSDC have been calculated using maximum possible breaking and non-breaking waves as dictated by the water depth restriction imposed by the berm top elevation.

In all cases, wave loading conditions are less than ice loads and therefore do not govern design.

Waves can impose restrictions during SSDC installation. The SSDC will be oriented so as to minimize difficulties during setdown, and a design setdown, significant sea state of 3.3 ft (1.0 m) has been established.

Other oceanographic parameters of currents and storm surge are not critical to berm design.

2. Ice

Detailed descriptions of design ice loading conditions and expected ice loads are given in Appendix E. Stated briefly, the SSDC is designed to resist a worst case, first-year ice load by transferring the load to the berm and seabed. Such loading is expected to result from full crushing of 6.5-ft (2.0-m) thick first-year ice. Multi-year ice and extreme ice loading conditions are considered probabilistically. Safety against extreme events is assured through alert procedures and evacuation plans.

IV. GEOLOGICAL/GEOTECHNICAL INFORMATION

Proprietary and confidential geologic data is included in Appendix D for the exclusive use of the Minerals Management Service in pursuance of NTL 80-2 and will therefore be excluded from the public copies. Included in Appendix D are current structure maps, appropriate diagrammatic cross-sections, and a geological prognosis for the initial well.

Site specific information has been gathered for the proposed initial well site. Preliminary analysis of the data indicates that no major bathymetric features occur on the sea floor, although there are shallow ice gouges about 1-2 ft (0.5 meters) in depth trending in parallel bands on a east-northeast bearing. It appears, however, that no man made objects, shallow faults, or near surface gas bearing horizons occur at the site. It is therefore concluded that no significant geologic hazards are present.

The Geohazards Report will be submitted under separate cover as Appendix G. Additional geohazard surveys will be initiated for the remaining proposed well localities at some future time and will subsequently be submitted with the appropriate APD's.

V. SAFETY CONCERNS

A. Safety Meetings and Fire Drills

Weekly safety meetings will be attended by all rig personnel to discuss accident prevention, encourage safe work practices, and to review any accidents that may have occurred during the preceding week. Personnel will be actively and continually encouraged to identify unsafe practices and situations in their own work area and to correct them accordingly. Special attention will be given to high risk rig activities.

Fire drills will be conducted on a weekly basis for all rig personnel. Duty assignments and muster lists will be posted in the mess hall, living quarters, recreation facilities, drilling facilities, and other conspicuous places to provide for and help ensure adequate and correct fire responses.

B. Training for Drilling System Personnel

Company and contractor personnel will be trained and certified, where applicable, in MMS approved courses for Well Control, H_2S, Ice Alert Procedures, BOP drills and operations, first aid and general offshore operations, (i.e., helicopter procedures). Training courses will also be conducted to ensure the safe evacuation of the drilling unit, should that unlikely event ever occur.

C. Pollution Prevention--Drills and Training

Drills and training will be carried out by the oil spill response team, as is outlined in the Oil Spill Contingency Plan (Appendix C) and as required by MMS Alaska Region OCS Orders.

VI. CONTINGENCY PLANNING

A. Oil Spill Contingency Plan

Tenneco has prepared a Spill Prevention Control and Counter Measure Plan and an Oil Spill Contingency Plan for the Harrison Bay lease area in the Alaskan Beaufort Sea. The plan outlines provisions to ensure that both Tenneco's and contractor's full resource capabilities are known and committed during any spill incident. This includes inventory of applicable equipment, materials and supplies, time requirements for deployment of same, and training of key personnel. The plan also provides for varying degrees of response depending on the severity of an oil spill and for identifying and protecting areas of special biological sensitivity. The plan establishes procedures for early detection and timely notification of appropriate company personnel and governmental agencies in the event of an oil spill incident.

Tenneco's Spill Prevention Control and Counter Measure Plan and Oil Spill Contingency Plan is Appendix C of the Exploration Plan.

B. Critical Operations and Curtailment Plan

It is recognized that during the drilling of the proposed well certain operations will be more critical than others. Therefore, a Critical Operations and Curtailment Plan (COCP) has been developed which addresses those areas as cited in MMS OCS No. 2, Section 9.

This plan is Appendix B and contains the confidential alert manual as developed by the contractor. The COCP allows the drilling vessel to be prepared for any situation which may arise.

C. Emergency Operations Plan

The company and the contractor will follow prudent practices throughout the entire offshore operation. The contractor has developed Alert Procedures, which will be modified to be site specific. For any given situation, the contractor is able to make an overall assessment relating environmental conditions, structural responses, geotechnical deformations and well drilling activities. This ensures that the appropriate plan of action is always in place and that sufficient time will be available to execute the plan, if necessary. Should any conditions be predicted which may endanger life and/or environment, the appropriate alert level will dictate the necessary action. If evacuation is necessary, the company will secure the well, ensure that the contractor has secured the drilling vessel, and evacuate the rig in an orderly, predetermined manner. The appropriate equipment and infrastructure will be available at all times to safely evacuate the drilling vessel.

1. Relief Well Drilling

In the unlikely event of a blowout, plans have been made to drill a relief well to regain control of the blowing well. These plans, which include construction of a relief well pad, mobilization and logistics of supply and support, relief well location options, and relief well rig selection, are contained in Appendix C.

2. Loss or Disablement of a Drilling Unit or a Drilling Rig

In the highly unlikely event that the drilling rig is lost or disabled, there are presently numerous rigs on the North Slope stacked and available for use as a replacement. The rig package on the SSDC would be removed and the replacement rig would be installed.

3. Loss of or Damage to Support Craft

Due to the large capacity of the SSDC and the ability to stockpile consumables, the drilling unit will require minimal support craft for continuing operations. Should damage or loss of support craft occur during the operation, a replacement unit from available resources in Prudhoe Bay will be deployed. The support craft requirements for emergency evacuation and support will always be maintained and plans will be modified accordingly to ensure continuous coverage.

4. Hazards Unique to the Site of Drilling Operations

Hazards unique to the site of drilling operations are addressed in Section III and Appendix E. The design of the drilling unit and the gravel berm will provide a sufficient safety factor for the ice conditions and load forces anticipated in the planned operations. A comprehensive monitoring program will be utilized along with the associated alert procedures outlined in Appendix B to respond to any situation.

D. H_2S Contingency Plan

Although hydrogen sulfide gas is not expected to be encountered, a complete and detailed program will be implemented, as required, to insure the safety of all rig site personnel should H_2S be detected during drilling. The following outline is a short description of the factors which will be addressed in the detailed H_2S contingency plan. The total plan will be submitted with the Application for Permit to Drill and will address all rig and site specific details for drilling in a possible H_2S environment.

I. RESPONSES TO H_2S and SO_2

II. PROCEDURES, EQUIPMENT & TRAINING
    - Category I
    - Category II
    - Category III

III. OPERATING CONDITIONS - CLASSIFICATION

IV. DUTIES OF PERSONNEL FOR EMERGENCY & SPECIAL OPERATIONS

V. BRIEFING AREAS

VI. MEDICAL AND EVALUATION PLANS

VII. NOTIFICATION REQUIREMENTS

VII. WELL CONTROL PROCEDURE

IX. PROCEDURE FOR LOST CIRCULATION

VII. COASTAL ZONE MANAGEMENT CERTIFICATION

The planned exploratory drilling activities outlined in this Exploration Plan comply with the appropriate portions of Alaska's Coastal Management Program. All activities will be conducted in a manner consistent with such program.

APPENDIX A

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

DRILLING EQUIPMENT DESCRIPTION CANMAR SSDC

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

Submitted: January 29, 1985

TABLE OF CONTENTS

Page

FIGURES

I. MAJOR DRILLING EQUIPMENT

A. Structure

(1) Mast - Cantilever Type, 147 ft (44.8 m) clear working height, 34 ft (9.14 m) leg spread, 1,300,000 lb (580,000 daN) gross nominal capacity, 1,000,000 lbs. (445,000 daN) hook load with 12 lines 1-1/2 in (38 mm) strung, seven - 60 in (1.5 m) sheave 500 ton (454 t) crown block, racking board, ladders, core line and cat line sheaves, tugger sheaves, tong block sheaves, counter weights. Sling line and equalizer, shoes, dual standpipe clamps, mast climbing device, steel winterizing.

(2) Substructure - Dreco posted vertical box consisting of 4 - 32 ft x 7 ft 10 in x 12 ft (9.73 m x 2.38 m x 3.65 m) vertical boxes, 2 x skid beams 55 ft x 7 ft 10 in x 3 ft (16.72 m x 2.38 m x 0.91 m), 38 ft (11.6 m) high floor, 800 ton (726 tonne) rotary capacity with 500,000 lbs. (222,000 daN) simultaneous set back area. 'A' leg mast elevator, drop in drawworks and set back sections. Substructure complete with skidding system with floor and mast in working position. Racking area designed for 240 stands of 5 in (127 mm) drillpipe plus 10 stands drill collars. Weather enclosure for substructure is steel with fiberglass insulation. Floor windwalls also of steel to 50 ft (15.2 m) above drill floor.

(3) Rig Skidding - 2 x 220 Ton (200 tonne) Hydraulic cylinder type with substructure skid connections for X - Y motion.

B. Power

(1) Engines/Generators

(a) Diesel Generator Units consisting of:

Engine - Caterpillar D 399 turbo charged jacket water aftercooled, air starter, forward control, instruments alarms, flex coupling, and all accessories. 4 ea.

Generator - Kato 1500 KVA continuous, 1050 kW, 600 Volt, 3 Phase, 60 Hz, Class F insulation, for SCR service. 4 ea.

(2) Air System

(a) Rig Air Compressors - 2 ea., Sullair Model 20-125H mounted, c/w 125 H.P. (93 kW) electric motors single stage, heavy duty, asymmetrical rotary screw compressors, each to deliver 445 SCFM (12.7 m^3 (st)/d) of free air at 125 psig (860 kPa), complete with inlet silencer, filter, aftercooler, instrumentation, control panel and enclosure. 2 - ea. Halliburton 465 SCFM at 125 psig rental units; see Contractor leased equipment.

(b) Cold Start Compressor - 1 ea. Sully skid mounted, c/w Murphy Diesel engine Skid mounted, c/w diesel driving the reciprocating compressor, capacity 60 ft^3 (1.7 m^3) air receiver, fuel tank, electric start system.

(c) Air Receivers - 2 ea. 125 ft^3 (3.54 m^3) air receivers rated for maximum working pressure of 150 psig (1030 kPa), in accordance with drgs. 80029-SK13 and 80029-SK14.

(d) Alcohol Injection Pump - Stonebor model C-6 PR 1 qt./day to 16 gal./day (1.13 L/day to 72.6 L/day) with 1/2 in (12.7 mm) plunger at 60 S.P.M.

(e) Air Dryer - 1 ea. Pure Aire Model PS1000 Skid mounted, refrigerant type air dryer rated for 890 SCFM (1512 m^3 (st)/hr) at 125 psig (860 kPa) and 93^{o}F (34^{o}C) c/w absorbent type prefilter.

(3) Electrical System

(a) SCR/Generator Control System

4 - Ross-Hill 1850 SCR cubicles rated 2000 Amps.

4 - Ross-Hill generator control cubicles c/w G.E. 1600 AF generator breakers and MCC feeder breakers.

1 - Synchronizing cubicle with auto-synch features. Generator 5 or 6 (camp utilities) can be synchronized to the main bus with the auto-synch.

2 - Tie Breaker cubicles (G.E. 1600 AF)

(b) 600 Volt Distribution

5 - Canadian General Electric motor control centers (different capacities) located in various areas of the rig. All braced for 65,000 Amps symmetrical fault current.

2 - Allen Bradley motor control centers (600 V and 208 V) to supply power to glycol heating fan motors.

2 - Westinghouse size 7 starters for ballast pumps.

(c) 480 Volt Distribution for production testing equipment - 45 kVA transformer - Federal Pioneer switchboard.

C. <u>Hoisting Equipment</u>

(1) <u>Drawworks</u> - National 1625-DE electric driven rated 3000 H.P. (2240 kW) unitized, skid mounted, with accessories for operation including console panel for operating brake clutches, sand- line assembly, driven by two GE752 electric motors, air controlled cathead, cradle assembly for Elmagco 7838 brake and crown saver.

(2) Drawwork Brake - Elmagco Model 7820 system capable of 100,000 ft-lb (135,000 joules) torque to 50 rpm - Model 7838 brake model PWM 20 electrical control system including model D39040 drillers control, model C39766-1 enclosure, and 6600-32-0157 power transformer.

(3) Drilling Motors - 2 each, General Electric D.C. Model GE752 with air blower 10 HP (7.5 kW). Explosion Proof.

(4) Hook/Block - National Type G500 API rated dead load capacity 454 tonnes (500 tons) including the following:

- six 60 in (1524 mm) steel sheaves with API wireline grooves for 1-1/2 in (38 mm) drilling line, sheave bearings.
- heavy steel sheave guards.

(5) Drilling Line - 1-1/2 in (38 mm) x 7500 ft (2286 m) 6 x 9.9.1 OLTS IPS IWRC, mounted on steel reel.

(6) Sandline - 9/16 in (14.5 mm) x 20,000 ft (6096 m) 6 x 7 IPS, OTLS, Polycore mounted on drawworks drum.

(7) Deadline Anchor - 1 ea. Dreco LDR - 100 C Anchor 1-1/2 in (38 mm) line.

(8) <u>Drilling Instrumentation, Geolograph, and Control</u> as follows:

(a) Martin-Decker AWEG-1 Type "EB" weight indicator (console mount) and sensor unit.

(b) Automatic driller (console mount) c/w control unit and rate of penetration cutoff switch.

(c) Mud gauge assemblies, 6000 psi (0-40 MPa) (1 ea), 10,000 psi (0-69 MPa) (1 ea) range (console mount).

(d) Tong torque indicating system (console mount) c/w load cylinder.

(e) Rotary table tachometer system (console mount) c/w signal generator suitable for use in Class 1, Group D, Division 1 areas.

(f) Pump stroke SPM tachometer system (console mount) c/w signal generators suitable for use in Class 1, Group D, Division 1 areas.

(g) Rotary table electric torque meter c/w signal current transformer suitable for use in Class 1, Group D, Division 1 areas.

D. Mud System

(1) H.P. Mud Pumps - 2 ea. National 12-P-160 triplex, 1600 H.P. (1200 kW) rating, max. discharge pressure of 5000 psi (35 MPa) at 567 GPM (35.8 L/s) and max. flow rate of 772 GPM (48.7 L/s) at 3200 psi (16.40 MPa) (calculated at 120 strokes per minute), max. piston diameter and stroke length 7-1/4 in x 12 in (184 mm x 305 mm) and including the following:

- 150 ANSI flanged 10 in (250 mm) suction manifold complete with suction dampener
- 5000 psi (35 MPa) A.P.I discharge manifold unit
- unitization for two top mounted General Electric D.C. motors model GE752 per pump.
- chains and sprockets lubricated with explosion proof, 3 H.P. (2.2 kW) motor driven oiling system
- liner spray pump, explosion proof, 3 H.P. (2.2 kW) electrically driven

(2) Pulsation Dampener - 2 ea. Hydril K-20-5,000, 5000 psi (35 MPa) working pressure with 4 in (100 mm) 5000 psi (35 MPa) A.P.I. R.T.J. connection.

(3) Safety Relief Valves - 2 ea. Cameron 3 in (76 mm) female N.P.T. connection 5000 psi (35 MPa) max. set pressure.

(4) Pressure Gauges - 2 ea. Cameron 0 - 5000 psi (35,000 kPa) range, 2 in (50 mm) female N.P.T. connection.

(5) Circulating Pumps

Charge Pumps - Mission Magnum

6 in x 5 in x 11 in (152 mm x 127 mm x 279 mm), 9-1/2 in (295 mm) impeller, with 75 H.P. (56 kW) 1750 RPM motors, unitized. 2 ea.

Mixing Pumps - Mission Magnum

6 in x 5 in x 11 in (152 mm x 127 mm x 279 mm), 10-1/4 in (257 mm) impeller with 75 H.P. (56 kW) 1750 RPM motors, unitized. 3 ea.

Transfer Pump - Mission Magnum

6 in x 5 in x 11 in (152 mm x 127 mm x 279 mm), 10-1/4 in (267 mm) impeller, 75 H.P. (56 kW) 1750 RPM motor, unitized. 1 ea..

Desander Pump - Mission Magnum

8 in x 6 in x 14 in (203 mm x 152 mm x 350 mm), 11-1/2 in (286 mm) impeller, with 125 H.P. (93 kW) 1750 RPM motor, unitized. 1 ea.

Desilter Pump - Mission Magnum

6 in x 5 in x 14 in (152 mm x 127 mm x 350 mm), 10-3/4 in (279 mm) impeller, with 100 H.P. (75 kW) 1750 RPM motor, unitized. 1 ea.

Hole Fill Pump - Mission Magnum

3 in x 2 in x 13 in (76 mm x 51 mm x 330 mm), 7-1/4 in (184 mm) impeller with 10 H.P. (7.5 kW) 1750 RPM motor, unitized. 1 ea.

Mud Cooling Pump - Mission Magnum

6 in x 5 in x 14 in (152 mm x 127 mm x 356 mm), 11 in (279 mm) impeller with 125 H.P. (93 kW) 1750 RPM motor, unitized. 1 ea.

(6) Agitators

Mud Agitators - Abcor 20 H.P. (15 kW) 1150 RPM electric motor c/w 44 in (1118 mm) impeller. 6 ea.

Mud Agitators - Abcor 10 H.P. (7.5 kW) 1150 RPM explosion proof electric motor c/w 36 in (914 mm) impeller. 5 ea.

Mud Agitators - Abcor 5 H.P. (3.7 kW) 1150 RPM explosion proof electric motor c/w 32 in (813 mm) impeller. 1 ea.

Mud Agitator - Abcor 5 H.P. (3.7 kW) 1150 RPM explosion proof electric motor c/w 28 in (711 mm) impeller. 1 ea.

Mud Guns - 3 in (75 mm) low pressure 150 psi (1030 KPa) Dreco bottom type. 14 ea.

(7) Mud Treatment

Mixing Hoppers - Geosource Sidewinder Mixer model 800 with sliding gate type valve, sack table, hopper, unitized. 3 ea.

Shale Shaker - Brandt triple tandem with screens, 5 H.P. (3.7 kW) explosion proof motors, 3 discharges, skid. 1 ea.

Desander - Brandt S3-12 (3x12 in (305 mm) Cones), capacity 1500 USGPM (5678 L/min) at 75 ft (23 m) head.

Desilter/Mud Cleaner - Shiffner Tandem Mudslinger (24x4 in (102 mm) cones), capacity 1200 USGPM (4542 L/min) at 75 ft (23 m) head.

Centrifuge - Wagner Sigma 150 GPM (568 L/min) c/w 50 H.P. (37.5 kW) explosion proof electric motor, unitized. Capacity 20-150 USGPM (75.7 - 570 L/m) unweighted mud c/w dual electrically driven extended shaft progressing cavity (Salamander) feed pumps. (3 HP (2.2 kW) ea.)

Degasser - Burgess Magna-Vac 20 HP (15 kW) vacuum degasser c/w 20 HP (15 kW) explosion proof motor, rated 211 USGPM (800 L/min)

Mud Gas Separator - cylindrical vessel. (fabricated).

(8) Tanks

Trip Tank - 50 bbl (8.0 m^3) capacity, fabricated, with electronic drillfloor volume indicator. + Manual read out (weighted w/sheave cap read out).

Mud Tanks - 3 skids, 1930 bbl (306.5 m^3) capacity as follows:

Settling tank capacity	=	37 bbl (5.9 m^3)
Suction tank capacity	=	203 bbl (32.3 m^3)
Suction tank capacity	=	197 bbl (31.4 m^3)
Reserve tank capacity	=	203 bbl (32.3 m^3)
Three Reserve tanks, capacity	=	197 bbl (31.4 m^3) ea.
Two Reserve tanks, capacity	=	208 bbl (33.2 m^3) ea.
Degasser tank capacity	=	112 bbl (17.9 m^3)
Desander tank capacity	=	121 bbl (19.3 m^3)
Mudcleaner tank capacity	=	121 bbl (19.3 m^3)
Underflow tank capacity	=	40 bbl (6.5 m^3)
Mud cooler tank capacity	=	121 bbl (19.3 m^3)
Active tank capacity	=	141 bbl (22.4 m^3)
Premix tank capacity	=	87 bbl (3.8 m^3)
Pill tank capacity	=	49 bbl (7.7 m^3)

Bulk Mud Surge Tank - Pneumatic vertical hopper bottom atmospheric tank, 70 ft^3 (2.0 m^3) capacity, c/w all associated piping and accessories. 2 ea.

(9) Mud Coolers - 2 ea. Plate & Frame Heat Exchangers, Alfa Laval utilizing sea water 1000 gpm (3.8 m^3/min) at 100 psi (700 kPa) to cool drilling mud at 1200 gpm (4.54 m^3/min) at 45 psi (315 kPa).

(10) Standpipe Manifold - Dreco dual manifold with Demco valves, misalignment unions and 160^0 goosenecks, 5 in (125 mm) 5000 psi (35 MPa) working pressure.

(11) Cementing Standpipe - Hammer Union at Rig Floor.

(12) Rotary Hose - 2 ea. 3-1/2 in (89 mm) x 75 ft (22.9 m) long with 4 in (100 mm) N.P.T. built in leak-proof male connections, test pressure 10,000 psi (69.0 MPa) c/w safety hobbles.

E. Rotary/Rig Floor Equipment

(1) Rotary Table - National Supply C-495, rated deadload capacity 800 tons (726 tonnes), 49-1/2 in (1257 mm) diameter table opening with 53-1/2 in (1353 mm) centerline space c/w mounts, coupling and accessories for General Electric D.C. Motor Model GE 752. Independent Rotary Drive D1632, tool guard/all units are epoxy coated.

(2) Rotary Table Motor - 1 each General Electric D.C. Model GE 752 c/w air blower 10 HP (7.5 kW).

(3) <u>Swivel</u> - National Model P500, API rated dead load capacity 500 tons (454 tonnes) API bearing rating 367 tons (333 tonnes) at 100 R.P.M. including the following:

- swivel body with 6-5/8 in API regular left-hand box with thread protector.
- long radius gooseneck with 4 in (100 mm) NPT female threads and a 2 in (50 mm) NPT female thread wireline opening with plug installed.
- 6-5/8 in API regular left-hand double pin sub with thread protectors.

(4) (a) <u>Hex Kelly</u> - 2 ea. 5-1/4 in (133 mm), 7-3/4 in (197 mm) O.D. top up set 6-5/8 in reg. L.H. box up, 2-13/16 in (71 mm) I.D. and 6-1/4 in (159 mm) O.D. bottom upset with 4-1/2 in A.P.I. I.F. R.H. pin down, 42 ft (12.8 m) long.

(b) <u>Hex Kelly</u> - 1 ea. 4-1/4 in x 40 ft (108 mm x 12.2 m).

(5) (a) <u>Kelly Cock Upper</u> - 1 ea. Hydril 1004880-5, 5-1/4 in (133 mm) NOM. 7-3/4 in (197 mm) O.D., 3-1/16 in (77.8 mm) I.D., 10,000 psi (69.0 MPa) working pressure with 6-5/8 in A.P.I. reg L.H. box and pin connections.

(b) Kelly Cock Lower - 2 ea. Hydril 1001880-2, 4-1/4 in (108 mm) NOM. 6-5/8 in (168 mm) O.D., 2-13/16 in (71 mm) I.D., 10,000 psi (69.0 MPa) working pressure with 5 in XH box and pin connections.

(6) (a) Float Valve - 1 ea. Baker 480-15-42,000 Model G, full flow, flapper type, size 4R for 6-3/4 in (171 mm) O.D. Collars.

(b) Float Valve - 1 ea. Baker 480-15-5462 Model G, full flow, flapper type, size 5F-6R for 9 in (229 mm) O.D. collars.

(7) (a) Float Valve Puller - 1 ea. Baker 480-90-4200 for use with 4R float valve.

(b) Float Valve Puller - 1 ea. Baker 480-90-5462 for use with 5F-6R float valve.

(8) Casing Stabbing Board - 20 ft (6.1 m) adjustable - Lamb or equal.

F. Drill String/Associated Equipment

(2) (a) Drill Pipe - 22,000 ft (6700 m), 5 in (127 mm) O.D. x 19.50 lb/ft (29.07 kg/m) IEU Grade "G" Range 2 with 6-3/8 in (162 mm) O.D. x 3-1/2 in (89 mm) I.D. 18° Taper Hughes extra hole tool joints (4-1/2 IF), and internal plastic coating.

(b) Drill Pipe - 660 ft (198 m) 5 in (127 mm) O.D. Hevi-Wate Heavy Wall range 2, 30.5 ft (9.3 m) overall length with 6-1/2 in (165 mm) O.D. x 3-1/8 in (79 mm) I.D. 18° Taper Drilco extra hole tool joints (4 1/2 IF), internal plastic coating and hardbanding.

(3) (a) Drill Collars - 30 ea. spiral grooved, 6-1/2 in (165 mm) O.D. x 2-13/16 in (71 mm) I.D. x 30 ft (9.1 m) approx. overall length, with 4-1/2 in I.F. box to pin connections, Drilco bore back on boxes and A.P.I. stress relief on pins, double zipped lift elevator and slip recesses.

(b) Drill Collars - 30 ea. spiral grooved, 8 in (203 mm) O.D. x 2-13/16 in (71 mm) I.D. x 30 ft (9.1 m) approx. overall length, with 6-5/8 in Reg box to pin connections, Drilco bore back on boxes and A.P.I. stress relief on pins, single zip lift slip recess.

(4) Casing Racks - mounted on the deck area are racks for casing and rotary tubulars. Storage capacities of these racks meet the requirements for two 16,400 ft (5000 m) Beaufort Sea wells.

(5) Pipe Handling System - all sizes up to 42 in (1067 mm) casing handling capacity. Mereco Pipe Handler c/w single hydraulic power unit and two control consoles for racking area and drill floor.

(6) Derrick Floor Winches - Two pneumatic operated with automatic brake, Ingersoll Rand K6ULAB on drill floor.

(7) Racking Platform Winch - electrically operated with automatic brake.

G. Heaters/Boilers

(1) Boiler - 100 hp Boiler (981 kW) Lister automatic with chemical water treating pot for deionization. 2 ea.

(2) Air Heater - Lister, 4 x 106 Btu/h (1142 kW), indirect fired, skid mounted. 1 ea.

(3) (i) Waste Heat Recovery Circulating Skid -
1 ea. including 754 US. gal. (2.8 m^3)
Tank, Tank Steam Heat Exchanger, and 3 ea. circulating pumps

- Armstrong series 4030 size 6E, 6 in x 4 in (152 mm x 102 mm), 13 in (229 mm) impeller, with one 25 H.P. (18 kW) and two 40 H.P. (30 kW), 600 volt, 1750 RPM explosion proof motors. NOTE: This unit used in conjunction with engine/ generator units waste heat recovery.

(ii) Waste Heat Recovery (Brake Cooling) Circulating System - 1 ea. including 951 US. gal. (3.6 m^3) tank and 2 ea. circulating pumps - Armstrong series 40M, 4 in x 3 in x 8 in (102 mm x 76 mm x 203 mm), 7 in (180 mm) impeller, with 30 hp (22 kW), 600 volt, 1750 RPM explosion proof motors.

NOTE: This unit used in conjunction with drawworks brake and drill floor motors cooling waste heat recovery.

H. Auxiliary Systems

(1) Bulk System - Bulk silos are built as an appendage to the hull on the main deck. There are 20 bulk gravity silos for barite 140,000 ft^3 (3990 m^3), oil well 'G' cement 20,000 ft^3 (570 m^3) and permafrost cement 40,000 ft^3 (1140 m^3).

Each silo has a capacity of 10,000 ft^3 (285 m^3).

Surge tanks consisting of two bulk barite, pneumatic, vertical, hopper type, tank, 70 ft^3 (2.0 m^3) capacity and one cement surge tank which is part of the leased cement unit.

Pressure tanks for the pneumatic system (five-1700 ft^3 tanks and two-2300 ft^3 tanks) are supplied as part of the leased cement system).

Bulk material is transferred by means of a low pressure Vackonveyor (Model 36) system and two 800 cfm/10 psi bulk air blowers from the bulk silos to the load sensing pressure tanks. From there, the two 465 cfm air compressors of the leased cement unit transfer the bulk to the surge tanks for mixing.

(2) <u>Water Makers</u> - 2 ea. Aqua-Chem model S-600 Spec E, produced distilled water = 600 US gph (2268 L/h). One in rig utilities module, one in accommodation utilities module.

(3) <u>Cranes</u>

- 2 ea. API 1500 FMC - Diesel Hydraulic - 63 ton (57 tonne), 120 ft (36.6 m) boom
- 1 ea API 238A FMC - Diesel Mechanical - 35 ton (32 tonne), 120 ft (36.6 m) boom
- 1 additional pedestal for a "1500" is provided immediately ahead of the camp and adjacent to the camp utilities.
- all 3 pedestal cranes have 10 ft (3 m) boom extension.

(4) <u>BOP Bridge Type Handling Crane</u> - Beebe Bros. 50 ton (45.4 tonne), dual 25 ton (23 tonne) handling cranes, substructure mounted, including operating control console.

(5) Crane (J&B) - with trolley.

(6) Mobile Equipment

(a) Mobile Crane - 22 ton (20 tonne) FMC Link Belt 1 ea. API HSP-8022 c/w GM-4-53 diesel engine with section boom 91 ft long (28 m).

(b) Fork Lift - Caterpillar 930 - c/w pallet lifter, driven by Caterpillar diesel with 218 in (5.53 m) mast.

(c) Cement Mix Water Tanks (2) - c/w 8V-71 Diesel power (2), mixing hopper, 8 in x 6 in x 14 in (203 mm x 152 mm x 356 mm) Impeller transfer pumps (2), steam heated.

(7) Well Test Equipment

(a) Wire Line Unit - Abcor - Hydraulic drive motor, variable speed transmission, skidder brake, type "O" measuring device, 20,000 ft (6096 m) of 0.092 in (2.3 mm) regular wireline installed on drum, Neoprene cover and Hay pulley.

(b) High Pressure Piping - All oil, gas, water lines manifolded for treater, heater, testing and flare booms.

(c) Production Test Flare Booms - Two 75 ft (23 m) flare booms with king posts and piping.

(8) Accommodations

28 Unit Camp - Custom Structures suitable for accommodation of 93 people, and 35 on emergency bunk basis and including drilling foreman's office, hospital, radio room, superintendent's office, conference room, company office, chief steward's office, general office, washrooms, geologist's office, change house, laundry/diner unit, kitchen/freezer unit, food storage unit, sleeping areas, and movie room, recreation room.

(9) Accommodation Utilities

Water Desalination - housing tankage, Aqua Chem S-600.

Capacity of Fresh Water	6600 USG (25 m^3)
Capacity of Saltwater Tank	5800 USG (22 m^3)

Sewage Disposal Plant - One Red Fox 7500 with capacity for 120 people, cold start compressor and electrical distribution equipment.

Accommodations Generator - c/w Caterpillar engine model D399 turbo charged, jacket water after cooled, air starter, remote radiator, forward control, instruments, alarms, silencer, spark arrestors, flex coupling, block heaters and all accessories. Generator 1500 KVA continuous, 1050 kW, 600 volt, 3 Phase, 60 Hz, Class F insulation, Kato for SCR service. Allen Bradley controls and switchgear. 2 ea.

Heat Exchangers - Two parallel installations of 2 Young heat exchangers to provide jacket water cooling with sea water.

Garbage Compactor (2)

I. Leased Equipment

Cement System - The following equipment is presently installed by Halliburton on a "free placement" basis; in this agreement rental is paid by the operator when equipment is used, provided Halliburton services are used. Halliburton has indicated that they are willing to provide a similar arrangement for an Alaskan Beaufort operation.

A Halliburton HT-400 Twin diesel driven unit which consists of the following:

- two 4-1/2 in x 8 in triplex pumps with 15,000 psi manifolding rated at 10,000 psi working c/w control console.
- low pressure suction manifold.
- one 20 bbl twin compartment displacement tank.
- recirculating cement mixer with two compartment 8 bbl mixing tub, densometer recorder and controls. One centrifugal pump and one centrifugal slurry pump.

If Halliburton services are not used, they are willing to rent the equipment on a month by month basis for the use of another service company.

Production Well Test Equipment

The following equipment is provided on a monthly rental basis to the operator by Technical Offshore Petroleum Services; all equipment is non H_2S service and sized for 10,000 BOPD at 10,000 psi and 30 MMSCF of gas.

- one triplex P.D. pump to supply burners 2500 BPD
- separator facilities, three phase, 1440 psi working pressure, 10,000 BOPD, 30 MMSCF gas
- two universal crude oil burners 12,000 BOPD each
- two 100 bbl gauge tanks, 100 psi working
- one atmospheric tank, 180 bbl
- steam line heater, 3,000,000 BTU
- piping, manifold, chemical injection pump
- lab facility

T.O.P.S. has indicated their willingness to provide equipment to Tenneco for this contract. Burner manifolds and burner booms are provided on the SSDC as part of the Contractor owned equipment. The 10,000 psi manifold is rented from Otis on a month by month basis.

II. DRILLING SAFETY SYSTEMS

A. BOP Equipment

(1) Low Pressure Stack

Annular Preventer - One 21-1/4 in (539 mm), 2000 psi (20.7 MPa), A.P.I, R.T.J. studded top and 21-1/4 in (539 mm), 3000 psi (13.8 MPa), A.P.I., R.T.J. Flanged bottom, stainless steel lined ring grooves, and packoff element.

Ram Preventers - One 20-3/4 in (539 mm), 3000 psi (20.7 MPa) A.P.I., R.T.J. Studded top double ram preventer, stainless steel lined ring grooves, side outlets, 1 set blind rams, 1 set pipe rams, automatic multiposition locks, handwheels, extensions, universal joints and wrenches. Four 3-1/16 in (77.8 mm) 5000 psi (34.5 MPa) flanged outlets.

Low Pressure Valves - One check valve, 3-1/8 in (79 mm), 3000 psi (20.7 MPa). Three gate valves, 3-1/8 in (79 mm), 3000 psi (20.7 MPa). One gate valve 3-1/8 in (79 mm), 3000 psi (20.7 MPa).

(2) High Pressure Stack

Annular Preventer - One 13-5/8 in (346 mm), 5,000 psi (34.5 MPa) A.P.I., R.T.J. studded top and 13-5/8 in (346 mm), 10,000 psi (69.0 MPa), Cameron clamped hub bottom, stainless steel lined ring grooves, and packoff element.

Ram Preventers - Three single ram preventers 13-5/8 in (346 mm), 10,000 psi (69.0 MPa). Cameron clamped hub top and bottom, stainless steel lined ring grooves, 2 side outlets each ram 3-1/16 in (77.8 mm), 10,000 psi (69 MPa) flanged, 1 set blind or shear rams, 2 sets pipe rams, automatic multiposition locks.

High Pressure Valves - Seven gate valves 3-1/16 in (78 mm), 10,000 psi (69.0 MPa) A.P.I., R.T.J. flanged, handwheel operated. One gate valve 3-1/16 in (78 mm), 10,000 psi (69.0 MPa) A.P.I., R.T.J. flanged, hydraulic operated. Two check valves 3-1/16 in (78 mm) 10,000 psi (69.0 MPa) A.P.I., R.T.J. flanged, swing type.

<u>Drilling Spool</u>

Drilling Spool - One 13-5/8 in (346 mm), 10,000 psi (69.0 MPa) Cameron clamped hub top and bottom c/w two 3-1/16 in (77.8 mm), 10,000 psi (69 MPa) flanged side outlets.

Adaptor Spool - One 13-5/8 in (346 mm) 10,000 psi (69.0 MPa) Cameron clamp hub top and 13-5/8 in (346 mm) 10,000 psi (69.0 MPa) API flanged bottom. c/w Starilex Steel lined ring grooves.

(3) Control System

(a) BOP Control Panel - (Hydril drill floor) 8 station electric, explosion proof c/w selected Diverter Control Functions. BOP actuation is via an electric/pneumatic/ hydraulic system.

(b) Accumulator - Hydril Valvcon 240 gal (908 litres) capacity twenty-two 15 US gal (57 litres) bottles with 8 station control manifold, 6 bottle Nitrogen emergency backup, electric drive triplex piston pump, 2 air pumps.

(c) BOP Control Panel (Hydril) - Toolpush office - 9 station electric - non explosion proof.

(d) Diverter Control Panel (Hydril) - sub mounted - 7 station manual control

(e) Choke Control Panel - Wagner Master Choke - hydraulic operated 10,000 psi (69.0 MPa).

(4) Choke and Kill Lines - fittings and valves downstream of the chokes are 10,000 psi (69.0 kPa).

(5) Fill up Line - One 3 in (76 mm) fill up line.

(6) Kill and Choke Manifold - Pacific Oilfield c/w Barton Valves, two each Willis Masterflo Chokes, 10,000 psi (69.0 MPa) one Wagner hydraulic adjustable choke, one HRC Gutline valve, valves, flanges fittings, spools, gauges, buffer chamber, target flanges and all necessary studs, nuts, and ring gaskets to assemble complete unit.

(7) Freezing Conditions - The BOP, related control equipment, and choke and kill manifold are located in heated areas. Freeze depressed control fluids are also used ensuring operation should the heating system malfunction.

(8) Testing - All BOP systems will be tested and maintained as per manufacturers specifications. Testing will be carried per OCS #2 and API RP53.

B. Safety Equipment

(1) Inside BOP (Fleet Valve) - 1 ea. Gray 62035 assembly with 5 in XH pin and box connections.

(2) Inside BOP Releasing Tool - 1 ea. Gray 62330 for Gray 62035 inside BOP with 5 in XH pin and box connectors.

(3) TTV trip tank volume system with chart recorder and audible/visual alarm.

(4) Combustible gas detectors.

(5) Automatic driller with penetration rate cut off switch

(6) Mud totalizing and flow system records cumulative volume of the six tanks, mud flow, cumulative pump stroke indicator, gain/loss gauge, chart recorder and alarm.

C. <u>Diverter Assembly</u>

(1) 1 - Regan KFDJ 500 psi (3.5 MPa) W.P. Support Housing for 49 1/2 in (1257 mm) rotary table c/w 2 - 12 in (305 mm) 500 psi (3.5 MPa) ANSI flanged outlets, 1 - 3 in 500 psi (3.5 MPa) ANSI flanged outlet, and locking dog assembly. Min. Bore = 47 in (1194 mm).

(2) 1 - Regan KFDJ 500 psi (3.5 MPa) W.P. diverter assembly for 49 1/2 in (1257 mm) Rotary table complete with flowline spool, two pressure energized packer seals. Solid Jay slot insert packer unit 28 in (711 mm) bore. Bottom connection is 39 in (991 mm) EC-6 pin with 36 1/2 in (927 mm) min. bore.

(3) Spacer spools and an overshot provide the flow path for the mud from the BOP stack to the diverter. The overshot contains a seal which seals on a BOP stack mandrel.

III. FIREFIGHTING EQUIPMENT

A. Fire and Gas Detection/Alarm System

(1) Fire Alarm System

The fire alarm system consists of a main fire alarm panel which is a Pyrotronics System 3. The panel was custom built with individual zones for separate areas.

Each zone has a separate alarm and trouble indication. The panel is programmed such that suppression systems such as sprinklers and Halon 1301 systems can be monitored.

The overall fire detection system is arranged as follows:

- In areas where the hazard is electrical, smoke detectors are used for detection.
- In all class B areas, rate compensated detectors are used for alarm.
- In all areas protected by Halon 1301 Systems, a manual discharge switch located by all exit doors.
- Bells are located throughout the complex; tone generator in P.A. system.
- In areas where there is no suppression, breakglass stations are provided by all exit doors.
- A zonal graphic is provided by the control panel.

(2) <u>Gas Alarm System</u>

- MSA Model 516 main panel in SCR room.
- MSA gas detectors.
- Alarms set at 20% and 60% LEL (Lower Explosive Level).
- Trouble indication at main panel.

B. <u>Fire Suppression System</u>

(1) Viking sprinkler system with melting plugs.

- Two independent systems, one for each floor level. The systems is a dry pipe type.
- Two Dry Pipe Valves
- One Water Gong
- One Air Compressor
- Two Shut-off Valves
- Eighteen Auxiliary Drain Valves
- Two Inspection Valves
- Two Maintenance Valves
- Two Pressure Operated Switches
- Two Monitoring Switches.

(2) Halon 1301 systems for water sensitive areas including caisson pumproom with manual pull station releasing Halon after preset time delay for personnel evacuation.

The Halon 1301 Systems provide protection in the following areas:

(1) - Camp Utilities, CU1, CU2, CU3

(2) - Generators, U2 and U3

- Electrical, Room U6

- Mud Areas, M7, M8 and M9

(3) - DA Trailers

(4) - Radio Room

(5) - Pumproom

(3) Hose reels and 30 lb (14 kg) Ansul extinguishers are located for easy access throughout the rig.

(4) Halon 1211 -13 lb (6 kg) extinguishers for small, enclosed spaces.

IV. POLLUTION PREVENTION EQUIPMENT

The disposal of wastes, drilling mud, and drilled solids will conform to the Environmental Protection Agency's procedures as laid down in the amended Federal Water Pollution Control Act. Training of the oil spill response team will be provided and oil spill response drill monitored.

A. Oilspill Cleanup Equipment

(1) Boom - 1000 ft x 36 in (305 m x 0.91 m) Bennett Navy in two - 800 ft (244 m) containers c/w towing gear & repair kits.

(2) Pump - One 3 in (76 mm) Komline Sanderson c/w 200 ft x 3 in (61 m x 76 mm) flexible oil resistant Arctic hose

(3) Storage Bladder - 1 x 1200 gal (4 m^3) including hose and recovery float and loading/discharge connectors.

V. LIFESAVING APPLIANCES

Are provided to COGLA requirements taking into consideration features of the SSDC. These include:

2	-	50 man totally enclosed lifeboats (WATERCRAFT)
2	-	58 man totally enclosed lifeboats (FISKAR)
1	-	rescue/pickup boat (WATERCRAFT)
5	-	25 man deck inflatable liferafts
180	-	lifejackets and exposure suits
4	-	scramble nets; and,
8	-	life rings

VI. BEST AVAILABLE AND SAFEST TECHNOLOGIES (BAST)

The contractor is confident that the safety systems aboard the SSDC have been chosen from the safest technologies available. These systems meet or exceed the requirements of the standards, codes and practices referenced in the OCS Orders.

Thus, by complying with this Order we are sure that our safety systems have incorporated the Best Available and Safest Technologies.

VII. TRAINING REQUIREMENTS

Canmar personnel will be trained to meet requirements for operating in the American Beaufort Sea. Training certification additional to normal Canmar requirements will be as follows for each position:

POSITION	CERTIFICATION
Drilling Superintendent	MMS Well Control Certificate MMS Approved H_2S Certificate Canmar Ice Alert (site specific)
Toolpusher	MMS Well Control Certificate MMS Approved H_2S Certificate Canmar Ice Alert (site specific)
Driller, Assistant Driller	MMS Well Control Certificate MMS Approved H_2S Certificate
Pumpman, Derrickman, MotorMan, Floorhand	MMS Approved BOP Certificate MMS Approved H_2S Certificate

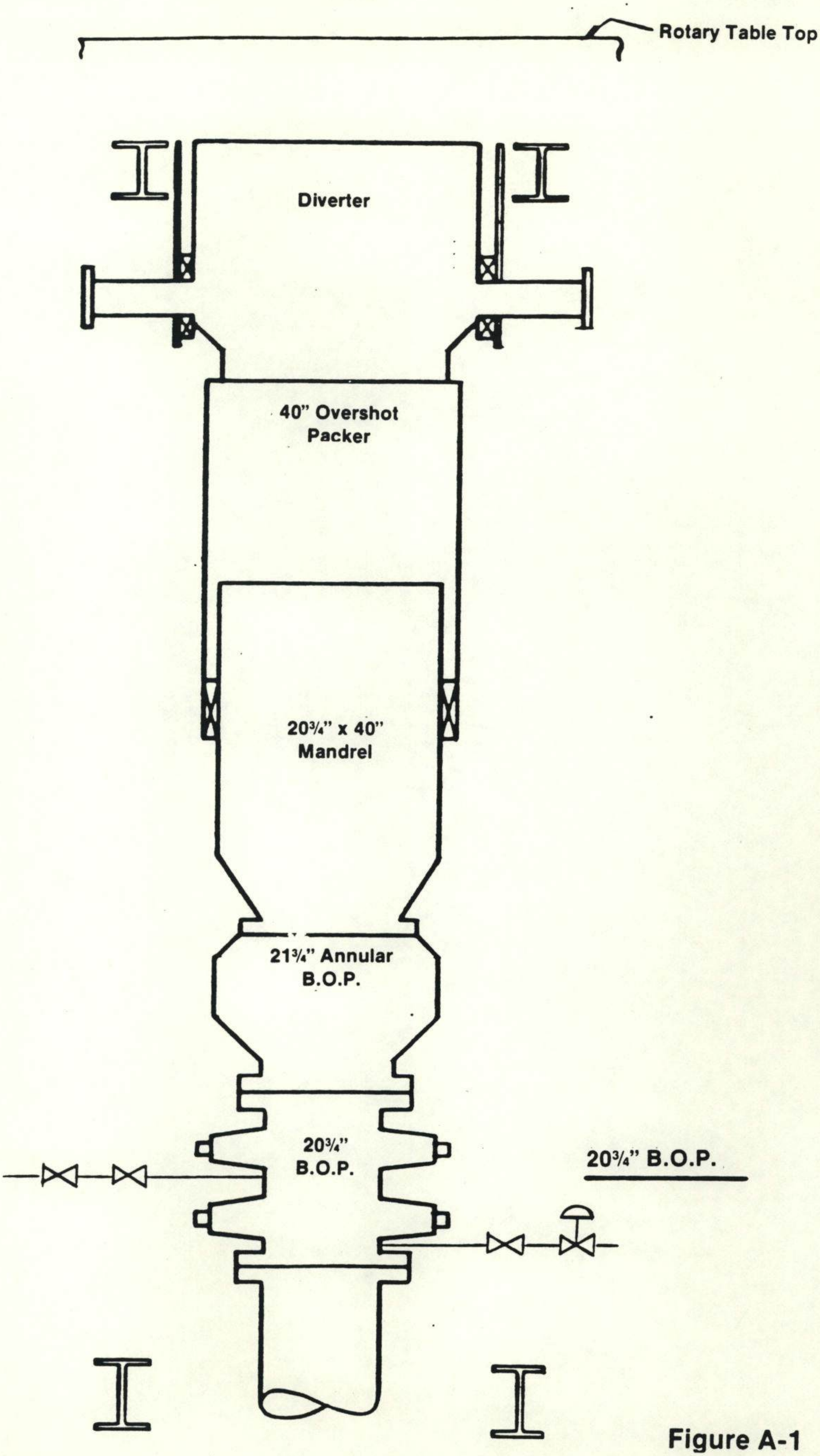
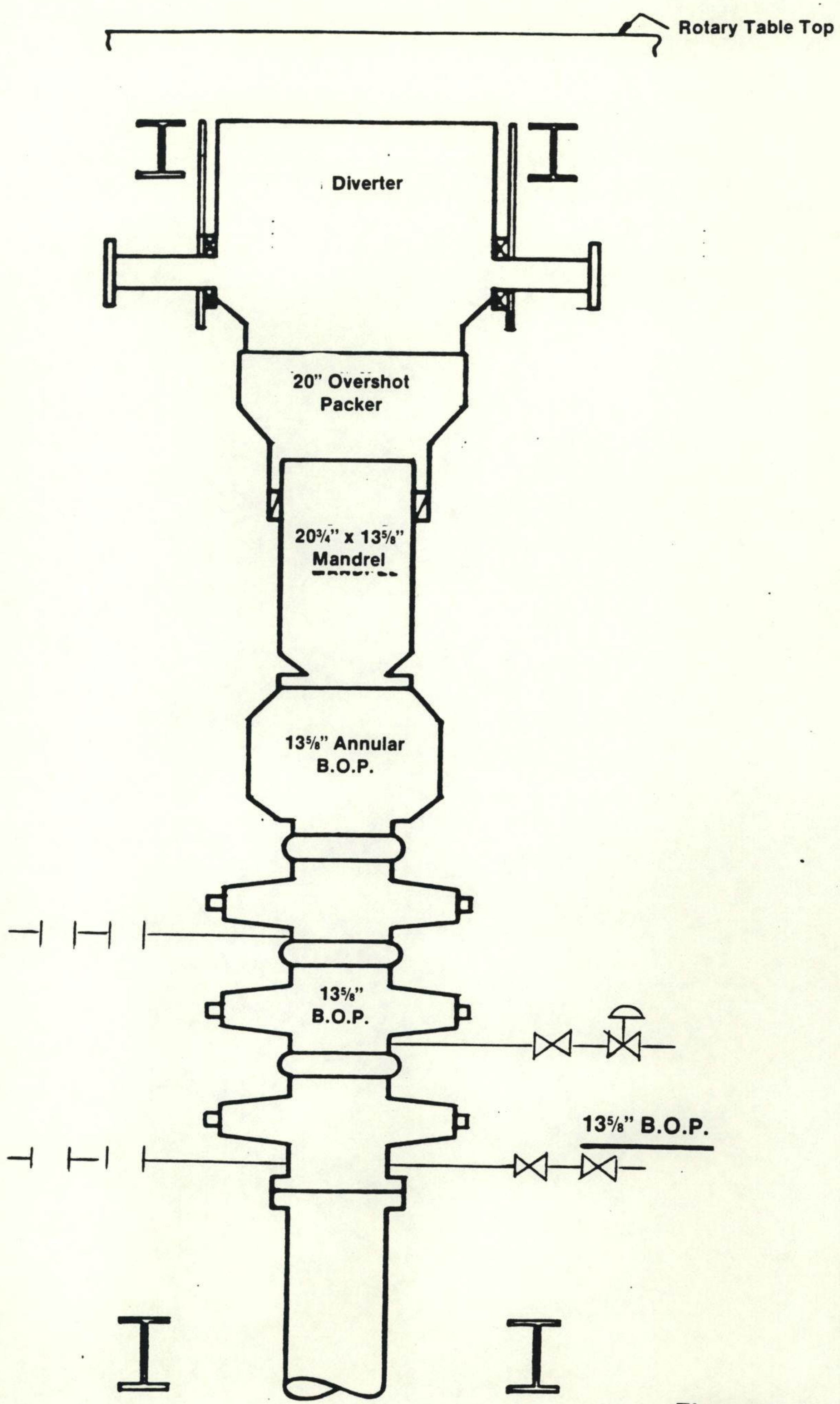

Rotary Table Top
Diverter
40" Overshot
Packer
20¾" x 40"
Mandrel
21¾" Annular
B.O.P.
20¾"
B.O.P.
20¾" B.O.P.

Figure A-1



Rotary Table Top
Diverter
20" Overshot Packer
20¾" x 13⅝" Mandrel
13⅝" Annular B.O.P.
13⅝" B.O.P.
13⅝" B.O.P.

Figure A-2

Diverter And Gumbo Box Valving Arrangement

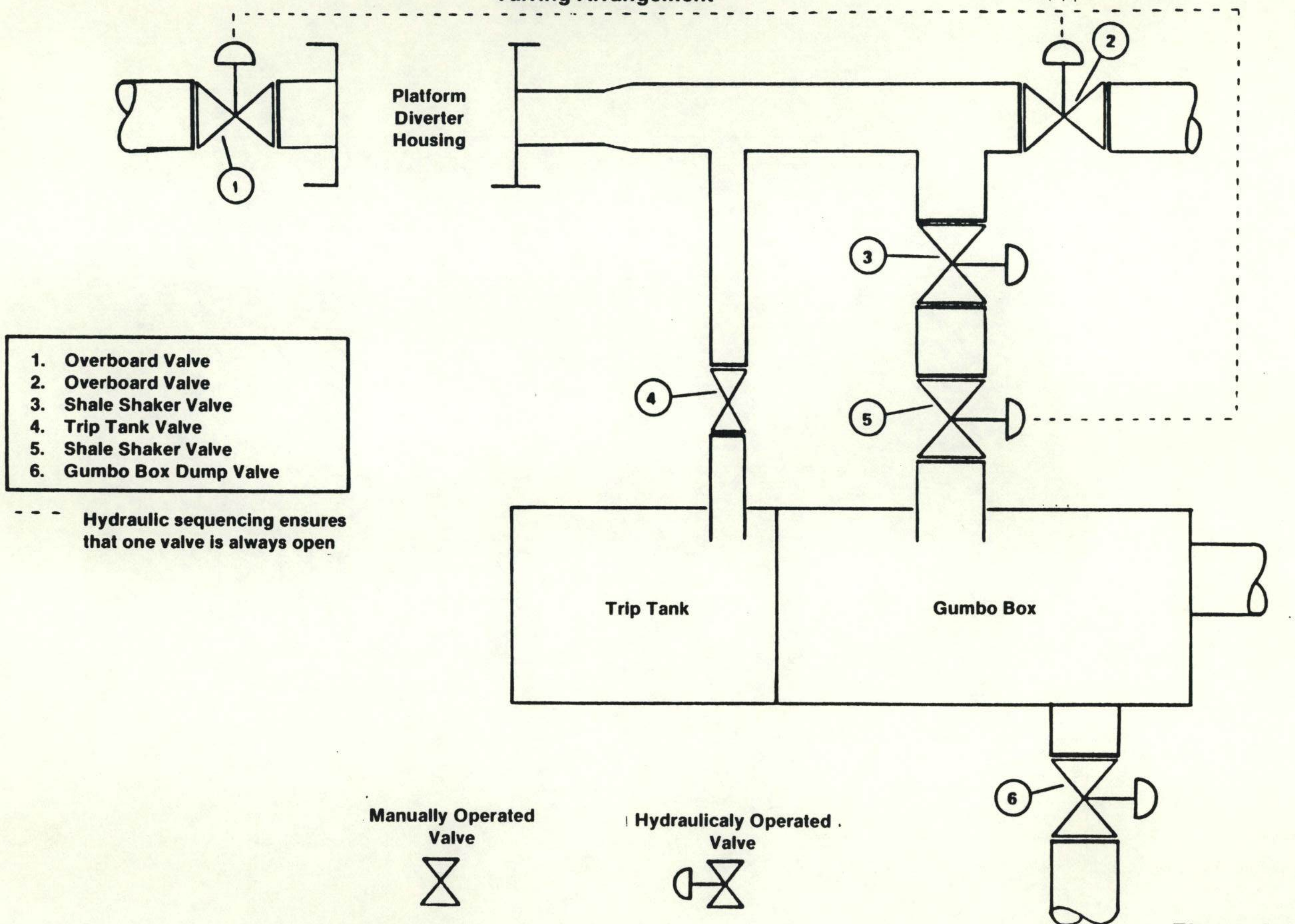
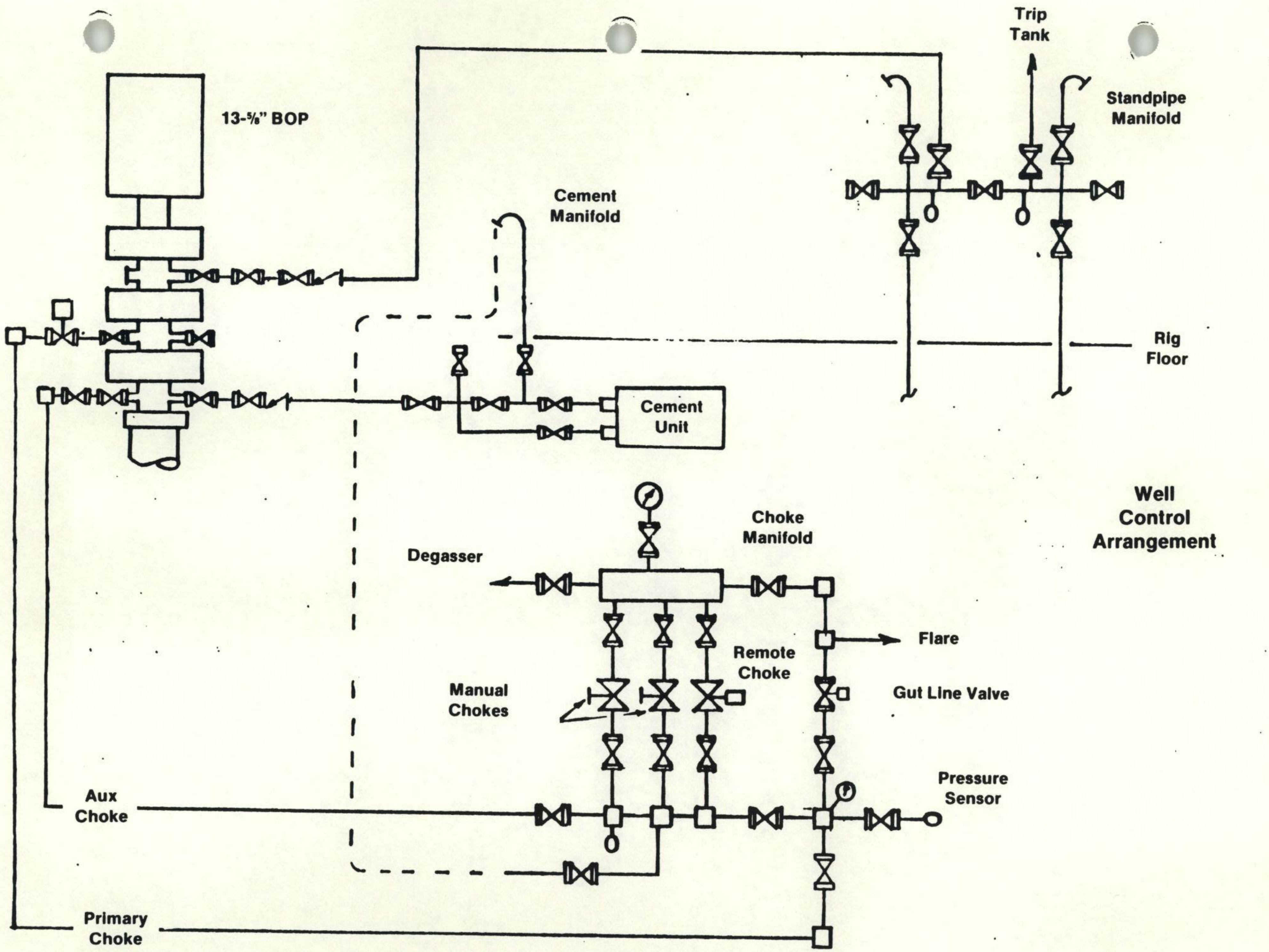
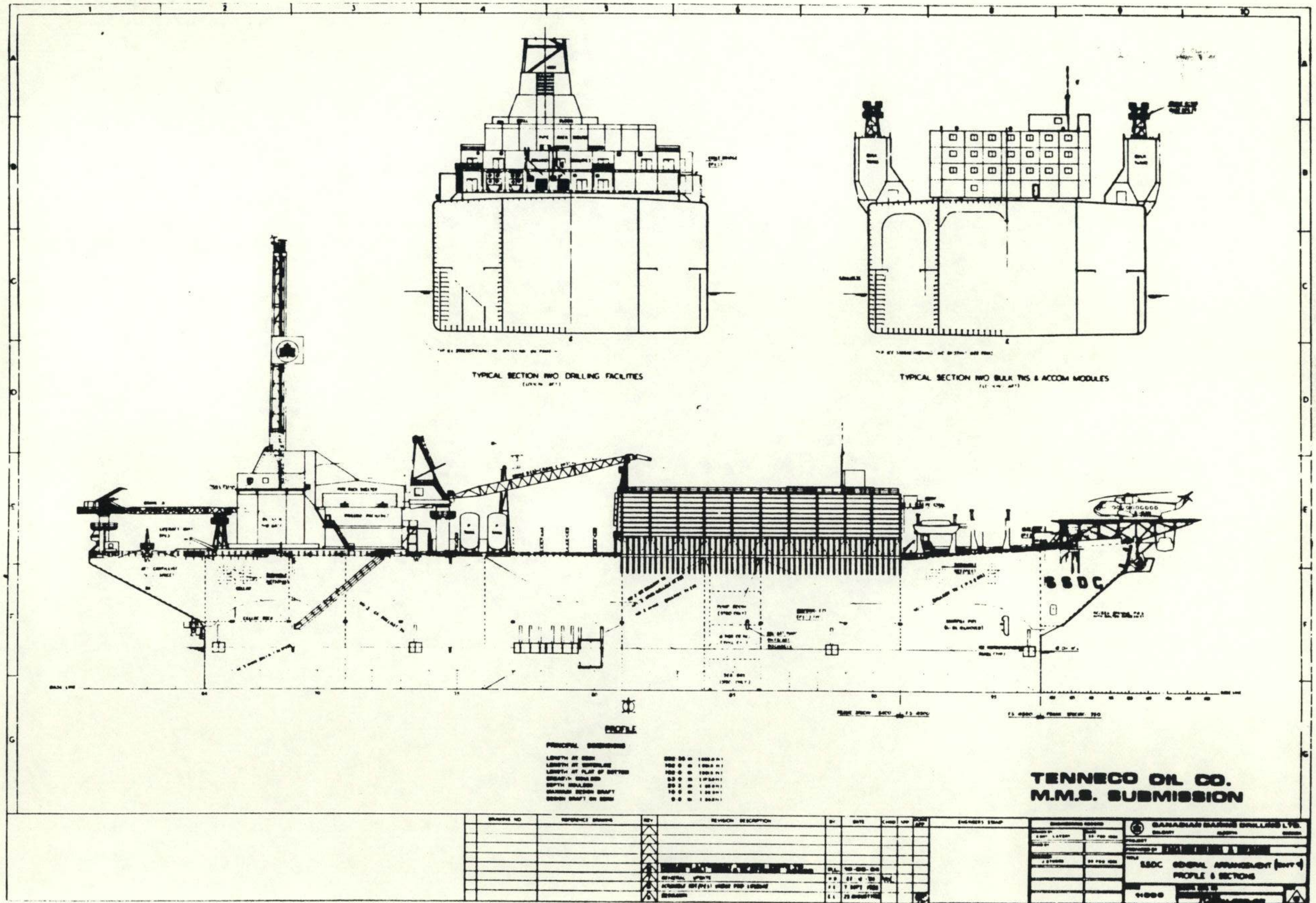


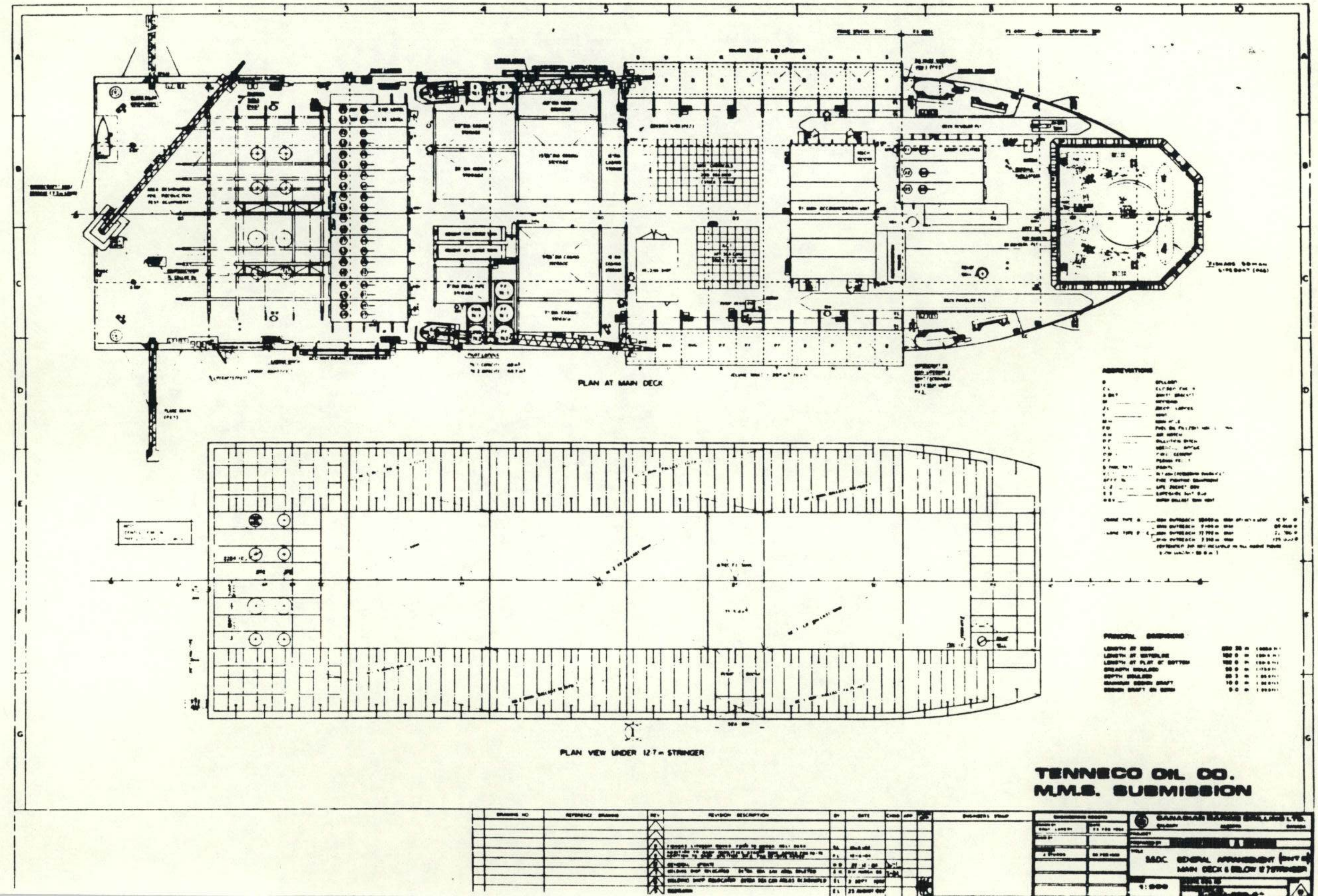
Figure A-3



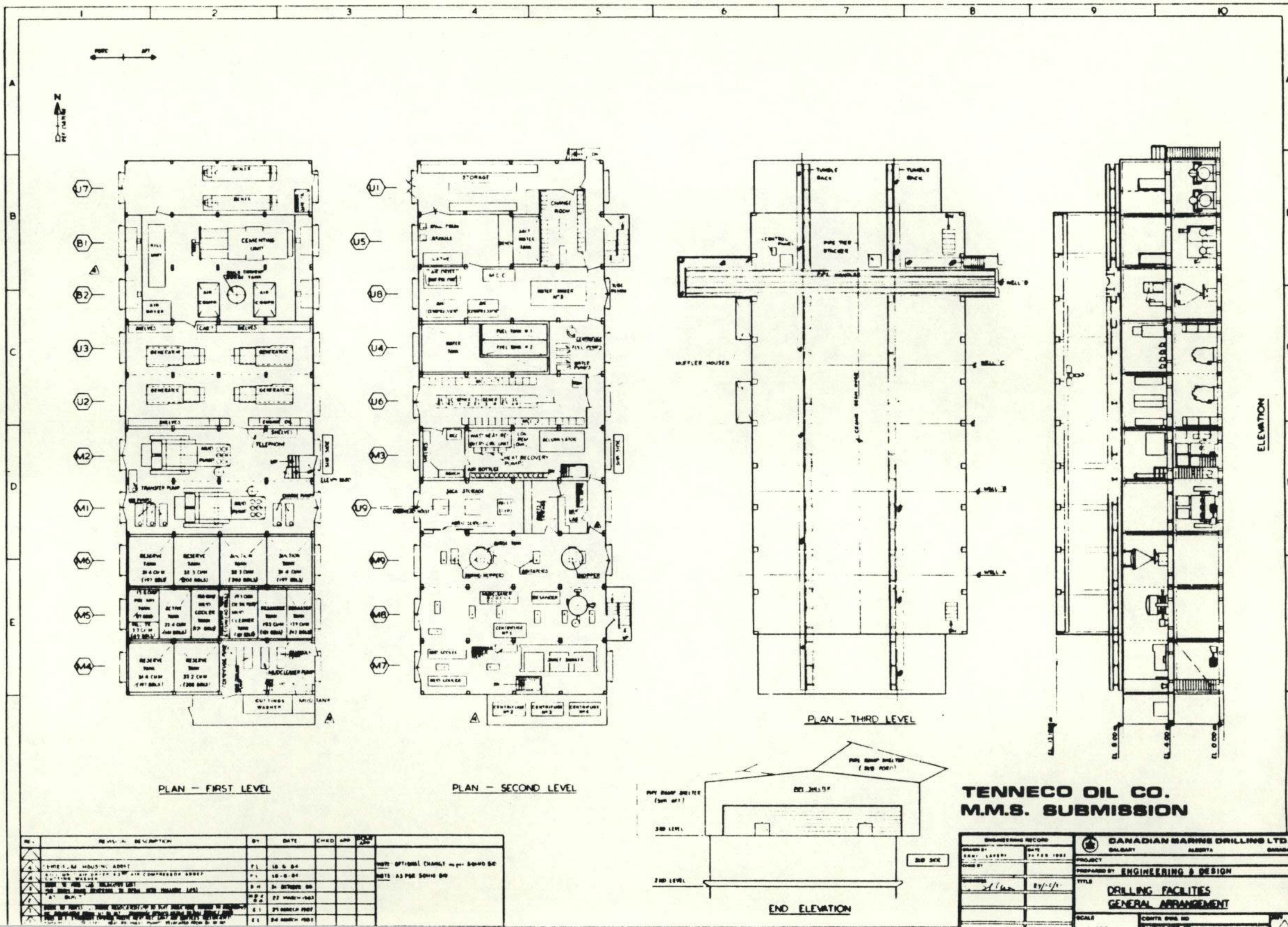
13-5/8" BOP
Cement Manifold
Trip Tank
Standpipe Manifold
Rig Floor
Cement Unit
Well Control Arrangement
Choke Manifold
Degasser
Flare
Remote Choke
Manual Chokes
Gut Line Valve
Pressure Sensor
Aux Choke
Primary Choke

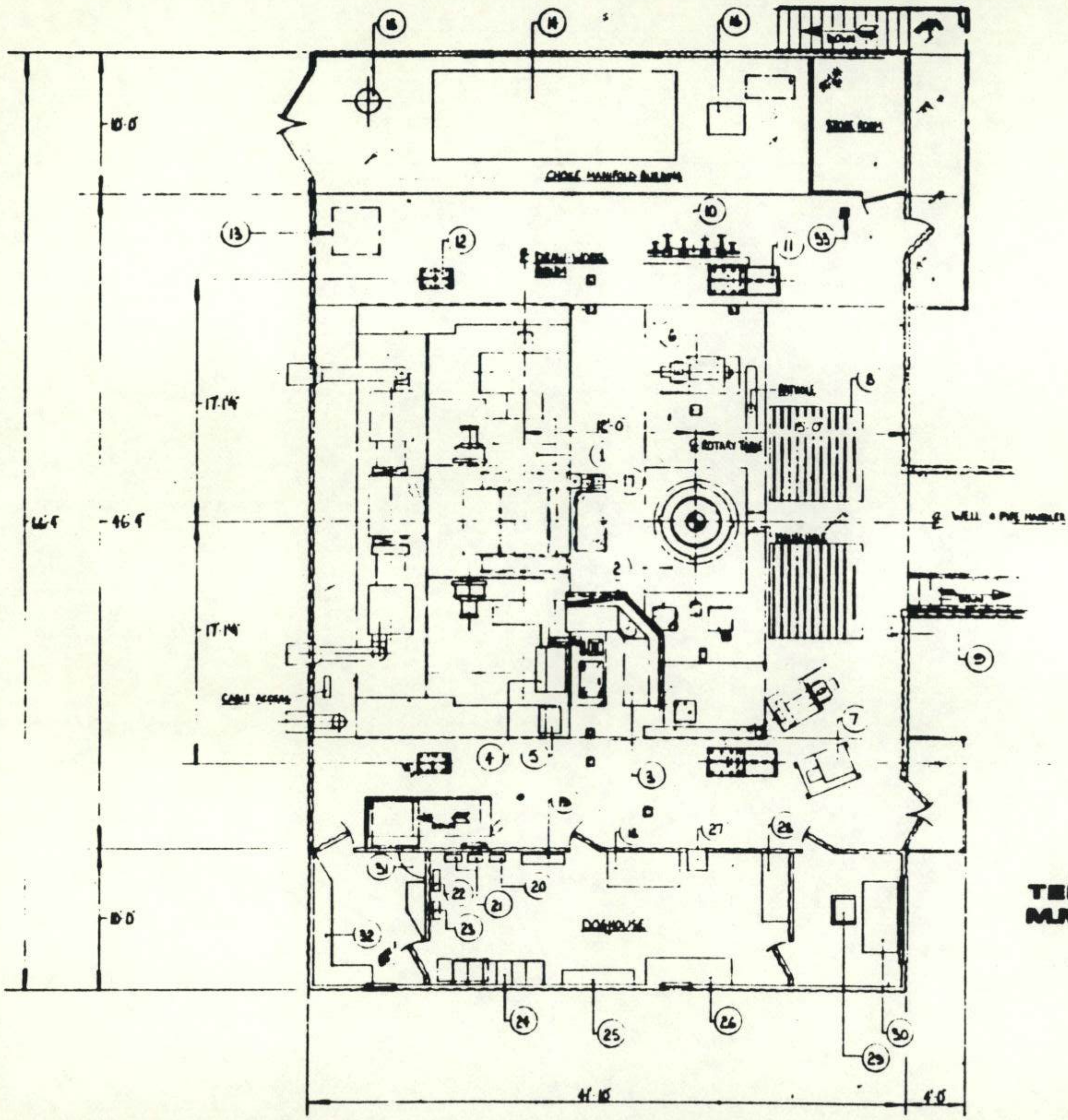
Figure A-4


TYPICAL SECTION IWO DRILLING FACILITIES
TYPICAL SECTION IWO BULK TKS & ACCOM MODULES
SSDC
PROFILE
PRINCIPAL DIMENSIONS
TENNECO OIL CO.
M.M.S. SUBMISSION
CANADIAN MARINE DRILLING LTD.
SSDC GENERAL ARRANGEMENT
PROFILE & SECTIONS



TENNECO OIL CO.
M.M.S. SUBMISSION


PLAN - FIRST LEVEL
PLAN - SECOND LEVEL
PLAN - THIRD LEVEL
ELEVATION
END ELEVATION
MUFFLER HOUSES
TUMBLE BACK
CEMENTING UNIT
STORAGE
CHANGE ROOM
M.C.C.
TELEPHONE
TRANSFER PUMP
HEAT RECOVERY PLANT
CUTTINGS WASHER
TENNECO OIL CO.
M.M.S. SUBMISSION
CANADIAN MARINE DRILLING LTD.
CALGARY
ALBERTA
PREPARED BY ENGINEERING & DESIGN
DRILLING FACILITIES
GENERAL ARRANGEMENT
REVISION DESCRIPTION
BY
DATE



Item	Qty	Description
1	1	[illegible]
2	1	[illegible]
3	1	DRILLERS CONSOLE
4	1	DRAWWORKS CONTROL PANEL
5	1	GEOLOGRAPH PANEL
6	2	INGERSOL TUGGER WINCH
7	1	ABCOR HYDRAULIC SUPPLY UNIT
8	2	SET BACK AREA
9	1	PIPE HANDLER CONTROL UNIT
10	1	STAND PIPE MANIFOLD
11	2	FRONT SHOE
12	2	REAR SHOE
13	4	OVERHEAD HEATER
14	1	CHOKE MANIFOLD
15	1	POOR BOY DEGASSER
16	1	CHOKE MANIFOLD MONITORING PANEL – [illegible]
17	1	ABCOR EASY TORQUE
18	1	KNOWLEDGE BOX
19	1	B.O.P. PANEL
20	1	ESSENTIAL SERVICES PANEL
21	2	DOGHOUSE PANEL
22	1	TRIP TANK ANALYSER
23	1	GEOLOGRAPH RECORDER
24	5	LOCKER
25	1	TOOL RACK
26	1	CUPBOARD
27	1	FIRE EXTINGUISHER BOX
28	1	CUPBOARD
29	1	CHAIR
30	1	DESK
31	1	SHELF
32	2	BENCH
33	1	KELLY PULL BACK POST

LEGEND

– OVERHEAD HEATER

– CHECKER PLATE FLOORING

– FLIP-UP COVER PLATE

TENNECO OIL CO.
M.M.S. SUBMISSION

AS BUILT

CANADIAN MARINE DRILLING LTD. CALGARY ALBERTA CANADA	
PREPARED BY	ENGINEERING & DESIGN
TITLE	DRILLERS FLOOR EQUIPMENT LAYOUT
DATE	84/04/21
SCALE	1 FOOT
CONTR. DWG. NO.	D-DOU-880-04
REV	0

APPENDIX B

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

CRITICAL OPERATIONS AND CURTAILMENT PLAN

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

Submitted: January 29, 1985

Appendix B is divided into two parts. Both are included in this submission for MMS review. Part Two contains a confidential and proprietary attachment which is for the sole use of the MMS. The attachment is entitled "<u>CANMAR ICE ALERT PROCEDURES</u>."

<u>PART ONE</u> Critical Operations and Curtailment

<u>PART TWO</u> Canmar Alerts Manual

CRITICAL OPERATIONS AND CURTAILMENT PLAN

PART ONE

I. CRITICAL OPERATIONS

A. Drilling in Close Proximity to Another Well

The exploratory wells contemplated in the Exploration Plan will be the first in the respective lease blocks. Present plans do not include more than one well per location. However, all wells covered in this Exploration Plan, and any additional wells, will have directional surveys taken in accordance with OCS Order 2.4 to avoid wellbore intersection.

B. Drill Stem Testing

1. Drill stem testing shall not be conducted:

   (a) in open hole.

   (b) using drill stem as a test string unless drill stem can be tested to a pressure in excess of calculated reservoir pressure.

2. The company supervisor in charge of a test should be prepared to stop the test if:

   (a) surface pressure exceeds the design or tested rating of surface equipment.

   (b) the surface facilities, burner, or storage become overloaded by the producing rate. This applies to both liquid and gas facilities.

   (c) the annulus-pressure behavior is erratic (some variation in pressure is normal from the effect of temperature and tubing pressure).

   (d) at any time the supervisor is concerned about safety because of weather, vessel stability, ice movement, doubtful integrity of any equipment, abnormal presence of hydrocarbon vapors or hydrogen sulfide, or any reason he deems unsafe for the personnel onboard.

3. During drill stem testing, the following will be prohibited: smoking, welding, open flames, and exposed lights in the area.

4. Before commencing any testing operations, a meeting of key rig personnel will be held to review the procedures and equipment to be utilized during the test. All vessels and flowlines will be tested to the maximum anticipated surface pressure, or 5000 psi, whichever is greater. All personnel will be alerted to the possible hazards of this operation.

C. <u>Running and Cementing Casing</u>

1. Casing should not be run or cemented unless hole conditions are stable, i.e.:

   (a) mud is not being cut.

   (b) well is not flowing.

   (c) circulation is not being lost.

   (d) bore hole is free of obstruction

2. If fluid is lost or well begins to flow while running casing, the process should be stopped and remedial measures should be taken, that is, establish circulation with mud properties required to correct the condition.

3. The company supervisor should not run casing or cement under any conditions he feels are unsafe due to vessel stability, weather, equipment, or personnel availability.

D. <u>Cutting and Recovering Casing</u>

1. During the abandonment of the well, each string should be cut and recovered in such a manner that additional cement plugs are set if open hole is exposed by the removal of the cut casing string.

2. The casing cutting operation shall not be commenced until the company supervisor is confident that the well is properly plugged in accordance with all existing regulations.

E. <u>Wireline Operations</u>

1. Logging shall not be attempted until:

   (a) the hole is stable, i.e., no mud flow, no lost circulation, mud is not being gas cut and the hole is clean as indicated by the shale shaker returns.

2. Conditions that are considered unfavorable for successful logging and require consideration for correction or curtailment are as follows:

   (a) API water loss is not appropriate for current mud and hole conditions.
   (b) high drilling solids content.
   (c) tight holes in first log run (indicating thick mud cake and possible hole sloughing).
   (d) directional wells or doglegs that increase the horizontal force component of the logging cable.
   (e) excessive time since circulating the well.

3. Do Not Allow:

   (a) excessive spudding of the logging tool to get down.

   (b) repeat runs in a hole that give evidence of being in bad condition. Instead, make a conditioning trip and then complete the logging program.

F. <u>Well Completion Operations</u>

This Exploration Plan contemplates expendable exploratory wells and does not include plans for well completions. In the event a requirement for well completion does occur, a plan will be submitted to the RS-FO for his approval.

G. <u>Moving the Drilling Vessel Off Location in an Emergency</u>

It is not anticipated that it will be required to move the SSDC off location during the drilling operation. The SSDC has previously demonstrated the ability to operate year round in the Beaufort Sea and remain on location. Additional site specific design considerations, i.e., ice pad and berm construction, increase the safety of the vessel on this location. These design factors, in addition to the extensive ice, oceanographic, and meteorological monitoring, will allow for detailed planning to secure the well in the event an emergency condition becomes apparent.

In the event this becomes necessary, the following procedure would be used:

1. Pull the pipe to the lowermost casing shoe and hang off utilizing a storm packer with back pressure valve at 100 ft below mud line. Retrieve setting tool and drill pipe and secure the well.

2. Secure the drilling unit for abandonment as per contractors directives and evacuate all personnel from the rig.

H. Fuel Transfer

1. All fuel oil transfer equipment will be pressure tested prior to the commencement of pumping.

2. The entire fuel transferring process will be closely supervised by personnel intimately familiar with and responsible for that operation.

II. CURTAILMENT

A stability monitoring program has been developed with the primary objective to ensure the safety of the drilling system and environment. Defined alert criteria and procedures clearly establish the instruments and techniques that are used to provide a continuous, real-time assessment of anticipated environmental loads and response of the structure. Successful use of this system requires the complementary interaction of SSDC staff, local and regional monitoring, and on-site instrumentation systems. These criteria and procedures will be contained in alert procedures, which will be completed in detail when site specific geotechnical details are obtained.

The monitoring program is also developed to collect the data required to comply with OCS Order 2 and the "Guidelines for Collection of Meteorological Oceanographic and Performance Data." Such data will be collated and reported to MMS as required.

The stability monitoring program will address each of the following key areas:

A. Geotechnical
B. Regional Ice Surveillance and Forecasting
C. Structural
D. Oceanographic
E. Environmental

A. The geotechnical monitoring program will concentrate on the measurement of deformations within the berm and foundation. The primary components of the program will include:

   - Manual inclinometers
   - In-place inclinometers
   - Settlement casing
   - Piezometers
   - Base contact pressure cells
   - Berm and Seabed thermistors

B. Regional ice surveillance and forecasting will be employed to ascertain the nature and proximity of hazardous ice features.

These techniques have been well-proven during both winter and summer drilling operations and include:

- Medium-range and short-range radar
- Airborne radar imagery
- Argos buoy tracking
- Weather and ice-movement forecasting

C. Structural monitoring will be carried out to measure stresses within the SSDC induced by differential settlements, ice loads, and temperature variations. This will be accomplished using:

- Accelerometers
- Deck level surveys
- Routine structural inspections
- Ballast level measurements

D. Oceanographic monitoring will be employed to assess the sea state during open water conditions and to measure the satisfactory performances of the berm during adverse sea states. The primary components of the oceanographic monitoring will include:

- Sea state measurements
- Wave forecasting
- Base contact pressure cells
- Sounding surveys

E. An environmental monitoring program will be in place to ensure the safety of the environment and to provide meteorological data necessary for operation of the drill system. Environmental monitoring methods will include:

- Meteorological data gathering
- Wildlife observations and records
- Weather forecasting
- Observations of local ice conditions including thickness, nature, and rubble field accumulation

The components of the monitoring program are integral to an alert procedures manual, which is contained in this Critical Operations and Curtailment Plan, as required by OCS Order 2, Section 9. Alert levels are assigned to:

1. The proximity of hazardous ice features
2. Lateral deformations and settlements
3. Stresses within the structure

The specific ice feature to trigger alert response is a function of structure response which will be determined when a detailed geotechnical investigation is carried out at the site.

In summary, the monitoring system for the SSDC has been designed around a four-phase monitoring philosophy: prediction, recognition, response, and analysis. The response phase requires strict adherence to detailed directives which guarantee the safety of man and environment. The other three phases relate primarily to the regular operations of the monitoring system.

The site specific Alert Procedures Manual will contain documentation of the steps necessary to ensure safe curtailment and abandonment. It will specifically address the following areas:

- General Procedures for Drilling Safety
- Known or Anticipated Environmental Loads
- General Structural Design
- Instrumentation and Monitoring Equipment
- Stability Alert Criteria
- Detailed Emergency Procedures

Similar manuals have been successfully implemented on several drilling structures operating in similar ice environments in the Canadian Beaufort Sea.

APPENDIX C

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

OIL SPILL CONTINGENCY PLAN
AND SPILL PREVENTION CONTROL
COUNTER MEASURE PLAN

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

Submitted: January 29, 1985

OIL SPILL PLAN

Due to the size of the Oil Spill Plan, it is submitted under separate cover.

RECEIVED
Anchorage, Alaska

FEB 0 1 1985

REGIONAL SUPERVISOR
FIELD OPERATION
MINERALS MANAGEMENT SERVICE

APPENDIX D

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

~~PROPRIETARY GEOLOGIC DATA~~

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

Submitted: January 29, 1985

Prospect Summary

The first eleven proposed well locations (Table 1D) will test an extremely large northwest-southeast trending anticlinal feature that is down-faulted into the crest of the Barrow Arch and crossed by a series of northwest-southeast trending normal faults (Figure 1D). The northern portion of the structure is truncated by the Neocomian Unconformity, placing the Pebble Shale in direct contact with the Ivishak Sandstone. In all eleven cases the Ivishak Sandstone is the primary objective. Structural-stratigraphic relationships are displayed on two diagrammatic cross-sections (Figures 2D and 3D). Two additional wells (Table 1D, Nos. 12 and 13) will test a large, but basically unfaulted, anticline to the west of the first group of wells (Figure 4D). This structure is also truncated by the Neocomian Unconformity which removes most of the Ivishak Sandstone. However, the Lisburne Formation is preserved and consequently becomes the primary objective. Structural and stratigraphic relationships are displayed on two additional diagrammatic cross-sections (Figures 5D and 6D). A listing of proposed well total depths and water depths can be found on Table 2D.

Well Prognosis

The stratigraphic tops expected at proposed locality No. 1 are as follows:

Geologic Horizon	Depth (MSL)
Colville	2760 ft
Torok	7080 ft
Ivishak	7350 ft
Lisburne	8250 ft
Basement	9000 ft
TD	9300 ft

Predictions of formation lithologies are based both on projections from existing on-shore wells as well as the results of regional mapping. The following is a well prognosis for proposed locality No. 1.

Post Neocomian:

0-2760 ft; conglomerate, sandstone, shale and coal of the mostly continental Saganivirktok Formation.

2760-7080 ft; sandstones, shales and minor coals of the transitional-full marine Colville Group.

7080-7350 ft; shales and minor sands of the neritic to abyssal sediments of the Torok Formation and underlying Pebble Shale. Pebble Shale lithologies will include highly organic, radioactive shales with floating, frosted quartz grains.

Pre Neocomian:

Due to truncation by the Neocomian Unconformity, sediments of the Kuparuk River, Kingak, Sag River and Shublik Formations are all absent.

7350-8250 ft; conglomerates, sandstones and minor shales of the fluvio-deltaic Ivishak Member; shales and minor sands of the prodelta Kavik Member and sands and minor shales of the full marine Echooka Member. Of the total 800 ft Sadlerochit Section, approximately 500 ft will be sand and conglomerate bearing Ivishak.

8250-8800 ft; The Lisburne Group consists of fine grained carbonate mudstone and wackestone of the inner bank deposits as well as dolomites and minor sandstones of the marginal marine environment.

8800-9000 ft; Sandstones, shales and coals of the fluvio-deltaic to prodeltaic shales of the Endicott Group.

9000 ft and below; "Argillite" of the basement complex.

Table 1D

LIST OF POSSIBLE DRILL SITES

Location	Block No.	OCS Serial No.	Lease Line Calls	UTM 6 Coordinates* X	UTM 6 Coordinates* Y	Latitude	Longitude
1	285	Y-0339	2250'FWL; 2750'FNL	1,594,974'	25,738,563'	70°42'42.12"N	150°22'32.59"W
2	241	Y-0813	1000'FWL; 8000'FNL	1,594,261'	25,750,823'	70°44'42.68"N	150°22'56.09"W
3	241	Y-0813	5000'FEL; 2500'FNL	1,604,273'	25,754,270'	70°45'17.17"N	150°17'58.13"W
4	242	Y-0814	6200'FEL; 3600'FNL	1,618,570'	25,752,434'	70°44'59.68"N	150°10'51.53"W
5	287	Y-0816	4800'FWL; 3600'FNL	1,628,919'	25,736,040'	70°42'18.61"N	150°05'42.18"W
6	286	Y-0815	3100'FWL; 2300'FNL	1,611,603'	25,738,230'	70°42'39.67"N	150°14'17.63"W
7	284	Y-0338	6000'FEL; 5500'FSL	1,586,299'	25,731,537'	70°41'32.42"N	150°26'49.24"W
8	286	Y-0815	750'FWL; 1000'FSL	1,608,533'	25,725,970'	70°40'38.93"N	150°15'47.41"W
9	330	Y-0349	2900'FWL; 6000'FSL	1,610,293'	25,715,165'	70°38'52.73"N	150°14'53.81"W
10	330	Y-0349	6000'FEL; 2250'FSL	1,616,973'	25,711,018'	70°38'12.16"N	150°11'35.23"W
11	238	Y-0812	2300'FEL; 4900'FNL	1,559,605'	25,753,845'	70°45' 9.47"N	150°40'10.20"W
12	189	Y-0315	3700'FWL; 2300'FSL	1,818,957'	25,752,307'	70°44'37.36"N	151°31'17.40"W
13	232	Y-0811	5300'FWL; 4300'FSL	1,832,938'	25,765,948'	70°46'48.00"N	151°24'10.08"W

NOTE*: X and Y coordinates for locations 1 - 11 calculated using minus 150 Central Meridian.
X and Y coordinates for locations 12 - 13 calculated using minus 153 Central Meridian.

Table 2D

List of water depths and well TVD's.

WELL LOCATION	BLOCK NO.	WATER DEPTH (ft)	WELL TD (ft)
1	285	61 ft	9,300 ft
2	241	60 ft	9,900 ft
3	241	58 ft	9,700 ft
4	242	55 ft	10,350 ft
5	287	57 ft	10,000 ft
6	286	57 ft	10,350 ft
7	284	55 ft	9,800 ft
8	286	46 ft	9,500 ft
9	330	47 ft	9,800 ft
10	330	40 ft	9,800 ft
11	238	58 ft	9,825 ft
12	189	50 ft	9,000 ft
13	232	41 ft	9,600 ft

STRATIGRAPHIC TIME SECTION
SEISMIC LINE 81-17
HARRISON BAY, ALASKA

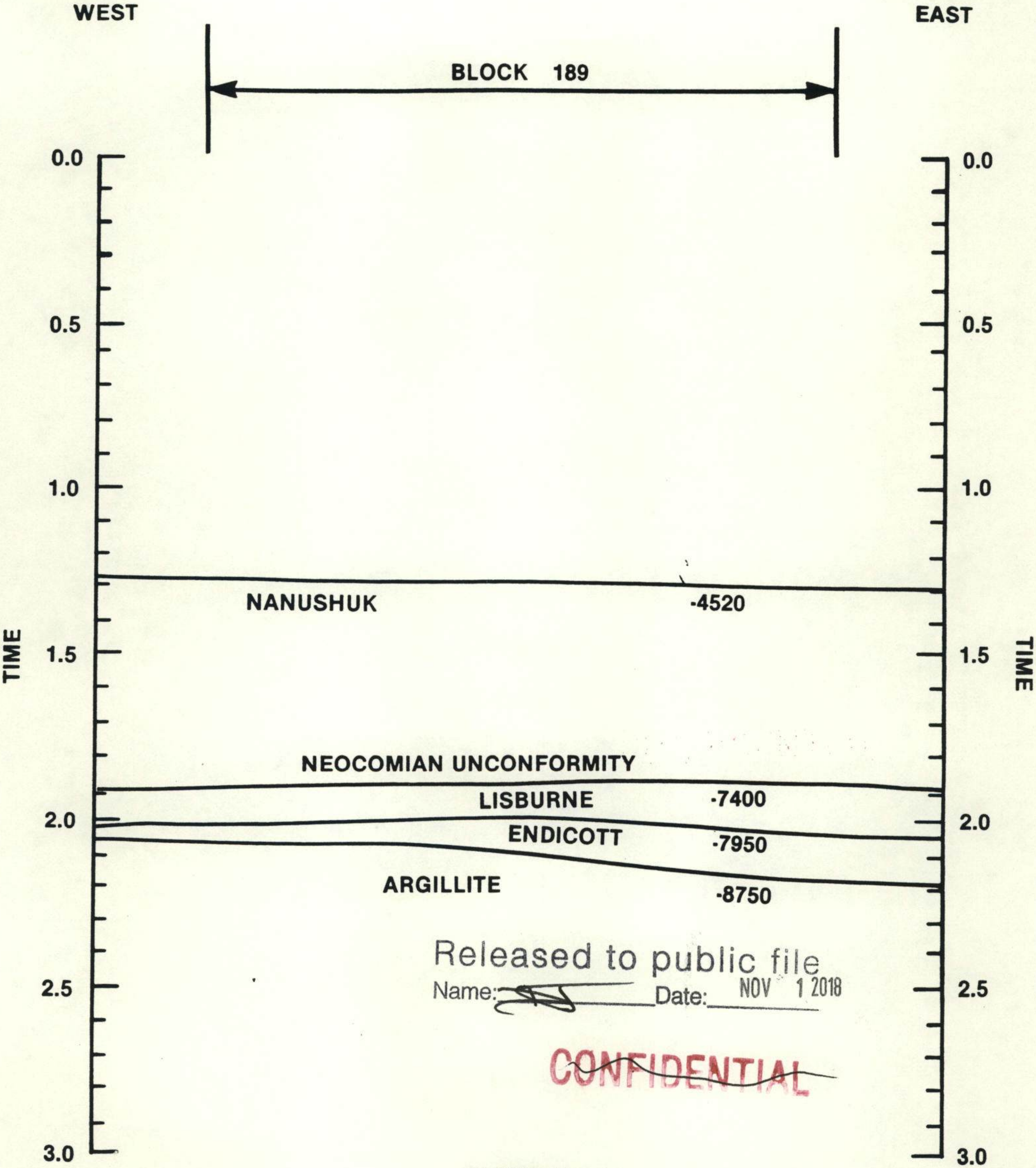


FIGURE
5D

STRATIGRAPHIC TIME SECTION
SEISMIC LINE 81-17
HARRISON BAY, ALASKA

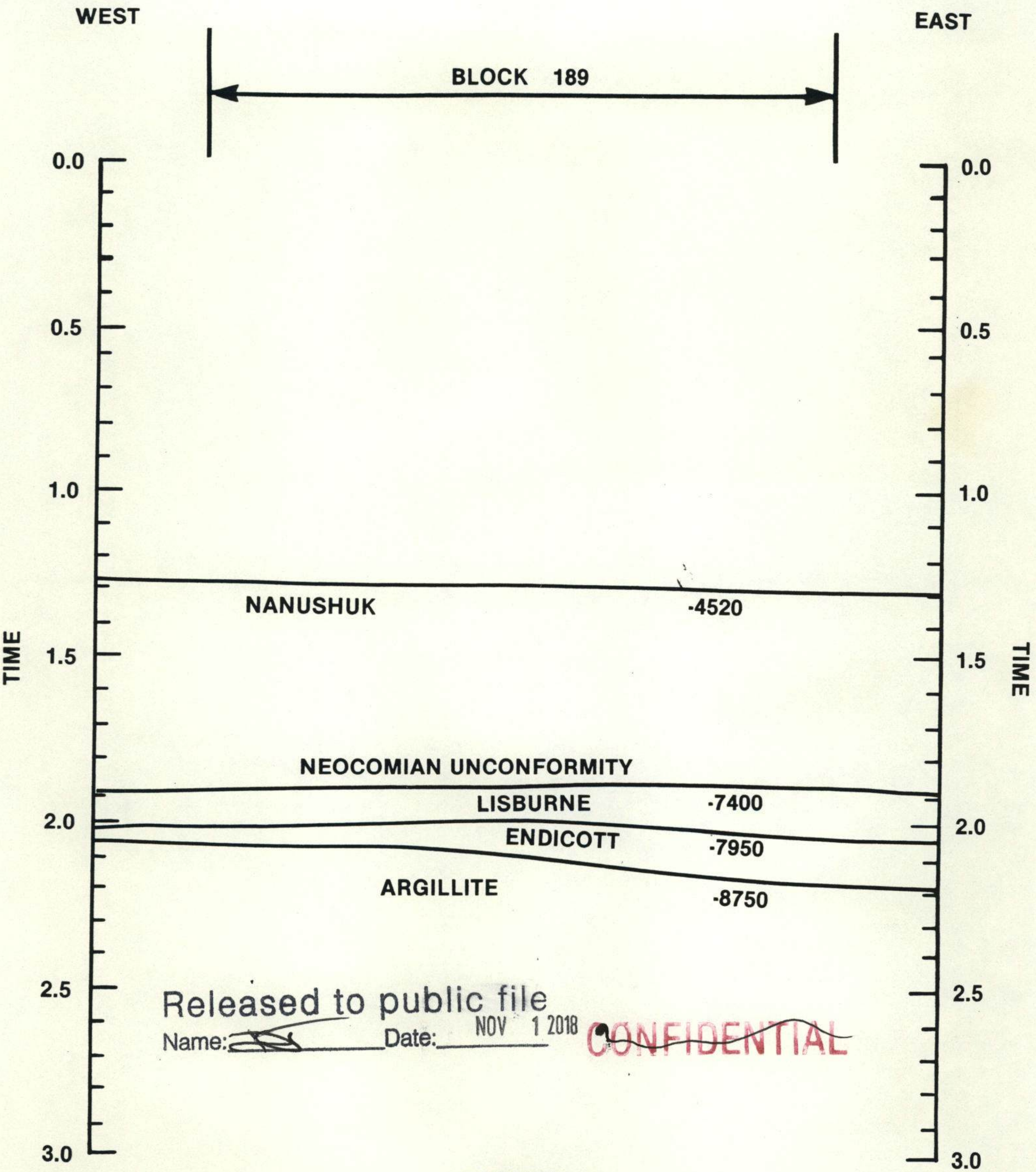
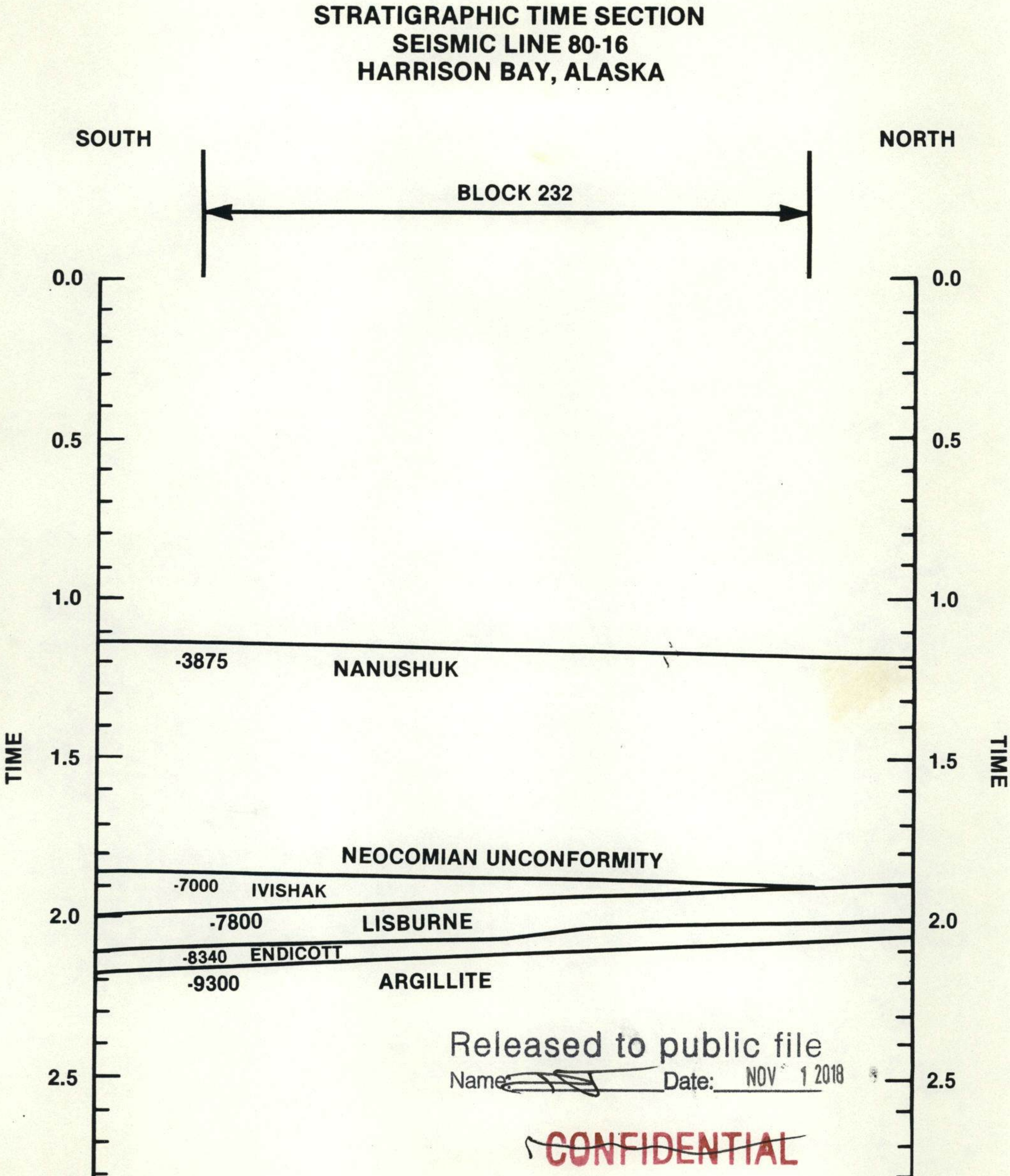


FIGURE
5D



Released to public file
Name: Date: NOV 1 2018

~~CONFIDENTIAL~~

FIGURE
6D

STRATIGRAPHIC TIME SECTION
SEISMIC LINE 80-16
HARRISON BAY, ALASKA

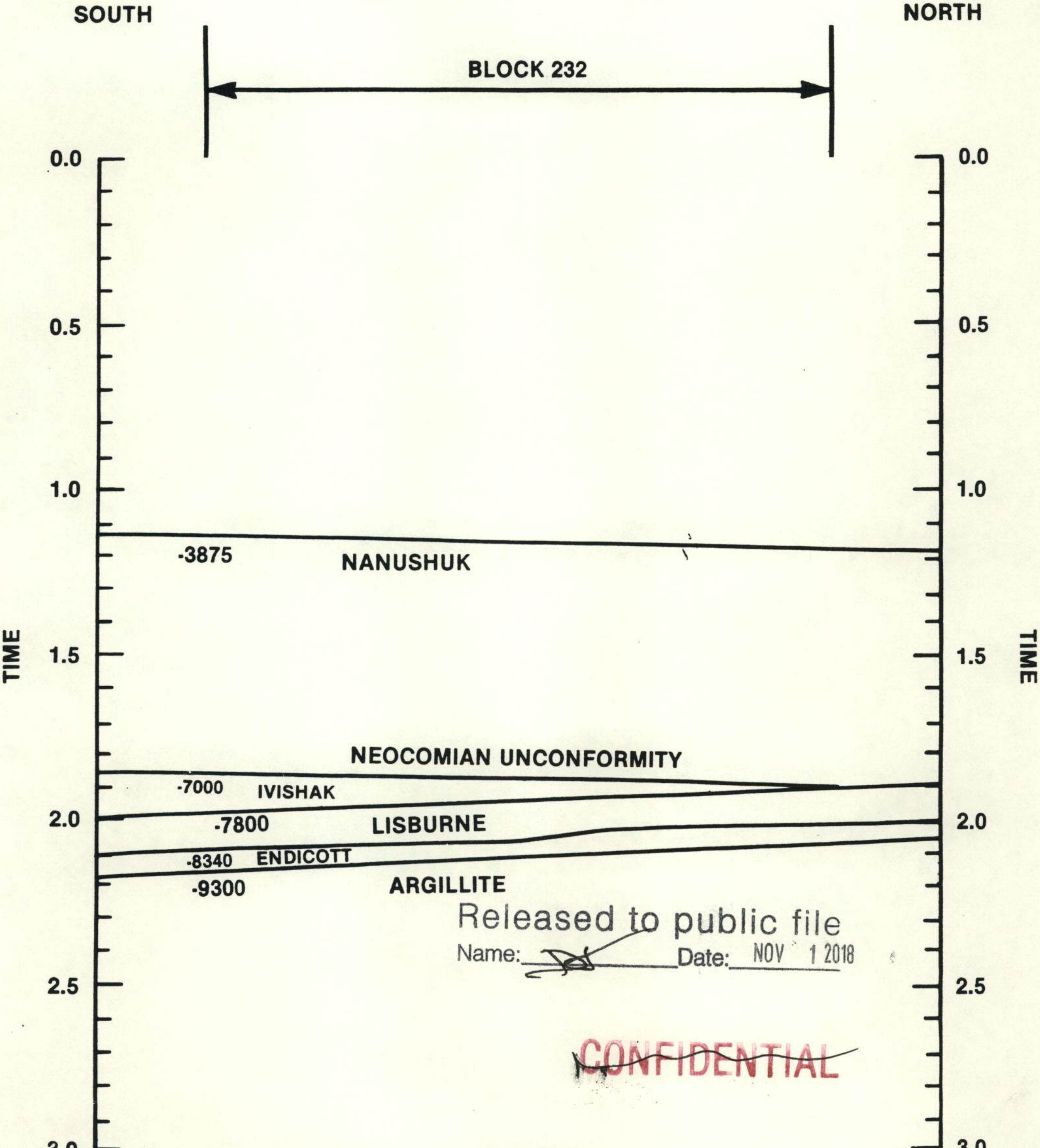


FIGURE
6D

APPENDIX E

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

PLATFORM VERIFICATION PLAN

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

Submitted: January 15, 1985

PLATFORM VERIFICATION PLAN

Submitted under separate cover in Appendix E, Platform Verification Plan, is a confidential presentation including the following:

1. Design Report

2. SSDC/Ice Loads

3. Figures

4. Construction Specifications

5. Operating Philosophy

Tenneco Oil
Exploration and Production
A Tenneco Company

Frontier Exploration Division

Tenneco Building
P.O. Box 2511
Houston, Texas 77001
(713) 757-2131

TENNECO

RECEIVED
Anchorage, Alaska

OCT 30 1985

REGIONAL SUPERVISOR
FIELD OPERATION
MINERALS MANAGEMENT SERVICE

October 25, 1985

Mr. Rodney A. Smith
Regional Supervisor
Field Operations
Minerals Management Service
Alaska OCS Region
Post Office Box 101159
Anchorage, Alaska 99510

Re: SSDC/MAT Construction Project

Dear Mr. Smith:

In our recent discussions with personnel in your office, interest was expressed with regard to the construction status of the Canmar/Reading & Bates steel MAT. Enclosed please find an artist's conception of the MAT under tow, as well as a timetable of some of the key phases of the MAT construction.

If your are in need of additional information, please contact Jason Kirksey at (713) 757-2295.

Yours very truly,

Cheng Sam Khoo

C. S. Khoo
Exploration Manager

CSK:MJK:rf
enclosures

cc: Minerals Management Service
Platform Verification Section
3301 North Causeway Boulevard
Metairie, Louisiana 70010

0315,12

TIMETABLE

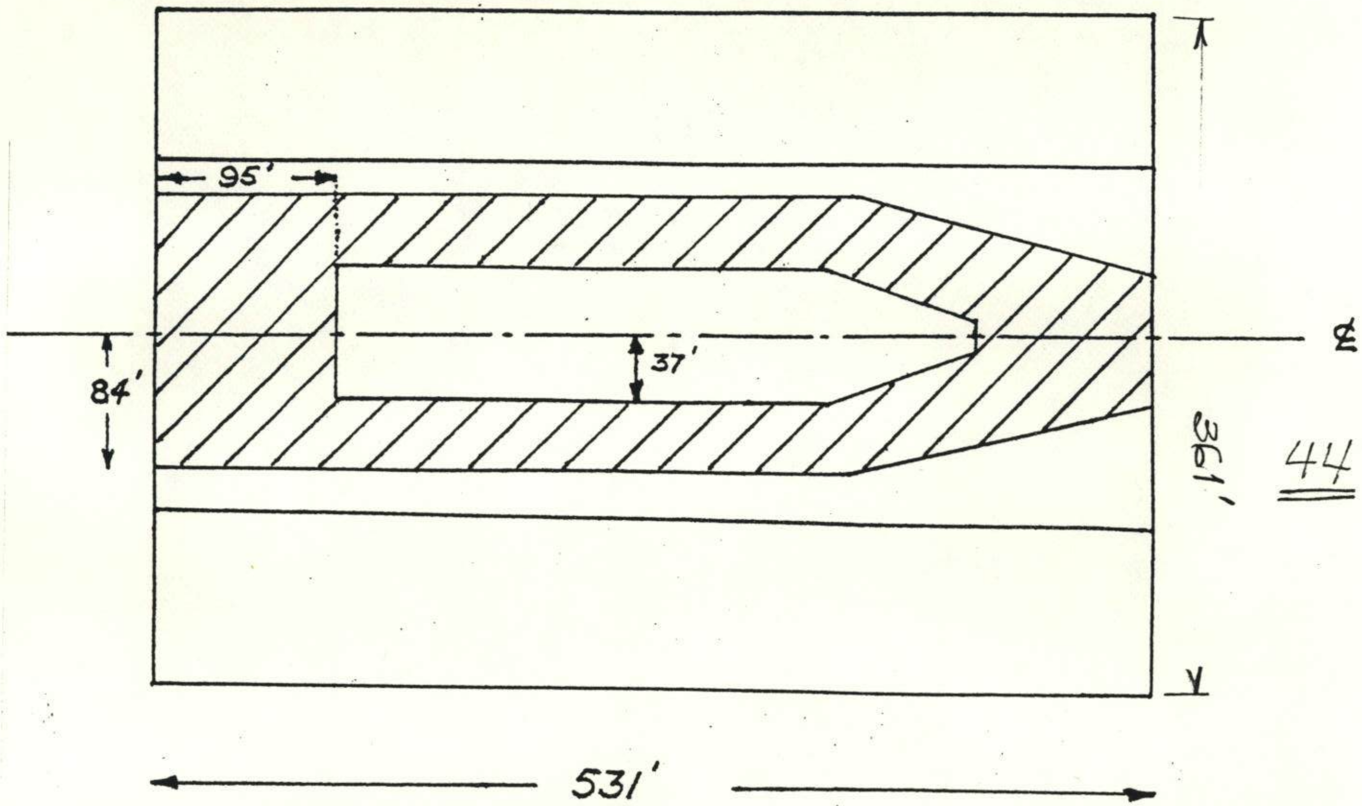
SSDC/MAT CONSTRUCTION PROJECT

Activity	Date
Mat Construction Contract-- Hitachi Zosen Corporation, Japan, with Canmar/Reading & Bates	June 29, 1985
Steel Ordering Commenced	July 15, 1985
Foam Quality Assurance Testing	Second week of September 1985
Steel Fabrication Commenced	Mid-September 1985
Foam Fabrication Commences	November 1, 1985
Erection of Components Commences	Mid-December 1985
Graving Dock Completed	March 1986
Joining of Three Units	April 1986
Sea Trials	May 1986
Initiate Mat Tow to Alaska	June 1986
Mat Reaches Point Barrow	August 1, 1986
Initiate SSDC Tow to Alaska	August 1986
Mate MAT and SSDC in Harrison Bay	August 30, 1986
Set-Down at Tenneco's Phoenix Well Site	September 1986

Note:

	Steel Ordered (Metric Tons)	Steel Delivered (Metric Tons)
End of September 1985	30,719	18,534
End of October 1985	34,400	28,400

(Total Metric Tons to be Ordered - 35,000)



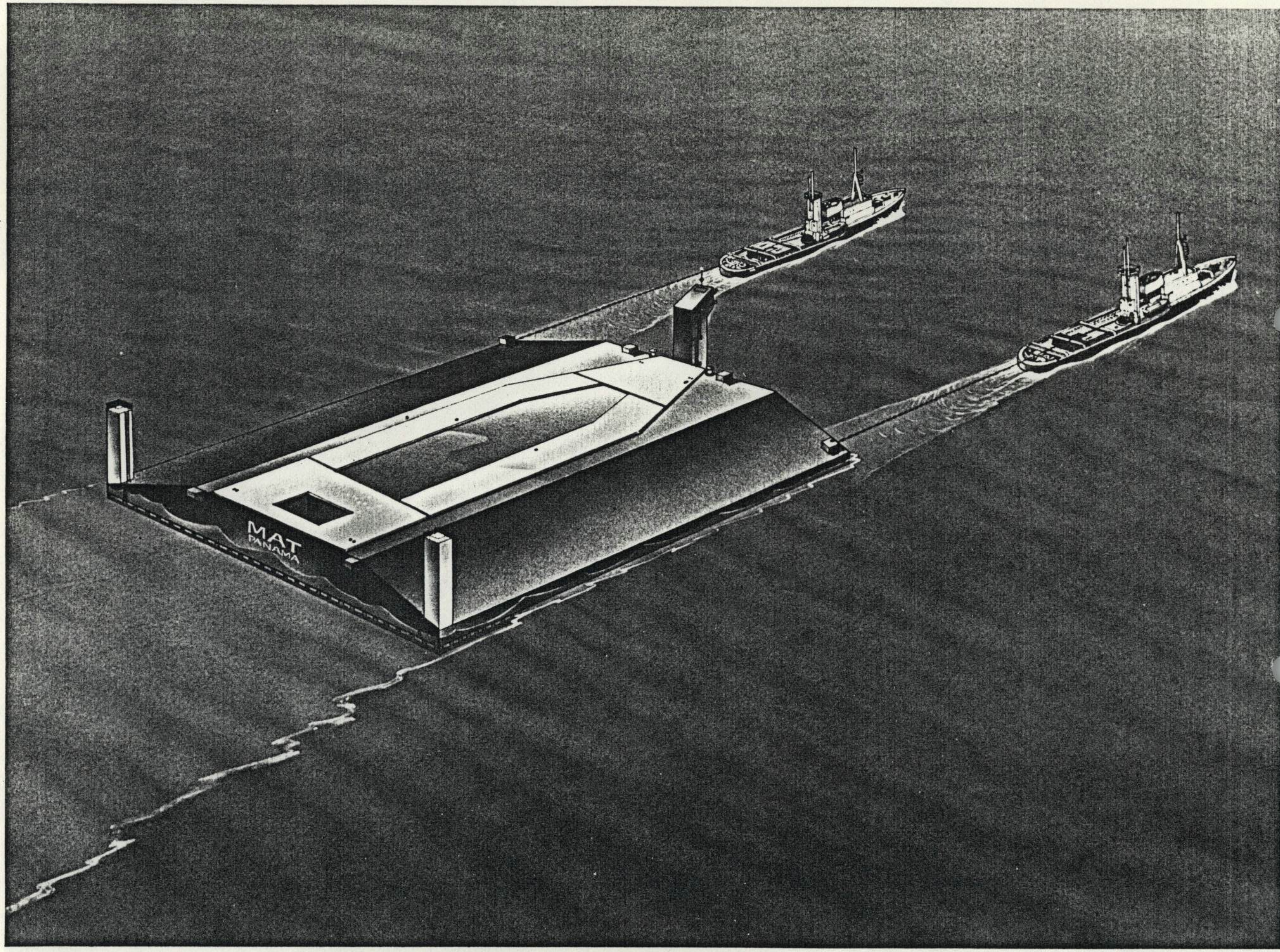
44' High.

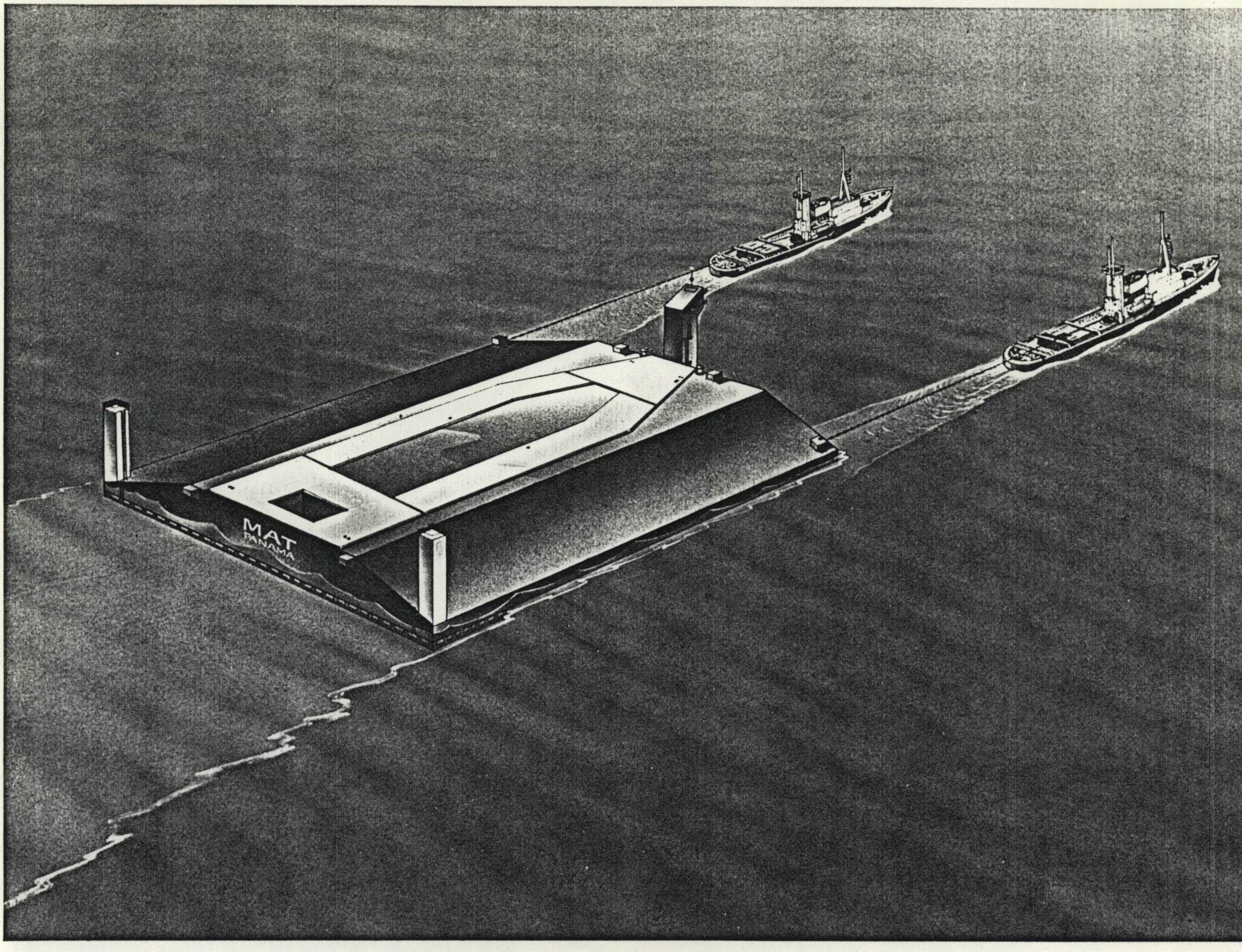
191,715 SF
FOOTPRINT
4.4 ACRES
OR
1.8 HECTARES.

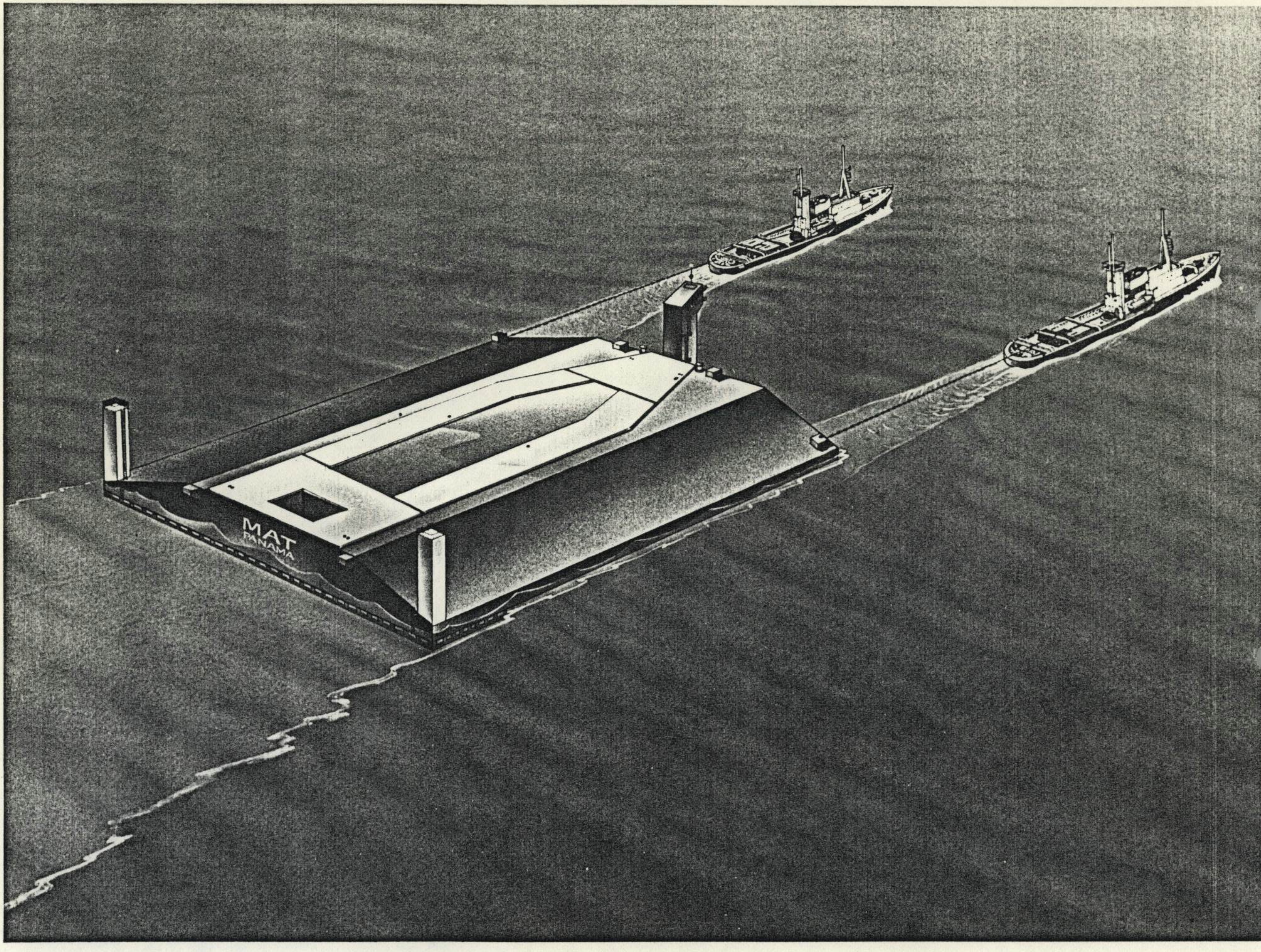
Very Stiff URETHANE FOAM BLOCK ARRANGEMENT

ALREADY USED AT UVILUK ISL. on Concrete Pads.

3' × 6.5' BLOCKS of URETHANE - 1' THICK plus shotcrete -


MAT
PANAMA


MAT
PANAMA

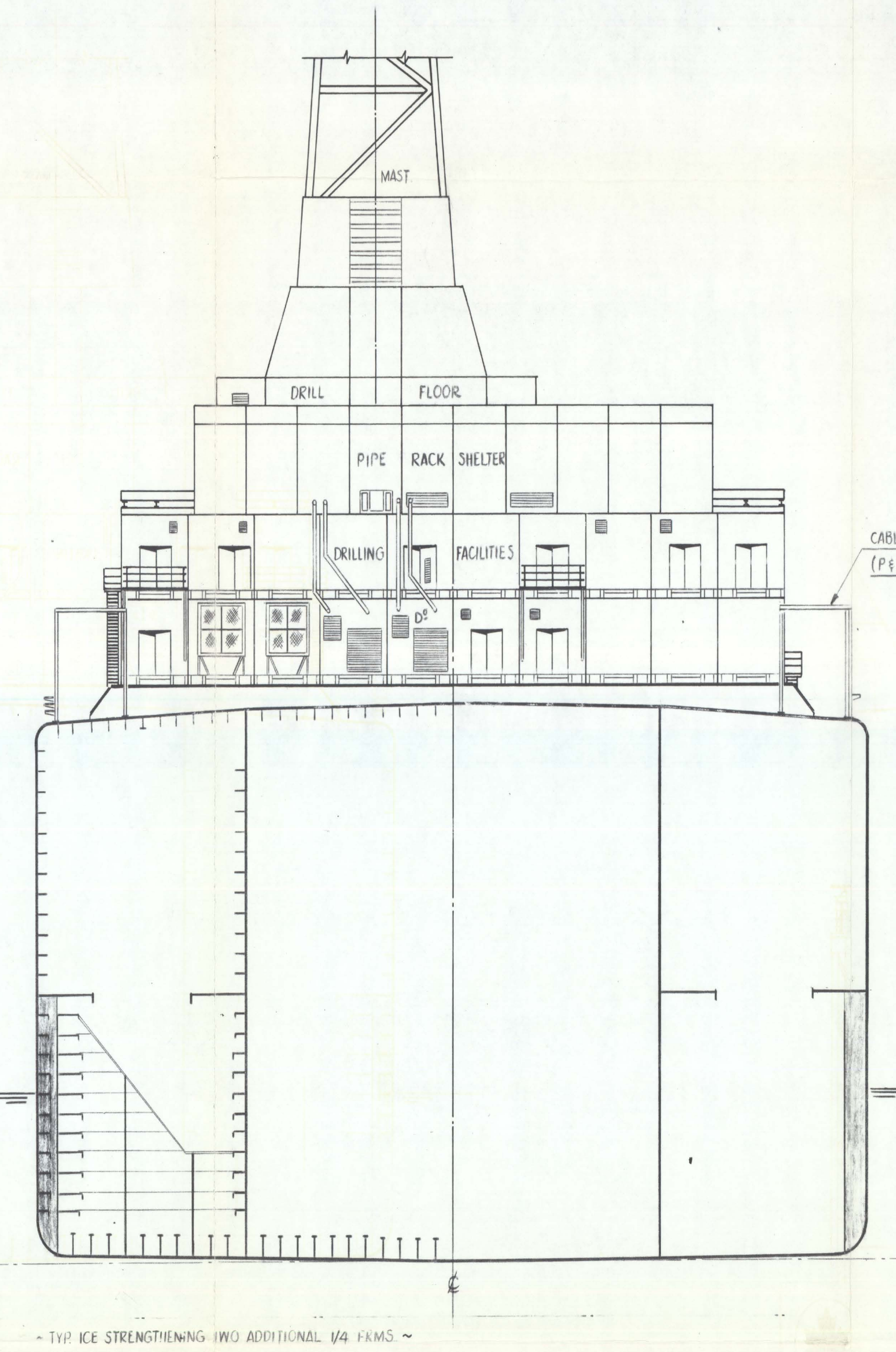

MAT
PANAMA

CONFIDENTIAL

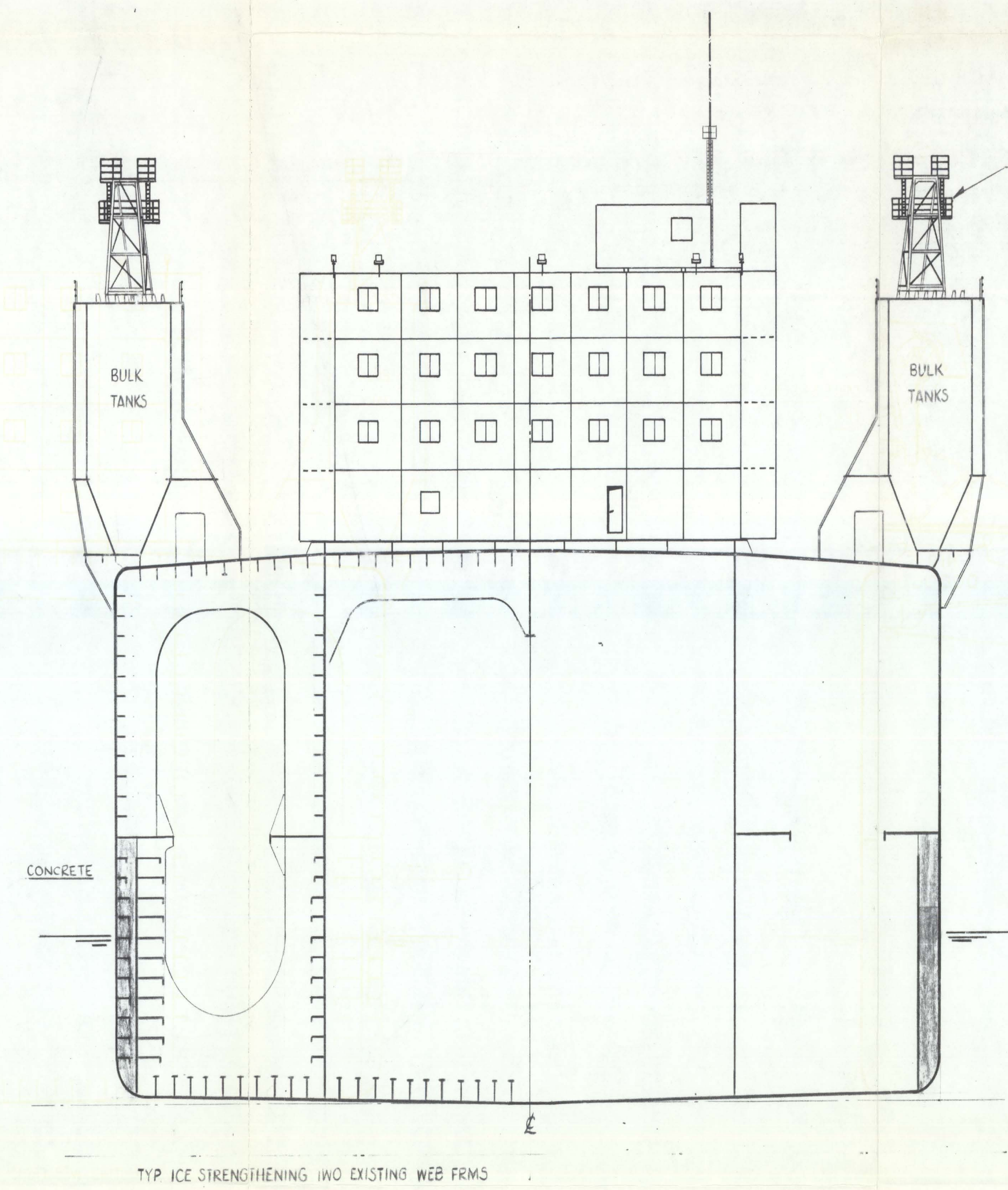
LIST OF DRAWINGS

Released to public file
Name: [signature] Date: NOV 2018

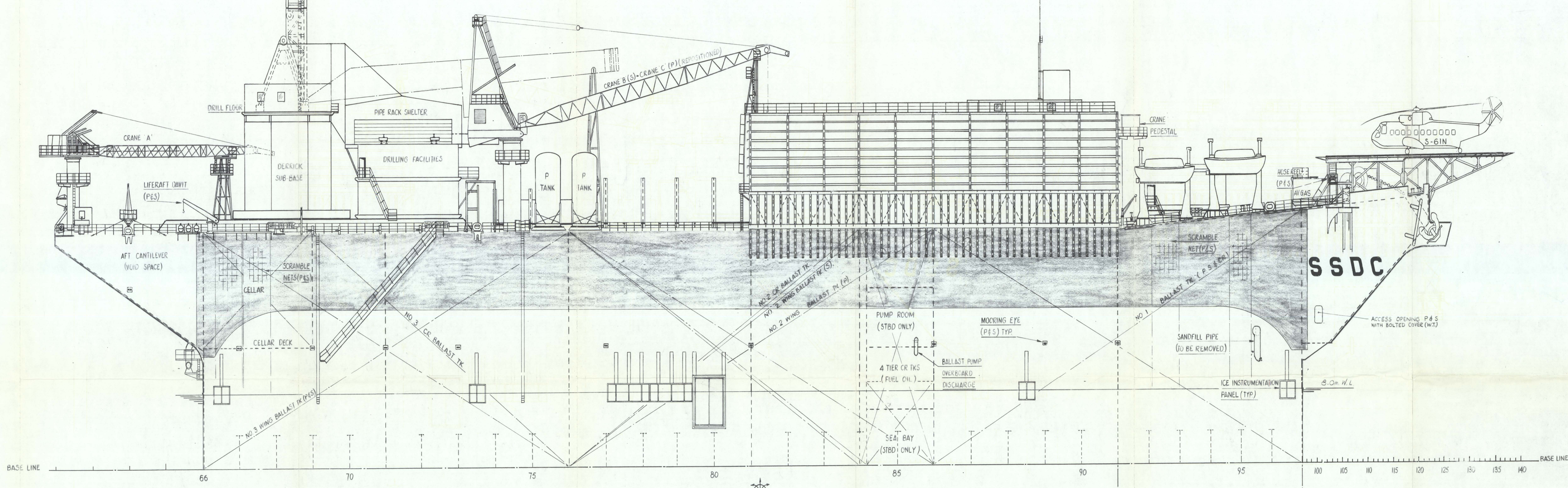
DWG. NO.	TITLE
E-SDC-860-01	SSDC General Arrangement Profile & Sections
D-SDC-860-02	Mid-Body Ice Stiffening
E-SDC-860-03	Aft End Ice Stiffening (Plan Views)
E-SDC-860-04	Aft End Ice Stiffening-Elevations
E-SDC-860-05	Aft End Ice Stiffening (Sections)
E-SDC-860-06	Fore End Ice Stiffening (Plans)
E-SDC-860-07	Fore End Ice Stiffening (Elevations)
E-SDC-860-08	Fore End Ice Stiffening (Sections)
E-SDC-860-12	Fuel Oil Tanks
D-SDC-860-14	Pump Room & Sea Chest Structure
E-SDC-860-20	Stern Cantilever Cladding
E-SDC-860-21	Bow Cantilever
E-SDC-860-22	Bulk Tanks
B-SDC-860-47	Maximum Permissible Deck Loading Diagram
E-SDC-860-50	Deck Loading Arrangement
E-SDC-860-15	Main Deck Aft (FRS 65-74) Support for Drilling Mast and Rig Utilities
B-SDC-860-48	Rig Deck Loading Max. Static Load
B-SDC-860-49	Rig Deck Loading Max. Dynamic Load
D-SDC-860-74	Drilling Facilities/Accommodation Unit & Accommodation Utilities: Deck Loading
E-SDC-860-33	Casing Storage Racks
D-SDC-860-10	Diagrammatic Arrangement of Ballast & Sea Water System
D-SDC-860-09	Diagrammatic Arrangement of Fuel Oil Filling & Transfer System
E-SDC-860-17	Schematic Arrangement of Sea Water Circulation & Heating From Generator Heat Recovery
ICE-1	Basic Data, Design Criteria & Capability



TYPICAL SECTION I.W.O. DRILLING FACILITIES
(LOOKING AFT)



TYPICAL SECTION I.W.O. BULK TKS. & ACCOM. MODULES
(LOOKING AFT)



PROFILE

PRINCIPAL DIMENSIONS :

LENGTH AT DECK	202·35 m.
LENGTH AT WATERLINE	162·0 m.
LENGTH AT FLAT OF BOTTOM	162·0 m.
BREADTH MOULDED	53·0 m.
DEPTH MOULDED	25·3 m.
MAXIMUM DESIGN DRAFT	10·0 m.
DESIGN DRAFT ON BERM	9·0 m.

Released to public file Name: Date: NOV 1 2018

Released to public file Name: Date:

CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWING	REV.	REVISION DESCRIPTION	BY	DATE	CHKD.	APP.	DOME APP.
		7	GENERAL UPDATE	H.D.	22-12-'83			
		6	SCRAMBLE NET (P&S) UNDER FWD LIFEBOAT	E.L.	7 SEPT. 1982			
		5	REDRAWN	E.L.	23 AUGUST 1982			

ENGINEERS STAMP

ENGINEERING RECORD

DRAWN BY ERNY LAVERY	DATE 23RD AUG.
CHKD BY	23-8-82
ENGINEER	
DOME APP.	82-08-24

DOME PETROLEUM LIMITED CALGARY ALBERTA CANADA

PROJECT S.S.D.C.

PREPARED BY BEAUFORT SEA ENG. & DESIGN

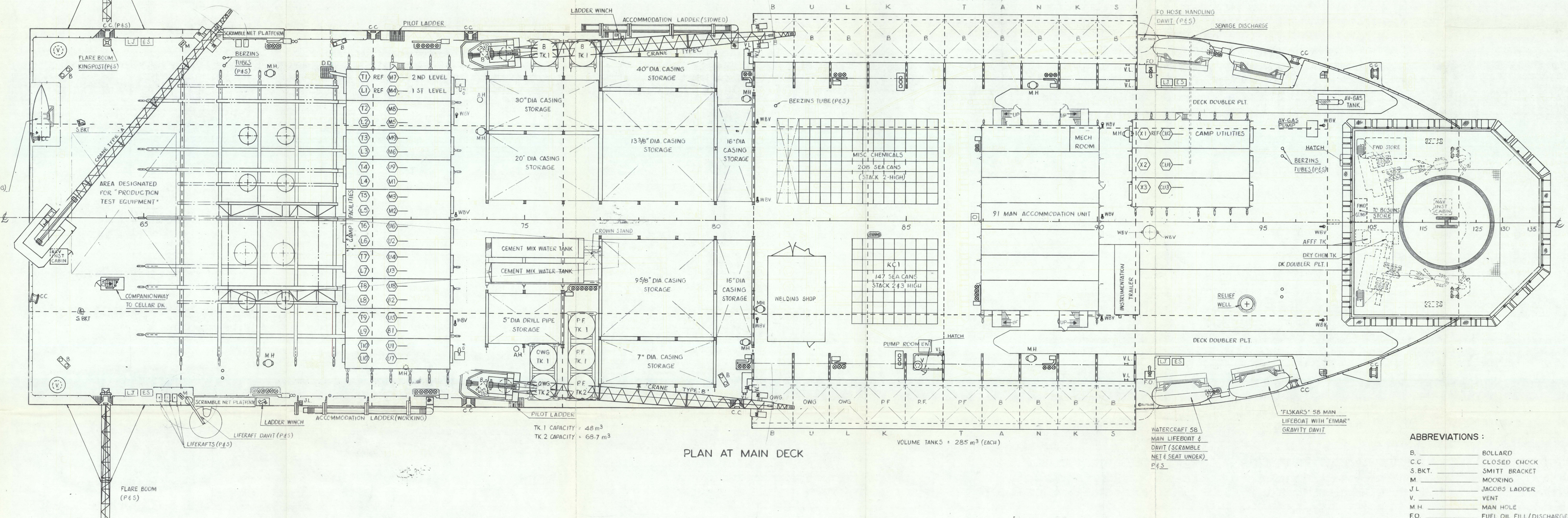
TITLE S.S.D.C. GENERAL ARRANGEMENT PROFILE & SECTIONS

SCALE 1 : 200

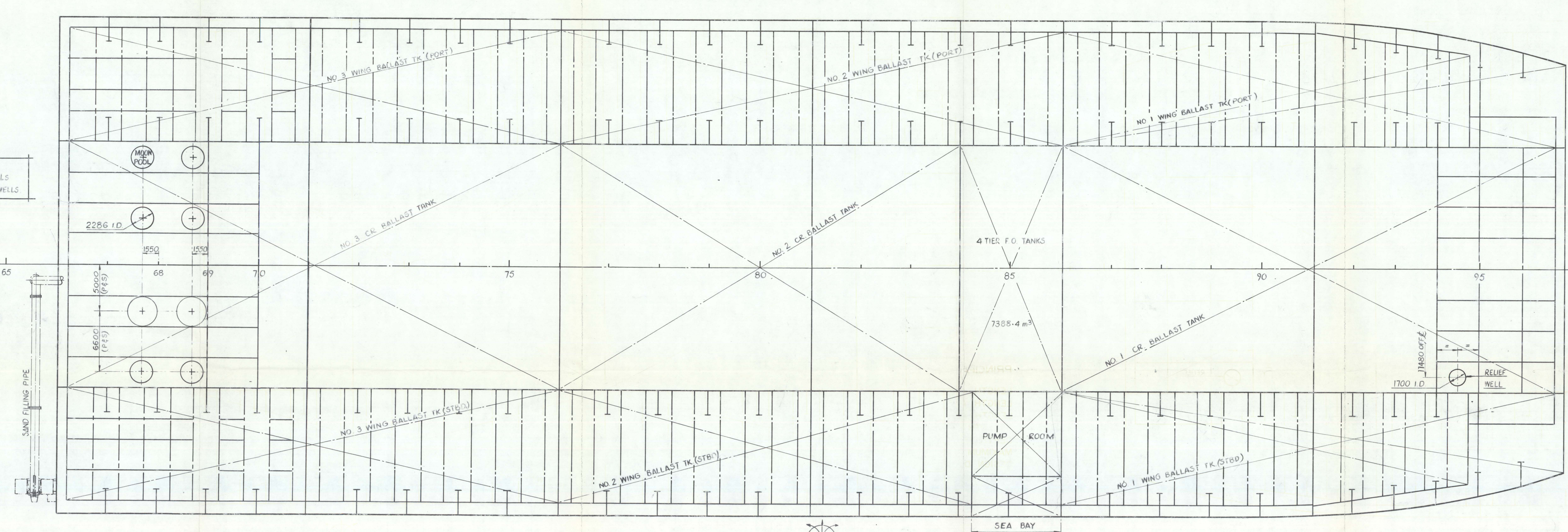
CONTR. DWG. NO.

DOME DWG. NO. E-SDC-860-01 (SHT. 1 of 2)

REV. 7



PLAN AT MAIN DECK



PLAN VIEW UNDER 12.7 m. STRINGER

ABBREVIATIONS :

B.	BOLLARD
C.C.	CLOSED CHOCK
S.BKT.	SMITT BRACKET
M.	MOORING
J.L.	JACOBS LADDER
V.	VENT
M.H.	MAN HOLE
F.O.	FUEL OIL FILL/DISCHARGE CONN.
A.H.	AIR HATCH
D.D.	DILLUTION DITCH
V.L.	VERTICAL LADDER
O.W.G.	O.W.G. CEMENT
P.F.	PERMA FROST
B. (I.W.O. TKS)	BARITE
K.C.1.	POT ASH (POTASSIUM CHLORIDE)
A.F.F.F. TK.	FIRE FIGHTING EQUIPMENT
L.J.	LIFE JACKET BOX
E.S.	EXPOSURE SUIT BOX
W.B.V.	WATER BALLAST TANK, VENT

CRANE TYPE 'A' — MAX. OUTREACH 37.490 m, MAX. API HOOK LOAD 10,900 #
MIN. OUTREACH 9.144 m, MAX. " 69,400 #
CRANE TYPE 'B' & 'C' — MAX. OUTREACH 37.795 m, MAX. " 22,700 #
MIN. OUTREACH 7.315 m, MAX. " 125,000 #
(EXTENDED JIB NOT INCLUDED IN ALL ABOVE FIGURES, BOOM LENGTH = 36.6 m.)

PRINCIPAL DIMENSIONS :

LENGTH AT DECK	202.35 m.
LENGTH AT WATERLINE	162.0 m.
LENGTH AT FLAT OF BOTTOM	162.0 m.
BREADTH MOULDED	53.0 m.
DEPTH MOULDED	25.3 m.
MAXIMUM DESIGN DRAFT	10.0 m.
DESIGN DRAFT ON BERM	9.0 m.

Released to public file
Name: Date: NOV 1 2018

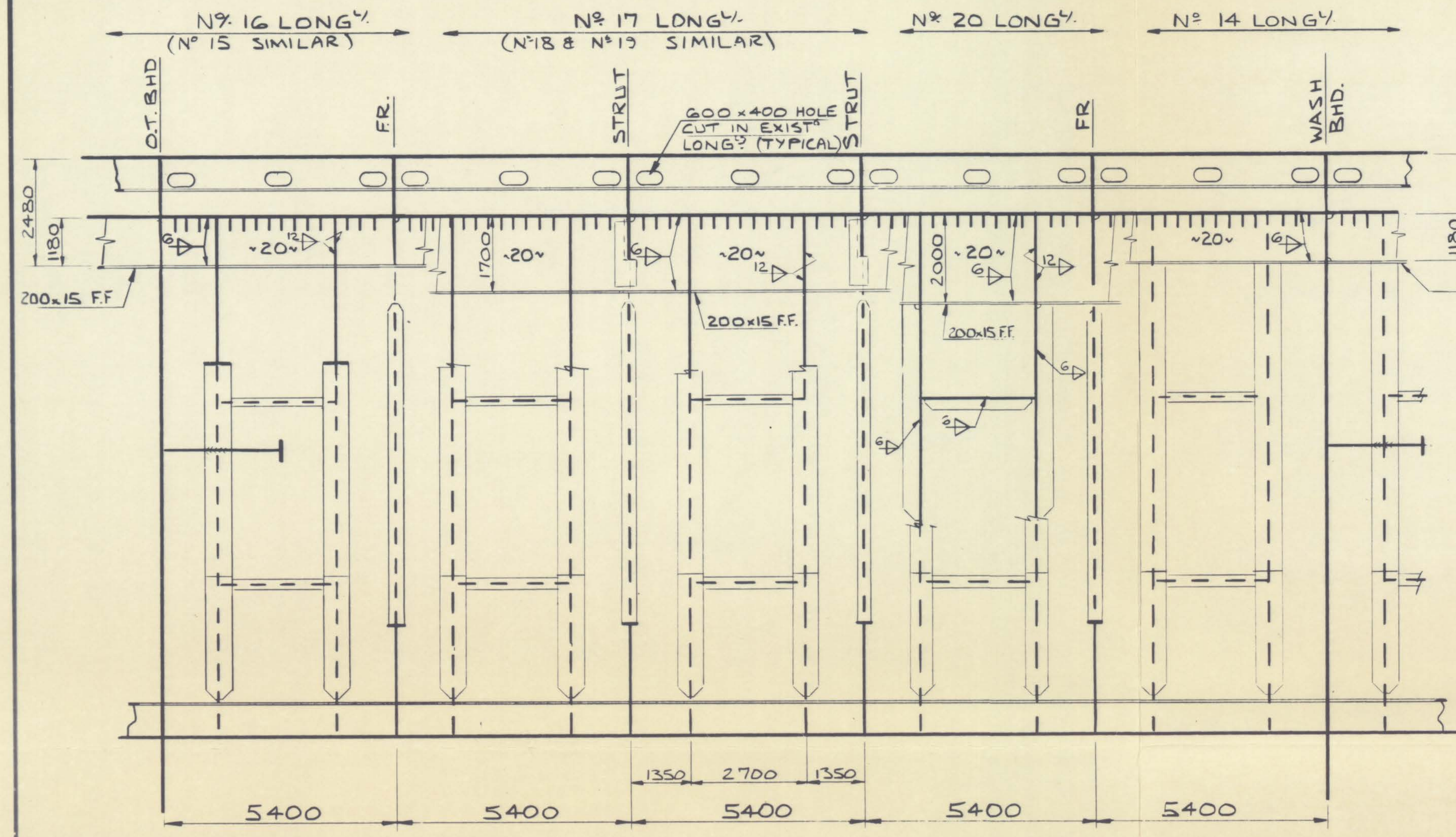
CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWING	REV.	REVISION DESCRIPTION	BY	DATE	CHKD.	APP.	DOME APP.
		8	GENERAL UPDATE	M.D.	22-12-83			
		7	WELDING SHOP RELOCATED. EXTRA SEA CAN AREA DELETED	S.H.	21ST MARCH, 83			
		6	WELDING SHOP RELOCATED. EXTRA SEA CAN AREAS DESIGNATED	E.L.	2 SEPT. 1982			
		5	REDRAWN	E.L.	23 AUGUST 1982			

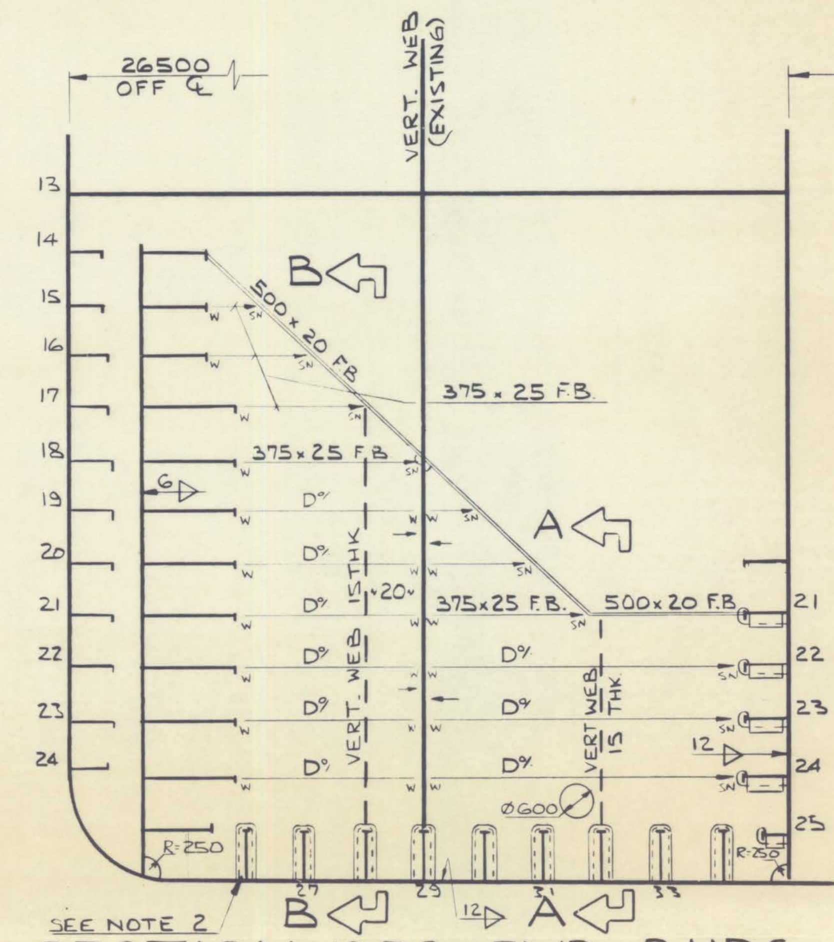
ENGINEERS STAMP

ENGINEERING RECORD
DRAWN BY: ERNY LAVERY — DATE: 23 RD AUG 1982
CHKD BY: 25-8-82
ENGINEER
DOME APP.: 82-08-24

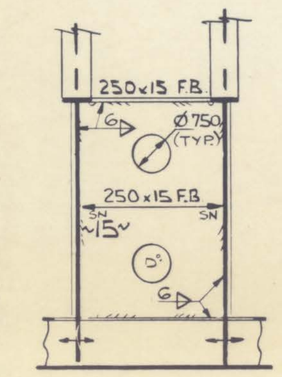
DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA
PROJECT: S.S.D.C.
PREPARED BY: BEAUFORT SEA ENG. & DESIGN
TITLE: S.S.D.C. GENERAL ARRANGEMENT MAIN DECK & BELOW 12.7 STRINGER
SCALE: 1 : 200
CONTR. DWG. NO.
DOME DWG. NO.: E-S.D.C.-860-01 (SHT. 2 of 2)
REV: 8



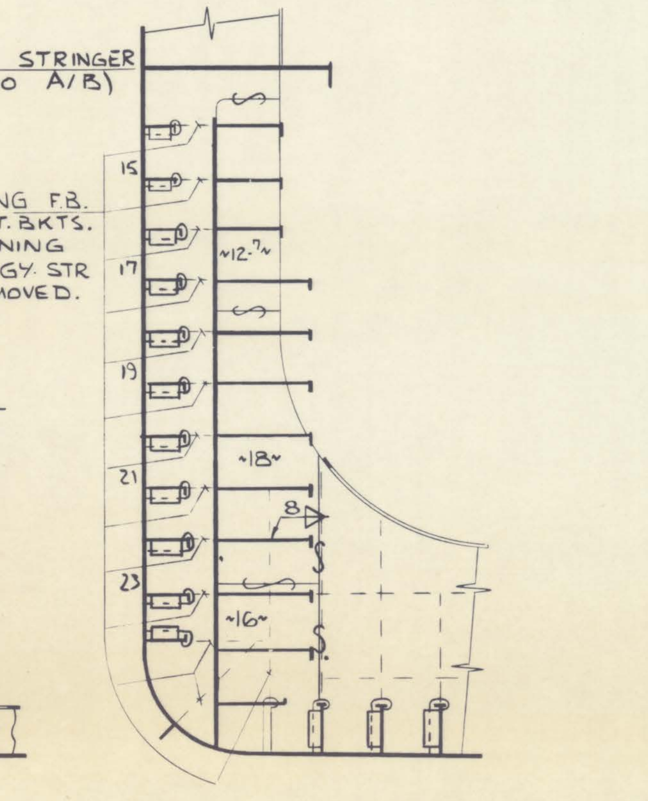
PLAN SHOWING LONGLS 14, 16, 17 & 20



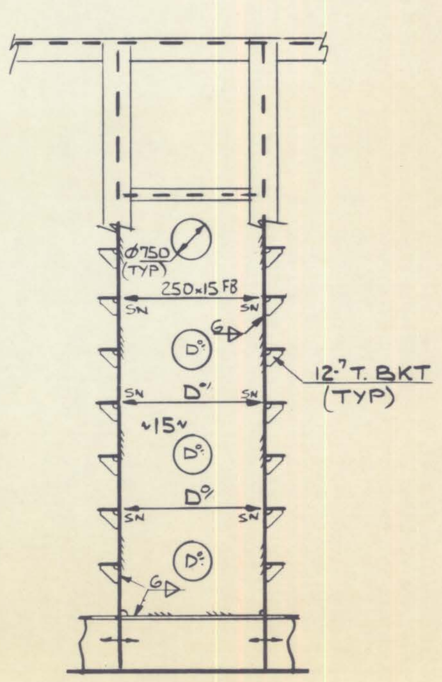
SECTION 1350 FWD. BHDS



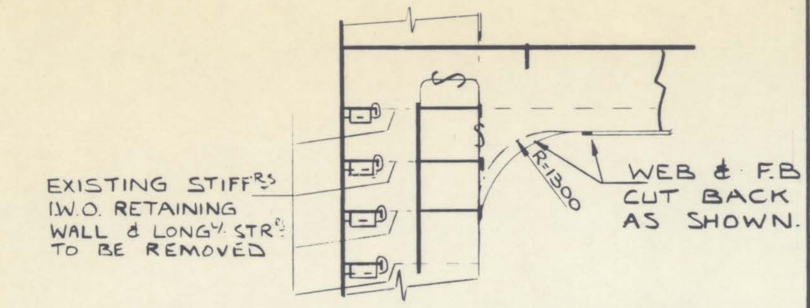
A-A



SECTION AT TRANS FR.



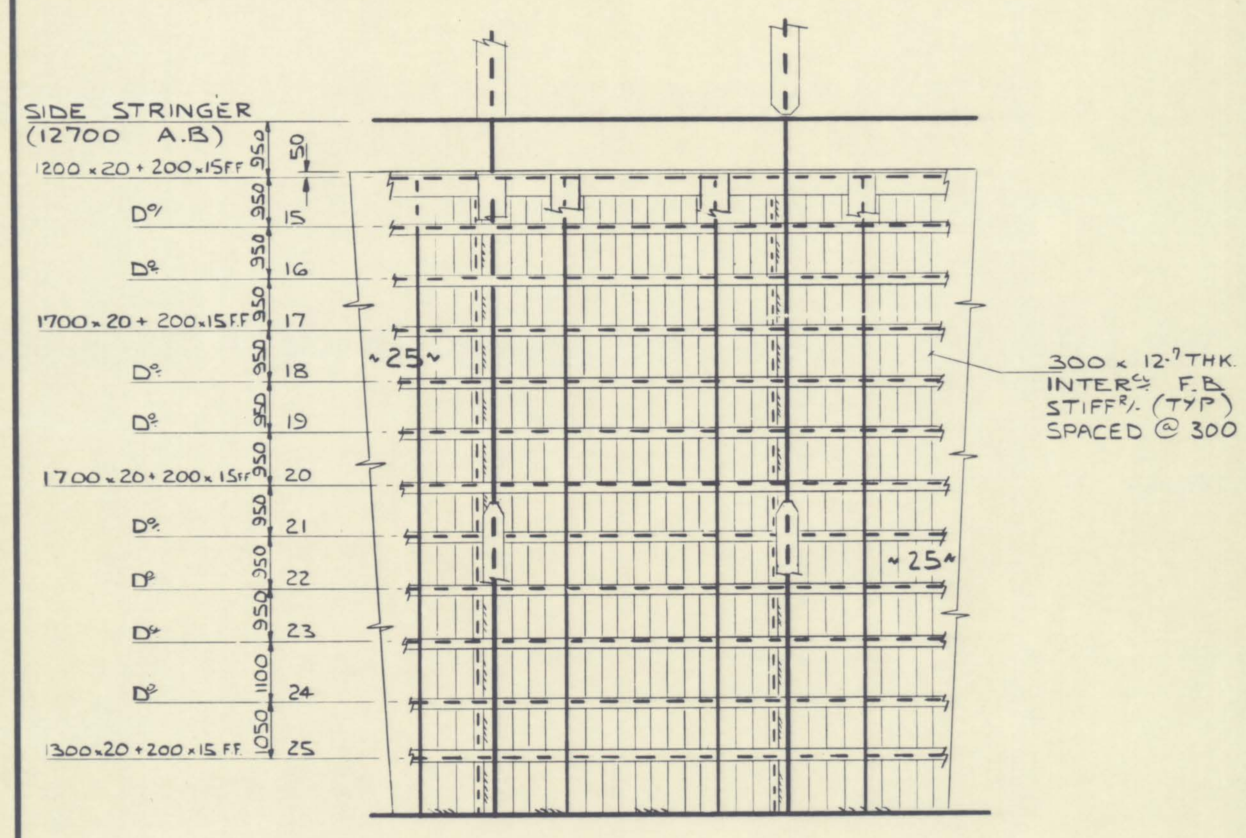
B-B



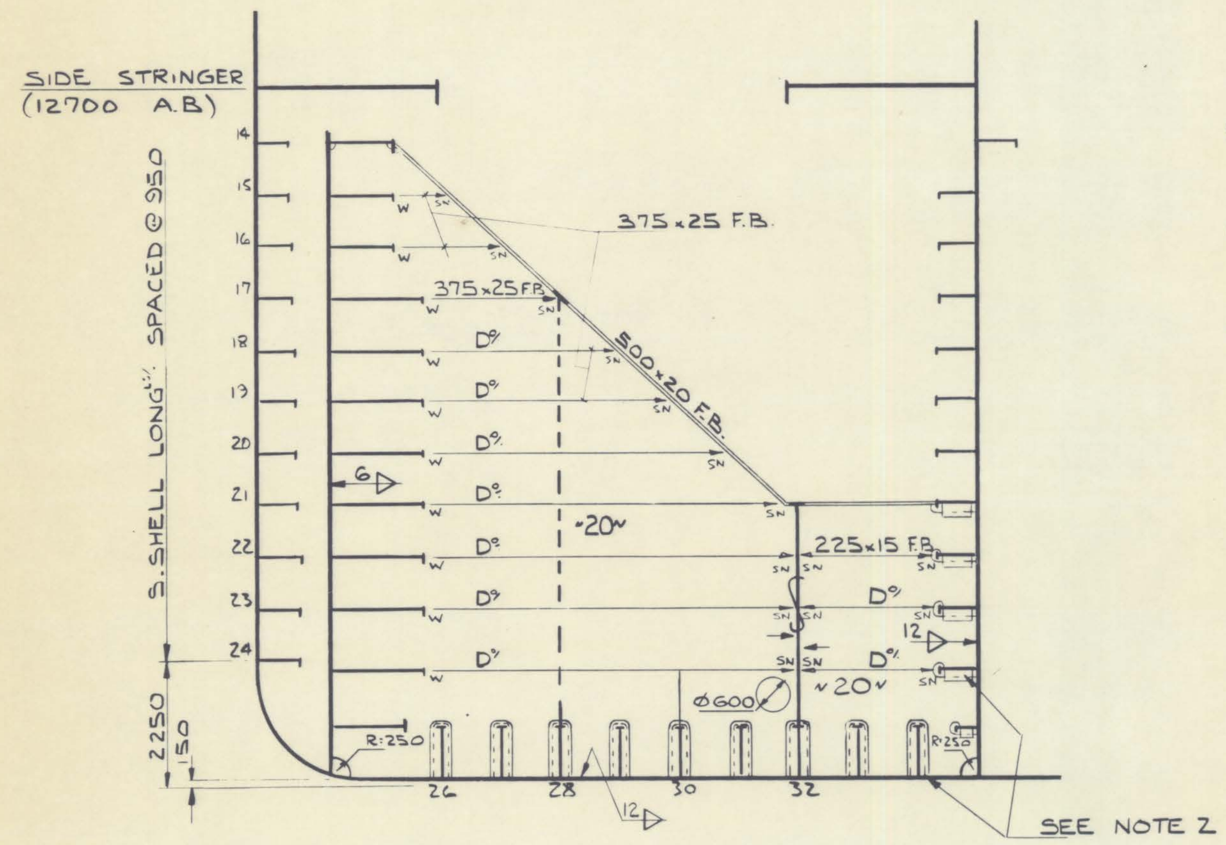
SECTION AT STRUT
(SIMILAR TO TRANS FR. EXCEPT AS SHOWN)

NOTES

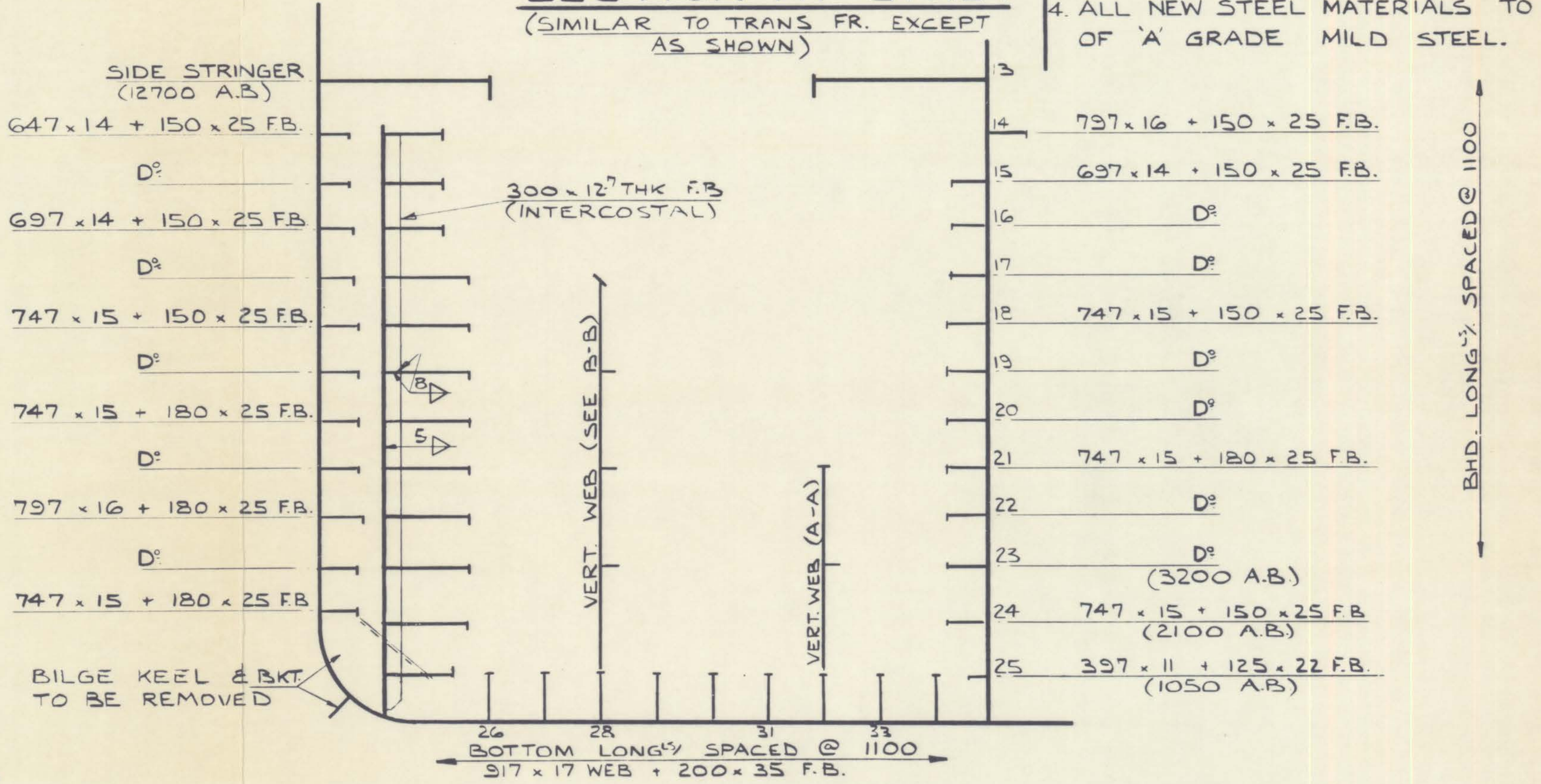
1. ALL STRUCTURE SHOWN THUS ———— IS EXISTING.
2. ALL CUT OUTS & COLLARS TO SUIT CONVERSION YARDS CURRENT PRACTICE AS APPROVED BY OWNERS.
3. ALL WELD SIZES ARE LEG LENGTHS
4. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL.



ELEVN ON RETAINING WALL
(ALL PLATING 25 THK)



SECTION AT INTERMEDIATE WEB



SECTION I.W.O. INTERCL F.B. STIFFRS

Released to public file
Name:
Date: NOV 1 2018

CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
		1	MODIFIED IN ACCORDANCE WITH 'HITACHI-ZOSEN' COMMENTS	AW	3RD MARCH '82			
			# GENE[illegible] - UPDATE					

ENGINEER'S STAMP

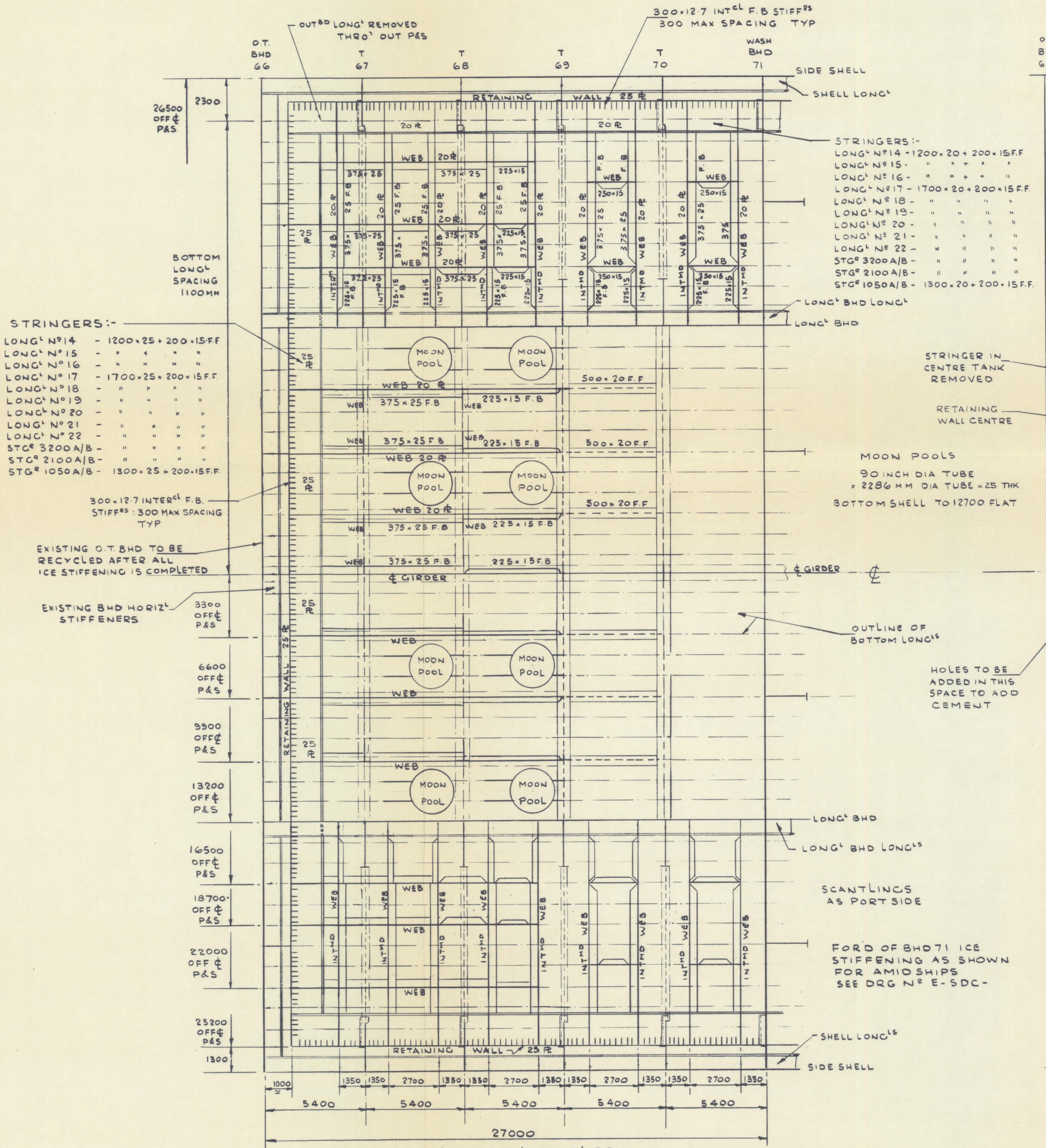
ENGINEERING RECORD	DATE
DRAWN BY ALAN WILLIAMS	18TH FEB 1982
CHKD BY	
ENGINEER	82-[illegible]
DOME APP. J.M. [signature]	82-02-22

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

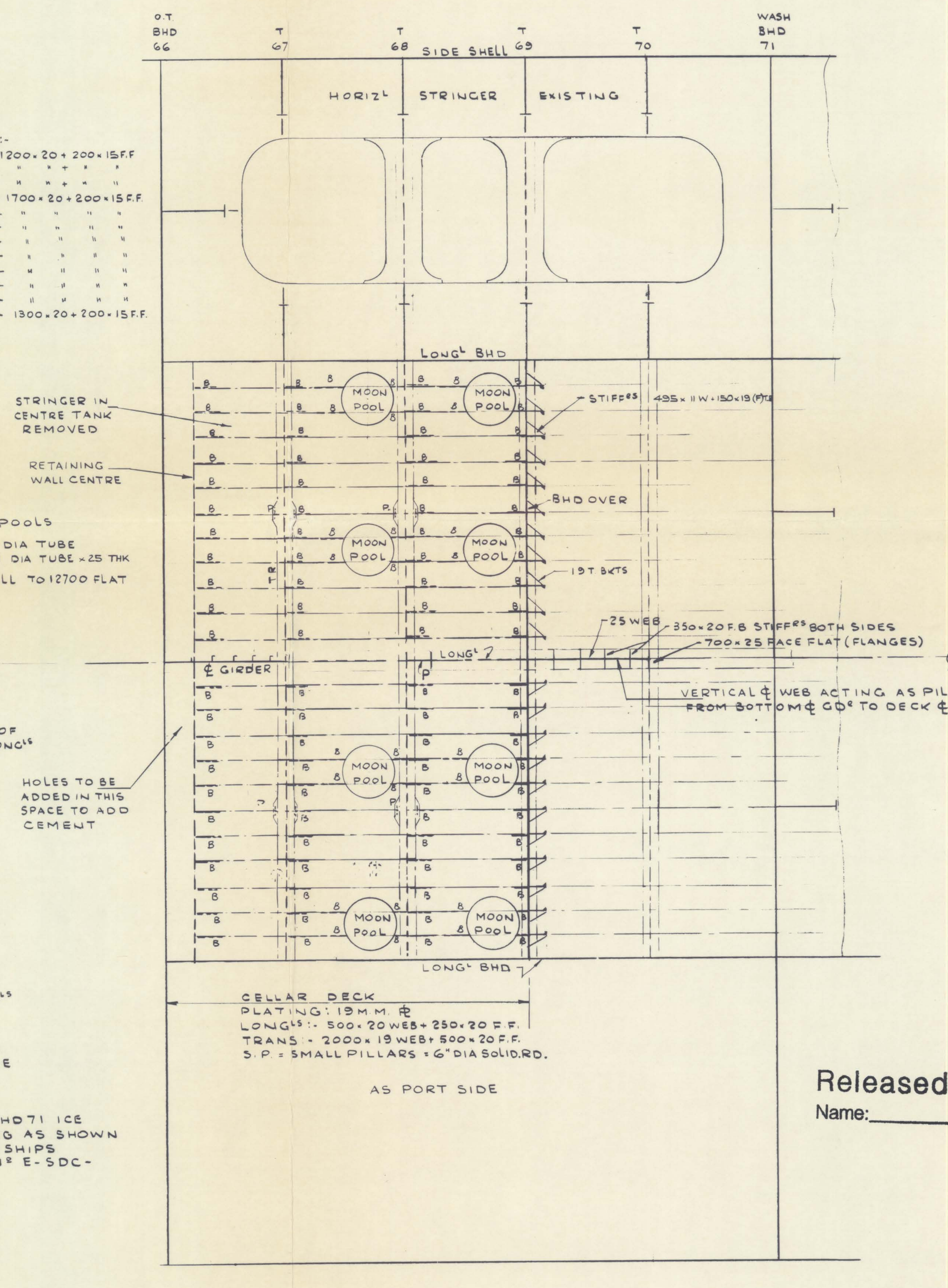
PROJECT: S.D.C.
PREPARED BY: BEAUFORT SEA ENG. & DESIGN
TITLE: MID BODY ICE STIFFENING
SCALE: 1:100
CONTR. DWG. NO.
DOME DWG. NO. D-SDC-860-02
REV 1

P = PILLAR 1100 × 20 WEB + 575 × 25 FACE FLAT

ALL EXISTING STIFF^RS, T. BKTS, FACE FLATS TO BE REMOVED FOR NEW STRUCTURE WHERE NECESSARY



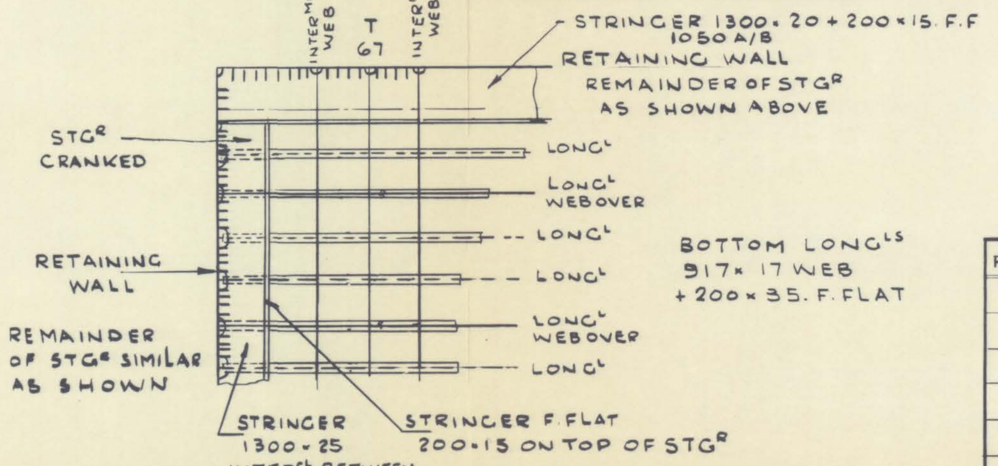
PLAN AT LONG^L 22 (SEE ALSO SECTION & ELEVATIONS)



PLAN VIEW 12700 A/B

Released to public file
Name:__________ Date: NOV 1 2018

NOTE
1. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL.



DETAIL OF BOTTOM STG^R

CONFIDENTIAL

REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
1	MODIFIED IN ACCORDANCE WITH 'HITACHI-ZOSEN' COMMENTS	AN	3^RD MARCH '82			
2	PILLARS (FRS 67 & 68, LONG^L Nº6) MODIFIED	[illegible]	20^TH MARCH '82			

ENGINEER'S STAMP

ENGINEERING RECORD

DRAWN BY: PHIL LAWSON	DATE: FEB 1982
CHKD BY:	
ENGINEER: [signature]	82-02-22
DOME APP.: J.M. Milne	22 Feb 82

DOME PETROLEUM LIMITED — CALGARY, ALBERTA, CANADA

PROJECT: S.D.C

PREPARED BY: BEAUFORT SEA ENG & DESIGN

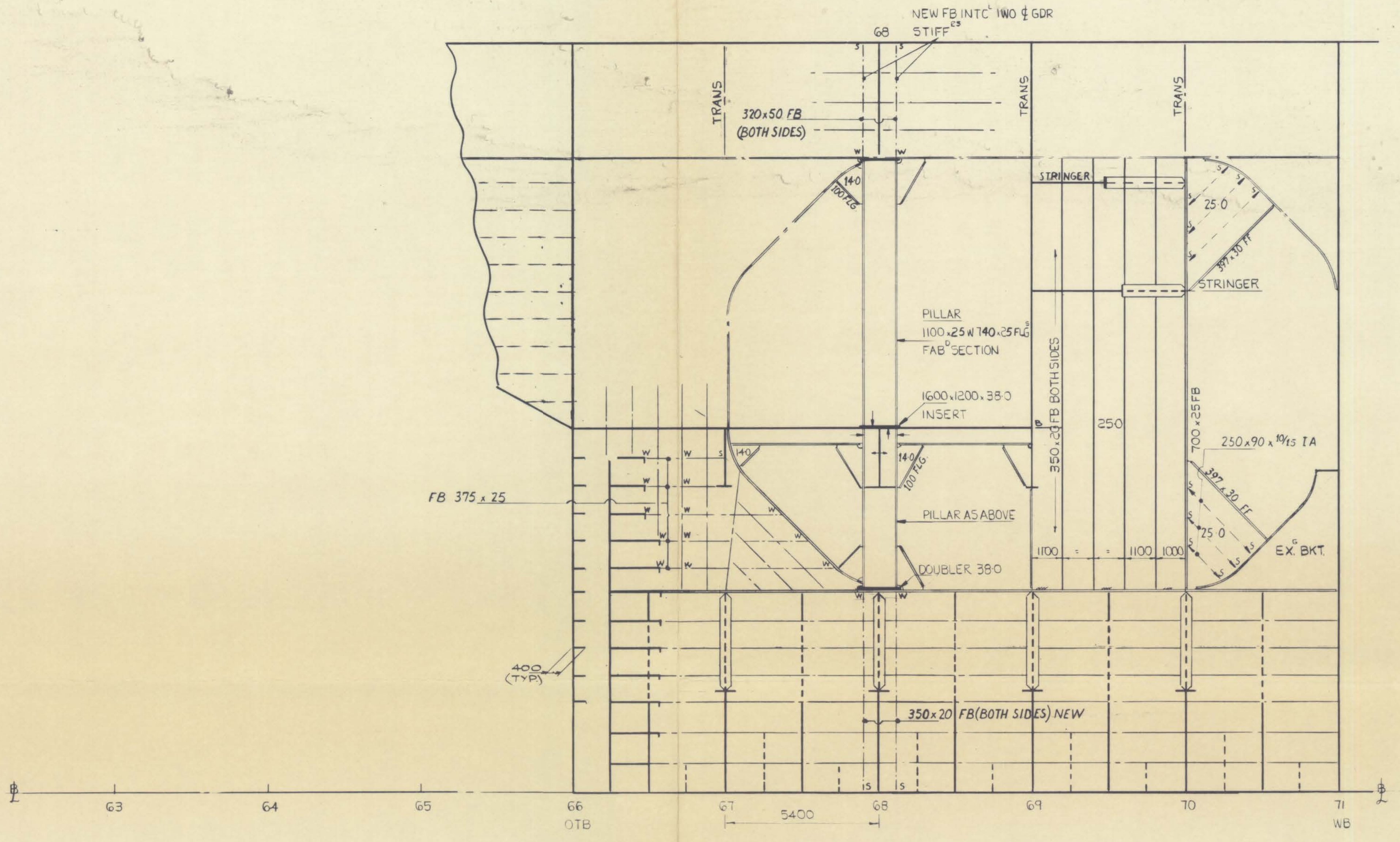
TITLE: AFT END ICE STIFFENING (PLAN VIEWS)

SCALE: 1:100

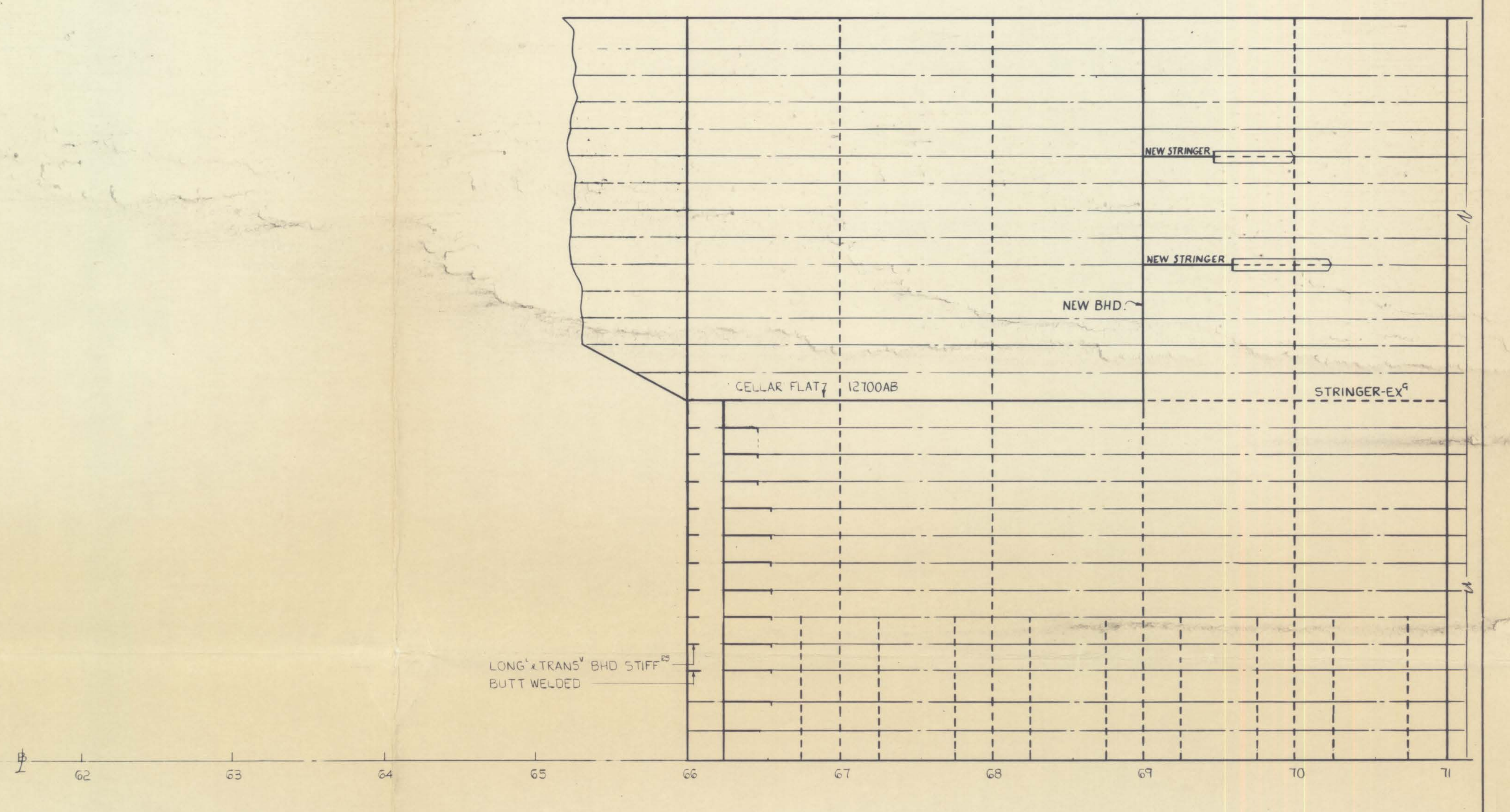
CONTR. DWG. NO.:

DOME DWG. NO.: E-SDC-860-03

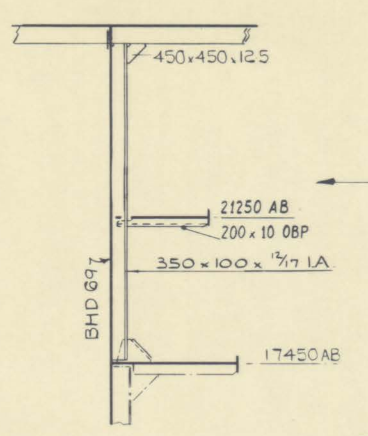
REV: 2



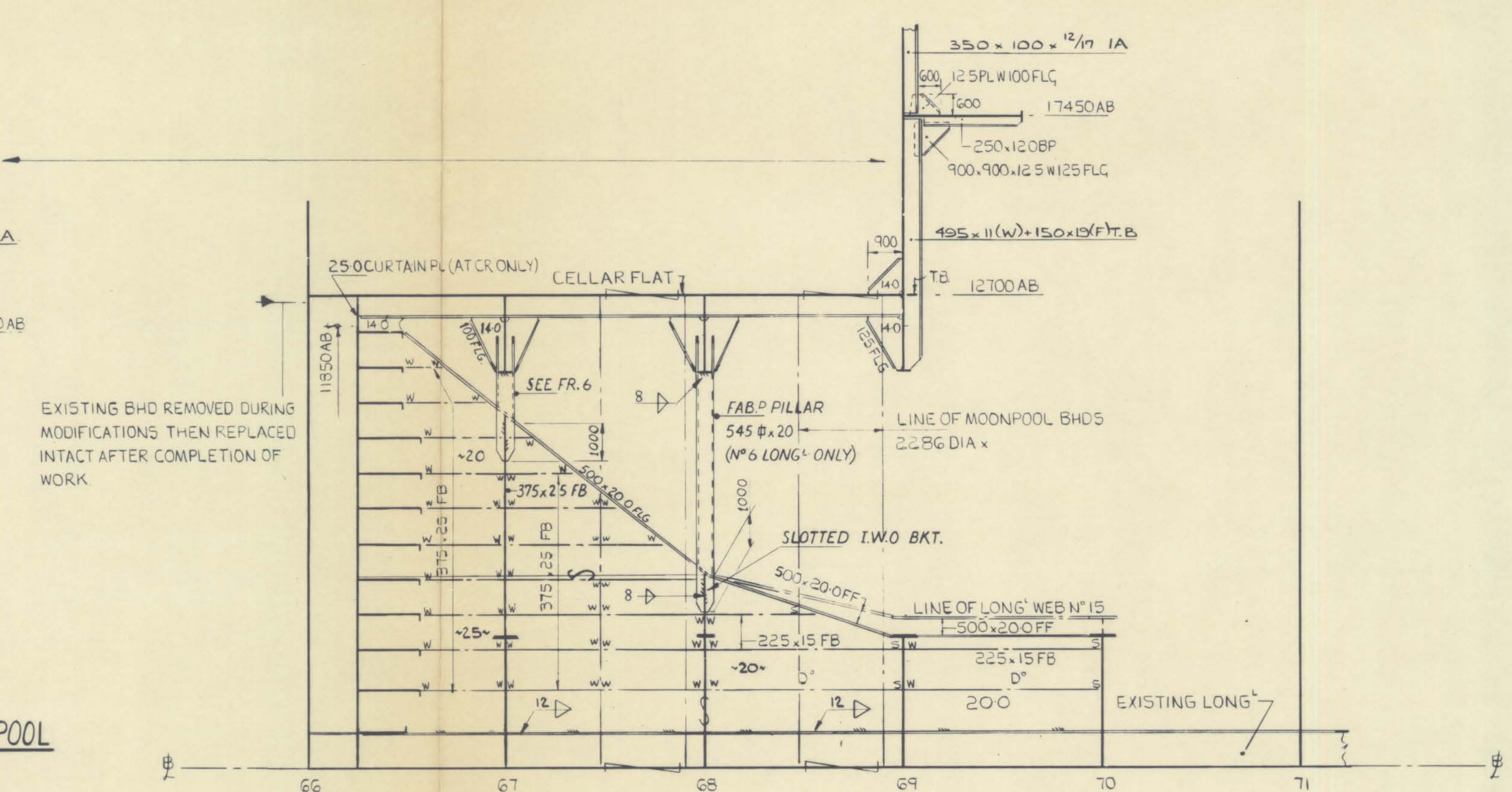
ELEVATION AT CENTRELINE



ELEVATION AT LONGITUDINAL BHD



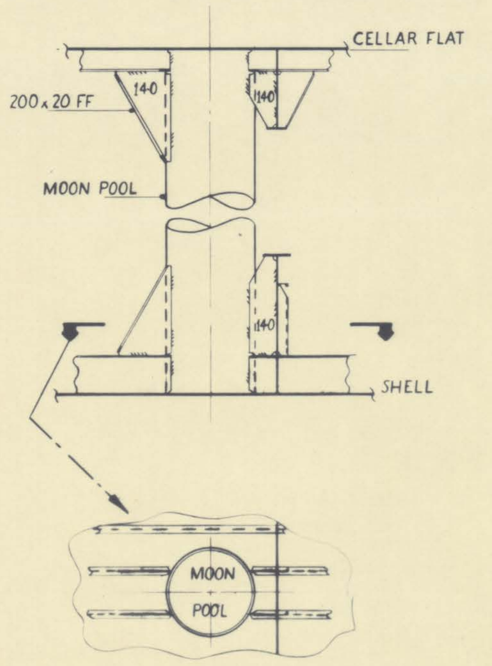
BHD 69

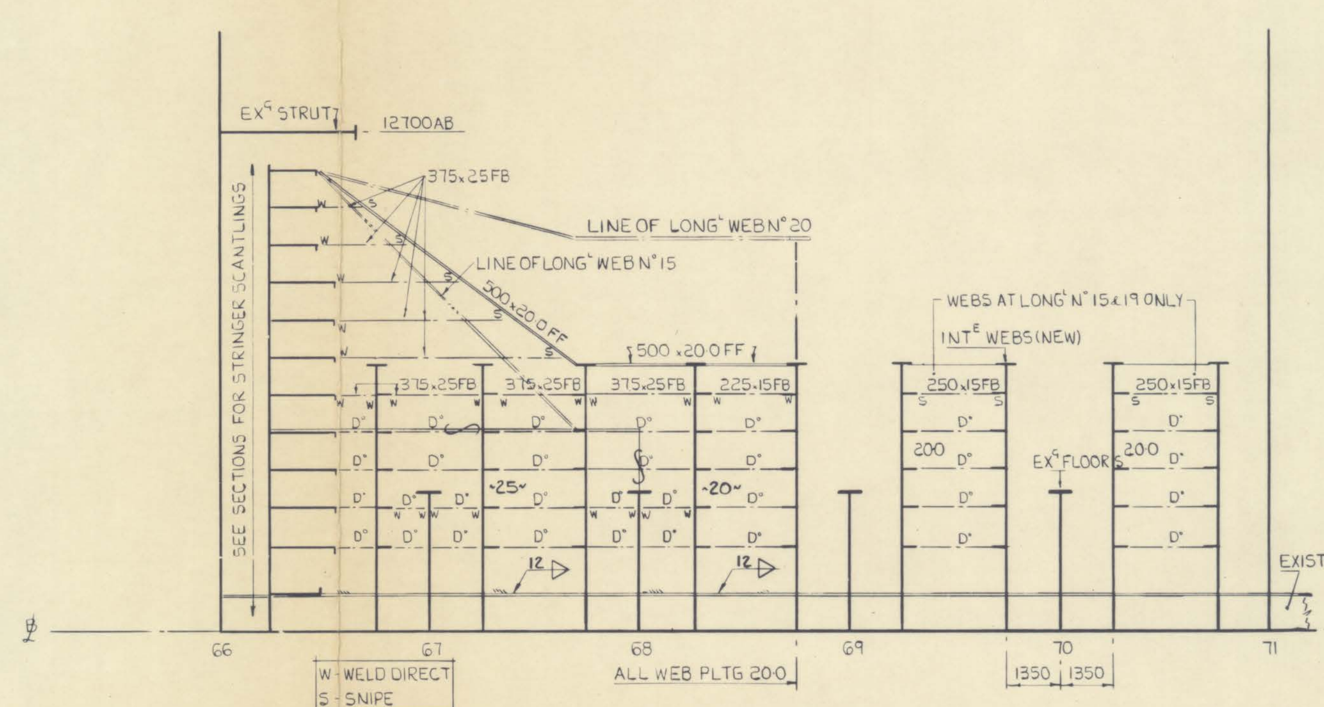


ELEVATION OF LONG^L WEBS AT CENTRE

DRAWN FOR LONG^L WEBS N^OS 3 & 6

ELEVATION I.W.O. MOON POOL





ELEVATION OF LONG^L WEBS AT SIDE

DRAWN FOR LONG^L WEB N^O 17

NOTE
1. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL.
2. EXISTING STRUCTURE SHOWN THUS

Released to public file
Name: Date: NOV 1 2018

CONFIDENTIAL

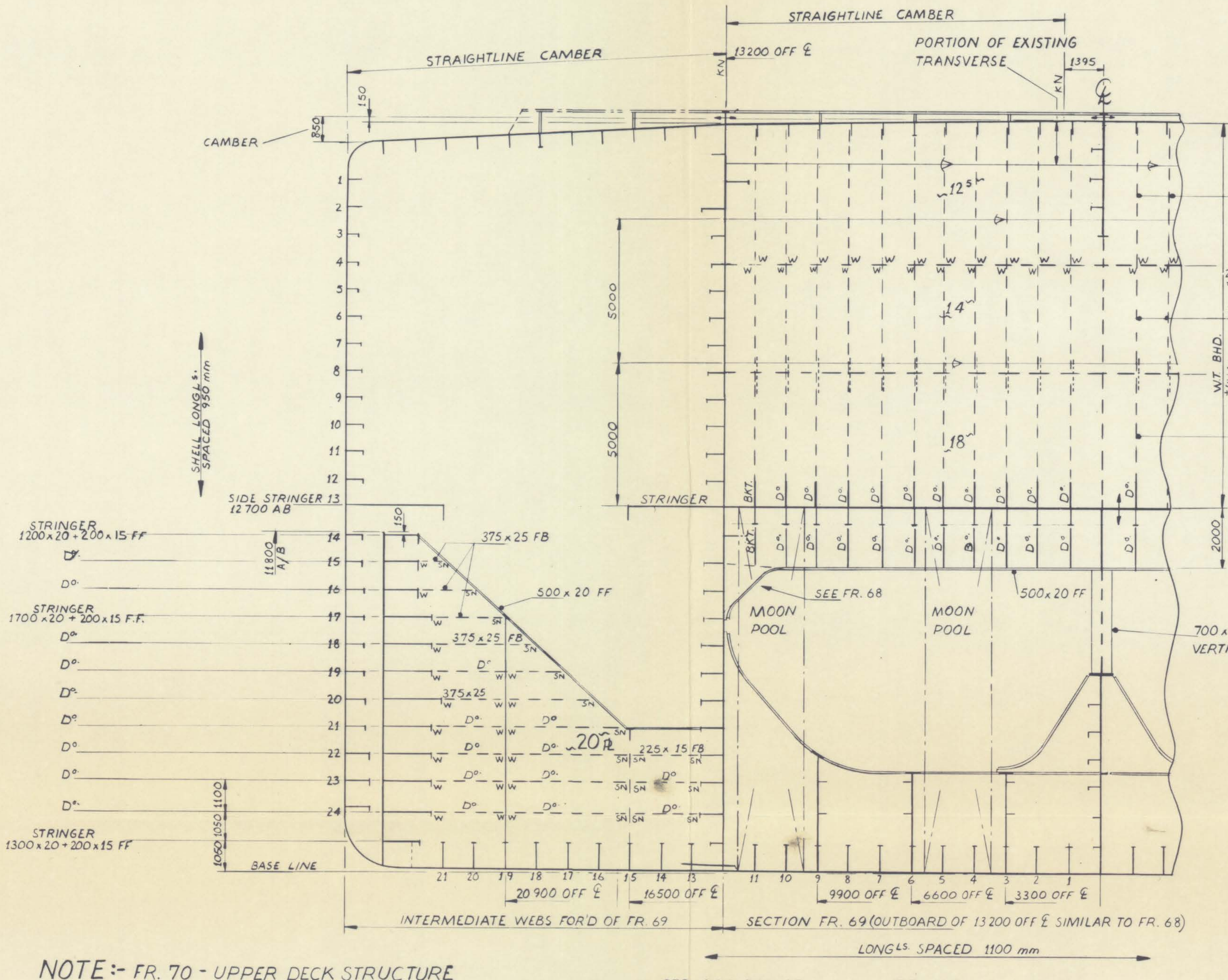
REF N^O	DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
			1	MODIFIED IN ACCORDANCE WITH HITACHI-ZOSEN COMMENTS & GENERAL UP-DATE	AW	3^RD MARCH '82			
			2	PILLARS ON LONG^L N^O 6 MODIFIED, MOON POOL DETAIL ADDED, STRINGERS ON NEW BHD. (FR. 69) CORRECTED.		20^TH MARCH '82			
			3	PILLARS ON LONG^L N^O 6 MODIFIED, PILLAR ON ℄ (FR. 68) RE-LOCATED 500 mm AFT		28^TH MARCH '82			

ENGINEER'S STAMP

ENGINEERING RECORD	DATE
DRAWN BY MARK COOK	22^ND FEB 82
CHKD BY	22 Mar 82
ENGINEER	22^ND FEB 82
DOME APP.	22^ND FEB 82

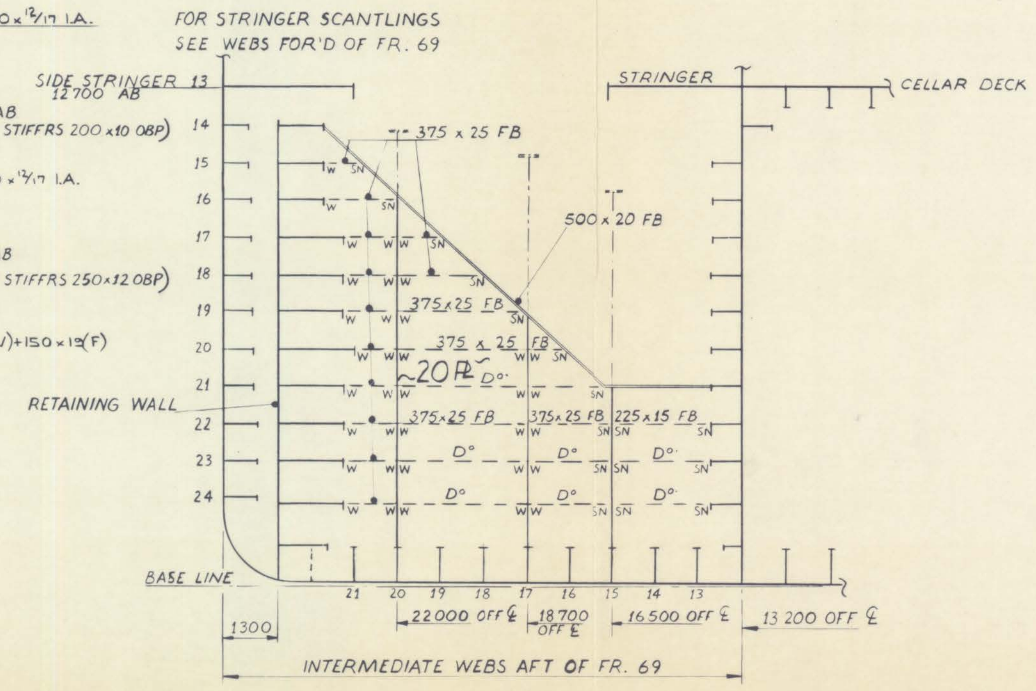
DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT: S.D.C.
PREPARED BY: BEAUFORT SEA ENG^G & DESIGN
TITLE: AFT END ICE STIFFENING - ELEVATIONS
SCALE: 1:100
CONTR. DWG. NO.
DOME DWG. NO.: E-SDC-860-04
REV: 3

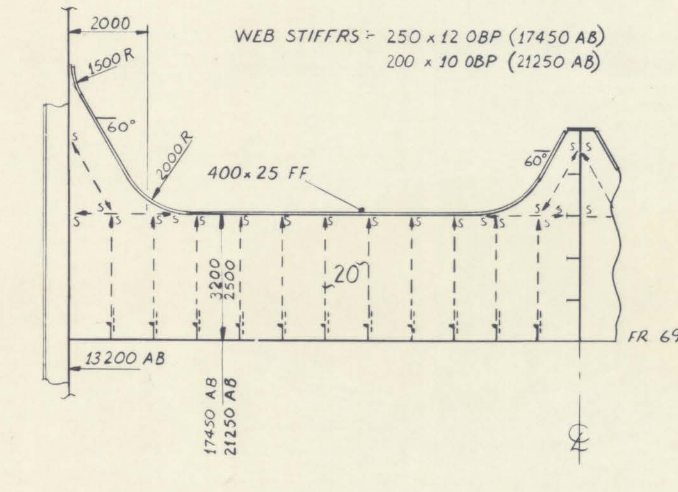


FR. 69

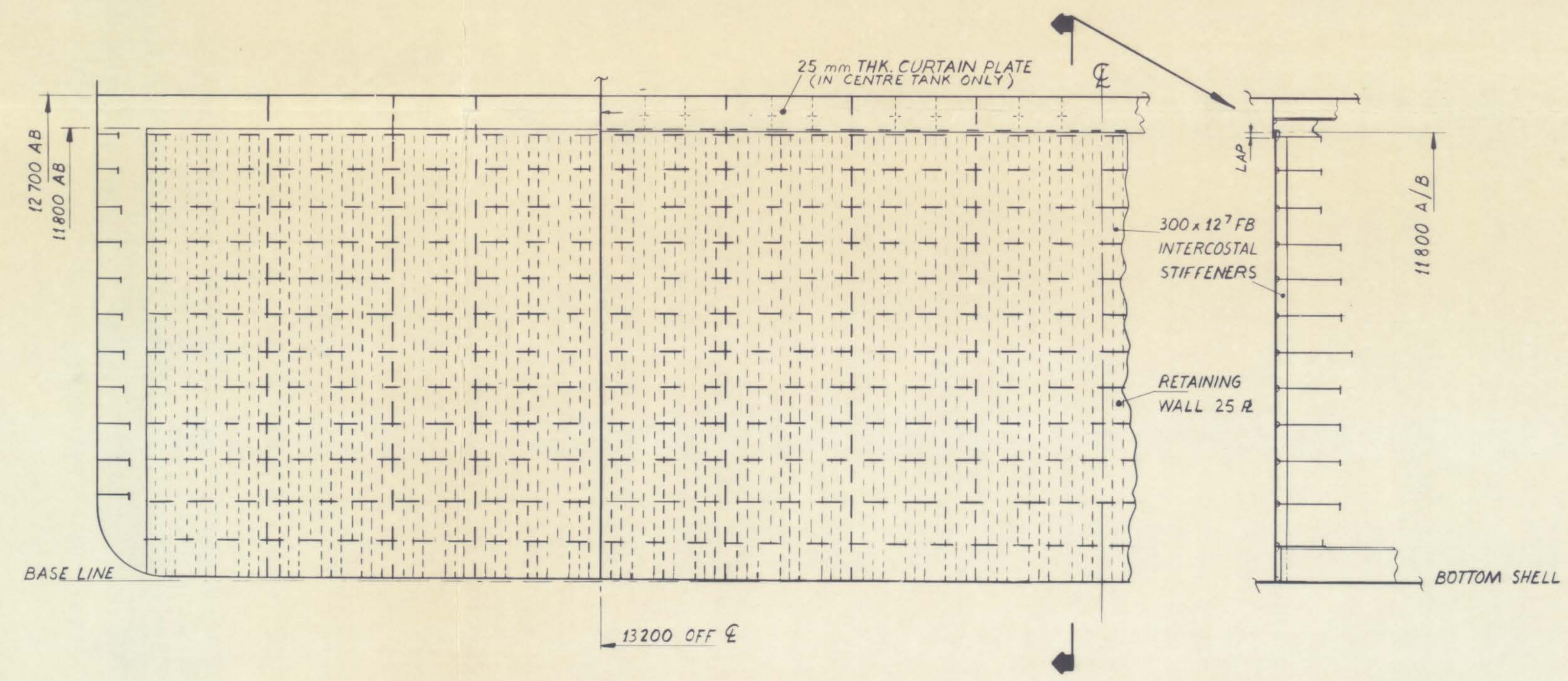
NOTE:- FR. 70 - UPPER DECK STRUCTURE SIMILAR TO FR. 68 & BOTTOM STRUCTURE SIMILAR TO FR. 69



STBD. SIDE SIMILAR

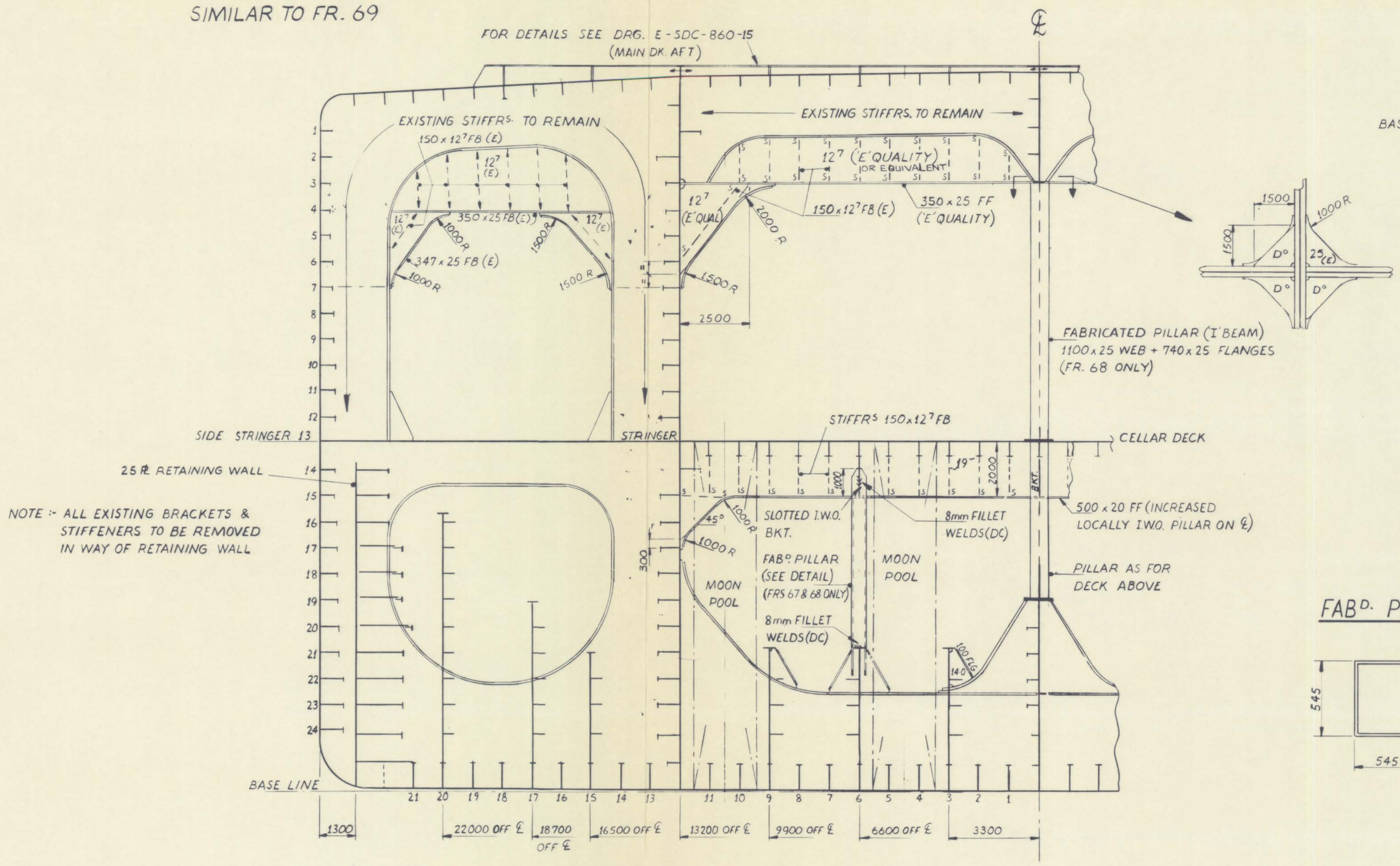


BHD. STRINGERS



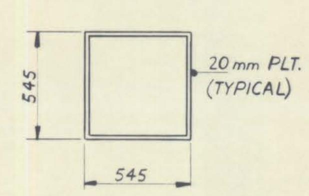
AFT RETAINING WALL

STBD. SIDE SIMILAR



SECTION AT FR. 68 (LOOKING FWD.) (STB SIDE SIMILAR)

FR. 67 SIMILAR
FR. 70 SIMILAR



FABD. PILLAR

NOTES:
1) W - WELDED CONNECTION
2) SN - SNIPE
3) ALL EXISTING STIFFENERS, TRIPPING BRACKETS AND FACE FLATS TO BE REMOVED, WHERE NECESSARY, FOR NEW STRUCTURE.
4) ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL EXCEPT AS NOTED.

Released to public file
Name: [signature] Date: NOV 1 2018

CONFIDENTIAL

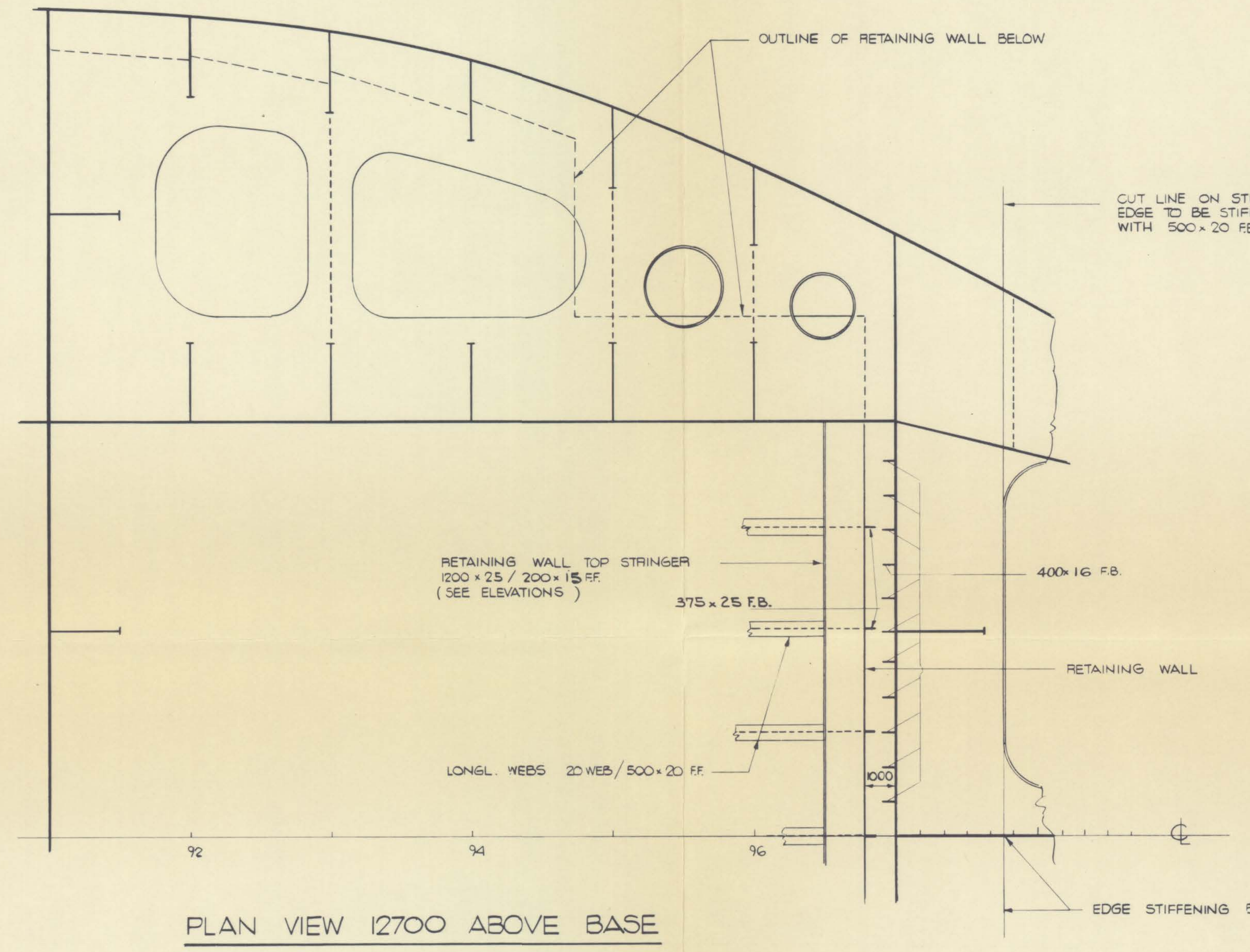
REF. Nº	DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD.	APR	DOME APP.
			1	MODIFIED IN ACCORDANCE WITH 'HITACHI-ZOSEN' COMMENTS & GENERAL UP-DATE	AW	4TH MARCH '82			
			2	PILLAR ON FRS. 67 & 68 (P&S) MODIFIED		20TH MARCH '82			
			3	PILLARS ON FRS. 67 & 68 (P&S) MODIFIED, PILLAR ON ℄ RE-LOCATED 550 mm AFT.		28TH MARCH '82			

ENGINEER'S STAMP

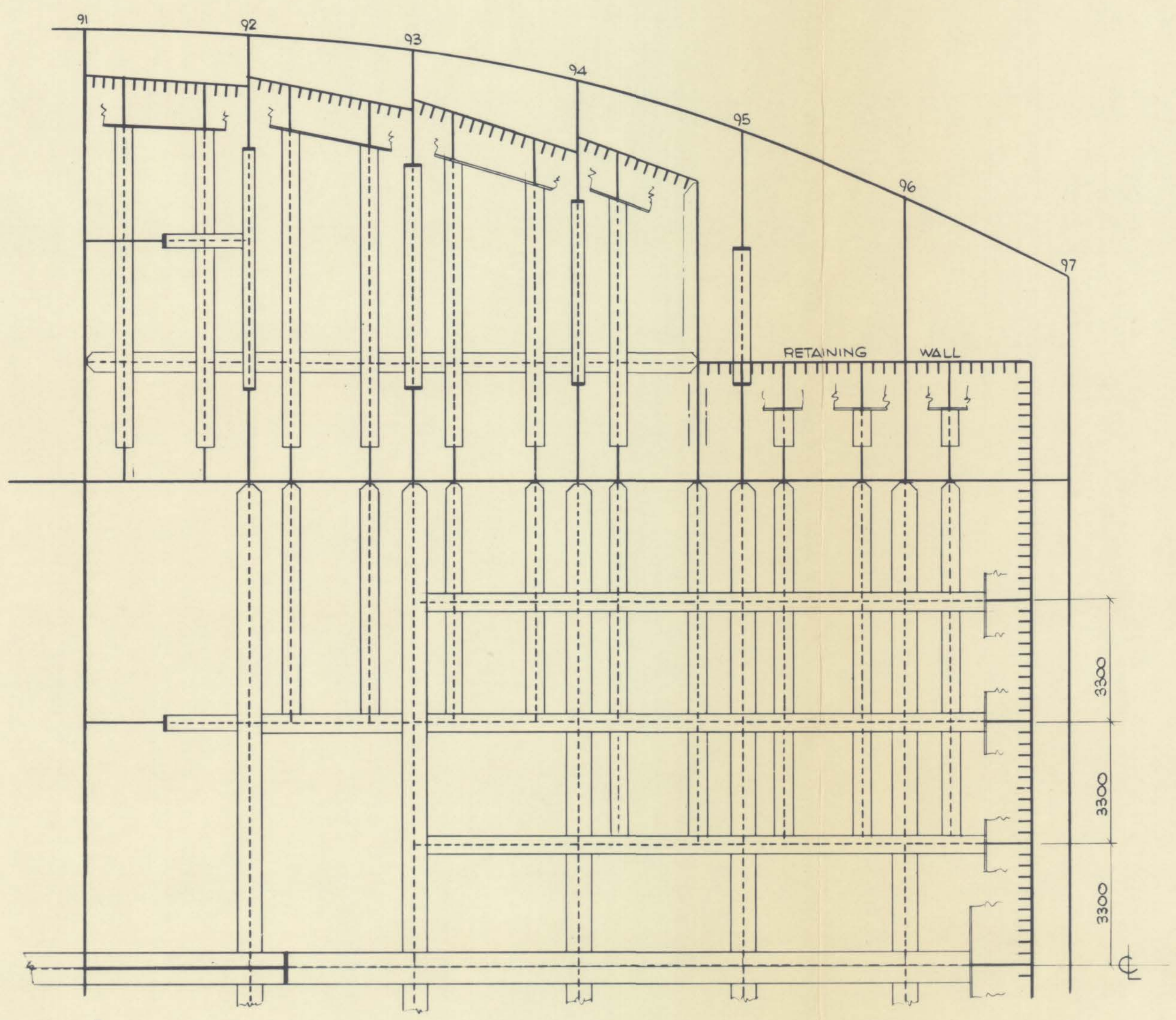
ENGINEERING RECORD	
DRAWN BY BRIAN J. GELDART	DATE 21ST FEB '82
CHKD BY [signature]	22 Mar 82
ENGINEER [signature]	82-03-22
DOME APP. J M Milne	22 Feb 82

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT: SDC
PREPARED BY: BEAUFORT SEA ENGINEERING & DESIGN
TITLE: AFT END ICE STIFFENING (SECTIONS)
SCALE: 1:100
CONTR. DWG. NO.
DOME DWG. NO. E-SDC-860-05
REV 3



PLAN VIEW 12700 ABOVE BASE



FLOOR PLAN

NOTE

1. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL.

Released to public file
Name:____________ Date: NOV 1 2018

CONFIDENTIAL

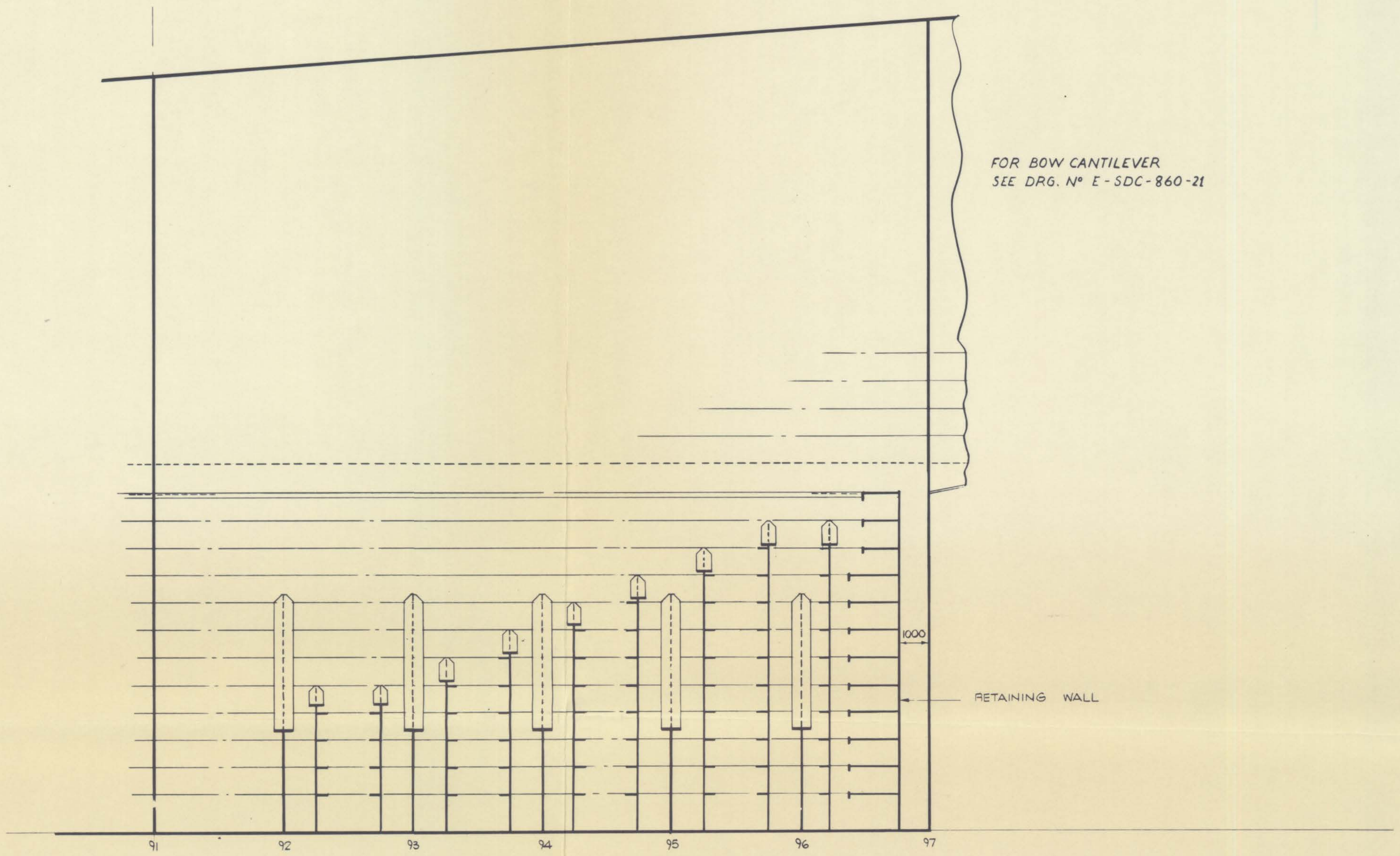
REF No	DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD.	APP.	DOME APP.
			1	MODIFIED IN ACCORDANCE WITH 'HITACHI-ZOSEN' COMENTS	AW	4th MARCH '82			

ENGINEER'S STAMP

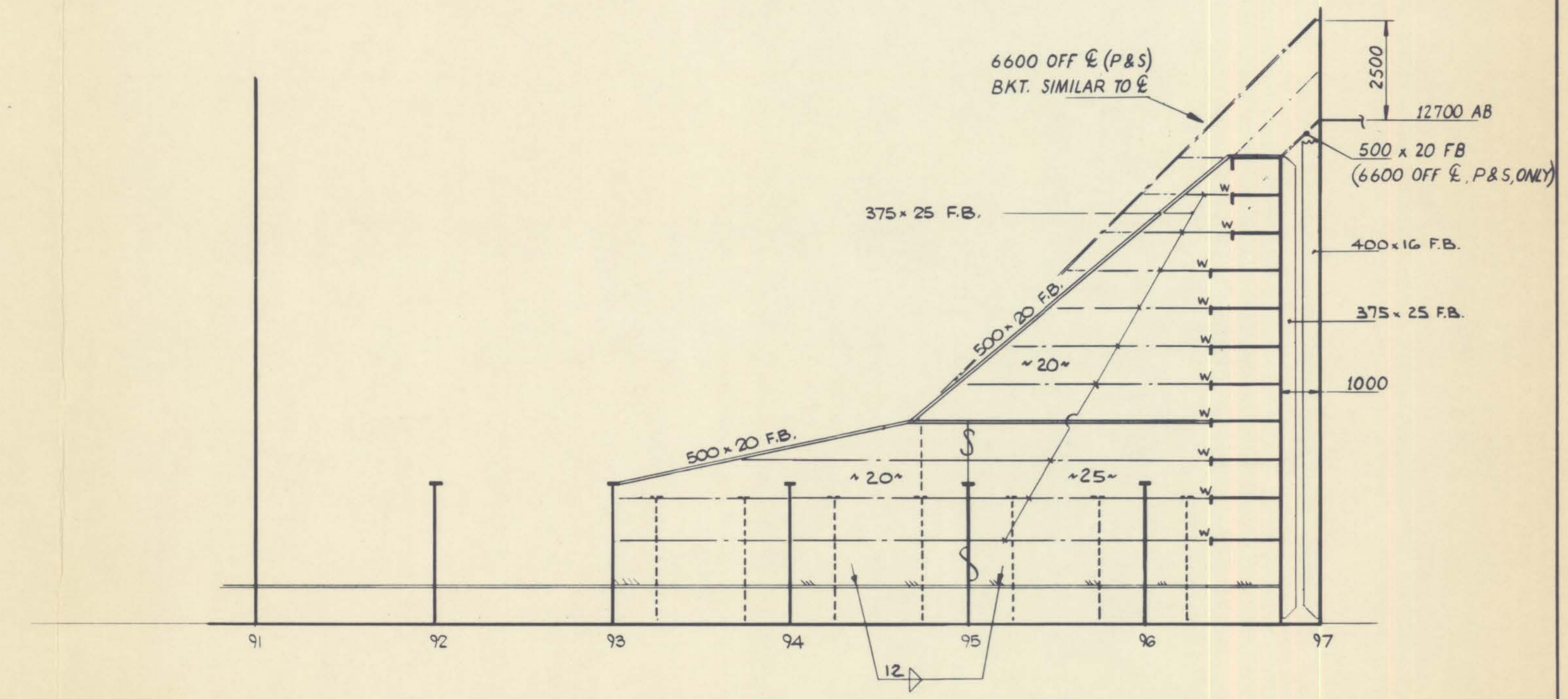
ENGINEERING RECORD	
DRAWN BY M. HARINEN	DATE FEB. 22/82
CHKD BY	
ENGINEER [signature]	82-02-22
DOME APP. [signature]	82-02-22

DOME PETROLEUM LIMITED CALGARY ALBERTA CANADA

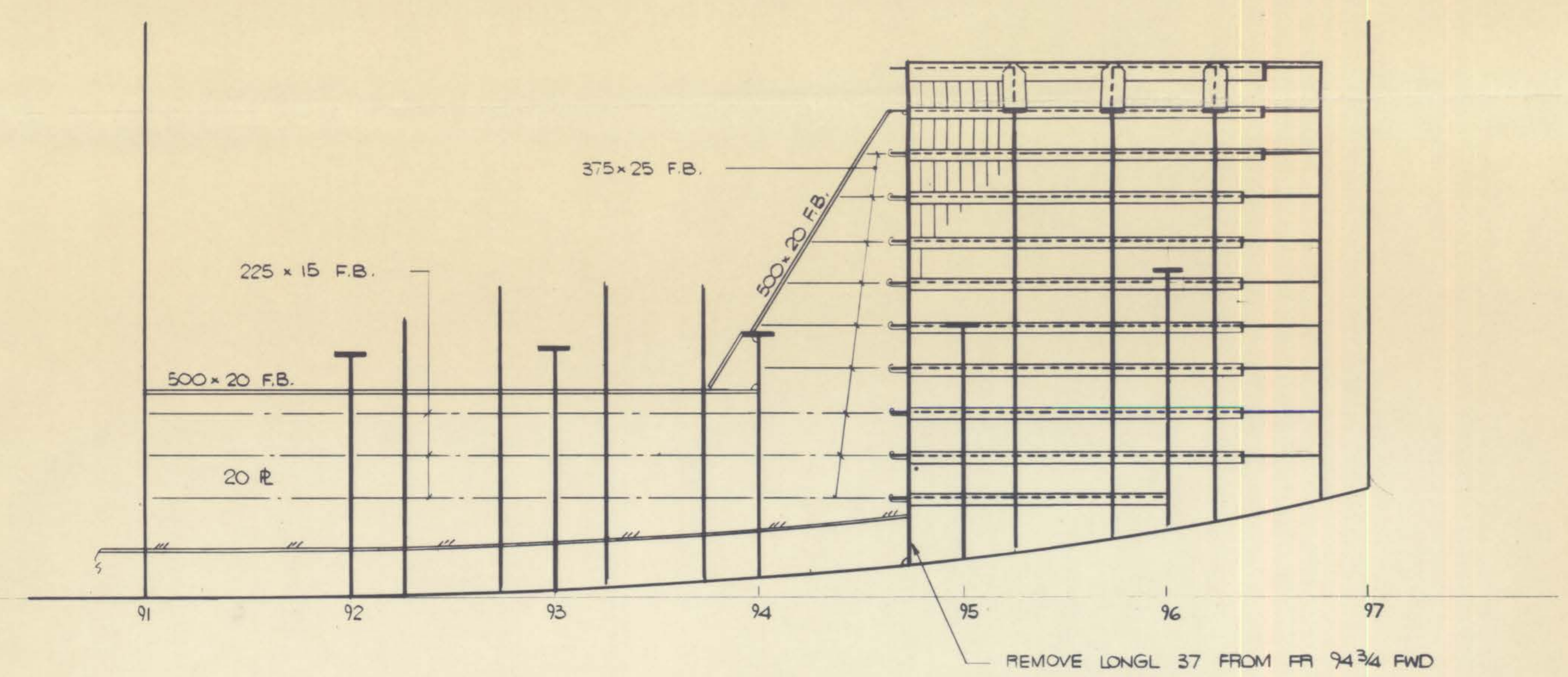
PROJECT	S.D.C.
PREPARED BY	BEAUFORT SEA ENG. & DESIGN
TITLE	FORE END ICE STIFFENING (PLANS)
SCALE 1:100	CONTR. DWG. NO. / DOME DWG. NO. E-SDC-860-06	REV 1



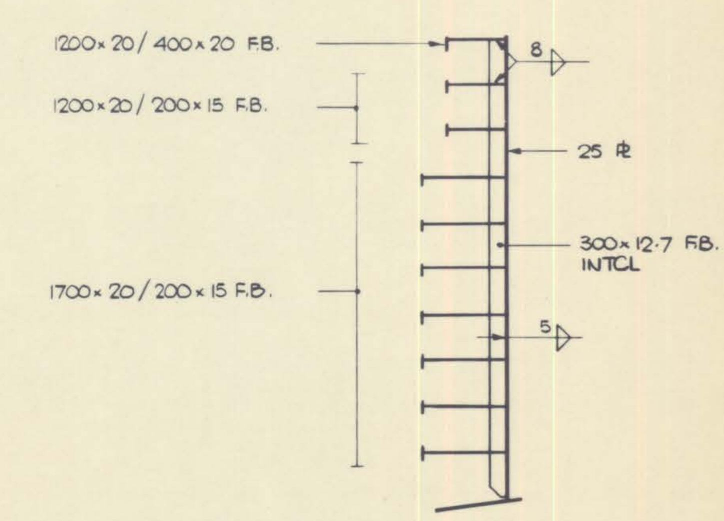
ELEVATION AT WING BHD



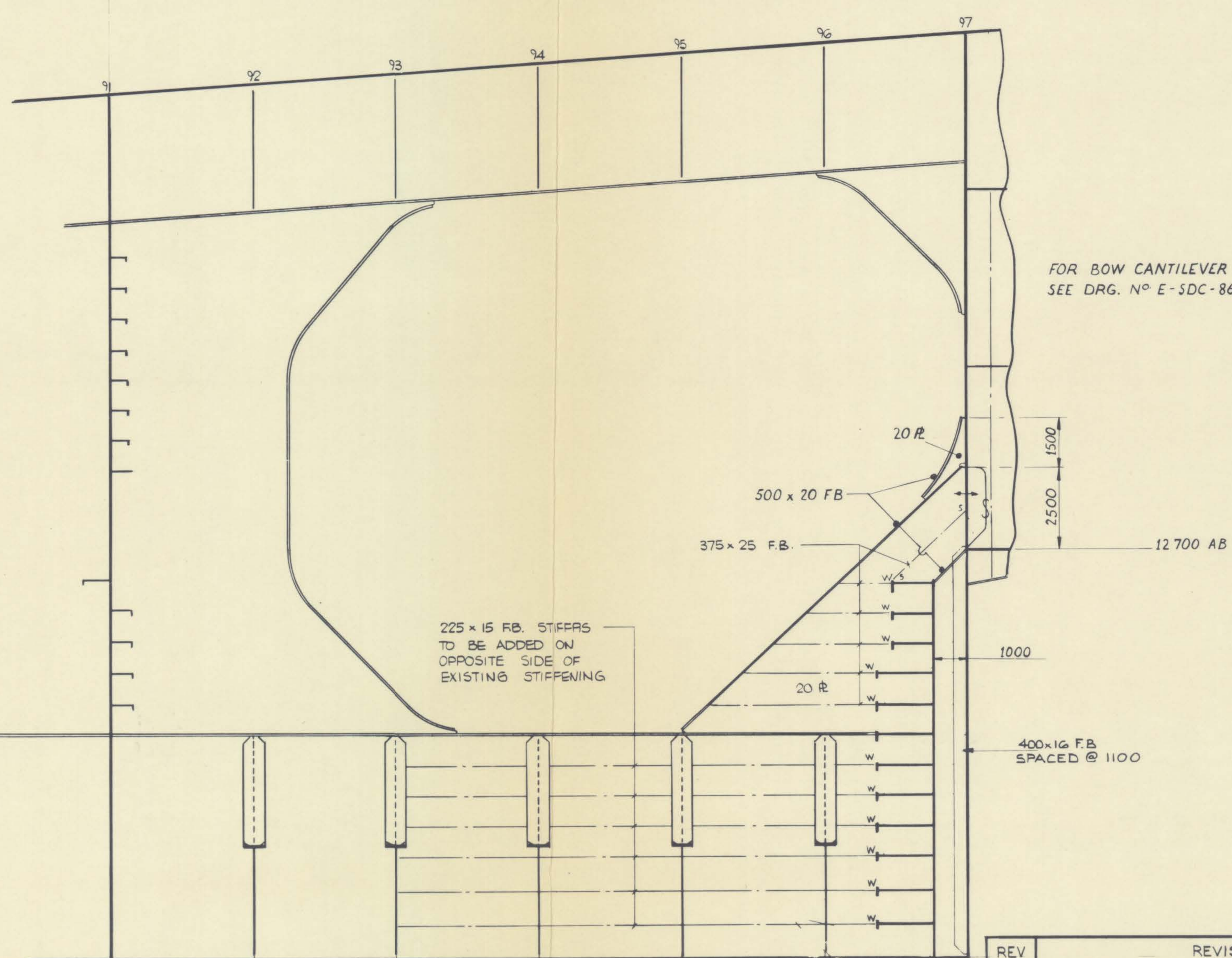
TYPICAL ELEVATION
(DRAWN FOR 3300 OFF ℄)



ELEVATION 16500 OFF ℄



RETAINING WALL



ELEVATION AT CTR. LINE

NOTE
1. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL.

Released to public file
Name: DJ Date: NOV 1

CONFIDENTIAL

REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
1	MODIFIED IN ACCORDANCE WITH HITACHI-ZOSEN COMMENTS	AW	4TH MARCH '82			
2	DRAWING UP-DATED		21ST MARCH '82			
3	LONGL. BKT. ON ℄ & 6600 OFF ℄ (P&S) INCREASED		28TH MARCH '82			
4	" " " ℄ MODIFIED - To Suit Modified Bow Cantilever cut [illegible]		31ST MARCH '82			

ENGINEER'S STAMP

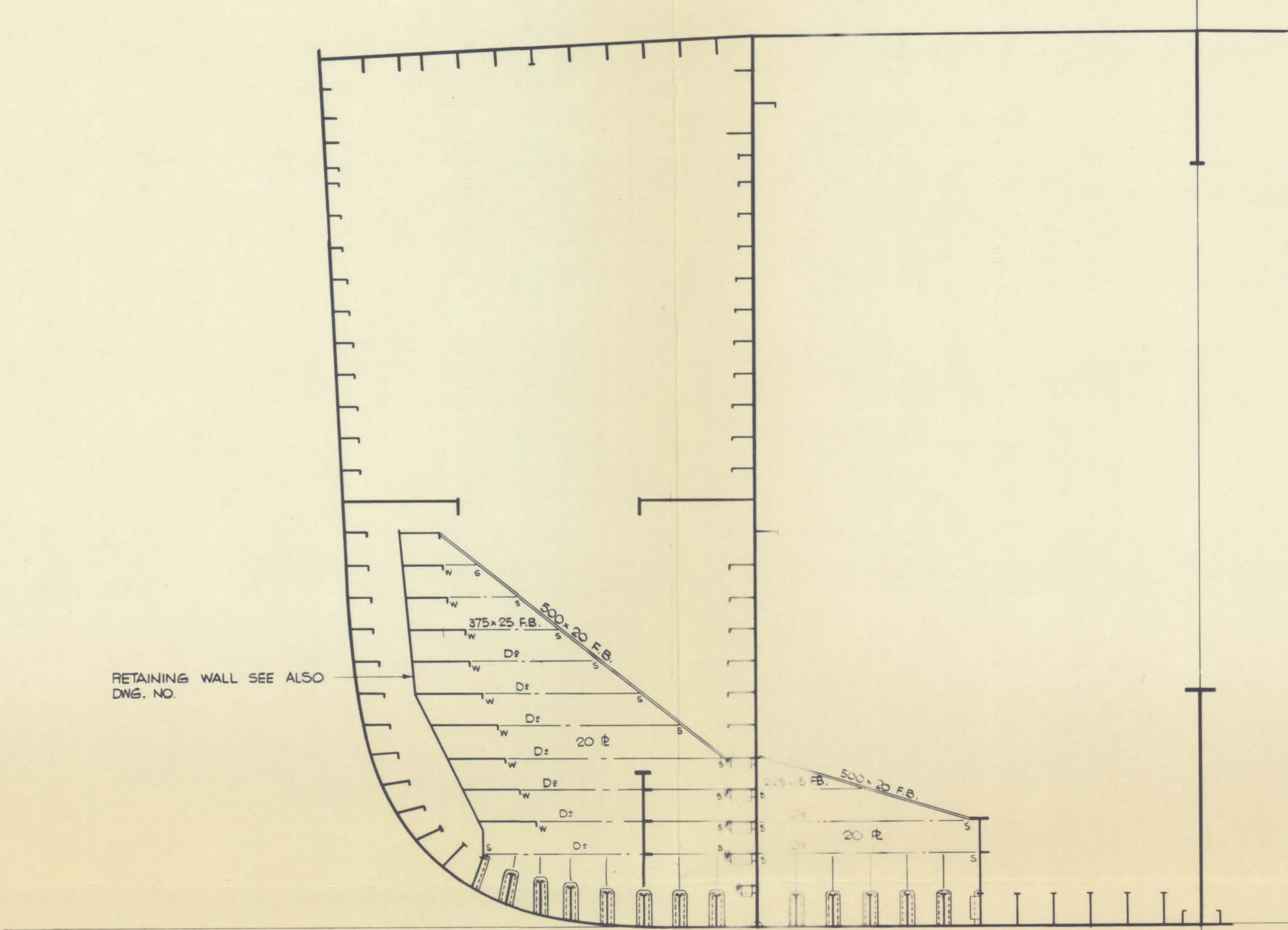
ENGINEERING RECORD	
DRAWN BY M. HARINEN	DATE FEB 22/82
CHKD BY	Mar 82.
ENGINEER John G. Stott	82-02-22
DOME APP. J. M. Milne	82-02-22

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

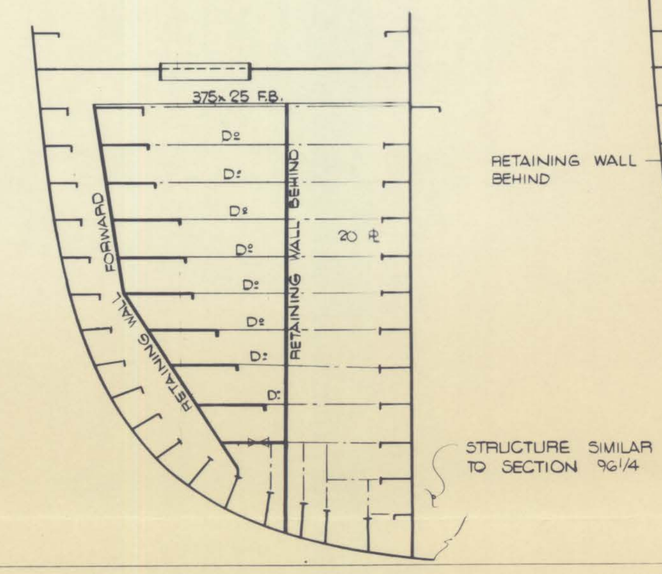
PROJECT S.D.C.
PREPARED BY BEAUFORT SEA ENG. & DESIGN
TITLE FORE END ICE STIFFENING (ELEVATIONS)
SCALE 1:100
CONTR. DWG. NO.
DOME DWG. NO. E - SDC - 860 - 07
REV 4

NOTES :

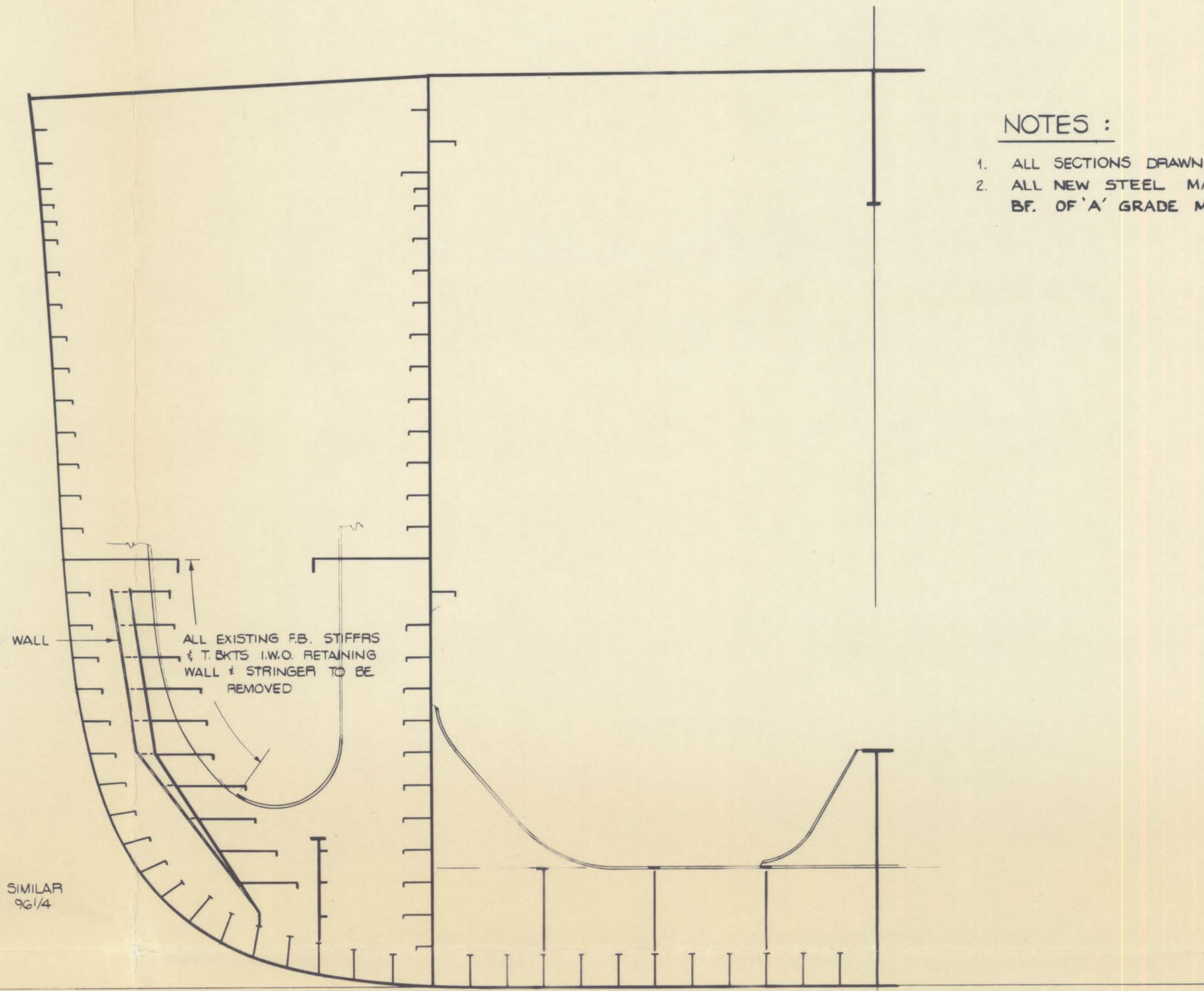
1. ALL SECTIONS DRAWN LOOKING FWD
2. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MILD STEEL.



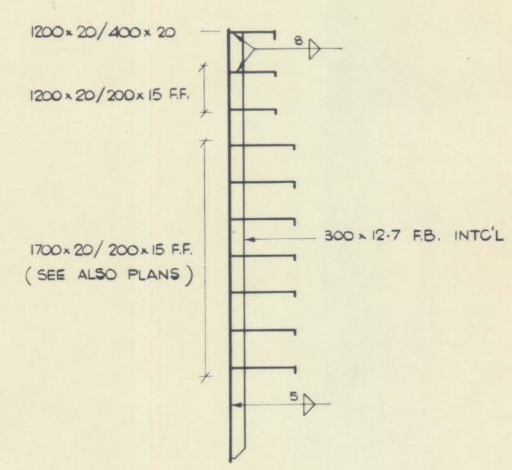
SECTION FRAME 92¼



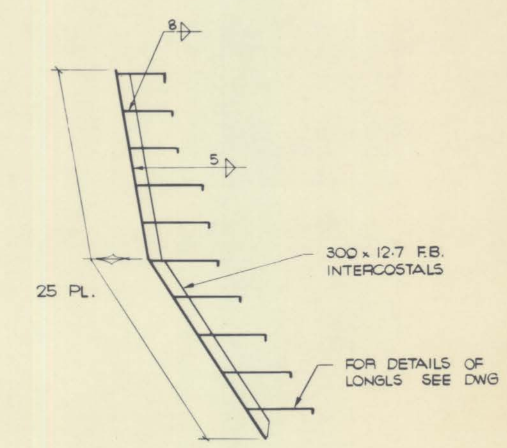
SECTION FR. 94¾



SECTION FRAME 94

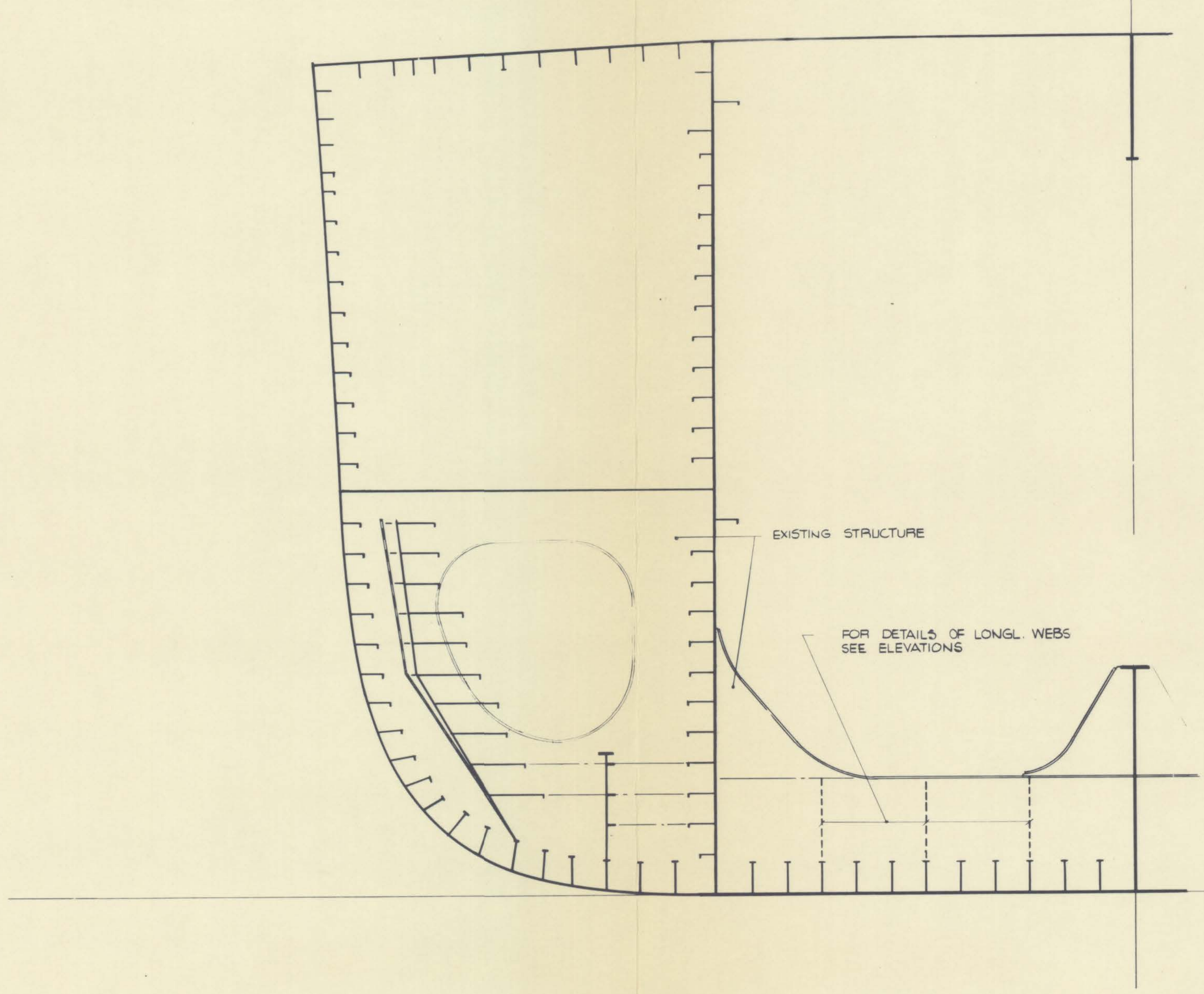


TYPICAL FOR FR. 94¾ - FWD

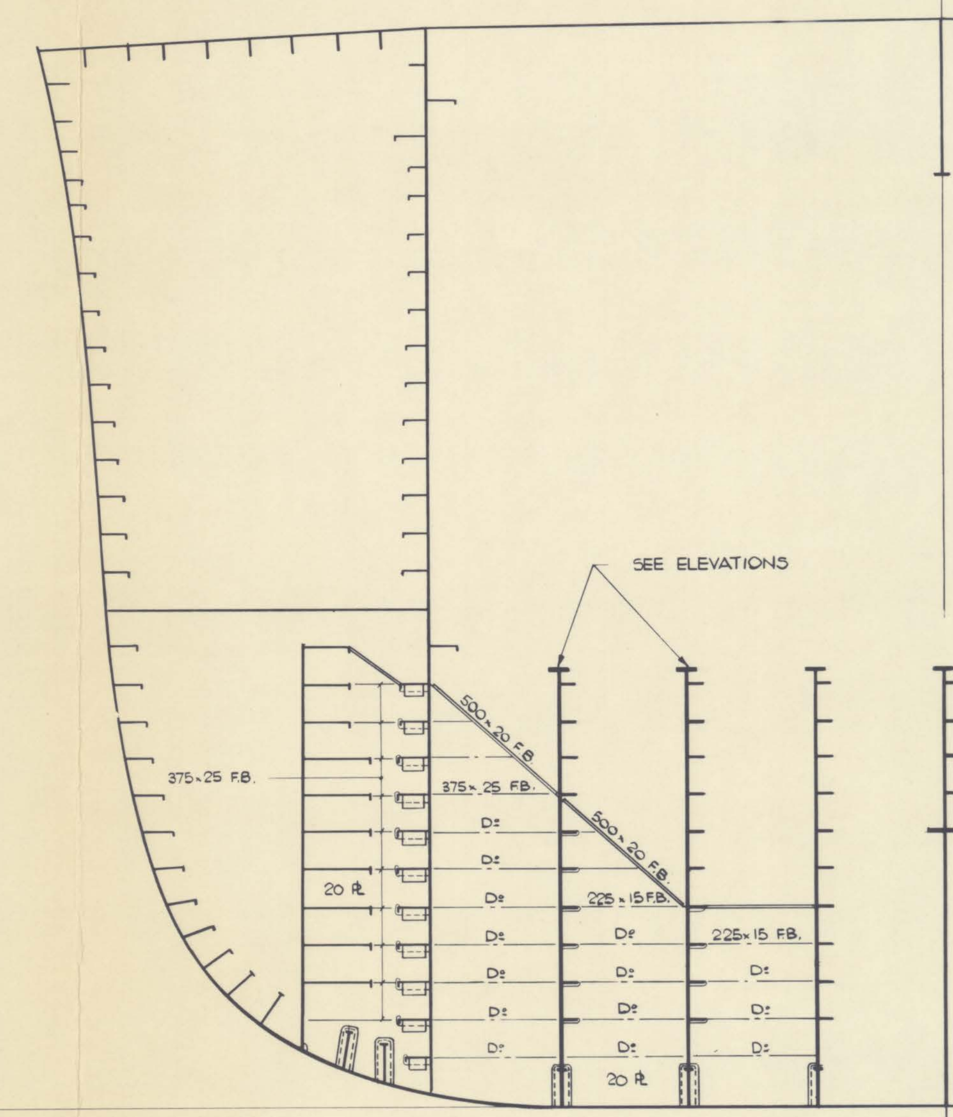


TYPICAL FOR FR. 94¾ - AFT

RETAINING WALL



SECTION FRAME 93



SECTION FR. 96¼

Released to public file
Name: [signature] Date: NOV 1 2013

CONFIDENTIAL

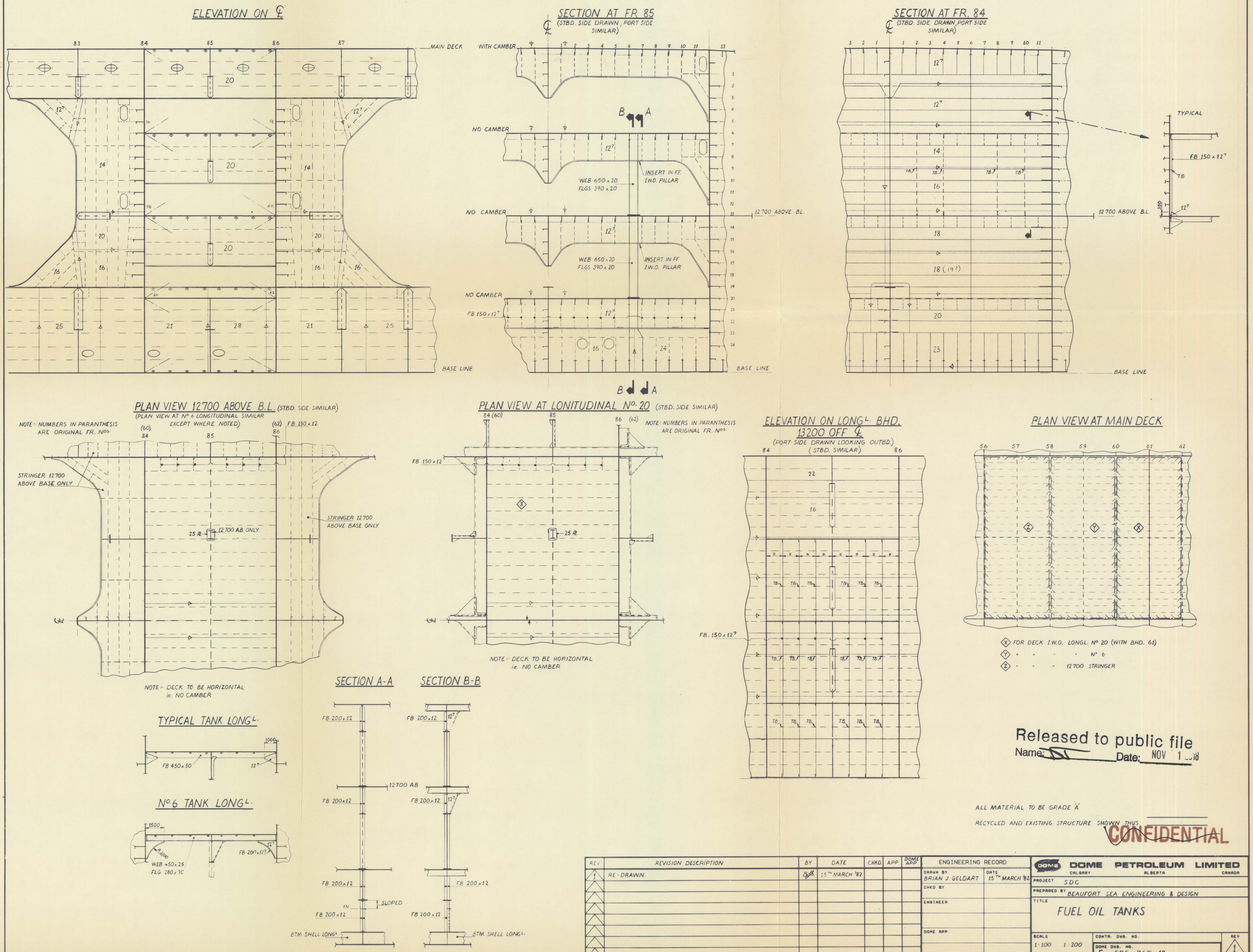
REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APR
1.	MODIFIED IN ACCORDANCE WITH 'HITACHI-ZOSEN' COMMENTS	AW	4th MARCH '82			

ENGINEER'S STAMP

ENGINEERING RECORD	
DRAWN BY M. HARINEN	DATE FEB. 21/82
CHKD BY	
ENGINEER [signature]	82-02-22
DOME APP. J. M. Milne	82-02-22

DOME PETROLEUM LIMITED — CALGARY ALBERTA CANADA

PROJECT	S.D.C.
PREPARED BY	BEAUFORT SEA ENG. & DESIGN
TITLE	FORE END ICE STIFFENING (SECTIONS)
SCALE	1:100
CONTR. DWG. NO.	
DOME DWG. NO.	E - SDC - 860 - 08
REV	1



Released to public file
Name: [signature] Date: NOV 1 2018

ALL MATERIAL TO BE GRADE 'A'

RECYCLED AND EXISTING STRUCTURE SHOWN THUS

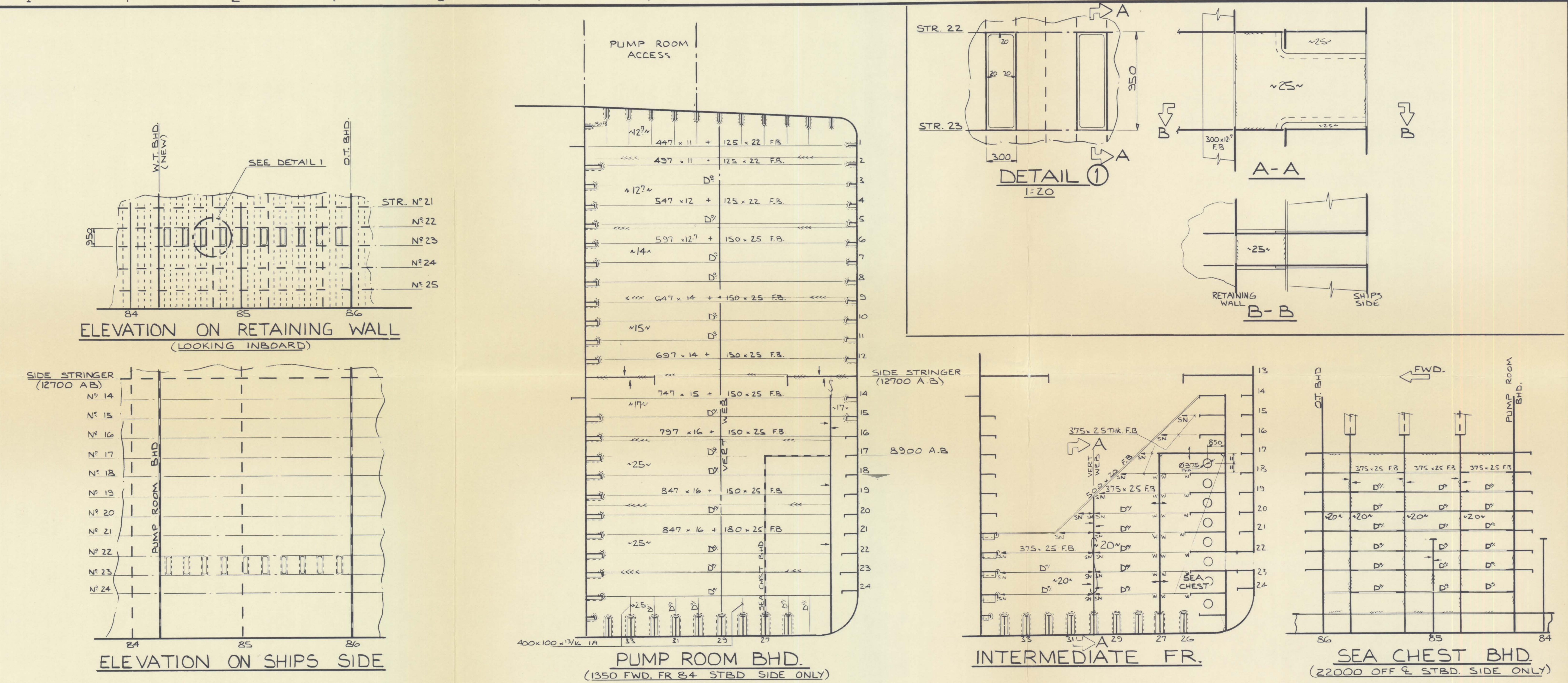
CONFIDENTIAL

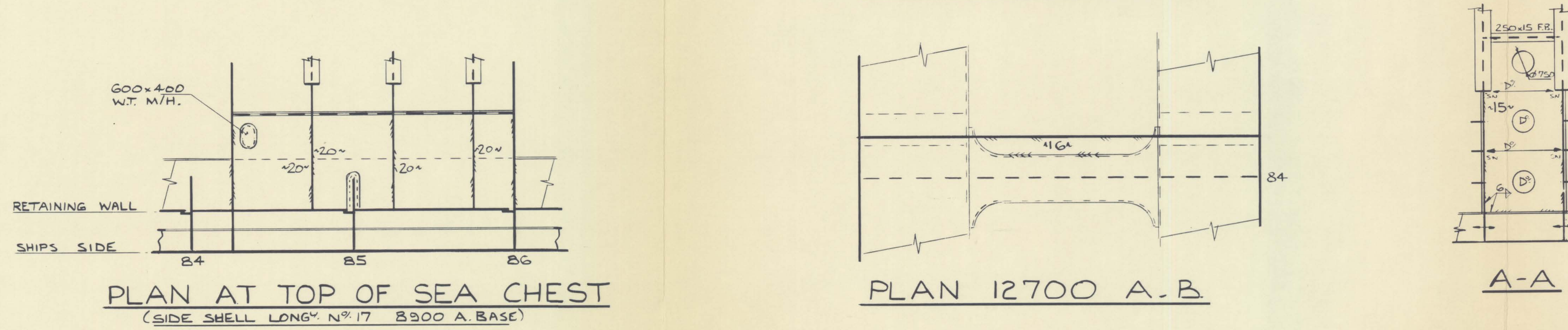
REV	REVISION DESCRIPTION	BY	DATE	CHKD.	APP	DOME APP
1	RE-DRAWN	B.J.G.	15TH MARCH '82			

ENGINEERING RECORD	
DRAWN BY BRIAN J. GELDART	DATE 15TH MARCH '82
CHKD BY	
ENGINEER	
DOME APP.	

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT: SDC
PREPARED BY: BEAUFORT SEA ENGINEERING & DESIGN
TITLE: FUEL OIL TANKS
SCALE: 1:100 1:200
CONTR. DWG. NO.
DOME DWG. NO.: E-SDC-860-12
REV: 1





NOTE

1. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE STEEL.
2. ALL STRUCTURE SHOWN THUS IS EXISTING

Released to public file
Name: Date: NOV 1 2018

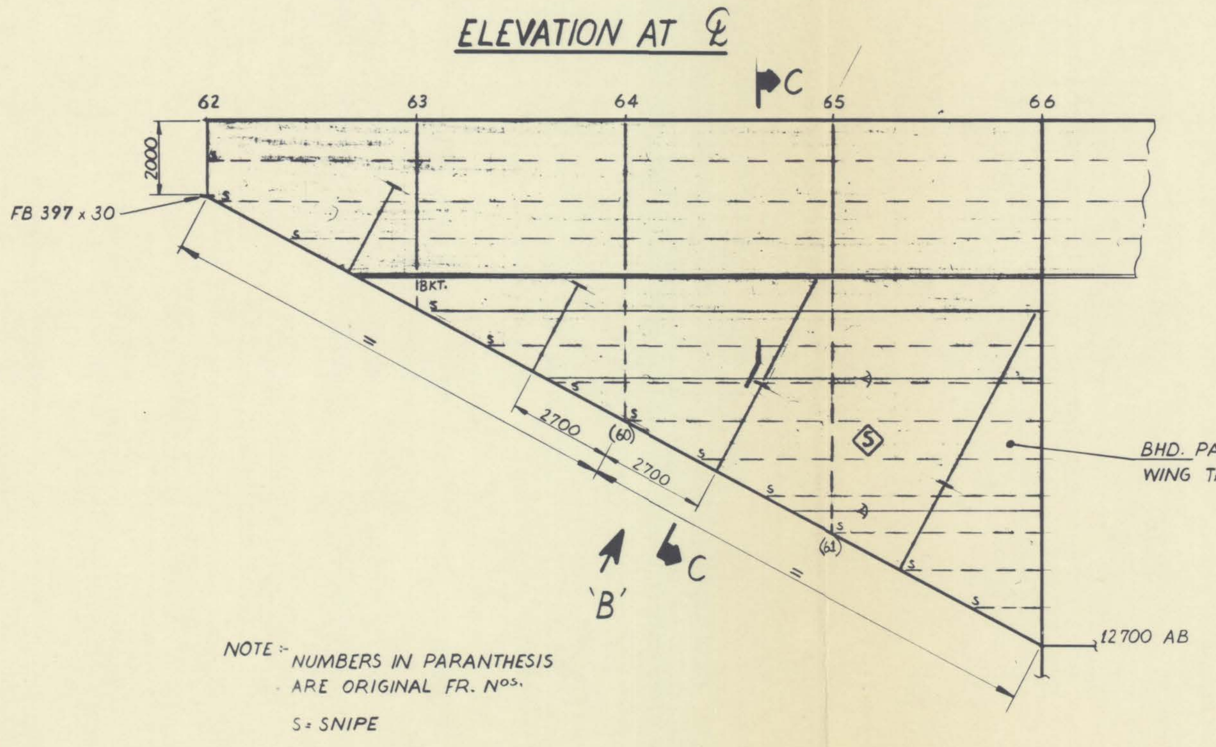
CONFIDENTIAL

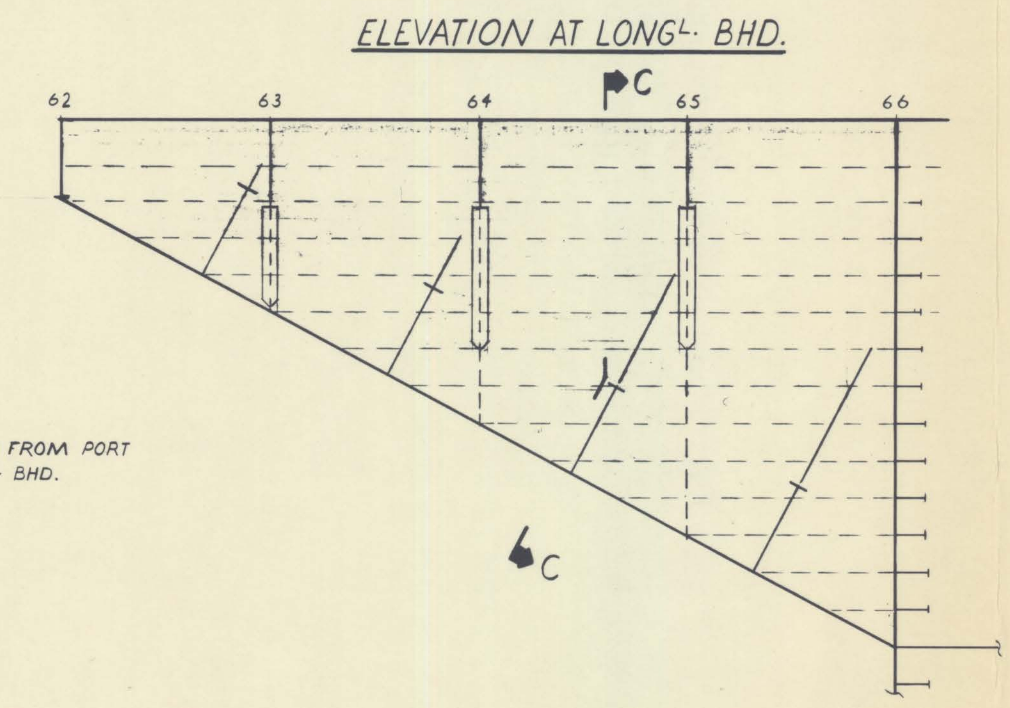
REF Nº	DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP	ENGINEER'S STAMP
1	D-SDC-860-02	MID BODY ICE STIFFENING	1	MODIFIED IN ACCORDANCE WITH HITACHI-ZOSEN COMMENTS	AW	3RD MARCH '82				
				# GENERAL UPDATE						

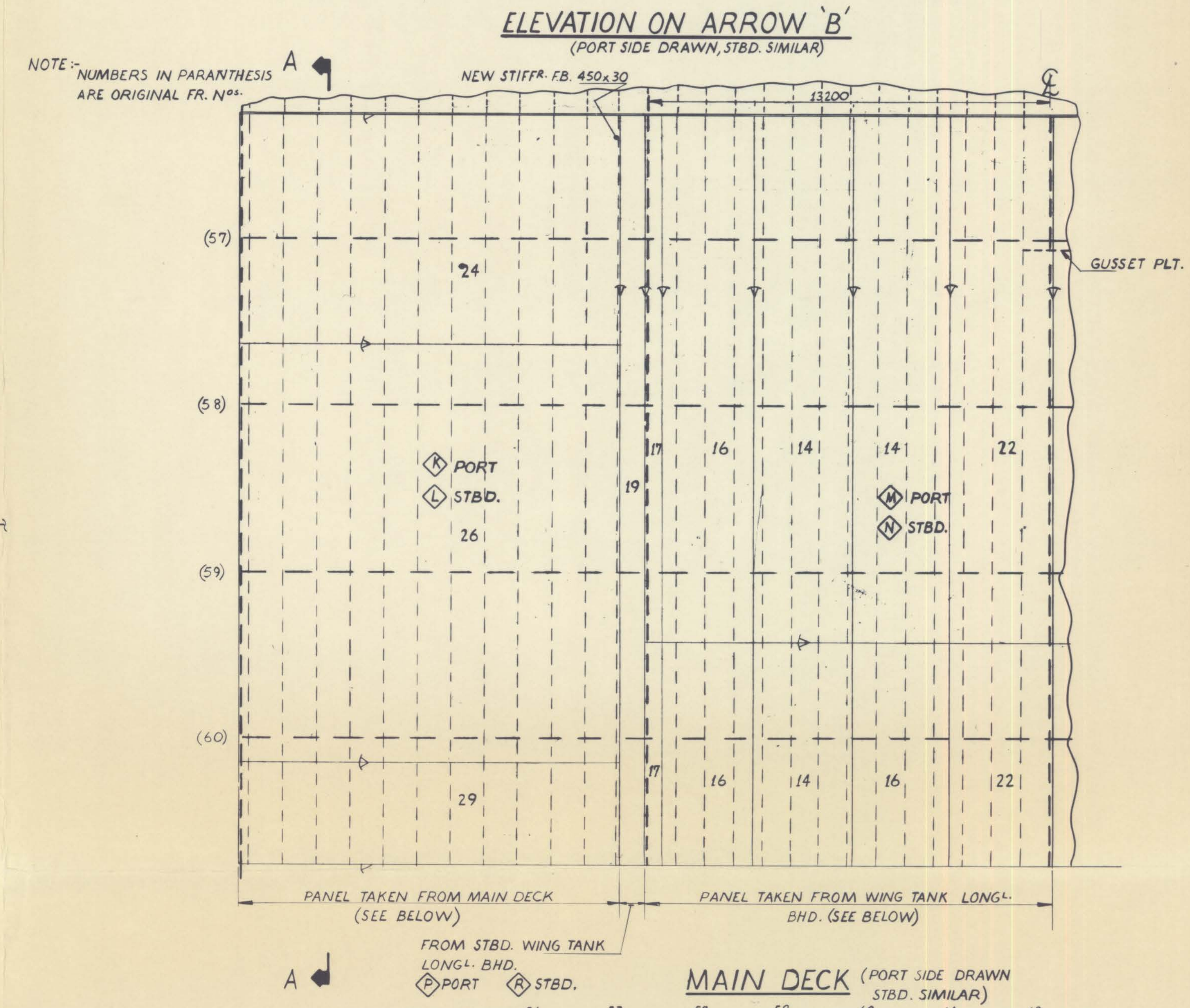
ENGINEERING RECORD	
DRAWN BY ALAN WILLIAMS	DATE 21ST FEB 1982
CHKD BY	
ENGINEER	82-02-22
DOME APP.	82-02-22

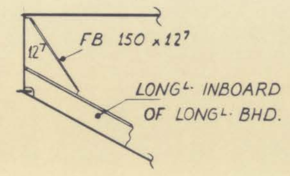
DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

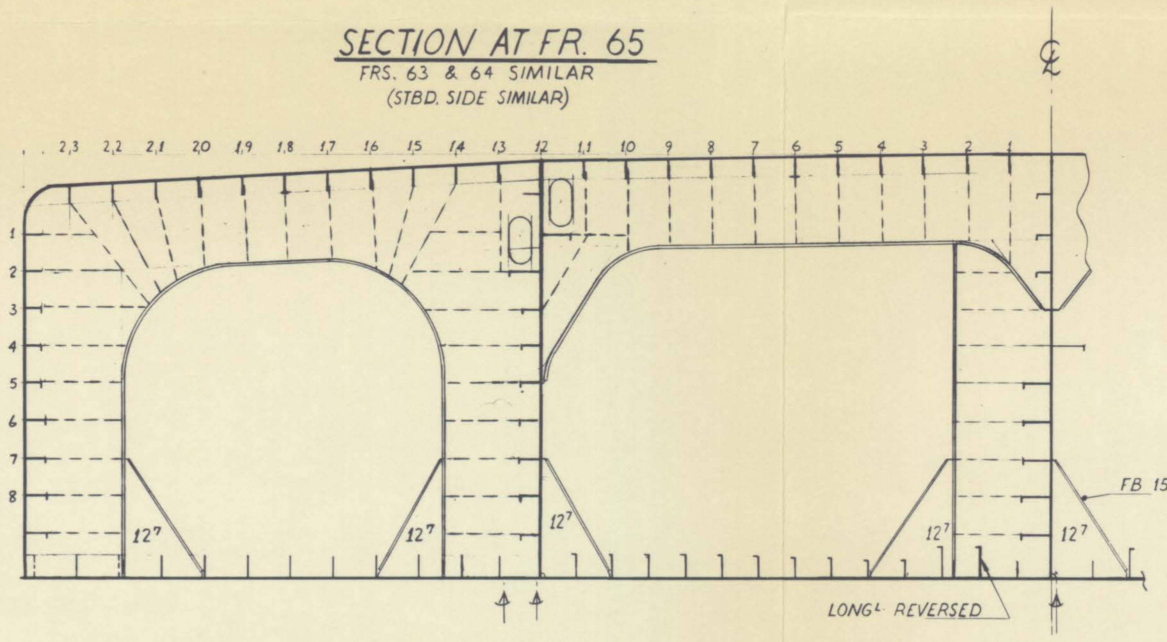
PROJECT S.D.C.
PREPARED BY BEAUFORT SEA ENGᴳ & DESIGN
TITLE PUMP ROOM & SEA CHEST STRUCTURE
SCALE 1:100 & AS STATED
CONTR. DWG. NO.
DOME DWG. NO. D-SDC-860-14
REV 1

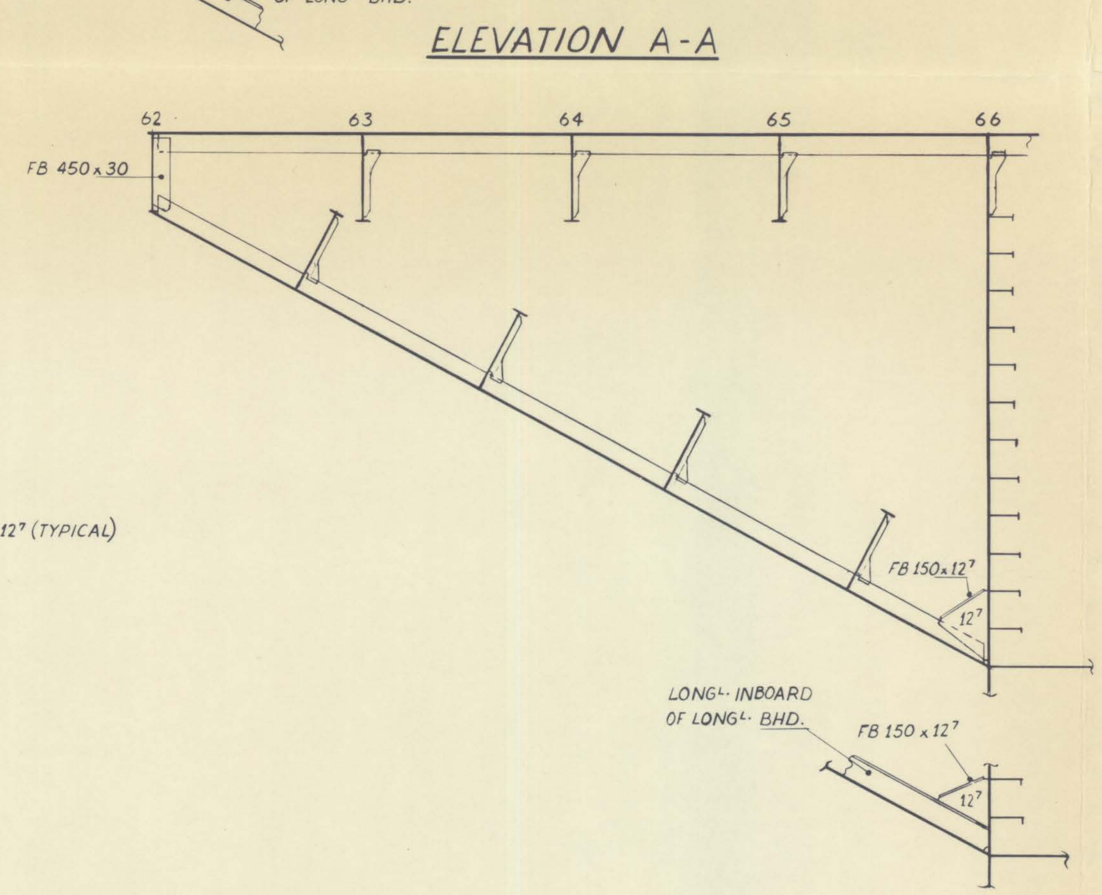


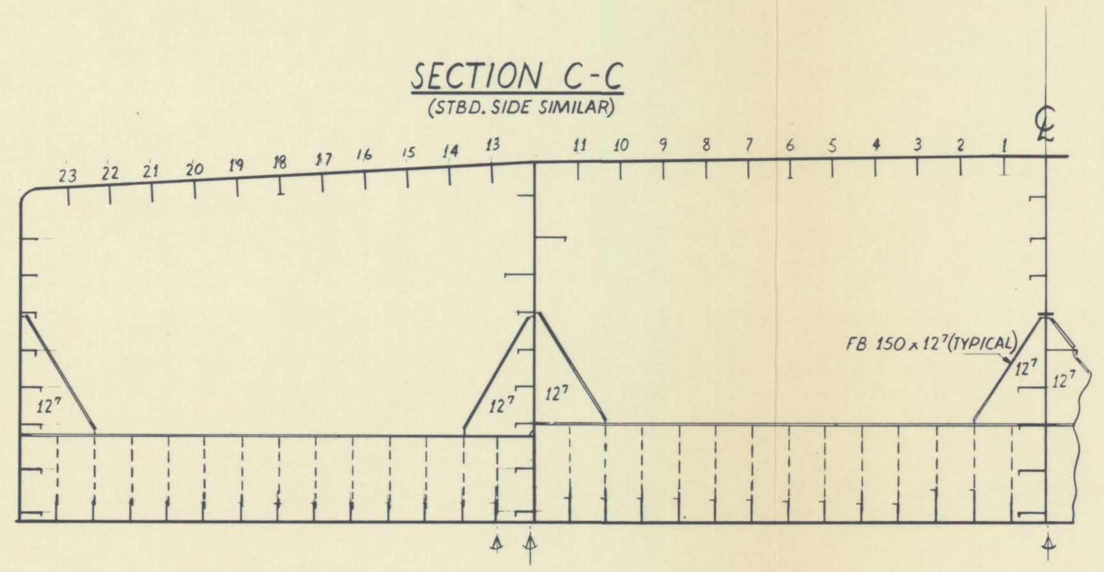


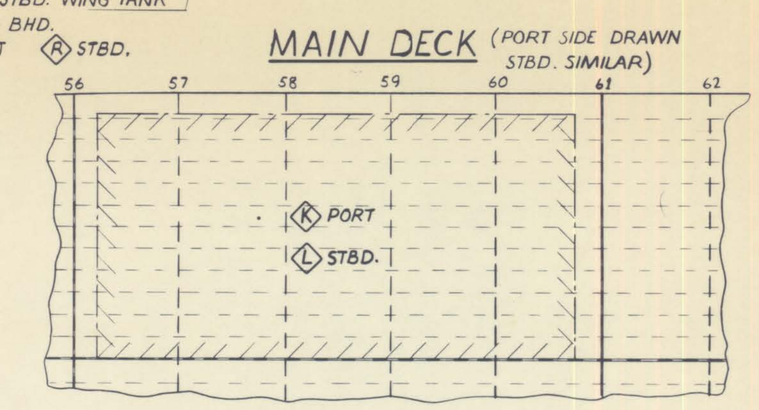


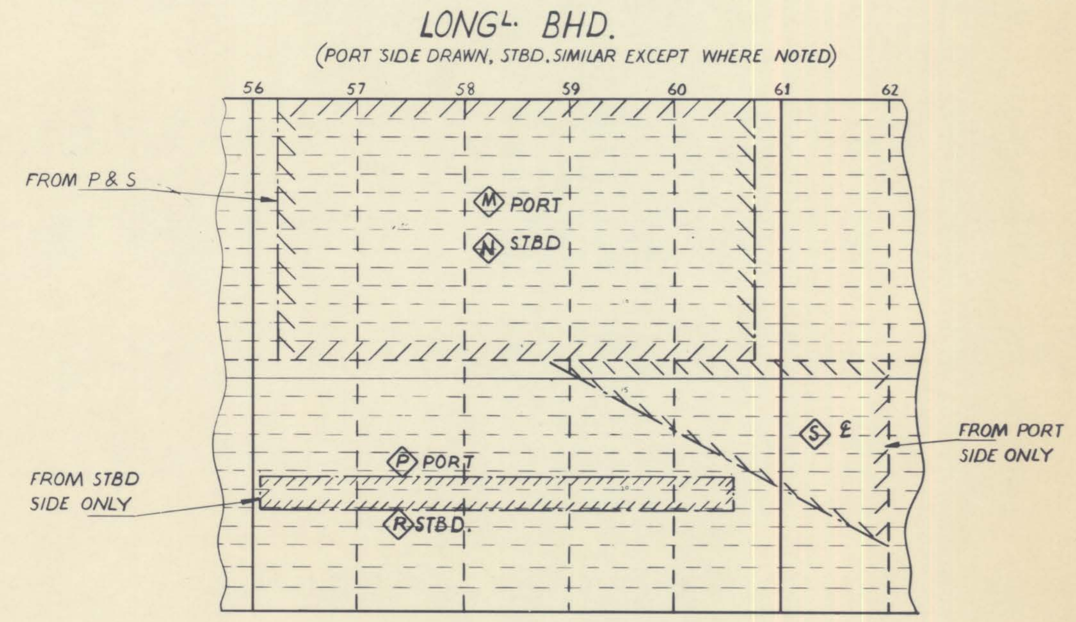












RECYCLED & EXISTING STRUCTURE SHOWN THUS :-

ALL MATERIAL GRADE 'A'

Released to public file
Name: _______ Date: NOV 1

CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD.	APP	DOME APP	ENGINEER'S STAMP
		1	CLADDING CHANGED TO RECYCLED MATL.: CANTILEVER STRENGTHENING ADDED		15TH MAR. '82				

ENGINEERING RECORD		
DRAWN BY BRIAN J. GELDART	DATE 9TH MARCH '82	
CHKD BY D. Elowe	9th March 82	
ENGINEER		
DOME APP.		

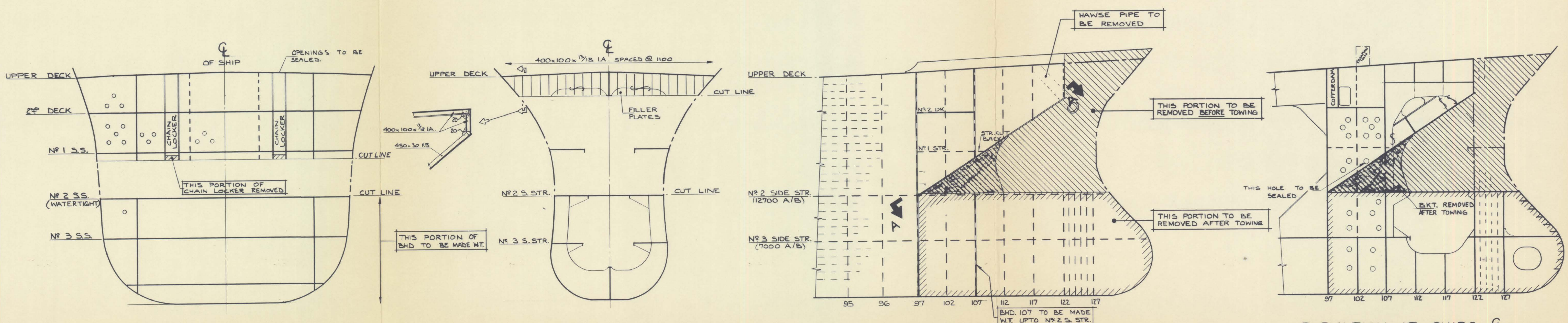
DOME PETROLEUM LIMITED CALGARY ALBERTA CANADA

PROJECT S.D.C.

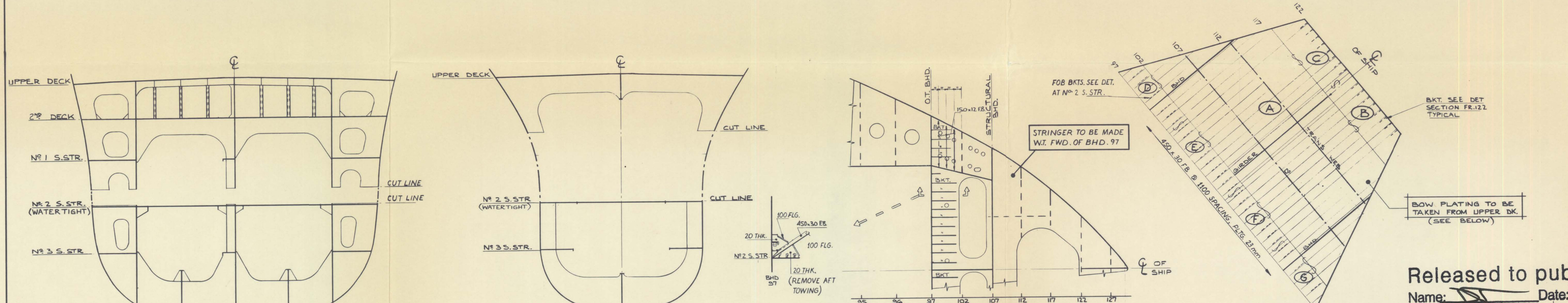
PREPARED BY BEAUFORT SEA ENGINEERING & DESIGN

TITLE STERN CANTILEVER CLADDING

SCALE	CONTR. DWG. NO.	REV
1:100 1:200	DOME DWG. NO. E-SDC-860-20	1

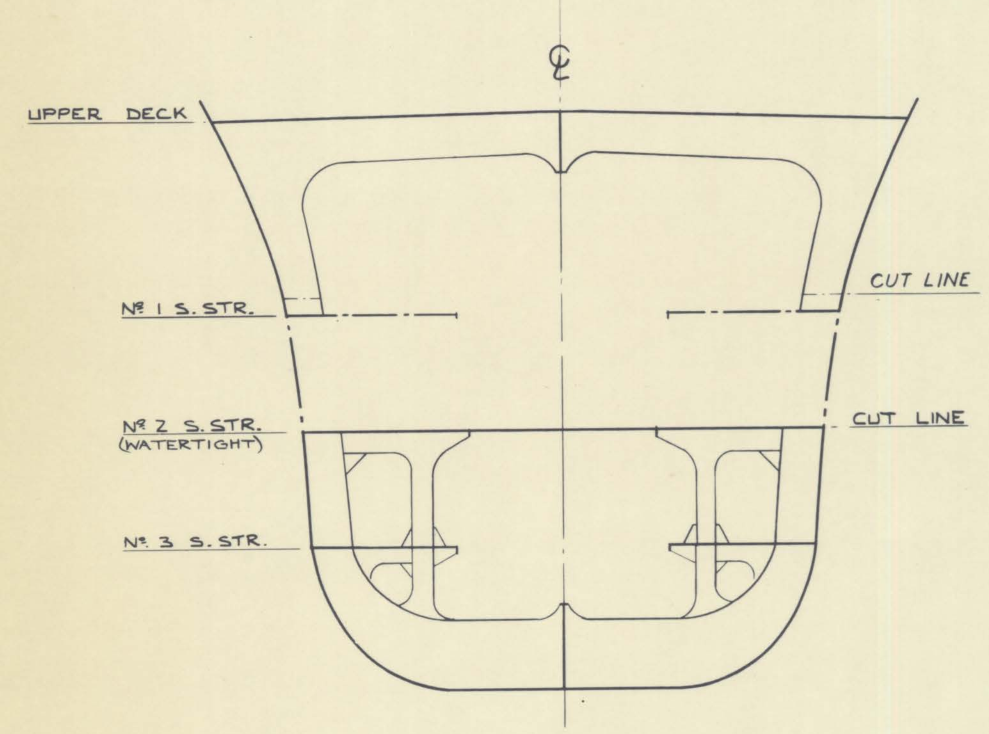


SECTION FR. 107 SECTION FR. 122 PROFILE ELEVATION AT SHIPS ℄



SECTION FR. 102 SECTION FR. 117 PLAN AT Nº 2 SIDE STRINGER SECTION A-A

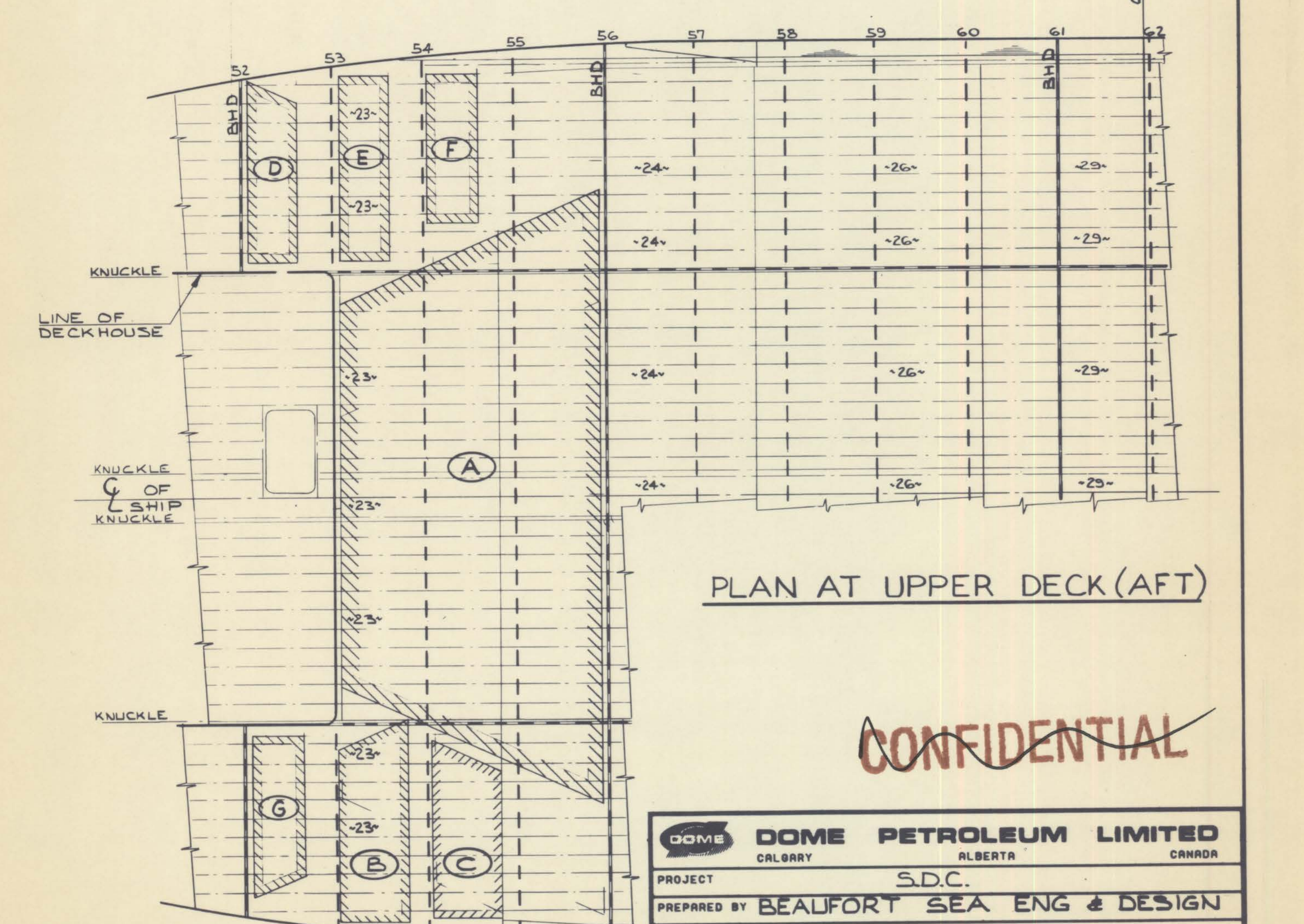
Released to public file
Name: Date: NOV 1 2018



SECTION FR. 112

NOTES

1. ALL NEW STEEL MATERIALS TO BE OF 'A' GRADE MATERIAL.
2. ANY OPENINGS IN BOW PLATING TAKEN FROM UPPER DECK TO BE SEALED AND MADE WATERTIGHT.
3. CARLINGS & DOUBLERS FOR TOWING ARRGT. TO BE ADDED WHEN TOWING POSITIONS ARE DECIDED.
4. HOSE TEST TO BE CARRIED OUT AFTER COMPLETION.
5. TEMPORARY HANDRAILS TO BE FITTED ON UPPER DECK AT FR. 122.



PLAN AT UPPER DECK (AFT)

CONFIDENTIAL

REF Nº	DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
1	E-SDC-860-06	FORE END ICE STIFFENING (PLANS)	1	LINE OF CANTILEVER MODIFIED PER BHS/SWAN WOOSTER		29TH MARCH '82			
2	E-SDC-860-07	" " " " (ELEVATIONS)							

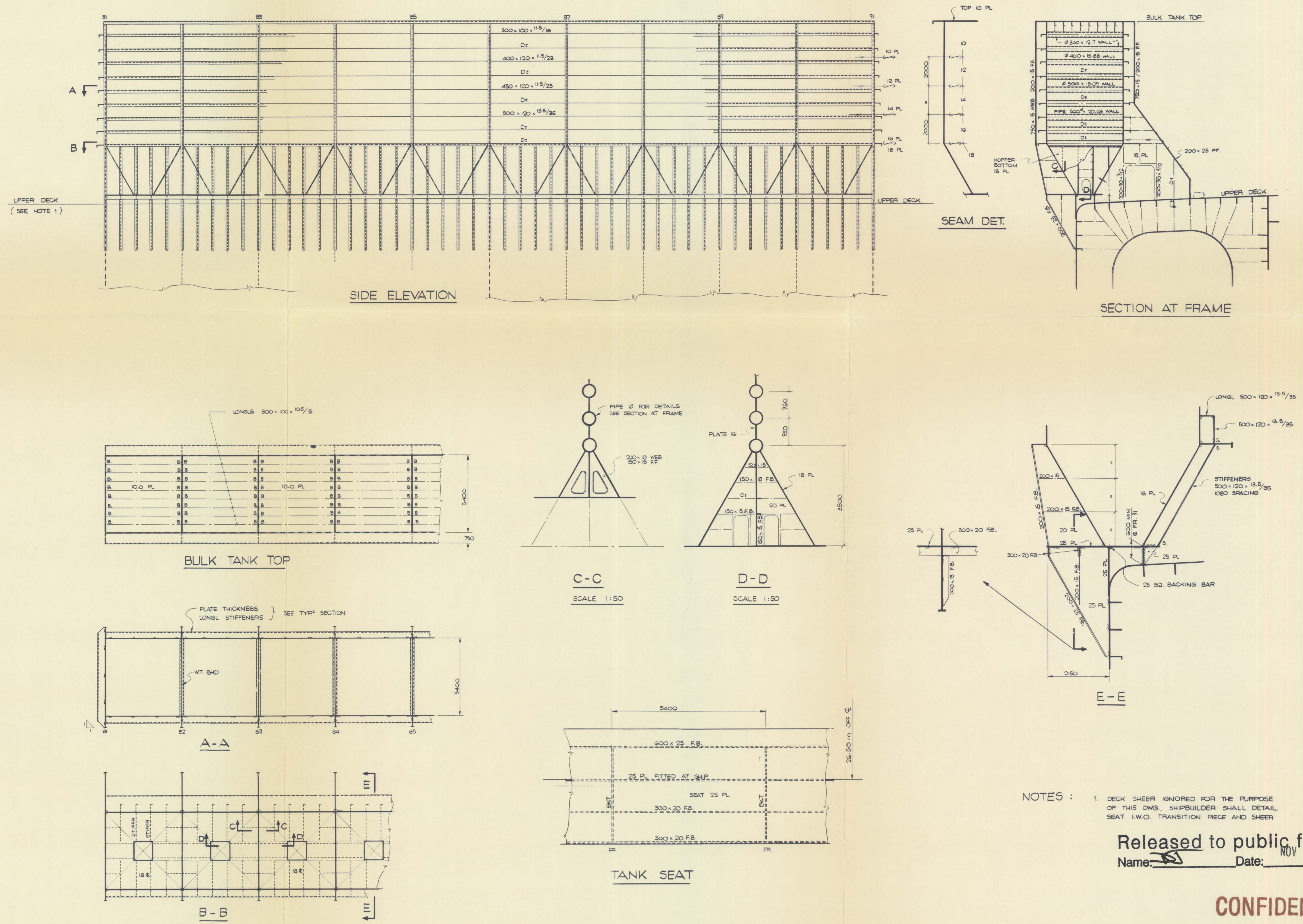
ENGINEER'S STAMP

ENGINEERING RECORD	
DRAWN BY ALAN WILLIAMS	DATE 13TH MARCH '82
CHKD. BY	
ENGINEER	15TH MAR 82
DOME APP.	

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT S.D.C.
PREPARED BY BEAUFORT SEA ENG & DESIGN
TITLE BOW CANTILEVER

SCALE 1:200
CONTR. DWG. NO.
DOME DWG. NO. E-SDC-860-21
REV 1



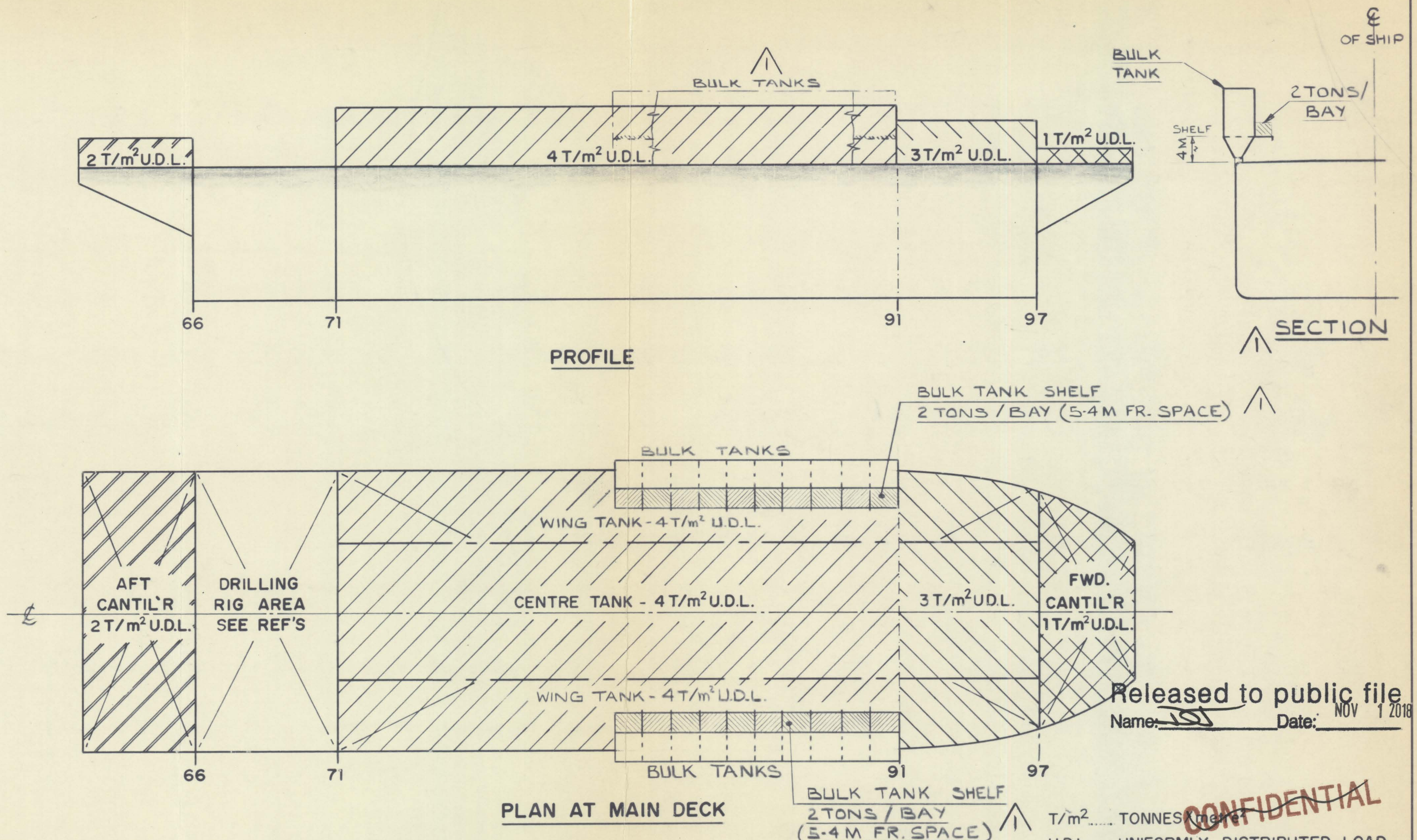
NOTES :

1. DECK SHEER IGNORED FOR THE PURPOSE OF THIS DWG., SHIPBUILDER SHALL DETAIL SEAT I.W.O. TRANSITION PIECE AND SHEER

Released to public file
Name: [signature] Date: NOV 1 2018

CONFIDENTIAL

ENGINEERING RECORD		DOME PETROLEUM LIMITED CALGARY ALBERTA CANADA	
DRAWN BY M. HARINEN	DATE MARCH 15/82	PROJECT S.D.C.	
CHKD BY [signature]	15 Mar 82	PREPARED BY BEAUFORT SEA ENG. & DESIGN	
ENGINEER		TITLE BULK TANKS	
DOME APP.		SCALE 1:100 & 1:50	CONTR. DWG. NO. / DOME DWG. NO. E - SDC - 860 - 22 / REV 0



T/m² ..... TONNES/metre²
U.D.L. ...... UNIFORMLY DISTRIBUTED LOAD

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
B-SDC-860-48	RIG DK. LOAD'G SHT. 1	1	BULK TANK SHELF LOADS ADDED	AW	12-10-82			
B-SDC-860-49	" " SHT. 2							

ENGINEER'S STAMP

ENGINEERING RECORD	DATE
DRAWN BY E.L	21-4-82
CHKD BY [signature]	82-04-23
ENGINEER [signature]	82-04-24
DOME APP. [signature]	82-04-24

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT S.D.C.
PREPARED BY BEAUFORT SEA ENGINEERING & DESIGN

TITLE
MAXIMUM PERMISSABLE DECK LOADING DIAGRAM

SCALE N.T.S.
CONTR. DWG. NO.
DOME DWG. NO. B-SDC-860-47
REV 1

Released to public file
Name: Date: Nov 1 2018

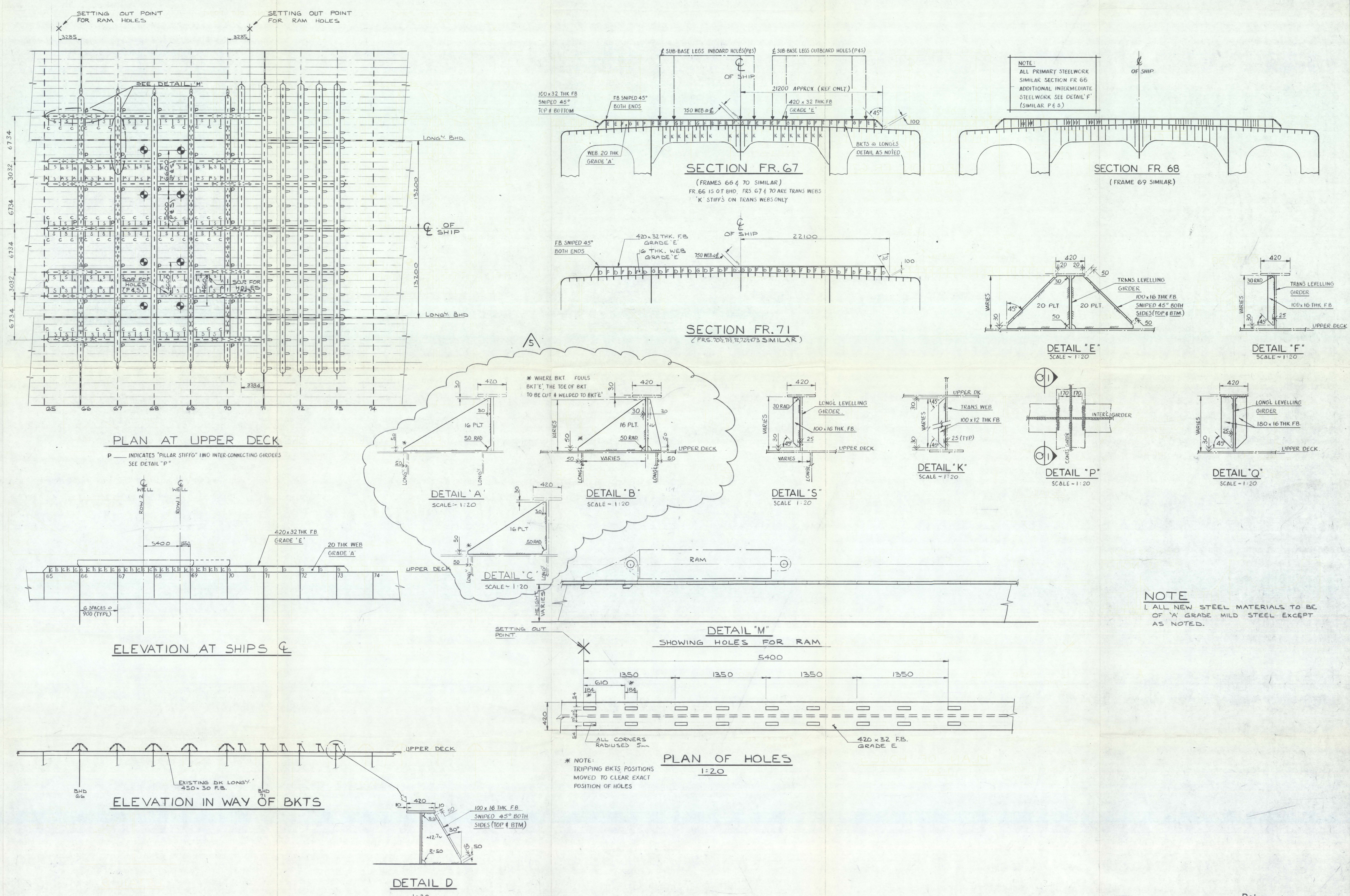
CONFIDENTIAL

REV	DESCRIPTION	BY
2	ACCOM UTILITIES, ACCOM UNIT & DRILLING FACILITIES DK WT & DK LOAD DELETED, WET WT WAS ALTERED	
1	ACCOM UTILITIES DK LOAD ALTERED WEIGHT OF P.F. TANK CHANGED	

ENGINEERING RECORD	
DRAWN BY	DATE 23 APRIL 1982
CHKD BY	12-04-22
ENGINEER	
DOME APP.	

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT S.D.C.
PREPARED BY BEAUFORT SEA ENG & DESIGN
TITLE DECK LOADING ARRANGEMENT
SCALE 1 : 250
CONTR. DWG. NO.
DOME DWG. NO. E-SDC-860-050
REV 2



Released to public file
Name: [signature] Date: NOV 1 2018

CONFIDENTIAL

REF No.	DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
			1.	REDRAWN TO ADD SUPPORT FOR RIG UTILITIES & 'HITACHI ZOSEN' COMMENTS INCORPORATED	AW	15TH MARCH '82			
			2	SUPPORTS FOR RIG UTILITIES EXTENDED FROM 19850 TO 21000	AW	29TH MARCH '82			
			3	SUPPORTS FOR RIG UTILITIES EXTENDED FROM 21000 TO 22100 & TRANS. BEAM ADDED AT FR 70½ TO SUIT SKID	AW	12TH APRIL '82			
			4	DETAILS 'B', S, K, E, F, P & Q ADDED. SECT. FR 68 ADDED PLANS & ELEVS MODIFIED TO SUIT ADDITIONS. HT @ ℄ CHANGED FROM 210 TO 750	E.L.	31ST MAY 1982			
			4	LEVELLING WEB FR 70½ RELOCATED TO 3384 AFT FR. 71 DETAIL 'A' MODIFIED NOTE ADDED RE-T.B/HOLE LOCATIONS	E.L.	3RD. JUNE 1982	[signature]	[signature]	[signature]
			5	BKTS. 'A' 'B' & 'C' ON LONG'L LEVELLING GIRDERS MODIFIED AS REQUESTED BY D.N.V	AW	9TH AUGUST '82	[signature]		

ENGINEER'S STAMP

ENGINEERING RECORD	
DRAWN BY: ALAN WILLIAMS	DATE: 15TH MARCH '82
CHKD BY: [signature]	8th June 82
ENGINEER: [signature]	22ND APR 82
DOME APP.: [signature] J. McSwiney	82-03-29
[signature]	82-04-22

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT: S.D.C.

PREPARED BY: BEAUFORT ENGINEERING & DESIGN

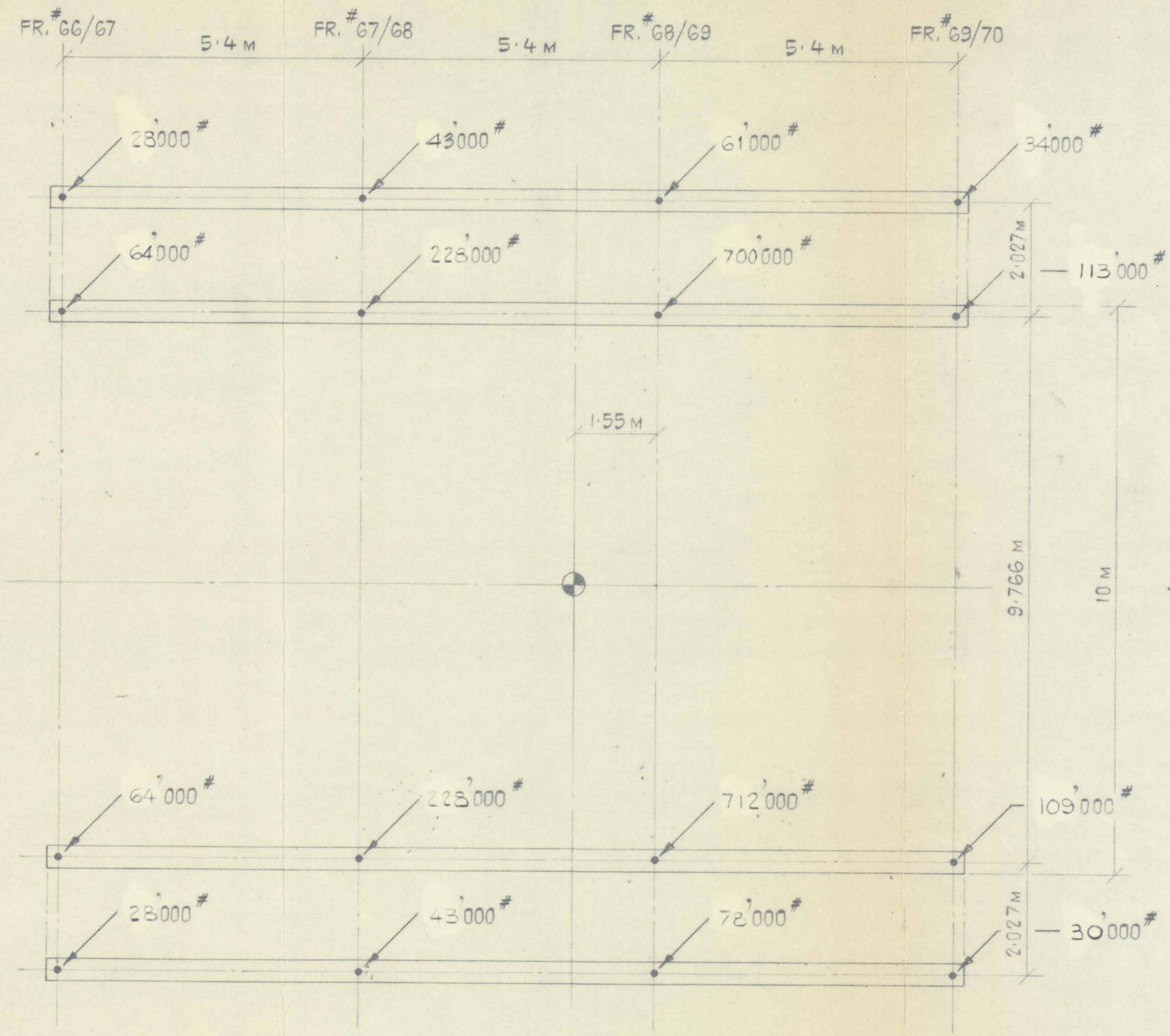
TITLE: MAIN DECK AFT (FRS 65-74)
SUPPORT FOR DRILLING MAST AND RIG UTILITIES

SCALE: 1:200

CONTR. DWG. NO.:

DOME DWG. NO.: E-SDC-860-15

REV: 5



LOADS ON SUBSTRUCTURE SUPPORTING SYSTEM

INDICATED LOADS ARE ESTIMATED, AND CAN VARY DUE TO :-

1) EQUIPMENT INSTALLED
2) ELASTICITY OF SUPPORTS (CONCENTRATION)
3) DIFFERENCE IN ELEVATION OF SUPPORTS

C) CONDITIONS :-

1) CASING LOAD
2) SETBACK LOAD
3) DEAD LOAD
4) TANKS FILLED UP
5) BOP'S ON PODS

TOTAL LOAD :~ 2563 K

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
		1	LOADS REVISED	AJ	18-10-82	[initials]		

ENGINEER'S STAMP

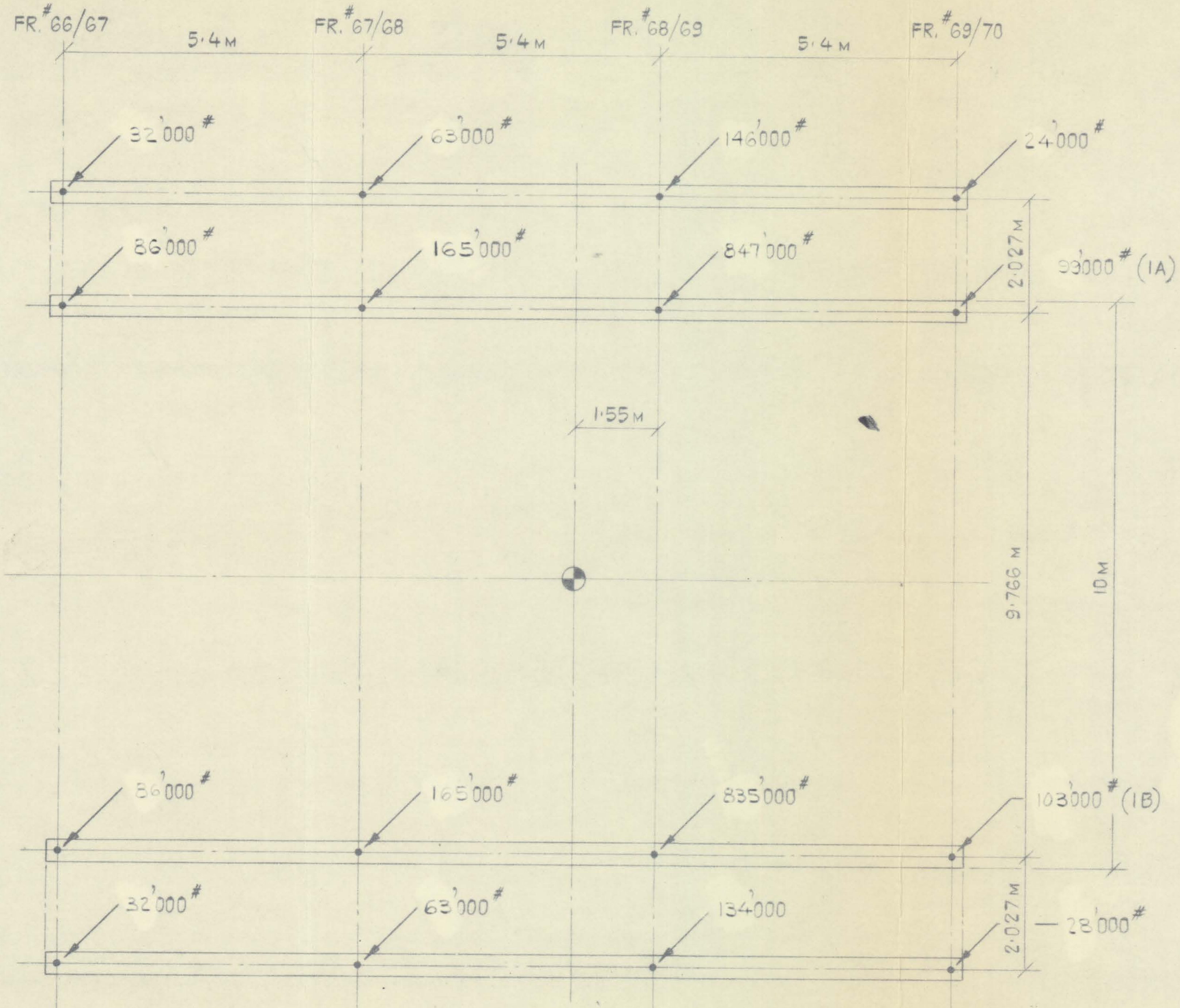
ENGINEERING RECORD

DRAWN BY	R.A.GLEN	APR. '82
CHKD BY	[signature]	82-04-23
ENGINEER		
DOME APP	[signature]	82-04-24
	[signature]	82-04-26

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT: S.S.D.C.
PREPARED BY: BEAUFORT SEA ENG. & DESIGN
TITLE: RIG DECK LOADING (SHT. 1 OF 2)
MAX. STATIC LOAD

SCALE: 1:100
CONTR. DWG. NO.
DOME DWG. NO.: B-S.D.C.-860-48
REV: 1



LOADS ON SUBSTRUCTURE SUPPORTING SYSTEM

INDICATED LOADS ARE ESTIMATED, AND CAN VARY DUE TO :-

1) EQUIPMENT INSTALLED
2) ELASTICITY OF SUPPORTS (CONCENTRATION)
3) DIFFERENCE IN ELEVATION OF SUPPORTS

B) CONDITIONS :-

1) CASING LOAD
2) SETBACK LOAD
3) DEAD LOAD
4) TANKS FILLED UP
5) BOP's ON PODS

TOTAL LOAD :~ 2908 K

Released to public file
Name: Date: NOV 1 2013

CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
		1	NOTE ADDED	S.C	26/4/82			
		2	LOADS REVISED & NOTE REMOVED	AW	18-10-82			

ENGINEER'S STAMP

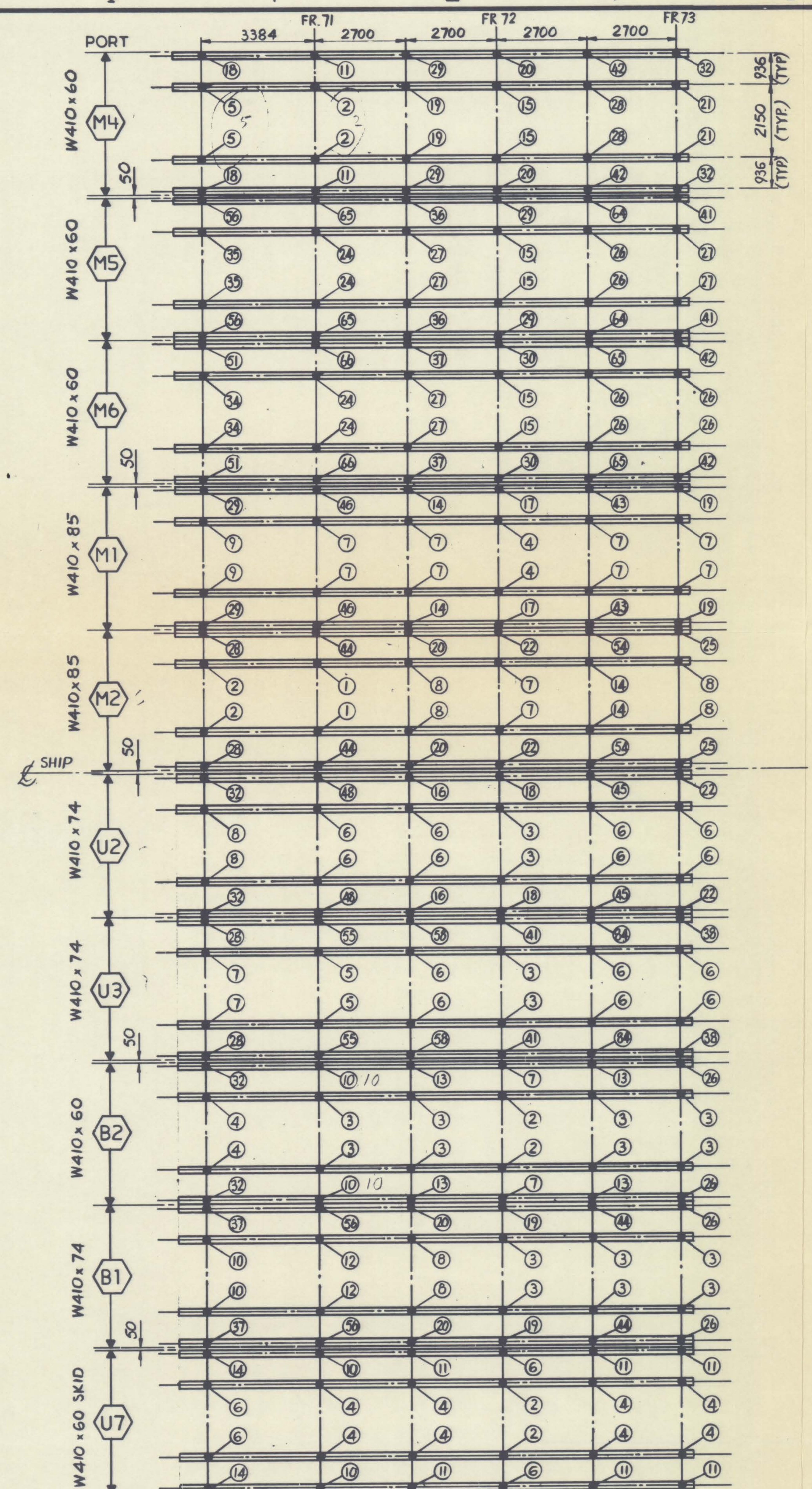
ENGINEERING RECORD

DRAWN BY	R.A.GLEN	APR. 82
CHKD BY		82-04-23
ENGINEER		
DOME APP		82-04-24
		82-09-26

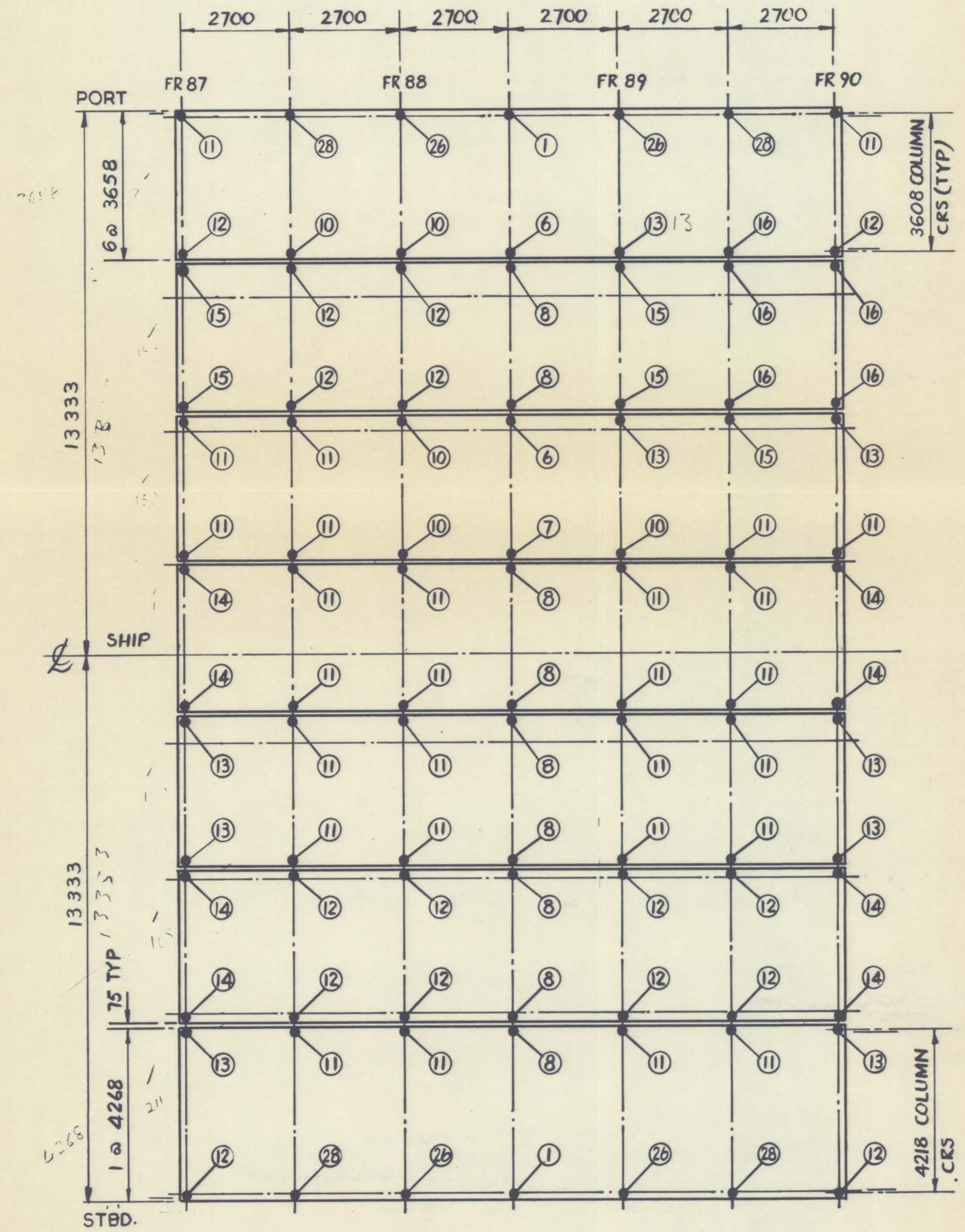
DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT: S.S.D.C.
PREPARED BY: BEAUFORT SEA ENG. & DESIGN
TITLE: RIG DECK LOADING (SHT. 2 OF 2)
MAX. DYNAMIC LOAD

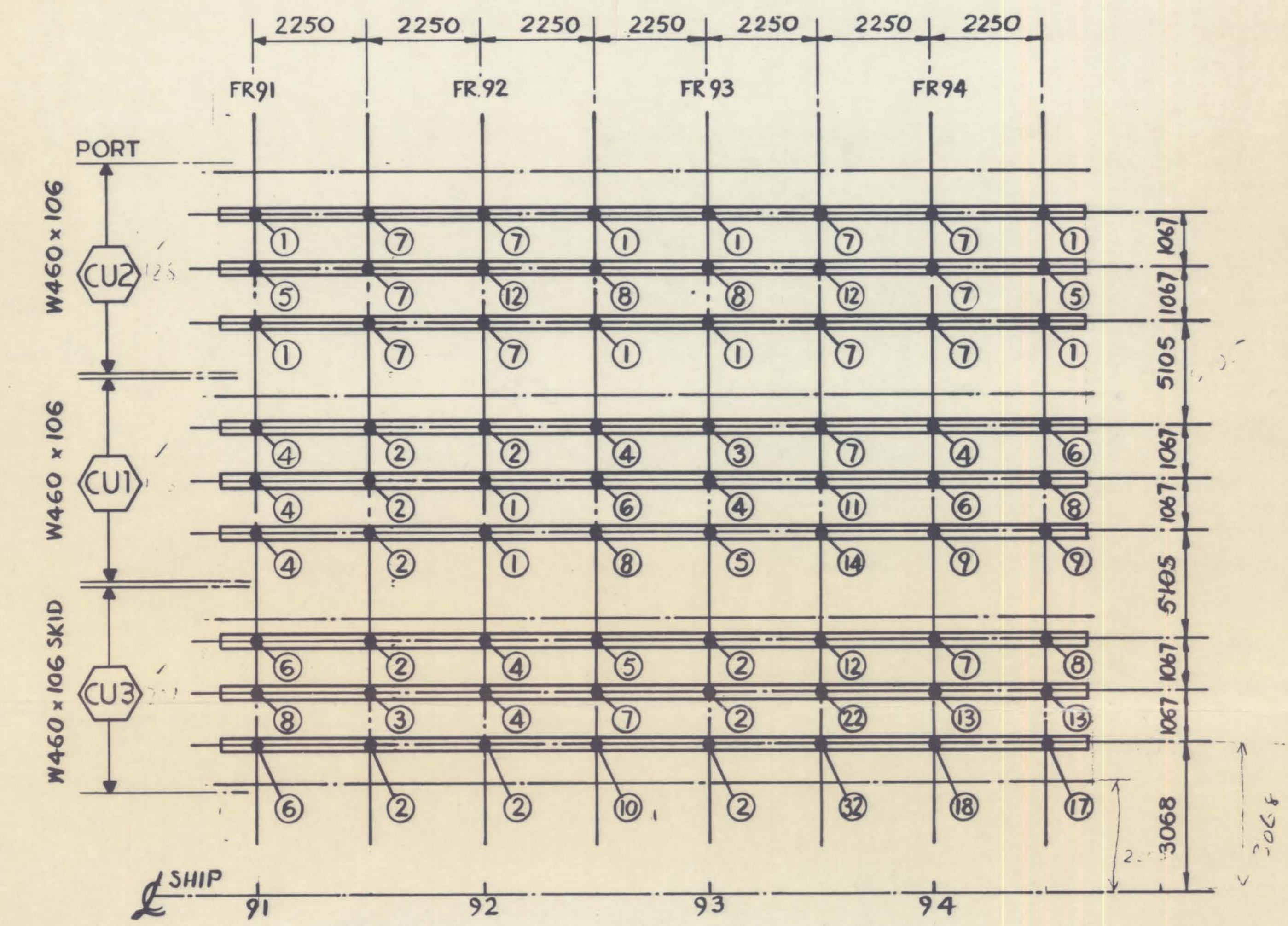
SCALE: 1:100
CONTR. DWG. NO.
DOME DWG. NO.: B-S.D.C.-860-49
REV: 2



PLAN (2D) DRILLING FACILITIES (WET WT ~~5144~~ kips.)



PLAN (4C) ACCOMMODATION UNIT (WET WT 1243 kips.)



PLAN (7B) ACCOMM. UTILITIES (WET WT 461 kips.)

GENERAL NOTES

1. ALL LOADS ARE GIVEN IN Kips (1,000# UNITS) i.e. (16) = 16 000#

Released to public file
Name: Date: NOV 1 2018

CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP

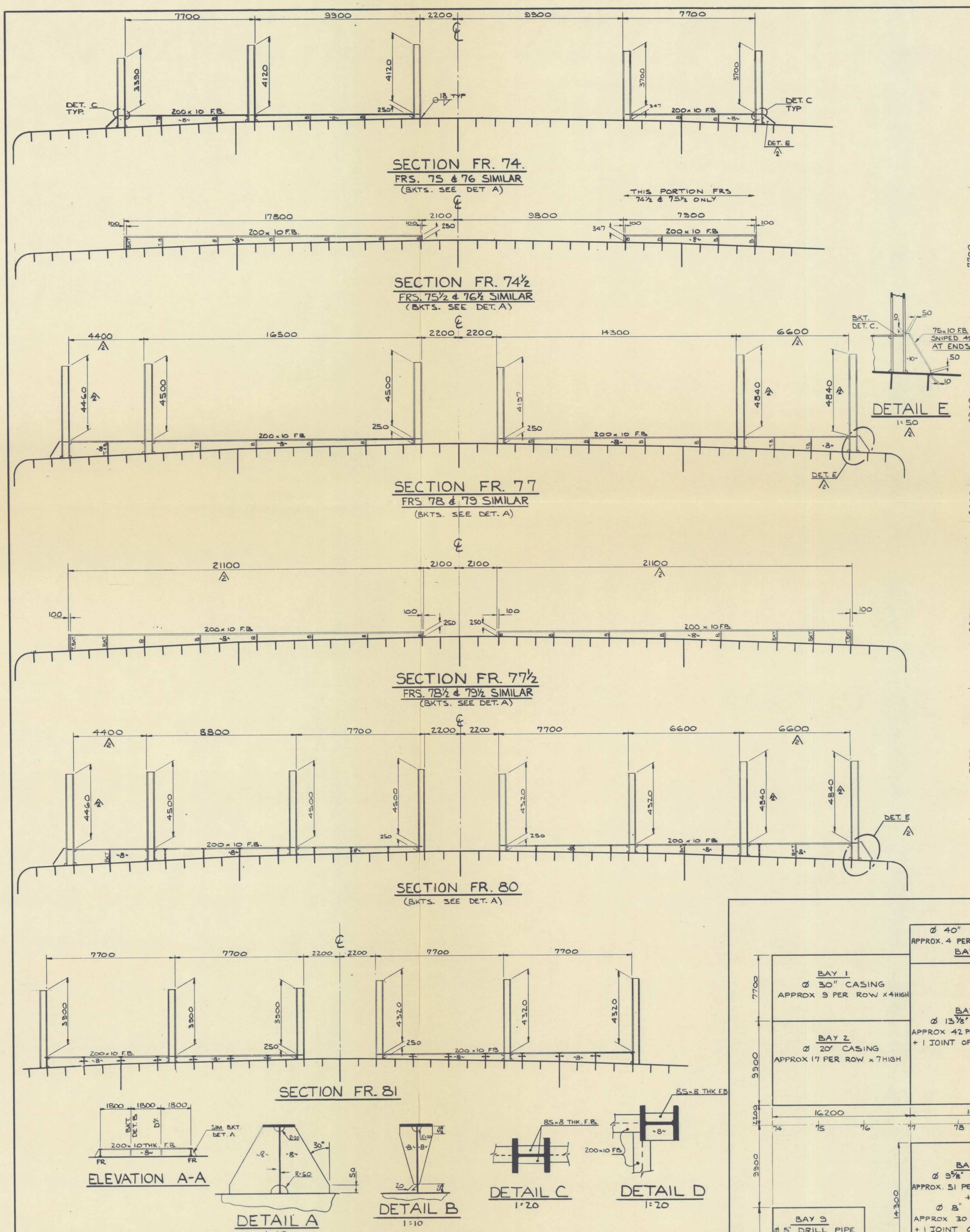
ENGINEER'S STAMP

ENGINEERING RECORD	
DRAWN BY ERNY LAVERY	DATE 14 JUNE 1982
CHKD BY	
ENGINEER	
DOME APP.	82-06-15

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

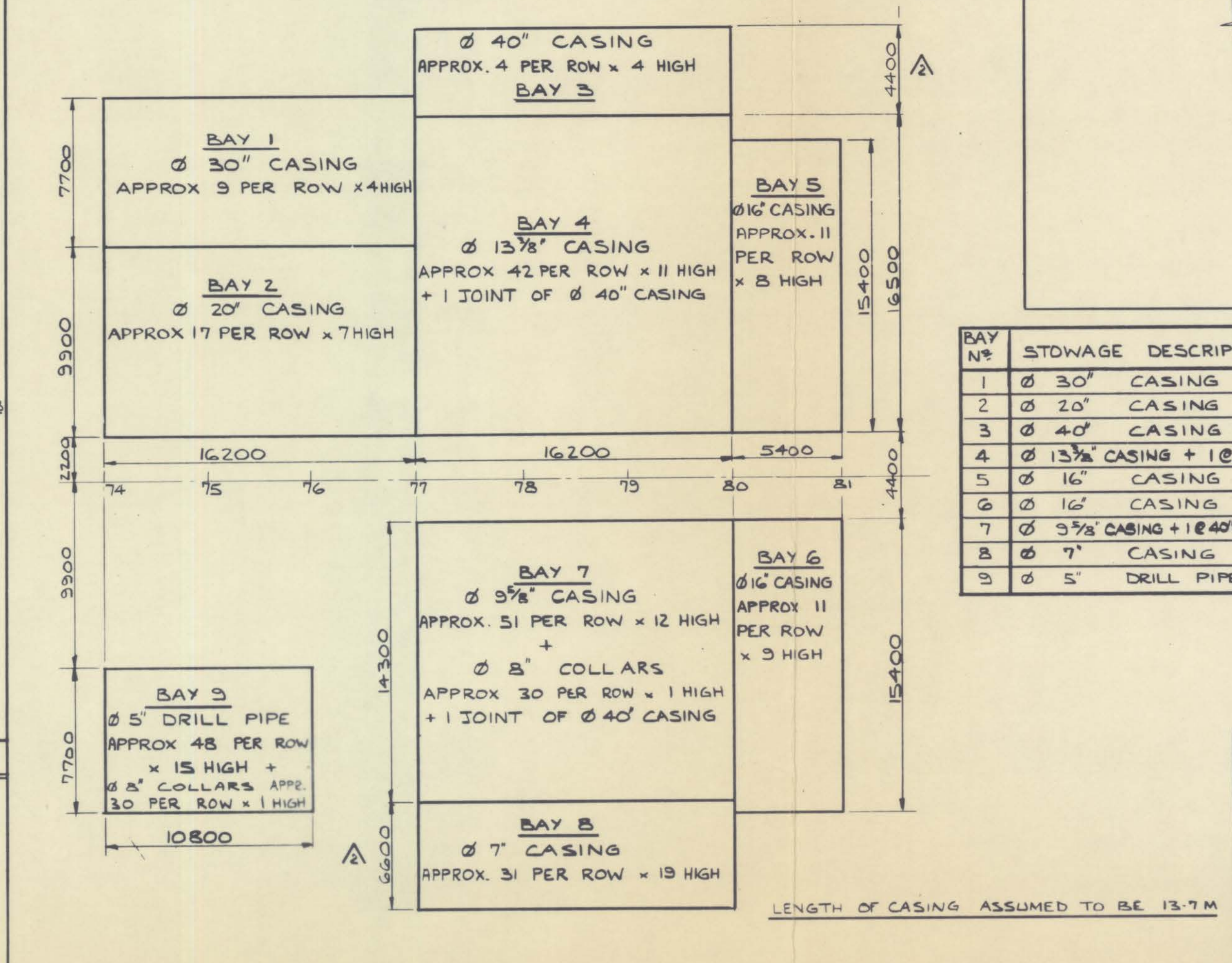
PROJECT: S.D.C. / BEAUFORT ISLAND RIG
PREPARED BY: BEAUFORT SEA ENG. & DESIGN
TITLE: DRILLING FACILITIES / ACCOM. UNIT & ACCOM. UTILITIES : DECK LOADING

SCALE: 1 : 100
CONTR. DWG. NO.
DOME DWG. NO. D-S.D.C-860-74
REV 0



PLAN AT MAIN DECK
(ALL COLUMNS ARE W360×421)

Released to public file
Name:
Date: NOV 1 2018



KEY PLAN

BAY Nº	STOWAGE DESCRIPTION	APPROX Nº OF PIPES	APPROX WEIGHT (TONNES)
1	Ø 30" CASING	36	194
2	Ø 20" CASING	122	277
3	Ø 40" CASING	16 ⚠2	137 ⚠2
4	Ø 13⅜" CASING + 1 @ 40" Ø	445 ⚠2	555 ⚠2
5	Ø 16" CASING	88	160
6	Ø 16" CASING	99	180
7	Ø 9⅝" CASING + 1 @ 40" Ø + COLLAR	730 ⚠2	625 ⚠2
8	Ø 7" CASING	582	319
9	Ø 5" DRILL PIPE	720	254

NOTES

1. ALL NEW STEEL MATERIALS ARE TO BE OF GRADE 'A' MILD STEEL UNLESS SHOWN OTHERWISE
2. DRAIN HOLES ARE TO BE FITTED TO SUIT DECK INSULLATION.
3. ALL WELDING TO BE 6 ◿ OR 6 ◿◺ UNLESS SHOWN OTHERWISE.
4. ALL DRILL PIPES AND CASINGS ARE TO BE SECURELY LASHED ON RACK FOR TRANSPORTATION PURPOSES.
5. ALL SECTIONS ARE DRAWN LOOKING FORWARD & ALL ELEVATIONS ARE DRAWN LOOKING TO PORT.

CONFIDENTIAL

REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP.	DOME APP.	ENGINEER'S STAMP
1	RE-DESIGNED	AW	22ND APRIL 1982			[signature]	
2	BAY 3 & BAY 8 REDUCED IN WIDTH I.W.O. PIPE AND CABLE TRAYS SEE DWG E-SDC-860-57. BKT. ADDED	AW	13TH MAY 1982	S Chan	[signature]	[signature]	

ENGINEERING RECORD	
DRAWN BY ALAN WILLIAMS	DATE 27TH MARCH '82
CHKD BY	
ENGINEER Chan [signature]	82-04-23
DOME APP [signature]	22 APRIL 82
[signature]	82-04-23

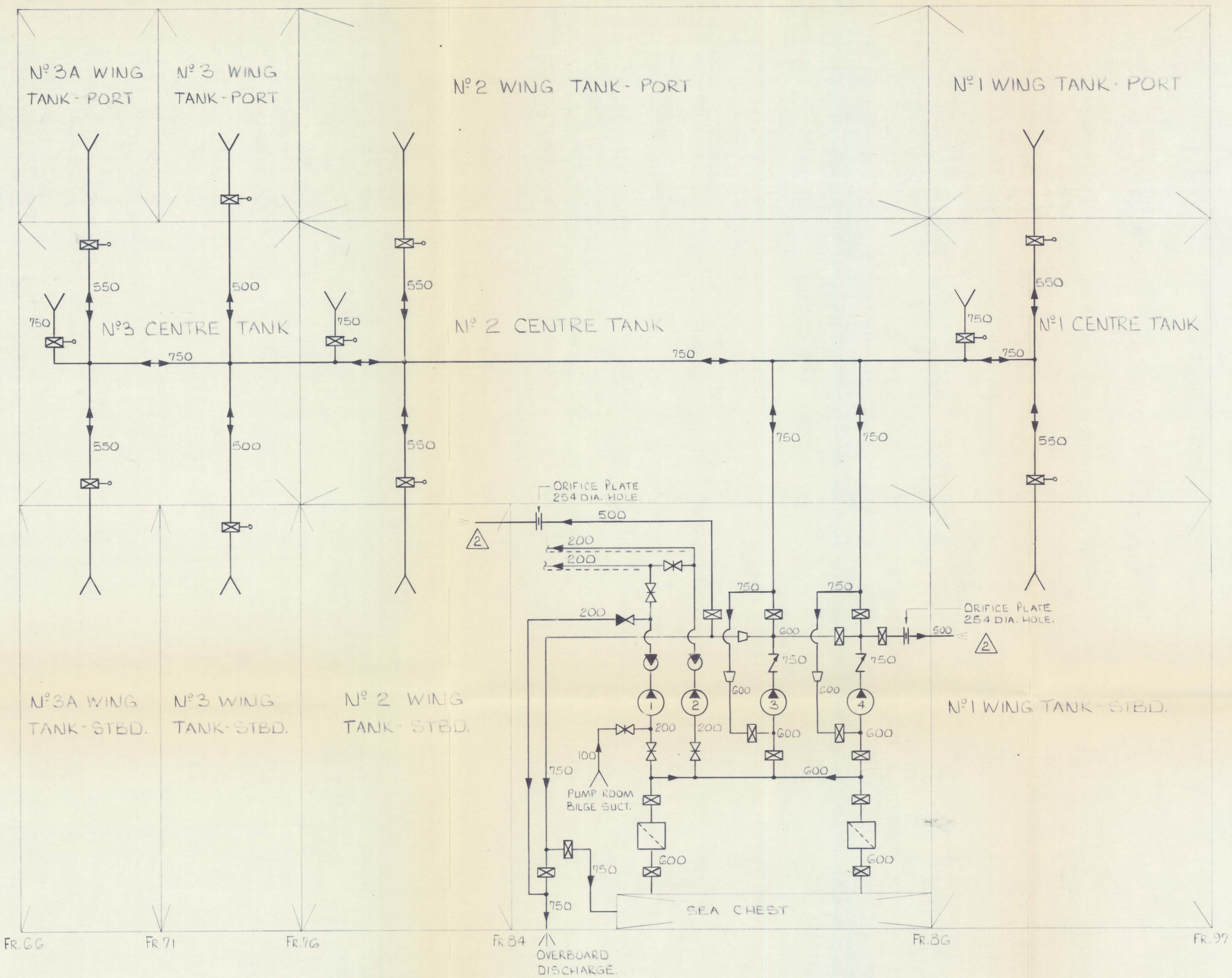
DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

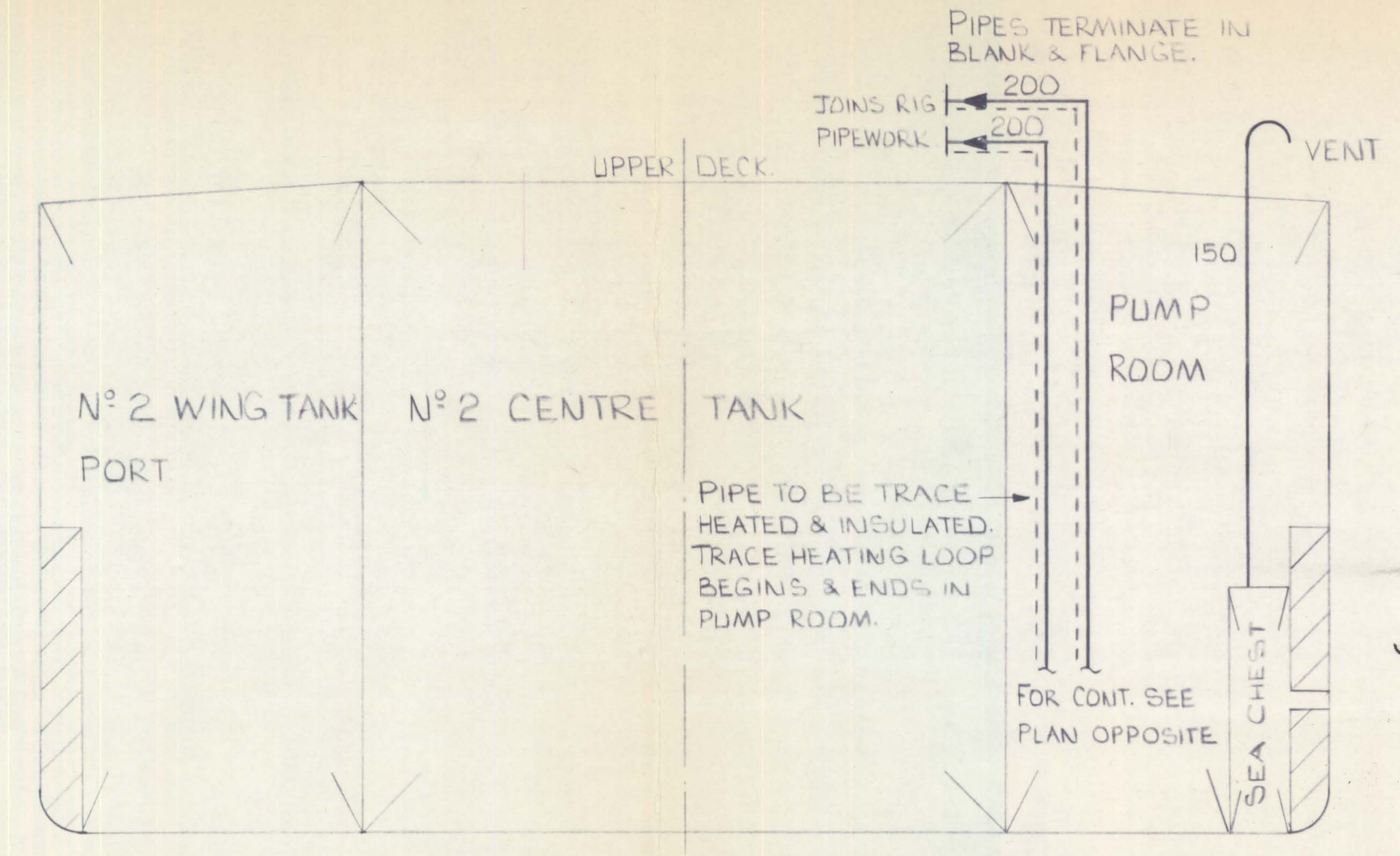
PROJECT S.D.C.

PREPARED BY BEAUFORT SEA ENG & DESIGN

TITLE
CASING STORAGE RACKS

SCALE 1:100 & AS STATED
CONTR. DWG. NO.
DOME DWG. NO. B-SDC - 860 - 033
REV 2





SECTION LOOKING FWD. THROUGH PUMP ROOM.

PIPE LIST

NOM. DIA.	OUT. DIA.	THICKNESS	MATERIAL	SURFACE TREATMENT	NOTES.
750	762,0	12,5	STPY 41	—	EXISTING PIPE RE-USED.
600	609,6	"	"	GALVANIZED	
550	558,8	"	"	—	EXISTING PIPE RE-USED.
500	508,0	"	"	—	"
250	267,4	"	"	GALVANIZED	
200	216,3	"	STPG 38 SCH.80	"	
150	165,2	5,0	SGP	"	AIR VENT
100	114,3	8,6	STPG 38 SCH.80	"	

VALVE LIST

SYMBOL	TYPE	NOM. DIA.	PRESS. KG/CM²	BODY MATERIAL	LOCATION	NOTES
	BUTTERFLY VALVE. HYDRAULIC. OPERATED.	750	10	CAST IRON	IN TANK	EXISTING VALVE RE-USED.
		550	"	"	"	"
		500	"	"	"	"
	BUTTERFLY VALVE. MANUALLY OPERATED.	750	"	DUCTILE CAST IRON	PUMP ROOM	
		750	"	CAST STEEL	"	
		600	"	"	"	
		600	"	DUCTILE CAST IRON	"	
	GATE VALVE	200	"	"	"	
		100	"	"	"	
	S.D.N.R. VALVE	200	"	"	"	
	ANGLE S.D.N.R. VALVE.	200	"	"	"	
	CHECK VALVE	750	"	"	"	

PUMPING REQUIREMENTS.

SEA WATER SYSTEM. 2 PUMPS EACH OF 90 K.W. TO BE CAPABLE OF PUMPING 340 M³ PER HOUR AGAINST A HEAD OF 53·3 M.

BALLAST SYSTEM. 2 PUMPS, EACH OF 355 K.W. TO BE CAPABLE OF PUMPING 3000 M³ PER HOUR AGAINST A HEAD OF 30 M. THE BALLAST PUMPS ARE TO BE CAPABLE OF EMPTYING & FILLING THE BALLAST TANKS USING EITHER OR BOTH PUMPS. THE PUMPS ARE ALSO TO BE CAPABLE OF RE-CIRCULATING THE WATER IN THE BALLAST TANKS, TO PREVENT FREEZING, USING A CONNECTION ON THE SAND FILLING SYSTEM - DRG N° D-SDC-860-10. UNDER EXTREME CONDITIONS OF TANK FREEZING, BOTH BALLAST PUMPS MAY BE REQUIRED TO OPERATE SIMULTANEOUSLY.

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
		2	RE-CIRC. LINES TO TANKS ADDED. LINE TO SANDFILLING SYSTEM DELETED.	I.S.R.	2ND APRIL '82	[signature]	[signature] 82-04-06	
		1	RE-DRAWN.	I.S.R.	15TH MARCH '82			

ENGINEER'S STAMP

ENGINEERING RECORD

DRAWN BY I.S. RICHMOND	DATE MARCH 1982
CHKD BY D E Lowe	15 Mar 82.
ENGINEER [signature]	82-04-06
DOME APP. [signature]	82-04-06

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT S.D.C.

PREPARED BY BEAUFORT SEA ENGINEERING & DESIGN.

TITLE DIAGRAMMATIC ARRANGEMENT OF BALLAST & SEA WATER SYSTEM.

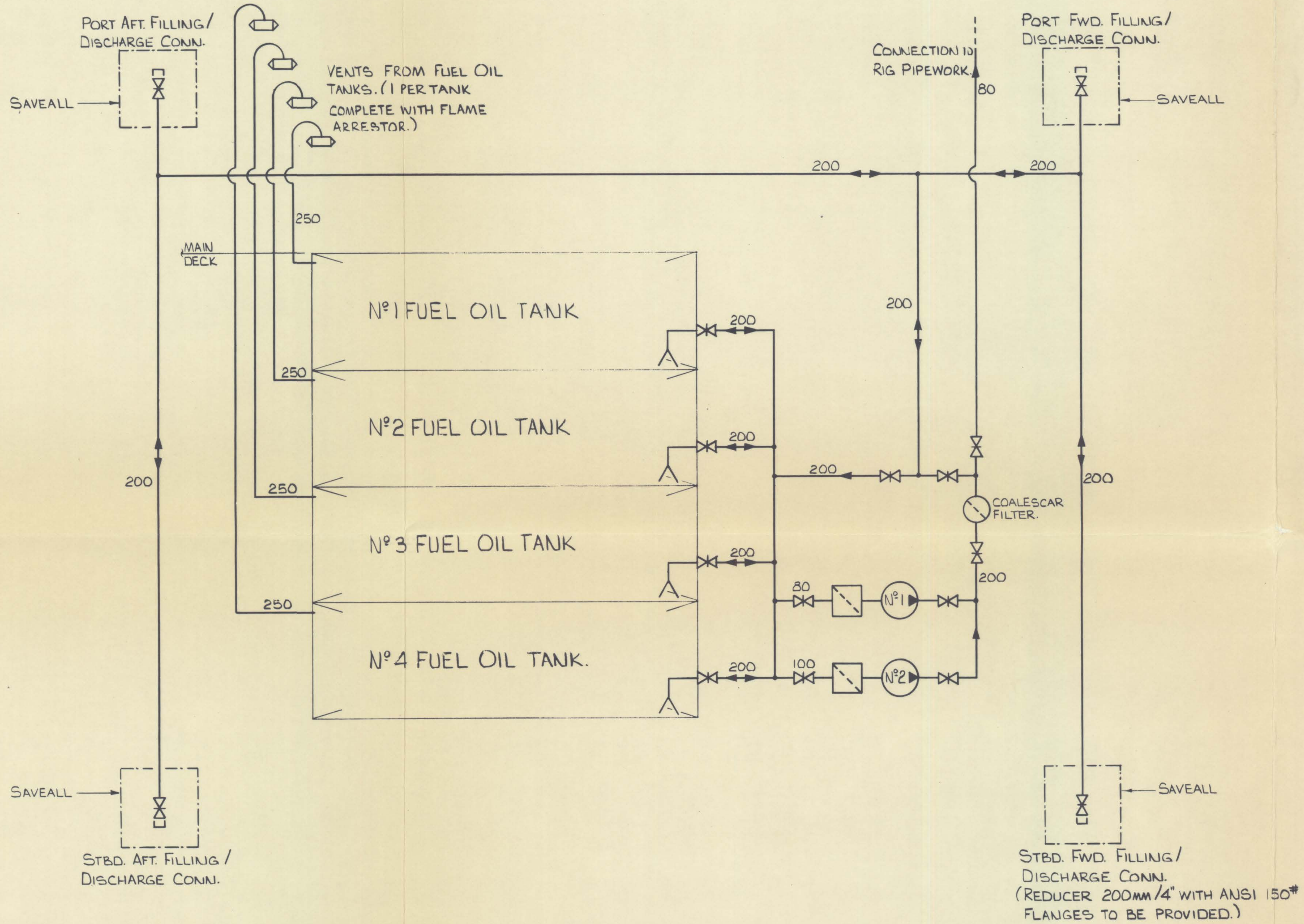
SCALE N.T.S.

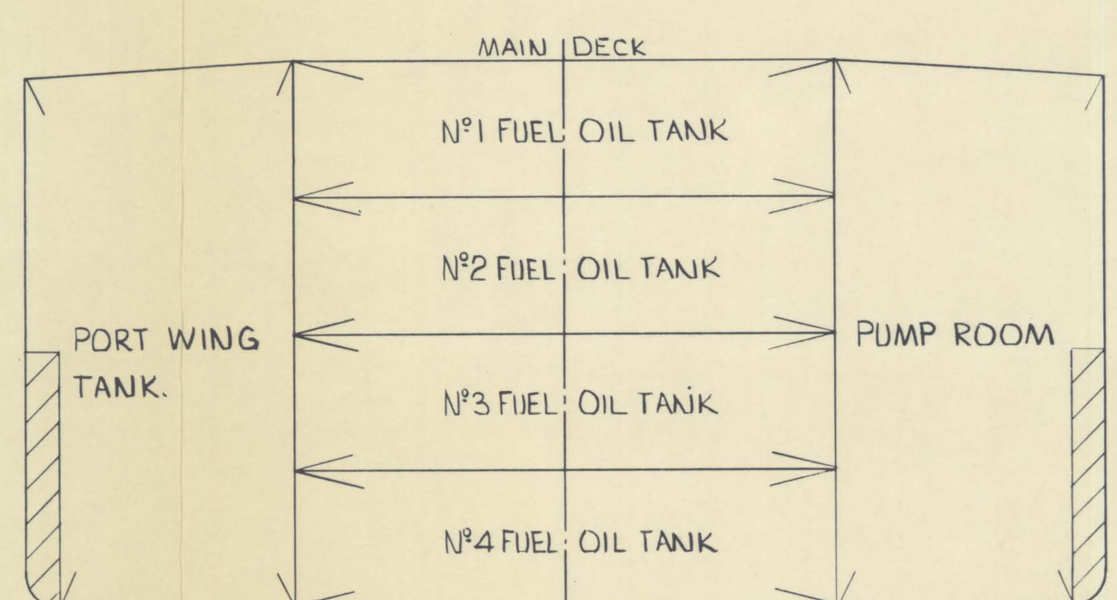
CONTR. DWG. NO.

DOME DWG. NO. D-SDC-860-10

REV 2

1	2	3	4	5	6	7	8





SECTION LOOKING FWD. ABOUT FR.85
(FUEL OIL TANKS POSITIONED BETWEEN FR.84 & FR.86)

PUMPING REQUIREMENTS.

1. TRANSFER PUMP Nº1 IS FOR RIG FUEL OIL DAY TANK & IS TO BE CAPABLE OF PUMPING THE DAILY REQUIREMENT OF 50M³ IN 1 HOUR AGAINST A HEAD OF 60M.
2. TRANSFER PUMP Nº2 IS FOR REPLENISHMENT OF ANOTHER VESSEL & IS TO BE CAPABLE OF DISCHARGING AT 150M³ PER HOUR AGAINST A HEAD OF 30M.
3. ELECTRICAL SUPPLY FOR PUMP MOTORS TO BE 600 VOLTS.

PIPE LIST

NOM. DIA.	OUT. DIA.	THICKNESS	MATERIAL	SURFACE TREATMENT	NOTES
250	267,4	6,7	SGP	BLACK	AIR VENT
200	216,3	8,2	STPG 38 SCH.40	"	
100	114,3	6,0	"	"	
80	89,1	5,5	"	"	

VALVE LIST

ABBREVIATION	TYPE	NOM. DIA.	PRESS. Kg/cm²	BODY MATERIAL	LOCATION	NOTES
—▷◁—	GATE Vv.	200	10	DUCTILE CAST IRON.	PUMP ROOM	
	"	100	"	"	"	
	"	80	"	"	"	

Released to public file
Name: [signature] Date: NOV 1 2018

CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APP
		1	FUEL OIL TANKS RE-POSITIONED. DIAGRAM RE-DRAWN. PIPE & VALVE LIST ADDED AS PER SHIPYARD REQUEST.	I.S.R.	13TH MARCH 1982			

ENGINEER'S STAMP

ENGINEERING RECORD	
DRAWN BY I.S. RICHMOND	DATE MARCH 1982
CHKD BY	
ENGINEER	
DOME APP.	

DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

PROJECT S.D.C.
PREPARED BY BEAUFORT SEA ENGINEERING & DESIGN.
TITLE DIAGRAMMATIC ARRANGEMENT OF FUEL OIL FILLING & TRANSFER SYSTEM.
SCALE N.T.S.
CONTR. DWG. NO.
DOME DWG. NO. D-SDC-860-09
REV 1

Released to public file
Name: Date: NOV 1 2018

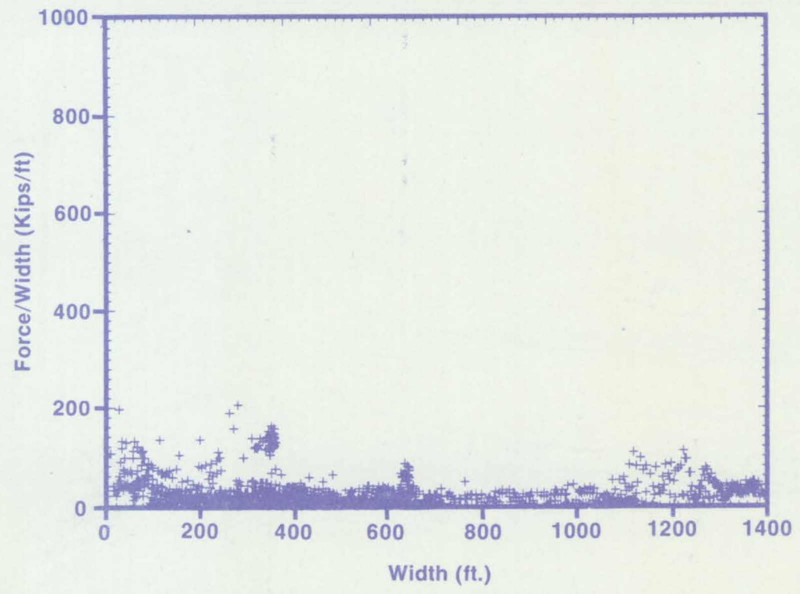
CONFIDENTIAL

DRAWING NO.	REFERENCE DRAWINGS	REV.	REVISION DESCRIPTION	BY	DATE	CHKD	APP	DOME APR	ENGINEERING RECORD
D-SDC-860-10	DIAGRAMMATIC ARRGT. OF BALLAST								DRAWN BY / DATE

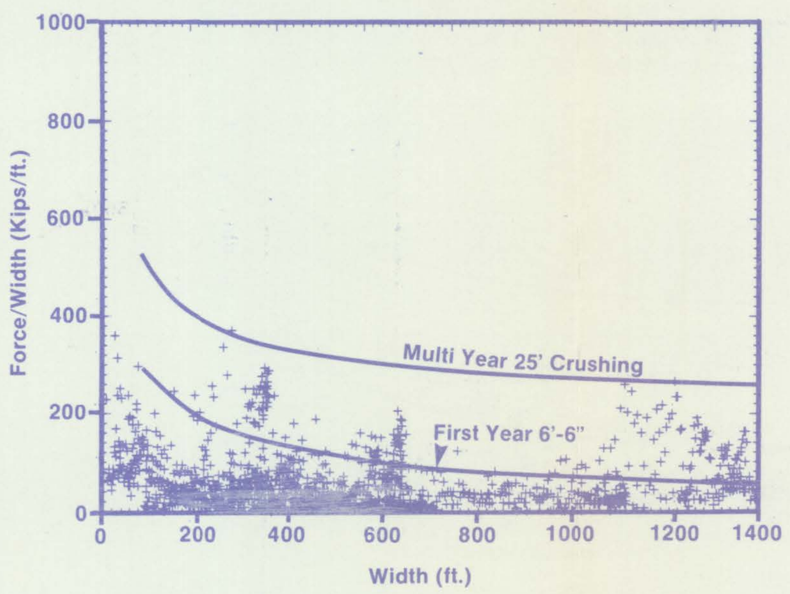
DOME PETROLEUM LIMITED
CALGARY ALBERTA CANADA

GLOBAL LOADS

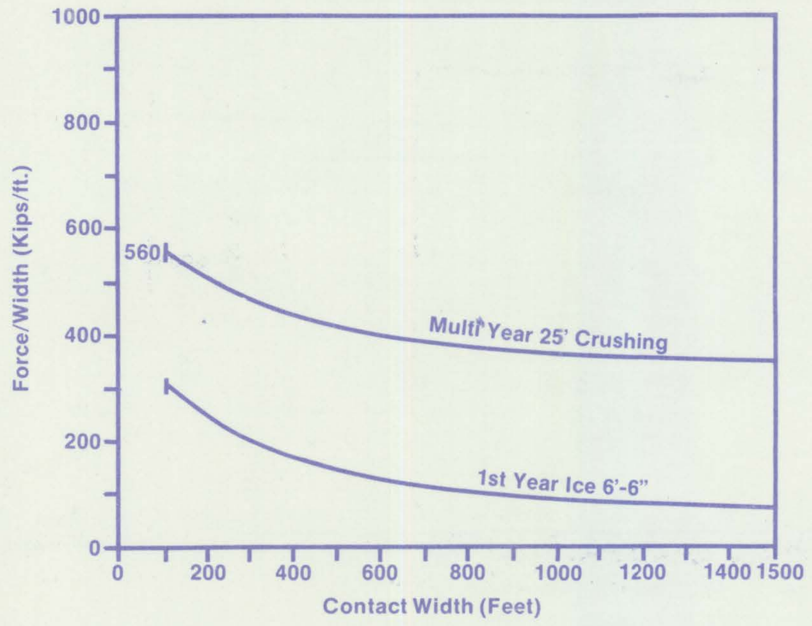
#1 Basic Ice Loads



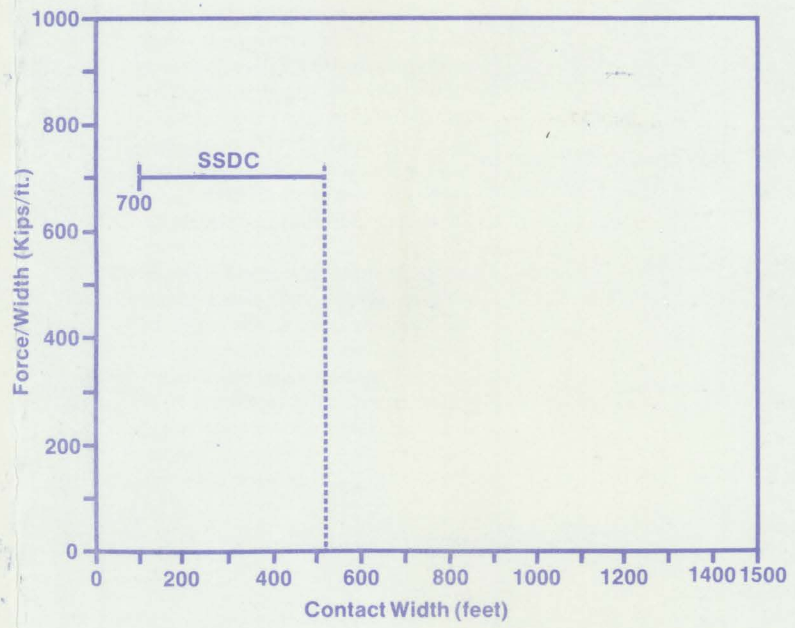
#2 Standardized Ice Loads



#3 Design Criteria



#4 Structural Capability



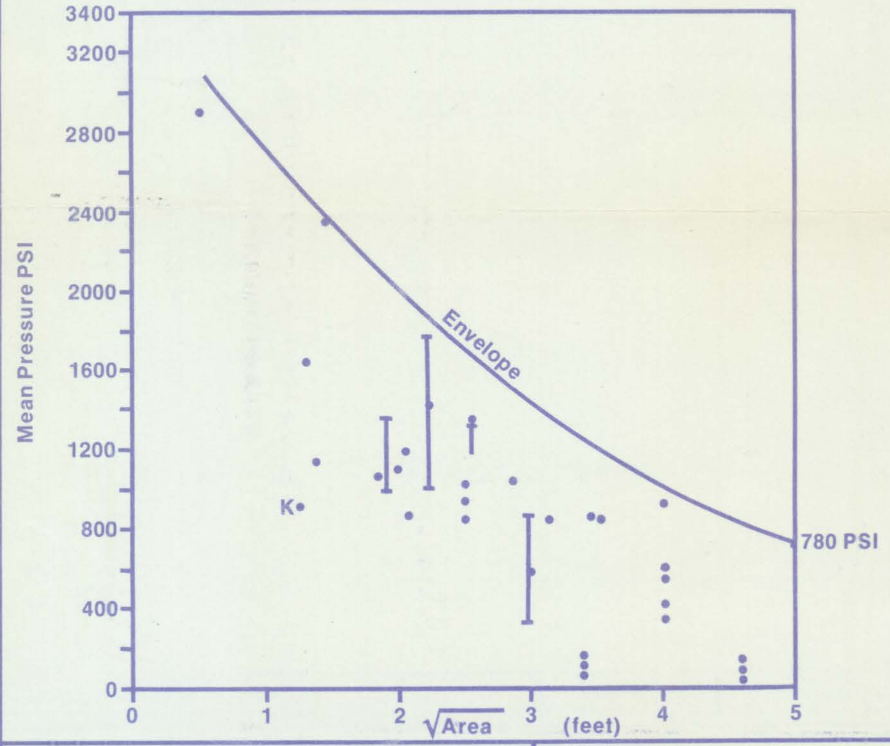
#5 Design Factors And Safety Factors

1. Design Factor is defined as the ratio between the design criteria and the envelope of the data curve. Design factors range from 1.1 where there are many data points and the consequence of failure is non critical (i.e. local structure) to 1.5 where there are few data points and the consequence of failure is critical

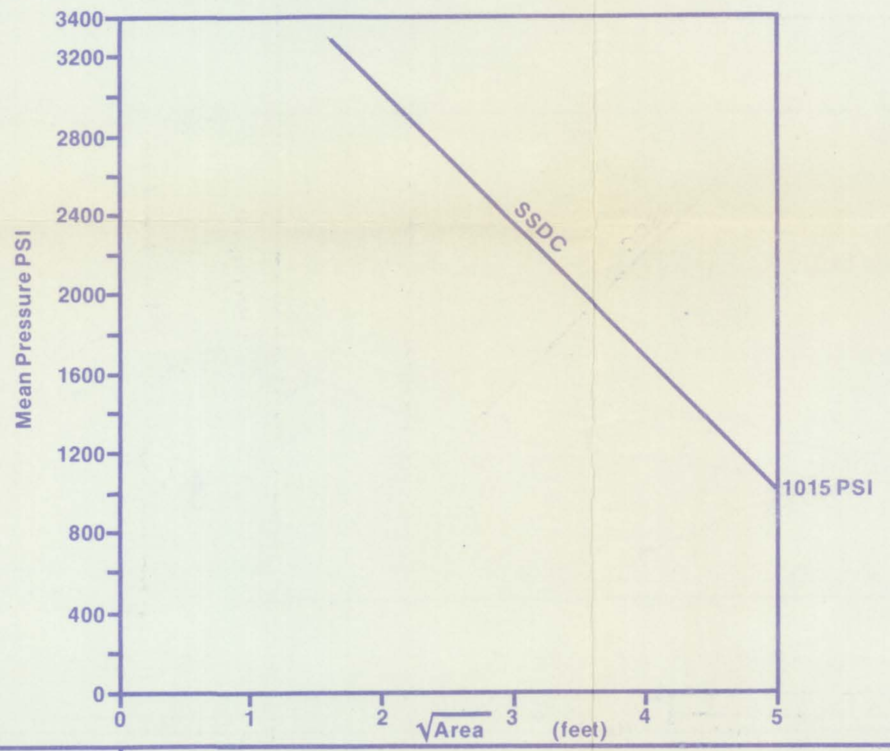
2. Safety Factor is defined as the ratio between capability and the design criteria for global (critical) loads the foundation capability generally dominates and the safety factors is 1.5, for local and semi local loads where damage is non critical the safety factors vary from 1.0 to 1.5

LOCAL & SEMI LOCAL LOADS

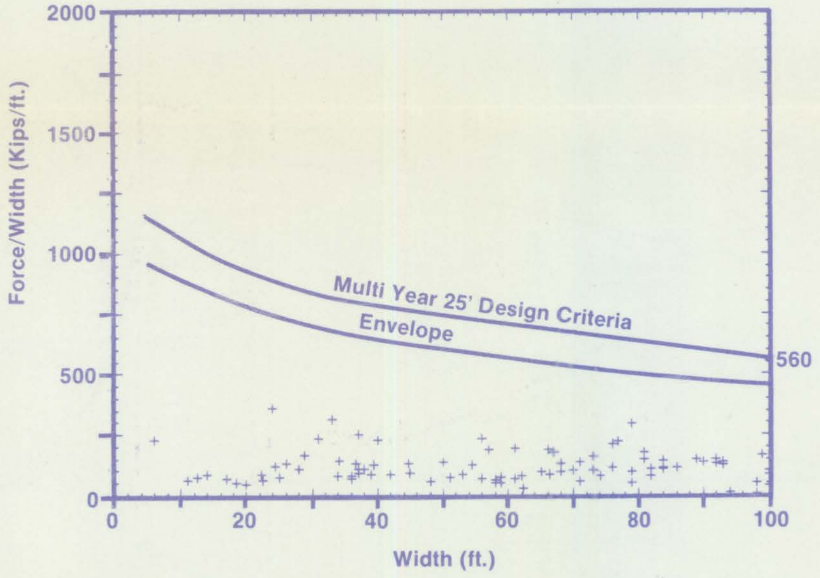
#6 Local Data & Design Criteria



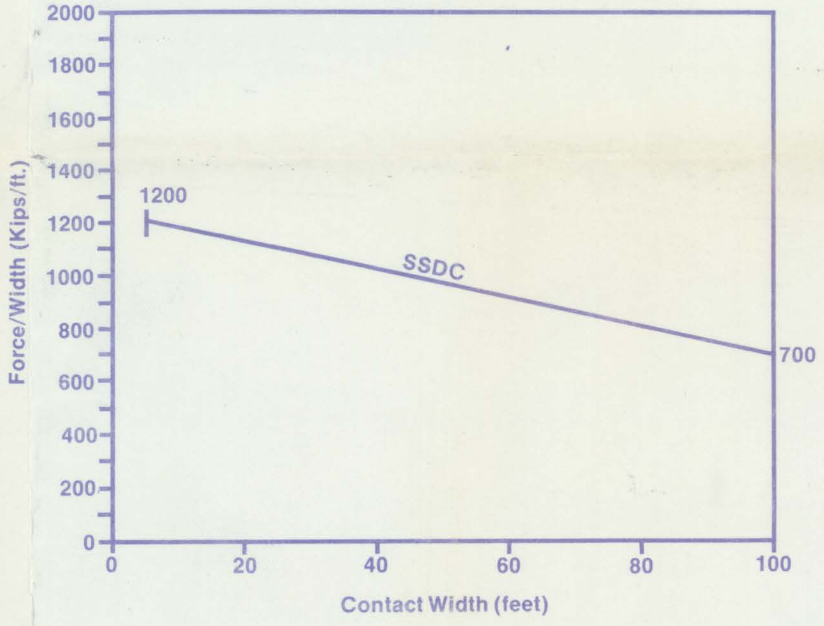
#7 Local Structural Capability



#8 Standardized Ice Loads



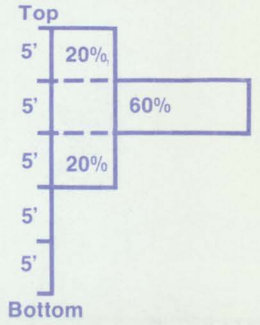
#9 Semi Local Structural Capability



SUPPLEMENTARY DATA

#10 Load Distribution

The worst case vertical load distribution associated with 25' thick multi year ice is assumed to be as shown below where 100% of the load is carried in the upper 60% of the structure.



#11 Reference Data For #6

- Kigoriak 1981 Tests 400 impact in 2nd & multi-year ice at speeds up to 14 knots
- Polar Sea a total of 1266 impacts in 1st and multi year ice
- APOA 1-9 Tuk & Eagle Lake indentation tests
- APOA 52 Eagle Lake indentation tests
- APOA 66 Eagle Lake indentation tests
- APOA 106 Eagle Lake indentation & laboratory tests
- Kivisild & Iyer Flaking tests

Released to public file
Name: ______ Date: NOV 1 2018

~~CONFIDENTIAL~~

ENGINEERING RECORD		CANADIAN MARINE DRILLING LTD. CALGARY ALBERTA CANADA
DRAWN BY	DATE	PROJECT SSDC (Tenneco)
CHKD BY		PREPARED BY
ENGINEER		TITLE Basic Data, Design Criteria & Capability
		SCALE / CONTR. DWG. NO. / CANMAR DWG. NO. Ice 1 / REV.

APPENDIX F

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

APPLICATION FOR PERMIT TO DRILL

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

APPLICATION FOR PERMIT TO DRILL

It is Tenneco's intention to submit an Application for Permit to Drill (APD) at a later date. The APD submittal will address all of those requirements of the MMS OCS Orders.

APPENDIX G

EXPLORATION PLAN

Harrison Bay Area, Diapir Field OCS

Lease Sale Nos. 71 & 87

GEOHAZARDS REPORT

Tenneco Oil Company
P. O. Box 2511
Houston, Texas

GEOHAZARDS REPORT

The Geohazards Report will be submitted at a later date. The field work has been completed and analysis is ongoing. Tenneco will comply with all Geohazard Report Requirements as outlined in the appropriate MMS OCS Orders.