

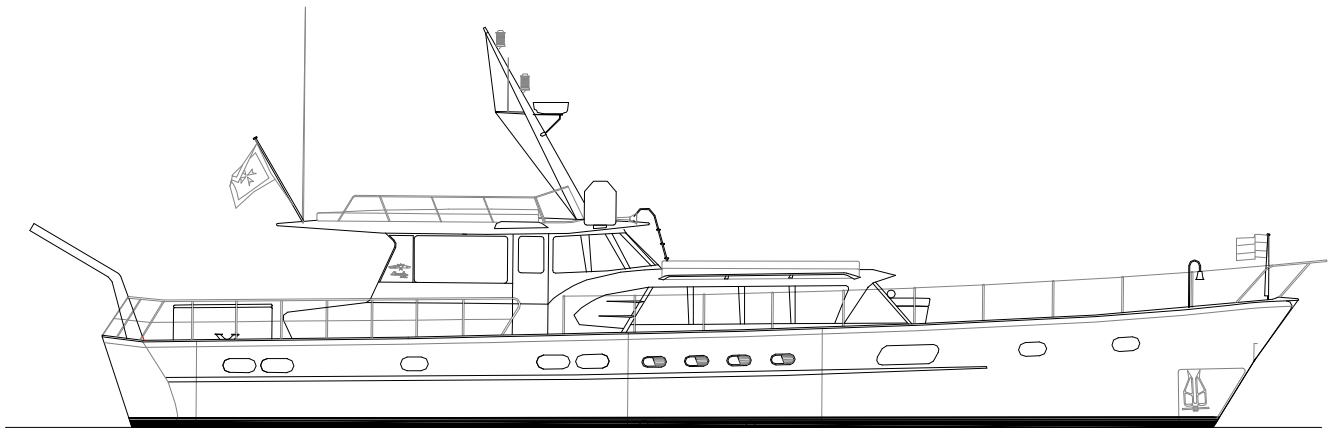


DE VOOGT

NAVAL ARCHITECTS

**FINAL
INTACT STABILITY
INFORMATION BOOKLET**

**HULL NO 583
MY "SERENA"**



FINAL INTACT STABILITY INFORMATION BOCKLET

Record of changes

Titel	Latest Revision	Issuance Date	Number of Pages	Author	Checked
Preliminary issue	0	1.4.2011	78	RWE	FG
Final issue	A	4.5.2011	78	RWE	



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1. SUMMARY

1. SUMMARY

GENERAL

This booklet is being submitted as the final intact stability booklet for a twin screw diesel motor yacht refitted at De Vries Makkum in 2011. The refit comprised complete new interior and engineering items.

The yacht was originally built at the De Vries Shipyard under yard number 583. This report shows the results of the intact stability calculations.

The calculations were performed with lightship weight and centre's of gravity as established from an inclining experiment performed on February 17st 2011.

A copy of this inclining experiment is also included in this document.

INTACT STABILITY RESULTS:

In all loading conditions, the motor yacht complies with the intact stability criteria as described by the ISO 12217-1 code.

2. INTRODUCTION TO INTACT STABILITY

2.1 GENERAL PARTICULARS

2.2 PRINCIPAL DIMENSIONS

2.3 LOADING CONDITIONS

2.4 ADOPTED CRITERIA

2.5 NOTES TO THE MASTER

2.6 ANGLES OF DOWN FLOODING

2.7 SPECIAL NOTES REGARDING THE STABILITY AND LOADING OF THE YACHT

2.8 BOUYANT SPACES & FLOODING POINTS

2.9 LIGHT SHIP HISTORY

2. INTRODUCTION TO INTACT STABILITY

2.1. GENERAL PARTICULARS

Yacht's name	:	Serena
Flag	:	Maltese
Category	:	Design category B
Port of Registry	:	Valetta
Builder's name	:	De Vries Shipyard
Yard no:	:	583
Delivered	:	1964
Call sign	:	9H9617

2.2. PRINCIPAL DIMENSIONS

Length o.a	:	22.50	m
LWL	:	19.90	m
Beam mld	:	5.10	m
Depth mld	:	3.25	m

Lightship weight	:	54.20	ton
LCG	:	9.55	m
VCG	:	2.25	m
TCG	:	0.00	m

Common reference	X	:	frame 0
	Y	:	centre line plane
	Z	:	baseline

Aft perpendicular	:	0.00m	aft of frame 0
Fore perpendicular	:	19.90m	fwd frame 0

2.3. LOADING CONDITIONS

This yacht has been provided with 400kg of fixed ballast for compensating heel. The TCG of the light ship weight used for the stability calculations is 0.0m off center line, as after completion of the refit the yacht had with the prescribed amount of ballast no heel with the black water and lube oil tank empty.

To limit trim forward, fuel is to be used first from the forward fuel tank and fuel level in the aft fuel tank should not be less then 50%.

The following loading conditions were defined. For these loading conditions the intact stability was assessed for:

- Light loaded condition (10% FO - 10% FW)
- Half loaded condition (50% FO - 50% FW)
- Fully loaded condition (100% FO - 100% FW)

These are the most common loading conditions.

In all conditions at least one fuel oil tank and the fresh water tank is taken as slack. The calculated righting arms reflect the actual variation of the centre of gravity caused by the slack tanks.

2.4. ADOPTED CRITERIA

In the following stability calculations, the intact stability was assessed using the criteria described in the EN ISO 12217-1 code for design category B option 1.

These criteria can be summarised as follows:

1. Freeboard to down flooding point >1.32m (see also chapter 8.3)
2. Angle from equilibrium to flood $\Phi_{D(R)} > \Phi_0 + 15 = 11.32 + 15 = 26.32^\circ$
3. Rolling in waves and wind area $A2 > A1$
4. Righting moment at $\Phi_{30^\circ} > 7\text{kNm}$
5. Righting arm at $\Phi_{30^\circ} > 0.2\text{m}$

2.5. NOTES TO THE MASTER

2.5.1. GENERAL INSTRUCTIONS

The yacht was assigned for design category B and is considered to be designed for waves of up to 4 m significant height and a wind of Beaufort force 8 or less.

The loading conditions shown in this booklet represent typical service conditions. Where a loading condition departs from those shown in this book a separate calculation should be made to ensure compliance with the stability criteria.

A copy of this booklet must be kept on board the vessel at all times. It must also be complete and readily available for use. If this booklet is lost or becomes unusable a replacement copy of the booklet must be obtained immediately.

In chapter 3 of this report, a standard form is added for calculating centers of gravity and loading conditions. This form includes a detailed step-by-step explanation (chapter 3.1).

Note that through minor openings such as chain pipes small quantities of water can enter the vessel. The bilge pump capacities are sufficient to counteract this. Bilge pump arrangements are to be standby.

2.5.2. GENERAL STABILITY REQUIREMENTS

It is important to ensure that in any sailing condition the stability of the yacht complies with the criteria of section 2.4.

This yacht has been provided with 400kg of fixed ballast for compensating heel. This ballast is not to be moved or removed without prior consultation. Should the ballast be required to be removed for survey/repair or any other reason it must be returned to its original position and secured.

2.5.3. PRECAUTIONS AGAINST CAPSIZING

Compliance with the stability criteria does not ensure immunity against capsizing or absolve the master from his responsibilities. Masters should therefore exercise prudence and good seamanship having regard to the season of the year, weather forecasts and the navigational zone and should take the appropriate action as to speed and course warranted by the prevailing circumstances.

Before a voyage commences care should be taken to ensure that the stores and sizeable pieces of equipment have been properly stowed or lashed so as to minimize the possibility of both longitudinal, and lateral shifting while at sea, under the effect of acceleration caused by rolling and pitching.

All external hull doors and flush hatches are to be closed and secured. If poor weather is likely to be encountered during the passage additionally storm boards and shutters should be fitted.

The number of slack tanks should kept to a minimum.

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2.5.4. OPERATION RESTRICTIONS

Note that the area of operation is only restricted in commercial use.

Area of operation in commercial use : 60 miles from a safe haven

2.5.5. DAMAGE STABILITY

This vessel has not been assessed for damage stability and therefore might not remain afloat in the event of damage or flooding.

2.5.6. MASTERS SHIPBOARD PROCEDURES

- IN SHELTERED ANCHORAGES AND IN PORT:

- The master is responsible for evaluating the risks and hazards present and taking appropriate precautions.

- PREPARING FOR SEA:

- Sidelights capable of being opened are to be secured closed.
- External hatches are to be closed, secured and recorded.
- Internal hinged WT doors are to be closed and secured.

- PREPARING FOR ROUGH WEATHER PASSAGE:

- The master is responsible for taking appropriate precautions whenever rough weather is anticipated.
- The precautions should include the following:
 - All loose gear (including tenders etc.) on deck, and in the technical space / locker room are to be securely lashed in place.
 - Large or heavy items of furniture to be secured.
 - The shutters provided are to be put up over the windows.
 - Deadlights are to be closed and secured.
 - Secure closing devices as appropriate.

- AT SEA:

- Hinged watertight doors are to be kept closed at sea at all times. They may be opened briefly to pass through the door, but should be closed immediately.

2.5.7. NOTES ON THE USE OF FREE SURFACE MOMENTS

Provided a tank is completely filled with liquid no movement of the liquid is possible and the effect on the ship's stability is precisely the same as if the tank contained solid material.

Immediately, after a quantity of liquid is withdrawn from the tank the situation changes completely and the stability of the ship is reduced by what is known as the "free surface effects". This reduction of the stability is referred to as a "loss in GM" or as a "virtual rise in V.C.G." and is calculated as follows:

$$\text{Virtual rise in VCG/ Loss of GM} = \frac{\text{Free Surface Mmt(Tonnes m)}}{\text{Vessel Displacement(Tonnes)}}$$

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2.5.8. NOTES ON THE USE OF RIGHTING LEVER TABLES

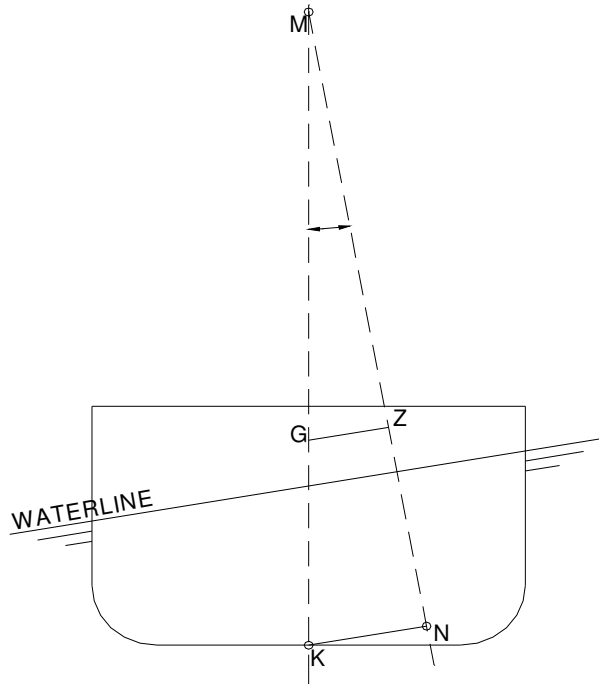
Righting lever tables for displacements of 50 to 70 tons are presented in chapter 6 for angles of heel at intervals between 0 and 70 degrees.

To obtain GZ curves at a given displacement, the following equation should be used:

$$GZ = KN - KG \sin \phi$$

Where KN is the righting lever given in the tables in chapter 6.

This enables the value of GZ to be calculated at each of the heel angles presented, and subsequently plotted as in the loading conditions presented herein.



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2.6. ANGLES OF DOWN FLOODING

The angle of down flooding is the angle of heel at which progressive down flooding of the yacht will occur due to the immersion on an opening. Where ">Righting arm" is indicated, flooding occurs at an angle after the righting arm diminishes to 0.

For this yacht the flowing openings and down flooding angles have been identified:

No.	Flood point	Location			Angle of Immersion (Intact) [deg]		
		LCG [m]	TCG [m]	VCG [m]	Light Load Condition	Half Load Condition	Fully Loaded Condition
1	Air in / outlet engine room	9.80	3.15	3.07	33.76	32.97	31.88
2	Air intake guest staterooms	0.15	1.10	3.54	> Righting Arm	87.82	85.28
3	Galley exhaust	14.79	1.45	3.73	68.49	68.00	66.54
4	Air intake crew	19.60	1.50	3.80	64.40	64.06	63.14
5	Air intake guest bathrooms	9.80	2.00	3.57	55.15	54.19	52.91
6	Air exhaust guest bathrooms	3.60	1.20	3.38	83.88	81.49	78.84
7	Door wheelhouse aft	4.80	1.30	3.46	79.44	77.34	74.97
8	Door wheelhouse side	7.60	1.65	3.44	64.38	62.99	62.00
9	Sliding hatch crew entrance	18.30	0.30	4.03	> Righting Arm	> Righting Arm	> Righting Arm
10	Chainpipes	19.70	0.20	3.82	> Righting Arm	> Righting Arm	> Righting Arm

2.7. SPECIAL NOTES REGARDING THE STABILITY AND LOADING OF THE YACHT

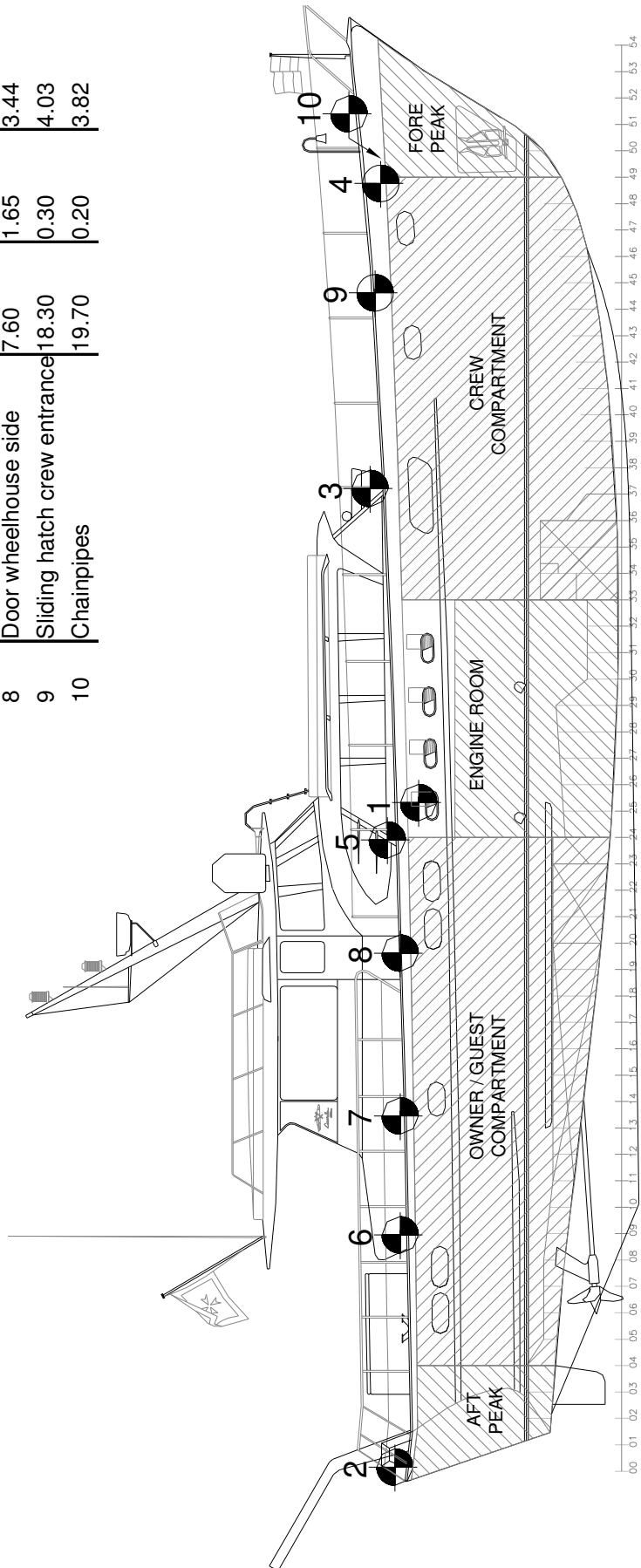
The following pages give an overview of the intact stability of the yacht in various loading conditions. Please note the following when interpreting the results of the calculations:

- Draught is measured from the baseline.
- All dimensions are in metres.
- The centres w.r.t frame 0, baseline and centreline
- All displacements and weights are in metric tons
- The buoyant spaces, down flooding points used in the calculations for determining the range of stability are shown in chapter 2.8.
- The flooding points are defined either all on the starboard side, or all on the port side of the ship depending on what side the ship heels to in the calculations.
- Down flooding points for the intact stability calculations are taken at:
 - Air in / outlet engine room
 - Air intake guest staterooms
 - Galley exhaust
 - Air intake crew
 - Air intake guest bathrooms
 - Air exhaust guest bathrooms
 - Door wheelhouse aft
 - Door wheelhouse side
 - Sliding hatch crew entrance
 - Chainpipes
- Theoretical tank volumes and quantities are used in the stability calculations; calibrated values due to suction losses are not accounted for.
- For the extreme draught add 290 mm.

2.8. BUOYANT SPACES & FLOODING POINTS

BUOYANT SPACES & FLOODING POINTS

No.	Flooding Points	X	Y	Z
1	Air in / outlet engine room	9.80	3.15	3.07
2	Air intake guest staterooms	0.15	1.10	3.54
3	Galley exhaust	14.79	1.45	3.73
4	Air intake crew	19.60	1.50	3.80
5	Air intake guest bathrooms	9.80	2.00	3.57
6	Air exhaust guest bathroom	3.60	1.20	3.38
7	Door wheelhouse aft	4.80	1.30	3.46
8	Door wheelhouse side	7.60	1.65	3.44
9	Sliding hatch crew entrance	18.30	0.30	4.03
10	Chainpipes	19.70	0.20	3.82



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2.9. LIGHTSHIP HISTORY

An inclining experiment was undertaken at De Vries Makkum on February 17st 2011.
 This gives the following listed particulars:

Lightship (MT)	LCG (m)	VCG (m)	TCG (m)
54.81	9.48	2.25	0.00

Whenever a significant change is made to the lightship, verified either by inclining experiment, lightweight check or calculation, the results are to be indicated in the following table and endorsed by an approved surveyor.

Lightship (kg)	LCG (m)	VCG (m)	TCG (m)	Date	Reason

3. SAMPLE FORM FOR CALCULATING LOADING CONDITION

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3. SAMPLE FORM FOR CALCULATING LOADING CONDITION

TABLE 1. TOTAL WEIGHT AND CoG CALCULATION							
ITEM	Load %	Weight ton	LCG m	L-Moment ton.m	VCG m	V-Moment ton.m	FSM ton.m
CREW AND EFFECTS							
GUESTS AND EFFECTS							
OWNER'S ALLOWANCE / SPARE PARTS / GEARS							
STORES & OTHER CONSUMABLES							
TANKS							
GREY WATER TANK FWD							
FRESH WATER TANK							
LUBE OIL TANK							
GREY WATER TANK AFT							
BLACK WATER TANK.							
FUEL TANK FWD							
FUEL TANK AFT							
TOTAL DEADWEIGHT							
LIGHTSHIP WEIGHT							
TOTAL DISPLACEMENT							

TABLE 2. STABILITY CALCULATION		
Displacement		metric tons
VCG		m
Estimated Fwd draught (relative to baseline)		m
Estimated Aft draught (relative to baseline)		m
Estimated Trim		m
Draught (amidships)		m
KMT		m
GMT (Solid)		m
FS-corr		m
GMT (Fluid)		m

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TABLE 3. TRIM CALCULATION		
LCG		m
LCB		m
Trim lever		m
Trim moment		ton-m
MTcm		ton.m/cm
Trim correction		cm
Trim		m
Draught at amidships		m
Draught aft		m
Draught fwd		m

3.1 EXPLANATION AND NOTES ON COMPLETING SAMPLE STABILITY FORM

3.1.1. TABLE 1. CALCULATING THE DISPLACEMENT AND CENTRES OF GRAVITY

1. Fill in the weights in column 3 (Weight) [unit: metric tons]
2. Fill in the longitudinal and vertical centre of gravity in columns 4 (LCG) and columns 6 (VCG) [unit: m]
3. Multiply the weight of each item by its centre to get the longitudinal and vertical moments and enter the moment in column 5 (L-Moment) and 7 (V-Moment)
4. From the tank capacity plan and tank capacities (Chapter 4) enter the tank weights into column 3 (Weight), LCG's into column 4 (LCG), VCG's in column 6 (VCG) and FSM's in column 8 (FSC) [units: metric tons, meters and metric ton-meters]
5. Multiply the weight of the tanks by its centre of gravity to get the longitudinal and vertical moments and enter these moments in column 5 (L-Moment) and 7 (V-Moment)
6. Sum up columns 3, 5 and 7 and enter the total in the "dead weight" row.
7. Add dead weight mass to light ship mass and enter the new total in the "total displacement" row, column 3
8. Add dead weight L-moment to light ship L-Moment and enter the new total in the "total displacement" row, column 5
9. Add deadweight V-Moment to light ship V-Moment and enter the new total in the "total displacement" row, column 6
10. Divide total displacement L-moment by the total displacement Weight, to calculate the estimate overall LCG for this loading condition. Fill in the result in column 4 (LCG)
11. Divide total displacement V-Moment by the total displacement Weight, to calculate the estimate overall VCG for this loading condition. Fill in the result in column 6 (VCG)
12. Sum up column 8 (FSM) and enter the total into "total displacement" row, column 8

3.1.2 TABLE 2. CALCULATING THE STABILITY

13. Transfer the value of the overall displacement and VCG from table 1 to table 2. Calculate the total free surface correction by dividing total FSM by overall displacement and enter in table 2 under FS-corr.
14. Estimate fwd and aft draught, and enter values in table 2
15. Subtract fwd draught from aft draught and enter trim value in table (note that trim bow down is negative, bow up is positive)
16. From the tables with hydrostatic data (Chapter 5), select the table with trim closest to the estimated trim. At the calculated displacement determine the value of Draught (at 28.85m), KMT, LCB and MT-cm (Moment to change trim by 1 cm) and enter these in tables 2 and 3. Note that the draught at 28.85 is the draught amidships
17. Subtract the overall VCG value in table 2 from KMT to obtain GMT (solid) and enter the result in table 2
18. Subtract the overall FS-corr value from table 1 from GMT (solid) to obtain GMT (fluid), and enter the value in table 2
- 19.

3.1.3 TABLE 3. CALCULATING THE TRIM

20. Transfer the value of the overall LCG from table 1 to table 3
21. Subtract the LCG from the LCB to obtain the trim lever
22. Multiply the displacement by the trim lever to obtain trim moment.
23. Divide trim moment by MT-cm to obtain the trim correction.
24. Calculate trim by adding trim correction to estimated trim.
25. Divide the trim by 2, and add this to the draught amidships to obtain the draught aft
26. Divide the trim by 2, and subtract this from the draught amidships to obtain the draught forward

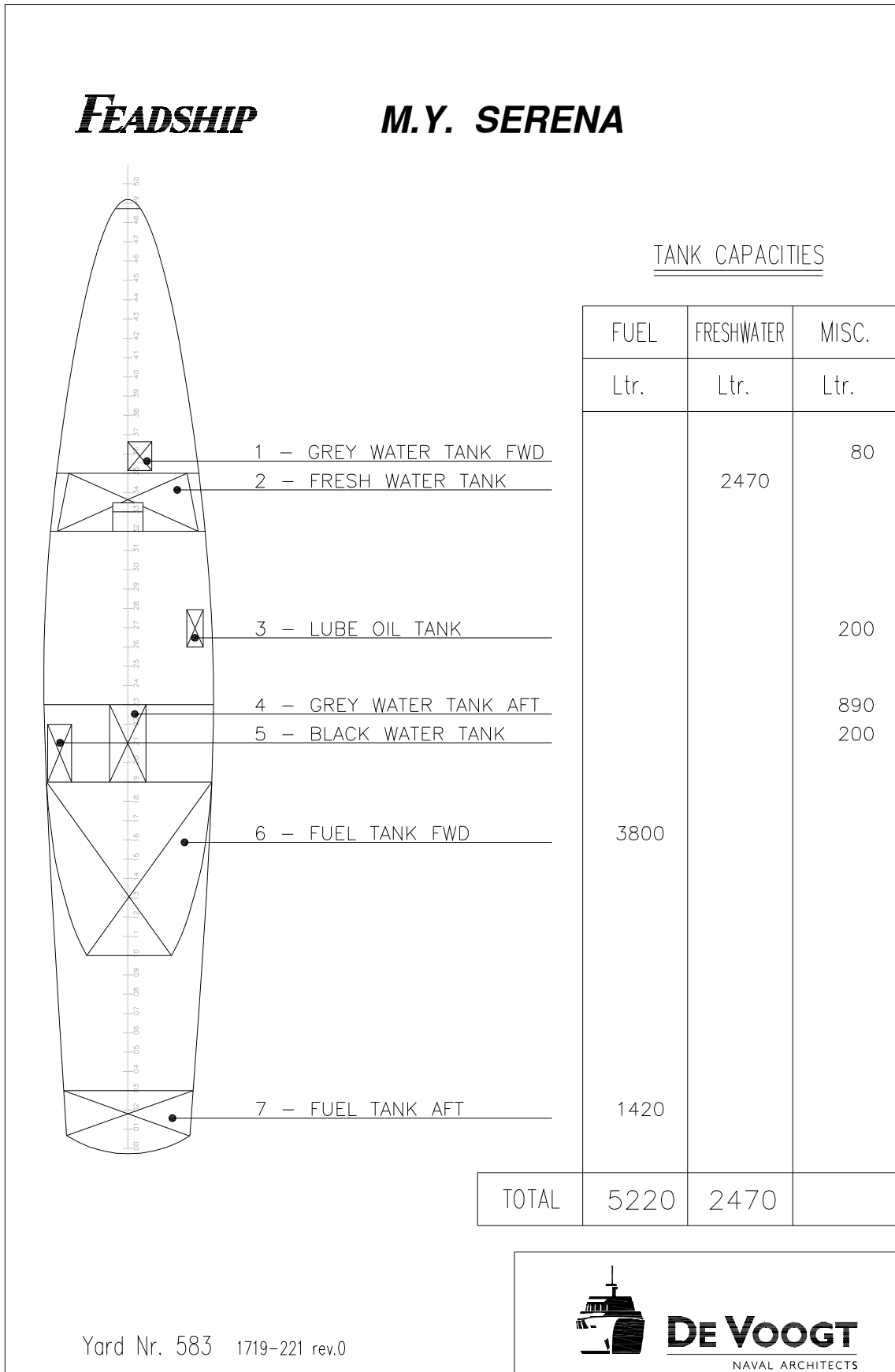
If the trim correction in step 22 is more than 20cm an additional calculation is recommended departing from step 15 and using an estimated trim being that found in step 23.

4. TANK CAPACITIES

The presented tank plan on the next page shows the theoretical tank volumes.

Values / quantities shown in the stability- and capacity- calculations in this booklet are theoretical tank volumes and don't account for suction losses.

4. TANK CAPACITIES



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Tank Capacities for SUMP_FWD.S containing Misc. (1.000)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.52	5.00%	0.00	0.00	14.350f	0.200s	0.510	0.00	0.00
0.54	10.00%	0.01	0.01	14.350f	0.200s	0.520	0.00	0.00
0.58	20.00%	0.02	0.02	14.350f	0.200s	0.540	0.00	0.00
0.62	30.00%	0.02	0.02	14.350f	0.200s	0.560	0.00	0.00
0.66	40.00%	0.03	0.03	14.350f	0.200s	0.580	0.00	0.00
0.70	50.00%	0.04	0.04	14.350f	0.200s	0.600	0.00	0.00
0.74	60.00%	0.05	0.05	14.350f	0.200s	0.620	0.00	0.00
0.78	70.00%	0.06	0.06	14.350f	0.200s	0.640	0.00	0.00
0.82	80.00%	0.06	0.06	14.350f	0.200s	0.660	0.00	0.00
0.86	90.00%	0.07	0.07	14.350f	0.200s	0.680	0.00	0.00
0.88	95.00%	0.07	0.07	14.350f	0.200s	0.690	0.00	0.00
0.89	98.00%	0.08	0.08	14.350f	0.200s	0.696	0.00	0.00
	100.00%	0.08	0.08	14.350f	0.200s	0.700		

Tank Capacities for FW.C containing FRESH WATER (1.000)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.30	5.00%	0.12	0.12	13.367f	0.000	0.217	0.06	0.12
0.40	10.00%	0.25	0.25	13.373f	0.000	0.285	0.17	0.17
0.55	20.00%	0.49	0.49	13.377f	0.000	0.381	0.47	0.24
0.66	30.00%	0.74	0.74	13.378f	0.000	0.455	0.85	0.29
0.76	40.00%	0.99	0.99	13.386f	0.000	0.518	1.28	0.28
0.85	50.00%	1.23	1.23	13.393f	0.000	0.576	1.77	0.32
0.94	60.00%	1.48	1.48	13.397f	0.000	0.629	2.22	0.35
1.01	70.00%	1.73	1.73	13.400f	0.000	0.678	2.64	0.37
1.09	80.00%	1.98	1.98	13.403f	0.000	0.725	2.68	0.38
1.17	90.00%	2.22	2.22	13.405f	0.000	0.771	2.68	0.38
1.21	95.00%	2.35	2.35	13.406f	0.000	0.793	2.68	0.38
1.23	98.00%	2.42	2.42	13.407f	0.000	0.806	2.68	0.38
	100.00%	2.47	2.47	13.407f	0.000	0.815		

Tank Capacities for LO.S containing LUBE OIL (0.924)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
1.83	5.00%	0.01	0.01	10.800f	2.092s	1.815	0.00	0.02
1.86	10.00%	0.02	0.02	10.800f	2.092s	1.830	0.00	0.02
1.92	20.00%	0.04	0.04	10.800f	2.092s	1.860	0.00	0.02
1.98	30.00%	0.06	0.05	10.800f	2.092s	1.890	0.00	0.02
2.04	40.00%	0.08	0.07	10.800f	2.092s	1.920	0.00	0.02
2.10	50.00%	0.10	0.09	10.800f	2.092s	1.950	0.00	0.02
2.16	60.00%	0.12	0.11	10.800f	2.092s	1.980	0.00	0.02
2.22	70.00%	0.14	0.13	10.800f	2.092s	2.010	0.00	0.02
2.28	80.00%	0.16	0.15	10.800f	2.092s	2.040	0.00	0.02
2.34	90.00%	0.18	0.16	10.800f	2.092s	2.070	0.00	0.02
2.37	95.00%	0.19	0.17	10.800f	2.092s	2.085	0.00	0.02
2.39	98.00%	0.19	0.18	10.800f	2.092s	2.094	0.00	0.02
	100.00%	0.20	0.18	10.800f	2.092s	2.100		

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Tank Capacities for SUMP_AFT.C containing Misc. (1.000)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.33	5.00%	0.04	0.04	8.730f	0.000	0.288	0.02	0.13
0.38	10.00%	0.09	0.09	8.626f	0.000	0.321	0.04	0.21
0.45	20.00%	0.18	0.18	8.523f	0.000	0.368	0.06	0.26
0.53	30.00%	0.27	0.27	8.482f	0.000	0.409	0.06	0.26
0.60	40.00%	0.36	0.36	8.461f	0.000	0.448	0.06	0.26
0.68	50.00%	0.45	0.45	8.449f	0.000	0.486	0.06	0.26
0.75	60.00%	0.54	0.54	8.441f	0.000	0.524	0.06	0.26
0.83	70.00%	0.63	0.63	8.435f	0.000	0.562	0.06	0.26
0.90	80.00%	0.72	0.72	8.431f	0.000	0.600	0.06	0.26
0.98	90.00%	0.80	0.80	8.427f	0.000	0.637	0.06	0.26
1.01	95.00%	0.85	0.85	8.426f	0.000	0.656	0.06	0.26
1.04	98.00%	0.88	0.88	8.425f	0.000	0.667	0.06	0.26
	100.00%	0.89	0.89	8.425f	0.000	0.675		

Tank Capacities for BLACK_WATER.P containing SEWAGE (1.025)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.76	5.00%	0.01	0.01	8.313f	1.323p	0.733	0.00	0.03
0.79	10.00%	0.02	0.02	8.277f	1.352p	0.756	0.00	0.04
0.84	20.00%	0.04	0.04	8.251f	1.391p	0.787	0.01	0.06
0.88	30.00%	0.06	0.06	8.239f	1.421p	0.811	0.01	0.07
0.91	40.00%	0.08	0.08	8.232f	1.445p	0.831	0.02	0.08
0.94	50.00%	0.10	0.10	8.227f	1.465p	0.849	0.02	0.09
0.96	60.00%	0.12	0.12	8.223f	1.483p	0.866	0.03	0.09
0.99	70.00%	0.14	0.14	8.220f	1.496p	0.882	0.03	0.09
1.01	80.00%	0.16	0.16	8.217f	1.506p	0.897	0.03	0.09
1.04	90.00%	0.18	0.18	8.216f	1.514p	0.911	0.03	0.09
1.05	95.00%	0.19	0.19	8.215f	1.517p	0.918	0.03	0.09
1.06	98.00%	0.19	0.20	8.214f	1.519p	0.922	0.03	0.09
	100.00%	0.20	0.20	8.214f	1.520p	0.925		

Tank Capacities for FUEL_TANK_FORE. containing FUEL OIL (0.840)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m ³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
0.57	5.00%	0.19	0.16	6.939f	0.000	0.511	0.24	0.68
0.64	10.00%	0.38	0.32	6.768f	0.000	0.560	0.62	1.67
0.72	20.00%	0.76	0.64	6.560f	0.000	0.622	1.61	3.91
0.78	30.00%	1.14	0.96	6.430f	0.000	0.665	2.81	5.70
0.83	40.00%	1.52	1.28	6.339f	0.000	0.699	4.15	7.09
0.87	50.00%	1.90	1.60	6.273f	0.000	0.729	5.56	8.19
0.90	60.00%	2.28	1.91	6.222f	0.000	0.755	6.84	9.00
0.94	70.00%	2.66	2.23	6.184f	0.000	0.779	6.78	8.98
0.98	80.00%	3.04	2.55	6.155f	0.000	0.801	6.73	8.95
1.01	90.00%	3.42	2.87	6.133f	0.000	0.823	6.67	8.93
1.03	95.00%	3.61	3.03	6.124f	0.000	0.833	6.64	8.91
1.04	98.00%	3.72	3.13	6.119f	0.000	0.840	6.62	8.90
	100.00%	3.80	3.19	6.115f	0.000	0.844		

FINAL INTACT STABILITY INFORMATION BOCKLET

Tank Capacities for FUEL_TANK_AFT. containing FUEL OIL (0.840)

No Trim, No Heel

Ref Ht (m)	Load (%)	Volume (m³)	Weight (MT)	Lcg (m)	Tcg (m)	Vcg (m)	FSMt (MT-m)	FSMI (MT-m)
	0.00%	0.00	0.00					
1.13	5.00%	0.07	0.06	0.771f	0.000	1.101	0.22	0.14
1.17	10.00%	0.14	0.12	0.720f	0.000	1.126	0.51	0.21
1.23	20.00%	0.28	0.24	0.681f	0.000	1.164	1.12	0.28
1.28	30.00%	0.43	0.36	0.658f	0.000	1.193	1.42	0.31
1.32	40.00%	0.57	0.48	0.644f	0.000	1.220	1.45	0.31
1.37	50.00%	0.71	0.60	0.635f	0.000	1.245	1.45	0.31
1.41	60.00%	0.85	0.72	0.629f	0.000	1.269	1.45	0.31
1.46	70.00%	1.00	0.84	0.625f	0.000	1.293	1.45	0.31
1.51	80.00%	1.14	0.96	0.622f	0.000	1.317	1.45	0.31
1.55	90.00%	1.28	1.08	0.620f	0.000	1.341	1.45	0.31
1.58	95.00%	1.35	1.14	0.618f	0.000	1.353	1.45	0.31
1.59	98.00%	1.39	1.17	0.618f	0.000	1.360	1.45	0.31
	100.00%	1.42	1.20	0.618f	0.000	1.364		

5. TABLES OF HYDROSTATIC DATA

FINAL INTACT STABILITY INFORMATION BOCKLET

5. HYDROSTATIC PARTICULARS

MY Serena HYDROSTATIC DATA TRIM 0.40 M FORW

Hydrostatic Properties

Draft is from Baseline.

Trim: fwd 0.400/19.900, No heel, VCG = 0.000

Draft at 9.950f (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m/cm)	KML (m)	KMT (m)
1.450	45.689	10.108f	1.022	8.764f	0.723	0.867	37.739	3.224
1.460	46.414	10.087f	1.028	8.750f	0.727	0.876	37.548	3.224
1.470	47.143	10.066f	1.035	8.737f	0.731	0.885	37.346	3.223
1.480	47.876	10.046f	1.041	8.725f	0.735	0.894	37.135	3.222
1.490	48.613	10.026f	1.047	8.714f	0.739	0.902	36.917	3.221
1.500	49.353	10.006f	1.054	8.704f	0.742	0.910	36.692	3.219
1.510	50.097	9.986f	1.060	8.695f	0.746	0.918	36.461	3.216
1.520	50.844	9.967f	1.066	8.686f	0.749	0.926	36.226	3.213
1.530	51.595	9.949f	1.073	8.679f	0.752	0.933	35.986	3.210
1.540	52.348	9.930f	1.079	8.673f	0.755	0.940	35.740	3.206
1.550	53.105	9.912f	1.085	8.667f	0.758	0.947	35.494	3.202
1.560	53.864	9.895f	1.091	8.663f	0.761	0.954	35.241	3.197
1.570	54.627	9.878f	1.098	8.658f	0.764	0.961	34.990	3.193
1.580	55.392	9.861f	1.104	8.655f	0.766	0.967	34.736	3.187
1.590	56.159	9.844f	1.110	8.652f	0.769	0.973	34.484	3.182
1.600	56.930	9.828f	1.116	8.650f	0.772	0.979	34.232	3.177
1.610	57.702	9.812f	1.123	8.648f	0.774	0.985	33.979	3.171
1.620	58.478	9.797f	1.129	8.647f	0.776	0.991	33.728	3.165
1.630	59.255	9.782f	1.135	8.646f	0.779	0.997	33.477	3.158
1.640	60.035	9.767f	1.141	8.646f	0.781	1.003	33.226	3.152
1.650	60.817	9.753f	1.147	8.646f	0.783	1.008	32.978	3.145
1.660	61.601	9.739f	1.153	8.646f	0.785	1.013	32.731	3.139
1.670	62.388	9.725f	1.159	8.647f	0.787	1.019	32.484	3.132
1.680	63.176	9.712f	1.166	8.648f	0.789	1.024	32.241	3.125
1.690	63.966	9.698f	1.172	8.650f	0.791	1.029	32.000	3.118
1.700	64.758	9.686f	1.178	8.652f	0.793	1.034	31.761	3.111
1.710	65.552	9.673f	1.184	8.654f	0.795	1.039	31.525	3.105
1.720	66.348	9.661f	1.190	8.656f	0.797	1.043	31.291	3.098
1.730	67.146	9.649f	1.196	8.658f	0.799	1.048	31.061	3.091
1.740	67.946	9.637f	1.202	8.661f	0.800	1.053	30.834	3.084
1.750	68.747	9.626f	1.208	8.664f	0.802	1.058	30.610	3.077

Water Specific Gravity = 1.025.

Trim is per 19.90m

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena HYDROSTATIC DATA TRIM 0.20 M FORW

Hydrostatic Properties

Draft is from Baseline.

Trim: fwd 0.200/19.900, No heel, VCG = 0.000

Draft at 9.950f (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m /cm)	KML (m)	KMT (m)
1.450	46.646	9.711f	1.025	8.541f	0.735	0.891	37.993	3.290
1.460	47.383	9.693f	1.031	8.536f	0.739	0.898	37.692	3.285
1.470	48.123	9.675f	1.038	8.531f	0.742	0.904	37.390	3.280
1.480	48.866	9.657f	1.044	8.528f	0.745	0.911	37.094	3.274
1.490	49.612	9.640f	1.050	8.525f	0.748	0.917	36.796	3.269
1.500	50.361	9.624f	1.057	8.522f	0.750	0.924	36.499	3.262
1.510	51.113	9.608f	1.063	8.520f	0.753	0.930	36.204	3.256
1.520	51.867	9.592f	1.070	8.519f	0.756	0.936	35.908	3.249
1.530	52.624	9.576f	1.076	8.518f	0.758	0.942	35.614	3.243
1.540	53.384	9.561f	1.082	8.518f	0.761	0.948	35.321	3.235
1.550	54.146	9.547f	1.089	8.518f	0.763	0.953	35.029	3.228
1.560	54.911	9.532f	1.095	8.519f	0.766	0.959	34.738	3.221
1.570	55.677	9.518f	1.101	8.520f	0.768	0.964	34.451	3.213
1.580	56.447	9.505f	1.107	8.521f	0.770	0.969	34.167	3.205
1.590	57.218	9.492f	1.114	8.523f	0.772	0.974	33.886	3.197
1.600	57.991	9.479f	1.120	8.525f	0.775	0.979	33.608	3.189
1.610	58.767	9.466f	1.126	8.527f	0.777	0.984	33.332	3.181
1.620	59.544	9.454f	1.132	8.529f	0.779	0.989	33.059	3.173
1.630	60.324	9.442f	1.138	8.531f	0.780	0.994	32.791	3.165
1.640	61.105	9.430f	1.145	8.534f	0.782	0.999	32.527	3.156
1.650	61.889	9.419f	1.151	8.537f	0.784	1.004	32.266	3.148
1.660	62.674	9.408f	1.157	8.541f	0.786	1.008	32.009	3.140
1.670	63.461	9.397f	1.163	8.544f	0.788	1.013	31.756	3.132
1.680	64.250	9.387f	1.169	8.548f	0.790	1.017	31.507	3.124
1.690	65.040	9.377f	1.175	8.551f	0.791	1.022	31.262	3.116
1.700	65.832	9.367f	1.181	8.555f	0.793	1.026	31.022	3.108
1.710	66.626	9.357f	1.187	8.560f	0.795	1.031	30.783	3.100
1.720	67.422	9.348f	1.194	8.564f	0.796	1.035	30.548	3.092
1.730	68.219	9.339f	1.200	8.568f	0.798	1.039	30.317	3.085
1.740	69.018	9.330f	1.206	8.572f	0.800	1.044	30.090	3.077
1.750	69.818	9.321f	1.212	8.576f	0.801	1.048	29.867	3.070

Water Specific Gravity = 1.025.

Trim is per 19.90m

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena HYDROSTATIC DATA AT EVEN KEEL

Hydrostatic Properties

Draft is from Baseline.
No Trim, No heel, VCG = 0.000

Draft at 9.950f (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m /cm)	KML (m)	KMT (m)
1.450	47.753	9.317f	1.032	8.381f	0.742	0.897	37.385	3.327
1.460	48.496	9.303f	1.039	8.381f	0.744	0.903	37.042	3.318
1.470	49.242	9.289f	1.045	8.382f	0.747	0.908	36.702	3.309
1.480	49.990	9.275f	1.052	8.384f	0.749	0.914	36.368	3.300
1.490	50.741	9.262f	1.058	8.385f	0.752	0.919	36.039	3.291
1.500	51.494	9.249f	1.065	8.387f	0.754	0.924	35.714	3.281
1.510	52.249	9.237f	1.071	8.390f	0.756	0.929	35.392	3.272
1.520	53.007	9.225f	1.077	8.393f	0.758	0.934	35.076	3.262
1.530	53.767	9.213f	1.084	8.396f	0.761	0.939	34.765	3.253
1.540	54.529	9.202f	1.090	8.399f	0.763	0.944	34.460	3.243
1.550	55.293	9.191f	1.096	8.402f	0.765	0.949	34.160	3.234
1.560	56.059	9.180f	1.103	8.406f	0.767	0.954	33.861	3.225
1.570	56.827	9.170f	1.109	8.410f	0.769	0.959	33.566	3.216
1.580	57.597	9.160f	1.115	8.415f	0.771	0.963	33.283	3.206
1.590	58.369	9.150f	1.121	8.419f	0.773	0.968	33.000	3.197
1.600	59.143	9.140f	1.127	8.423f	0.775	0.972	32.721	3.187
1.610	59.919	9.131f	1.134	8.428f	0.777	0.977	32.445	3.178
1.620	60.696	9.122f	1.140	8.432f	0.778	0.981	32.173	3.169
1.630	61.475	9.113f	1.146	8.437f	0.780	0.986	31.907	3.160
1.640	62.256	9.105f	1.152	8.442f	0.782	0.990	31.646	3.151
1.650	63.039	9.097f	1.158	8.446f	0.784	0.994	31.391	3.142
1.660	63.824	9.089f	1.164	8.451f	0.785	0.999	31.140	3.133
1.670	64.610	9.081f	1.170	8.455f	0.787	1.003	30.894	3.124
1.680	65.398	9.073f	1.177	8.460f	0.789	1.007	30.653	3.116
1.690	66.187	9.066f	1.183	8.465f	0.790	1.012	30.415	3.107
1.700	66.978	9.059f	1.189	8.470f	0.792	1.016	30.180	3.099
1.710	67.770	9.052f	1.195	8.475f	0.793	1.020	29.949	3.091
1.720	68.564	9.046f	1.201	8.481f	0.795	1.024	29.722	3.083
1.730	69.360	9.039f	1.207	8.486f	0.796	1.028	29.499	3.075
1.740	70.157	9.033f	1.213	8.492f	0.798	1.032	29.279	3.067
1.750	70.956	9.027f	1.219	8.497f	0.799	1.036	29.063	3.059

Water Specific Gravity = 1.025.
Trim is per 19.90m

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena HYDROSTATIC DATA TRIM 0.20 M AFT

Hydrostatic Properties

Draft is from Baseline.
Trim: aft 0.200/19.900, No heel, VCG = 0.000

Draft at 9.950f (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m /cm)	KML (m)	KMT (m)
1.450	48.973	8.937f	1.045	8.256f	0.744	0.893	36.298	3.339
1.460	49.718	8.926f	1.051	8.261f	0.746	0.898	35.950	3.328
1.470	50.466	8.917f	1.058	8.265f	0.748	0.903	35.608	3.316
1.480	51.215	8.907f	1.064	8.270f	0.751	0.908	35.274	3.305
1.490	51.967	8.898f	1.070	8.274f	0.753	0.913	34.947	3.294
1.500	52.721	8.889f	1.077	8.279f	0.755	0.917	34.628	3.283
1.510	53.477	8.881f	1.083	8.284f	0.757	0.922	34.312	3.271
1.520	54.234	8.872f	1.089	8.289f	0.759	0.927	33.996	3.260
1.530	54.994	8.864f	1.095	8.295f	0.761	0.931	33.687	3.248
1.540	55.756	8.857f	1.102	8.300f	0.763	0.935	33.385	3.238
1.550	56.519	8.849f	1.108	8.306f	0.764	0.940	33.090	3.227
1.560	57.285	8.842f	1.114	8.311f	0.766	0.944	32.802	3.217
1.570	58.052	8.835f	1.120	8.317f	0.768	0.949	32.521	3.208
1.580	58.822	8.828f	1.126	8.322f	0.770	0.953	32.246	3.198
1.590	59.593	8.822f	1.133	8.328f	0.772	0.958	31.977	3.189
1.600	60.366	8.816f	1.139	8.333f	0.774	0.962	31.714	3.179
1.610	61.141	8.809f	1.145	8.339f	0.775	0.966	31.450	3.169
1.620	61.917	8.804f	1.151	8.345f	0.777	0.971	31.192	3.160
1.630	62.695	8.798f	1.157	8.351f	0.779	0.975	30.939	3.150
1.640	63.475	8.793f	1.163	8.357f	0.780	0.979	30.692	3.141
1.650	64.257	8.787f	1.169	8.363f	0.782	0.983	30.447	3.131
1.660	65.040	8.782f	1.175	8.369f	0.784	0.987	30.204	3.122
1.670	65.824	8.777f	1.181	8.375f	0.785	0.991	29.965	3.112
1.680	66.610	8.773f	1.187	8.381f	0.787	0.995	29.736	3.103
1.690	67.397	8.768f	1.193	8.387f	0.788	0.999	29.508	3.095
1.700	68.186	8.764f	1.199	8.393f	0.790	1.003	29.284	3.086
1.710	68.976	8.760f	1.205	8.399f	0.791	1.007	29.065	3.078
1.720	69.768	8.756f	1.211	8.405f	0.793	1.012	28.851	3.071
1.730	70.561	8.752f	1.217	8.411f	0.794	1.015	28.637	3.062
1.740	71.355	8.748f	1.223	8.417f	0.795	1.019	28.427	3.054
1.750	72.151	8.744f	1.229	8.424f	0.797	1.023	28.221	3.046

Water Specific Gravity = 1.025.
Trim is per 19.90m

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena HYDROSTATIC DATA TRIM 0.40 M AFT

Hydrostatic Properties

Draft is from Baseline.

Trim: aft 0.400/19.900, No heel, VCG = 0.000

Draft at 9.950f (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m /cm)	KML (m)	KMT (m)
1.450	50.280	8.575f	1.061	8.152f	0.744	0.884	34.976	3.334
1.460	51.025	8.569f	1.067	8.159f	0.746	0.888	34.644	3.321
1.470	51.772	8.563f	1.074	8.165f	0.748	0.893	34.320	3.308
1.480	52.521	8.557f	1.080	8.172f	0.750	0.898	34.003	3.296
1.490	53.271	8.552f	1.086	8.178f	0.752	0.902	33.693	3.284
1.500	54.024	8.547f	1.092	8.184f	0.754	0.907	33.391	3.272
1.510	54.779	8.542f	1.099	8.191f	0.756	0.911	33.094	3.261
1.520	55.535	8.537f	1.105	8.197f	0.758	0.916	32.802	3.249
1.530	56.294	8.532f	1.111	8.204f	0.760	0.920	32.514	3.239
1.540	57.054	8.528f	1.117	8.210f	0.761	0.924	32.232	3.228
1.550	57.816	8.524f	1.123	8.217f	0.763	0.929	31.955	3.217
1.560	58.580	8.520f	1.129	8.224f	0.765	0.933	31.683	3.207
1.570	59.346	8.516f	1.135	8.231f	0.767	0.937	31.415	3.196
1.580	60.114	8.513f	1.141	8.238f	0.768	0.941	31.153	3.186
1.590	60.883	8.509f	1.147	8.244f	0.770	0.945	30.895	3.176
1.600	61.654	8.506f	1.153	8.251f	0.772	0.950	30.643	3.165
1.610	62.426	8.503f	1.159	8.258f	0.773	0.954	30.396	3.156
1.620	63.200	8.500f	1.165	8.265f	0.775	0.958	30.155	3.146
1.630	63.976	8.497f	1.171	8.272f	0.777	0.962	29.917	3.136
1.640	64.753	8.494f	1.177	8.278f	0.778	0.966	29.682	3.127
1.650	65.532	8.492f	1.183	8.285f	0.780	0.970	29.452	3.117
1.660	66.312	8.490f	1.189	8.292f	0.781	0.974	29.226	3.108
1.670	67.094	8.487f	1.195	8.299f	0.783	0.978	29.004	3.099
1.680	67.877	8.485f	1.201	8.306f	0.784	0.982	28.786	3.090
1.690	68.662	8.483f	1.207	8.313f	0.785	0.986	28.572	3.082
1.700	69.448	8.481f	1.213	8.320f	0.787	0.990	28.362	3.073
1.710	70.236	8.480f	1.219	8.327f	0.788	0.994	28.156	3.065
1.720	71.025	8.478f	1.225	8.333f	0.790	0.998	27.954	3.057
1.730	71.815	8.477f	1.230	8.340f	0.791	1.002	27.754	3.048
1.740	72.607	8.475f	1.236	8.347f	0.792	1.006	27.557	3.041
1.750	73.400	8.474f	1.242	8.354f	0.794	1.009	27.363	3.033

Water Specific Gravity = 1.025.

Trim is per 19.90m

6. CROSS CURVES OF STABILITY

FINAL INTACT STABILITY INFORMATION BOCKLET

6. CROSS CURVES OF STABILITY

MY Serena RIGHTING LEVERS AND CROSS CURVES OF STABILITY

INITIAL TRIM 0.4 MTR FORW

Cross Curves of Stability

Righting Arms(heel) for VCG = 0.00
Trim fwd 0.400/19.900 at heel = 0 (RA Trim = 0)

Displ (MT)	5.000s	10.000s	15.000s	20.000s	25.000s	30.000s	35.000s	40.000s
50.000	0.278s	0.543s	0.790s	1.017s	1.227s	1.422s	1.609s	1.789s
51.000	0.278s	0.543s	0.790s	1.017s	1.228s	1.424s	1.611s	1.792s
52.000	0.278s	0.543s	0.790s	1.018s	1.229s	1.426s	1.612s	1.794s
53.000	0.277s	0.542s	0.789s	1.018s	1.230s	1.427s	1.614s	1.796s
54.000	0.277s	0.542s	0.789s	1.018s	1.230s	1.428s	1.616s	1.798s
55.000	0.276s	0.541s	0.789s	1.018s	1.231s	1.430s	1.618s	1.800s
56.000	0.276s	0.540s	0.788s	1.018s	1.232s	1.431s	1.620s	1.803s
57.000	0.275s	0.540s	0.788s	1.018s	1.232s	1.432s	1.621s	1.805s
58.000	0.275s	0.539s	0.787s	1.018s	1.233s	1.433s	1.623s	1.807s
59.000	0.274s	0.538s	0.787s	1.018s	1.233s	1.435s	1.625s	1.809s
60.000	0.273s	0.537s	0.786s	1.018s	1.234s	1.436s	1.626s	1.811s
61.000	0.273s	0.537s	0.785s	1.018s	1.234s	1.437s	1.628s	1.813s
62.000	0.272s	0.536s	0.785s	1.017s	1.234s	1.437s	1.630s	1.815s
63.000	0.272s	0.535s	0.784s	1.017s	1.235s	1.438s	1.631s	1.817s
64.000	0.271s	0.534s	0.783s	1.017s	1.235s	1.439s	1.632s	1.819s
65.000	0.270s	0.533s	0.782s	1.016s	1.235s	1.440s	1.634s	1.821s
66.000	0.270s	0.532s	0.782s	1.016s	1.235s	1.441s	1.635s	1.823s
67.000	0.269s	0.531s	0.781s	1.015s	1.235s	1.441s	1.637s	1.825s
68.000	0.268s	0.530s	0.780s	1.015s	1.235s	1.442s	1.638s	1.826s
69.000	0.267s	0.529s	0.779s	1.014s	1.235s	1.443s	1.639s	1.828s
70.000	0.267s	0.528s	0.778s	1.014s	1.235s	1.443s	1.641s	1.829s
Displ (MT)	45.000s	50.000s	55.000s	60.000s	65.000s	70.000s		
50.000	1.970s	2.144s	2.292s	2.412s	2.498s	2.549s		
51.000	1.973s	2.144s	2.290s	2.409s	2.494s	2.545s		
52.000	1.975s	2.145s	2.289s	2.406s	2.490s	2.540s		
53.000	1.978s	2.145s	2.287s	2.403s	2.486s	2.536s		
54.000	1.980s	2.146s	2.286s	2.400s	2.482s	2.531s		
55.000	1.982s	2.146s	2.284s	2.396s	2.477s	2.526s		
56.000	1.984s	2.146s	2.282s	2.393s	2.473s	2.522s		
57.000	1.985s	2.146s	2.280s	2.390s	2.469s	2.517s		
58.000	1.987s	2.146s	2.278s	2.386s	2.465s	2.512s		
59.000	1.988s	2.146s	2.277s	2.383s	2.461s	2.507s		
60.000	1.990s	2.145s	2.275s	2.380s	2.456s	2.503s		
61.000	1.991s	2.145s	2.273s	2.376s	2.452s	2.498s		
62.000	1.992s	2.145s	2.271s	2.373s	2.448s	2.493s		
63.000	1.993s	2.144s	2.269s	2.369s	2.443s	2.488s		
64.000	1.994s	2.144s	2.267s	2.366s	2.439s	2.483s		
65.000	1.995s	2.143s	2.265s	2.362s	2.434s	2.478s		
66.000	1.996s	2.142s	2.262s	2.359s	2.430s	2.474s		
67.000	1.996s	2.141s	2.260s	2.355s	2.425s	2.469s		
68.000	1.997s	2.141s	2.258s	2.351s	2.420s	2.464s		
69.000	1.997s	2.140s	2.256s	2.348s	2.416s	2.459s		
70.000	1.998s	2.139s	2.253s	2.344s	2.411s	2.454s		

Water Specific Gravity = 1.025.

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena RIGHTING LEVERS AND CROSS CURVES OF STABILITY

INITIAL TRIM 0.2 MTR FORW

Cross Curves of Stability

Righting Arms(heel) for VCG = 0.00
 Trim fwd 0.200/19.900 at heel = 0 (RA Trim = 0)

Displ (MT)	5.000s	10.000s	15.000s	20.000s	25.000s	30.000s	35.000s	40.000s
50.000	0.282s	0.551s	0.800s	1.029s	1.240s	1.435s	1.620s	1.799s
51.000	0.282s	0.550s	0.800s	1.029s	1.240s	1.436s	1.622s	1.801s
52.000	0.281s	0.550s	0.799s	1.029s	1.241s	1.438s	1.623s	1.803s
53.000	0.280s	0.549s	0.798s	1.029s	1.241s	1.439s	1.625s	1.804s
54.000	0.280s	0.548s	0.798s	1.028s	1.242s	1.440s	1.626s	1.806s
55.000	0.279s	0.547s	0.797s	1.028s	1.242s	1.440s	1.628s	1.808s
56.000	0.278s	0.546s	0.796s	1.028s	1.242s	1.441s	1.629s	1.810s
57.000	0.277s	0.545s	0.795s	1.027s	1.242s	1.442s	1.630s	1.812s
58.000	0.277s	0.543s	0.794s	1.027s	1.242s	1.443s	1.632s	1.813s
59.000	0.276s	0.542s	0.793s	1.026s	1.242s	1.444s	1.633s	1.815s
60.000	0.275s	0.541s	0.792s	1.026s	1.242s	1.444s	1.634s	1.817s
61.000	0.274s	0.540s	0.791s	1.025s	1.242s	1.445s	1.636s	1.819s
62.000	0.273s	0.539s	0.790s	1.024s	1.242s	1.445s	1.637s	1.821s
63.000	0.273s	0.538s	0.789s	1.024s	1.242s	1.446s	1.638s	1.822s
64.000	0.272s	0.536s	0.788s	1.023s	1.242s	1.446s	1.639s	1.824s
65.000	0.271s	0.535s	0.787s	1.022s	1.242s	1.447s	1.640s	1.826s
66.000	0.270s	0.534s	0.785s	1.021s	1.241s	1.447s	1.641s	1.827s
67.000	0.269s	0.533s	0.784s	1.020s	1.241s	1.448s	1.642s	1.829s
68.000	0.269s	0.532s	0.783s	1.020s	1.241s	1.448s	1.643s	1.830s
69.000	0.268s	0.530s	0.782s	1.019s	1.241s	1.448s	1.644s	1.832s
70.000	0.267s	0.529s	0.781s	1.018s	1.240s	1.449s	1.645s	1.833s
Displ (MT)	45.000s	50.000s	55.000s	60.000s	65.000s	70.000s		
50.000	1.977s	2.149s	2.297s	2.418s	2.505s	2.551s		
51.000	1.979s	2.149s	2.295s	2.415s	2.500s	2.547s		
52.000	1.981s	2.150s	2.293s	2.411s	2.496s	2.542s		
53.000	1.983s	2.150s	2.291s	2.408s	2.491s	2.537s		
54.000	1.985s	2.150s	2.289s	2.404s	2.487s	2.533s		
55.000	1.987s	2.150s	2.287s	2.400s	2.482s	2.528s		
56.000	1.988s	2.150s	2.285s	2.397s	2.478s	2.523s		
57.000	1.990s	2.149s	2.283s	2.393s	2.473s	2.519s		
58.000	1.991s	2.149s	2.281s	2.389s	2.468s	2.514s		
59.000	1.992s	2.149s	2.279s	2.385s	2.464s	2.509s		
60.000	1.993s	2.148s	2.277s	2.381s	2.459s	2.504s		
61.000	1.995s	2.147s	2.274s	2.377s	2.454s	2.499s		
62.000	1.995s	2.147s	2.272s	2.374s	2.449s	2.494s		
63.000	1.996s	2.146s	2.270s	2.370s	2.444s	2.489s		
64.000	1.997s	2.145s	2.267s	2.366s	2.439s	2.484s		
65.000	1.998s	2.144s	2.265s	2.362s	2.434s	2.479s		
66.000	1.998s	2.144s	2.263s	2.358s	2.429s	2.474s		
67.000	1.999s	2.143s	2.260s	2.354s	2.424s	2.469s		
68.000	1.999s	2.142s	2.258s	2.350s	2.419s	2.464s		
69.000	2.000s	2.140s	2.255s	2.346s	2.414s	2.459s		
70.000	2.000s	2.139s	2.253s	2.342s	2.409s	2.453s		

Water Specific Gravity = 1.025.

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena RIGHTING LEVERS AND CROSS CURVES OF STABILITY

EVEN KEEL

Cross Curves of Stability

Righting Arms(heel) for VCG = 0.00
Trim zero at heel = 0 (RA Trim = 0)

Displ (MT)	5.000s	10.000s	15.000s	20.000s	25.000s	30.000s	35.000s	40.000s
50.000	0.286s	0.558s	0.810s	1.041s	1.252s	1.448s	1.632s	1.809s
51.000	0.285s	0.556s	0.809s	1.040s	1.252s	1.449s	1.633s	1.811s
52.000	0.284s	0.555s	0.807s	1.039s	1.252s	1.450s	1.635s	1.812s
53.000	0.283s	0.554s	0.806s	1.039s	1.252s	1.450s	1.636s	1.814s
54.000	0.282s	0.553s	0.805s	1.038s	1.252s	1.451s	1.637s	1.815s
55.000	0.281s	0.551s	0.804s	1.037s	1.252s	1.451s	1.638s	1.817s
56.000	0.280s	0.550s	0.803s	1.036s	1.252s	1.452s	1.639s	1.818s
57.000	0.279s	0.548s	0.801s	1.035s	1.252s	1.452s	1.640s	1.820s
58.000	0.278s	0.547s	0.800s	1.034s	1.251s	1.452s	1.641s	1.821s
59.000	0.277s	0.546s	0.799s	1.034s	1.251s	1.453s	1.642s	1.823s
60.000	0.276s	0.544s	0.797s	1.033s	1.250s	1.453s	1.643s	1.824s
61.000	0.275s	0.543s	0.796s	1.032s	1.250s	1.453s	1.644s	1.826s
62.000	0.274s	0.541s	0.794s	1.030s	1.250s	1.453s	1.645s	1.827s
63.000	0.273s	0.540s	0.793s	1.029s	1.249s	1.453s	1.645s	1.829s
64.000	0.272s	0.538s	0.792s	1.028s	1.248s	1.454s	1.646s	1.830s
65.000	0.271s	0.537s	0.790s	1.027s	1.248s	1.454s	1.647s	1.831s
66.000	0.271s	0.536s	0.789s	1.026s	1.247s	1.454s	1.648s	1.833s
67.000	0.270s	0.534s	0.787s	1.025s	1.247s	1.454s	1.648s	1.834s
68.000	0.269s	0.533s	0.786s	1.024s	1.246s	1.454s	1.649s	1.835s
69.000	0.268s	0.531s	0.784s	1.023s	1.245s	1.454s	1.650s	1.836s
70.000	0.267s	0.530s	0.783s	1.022s	1.245s	1.454s	1.650s	1.837s
Displ (MT)	45.000s	50.000s	55.000s	60.000s	65.000s	70.000s		
50.000	1.985s	2.155s	2.302s	2.424s	2.510s	2.551s		
51.000	1.987s	2.155s	2.300s	2.420s	2.505s	2.546s		
52.000	1.988s	2.155s	2.298s	2.416s	2.500s	2.541s		
53.000	1.990s	2.155s	2.295s	2.412s	2.496s	2.537s		
54.000	1.991s	2.154s	2.293s	2.407s	2.491s	2.532s		
55.000	1.993s	2.154s	2.291s	2.403s	2.486s	2.527s		
56.000	1.994s	2.153s	2.288s	2.399s	2.480s	2.522s		
57.000	1.995s	2.153s	2.286s	2.395s	2.475s	2.518s		
58.000	1.996s	2.152s	2.283s	2.390s	2.470s	2.513s		
59.000	1.997s	2.152s	2.281s	2.386s	2.465s	2.508s		
60.000	1.998s	2.151s	2.278s	2.382s	2.459s	2.503s		
61.000	1.999s	2.150s	2.275s	2.378s	2.454s	2.498s		
62.000	2.000s	2.149s	2.273s	2.373s	2.448s	2.493s		
63.000	2.000s	2.148s	2.270s	2.369s	2.443s	2.488s		
64.000	2.001s	2.147s	2.267s	2.365s	2.437s	2.483s		
65.000	2.001s	2.146s	2.265s	2.360s	2.432s	2.478s		
66.000	2.002s	2.145s	2.262s	2.356s	2.426s	2.473s		
67.000	2.002s	2.144s	2.259s	2.352s	2.421s	2.468s		
68.000	2.002s	2.142s	2.257s	2.348s	2.416s	2.462s		
69.000	2.002s	2.141s	2.254s	2.344s	2.411s	2.456s		
70.000	2.002s	2.140s	2.251s	2.340s	2.405s	2.450s		

Water Specific Gravity = 1.025.

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena RIGHTING LEVERS AND CROSS CURVES OF STABILITY

INITIAL TRIM 0.2 MTR AFT

Cross Curves of Stability

Righting Arms(heel) for VCG = 0.00
Trim aft 0.200/19.900 at heel = 0 (RA Trim = 0)

Displ (MT)	5.000s	10.000s	15.000s	20.000s	25.000s	30.000s	35.000s	40.000s
50.000	0.288s	0.563s	0.818s	1.051s	1.265s	1.461s	1.645s	1.820s
51.000	0.287s	0.561s	0.816s	1.050s	1.264s	1.461s	1.646s	1.822s
52.000	0.286s	0.560s	0.815s	1.049s	1.264s	1.462s	1.647s	1.823s
53.000	0.284s	0.558s	0.813s	1.048s	1.263s	1.462s	1.647s	1.824s
54.000	0.283s	0.556s	0.812s	1.047s	1.262s	1.462s	1.648s	1.825s
55.000	0.282s	0.555s	0.810s	1.045s	1.262s	1.462s	1.649s	1.826s
56.000	0.281s	0.553s	0.808s	1.044s	1.261s	1.462s	1.649s	1.828s
57.000	0.280s	0.551s	0.807s	1.043s	1.260s	1.462s	1.650s	1.829s
58.000	0.279s	0.550s	0.805s	1.042s	1.260s	1.462s	1.650s	1.830s
59.000	0.278s	0.548s	0.803s	1.040s	1.259s	1.461s	1.651s	1.831s
60.000	0.277s	0.546s	0.802s	1.039s	1.258s	1.461s	1.652s	1.832s
61.000	0.276s	0.545s	0.800s	1.037s	1.257s	1.461s	1.652s	1.833s
62.000	0.275s	0.543s	0.798s	1.036s	1.256s	1.461s	1.652s	1.835s
63.000	0.274s	0.541s	0.796s	1.035s	1.256s	1.461s	1.653s	1.836s
64.000	0.273s	0.540s	0.795s	1.033s	1.255s	1.461s	1.653s	1.837s
65.000	0.272s	0.538s	0.793s	1.032s	1.254s	1.460s	1.654s	1.838s
66.000	0.271s	0.537s	0.791s	1.030s	1.253s	1.460s	1.654s	1.838s
67.000	0.270s	0.535s	0.790s	1.029s	1.252s	1.460s	1.655s	1.839s
68.000	0.269s	0.534s	0.788s	1.028s	1.251s	1.459s	1.655s	1.840s
69.000	0.268s	0.532s	0.786s	1.026s	1.250s	1.459s	1.655s	1.840s
70.000	0.267s	0.530s	0.785s	1.025s	1.249s	1.459s	1.656s	1.841s
Displ (MT)	45.000s	50.000s	55.000s	60.000s	65.000s	70.000s		
50.000	1.994s	2.161s	2.307s	2.428s	2.512s	2.548s		
51.000	1.995s	2.161s	2.304s	2.423s	2.507s	2.543s		
52.000	1.996s	2.160s	2.301s	2.418s	2.503s	2.538s		
53.000	1.997s	2.159s	2.299s	2.414s	2.498s	2.534s		
54.000	1.998s	2.159s	2.296s	2.409s	2.493s	2.529s		
55.000	1.999s	2.158s	2.293s	2.404s	2.487s	2.524s		
56.000	2.000s	2.157s	2.290s	2.400s	2.481s	2.519s		
57.000	2.001s	2.156s	2.287s	2.395s	2.475s	2.514s		
58.000	2.002s	2.156s	2.284s	2.390s	2.469s	2.509s		
59.000	2.003s	2.155s	2.281s	2.386s	2.463s	2.505s		
60.000	2.003s	2.153s	2.279s	2.381s	2.457s	2.500s		
61.000	2.004s	2.152s	2.276s	2.376s	2.451s	2.495s		
62.000	2.004s	2.151s	2.273s	2.371s	2.445s	2.490s		
63.000	2.005s	2.150s	2.270s	2.367s	2.440s	2.485s		
64.000	2.005s	2.149s	2.267s	2.362s	2.434s	2.480s		
65.000	2.005s	2.148s	2.264s	2.358s	2.428s	2.475s		
66.000	2.005s	2.146s	2.261s	2.353s	2.422s	2.469s		
67.000	2.005s	2.145s	2.258s	2.349s	2.417s	2.463s		
68.000	2.005s	2.143s	2.255s	2.345s	2.411s	2.457s		
69.000	2.005s	2.142s	2.252s	2.341s	2.406s	2.451s		
70.000	2.004s	2.140s	2.250s	2.337s	2.400s	2.444s		

Water Specific Gravity = 1.025.

FINAL INTACT STABILITY INFORMATION BOCKLET

MY Serena RIGHTING LEVERS AND CROSS CURVES OF STABILITY

INITIAL TRIM 0.4 MTR AFT

Cross Curves of Stability

Righting Arms(heel) for VCG = 0.00
Trim aft 0.400/19.900 at heel = 0 (RA Trim = 0)

Displ (MT)	5.000s	10.000s	15.000s	20.000s	25.000s	30.000s	35.000s	40.000s
50.000	0.289s	0.567s	0.825s	1.061s	1.276s	1.474s	1.658s	1.833s
51.000	0.288s	0.565s	0.823s	1.059s	1.275s	1.474s	1.658s	1.834s
52.000	0.287s	0.563s	0.821s	1.058s	1.274s	1.473s	1.659s	1.834s
53.000	0.285s	0.561s	0.819s	1.056s	1.273s	1.473s	1.659s	1.835s
54.000	0.284s	0.559s	0.817s	1.055s	1.272s	1.472s	1.659s	1.836s
55.000	0.283s	0.558s	0.815s	1.053s	1.271s	1.472s	1.659s	1.837s
56.000	0.282s	0.556s	0.813s	1.051s	1.270s	1.472s	1.660s	1.838s
57.000	0.281s	0.554s	0.811s	1.050s	1.269s	1.471s	1.660s	1.838s
58.000	0.279s	0.552s	0.809s	1.048s	1.268s	1.471s	1.660s	1.839s
59.000	0.278s	0.550s	0.807s	1.046s	1.266s	1.470s	1.660s	1.840s
60.000	0.277s	0.548s	0.805s	1.044s	1.265s	1.470s	1.660s	1.841s
61.000	0.276s	0.546s	0.803s	1.043s	1.264s	1.469s	1.660s	1.842s
62.000	0.275s	0.544s	0.801s	1.041s	1.263s	1.468s	1.660s	1.842s
63.000	0.274s	0.543s	0.799s	1.039s	1.262s	1.468s	1.661s	1.843s
64.000	0.273s	0.541s	0.797s	1.038s	1.261s	1.467s	1.661s	1.843s
65.000	0.272s	0.539s	0.795s	1.036s	1.259s	1.467s	1.661s	1.844s
66.000	0.271s	0.537s	0.793s	1.034s	1.258s	1.466s	1.661s	1.844s
67.000	0.270s	0.536s	0.792s	1.032s	1.257s	1.466s	1.661s	1.845s
68.000	0.269s	0.534s	0.790s	1.031s	1.256s	1.465s	1.661s	1.845s
69.000	0.268s	0.532s	0.788s	1.029s	1.254s	1.464s	1.661s	1.845s
70.000	0.267s	0.531s	0.786s	1.027s	1.253s	1.464s	1.661s	1.845s
Displ (MT)	45.000s	50.000s	55.000s	60.000s	65.000s	70.000s		
50.000	2.003s	2.167s	2.310s	2.430s	2.511s	2.543s		
51.000	2.004s	2.166s	2.307s	2.424s	2.506s	2.538s		
52.000	2.005s	2.165s	2.304s	2.419s	2.502s	2.533s		
53.000	2.006s	2.164s	2.301s	2.414s	2.496s	2.528s		
54.000	2.007s	2.163s	2.298s	2.409s	2.491s	2.524s		
55.000	2.007s	2.162s	2.294s	2.404s	2.485s	2.519s		
56.000	2.008s	2.161s	2.291s	2.399s	2.479s	2.514s		
57.000	2.009s	2.160s	2.288s	2.393s	2.473s	2.509s		
58.000	2.009s	2.159s	2.285s	2.388s	2.466s	2.504s		
59.000	2.009s	2.158s	2.282s	2.383s	2.460s	2.499s		
60.000	2.010s	2.156s	2.278s	2.378s	2.453s	2.494s		
61.000	2.010s	2.155s	2.275s	2.373s	2.447s	2.489s		
62.000	2.010s	2.154s	2.272s	2.368s	2.440s	2.484s		
63.000	2.010s	2.152s	2.269s	2.363s	2.434s	2.479s		
64.000	2.009s	2.150s	2.266s	2.359s	2.428s	2.473s		
65.000	2.009s	2.149s	2.263s	2.354s	2.422s	2.467s		
66.000	2.009s	2.147s	2.260s	2.350s	2.416s	2.461s		
67.000	2.008s	2.145s	2.257s	2.346s	2.410s	2.455s		
68.000	2.007s	2.144s	2.254s	2.341s	2.405s	2.448s		
69.000	2.007s	2.142s	2.251s	2.337s	2.399s	2.442s		
70.000	2.006s	2.140s	2.248s	2.333s	2.394s	2.435s		

Water Specific Gravity = 1.025.

7. INTACT STABILITY RESULTS

- 7.1. ARRIVAL CONDITION**
- 7.2. HALF LOADED CONDITION**
- 7.3. DEPARTURE CONDITION**

7. LOADING CONDITIONS

7.1. ARRIVAL CONDITION

The results of the intact stability calculations for the 10% - 10% condition are shown hereafter. Summarising these results in terms of static and dynamic stability requirements yields the following table.

Item	Design	Criteria ISO	Unit
Draught Fore *	1.675		m
Draught Aft *	1.540		m
Displacement	58.95		tonnes
R.A at 30 deg	0.324	0.02	m
Freeboard to downflooding point	1.372	1.32	m
Initial Stability	0.934		m
Pos righting lever	>90.00		deg
DFA = Down flooding angle	33.76	26.32	deg

* For the extreme draught add 290 mm

FINAL INTACT STABILITY INFORMATION BOCKET

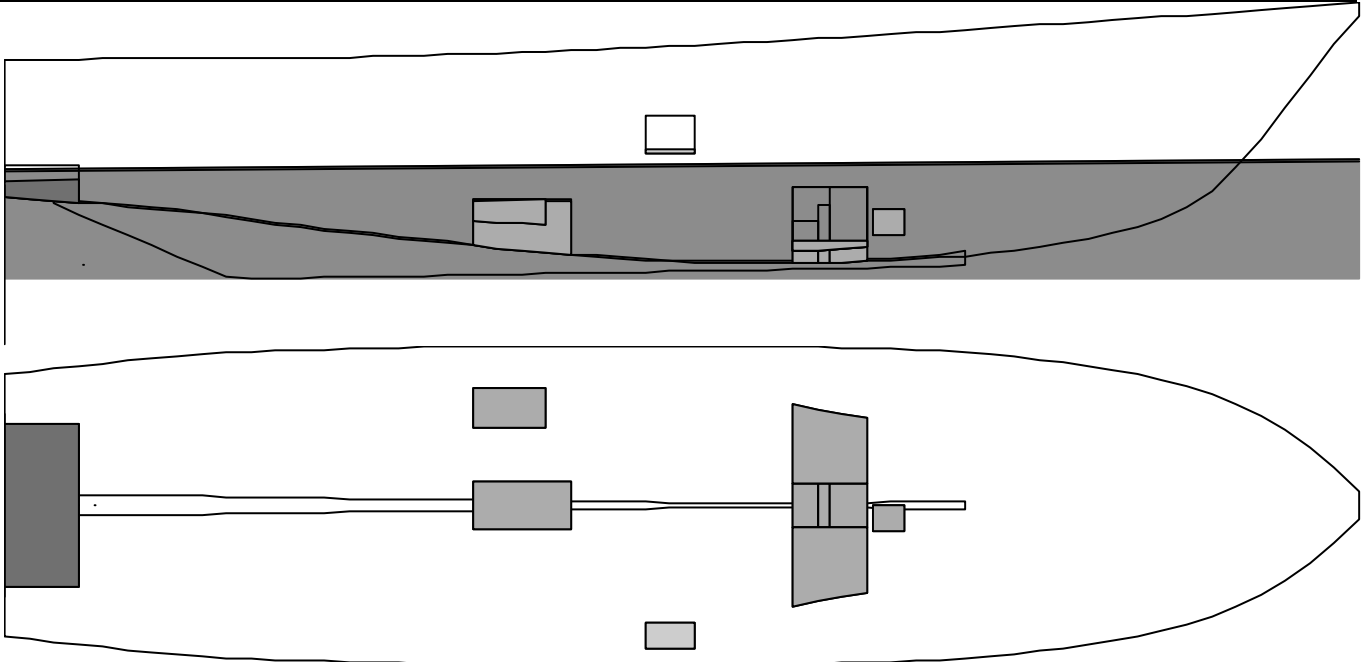
MY Serena Intact ARRIVAL CONDITION 10% FO - 10% FW

Floating Status

Draft FP	1.675 m	Heel	port 0.26 deg.	GM(Solid)	0.963 m
Draft MS	1.608 m	Equil	No	F/S Corr.	0.029 m
Draft AP	1.540 m	Wind	Off	GM(Fluid)	0.934 m
Trim	fwd 0.135/19.900	Wave	No	KMt	3.183 m
LCG	9.350f m	VCG	2.220 m	TPcm	0.78
Displacement	58.95 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	54.81	9.480f	0.000	2.250
Deadweight	4.14	7.637f	0.062p	1.830
Displacement	58.95	9.350f	0.004p	2.220



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		.60	13.63%
Misc.		.95	98.00%
FRESH WATER		.25	10.00%
LUBE OIL		.02	10.00%
SEWAGE		.20	98.01%

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	54.81	9.480f	0.000	2.250u
PERSONS AND EFFECTS	1.60	10.000f	0.000	2.200u
STORES	0.10	16.500f	0.000	1.600u
TENDER	0.43	0.000	0.000	5.200u
Total Fixed:	56.94	9.435f	0.000	2.270u

FINAL INTACT STABILITY INFORMATION BOCKLET

Tank Status

FUEL OIL (SpGr 0.840)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FUEL_TANK_AFT.	50.00%	0.60	0.639f	0.011p	1.245	1.45
Subtotals:	13.63%	0.60	0.639f	0.011p	1.245	1.45

Misc. (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
SUMP_AFT.C	98.00%	0.88	8.427f	0.000	0.667	0.06
SUMP_FWD.S	98.00%	0.08	14.350f	0.200s	0.696	0.00
Subtotals:	98.00%	0.95	8.907f	0.016s	0.670	0.06

FRESH WATER (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW.C	10.00%	0.25	13.378f	0.003p	0.285	0.17
Subtotals:	10.00%	0.25	13.378f	0.003p	0.285	0.17

LUBE OIL (SpGr 0.924)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
LO.S	10.00%	0.02	10.806f	2.091s	1.830	0.00
Subtotals:	10.00%	0.02	10.806f	2.091s	1.830	0.00

SEWAGE (SpGr 1.025)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
BLACK_WATER.P	98.01%	0.20	8.217f	1.519p	0.922	0.03
Subtotals:	98.01%	0.20	8.217f	1.519p	0.922	0.03

All Tanks

	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:	0.98%	2.01	6.951f	0.127p	0.828	1.72

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	58.95	9.358f	0.009p	1.127	1.000
SubTotals:			58.95	9.358f	0.009p	1.127	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540p, 3.070	1.449
(2) air intake guest staterooms	0.150f, 1.100p, 3.540	1.994
(3) galley exhaust	14.790f, 1.450p, 3.730	2.083
(4) air intake crew	19.600f, 1.500p, 3.800	2.120
(5) air intake guest bathrooms	9.800f, 2.000p, 3.570	1.954
(6) air exhaust guest bathrooms	3.600f, 1.200p, 3.380	1.810
(7) door wheelhouse aft	4.800f, 1.300p, 3.460	1.881
(8) door wheelhouse side	7.600f, 1.650p, 3.440	1.841
(9) sliding hatch crew entrance	18.300f, 0.300p, 4.030	2.364
(10) chainpipes	19.700f, 0.200p, 3.820	2.145

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)

Righting Arms vs Heel Angle

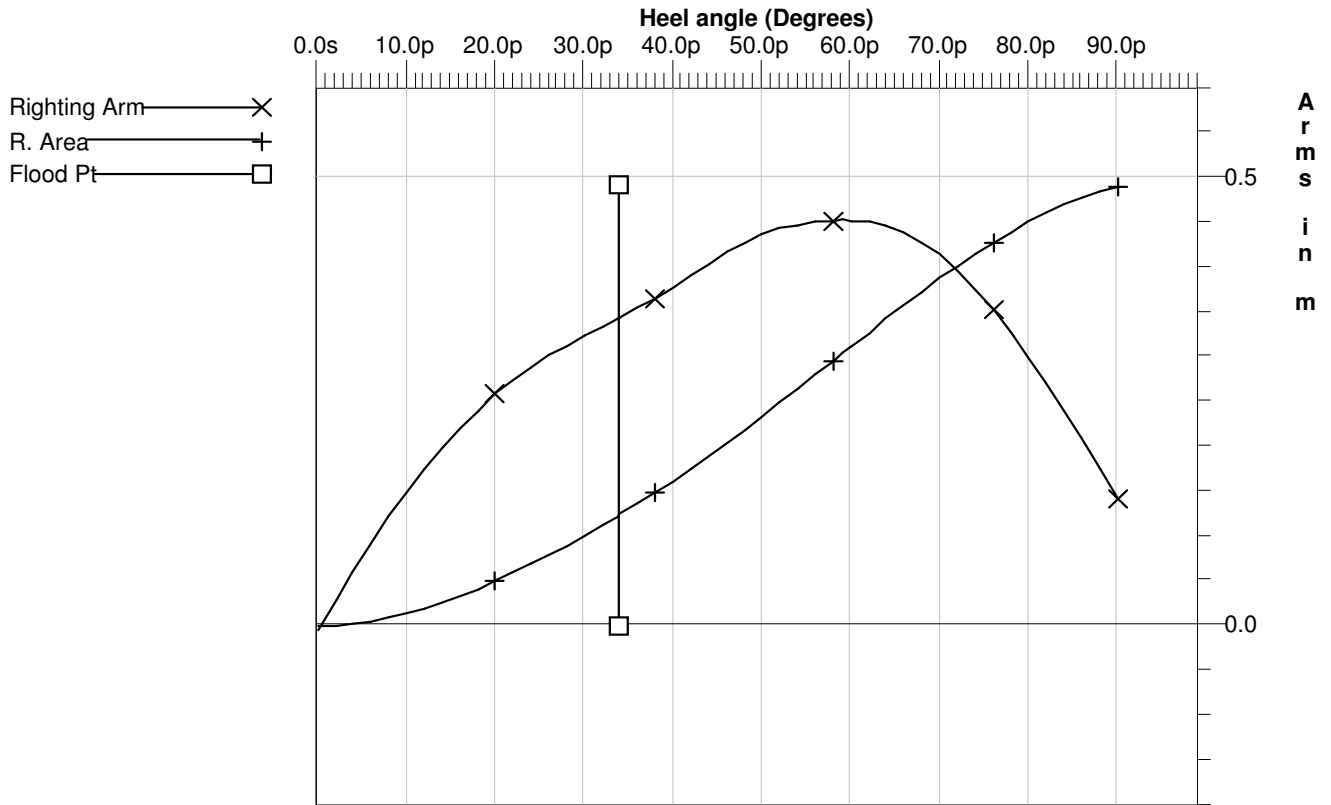
Heel Angle (deg)	Trim Angle (deg)	Origin Depth (m)	Righting Arm (m)	Area (m-Rad)	Flood Pt Height (m)	Notes
0.00	0.39f	1.540	-0.004	0.000	1.461 (1)	
2.00p	0.39f	1.539	0.028	0.000	1.372 (1)	
4.00p	0.39f	1.533	0.060	0.002	1.282 (1)	
6.00p	0.40f	1.524	0.091	0.005	1.192 (1)	
8.00p	0.42f	1.511	0.121	0.008	1.102 (1)	
10.00p	0.44f	1.493	0.149	0.013	1.012 (1)	
12.00p	0.46f	1.471	0.175	0.019	0.922 (1)	
14.00p	0.49f	1.445	0.199	0.025	0.832 (1)	
16.00p	0.53f	1.413	0.221	0.033	0.743 (1)	
18.00p	0.57f	1.378	0.240	0.041	0.655 (1)	
20.00p	0.62f	1.338	0.258	0.049	0.568 (1)	
22.00p	0.67f	1.294	0.274	0.059	0.481 (1)	
24.00p	0.73f	1.246	0.288	0.068	0.396 (1)	
26.00p	0.79f	1.195	0.301	0.079	0.312 (1)	
28.00p	0.84f	1.139	0.313	0.089	0.229 (1)	
30.00p	0.90f	1.080	0.324	0.101	0.148 (1)	
32.00p	0.96f	1.018	0.334	0.112	0.069 (1)	
33.76p	1.01f	0.961	0.343	0.122	0.000 (1)	FldPt
34.00p	1.02f	0.953	0.344	0.124	-0.009 (1)	
36.00p	1.08f	0.885	0.354	0.136	-0.085 (1)	
38.00p	1.13f	0.815	0.365	0.149	-0.160 (1)	
40.00p	1.18f	0.742	0.377	0.162	-0.232 (1)	
42.00p	1.22f	0.667	0.390	0.175	-0.302 (1)	
44.00p	1.26f	0.591	0.404	0.189	-0.370 (1)	
46.00p	1.28f	0.515	0.417	0.203	-0.437 (1)	
48.00p	1.31f	0.439	0.427	0.218	-0.504 (1)	
50.00p	1.33f	0.363	0.436	0.233	-0.570 (1)	
52.00p	1.34f	0.286	0.443	0.248	-0.635 (1)	
54.00p	1.35f	0.210	0.447	0.264	-0.700 (1)	
56.00p	1.36f	0.134	0.450	0.279	-0.764 (1)	
58.00p	1.37f	0.058	0.452	0.295	-0.827 (1)	
59.13p	1.37f	0.015	0.452	0.304	-0.863 (1)	MaxRa
60.00p	1.38f	-0.018	0.452	0.311	-0.890 (1)	
62.00p	1.38f	-0.094	0.450	0.327	-0.952 (1)	
64.00p	1.38f	-0.170	0.445	0.342	-1.012 (1)	
66.00p	1.39f	-0.247	0.438	0.358	-1.071 (1)	
68.00p	1.40f	-0.324	0.428	0.373	-1.129 (1)	
70.00p	1.40f	-0.401	0.414	0.388	-1.183 (1)	
72.00p	1.39f	-0.477	0.396	0.402	-1.235 (1)	
74.00p	1.37f	-0.552	0.375	0.415	-1.285 (1)	
76.00p	1.34f	-0.626	0.352	0.428	-1.333 (1)	
78.00p	1.30f	-0.698	0.327	0.440	-1.378 (1)	
80.00p	1.25f	-0.770	0.299	0.451	-1.420 (1)	
82.00p	1.20f	-0.840	0.270	0.461	-1.461 (1)	
84.00p	1.15f	-0.909	0.240	0.470	-1.499 (1)	
86.00p	1.08f	-0.977	0.208	0.477	-1.534 (1)	
88.00p	1.01f	-1.043	0.175	0.484	-1.567 (1)	
90.00p	0.94f	-1.108	0.141	0.490	-1.598 (1)	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540p, 3.070	1.461

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)



ISO REQUIREMENTS (ISO 12217-1)

Limit	Min/Max	Actual	Margin	Pass
(1) Righting Arm at 30.00 deg	>0.200 m	0.324	0.124	Yes
(2) Angle from 0.00 deg to Flood	>26.33 deg	33.76	7.43	Yes

Hydrostatic Properties

Draft is from Baseline.
 Trim: fwd 0.135/19.900, heel: port 0.26 deg., VCG = 2.220

LCF Draft (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m/cm)	GML (m)	GM(Fluid) (m)
1.598	58.955	9.358f	1.127	8.492f	0.776	0.915	30.891	0.934

Water Specific Gravity = 1.025.
 Trim is per 19.90m

FINAL INTACT STABILITY INFORMATION BOCKLET

7.2. HALF LOADED CONDITION

The results of the intact stability calculations for the half loaded condition are shown hereafter. Summarising these results in terms of static and dynamic stability requirements yields the following table.

Item	Design	Criteria ISO	Unit
Draught Fore *	1.703		m
Draught Aft *	1.571		m
Displacement	61.25		tonnes
R.A at 30 deg	0.336	0.02	m
Freeboard to downflooding point	1.432	1.32	m
Initial Stability	0.881		m
Pos righting lever	>90.00		deg
DFA = Down flooding angle	32.97	26.32	deg

* For the extreme draught add 290 mm

FINAL INTACT STABILITY INFORMATION BOCKLET

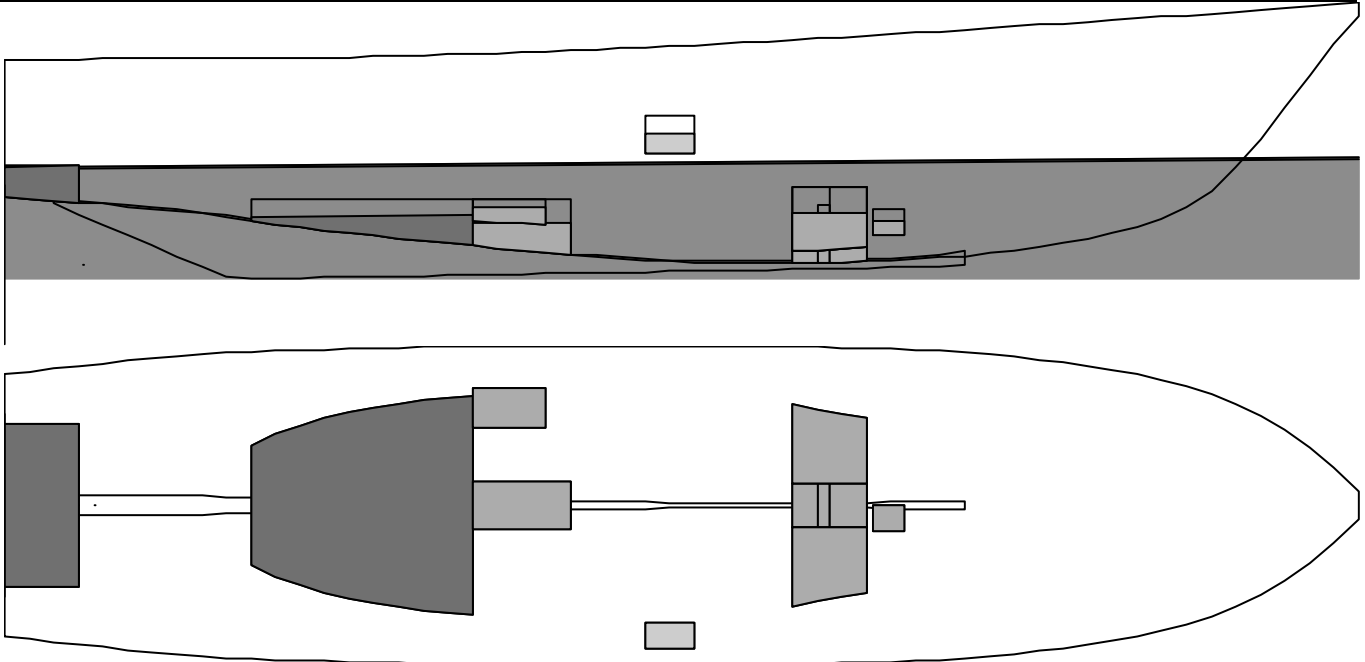
MY Serena Intact HALF LOADED CONDITION 50% FO - 50% FW

Floating Status

Draft FP	1.703 m	Heel	stbd 0.05 deg.	GM(Solid)	0.985 m
Draft MS	1.637 m	Equil	No	F/S Corr.	0.104 m
Draft AP	1.571 m	Wind	Off	GM(Fluid)	0.881 m
Trim	fwd 0.133/19.900	Wave	No	KMt	3.158 m
LCG	9.316f m	VCG	2.172 m	TPcm	0.78
Displacement	61.25 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	54.81	9.480f	0.000	2.250
Deadweight	6.44	7.918f	0.009s	1.512
Displacement	61.25	9.316f	0.000	2.172



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		2.19	49.99%
Misc.		.49	50.00%
FRESH WATER		1.23	50.00%
LUBE OIL		.09	50.00%
SEWAGE		.10	50.00%

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	54.81	9.480f	0.000	2.250u
PERSONS AND EFFECTS	1.60	10.000f	0.000	2.200u
STORES	0.30	16.500f	0.000	1.600u
TENDER	0.43	0.000	0.000	5.200u
Total Fixed:	57.14	9.460f	0.000	2.267u

FINAL INTACT STABILITY INFORMATION BOCKLET

Tank Status

FUEL OIL (SpGr 0.840)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FUEL_TANK_AFT.	98.00%	1.17	0.620f	0.001s	1.360	1.45
FUEL_TANK_FORE.	32.00%	1.02	6.447f	0.003s	0.672	3.08
Subtotals:	49.99%	2.19	3.333f	0.002s	1.040	4.53

Misc. (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
SUMP_AFT.C	50.00%	0.45	8.453f	0.000	0.486	0.06
SUMP_FWD.S	50.00%	0.04	14.351f	0.200s	0.600	0.00
Subtotals:	50.00%	0.49	8.931f	0.016s	0.496	0.06

FRESH WATER (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW.C	50.00%	1.23	13.395f	0.001s	0.576	1.76
Subtotals:	50.00%	1.23	13.395f	0.001s	0.576	1.76

LUBE OIL (SpGr 0.924)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
LO.S	50.00%	0.09	10.801f	2.092s	1.950	0.00
Subtotals:	50.00%	0.09	10.801f	2.092s	1.950	0.00

SEWAGE (SpGr 1.025)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
BLACK_WATER.P	50.00%	0.10	8.233f	1.465p	0.850	0.02
Subtotals:	50.00%	0.10	8.233f	1.465p	0.850	0.02

All Tanks

	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:	1.99%	4.11	7.309f	0.013s	0.851	6.38

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	61.25	9.323f	0.002s	1.145	1.000
SubTotals:			61.25	9.323f	0.002s	1.145	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.429
(2) air intake guest staterooms	0.150f, 1.100s, 3.540	1.967
(3) galley exhaust	14.790f, 1.450s, 3.730	2.059
(4) air intake crew	19.600f, 1.500s, 3.800	2.097
(5) air intake guest bathrooms	9.800f, 2.000s, 3.570	1.932
(6) air exhaust guest bathrooms	3.600f, 1.200s, 3.380	1.784
(7) door wheelhouse aft	4.800f, 1.300s, 3.460	1.856
(8) door wheelhouse side	7.600f, 1.650s, 3.440	1.817
(9) sliding hatch crew entrance	18.300f, 0.300s, 4.030	2.337
(10) chainpipes	19.700f, 0.200s, 3.820	2.118

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)

Righting Arms vs Heel Angle

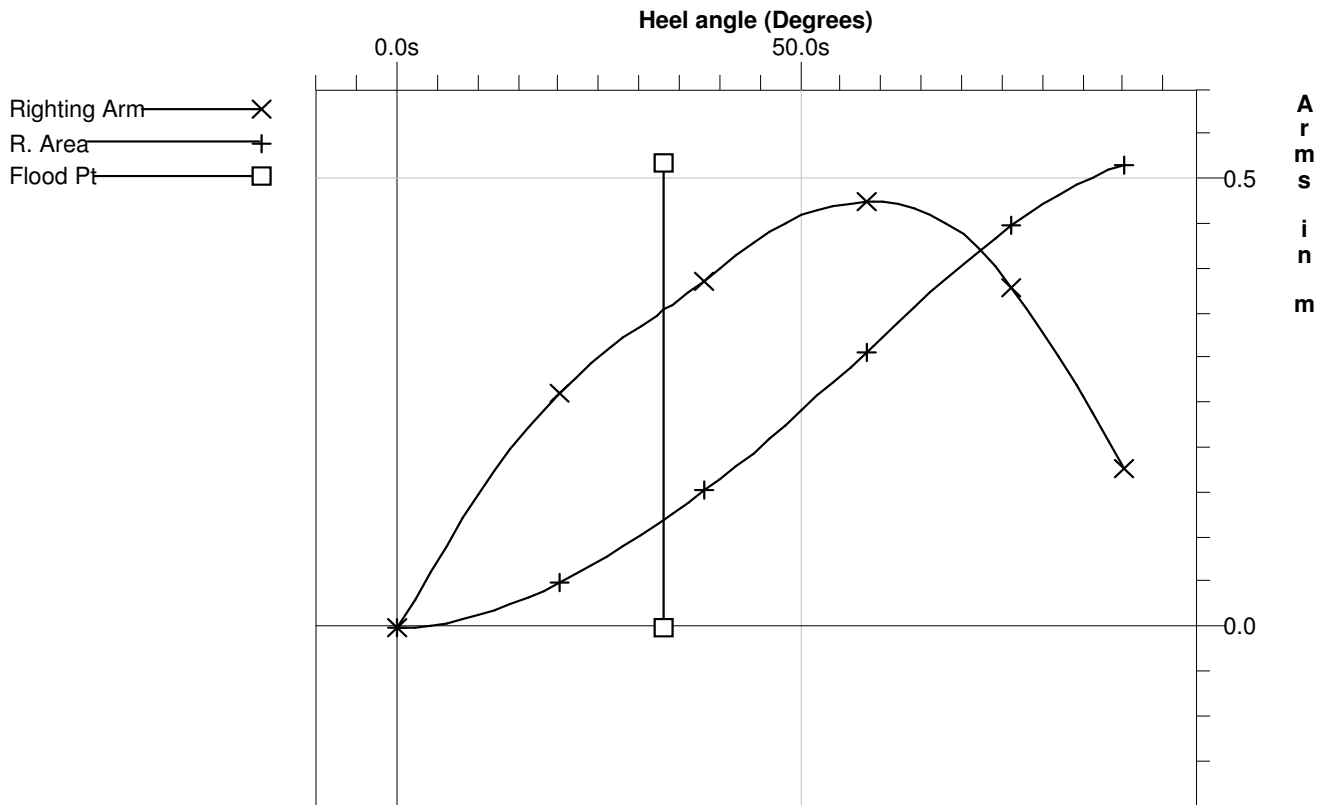
Heel Angle (deg)	Trim Angle (deg)	Origin Depth (m)	Righting Arm (m)	Area (m-Rad)	Flood Pt Height (m)	Notes
0.00	0.38f	1.571	-0.001	0.000	1.432 (1)	
2.00s	0.38f	1.569	0.030	0.001	1.343 (1)	
4.00s	0.39f	1.564	0.061	0.002	1.253 (1)	
6.00s	0.39f	1.555	0.092	0.005	1.163 (1)	
8.00s	0.40f	1.542	0.121	0.009	1.073 (1)	
10.00s	0.42f	1.526	0.149	0.013	0.982 (1)	
12.00s	0.44f	1.504	0.175	0.019	0.892 (1)	
14.00s	0.47f	1.479	0.199	0.025	0.802 (1)	
16.00s	0.50f	1.449	0.222	0.033	0.713 (1)	
18.00s	0.54f	1.414	0.242	0.041	0.625 (1)	
20.00s	0.58f	1.376	0.261	0.050	0.537 (1)	
22.00s	0.63f	1.333	0.279	0.059	0.451 (1)	
24.00s	0.68f	1.286	0.295	0.069	0.365 (1)	
26.00s	0.73f	1.235	0.309	0.080	0.281 (1)	
28.00s	0.78f	1.181	0.323	0.091	0.199 (1)	
30.00s	0.84f	1.123	0.336	0.102	0.117 (1)	
32.00s	0.89f	1.062	0.349	0.114	0.038 (1)	
32.97s	0.92f	1.031	0.354	0.120	0.000 (1)	FldPt
34.00s	0.95f	0.997	0.361	0.127	-0.040 (1)	
36.00s	1.00f	0.930	0.373	0.139	-0.116 (1)	
38.00s	1.05f	0.860	0.386	0.153	-0.190 (1)	
40.00s	1.09f	0.787	0.400	0.166	-0.262 (1)	
42.00s	1.13f	0.713	0.414	0.180	-0.332 (1)	
44.00s	1.16f	0.638	0.429	0.195	-0.400 (1)	
46.00s	1.19f	0.562	0.441	0.210	-0.468 (1)	
48.00s	1.21f	0.487	0.452	0.226	-0.535 (1)	
50.00s	1.23f	0.411	0.460	0.242	-0.601 (1)	
52.00s	1.24f	0.336	0.466	0.258	-0.667 (1)	
54.00s	1.25f	0.261	0.471	0.274	-0.732 (1)	
56.00s	1.25f	0.186	0.473	0.291	-0.796 (1)	
58.00s	1.25f	0.111	0.474	0.307	-0.860 (1)	
58.84s	1.25f	0.080	0.474	0.314	-0.887 (1)	MaxRa
60.00s	1.25f	0.037	0.474	0.324	-0.923 (1)	
62.00s	1.25f	-0.037	0.471	0.340	-0.986 (1)	
64.00s	1.25f	-0.111	0.467	0.357	-1.047 (1)	
66.00s	1.24f	-0.185	0.461	0.373	-1.107 (1)	
68.00s	1.25f	-0.261	0.451	0.389	-1.165 (1)	
70.00s	1.25f	-0.337	0.439	0.405	-1.221 (1)	
72.00s	1.23f	-0.412	0.422	0.420	-1.273 (1)	
74.00s	1.21f	-0.486	0.402	0.434	-1.324 (1)	
76.00s	1.18f	-0.558	0.380	0.448	-1.372 (1)	
78.00s	1.14f	-0.630	0.355	0.460	-1.418 (1)	
80.00s	1.10f	-0.701	0.329	0.472	-1.461 (1)	
82.00s	1.04f	-0.771	0.301	0.483	-1.502 (1)	
84.00s	0.99f	-0.839	0.272	0.493	-1.540 (1)	
86.00s	0.92f	-0.906	0.241	0.502	-1.576 (1)	
88.00s	0.85f	-0.972	0.209	0.510	-1.610 (1)	
90.00s	0.78f	-1.037	0.176	0.517	-1.641 (1)	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.432

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)



ISO REQUIREMENTS (ISO 12217-1)

Limit	Min/Max	Actual	Margin	Pass
(1) Righting Arm at 30.00 deg	>0.200 m	0.336	0.136	Yes
(2) Angle from 0.00 deg to Flood	>26.33 deg	32.97	6.64	Yes

Hydrostatic Properties

Draft is from Baseline.
 Trim: fwd 0.133/19.900, heel: stbd 0.05 deg., VCG = 2.172

LCF Draft (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m/cm)	GML (m)	GM(Fluid) (m)
1.627	61.245	9.323f	1.145	8.500f	0.782	0.925	30.044	0.881

Water Specific Gravity = 1.025.
 Trim is per 19.90m

FINAL INTACT STABILITY INFORMATION BOCKLET

7.3. DEPARTURE CONDITION

The results of the intact stability calculations for the fully loaded condition are shown hereafter. Summarising these results in terms of static and dynamic stability requirements yields the following table.

Item	Design	Criteria ISO	Unit
Draught Fore*	1.756		m
Draught Aft*	1.600		m
Displacement	64.36		tonnes
R.A at 30 deg	0.380	0.02	m
Freeboard to downflooding point	1.390	1.32	m
Initial Stability	0.884		m
Pos righting lever	>90.00		deg
DFA = Down flooding angle	31.88	26.32	deg

* For the extreme draught add 290 mm

FINAL INTACT STABILITY INFORMATION BOCKET

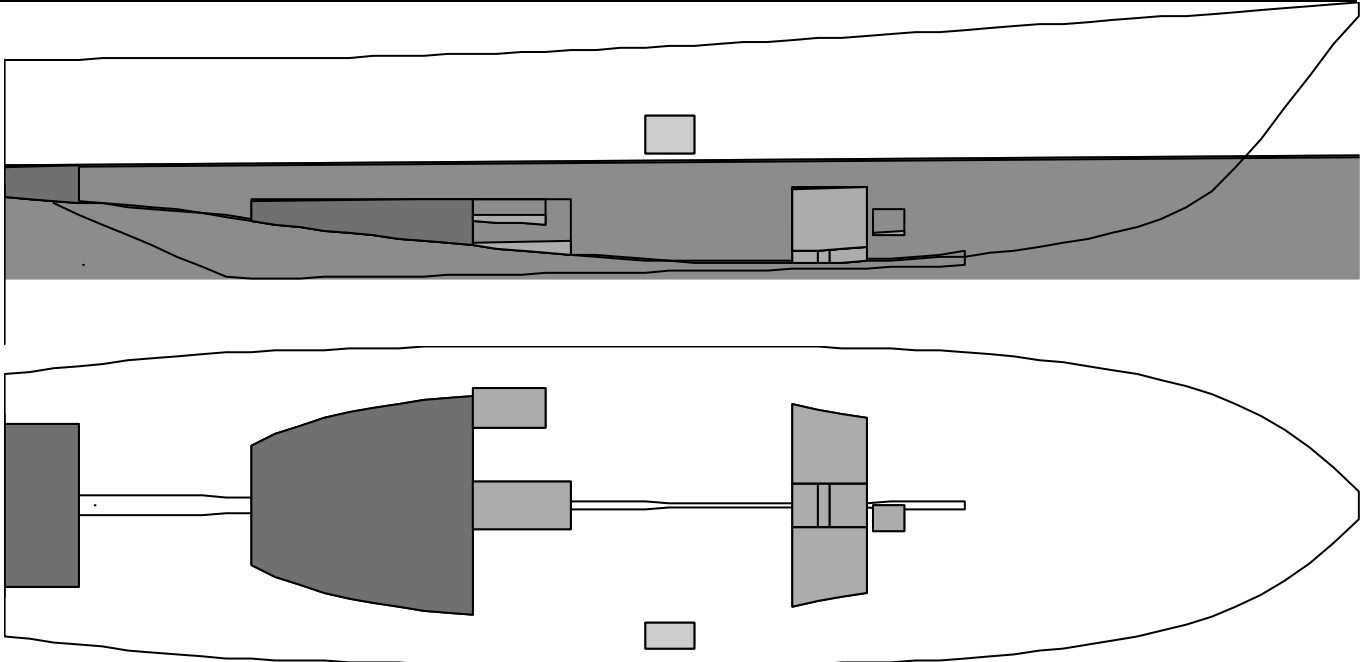
MY Serena Intact FULLY LOADED CONDITION 100% FO - 100% FW

Floating Status

Draft FP	1.756 m	Heel	stbd 0.36 deg.	GM(Solid)	1.003 m
Draft MS	1.678 m	Equil	No	F/S Corr.	0.119 m
Draft AP	1.600 m	Wind	Off	GM(Fluid)	0.884 m
Trim	fwd 0.156/19.900	Wave	No	KMt	3.124 m
LCG	9.311f m	VCG	2.121 m	TPcm	0.79
Displacement	64.36 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	54.81	9.480f	0.000	2.250
Deadweight	9.55	8.340f	0.043s	1.378
Displacement	64.36	9.311f	0.006s	2.121



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.30	98.00%
Misc.		.10	10.00%
FRESH WATER		2.42	98.00%
LUBE OIL		.18	100.00%
SEWAGE		.02	10.01%

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	54.81	9.480f	0.000	2.250u
PERSONS AND EFFECTS	1.60	10.000f	0.000	2.200u
STORES	0.50	16.500f	0.000	1.600u
TENDER	0.43	0.000	0.000	5.200u
Total Fixed:	57.34	9.485f	0.000	2.265u

FINAL INTACT STABILITY INFORMATION BOCKLET

Tank Status

FUEL OIL (SpGr 0.840)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FUEL_TANK_AFT.	98.00%	1.17	0.620f	0.008s	1.360	1.28
FUEL_TANK_FORE.	98.00%	3.13	6.135f	0.008s	0.840	3.67
Subtotals:	98.00%	4.30	4.632f	0.008s	0.981	4.95

Misc. (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
SUMP_AFT.C	10.00%	0.09	8.643f	0.003s	0.321	0.04
SUMP_FWD.S	10.00%	0.01	14.354f	0.202s	0.520	0.00
Subtotals:	10.00%	0.10	9.106f	0.019s	0.337	0.05

FRESH WATER (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW.C	98.00%	2.42	13.408f	0.007s	0.806	2.68
Subtotals:	98.00%	2.42	13.408f	0.007s	0.806	2.68

LUBE OIL (SpGr 0.924)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
LO.S	100.00%	0.18	10.800f	2.092s	2.100	0.00
Subtotals:	100.00%	0.18	10.800f	2.092s	2.100	0.00

SEWAGE (SpGr 1.025)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
BLACK_WATER.P	10.01%	0.02	8.292f	1.351p	0.756	0.00
Subtotals:	10.01%	0.02	8.292f	1.351p	0.756	0.00

All Tanks

	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:	3.40%	7.02	7.891f	0.058s	0.940	7.68

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	64.36	9.318f	0.012s	1.169	1.000
SubTotals:			64.36	9.318f	0.012s	1.169	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.374
(2) air intake guest staterooms	0.150f, 1.100s, 3.540	1.932
(3) galley exhaust	14.790f, 1.450s, 3.730	2.005
(4) air intake crew	19.600f, 1.500s, 3.800	2.037
(5) air intake guest bathrooms	9.800f, 2.000s, 3.570	1.880
(6) air exhaust guest bathrooms	3.600f, 1.200s, 3.380	1.744
(7) door wheelhouse aft	4.800f, 1.300s, 3.460	1.814
(8) door wheelhouse side	7.600f, 1.650s, 3.440	1.770
(9) sliding hatch crew entrance	18.300f, 0.300s, 4.030	2.284
(10) chainpipes	19.700f, 0.200s, 3.820	2.064

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)

Righting Arms vs Heel Angle

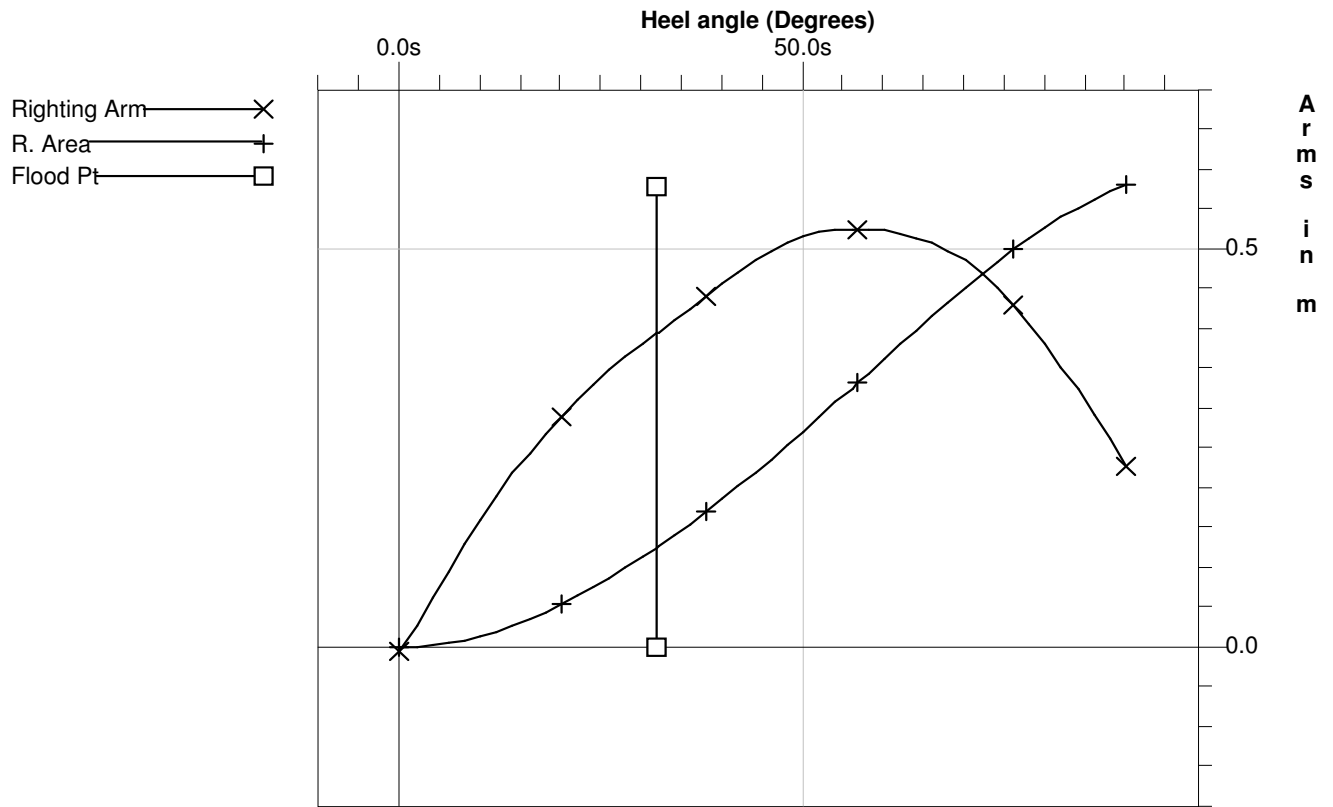
Heel Angle (deg)	Trim Angle (deg)	Origin Depth (m)	Righting Arm (m)	Area (m-Rad)	Flood Pt Height (m)	Notes
0.00	0.45f	1.600	-0.005	0.000	1.390 (1)	
2.00s	0.45f	1.599	0.027	0.000	1.301 (1)	
4.00s	0.45f	1.594	0.062	0.002	1.212 (1)	
6.00s	0.45f	1.586	0.096	0.005	1.121 (1)	
8.00s	0.46f	1.574	0.128	0.009	1.031 (1)	
10.00s	0.47f	1.558	0.160	0.014	0.940 (1)	
12.00s	0.49f	1.538	0.190	0.020	0.850 (1)	
14.00s	0.51f	1.513	0.218	0.027	0.760 (1)	
16.00s	0.54f	1.484	0.244	0.035	0.671 (1)	
18.00s	0.57f	1.451	0.268	0.044	0.582 (1)	
20.00s	0.61f	1.413	0.290	0.054	0.495 (1)	
22.00s	0.65f	1.372	0.311	0.064	0.408 (1)	
24.00s	0.69f	1.326	0.330	0.075	0.323 (1)	
26.00s	0.74f	1.276	0.347	0.087	0.239 (1)	
28.00s	0.79f	1.223	0.364	0.099	0.156 (1)	
30.00s	0.84f	1.166	0.380	0.112	0.075 (1)	
31.88s	0.88f	1.109	0.394	0.125	0.000 (1)	FldPt
32.00s	0.88f	1.105	0.395	0.126	-0.005 (1)	
34.00s	0.93f	1.042	0.410	0.140	-0.082 (1)	
36.00s	0.98f	0.975	0.424	0.155	-0.158 (1)	
38.00s	1.02f	0.906	0.440	0.170	-0.232 (1)	
40.00s	1.06f	0.834	0.456	0.185	-0.303 (1)	
42.00s	1.10f	0.760	0.472	0.201	-0.373 (1)	
44.00s	1.12f	0.686	0.486	0.218	-0.442 (1)	
46.00s	1.15f	0.612	0.498	0.235	-0.509 (1)	
48.00s	1.16f	0.537	0.508	0.253	-0.577 (1)	
50.00s	1.17f	0.463	0.515	0.271	-0.643 (1)	
52.00s	1.18f	0.389	0.520	0.289	-0.710 (1)	
54.00s	1.18f	0.315	0.524	0.307	-0.775 (1)	
56.00s	1.18f	0.241	0.525	0.325	-0.840 (1)	
56.66s	1.18f	0.217	0.525	0.331	-0.861 (1)	MaxRa
58.00s	1.18f	0.168	0.525	0.344	-0.905 (1)	
60.00s	1.17f	0.096	0.523	0.362	-0.968 (1)	
62.00s	1.16f	0.024	0.520	0.380	-1.031 (1)	
64.00s	1.15f	-0.048	0.514	0.398	-1.093 (1)	
66.00s	1.14f	-0.120	0.508	0.416	-1.154 (1)	
68.00s	1.14f	-0.193	0.498	0.434	-1.213 (1)	
70.00s	1.13f	-0.267	0.487	0.451	-1.270 (1)	
72.00s	1.12f	-0.341	0.471	0.468	-1.324 (1)	
74.00s	1.10f	-0.414	0.451	0.484	-1.376 (1)	
76.00s	1.07f	-0.486	0.430	0.499	-1.425 (1)	
78.00s	1.03f	-0.557	0.406	0.514	-1.472 (1)	
80.00s	0.99f	-0.627	0.380	0.527	-1.516 (1)	
82.00s	0.94f	-0.696	0.352	0.540	-1.557 (1)	
84.00s	0.88f	-0.764	0.323	0.552	-1.596 (1)	
86.00s	0.82f	-0.831	0.293	0.563	-1.633 (1)	
88.00s	0.75f	-0.897	0.261	0.572	-1.667 (1)	
90.00s	0.68f	-0.961	0.228	0.581	-1.699 (1)	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.390

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)



ISO REQUIREMENTS (ISO 12217-1)

Limit	Min/Max	Actual	Margin	Pass
(1) Righting Arm at 30.00 deg	>0.200 m	0.380	0.180	Yes
(2) Angle from 0.00 deg to Flood	>26.33 deg	31.88	5.55	Yes

Hydrostatic Properties

Draft is from Baseline.
 Trim: fwd 0.156/19.900, heel: stbd 0.36 deg., VCG = 2.121

LCF Draft (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m/cm)	GML (m)	GM(Fluid) (m)
1.667	64.356	9.318f	1.169	8.527f	0.789	0.943	29.156	0.884

Water Specific Gravity = 1.025.
 Trim is per 19.90m

8. OTHER STABILITY CRITERIA

8. OTHER STABILITY CRITERIA

8.1 ANGLE OF HEEL DUE TO CROWDING OF GUESTS ON ONE SIDE

8.2 RESISTANCE TO WIND AND WAVES

8.3 MINIMUM FREEBOARD TO DOWNFLOODING POINT

8.4 DOWNFLOODING HEIGHT TEST

FINAL INTACT STABILITY INFORMATION BOCKLET

8.1 ANGLE OF HEEL DUE TO CROWDING OF GUESTS ON ONE SIDE

ISO 12217-1 6.2

These criteria can be summarised as follows:

- Max heel angle $\Phi_{O(R)} < 11.5 + (24 - L_H)^3 / 520 = 11.51^\circ$
- Residual freeboard $> 0.145B_H = 0.74\text{m}$

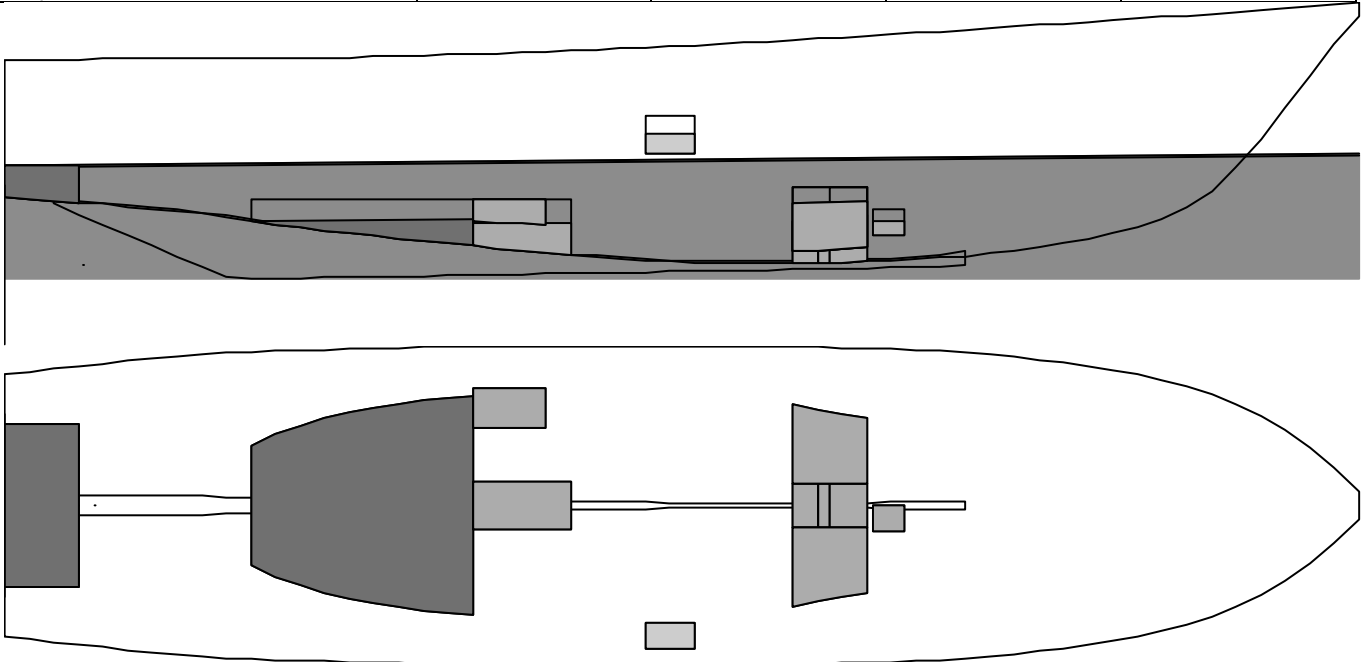
MY Serena Intact HALF LOADED CONDITION 50% FO - 50% FW + HEEL WEIGHT

Floating Status

Draft FP	1.763 m	Heel	stbd 11.38 deg.	GM(Solid)	0.742 m
Draft MS	1.678 m	Equil	No	F/S Corr.	0.056 m
Draft AP	1.594 m	Wind	Off	GM(Fluid)	0.686 m
Trim	fwd 0.166/19.900	Wave	No	KMt	2.987 m
LCG	9.308f m	VCG	2.260 m	TPcm	0.78
Displacement	65.66 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	54.81	9.480f	0.000	2.250
Deadweight	10.85	8.440f	0.988s	2.309
Displacement	65.66	9.308f	0.163s	2.260



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		2.19	49.99%
Misc.		.49	50.00%
FRESH WATER		1.23	50.00%
LUBE OIL		.09	50.00%
SEWAGE		.10	49.96%

FINAL INTACT STABILITY INFORMATION BOCKLET

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	54.81	9.480f	0.000	2.250u
HEEL WEIGHT	4.42	9.200f	2.200s	3.450u
PERSONS AND EFFECTS	1.60	10.000f	0.000	2.200u
STORES	0.30	16.500f	0.000	1.600u
TENDER	0.43	0.000	0.000	5.200u
Total Fixed:	61.56	9.441f	0.158s	2.352u

Tank Status

FUEL OIL (SpGr 0.840)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FUEL_TANK_AFT.	98.00%	1.17	0.618f	0.023s	1.360	0.01
FUEL_TANK_FORE.	32.00%	1.02	6.455f	0.553s	0.724	2.03
Subtotals:	49.99%	2.19	3.336f	0.270s	1.064	2.04

Misc. (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
SUMP_AFT.C	50.00%	0.45	8.454f	0.026s	0.489	0.06
SUMP_FWD.S	50.00%	0.04	14.351f	0.213s	0.601	0.00
Subtotals:	50.00%	0.49	8.932f	0.041s	0.498	0.06

FRESH WATER (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW.C	50.00%	1.23	13.390f	0.274s	0.603	1.55
Subtotals:	50.00%	1.23	13.390f	0.274s	0.603	1.55

LUBE OIL (SpGr 0.924)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
LO.S	50.00%	0.09	10.801f	2.102s	1.951	0.00
Subtotals:	50.00%	0.09	10.801f	2.102s	1.951	0.00

SEWAGE (SpGr 1.025)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
BLACK_WATER.P	49.96%	0.10	8.231f	1.428p	0.853	0.02
Subtotals:	49.96%	0.10	8.231f	1.428p	0.853	0.02

All Tanks

	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:	1.99%	4.10	7.309f	0.243s	0.873	3.67

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	65.66	9.301f	0.373s	1.216	1.000
SubTotals:			65.66	9.301f	0.373s	1.216	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.429
(2) air intake guest staterooms	0.150f, 1.100s, 3.540	1.967

FINAL INTACT STABILITY INFORMATION BOCKLET

(3) galley exhaust	14.790f, 1.450s, 3.730	2.059
(4) air intake crew	19.600f, 1.500s, 3.800	2.097
(5) air intake guest bathrooms	9.800f, 2.000s, 3.570	1.932
(6) air exhaust guest bathrooms	3.600f, 1.200s, 3.380	1.784
(7) door wheelhouse aft	4.800f, 1.300s, 3.460	1.856
(8) door wheelhouse side	7.600f, 1.650s, 3.440	1.817
(9) sliding hatch crew entrance	18.300f, 0.300s, 4.030	2.337
(10) chainpipes	19.700f, 0.200s, 3.820	2.118

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)

Righting Arms vs Heel Angle

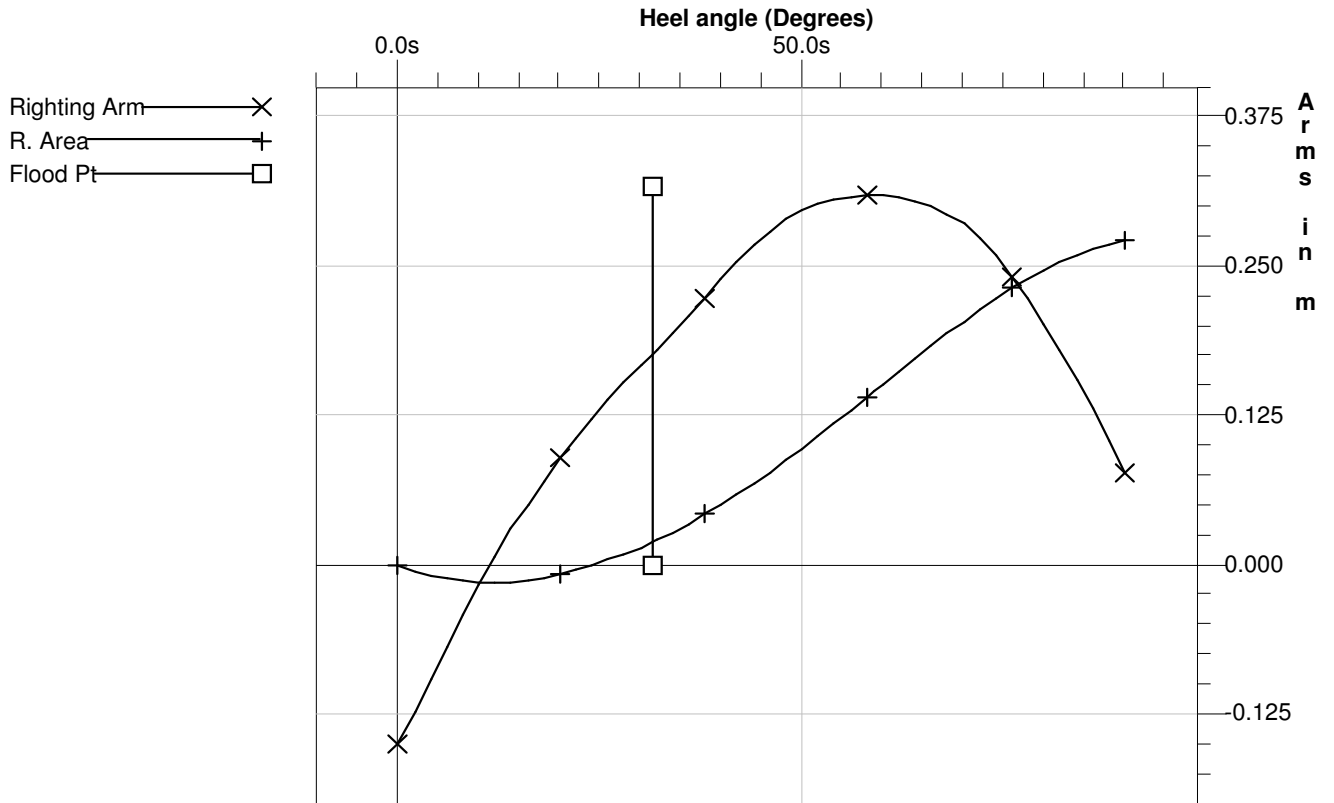
Heel Angle (deg)	Trim Angle (deg)	Origin Depth (m)	Righting Arm (m)	Area (m-Rad)	Flood Pt Height (m)	Notes
0.00	0.48f	1.613	-0.149	0.000	1.373 (1)	
2.00s	0.48f	1.611	-0.122	-0.005	1.284 (1)	
4.00s	0.48f	1.606	-0.095	-0.009	1.194 (1)	
6.00s	0.48f	1.598	-0.068	-0.011	1.104 (1)	
8.00s	0.49f	1.586	-0.042	-0.013	1.013 (1)	
10.00s	0.50f	1.571	-0.017	-0.014	0.923 (1)	
12.00s	0.51f	1.551	0.007	-0.014	0.833 (1)	
14.00s	0.53f	1.527	0.030	-0.014	0.743 (1)	
16.00s	0.56f	1.498	0.051	-0.012	0.653 (1)	
18.00s	0.59f	1.466	0.071	-0.010	0.565 (1)	
20.00s	0.62f	1.429	0.090	-0.007	0.477 (1)	
22.00s	0.66f	1.387	0.107	-0.004	0.390 (1)	
24.00s	0.70f	1.342	0.123	0.000	0.305 (1)	
26.00s	0.74f	1.293	0.139	0.005	0.221 (1)	
28.00s	0.79f	1.240	0.153	0.010	0.138 (1)	
30.00s	0.83f	1.184	0.167	0.015	0.057 (1)	
31.44s	0.87f	1.141	0.177	0.020	0.000 (1)	FldPt
32.00s	0.88f	1.124	0.181	0.021	-0.022 (1)	
34.00s	0.92f	1.061	0.195	0.028	-0.100 (1)	
36.00s	0.97f	0.995	0.209	0.035	-0.176 (1)	
38.00s	1.01f	0.926	0.223	0.042	-0.249 (1)	
40.00s	1.05f	0.854	0.239	0.051	-0.320 (1)	
42.00s	1.08f	0.781	0.254	0.059	-0.390 (1)	
44.00s	1.10f	0.707	0.268	0.068	-0.459 (1)	
46.00s	1.12f	0.634	0.280	0.078	-0.527 (1)	
48.00s	1.14f	0.560	0.289	0.088	-0.594 (1)	
50.00s	1.15f	0.486	0.297	0.098	-0.661 (1)	
52.00s	1.15f	0.412	0.302	0.108	-0.728 (1)	
54.00s	1.15f	0.339	0.306	0.119	-0.793 (1)	
56.00s	1.15f	0.266	0.308	0.130	-0.859 (1)	
58.00s	1.14f	0.194	0.309	0.141	-0.923 (1)	
58.87s	1.14f	0.163	0.310	0.145	-0.951 (1)	MaxRa
60.00s	1.13f	0.122	0.309	0.151	-0.987 (1)	
62.00s	1.12f	0.051	0.308	0.162	-1.050 (1)	
64.00s	1.10f	-0.020	0.304	0.173	-1.113 (1)	
66.00s	1.09f	-0.091	0.300	0.183	-1.174 (1)	
68.00s	1.08f	-0.163	0.294	0.194	-1.233 (1)	
70.00s	1.07f	-0.236	0.286	0.204	-1.291 (1)	
72.00s	1.06f	-0.309	0.275	0.214	-1.346 (1)	
74.00s	1.04f	-0.382	0.260	0.223	-1.398 (1)	
76.00s	1.01f	-0.453	0.242	0.232	-1.447 (1)	
78.00s	0.97f	-0.524	0.223	0.240	-1.494 (1)	
80.00s	0.93f	-0.594	0.202	0.247	-1.539 (1)	
82.00s	0.88f	-0.662	0.179	0.254	-1.581 (1)	
84.00s	0.82f	-0.730	0.156	0.260	-1.620 (1)	
86.00s	0.76f	-0.797	0.131	0.265	-1.657 (1)	
88.00s	0.69f	-0.862	0.105	0.269	-1.691 (1)	
90.00s	0.62f	-0.926	0.078	0.272	-1.723 (1)	

FINAL INTACT STABILITY INFORMATION BOCKLET

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.373

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)



8.2 RESISTANCE TO WIND AND WAVES

8.2.1 INTRODUCTION TO THE CALCULATIONS

The following part of this report presents the calculation of the resistance to wind and waves. The calculations were performed as described in ISO 12217-1, 6.2.

These criteria can be summarised as follows:

- Rolling in waves and wind area $A_2 > A_1$
- Righting moment at $\Phi=30^\circ > 7\text{kNm}$
- Righting arm at $\Phi=30^\circ > 0.2\text{m}$

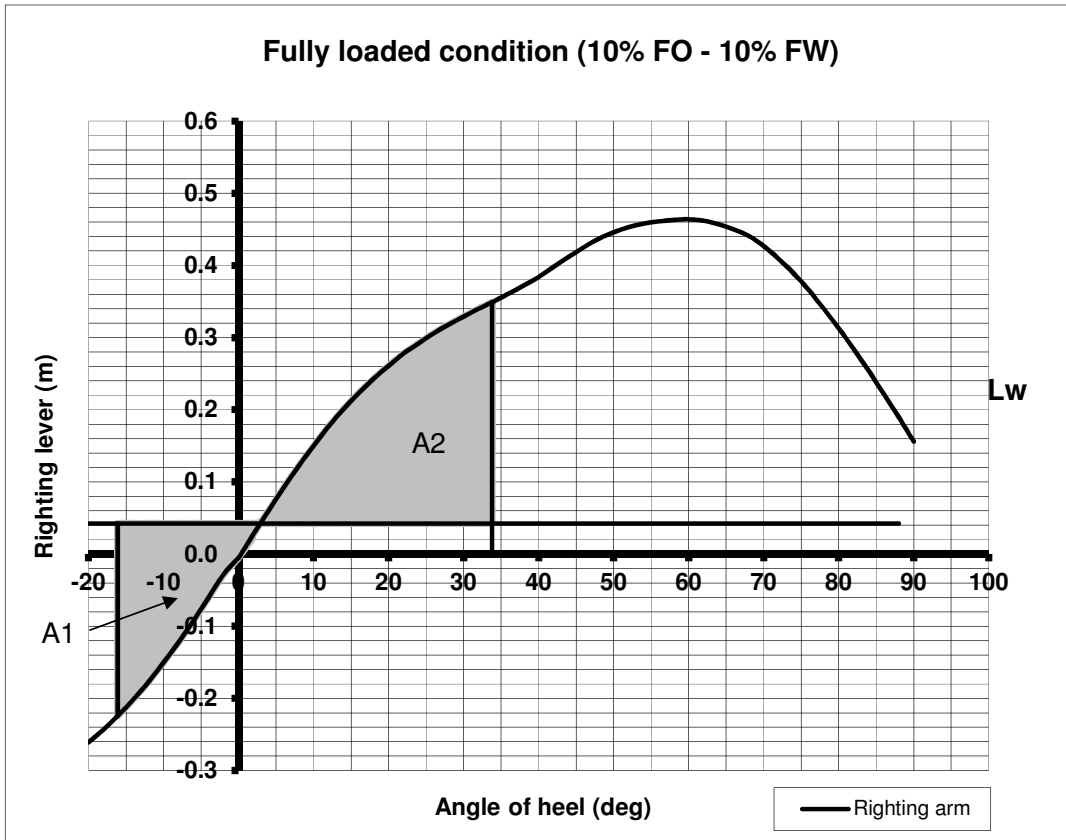
8.2.2 RESULTS OF THE CALCULATIONS

The results are presented for the light loaded, half loaded & fully loaded condition condition:

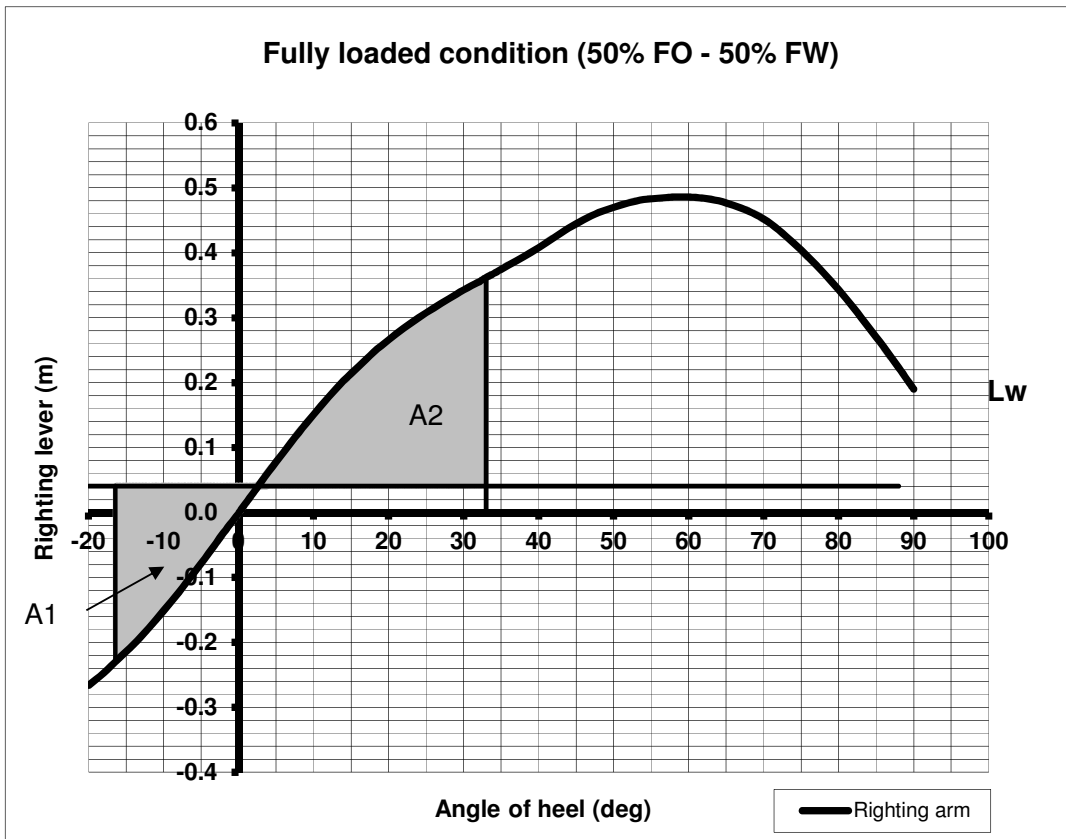
Resistance to wind and waves				
	Unit	100%-100%	50%-50%	10%-10%
Windspeed	m/s	21	21	21
loa	m	22.50	22.50	22.50
lwl = L	m	19.90	19.90	19.90
draft = d	m	1.68	1.64	1.61
displ	ton	64	61	59
A	m ²	63.1	63.1	63.1
DERIVED DATA				
Mw	N*m	24422	24468	24501
lw	m	0.039	0.041	0.042

FINAL INTACT STABILITY INFORMATION BOCKLET

LIGHT LOADED CONDITION: 10% FO- 10% FW

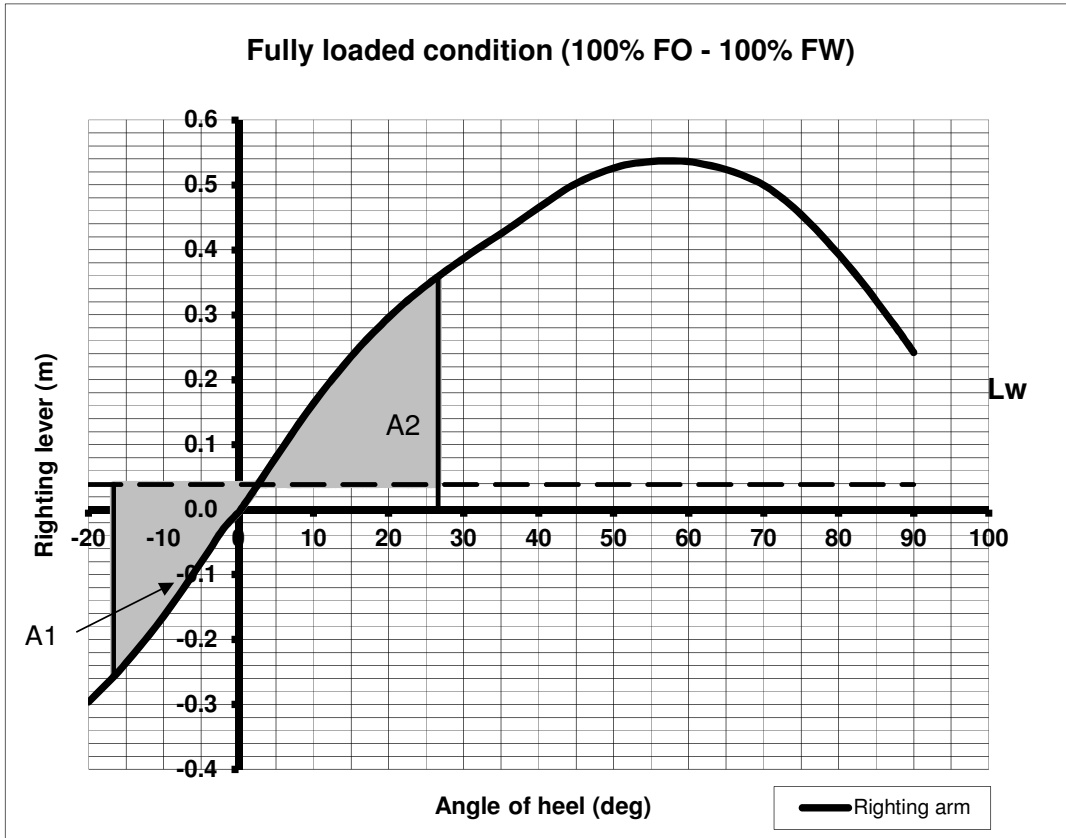


HALF LOADED CONDITION: 50% FO- 50% FW



FINAL INTACT STABILITY INFORMATION BOCKLET

FULLY LOADED CONDITION: 100% FO- 100% FW



8.3 MINIMUM FREEBOARD TO DOWNFLOODING POINT

Min freeboard to downflooding point			
Length hull	Lh	22.5	[m]
required freeboard height		1.32	[m]

FINAL INTACT STABILITY INFORMATION BOCKLET

8.4 DOWNFLOODING HEIGHT TEST

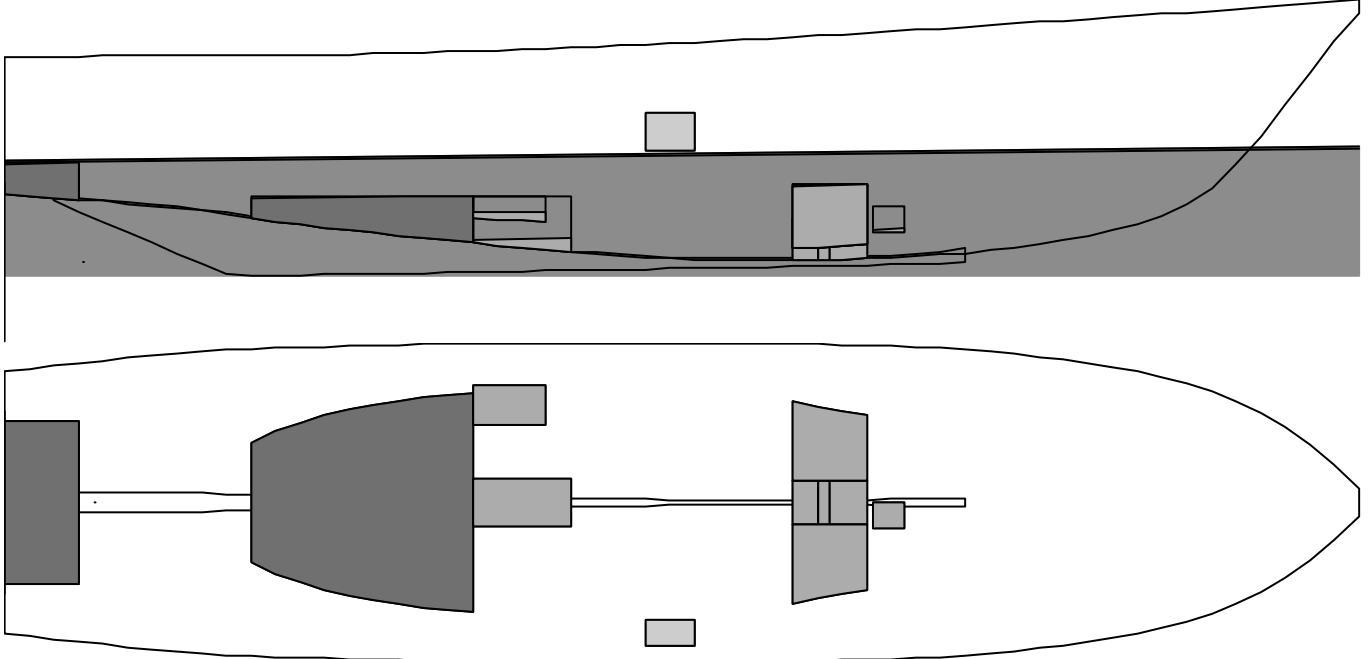
MY Serena Intact FULLY LOADED CONDITION 100% FO - 100% FW + ADDITIONAL WEIGHT

Floating Status

Draft FP	1.830 m	Heel	stbd 0.39 deg.	GM(Solid)	0.873 m
Draft MS	1.736 m	Equil	No	F/S Corr.	0.106 m
Draft AP	1.643 m	Wind	Off	GM(Fluid)	0.767 m
Trim	fwd 0.187/19.900	Wave	No	KMt	3.079 m
LCG	9.304f m	VCG	2.206 m	TPcm	0.80
Displacement	68.78 MT	WaterSpgr	1.025		

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	54.81	9.480f	0.000	2.250
Deadweight	13.97	8.613f	0.029s	2.034
Displacement	68.78	9.304f	0.006s	2.206



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
FUEL OIL		4.30	98.00%
Misc.		.10	10.00%
FRESH WATER		2.42	98.00%
LUBE OIL		.18	100.00%
SEWAGE		.02	10.01%

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	54.81	9.480f	0.000	2.250u
ADDITIONAL WEIGHT	4.42	9.200f	0.000	3.450u
PERSONS AND EFFECTS	1.60	10.000f	0.000	2.200u
STORES	0.50	16.500f	0.000	1.600u
TENDER	0.43	0.000	0.000	5.200u
Total Fixed:	61.76	9.464f	0.000	2.350u

FINAL INTACT STABILITY INFORMATION BOCKLET

Tank Status

FUEL OIL (SpGr 0.840)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FUEL_TANK_AFT.	98.00%	1.17	0.620f	0.008s	1.360	1.19
FUEL_TANK_FORE.	98.00%	3.13	6.137f	0.008s	0.840	3.37
Subtotals:	98.00%	4.30	4.633f	0.008s	0.981	4.56

Misc. (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
SUMP_AFT.C	10.00%	0.09	8.647f	0.003s	0.321	0.04
SUMP_FWD.S	10.00%	0.01	14.355f	0.202s	0.520	0.00
Subtotals:	10.00%	0.10	9.109f	0.019s	0.337	0.05

FRESH WATER (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
FW.C	98.00%	2.42	13.408f	0.008s	0.806	2.68
Subtotals:	98.00%	2.42	13.408f	0.008s	0.806	2.68

LUBE OIL (SpGr 0.924)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
LO.S	100.00%	0.18	10.800f	2.092s	2.100	0.00
Subtotals:	100.00%	0.18	10.800f	2.092s	2.100	0.00

SEWAGE (SpGr 1.025)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
BLACK_WATER.P	10.01%	0.02	8.295f	1.352p	0.756	0.00
Subtotals:	10.01%	0.02	8.295f	1.352p	0.756	0.00

All Tanks

	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	FSM (MT-m)
Totals:	3.40%	7.02	7.892f	0.058s	0.940	7.29

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	68.78	9.313f	0.013s	1.204	1.000
SubTotals:			68.78	9.313f	0.013s	1.204	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.429
(2) air intake guest staterooms	0.150f, 1.100s, 3.540	1.967
(3) galley exhaust	14.790f, 1.450s, 3.730	2.059
(4) air intake crew	19.600f, 1.500s, 3.800	2.097
(5) air intake guest bathrooms	9.800f, 2.000s, 3.570	1.932
(6) air exhaust guest bathrooms	3.600f, 1.200s, 3.380	1.784
(7) door wheelhouse aft	4.800f, 1.300s, 3.460	1.856
(8) door wheelhouse side	7.600f, 1.650s, 3.440	1.817
(9) sliding hatch crew entrance	18.300f, 0.300s, 4.030	2.337
(10) chainpipes	19.700f, 0.200s, 3.820	2.118

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)

Righting Arms vs Heel Angle

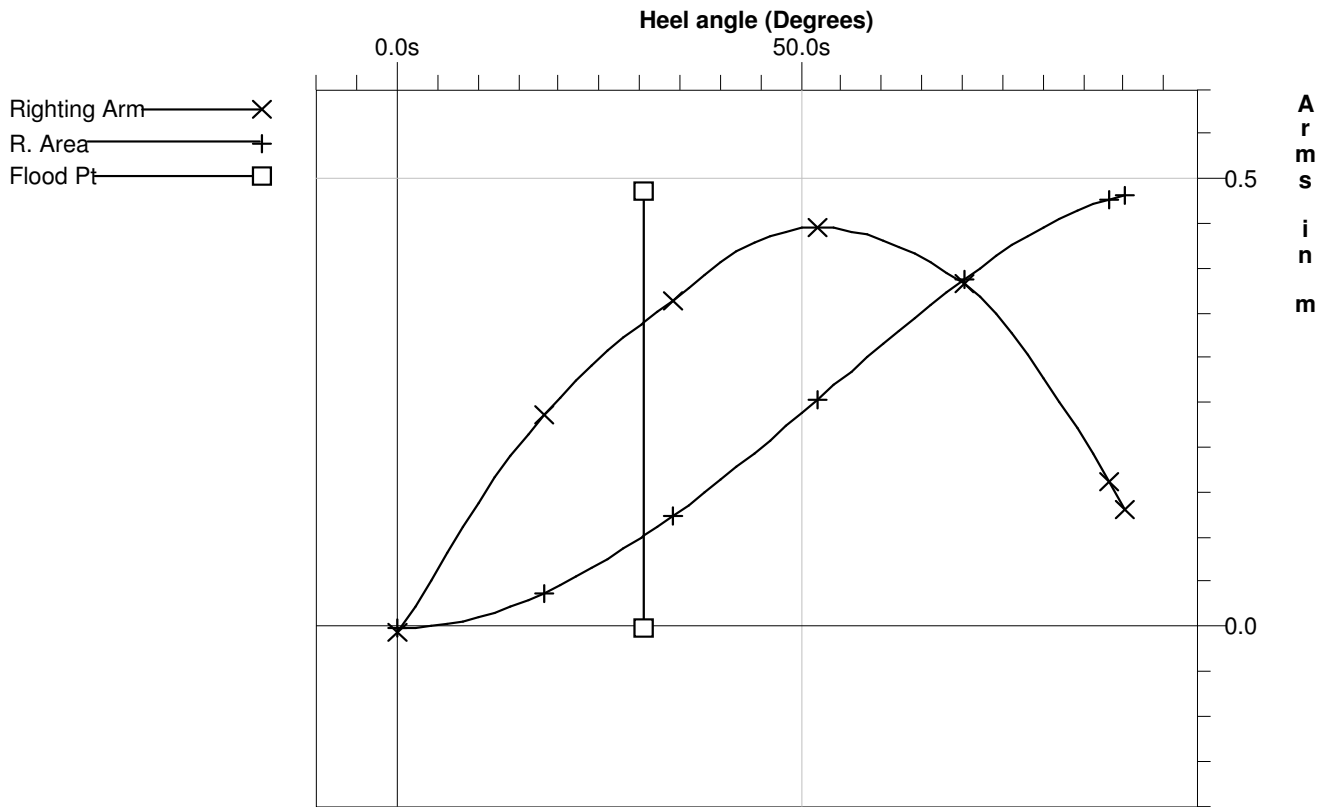
Heel Angle (deg)	Trim Angle (deg)	Origin Depth (m)	Righting Arm (m)	Area (m-Rad)	Flood Pt Height (m)	Notes
0.00	0.54f	1.643	-0.005	0.000	1.332 (1)	
2.00s	0.54f	1.641	0.023	0.000	1.243 (1)	
4.00s	0.54f	1.637	0.053	0.002	1.153 (1)	
6.00s	0.54f	1.629	0.083	0.004	1.063 (1)	
8.00s	0.54f	1.618	0.112	0.007	0.973 (1)	
10.00s	0.55f	1.603	0.140	0.012	0.882 (1)	
12.00s	0.56f	1.584	0.167	0.017	0.792 (1)	
14.00s	0.58f	1.561	0.192	0.023	0.702 (1)	
16.00s	0.60f	1.533	0.215	0.031	0.612 (1)	
18.00s	0.62f	1.501	0.237	0.038	0.523 (1)	
20.00s	0.65f	1.465	0.257	0.047	0.435 (1)	
22.00s	0.68f	1.425	0.276	0.056	0.349 (1)	
24.00s	0.72f	1.381	0.293	0.066	0.263 (1)	
26.00s	0.75f	1.333	0.309	0.077	0.179 (1)	
28.00s	0.79f	1.281	0.324	0.088	0.096 (1)	
30.00s	0.83f	1.225	0.338	0.099	0.015 (1)	
30.39s	0.84f	1.214	0.341	0.102	0.000 (1)	FldPt
32.00s	0.87f	1.166	0.352	0.111	-0.064 (1)	
34.00s	0.91f	1.104	0.365	0.124	-0.141 (1)	
36.00s	0.95f	1.039	0.379	0.137	-0.217 (1)	
38.00s	0.99f	0.971	0.393	0.150	-0.290 (1)	
40.00s	1.02f	0.900	0.407	0.164	-0.361 (1)	
42.00s	1.04f	0.828	0.419	0.179	-0.431 (1)	
44.00s	1.06f	0.756	0.430	0.194	-0.500 (1)	
46.00s	1.08f	0.683	0.437	0.209	-0.569 (1)	
48.00s	1.09f	0.610	0.443	0.224	-0.636 (1)	
50.00s	1.10f	0.537	0.445	0.240	-0.704 (1)	
52.00s	1.10f	0.483	0.446	0.255	-0.771 (1)	
54.00s	1.09f	0.393	0.445	0.271	-0.837 (1)	
56.00s	1.09f	0.321	0.442	0.286	-0.903 (1)	
58.00s	1.07f	0.251	0.438	0.302	-0.968 (1)	
60.00s	1.06f	0.180	0.432	0.317	-1.032 (1)	
62.00s	1.04f	0.110	0.425	0.332	-1.096 (1)	
64.00s	1.02f	0.041	0.417	0.346	-1.159 (1)	
66.00s	1.00f	-0.028	0.407	0.361	-1.220 (1)	
68.00s	0.98f	-0.097	0.396	0.375	-1.281 (1)	
70.00s	0.96f	-0.167	0.384	0.388	-1.339 (1)	
72.00s	0.95f	-0.239	0.368	0.402	-1.396 (1)	
74.00s	0.93f	-0.311	0.349	0.414	-1.449 (1)	
76.00s	0.90f	-0.382	0.328	0.426	-1.499 (1)	
78.00s	0.86f	-0.452	0.304	0.437	-1.547 (1)	
80.00s	0.82f	-0.521	0.278	0.447	-1.592 (1)	
82.00s	0.77f	-0.589	0.251	0.456	-1.635 (1)	
84.00s	0.71f	-0.656	0.223	0.465	-1.675 (1)	
86.00s	0.65f	-0.722	0.193	0.472	-1.713 (1)	
88.00s	0.58f	-0.787	0.162	0.478	-1.748 (1)	
90.00s	0.51f	-0.851	0.131	0.483	-1.780 (1)	

Unprotected Flood Points

Name	L,T,V (m)	Height (m)
(1) engine room air intake	10.150f, 2.540s, 3.070	1.332

FINAL INTACT STABILITY INFORMATION BOCKLET

Righting Arms vs. Heel - ISO REQUIREMENTS (ISO 12217-1)



ISO REQUIREMENTS (ISO 12217-1)

Limit	Min/Max	Actual	Margin	Pass
(1) Righting Arm at 30.00 deg	>0.200 m	0.338	0.138	Yes
(2) Angle from 0.00 deg to Flood	>26.33 deg	30.39	4.06	Yes

Hydrostatic Properties

Draft is from Baseline.
Trim: fwd 0.187/19.900, heel: stbd 0.39 deg., VCG = 2.206

LCF Draft (m)	Displ (MT)	LCB (m)	VCB (m)	LCF (m)	TPcm (MT/cm)	MTcm (MT-m/cm)	GML (m)	GM(Fluid) (m)
1.723	68.776	9.313f	1.204	8.565f	0.799	0.962	27.849	0.767

Water Specific Gravity = 1.025.
Trim is per 19.90m

Appendix I INCLINING REPORT

APPENDIX I INCLINING REPORT




DE VOOGT
NAVAL ARCHITECTS

**INCLINING TEST
CALCULATION**

**HULL NO 583
MY "SERENA"**

PRINCIPAL DIMENSIONS

Length OA 22.50 [m]
Length WL 19.90 [m]
Beam (moulded) 5.10 [m]
Depth (moulded) 3.25 [m]

 <p>De Voogt Naval Architects ZIJLWEG 148C - 2015 BJ HAARLEM - HOLLAND PHONE +31 (0)23 5247000 E-MAIL info@devoogtnavalarchitects.nl</p>		Revisions		Description	Author	Checked
		H				
<p>This calculation is protected by copyright and property of the designer. No part whatsoever may be copied reproduced or used in any manner without permission</p>		G				
		F				
<p>YACHT SERVICE NO. 328</p>		E				
		D				
<p>YARD De Vries Scheepsbouw</p>		C				
		B				
<p>CLASS/REGULATION</p>		A	4.5.2011	Summary incl fixed ballast	RWE	
		0	2.3.2011	Original Issue	RWE	
		Dwg/Calc No	TITLE			
		-	INCLINING TEST CALCULATION			

FINAL STABILITY INFORMATION BOCKLET

1. GENERAL DATA

1.1 MAIN DIMENSIONS

Length overall	22.50
Length waterline	19.90
Beam	5.10
Depth (mld)	3.25

1.2 REFERENCES

LCG	Relative to frame 0
TCG	Relative to CL, starboard is positive
VCG	Relative to baseline

1.3 ENVIRONMENTAL CONDITIONS:

Date:	17.2.2011
Location:	De Vries Makkum
Weather and wind:	light wind

1.4 WITNESSES OF INCLINING TEST:

Classification society:

Owner's representative:

1.5 INCLINING TEST PERFORMED BY:

De Voogt naval architects:

Shipyard

1.6 PENDULUMS:

Location pendulum 1:

Length of pendulum 1:

Location pendulum 2:

Length of pendulum 2:

1.7 DENSITY WATER:

Reading hydrometer:

1.8 GENERAL REMARKS:

- At the inclining test the yacht was floating freely with all mooring lines slack.

1.9 LOADING CONDITION DURING INCLINING TEST

- Yacht complete, except for the items as described in "to be added"
- Systems full
- Tank loading as reflected in "TANKS"

FINAL STABILITY INFORMATION BOCKLET

2. WEIGHTS

Location: Maindeck

	WEIGHT	
WEIGHT GROUP 1	150	[kg]
WEIGHT GROUP 2	150	[kg]
WEIGHT GROUP 3	150	[kg]
WEIGHT GROUP 4	150	[kg]
TOTAL WEIGHT	450	[kg]

WEIGHT SHIFTS

SHIFT 0		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	-1668	-0.25
WEIGHT GROUP 4	1668	0.25
TOTAL		0.00

SHIFT 1		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	1668	0.25
WEIGHT GROUP 4	1668	0.25
TOTAL		0.50

SHIFT 2		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	2058	0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	1668	0.25
WEIGHT GROUP 4	1668	0.25
TOTAL		1.12

SHIFT 3		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	1668	0.25
WEIGHT GROUP 4	1668	0.25
TOTAL		0.50

SHIFT 4		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	-1668	-0.25
WEIGHT GROUP 4	1668	0.25
TOTAL		0.00

SHIFT 5		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	-1668	-0.25
WEIGHT GROUP 4	-1668	-0.25
TOTAL		-0.50

SHIFT 6		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	-2058	-0.31
WEIGHT GROUP 3	-1668	-0.25
WEIGHT GROUP 4	-1668	-0.25
TOTAL		-1.12

SHIFT 7		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	-1668	-0.25
WEIGHT GROUP 4	-1668	-0.25
TOTAL		-0.50

SHIFT 8		
	DISTANCE OFF CL	MOMENT
	[mm]	[tonm]
WEIGHT GROUP 1	-2058	-0.31
WEIGHT GROUP 2	2058	0.31
WEIGHT GROUP 3	-1668	-0.25
WEIGHT GROUP 4	1668	0.25
TOTAL		0.00

FINAL STABILITY INFORMATION BOCKLET

3. Pendulums

PENDULUM 1

Location: Crew stair case
 Length: 2340 [mm]

DEFLECTIONS PENDULUM 1

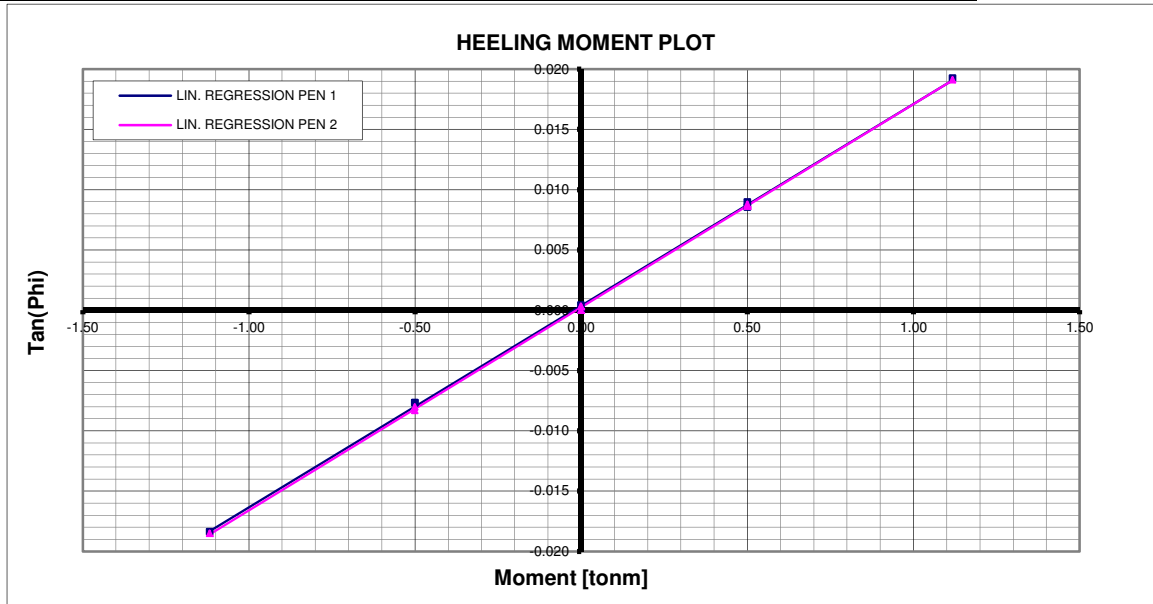
	Defl. rt last shift [mm]	Tot. deflection [mm]	Tan (Phi) [-]	Moment [tonm]
SHIFT 0	0	0	0.000	0.000
SHIFT 1	20	20	0.009	0.500
SHIFT 2	25	45	0.019	1.118
SHIFT 3	-24	21	0.009	0.500
SHIFT 4	-20	1	0.000	0.000
SHIFT 5	-19	-18	-0.008	-0.500
SHIFT 6	-25	-43	-0.018	-1.118
SHIFT 7	25	-18	-0.008	-0.500
SHIFT 8	18	0	0.000	0.000

PENDULUM 2

Location: Maindeck aft
 Length: 3243 [mm]

DEFLECTIONS PENDULUM 2

	Defl. rt last shift [mm]	Tot. deflection [mm]	Tan (Phi) [-]	Moment [tonm]
SHIFT 0	0	0.0	0.000	0.000
SHIFT 1	28	28.0	0.009	0.500
SHIFT 2	34	62.0	0.019	1.118
SHIFT 3	-34	28.5	0.009	0.500
SHIFT 4	-28	1.0	0.000	0.000
SHIFT 5	-28	-27.0	-0.008	-0.500
SHIFT 6	-33	-60.0	-0.019	-1.118
SHIFT 7	34	-26.0	-0.008	-0.500
SHIFT 8	27	1.0	0.000	0.000



FINAL STABILITY INFORMATION BOCKLET

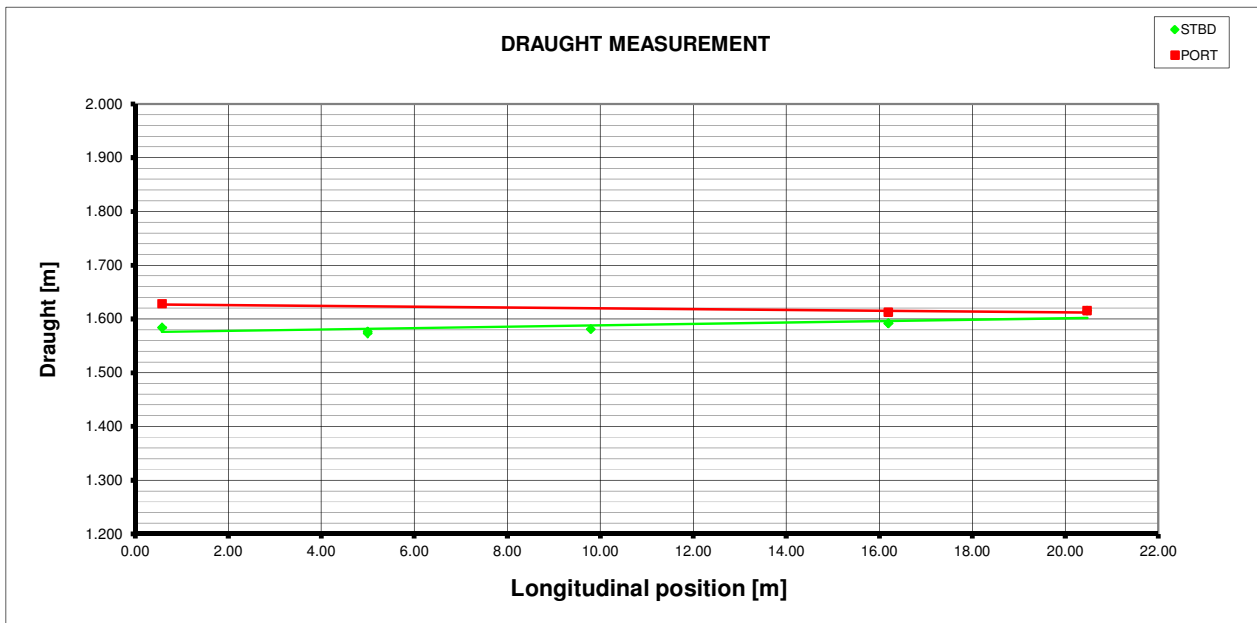
4. Draught measurement

STARBOARDSIDE DRAUGHTS

Location	Description mark	Location rt. Fr 0 [m]	Distance to WL [mm]	Height mark AB [mm]	Draught [m]
Fr. 2-220	top antifouling	0.58	45	1629	1.584
Fr. 2-220	top of blue boot top line	0.58	195	1779	1.584
Fr. 12.5	top antifouling	5.00	67	1643	1.576
Fr. 12.5	center scupper	5.00	20	1593	1.573
Fr. 24.5	top antifouling	9.80	73	1654	1.581
Fr. 40.5	top antifouling	16.20	75	1667	1.592
Fr. 40.5	scupper	16.20	75	1667	1.592
Fr. 51+70	top antifouling	20.48	65	1680	1.615

PORTSIDE DRAUGHTS

Location	Description mark	Location rt. Fr 0 [m]	Distance to WL [mm]	Height mark AB [mm]	Draught [m]
Fr. 2-220	top of blue boot top line	0.58	136	1764	1.628
Fr. 40.5	top antifouling	16.20	30	1642	1.612
Fr. 51+70	top antifouling	20.48	65	1680	1.615



CALCULATED (AVERAGED) DRAUGHTS FOR DETERMINING DISPLACEMENT

Description	Draft [m]	Long. Position [m]
Fr. 2-220	1.601	0.58
Fr. 40.5	1.606	16.20
Fr. 51+70	1.607	20.48

Location	Local beam at Draught measurement [m]	HEEL [deg]
Fr. 2-220	3.94	-0.749
Fr. 40.5	2.89	-0.381

HEEL ANGLE

-0.56 [deg] HEEL ANGLE IS TO PORTSIDE

DEVIATIONS TO MEASURED DRAUGHTS

Location	AVER. MEASURED (STBD & PORT) [m]	AVER. CALC. (STBD & PORT) [m]	DEVIATION [m]
Fr. 2-220	1.606	1.601	-0.005
Fr. 40.5	1.602	1.606	0.004
Fr. 51+70	1.615	1.607	-0.008

FINAL STABILITY INFORMATION BOCKLET

5. Inclined ship co Description

5.1 DATA USED FOR DERIVING DISPLACEMENT

DENSITY WATER 1.000 [kg/m³]

Description	Draft [m]	Long. Position [m]
Fr. 2-220	1.601	0.58
Fr. 40.5	1.606	16.20
Fr. 51+70	1.607	20.48

HEEL ANGLE -0.56 [deg] HEEL ANGLE IS TO PORTSIDE

5.2.1 DATA DERIVED FROM DRAFT MEASUREMENTS

Note: During draft measurements no person and no inclining weight on board

DISPLACEMENT 57.96 [tons]
 LCG 9.15 [m]
 KM 3.18 [m]

5.2.2 DATA DERIVED FROM DRAFT MEASUREMENTS WITH INCLINING CREW

DISPLACEMENT 58.26 [tons]
 LCG 9.14 [m]
 KM 3.18 [m]

5.3 METACENTRIC HEIGHT AND VERTICAL CENTRE OF GRAVITY OF INCLINED SHIP

Based on the deflections of the pendulums and the displacement the following GM values are derived

GM based on pendulum 1 1.027 [m]
 GM based on pendulum 2 1.019 [m]
GM averaged 1.023 [m]

KG inclined ship 2.161 [m] KG including free surface effects
 TCG -0.010 [m]

6. TANKS

	VOLUME [ltrs]	DENSITY [ton/m ³]	WEIGHT [kg]	LCG [m]	L-moment [kgm]	TCG [m]	T-moment [kgm]	VCG [m]	V-moment [kgm]	FSM [tonm]
Sump fwd	20	1.000	20	14.35	287	0.20	4	0.56	11	0.00
Fresh water	30	1.000	30	13.37	401	0.00	0	0.21	6	0.08
Sump aft	0	1.000	0	8.43	0	0.00	0	0.68	0	0.00
Black water	0	1.025	0	8.22	0	-1.52	0	0.92	0	0.00
Lube oil tank	0	0.924	0	10.80	0	2.09	0	2.10	0	0.00
Fuel Tank fore	3800	0.840	3192	6.12	19519	0.00	0	0.84	2681	0.00
Fuel Tank aft	1420	0.840	1193	0.62	737	0.00	0	1.36	1627	0.00
TOTAL			4435	4.72	20944	0.00	4	0.98	4326	0.08

FREE SURFACE CORRECTION 0.001 [m]

FINAL STABILITY INFORMATION BOCKLET

7. INCLINING CREW & WEIGHTS

7.1 INCLINING CREW/PERSONS ON BOARD

Description	WEIGHT [kg]	LCG [m]	L-moment [kgm]	TCG [m]	T-moment [kgm]	VCG [m]	V-moment [kgm]
maindeck aft	75	2.15	161	0.00	0	4.00	300
maindeck aft	75	5.15	386	0.00	0	4.00	300
wheelhouse	75	6.80	510	0.00	-1	3.80	285
crew stair case	75	14.00	1050	0.00	0	2.50	188
TOTAL	300	7.03	2108	0.00	-1	3.58	1073

7.2 INCLINING WEIGHTS

Description	WEIGHT [kg]	LCG [m]	L-moment [kgm]	TCG [m]	T-moment [kgm]	VCG [m]	V-moment [kgm]
WEIGHT GROUP 1	150	15.40	2310	-2.06	-309	3.64	546
WEIGHT GROUP 2	150	15.40	2310	2.06	309	3.64	546
WEIGHT GROUP 3	150	1.50	225	-1.67	-250	3.29	494
WEIGHT GROUP 4	150	1.50	225	1.67	250	3.29	494
TOTAL	600	8.45	5070	0.00	0	3.47	2079

8. TO BE SUBTRACTED

Description	WEIGHT [kg]	LCG [m]	L-moment [kgm]	TCG [m]	T-moment [kgm]	VCG [m]	V-moment [kgm]
fire ext sb gust stateroom	25	6.40	160	1.15	29	1.65	41
fire ext. Pantry	25	14.40	360	-0.40	-10	1.80	45
fire ext. Crew mess	25	15.40	385	0.50	13	1.80	45
			0		0		0
vacuum cleaner lounge	15	11.60	174	-1.15	-17	2.90	44
tools	15	6.10	92	-1.00	-15	3.50	53
fenders	63	10.00	630	-2.40	-151	4.10	258
			0		0		0
water in skeg	100	5.40	540	0.00	0	0.30	30
TOTAL	268	8.73	2341	-0.57	-152	1.92	516

FINAL STABILITY INFORMATION BOCKLET

9. TO BE ADDED

Description	WEIGHT [kg]	LCG [m]	L-moment [kgm]	TCG [m]	T-moment [kgm]	VCG [m]	V-moment [kgm]
Owner cabin							
chair	20	0.18	4	0.00	0	1.70	34
matress	112	2.40	269	0.00	0	1.60	179
carpet	20	3.20	64	0.00	0	1.25	25
guest stateroom ps							
matress	80	8.60	688	-1.20	-96	1.60	128
carpet	8	7.60	57	-1.20	-9	1.25	9
guest stateroom ps							
matress	80	8.60	688	1.20	96	1.60	128
carpet	8	7.60	57	1.20	9	1.25	9
carpet lowerdeck guest passage	11	5.60	60	0.00	0	1.25	14
crew area							
cushions crew mess	76	15.50	1178	1.05	80	2.00	152
maindeck outside							
cushions	20	5.10	102	-0.50	-10	3.70	74
chairs	30	3.70	111	-0.50	-15	3.70	111
wheelhouse							
captain chairs	80	8.36	669	-0.50	-40	4.00	320
cushions	70	6.25	438	-0.90	-63	3.80	266
lounge							
cushions with wooden backing	60	10.60	636	-1.00	-60	3.00	180
backrest	56	10.60	594	-1.20	-67	3.20	179
table	100	11.57	1157	-0.35	-35	3.20	320
chairs	80	12.30	984	-0.20	-16	3.20	256
Misc.							
tools	70	0.60	42	0.00	0	2.30	161
spare parts under guest floors	400	15.60	6240	0.00	0	1.10	440
fenders	70	10.00	700	0.00	0	4.00	280
pots and china	100	9.50	950	0.00	0	2.70	270
linen	50	9.50	475	0.00	0	2.00	100
charts books	80	9.50	760	0.00	0	4.40	352
safety equipment	70	9.50	665	0.00	0	4.00	280
	1750	10.05	17587	-0.13	-226	2.44	4268

FINAL STABILITY INFORMATION BOCKLET

10. SUMMARY

Description	WEIGHT [kg]	LCG [m]	L-moment [kgm]	TCG [m]	T-moment [kgm]	VCG [m]	V-moment [kgm]
Inclined ship	58260	9.135	532210	-0.0101	-587	2.161	125906
Tanks	-4435	4.72	-20944	0.00	-4	0.98	-4326
Subtotal uncorrected for FSM	<i>53825</i>	<i>9.499</i>	<i>511265</i>	<i>-0.011</i>	<i>-591</i>	<i>2.259</i>	<i>121581</i>
Free Surface Moment tanks						-0.001	-80
Subtotal corrected for FSM	<i>53825</i>	<i>9.499</i>	<i>511265</i>	<i>-0.011</i>	<i>-591</i>	<i>2.26</i>	<i>121507</i>
To be added	1750	10.05	17587	-0.13	-226	2.44	4268
To be subtracted	-268	8.73	-2341	-0.57	152	1.92	-516
Inclining weights	-600	8.45	-5070	0.00	0	3.47	-2079
Inclining crew	-300	7.03	-2108	0.00	1	3.58	-1073
LSW FROM INCLINING TEST	54407	9.55	519334	-0.012	-665	2.24	122107
FIXED BALLAST	400	27.23	10.4	2.350	940	2.75	1100
LSW INCLUDING FIXED BALLAST	54807	9.48	519345	0.005	275	2.25	123207

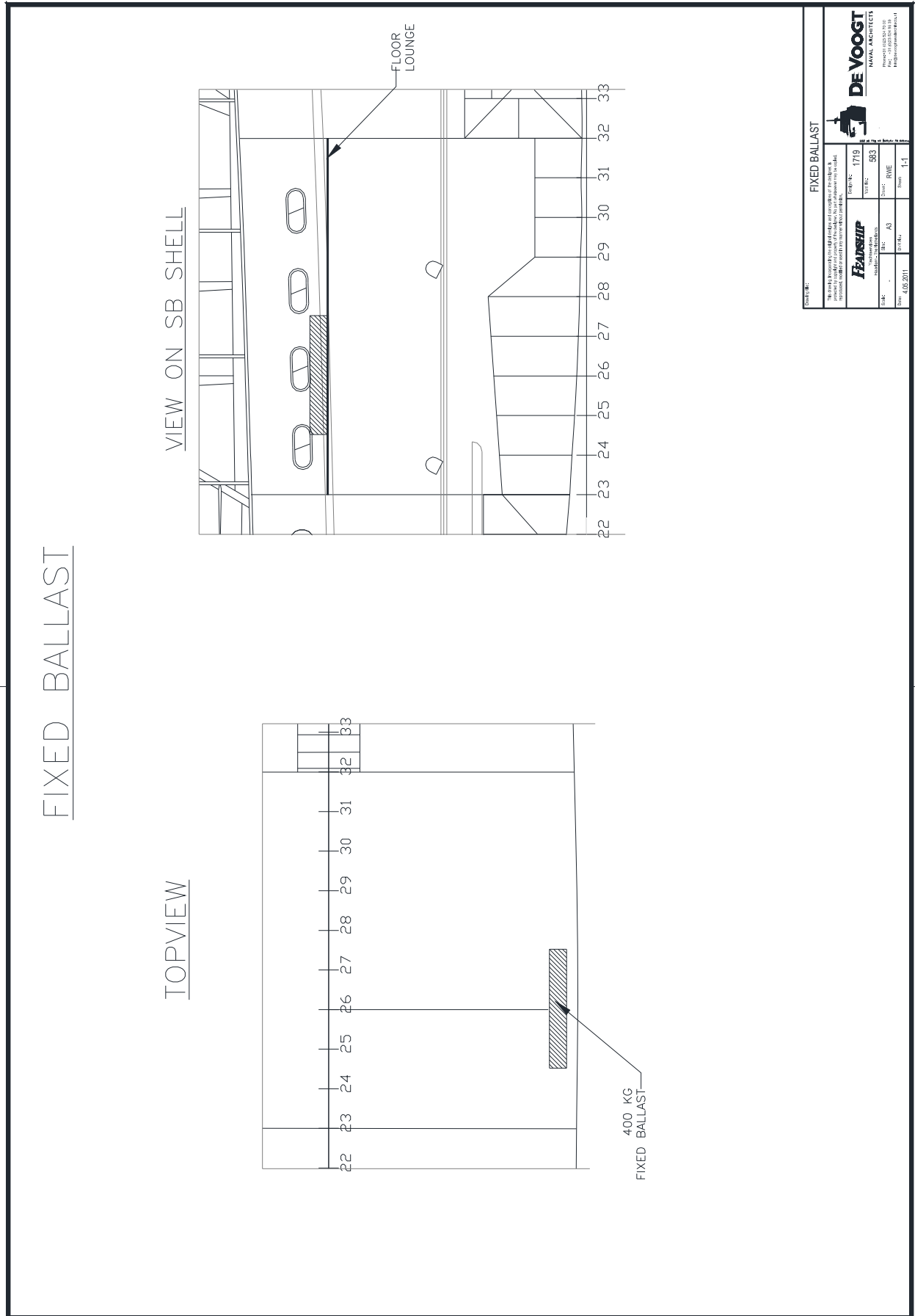
NOTE:

LSW excluding tender

LSW including spare parts, tools, linen, pots and china

Appendix II Location Fixed Ballast

APPENDIX II LOCATION FIXED BALLAST



FIXED BALLAST			
<small>The work is approved for use in the Netherlands. It is not approved for use in other countries. The user is responsible for the correct use of the information provided in this document.</small>			
FEARSHIP <small>NAVAL ARCHITECTS</small>	DRAWING: 1719	DE VOOGT <small>NAVAL ARCHITECTS</small>	
	DATE: 4/05/2011	YEAR: 583	PROJECT: 141
NAME: A3	DRAW: RWE	PROJECT: 141	

Appendix III Abbreviations and conversion tables

APPENDIX III ABBREVIATIONS AND CONVERSION TABLES

III.1 ABBREVIATION LIST

ABBR.	EXPLANATION	UNIT
(m)	Metres	m
(MT)	Metric tons	MT
BW	Black water	-
CoG	Centre of gravity	m
DFA	Down flooding angle	Deg
Disp	Displacement	MT
DLO	Dirty lubrication oil	-
Draft AP	Draft at aft perpendicular	m
Draft FP	Draft at forward perpendicular relative to baseline	m
Draft MS	Draft at forward perpendicular relative to baseline	m
Draught aft	Draught at aft perpendicular relative to baseline	m
Draught fore	Draught at forward perpendicular relative to baseline	m
F/S Corr	Free surface correction	m
FO	Fuel oil	-
FSM	Free surface moment	MTm
FW	Fresh water	-
G'M	Initial stability, metacentric height: distance from KG to metacenter corrected for free surface moment, identical to: GM (fluid)	m
GM	Initial stability, metacentric height: distance from KG to metacenter	m
GM (fluid)	Initial stability, metacentric height: distance from KG to metacenter corrected for free surface moment	m
GML	Longitudinal metacentric height	m
GW	Grey water	-
GZ	Same as righting arm (RA)	m
KMT	Distance from baseline to metacenter	m
LCB	Longitudinal centre of buoyancy relative to aft perpendicular	m
LCF	Longitudinal centre of floatation relative to aft perpendicular	m
LCG	Longitudinal centre of gravity relative to aft perpendicular	m
Length o.a.	Length overall	m
Length w.l.	Length waterline	m
LO	(Clean) lubrication oil	-
MaxRA	Maximum righting arm	m
mld	Moulded	m
MTcm	Required trim moment to obtain a trim change of 1 cm	MT-m/cm
Perm	Permeability	-
R. area	Righting area under righting arm curve	mrad
TCB	Transverse centre of buoyancy relative to centreline plane	m
TCG	Transverse centre of gravity relative to centre line plane	m
TPcm	Required weight to obtain a draught change of 1 cm	MT/cm
VCB	Vertical centre of buoyancy relative to baseline	m
VCG	Vertical centre of gravity (relative to baseline)	m
WT	Watertight	-

FINAL STABILITY INFORMATION BOCKLET

III.2 CONVERSION TABLE

All units as used in this report are in the SI-units (Systeme Internationale). The use of SI-units is strongly recommended. Below a conversion table is shown:

Multiply by	To convert from	To obtain	-
0.03937	Millimetres	Inches	25.400
0.3937	Centimetres	Inches	2.540
3.2808	Metres	Feet	0.3048
2.2046	Kilograms	Pounds	0.45359
0.0009842	Kilograms	Tons (2240 lbs)	1016.047
0.9842	Metric tons (i.e. tonnes of 1000 kilos)	Tons (2240 lbs)	1.016
2.4998	Metric tons per centimetre	Tons per inch (immersion)	0.400
8.2014	Moment to change trim one centimetre	Moment to change trim one inch	0.122
187.9767	Metre radians	Feet degrees	0.0053
0.26417	Litre	US Gallon	3.7854
0.21997	Litre	Gallon	4.5461
-	To obtain	To convert from	Multiply by the above