

Lloyd's Register of Shipping.
SURVEYS FOR FREEBOARD.Index. No. 28405
(For London Office only.)

18 OCT 1932

Computation of Freeboard for *Steamer Sailing Ship, Tanker*
having *Poof, Bridge and Forecastle.* Port of Survey *Montreal*

(Type of Superstructures.)

Ship's Name *S.S. "El Oro"* Nationality and Port of Registry *British London* Official Number *146105* Gross Tonnage *7267.40* Date of Build *1921.9*

Moulded Dimensions: Length *440.12* Breadth *57.16* Depth *33.11"*
Moulded displacement at moulded draught = 85 per cent. of moulded depth *16470* tons
Coefficient of fineness for use with Tables *.995*

Particulars of Classification *+100A.1.*
S.S. Hull No. 2029
Carrying petroleum in bulk

Depth for Freeboard (D)	Depth correction	Round of Beam correction
Moulded depth 33.92	(a) Where D is greater than Table depth (D-Table depth) R = <i>(33.99 - 29.34) 3 + 13.95</i>	Moulded Breadth (B) <i>57.16</i>
Stringer plate 07	(b) Where D is less than Table depth (if allowed) (Table depth-D) R =	Standard Round of Beam = $\frac{B \times 12}{50} = 13.72$
Sheathing on exposed deck <i>Steel deck</i> $T \left(\frac{L-S}{L} \right) =$	If restricted by superstructures	Ship's Round of Beam <i>14.9</i> = $\frac{14.00}{.28}$
Depth for Freeboard (D) = <i>33.99</i>		Difference
		Restricted to
		Correction = $\frac{\text{Diff}^2}{4} \times \left(1 - \frac{S_1}{L} \right) = \frac{.28^2}{4} (1 - .3766) = -.04$

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)	
Poof enclosed	<i>92.0"</i>	<i>92.00</i>	<i>7'6"</i>		<i>92.00</i>	Standard Height of Superstructure <i>7.50'</i>
" overhang						" " R.Q.D. <i>✓</i>
R.Q.D. enclosed	<i>✓</i>					Deduction for complete superstructure <i>42"</i>
" overhang						Percentage covered $\frac{S}{L} = 37.66$
Bridge enclosed... ..	<i>32.3"</i>	<i>32.25</i>	<i>7'6"</i>		<i>32.25</i>	" " $\frac{S_1}{L} = 37.66$
" overhang aft						" " $\frac{E}{L} = 37.66$
" overhang forward						Percentage from Table, Line A.
" enclosed	<i>41.6"</i>	<i>41.50</i>	<i>7'6"</i>		<i>41.50</i>	(corrected for absence of forecastle (if required))
" overhang						Percentage from Table, Line B. <i>Tanker 28.66</i>
Trunk aft						(corrected for absence of forecastle (if required))
" forward						Interpolation for bridge less than 2L (if required)
Tonnage opening aft ...						Deduction = $42 \times .2866 = -12.04$
" " forward						
Total	<i>165.75</i>	<i>165.75</i>			<i>165.75</i>	

SHEER CORRECTION.

Station	Standard Ordinate	S	M	Product	Actual Ordinate	Effective Ordinate	S	M	Product	
A.P.	<i>54.01</i>	1		<i>54.01</i>	<i>54.00</i>	<i>54.0</i>	1		<i>54.00</i>	Mean actual sheer aft = <i>Deficient > 75%</i>
$\frac{1}{2}$ L from A.P.	<i>24.03</i>	4		<i>96.12</i>	<i>23.70</i>	<i>23.70</i>	4		<i>94.80</i>	Mean actual sheer forward = <i>Deficient</i>
$\frac{2}{3}$ L "	<i>5.94</i>	2		<i>11.88</i>	<i>5.92</i>	<i>5.92</i>	2		<i>11.84</i>	Mean standard sheer forward
Amidships	<i>—</i>	4		<i>—</i>	<i>—</i>	<i>—</i>	4		<i>—</i>	Length of enclosed superstructure forward of amidships =
$\frac{2}{3}$ L from F.P.	<i>11.88</i>	2		<i>23.76</i>	<i>12.00</i>	<i>12.0</i>	2		<i>24.00</i>	" " aft of " = <i>Tanker</i>
$\frac{1}{2}$ L "	<i>48.07</i>	4		<i>192.28</i>	<i>48.00</i>	<i>48.0</i>	4		<i>192.00</i>	
F.P.	<i>108.02</i>	1		<i>108.02</i>	<i>106.5</i>	<i>106.5</i>	1		<i>106.50</i>	
Total				<i>486.07</i>					<i>483.14</i>	

Correction = $\frac{\text{Difference between sums of products}}{18} \left(.75 - \frac{S}{2L} \right) = \frac{2.93}{18} (.75 - .1883) = +.09$

If limited on account of midship superstructure.

If limited to maximum allowance of 1½ ins. per 100 ft.

Deduction for Tropical Freeboard.	Deduction for Fresh Water.	TABULAR FREEBOARD corrected for Flush Deck (if required)
Addition for Winter and Winter North Atlantic Freeboard.	Displacement in salt water at summer load water line	Correction for coefficient $\frac{795 + 680}{1.36} = \frac{1475}{1.36}$
Depth to Freeboard Deck = <i>33.99</i>	$\Delta = 155.61$	Depth Correction <i>13.95</i>
Summer freeboard = <i>6.71</i>	Tons per inch immersion at summer load water line	Deduction for superstructures <i>12.04</i>
Moulded draught (d) = <i>27.28</i>	T = <i>51.35</i>	Sheer correction <i>09</i>
Deduction for Tropical freeboard and addition for	Deduction = $\frac{\Delta}{40T}$ inches	Round of Beam correction <i>.04</i>
Winter freeboard = $\frac{d}{4}$ inches = <i>6.82</i> = <i>6¾</i>	= <i>7.57</i>	Correction for Thickness of Deck amidships <i>—</i>
Addition for Winter North Atlantic Freeboard (if required) = <i>4.40</i> = <i>4½</i>	= <i>7½</i>	Other corrections, scantlings, etc. <i>—</i>
		14.04 12.08 + 1.96
		Summer Freeboard = <i>80.62</i>

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

Tropical Fresh Water Line above Centre of Disc	<i>14¾</i>
Fresh Water Line " "	<i>7½</i>
Tropical Line " "	<i>6¾</i>
Winter Line below " "	<i>6¾</i>
Winter North Atlantic Line " "	<i>11¼</i>

Tropical Fresh Water Freeboard	<i>5-6¼</i>
Fresh Water " "	<i>6-1</i>
Tropical " "	<i>6-1¾</i>
Winter " "	<i>4-3¼</i>
Winter North Atlantic " "	<i>7-4¾</i>

PARTICULARS OF PROTECTION TO OPENINGS, ETC.

HATCHWAYS ON FREEBOARD AND SUPERSTRUCTURE DECKS									
Description of Hatchway		...	...	N ^o 1					
Dimensions of Hatchway		...	...	9' 0" x 12' 0"					
COAMINGS	Height above Deck	...	...	30"					
	Thickness	{	Sides	40					
		{	Ends	40					
	Stiffeners	...	...				
	Brackets, Stays	...	...	None					
HATCH BEAMS	Number	...	...	1					
	Spacing	...	...	11 x 40	7/16	3 x 3 x 38			
	Scantling and Sketch	...	...		1/16				
	Bearing Surface	...	...	3"					
FORE AND AFTERS	Number	...	...				
	Spacing	...	...				
	Unsupported Lengths	...	...				
	Scantling* and Sketch	...	...				
	Bearing Surface	...	...				
HATCH COVERS	Material	...	...	Wood					
	Thickness	...	...	3"					
	How fitted	...	...	3" x 1 1/2"					
	Bearing Surface	...	...				
Spacing of Cleats		...	...	12"					
Number of Tarpaulins		...	...	3					

Particulars of fiddley, funnel and ventilator coamings:—

Fiddley, Tunnel and Vent Boamings all in superstructure.
Tunnel Boaming 24" high. Fiddley gratings with hinged (Hinges to replace)
doors. Engine & Galley skylight of steel. $\frac{1}{2}$ " thick. $\frac{1}{2}$ " steel plate over lights.

Particulars of Flush Bunker Scuttles:—

None

Particulars of Companionways :—

Two - One each side on Prof. deck. ^{to brass quarters.}
 1 @ 6' x 5' 9" x 3' 0" ⁽¹¹⁸⁴⁾ 2' 6" (5) x 1 @ 6' 3" x 6" high ^{frames of 1/2" steel plate & with 1 1/2"}
 Wooden doors, sill ^{1 1/2"} 14" high. Doors operated both sides.
 2. Pump room. 14' 6" x 6' 1/2" x 7' 6" high frames of 1/2" steel plate, 1/2" steel doors in balance 1 1/4"
 Doors operated both sides. ^{with 1 1/2"}

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

Pool Superstructure deck, & Ventilators.

[illegible]

Particulars of Gangway Cargo and Coaling Ports:—

None

Particulars of Scuppers and Sanitary Discharge Pipes — ~~4 in Forecastle, 4 in Bridge space and 4 in Poop~~

~~with gun metal Clapper valves fitted to ship side.~~
In fore castle - 2 metal stem valves (P. 113) connecting to E. ship side pipes about 4' above main deck in fore hold. (P. 113) straight pipe from
lower back corner in line with stem valves. In Bowls 2 P. 115 stem valves from upper deck. 1.4 straight pipe from back room through
pulp. side. In poop fore side 3 stem valves fitted to ship side below main deck in E.R. Starboard side one fitted on same line
stem valves connected to ship side lead iron pipe. 1.54. from gallery on P. side above main deck in E.R.

Particulars of Side Scuttles:

In Stk.:- On putboard deck 12. 10" lights (one missing D.L.). Rose On deck ladder 12. 9" lights all with D.L.
In Bridge space:- 5-12" lights fitted with D.L. In porch:- (P.B.) 11. 15" lights with D.L. (excepting 2 missing), (S.S.) 10-18" lights
 all on putboard deck and 2. 7" lights with D.L. in store.

Particulars of Guard Rails :—

14 ^{1"} Ellis bulwarks P+S sides of F+H wells. ^{None} 3' 6" High with 6.3, $\frac{3}{4}$ O.A. rail on top & 6.3, $\frac{3}{4}$ O.A. Strip pitched about 6' apart.

Particulars of Gangways, Lifelines, etc. — Fore and aft gangway from Forecastle to Bridge and from Bridge to Poop.
~~11 Stanchions 8 feet apart in Fore deck 16 stanchions 8 feet apart in~~

Aft. deck.
3'-0" wide $\frac{1}{2}$ " unguisado plate trans riveted to 3'-3- $\frac{3}{8}$ " angles each side full length. Stanchions 5' apart 3' high with angle 1" plate bar running fore & aft. Supported by built steel uprights with side angles 5'-3- $\frac{3}{8}$ " and cross ties angles 3'-3- $\frac{3}{8}$ " with maximum pitch of about 11'-0". Gangway portable over forward cargo hatch.

	Length of Bulwark	Height of Bulwark	Size of Freeing Ports	Number each side	Area each side	Rule area each side
After Well	156' 154'	42" 40"	6 @ 36 x 22" 36" x 21 1/2" 3 @ 24 x 18" O	69	41 92-28 1/2	
Forward Well	120-27 114' 118-37	42" 40"	4 @ 36 x 22" 36" x 21 1/2" 3 @ 24 x 18" O	47	30 245 1/2	

State position of each freeing port } After Well : " Equally spaced in aft well deck
(F. and A. position and height above deck edge) } Forward Well : " 2ft. " 12" above deck edge.

State whether the freeing ports are fitted with shutters, bars, or rails, and give particulars of such : — 3 bars in each. 36-22 pmbs.
One bar in others

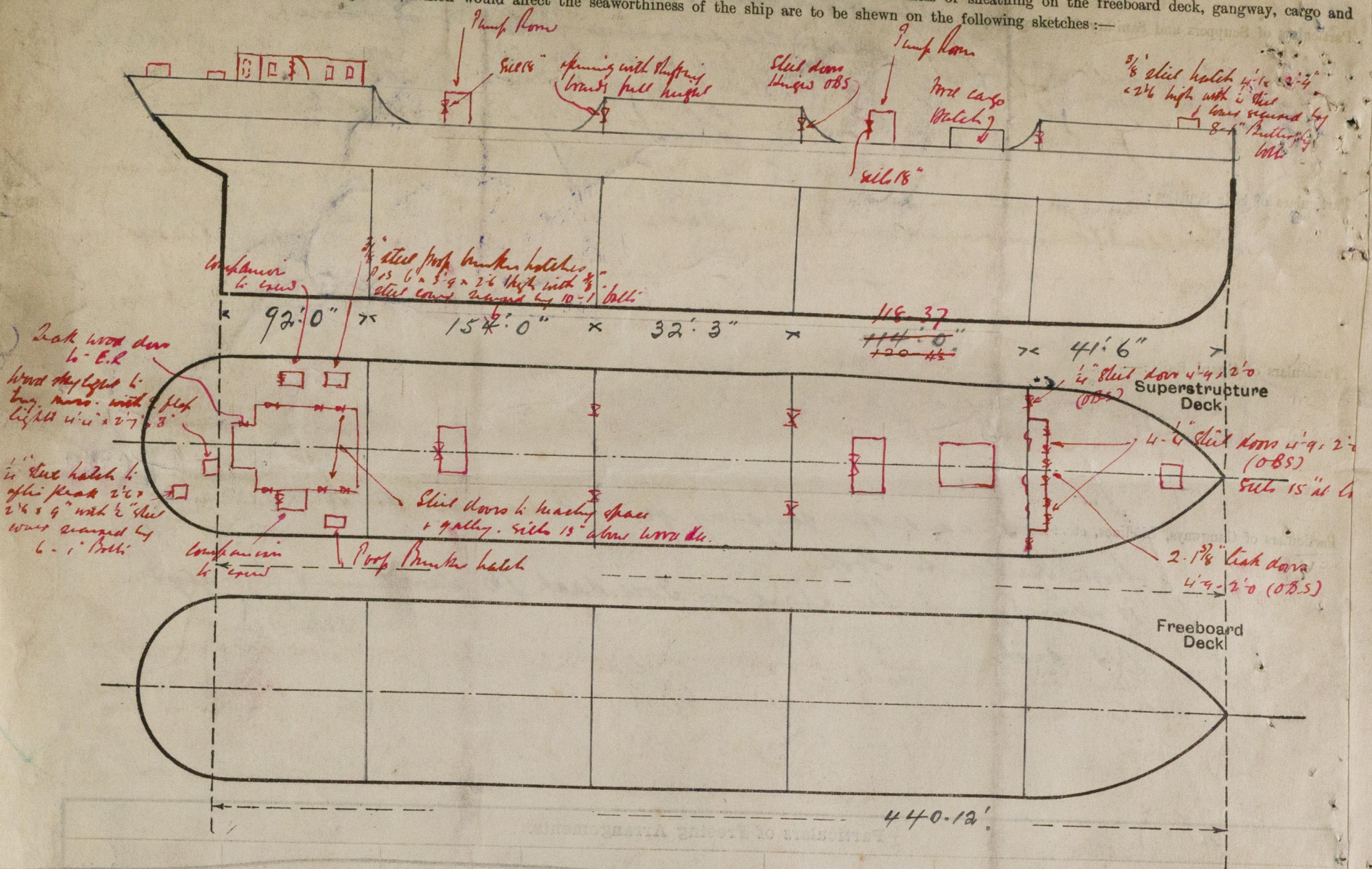
Additional area where sheer is less than standard.

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	✓	8 1/2" ^{3 1/2"}	9" x 3 1/2" B.A. ^{4 1/2"}	30"	Brackets top and bottom	none	none	7'6"	
Raised Quarter Deck Bulkhead ...	✓	✓	✓	✓	✓	2 doors	✓	✓	
Bridge, After Bulkhead ...	✓	4 1/2" x 5" ^{2 1/2"}	6" x 3 1/2" B.A. ^{3 1/2"}	30"	Brackets top and bottom	48" x 58"	18 1/4"	7'6"	
Bridge, Forward Bulkhead ...	✓	25" ^{2 1/2"}	8 1/2" x 4 1/2" B.A. ^{3 1/2"}	30"	Brackets top and bottom	58" x 25 1/2"	18"	7'6"	
Forecastle Bulkhead ...	✓	14" x 7 1/2" ^{1 1/2"}	3" x 2 1/2" L ₆ ^{9 1/2"}	30 1/4"	none	2-24" x 4'9" ^{4'9" x 24"}	16 1/8"	7'6"	
Trunk, Aft	✓					2-24 1/4" x 4'8"			
Trunk, Forward	✓								
Exposed Machinery Casings on Free-board or Raised Quarter Decks ...	All machinery casings enclosed in deck houses								
Exposed Machinery Casings on Super-structure Decks ^{14" above 3' high etc.} 14" above 3' high etc. ...		1 1/2"	4" x 3 1/2" B.A. ^{9 1/2"}	30"	Brackets top	4'10" x 2'0"	15" above 4'0" etc.	7'0"	
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	...	...	...	None. No openings.
Raised Quarter Deck Bulkhead	...	...	...	None.
Bridge, After Bulkhead	...	...	...	Two doors $59' \times 18' \frac{1}{2}"$ having openings with wood lattice in channels. closed by 3" shifting boards.
Bridge, Forward Bulkhead	...	...	...	Two steel doors $59' \times 28' \frac{1}{2}"$ watertight. Can be opened from both sides.
Forecastle Bulkhead	...	...	...	Two wood doors $24' \times 4' 9"$. Two steel doors $56' \times 24' \frac{1}{2}"$. Can be opened from both sides.
Exposed Machinery Casings on Forward or Raised Quarter Decks	...	...	...	3' - 2' steel doors in 11' 5' side, 1-18"
Exposed Machinery Casings on Superstructure Decks	...	...	...	Protected by deck houses. Link door on Port to E. Rm.; operates both sides.
Machinery Casings within Superstructures not fitted with Class I Closing Appliances	...	...	...	✓
Deckhouses on Flush Deck Ships	...	...	...	✓

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:— Tons at 26' 5 3/8" = 10352. Tons at 24' 3 3/8" = 9000 tons
Tons at 19' 3 3/8" = 6000 Tons at 17' 7 1/2" = 5000.

This vessel was examined while laying afloat at Section #106 Montreal.

Builder's name and yard number. *Armstrong Whitworth & Co. Ltd. Yard N° 537.*

Names of sister ships. *S.S. "El Grillo".*

Owners. *Lobitos Oilfields Ltd.*

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