0340 Preliminary Stability Calculation Booklet

According ISO 12217-1

Jetten 38 Cabrio

6302 / Jetten Yachting

Index

Preface

The information presented in this report is based on a calculated Light Ship Weight, corresponding to Revision A of the Preliminary Weight Calculation. It contains the calculations made to show compliance with the stability criteria as known for design category C, as well as the hydrostatic properties and stability calculations.

Sneek, 21/06/2010

Identification And Approval

General information of the ship				
1	Ship's Name	-		
2	Type of ship	Jetten 38 Cabrio		
3	Name of builders	Jetten Yachting		
4	HIN code	-		
5	CE design Category	C		
6	Maximum load	1200 kg (including persons, excl. tanks)		
7	Crew Limit	8 persons		
8	Principal dimensions			
		Length hull	10.720	m
		Breadth hull	3.560	m

In order to obtain the light ship weight an inclining test will be held. The test has not been conducted yet, therefore the weights and their centres of mass have been estimated by means of a weight calculation.

Light Ship Particulars				
Item	Weight	LCG	TCG	VCG
	[kg]	[m]	[m]	[m]
Light ship	9837	4.546	0.000	1.393
Trimballast	###	#.###	#.###	#.###
Crew Limit (8 persons)	600	2.200	1.700	2.300
Maximum Total Load (pers. & tanks excl.)	600	5.000	0.000	1.300
Maximum Fuel Capacity	336	4.618	0.000	0.480
Maximum Fresh water Capacity	340	5.818	0.000	0.613

Note : All centres are measured from ship's origin

Based on the above mentioned data, the following information has become available :

Item		Weight	LCG	TCG	VCG
		[kg]	[m]	[m]	[m]
Minimum Operating mass	M_{MOC}	10003	4.526	0.000	1.408
Loaded displacement mass	M_{LDC}	11702	4.487	0.000	1.408

Note : All centres are measured from ship's origin
A detailed list of the loading conditions can be found in Appendix 1 – Loading Conditions.

Any opening that may admit water into the interior or bilge of a boat is defined as a down flooding point. Such openings are limiting the stability curves. The following down flooding points have been defined :

Down flooding points			
Item	Longitudinal position [m]	Transverse position [m]	Vertical position [m]
ER VENTILATION PS AND SB	2.970	1.700	1.767
ER VENTILATION PS AND SB	3.370	1.700	1.767
SILL TO INTERIOR	4.000	0.350	1.445

Note : All centres are measured from ship's origin

Stability Criteria

Down flooding height

According to ISO 12217-1 Chapter 6.1.2 sufficient freeboard margin has to be demonstrated before water is shipped on board. This test has to be conducted for the boat in the loaded displacement condition.

Criteria :

For category C :

HD > HD(R), where HD(R) = LH /10 = 1.072 m, with a maximum of 0.75

LH = 10.72 m

Attained :

HD = 0.721 m, which is smaller than 0.75m

Conclusion :

HD > HD(R). The down flooding heights comply with category C.

Offset-load test

The offset load angle ($Ø_0$) is the angle of heel as a result of an offset load by all persons on board. In requirement 6.2 of the ISO 12217-1 assessment sufficient stability is to be demonstrated for the ship in loaded displacement condition.

Criteria :

For all categories :

$Ø_0 < Ø_{0(R)}$, where $Ø_{0(R)} = 10 + \frac{(24 - L)^3}{600^H} = 13.90°$

LH = 10.72 m

For boats using option 5 or 6 of table 2, in addition to the above during this test, the least height from the waterline to the point at which water could first begin to enter the interior of the boat shall exceed a height in metres equal to 0.11xLH^0.5 for boats of design category C.

0.11xLH^0.5 = 0.36 m

Attained :

Ø0 = 4.17°
HD = 0.40 m

Conclusion :

The offset load angle Ø0 < Ø0(R) . The offset load complies with category C.
HD > 0.11xLH^2

Heel due to wind action (Cat. C)

In assessment 6.4 of the ISO 12217-1 requirement. Sufficient resistance against heel due to wind action has to be demonstrated.

Boats shall be assessed in the minimum operating condition unless the ratio Mmldc/Mmoc>1.15, in which case the loaded displacement condition shall also be assessed
Boats of design categories C and D, where Alv<Lh x Bh, do not have to be assessed.

The heeling moment due to wind, M_w, expressed in Newton metres, is assumed to be constant at all angles of heel and shall be calculated as follows :

$M_W = 0.3A_{LV} \frac{A_{LV}}{LA_{WL}} + T_m v_w^2$ where A_{LV} shall be taken minimal 0.55 LHBH

The attained heeling angle due to wind action shall be less than 0.5 ØO(R) , Derived from the offset load test in 6.2.

Minimum operating condition :		
A_{LV} :	18.1	m_2
LH:	10.72	m
BH:	3.56	m
LHxBH	38	m_2

Loaded displacement condition :		
A_{LV}	17.4	m_2
LH:	10.72	m
BH:	3.56	m
LHxBH	38	m_2

Criteria :

Attained :

$A_{lv} < L_H \times B_H$

Conclusion :

The heel due to wind action complies with category C.

Conclusions

Based on the information presented in this report and other available data the ship is tested on all criteria, resulting in compliance of the ship with the criteria of design category C.

This means that the ship stability wise is a category C ship.

A boat given design category C is considered to be designed for waves of up to 2 m significant height and a typical steady wind force of Beaufort force 6 or less. Such conditions may be encountered on exposed inland waters, in estuaries, and in coastal waters in moderate weather conditions. Winds are assumed to gust to 17 m/s.

Appendices

Appendix 1 – Loading Conditions

Preliminary Lightship, Deadweight and Trim Calculations

Project : Jetten 38 Cabrio — Date : 21/06/2010
Project nr : 6302 — Rev : A

Principle dimensions

Length over all :	10.76 m	
Length Hull :	10.72 m	*(CE: L_H)*
Beam waterline :	3.56 m	
Beam Hull :	3.56 m	*(CE: B_H)*
Draft (half load) :	1.00 m	*(measured from baseline)*
Draft (DWL) :	1.03 m	*(measured from baseline)*

Light ship items	Weight [kg]	[%]
Group 1 Hull construction	5317	54.1%
Group 2 Superstructure construction	814	8.3%
Group 3 Propulsion & Steering	767	7.8%
Group 4 Auxiliary systems	399	4.1%
Group 5 Electrical installation	482	4.9%
Group 6 Electronics	32	0.3%
Group 7 Interior Joinery & Furniture	963	9.8%
Group 8 Interior Outfitting	53	0.5%
Group 9 Exterior Joinery	120	1.2%
Group 10 Exterior Outfitting	516	5.2%
Group 11 Fairing & Paintwork	275	2.8%
Group 12 Customer Supplies	68	0.7%
Group 13 Safety & Fire Equipment	32	0.3%
Group 14 Recreational equipment and handling	0	0.0%
Group 15 Miscellaneous	0	0.0%

Total light ship	9837	100.0%

Fixed deadweight items	Weight [kg]		
Crew	150	Number of crew :	2
Crew limit	600	Crewlimit :	8
Maximum total load	600		
Ballast	0		

Preliminary Lightship, Deadweight and Trim Calculations

Project : Jetten 38 Cabrio — Date : 21/06/2010

Project nr : 6302 — Rev : A

			Condition 1		**Condition 2**		**Condition 3**		**Condition 4**	
			Light craft		Minimum Operating		**HALF LOAD**		Loaded Displacement	
			0% FO		2% FO		**50% FO**		98% FO	
			0% FW		2% FW		**50% FW**		98% FW	
Liquid loads			0% BA		2% HO		**2% HO**		2% HO	
Tank	Discr.	Capacity	Load	Weight	Load	Weight	Load	Weight	Load	Weight
Fuel tanks		Ltr	%	kg	%	kg	%	kg	%	kg
FO 01	Fuel Oil tank	400	0.0%	0	2.0%	7	50.0%	168	98.0%	329
Total Fuel tanks		**400**		**0**		**7**		**168**		**329**
Fresh water tanks		Ltr	%	kg	%	kg	%	kg	%	kg
FW 01	Fresh Water Tank fwd	340	0.0%	0	2.0%	7	50.0%	170	98.0%	333
Total fresh water		**340**		**0**		**7**		**170**		**333**
Holding tanks		Ltr	%	kg	%	kg	%	kg	%	kg
HO 01 Holding Tank		120	0.0%	0	2.0%	2	2.0%	2	2.0%	2
Total holding tanks		**120**		**0**		**2**		**2**		**2**
Total liquid loads				**0**		**16**		**340**		**665**

Storages / Maximum total loa	150	0.0%	0	0.0%	0	100.0%	150	100.0%	600

Total variable dead weight			**0**		**16**		**490**		**1265**
Fixed dead weight items	kg	%	kg	%	kg	%	kg	%	kg
Crew / Crew Limit	150	0.0%	0	100.0%	150	100.0%	150	100.0%	600
Ballast	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0
Total fixed dead weight items			**0**		**150**		**150**		**600**

TOTAL DEAD WEIGHT			**0**		**166**		**640**		**1865**
Hydrostatic properties									
Draft at FRAME 0		0.99 m		1.00 m		1.00 m		1.05 m	
Draft at FRAME 26		0.96 m		0.96 m		1.00 m		1.03 m	
DRAFT AVERAGE		0.98 m		0.98 m		**1.00** m		1.04 m	
TRIM		0.03 m aft		0.03 m aft		**0.00** m aft		0.02 m aft	
Trim		0.14 °		0.19 °		0.02 °		0.11 °	
DISPLACEMENT		9840 kg		10000 kg		**10480** kg		11700 kg	
VCG of fixed weights		1.39 m		1.41 m		1.41 m		1.44 m	
VCG total (with fluids)		1.39 m		1.41 m		1.40 m		1.41 m	
GM		1.43 m		1.39 m		1.33 m		1.18 m	

Distance between fwd/aft draftmarks 10.40 m

6302 Jetten 38 Cabrio
INTACT STABILITY AT CONDITION 1
OPERATIONAL CONDITION : LIGHT CRAFT CONDITION

SUMMARY OF LOADING

0.0 Cu.M. (0%) FUEL 0.0 Cu.M. (0%) FRESH

0.0 Cu.M. (0%) SEWAGE

WEIGHT STATUS

Trim: Aft 0.026/10.400, Heel: zero

Part	Weight(MT)	LCG	TCG	VCG	FSM
WEIGHT	9.84	4.546f	0.000	1.393	

	Load	SpGr	Weight(MT)	LCG	TCG	VCG	
FO1	0.000	0.840	0.00				0.00
FW1	0.000	1.000	0.00				0.00
HO1	0.000	1.000	0.00				0.00
Total Tanks			**0.00**				**0.00**

Distances in METERS. Moments in m.-MT.

HYDROSTATIC PROPERTIES

Trim: Aft 0.026/10.400, No Heel, VCG = 1.393

LCF Draft	Displacement Weight(MT)	Buoyancy-Ctr. LCB	VCB	Weight/ cm	LCF	Moment/ cm trim	GML	GMT
0.976	9.84	4.544f	0.735	0.27	4.089f	0.16	16.82	1.428

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT.

Trim is per 10.40m.

Draft is from Baseline.

CRITICAL POINT STATUS

Baseline draft: 0.961 @ 10.40f, 0.987 @ 0.00 Trim:
Aft 0.026/10.400, Heel: zero

	Critical Points	LCP	TCP	VCP	Height
(1)	AFT DRAFT MARK FRAME 0	0.000	0.000	0.000	-0.987
(2)	FWD DRAFT MARK FRAME 26	10.400f	0.000	0.000	-0.961

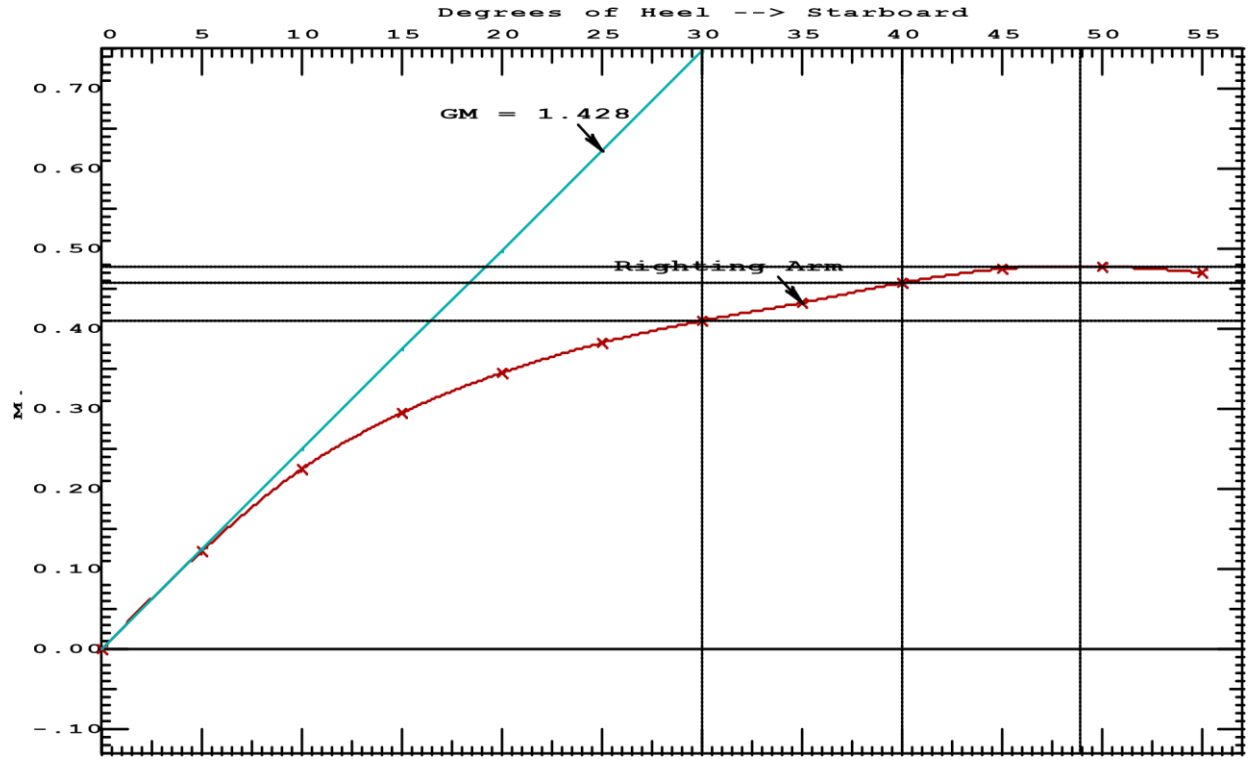
Distances in METERS.

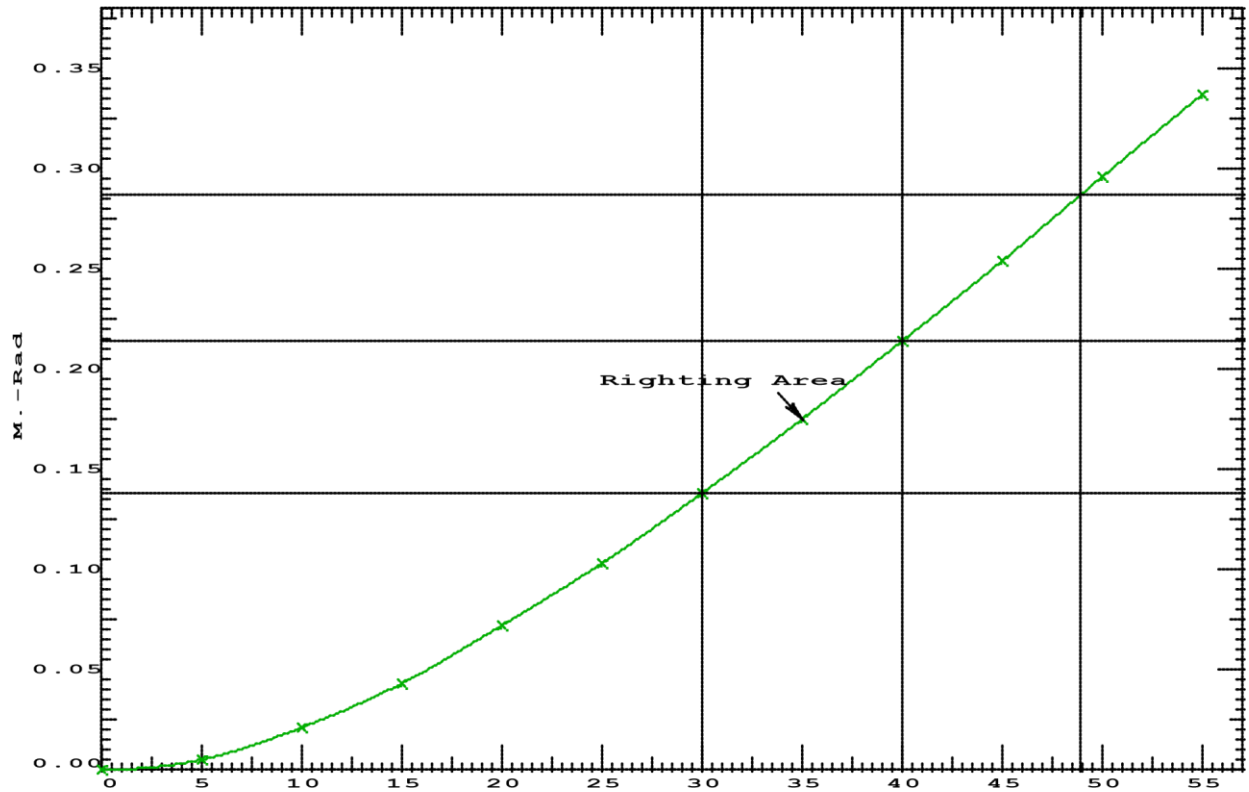
RIGHTING ARMS vs HEEL ANGLE

LCG = 4.546f TCG = 0.000 VCG = 1.393

Origin Depth	Degrees of Trim	Heel	Displacement Weight(MT)	Righting Arms in Trim	in Heel	Freebd Area -(Extra)
0.987	0.14a	0.00	9.84	0.000	0.000	0.0000
0.980	0.13a	5.00s	9.84	0.000	0.122	0.0053
0.950	0.02a	10.00s	9.84	0.000	0.224	0.0206
0.896	0.16f	15.00s	9.83	0.000	0.295	0.0435
0.822	0.37f	20.00s	9.83	0.000	0.346	0.0716
0.731	0.60f	25.00s	9.83	0.000	0.382	0.1035
0.629	0.81f	30.00s	9.83	0.000	0.409	0.1381
0.514	0.99f	35.00s	9.83	0.000	0.433	0.1748
0.392	1.14f	40.00s	9.84	0.000	0.457	0.2137
0.265	1.24f	45.00s	9.84	0.000	0.474	0.2544
0.175	1.26f	48.69s	9.84	0.000	**0.478**	**0.2850**
0.144	1.26f	50.00s	9.84	0.000	0.477	0.2960
0.031	1.18f	55.00s	9.84	0.000	0.469	0.3374

Distances in METERS. Specific Gravity = 1.000. Area in m.-Rad.





INTACT STABILITY AT CONDITION 2 OPERATIONAL
CONDITION : MINIMUM OPERATING CONDITION

SUMMARY OF LOADING

0.0 Cu.M. (2%) FUEL 0.0 Cu.M. (2%) FRESH
0.0 ı.M. (2%) SEWAGE
0.15 MT of CREW

WEIGHT STATUS

Trim: Aft 0.034/10.400, Heel: zero

Part	Weight(MT)	LCG	TCG	VCG
LIGHT SHIP	9.84	4.546f	0.000	1.393
CREW	0.15	3.200f	0.000	2.300
Total Fixed	**9.99**	**4.526f**	**0.000**	**1.407**

	Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM
FO1	0.020	0.840	0.01	4.848f	0.000	0.261	0.00
FW1	0.020	1.000	0.01	5.808f	0.000	0.298	0.00
HO1	0.020	1.000	0.00	1.784f	0.000	0.865	0.02
Total Tanks			**0.02**	**4.798f**	**0.000**	**0.368**	**0.03**

Total Weight	**10.00**	**4.526f**	**0.000**	**1.405**
Free Surface Adjustment				**0.003**
Adjusted CG		**4.526f**	**0.000**	**1.408**

Distances in METERS. Moments in m.-MT.

HYDROSTATIC PROPERTIES

Trim: Aft 0.034/10.400, No Heel, VCG = 1.405

LCF	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
Draft	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
0.982	10.00	4.524f	0.739	0.27	4.091f	0.16	16.56	1.387

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT.
Trim is per 10.40m.
Draft is from Baseline. True Free Surface included.

CRITICAL POINT STATUS

Baseline draft: 0.962 @ 10.40f, 0.996 @ 0.00 Trim:
Aft 0.034/10.400, Heel: zero

	Critical Points	LCP	TCP	VCP	Height
(1)	AFT DRAFT MARK FRAME 0	0.000	0.000	0.000	-0.996
(2)	FWD DRAFT MARK FRAME 26	10.400f	0.000	0.000	-0.962

Distances in METERS.

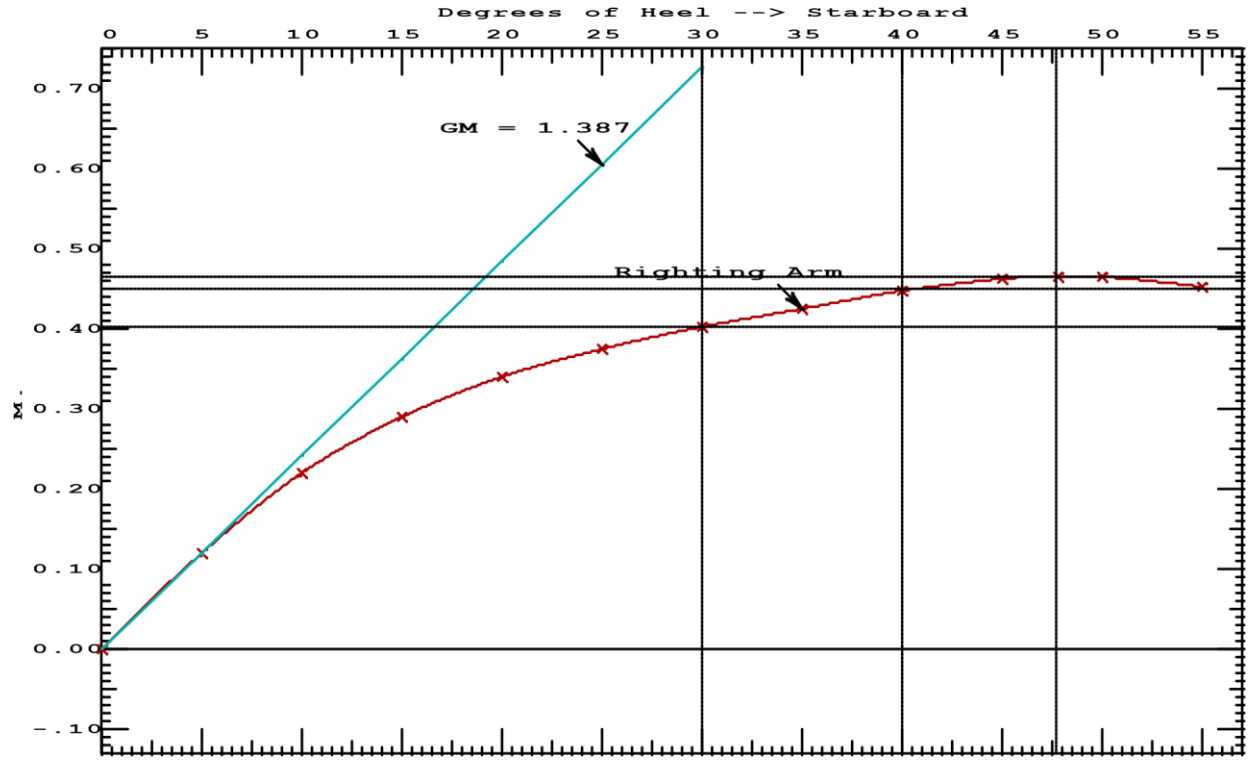
RIGHTING ARMS vs HEEL ANGLE Fixed

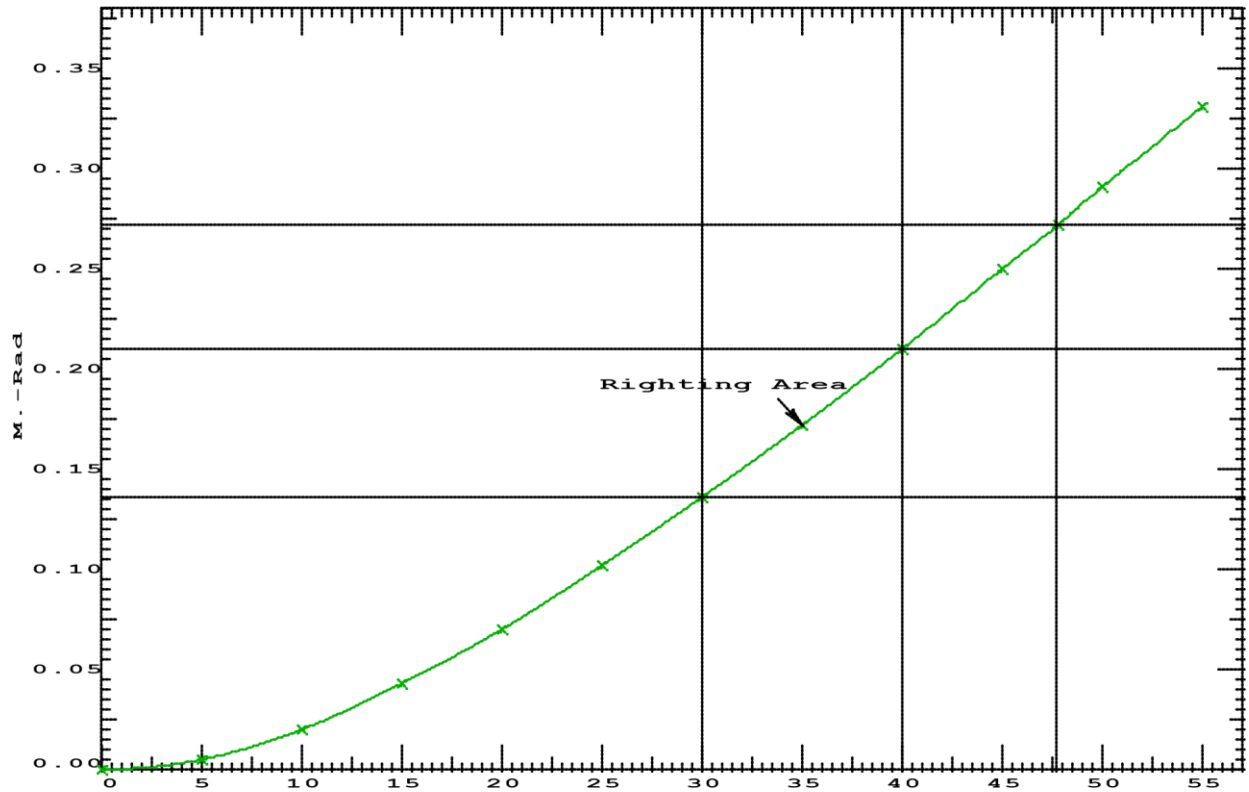
CG: LCG = 4.526f TCG = 0.000 VCG = 1.407

Origin Depth	Degrees of Trim	Degrees of Heel	Displacement Weight(MT)	Righting Arms in Trim	Righting Arms in Heel	Freebd Area -(Extra)
0.996	0.19a	0.00	10.00	0.000	0.000	0.0000
0.990	0.18a	5.00s	10.00	0.000	0.119	0.0052
0.961	0.08a	10.00s	10.00	0.000	0.221	0.0202
0.908	0.09f	15.00s	10.00	0.000	0.291	0.0427
0.835	0.29f	20.00s	10.00	0.000	0.340	0.0704
0.747	0.50f	25.00s	10.00	0.000	0.376	0.1018
0.645	0.70f	30.00s	10.00	0.000	0.403	0.1358
0.532	0.88f	35.00s	10.00	0.000	0.426	0.1720
0.409	1.02f	40.00s	10.00	0.000	0.449	0.2101
0.284	1.11f	45.00s	10.00	0.000	0.464	0.2500
0.217	1.13f	47.76s	10.00	0.000	**0.466**	**0.2724**
0.165	1.12f	50.00s	10.00	0.000	0.464	0.2906
0.056	1.01f	55.00s	10.00	0.000	0.453	0.3307

Distances in METERS. Specific Gravity = 1.000. Area in m.-Rad.

Note: The Center of Gravity shown above is for the Fixed Weight of 9.99 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.





INTACT STABILITY AT CONDITION 3
OPERATIONAL CONDITION : HALFLOAD

GHS 11.50 6302 Jetten 38 Cabrio
TANKLOAD OPTIMISED FOR MINIUMUM TRIM
Note: Weight item "CREW" replaced.

SUMMARY OF LOADING

0.2 Cu.M. (50%) FUEL 0.2 Cu.M. (50%) FRESH
0.0 Cu.M. (2%) SEWAGE
0.15 MT of CREW 0.15 MT of STORES

WEIGHT STATUS

Trim: Aft 0.003/10.400, Heel: zero

Part	Weight(MT)	LCG	TCG	VCG
LIGHT SHIP	9.84	4.546f	0.000	1.393
CREW	0.15	3.200f	0.000	2.300
STORES	0.15	5.000f	0.000	1.300
Total Fixed	**10.14**	**4.533f**	**0.000**	**1.405**

	Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM
FO1	0.500	0.840	0.17	4.636f	0.000	0.393	0.11
FW1	0.500	1.000	0.17	5.817f	0.000	0.486	0.12
HO1	0.020	1.000	0.00	1.790f	0.000	0.865	0.02
Total Tanks			**0.34**	**5.206f**	**0.000**	**0.443**	**0.25**
Total Weight			**10.48**	**4.555f**	**0.000**	**1.374**	
Free Surface Adjustment						**0.024**	
Adjusted CG				**4.555f**	**0.000**	**1.398**	

Distances in METERS. Moments in m.-MT.

HYDROSTATIC PROPERTIES

Trim: Aft 0.003/10.400, No Heel, VCG = 1.374

LCF Draft	Displacement Weight(MT)	Buoyancy-Ctr. LCB	VCB	Weight/ cm	LCF	Moment/ cm trim	GML	GMT
1.000	10.48	4.555f	0.750	0.27	4.118f	0.16	16.12	1.334

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT.
Trim is per 10.40m.
Draft is from Baseline. True Free Surface included.

CRITICAL POINT STATUS

Baseline draft: 0.998 @ 10.40f, 1.001 @ 0.00 Trim:
Aft 0.003/10.400, Heel: zero

	Critical Points	LCP	TCP	VCP	Height
(1)	AFT DRAFT MARK FRAME 0	0.000	0.000	0.000	-1.001
(2)	FWD DRAFT MARK FRAME 26	10.400f	0.000	0.000	-0.998

Distances in METERS.

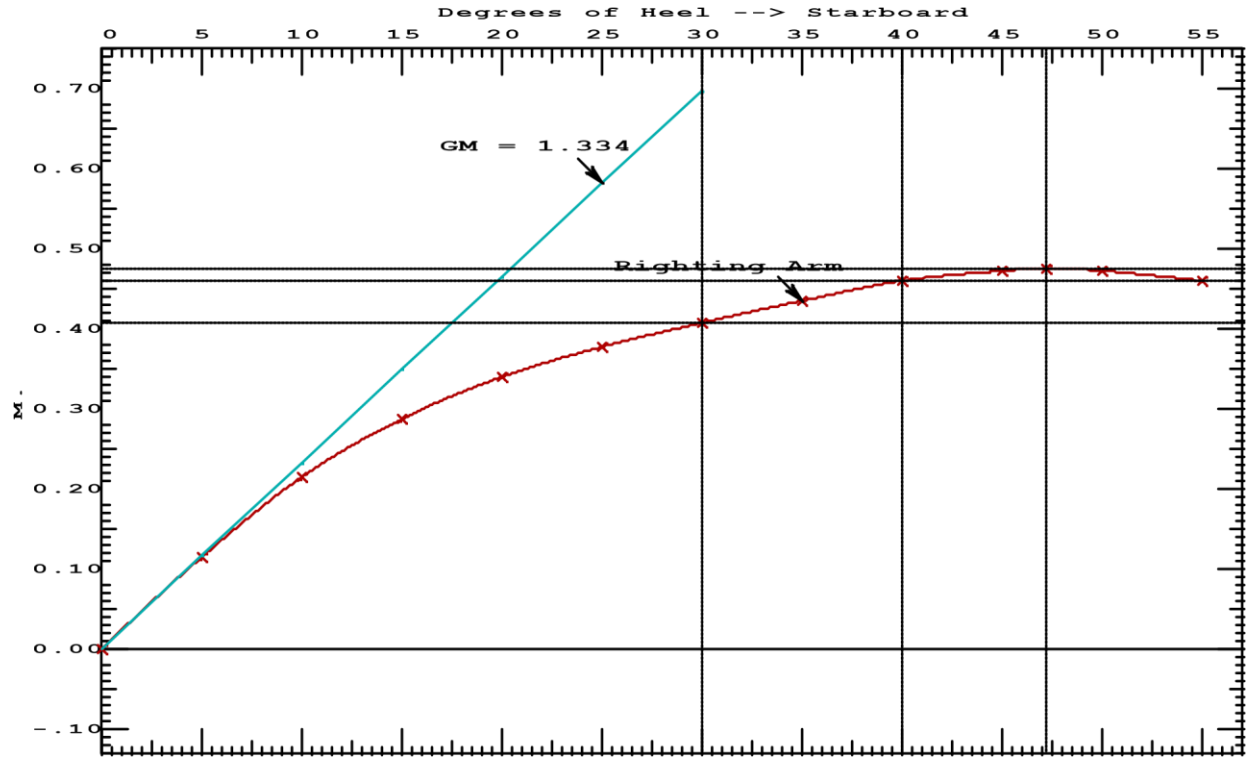
RIGHTING ARMS vs HEEL ANGLE Fixed

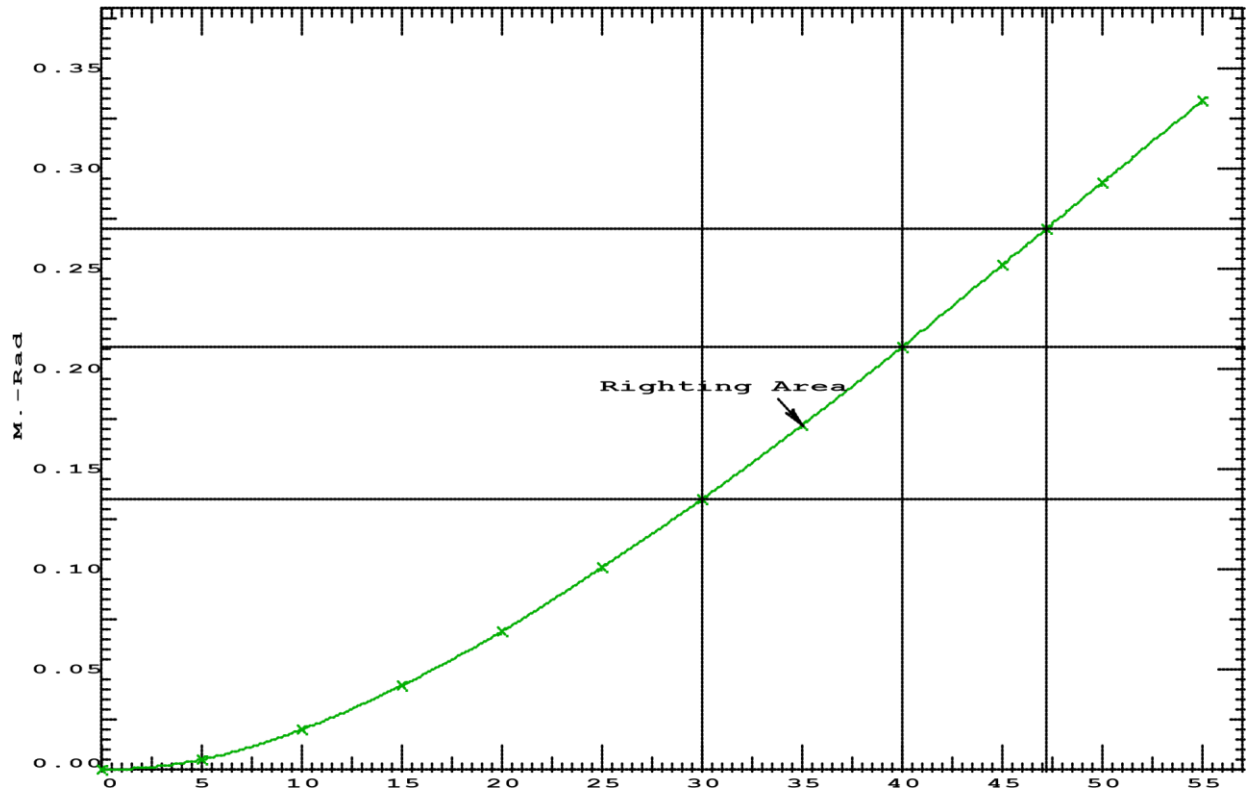
CG: LCG = 4.533f TCG = 0.000 VCG = 1.405

Origin Depth	Degrees of Trim	Heel	Displacement Weight(MT)	Righting Arms in Trim	in Heel	Area	Freebd -(Extra)
1.001	0.02a	0.00	10.48	0.000	0.000	0.0000	
0.995	0.01a	5.00s	10.48	0.000	0.115	0.0050	
0.968	0.08f	10.00s	10.48	0.000	0.216	0.0196	
0.917	0.24f	15.00s	10.48	0.000	0.288	0.0418	
0.845	0.43f	20.00s	10.48	0.000	0.340	0.0694	
0.758	0.63f	25.00s	10.47	0.000	0.378	0.1008	
0.659	0.81f	30.00s	10.47	0.000	0.408	0.1351	
0.547	0.97f	35.00s	10.48	0.000	0.434	0.1719	
0.426	1.10f	40.00s	10.48	0.000	0.459	0.2109	
0.303	1.18f	45.00s	10.48	0.000	0.474	0.2517	
0.251	1.18f	47.19s	10.48	0.000	**0.475**	**0.2698**	
0.187	1.16f	50.00s	10.48	0.000	0.473	0.2931	
0.083	1.01f	55.00s	10.48	0.000	0.461	0.3339	

Distances in METERS. Specific Gravity = 1.000. Area in m.-Rad.

Note: The Center of Gravity shown above is for the Fixed Weight of 10.14 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.





INTACT STABILITY AT CONDITION 4

OPERATIONAL CONDITION : MAXIMUM TOTAL LOAD

SUMMARY OF LOADING

0.4 Cu.M. (98%) FUEL 0.3 Cu.M. (98%) FRESH
0.0 Cu.M. (2%) SEWAGE
0.60 MT of CREWLIMIT 0.60 MT of MAXIMUM TOTAL LOAD

WEIGHT STATUS

Trim: Aft 0.020/10.400, Heel: zero

Part	Weight(MT)	LCG	TCG	VCG
LIGHT SHIP	9.84	4.546f	0.000	1.393
CREWLIMIT	0.60	2.200f	0.000	2.300
MAXIMUM TOTAL LOAD	0.60	5.000f	0.000	1.300
Total Fixed	**11.04**	**4.443f**	**0.000**	**1.437**

	Load	SpGr	Weight(MT)	LCG	TCG	VCG	FSM
FO1	0.980	0.840	0.33	4.618f	0.000	0.477	0.11
FW1	0.980	1.000	0.33	5.817f	0.000	0.608	0.12
HO1	0.020	1.000	0.00	1.787f	0.000	0.865	0.02
Total Tanks			**0.66**	**5.209f**	**0.000**	**0.544**	**0.25**
Total Weight			**11.70**	**4.487f**	**0.000**	**1.386**	
Free Surface Adjustment						**0.021**	
Adjusted CG				**4.487f**	**0.000**	**1.408**	

Distances in METERS. Moments in m.-MT.

HYDROSTATIC PROPERTIES

Trim: Aft 0.020/10.400, No Heel, VCG = 1.386

LCF	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
Draft	Weight(MT)	LCB	VCB	cm	LCF	cm trim	GML	GMT
1.044	11.70	4.486f	0.778	0.28	4.145f	0.17	14.72	1.177

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT.
Trim is per 10.40m.
Draft is from Baseline. True Free Surface included.

CRITICAL POINT STATUS

Baseline draft: 1.032 @ 10.40f, 1.052 @ 0.00 Trim:
Aft 0.020/10.400, Heel: zero

	Critical Points	LCP	TCP	VCP	Height
(1)	AFT DRAFT MARK FRAME 0	0.000	0.000	0.000	-1.052
(2)	FWD DRAFT MARK FRAME 26	10.400f	0.000	0.000	-1.032

Distances in METERS.

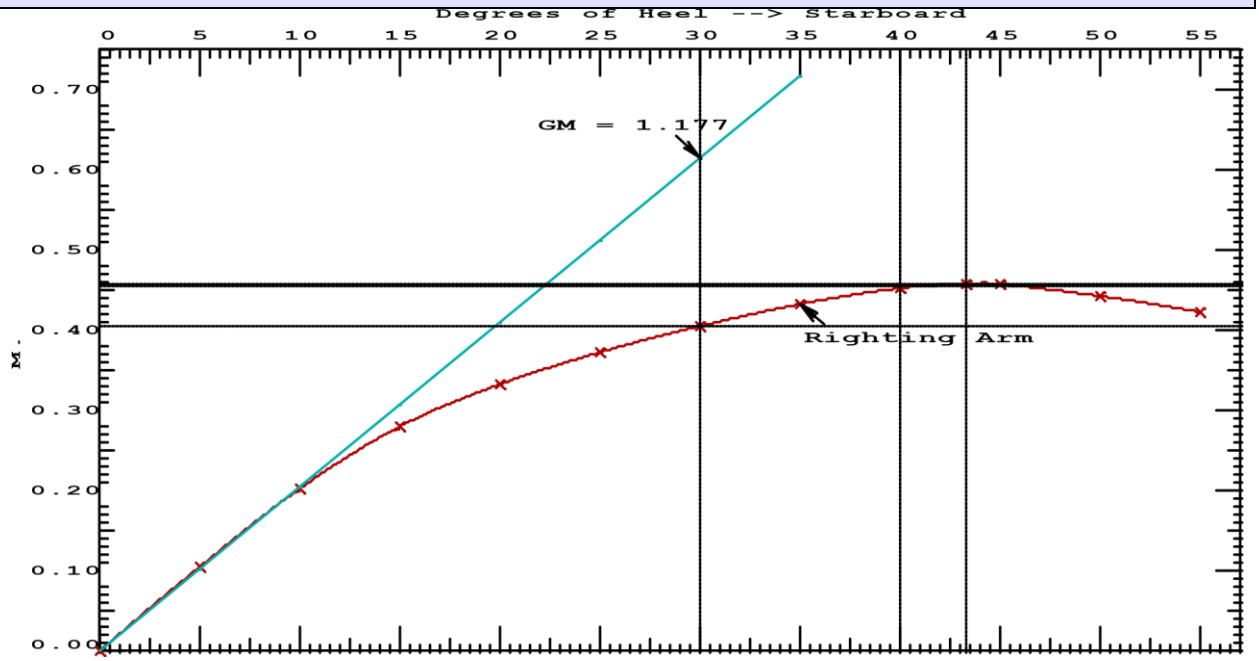
RIGHTING ARMS vs HEEL ANGLE Fixed

CG: LCG = 4.443f TCG = 0.000 VCG = 1.437

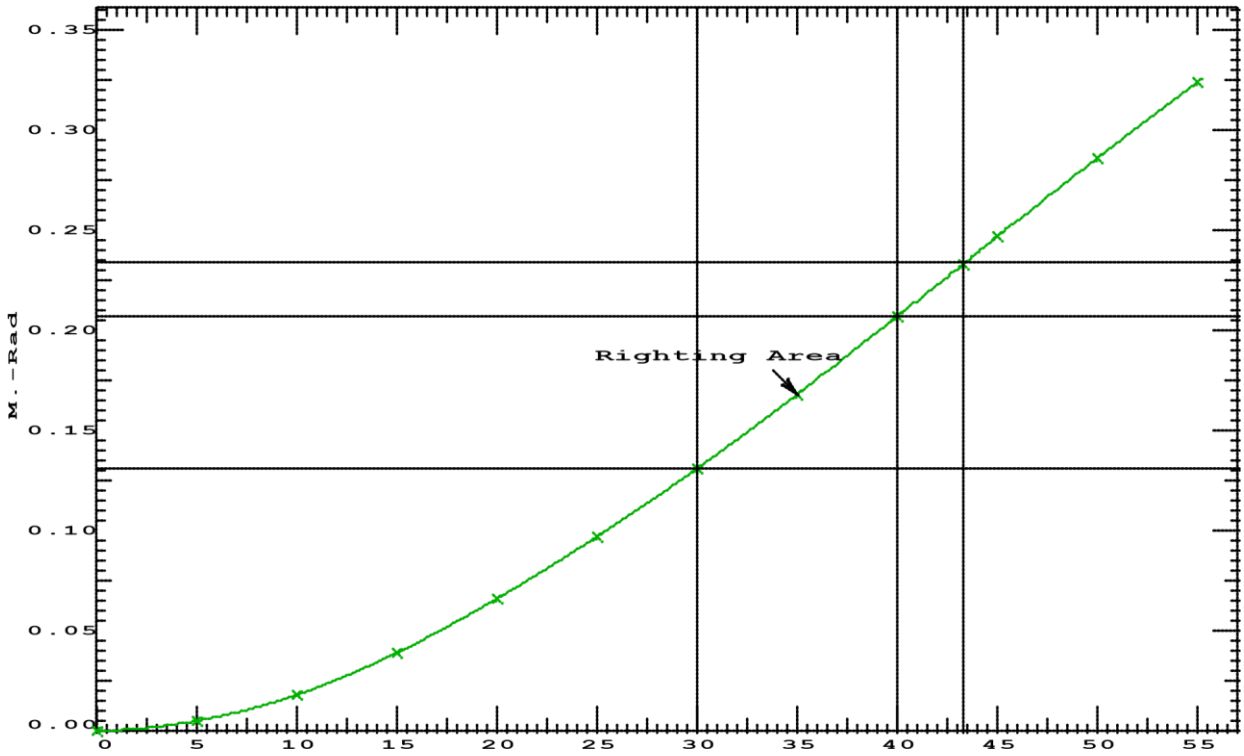
Origin Depth	Degrees of Trim	Degrees of Heel	Displacement Weight(MT)	Righting Arms in Trim	Righting Arms in Heel	Freebd Area -(Extra)
1.052	0.11a	0.00	11.70	0.000	0.000	0.0000
1.048	0.12a	5.00s	11.70	0.000	0.104	0.0046
1.028	0.10a	10.00s	11.70	0.000	0.204	0.0180
0.985	0.00	15.00s	11.70	0.000	0.279	0.0393
0.922	0.13f	20.00s	11.70	0.000	0.333	0.0661
0.845	0.24f	25.00s	11.70	0.000	0.373	0.0971
0.754	0.35f	30.00s	11.70	0.000	0.405	0.1310
0.649	0.44f	35.00s	11.70	0.000	0.433	0.1676
0.536	0.50f	40.00s	11.70	0.000	0.454	0.2064
0.464	0.49f	43.32s	11.70	0.000	**0.458**	**0.2328**
0.429	0.46f	45.00s	11.70	0.000	0.457	0.2462
0.333	0.29f	50.00s	11.70	0.000	0.443	0.2856
0.248	0.04a	55.00s	11.71	0.000	0.423	0.3234

Distances in METERS. Specific Gravity = 1.000. Area in m.-Rad.

Note: The Center of Gravity shown above is for the Fixed Weight of 11.04 MT. As the tank load centers shift with heel and trim, the total Center of Gravity varies. The righting arms shown above include the effect of the C.G. variation.



GHS 11.50 6302 Jetten 38 Cabrio



Appendix 2 – Hydrostatic Properties

GHS 11.50 6302 Jetten 38 Cabrio

HYDROSTATIC PROPERTIES

No Trim, No Heel, VCG = 0.000

LCF	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
Draft	Weight(MT)	LCB	VCB	cm	LCF	Deg trim	KML	KMT
0.950	9.12	4.627f	0.717	0.27	4.077f	3.08	19.36	2.943
0.960	9.39	4.611f	0.723	0.27	4.086f	3.11	18.95	2.896
0.970	9.66	4.597f	0.730	0.27	4.094f	3.13	18.57	2.851
0.980	9.94	4.583f	0.737	0.27	4.103f	3.16	18.21	2.809
0.990	10.21	4.571f	0.744	0.27	4.111f	3.18	17.85	2.769
1.000	10.48	4.559f	0.750	0.27	4.119f	3.20	17.52	2.732
1.010	10.75	4.548f	0.757	0.27	4.127f	3.23	17.20	2.696
1.020	11.03	4.538f	0.763	0.27	4.135f	3.25	16.89	2.662
1.030	11.30	4.528f	0.769	0.27	4.142f	3.27	16.59	2.630
1.040	11.58	4.519f	0.776	0.28	4.149f	3.30	16.31	2.599
1.050	11.85	4.510f	0.782	0.28	4.156f	3.32	16.04	2.570
1.060	12.13	4.503f	0.788	0.28	4.162f	3.34	15.76	2.543
1.070	12.41	4.495f	0.794	0.28	4.169f	3.36	15.51	2.517
1.080	12.69	4.488f	0.801	0.28	4.176f	3.38	15.27	2.492
1.090	12.96	4.481f	0.807	0.28	4.182f	3.40	15.03	2.468
1.100	13.24	4.475f	0.813	0.28	4.188f	3.42	14.81	2.445
1.110	13.52	4.469f	0.819	0.28	4.194f	3.44	14.59	2.424
1.120	13.80	4.464f	0.825	0.28	4.200f	3.46	14.38	2.403
1.130	14.08	4.458f	0.831	0.28	4.206f	3.48	14.17	2.384
1.140	14.37	4.454f	0.837	0.28	4.212f	3.51	13.98	2.365
1.150	14.65	4.449f	0.843	0.28	4.218f	3.53	13.79	2.348

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT.
Draft is from Baseline.

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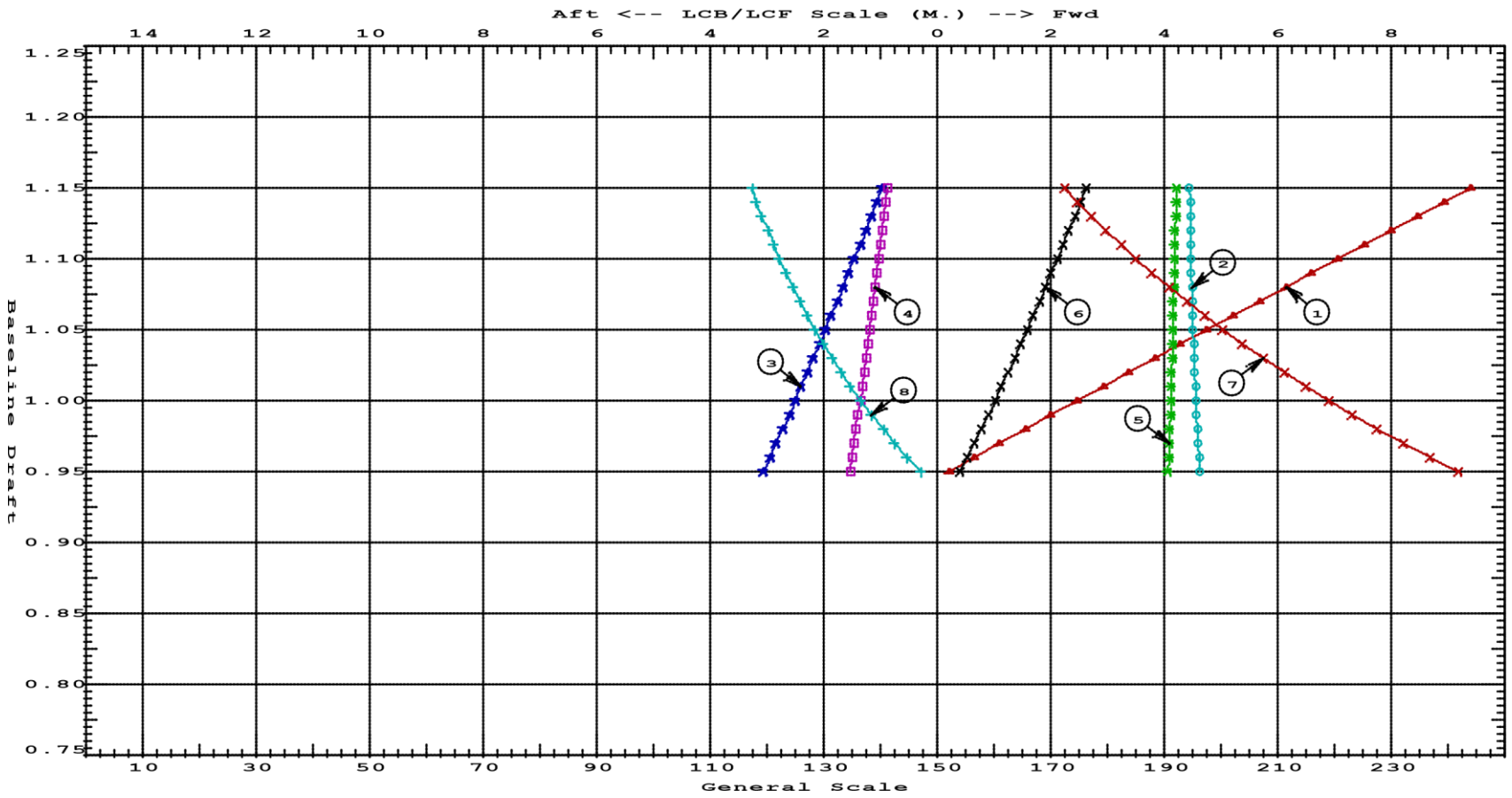
HYDROSTATIC PROPERTIES at LEVEL TRIM



1	Displacement 1=.06 MT	4	Immersion 1=.002 MT/cm	6	Moment/Trim 1=.02 M.-MT/Deg
2	LCB (use top scale)	4	WPA 1=.2 Sq.M.	7	KML 1=.08 M.
3	VCB (KB) 1=.006 M.	5	LCF (use top scale)	8	KMT 1=.02 M.

Specific Gravity = 1.000 Assumed KG = 0.00 M.

"K" = Baseline (BOK, DWL-103

Appendix 3 – Down Flooding Height

GHS 11.50 6302 Jetten 38 Cabrio 6.1.2 DOWNFLOODING HEIGHT (LOADED DISPLACEMENT CONDITION)

WEIGHT STATUS

Trim: Aft 0.11 deg., Heel: zero

Part	Weight(MT)	LCG	TCG	VCG
LIGHT SHIP	9.84	4.546f	0.000	1.393
CREWLIMIT	0.60	2.200f	1.700s	2.300
MAXIMUM TOTAL LOAD	0.60	5.000f	0.000	1.300
Total Fixed	**11.04**	**4.443f**	**0.092s**	**1.437**

	Ltrs.	SpGr	Weight(MT)	LCG	TCG	VCG	FSM
FO1	392.0	0.840	0.33	4.618f	0.000	0.477	0.11
FW1	333.2	1.000	0.33	5.817f	0.000	0.608	0.12
Total Tanks			**0.66**	**5.221f**	**0.000**	**0.543**	**0.23**

Total Weight	**11.70**	**4.487f**	**0.087s**	**1.387**
Free Surface Adjustment				**0.019**
Adjusted CG		**4.487f**	**0.087s**	**1.406**

Distances in METERS. Moments in m.-MT.

HYDROSTATIC PROPERTIES

Trim: Aft 0.11 deg., No Heel, VCG = 1.387

LCF Draft	Displacement Weight(MT)	Buoyancy-Ctr. LCB	VCB	Weight/ cm	LCF	Moment/ Deg trim	GML	GMT
1.044	11.70	4.486f	0.778	0.28	4.145f	3.01	14.72	1.179

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT. Draft is from Baseline. True Free Surface included.

CRITICAL POINT STATUS

Baseline draft: 1.052 @ Origin
Trim: Aft 0.11 deg., Heel: zero

	Critical Points		LCP	TCP	VCP	Height
(1)	ER VENTILATION PS	FLOOD	2.970f	1.700s	1.767	0.720
(1)	ER VENTILATION PS	FLOOD	2.970f	1.700p	1.767	0.720
(2)	ER VENTILATION PS	FLOOD	3.370f	1.700s	1.767	0.721
(2)	ER VENTILATION PS	FLOOD	3.370f	1.700p	1.767	0.721

Distances in METERS.

Appendix 4 – Offset Load Test

6.2 A-SYMMETRIC LOADING AT LOADED DISPLACEMENT

WEIGHT STATUS

Trim: Aft 0.11 deg., Heel: Stbd 4.17 deg.

Part	Weight(MT)	LCG	TCG	VCG
LIGHT SHIP	9.84	4.546f	0.000	1.393
MAXIMUM TOTAL LOAD	0.60	5.000f	0.000	1.300
8 PERSONS	0.60	2.200f	1.700s	2.300
Total Fixed	**11.04**	**4.443f**	**0.092s**	**1.437**

	Ltrs.	SpGr	Weight(MT)	LCG	TCG	VCG	FSM
FO1	392.0	0.840	0.33	4.618f	0.008s	0.477	0.01
FW1	333.2	1.000	0.33	5.817f	0.010s	0.608	0.01
Total Tanks			**0.66**	**5.221f**	**0.009s**	**0.543**	**0.02**
Total Weight			**11.70**	**4.487f**	**0.088s**	**1.387**	
Free Surface Adjustment						**0.001**	
Adjusted CG				**4.487f**	**0.088s**	**1.388**	

Distances in METERS. Moments in m.-MT.

HYDROSTATIC PROPERTIES

Trim: Aft 0.11 deg., Heel: Stbd 4.17 deg., VCG = 1.387

LCF	Displacement	Buoyancy-Ctr.		Weight/		Moment/		
Draft	Weight(MT)	LCB	VCB	cm	LCF	Deg trim	GML	GMT
1.043	11.70	4.488f	0.783	0.28	4.143f	3.01	14.75	1.213

Distances in METERS. Specific Gravity = 1.000. Moment in m.-MT. Draft is from Baseline. True Free Surface included.

CRITICAL POINT STATUS

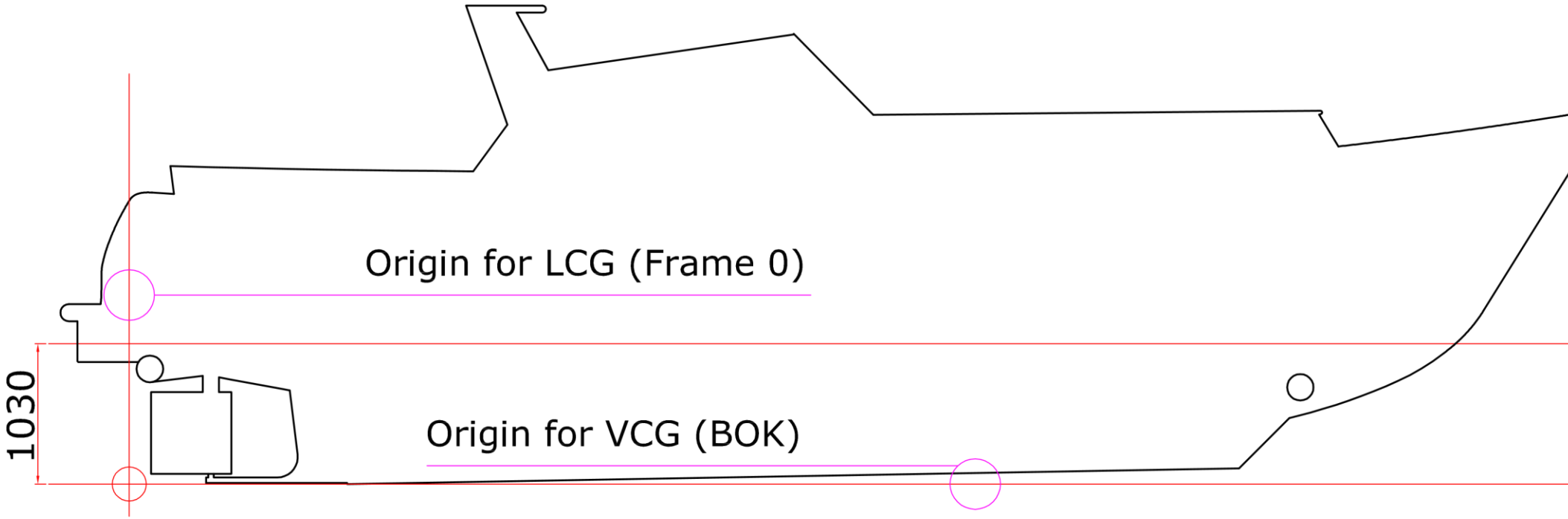
Baseline draft: 1.051 @ Origin

Trim: Aft 0.11 deg., Heel: Stbd 4.17 deg.

	Critical Points		LCP	TCP	VCP	Height
(1)	ER VENTILATION PS	FLOOD	2.970f	1.700s	1.767	0.596
(1)	ER VENTILATION PS	FLOOD	2.970f	1.700p	1.767	0.843
(2)	ER VENTILATION PS	FLOOD	3.370f	1.700s	1.767	0.597
(2)	ER VENTILATION PS	FLOOD	3.370f	1.700p	1.767	0.844
(3)	SILL TO INTERIOR	FLOOD	4.000f	0.350s	1.469	0.399
(3)	SILL TO INTERIOR	FLOOD	4.000f	0.350p	1.469	0.450

Distances in METERS.

Appendix 5 – Basepoint Definition


Origin for LCG (Frame 0)
1030
Origin for VCG (BOK)