

21 MAR 1932

Index. No. **25778**
(For London Office only.)

Lloyd's Register of Shipping.

SURVEYS FOR FREEBOARD.

 Computation of Freeboard for Steamer, Sailing Ship, Tanker
 having *Complete Superstructure*
Port of Survey *Göteborg*Date of Survey *18th March 1932*Name of Surveyor *C. Hjörngren*Particulars of Classification **100 A.1.**Shelter deck with freeboard.*

Ship's Name	Nationality and Port of Registry	Official Number	Gross Tonnage	Date of Build
<i>M/S BULLAREN</i>	<i>Swedish Göteborg</i>	<i>6002</i>	<i>5722</i>	<i>1918</i> <i>5 m.</i>

 Moulded Dimensions: Length *425'-0"* Breadth *56'-0"* Depth *30'-0"*
 Moulded displacement at moulded draught = 85 per cent. of moulded depth *13200* tons
 Coefficient of fineness for use with Tables *.761*

Depth for Freeboard (D)	
Moulded depth	<i>30.00</i>
Stringer plate	<i>0.04</i>
Sheathing on exposed deck	<i>✓</i>
$T \left(\frac{L-S}{L} \right) =$	
Depth for Freeboard (D) =	<i>30.04</i>

Depth correction	
(a) Where D is greater than Table depth (D - Table depth) R =	<i>(30.04 - 28.33) 3.0</i> <i>+5.13</i>
(b) Where D is less than Table depth (if allowed) (Table depth - D) R =	<i>-</i>
If restricted by superstructures	<i>-</i>

Round of Beam correction	
Moulded Breadth (B)	<i>56.0</i>
Standard Round of Beam = $\frac{B \times 12}{50}$	<i>= 13.44</i>
Ship's Round of Beam	<i>= 14.8</i>
Difference	<i>.68</i>
Restricted to	
Correction = $\frac{\text{Diff}^2}{4} \times \left(1 - \frac{S_1}{L} \right)$	<i>= .68^2 / 4 \times (1 - \frac{S_1}{L}) = .001</i>

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)
Poop enclosed ...	<i>31'-9"</i>	<i>31.75</i>	<i>8'-0"</i>		<i>31.75</i>
" overhang ...	<i>2'-3"</i>	<i>1.12</i>	<i>8'-0"</i>		<i>1.12</i>
R.Q.D. enclosed ...					
" overhang ...					
Bridge enclosed ...	<i>384'-4"</i>	<i>384.33</i>	<i>8'-0"</i>		<i>384.33</i>
" overhang aft ...	<i>2'-3"</i>	<i>1.69</i>	<i>8'-0"</i>		<i>1.69</i>
" overhang forward					
Fore enclosed ...	<i>36'-0"</i>	<i>-</i>	<i>7'-6"</i>		
" overhang ...	<i>0'-0"</i>	<i>-</i>			
Trunk aft ...					
" forward ...	<i>4'-5"</i>	<i>3.06</i>			<i>3.06</i>
Tonnage opening aft ...	<i>8'-11"</i>		<i>8'-0"</i>		
" forward					
Total ...	<i>425-0</i>	<i>421.95</i>			<i>421.95</i>

Standard Height of Superstructure *7.5*" " R.Q.D. *-*Deduction for complete superstructure *42.00*Percentage covered $\frac{S}{L} = 1.00$ " $\frac{S_1}{L} = \frac{421.95}{425} = .9930$ " $\frac{E}{L} = \frac{421.95}{425} = .9930$ Percentage from Table, Line A. *-*

(corrected for absence of forecastle (if required))

Percentage from Table, Line B. *.9914*

(corrected for absence of forecastle (if required))

Interpolation for bridge less than .2L (if required) *-*Deduction = *42.0 + .9914 = 41.63*

SHEER CORRECTION.

Station	Standard Ordinate	S M	Product	Actual Ordinate	Effective Ordinate	S M	Product
A.P. ...	<i>52.5</i>	<i>1</i>	<i>52.50</i>	<i>118.4</i>	<i>46.75</i>	<i>1</i>	<i>46.75</i>
$\frac{1}{4}$ L from A.P. ...	<i>233.6</i>	<i>4</i>	<i>934.4</i>	<i>298</i>	<i>122.2</i>	<i>4</i>	<i>488.8</i>
$\frac{2}{4}$ L " ...	<i>5.77</i>	<i>2</i>	<i>11.54</i>	<i>-20</i>	<i>3.55</i>	<i>2</i>	<i>7.10</i>
Amidships ...		<i>4</i>		<i>0</i>		<i>4</i>	
$\frac{3}{4}$ L from F.P. ...	<i>11.51</i>	<i>2</i>	<i>23.02</i>	<i>363</i>	<i>10.9</i>	<i>2</i>	<i>21.8</i>
$\frac{1}{4}$ L " ...	<i>46.72</i>	<i>4</i>	<i>186.88</i>	<i>1141</i>	<i>43.65</i>	<i>4</i>	<i>174.6</i>
F.P. ...	<i>105.0</i>	<i>1</i>	<i>105.00</i>	<i>2588</i>	<i>108.00</i>	<i>1</i>	<i>108.00</i>
Total ...	<i>472.5</i>		<i>472.44</i>		<i>46</i>		<i>459.86</i>

 Mean actual sheer aft = *Deficient = 120.52*
 Mean standard sheer aft = *139.89* *86%*

 Mean actual sheer forward = *Excess*
 Mean standard sheer forward = *Excess*
Length of enclosed superstructure forward of amidships = *Shelter deck*
 " " aft of " = *Shelter deck*
 Standard Sheer Aft: *45.16 1 45.16*
23.36 3 70.08
5.77 3 17.31
120.52

 Correction = $\frac{\text{Difference between sums of products}}{18} \left(.75 - \frac{S}{2L} \right) = \frac{12.58}{18} (.75 - .50) = +.17$

If limited on account of midship superstructure.

If limited to maximum allowance of $1\frac{1}{2}$ ins. per 100 ft. *-*
 Deduction for Tropical Freeboard.
 Addition for Winter and Winter North Atlantic Freeboard.

 Depth to Freeboard Deck = *30.04*
 Summer freeboard = *3.98*
 Moulded draught (d) = *26.06*

Deduction for Tropical freeboard and addition for

Winter freeboard = $\frac{d}{4}$ inches = *6.51*Addition for Winter North Atlantic Freeboard (if required) = *-*

Deduction for Fresh Water.

 Displacement in salt water at summer load water line *21.25*
 $\Delta = 11730, 12690, 13630$ TONS

Tons per inch immersion at summer load water line

 $T = \frac{7.0M}{48.8} \frac{7.5M}{48.2} \frac{8.0M}{48.5}$ DRAUGHT
 $T = 47.8, 48.2, 48.5$ TONS
Deduction = $\frac{\Delta}{40T}$ inches= *13.30*= *7.02*

TABULAR FREEBOARD corrected for Flush Deck (if required)

Correction for coefficient *.64 + .761 = 1.401*Depth Correction ... *5.13*Deduction for superstructures ... *41.63*Sheer correction ... *.17*Round of Beam correction ... *-*Correction for Thickness of Deck amidships ... *-*Other corrections, scantlings, etc. ... *-*
 Summer Freeboard = *47.75*
 5.30 41.63 = 36.33
SUMMER FREEBOARD amidships from Centre of Disc to top of Deck Line, Wood, Steel, Deck: *47.75 = 1213 METRES*

Tropical Fresh Water Line above Centre of Disc ...	<i>3.53 = 34.1M</i>	Tropical Fresh Water Freeboard ...	<i>34.22 = 869.870</i>
Fresh Water Line " " ...	<i>7.02 = 178</i>	Fresh Water " " ...	<i>40.73 = 1035</i>
Tropical Line " " ...	<i>6.51 = 165</i>	Tropical " " ...	<i>41.24 = 1048</i>
Winter Line below " " ...	<i>6.51 = 165</i>	Winter " " ...	<i>54.26 = 1378</i>
Winter North Atlantic Line " " ...	<i>-</i>	Winter North Atlantic " " ...	<i>-</i>

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MARKING FORM

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PARTICULARS OF PROTECTION TO OPENINGS, ETC.

HATCHWAYS ON FREEBOARD AND SUPERSTRUCTURE DECKS										
Upper deck.					Shelter deck.					
Description of Hatchway	... ..	... ..	... ..	... ..	Rated to fore peak	... ..	... ..	... ..	... ..	Rated to fore peak
Dimensions of Hatchway	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
COAMINGS	Height above Deck	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Thickness	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Stiffeners	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Brackets, Stays	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
HATCH BEAMS	Number	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Spacing	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Scantling and Sketch	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Bearing Surface	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
FORE AND AFTERS	Number	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Spacing	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Unsupported Lengths	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Scantling* and Sketch	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
HATCH COVERS	Material	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Thickness	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	How fitted	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
	Bearing Surface	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
Spacing of Cleats	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..
Number of Tarpaulins	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..	... ..

Please see page 4.

Particulars of fiddley, funnel and ventilator coamings :—

Particulars of fiddle, funnel and ventilator coamings:—
 Ventilators to marksmen's space and hold on top of a 7'-6" high casing
 6 ventilators 10'-0" height 24 diam coaming .40" Engine skylight of steel
 strongly constructed.

Particulars of Flush Bunker Scuttles:—

None /

Particulars of Companionways :—

Done!

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

Particulars of Ventilators in exposed positions on freeboard and superstructure decks :—					
<u>Forecastle deck:</u>	2 @	12" diam binnings	36' x .28 led to fore peak	and crew space	} All ventilators with steel covers and canvas covers ✓
	5 @	" "	32' x .20 "	crew space	
<u>Hulk's deck:</u>	8 @	6' " "	32' x .20 "	ft.	
	2 @	6' " "	6' x .20 "	with screw cap.	
	8 @	24' " "	X 6' 6" x 36'	hold.	

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

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

Forecastle deck:	1 @ 2½ diam 15" high gooseneck led to fore peak	} All air pipes with means of closing wood plug or canvas covers
	2 @ 2" " 15" " " " new space	
Shelter deck:	16 @ 2" " 28"-36" height gooseneck led to tanks.	

Particulars of Gangway Cargo and Coaling Ports:—

None

Particulars of Scuppers and Sanitary Discharge Pipes — 4 scuppers P.O.S. from hosen deck space with storm valves led overboard and rubber painted strong bark covers at deck. Sanitary discharges pipes fitted with valve at ship's side and efficient trap at inner end.

Particulars of Side Scuttles :

Scuttles: Side scuttles to crew spaces in forecabin and forenoon deck space provided with portable deadlights. All scuttles of substantial construction.

Particulars of Guard Rails :—

Guard rails on shelter deck 3'-8" high having three rods and stanchions spaced 4'-1" apart. Steel bulwark in way of accommodation 4'-1" high efficiently constructed and supported.

Particulars of Gangways, Lifelines, etc. :—

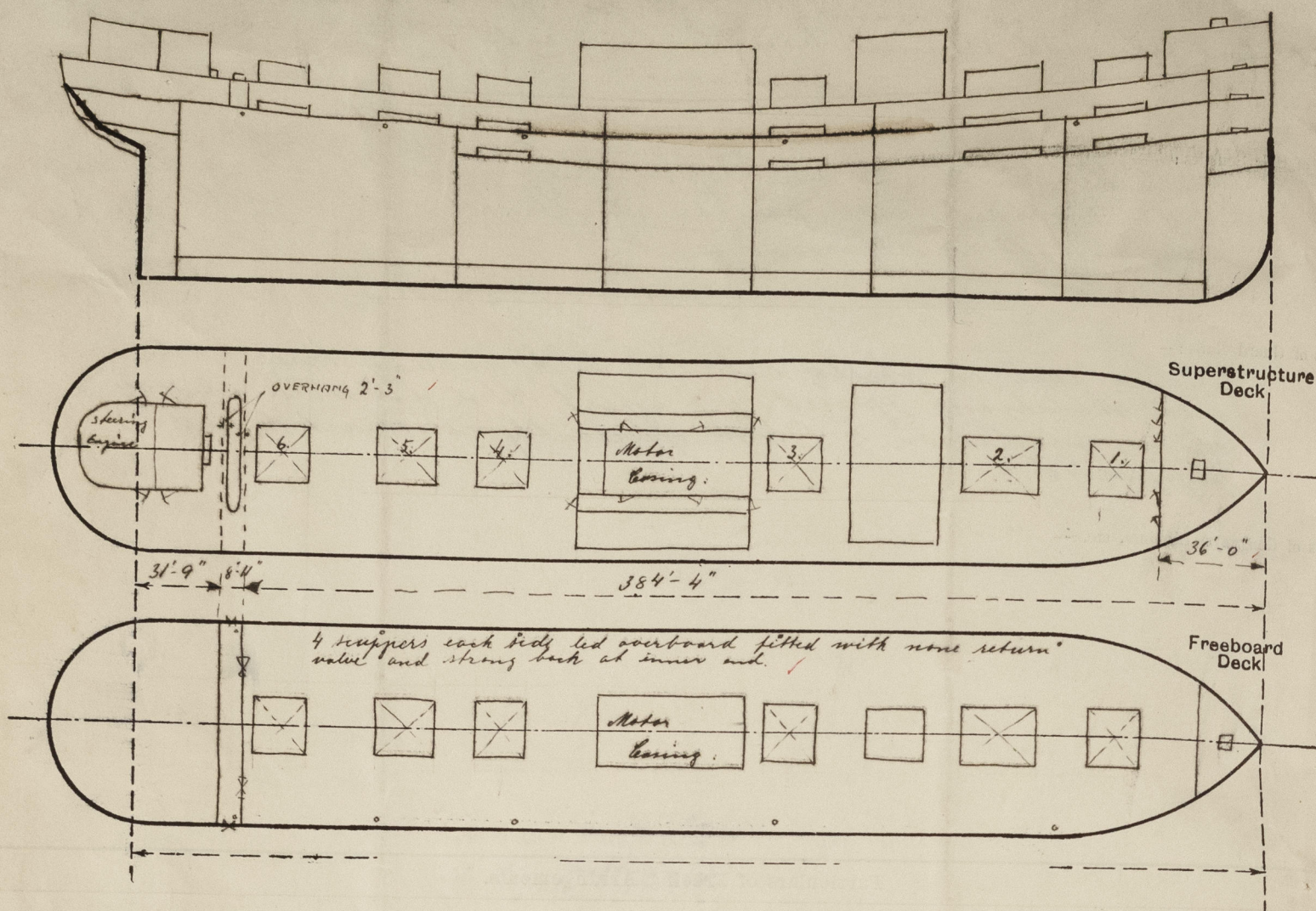
Particulars of Freeing Arrangements.						
	Length of Bulwark	Height of Bulwark	Size of Freeing Ports	Number each side	Area each side	Rule area each side
After Well	} <i>Open rails fore and aft</i> /					
Forward Well						
State position of each freeing port } After Well :— (P. and A. position and height 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 ... ..	.26 ✓	.26 ✓	^{4" flange plate L} 2½" x 3½" .28 ✓	32" - 34" ✓	None ✓	None ✓	✓	✓
Raised Quarter Deck Bulkhead ...			^{4" flange 1 plate R} 2½" x 3½" .28 ✓	32" - 34" ✓	None ✓	8'-0" x 3'-0" ✓	None ✓	✓
Bridge, After Bulkhead ... ..	.26 ✓	.26 ✓	2½" x 3½" .28 ✓	32" - 34" ✓	None ✓	8'-0" x 3'-0" ✓	None ✓	✓
Bridge, Forward Bulkhead			^{5 solid bld L} 3½" x 2½" .28 L	24" - 36" ✓	None ✓	5'-4" x 2'-0" ✓	12" ✓	7' 1/6" ✓
Forecastle Bulkhead ... ..	.28 ✓	.28 ✓	3½" x 2½" .28 L	24" - 36" ✓	None ✓	5'-4" x 2'-0" ✓	12" ✓	7' 1/6" ✓
Trunk, Aft								
Trunk, Forward								
Exposed Machinery Casings on Freeboard or Raised Quarter Decks ...								
Exposed Machinery Casings on Superstructure Decks ... ..	.28 ✓	.28 ✓	3" x 3" .32 L	26.75" ✓	bracket top continued at bottom.	5'-1" x 2'-0" ✓	15" ✓	7'-3" ✓
Machinery Casings within Superstructures not fitted with Class I Closing Appliances ... ..	.26 ✓	.26 ✓	3½" x 3½" x 28 ✓	31" ✓	None ✓	None ✓	✓	8'-0" ✓
Deckhouses ^{on weather deck} on Flush Deck Ships ...	.28 ✓	.28 ✓	4" x 3" x 36 L	33" ✓	None ✓	5'-2" x 1'-11" ✓	12" ✓	7'-3" ✓

Particulars of Closing Appliances (state if capable of being manipulated from both sides).

Poop Bulkhead	No opening. ✓
Raised Quarter Deck Bulkhead ...	Slipping boards in riveted channels full height. ✓
Bridge, After Bulkhead	Hinged steel doors capable of being manipulated from both sides. ✓
Bridge, Forward Bulkhead	Hinged steel doors capable of being manipulated from both sides.
Forecastle Bulkhead	
Exposed Machinery Casings on Free-board or Raised Quarter Decks ...	
Exposed Machinery Casings on Superstructure Decks	
Machinery Casings within Superstructures not fitted with Class I Closing appliances	
Upper shelter deck Bulkheads	Wood doors capable of being manipulated from both sides. ✓
Deck Ships	

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



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

Hatch on forecastle deck to crew space 28' x 24'

Coaming: 24" x 32"

Cover: W.T. hinged steel .32"

Skylight at deckhouse aft to crew space of steel efficiently constructed with W.T. hinged steel cover.

Tonnage opening

Tonnage opening hatch 4'-5" x 15'-0". Bulk angle coaming 9' x 3 1/2" x .52"
Efficient temporary covers 3" wood 3" bearing surface and 2 tarpaulins.
One wash port each side in tonnage opening space 38' x 25" and
one mupper each side led overboard fitted with none return valve
and rubber pointed strong back cover at deck.

Builder's name and yard number A.B. Götaverken N° 344

Names of sister ships

Owners Rederi aktief. Transatlantic Gøteborg.

Fee £ 390-

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