

REPORT ANNEX - Data used for the calculation(s)

Berth: Demo Terminal
North Berth [test] 120°

Vessel: Flex Polaris [test] 7654321
Port Side, Fully laden

Vessel Details:

Ship Identity:	Q-Flex	Max Draft (m):	12.5
LOA (m):	315	Max Air Draft (m):	52
LBP (m):	303	Max Displacement (t):	150000
Beam (m):	50	Forecastle Elevation (m):	0
Moulded Depth (m):	27	Forecastle Length (m):	45
Frontal/Transverse Wind Area (m ²):	875	Poopdeck Elevation (m):	-5.75
Broadside/Lateral Wind Area (m ²):	2984	Poopdeck Length (m):	18.1
Max Hull Pressure (t/m ²):	20	Poopdeck Transom Width (m):	24
		Allowed Side Alongside:	Both

Manifold Offsets (m):	x	y	z
Port Side:	2.65	21.75	1.7
Starboard Side:	2.65	-21.75	1.7

Data Quality Comments:

Highest - Validated

LBP Calculated on plan.
305.4 measured due to scan error (1.1% error) => measure short distance on GA plan.

Estimated Data

Max Displacement Deadweight 107,000 t + lightship ?

Max Hull Pressure

Good - not validated

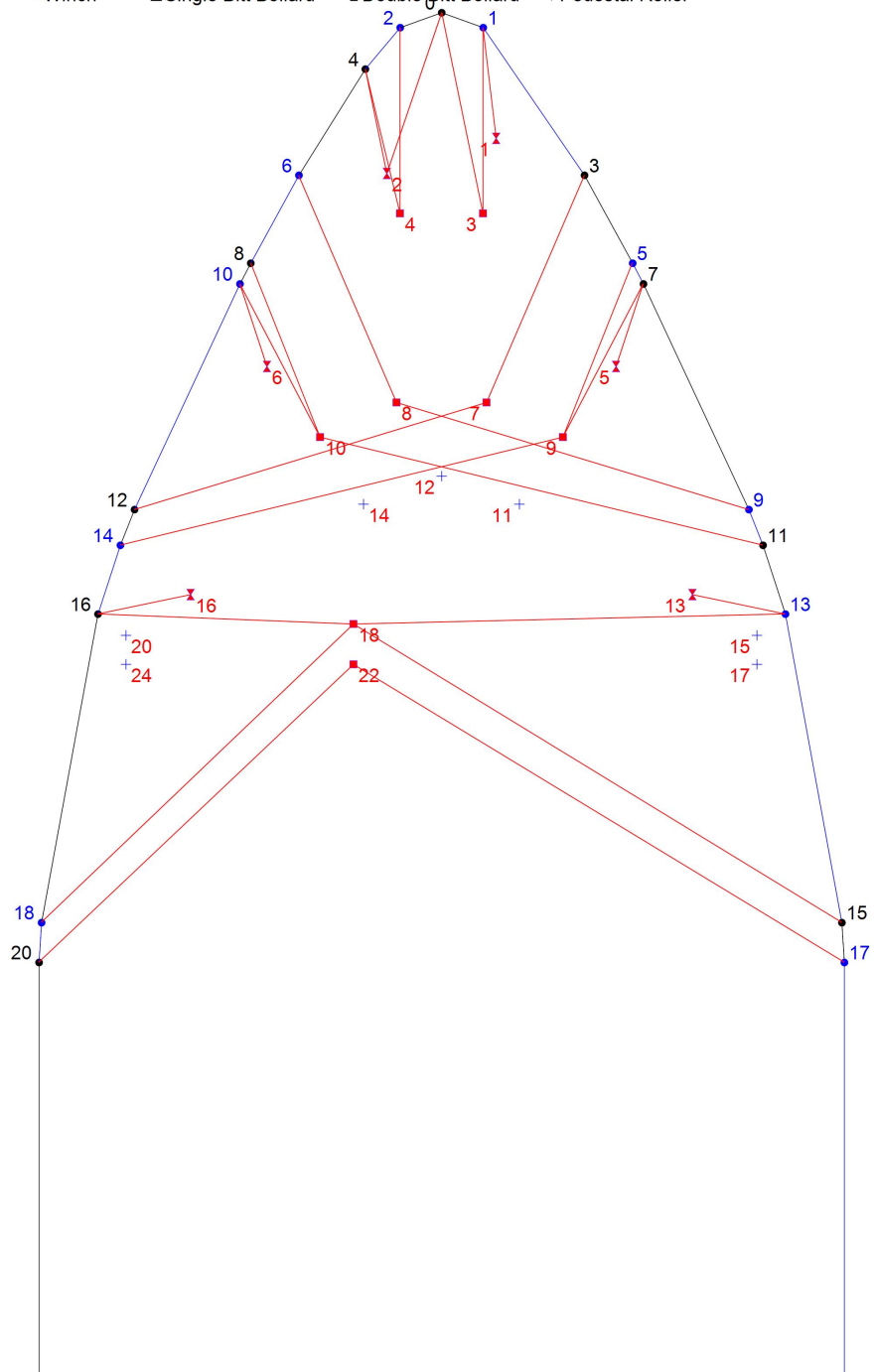
Max Air Draft

Longitudinal Wind Area Measured from GA plan

Lateral Wind Area Measured from GA plan

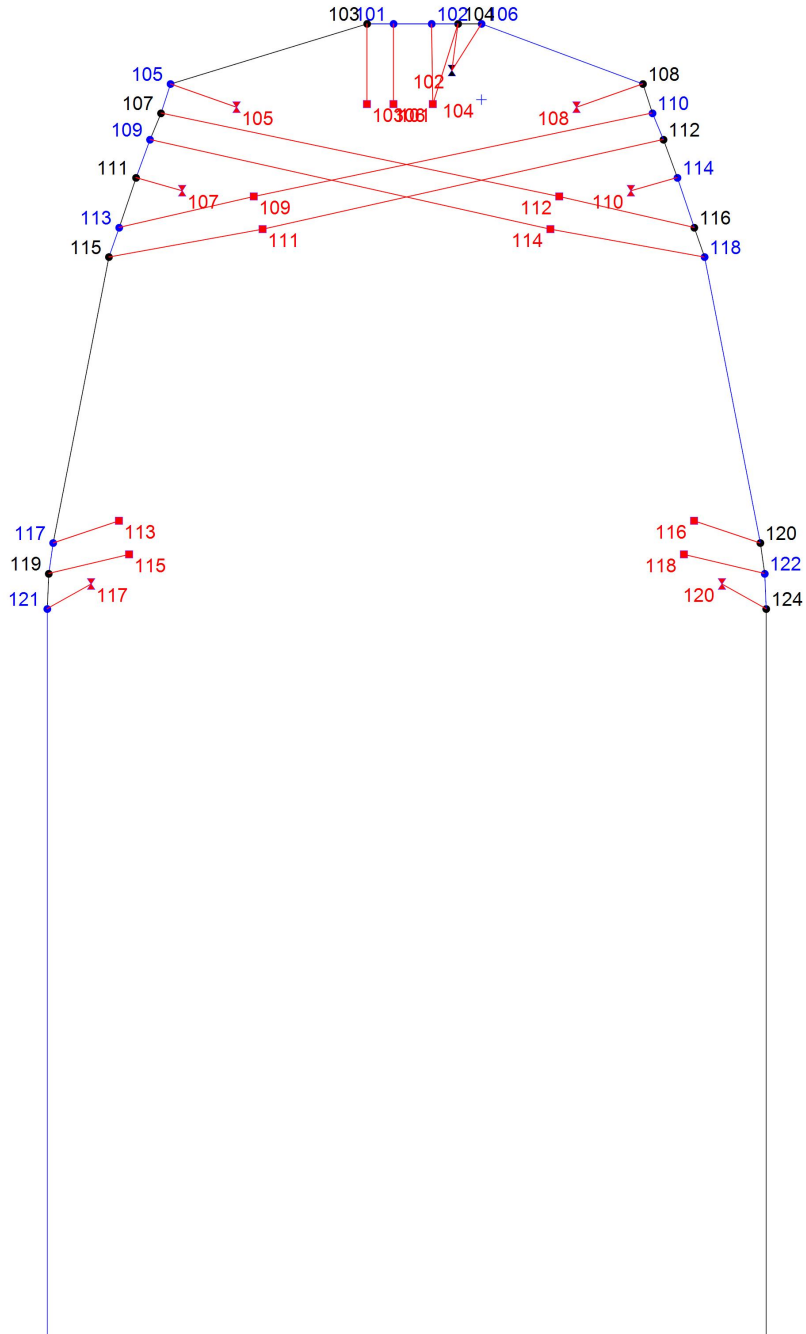
GA Deck Plan - Bow

● Fairlead ■ Winch ▲ Single Bitt Bollard ✕ Double Bitt Bollard + Pedestal Roller



GA Deck Plan - Stern

● Fairlead ■ Winch ▲ Single Bitt Bollard ✕ Double Bitt Bollard + Pedestal Roller



Fairleads:

Nr	Ref.	For lines	SWL [t]	Position [m]		
				X	Y	Z
0		H/St	190	159.10	0.00	0.50
1		H/St	190	158.20	-2.50	0.50
2		H/St	190	158.20	2.50	0.50
3		H/St	190	149.30	-8.60	0.50
4		H/St	190	155.70	4.60	0.50
5		H/St	190	144.00	-11.50	0.50
6		H/St	190	149.30	8.60	0.50
7		H/St	190	142.75	-12.15	0.50
8		H/St	190	144.00	11.50	0.50
9		B	190	129.15	-18.50	0.50
10		H/St	190	142.75	12.15	0.50
11		B	190	127.00	-19.35	0.50
12		B	190	129.15	18.50	0.50
13		B	190	122.85	-20.70	0.50
14		B	190	127.00	19.35	0.50
15		Sp	190	104.25	-24.10	0.50
16		B	190	122.85	20.70	0.50
17		Sp	190	101.85	-24.25	0.50
18		Sp	190	104.25	24.10	0.50
20		Sp	190	101.85	24.25	0.50
101		H/St	190	-155.50	-0.90	-5.25
102		H/St	190	-155.50	1.70	-5.25
103		H/St	190	-155.50	-2.70	-5.30
104		H/St	190	-155.50	3.50	-5.25
105		B	190	-151.40	-16.10	-5.30
106		H/St	190	-155.50	5.10	-5.50
107		B	190	-149.40	-16.75	-5.30
108		B	190	-151.40	16.10	-5.30
109		B	190	-147.60	-17.50	-5.25
110		B	190	-149.40	16.75	-5.30
111		B	190	-145.00	-18.45	-5.30
112		B	190	-147.60	17.50	-5.25
113		B	190	-141.60	-19.60	-5.30
114		B	190	-145.00	18.45	-5.30
115		B	190	-139.60	-20.30	-5.30
116		B	190	-141.60	19.60	-5.30
117		Sp	190	-120.10	-24.10	0.50
118		B	190	-139.60	20.30	-5.30
119		Sp	190	-118.00	-24.40	0.50
120		Sp	190	-120.10	24.10	0.50
121		Sp	190	-115.60	-24.50	0.50

122	Sp	190	-118.00	24.40	0.50
124	Sp	190	-115.60	24.50	0.50

Data Quality Comments:

Fairlead Nr 0

Estimated Data

SWL MEG4 indicates fairleads at x2 design mooring line MBL

Fairlead Nr 113

Estimated Data

SWL

Fairlead Nr 116

Estimated Data

SWL

Winches:

Nr	Ref.	Type	Max. Brake Load	Max. Lines	Position [m]		
					X	Y	Z
1	Bollard	Double Bitt Bollard	0	1	151.50	-3.30	0.30
2	Bollard	Double Bitt Bollard	0	1	149.40	3.30	0.30
3	Fwd mooring (SB)	Winch Single	56	1	147.00	-2.50	1.00
4	Fwd mooring (PS)	Winch Single	56	2	147.00	2.50	1.00
5	Bollard	Double Bitt Bollard	0	1	137.75	-10.50	0.30
6	Bollard	Double Bitt Bollard	0	1	137.75	10.50	0.30
7	Fwd Anchor 2 (SB)	Winch Single	56	1	135.60	-2.70	1.00
8	Fwd Anchor 2 (PS)	Winch Single	56	1	135.60	2.70	1.00
9	Fwd Anchor (SB)	Winch Single	56	2	133.50	-7.30	1.00
10	Fwd Anchor (PS)	Winch Single	56	2	133.50	7.30	1.00
11	Pedestal	Pedestal Roller	0	1	129.45	-4.70	1.00
12	Pedestal	Pedestal Roller	0	1	131.15	0.00	1.00
13	Bollard	Double Bitt Bollard	0	1	124.00	-15.10	0.30
14	Pedestal	Pedestal Roller	0	1	129.45	4.70	1.00
15	Pedestal	Pedestal Roller	0	1	121.55	-19.00	1.00
16	Bollard	Double Bitt Bollard	0	1	124.00	15.10	0.30
17	Pedestal	Pedestal Roller	0	1	119.80	-19.00	1.00
18	Fwd (centre)	Winch Single	56	2	122.25	5.30	1.00
20	Pedestal	Pedestal Roller	0	1	121.55	19.00	1.00
22	Fwd (centre)	Winch Single	56	1	119.80	5.30	1.00
24	Pedestal	Pedestal Roller	0	1	119.80	19.00	1.00
101	Aft Centre	Winch Single	56	1	-150.00	-0.90	-4.75
102	Aft Centre	Double Bitt Bollard	0	1	-152.30	3.10	-5.45
103	Aft Centre	Winch Single	56	1	-150.00	-2.70	-4.75
104	Aft Centre	Pedestal Roller	0	1	-150.30	5.10	-4.75
105	Aft SB	Double Bitt Bollard	0	1	-149.80	-11.60	-5.45
106	Aft Centre	Winch Single	56	2	-150.00	1.80	-4.75
107	Aft SB	Double Bitt Bollard	0	1	-144.10	-15.30	-5.45
108	Aft PS	Double Bitt Bollard	0	1	-149.80	11.60	-5.45
109	Aft SB	Winch Single	56	2	-143.70	-10.40	-4.75
110	Aft PS	Double Bitt Bollard	0	1	-144.10	15.30	-5.45
111	Aft SB	Winch Single	56	1	-141.50	-9.80	-4.75
112	Aft PS	Winch Single	56	2	-143.70	10.40	-4.75
113	Aft Spring (SB)	Winch Single	56	1	-121.60	-19.60	1.00
114	Aft PS	Winch Single	56	1	-141.50	9.80	-4.75
115	Aft Spring (SB)	Winch Single	56	2	-119.30	-18.90	1.00
116	Aft Spring (PS)	Winch Single	56	1	-121.60	19.60	1.00

117	Aft Spring Bollard	Double Bitt Bollard	0	1	-117.30	-21.50	0.30
118	Aft Spring (PS)	Winch Single	56	2	-119.30	18.90	1.00
120	Aft Spring Bollard	Double Bitt Bollard	0	1	-117.30	21.50	0.30

Data Quality Comments:

Mooring Nr 4

Estimated Data

SWL	100% of mooring line design MBL (MEG4)
Winch Max Brake Load	60% of mooring line design MBL (MEG4)

Mooring Lines:

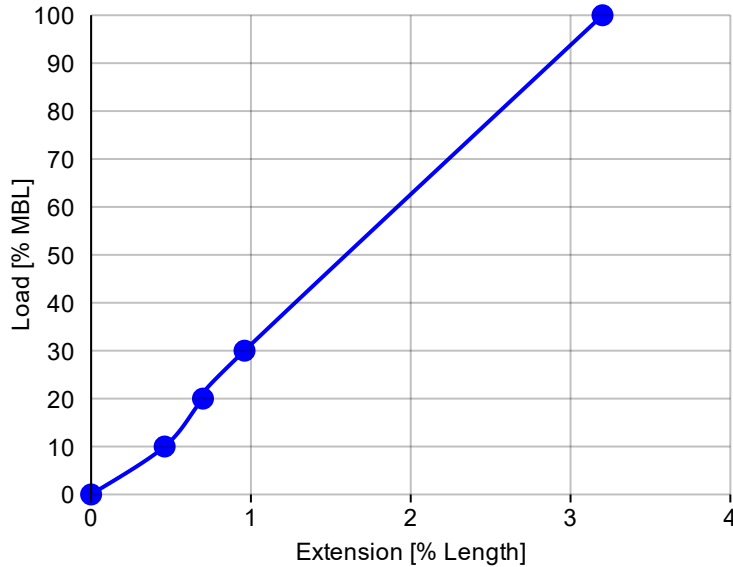
Line	Material	Manufacturer	Model	Description	LDBF [t]	Length [m]	Diameter [mm]	Pre Tension [t]
Headline 1	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	0
Headline 2	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Headline 3	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Headline 4	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	0
Fwd Breast Line 1	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Fwd Breast Line 2	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Fwd Breast Line 3	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	0
Fwd Spring Line 1	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Fwd Spring Line 2	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Aft Spring Line 1	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Aft Spring Line 2	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Aft Breast Line 1	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Aft Breast Line 2	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Aft Breast Line 3	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	0
Sternline 1	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Sternline 2	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Sternline 3	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	5
Sternline 4	Dyneema	Samson	Amsteel-Blue	Primary mooring rope (12 strand)	93.1	220	36	0

Line	TAIL						
	Material	Manu facturer	Model	Description	LDB F [t]	Length [m]	Diameter [mm]
Headline 1	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Headline 2	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Headline 3	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Headline 4	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Fwd Breast Line 1	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Fwd Breast Line 2	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Fwd Breast Line 3	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Fwd Spring Line 1	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Fwd Spring Line 2	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Aft Spring Line 1	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Aft Spring Line 2	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Aft Breast Line 1	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Aft Breast Line 2	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Aft Breast Line 3	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Sternline 1	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Sternline 2	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Sternline 3	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88
Sternline 4	Nylon	Samson	RP-12 Nylon	Round plaited 12 Strand	122	11	88

Mooring Line curves:

Lines: Headline 1, Headline 2, Headline 3, Headline 4, Fwd Breast Line 1, Fwd Breast Line 2, Fwd Breast Line 3, Fwd Spring Line 1, Fwd Spring Line 2, Aft Spring Line 1, Aft Spring Line 2, Aft Breast Line 1, Aft Breast Line 2, Aft Breast Line 3, Sternline 1, Sternline 2, Sternline 3, Sternline 4

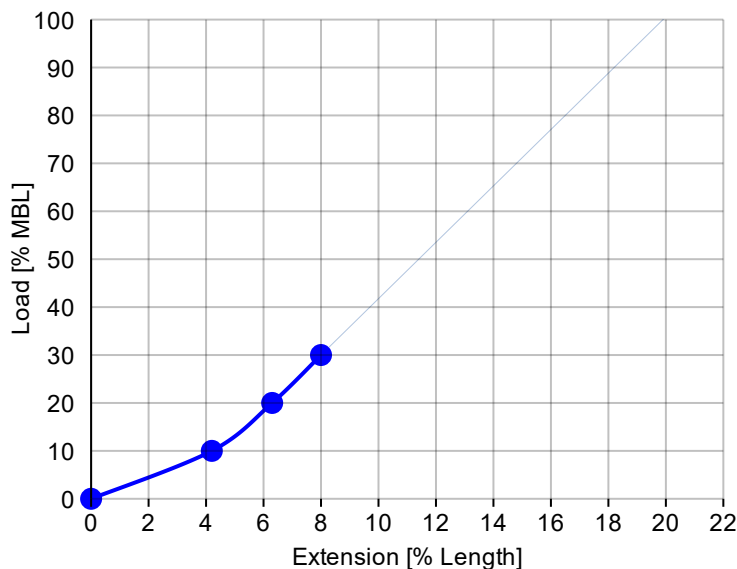
Extension [% Length]	Load [% MBL]
0.00	0
0.46	10
0.70	20
0.96	30
3.20	100



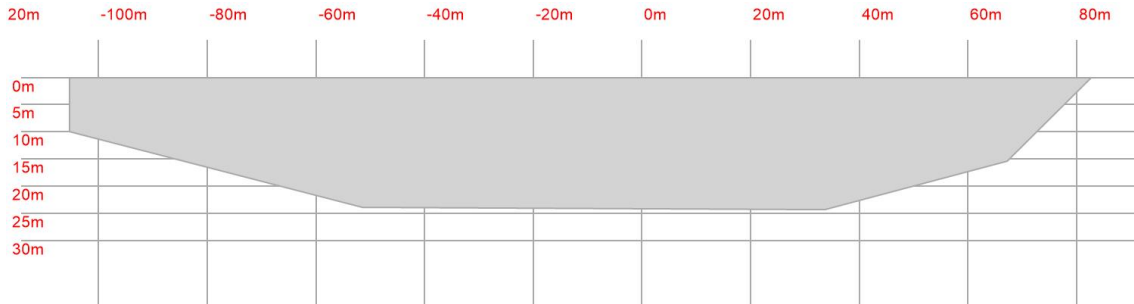
Mooring Tail Curves

Lines: Headline 1, Headline 2, Headline 3, Headline 4, Fwd Breast Line 1, Fwd Breast Line 2, Fwd Breast Line 3, Fwd Spring Line 1, Fwd Spring Line 2, Aft Spring Line 1, Aft Spring Line 2, Aft Breast Line 1, Aft Breast Line 2, Aft Breast Line 3, Sternline 1, Sternline 2, Sternline 3, Sternline 4

Extension [% Length]	Load [% MBL]
0.00	0
4.20	10
6.30	20
8.00	30



Parallel Body (PMB)



Distance X (m) along longitudinal axis, 0 at midship LBP/2, + FWD
-105.40
-105.39
-51.45
33.60
67.25
82.60

Depth Z (m) 0 at main deck level, + DOWN
0.00
10.00
23.95
24.25
15.35
0.00

Load Condition Parameters:

Load Condition:	Fully laden		
Block Coefficient	0.85		
Displacement (t)	147000		
Draft (m)	12.1		
Trim (m)	0		
Centre of Gravity x, y, z (m)	0	0	16.38
GM(T) - Transverse Metacentric Height (m)	5.04	GM(L) - Longitudinal Metacentric Height (m)	604
Inertia x, y, z (t.m ²)	74895213	1371989547	1371989547
Frontal Wind Position x, y, z (m)	0	0	16.38
Side Wind Position x, y, z (m)	0	0	16.38

Data Quality Comments:

Estimated Data

Block Coef From AMax data

Hull Wind Coefficients:

Coefficient Set: MEG4 SIGTTO 2007 Prismatic

Draft (m): N/A

MEG4. LNG Carrier.

Depth/Draft Ratio: N/A

The wind coefficient values are based on a comprehensive set of wind tunnel tests conducted on prismatic and spherical gas carriers for SIGTTO's Prediction of Wind Loads on Large Liquefied Gas Carriers (2007).

Model tests covered the following sizes:

Prismatic 75,000, 135,000 to 155,000, 210,000 and 260,000m³

Angle	CFx	CFy	CMz
0	0.918	0.002	0
10	0.963	0.143	-0.049
20	0.974	0.313	-0.1
30	0.93	0.507	-0.144
40	0.827	0.693	-0.169
50	0.681	0.846	-0.17
60	0.456	0.952	-0.153
70	0.22	1.026	-0.125
80	0.017	1.074	-0.091
90	-0.104	1.1	-0.054
100	-0.135	1.09	-0.019
110	-0.21	1.062	0.011
120	-0.333	0.994	0.032
130	-0.493	0.899	0.043
140	-0.676	0.725	0.045
150	-0.827	0.507	0.044
160	-0.918	0.293	0.029
170	-0.955	0.127	0.015
180	-0.973	0.002	-0.001
190	-0.955	-0.127	-0.015
200	-0.918	-0.293	-0.029
210	-0.827	-0.507	-0.044
220	-0.676	-0.725	-0.045
230	-0.493	-0.899	-0.043
240	-0.333	-0.994	-0.032
250	-0.21	-1.062	-0.011
260	-0.135	-1.09	0.019
270	-0.104	-1.1	0.054
280	0.017	-1.074	0.091
290	0.22	-1.026	0.125
300	0.456	-0.952	0.153
310	0.681	-0.846	0.17
320	0.827	-0.693	0.169
330	0.93	-0.507	0.144

340	0.974	-0.313	0.1
350	0.963	-0.143	0.049
360	0.918	0.002	0

Hull Current Coefficients:

Coefficient Set: MEG4 LNG Carrier 1.05

Ballast and Laden.

Draft (m): N/A

Depth/Draft Ratio: 1.05

LNG Carrier current coefficients are matching closely with figures for laden tankers except for C_y when $Wd/T = 1.05$ and 1.10 .

Angle	CFx	CFy	CMz
0	0.043	0	0
10	0.005	0.798	-0.175
20	0.0845	0.984	-0.207
30	0.164	1.17	-0.239
40	0.1913	1.6323	-0.22
50	0.2187	2.0947	-0.201
60	0.246	2.557	-0.182
70	0.1927	2.8323	-0.1253
80	0.1393	3.1077	-0.0687
90	0.086	3.383	-0.012
100	0.0227	3.1313	0.0377
110	-0.0407	2.8797	0.0873
120	-0.104	2.628	0.137
130	-0.1037	2.2747	0.157
140	-0.1033	1.9213	0.177
150	-0.103	1.568	0.197
160	-0.0305	1.1855	0.187
170	0.042	0.803	0.177
180	-0.034	0	0
190	0.042	-0.803	-0.177
200	-0.0305	-1.1855	-0.187
210	-0.103	-1.568	-0.197
220	-0.1033	-1.9213	-0.177
230	-0.1037	-2.2747	-0.157
240	-0.104	-2.628	-0.137
250	-0.0407	-2.8797	-0.0873
260	0.0227	-3.1313	-0.0377
270	0.086	-3.383	0.012
280	0.1393	-3.1077	0.0687
290	0.1927	-2.8323	0.1253
300	0.246	-2.557	0.182
310	0.2187	-2.0947	0.201
320	0.1913	-1.6323	0.22
330	0.164	-1.17	0.239
340	0.0845	-0.984	0.207
350	0.005	-0.798	0.175

360	0.043	0	0
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Berth Details:

Berth: North Berth [test]

Latitude/Longitude

Shape	T	Side Alongside	P
Orientation (°)	120	Vessel Min LOA (m)	275
Vertical Datum (VD)	LAT	Max LOA (m)	350
Diff. (m) BA Chart/VD	0	Max BOA (m)	55
Controlled Depth (m)	11.7	Max Displacement	185000
Vessel Max Draft (m)	13	Mooring Tail Length (m)	N/A
Max Air Draft (m)	55	Loading Arm Arrangement	LH[V]L
Berth Full Length incl. Dolphins (m)	500	Distance from jetty centre to spotting line (m)	0
Central jetty length (m)	52		
Central jetty height (m)	8		

Capacity	
Minimum	125000
Maximum	260000
Unit	m ³

Tide: 1 (manual)

Mooring Hooks (bollards):

Nr	Ref.	Type	Nr of Hooks	Max. Lines	SWL [t]	Position [m] *		
						X	Y	Z
1	W5 hook	Hook	3	1	120	-240.00	30.00	8.50
2	W4 hook	Hook	3	1	120	-180.00	30.00	8.50
3	W3 hook	Hook	3	1	120	-120.00	30.00	8.50
4	W2 hook	Hook	2	1	120	-80.00	3.75	8.50
5	W1 hook	Hook	2	1	120	-40.00	3.75	8.50
6	E1 (hook)	Hook	2	1	120	40.00	4.10	8.50
7	E2 (hook)	Hook	2	1	120	80.00	3.75	8.50
8	E3 (hook)	Hook	3	1	120	120.00	30.00	8.50
9	E4 (hook)	Hook	3	1	120	180.00	30.00	8.50
10	E5 (hook)	Hook	3	1	120	240.00	30.00	8.50

- * X = Distance from Spotting Line (-ve left)
- Y = Distance from Jetty Face (+ve toward shore)
- Z = Distance from Berth Vertical Datum (+ve above)

Fenders:

Nr	Name	Manufactur- er	Model	Max. Reaction Force per Support [t]	Num of Supports	*BD - Buckling Compression Distance MCD - Maximum Compression Distance				Location [m] **		
						* BD [m]	MCD [m]	Height [m]	Width [m]	X	Y	Z
1	F1	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	-80.00	-2.40	5.90
Super Cone Fender												
2	F2	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	-40.00	-2.40	5.90
Super Cone Fender												
3	F3-Jetty	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	-20.00	-2.40	5.90
Super Cone Fender												
4	F4-Jetty	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	0.00	-2.40	5.90
Super Cone Fender												
5	F5-Jetty	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	20.00	-2.40	5.90
Super Cone Fender												
6	F6	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	40.00	-2.40	5.90
Super Cone Fender												
7	F7	Trelleborg	SCN 2250	38.6	1	0.79	1.62	4.20	3.60	80.00	-2.40	5.90
Super Cone Fender												

- ** X = Panel Centre distance from Spotting Line (-ve left of spotting line as seen from ship)
- Y = Panel Face distance from Jetty Face (-ve sea-side)
- Z = Panel Centre distance from Berth Vertical Datum (+ve above)

Data Quality Comments:

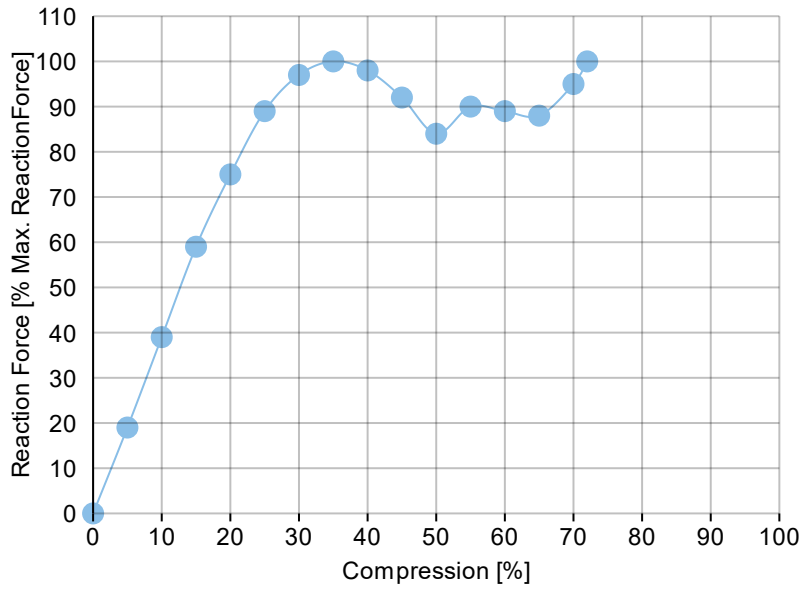
Fender Nr 1

Unknown Source

Max Comp Distance Test for report

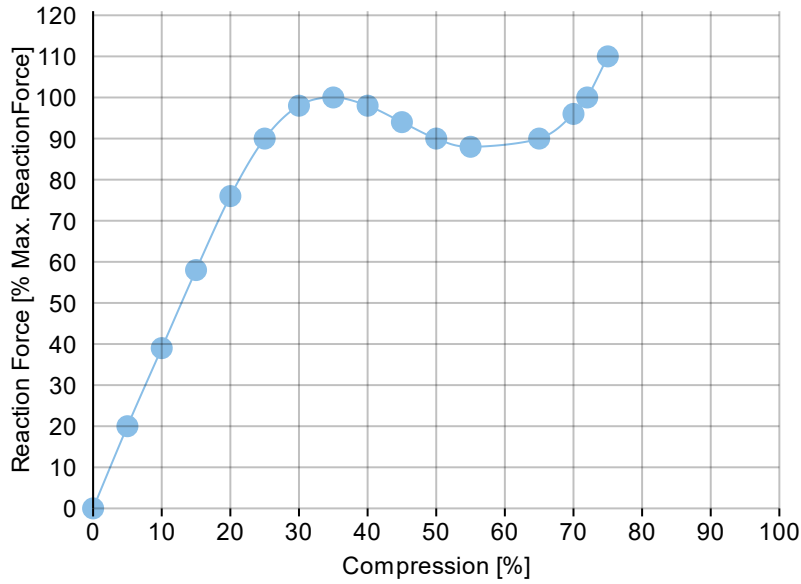
Fender curves:

Fender Nr: 1



Compression [%]	Reaction Force [%]
0	0.00
5	19.00
10	39.00
15	59.00
20	75.00
25	89.00
30	97.00
35	100.00
40	98.00
45	92.00
50	84.00
55	90.00
60	89.00
65	88.00
70	95.00
72	100.00

Fender Nr: 2, 3, 4, 5, 6, 7



Compression [%]	Reaction Force [%]
0	0.00
5	20.00
10	39.00
15	58.00
20	76.00
25	90.00
30	98.00
35	100.00
40	98.00
45	94.00
50	90.00
55	88.00
65	90.00
70	96.00
72	100.00
75	110.00