

Lloyd's Register of Shipping.

SURVEYS FOR FREEBOARD.

25 FEB 1942

Computation of Freeboard for Steamer, Sailing Ship, Tanker

having Poop, Bridge and ForecastlePort of Survey Bombay

(Type of Superstructures.)

Date of Survey 14/10/41Ship's Name
EMPIRE RAJANationality and Port of
Registry BritishOfficial Number
168220Gross Tonnage
6224Date of Build
1922Name of Surveyor John RundleWildenfelde431.056.032.10 1/814800769Moulded Dimensions: Length 433.9Breadth 56.0Depth 32.10 1/814800769

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

Coefficient of fineness for use with Tables

Particulars of Classification

Depth for Freeboard (D)

Moulded depth 32.10 1/8Stringer plate 0.05Sheathing on exposed deck
 $T \left(\frac{L-S}{L} \right) = \frac{214.154}{421} = 0.508$ Depth for Freeboard (D) = 32.97

Depth correction

(a) Where D is greater than Table depth

(D - Table depth) R = (32.97 - 28.73) x 3 = + 12.72

(b) Where D is less than Table depth (if allowed)

(Table depth - D) R = 4.24If restricted by superstructures ☒

Round of Beam correction

Moulded Breadth (B) 56Standard Round of Beam = $\frac{B \times 12}{50} = 13.44$ Ship's Round of Beam = 10 1/2 insDifference 2.94

Restricted to

Correction = $\frac{\text{Diff}^2}{4} \times \left(1 - \frac{S_1}{L} \right) = \frac{2.94^2}{4} \times \frac{421}{4} = +.31$

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)
Poop enclosed	<u>61.433</u>	<u>61.33</u>	<u>8.0</u>	<u>-</u>	<u>61.33</u>
" overhang					
R.Q.D. enclosed					
" overhang	<u>127.56</u>	<u>127.56</u>	<u>8.11</u>	<u>-</u>	<u>127.56</u>
Bridge enclosed. <u>equivalent</u>	<u>127.56</u>	<u>127.56</u>	<u>8.11</u>	<u>-</u>	<u>127.56</u>
" overhang aft	<u>6.58</u>	<u>6.58</u>	<u>8.11</u>	<u>-</u>	<u>6.58</u>
" overhang forward	<u>2.55</u>	<u>2.55</u>	<u>7.3</u>	<u>-</u>	<u>2.55</u>
Fore enclosed <u>including</u>	<u>52.55</u>	<u>52.55</u>	<u>7.3</u>	<u>-</u>	<u>52.55</u>
" overhang	<u>1.14</u>	<u>1.14</u>	<u>7.3</u>	<u>-</u>	<u>1.14</u>
Trunk aft					
" forward					
Tonnage opening aft					
" " forward					
Total	<u>252.49</u>	<u>249.16</u>			<u>249.16</u>

Standard Height of Superstructure 7.5" " R.Q.D. 42Deduction for complete superstructure 42Percentage covered $\frac{S}{L} = 58.58$ " " $\frac{S_1}{L} = 57.81$ " " $\frac{E}{L} = 57.81$

Percentage from Table, Line A.

(corrected for absence of forecastle (if required))

Percentage from Table, Line B. 43.81

(corrected for absence of forecastle (if required))

Interpolation for bridge less than 2L (if required)

Deduction = 42 x 43.81 = - 18.40.03

SHEER CORRECTION.

Station	Standard Ordinate	S	M	Product	Actual Ordinate	Effective Ordinate	S	M	Product
A.P.	<u>53.10</u>	1	1	<u>53.10</u>	<u>4.3</u>	<u>51.0</u>	1	1	<u>51.0</u>
1/8 L from A.P.	<u>23.63</u>	4	4	<u>94.52</u>	<u>1.8</u>	<u>20.0</u>	4	4	<u>80.0</u>
3/8 L "	<u>5.84</u>	2	2	<u>11.68</u>	<u>nil</u>	<u>-</u>	2	2	<u>-</u>
Amidships	<u>-</u>	4	4	<u>-</u>	<u>nil</u>	<u>-</u>	4	4	<u>-</u>
5/8 L from F.P.	<u>11.68</u>	2	2	<u>23.36</u>	<u>1.9 1/2</u>	<u>21.5</u>	2	2	<u>43.0</u>
7/8 L "	<u>47.26</u>	4	4	<u>189.04</u>	<u>4.11</u>	<u>59.0</u>	4	4	<u>236.0</u>
F.P.	<u>106.20</u>	1	1	<u>106.20</u>	<u>10.1 1/2</u>	<u>121.5</u>	1	1	<u>121.5</u>
Total				<u>477.90</u>					<u>531.5</u>

Mean actual sheer aft = .784

Mean standard sheer aft

Mean actual sheer forward = Zero

Mean standard sheer forward

Length of enclosed superstructure forward of amidships = > .1aft of " = > .1

<u>53.10</u>	<u>1</u>	<u>53.10</u>	<u>1</u>	<u>51</u>
<u>23.63</u>	<u>3</u>	<u>70.89</u>	<u>3</u>	<u>60</u>
<u>5.84</u>	<u>3</u>	<u>17.52</u>	<u>3</u>	<u>-</u>
<u>-</u>	<u>1</u>	<u>14.51</u>	<u>1</u>	<u>-</u>
		<u>141.51</u>		<u>111</u>

Correction = $\frac{\text{Difference between sums of products}}{18} \left(.75 - \frac{S}{2L} \right) = \frac{53.6}{18} \left(.75 - \frac{2929}{4571} \right) = -1.36$ 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 = 32.89Summer freeboard = 6.56Moulded draught (d) = 26.33

Deduction for Tropical freeboard and addition for

Winter freeboard = $\frac{d}{4}$ inches = 6.58 = 6 1/2Addition for Winter North Atlantic Freeboard (if required) = ☒

Deduction for Fresh Water.

Displacement in salt water at summer load water line

 $\Delta = 13978$

Tons per inch immersion at summer load water line

T = 45.347.8Deduction = $\frac{\Delta}{40T}$ inches= 2.71 7/31= 7 1/4

TABULAR FREEBOARD corrected for Flush Deck (if required)

Correction for coefficient

769 + 68 = 1.4491.36Depth Correction 12.72Deduction for superstructures 18.40Sheer correction 1.36Round of Beam correction31Correction for Thickness of Deck amidships96Other corrections, scantlings, etc. - .35Summer Freeboard = 78.82.19SUMMER FREEBOARD amidships from Centre of Disc to top of Deck Line, Wood, Steel, Deck:—

Existing freeboard assigned by Germanischer Lloyd Hamburg.

Tropical Fresh Water Line above Centre of Disc 13 3/4Fresh Water Line " " 7 1/4Tropical Line " " 6 1/2Winter Line below " " 6 1/2Winter North Atlantic Line " " ☒Tropical Fresh Water Freeboard 5.5Fresh Water " " 5.11 1/2Tropical " " 6.0 1/4Winter " " 7.1 1/4Winter North Atlantic " " ☒

PARTICULARS OF PROTECTION TO OPENINGS, ETC.

HATCHWAYS ON FREEBOARD AND SUPERSTRUCTURE DECKS										
Description of Hatchway	...	...	...				
Dimensions of Hatchway	...	...	...				
COAMINGS	{	Height above Deck	...							
		Thickness	{ Sides	...						
			{ Ends	...						
		Stiffeners	...	...				
		Brackets, Stays	...	...				
HATCH BEAMS	{	Number	...	...				
		Spacing	...	...				
		Scantling and Sketch	...	...				
		Bearing Surface	...	...				
FORE AND AFTERS	{	Number	...	...				
		Spacing	...	...				
		Unsupported Lengths	...	...				
		Scantling* and Sketch	...	...				
		Bearing Surface	...	...				
HATCH COVERS	{	Material	...	...				
		Thickness	...	...				
		How fitted	...	...				
		Bearing Surface	...	...				
Spacing of Cleats	...	...	...	...		
Number of Tarpaulins	...	...	...	...		
*Are wood fore and afters steel shod at all bearing surfaces? Are battens and wedges efficient and in good condition? Are tarpaulins in good condition and in accordance with rule requirements? Are lashings provided in accordance with rule requirements?										

Particulars of fiddle, funnel and ventilator coamings :—

Particulars of Flush Bunker Scuttles :—

Bridge

136.33

Recess

$$\frac{11.16 \times 44}{56} = 8.77$$

$$\underline{\underline{127.56}}$$

Particulars of Companionways :—

File.

54.83

Recess

$$\frac{4.5 \times 24}{47.33} = 2.28$$

$$\underline{\underline{52.55}}$$

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

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

Particulars of Gangway Cargo and Coaling Ports :—

