

LLOYD'S REGISTER OF SHIPPING.
(CLASSIFICATION SOCIETY RECOGNISED BY THE JAPANESE GOVERNMENT)
SURVEY FOR FREEBOARD.

Ship's Name "RYOYO MARU"	Port of Registry Yokohama	Official No. --	No. in R.B. --	Gross Tonnage 5973	Tonnage under Fbd. Deck = V 5307.87	Date of Launch 24th. Sept. 1930	Date when Built Building	Report Number. 76
Owners TOYO KISEN KAISHA.		Builders Kawasaki Dockyard.		Yard No. 562		Port of Survey Kobe.		
Type of vessel Full scantling. Peep, Bridge & Forecastle.		Particulars of Classification * 100 A.1.		Position of Freeboard Deck Upper Deck.		Date of Survey While Building		
						Name of Surveyor M.M.Parker.		

PRINCIPAL DIMENSIONS.		
Length between perpendiculars 415 ft.	Breadth Moulded = B ₀ 56 ft.	Depth Moulded to Fbd. deck = D 31.81 ft.
Length on Load Line 415 ft.	Thickness of Side plating in ins. x ³ / ₁₂ .66" x 3/12 +.17 ft.	Round of Beam +1.17 ft.
	*(2/12 if plating is joggled)	Depth from base line to top of inner bottom plating or ordinary floors 32.98 ft.
Length for Freeboard = L 415 ft.	Breadth for Freeboard = B 56.17 ft.	Depth for Tonnage Coef. (Art. 39) = D 29.22 ft.

CORRECTION TO TONNAGE (Art. 39)				DEPTH OF DOUBLE BOTTOM (Art. 39)					
Tonnage between top of ceiling on double bottom or ordinary floors as fitted and standard level of top of ceiling (v) = + 1.07 tons.				Depth of Actual Double Bottom (including plating) or Ordinary Floors 45.16 ins.					
				Depth of Standard Double Bottom (including plating) or Ordinary Floors 44.52 ins.					
				Difference .64					
				x ¹ / ₁₂ = .05 = d.					
SHEER (Arts. 39 and 60-63)				FRAMING (Art. 39) Inside Frames.					
Ordinate	Height of Sheer in inches.	S.M.	Products	Between Frames	Length in ft.	Depth of Frame in ins.	Thickness of Sparring in inches	Total depth in inches	Products ft. x inches
1	48"	1	48	AP - 11	22.80	8"	0	8	182.40
2	17"	4	68	11 - 63	143.00	12"	¹/₈"	12.5	1787.50
3	3"	2	6	63 - 79	44.00	12"	0	12	528.00
4	0	4	0	79 - 123	121.00	12"	¹/₈"	12.5	1512.50
5	9.5"	2	19	123 - 133	22.50	11"	¹/₈"	11.5	258.75
6	38.25"	4	153	133 - 149	36.00	12"	¹/₈"	12.5	450.00
7	96.0"	1	96	149 - FP	25.70	8"	0	8.0	205.60
Sum of Products = 390				Sum of Products = 415.00			Sum of Products = 4924.75		
Mean Height of Sheer = S = $\frac{\text{Sum of Products}}{18} = \frac{390}{18} = 21.67$ ins.				Sum of Products = Actual Mean Depth of framing 11.87 ins.			Standard " " " " 8.5 ins.		
Standard Mean Height = S ₀ = $\frac{1}{3}(L/10 + 10) = \frac{1}{3}(41.5 + 10) = 17.17$ ins.				Length of Ship			Difference 3.37 x ² / ₁₂ = .56 = 2b		
Difference 4.50 x ¹ / ₁₂ = .38 ft. = d ₁									
Correction (Arts. 60-63) = $\frac{3}{4}(1 - e)(S_0 - S) = \frac{3}{4}(1 - e)(17.17 - 21.67) = 2.38$ ins.									

COEFFICIENT OF FINENESS (Art. 39 or 43)

$$\frac{100(V + v)}{L(B - 2b)(D + d + d_1) + n}$$
$$\frac{100(5307.87 + 7.62)}{415(56.17 - .56)(29.22 + .05 + .38)} = .78$$

or

$$\frac{35 \times \Delta}{L \times B_0 \times d_0} + 0.04$$
$$= \frac{35 \times 2190}{415 \times 56 \times 29.22} + 0.04 = -5.48$$

See Plans.

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

Tank top is level.

2 1/2" Ceiling fitted on 2" battens throughout except in Machinery Space.
Standard depth of double bottom = 44.52" + 2 1/2" = 47.02"
Actual depth of double bottom = 45.16" + 3" = 48.16"
Diff. +1.14 = .10 ft.

Total area of Tank top = 13102 sq. ft. No ceiling in E.R. 2190 x .25
 $\frac{13102 \times .10}{100} = + 13.10$ tons. $\frac{2190 \times .25}{100} = -5.48$
Nett Correction + 7.62 Tons.

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.

WOOD DECK (Arts. 5 and 6)

	Mean Length in ft.	Thickness in ins.	Products
Forecastle	39.20	3.1	118.25
Bridge	118.25	3.1	368.58
Poop or R.Q.D.	33.80	3.1	104.78
Open Deck, fwd.		0	
.. .. aft.		0	
Total length = L	191.25		592.88
Sum of Products = t_1	3.1		1.43

CORRECTION FOR DEPTH & CORRECTION FOR FREEBOARD.

If no sheathing fitted amidships = $t_1 = \pm 1.43$ 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 = 31.96 ft. ins.
 Thickness of Stringer Plate = .40
 Thickness of Wood Deck Amidships = 31.10.06
 Correction for partial wood deck = 1.43
 Depth to use in Freeboard Tables = 31.11.49 ft. ins. = $D_1 = 31.96$ ft.

SUPERSTRUCTURES.

HEIGHT (Arts. 46-48)
 Standard Height = $(0.018 L + 1.2)$ ft. = 7.5 ft.

	Complete Superstructure	Forecastle	Bridge	Poop or R.Q.D.
Actual	7.63	7.63	7.63	7.63
Standard	7.5	7.5	7.5	7.5

CLOSING APPLIANCES (Arts. 50 and 54)

	Forecastle	Bridge	Poop or R.Q.D.
Means of Closing openings in bulkhead	Storm Doors in Channels	Steel W.T. Doors	Storm Doors in Channels
Corresponding Class	II	I	I

EFFECTIVE LENGTH (Arts. 55 and 56)

	Mean Length	Coef. Art. 56	Height Coef.	Products
Forecastle closed part	39.00	1	1	39.00
.. open part	118.25	1	1	118.25
Bridge closed part	33.80	1	1	33.80
.. open part fwd.				
.. .. aft.				
Poop closed part				
.. open part				
Total Effective Length = L	191.25			
Total Effective Length = r	.46			
Corresponding Coef. in Table (Art. 49) = c	.294			
Reduction for Complete Superstructure	39			11.47
Product				11.47
Correction for Superstructures				

EFFECTIVE LENGTH (Shelter Deck Vessels Arts. 87-92)

$L + \frac{1}{2}(1-p)(L-r) =$.. ft.
 (* See Art. 90)

CORRECTION FOR PROPORTIONS L/D (Art. 58)

When D_1 is less than 35 ft. = $\frac{D_1 + 16}{300}(1 - \frac{c}{2})(L - 12 D_1)$
 greater than 35 ft. = $\frac{21.96 + 16}{300} \times .853 \times 31.48 = 4.29$ ins.
 [Note: $c = 1.0$ if more than $\frac{1}{10}$ covered]

CORRECTION FOR ROUND OF BEAM (Art. 59)

Standard Round of Beam = $\frac{\text{Length of Beam in ins.}}{50} = 13.44$ ins.
 Correction = $\frac{1}{2}(\text{Standard Round of Beam} - \text{Actual Round of Beam}) = \frac{1}{2}(13.44 - 14) = .14$ 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? Bridge House.
 Height and breadth of gangway ..
 Correction = $-.012(80 - l) D_1$ or $1.2(r - 0.5) D_1 = +$.. ins.

SUMMARY.

Freeboard by Tables = 94.12 ins.
 Correction for Sheer = 2.38
 .. Partial Wood Deck = 1.43
 .. Superstructures = 11.47
 .. Proportions L/D = 4.29
 .. Round of Beam = .14
 .. Freeing Ports ..
 .. Access to Crew's Quarters ..
 Totals = 4.29 15.42
 Net Correction = 11.13
 Geometric Freeboard = 82.99 ins.
 Corresponding Geometric Draught (mld.) = 24.92 ft.
 Moulded Draught limited by $(\frac{L}{100} + \frac{r}{45} \times (59 - D_1))$ to 24.92 ft.
 Corresponding Freeboard (Summer) = 83.0 ins.

Winter Freeboard (Art. 22) = $\frac{1}{2}(D_1 + 10) + \frac{r}{45} \times (59 - D_1) = 21.96 + 4.6/45 \times 27.04 = 5.77$ ins.
 Tropical Freeboard (Art. 24) do. do. = 5.77 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 = 6.23 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) = 83.0 ins.
 Fresh Water Load Line above centre of disc. = 6.2 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 plate of the 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. All Scuttles above upper deck.

State if there are any cargo ports or scuppers through sides of vessel below upper deck. No.

State any special features in the construction of the vessel. --

Similar xxx / Soyo Maru, Asano S.B.Co. No. 270.

Sister vessels ..

Fee, Yen ..; Depth of Keel .. ins.; Draught (btm. keel) .. ft. .. ins.

DETAILS OF CONSTRUCTION OF WEATHER DECK HATCHWAYS.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Length and Breadth	29'3" x 20'	30'3" x 20'	30'3" x 20'	19'3" x 20'	30'3" x 20'	30'3" x 20'
Height above deck and thickness of side and end coaming	27 x .46 .44 End	27 x .46 .44 End	24 x .46 .44 End	27 x .46 .44 End	27 x .46 .44 End	27 x .46 .44 End
Shifting Beams	16 x .34 4 x 3 x .44	17 x .34 4 x 3 x .44	13 x .32 4 x 3 x .44	18 x .35 4 x 3 x .44	17 x .34 4 x 3 x .44	17 x .34 4 x 3 x .44
* Fore and Afters			NONE.			
Thickness of hatches	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Remarks						
* When the fore and afters are of wood the depth should be stated from the underside of hatches.						

LONGITUDINAL MODULUS.

Height of Assumed Axis above base = .. Section at ..

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						" " "					
" " B						" " Str. Ang.					
" " C						Sheerstrake					
" " D						Strake below					
" " E						Shell Strake					
" " 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 $\times x^2 \times 2$) = ..					
Moment of Inertia about assumed axis = 2						Moment of Inertia about Neutral Axis ..					
Distance from Neutral Axis to top of Strength deck beam at side = .. ft.						Distance from Neutral Axis to top of Keel ..					
MODULUS OF SECTION = ..						Actual Modulus = $\frac{\text{Actual Modulus}}{f. B_0} =$..					

DRAUGHT PERMITTED BY LONGITUDINAL STRENGTH (Arts. 81-86) = $\frac{\text{Actual Modulus}}{f. B_0} =$..

TRANSVERSE MODULUS.

Minimum Side Plating (Art. 77) $\frac{0.105 \times}{100} + 17 =$..; Standard Frame Spacing (Art. 78) = $.025 \times + 17 =$..

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 = $\frac{I/y \times 1000}{s(f_1 + f_2)} + t =$..

