

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

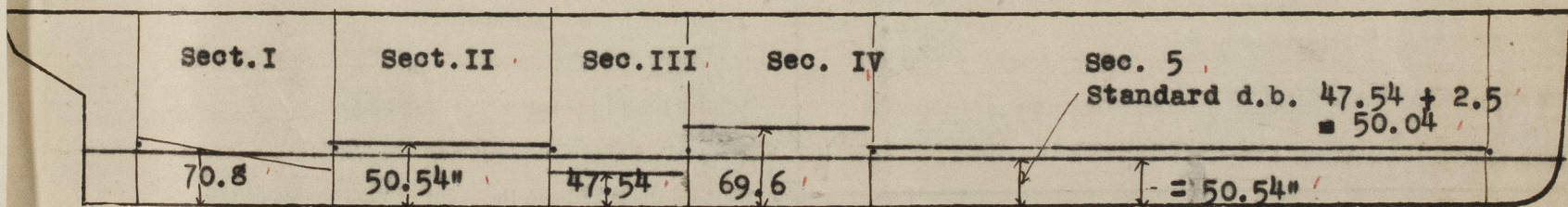
Ship's Name MAGISAN MARU	Port of Registry Kobe.	Official No.	No. in R.B.	Gross Tonnage 7650 Approx.	Tonnage under Fbd. Deck = V 6838.75	Date of Launch 6th Nov. 1933	Date when Built 1933	Report Number 94 93
Owners Mitsui Bussan Kaisha, Ltd.		Builders Mitsui Bussan Kaisha, Ltd.		Yard No. 196		Port of Survey Tama.		
Type of vessel Light Soantling, oop, Long Bridge and Postle.	Particulars of Classification * 100 A. 1. "With Freeboard.		Position of Freeboard Deck Upper Deck.		Date of Survey While Building. Name of Surveyor A. D. Morrison & M. M. Parker.			

PRINCIPAL DIMENSIONS.		
Length between perpendiculars..... 450ft.	Breadth Moulded = B ₀ 60.00ft.	Depth Moulded to Fbd. deck = D ₀ 37.00ft.
Length on Load Line..... 450ft.	Thickness of Side plating in ins. x 3/12"..... .70x3/12ft.	Round of Beam..... 15"ft.
	* (2/12 if plating is joggled)	Depth from top Top of keel line to top of inner bottom plating or ordinary floors..... 38.25ft.
Length for Freeboard = L..... 450ft.	Breadth for Freeboard = B..... 60.18ft.	Depth for Tonnage Coef. (Art. 39) = D..... 34.29ft.

CORRECTION TO TONNAGE (Art. 39)	DEPTH OF DOUBLE BOTTOM (Art. 39)
Volume between top of ceiling on double bottom or ordinary floors as fitted and standard level of top of ceiling (v) =..... + 73.07tons.	Depth of Actual Double Bottom (including plating) or Ordinary Floors..... 47.54ins.
	Depth of Standard Double Bottom (including plating) or Ordinary Floors..... 47.54ins.
	Difference..... 0.00
	x 1/12 =..... -= d.

SHEER (Arts. 39 and 60-63)				FRAMING (Art. 39)					
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	96.00	1	96.00	AP - 10	20	9.06	Sparring	9.06	181.20
2	42.63	4	170.52	10 - 14	11	9.84	Flush	9.84	108.24
3	10.50	2	21.00	14 - 28	38.5	11.02	with	11.02	424.27
4	0	4	0	28 - 143	310.75	12.60	frame.	12.60	3915.45
5	5.81	2	11.62	143 - 167	46	13.39	1	13.39	615.94
6	22.88	4	91.52	167 - FP.	23.75	9.06	1	9.06	215.18
7	51.00	1	51.00		450.00				
Sum of Products =..... 441.66				Sum of Products =..... 5460.28					
Mean Height of Sheer = S = $\frac{\text{Sum of Products}}{18}$ =..... 24.54ins.				Sum of Products = Actual Mean Depth of framing..... 12.13ins.					
Standard Mean Height = S ₀ = $\frac{1}{3}(L/10 + 10)$ =..... 18.33ins.				Length of Ship..... 7 1/2ft. =..... 9.50ins.					
Difference..... 6.21ft. =..... .52ft. = d ₁				Standard..... 7 1/2ft. =..... 9.50ins.					
Correction (Arts. 60-63) = $\frac{3}{4}(1 - e)(S_0 - S)$ =..... .75x.672x-6.21=-3.13ins.				Difference..... 2.63ft. =..... .44ft. = 2b					

COEFFICIENT OF FINENESS (Art. 39 or 43)	
$\frac{100(V + v)}{L(B - 2b)(D + d + d_1) + n}$	or $\frac{35 \times \Delta}{L \times B_0 \times d_0} + 0.04$
= $\frac{691182}{450 \times 59.74 \times 34.81} +$	=.....+ 0.04 =
= .74	



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

Section	Area	Diff. of D.B.	Correction in Tons.
I	460 x 2	1.73 (Mean)	+ 15.92
II & V	4293 x 2	.0416	+ 3.57
III	702 x 2	.208	- 2.92
IV	1732.5 x 2	1.63 (Mean)	+ 56.50
Total			+ 73.07

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	31.08	3.5	703.28
Bridge	170.50	3.06	
Poop or R.Q.D.	28.25		
Open Deck, ford.			
.. aft.			
Total length = $l =$	229.83	Sum of Products =	703.28
Sum of Products = $t =$	ins.	Sum of Products = $t_1 =$	1.56 ins.

CORRECTION FOR DEPTH & CORRECTION FOR FREEBOARD.

If no sheathing fitted amidships = $t_1 = \pm 1.56$ 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 = 37 ft. 0 in.
 Thickness of Stringer Plate = 0 in.
 Thickness of Wood Deck Amidships = 37 - 0.44 = 36.56 ft.
 Correction for partial wood deck = 1.56 in.
 Depth to use in Freeboard Tables = 37 ft. 2.00 ins. = $D_1 = 37.17$ 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		7.37	7.63	7.79
Standard		7.5	7.5	7.5

CLOSING APPLIANCES (Arts. 50 and 54)

	Forecastle	Bridge	Poop or Raised Quarter Deck
Means of Closing openings in bulkhead	Hinged Steel Door	Forward End. Steel W.T. Door	Aft End. Storm boards height. Steel W.T. Door
Corresponding Class	II	I	I

EFFECTIVE LENGTH (Arts. 55 and 56)

	Mean Length	Coef. Art. 56	Height Coef.	Products.
Forecastle closed part	31.08	1.00	.98	30.46
(Mean) open part	2.27	.75	.98	1.67
Bridge closed part	170.5	1.00	1.00	170.50
.. open part ford.				
.. aft.				
Poop closed part	28.25	1.00	1.00	28.25
.. open part				

Total Effective Length = 230.88
 Total Effective Length = $r = \frac{230.88}{450} = .51$
 Length of Vessel = 450
 Corresponding Coef. in Table (Art. 49) = $e = .328$
 Reduction for Complete Superstructure = 39.89 in.
 Product = 12.79 in.
 Correction for Superstructures = -12.79 in.

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. = $0.17 (1 - e/2) (L - 12 D_1)$ +.56
 [Note $e = 1.0$ if more than 6/10 covered] = .17(1-.164)(450-446.04) = +.56

CORRECTION FOR ROUND OF BEAM (Art. 59)

Standard Round of Beam = $\frac{Length of Beam in ins.}{50} = 14.4$ ins.
 Correction = $\frac{1}{4} (\text{Standard Round of Beam} - \text{Actual Round of Beam})$
 = $\frac{1}{4} (14.4 - 15) = -.15$ 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? = ft.
 Height and breadth of gangway = ft.
 Correction = $-.012 (80 - l) D_1$ or $1.2 (r - 0.5) D_1 = +$ ins.

SUMMARY.

Freeboard by Tables = 115.15 ins.
 Correction for Sheer = 3.13 in.
 .. Partial Wood Deck = 1.56 in.
 .. Superstructures = 12.79 in.
 .. Proportions L/D = .56 in.
 .. Round of Beam = .15 in.
 .. Freeing Ports = .. in.
 .. Access to Crew's Quarters = .. in.
 Totals = 56 17.63
 Net Correction = 17.07
 Geometric Freeboard = 98.08 in.
 Corresponding Geometric Draught (mld.) = 28.86 ft.
 Moulded Draught limited by (Design) to 27'-7" ft.
 Corresponding Freeboard (Summer) = 113.4 in.

Winter Freeboard (Art. 22) = $\frac{1}{4} (D_1 - 16) + \frac{1}{45} (59 - D_1)$
 = $\frac{1}{4} (37.17 - 16) + \frac{1}{45} (59 - 37.17) = 7.04$ ins.
 Tropical Freeboard (Art. 24) do. do. = -7.04 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 = 6.90 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) = 113.4 in.
 Fresh Water Load Line above centre of disc. = 6.9 in.
 Tropical Load Line above = 7.0 in.
 Winter Load Line below = 7.0 in.
 Winter N.A. Load Line below = ins.

Vertical distance from the point of intersection of the extended line of the upper surface of Stringer plate 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 = 0.0 ins.

Are the Engine and Boiler openings covered by a Bridge, Poop, Raised Quarter Deck or enclosed by a strong steel deck house? **Covered by Bridge.**

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 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

Sister vessels **Azumasan Maru, Yard No. 195.**

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	No. 7
Length and Breadth	25'x24'to 20'	27'3" x 24'	38'6" x 24'	27'6" x 24'	24'9" x 24'	44' x 24'	27'6"x24'
Height above deck and thickness of side and end coaming	37" x .50 side .44 end	37" x .50 side .44 end	37" x .50 side .44 end	31 1/2" x .44	31 1/2" x .44	37" .50 side .44 end	37" .50 side .44 end
Shifting Beams	Four Plate 20 x .38 150x75x10.5 B.A.	Five 20 x .38 150x75x10.5 B.A.	Seven 20 x .38 150x75x10.5 B.A.	Five 14 1/2 x .34 150x75x10.5 B.A.	Four 14 1/2 x .34 150x75x10.5 B.A.	Eight 20 x .38 150x75x10.5 B.A.	Five and 20x.38 150x75x10.5 B.A.
*Fore and Afters	Number and Material Scantlings	Number and Material Scantlings	Number and Material Scantlings	Number and Material Scantlings	Number and Material Scantlings	Number and Material Scantlings	Number and Material Scantlings
Thickness of hatches	2 1/2" O.P. throughout.						
Remarks							

* When the fore and afters are of wood the depth should be stated from the underside of hatches.

LONGITUDINAL MODULUS. (Minimum)

Top of Keel = 14.8' Height of Assumed Axis above keel = 14.8'

Section at **Say frame 113 rising midship-section plan.**

BELOW ASSUMED AXIS.						ABOVE ASSUMED AXIS.					
Item	Scantlings	Area	Lever	Moment	Mt. of Inertia	Item	Scantlings	Area	Lever	Moment	Mt. of Inertia
Flat Keel (1/2)	36" x .88"	31.7	14.8	469	6940	Top Deck Str.	74.19x.84	62.3	22.5	1402	31540
" "						" " "					
Centre Girder	47 x .60x1/2	14.1	12.8	180	2310	" " Plating	78.38x.80	62.7	22.9	1436	32880
C.G. btm. ang.	130x130x17 1/2	3.2	14.7	47	690	" " "	74.63x.80	59.7	23.2	1385	32130
C.G. top angles	90x90x14x1/2	1.8	11.0	20	220	" " "					
T.T. Cr. Strake (1/2)	36 x .54	19.4	10.8	210	2260	" " Str. Ang.	160x160x20	9.4	22.4	211	4720
T.T. plating	(79.25)					2nd Deck Str.	66.2x.44	29.1	11.5	335	3850
" "	(79.63) x .46	127.3	10.8	1375	14850	" " Plating	74.25x.40	29.7	11.8	350	4140
" "	(276.76)					" " "	73.81x.40	29.5	12.2	360	4390
" "	(37.88)					" " "					
" Cont. Gusset	14 x .46	6.4	10.5	67	710	" " Str. Ang.					
Marrin Plate	38.5 x .62	23.9	12.6	301	3790	3rd Deck Str.					
" Flange	6.0 x .62	3.7	10.7	40	420	" " Plating					
" Angle	110x110x14	4.5	14.4	65	930	" " "					
Shell Strake A	84" x .72	60.5	14.7	889	13070	" " Str. Ang.					
" " B	83.75x.72	60.3	14.7	886	13030	Sheerstrake	66 x .92	60.7	20.7	1256	26010
" " C	84" x .72	60.5	14.5	877	12710	Strake below	77.19x.72	55.6	15.2	845	12850
" " D	80.75x.72	58.1	14.3	831	11880	Shell Strake	86.25x.70	60.4	1.9	115	220
" " E	72.5x.72	52.2	10.8	564	6090	" " H	87.38x.70	61.2	8.7	532	4630
" " F	84.69x.70	59.3	4.8	285	1370	" " "					
" " XG						" " "					
Totals below assumed axis		586.9		7106	91270	Totals above assumed axis		520.3		8227	157360
" above assumed axis		520.3		8227	157360						
Sum or Difference		1107.2		1121	248630						

Moment of Inertia about assumed axis = 497260

Neutral Axis above assumed axis (x) = $\frac{1121}{1107.2} = 1.0126$
 Correction = $(\text{Total Area} \times x^2 \times 2) = -1107.2 \times 1.0126^2 \times 2 = -2270$
 Moment of Inertia about Neutral Axis = 494990
 Distance from Neutral Axis to top of Keel = 21.19 ft.

MODULUS OF SECTION = $\frac{23360}{13.635 \times 60} = 28.55$

DRAUGHT PERMITTED BY LONGITUDINAL STRENGTH (Arts. 81-86) = $\frac{23360}{f \cdot B_0} = 28.55$

TRANSVERSE MODULUS. (in way of Hold Framing A (under Bridge). in way of Engine Room B)

Minimum Side Plating (Art. 77) $\frac{0.105 \times 450 + 17}{100} = .64$ in.; Standard Frame Spacing (Art. 78) = $.025 \times 450 + 17 = 28.25$ in.

Actual Side Plating = .70 in.; Actual Frame Spacing = 33.00 in.

If actual frame spacing exceeds the standard $\sqrt{\frac{\text{Actual frame spacing}}{\text{Standard frame spacing}}} = \sqrt{\frac{33}{28.25}} = 1.09$

Moulded Geometric Draught (d) = 28.86 ft. H = 20.65 : 18.95 : 18.95 : 38.28 : 32.58
 5-35 7.05 K = 23.5 : 23.5 : 4.05 : 4.05
 d = 23.51 21.81 f₁ + f₂ = 42.33 36.63

Standard $I/y = \frac{s(d-t)(f_1 + f_2)}{1000} = \frac{33 \times 23.51 \times 42.33}{1000} = 32.86$ $\frac{33 \times 21.81 \times 36.63}{1000} = 26.38$

Frame in B = 320x100x14.5 B.A. at 33" spacing, 1/y = 34.5 A.
 520x100x13.5 B.A. 33.2 B. 34.5x1000

DRAUGHT PERMITTED BY TRANSVERSE STRENGTH = $\frac{I/y \times 1000}{s(f_1 + f_2)} = \frac{34.5 \times 1000}{33 \times 42.33} = 24.54$ A.
 $\frac{33.2 \times 1000}{33 \times 36.63} = 28.55$ B.

Note: Clear. of Superstructure K = 18.5
 Draught Permitted = 30.88