

LLOYD'S REGISTER OF SHIPPING.

(CLASSIFICATION SOCIETY RECOGNISED BY THE JAPANESE GOVERNMENT)

SURVEY FOR FREEBOARD.

Ship's Name YO MARU	Port of Registry Yokohama	Official No. -	No. in R.B. -	Gross Tonnage about 8600	Tonnage under Fbd. Deck = V 7884	Date of Launch 17th May 1924	Date when Built -	Report Number 25
Owners Kisen Kaisha		Builders Asano Zosen Kaisha			Yard No. 39	Port of Survey Yokohama		
Type of vessel Deck with Focle age opening.	Particulars of Classification * 100 Al. shelter deck with freeboard.		Position of Freeboard Deck Shelter deck		Date of Survey while Building			
					Name of Survey James Crichton & H.J. Cox.			

PRINCIPAL DIMENSIONS.

Length between perpendiculars	445.0 ft.	Breadth Moulded = B ₀	58.0 ft.	Depth Moulded to Fbd. deck = D ₀	40.0 ft.
Length on Load Line	444.29 ft.	Thickness of Side plating in ins. x 3/12	475 x 3/12 + .19 ft.	Round of Beam	14 1/2" 1.20 ft.
		*(2/12 if plating is jogged)		Depth from base line to top of in bottom plating or ordinary floor	41.20 ft.
Length for Freeboard = L	444.29 ft.	Breadth for Freeboard = B	58.19 ft.	Depth for Tonnage Coef. (Art. 39)	37.32 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) = **- 56.2** tons.

DEPTH OF DOUBLE BOTTOM (Art. 39)

Depth of Actual Double Bottom (including plating) or Ordinary Floors	46.54 ins.
Depth of Standard Double Bottom (including plating) or Ordinary Floors	47.54 ins.
Difference	- 1.00
x 1/12 =	- .08 = d.

SHEER (Arts. 39 and 60-63)

Ordinate	Height of Sheer in inches.	S.M.	Products
1	48.2	1	48.2
2	16.0	4	64.0
3	3.3	2	6.6
4	0.0	4	0.0
5	12.0	2	24.0
6	46.2	4	184.8
7	119.9	1	119.9
Sum of Products =			447.5
Mean Height of Sheer = S = $\frac{\text{Sum of Product}}{18}$			24.86 ins.
Standard Mean Height = S ₀ = $\frac{1}{3}(L/10 + 10)$			18.14 ins.
Difference			6.72
Correction (Arts. 60-63) = $\frac{1}{3}(1 - e)(S_0 - S)$			-4.77 ins.

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
AB to 32	86.0	10	2	12	1032.0
32 " 55	69.0	12	2	14	966.0
55 " 88	99.0	12	-	12	1188.0
88 " 122	102.0	12	2	14	1428.0
122 " F.P.	88.29	10	2	12	1059.48
Sum of Products =					5673.48
Sum of Products = Actual Mean Depth of framing					12.77 ins.
Length of Ship					9.50 ins.
Standard " " " "					9.50 ins.
Difference					3.27
x 2/12 =					.55 = 2b

COEFFICIENT OF FINENESS (Art. 37 or 43)

$$\frac{100(V + v)}{L(B - 2b)(D + d + d_1)} + n$$

$$\frac{100(7884 - 56.2)}{444.29(58.19 - .55)(37.32 - .094.56)} = .81$$

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

$$= \frac{35 \times 40.0}{444.29 \times 58.19 \times 37.32} + 0.04 = .75$$

SEE PLANS

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

SEE PLANS

Standard depth double bottom = $47.54 + 2.5 = 50.04$
 Actual = $46.56 - 2.75 = 43.81 + 3.0 = 46.81$
 Diff = 3.23
 Tonnage Corr = $\frac{15400 \times 3.23}{100} = 49.74$ tons
 No ceiling in No. 1 Hold, E & B space & Deep tanks
 = $\frac{5920 \times 2.5}{100} = 14.8$ tons

Note: -5" Ceiling in Nos. 2, 3, 4 & 5 holds only. Tank top drops 5 1/2" to margin.

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			
Bridge			
Poop or R.Q.D.			
Open Deck, ford.			
" " aft.			
Total length = l =	Sum of Products =		
Sum of Products = t =	ins. ;	Sum of Products = t_1 =	ins.

CORRECTION FOR DEPTH & CORRECTION FOR FREEBOARD.

If no sheathing fitted amidships = $t_1 = \pm$ ins. (Arts. 6 and 57 p. 1)
 If sheathing is fitted amidships = $(t - t_1) = \pm$ 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 = 40 ft. 0 ins.
 Thickness of Stringer Plate = 0.64
 Thickness of Wood Deck Amidships = 3.00
 Correction for partial wood deck = 40 3.64
 Depth to use in Freeboard Tables = 40 ft. 3.64 ins. = $D_1 = 40.30$ ft.

SUPERSTRUCTURES.

HEIGHT (Arts. 46-48)
 Standard Height = $(0.018 L + 1.2)$ ft. = 7.6" ft.

	Complete Superstructure	Forecastle	Bridge	Poop or R.Q.D.
Actual	80	1		
Standard	7.5			

CLOSING APPLIANCES (Arts. 50 and 54)

	Forecastle	Bridge	Poop or Raised Quarter Deck
Means of Closing openings in bulkhead	Hinged Steel doors.		
Corresponding Class	I		

EFFECTIVE LENGTH (Arts. 55 and 56)

	Mean Length	Coef. Art. 56	Height Coef.	Products.
Forecastle closed part	44.76	1	1	44.76
" " open part				
Bridge closed part				
" " open part ford.				
" " aft.				
Poop closed part				
" " open part				
Total Effective Length =	44.76			
Length of Vessel = l =	120			
Corresponding Coef. in Table (Art. 49) = c =	.053			
Reduction for Complete Superstructure	.39 ins.			
Product	2.067 ins.			
Correction for Superstructures	-2.07 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] = $.17 \times .974 \times 39.31 = 6.51$ 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 **37'-4"**

State if there are any cargo ports or scuppers through sides of vessel below **yes lowest sill 32'10"**

State any special features in the construction of the vessel.

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	20'3"x2'0"	30'x20'	21'x20'	30'x20'	27'x20'	
Height above deck and thickness of side and end coaming	27"x .44	27"x .50	27"x .46	27"x .50	27"x .50	
Shifting Beams	Number and Material 4 steel angles 4 x 3 x .44 web 16 x .36	5 steel 4 x 3 x .44 18" x .36	same as No. 1	Same as No. 2		
* Fore and Afters	Number and Material Scantlings		None fitted.			
Thickness of hatches	all 3"					
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 = 16.0

Section No. 3 Cargo Hatch

BELOW ASSUMED AXIS.						ABOVE ASSUMED AXIS.					
Item	Scantlings	Area	Lever	Moment	Mt. of Inertia	Item	Scantlings	Area	Lever	Moment	Mt. of Inertia
Flat Keel	5 x 1.10	27.0	16.1	434.7	6998.7	Top Deck Str.	62 x .60	37.2	24.3	904.0	21967.2
" "						" " Plating	62 x .48	30.0	24.6	738.0	18154.8
Centre Girder	4 x .28	12.9	14.1	181.9	2564.8	" " " "	66 x .48	31.7	24.9	789.3	19653.6
C.G. btm. ang.	5 x 5 x .625	5.9	15.8	93.2	1472.6	" " " "	33 x .52	17.2	25.0	430.0	10750.0
C.G. top angles	5 x 5 x .625	3.0	12.4	37.2	461.3	" " " "	5 x 5 x .75	6.4	24.3	155.5	3778.7
T.T. Cr. Strake	23 x .54	12.4	12.2	151.3	1845.9	2nd Deck Str.	37 x .48	17.8	16.3	290.1	4728.6
T.T. plating	76 x .48	36.7	12.2	447.7	5461.9	" " Plating	68 x .42	28.6	16.6	474.8	7881.7
" "	75 x .48	36.0	12.3	442.8	5446.4	" " " "	72 x .42	30.5	16.8	512.4	8608.3
" "	75 x .48	36.0	12.4	446.4	5535.4	" " " "	40 x .46	18.4	17.0	312.8	5317.6
" "	69 x .48	33.1	12.5	413.8	5124.5	" " " "	3 x 3 x .3	3.3	16.3	53.8	876.9
Margin Plate	39 x .54	21.1	13.5	284.9	3846.2	3rd Deck Str.	44 x .44	19.4	6.0	116.4	698.4
" "						" " Plating	59 x .32	19.0	6.3	119.7	754.1
" Angle	4 x 4 x .50	3.8	13.6	51.7	703.1	" " " "	68 x .32	21.8	6.6	143.9	949.7
Shell Strake	66.0 x .78	51.5	16.0	824.0	13184.0	" " " "	44 x .32	14.1	6.8	95.9	652.1
" " B	52 x .78	51.3	15.9	815.7	12969.6	" " " "	4" flange	1.8	6.0	10.8	64.8
" " C	65.75 x .78	51.3	15.8	810.5	12805.9	Sheerstrake	49 x .86	42.1	22.9	964.1	22077.9
" " D	65.75 x .78	51.3	15.8	810.5	12805.9	Strake below	49 x .80	39.2	19.3	756.6	14602.4
" " E	65.13 x .78	50.8	15.5	787.4	12204.7	Shell Strake	64 x .76	48.6	15.1	733.9	11081.9
" " F	64.75 x .78	50.5	13.5	681.8	9204.3	" " " "	66.1 x .74	48.9	10.1	493.9	4988.4
" " G	65.75 x .74	48.7	8.8	428.6	3771.7	" " " "	L 63.25 x .76	48.1	5.3	254.9	1351.0
" " H	58 x .76	44.1	4.2	185.2	777.8	Part J	36 x .74	26.6	1.5	39.9	59.9
Part J	28 x .74	21.1	1.2	25.3	30.4						
Totals below assumed axis		648.5		8354.6	117263.1	Totals above assumed axis		550.7		8390.7	158998.0
" above assumed axis		550.7		8390.7	158998.0						
Sum or Difference		1199.2		36.1	276261.1						

Moment of Inertia about assumed axis = 552522.2

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

Actual Modulus = 23050.5 = 29.76 ft.

TRANSVERSE MODULUS.

Minimum Side Plating (Art. 77)	$\frac{0.105 \times 44.9}{100} + 17 = .64$	Standard Frame Spacing (Art. 78) = .025	$44.29 + 17 = 28.11$
Actual Side Plating	$.74$	Actual Frame Spacing	$36"$
If actual frame spacing exceeds the standard	$\sqrt{\frac{\text{Actual frame spacing}}{\text{Standard frame spacing}}} = \frac{36}{28.11} = 1.28$		
Moulded Geometric Draught (d)	30.31	H = 16.37	$f_1 = 25.02$
t =	5.38	K = 25.75	$f_2 = 4.8$
d - t	24.93	$f_1 + f_2$	29.82

Standard $I_y = \frac{s(d-t)(f_1+f_2)}{1000} = \frac{36 \times 24.93 \times 29.82}{1000} = 26.77$

Frame in ship $12 \times 3.45 \times 3.45 \times .45$ at $36"$ spacing, $I_y = \frac{1}{s(f_1+f_2)} = \frac{30.4 \times .91}{27.66 \times 1000 + 5.38} = 27.66$

DRAUGHT PERMITTED BY TRANSVERSE STRENGTH = $\frac{I_y \times 1000}{s(f_1+f_2)} = \frac{27.66 \times 1000}{36 \times 29.82} = 31.16$ ft

