

DISCLOSED

SECTION 1049

LLOYD'S REGISTER OF SHIPPING.

(CLASSIFICATION SOCIETY RECOGNISED BY THE JAPANESE GOVERNMENT)

SURVEY FOR FREEBOARD.

Ship's Name "COLUMBIA MARU"	Port of Registry	Official No.	No. in R.B.	Gross Tonnage	Tonnage under Fbd. Deck = V 5222.91	Date of Launch	Date when Built 1927	Report Number 45
Owners Mitsubishi Shoji Kaisha.		Builders Mitsubishi Zosen Kaisha Ltd. (Nagasaki works)			Yard No. NO. 427	Port of Survey Nagasaki.		
Type of vessel Full Scantling Poop, Bridge & Fore'le.		Particulars of Classification Lloyd's Class 100 A.1.		Position of Freeboard Deck Upper Deck.		Date of Survey Whilst building.		
						Name of Surveyor G. Anderson & R. Crawford.		

PRINCIPAL DIMENSIONS.

Length between perpendiculars.....	405	ft.	Breadth Moulded = B ₀	55.0	ft.	Depth Moulded to Fbd. deck = D ₀	32.00	ft.
Length on Load Line.....	405	ft.	Thickness of Side plating in ins. x 3/12.....	66 x 5/12 + 0.17	ft.	Round of Beam.....	13" x 1/12 + 1.08	ft.
			* (2/12 if plating is jogged)			Depth from base line to top of inner bottom plating or ordinary floors.....	33.08 - 3.71	ft.
Length for Freeboard = L.....	405	ft.	Breadth for Freeboard = B.....	55.17	ft.	Depth for Tonnage Coef. (Art. 39) = D.....	29.37	ft.

CORRECTION TO TONNAGE (Art. 39)

Tonnage between top of ceiling on double bottom
or ordinary floors as fitted and standard level of
top of ceiling (v) = tons.

8.50

DEPTH OF DOUBLE BOTTOM (Art. 39)

Depth of Actual Double Bottom (including plating) or Ordinary Floors.....	44.52	ins.
Depth of Standard Double Bottom (including plating) or Ordinary Floors.....	44.52	ins.
Difference.....	0.00	
x 1/12 =.....	Nil.	= d.

SHEER (Arts. 39 and 60-63)

Ordinate	Height of Sheer in inches.	S.M.	Products
1	117.0	1	117.0
2	52.2	4	208.8
3	13.2	2	26.4
4	0	4	0
5	5.76	2	11.52
6	24.00	4	96.00
7	54.00	1	54.00
			513.72

Sum of Products =

Mean Height of Sheer = S = $\frac{\text{Sum of Products}}{18}$ = 28.54 / 18 = 1.683 ins.Standard Mean Height = S₀ = $\frac{1}{3}(L/10 + 10)$ = 11.71 ins.Difference = 1.683 - 11.71 = -10.027 ft. = d₁Correction (Arts. 60-63) = $\frac{3}{4}(1 - e)(S_0 - S)$ = 0.98

FRAMING (Art. 39)

Between Frames	Length in ft.	Depth of Frame in ins.	Thickness of Sparring in inches	Total depth in inches	Products ft. x inches
AP - 15	36.04	9	2	11	396
15 - 61	126.5	11.5	2	13.5	1708
61 - 77	44.0	11.5	0	11.5	506
77 - 119	115.5	11.5	2	13.5	1559
119 - 129	22.5	11	2	13	293
129 - F.P.	60.46	11.5	2	13.5	816

405 ft.

Sum of Products = 5278

Sum of Products = Actual Mean Depth of framing = 13.03 ins.

Standard " " " " = 8.50 ins.

Difference = 4.53 x 2/12 = 0.76 = 2b

COEFFICIENT OF FINENESS (Art. 39 or 43)

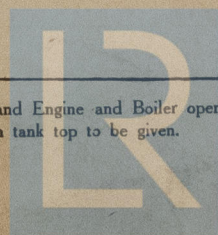
$$\frac{100(V \pm v)}{L(B - 2b)(D + d + d_1) + n} + n$$
$$\frac{100 \times 5231.41}{405 \times (55.17 - 0.76) \times (29.37 + 0.98)} = 0.78$$

$$\text{or } \frac{35 \times \Delta}{L \times B_0 \times d_0} + 0.04$$
$$= \dots + 0.04 =$$

Sketch showing arrangement and height of double bottom or ordinary floors and of superstructures (unless complete plans are submitted).

4 1/2" Ceiling throughout except in engine room.

Sketch of deck erections showing openings in end bulkheads and position and arrangement of closing appliances. Hatchways, and Engine and Boiler openings also to be shown. Extent and thickness of wood deck or composition to be shown in red ink, and extent and thickness of ceiling (and battens) on tank top to be given.



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Lloyd's Register
Foundation

009409-009417-0285 1/2

WOOD DECK (Arts. 5 and 6)

	Mean Length in ft.	Thickness in ins.	Products
Forecastle	40.06	3.10	124.19
Bridge	110.00	3.10	341.00
Poop or R.Q.D.	44.29	3.10	137.30
Open Deck, ford.			
" " aft.			

Total length = $l =$ Sum of Products = **602.49**
Sum of Products $\div l =$ ins.; Sum of Products $\div L =$ **1.49** ins.

CORRECTION FOR DEPTH & CORRECTION FOR FREEBOARD.
If no sheathing fitted amidships = $t_1 = \pm 1.49$ ins. (Arts. 6 and 57 p. 1)
If sheathing is fitted amidships = $(t - t_1) = \mp$ ins. (Arts. 6 and 57 p. 2)
* Note: Use the upper sign in correction for depth and the lower sign in correction for freeboard.

DEPTH TO USE IN FREEBOARD TABLE.
Depth moulded **32** ft. **0** ins.
Thickness of Stringer Plate **0.40** ins.
Thickness of Wood Deck Amidships **1.49** ins.
Correction for partial wood deck \pm **1.49** ins.
Depth to use in Freeboard Tables **32** ft. **1.89** ins. = $D_1 = 32.16$ ft.

SUPERSTRUCTURES.
HEIGHT (Arts. 46-48)
Standard Height = $(0.018 L + 1.2) \text{ ft.} = 7' - 6"$ ft.

	Complete Superstructure	Forecastle	Bridge	Poop or R.Q.D.
Actual		7.37	7.38	7.37
Standard		7.50	7.50	7.50

CLOSING APPLIANCES (Arts. 50 and 54)

	Forecastle	Bridge	Poop or R.Q.D.
Means of Closing openings in bulkhead	Storm board	No opening	Storm board
Corresponding Class	II	IV	II

EFFECTIVE LENGTH (Arts. 55 and 56)

	Mean Length	Coef. Art. 56	Height Coef.	Products.
Forecastle closed part	40.06	1.00	.983	39.38
" open part				
Bridge closed part	110.00	1.00	.984	108.24
" open part ford.				
" " aft.				
Poop closed part	44.29	1.00	.983	43.54
" open part				

Total Effective Length = **191.16**
 $\frac{\text{Total Effective Length}}{\text{Length of Vessel}} = r = 0.47$
Corresponding Coef. in Table (Art. 49) = $e = 0.301$
Reduction for Complete Superstructure **39.00** ins.
Product **11.74** ins.
Correction for Superstructures **-11.74** ins.

EFFECTIVE LENGTH (Shelter Deck Vessels Arts. 87-92)
 $l + \frac{1}{2}(1-p)(L-l) =$ ft.
(* See Art. 90)

CORRECTION FOR PROPORTIONS L/D (Art. 58)
When D_1 is less than 35 ft. = $\frac{D_1 + 16}{300} (1 - e/2) (L - 12 D_1)$
" " greater than 35 ft. = $0.17 (1 - e/2) (L - 12 D_1)$
[Note $e = 1.0$ if more than $6/10$ covered] = **0.16 x 0.849 x 19.08 = 2.59** ins.

CORRECTION FOR ROUND OF BEAM (Art. 59)
Standard Round of Beam = $\frac{\text{Length of Beam in ins.}}{50} = 13.20$ ins.
Correction = $\frac{1}{2} (\text{Standard Round of Beam} - \text{Actual Round of Beam})$
= $\frac{1}{2} (13.20 - 13.00) = 0.10$ ins.

CORRECTION FOR FREEING PORTS
(in vessels less than 15 ft. Depth Art. 64)
Length of bulwark in feet each side **--** ft.
Area of Freeing ports each side **--** sq. ft.
Area of Freeing ports required by Table **--** sq. ft.
Correction $1.2 (r - 0.5) D_1 = +$ **--** ins.

CORRECTION FOR ACCESS TO CREW'S QUARTERS (Arts. 65-67)
Are Crew berthed in Bridge House or Forecastle? **--**
Height and breadth of gangway **--**
Correction = $0.012 (80 - l) D_1$ or $1.2 (r - 0.5) D_1$ **--** ins.

SUMMARY.
Freeboard by Tables **95.04** ins.
Correction for Sheer **6.14** ins.
" Partial Wood Deck **1.49** ins.
" Superstructures **11.74** ins.
" Proportions L/D **2.59** ins.
" Round of Beam **0.05** ins.
" Freeing Ports **2.64** ins.
" Access to Crew's Quarters **19.37** ins.
Totals **16.73** ins.
Net Correction **78.31** ins.
Geometric Freeboard **25.50** ft.
Corresponding Geometric Draught (mld.) **25.50** ft.
Moulded Draught limited by $\left(\frac{\text{form transverse strength}}{\text{longitudinal strength}} \right)$ to **25.50** ft.
Corresponding Freeboard (Summer) **78.3** ins.

Winter Freeboard (Art. 22) = $\frac{1}{4} (D_1 - 10) + 1/45 (59 - D_1)$ **5.8** ins.
= **5.8** ins.
Tropical Freeboard (Art. 24) do. do. **5.8** ins.

Winter North Atlantic Fbd. (Art. 23) Vessels 330 ft. and below. **--**
Ratio of effective length of superstructures to length of vessel **--**
Additional Freeboard **--** ins.

Fresh Water Freeboard (Art. 27)
 $\frac{1}{4}$ " per foot of Summer Draught = **6.4** ins.

FREEBOARD TO BE ASSIGNED.
Vertical distance from upper edge of horizontal line indicating the freeboard deck to the centre of the disc. (Summer Line) **78.3** ins.
Fresh Water Load Line above centre of disc. **6.4** ins.
Tropical Load Line above " " " **5.8** ins.
Winter Load Line below " " " **5.8** ins.
Winter N.A. Load Line below " " " **--** ins.

Vertical distance from the point of intersection of the extended line of the upper surface of the **Upper** deck at mid length of the vessel with the outside of shell plating to the upper edge of the horizontal line indicating the freeboard deck **0.00** ins.

Are the Engine and Boiler openings covered by a Bridge, Poop, Raised Quarter Deck or enclosed by a strong steel deck house? **Yes**
If openings are not so protected give thickness of plating and scantlings and spacing of stiffeners of Casings **--**
Are suitable means provided for closing all openings in them in bad weather? **Yes**
State the vertical distance from base line at top of keel to lower edge of lowest side scuttle **Above freeboard deck.**
State if there are any cargo ports or scuppers through sides of vessel below upper deck **All above freeboard deck.**
State any special features in the construction of the vessel

Sister vessels **25**
Fee. Yen. **1.60** ins.; Depth of Keel **7.60** ins.; Draught (btm. keel) **7.60** ins.

DETAILS OF CONSTRUCTION OF WEATHER DECK HATCHWAYS.

	No. 1	No. 2	No. 3	No. 4	No. 5 & 6	No. 7
Length and Breadth	33'9"x20'0"	38'6"x20'0"	22'0"x20'0"	8'3"x20'0"	33'0"x20'0"	8'3"x12'0"
Height above deck and thickness of side and end coaming	30"	30"	30"	30"	30"	18"
Shifting Beams	5 Steel 19 1/2"x.38" 4"x3"x.44"	6 Steel 19 x.38" 4"x3"x.44"	3 Steel 19"x.38" 4"x3"x.44"	1 Steel 15 1/2"x.34" 4"x3"x.44"	5 Steel 19"x.38" 4"x3"x.44"	1 Steel 10"x.30" 3"x3"x.40"
*Fore and Afters	None	None	None	None	None	None
Thickness of hatches	3"	3"	3"	3"	3"	2 1/2"
Remarks	* When the fore and afters are of wood the depth should be stated from the underside of hatches.					

LONGITUDINAL MODULUS.

BELOW ASSUMED AXIS.						ABOVE ASSUMED AXIS.					
Item	Scantlings	Area	Lever	Moment	Mt. of Inertia	Item	Scantlings	Area	Lever	Moment	Mt. of Inertia
Flat Keel						Top Deck Str.					
" "						" " "					
Centre Girder						" " Plating					
C.G. btm. ang.						" " "					
C.G. top angles						" " "					
T.T. Cr. Strake						" " Str. Ang.					
T.T. plating						2nd Deck Str.					
" "						" " Plating					
" "						" " "					
" "						" " "					
" "						" " Str. Ang.					
Margin Plate						3rd Deck Str.					
" "						" " Plating					
" Angle						" " "					
Shell Strake A						" " Str. Ang.					
" " B						Sheerstrake					
" " C						Strake below					
" " D						Shell Strake					
" " E						" "					
" " F						" "					
" " G											
Totals below assumed axis						Totals above assumed axis					
" above assumed axis						Neutral Axis above assumed axis (x) =					
Sum or Difference						Correction = (Total Area x x ² x 2) =					
						Moment of Inertia about Neutral Axis					
						Distance from Neutral Axis to top of Keel					
						MODULUS OF SECTION =					
						Actual Modulus					
						f. B ₀					

DRAUGHT PERMITTED BY LONGITUDINAL STRENGTH (Arts. 81-86)

TRANSVERSE MODULUS.
Minimum Side Plating (Art. 77) $\frac{0.105 \times +17}{100} =$; Standard Frame Spacing (Art. 78) = $0.025 \times +17 =$
Actual Side Plating $=$; Actual Frame Spacing $=$
If actual frame spacing exceeds the standard $\sqrt{\frac{\text{Actual frame spacing}}{\text{Standard frame spacing}}} t =$
Moulded Geometric Draught (d) = $H =$ $f_1 =$
 $t =$ $K =$ $f_2 =$
 $d - t =$ $f_1 + f_2 =$
Standard $I/y = \frac{s(d-t)(f_1 + f_2)}{1000} =$
Frame in ship = at spacing, $I/y =$
DRAUGHT PERMITTED BY TRANSVERSE STRENGTH = $\frac{I/y \times 1000}{s(f_1 + f_2)} + t =$