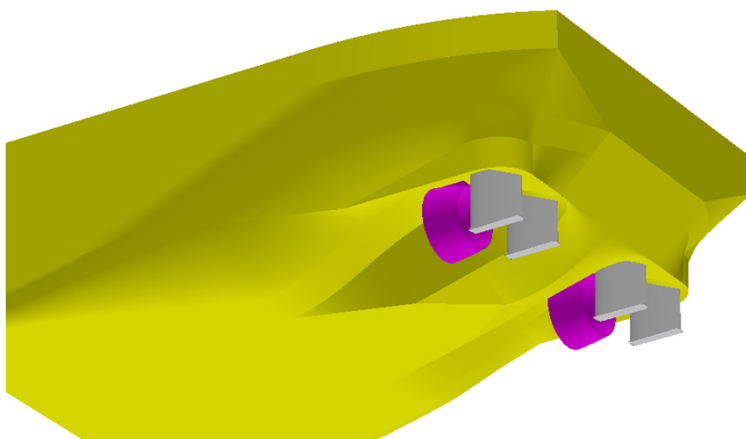
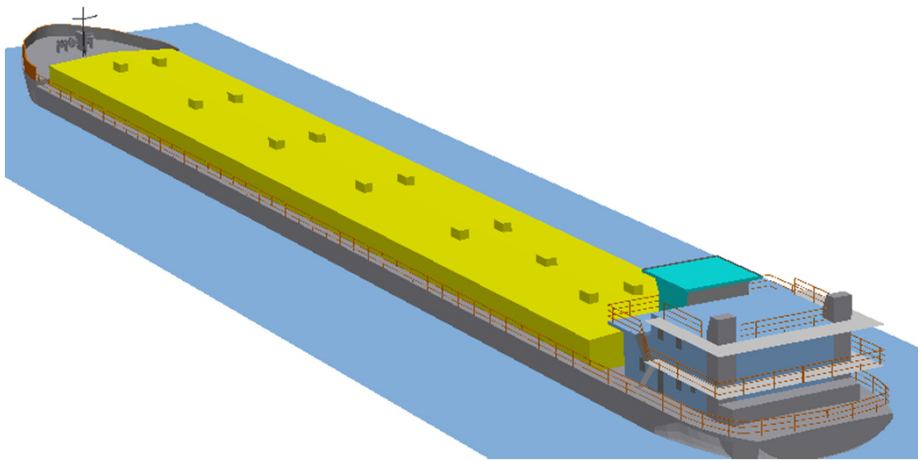
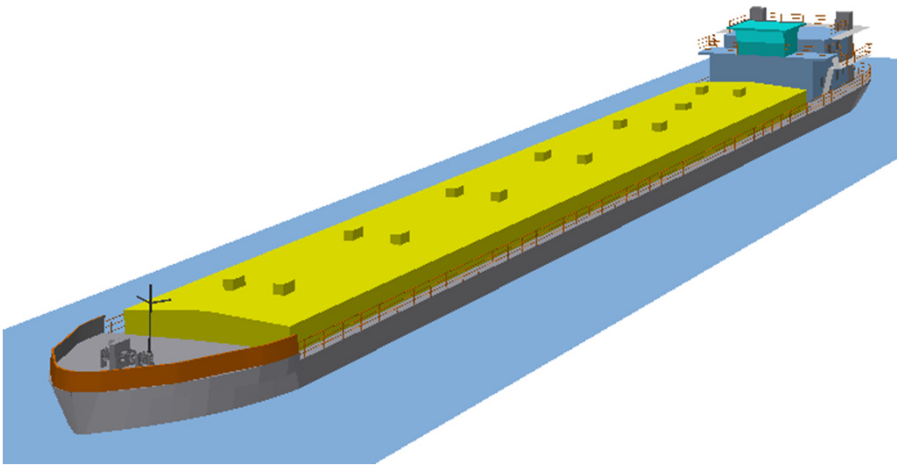

Tanker T2



Main dimensions

Cargo type		Tanker
Hull type		T2
Length o.A.	L	110,00 m
Breadth	B	12,00 m
Depth Main Deck	D	3,70 m
Draught max.	T	2,80 m
Lightweight estimate		905 t
Payload at Tmax		2459 t

Applicable regulations

- Vessel built according to Rules and Regulations for the Construction and Classification of Inland Waterways Ships by the Indian Register of Shipping.
- Applicable rules of IWAI for navigation on NW-1, all reaches from Haldia (West Bengal) to Allahabad (Uttar Pradesh).
- ADN Rules 2003 for the transport of dangerous goods on inland waterways, including criteria for intact and damaged stability

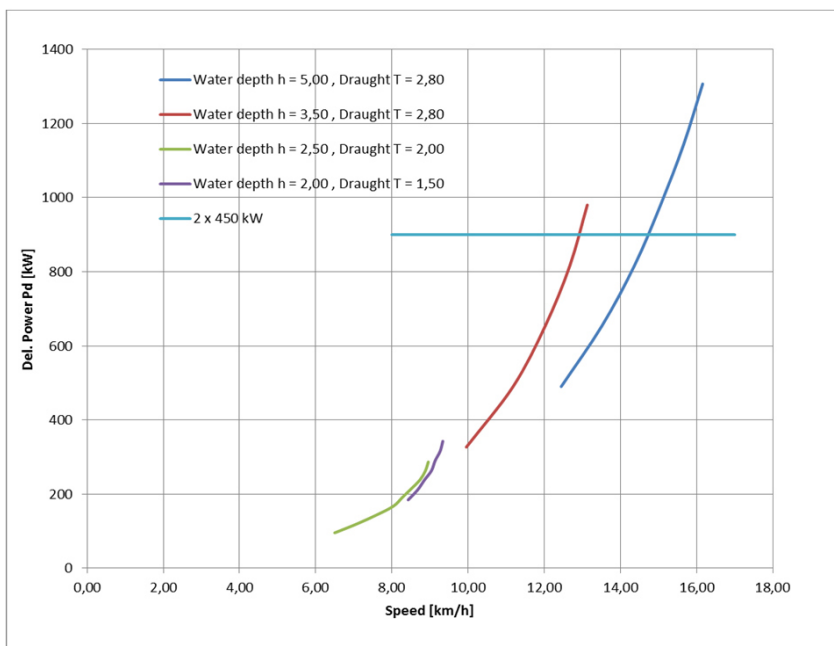
Powering

Number of Propellers (in nozzles)		2
Propeller diameter	D_p	1,45 m
Del. total power	P_D	900 kW
Rate of rev.	n [1/min]	390

Reversible gear box

Diesel marine engine 500 kW in rating A (heavy, uninterrupted duty)

Estimated speed and power



Cargo tanks

	Lc	Bc	Hc	Volume
Dimensions per tank	13,0 m	5,1 m	4,9 m	304 m ³
Total volume in 12 tanks				3650 m ³

Tanks suitable for oil and fuel oil as Diesel Oil, Lubricating Oils, Gas Oil, Kerosene, Naphtha.

Tank Cargo Handling

Main cargo pump with electric drive behind the tanks and in front of the accommodation. All tanks with separate loading / unloading pipe in diameter 150 mm, connected to central pipe in diameter 250. Shore connection valves in the center part of the vessel. Separate pipes in diameter 80 for extraction of residual cargo.

Gas displacement line in diameter 150 with safety pressure valves.

Tank heating and / or special tank coating to be specified by the owner

Sludge tank

	Lc	Bc	Hc	Volume
Dimensions per tank	1,2 m	10,1 m	4,9 m	56,0 m ³

Provisions

Diesel Oil	30 t
Fresh Water	12 t
Lub Oil	1 t
Sludge	2 t
Black Water	8 t

Equipment

- Twin rudder blades with high efficiency profiles behind each propeller.
- Bow thruster with vertical propeller shaft, propeller diameter 0.80 m. Diesel engine drive, 150 kW.
- Two bow rudder flaps in dimension of b x h = 2.0 x 1.0 m
- Two bow anchors, each 1230 kg
- One stern anchor 615 kg

Accommodation

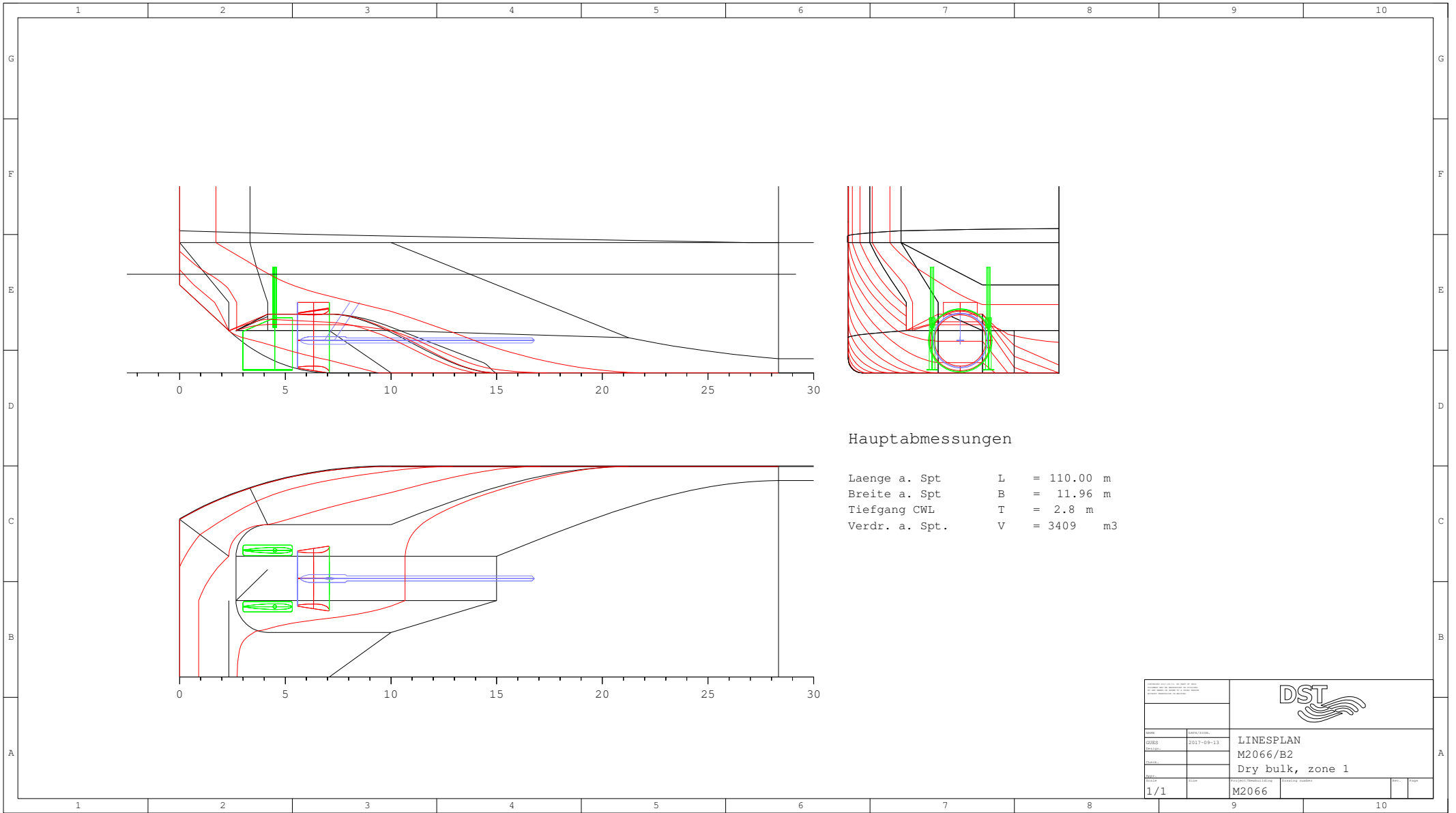
- Accommodation on two decks for crew of 8 persons

Weight calculation results for major components

Steel weight, longt. Framing	803 t
Accommodation	100 t
Machinery & outfitting	50 t
Tank equipment	40 t
Sum	905 t


Electric load requirements

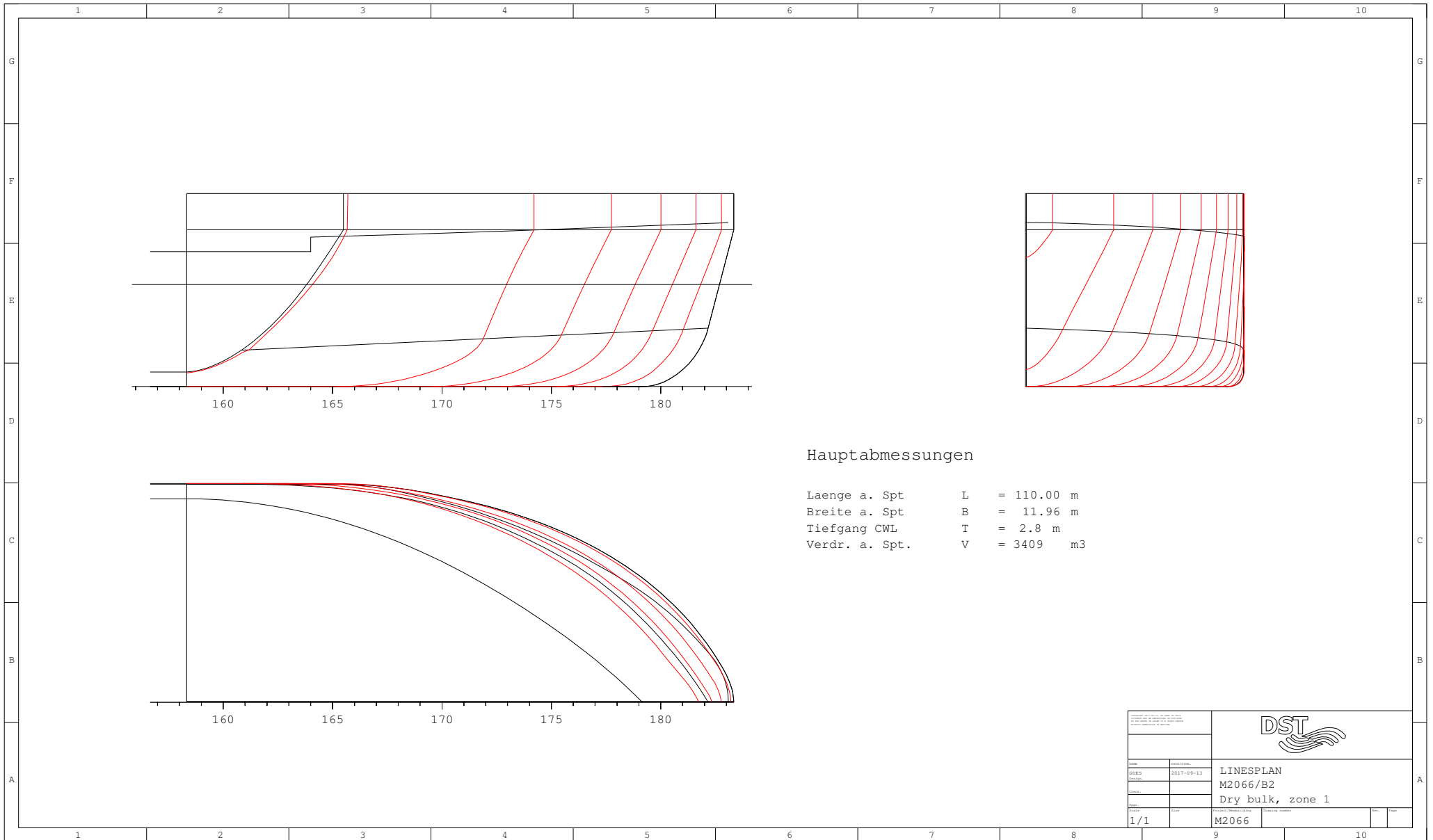
Diesel driven genset, 60 kW output
 Three-phase AC supply to cargo loading / unloading pump
 Three-phase AC supply to anchor winches
 220 V supply to accommodation
 220 V supply to AC accommodation
 24 V emergency circuit



Hauptabmessungen

Laenge a. Spt L = 110.00 m
 Breite a. Spt B = 11.96 m
 Tiefgang CWL T = 2.8 m
 Verdr. a. Spt. V = 3409 m3

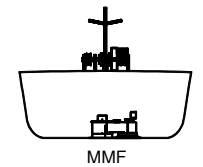
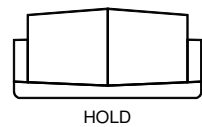
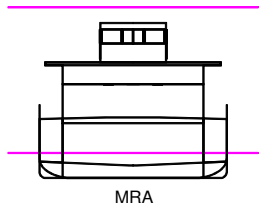
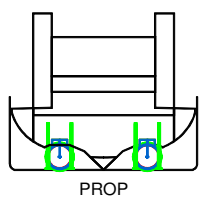
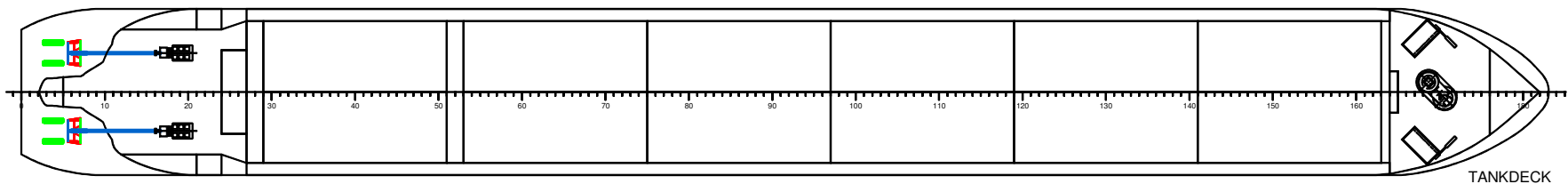
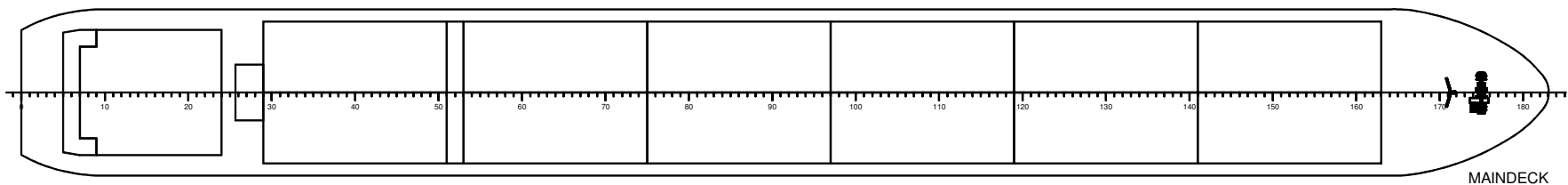
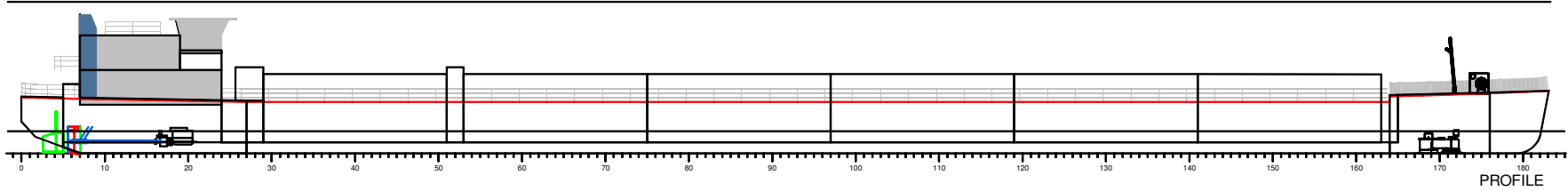
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DATE:	2017-09-13	LINESPLAN	
DESIGN:		M2066/B2	
TITLE:		Dry bulk, zone 1	
SCALE:	1/1	PROJECT NUMBER:	M2066
		DRAWING NUMBER:	
		REV.:	
		DATE:	



Hauptabmessungen


Laenge a. Spt L = 110.00 m
 Breite a. Spt B = 11.96 m
 Tiefgang CWL T = 2.8 m
 Verdr. a. Spt. V = 3409 m³

<small> DSC-Systeme Design & Ship Control 2017-09-13 </small>			
<small> Name Datum Blatt </small>	<small> DSC-Systeme 2017-09-13 1/1 </small>	<small> Projekt M2066/B2 Dry bulk, zone 1 </small>	
<small> Blatt 1/1 </small>	<small> Projekt M2066 </small>	<small> Entwurf Name Datum </small>	<small> Blatt Name Datum </small>

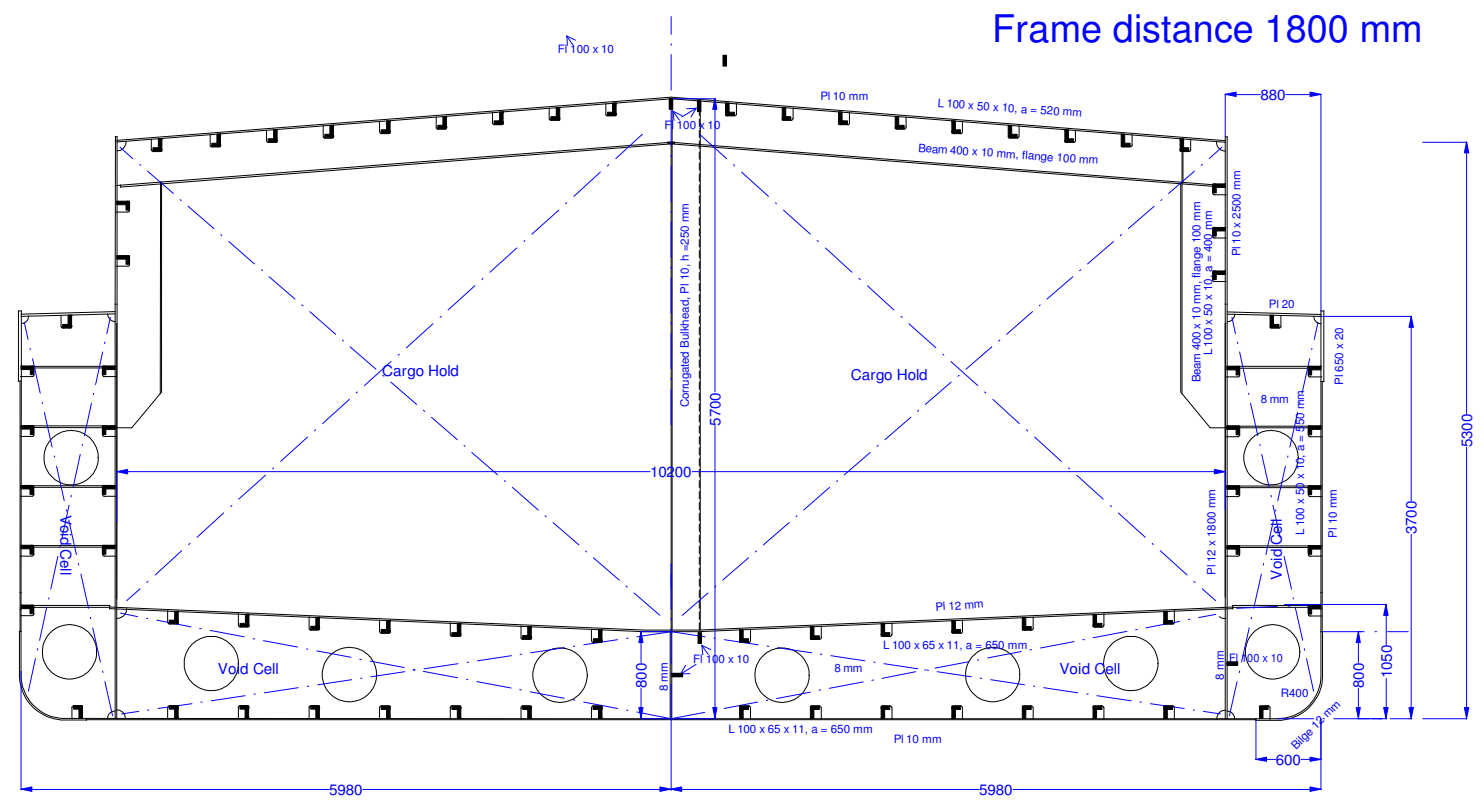


Main dimensions

Length L = 110.00 m
 Breadth oA BoA = 12.00 m
 Draught max T = 2.80 m
 Navigation Zone 1


																			
T2																			
<table border="1"> <tr><td>Model</td><td>2017-09-06</td></tr> <tr><td>Date</td><td>2017-09-06</td></tr> <tr><td>Client</td><td></td></tr> <tr><td>Scale</td><td></td></tr> <tr><td>Author</td><td></td></tr> <tr><td>Rev</td><td></td></tr> </table>	Model	2017-09-06	Date	2017-09-06	Client		Scale		Author		Rev		<table border="1"> <tr><td>Project Number</td><td>2017-09-06</td></tr> <tr><td>Sheet</td><td>T2</td></tr> <tr><td>Total</td><td>1</td></tr> </table>	Project Number	2017-09-06	Sheet	T2	Total	1
Model	2017-09-06																		
Date	2017-09-06																		
Client																			
Scale																			
Author																			
Rev																			
Project Number	2017-09-06																		
Sheet	T2																		
Total	1																		

Tanker T2- Main Frame and Scantling



Main Dimensions	
Lenght PP	: 110.000 m
Breadth moulded	: 11.960 m
Breadth o. all	: 12.000 m
Draught design	: 2.800 m
Navigation Zone 1	

Date 28.08.2017

	
Tanker T2 Main Section	
<small>Scale</small> 1:1	<small>Sheet No.</small> G 1

M2066/T2

PROJECT INFO

L x B = 110.00 x 11.96 m

Project M2066/T2

T m	DISP t	DW t	MCT tm/cm	TCP t/cm	KMT m	TK m
0.800	933.52	28.5	89.2	11.87	14.909	0.810
0.900	1052.48	147.5	90.1	11.92	13.374	0.910
1.000	1171.81	266.8	91.0	11.95	12.153	1.010
1.100	1291.50	386.5	91.8	11.99	11.160	1.110
1.200	1411.51	506.5	92.7	12.03	10.341	1.210
1.300	1532.10	627.1	94.3	12.09	9.679	1.310
1.400	1653.47	748.5	96.3	12.18	9.129	1.410
1.500	1776.02	871.0	98.5	12.28	8.655	1.510
1.600	1898.96	994.0	99.3	12.31	8.220	1.610
1.700	2022.41	1117.4	101.3	12.39	7.859	1.710
1.800	2146.41	1241.4	101.8	12.41	7.521	1.810
1.900	2270.64	1365.6	102.4	12.44	7.226	1.910
2.000	2395.11	1490.1	102.9	12.46	6.967	2.010
2.100	2519.87	1614.9	103.6	12.49	6.741	2.110
2.200	2644.88	1739.9	104.2	12.51	6.540	2.210
2.300	2770.15	1865.1	104.9	12.54	6.360	2.310
2.400	2895.69	1990.7	105.5	12.57	6.200	2.410
2.500	3021.48	2116.5	106.1	12.59	6.057	2.510
2.600	3147.50	2242.5	106.5	12.61	5.928	2.610
2.700	3273.70	2368.7	107.0	12.63	5.813	2.710
2.800	3400.10	2495.1	107.4	12.65	5.710	2.810
2.900	3526.68	2621.7	107.9	12.66	5.617	2.910
3.000	3653.44	2748.4	108.3	12.68	5.534	3.010

M2066/T2

PROJECT INFO

L x B = 110.00 x 11.96 m

Project M2066/T2, 2017-09-11

LOADING CASES

NAME	TEXT	DISP t	MASS t	MASS t	T m	TR m
1-LIGHTSHIP		940.00	0.00	0.00	0.808	-1.227
2-TMAX	All tanks loaded	3396.55	2456.55	0.00	2.796	-0.003
3-T180	Part. load	2138.25	1198.25	0.00	1.793	0.000
4-T130	Min. load	1532.32	592.32	0.00	1.299	0.000

M2066/T2

LOADING CONDITION 1-LIGHTSHIP

LOADING COMPONENTS

Name		Max. weight	Mass	Center of gravity cgx cgy cgz			Free s. moment

Diesel Oil, RHO=0.860							

DOA	Diesel oil a.	25.5	17.00	15.30	0.00	1.79	26.20
DOF	Diesel oil f.	4.9	3.00	98.70	0.00	1.81	0.00

Total of DO		30.4	20.00	27.81	0.00	1.79	26.20

Fresh Water, RHO=1.000							

FW	Side Tanks a.	13.6	10.00	13.50	0.00	1.98	29.87

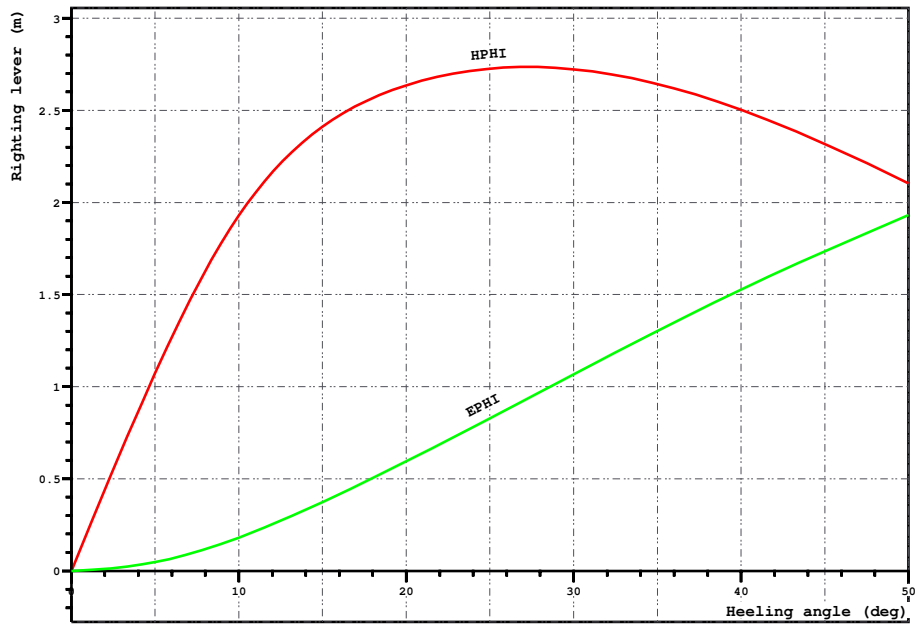
Deadweight			35.0	21.46	0.00	2.73	56.1
Lightweight			905.0	45.22	0.00	2.47	
Displacement (rho=1.000)			940.0	44.34	0.00	2.48	56.1

FLOATING POSITION

Draught moulded	0.808	m	KM	14.97	m
Trim	-1.227	m	KG	2.48	m
Heel, PS=+	0.0	deg			
TA	1.421	m	GM0	12.49	m
TF	0.195	m	GMCORR	-0.06	m
Trimming moment	-11231	tonm	GM	12.43	m



Loading case1 1-LIGHTSHIP,

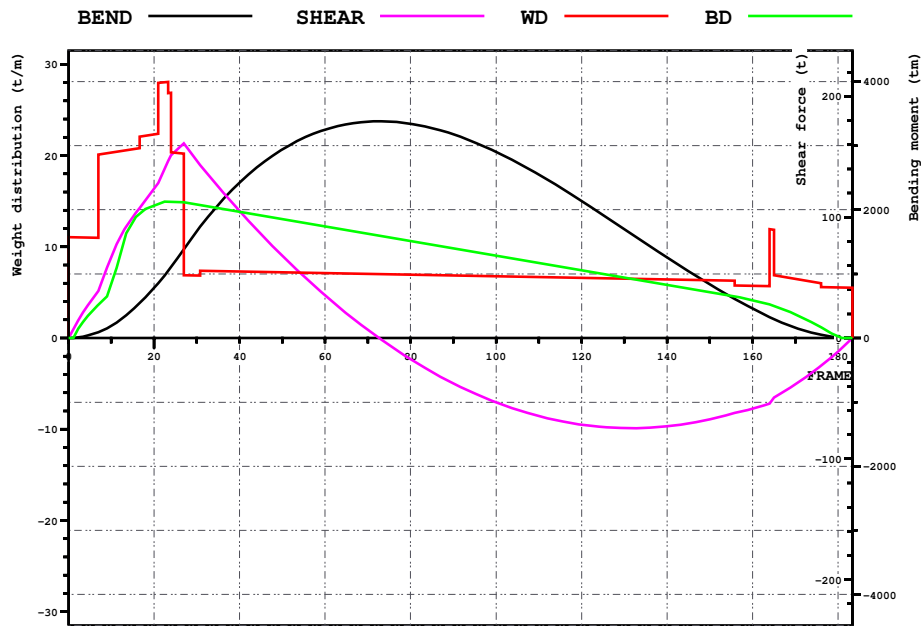


LOADING CONDITION 1-LIGHTSHIP

HEEL deg	MS m	HPI m	EPI mrad	FSMOM tm	DGZ m
0.0	0.000	0.00	0.000	0.0	0.000
5.0	-0.010	1.07	0.048	4.9	0.005
10.0	-0.229	1.93	0.181	9.9	0.011
15.0	-0.804	2.41	0.373	14.9	0.016
20.0	-1.615	2.64	0.594	18.6	0.020
30.0	-3.494	2.72	1.067	24.4	0.026
40.0	-5.495	2.50	1.527	26.4	0.028
50.0	-7.433	2.10	1.931	25.9	0.028

M2066/T2

Loading case1 1-LIGHTSHIP,



LOADING CONDITION 1-LIGHTSHIP

X m	FR #	BEND tm	SHEAR t	WD t/m	BD t/m
0.000	0.00	0	0	11.06	0.00
6.000	10.00	188	67	20.34	5.95
12.000	20.00	778	124	22.31	14.51
18.000	30.00	1665	147	6.85	14.64
24.000	40.00	2421	105	7.30	13.85
30.000	50.00	2940	68	7.21	13.05
36.000	60.00	3249	35	7.13	12.24
42.000	70.00	3375	7	7.04	11.44
48.000	80.00	3342	-18	6.95	10.64
54.000	90.00	3176	-38	6.87	9.84
60.000	100.00	2903	-53	6.78	9.04
66.000	110.00	2549	-65	6.69	8.24
72.000	120.00	2140	-72	6.61	7.43
78.000	130.00	1700	-75	6.52	6.63
84.000	140.00	1257	-73	6.43	5.83
90.000	150.00	835	-67	6.34	5.03
96.000	160.00	459	-59	5.72	4.13
102.000	170.00	162	-38	6.47	2.58
108.000	180.00	11	-11	5.55	0.18

M2066/T2

LOADING CONDITION 1-LIGHTSHIP

L O A D I N G C O M P O N E N T S

Name		Max. weight	Mass	Center of gravity cgx cgy cgz			Free s. moment

Diesel Oil, RHO=0.860							

DOA	Diesel oil a.	25.5	17.00	15.30	0.00	1.79	26.20
DOF	Diesel oil f.	4.9	3.00	98.70	0.00	1.81	0.00

Total of DO		30.4	20.00	27.81	0.00	1.79	26.20

Fresh Water, RHO=1.000							

FW	Side Tanks a.	13.6	10.00	13.50	0.00	1.98	29.87

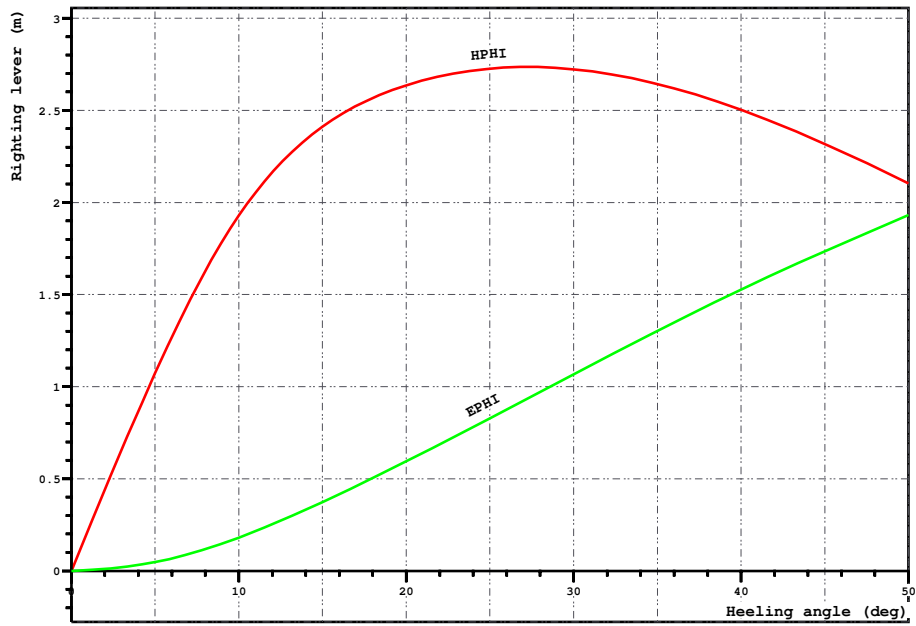
Deadweight			35.0	21.46	0.00	2.73	56.1
Lightweight			905.0	45.22	0.00	2.47	
Displacement (rho=1.000)			940.0	44.34	0.00	2.48	56.1

FLOATING POSITION

Draught moulded	0.808	m	KM	14.97	m
Trim	-1.227	m	KG	2.48	m
Heel, PS=+	0.0	deg			
TA	1.421	m	GM0	12.49	m
TF	0.195	m	GMCORR	-0.06	m
Trimming moment	-11231	tonm	GM	12.43	m



Loading case 2-T280,

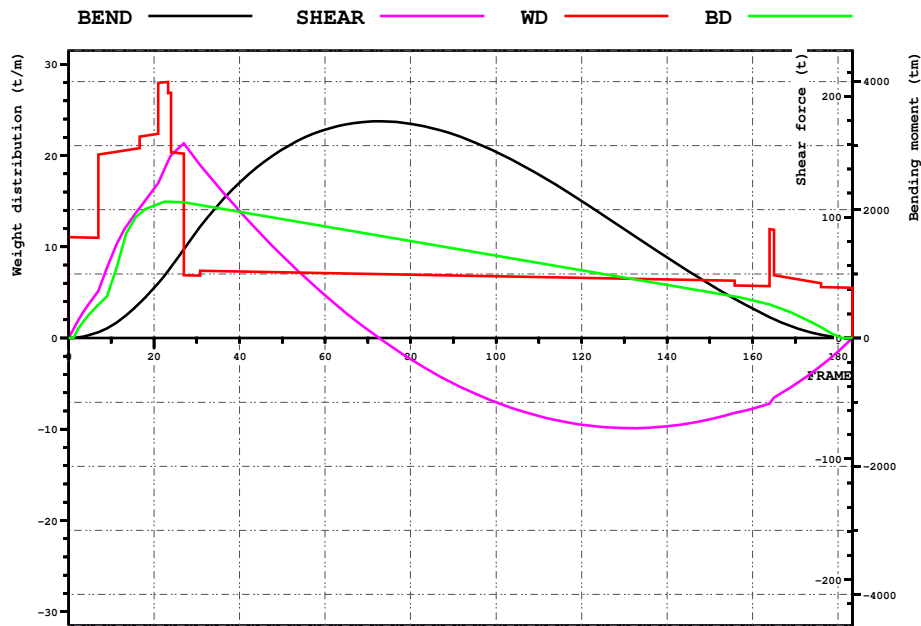


LOADING CONDITION 1-LIGHTSHIP

HEEL deg	MS m	HPHI m	EPII mrad	FSMOM tm	DGZ m
0.0	0.000	0.00	0.000	0.0	0.000
5.0	-0.010	1.07	0.048	4.9	0.005
10.0	-0.229	1.93	0.181	9.9	0.011
15.0	-0.804	2.41	0.373	14.9	0.016
20.0	-1.615	2.64	0.594	18.6	0.020
30.0	-3.494	2.72	1.067	24.4	0.026
40.0	-5.495	2.50	1.527	26.4	0.028
50.0	-7.433	2.10	1.931	25.9	0.028

M2066/T2

Loading case 2-T280,



LOADING CONDITION 1-LIGHTSHIP

X m	FR #	BEND tm	SHEAR t	WD t/m	BD t/m
0.000	0.00	0	0	11.06	0.00
6.000	10.00	188	67	20.34	5.95
12.000	20.00	778	124	22.31	14.51
18.000	30.00	1665	147	6.85	14.64
24.000	40.00	2421	105	7.30	13.85
30.000	50.00	2940	68	7.21	13.05
36.000	60.00	3249	35	7.13	12.24
42.000	70.00	3375	7	7.04	11.44
48.000	80.00	3342	-18	6.95	10.64
54.000	90.00	3176	-38	6.87	9.84
60.000	100.00	2903	-53	6.78	9.04
66.000	110.00	2549	-65	6.69	8.24
72.000	120.00	2140	-72	6.61	7.43
78.000	130.00	1700	-75	6.52	6.63
84.000	140.00	1257	-73	6.43	5.83
90.000	150.00	835	-67	6.34	5.03
96.000	160.00	459	-59	5.72	4.13
102.000	170.00	162	-38	6.47	2.58
108.000	180.00	11	-11	5.55	0.18

M2066/T2

LOADING CONDITION 3-T180, Part. load

LOADING COMPONENTS

Name		Max. weight	Mass	Center of gravity cgx cgz			Free s. moment

Diesel Oil, RHO=0.860							

DOA	Diesel oil a.	25.5	17.00	15.30	0.00	1.79	26.20
DOF	Diesel oil f.	4.9	3.00	98.70	0.00	1.81	0.00

Total of DO		30.4	20.00	27.81	0.00	1.79	26.20

Fresh Water, RHO=1.000							

FW	Side Tanks a.	13.6	10.00	13.50	0.00	1.98	29.87

Liquid cargo, RHO=1.000							

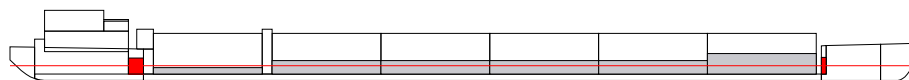
LTANK_S6		304.0	157.44	91.20	-2.51	2.09	143.00
LTANK_P2		304.3	99.80	38.40	2.49	1.66	143.00
LTANK_S4		304.2	99.76	64.80	-2.49	1.66	143.00
LTANK_S3		304.2	99.78	51.60	-2.49	1.66	143.00
LTANK_P5		304.1	99.74	78.00	2.49	1.66	143.00
LTANK_P3		304.2	99.78	51.60	2.49	1.66	143.00
LTANK_P1	Tank 1 P	304.3	42.60	24.00	2.40	1.22	143.00
LTANK_S2		304.3	99.80	38.40	-2.49	1.66	143.00
LTANK_S1		304.3	42.60	24.00	-2.40	1.22	143.00
LTANK_S5		304.1	99.74	78.00	-2.49	1.66	143.00
LTANK_P6		304.0	157.44	91.20	2.51	2.09	143.00
LTANK_P4		304.2	99.76	64.80	2.49	1.66	143.00

Total of CAL		3650.2	1198.25	64.44	0.00	1.74	1715.97

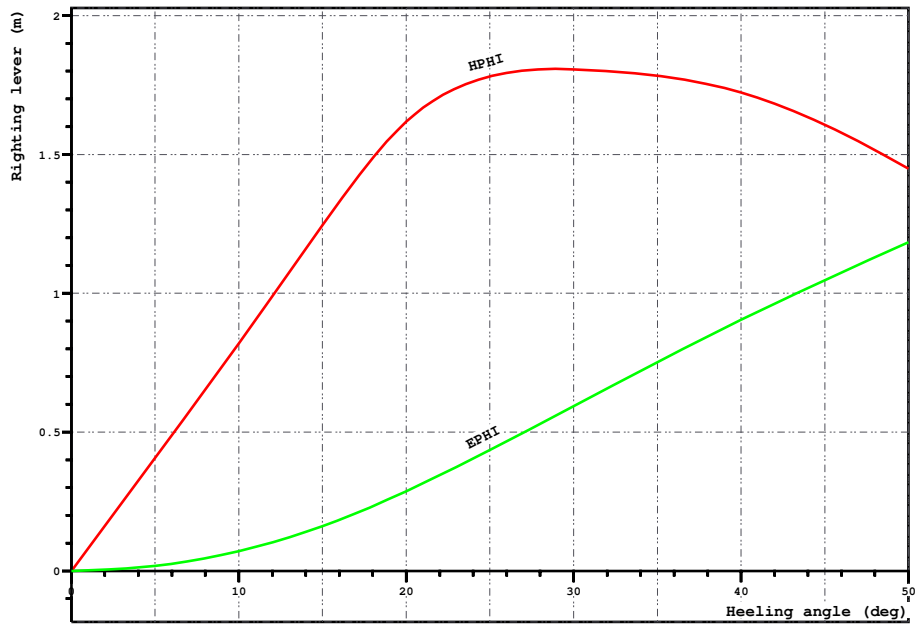
Deadweight			1233.2	63.22	0.00	1.77	1772.0
Lightweight			905.0	45.22	0.00	2.47	
Displacement (rho=1.000)			2138.2	55.60	0.00	2.06	1772.0

FLOATING POSITION

Draught moulded	1.793	m	KM	7.55	m
Trim	0.000	m	KG	2.06	m
Heel, PS=+	0.0	deg			
TA	1.793	m	GM0	5.48	m
TF	1.793	m	GMCORR	-0.83	m
Trimming moment	1	tonm	GM	4.65	m



Loading case 3-T180, Part. load

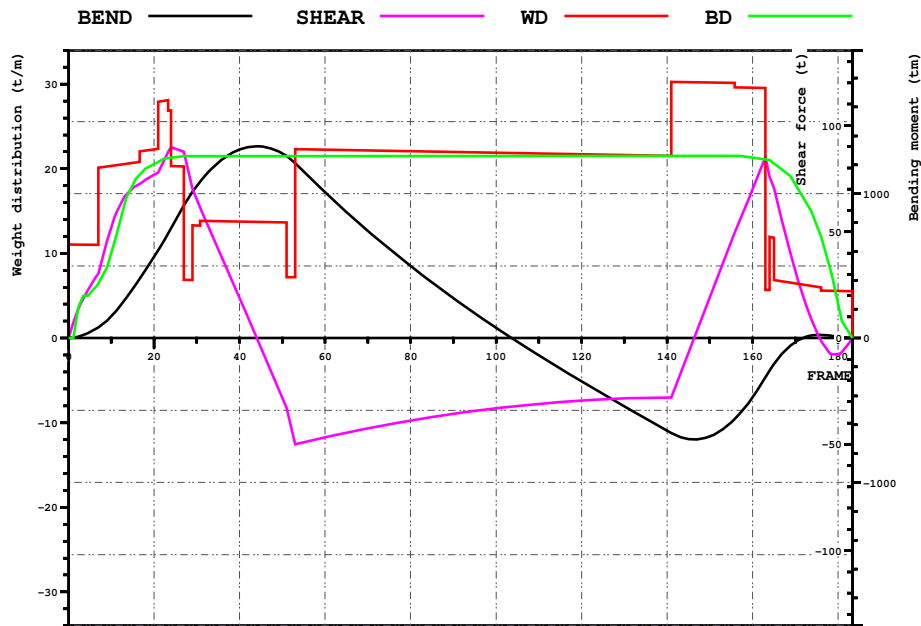


LOADING CONDITION 3-T180, Part. load

HEEL deg	MS m	HPHI m	EPII mrad	FSMOM tm	DGZ m
0.0	0.000	0.00	0.000	0.0	0.000
5.0	0.002	0.41	0.018	155.0	0.073
10.0	0.013	0.82	0.071	312.5	0.146
15.0	0.048	1.25	0.161	473.7	0.222
20.0	0.041	1.62	0.287	635.6	0.297
30.0	-0.477	1.81	0.594	976.8	0.457
40.0	-1.184	1.72	0.904	1316.6	0.616
50.0	-2.003	1.45	1.183	1598.4	0.748

M2066/T2

Loading case 3-T180, Part. load



LOADING CONDITION 3-T180, Part. load

X m	FR #	BEND tm	SHEAR t	WD t/m	BD t/m
0.000	0.00	0	0	11.06	0.00
6.000	10.00	151	52	20.34	10.07
12.000	20.00	561	77	22.31	20.55
18.000	30.00	1053	65	13.31	21.50
24.000	40.00	1306	19	13.75	21.51
30.000	50.00	1279	-28	13.67	21.51
36.000	60.00	1009	-47	22.25	21.51
42.000	70.00	742	-42	22.16	21.51
48.000	80.00	499	-39	22.07	21.51
54.000	90.00	277	-36	21.98	21.51
60.000	100.00	71	-33	21.89	21.51
66.000	110.00	-120	-31	21.81	21.51
72.000	120.00	-301	-29	21.72	21.51
78.000	130.00	-473	-28	21.63	21.51
84.000	140.00	-642	-28	21.54	21.51
90.000	150.00	-681	19	30.20	21.51
96.000	160.00	-410	70	29.58	21.30
102.000	170.00	-28	32	6.47	18.16
108.000	180.00	9	-8	5.55	4.12

M2066/T2

LOADING CONDITION 4-T130, Min. load

LOADING COMPONENTS

Name		Max. weight	Mass	Center of gravity cgx cgy cgz			Free s. moment

Diesel Oil, RHO=0.860							

DOA	Diesel oil a.	25.5	17.00	15.30	0.00	1.79	26.20
DOF	Diesel oil f.	4.9	3.00	98.70	0.00	1.81	0.00

Total of DO		30.4	20.00	27.81	0.00	1.79	26.20

Fresh Water, RHO=1.000							

FW	Side Tanks a.	13.6	10.00	13.50	0.00	1.98	29.87

Liquid cargo, RHO=1.000							

LTANK_S6		304.0	117.50	91.20	-2.50	1.79	143.00
LTANK_P2		304.3	49.29	38.40	2.42	1.27	143.00
LTANK_S4		304.2	49.27	64.80	-2.42	1.27	143.00
LTANK_S3		304.2	1.33	51.60	-0.74	0.85	0.00
LTANK_P5		304.1	78.77	78.00	2.47	1.50	143.00
LTANK_P3		304.2	1.33	51.60	0.74	0.85	0.00
LTANK_S2		304.3	49.29	38.40	-2.42	1.27	143.00
LTANK_S5		304.1	78.77	78.00	-2.47	1.50	143.00
LTANK_P6		304.0	117.50	91.20	2.50	1.79	143.00
LTANK_P4		304.2	49.27	64.80	2.42	1.27	143.00

Total of CAL		3041.5	592.32	74.33	0.00	1.53	1143.98

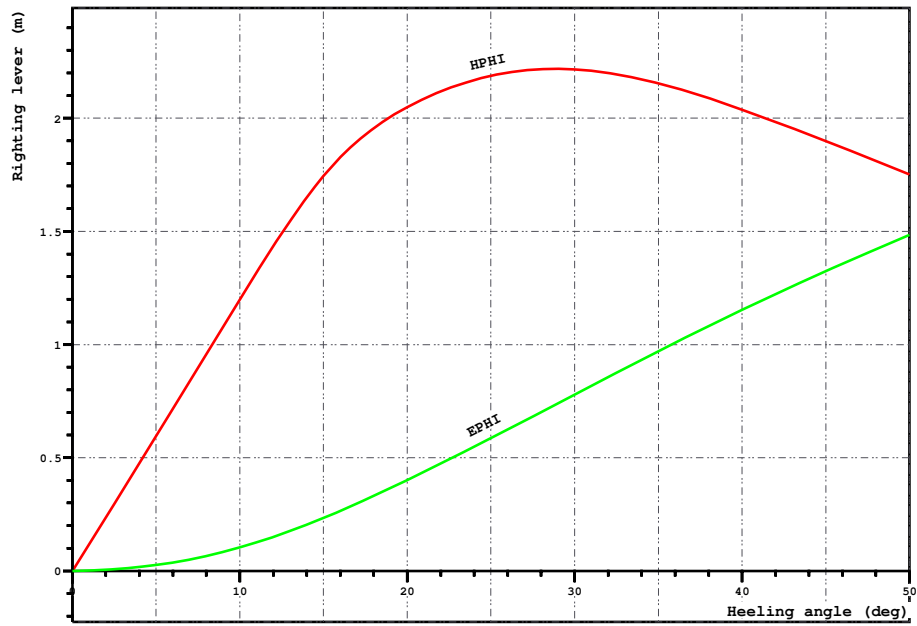
Deadweight			627.3	71.38	0.00	1.60	1200.1
Lightweight			905.0	45.22	0.00	2.47	
Displacement (rho=1.000)			1532.3	55.93	0.00	2.11	1200.1

FLOATING POSITION

Draught moulded	1.299	m	KM	9.68	m
Trim	0.000	m	KG	2.11	m
Heel, PS=+	0.0	deg			
TA	1.299	m	GM0	7.57	m
TF	1.299	m	GMCORR	-0.78	m
Trimming moment	0	tonm	GM	6.79	m



Loading case 4-T130, Min. load

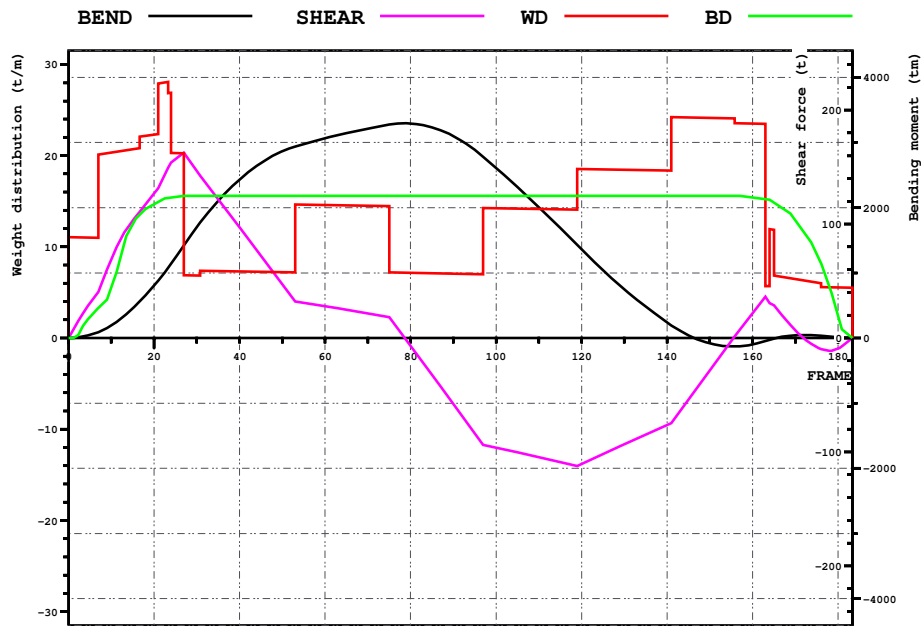


LOADING CONDITION 4-T130, Min. load

HEEL deg	MS m	HPHI m	EPhi mrad	FSMOM tm	DGZ m
0.0	0.000	0.00	0.000	0.0	0.000
5.0	0.003	0.59	0.026	105.0	0.069
10.0	0.023	1.20	0.104	211.6	0.138
15.0	-0.005	1.74	0.234	321.3	0.210
20.0	-0.261	2.05	0.401	427.5	0.279
30.0	-1.169	2.22	0.779	612.5	0.400
40.0	-2.330	2.04	1.154	762.4	0.498
50.0	-3.476	1.75	1.485	875.3	0.571

M2066/T2

Loading case1 4-T130, Min. load



LOADING CONDITION 4-T130, Min. load

X m	FR #	BEND tm	SHEAR t	WD t/m	BD t/m
0.000	0.00	0	0	11.06	0.00
6.000	10.00	193	69	20.34	5.57
12.000	20.00	800	127	22.31	14.65
18.000	30.00	1698	147	6.85	15.59
24.000	40.00	2432	97	7.30	15.59
30.000	50.00	2865	47	7.21	15.59
36.000	60.00	3064	28	14.59	15.59
42.000	70.00	3214	22	14.51	15.59
48.000	80.00	3291	-7	7.15	15.59
54.000	90.00	3098	-58	7.07	15.59
60.000	100.00	2611	-96	14.24	15.59
66.000	110.00	2010	-104	14.16	15.59
72.000	120.00	1359	-111	18.54	15.59
78.000	130.00	748	-93	18.45	15.59
84.000	140.00	240	-76	18.37	15.59
90.000	150.00	-82	-28	24.15	15.59
96.000	160.00	-99	22	23.53	15.41
102.000	170.00	42	7	6.47	12.89
108.000	180.00	10	-9	5.55	2.46