

Lloyd's Register of Shipping.
SURVEYS FOR FREEBOARD.Index. No. 34387.
(For London Office only.)

11,334

Computation of Freeboard for <i>Motor Vessel</i> having <i>Complete Superstructure with Tonnage Opening aft</i>					Port of Survey <i>Belfast</i>	
(Type of Superstructures.)					Date of Survey <i>During construction</i>	
Ship's Name <i>DURHAM</i>	Nationality and Port of Registry <i>British London</i>	Official Number <i>163522</i>	Gross Tonnage <i>10893</i>	Date of Build <i>1934</i>	Name of Surveyor <i>J. B. Cocks</i>	
Moulded Dimensions: Length <i>490</i>		Breadth <i>68.33</i>	Depth <i>38.677</i>	Particulars of Classification <i>Class 100A1</i>		
Moulded displacement at moulded draught = 85 per cent. of moulded depth		<i>23105</i> tons		<i>with freeboard contemplated.</i>		
Coefficient of fineness for use with Tables		<i>.735</i>				
Depth for Freeboard (D)			Depth correction		Round of Beam correction	
Moulded depth <i>38.68</i>			(a) Where D is greater than Table depth (D - Table depth) R = <i>✓</i> <i>(38.72 - 32.67) × 3 = + 18.15</i>		Moulded Breadth (B) <i>68.33</i>	
Stringer plate <i>.04</i>			(b) Where D is less than Table depth (if allowed). (Table depth - D) R = <i>✓</i>		Standard Round of Beam = $\frac{B \times 12}{50} =$ <i>16.40</i>	
Sheathing on exposed deck $T \left(\frac{L-S}{L} \right) =$			If restricted by superstructures <i>✓</i>		Ship's Round of Beam = <i>16.00</i>	
Depth for Freeboard (D) = <i>38.72</i>					Difference <i>.40</i>	
					Restricted to	
					Correction = $\frac{\text{Diff}^e}{4} \times (1 - \frac{S_1}{L}) =$ <i>.40 × .005 = Nil.</i>	

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)	
Poop enclosed ...	<i>59.50</i>	<i>59.50</i>	<i>8.6 + 2.5</i>	<i>✓</i>	<i>59.50</i>	Standard Height of Superstructure <i>7.5</i>
" overhang ...	<i>.58</i>	<i>.29</i>			<i>.29</i>	" " R.Q.D. <i>-</i>
R.Q.D. enclosed						Deduction for complete superstructure <i>42</i>
" overhang						Percentage covered $\frac{S}{L} =$ <i>100.2</i>
Bridge enclosed...						" " $\frac{S_1}{L} =$ <i>99.52</i>
" overhang aft	<i>424.83</i>	<i>424.83</i>	<i>8.6 + 1.5</i>	<i>✓</i>	<i>424.83</i>	" " $\frac{E}{L} =$ <i>99.51</i>
" overhang forward						Percentage from Table, Line A. <i>99.382</i>
Fore enclosed ...						(corrected for absence of forecastle (if required))
" overhang	<i>.59</i>	<i>.44</i>		<i>✓</i>	<i>.44</i>	Percentage from Table, Line B. <i>✓</i>
Trunk aft ...						(corrected for absence of forecastle (if required))
" forward...						Interpolation for bridge less than 2L (if required) <i>✓</i>
Tonnage opening aft ...	<i>4.50</i>	<i>2.47</i>	<i>2.5</i>	<i>✓</i>	<i>2.47</i>	Deduction = <i>42 × .9938 = -41.74</i>
" " forward						
Total ...	<i>490.00</i>	<i>487.53</i>			<i>487.53</i>	

SHEER CORRECTION.

Station	Standard Ordinate	S	M	Product	Actual Ordinate	Effective Ordinate	S	M	Product	
A.P. ...	<i>59.00</i>	<i>1</i>	<i>✓</i>	<i>59.00</i>	<i>66.00</i>	<i>80.50</i>	<i>1</i>	<i>✓</i>	<i>80.50</i>	Mean actual sheer aft = <i>Excess</i>
$\frac{1}{4}$ L from A.P. ...	<i>26.25</i>	<i>4</i>	<i>✓</i>	<i>105.00</i>	<i>29.25</i>	<i>35.82</i>	<i>4</i>	<i>✓</i>	<i>143.28</i>	Mean actual sheer forward = <i>Excess</i>
$\frac{2}{4}$ L " ...	<i>6.49</i>	<i>2</i>	<i>✓</i>	<i>12.98</i>	<i>7.25</i>	<i>8.85</i>	<i>2</i>	<i>✓</i>	<i>17.70</i>	Mean standard sheer forward
Amidships ...	<i>-</i>	<i>4</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>4</i>	<i>-</i>	<i>-</i>	Length of enclosed superstructure forward of amidships = <i>3 C.S.S.</i>
$\frac{3}{4}$ L from F.P. ...	<i>12.98</i>	<i>2</i>	<i>✓</i>	<i>25.96</i>	<i>16.50</i>	<i>17.82</i>	<i>2</i>	<i>✓</i>	<i>35.64</i>	" " aft of " = <i>3 C.S.S.</i>
$\frac{1}{4}$ L " ...	<i>52.51</i>	<i>4</i>	<i>✓</i>	<i>210.04</i>	<i>66.50</i>	<i>72.09</i>	<i>4</i>	<i>✓</i>	<i>288.36</i>	
F.P. ...	<i>118.00</i>	<i>1</i>	<i>✓</i>	<i>118.00</i>	<i>150.00</i>	<i>162.00</i>	<i>1</i>	<i>✓</i>	<i>162.00</i>	
Total ...	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>530.98</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>727.48</i>	

Correction = $\frac{\text{Difference between sums of products}}{18} \left(\frac{.75 - S}{2L} \right) = \frac{196.50}{18} \times .25 = -2.73$

If limited on account of midship superstructure. *✓*

If limited to maximum allowance of $1\frac{1}{2}$ ins. per 100 ft. *✓*

Deduction for Tropical Freeboard.	Deduction for Fresh Water.	TABULAR FREEBOARD corrected for Fresh Deck (if required)	<i>99.30</i>
Addition for Winter and Winter North Atlantic Freeboard.	Displacement in salt water at summer load water line	Correction for coefficient $\frac{735 + .68}{1.36} = \frac{1.415}{1.36}$	<i>103.32</i>
Depth to Freeboard Deck = <i>38.89</i>	$\Delta =$ <i>2.3135</i>	Depth Correction <i>18.15</i>	
Summer freeboard = <i>6.58</i>	Tons per inch immersion at summer load water line	Deduction for superstructures <i>- 41.74</i>	
Moulded draught (d) = <i>32.31</i>	T = <i>69.65</i>	Sheer correction <i>- 2.73</i>	
Deduction for Tropical freeboard and addition for Winter freeboard = $\frac{d}{4}$ inches = <i>8.08</i>	Deduction = $\frac{\Delta}{40T}$ inches = <i>8.30</i>	Round of Beam correction <i>2.00</i>	
Addition for Winter North Atlantic Freeboard (if required) =	= <i>8.30</i>	Correction for Thickness of Deck amidships <i>2.00</i>	
		Other corrections, scantlings, etc. <i>✓</i>	
		<i>✓</i> <i>20.15</i> <i>44.47</i> <i>-24.32</i>	
		Summer Freeboard = <i>79.00</i>	

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

Tropical Fresh Water Line above Centre of Disc ...	<i>16 1/4</i>	Tropical Fresh Water Freeboard ...	<i>5-2 3/4</i>
Fresh Water Line " " ...	<i>8 1/4</i>	Fresh Water " " ...	<i>5-10 3/4</i>
Tropical Line " " ...	<i>8</i>	Tropical " " ...	<i>5-11</i>
Winter Line below " " ...	<i>8</i>	Winter " " ...	<i>7-3</i>
Winter North Atlantic Line " " ...	<i>✓</i>	Winter North Atlantic " " ...	<i>✓</i>

PARTICULARS OF PROTECTION TO OPENINGS, ETC.

HATCHWAYS ON FREEBOARD AND SUPERSTRUCTURE DECKS											
<div style="display: flex; justify-content: space-between;"> Supersubstructure Deck Freeboard Deck </div>											
Description of Hatchway	N ^o 1	N ^o 2	N ^{os} 3, 4, 5	N ^o 6	Tonnage Opening	N ^o 1	N ^o 2	N ^{os} 3, 4, 5	N ^o 6		
Dimensions of Hatchway	28'0" x 20'0"	37'1" x 20'0"	34'0" x 20'0"	19'0" x 20'0"	4'6" x 20'0"	28'0" x 20'0"	37'1" x 20'0"	34'0" x 20'0"	19'0" x 20'0"		
COAMINGS	Height above Deck	30"	30"	30" above wood deck	30" above wood deck	30"	30"	30"	30"		
	Thickness	46"	46"	46"	46"	46"	46"	46"	46"		
	Sides	46"	46"	46"	46"	46"	46"	46"	46"		
	Stiffeners	7 x 3 x 40 lbs	7 x 3 x 40 lbs	7 x 3 x 40 lbs	7 x 3 x 40 lbs	7 x 3 x 40 lbs	7 x 3 x 40 lbs	7 x 3 x 40 lbs	7 x 3 x 40 lbs		
	Brackets, Stays	1 1/2 rounds spaced 6 ft.	1 1/2 rounds spaced 5'8"	1 1/2 rounds spaced 5'8"	1 1/2 rounds spaced 5'8"	1 1/2 rounds spaced 5'8"	1 1/2 rounds spaced 5'8"	1 1/2 rounds spaced 5'8"	1 1/2 rounds spaced 5'8"		
HATCH BEAMS	Number	4	6	5	3	4	6	5	3		
	Spacing	6'2 1/2"	6'2 1/2"	6'2 1/2"	5'11"	6'2 1/2"	6'2 1/2"	6'2 1/2"	5'11"		
	Scantling and Sketch	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"	18" x 36" Angles 3 x 3 1/2 x 48"		
	Bearing Surface	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"		
FORE AND AFTERS	Number										
	Spacing										
	Unsupported Lengths										
	Scantling* and Sketch				NONE						
	Bearing Surface										
HATCH COVERS	Material		Oregon Pine								
	Thickness		3"								
	How fitted		In slabs framed on 8 1/2" x 3" x 50 angles + 1/2" by 3 1/2" x 5 plates (plains + a)								
	Bearing Surface										
Spacing of Cleats	24"	24"	24"	24"		23"	23"	23"	23"		
Number of Tarpaulins	3	3	3	3		1	1	1	1		

*Are wood fore and afters steel shod at all bearing surfaces? ☒

Are battens and wedges efficient and in good condition? ☒

Are tarpaulins in good condition and in accordance with rule requirements? ☒

Are lashings provided in accordance with rule requirements? ☒

Particulars of fiddley, funnel and ventilator coamings :—

all of steel, substantially constructed.
No open gratings.

Particulars of Flush Banker Scuttles:—

None.

Particulars of Compartments:— Entrance to Shelter, front decks in midship deckhouse, starboard side; Deckhouse plating 32
 stiffeners 2-2-36, spaced 30. Opening 5-8-2-4, sill 7, angled hardwood door 2' high, pivoted from both sides
 Entrance to Engine Room in after bulkhead of midship deckhouse; plating 3-0-2-6, sill 6, angled hardwood door, 2'
 high, pivoted from both sides
 Entrance to Apparent Accommodation in deckhouse, between 3-5-6 hatches Deckhouse 5-0 high, 28 plating stiffeners
 3-2-30 angles spaced 30. Opening port side 5-2-2-9, sill 16, 10 angled hardwood doors 2' high, pivoted both sides
 Entrance to Steering flat - tunnel escape in after deckhouse. Deckhouse 7-9 high, 28 plating stiffeners 3-3-36, spaced 33
 Opening 5-3-2-0, sill 16, angled steel weatherlight doors, pivoted both sides
 Entrance to Green decks in midship lower houses. Houses 5-0 high, plating 32. Stiffeners 5-3-32-3-0-2-30 angles
 spaced 33. Opening 5-8-2-3, sill 16, angled steel weatherlight doors, pivoted both sides

Particulars of Ventilators in exposed positions on ~~freeboard~~ and superstructure decks :-

Ques 12	new 10	Low Seat	36 x 35	Ques 21	new 10	N° 4 Hold + tween dco	30 x 35
Ques 9	new 10	Handlase Motor room	36 x 30	Ques 12	new 10	N° 4 tween dco	30 x 40
Ques 21	new 10	N° 1 Hold + tween dco	36 x 40	Ques 21	new 10	N° 5 Hold + tween dco	30 x 40
Ques 24	new 10	N° 2	36 x 40	Ques 13	new 10	Apprentices accom?	30 x 36
Ques 24	new 10	N° 3	36 x 40	Ques 12	new 10	N° 6 Hold + tween dco	30 x 36
Ques 12	new 10	N° 3 tween dco	30 x 35	Ques 9	new 10	Apprentices accom?	30 x 32
Ques 12	new 10	N° 4	30 x 35	Ques 10	new 10	N° 6 tween dco	30 x 32
Ques 9	new 10	Midship tween dco dco	30 x 32	Ques 10	new 10	Apprentices accom?	30 x 32

Particulars of Air Pipes in exposed positions on freeboard, raised quarter, or superstructure decks — *all ventilator coamings provided with wood plugs & canvas covers.*

4	for peak an + filling	1 P. 15.	2	Deep cofferdam an	1 P. 15.
1	Cham locker an	1 P. 15.	2	cofferdam an	1 P. 15.
2	Cofferdam an	1 P. 15.	4	Feed tank an	1 P.
4	N° 3 double bottom an + filling	1 P. 15.	4	" an + filling	1 P.
2	Cofferdam an	1 P. 15.	2	after peak an + filling	1 P. 15.
4	N° 3 double bottom an + filling	1 P. 15.			

all these air pipes 30" high to opening.
Remaining air pipes are led to positions high up mast or derrick posts.
All air pipes fitted with wire gauge

Particulars of Gangway Cargo and Coaling Ports :—

Cargo Doors :-				
Port side	in Superstructure tween deos,	between frames	88 x 91	6'5" x 6'9" clear opening
Std. "	" "	" "	88 x 91	6'0" x 5'6" "
" "	" "	" "	75 x 76	6'0" x 3'2½" "

Mutton Ports :- 4 port, 5 starboard, in upper tween dks. 2'3" x 1'10" clear opening.

All the above are of substantial construction, with strong hinged steel r.t. doors, secured by toggles & strongbacks, and have been hose tested with satisfactory results.

Particulars of Scuppers and Sanitary Discharge Pipes :—

All scuppers from spaces below freeboard deck and from enclosed spaces between Superstructure and freeboard decks led to bilge, with trap and check valve at lower end.
All scuppers from spaces above freeboard deck not permanently enclosed led overboard through cast steel storm valves on ship's side.
Sanitary discharges through ship's side fitted with cast steel storm valves.

Particulars of Side Scuttles :—

No side scuttles below Treboard Deck.

Side Scuttles in Shelter Tween decks aft in Apprentices accommodation fitted with strong deadlights.

Particulars of Guard Rails :—

Guard Rails 3'8" high, 3 rails, stanchions spaced 4'6"
Bulwarks forward 4'6" to 3'9" high, 36" plating. Rail 7'3" butt angle. Stays 6" butt angle spaced 4'9" to 6'0"
" amidships 3'9" high, 36" plating, rail 7'3" butt angle, stays 6" butt plate spaced 5'8"

. Particulars of Gangways, Lifelines, etc. :—

None.

Particulars of Freeing Arrangements.						
	Length of Bulwark	Height of Bulwark	Size of Freeing Ports	Number each side	Area each side	Rule area each side
Tonnage After Well	5' 8"		25" x 12½" (circular ends)	One		
Forward Well						

State position of each freeing port } After Well:— 12" above deck
(P, and A. position and height above deck edge) } Forward Well:—

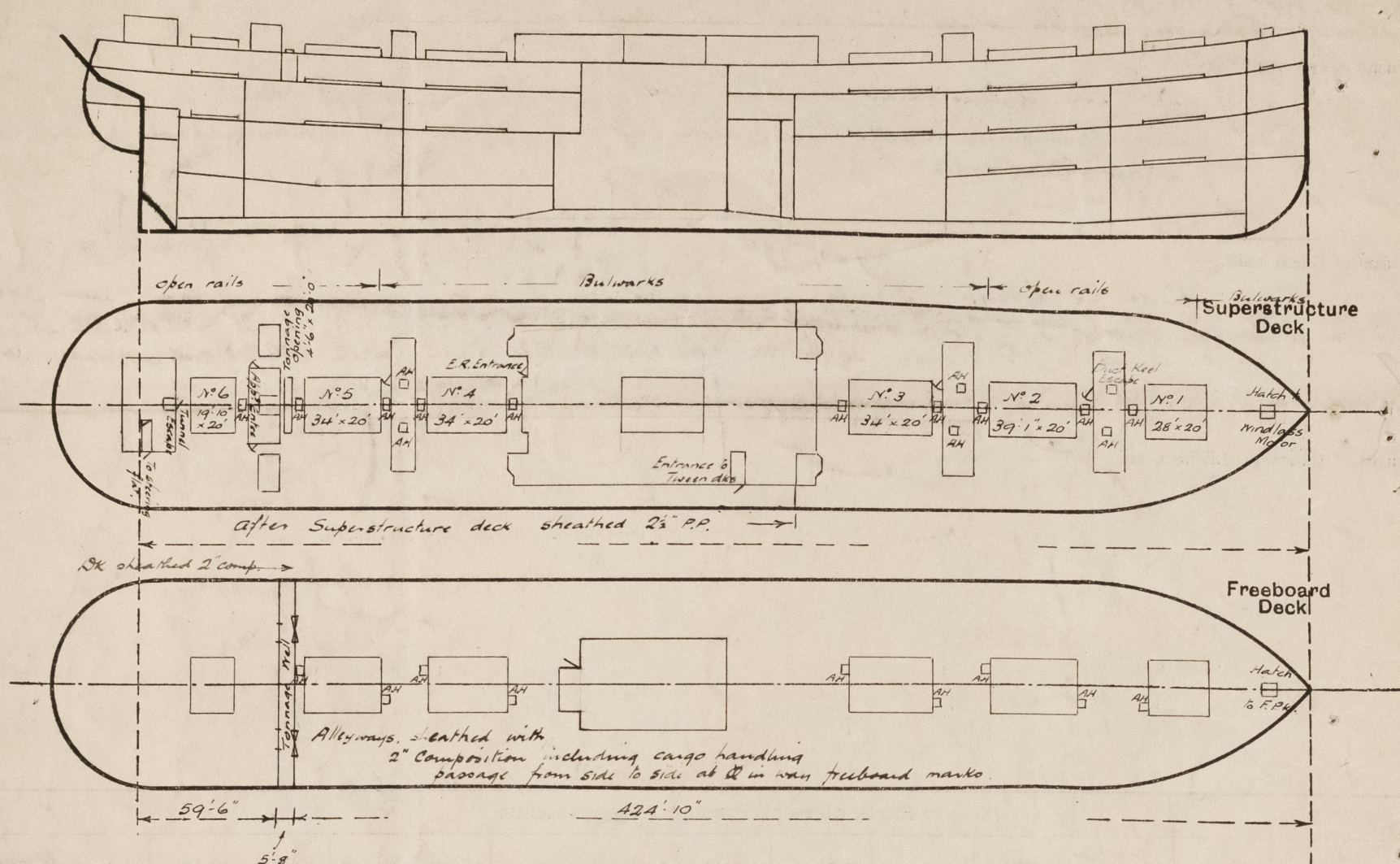
State whether the freeing ports are fitted with shutters, bars, or rails, and give particulars of such:— Hinged steel shutters.

Additional area where sheer is less than standard.

Particulars of Superstructures, Trunks, Casings, Deckhouses.								
	Coaming	Plating	Stiffeners	Spacing	End Attachments of Stiffeners	Size of Openings	Height of Sills	Height of Casings
Poop Bulkhead in <i>Shelter house etc</i>	28	28	4 x 3 x 30 L	36	None	2 @ 5'6" x 2'6"	20"	
Raised Quarter Deck Bulkhead ...								
Bridge, After Bulkhead ...								
Bridge, Forward Bulkhead ...								
Forecastle Bulkhead in <i>Shelter house etc</i>	28	28	4 x 3 x 30 L	36	None	2 @ 5'2" x 4'0"	17"	
Trunk, Aft ...								
Trunk, Forward ...								
Exposed Machinery Casings on Freeboard or Raised Quarter Decks ...								
Exposed Machinery Casings on Superstructure Decks ...								
Machinery Casings within Superstructures not fitted with Class I Closing Appliances ...	36	36	4 x 3 x 36 L	34	B&E. 6p only	5'6" x 2'4"	11"	
Deckhouses on Flush Deck Ships ...								

Particulars of Closing Appliances (state if capable of being manipulated from both sides).	
Poop Bulkhead ...	Hinged steel watertight doors, operated from both sides ✓
Raised Quarter Deck Bulkhead ...	
Bridge, After Bulkhead ...	
Bridge, Forward Bulkhead ...	
Forecastle Bulkhead ...	Storm boards 3' thick full height in riveted channels ✓
Exposed Machinery Casings on Freeboard or Raised Quarter Decks ...	
Exposed Machinery Casings on Superstructure Decks ...	
Machinery Casings within Superstructures not fitted with Class I Closing Appliances ...	Hinged steel door, operated from both sides ✓
Deckhouses on Flush Deck Ships ...	

Superstructure bulkheads, trunks, deckhouses, casings, cargo and coaling hatchways, extent and thickness of sheathing on the freeboard deck, gangway, cargo and coaling ports, and any other openings, etc., which would affect the seaworthiness of the ship are to be shewn on the following sketches:—



External Displacement at 31'0" W.L.	21840 tons	T.P.L.	69.1 tons
32'0"	22690		69.5
33'0"	23510		69.8

State any special features in the construction of the ship:—

Small Hatches on Superstructure Deck:

- Hatch to Windlass Motor Comp. 3'2" x 2'6" Coaming 30" high 40" thick Cover of steel, jointed N.T. with rubber toggles spaced 12".
- Access Hatches, outside winch motor houses. Coamings 30" wide, 23" to 26" long, height 30" above deck thickness 45".
- Covers of steel, N.T. jointed with rubber butterfly toggles spaced 12"-14".
- Access Hatches inside winch motor houses.
- Duct Keel escape: Coaming 24" x 26" x 5" high above keels. 6 x 3 built angle. Cover steel watertight rubber jointed. 4 toggles.
- Access hatches to insulated spaces in shelter tween decks: Coamings 6 x 3 built angles. In forward winch house 16 x 25", remainder 24" x 26" 5" high above keels. Covers steel watertight rubber jointed. 4 toggles.
- Insulating plugs fitted below steel covers.

Small Hatches on Freeboard Deck:

- Hatch to Fore Peak. 3'7" x 2'6" Coaming 3 x 3 x 30 angle. Wood covers, 3" thick, 2 1/2" rest. One tarpaulin, efficient battening arrangements.
- Access Hatches to upper Tween decks: Coamings 2'6" x 3'3" 9 x 3 x 32 built angles Rest bars 3" N.P. covers 3" thick, cleats spaced 26", 1 tarpaulin + battens. Insulated plugs fitted below.

Builder's name and yard number Workman Clark (1928) Ltd. N° 533

Names of sister ships

Owners Federal Steam Navigation Co. Ltd.

Fee £ : : Received by me



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Foundation