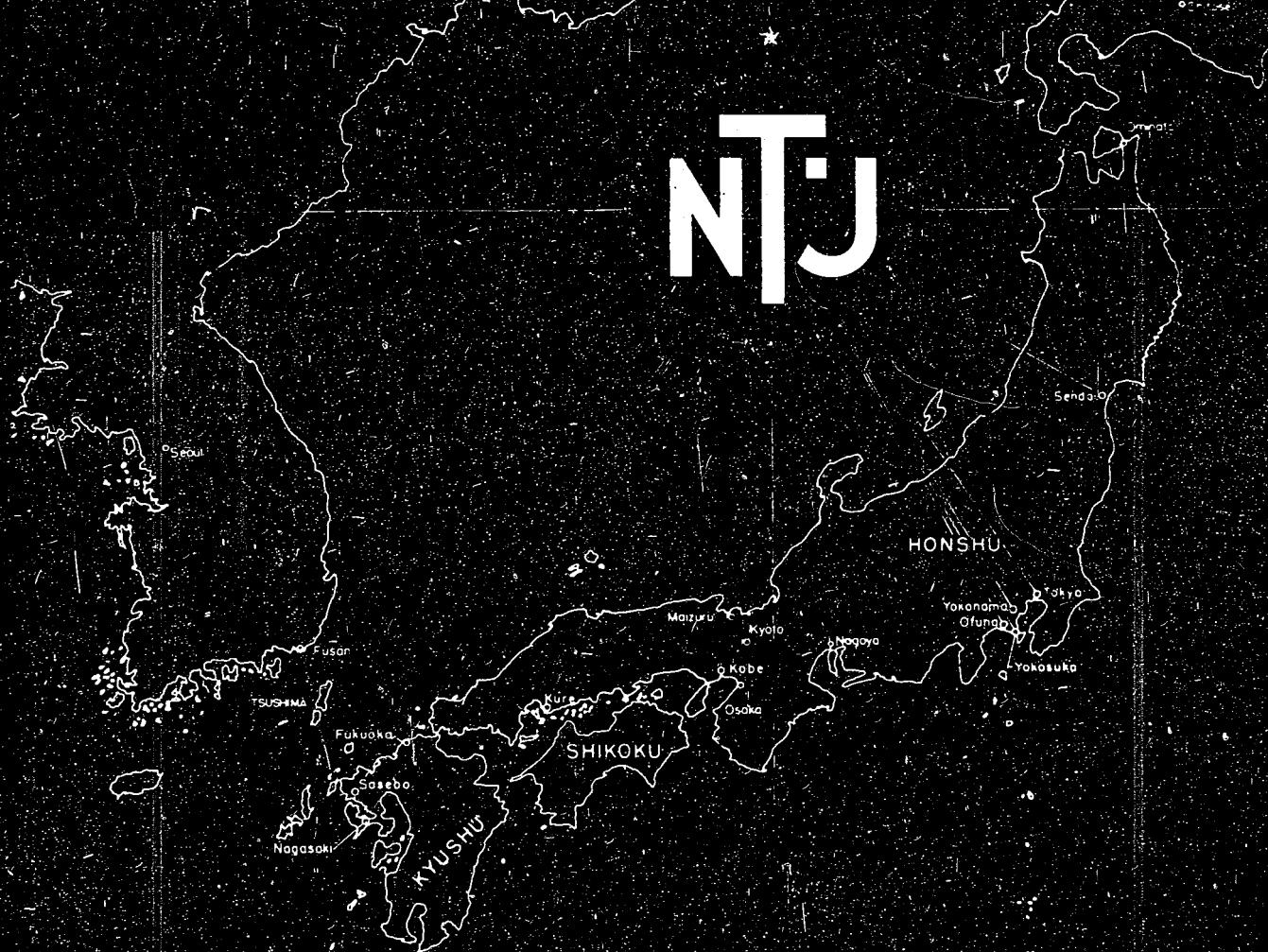


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RESTRICTED

INDEX NO. S-82(N)

SHIP AND RELATED TARGETS

PROVISIONS FOR MILITARY CONVERSION
OF JAPANESE MERCHANT SHIPS

U.S. NAVAL TECHNICAL MISSION TO JAPAN

NS/bb

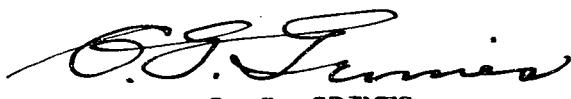
U. S. NAVAL TECHNICAL MISSION TO JAPAN
CARE OF FLEET POST OFFICE
SAN FRANCISCO, CALIFORNIA

29 January 1946

RESTRICTED

From: Chief, Naval Technical Mission to Japan.
To : Chief of Naval Operations.
Subject: Target Report - Provisions for Military Conversion of
Japanese Merchant Ships.
Reference: (a)"Intelligence Targets Japan" (DNI) of Sept. 1945.

1. Subject report, covering Target S-82(N) of Fascicle S-1 of Reference (a), is submitted herewith.
2. The investigation of the target and the target report were accomplished by Lt. Comdr. Kenneth Messenger, USNR, and Lt. Comdr. C. B. Thorn, USNR, assisted by Lt.(jg) Philip Lehner, USNR, as interpreter and translator.


C. G. GRIMES
Captain, USN

RESTRICTED

S-82(N)

PROVISIONS FOR MILITARY CONVERSION OF JAPANESE MERCHANT SHIPS

"INTELLIGENCE TARGETS JAPAN" (DNI) OF 4 SEPT. 1945

FASCICLE S-1, TARGET S-82(N)

JANUARY 1946

U.S. NAVAL TECHNICAL MISSION TO JAPAN

SUMMARY

SHIP AND RELATED TARGETS

PROVISIONS FOR MILITARY CONVERSION OF JAPANESE MERCHANT SHIPS

In 1932, the Japanese Government initiated action to provide in all merchant ships of 4000 gross tons and upward, and capable of a minimum speed of 13.5 knots, structural elements necessary for their eventual conversion for military use. These elements consisted principally of structural foundations for 12cm guns to 20cm guns, two to six per ship.

Certain merchant ships were so designed and constructed that they could be converted readily to aircraft carriers, others to "LSD" type transports. The minimum height between decks of some passenger ships was specified by the Army so that horses, as well as troops, could be transported. Attachments for paravanes were built into some merchant ships.

With rare exceptions, designs of merchant ships included no special provisions for making them more capable of withstanding battle damage.

TABLE OF CONTENTS

Summary	Page 1
List of Enclosures	Page 3
References	Page 4
Introduction	Page 5
The Report	
Part I Provisions for Conversion to Fleet Auxiliaries	Page 7
Part II Provisions for Withstanding Battle Damage	Page 9

LIST OF ENCLOSURES

- (A) Subsidized Shipbuilding Programs Page 11
- (B) Data on Ships of MAYASAN MARU and KIBITSU MARU Class Page 12
- (C) Paravane Attaching Device, SADO MARU Page 13
- (D) Plans Showing Arrangement of Armament, MAYASAN MARU Page 15
- (E) Typical General Arrangement Plans (Showing position of gun supports) Page 17
- (F) Typical 14cm and 8cm Gun Support Construction Plans Page 19
- (G) General Arrangement Plans, ARIMASAN MARU (Showing location of gun and catapult mounts) Page 21
- (H) Plans of 12cm Gun and Catapult Supports, ARIMASAN MARU Page 23
- (I) Plans of 12cm AA Gun Mount Supports, ARIMASAN MARU Page 25

REFERENCES

Location of Target:

Shipping Section, Transportation Ministry, TOKYO.
Fourth Section, Navy Technical Department, Navy Ministry, TOKYO.
Shipping Section, Army Ministry, TOKYO.
Harima Shipbuilders, HARIMA.
Mitsubishi Gunworks, NAGASAKI.
Hakodate Dock Company, HAKODATE.
Hideachi Shipbuilders, Habu, INNOSHIMA.
Kawasaki Gunworks, KOBE

Japanese Personnel Who Assisted in Gathering Documents:

T. ONOGI, Shipping Section, Transportation Ministry, TOKYO.
S. MAKINO, Capt. (IJN), Fourth Section, Navy Technical Department,
Navy Ministry, TOKYO.

Japanese Personnel Interviewed:

T. ONOGI, Chief, Shipping Section, Transportation Ministry. An authority on merchant ship design. Fifteen years in this section.
S. MAKINO, Capt. (IJN), Chief Designer of Fourth Section, Navy Technical Department, Navy Ministry. Connected with merchant ship design since 1938 from the point-of-view of military requirements.
C. MONONOBE, Lt. Gen., Chief of Staff, Shipping Section, Army Ministry, 1942-43; Chief, Philippine Shipping Section 1943-44. Fifteen years experience with army shipping.
T. UCHIYAMA, Lt. Col., Chief, Shipping Section, Maintenance Division, Army Transportation Department.
S. YOKO, President, Harima Shipbuilders, HARIMA.
MUTO, General Manager, Mitsubishi Gunworks, NAGASAKI.
J. WATANABE, General Manager, Hakodate Dock Co., HAKODATE.
T. TOKUNAGA, President, Hidechi Shipbuilders, HABU, INNOSHIMA.
Y. YOSHIOKA, Managing Director, Kawasaki Gunworks, KOBE.
T. AKIYAMA, Capt. (IJN), Supervised shipbuilding in OSAKA during war.

INTRODUCTION

This report describes the arrangements made in designs of merchant ships (liners, cargo vessels, tankers, fishing vessels, etc.) to enable them to be used as fleet auxiliaries and to better withstand battle damage. Since the actual conversion, including the installation of wartime armament and armor, was not within the scope of this investigation, only the military provisions which were a part of the original ship construction plans are discussed.

Some "military requirements" were set up by the Government as a part of a subsidy program as early as 1932. These requirements were not applied throughout the ship-building industry, nor were they standard. It appears that, for security reasons, elements of ship construction were not specified in writing, but were mutually understood. These elements varied in design and scope largely in accordance with the initiative of the shipbuilder. A moderate degree of control, however, was exercised by the Government through its prerogative to approve plans.

At the beginning of the investigation, some indications were found of a broad, unified program for providing merchant ships with the elements necessary for installing armament and other military features. A rather exhaustive search, however, leading to many of the shipyards, revealed considerable disunity in government control.

In Part I of this report, the basic program for the inclusion of potential military features in the construction of merchant ships is outlined, and specific examples are given. A discussion of specific types of ships and shipbuilding programs is included. Part II covers the provisions made in the design of merchant ships to enable them to withstand battle damage.

6

THE REPORT

Part I

PROVISIONS FOR CONVERSION TO FLEET AUXILIARIES

A. The General Program

The basic policy for designing merchant ships capable of being readily converted to fleet auxiliaries, follows closely the Government's subsidized shipbuilding programs.

Under the first, the "Shipping Improvement Program" of 1932 (Enclosure (A)), cargo vessels and tankers, totalling approximately 300,000 gross tons, with minimum specifications of 13.5 knots and 4,000 gross tons, were constructed. Although the inclusion of structural military provisions was not a declared part of this program, it was a de facto requirement. The amount of the subsidy was expected to cover the extra cost of such elements of construction.

The second program, the "Superior Ship Construction Program" of 1937 (Enclosure (A)), called for the construction of another 300,000 gross tons, one-half to be cargo ships and tankers of the same minimum specifications as in the 1932 program, and one-half to be passenger and passenger-cargo ships of at least 6000 gross tons and capable of making a minimum speed of 19 knots. In 1938 and 1940 similar subsidy programs were adopted (Enclosure (A)).

Ships totalling approximately 730,000 gross tons were built under these programs between 1932 and 1941. Some military features were included in the construction of all of them. In addition, a majority of ships of more than 4,000 gross tons and 13.5 knots built during this period independent of the subsidy programs, had some provision for military conversions.

There is no evidence that ships smaller than 4000 gross tons were designed with military features at any time, with the exception of those wartime standard ships built with provisions for sound detection equipment.

The requirements laid down by the Navy and the Army varied, depending on the type of ship and the time of construction. No completely systematic policy was established, either as to the quantity or size of armament or to construction details. At first, some merchant ships with minimum specifications of 4000 gross tons and 13.5 knots had gun mount supports and others did not, but by 1937 nearly all ships of this category were designed with some military provisions.

In general, requirements were directed toward making ships convertible to armed cargo or transport ships rather than to any particular type of fleet auxiliary.

Plans for subsidized merchant ships were prepared by civilian shipbuilding companies and presented for approval to the Navy Technical Department (or in special cases, to the Army) and to the Transportation Ministry. It was required that these plans show the positions and construction details of gun supports.

In the first program, the only Navy requirements were for the construction of from four to six gun mount supports suitable for 12 to 20cm guns, depending on the size and type of ship. Details of construction varied with individual shipyards (see Enclosures (B) and (C)) but supports usually consisted of no more than a cylinder (extending downward through one or more decks), angle braces and reinforcing under the prospective location.

Supports intended for guns of 15cm or larger nearly always were cylindrical in form. For smaller guns and in instances of acute material shortages, double channels forming a built-up "H" column were used.

In practice, the number of guns actually installed at the time of military commission often was less than the number provided for in the original design. This was due primarily to a shortage of guns. Usually not more than two guns per ship were installed.

A number of ships (of more than 4000 gross tons), not qualifying for aid under the regular subsidy programs, were constructed with gun mount supports. The government paid an average subsidy of ¥ 3000 for each approved support.

The Army required that cargo ships built under its cognizance be designed with sufficient between-deck height (8 feet minimum) to permit their use for the transportation of horses as well as men. Two such decks were required in ships of 4000 and 5000 gross tons and three in larger ships.

Depending upon the size of a ship, the Army specified that it be provided with (1) one or two 7-ton winches, (2) that it be able to transport from two to six large barges or from eight to twelve small ones, and (3) that it have a 20 to 30-day cruising range.

Starting in 1938, the Navy required that a paravane attaching device be constructed on the forefoot of each subsidized ship. This device is illustrated in Enclosure (C).

The Transportation Ministry set up no specifications for the size of radio rooms or for radio equipment except those necessary to meet the requirements of international law.

In a few ships, supports were so constructed and located (beneath the weather decks) that they could be used for either gun mounts or catapults (Enclosures (G), (H), and (I)).

No provisions were made for the installation of degaussing equipment.

During the war, standard-type ships A, B, C, D, TL, TM and their modifications were designed with provisions for the installation of sound detection gear. (See NavTechJap Report "General Arrangement and Capacity Plans of Japanese Standard Type Merchant Ships", Index No. S-12).

B. Ships Designed for Special Conversion.

In addition to the categories mentioned above, some ships and classes of ships were designed for future conversion into particular types of fleet auxiliaries.

1. Army Transports Built from 1932 to '36. Four 7,000 gross ton, 18-knot ships and two 4,500 gross ton, 14-knot ships built under the subsidy programs, although similar in most respects to other ships of their classes, were constructed according to particular Army requirements. Long, double hulls to provide an additional safety factor against war damage and to afford more fresh water tank space, heavy duty winches (one 25-ton, others 10-ton), and two gun mount supports forward and two aft were the significant elements of military interest.

2. Passenger Ships NITTA MARU, YAWATA MARU, KASUGA MARU. Three 17,000 gross ton, 22-knot passenger ships laid down in 1938, the NITTA MARU, YAWATA MARU, AND KASUGA MARU, were structurally designed to be converted to aircraft carriers. However, they did not embrace any obvious military characteristics, such as outboard funnels, special elevators, gun supports, or flight decks.

3. KASHIWARARA MARU, IZUMO MARU. KASHIWARARA MARU, which afterwards became HAYATAKA, and IZUMO MARU, which became HITAKA, were 27,700 gross ton, 24-knot passenger vessels. Their keels were laid in 1939. They were specifically designed for conversion to carriers. They had double hulls, extra height between decks, provision for elevators, extra tank capacity, and provisions for the installation of extra longitudinal and traverse bulkheads. No gun supports or outboard funnels were included in the construction.

4. The AKITSU MARU and MAYASAN MARU Class. In 1935, the Army drew up a "Special Ship Construction Program" for the subsidizing of large-type ships suitable for conversion to transports for landing craft and aircraft. Under this program, eight 10,000 gross ton, 20-knot and one 5,000 gross ton, LSD-type merchant ships were built (Enclosure(B)). These ships were designed for the fastest possible launching of landing craft. Under good conditions the 27 large barges carried by one ship could be launched in forty minutes. They had a continuous No. 2 deck running from the bow to a launching ramp in the stern. Hatches in this deck were flush and watertight. The funnels were outboard. Two of the ships of this class had the additional equipment necessary for carrying aircraft. The number of gun mount supports varied with the ship, but all the ships of this class were provided with the structural qualities necessary for heavy arming with AA guns and machine guns (Enclosure(D)).

C. Wartime Standard Merchant Ships.

During the war, standard-type merchant ships (Types A,B,C,D,E,F,TL,TM,TS,K, and their modifications) were built from plans prepared jointly by the Shipping Improvement Association, The Transportation Ministry, and the Navy. (See NavTechJap Report "General Arrangement and Capacity Plans of Japanese Standard Type Merchant Ships", Index No. S-12.)

The prime aim of this program was the rapid, economical construction of merchant ships. No military element entered into their design, except that in standard-types A,B,C,D,TL,TM and their modifications, there were provisions for the installation of sound detection equipment.

Part II

PROVISIONS FOR WITHSTANDING BATTLE DAMAGE

With rare exceptions, designs of merchant ships included no special provisions for making them more capable of withstanding battle damage.

Two exceptions were KASHIWABARA MARU and IZUMO MARU (Part I, Section B, Paragraph 3 of this report), which were built with double hulls and fitted with special angle irons so that extra bulkheads could be attached at the time of conversion.

Other exceptions were six Army transports (Part I, Section B, Paragraph 1), which were built with double hulls.

No additional exceptions were found.

RESTRICTED**S-82(N)****ENCLOSURE (A)**
**SUBSIDIZED SHIPBUILDING PROGRAMS
(30 MAY, 1942. Shipbuilding Section)**

Name	Classification	Time Required	No. of Ships to be Built*	Total Tonnage Built*	Total Tonnage to be Scrapped	Subsidy Per Ton (\$)*	Total Subsidy (\$)
Shipping Improvement Program	1st	From Oct. 1932 To March 1935 (2½ years)	(31)	200,000 (198,959)	400,000	55	22,000,000
	2nd	From April 1935 to March 1936 (1 year)	(8)	50,000 (50,874)	50,000 (32,293) not yet scrapped	30	1,500,000
	3rd	From April 1936 To March 1937 (1 year)	(9)	50,000 (50,891)	50,000 (44,952) not yet scrapped	30	1,500,000
	Total		(48)	300,000	425,845		= 25,000,000
Superior Ship Construction Program	No. 1 Capital Ship	From April 1937 To March 1941 (4 years)	15 (12)	150,000 (154,623)		Average $\Delta 225^{\circ}$	44,693,567
	No. 2 Capital Ship		21 (15)	150,000 (139,018)		40	6,000,000
	Total		36 (27)	300,000 (293,641)			50,693,567
Large Size Superior Ship Construction Program	San Francisco Line	From April 1938 To March 1941 (3 years)	2	55,400		About 5/44 (60% of Building cost)	28,800,000
Special Ship Construction Program	Type A 8000-T. Type 4000-T. Type	From April 1940 To March 1943 (3 years)	6 2	43,000 8,000		60 90	2,880,000 720,000
	Type B 3000-T. Type 1500-T. Type 5000-T. Type	From April 1940 To March 1942 (2 years)	2 1 2	6,000 1,500 10,000		40 90 50	240,000 135,000 500,000
	Total		13	73,500			4,473,000
	Subsidized Tanker Building	From April 1941 To March 1944 (3 years)	15 10	150,000 50,000		72 108	10,800,000 5,400,000
	Total		25	200,000			16,200,000

*Bracketed figures in "Total Tonnage Built" and "Number of Ships to be Built" columns show actual results.

** Δ indicates subsidy which comes from principal and interest of funds (interest 3.75 per year, non-redemable for 2 years, equal redemption each year for following 13 years) collected for shipbuilding cost and calculated by total tonnage on an average of $\frac{V}{225}$. Using the speed equation for calculating the subsidy per ton:

$$X = \frac{47V - 738.5}{(with V in knots)}$$

gives $V = 201.5$ for 20 knots and $V = 203.5$ for 21 knots

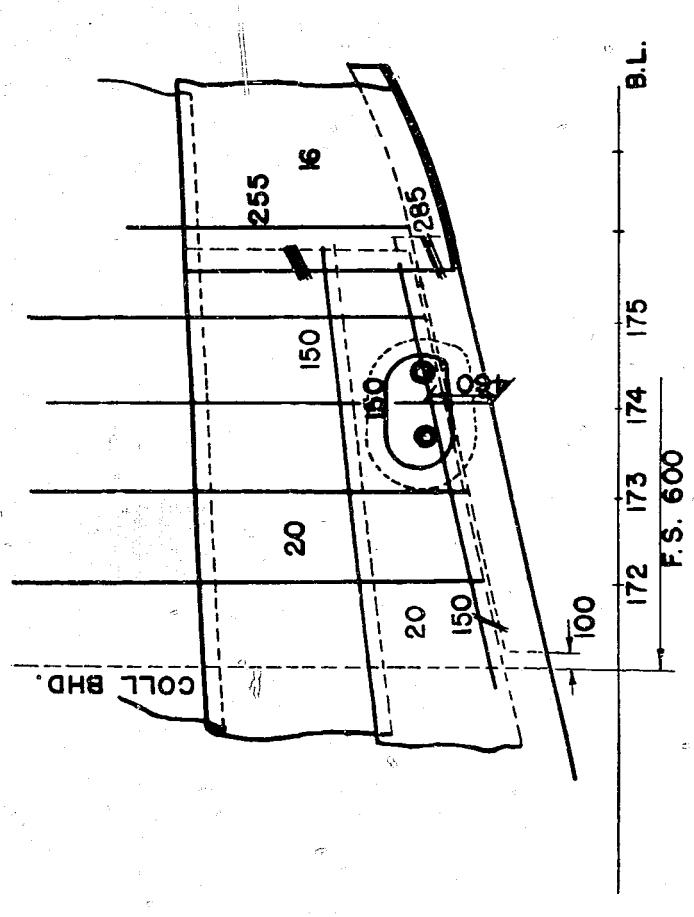
ENCLOSURE (B)

	Ship Yard	Owner	Construction Date		Gross Tonnage	Type of Ship When Converted	Subsidy
			Commencement Date	Finishing Date			
AKITSU MARU	Harima Shipbuilders	Japanese Maritime Service Kabushiki Co.	Nov. 1939	March 1941	10,000 (approx.)	Large size landing craft and airplane transport	No subsidy
GOSHIN MARU (NIGETSU MARU)	Harima Shipbuilders	Japanese Maritime Service Kabushiki Co.	June 1941	March 1943	10,000 (approx.)	Large size landing craft and airplane transport	(£ 50 per ton)
MAYASAN MARU	Mitsui TAMA Shipbuilders	Mitsui Shipping	Feb. 1941	Nov. 1942	10,000 (approx.)	Transport for personnel, ammunition, and large size landing craft	(£ 50 per ton)
TAMATSU MARU	Mitsui TAMA Shipbuilders	OSAKA Shosen Co.	Oct. 1942	Jan. 1944	10,000 (approx.)	Transport for personnel, ammunition, and large size landing craft	(£ 50 per ton)
TAKATSU MARU	URAGA Shipbuilders	Yamashita Steamship Co.	Feb. 1943	Jan. 1944	5,000 (approx.)	Transport for personnel, ammunition, and large size landing craft	(£ 50 per ton)
KIBITSU MARU	HIDACHI INOSHIMA Shipbuilders	Japanese Mail Steamship Co.	March 1943	Jan. 1944	10,000 (approx.)	Transport for personnel, ammunition, and large size landing craft	(£ 50 per ton)
HYUGA MARU	HIDACHI INOSHIMA Shipbuilders	Nissan Shipbuilders	March 1944	Nov. 1944	10,000 (approx.)	Transport for personnel, ammunition, and large size landing craft	(£ 50 per ton)
KUMANO MARU	HIDACHI INOSHIMA Shipbuilders	Karasaki Steamship Co.	Aug. 1944	March 1945	10,000 (approx.)	Transport for personnel, ammunition, and large size landing craft (flight deck)	(£ 50 per ton)
SETSU MARU	HIDACHI INOSHIMA Shipbuilders	OSAKA Shosen Co.	April 1944	Jan. 1945	10,000 (approx.)	Transport for Personnel, ammunition and large size landing craft	(£ 50 per ton)

RESTRICTED

ENCLOSURE

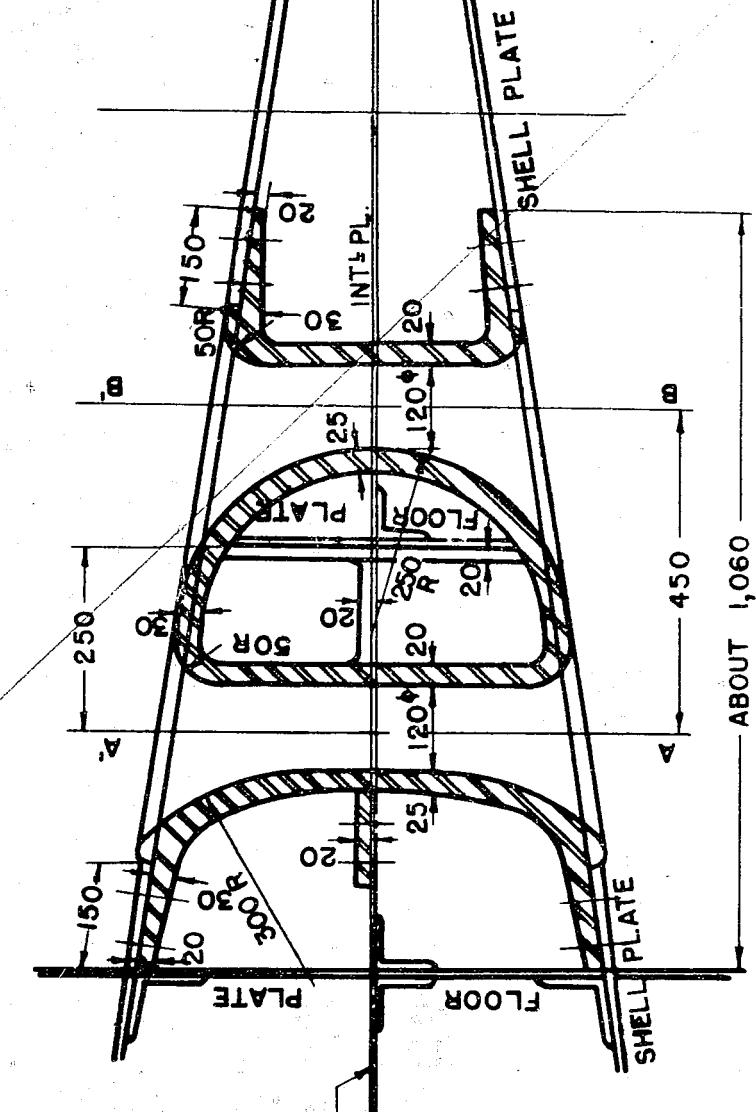
OUTER STARBOARD PLATING
SCALE 1/50



LOOKING AFT
A-A' SECTION
B-B' SECTION

SCREW BOLT DETAIL
SCALE 1/5

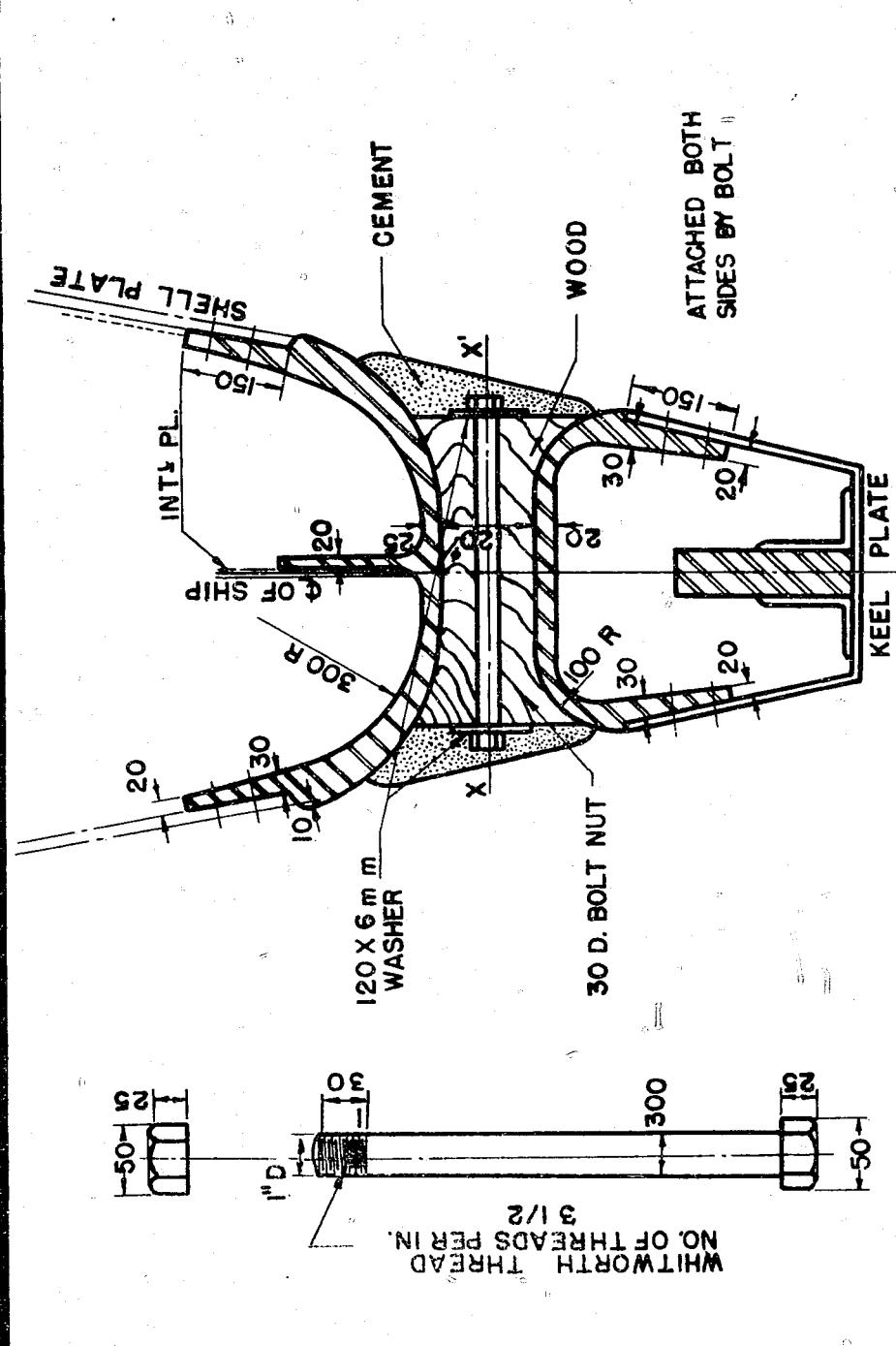
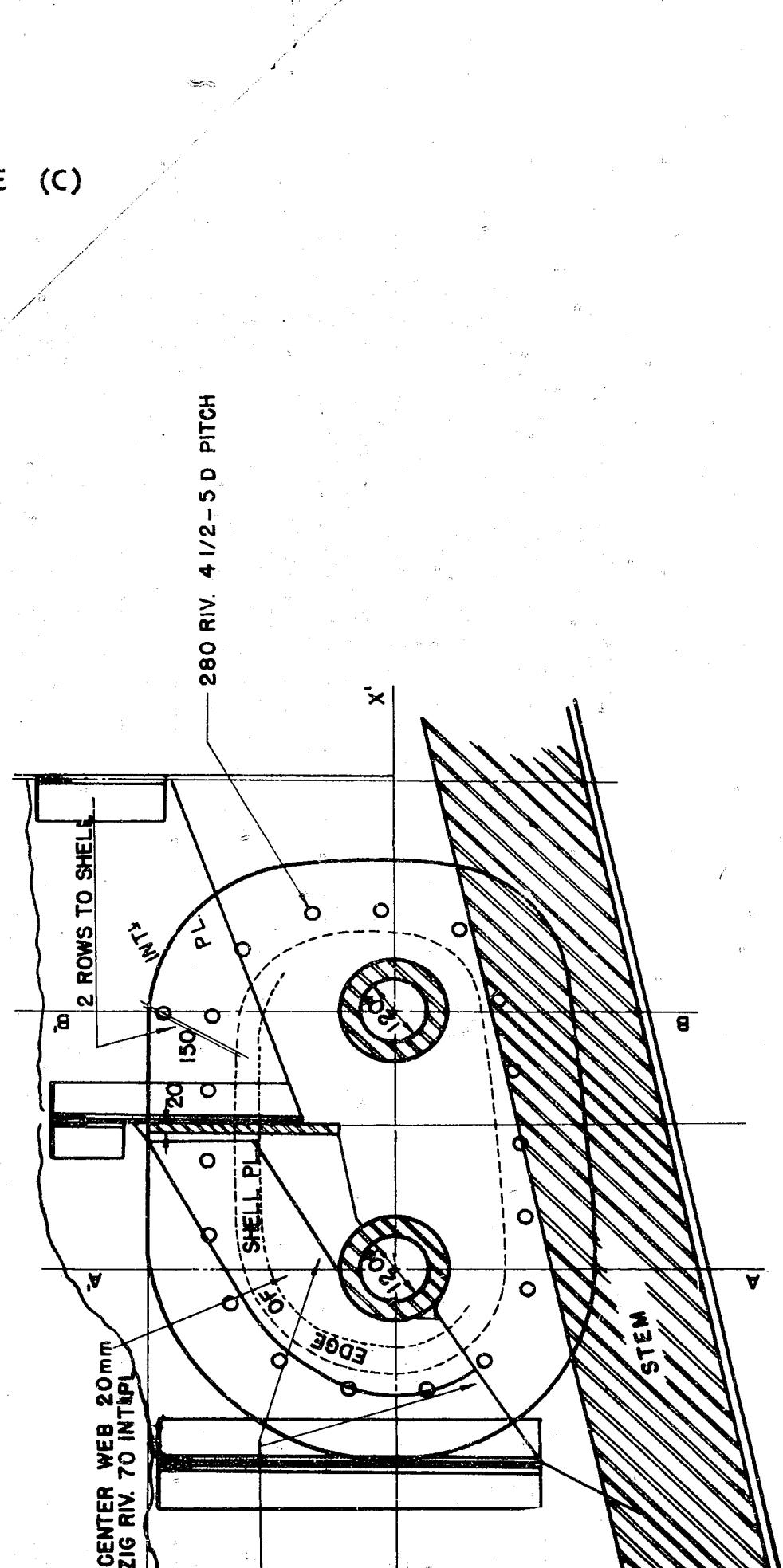
X-X' SECTION



CENTER LINE CROSS SECTION
LOOKING AFT

S-82(N)

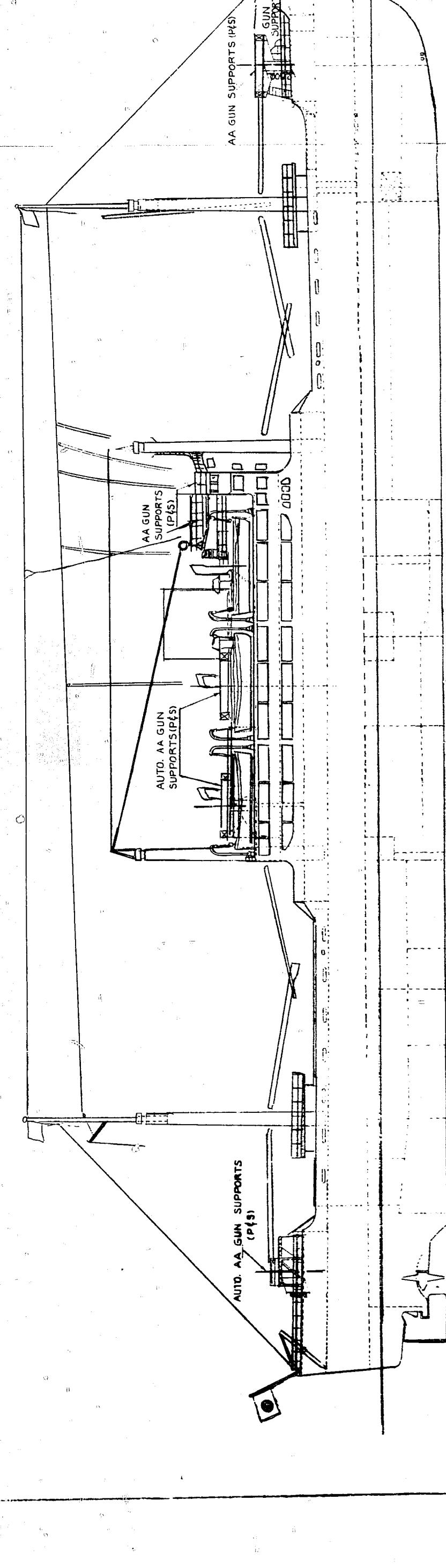
SADO MARU
PARAVANE ATTACHING DEVICE
1 AUGUST 1938

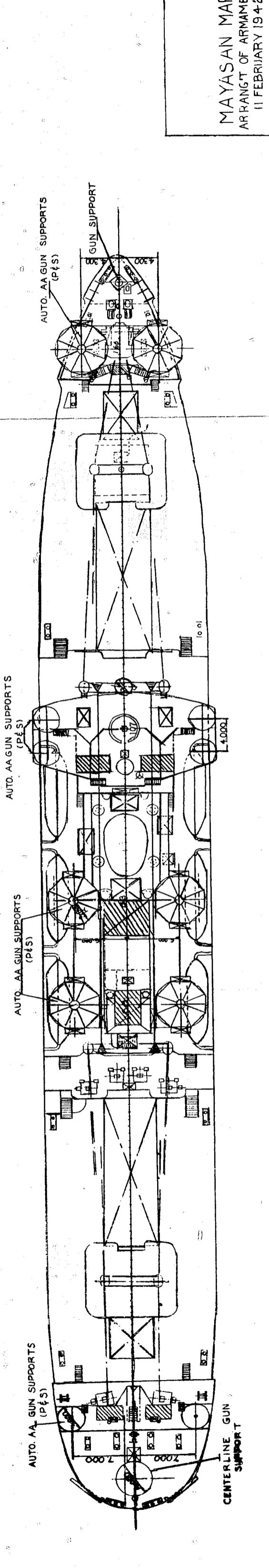


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ENCLOSURE (D)

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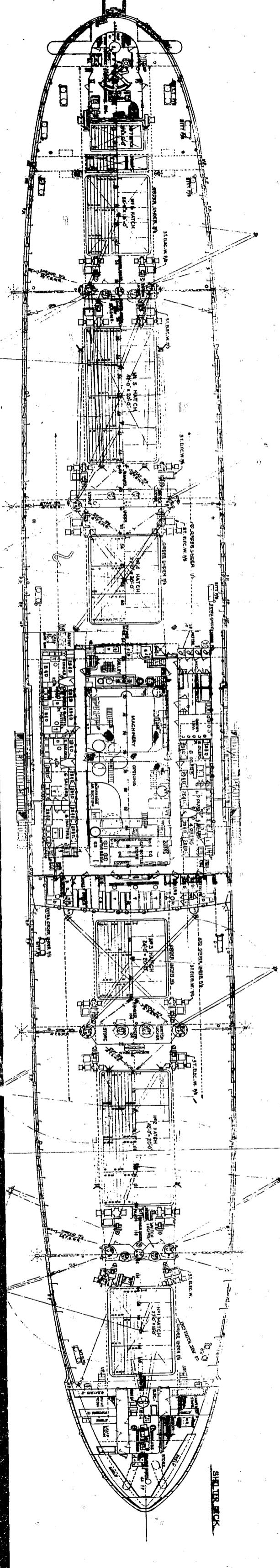


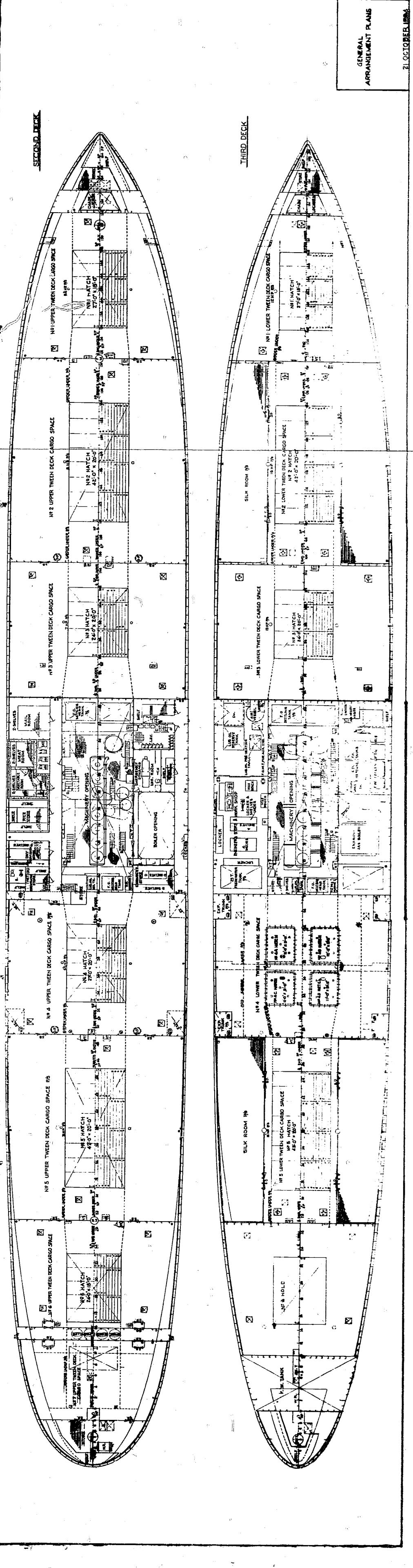


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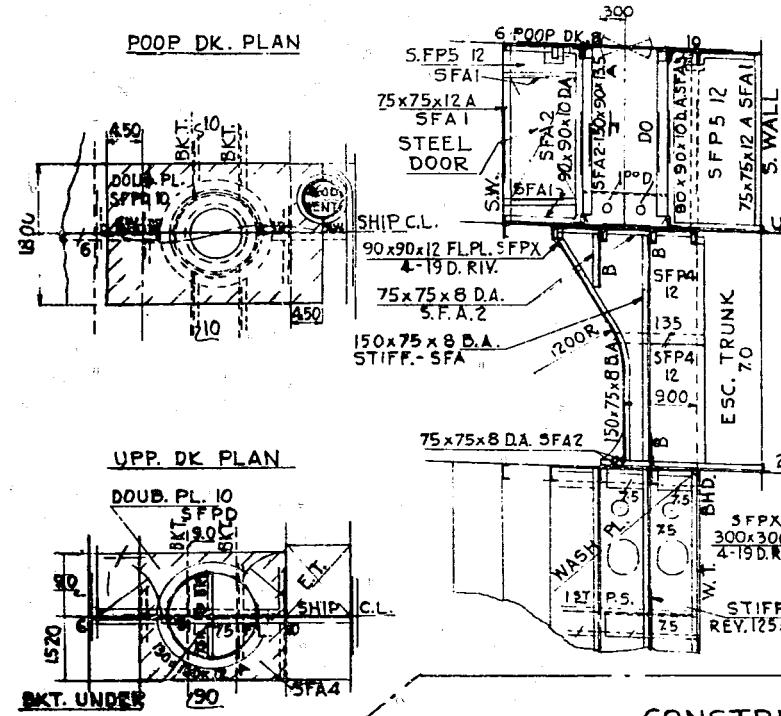
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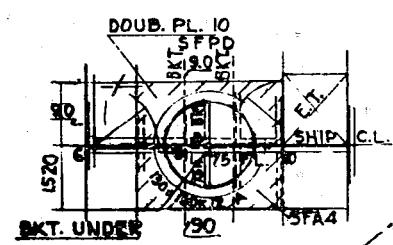


F 6-10

POOP DK. PLAN



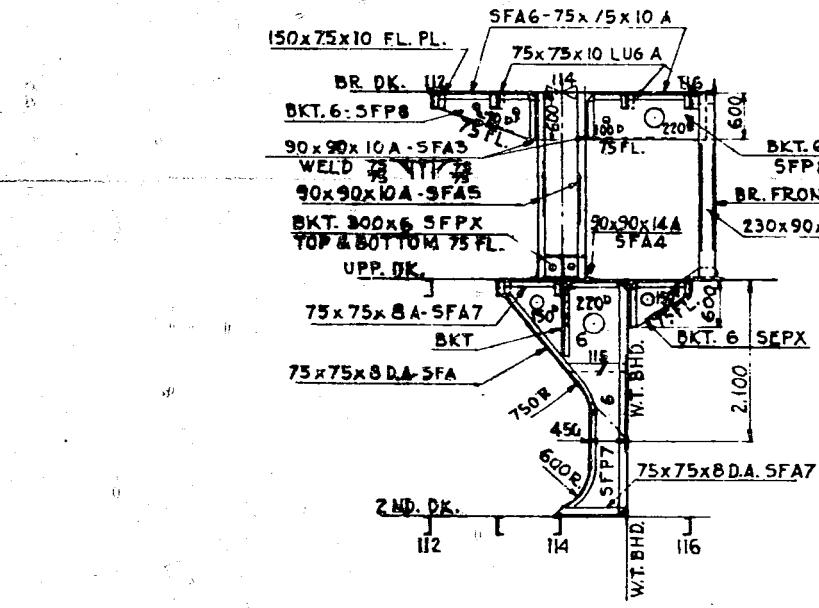
UPP. DK PLAN



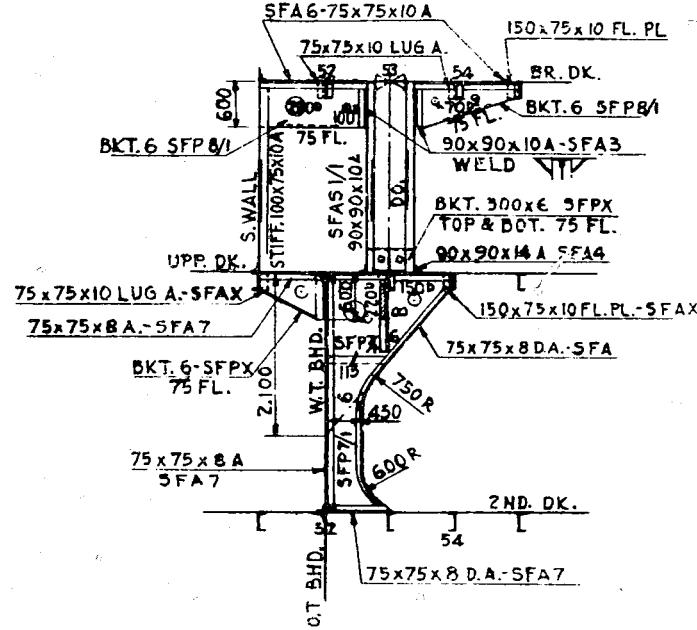
CONSTRUCTION DIAGRAM OF SUPPORT FOR 8 CM AA GUN

F 112-1 6

F. 114



F. 51-55



RESTRICTED

F163

STIFF. 75x100x12 A-SFAS

75x75x10 DA-SFA5

FCL. DK.

FCL. DK. PLAN

90x90x10 D.A. SFA3
356x457 MH

BKT. 450x10-SFPX
TOP & BOT. 75 FLG.

UPP. DK.

200x80x80x $\frac{3}{4}$ CH.

75x75x8 D.A. SFA3

SFA1

BKT. 1500x800x12 SFP3

PX 10

75 FLG

600

12 SFP 10

SFA3 5 90x90x3A

* C 90x90x3A

BKT. 300x10-SFPX

TOP & BOT. 75 FLG.

2 ND DK.

200x80x80x $\frac{3}{4}$ CH.

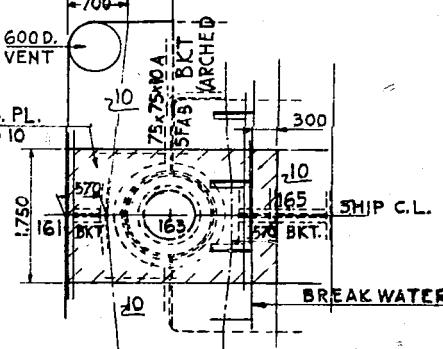
FLD 75 FL

BKT. 10-SFPX

200 D.10 PILLAR TO TANK TOP

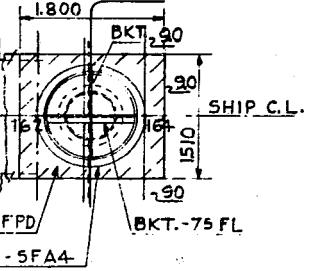
SFP

FCL. DECK PLAN



BOLTS

UPP. DECK PLAN



GUN PEDESTAL

"X-X"

$\frac{1}{25}$

D=876.3

D=736.6

10

16

WELD

200x16

75x75x10A.

10

DA

600

20x90x10A.

90x90x10A.

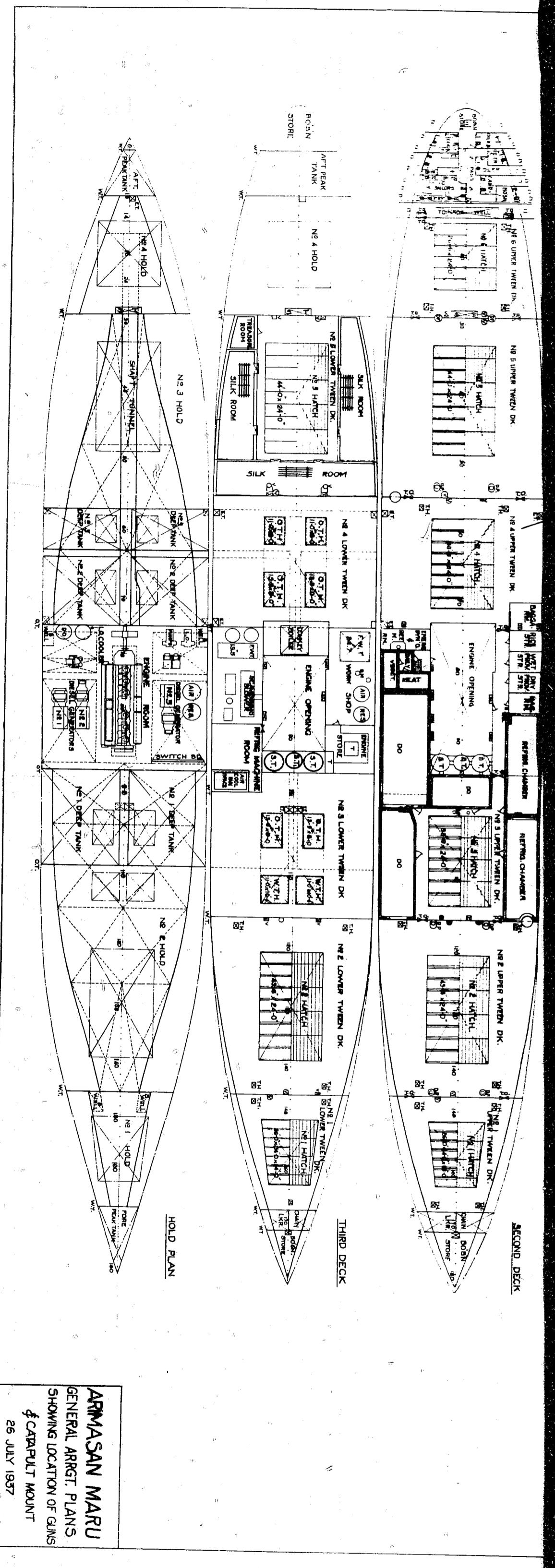
10

50

100

14CM & 8CM GUN
SUPPORT CONSTRUCTION
PLANS
14 NOVEMBER 1933

S.B.R.(N)



*ARMASAN MARU
GENERAL ARRGT. PLANS
SHOWING LOCATION OF GUNS
& CATAFULT MOUNT*

26 JULY 1937

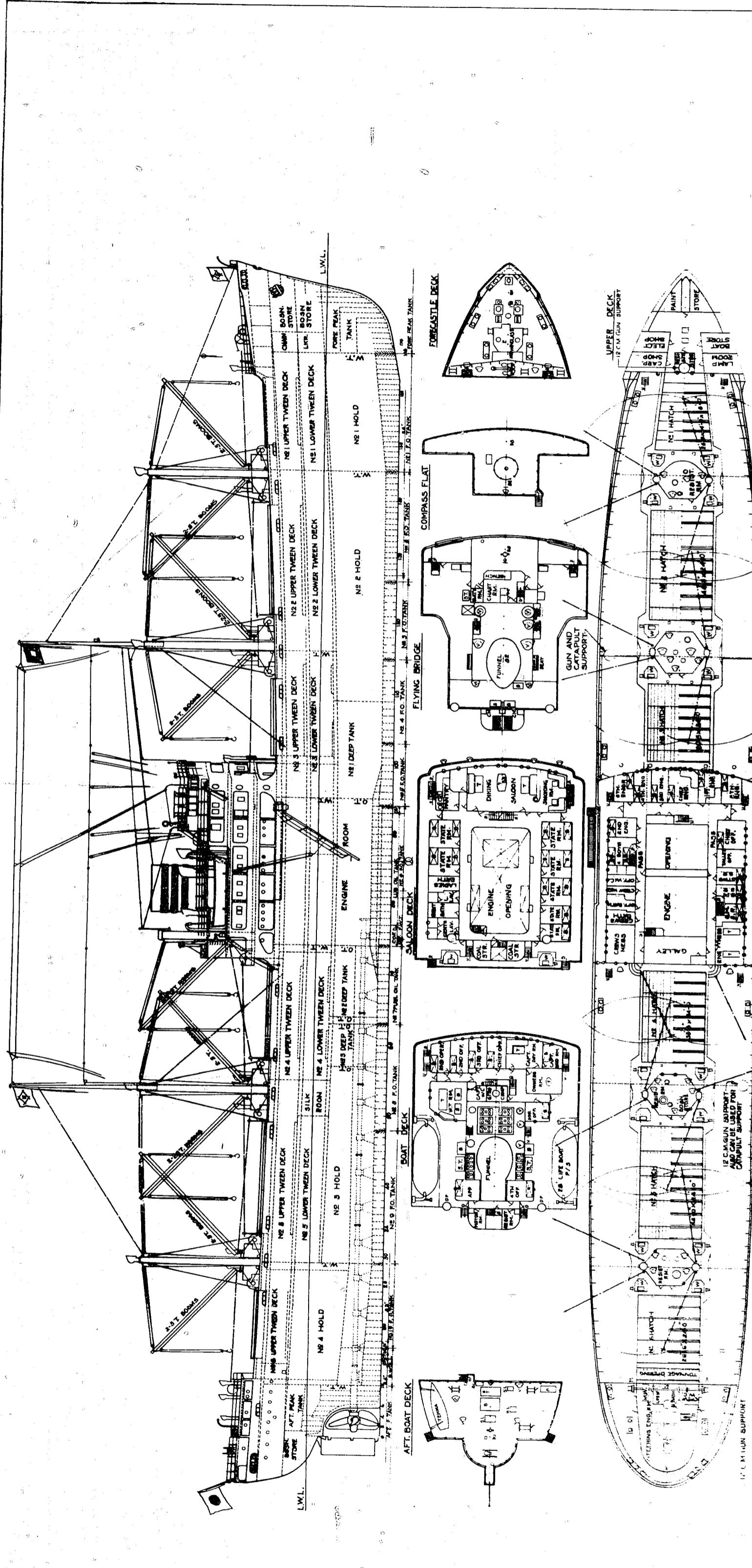
$\frac{1}{16} = 100'$

21

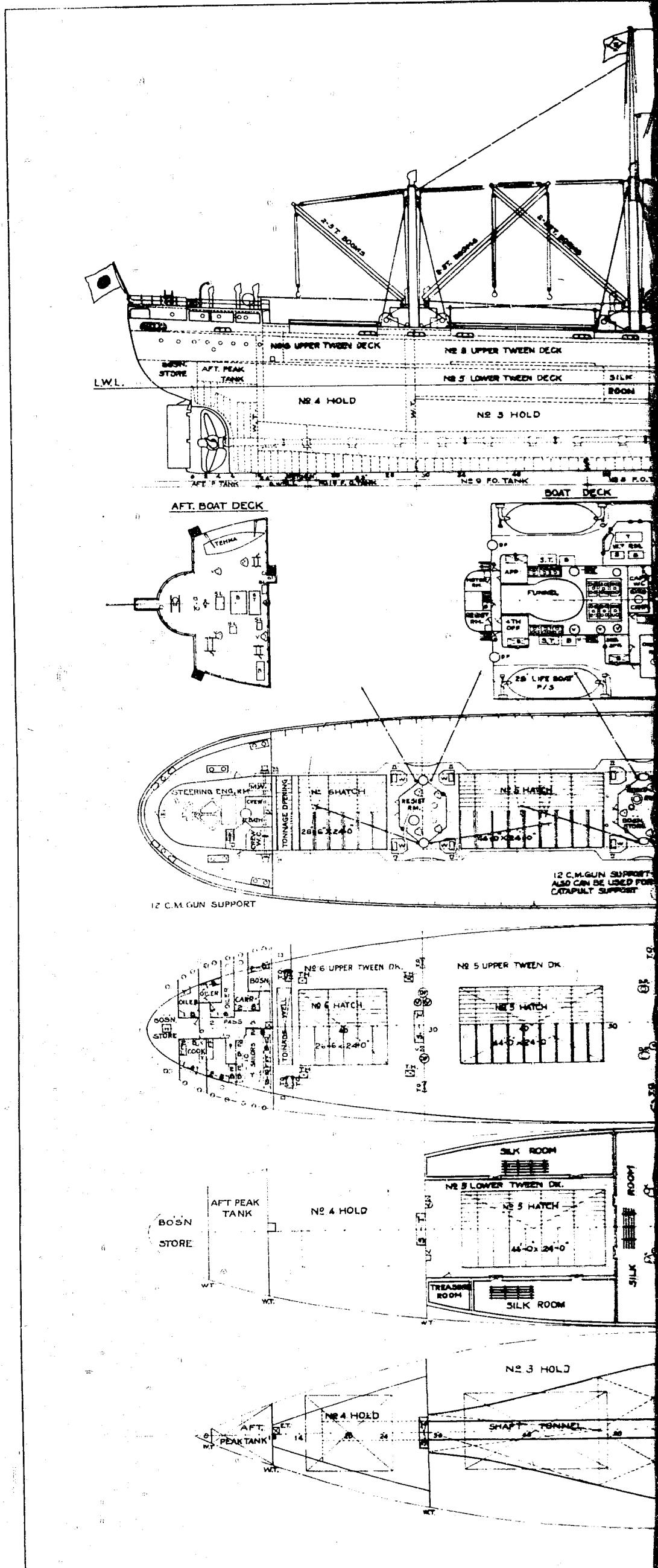
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ENCLOSURE (G)

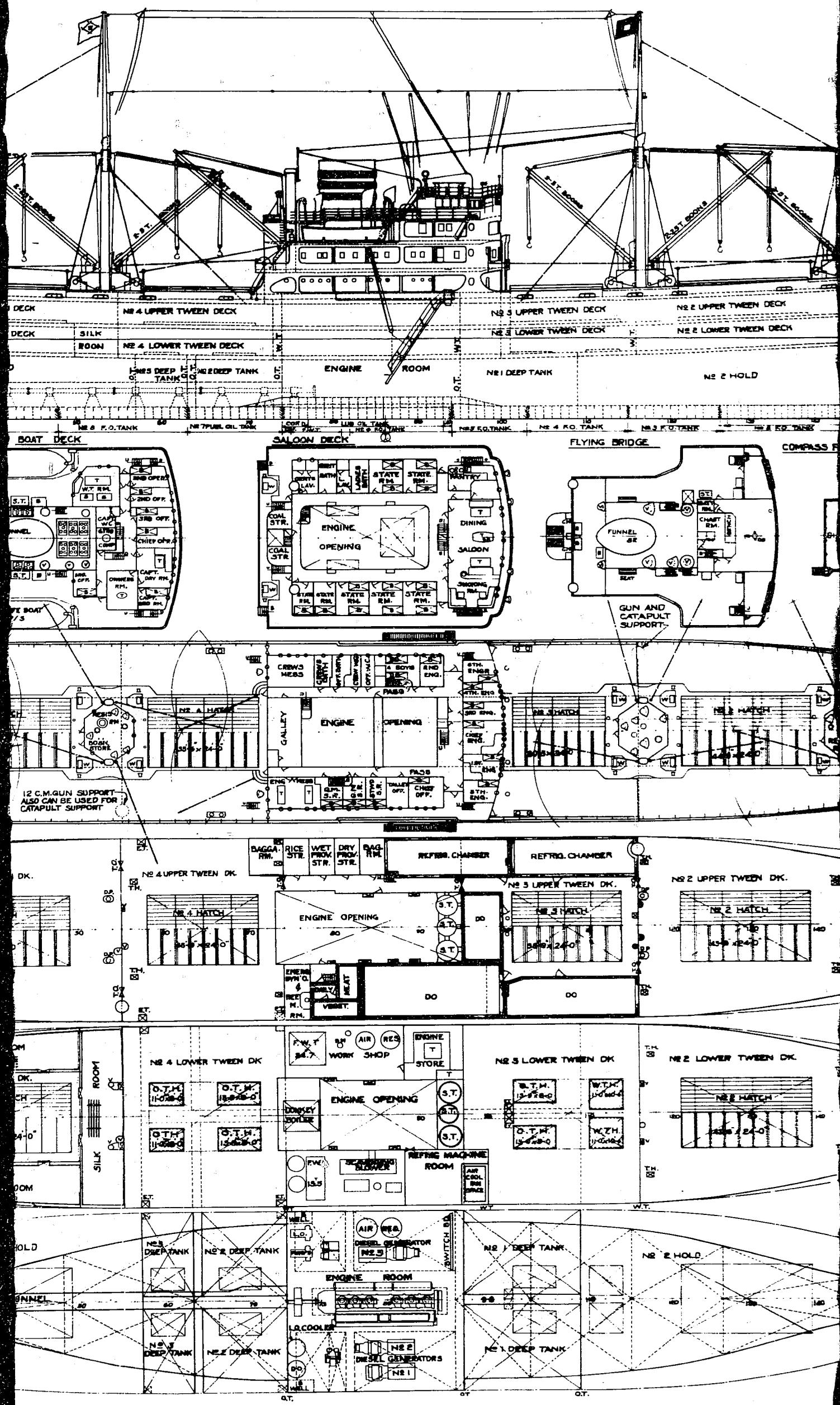
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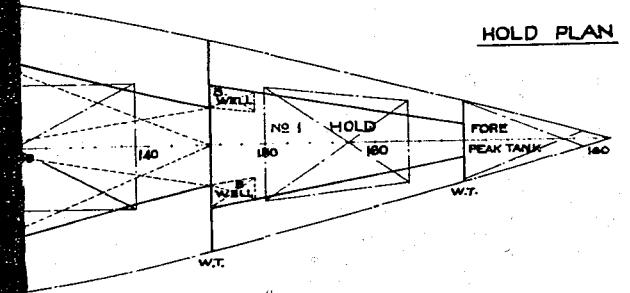
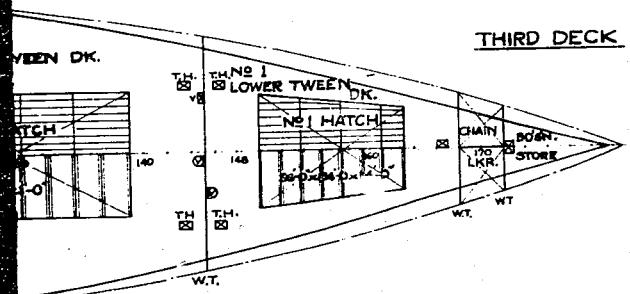
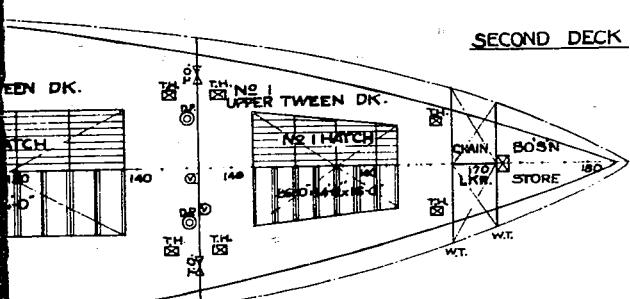
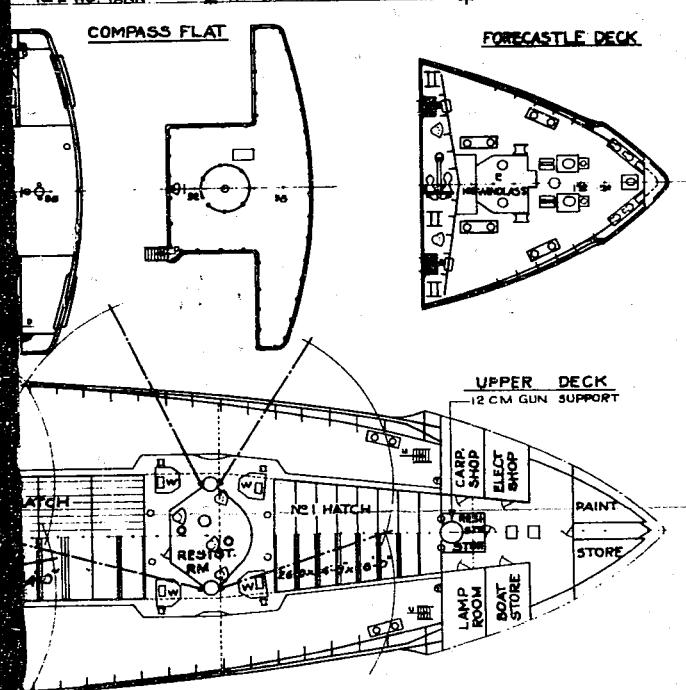
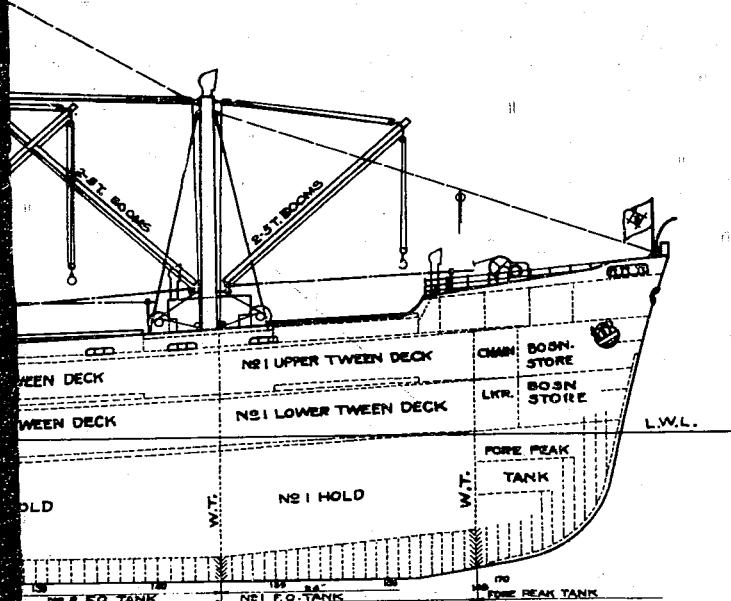


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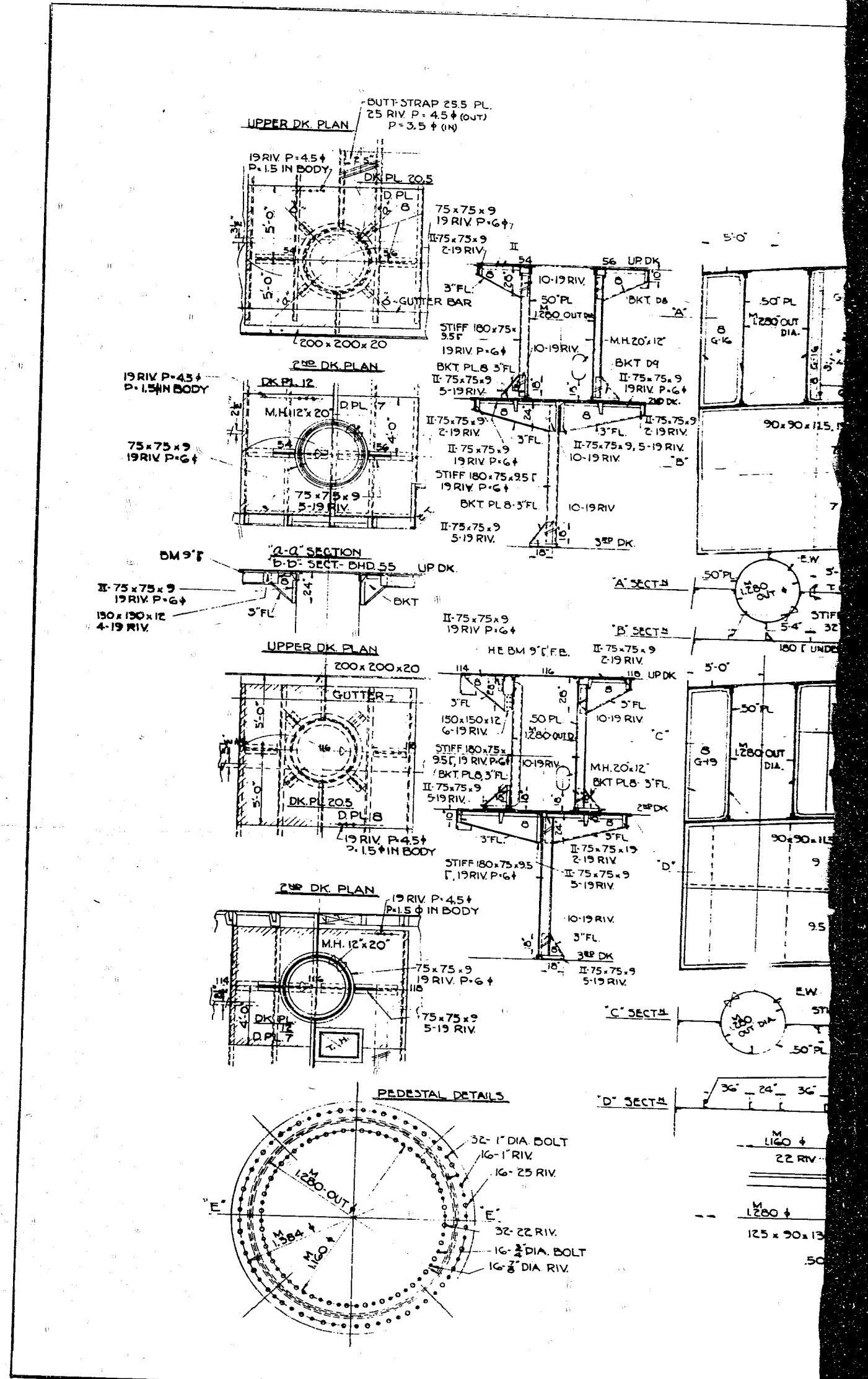


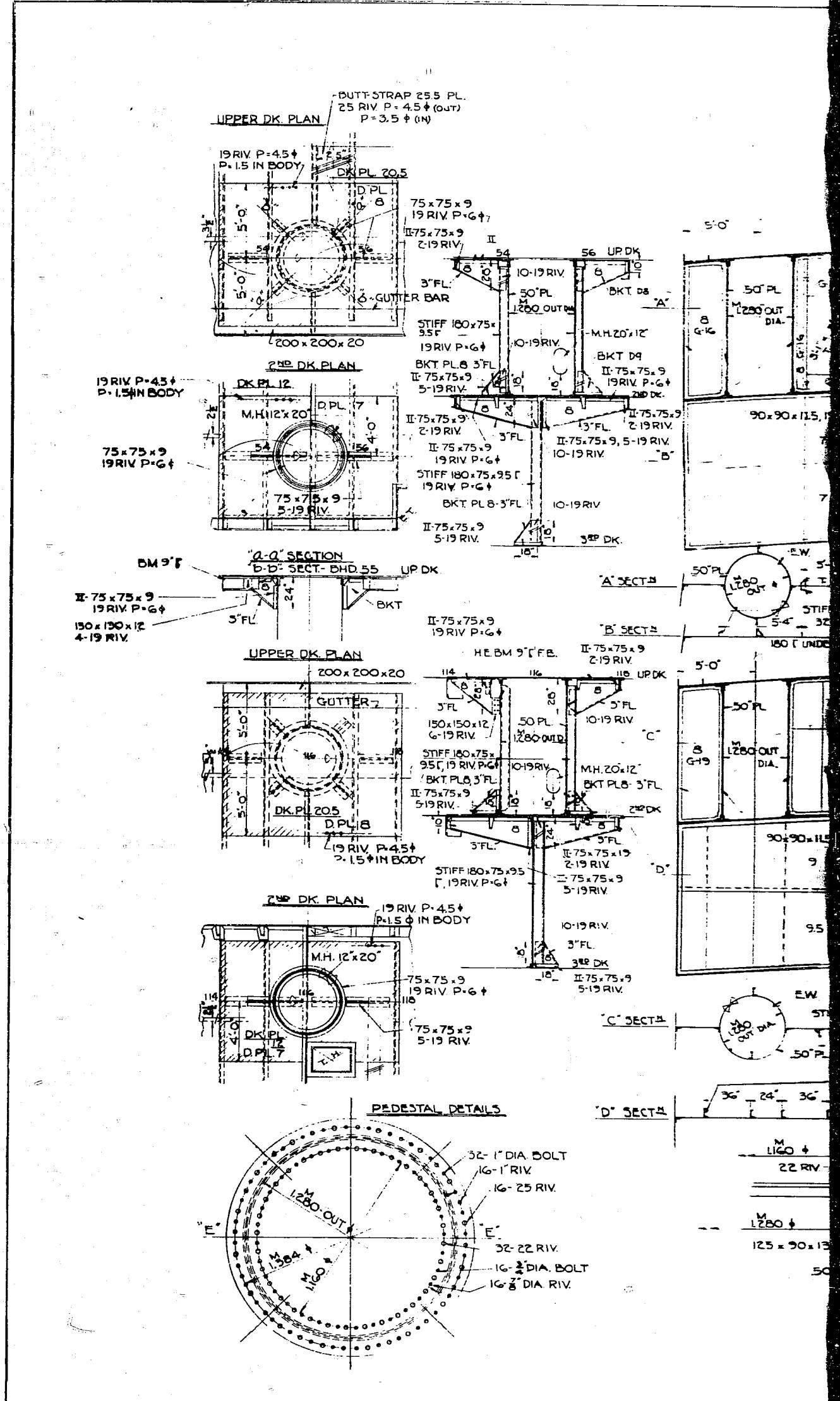
ENCLOSURE (G)



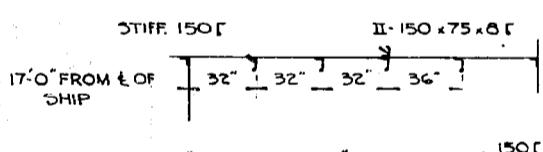
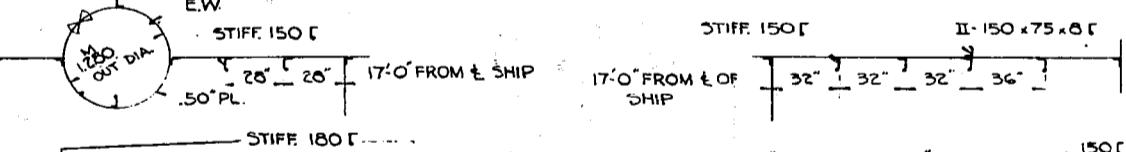
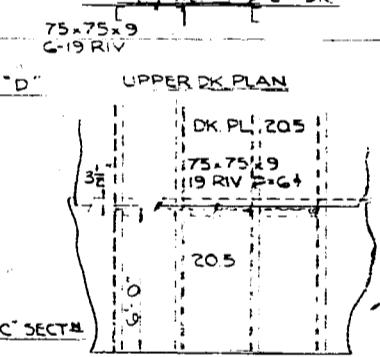
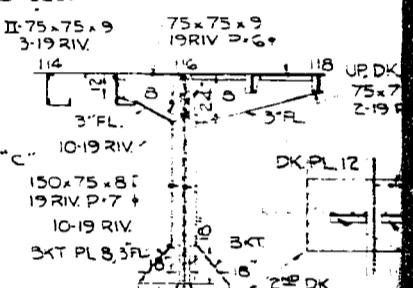
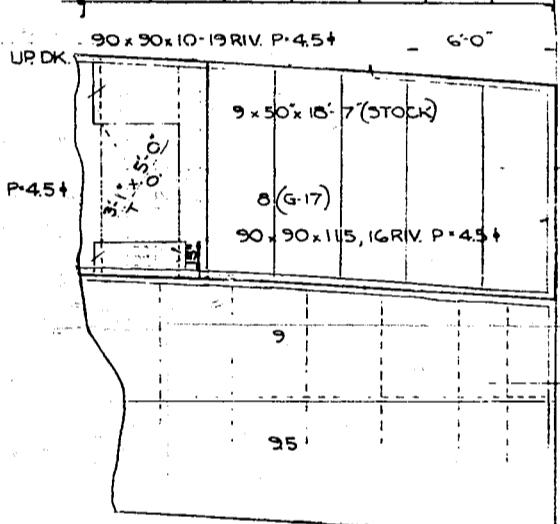
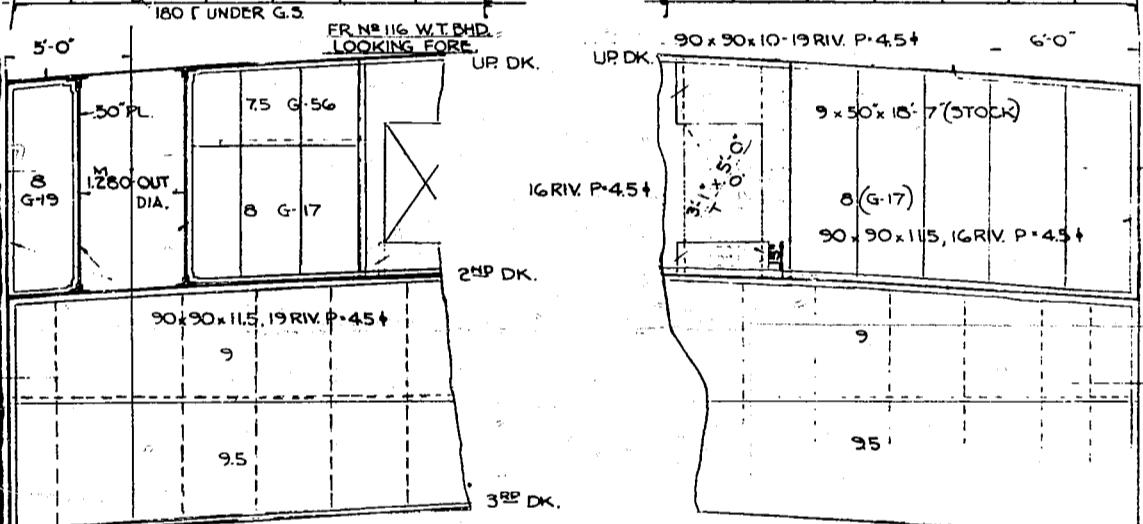
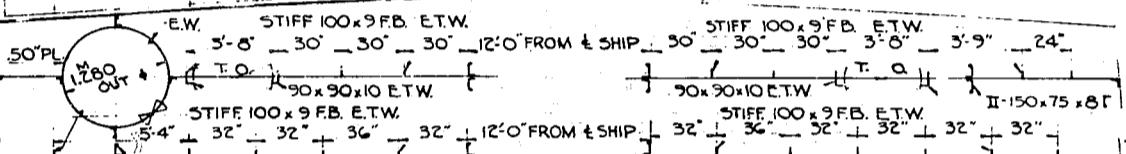
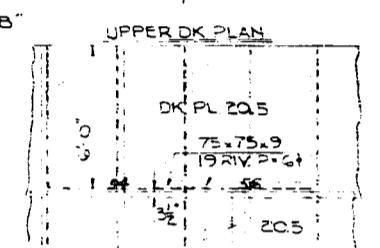
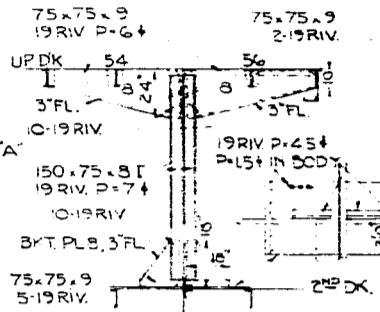
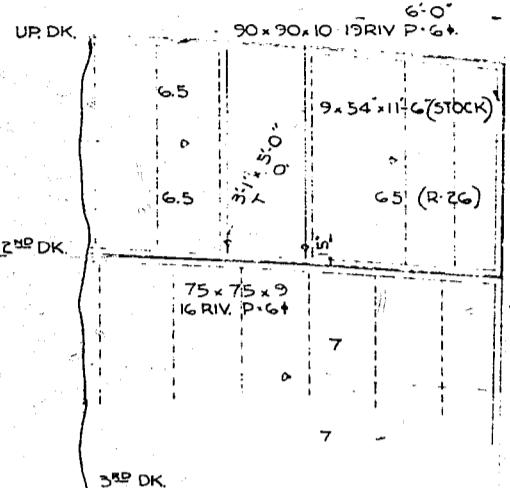
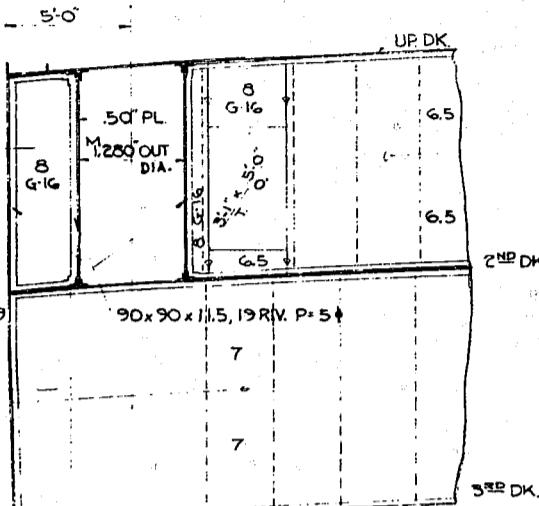


ARIMASAN MARU
GENERAL ARRGT. PLANS
SHOWING LOCATION OF GUNS
& CATAFULT MOUNT
26 JULY 1937

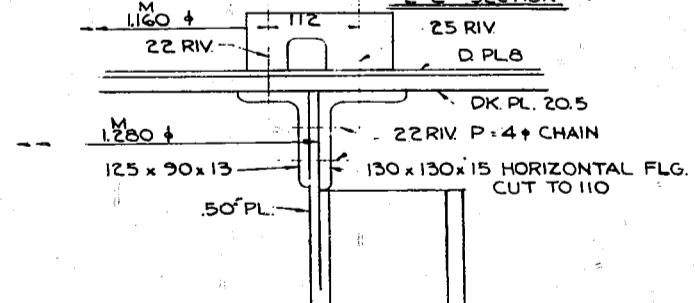




FR. N° 55 S.BHD
LOOKING AFT



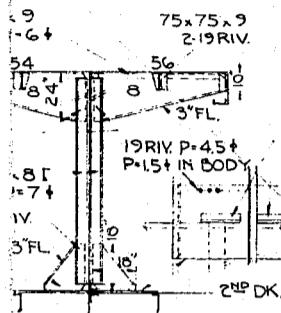
M	T	B
STOCK	.50	79"
"	"	"
E 52	10	14"
J 52	8	45
G 16	8	79"
P 74	7.5	61"
F D 1	9.5	180x75
D-79	8	150x75
F A 43	15	180x130
STOCK	13	125x90
SCRAP	11.5	90x90
B 48	9	75x75



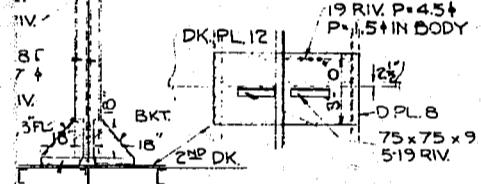
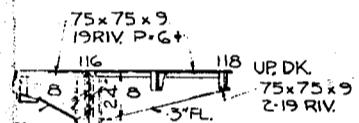
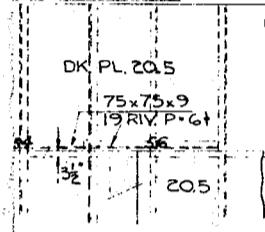
RESTRICTED

ENCLOSURE (H)

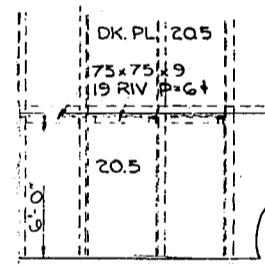
S-82(N)



UPPER DK PLAN



UPPER DK PLAN



M	T	B	L	P	REMARKS
STOCK	.50"	79"	7'-9"	4	G.S. PL. FCSLE & POOP
"	"	"	9'-3"	4	" AT SIDE FR 55 & 116
E 52	10	14"	27'-6"	1	BKT. PL. & FB 0-20 BM RUNNER
J 52	8	45	19'-0"	4	BKT. & PILLAR FR 7 & 116
G 16	8	79"	18'-3"	1	F 55 S BHD.
P 74	7.5	61"	19'-3"	1	F 116 BHD S SIDE
FD 1	9.5	180x75	62'-1"	1	STIFF (SCRAP)
D-79	8	150x75	36'-3"	1	" CUT 4
FA 43	15	130x130	33'-0"	1	CUT G S (AT SIDE) UP DK ANG
STOCK	13	125x90	26'-6"	1	
SCRAP	11.5	90x90	20'-0"	1	BM RUNNER FB (FR 0 - 20)
B 48	9	75x75	40'-0"	13	CONN ANGLE

ARIMASAN MARU
12 CM GUN AND
CATAPULT SUPPORT CONSTRUCTION
PLANS
26 JULY 1937

AFT BOAT DK.

19 RIV. P=4.5

D. PL. 12

75x75x9

19 RIV. P=6

UPPER DK. PLAN

II - 75x75x9
5-19 RIV.

STIFF. 180x75x9.5 E

19 RIV. P=6

M 1280 O.D.

D. S.

BKT. 8, 2° FLG.
II - 75x75x9
3-19 RIV.
UP. DK.

E. W.

PILLAR 6" DIA

4.5" E.

DOUBLING PL.
2ND DK

FR. NO. 7
LOOKING AFT.

AFT BOAT DK.

75x75x9
19 RIV. P=6

M 1280 O.D.

0.5 PL.

M.H. 12+20

75x75x9
4-19 RIV.

BM 180 E

19 RIV. P=6

19 RIV. P=7

UP. DK.

'C C' SECTION

"dd" SECTION-FR. T

BM 150 Z 4-19 RIV.

II - 75x75x9 19 RIV. P=7

150x150x12 3-19 RIV.

2.00 DK

3° FLG.

II - 95x95x9.5-19 R.

0.5 PL

M 1280 O.D.

DOUBLING PL.

2-19 RIV.

2-19 R.

BM 2.00 E

150x130x12

19 R. P=7

150x130x12

19 R. P=7

PANT. BR. 2.00

2-19 RIV

2-19 R.

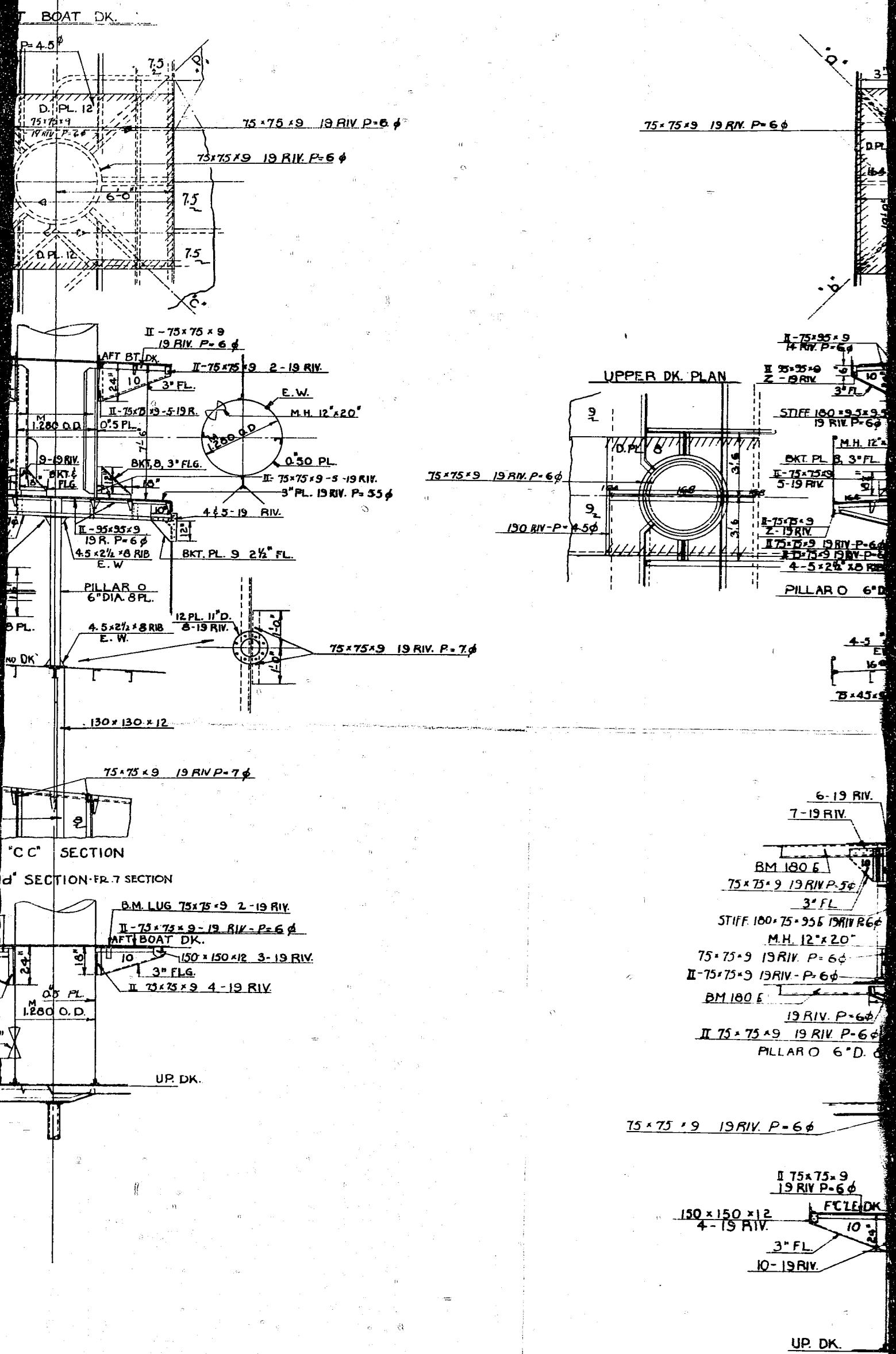
Z-19 R.

3/8" PL

NO. 226 SHIP. FL.

75x75x9

21° D

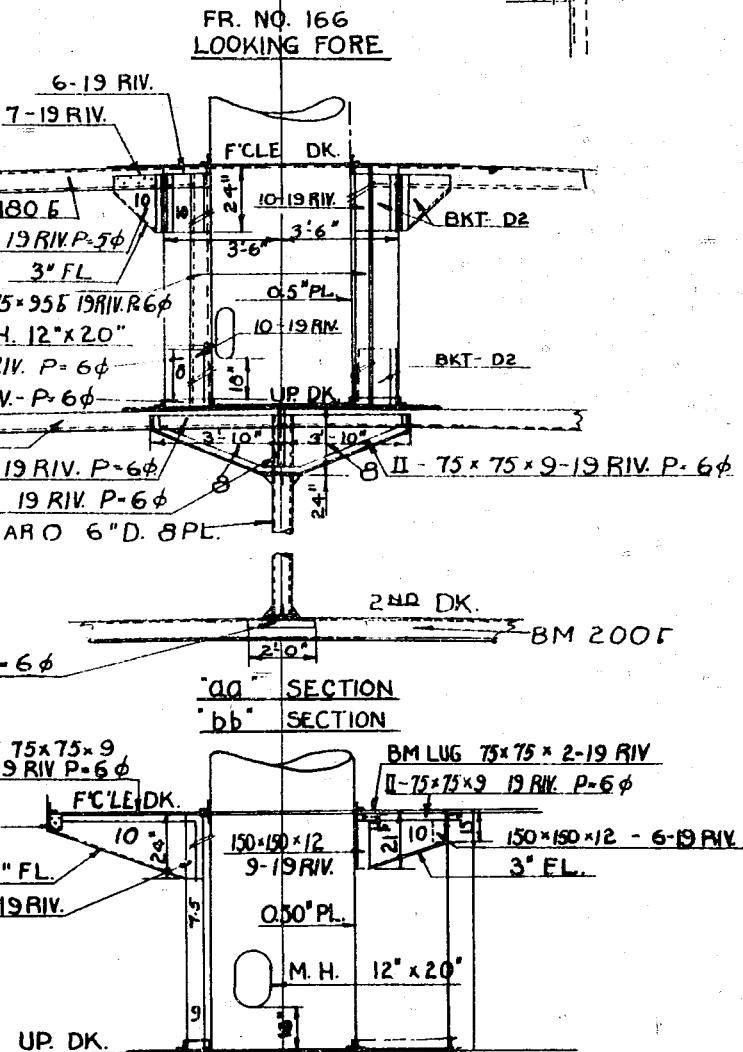
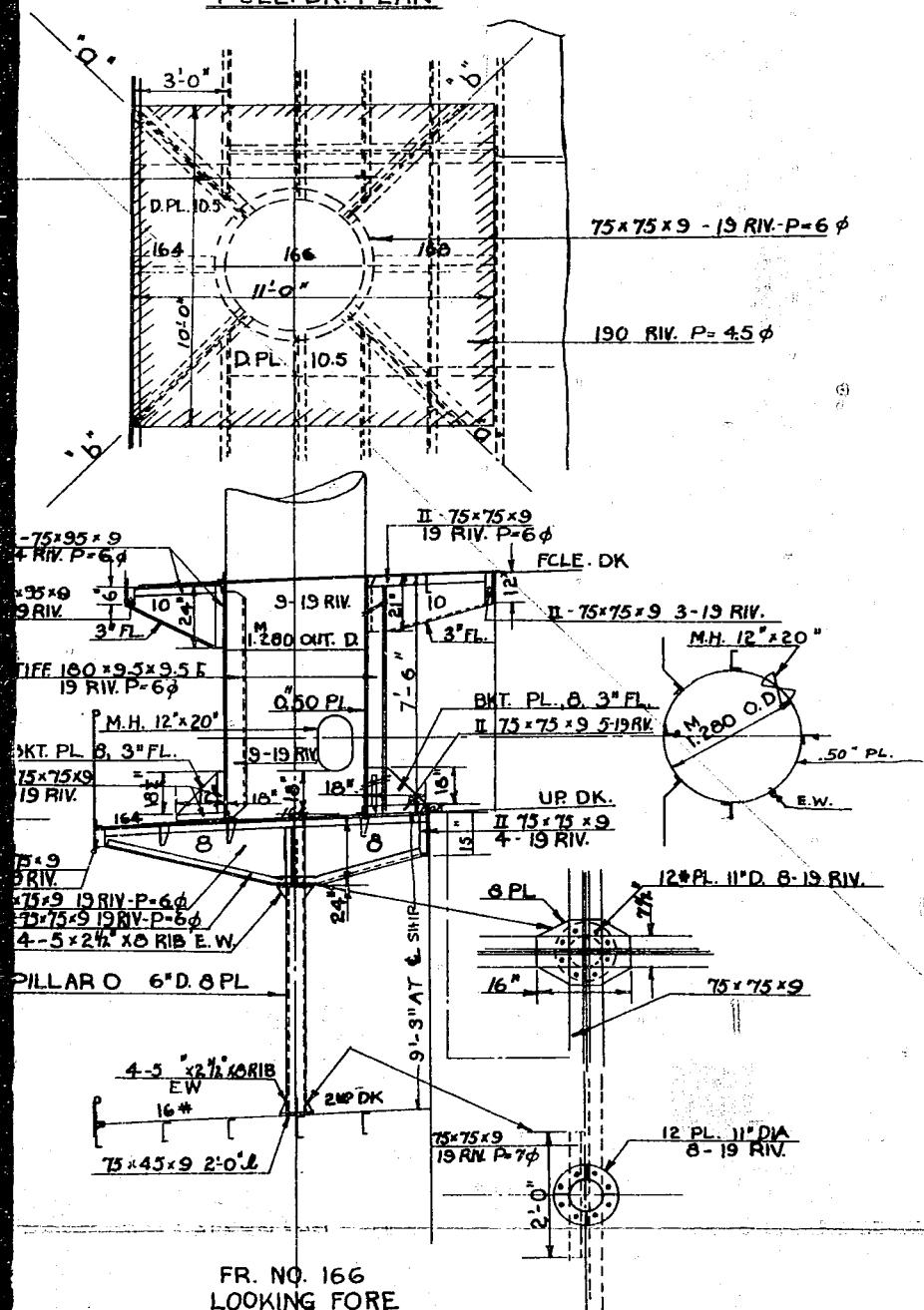


RESTRICTED

ENCLOSURE (1)

S-82(N)

F'CLE. DK. PLAN



ARMASAN MARU

12 CM AA GUNMOUNT
SUPPORT (FORE & AFT)
26 JULY 1937