

Lloyd's Register of Shipping.  
SURVEYS FOR FREEBOARD.  
(COMPUTATION FOR TANKER.)

Mdb. 17709.

Ship's Name FURNESS YARD N° 360. S/S "EMPIRE PROTECTOR"	Official Number 169147	Nationality and Port of Registry BRITISH MIDDLESBROUGH	Gross Tonnage 8147.99 8130 (APPROX.) 8157.15	Date of Build 1944.	Port of Survey MIDDLESBROUGH.
Moulded Dimensions: Length 465'-0" Breadth 64'-0" Depth 35'-6" Moulded draught = 28'-3 1/4" = 16300 TONS DEPTH OF KEEL = 1'-7 1/4" BELOW BASE LINE. 17605 tons Coefficient of fineness for use with Tables. 685					Date of Survey WHILE BUILDING.
Particulars of Classification CARRYING PETROLEUM IN BULK. LONGITUDINAL FRAMING AT BOTTOM & AT DECK. CLASS CONTEMPLATED.					Surveyor's Signature H.C. Young.

<b>DEPTH FOR FREEBOARD (D).</b> Moulded depth ... 35.50' Stringer plate ... 30" ... 0.0' Sheathing on exposed deck NIL. $T \left( \frac{L-S}{L} \right) =$ Depth for Freeboard (D) = 35.50'	<b>DEPTH CORRECTION.</b> (a) Where D is greater than Table depth (D - Table depth) R = (35.57 - 31.07) x 3 = +13.50 4.50 (b) Where D is less than Table depth (if allowed) (Table depth - D) R = If restricted by superstructures	<b>ROUND OF BEAM CORRECTION.</b> Moulded Breadth (B) 64' Standard Round of Beam = $\frac{B \times 12}{50} = 15.36$ Ship's Round of Beam 16.13 Difference FROM AFT PERP. TO 126'-1" FROM F.P. 0.77 Restricted to Correction = $\frac{\text{Diff}}{4} \times \left( 1 - \frac{S_1}{L} \right) = \frac{.77}{4} \times .5731 = -.10$
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<b>DEDUCTION FOR SUPERSTRUCTURES.</b>					
	Mean Covered Length (S)	Equivalent Enclosed Length (S <sub>1</sub> )	Height	Height Correction	Effective Length (E)
Poop enclosed	125.79	125.79	7'-6"	✓	125.79
" overhang	NIL				
R.Q.D. enclosed	✓				
" overhang	47.00				
Bridge enclosed	44.83	47.00	7'-6"	✓	47.00
" overhang aft	2'-6"	1.87			1.87
" overhang forward	NIL				
F'cle enclosed	52.19	52.19	7'-6"	✓	52.19
" overhang	2'-3" IN CENTRE.				
Trunk aft	✓				
" forward	✓				
Tonnage opening aft	✓				
" " forward	227.48				
Total	228.77	226.85			226.85

Standard Height of Superstructure	7.5'
" " R.Q.D.	✓
Deduction for complete superstructure	42"
Percentage covered $\frac{S}{L} =$	48.83
" " $\frac{S_1}{L} =$	48.69
" " $\frac{E}{L} =$	39.69
Percentage from Table, Line A. Tanker	39.69
(corrected for absence of forecastle (if required))	✓
Percentage from Table, Line B.	✓
(corrected for absence of forecastle (if required))	✓
Interpolation for bridge less than .2L (if required)	✓
Deduction =	42 x .3969 = -16.67.

<b>SHEER CORRECTION.</b>							
Station	Standard Ordinate	S	M	Product	Actual Ordinate	Effective Ordinate	S
A.P.	56.60	1		56.60	13"	13.00	1
1/8 L from A.P.	25.185	4		100.74	2.25	2.25	4
3/8 L	6.225	2		12.45	0	-	2
Amidships	-	4		-	0	-	4
5/8 L from F.P.	12.45	2		24.90	0	-	2
7/8 L	50.37	4		201.48	11.625	11.625	4
F.P.	113.19	1		113.19	84"	84.00	1
Total				509.36			

Mean actual sheer aft	
Mean standard sheer aft	
Mean actual sheer forward	
Mean standard sheer forward	
Length of enclosed superstructure forward of amidships	
" " aft of	

Correction =  $\frac{\text{Difference between sums of products}}{18} \left( .75 - \frac{S}{2L} \right) = \frac{356.86 - .2441}{18} = +10.03$   
If limited on account of midship superstructure. ✓

<b>Deduction for Tropical Freeboard.</b> Addition for Winter and Winter North Atlantic Freeboard. Depth to Freeboard Deck = 35.57 Summer freeboard = 7.19 Moulded draught (d) = 28.38 Deduction for Tropical freeboard and addition for Winter freeboard = $\frac{d}{4}$ inches = 7.09 = 7" Addition for Winter North Atlantic Freeboard (if required) = 7.09 + 4.66 = 11.75 = 11 3/4"	<b>Deduction for Fresh Water.</b> Displacement in salt water at summer load water line $\Delta = 16378$ Tons per inch immersion at summer load water line T = 57 Deduction = $\frac{\Delta}{40 T}$ inches = 7.18 = 7 1/4"	<b>TABULAR FREEBOARD</b> corrected for Flush Deck (if required) Correction for coefficient $\frac{.685 + .68}{1.36} = \frac{1.365}{1.36}$ Depth Correction ... 13.50 Deduction for superstructures ... 16.67 Sheer correction ... 10.03 Round of Beam correction ... 10 Correction for Thickness of Deck amidships ... Other corrections, scantlings, etc. ... Summer Freeboard = 86.24
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SUMMER FREEBOARD amidships from Centre of Disc to top of Deck Line, Wood, Steel, Deck :-

Tropical Fresh Water Line above Centre of Disc	14 1/4"	Tropical Fresh Water Freeboard	6'-0"
Fresh Water Line	7 1/4"	Fresh Water	6'-7"
Tropical Line	7"	Tropical	6'-7 1/4"
Winter Line below	7"	Winter	7'-9 1/4"
Winter North Atlantic Line	11 3/4"	Winter North Atlantic	8'-2"



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.

$$\begin{array}{r} \text{Poop} \quad 122.96 \\ 2/3 \times 4.25 = \frac{2.83}{125.79} \end{array}$$

$$\begin{array}{r} \text{Bridge} \quad 44.00 \\ 2/3 \times 4.5 = \frac{3.00}{47.00} \end{array}$$

$$\begin{array}{r} \text{Fck} \quad 62.25 \\ \text{Run } \frac{18 \times 26}{46.5} = \frac{-10.06}{52.19} \end{array}$$

$$\begin{array}{l} \text{Camber} \quad \text{Area } \frac{22+21}{2} \times \frac{16}{12} = \\ \text{Mean height} = \frac{(22+21) \times 16}{64 \times 12} \text{ ft.} \\ = \frac{43 \times 16}{64} \text{ inches} \end{array}$$

$$\therefore \text{equivalent camber} = \frac{3}{2} \times \frac{43 \times 16}{64} = 16.13 \text{ in.}$$

Trade of ship TANKER.

Names of sister ships 5/s "EMPIRE BOUNTY" (N° 356). 5/s "EMPIRE LAW" (N° 357) 5/s "EMPIRE MILNER" (N° 358) 5/s "EMPIRE PALADIN" (N° 359).

Builder's name and yard number FURNESS S.B. CO. LTD YARD N° 360.

Owners MINISTRY OF WAR TRANSPORT.

Fee £ WILL BE CHARGED ON FIRST ENTRY REPORT.



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Foundation