

Lloyd's Register of Shipping.

SURVEYS FOR FREEBOARD.

Twin Screw Motor
Computation of Freeboard for ~~Steamer~~, Sailing Ship, Tanker

having Forecastle, Bridge and Poop

Port of Survey Copenhagen

Date of Survey 5th December 1936

Name of Surveyor Hk. Juul

Particulars of Classification +100A1
carrying Petroleum in Bulk
(contemplated) long framing.

(Type of Superstructures.)

Ship's Name	Nationality and Port of Registry	Official Number	Gross Tonnage	Date of Build
"Esso Belgium"	Belgium Antwerp.	<i>Signal letters</i> O.S.V.A.	10568	1936

Moulded Dimensions: Length 486'3" Breadth 74'6" Depth 37'0"

Moulded displacement at moulded draught = 85 per cent. of moulded depth 23140 tons

Coefficient of fineness for use with Tables 0.713711

Depth for Freeboard (D)	Depth correction	Round of Beam correction
Moulded depth ... <u>(11277/16) 37'0"</u>	(a) Where D is greater than Table depth (D - Table depth) R = <u>(37.07 - 32.42) 3 = + 13.95"</u>	Moulded Breadth (B) <u>(22707/16) 74'6"</u> Standard Round of Beam = $\frac{B \times 12}{50} = 17.88$ Ship's Round of Beam <u>420/16 = 18 1/2"</u>
Stringer plate ... <u>(20.5)</u>	(b) Where D is less than Table depth (if allowed) (Table depth - D) R = <u>4.65</u>	Difference <u>.62 excess</u>
Sheathing on exposed deck $T \left(\frac{L-S}{L} \right) =$	If restricted by superstructures	Restricted to
Depth for Freeboard (D) = <u>37.07</u>		Correction = $\frac{\text{Diff}^e}{4} \times \left(1 - \frac{S_1}{L} \right) = \frac{.62}{4} \times .6211 = .09$

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)	
Poop enclosed ...	<u>32765</u>	<u>108.75</u>	<u>2440</u>		<u>108.75</u>	Standard Height of Superstructure <u>7.5</u>
" overhang ...	<u>108.75</u>					" " R.Q.D. <u>✓</u>
R.Q.D. enclosed ...						Deduction for complete superstructure <u>42.00"</u>
" overhang ...						Percentage covered $\frac{S}{L} = 37.89$
Bridge enclosed...	<u>12190</u>	<u>39.99</u>	<u>2440</u>		<u>39.99</u>	" " $\frac{S_1}{L} = 37.89$
" overhang aft ...	<u>39.99</u>					" " $\frac{E}{L} = 37.89$
" overhang forward						Percentage from Table, Line A. TANKER
F'cle enclosed ...	<u>10820</u>	<u>35.50</u>	<u>2285</u>		<u>35.50</u>	(corrected for absence of forecastle (if required)) <u>28.89</u>
" overhang ...	<u>35.50</u>					Percentage from Table, Line B.
Trunk aft ...						(corrected for absence of forecastle (if required))
" forward ...						Interpolation for bridge less than 2L (if required)
Tonnage opening aft ...						Deduction = <u>42.00 × .2889 = - 12.13</u>
" " forward						
Total ...	<u>184.24</u>	<u>184.24</u>			<u>184.24</u>	

SHEER CORRECTION.

Station	Standard Ordinate	S	M	Product	Actual Ordinate	Effective Ordinate	S	M	Product	
A.P. ...	<u>58.62</u>	1		<u>58.62</u>	<u>59.45</u>	<u>59.45</u>	1		<u>59.45</u>	Mean actual sheer aft = <u>Deficient (over 75%)</u>
1/8 L from A.P. ...	<u>26.09</u>	4		<u>104.36</u>	<u>25.00</u>	<u>25.00</u>	4		<u>100.00</u>	Mean actual sheer forward = <u>Excess</u>
1/4 L " ...	<u>6.45</u>	2		<u>12.90</u>	<u>6.30</u>	<u>6.30</u>	2		<u>12.60</u>	Mean standard sheer forward
Amidships ...	-	4		-	0		4			Length of enclosed superstructure forward of amidships =
3/8 L from F.P. ...	<u>12.90</u>	2		<u>25.80</u>	<u>12.99</u>	<u>12.99</u>	2		<u>25.98</u>	" " aft of " =
1/2 L " ...	<u>52.17</u>	4		<u>208.68</u>	<u>52.75</u>	<u>52.75</u>	4		<u>211.00</u>	
F.P. ...	<u>117.25</u>	1		<u>117.25</u>	<u>118.31</u>	<u>118.31</u>	1		<u>118.31</u>	
Total ...				<u>527.61</u>					<u>527.34</u>	

$$\text{Correction} = \frac{\text{Difference between sums of products}}{18} \left(.75 - \frac{S}{2L} \right) = \frac{.27}{18} \left(.75 - \frac{.1894}{.5606} \right) = + .01$$

If limited on account of midship superstructure.

If limited to maximum allowance of 1 1/2 ins. per 100 ft.

Deduction for Tropical Freeboard.
Addition for Winter and Winter North Atlantic Freeboard.

Depth to Freeboard Deck = 37.07 Ft.
Summer freeboard = 7.32
Moulded draught (d) = 29.75

Deduction for Tropical freeboard and addition for Winter freeboard = $\frac{d}{4}$ inches = 7.44 = 1897

Addition for Winter North Atlantic Freeboard (if required) = 7.44 + 4.86 = 12.30 = 312

Deduction for Fresh Water.

Displacement in salt water at summer load water line
 $\Delta =$ 21440
Tons per inch immersion at summer load water line
T = 71.5

Deduction = $\frac{\Delta}{40 T}$ inches
= 7.64
= 1947

TABULAR FREEBOARD corrected for Flush Deck (if required)

Correction for coefficient

$$\frac{.711 + .68}{1.36} = \frac{1.391}{1.36}$$

Depth Correction ... 13.95
Deduction for superstructures ... 12.13
Sheer correction01
Round of Beam correction10
Correction for Thickness of Deck amidships09
Other corrections, scantlings, etc.3

Summer Freeboard = 87.86 = 2231

SUMMER FREEBOARD amidships from Centre of Disc to top of Deck Line, Wood, Steel, Deck:-

Tropical Fresh Water Line above Centre of Disc ...	<u>383</u>	Tropical Fresh Water Freeboard ...	<u>1848</u>
Fresh Water Line " " ...	<u>194</u>	Fresh Water " " ...	<u>2037</u>
Tropical Line " " ...	<u>189</u>	Tropical " " ...	<u>2042</u>
Winter Line below " " ...	<u>189</u>	Winter " " ...	<u>2420</u>
Winter North Atlantic Line " " ...	<u>312</u>	Winter North Atlantic " " ...	<u>2543</u>

15 DEC 1936

Esso Belgium - 8 DEC 1936

Particulars of fiddley, funnel and ventilator coamings:—

All openings in fiddley tops provided with permanently attached steel covers.

Funnel and steel skylight of Substantial construction.

Ventilators on fiddley top:

2 off	1065 diam. coaming	1830 x 5	in
3 off	835 "	1830 x 5	in
2 off	760 "	5950 x 12	(5950 x 12) (posts)

none

Particulars of Comparisonways:—

Particulars of Compartments:—

Access to crew's quarters within poop through steel house on poop having w.t. steel doors with turnbuckles capable of being manipulated from both sides. Opening 152 5/8" x 66 1/2" sill 460" ¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ²⁰ ²¹ ²² ²³ ²⁴ ²⁵ ²⁶ ²⁷ ²⁸ ²⁹ ³⁰ ³¹ ³² ³³ ³⁴ ³⁵ ³⁶ ³⁷ ³⁸ ³⁹ ⁴⁰ ⁴¹ ⁴² ⁴³ ⁴⁴ ⁴⁵ ⁴⁶ ⁴⁷ ⁴⁸ ⁴⁹ ⁵⁰ ⁵¹ ⁵² ⁵³ ⁵⁴ ⁵⁵ ⁵⁶ ⁵⁷ ⁵⁸ ⁵⁹ ⁶⁰ ⁶¹ ⁶² ⁶³ ⁶⁴ ⁶⁵ ⁶⁶ ⁶⁷ ⁶⁸ ⁶⁹ ⁷⁰ ⁷¹ ⁷² ⁷³ ⁷⁴ ⁷⁵ ⁷⁶ ⁷⁷ ⁷⁸ ⁷⁹ ⁸⁰ ⁸¹ ⁸² ⁸³ ⁸⁴ ⁸⁵ ⁸⁶ ⁸⁷ ⁸⁸ ⁸⁹ ⁹⁰ ⁹¹ ⁹² ⁹³ ⁹⁴ ⁹⁵ ⁹⁶ ⁹⁷ ⁹⁸ ⁹⁹ ¹⁰⁰ ¹⁰¹ ¹⁰² ¹⁰³ ¹⁰⁴ ¹⁰⁵ ¹⁰⁶ ¹⁰⁷ ¹⁰⁸ ¹⁰⁹ ¹¹⁰ ¹¹¹ ¹¹² ¹¹³ ¹¹⁴ ¹¹⁵ ¹¹⁶ ¹¹⁷ ¹¹⁸ ¹¹⁹ ¹²⁰ ¹²¹ ¹²² ¹²³ ¹²⁴ ¹²⁵ ¹²⁶ ¹²⁷ ¹²⁸ ¹²⁹ ¹³⁰ ¹³¹ ¹³² ¹³³ ¹³⁴ ¹³⁵ ¹³⁶ ¹³⁷ ¹³⁸ ¹³⁹ ¹⁴⁰ ¹⁴¹ ¹⁴² ¹⁴³ ¹⁴⁴ ¹⁴⁵ ¹⁴⁶ ¹⁴⁷ ¹⁴⁸ ¹⁴⁹ ¹⁵⁰ ¹⁵¹ ¹⁵² ¹⁵³ ¹⁵⁴ ¹⁵⁵ ¹⁵⁶ ¹⁵⁷ ¹⁵⁸ ¹⁵⁹ ¹⁶⁰ ¹⁶¹ ¹⁶² ¹⁶³ ¹⁶⁴ ¹⁶⁵ ¹⁶⁶ ¹⁶⁷ ¹⁶⁸ ¹⁶⁹ ¹⁷⁰ ¹⁷¹ ¹⁷² ¹⁷³ ¹⁷⁴ ¹⁷⁵ ¹⁷⁶ ¹⁷⁷ ¹⁷⁸ ¹⁷⁹ ¹⁸⁰ ¹⁸¹ ¹⁸² ¹⁸³ ¹⁸⁴ ¹⁸⁵ ¹⁸⁶ ¹⁸⁷ ¹⁸⁸ ¹⁸⁹ ¹⁹⁰ ¹⁹¹ ¹⁹² ¹⁹³ ¹⁹⁴ ¹⁹⁵ ¹⁹⁶ ¹⁹⁷ ¹⁹⁸ ¹⁹⁹ ²⁰⁰ ²⁰¹ ²⁰² ²⁰³ ²⁰⁴ ²⁰⁵ ²⁰⁶ ²⁰⁷ ²⁰⁸ ²⁰⁹ ²¹⁰ ²¹¹ ²¹² ²¹³ ²¹⁴ ²¹⁵ ²¹⁶ ²¹⁷ ²¹⁸ ²¹⁹ ²²⁰ ²²¹ ²²² ²²³ ²²⁴ ²²⁵ ²²⁶ ²²⁷ ²²⁸ ²²⁹ ²³⁰ ²³¹ ²³² ²³³ ²³⁴ ²³⁵ ²³⁶ ²³⁷ ²³⁸ ²³⁹ ²⁴⁰ ²⁴¹ ²⁴² ²⁴³ ²⁴⁴ ²⁴⁵ ²⁴⁶ ²⁴⁷ ²⁴⁸ ²⁴⁹ ²⁵⁰ ²⁵¹ ²⁵² ²⁵³ ²⁵⁴ ²⁵⁵ ²⁵⁶ ²⁵⁷ ²⁵⁸ ²⁵⁹ ²⁶⁰ ²⁶¹ ²⁶² ²⁶³ ²⁶⁴ ²⁶⁵ ²⁶⁶ ²⁶⁷ ²⁶⁸ ²⁶⁹ ²⁷⁰ ²⁷¹ ²⁷² ²⁷³ ²⁷⁴ ²⁷⁵ ²⁷⁶ ²⁷⁷ ²⁷⁸ ²⁷⁹ ²⁸⁰ ²⁸¹ ²⁸² ²⁸³ ²⁸⁴ ²⁸⁵ ²⁸⁶ ²⁸⁷ ²⁸⁸ ²⁸⁹ ²⁹⁰ ²⁹¹ ²⁹² ²⁹³ ²⁹⁴ ²⁹⁵ ²⁹⁶ ²⁹⁷ ²⁹⁸ ²⁹⁹ ³⁰⁰ ³⁰¹ ³⁰² ³⁰³ ³⁰⁴ ³⁰⁵ ³⁰⁶ ³⁰⁷ ³⁰⁸ ³⁰⁹ ³¹⁰ ³¹¹ ³¹² ³¹³ ³¹⁴ ³¹⁵ ³¹⁶ ³¹⁷ ³¹⁸ ³¹⁹ ³²⁰ ³²¹ ³²² ³²³ ³²⁴ ³²⁵ ³²⁶ ³²⁷ ³²⁸ ³²⁹ ³³⁰ ³³¹ ³³² ³³³ ³³⁴ ³³⁵ ³³⁶ ³³⁷ ³³⁸ ³³⁹ ³⁴⁰ ³⁴¹ ³⁴² ³⁴³ ³⁴⁴ ³⁴⁵ ³⁴⁶ ³⁴⁷ ³⁴⁸ ³⁴⁹ ³⁵⁰ ³⁵¹ ³⁵² ³⁵³ ³⁵⁴ ³⁵⁵ ³⁵⁶ ³⁵⁷ ³⁵⁸ ³⁵⁹ ³⁶⁰ ³⁶¹ ³⁶² ³⁶³ ³⁶⁴ ³⁶⁵ ³⁶⁶ ³⁶⁷ ³⁶⁸ ³⁶⁹ ³⁷⁰ ³⁷¹ ³⁷² ³⁷³ ³⁷⁴ ³⁷⁵ ³⁷⁶ ³⁷⁷ ³⁷⁸ ³⁷⁹ ³⁸⁰ ³⁸¹ ³⁸² ³⁸³ ³⁸⁴ ³⁸⁵ ³⁸⁶ ³⁸⁷ ³⁸⁸ ³⁸⁹ ³⁹⁰ ³⁹¹ ³⁹² ³⁹³ ³⁹⁴ ³⁹⁵ ³⁹⁶ ³⁹⁷ ³⁹⁸ ³⁹⁹ ⁴⁰⁰ ⁴⁰¹ ⁴⁰² ⁴⁰³ ⁴⁰⁴ ⁴⁰⁵ ⁴⁰⁶ ⁴⁰⁷ ⁴⁰⁸ ⁴⁰⁹ ⁴¹⁰ ⁴¹¹ ⁴¹² ⁴¹³ ⁴¹⁴ ⁴¹⁵ ⁴¹⁶ ⁴¹⁷ ⁴¹⁸ ⁴¹⁹ ⁴²⁰ ⁴²¹ ⁴²² ⁴²³ ⁴²⁴ ⁴²⁵ ⁴²⁶ ⁴²⁷ ⁴²⁸ ⁴²⁹ ⁴³⁰ ⁴³¹ ⁴³² ⁴³³ ⁴³⁴ ⁴³⁵ ⁴³⁶ ⁴³⁷ ⁴³⁸ ⁴³⁹ ⁴⁴⁰ ⁴⁴¹ ⁴⁴² ⁴⁴³ ⁴⁴⁴ ⁴⁴⁵ ⁴⁴⁶ ⁴⁴⁷ ⁴⁴⁸ ⁴⁴⁹ ⁴⁵⁰ ⁴⁵¹ ⁴⁵² ⁴⁵³ ⁴⁵⁴ ⁴⁵⁵ ⁴⁵⁶ ⁴⁵⁷ ⁴⁵⁸ ⁴⁵⁹ ⁴⁶⁰ ⁴⁶¹ ⁴⁶² ⁴⁶³ ⁴⁶⁴ ⁴⁶⁵ ⁴⁶⁶ ⁴⁶⁷ ⁴⁶⁸ ⁴⁶⁹ ⁴⁷⁰ ^{471</}

Particulars of Ventilators in exposed positions on freeboard and superstructure decks :—

Particulars of Ventilators in exposed positions on freeboard and superstructure decks :-

2 ventilators to pumproom (Samsonposts)	610 diam	coaming 8500 + 14 ⁱⁿ
1 ventilator " " forward	610 ²⁴	" 11 ²⁴ 3600 + 10 ²⁰
3 ventilators on forecattle to stores	430 ²⁴	" 5 ²⁴ 1530 + 10 ²⁰ on top 6 ⁱⁿ
3 " " on bridge to stores	300 ²⁴	" 3 ²⁴ 760 + 6.5 ⁱⁿ

No ventilator coamings on poop. All coaming efficiently connected to deck, partly wood plug, partly steel covers with canvas covers supplied.

Particulars of Air Pipes in exposed positions on freeboard, raised quarter, or superstructure decks:—

Particulars of Air Pipes in exposed positions freeboard, raised quarter, or superstructure decks :-

opening of airpipes on poop and forecastle	460 ¹⁸ / ₁₆ in	above deck
" " " on freeboard deck	915 ³⁶ / ₁₆ in	" " "
wood plugs and canvas covers supplied.		

name.

Particulars of Scuppers and Sanitary Discharge Pipes :—

Particulars of Scuppers and Sanitary Discharge Pipes:— Steel scuppers led overboard below freeboard deck (400 $\frac{1}{2}$ in) 3 each side.
Sanitary discharge pipes amidships from spaces above bridge deck and aft from spaces above poop deck & freeboard deck led overboard above lead water line and made of steel. Steel discharge pipes are fitted with storm valves and always accessible.

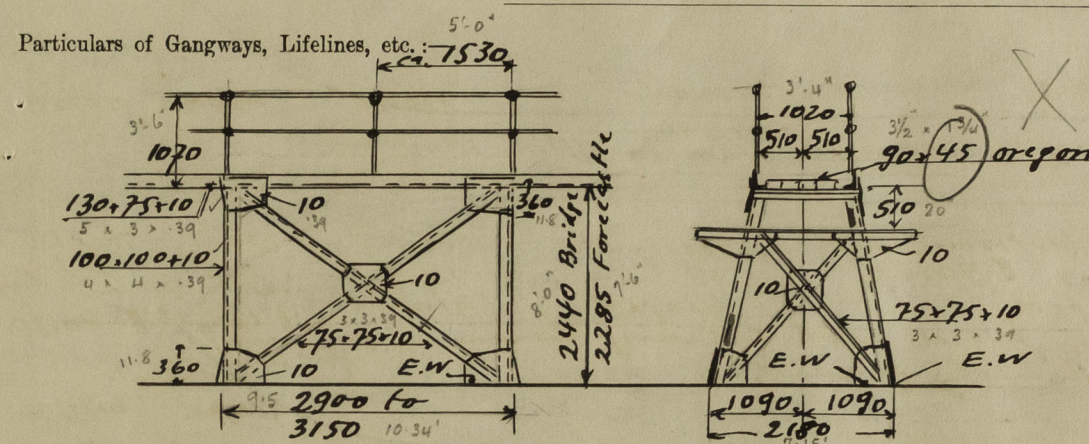
Particulars of Side Scuttles:—

No sidelights below freeboard deck. All sidelights are provided with permanent attached efficiently constructed steel hinges & deadlights.

Particulars of Guard Rails :—

open Rails on freeboard deck, fore-castle, bridge
and poop. 1070 ^{3.16} ft height, 3 rods equally spaced
stanchions about 1500 ^{1.0} apart.

Particulars of Gangways, Lifelines, etc. :—763



Particulars of Freeing Arrangements.						
	Length of Bulwark	Height of Bulwark	Size of Freeing Ports	Number each side	Area each side	Rule area each side
After Well		<i>open rails all fore and aft.</i>				
Forward Well						

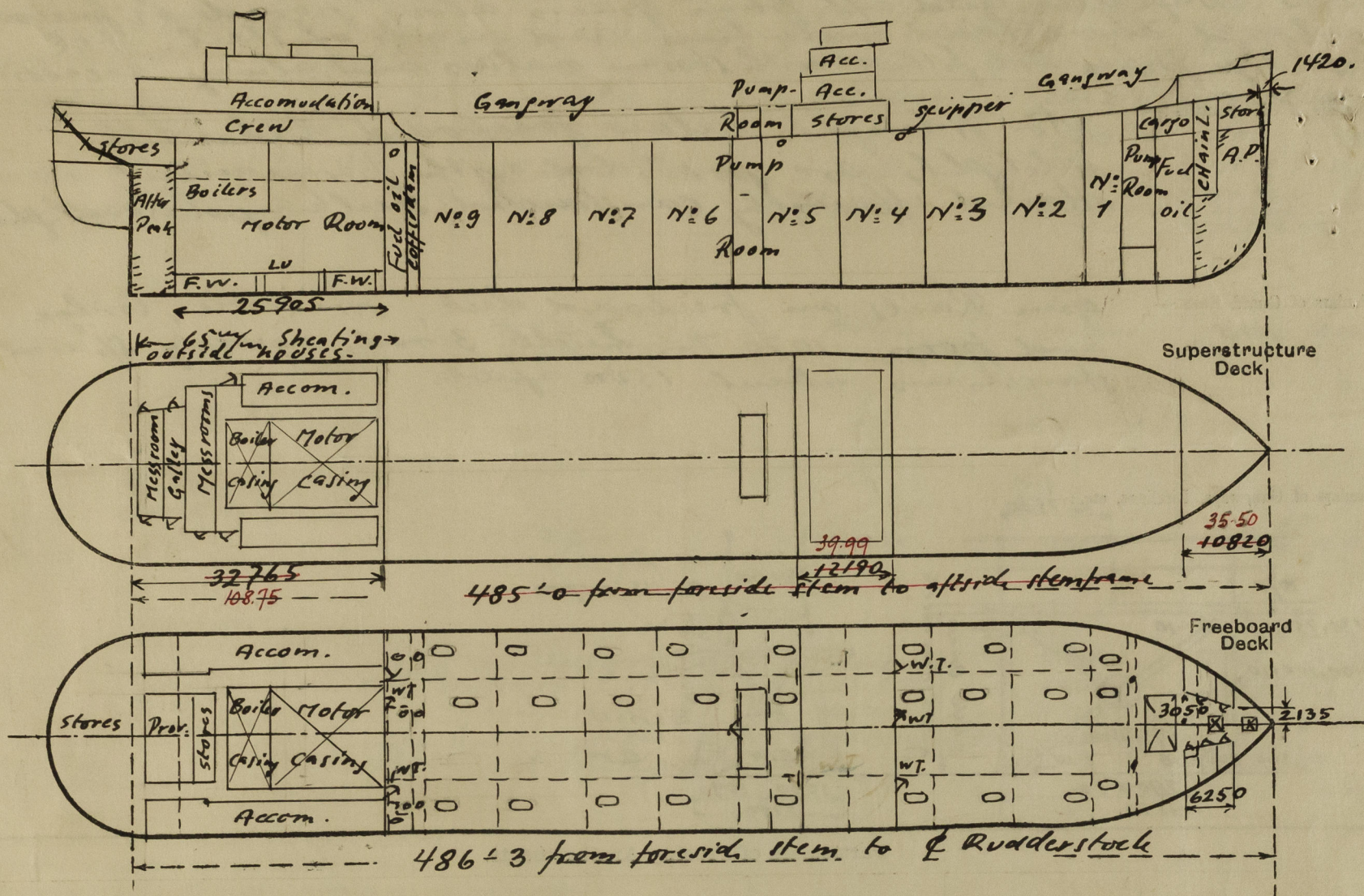
State position of each freeing port { After Well :—
 (F. and A. position and height above deck edge) { Forward Well :—
 State whether the freeing ports are fitted with shutters, bars, or rails, and give particulars of such :—
 Additional area where sheer is less than standard.

Particulars of Superstructures, Trunks, Casings, Deckhouses.								
	Coaming	Plating	Stiffeners	Spacing	End Attachments of Stiffeners	Size of Openings	Height of Sills	Height of Casings
Poop Bulkhead	12.5	12.5	280+90+12 L	760 ³⁰	Brackets on Top. E. & W. on keel	1525x710 (20ft) 1830x610 (14ft)	18	2440
Raised Quarter Deck Bulkhead ...								
Bridge, After Bulkhead ...	L 250+90+13	9 ³⁵	180+90+9.5 L	915	Brackets on Top. E. & W. on keel	(20ft) 1265x955	23.65	2440
Bridge, Forward Bulkhead ...	L 250+90+13	12.5	250+90+11 L	915 ¹⁰	Brackets on Top and keel	1525x710 (30ft)	18	2440
Forecastle Bulkhead ^{transvers}	L 150+90+10	8.5 ³⁵	180+90+9 L	760 ³⁰	✓			2285
Trunk, ^{11ft} " long ...	"	"	100+75+8.5 L	610/680	✓	1525x610 (50ft)	18	
Trunk, Forward								
Exposed Machinery Casings on Free-board or Raised Quarter Decks ...								
Exposed Machinery Casings on Super-structure Decks	8.5	8.5	90+75+9 L	760	Brackets on top.	✓		1600 ^{5.5}
Machinery Casings within Superstructures not fitted with Class I Closing Appliances								
Deckhouses on Flush Deck Ships ...								

Particulars of Closing Appliances (state if capable of being manipulated from both sides).			
Poop Bulkhead	...	...	3 steelhinged doors with turnbuckles w.t. manip. both sides.
Raised Quarter Deck Bulkhead	...		
Bridge, After Bulkhead	...	...	10 $\frac{1}{4}$ " steelplates with 7/8" hookbolts in 310 spacing. 2 off.
Bridge, Forward Bulkhead	...	...	3 steelhinged w.t. doors with turnbuckles manip. both sides.
Forecastle Bulkhead	...	...	5 w.t. steelhinged doors with turnbuckles. manip. both sides.
Exposed Machinery Casings on Free-board or Raised Quarter Decks	...	...
Exposed Machinery Casings on Super-structure Decks	...	...
Machinery Casings within Superstructures not fitted with Class I Closing Appliances	
Deckhouses on Flush Deck Ships	

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Superstructure bulkheads, trunks, deckhouses, casings, cargo and coaling hatchways, extent and thickness of sheathing on the freeboard deck, gangway, cargo and coaling ports, and any other openings, etc., which would affect the seaworthiness of the ship are to be shewn on the following sketches:—



State any special features in the construction of the ship:—

*Is herwood Long. framing System
2 longitudinal bulkheads.
Displacement 21440 Tons and
approximate L.W.L. 29'6 draught.*

Builder's name and yard number *A/S. Burmeister & Wain's yard Nº 623*

Names of sister ships

Owners *Panama Transport Company Ltd.*

*To be paid
on completion*

Received by me



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Foundation