MARITIME & COASTGUARD AGENCY (UK)

in conjunction with

SCOTTISH QUALIFICATIONS AUTHORITY

EXAMINATION FOR CHIEF MATE/MASTER UNLIMITED - STABILITY AND STRUCTURE

SHIP A

GENERAL CARGO SHIP

SHIP STABILITY DATA SHEETS

The information provided are *limited extracts* and are intended for exercise and examination purposes only.

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REVISION LOG

Revision No.	Remarks	Date
Version 3.1	SHIP A GENERAL CARGO SHIP; SHIP STABILITY DATA SHEETS : Revision log added and additional capacity data included.	February 2023

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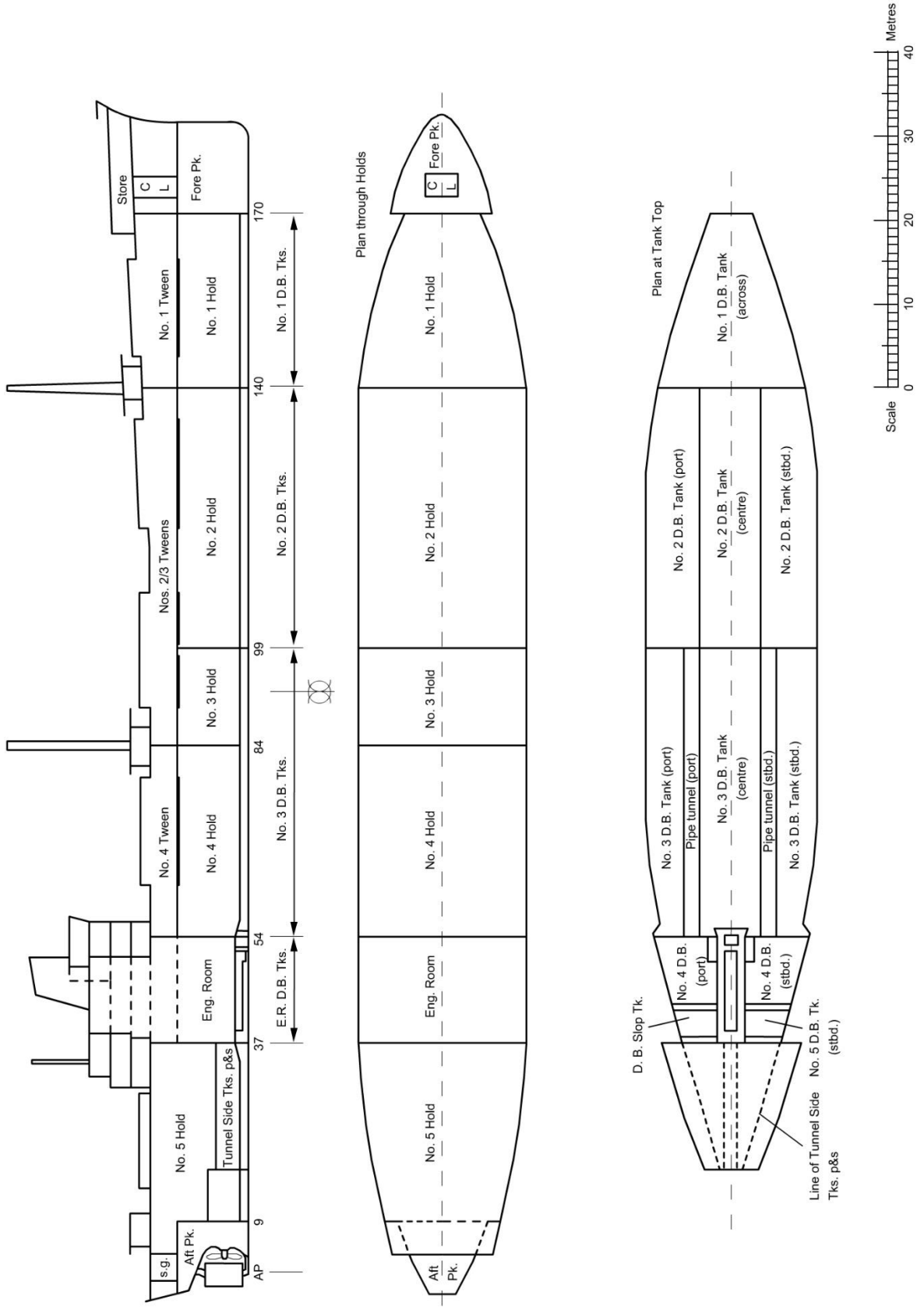
PRINCIPAL DIMENSIONS

Ship's name	Ship A
LBP	137.500 metres
Moulded Breadth	20.422 metres
Moulded Depth	11.750 metres
Block Coefficient	0.7437
Summer Load Draught	8.867 metres
Summer Load Displacement	19006 tonnes
Summer Deadweight	15175 tonnes
Light Displacement	3831 tonnes
Light KG	8.211 metres
Light LCG	61.665 metres forward of AP
Gross Tonnage	8996
Net Tonnage	6238

PROFILE AND PLANS SHOWING CARGO SPACES, STOREROOMS AND TANKS



CARGO AND STOREROOM CAPACITIES

CARGO CAPACITIES

COMPARTMENT	FRAMES	GROSS Metres^3	NET* CAPACITY Metres^3	LCG (foap) Metres	KG Metres
No. 1 Hold	140-170	2215	1966	114.48	5.09
No. 2 Hold	99-140	4672	4254	89.97	4.95
No. 3 Hold	84-99	1742	1536	68.91	4.94
No. 4 Hold	54-84	3474	3161	51.77	4.95
No. 5 Hold	4-37	2605	2371	17.26	8.76
TOTAL HOLDS		**14708**	**13288**	**69.27**	**5.64**
No. 1 Tween Deck	140-170	1695	1581	115.52	11.26
No. 2 Tween Deck	113-140	1676	1583	95.59	10.78
No. 3 Tween Deck	84-113	1626	1523	74.05	10.59
No. 4 Tween Deck	54-84	1674	1561	51.67	10.57
TOTAL TWEENDECKS		**6671**	**6248**	**84.38**	**10.60**
TOTAL HOLDS & TWEENDECKS		**21379**	**19536**	**73.98**	**7.25**

*NET Figures are to inside of cargo battens, where fitted.

FORECASTLE STORE CAPACITY

COMPARTMENT	FRAMES	GROSS Metres^3	NET* CAPACITY Metres^3	LCG (foap) Metres	KG Metres
Forecastle Store	168-Stem	201	173	130.90	15.69

COLD STORES CAPACITIES

COMPARTMENT	FRAMES	GROSS Metres^3	NET* CAPACITY Metres^3	LCG (foap) Metres	KG Metres
MEAT ROOM	37-39	15.0	-	28.19	10.29
FISH ROOM	39-43	10.0	-	30.34	10.29
VEGETABLE ROOM	43-46	20.5	-	32.78	10.33
HANDLING ROOM	39-43	12.0	-	30.41	10.32
TOTAL		**57.5**	**-**	**30.66**	**10.31**

PRINCIPAL TANK CAPACITIES

	CAPACITY Metres^3	LCG (foap) Metres	KG Metres	TCG from Centreline Metres	Moment of Inertia (m^4)
WATER BALLAST					
Fore Peak	554	130.56	8.43		519
After Peak	108	3.07	7.73		325
No. 3 Hold	1786	68.91	4.94		8113
No. 1 D.B. tank across	255	113.95	0.61		3722
No. 2 D.B. tank centre	271	90.00	0.59		1021
No. 2 D.B. tank port	223	89.47	0.60	6.48	680
No. 2 D.B. tank stbd.	223	89.47	0.60	6.48	680
HEAVY FUEL OIL					
No. 3 D.B. tank centre	271	57.02	0.60		1142
No. 3 D.B. tank port	153	57.87	0.63	7.29	275
No 3 D.B. tank stbd.	153	57.87	0.63	7.29	275
Tunnel side tank port	198	21.08	2.29	2.04	246
Tunnel side tank stbd.	174	21.28	2.24	2.04	183
DIESEL OIL					
No. 4 D.B. tank port	55	35.66	0.83	4.45	168
No. 4 D.B. tank stbd.	52	35.50	0.83	4.45	150
FRESH WATER					
Forward tank	51	32.47	7.35		29
After tank	44	28.67	7.38		46

FREEBOARD DATA

Mark	Season	Freeboard (mm)	Draught moulded (m)	Displacement (t)	Deadweight (t)
S	Summer	2883	8.867	19006	15175
F	Summer fresh water	2687	9.063	19006	15175
T	Tropical	2698	9.052	19456	15625
TF	Tropical fresh water	2502	9.248	19456	15625
W	Winter	3068	8.682	18557	14726

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HYDROSTATIC PARTICULARS

DRAUGHT	DISPLACEMENT t		TPC t		MCTC tm		KM_T	KB	LCB foap	LCF foap
m	SW RD 1.025	FW RD 1.000	SW RD 1.025	FW RD 1.000	SW RD 1.025	FW RD 1.000	m	m	m	m
10.000	21789	21258	24.85	24.24	224.8	219.3	8.69	5.25	68.71	65.11
9.900	21541	21016	24.80	24.20	223.6	218.1	8.67	5.20	68.75	65.16
9.800	21293	20774	24.75	24.15	222.4	217.0	8.64	5.15	68.79	65.20
9.700	21046	20533	24.70	24.10	221.2	215.8	8.62	5.10	68.83	65.25
9.600	20799	20292	24.65	24.05	220.0	214.6	8.60	5.04	68.87	65.29
9.500	20553	20052	24.60	24.00	218.8	213.5	8.58	4.99	68.92	65.34
9.400	20307	19812	24.55	23.95	217.6	212.3	8.56	4.93	68.96	65.39
9.300	20062	19573	24.50	23.90	216.4	211.1	8.54	4.88	69.00	65.45
9.200	19817	19334	24.45	23.85	215.2	210.0	8.52	4.82	69.04	65.50
9.100	19573	19096	24.40	23.80	213.0	207.8	8.50	4.77	69.09	65.56
9.000	19329	18858	24.35	23.76	212.7	207.5	8.48	4.72	69.13	65.62
8.900	19086	18620	24.30	23.71	211.5	206.3	8.47	4.67	69.18	65.68
8.800	18843	18383	24.24	23.65	210.2	205.1	8.45	4.61	69.22	65.74
8.700	18601	18147	24.18	23.59	208.0	202.9	8.43	4.56	69.27	65.81
8.600	18359	17911	24.13	23.54	207.7	202.6	8.42	4.50	69.31	65.87
8.500	18119	17677	24.08	23.49	206.4	201.4	8.41	4.45	69.36	65.95
8.400	17878	17442	24.02	23.43	205.1	200.1	8.39	4.39	69.40	66.02
8.300	17639	17208	23.96	23.38	203.8	198.8	8.38	4.34	69.45	66.10
8.200	17399	16975	23.90	23.32	202.4	197.5	8.37	4.28	69.49	66.17
8.100	17161	16742	23.84	23.26	201.0	196.1	8.36	4.23	69.54	66.25
8.000	16922	16509	23.78	23.20	199.6	194.7	8.35	4.17	69.58	66.33
7.900	16685	16278	23.71	23.13	198.2	193.4	8.35	4.12	69.63	66.42
7.800	16448	16047	23.65	23.07	196.8	192.0	8.34	4.07	69.67	66.51
7.700	16212	15817	23.59	23.01	195.4	190.6	8.34	4.02	69.72	66.61
7.600	15976	15586	23.52	22.95	193.9	189.2	8.33	3.96	69.76	66.71
7.500	15742	15358	23.45	22.88	192.4	187.7	8.33	3.91	69.81	66.82
7.400	15507	15129	23.39	22.82	190.9	186.2	8.33	3.85	69.85	66.92
7.300	15274	14901	23.33	22.76	189.4	184.8	8.33	3.80	69.90	67.03
7.200	15040	14673	23.26	22.69	187.8	183.2	8.33	3.75	69.94	67.13
7.100	14808	14447	23.19	22.62	186.2	181.7	8.34	3.70	69.99	67.24
7.000	14576	14220	23.13	22.57	184.6	180.1	8.34	3.64	70.03	67.35
6.900	14345	13996	23.06	22.50	183.0	178.5	8.35	3.58	70.08	67.46
6.800	14115	13771	22.99	22.43	181.4	177.0	8.36	3.53	70.12	67.57
6.700	13886	13548	22.92	22.36	179.9	175.5	8.37	3.48	70.16	67.68
6.600	13657	13324	22.85	22.29	178.3	174.0	8.38	3.43	70.20	67.79
6.500	13429	13102	22.78	22.23	176.8	172.5	8.39	3.38	70.24	67.90
6.400	13201	12879	22.72	22.17	175.3	171.0	8.41	3.33	70.28	68.00
6.300	12975	12658	22.66	22.11	173.9	169.6	8.43	3.28	70.32	68.10
6.200	12748	12437	22.60	22.05	172.5	168.3	8.46	3.22	70.35	68.20
6.100	12523	12217	22.54	21.99	171.1	167.0	8.49	3.17	70.38	68.30
6.000	12297	11997	22.48	21.93	169.8	165.7	8.52	3.11	70.42	68.39
5.900	12073	11778	22.43	21.87	168.5	164.4	8.55	3.06	70.46	68.43
5.800	11848	11559	22.37	21.82	167.3	163.2	8.59	3.01	70.50	68.57
5.700	11625	11342	22.32	21.77	166.1	162.1	8.63	2.95	70.53	68.65

DRAUGHT	DISPLACEMENT t		TPC t		MCTC tm		KM_T	KB	LCB foap	LCF Foap
m	SW RD 1.025	FW RD 1.000	SW RD 1.025	FW RD 1.000	SW RD 1.025	FW RD 1.000	m	m	m	m
5.600	11402	11124	22.26	21.72	165.0	161.0	8.67	2.90	70.57	68.73
5.500	11180	10908	22.21	21.66	163.9	160.0	8.71	2.85	70.60	68.80
5.400	10958	10691	22.15	21.61	162.9	158.9	8.76	2.80	70.64	68.88
5.300	10737	10476	22.10	21.56	161.8	157.9	8.81	2.74	70.68	68.95
5.200	10516	10260	22.05	21.51	160.8	156.9	8.86	2.69	70.72	69.02
5.100	10296	10045	22.00	21.46	159.8	155.9	8.92	2.63	70.75	69.09
5.000	10076	9830	21.95	21.41	158.8	154.9	8.98	2.58	70.79	69.16
4.900	9857	9616	21.90	21.36	157.9	154.0	9.06	2.53	70.82	69.23
4.800	9638	9403	21.85	21.32	156.9	153.1	9.13	2.48	70.86	69.29
4.700	9420	9190	21.80	21.27	156.0	152.2	9.22	2.43	70.90	69.35
4.600	9202	8978	21.75	21.22	155.1	151.3	9.30	2.38	70.93	69.42
4.500	8985	8766	21.70	21.17	154.2	150.5	9.40	2.32	70.96	69.48
4.400	8768	8554	21.65	21.12	153.3	149.6	9.49	2.27	71.00	69.55
4.300	8552	8344	21.60	21.07	152.4	148.7	9.60	2.22	71.04	69.62
4.200	8336	8133	21.55	21.02	151.5	147.8	9.71	2.17	71.08	69.68
4.100	8121	7923	21.50	20.97	150.6	146.9	9.83	2.12	71.12	69.74
4.000	7906	7713	21.45	20.93	149.7	146.0	9.96	2.07	71.15	69.81
3.900	7692	7505	21.40	20.88	148.7	145.1	10.11	2.01	71.18	69.88
3.800	7478	7296	21.35	20.83	147.8	144.2	10.25	1.96	71.22	69.94
3.700	7265	7088	21.30	20.78	146.8	143.3	10.41	1.91	71.25	70.00
3.600	7052	6880	21.24	20.72	145.9	142.3	10.57	1.86	71.29	70.07
3.500	6840	6673	21.19	20.67	144.9	141.3	10.76	1.81	71.33	70.14
3.400	6628	6466	21.13	20.61	143.9	140.4	10.95	1.75	71.37	70.20
3.300	6418	6261	21.08	20.56	142.9	139.4	11.18	1.70	71.41	70.27
3.200	6207	6056	21.02	20.51	141.9	138.4	11.40	1.65	71.44	70.33
3.100	5998	5852	20.96	20.45	140.9	137.5	11.66	1.60	71.48	70.40
3.000	5788	5647	20.90	20.39	139.9	136.5	11.92	1.55	71.52	70.46
2.900	5580	5444	20.84	20.33	138.9	135.5	12.22	1.50	71.56	70.53
2.800	5371	5240	20.78	20.27	137.9	134.5	12.52	1.44	71.60	70.59
2.700	5164	5038	20.72	20.21	136.9	133.6	12.87	1.39	71.64	70.66
2.600	4957	4836	20.65	20.15	135.9	132.6	13.21	1.34	71.67	70.73
2.500	4752	4636	20.58	20.08	134.9	131.6	13.63	1.29	71.71	70.80
2.400	4546	4435	20.51	20.01	133.9	130.6	14.04	1.23	71.75	70.87
2.300	4342	4236	20.44	19.94	132.9	129.6	14.56	1.18	71.79	70.94
2.200	4138	4037	20.36	19.86	131.8	128.6	15.07	1.13	71.83	71.01
2.100	3936	3840	20.28	19.79	130.7	127.5	15.72	1.08	71.87	71.08
2.000	3733	3642	20.20	19.71	129.5	126.3	16.36	1.02	71.91	71.15
1.900	3532	3446	20.12	19.63	128.3	125.2	17.19	0.97	71.96	71.22
1.800	3331	3250	20.03	19.54	127.0	123.9	18.01	0.92	72.00	71.29
1.700	3132	3055	19.93	19.45	125.6	122.5	19.08	0.87	72.05	71.37
1.600	2932	2860	19.83	19.35	124.1	121.1	20.15	0.82	72.09	71.44

THESE HYDROSTATIC PARTICULARS HAVE BEEN DEVELOPED WITH THE VESSEL FLOATING ON AN EVEN KEEL WATERLINE HAVING A LENGTH OF 137.500 METRES BETWEEN THE PERPENDICULARS

TABULATED KN VALUES

KN values in metres

KN values calculated for ship on even keel and fixed trim

DISPLACEMENT TONNES	ANGLE OF HEEL - DEGREES						
	12	20	30	40	50	60	75
20000	1.80	2.90	4.14	5.14	5.92	6.51	6.84
19500	1.79	2.90	4.17	5.19	5.97	6.55	6.86
19000	1.78	2.91	4.20	5.24	6.02	6.59	6.88
18500	1.77	2.92	4.23	5.29	6.07	6.63	6.90
18000	1.75	2.93	4.27	5.36	6.12	6.67	6.92
17500	1.75	2.94	4.30	5.43	6.18	6.71	6.94
17000	1.74	2.95	4.34	5.48	6.23	6.75	6.96
16500	1.74	2.97	4.37	5.54	6.29	6.79	6.98
16000	1.73	2.98	4.40	5.60	6.35	6.83	7.00
15500	1.73	2.98	4.44	5.66	6.44	6.87	7.02
15000	1.73	2.98	4.48	5.72	6.48	6.91	7.04
14500	1.74	2.98	4.51	5.79	6.58	6.95	7.07
14000	1.75	2.98	4.53	5.81	6.68	7.00	7.10
13500	1.76	2.99	4.56	5.86	6.73	7.05	7.13
13000	1.77	3.00	4.59	5.90	6.78	7.10	7.16
12500	1.78	3.03	4.64	5.96	6.83	7.15	7.19
12000	1.79	3.06	4.68	6.02	6.88	7.20	7.21
11500	1.81	3.10	4.73	6.07	6.93	7.25	7.24
11000	1.83	3.14	4.78	6.12	6.98	7.30	7.26
10500	1.84	3.19	4.81	6.17	7.02	7.35	7.29
10000	1.87	3.24	4.85	6.21	7.08	7.40	7.31
9500	1.93	3.28	4.91	6.25	7.11	7.45	7.34
9000	2.00	3.36	4.96	6.28	7.18	7.50	7.36
8500	2.05	3.43	5.03	6.32	7.20	7.55	7.39
8000	2.10	3.52	5.09	6.35	7.22	7.60	7.41
7500	2.17	3.62	5.17	6.38	7.24	7.65	7.43
7000	2.22	3.70	5.25	6.41	7.26	7.70	7.45
6500	2.32	3.85	5.35	6.44	7.27	7.70	7.47
6000	2.42	4.00	5.45	6.48	7.28	7.70	7.49
5500	2.57	4.15	5.55	6.53	7.29	7.68	7.47
5000	2.72	4.32	5.67	6.58	7.30	7.66	7.45
4500	2.92	4.55	5.79	6.64	7.25	7.60	7.42
4000	3.15	4.75	5.91	6.71	7.22	7.52	7.40
3500	3.45	5.00	6.08	6.78	7.20	7.42	7.38

KN values are for hull and forecastle only

ANGLE OF HEEL DATA

DISPLACEMENT TONNES	ANGLE TO IMMERSE DECK EDGE	ANGLE OF FLOODING	WIND MOMENT TONNES.METRES
4000	54.9	76.8	897
5000	50.3	73.3	869
6000	46.7	69.8	841
7000	43.6	66.7	814
8000	40.7	63.6	786
9000	38.0	60.6	760
10000	35.3	57.8	733
11000	32.9	55.2	707
12000	30.8	52.8	681
13000	28.4	50.6	655
14000	26.3	48.5	630
15000	24.3	46.5	604
16000	22.3	44.5	580
17000	20.3	42.6	555
18000	18.2	40.6	531
19000	16.0	38.7	507
20000	13.8	36.7	483

MAXIMUM KG TO COMPLY WITH MINIMUM IMO *INTACT* STABILITY CRITERIA

Displacement Tonnes	KG Metres
19500	7.849
19000	7.932
18500	8.015
18000	8.100
17500	8.169
17000	8.203
16500	8.189
16000	8.181
15500	8.180
15000	8.185
14500	8.196
14000	8.215
13500	8.243
13000	8.283
12500	8.341
12000	8.415
11500	8.502
11000	8.599
10500	8.712
10000	8.854
9500	9.030
9000	9.238
8500	9.476
8000	9.729
7500	9.817
7000	9.619
6500	9.424
6000	9.180
5500	8.838
5000	8.398

If after calculating the condition of loading, the KG (corrected for free surface) is less than or equal to that indicated in the above table, the stability of the vessel will comply with at least the minimum IMO criteria.

GRAIN HEELING DATA FOR FULL TWEEN DECKS AND HOLDS

FULL HOLDS

HOLD	GRAIN CAPACITY Metres^3	VOLUMETRIC HEELING MOMENT Metres^4	KG of HOLD Metres
No. 1	2215	410	5.09
No. 2	4672	1285	4.95
No. 3	1742	475	4.94
No. 4	3474	910	4.95
No. 5	2605	455	8.76

FULL TWEEN DECKS

TWEEN DECK	GRAIN CAPACITY Metres^3	VOLUMETRIC HEELING MOMENT Metres^4	KG of TWEEN DECK Metres
No. 1	1695	352	11.26
No. 2	1676	539	10.78
No. 3	1626	578	10.59
No. 4	1674	604	10.57

VOLUMETRIC HEELING MOMENTS OF PARTLY FILLED COMPARTMENTS

No. 1 TWEEN DECK			
ULLAGE DATUM: Top of hatch side coaming at its mid length No centreline division			
ULLAGE Metres	VOLUME OF GRAIN Metres^3	VOLUMETRIC HEELING MOMENT Metres^4	Kg of GRAIN Metres
0.25	1686	598	11.24
0.50	1668	659	11.19
0.75	1649	746	11.13
1.00	1628	864	11.07
1.25	1607	1016	11.01
1.50	1510	1176	10.94
1.75	1416	1372	10.88
2.00	1324	1577	10.82
2.25	1232	1700	10.75
2.50	1144	2017	10.69
2.75	1059	2218	10.63
3.00	970	2388	10.59
3.25	883	2512	10.55
3.50	800	2579	10.50
3.75	714	2575	10.45
4.00	633	2500	10.39
4.25	550	2362	10.31
4.50	467	2155	10.21
4.75	384	1908	10.20
5.00	302	1592	9.98
5.25	222	1239	9.81
5.50	143	848	9.56
5.75	64	380	9.27
5.95	0	0	8.70
Ullage for maximum volumetric heeling moment			
3.60	**764**	**2578**	**10.48**

The volumetric heeling moment for the slack tween deck has been obtained by calculating the maximum volumetric heeling moment and increasing it by 12%. The Kg of the level grain is to be used when calculating the KG of the ship.

No. 2 TWEEN DECK			
ULLAGE DATUM: Top of hatch side coaming at its mid length No centreline division			
ULLAGE Metres	VOLUME OF GRAIN Metres^3	VOLUMETRIC HEELING MOMENT Metres^4	Kg of GRAIN Metres
0.25	1659	975	10.76
0.50	1634	1019	10.74
0.75	1609	1122	10.70
1.00	1584	1344	10.69
1.25	1560	1642	10.65
1.50	1472	1948	10.62
1.75	1369	2257	10.59
2.00	1264	2566	10.56
2.25	1165	2874	10.50
2.50	1062	3160	10.44
2.75	959	3350	10.38
3.00	858	3460	10.32
3.25	757	3514	10.28
3.50	658	3432	10.24
3.75	550	3218	10.18
4.00	452	2925	10.11
4.25	349	2473	10.00
4.50	248	1868	9.85
4.75	143	1160	9.62
5.00	47	368	9.23
5.12	0	0	8.70
Ullage for maximum volumetric heeling moment			
3.25	**757**	**3514**	**10.28**

The volumetric heeling moment for the slack tween deck has been obtained by calculating the maximum volumetric heeling moment and increasing it by 12%. The Kg of the level grain is to be used when calculating the KG of the ship.

No. 3 TWEEN DECK			
ULLAGE DATUM: Top of hatch side coaming at its mid length No centreline division			
ULLAGE Metres	VOLUME OF GRAIN Metres^3	VOLUMETRIC HEELING MOMENT Metres^4	Kg of GRAIN Metres
0.25	1598	1028	10.55
0.50	1569	1051	10.53
0.75	1540	1122	10.50
1.00	1512	1268	10.48
1.25	1476	1547	10.47
1.50	1399	1900	10.45
1.75	1308	2236	10.42
2.00	1203	2558	10.36
2.25	1086	2863	10.32
2.50	979	3142	10.25
2.75	866	3304	10.19
3.00	758	3339	10.13
3.25	649	3291	10.08
3.50	538	3109	10.04
3.75	427	2750	9.98
4.00	317	2262	9.86
4.25	206	1610	9.62
4.50	97	796	9.37
4.72	0	0	8.70
Ullage for maximum volumetric heeling moment			
3.00	**7.58**	**3339**	**10.13**

The volumetric heeling moment for the slack tween deck has been obtained by calculating the maximum volumetric heeling moment and increasing it by 12%. The Kg of the level grain is to be used when calculating the KG of the ship.

No. 4 TWEEN DECK			
ULLAGE DATUM: Top of hatch side coaming at its mid length No centreline division			
ULLAGE Metres	VOLUME OF GRAIN Metres^3	VOLUMETRIC HEELING MOMENT Metres^4	Kg of GRAIN Metres
0.25	1646	1072	10.58
0.50	1618	1147	10.56
0.75	1589	1248	10.54
1.00	1561	1398	10.52
1.25	1530	1592	10.50
1.50	1452	1847	10.47
1.75	1360	2150	10.43
2.00	1243	2512	10.37
2.25	1132	2857	10.32
2.50	1014	3116	10.27
2.75	900	3278	10.20
3.00	786	3323	10.14
3.25	672	3283	10.09
3.50	555	3094	10.04
3.75	444	2794	9.98
4.00	329	2250	9.85
4.25	213	1526	9.67
4.50	98	813	9.37
4.72	0	0	8.70
Ullage for maximum volumetric heeling moment			
3.00	**786**	**3323**	**10.14**

The volumetric heeling moment for the slack tween deck has been obtained by calculating the maximum volumetric heeling moment and increasing it by 12%. The Kg of the level grain is to be used when calculating the KG of the ship.

MAXIMUM PERMISSIBLE GRAIN HEELING MOMENTS

DISPL. Tonnes	VIRTUAL VCG = SOLID VCG + F.S. CORRECTION										GRAIN CONDITIONS		
											MAX. VCG	CORRESPONDING	
	5.500	**5.600**	**5.700**	**5.800**	**5.900**	**6.000**	**6.100**	**6.200**	**6.300**	**6.400**		GM	HM
5000	8425	8315	8204	8094	7983	7873	7762	7651	7541	7430	8.398	4.747	5221
5500	8336	8214	8093	7971	7850	7728	7606	7485	7363	7241	8.838	3.566	4276
6000	8158	8026	7893	7760	7628	7495	7362	7230	7097	6964	9.180	2.525	3033
6500	7987	7843	7699	7556	7412	7268	7124	6981	6837	6693	9.424	1.666	1746
7000	7891	7737	7582	7427	7272	7117	6963	6808	6653	6498	9.619	0.972	615
7500	7911	7745	7579	7413	7248	7082	6916	6750	6584	6418	9.687	0.515	0
8000	7979	7802	7625	7448	7271	7094	6917	6741	6564	6387	9.569	0.323	0
8500	8006	7818	7630	7442	7254	7066	6879	6691	6503	6315	9.326	0.300	509
9000	8017	7818	7619	7420	7221	7022	6823	6624	6425	6226	9.088	0.300	875
9500	8062	7852	7642	7432	7222	7012	6802	6592	6382	6171	8.880	0.300	962
10000	8151	7930	7709	7488	7267	7046	6824	6603	6382	6161	8.704	0.300	1067
10500	8270	8038	7800	7573	7341	7109	6877	6645	6412	6180	8.562	0.300	1159
11000	8376	8133	7890	7647	7403	7160	6917	6674	6430	6187	8.449	0.300	1203
11500	8437	8182	7928	7674	7419	7165	6911	6656	6402	6148	8.352	0.300	1184
12000	8511	8245	7980	7714	7449	7184	6918	6653	6388	6122	8.265	0.300	1173
12500	8655	8379	8102	7826	7549	7273	6997	6702	6444	6167	8.191	0.300	1217
13000	8809	8522	8234	7947	7659	7372	7084	6797	6509	6222	8.133	0.300	1239
13500	8909	8611	8312	8013	7715	7416	7118	6819	6521	6222	8.093	0.300	1169
14000	9053	8743	8434	8124	7815	7505	7195	6886	7576	6267	8.065	0.300	1112
14500	9347	9026	8706	8385	8065	7744	7423	7103	6782	6461	8.046	0.300	1182

DISPL. Tonnes	VIRTUAL VCG = SOLID VCG + F.S. CORRECTION										GRAIN CONDITIONS		
											MAX. VCG	CORRESPONDING	
	6.500	**6.600**	**6.700**	**6.800**	**6.900**	**7.000**	**7.100**	**7.200**	**7.300**	**7.400**		GM	HM
5000	7320	7209	7099	6988	6877	6767	6656	6546	6435	6325	8.398	4.747	5221
5500	7120	6998	6877	6755	6633	6512	6390	6268	6147	6025	8.838	3.566	4276
6000	6832	6699	6566	6434	6301	6168	6035	5903	5770	5637	9.180	2.525	3033
6500	6550	6406	6262	6118	5975	5831	5687	5543	5400	5256	9.424	1.666	1746
7000	6343	6189	6034	5879	5724	5569	5415	5260	5105	4950	9.619	0.972	615
7500	6252	6087	5921	5755	5589	5423	5257	5091	4926	4760	9.687	0.515	0
8000	6210	6033	5856	5679	5502	5325	5148	4971	4795	4618	9.569	0.323	0
8500	6127	5939	5751	5563	5375	5187	4999	4811	4623	4435	9.326	0.300	509
9000	6027	5828	5629	5430	5231	5032	4833	4634	4435	4236	9.088	0.300	875
9500	5961	5751	5541	5331	5121	4911	4701	4491	4281	4071	8.880	0.300	962
10000	5940	5719	5498	5276	5055	4834	4613	4392	4171	3950	8.704	0.300	1067
10500	5948	5716	5484	5251	5019	4787	4555	4323	4090	3858	8.562	0.300	1159
11000	5944	5701	5457	5214	4971	4728	4484	4241	3998	3755	8.449	0.300	1203
11500	5893	5639	5385	5130	4876	4622	4368	4113	3859	3605	8.352	0.300	1184
12000	5857	5591	5326	5061	4795	4630	4265	3999	3734	3468	8.265	0.300	1173
12500	5891	5614	5338	5062	4785	4509	4232	3956	3679	3403	8.191	0.300	1217
13000	5934	5647	5359	5072	4784	4497	4209	3922	3634	3347	8.133	0.300	1239
13500	5924	5625	5327	5028	4730	4431	4132	3834	3535	3237	8.093	0.300	1169
14000	5957	5647	5338	5028	4719	4409	4099	3790	3480	3171	8.065	0.300	1112
14500	6141	5820	5499	5179	4858	4537	4217	3896	3575	3255	8.046	0.300	1182

DISPL. Tonnes	VIRTUAL VCG = SOLID VCG + F.S. CORRECTION										GRAIN CONDITIONS		
											MAX. VCG	CORRESPONDING	
	7.500	**7.600**	**7.700**	**7.800**	**7.900**	**8.000**	**8.100**	**8.200**	**8.300**	**8.400**		GM	HM
5000	6214	6103	5993	5882	5772	5661	5551	5440	5329		8.398	4.747	5221
5500	5903	5782	5660	5539	5417	5295	5174	5052	4930	4809	8.838	3.566	4276
6000	5505	5372	5239	5107	4974	4841	4709	4576	4443	4311	9.180	2.525	3033
6500	5112	4968	4825	4681	4537	4393	4250	4106	3962	3818	9.424	1.666	1746
7000	4795	4641	4486	4331	4176	4021	3867	3712	3557	3402	9.619	0.972	615
7500	4594	4428	4262	4096	3930	3765	3599	3433	3267	3101	9.687	0.515	0
8000	4441	4264	4087	3910	3733	3556	3379	3202	3025	2848	9.569	0.323	0
8500	4247	4059	3871	3683	3495	3307	3119	2931	2743	2555	9.326	0.300	509
9000	4037	3838	3639	3440	3241	3041	2842	2643	2444	2245	9.088	0.300	875
9500	3860	3650	3440	3230	3020	2810	2600	2390	2180	1970	8.880	0.300	962
10000	3728	3507	3286	3065	2844	2623	2402	2180	1959	1738	8.704	0.300	1067
10500	3626	3394	3162	2929	2697	2465	2233	2001	1768	1536	8.562	0.300	1159
11000	3511	3268	3025	2782	2538	2295	2052	1808	1565	1322	8.449	0.300	1203
11500	3350	3096	2842	2587	2333	2079	1824	1570	1316		8.352	0.300	1184
12000	3203	2938	2672	2407	2142	1876	1611	1346			8.265	0.300	1173
12500	3127	2850	2574	2297	2021	1744	1468				8.191	0.300	1217
13000	3059	2772	2484	2197	1909	1622	1335				8.133	0.300	1239
13500	2938	2640	2341	2043	1744	1446					8.093	0.300	1169
14000	2861	2551	2242	1932	1623	1313					8.065	0.300	1112
14500	2934	2613	2293	1972	1651	1331					8.046	0.300	1182

DISPL. Tonnes	VIRTUAL VCG = SOLID VCG + F.S. CORRECTION										GRAIN CONDITIONS		
											MAX. VCG	CORRESPONDING	
	5.500	**5.600**	**5.700**	**5.800**	**5.900**	**6.000**	**6.100**	**6.200**	**6.300**	**6.400**		GM	HM
15000	9702	9371	9039	8707	8376	8044	7712	7380	7049	6717	8.035	0.300	1294
15500	10010	9667	9325	8982	8639	8296	7954	7611	7268	6925	8.030	0.300	1338
16000	10352	9998	9644	9290	8937	8583	8229	7875	7521	7167	8.031	0.300	1396
16500	10823	10458	10093	9728	9363	8998	8634	8269	7904	7539	8.039	0.300	1384
17000	11329	10953	10577	10201	9826	9450	9074	8698	8322	7946	8.053	0.300	581
17500	11762	11375	10988	10601	10214	9827	9440	9053	8666	8279	8.048	0.325	0
18000	12173	11775	11377	10979	10581	10183	9785	9387	8989	8590	7.967	0.432	0
18500	12626	12217	11808	11398	10989	10580	10171	9762	9353	8944	7.902	0.527	0
19000	13040	12619	12199	11779	11539	10939	10519	10098	9678	9258	7.846	0.616	0
19500	13376	12945	12514	12082	11651	11220	10789	10357	9926	9495	7.783	0.714	0

DISPL. Tonnes	VIRTUAL VCG = SOLID VCG + F.S. CORRECTION										GRAIN CONDITIONS		
											MAX. VCG	CORRESPONDING	
	6.500	**6.600**	**6.700**	**6.800**	**6.900**	**7.000**	**7.100**	**7.200**	**7.300**	**7.400**		GM	HM
15000	6385	6053	5722	5390	5058	4727	4395	4063	3731	3400	8.035	0.300	1294
15500	6583	6240	5897	5554	5211	4869	4526	4183	3840	3498	8.030	0.300	1338
16000	6814	6460	6106	5752	5398	5045	4691	4337	3983	3629	8.031	0.300	1396
16500	7174	6809	6444	6079	5715	5350	4985	4620	4255	3890	8.039	0.300	1384
17000	7570	7194	6818	6442	6066	5690	5314	4938	4562	4186	8.053	0.300	581
17500	7892	7505	7118	6731	6344	5957	5570	5183	4796	4409	8.048	0.325	0
18000	8192	7794	7396	6998	6600	6202	5804	5406	5008	4610	7.967	0.432	0
18500	8535	8125	7716	7307	6898	6489	6080	5671	5262	4853	7.902	0.527	0
19000	8838	8418	7998	7577	7157	6737	6317	5897	5076	3995	7.846	0.616	0
19500	9064	8633	8201	7770	7339	6908	6476	5616	4490	3427	7.783	0.714	0

DISPL. Tonnes	VIRTUAL VCG = SOLID VCG + F.S. CORRECTION										GRAIN CONDITIONS		
											MAX. VCG	CORRESPONDING	
	7.500	**7.600**	**7.700**	**7.800**	**7.900**	**8.000**	**8.100**	**8.200**	**8.300**	**8.400**		GM	HM
15000	3068	2736	2405	2073	1741	1409					8.035	0.300	1294
15500	3155	2812	2469	2127	1784	1441					8.030	0.300	1338
16000	3275	2922	2568	2214	1860	1506					8.031	0.300	1396
16500	3525	3160	2795	2431	2066	1701					8.039	0.300	1384
17000	3810	3434	3059	2683	2079	1064					8.053	0.300	581
17500	4022	3635	3248	2411	1324	383					8.048	0.300	0
18000	4212	3814	2563	1493	542						7.967	0.432	0
18500	3721	2662	1681	793	14						7.902	0.527	0
19000	2974	2029	1156	349							7.846	0.616	0
19500	2436	1514	644								7.783	0.714	0

TRIM & STABILITY WORKSHEET

CONDITION:

Compartment	Capacity m^3	Stowage Factor m^3/t	Weight t	KG m	Vertical Moment m	Free Surface Moment t.m	LCG foap m	Longitudinal Moment t.m
Total Free Surface Moments:								
Deadweight								
Lightship								
DISPLACEMENT								
HYDROSTATICS								
TMD:		MCTC:		LCB:		LCF:		
Trim calculation:								
		TMD:		TMD:			KM_T:	
		CoT f:		CoT a:			KG:	