

Lloyd's Register of Shipping.

SURVEYS FOR FREEBOARD.

(COMPUTATION FOR STEAMER, SAILING SHIP, TANKER.)

Ship's Name <i>Empire Belgrave</i> AQUEITY	Official Number 169440	Nationality and Port of Registry <i>British,</i> <i>Glasgow</i>	Gross Tonnage 890.45	Date of Build 1945	Port of Survey
Moulded Dimensions: Length <i>190.5</i> Breadth <i>32.0</i> Depth <i>14.75'</i> <i>to centre of main deck</i>					Date of Survey <i>9.4.47</i>
Moulded displacement at moulded draught = 85 per cent. of moulded depth					Surveyor's Signature
Coefficient of fineness for use with Tables <i>707</i>					Particulars of Classification <i>+100 A1</i> <i>carrying petroleum in bulk</i>

DEPTH FOR FREEBOARD (D).	DEPTH CORRECTION.	ROUND OF BEAM CORRECTION.
Moulded depth ... <i>14.75'</i>	(a) Where D is greater than Table depth (D - Table depth) R = <i>(14.75 - 12.70) x 1.465 = +3.05'</i>	Moulded Breadth (B) <i>32.0'</i>
Stringer plate ... <i>03</i>	(b) Where D is less than Table depth (if allowed) (Table depth - D) R = <i>2.08</i>	Standard Round of Beam = $\frac{B \times 12}{50} = \frac{32.0 \times 12}{50} = 7.68$
Sheathing on exposed deck $T \left(\frac{L-S}{L} \right) =$ <i>-</i>	If restricted by superstructures	Ship's Round of Beam = <i>7.50</i>
Depth for Freeboard (D) = <i>14.78</i>		Difference = <i>.18</i>
		Restricted to
		Correction = $\frac{\text{Diff}^2}{4} \times \left(1 - \frac{S_1}{L} \right) = \frac{.18^2}{4} \times \frac{2607}{4} = +.01''$

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)	
Poop enclosed <i>Equit.</i>	60.99	60.99	7.5	-	60.99	Standard Height of Superstructure <i>6.0</i>
" overhang ...			2.75			R.Q.D. <i>3.603</i>
R.Q.D. enclosed ...						Deduction for complete superstructure <i>25.03</i>
" overhang ...						Percentage covered $\frac{S}{L} = \frac{60.99}{118.75} = 51.30$
Bridge enclosed	16.13	16.13	2.75	2.75/6	7.39	$\frac{S_1}{L} = \frac{73.93}{118.75} = 73.93$
<i>Raised upper deck</i> overhang aft						$\frac{E}{L} = \frac{57.08}{118.75} = 57.08$
" overhang forward						Percentage from Table, Line A. <i>Tanker 48.79</i>
F'cle enclosed	20.61	20.61	7.0	-	20.61	(corrected for absence of forecastle (if required))
" overhang						Percentage from Table, Line B.
Trunk <i>92 x 15/32</i>		43.12	2.75	2.75	19.76	(corrected for absence of forecastle (if required))
" forward						Interpolation for bridge less than .2L (if required)
Tonnage opening aft						Deduction = $25.05 \times .4879 = -12.22$
" " forward						
Total	97.73	140.85			108.75	

SHEER CORRECTION.

Station	Standard Ordinate	S M	Product	Actual Ordinate	Effective Ordinate	S M	Product
A.P. ...	29.05	1	29.05	55.87	29.05	1	29.05
$\frac{1}{8}$ L from A.P. ...	12.925	4	51.70	11.87	12.925	4	51.70
$\frac{3}{8}$ L „ ...	3.195	2	6.39	-	3.195	2	6.39
Amidships ...	-	4	-	-	-	4	-
$\frac{5}{8}$ L from F.P. ...	6.39	2	12.78	-	-	2	-
$\frac{7}{8}$ L „ ...	25.85	4	103.40	.63	.63	4	2.52
F.P. ...	58.10	1	58.10	40.5	40.5	1	40.50
Total ...			261.42				130.16

Correction = $\frac{\text{Difference between sums of products}}{18} \left(.75 - \frac{S}{2L} \right) = \frac{131.26(75 - .2565)}{18} = +3.60$
If limited on account of midship superstructure.

Mean actual sheer aft = *Excess*
Mean standard sheer aft =

Mean actual sheer forward = *Deficient*
Mean standard sheer forward =

Length of enclosed superstructure forward of amidships = *-*

" " aft of " = *-*

Deduction for Tropical Freeboard.

Addition for Winter and Winter North Atlantic Freeboard.

Depth to Freeboard Deck = *14.78*
Summer freeboard = *1.37*
Moulded draught (d) = *13.41*

Deduction for Tropical freeboard and addition for

Winter freeboard = $\frac{d}{4}$ inches = *3.35 = 3 1/4*

Addition for Winter North Atlantic Freeboard (if required) = *5 1/4"*

Deduction for Fresh Water.

Displacement in salt water at summer load water line
 $\Delta = 1712$
Tons per inch immersion at summer load water line
T = *12.12*

Deduction = $\frac{\Delta}{40 T}$ inches
= *3.53*
= *3 1/2"*

TABULAR FREEBOARD corrected for Fresh Deck (if required)

Correction for coefficient *707 + .68 = 1.387/1.36*

	+	-
Depth Correction	3.05	-
Deduction for superstructures	-	12.22
Sheer correction	3.60	-
Round of Beam correction	.01	-
Correction for Thickness of Deck amidships	-	-
Other corrections, scantlings, etc.	-	-
	6.66	12.22

Summer Freeboard = *16.45*

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

Tropical Fresh Water Line above Centre of Disc	...	<i>6 3/4"</i>
Fresh Water Line	"	<i>3 1/2"</i>
Tropical Line	"	<i>3 1/4"</i>
Winter Line below	"	<i>3 1/4"</i>
Winter North Atlantic Line	"	<i>5 1/4"</i>

Tropical Fresh Water Freeboard	<i>14 1/2"</i>
Fresh Water	<i>9 3/4"</i>
Tropical	<i>11 1/4"</i>
Winter	<i>17 3/4"</i>
Winter North Atlantic	<i>21 5/8"</i>

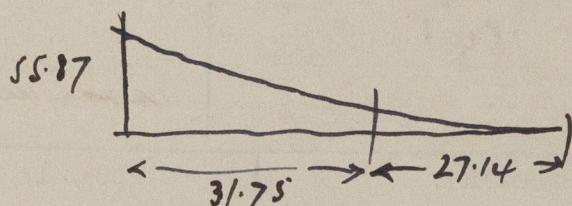
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A new form should be prepared if any alterations that affect the freeboard have been made. If no such alterations have been made, the Surveyor should endorse the form on this side with his signature and the date.

Virtual Sheer Calculation.

Height of poop at A.P. = $37.87 + 90 = 127.87'$
 Standard height of poop = $72.00'$
 Virtual sheer at A.P. = $55.87'$

$$\frac{L}{6} = \frac{190.5}{6} = 31.75.$$



length of
poop

58.39
50
58.89
31.75
27.14

$$55.87 \times \left(\frac{27.14}{58.89} \right)^2 = 11.87''$$

$$55.87 \times \left(\frac{29.445}{58.89} \right)^2 = 13.97''$$

$$\frac{58.89}{2} = 29.445.$$

Area under virtual sheer curve aft.

1	55.87	1	55.87
2	13.97	4	55.88
3	0	1	

$$111.75 \times \frac{1}{3} \times 29.445 = 1097.$$

Area under standard sheer curve aft.

1	29.05	1	29.05
2	12.925	3	38.77
3	3.195	3	9.58
4		1	

$$77.40 \times \frac{3}{8} \times \frac{190.5}{6} = 921$$

\therefore Area of virtual sheer curve aft
is in excess of standard area.

For actual sheer curve see
back of original h.p. CII comp.

omit

Trade of ship.....
 Names of sister ships.....
 Builder's name and yard number.....
 Owners.....
 Fee £.....



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Foundation