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(For London Office only.)

Lloyd's Register of Shipping.  
SURVEYS FOR FREEBOARD.  
(COMPUTATION FOR STEAMER, SAILING SHIP, TANKER.)

N<sup>o</sup>. 34078

Ship's Name <b>"EMPIRE MANDALAY"</b>	Official Number <b>180148</b>	Nationality and Port of Registry <b>BRITISH, SUNDERLAND</b>	Gross Tonnage <b>7086</b>	Date of Build <b>✓</b>	Port of Survey <b>Sunderland</b>
Moulded Dimensions: Length <b>424.875 FT.</b> Breadth <b>56.0</b> Depth <b>34.67</b> <b>2<sup>ND</sup> DK 28.67</b> <b>TO &amp; OF RUDDER STOCK @ 32.02 = 17140</b>				Date of Survey <b>While building</b>	
Moulded displacement at moulded draught = 85 per cent. of moulded depth <b>@ 24.36 = 12577</b> tons				Surveyor's Signature <b>R. Wilson</b>	
Coefficient of fineness for use with Tables <b>.787 (32.02) .759 (24.36)</b>				Particulars of Classification <b>100 A.I. With freeboard (Contemplated)</b>	

<b>DEPTH FOR FREEBOARD (D).</b>	<b>DEPTH CORRECTION.</b>	<b>ROUND OF BEAM CORRECTION.</b>
Moulded depth ... <b>34.67</b>	(a) Where D is greater than Table depth (D-Table depth) R = <b>(37.72-28.32) x 3 = +28.20</b>	Moulded Breadth (B) <b>56.0</b>
Stringer plate ... <b>UPPER DK .65 .05</b>	(b) Where D is less than Table depth (if allowed) (Table depth-D) R = <b>✓</b>	Standard Round of Beam = $\frac{B \times 12}{50} = 13.44$
Sheathing on exposed deck <b>✓</b>	<b>✓</b>	Ship's Round of Beam = <b>14.56</b>
$T \left( \frac{L-S}{L} \right) =$	<b>✓</b>	Difference <b>✓</b>
Depth for Freeboard (D) = <b>37.72</b>	If restricted by superstructures	Restricted to
		Correction = $\frac{\text{Diff}^e}{4} \times \left( 1 - \frac{S_1}{L} \right) = \frac{.56}{4} \times .916 = -.13$

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S <sub>1</sub> )	Height	Height Correction	Effective Length (E)	
Poop enclosed ...						Standard Height of Superstructure <b>7.5'</b>
„ overhang ...						„ „ R.Q.D. <b>✓</b>
R.Q.D. enclosed ...						Deduction for complete superstructure <b>42'</b>
„ overhang ...						Percentage covered $\frac{S}{L} = \frac{S_1}{L} = \frac{E}{L} = \left. \begin{matrix} 8.40 \\ 7.56 \end{matrix} \right\}$
Bridge enclosed ...						Percentage from Table, Line A. <b>3.78</b>
„ overhang aft ...						(corrected for absence of fore-castle (if required))
„ overhang forward ...						Percentage from Table, Line B. <b>✓</b>
F'cle enclosed ...	<b>35.67</b>	<b>35.67</b>	<b>6.75</b>	<b>x 6.75/7.5</b>	<b>32.11</b>	(corrected for absence of fore-castle (if required))
„ overhang ...						Interpolation for bridge less than .2L (if required) <b>✓</b>
Trunk aft ...						Deduction = <b>42 x .0378 = -1.59.</b>
„ forward ...						
Tonnage opening aft ...						
„ „ forward ...						
Total ...	<b>35.67</b>	<b>35.67</b>			<b>32.11</b>	

SHEER CORRECTION.

Station	Standard Ordinate	S M	Product	Actual Ordinate	Effective Ordinate	S M	Product	
A.P. ...	<b>52.49</b>	1	<b>52.49</b>	<b>23.0</b>	<b>23</b>	1	<b>23</b>	Mean actual sheer aft =
1/4 L from A.P. ...	<b>23.36</b>	4	<b>93.44</b>	-	-	4	-	Mean standard sheer aft =
3/8 L „ ...	<b>5.77</b>	2	<b>11.54</b>	-	-	2	-	Mean actual sheer forward =
Amidships ...	-	4	-	-	-	4	-	Mean standard sheer forward =
3/8 L from F.P. ...	<b>11.55</b>	2	<b>23.10</b>	-	-	2	-	Length of enclosed superstructure forward of amidships =
1/4 L „ ...	<b>46.71</b>	4	<b>186.84</b>	<b>7.0</b>	<b>7</b>	4	<b>28</b>	„ „ aft of „ =
F.P. ...	<b>104.97</b>	1	<b>104.97</b>	<b>81.0</b>	<b>81</b>	1	<b>81</b>	
Total ...			<b>472.38</b>				<b>132</b>	

Correction =  $\frac{\text{Difference between sums of products}}{18} \left( .75 - \frac{S}{2L} \right) = \frac{340.38}{18} \left( .75 - \frac{.042}{.708} \right) = +13.39$   
If limited on account of midship superstructure. **✓** If limited to maximum allowance of 1 1/2 ins. per 100 ft. **✓**

<b>Deduction for Tropical Freeboard.</b> <b>Addition for Winter and Winter North Atlantic Freeboard.</b>	<b>Deduction for Fresh Water.</b> Displacement in salt water at summer load water line $\Delta = 13976$ Tons per inch immersion at summer load water line $T = 49$ Deduction = $\frac{\Delta}{40 T}$ inches $= \frac{7.13}{7.14}$	<b>TABULAR FREEBOARD</b> <b>79.31 + 1.55</b> corrected for Flush Deck (if required) Correction for coefficient $\frac{.787 + .68}{1.36} = \frac{1.467}{1.36}$	<b>80.86</b> <b>87.22</b>
Depth to Freeboard Deck = <b>37.72</b> Summer freeboard = <b>11.09</b> Moulded draught (d) = <b>26.63</b>		Depth Correction ... <b>28.20</b> Deduction for superstructures ... <b>1.59</b> Sheer correction ... <b>13.39</b> Round of Beam correction ... <b>.13</b> Correction for Thickness of Deck amidships ... <b>5.91</b> Other corrections, scantlings, etc. to conform to a summer estimate draught <b>726.9</b>	<b>87.6</b> <b>22-11-44</b> <b>+45.78</b> Summer Freeboard = <b>133.00</b>

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

Tropical Fresh Water Line above Centre of Disc ...	<b>14"</b>	Tropical Fresh Water Freeboard ...	<b>9'-11"</b>
Fresh Water Line „ „ ...	<b>7 1/4"</b>	Fresh Water „ „ ...	<b>10'-5 3/4"</b>
Tropical Line „ „ ...	<b>6 3/4"</b>	Tropical „ „ ...	<b>10'-6 1/4"</b>
Winter Line below „ „ ...	<b>6 3/4"</b>	Winter „ „ ...	<b>11'-7 3/4"</b>
Winter North Atlantic Line „ „ ...	-	Winter North Atlantic „ „ ...	-



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.

Displacement at 26'9" draught = 13946 tons

Tons per inch = 49 tons

Allowance for keel = 1 1/2"

*Amend*

*Amend*

Trade of ship .....

Names of sister ships "EMPIRE GLADSTONE" SUNDERLAND RPT NO 33902 "EMPIRE TUDOR" SUNDERLAND RPT NO 33975

Builder's name and yard number Shipbuilding Corporation Ltd (Wear Branch) Sunderland Yard No 5.

Owners Ministry of War Transport

Fee £ 18 : 0 : 0

Will be charged on 4<sup>th</sup> report.



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