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SECTION SCANTLINGS

Hull Section Scantlings according to DNV Rules for ships with $L < 100$ m

Rule edition : Jan. 2012
Program version ... : 18.5.3278

Ship Identification **Vessel ID: Brønnbåt**

ID No : Brønnbåt
Date/Sign : 2020-03-30 ingried

Cross Section Identification **Section 1**

Midship section? : Yes
Distance from AP (m) : 42.175
Date/Sign : 2020-03-30 ingried

Database: C:\Documents\DNV\Nauticus\Vessels\Brønnbåt\WFDpot\Midship #75.pw

Main Dimensions

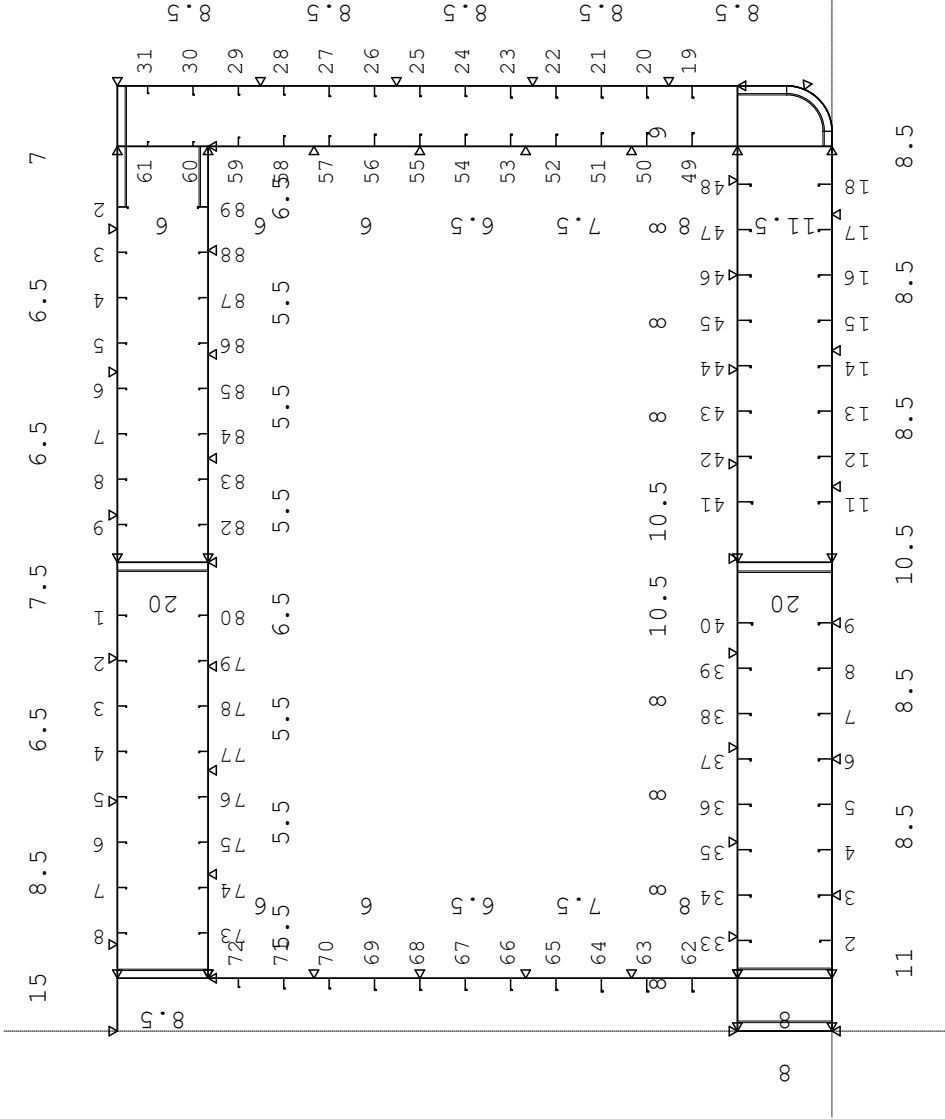
Length betw. perpendiculars, Lbp	(m) :	84.350
Rule length, L	(m) :	84.350
Breadth moulded, B	(m) :	25.000
Depth moulded, D	(m) :	9.450
Draught moulded, T	(m) :	7.000
Block coefficient, Cb	:	0.798
Min. design draught at AP	(m) :	3.464
Min. design draught at FP	(m) :	1.395
Waterplane area coefficient, Cwp	:	0.954

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Profiles:			Steel	
Nos	Type	Dimensions		
Outer Shell				
2	HPbulb	160 x 11.5		
3 - 8	HPbulb	180 x 8		
9 - 11	HPbulb	180 x 11		
12 - 17	HPbulb	180 x 9		
18	HPbulb	180 x 8		
19 - 20	HPbulb	160 x 11		
21	HPbulb	160 x 9		
22	HPbulb	160 x 8		
23	HPbulb	160 x 7		
24	HPbulb	140 x 9		
25	HPbulb	140 x 8		
26 - 27	HPbulb	140 x 6		
28 - 29	HPbulb	120 x 7		
30	HPbulb	120 x 6		
31	HPbulb	100 x 7		
2	HPbulb	140 x 6		
3 - 9	HPbulb	120 x 6		
1	HPbulb	120 x 7		
2 - 7	HPbulb	120 x 6		
8	HPbulb	120 x 7		
Inner Bottom				
33	HPbulb	180 x 10		
34 - 35	HPbulb	180 x 11		
36 - 39	HPbulb	180 x 10		
40 - 41	HPbulb	200 x 8.5		
42 - 45	HPbulb	180 x 10		
46 - 47	HPbulb	180 x 11		
48	HPbulb	180 x 10		
Inner Side 11700				
49	HPbulb	180 x 10		
50	HPbulb	180 x 9		
51	HPbulb	180 x 8		
52	HPbulb	160 x 11.5		
53	HPbulb	160 x 11		
54 - 55	HPbulb	160 x 9		
56	HPbulb	160 x 7		
57	HPbulb	140 x 9		
58	HPbulb	140 x 7		
59	HPbulb	120 x 8		
60 - 61	HPbulb	60 x 6		
'tween deck 8250				
73	HPbulb	120 x 7		
74 - 88	HPbulb	120 x 6		
89	HPbulb	140 x 6		
Long. Bulkhead 700				
62	HPbulb	180 x 10		
63	HPbulb	180 x 9		
64	HPbulb	180 x 8		
65	HPbulb	160 x 11.5		
More...				



Nauticus Hull Section Scantlings	Vessel ID: Brønnbåt Date/Sign : 2020-03-30 ingried Main dim. : Lpp=84.35 B=25 D=9.45 T=7 {m} CB=0.798	Scale: 1:100
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1 Rule Reference

NOTE: THE FOLLOWING REQUIREMENTS ARE NOT INCLUDED:

- Floors and brackets
- Ice strengthening of hull
- Slamming and bow impact
- Tugs, Supply vessels and other offshore/harbour vessels
- Class notation ICM (Increased corrosion margins)

2 Input Data

Main Dimensions

Length betw. perpendiculars, Lbp	(m) :	84.350
Rule length, L	(m) :	84.350
Breadth moulded, B	(m) :	25.000
Depth moulded, D	(m) :	9.450
Draught moulded, T	(m) :	7.000
Block coefficient, Cb	:	0.798
Min. design draught at AP	(m) :	3.464
Min. design draught at FP	(m) :	1.395
Waterplane area coefficient, Cwp	:	0.954

General Ship Data

Maximum service speed, V	(knots) :	9.000
Bilge keel?	:	Yes
Active roll damping facility?	:	No
Period of roll, Tr	(s) :	0.000
Metacentric height, GM	(m) :	0.000
Homogeneous stowage rate, roDC	(t/m3) :	0.000
No of decks above 0.7D from baseline	:	2
Height from base to top of ship side	(mm) :	9450

Areas forward of 0.2L from FP:

- Projected area of the upper deck	(m2) :	0.000
- Area of the waterplane	(m2) :	0.000
Height from base to deck line at FP	(mm) :	0
Speed/flare factor, Caf	:	0.000

Continuous Strength Members above Strength Deck

None

Class notations

Hull Section Material

Location	Amidships			Current cross section		
	Group	Yield N/mm2	f1	Group	Yield N/mm2	f1
- Above strength deck	NV-NS	235	1.00	NV-NS	235	1.00
- Strength deck	NV-NS	235	1.00	NV-NS	235	1.00
- Between bottom and deck	NV-NS	235	1.00	NV-NS	235	1.00
- Bottom	NV-NS	235	1.00	NV-NS	235	1.00

Transverse Bulkhead Positions (Frame No)

Aft peak bulkhead	: Not given.
Engine room bulkhead	: Not given.
Fore peak bulkhead	: Not given.

Hull girder Bending Moments

(From curves given as input in Brix Explorer)
Considered cross-section: 42.175 m from AP.

Hull girder bending moments:		Amidships	Current cross section
- Still water, sagging	(kNm) :	0	0
- Still water, hogging	(kNm) :	206381	206381
- Wave, sagging	(kNm) :	0	0
- Wave, hogging	(kNm) :	0	0
- Wave, horizontal	(kNm) :	0	0
Hull girder shear forces			
- Still water, positive	(kN) :	0	0
- Still water, negative	(kN) :	0	0

Spacing between Transverse Frames

(Where the frame spacing changes along the ship)

Position of frame 0: 0 mm aft of A.P..

Frame Nos where the spacing changes:

Frame No	Spacing forward (mm)
0	600

3 Panel Geometry

Node No	y (mm)	z (mm)	Radius (mm)	Position
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Outer Shell

0	0	
700	0	Bottom
6200	0	Bottom
11700	0	Bottom
11900	0	Bottom
12500	600	600 Bilge
12500	1250	Side
12500	8250	Side
12500	9450	Side
11700	9450	Strength deck
6200	9450	Strength deck
700	9450	Strength deck
0	9450	Strength deck

Inner Bottom

0	1250	
700	1250	Inner bottom
6200	1250	Inner bottom
11700	1250	Inner bottom
12500	1250	Inner bottom

Inner Side 11700

11700	0	
11700	1250	Inner side
11700	8250	Inner side
11700	9450	Inner side

Long. Bulkhead 6200

6200	0	
6200	1250	Longitudinal bulkhead

'tween deck 8250

700	8250	
6200	8250	'tween deck
11700	8250	'tween deck

Long. Bulkhead 700

700	1250	
700	8250	Longitudinal bulkhead

Long. Bulkhead 0

0	0	
0	1250	Longitudinal bulkhead

Long. Bulkhead 700

700	0	
700	1250	Longitudinal bulkhead

Long. Bulkhead 700

700	8250	
700	9450	Longitudinal bulkhead

Long. Bulkhead 6200

6200	8250	
6200	9450	Longitudinal bulkhead

4 Node Co-ordinates

Node No	y (mm)	z (mm)
	6200	1250
	6200	8250
	6200	9450
	6200	0
	700	1250
	700	8250
	700	9450
	700	0
	11700	1250
	11700	8250
	11700	9450
	11700	0
	12500	8250
	12500	1250
	0	1250
	12500	9450
	0	9450
	12500	600
	11900	0
	0	0

5 Layout of Plates and Profiles

Plate		Y ₁ (mm)	Z ₁ (mm)	Y ₂ (mm)	Z ₂ (mm)	—	B (mm)	BCUT (mm)	T (mm)	Steel	Area cm ²
Stiff	No	Y	Z	Y _{CG}	Z _{CG}	Typ	H	BF	T	TF (mm)	Area

Outer Shell (Bending efficiency: 100%)

PL	1	0	0	1800	0		1800	0	11.0	std	198.00
PL	2	1800	0	3600	0		1800	0	8.5	std	153.00
PL	3	3600	0	5400	0		1800	0	8.5	std	153.00
PL	4	5400	0	7200	0		1800	0	10.5	std	189.00
PL	5	7200	0	9000	0		1800	0	8.5	std	153.00
PL	6	9000	0	10800	0		1800	0	8.5	std	153.00
PL	7	10800	0	12452	364		1800	0	8.5	std	153.00
PL	8	12452	364	12500	2158		1800	0	8.5	std	153.00
PL	9	12500	2158	12500	3958		1800	0	8.5	std	153.00
PL	10	12500	3958	12500	5758		1800	0	8.5	std	153.00
PL	11	12500	5758	12500	7558		1800	0	8.5	std	153.00
PL	12	12500	7558	12500	9450		1892	0	8.5	std	160.86
PL	13	12500	9450	10608	9450		1892	0	7.0	std	132.47
PL	14	10608	9450	8716	9450		1892	0	6.5	std	122.98
PL	15	8716	9450	6824	9450		1892	0	6.5	std	122.98
PL	16	6824	9450	4931	9450		1892	0	7.5	std	141.94
PL	17	4931	9450	3039	9450		1892	0	6.5	std	123.01
PL	18	3039	9450	1146	9450		1892	0	8.5	std	160.86
PL	19	1146	9450	0	9450		1146	0	15.0	std	171.91

ST	2	1200	0	1198	91	20	160	0	11.5	0.0	21.80
ST	3	1800	0	1797	109	20	180	0	8.0	0.0	18.86
ST	4	2400	0	2397	109	20	180	0	8.0	0.0	18.86
ST	5	3000	0	2997	109	20	180	0	8.0	0.0	18.86
ST	6	3600	0	3597	109	20	180	0	8.0	0.0	18.86
ST	7	4200	0	4197	109	20	180	0	8.0	0.0	18.86
ST	8	4800	0	4797	109	20	180	0	8.0	0.0	18.86
ST	9	5400	0	5397	105	20	180	0	11.0	0.0	24.26
ST	11	7000	0	6997	105	20	180	0	11.0	0.0	24.26
ST	12	7600	0	7597	107	20	180	0	9.0	0.0	20.66
ST	13	8200	0	8197	107	20	180	0	9.0	0.0	20.66
ST	14	8800	0	8797	107	20	180	0	9.0	0.0	20.66
ST	15	9400	0	9397	107	20	180	0	9.0	0.0	20.66
ST	16	10000	0	9997	107	20	180	0	9.0	0.0	20.66
ST	17	10600	0	10597	107	20	180	0	9.0	0.0	20.66
ST	18	11200	0	11197	109	20	180	0	8.0	0.0	18.86
ST	19	12500	1850	12408	1848	20	160	0	11.0	0.0	21.00
ST	20	12500	2450	12408	2448	20	160	0	11.0	0.0	21.00
ST	21	12500	3050	12406	3047	20	160	0	9.0	0.0	17.80
ST	22	12500	3650	12405	3647	20	160	0	8.0	0.0	16.20
ST	23	12500	4250	12403	4247	20	160	0	7.0	0.0	14.60
ST	24	12500	4850	12419	4848	20	140	0	9.0	0.0	15.23
ST	25	12500	5450	12418	5448	20	140	0	8.0	0.0	13.83
ST	26	12500	6050	12415	6047	20	140	0	6.0	0.0	11.03
ST	27	12500	6650	12415	6647	20	140	0	6.0	0.0	11.03
ST	28	12500	7250	12429	7248	20	120	0	7.0	0.0	10.52
ST	29	12500	7850	12429	7848	20	120	0	7.0	0.0	10.52
ST	30	12500	8450	12428	8448	20	120	0	6.0	0.0	9.32
ST	31	12500	9050	12441	9048	20	100	0	7.0	0.0	8.75
ST	2	10900	9450	10897	9365	20	140	0	6.0	0.0	11.03
ST	3	10300	9450	10298	9378	20	120	0	6.0	0.0	9.32
ST	4	9700	9450	9698	9378	20	120	0	6.0	0.0	9.32
ST	5	9100	9450	9098	9378	20	120	0	6.0	0.0	9.32
ST	6	8500	9450	8498	9378	20	120	0	6.0	0.0	9.32
ST	7	7900	9450	7898	9378	20	120	0	6.0	0.0	9.32
ST	8	7300	9450	7298	9378	20	120	0	6.0	0.0	9.32
ST	9	6700	9450	6698	9378	20	120	0	6.0	0.0	9.32
ST	1	5500	9450	5498	9379	20	120	0	7.0	0.0	10.52
ST	2	4900	9450	4898	9378	20	120	0	6.0	0.0	9.32
ST	3	4300	9450	4298	9378	20	120	0	6.0	0.0	9.32
ST	4	3700	9450	3698	9378	20	120	0	6.0	0.0	9.32
ST	5	3100	9450	3098	9378	20	120	0	6.0	0.0	9.32
ST	6	2500	9450	2498	9378	20	120	0	6.0	0.0	9.32
ST	7	1900	9450	1898	9378	20	120	0	6.0	0.0	9.32
ST	8	1300	9450	1298	9379	20	120	0	7.0	0.0	10.52

Inner Bottom (Bending efficiency: 100%)

PL	1	0	1250	1250	1250		1250	0	8.0	std	100.00
PL	2	1250	1250	2500	1250		1250	0	8.0	std	100.00
PL	3	2500	1250	3750	1250		1250	0	8.0	std	100.00
PL	4	3750	1250	5000	1250		1250	0	8.0	std	100.00
PL	5	5000	1250	6250	1250		1250	0	10.5	std	131.25
PL	6	6250	1250	7500	1250		1250	0	10.5	std	131.25
PL	7	7500	1250	8750	1250		1250	0	8.0	std	100.00

Layout of Plates and Profiles (cont.)

Plate		Y ₁ (mm)	Z ₁ (mm)	Y ₂ (mm)	Z ₂ (mm)	—	B (mm)	BCUT (mm)	T (mm)	Steel	Area cm ²
Stiff	No	Y	Z	Y _{CG}	Z _{CG}	Typ	H	BF	T	TF (mm)	Area
PL	8	8750	1250	10000	1250		1250	0	8.0	std	100.00
PL	9	10000	1250	11250	1250		1250	0	8.0	std	100.00
PL	10	11250	1250	12500	1250		1250	0	9.0	std	112.50
ST	33	1200	1250	1197	1144	20	180	0	10.0	0.0	22.46
ST	34	1800	1250	1797	1145	20	180	0	11.0	0.0	24.26
ST	35	2400	1250	2397	1145	20	180	0	11.0	0.0	24.26
ST	36	3000	1250	2997	1144	20	180	0	10.0	0.0	22.46
ST	37	3600	1250	3597	1144	20	180	0	10.0	0.0	22.46
ST	38	4200	1250	4197	1144	20	180	0	10.0	0.0	22.46
ST	39	4800	1250	4797	1144	20	180	0	10.0	0.0	22.46
ST	40	5400	1250	5396	1128	20	200	0	8.5	0.0	22.66
ST	41	7000	1250	6996	1128	20	200	0	8.5	0.0	22.66
ST	42	7600	1250	7597	1144	20	180	0	10.0	0.0	22.46
ST	43	8200	1250	8197	1144	20	180	0	10.0	0.0	22.46
ST	44	8800	1250	8797	1144	20	180	0	10.0	0.0	22.46
ST	45	9400	1250	9397	1144	20	180	0	10.0	0.0	22.46
ST	46	10000	1250	9997	1145	20	180	0	11.0	0.0	24.26
ST	47	10600	1250	10597	1145	20	180	0	11.0	0.0	24.26
ST	48	11200	1250	11197	1144	20	180	0	10.0	0.0	22.46

Inner Side 11700 (Bending efficiency: 100%)

PL	1	11700	0	11700	1250		1250	0	11.5	std	143.75
PL	2	11700	1250	11700	2650		1400	0	8.0	std	112.00
PL	3	11700	2650	11700	4050		1400	0	7.5	std	105.00
PL	4	11700	4050	11700	5450		1400	0	6.5	std	91.00
PL	5	11700	5450	11700	6850		1400	0	6.0	std	84.00
PL	6	11700	6850	11700	8250		1400	0	6.0	std	84.00
PL	7	11700	8250	11700	9450		1200	0	6.0	std	72.00
ST	49	11700	1850	11806	1847	20	180	0	10.0	0.0	22.46
ST	50	11700	2450	11807	2447	20	180	0	9.0	0.0	20.66
ST	51	11700	3050	11809	3047	20	180	0	8.0	0.0	18.86
ST	52	11700	3650	11791	3648	20	160	0	11.5	0.0	21.80
ST	53	11700	4250	11792	4248	20	160	0	11.0	0.0	21.00
ST	54	11700	4850	11794	4847	20	160	0	9.0	0.0	17.80
ST	55	11700	5450	11794	5447	20	160	0	9.0	0.0	17.80
ST	56	11700	6050	11797	6047	20	160	0	7.0	0.0	14.60
ST	57	11700	6650	11781	6648	20	140	0	9.0	0.0	15.23
ST	58	11700	7250	11783	7248	20	140	0	7.0	0.0	12.43
ST	59	11700	7850	11770	7848	20	120	0	8.0	0.0	11.72
ST	60	11700	8450	11736	8448	20	60	0	6.0	0.0	4.71
ST	61	11700	9050	11736	9048	20	60	0	6.0	0.0	4.71

Long. Bulkhead 6200 (Bending efficiency: 100%)

PL	1	6200	0	6200	1250		1250	0	20.0	std	250.00
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'tween deck 8250 (Bending efficiency: 100%)

PL	1	700	8250	2075	8250		1375	0	5.5	std	75.63
PL	2	2075	8250	3450	8250		1375	0	5.5	std	75.63
PL	3	3450	8250	4825	8250		1375	0	5.5	std	75.63
PL	4	4825	8250	6200	8250		1375	0	6.5	std	89.38
PL	5	6200	8250	7575	8250		1375	0	5.5	std	75.63
PL	6	7575	8250	8950	8250		1375	0	5.5	std	75.63
PL	7	8950	8250	10325	8250		1375	0	5.5	std	75.63
PL	8	10325	8250	11700	8250		1375	0	6.5	std	89.38
ST	73	1300	8250	1298	8321	20	120	0	7.0	0.0	10.52
ST	74	1900	8250	1898	8322	20	120	0	6.0	0.0	9.32
ST	75	2500	8250	2498	8322	20	120	0	6.0	0.0	9.32
ST	76	3100	8250	3098	8322	20	120	0	6.0	0.0	9.32
ST	77	3700	8250	3698	8322	20	120	0	6.0	0.0	9.32
ST	78	4300	8250	4298	8322	20	120	0	6.0	0.0	9.32
ST	79	4900	8250	4898	8322	20	120	0	6.0	0.0	9.32
ST	80	5500	8250	5498	8322	20	120	0	6.0	0.0	9.32
ST	82	6700	8250	6698	8322	20	120	0	6.0	0.0	9.32
ST	83	7300	8250	7298	8322	20	120	0	6.0	0.0	9.32
ST	84	7900	8250	7898	8322	20	120	0	6.0	0.0	9.32
ST	85	8500	8250	8498	8322	20	120	0	6.0	0.0	9.32
ST	86	9100	8250	9098	8322	20	120	0	6.0	0.0	9.32
ST	87	9700	8250	9698	8322	20	120	0	6.0	0.0	9.32
ST	88	10300	8250	10298	8322	20	120	0	6.0	0.0	9.32

Layout of Plates and Profiles (cont.)

Plate		Y ₁ (mm)	Z ₁ (mm)	Y ₂ (mm)	Z ₂ (mm)	—	B (mm)	BCUT (mm)	T (mm)	Steel	Area cm ²
Stiff	No	Y	Z	Y _{CG}	Z _{CG}	Typ	H	BF	T	TF (mm)	Area
ST	89	10900	8250	10897	8335	20	140	0	6.0	0.0	11.03
Long. Bulkhead 700 (Bending efficiency: 100%)											
PL	1	700	1250	700	2650		1400	0	8.0	std	112.00
PL	2	700	2650	700	4050		1400	0	7.5	std	105.00
PL	3	700	4050	700	5450		1400	0	6.5	std	91.00
PL	4	700	5450	700	6850		1400	0	6.0	std	84.00
PL	5	700	6850	700	8250		1400	0	6.0	std	84.00
ST	62	700	1850	594	1847	20	180	0	10.0	0.0	22.46
ST	63	700	2450	593	2447	20	180	0	9.0	0.0	20.66
ST	64	700	3050	591	3047	20	180	0	8.0	0.0	18.86
ST	65	700	3650	609	3648	20	160	0	11.5	0.0	21.80
ST	66	700	4250	608	4248	20	160	0	11.0	0.0	21.00
ST	67	700	4850	606	4847	20	160	0	9.0	0.0	17.80
ST	68	700	5450	603	5447	20	160	0	7.0	0.0	14.60
ST	69	700	6050	603	6047	20	160	0	7.0	0.0	14.60
ST	70	700	6650	619	6648	20	140	0	9.0	0.0	15.23
ST	71	700	7250	617	7248	20	140	0	7.0	0.0	12.43
ST	72	700	7850	629	7848	20	120	0	7.0	0.0	10.52
Long. Bulkhead 0 (Bending efficiency: 100%)											
PL	1	0	0	0	1250		1250	0	8.0	std	100.00
Long. Bulkhead 700 (Bending efficiency: 100%)											
PL	1	700	0	700	1250		1250	0	8.0	std	100.00
Long. Bulkhead 700 (Bending efficiency: 100%)											
PL	1	700	8250	700	9450		1200	0	8.5	std	102.00
Long. Bulkhead 6200 (Bending efficiency: 100%)											
PL	1	6200	8250	6200	9450		1200	0	20.0	std	240.00

6 Layout of transverse stiffeners

Stiffener		y1 (mm)	z1 (mm)	y2 (mm)	z2 (mm)	Type		h (mm)	bf (mm)	t (mm)	tf (mm)
Bracket	(mm) Arm1	h1	bf1	t1	tf1		(mm) Arm2	h2	bf2	t2	tf2

Outer Shell

Mframe	11700	0	11900	0	20			120		6.0	
Mframe	11900	0	12500	600	20			120		6.0	
Mframe	12500	600	12500	1250	20			120		6.0	
Tstif	12500	9450	11700	9450	20			120		6.0	
Tstif	11700	9450	10900	9450	20			120		6.0	

Long. Bulkhead 6200

Girder	6200	0	6200	1250	0			0		0.0	
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'tween deck 8250

Tstif	10900	8250	11700	8250	20			120		6.0	
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Long. Bulkhead 0

Girder	0	0	0	1250	0			0		0.0	
--------	---	---	---	------	---	--	--	---	--	-----	--

Long. Bulkhead 700

Girder	700	0	700	1250	0			0		0.0	
--------	-----	---	-----	------	---	--	--	---	--	-----	--

Long. Bulkhead 700

Tdkfrm	700	8250	700	9450	20			120		6.0	
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Long. Bulkhead 6200

Tdkfrm	6200	8250	6200	9450	20			120		6.0	
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7 Cross-Sectional Area

Plates

Panels:	NS-Steel		HS-Steel		Total	
	Effective cm ²	Gross cm ²	Effective cm ²	Gross cm ²	Effective cm ²	Gross cm ²
Outer Shell	5802.0	5802.0	0.0	0.0	5802.0	5802.0
Inner Bottom	2150.0	2150.0	0.0	0.0	2150.0	2150.0
Inner Side 11700	1383.5	1383.5	0.0	0.0	1383.5	1383.5
Long. Bulkhead 6200	500.0	500.0	0.0	0.0	500.0	500.0
'tween deck 8250	1265.0	1265.0	0.0	0.0	1265.0	1265.0
Long. Bulkhead 700	952.0	952.0	0.0	0.0	952.0	952.0
Long. Bulkhead 0	100.0	100.0	0.0	0.0	100.0	100.0
Long. Bulkhead 700	200.0	200.0	0.0	0.0	200.0	200.0
Long. Bulkhead 700	204.0	204.0	0.0	0.0	204.0	204.0
Long. Bulkhead 6200	480.0	480.0	0.0	0.0	480.0	480.0
TOTAL AREA	13036.5	13036.5	0.0	0.0	13036.5	13036.5

Profiles

Panels:	NS-Steel		HS-Steel		Total	
	Effective cm ²	Gross cm ²	Effective cm ²	Gross cm ²	Effective cm ²	Gross cm ²
Outer Shell	1320.7	1320.7	0.0	0.0	1320.7	1320.7
Inner Bottom	733.9	733.9	0.0	0.0	733.9	733.9
Inner Side 11700	407.6	407.6	0.0	0.0	407.6	407.6
Long. Bulkhead 6200	0.0	0.0	0.0	0.0	0.0	0.0
'tween deck 8250	304.1	304.1	0.0	0.0	304.1	304.1
Long. Bulkhead 700	379.9	379.9	0.0	0.0	379.9	379.9
Long. Bulkhead 0	0.0	0.0	0.0	0.0	0.0	0.0
Long. Bulkhead 700	0.0	0.0	0.0	0.0	0.0	0.0
Long. Bulkhead 700	0.0	0.0	0.0	0.0	0.0	0.0
Long. Bulkhead 6200	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AREA	3146.2	3146.2	0.0	0.0	3146.2	3146.2

DESCRIPTION:

Gross Results based on the given scantlings.

Effective Results based on the effective cross-sectional area, as follows:
Possible cut-outs are subtracted (plates only).
The area of plates and stiffeners are multiplied by the given bending efficiency for the related panel.

8 Cross-Sectional Data

	EFFECTIVE Cut-outs subtracted	GROSS Cut-outs disreg.
Cross sectional area of the longitudinal elements (cm2) :	16182.8	16182.8
Position of the centroid: Ycg (mm) :	0	0
Position of the centroid: Zcg (mm) :	4168	4168
Moment of inertia about the horz. neutral axis, I _h (m4) :	22.138	22.138
Moment of inertia about the vert. neutral axis, I _v (m4) :	105.889	105.889
Product of inertia about the neutral axes, I _{hv} (m4) :	0.000	0.000
<hr/>		
SECTION MODULUS, BOTTOM (z = 0 mm) (m3) :	5.312	5.312
SECTION MODULUS, DECK LINE (z = 9449 mm) (m3) :	4.191	4.191
SECTION MODULUS, TOP (z = 9450 / 9450 mm) * (m3) :	4.191	4.191
SECTION MODULUS, AT SIDE (y = 12500 mm) (m3) :	8.471	8.471
<hr/>		
First moment of the area above the neutral axis, S (cm3) :	2786479.7	2786479.7
I/S (cm) :	794	794

DESCRIPTION:

Gross Results based on the given scantlings.

Effective Results based on the effective cross-sectional area, as follows:
Possible cut-outs are subtracted (plates only).
The area of plates and stiffeners are multiplied by the given bending efficiency for the related panel.

9 Design Bending Moments

AT ACTUAL POSITION (42.2 m from AP)	SAGGING (kNm)	HOGGING (kNm)
Still water bending moments:		
- Standard values according to Rules, Ms	116872	116872
- Given as input in Brix Explorer (curves)	0	206381
- Given as input (Design Bending Moments dialog).....	0	0
Design still water bending moments, Ms	116872	206381
Design wave bending moments, Mw	195806 (Rules)	180168 (Rules)
Design wave bending moments, Mw for buckling check	195806 (Rules)	180168 (Rules)

10 Hull Girder Strength Requirements

	BOTTOM	DECK	ABOVE DECK	SIDE
Material strength group	NV-NS	NV-NS	NV-NS	NV-NS
Yield point of material (N/mm ²) :	235	235	235	235
Material factor, f1..... :	1.00	1.00	1.00	1.00
Section modulus ratio, Z _a /Z _r :	2.405	1.897		
	Based on:			
	Z _a	5.312	4.191	
	Z _r	2.209	2.209	
Speed factor, C _{av}	0.000			
Speed/flare factor, C _{af}	0.000			
Wave coefficient, C _w	6.681			
Wave coefficient, C _{wo}	7.556			
Wave coefficient, C _{wu}	6.681			

AT ACTUAL POSITION (42.2 m from AP) (Midship section)

	BOTTOM	DECK
Minimum section modulus, Z _o (m ³) :	2.01325	2.01325
Section modulus requirement based on design bending moments (kNm):		
- Sagging (still w = 116872, wave = 195806) (m ³) :	1.78673	1.78673
- Hogging (still w = 206381, wave = 180168) (m ³) :	2.20885	2.20885
Rule section modulus (m ³):	2.20885	2.20885

GUIDANCE:

The required section modulus along the hull girder will normally be satisfied when calculated for the midship section only, provided the following rules for tapering are complied with:

- Scantlings at bottom and deck are kept unaltered within 0.4L amidships.
- Scantlings outside 0.4L amidships are gradually reduced to the local requirements at the ends, and the same material strength group is applied over the full length of the ship.

11 Hull Girder Strength Summary

	ACTUAL	RULE	STATUS (%) (100=Rule)
Cross-sectional area (cm2) :	16183		
Height to the neutral axis (mm) :	4168		
Moment of inertia (m4) :	22.138		
Section modulus, bottom (m3) :	5.312	2.209	240.5
Section modulus, deck line (z = 9450 mm)..... (m3) :	4.191	2.209	189.7
Material factor, f1, strength deck :	1.00		
Material factor, f1, bottom :	1.00		

Design bending moments used as basis for the Rule Section moduli:
Bottom (hogging): Still w. = 206381 kNm (Input), Wave = 180168 kNm (Rule)
Deck (hogging): Still w. = 206381 kNm (Input), Wave = 180168 kNm (Rule)

11.1 Variation of the section modulus and moment of inertia

Change at bottom	dZb dZd dI	Change at deck				
		-100 cm2	-1 mm	0	+ 1 mm	+100 cm2
-100 cm2	dZb	-0.096	-0.136	-0.071	-0.010	-0.046
	dZd	-0.090	-0.208	-0.011	0.185	0.067
	dI	-0.442	-0.866	-0.164	0.516	0.111
-1 mm	dZb	-0.229	-0.267	-0.204	-0.145	-0.180
	dZd	-0.112	-0.229	-0.033	0.162	0.045
	dI	-0.751	-1.167	-0.478	0.190	-0.209
0	dZb	-0.026	-0.066	0.000	0.061	0.025
	dZd	-0.079	-0.197	0.000	0.197	0.079
	dI	-0.281	-0.708	0.000	0.687	0.277
+1 mm	dZb	0.177	0.136	0.204	0.267	0.229
	dZd	-0.048	-0.167	0.031	0.229	0.110
	dI	0.173	-0.266	0.462	1.167	0.746
+100 cm2	dZb	0.045	0.004	0.071	0.133	0.096
	dZd	-0.068	-0.186	0.011	0.208	0.090
	dI	-0.121	-0.553	0.162	0.856	0.442

Bottom plating: 1 mm = 288.0 cm2. 100 cm2 = 0.3 mm.

Deck plating: 1 mm = 250.0 cm2. 100 cm2 = 0.4 mm.

EXPLANATION:

Change at bottom Assumed change to the bottom and bilge plating
Change at deck Assumed change to the deck plating

dZb Resulting change in section modulus, bottom
dZd do., deck
dI Resulting change in moment of inertia

12 Compartments and Loads

12.1 Compartment Data I

Ref.	Comp. group (Comp. type)	Comp No	Frame No aft	Frame No fwd	Restr. filling (*)	Coated (*)	Volume (m3)	Contents WB / Oil / Liq / Hliq / Bulk
1	pipes2						0	
2	pipes						0	
3	void						0	
4	void						0	
5	Fish hold						0	Liq
6	void						0	
7	void						0	
8	skin						0	
9	pipes 3						0	

12.2 Compartment Data II

Ref.	Comp. No	Length (mm)	Sloshing length (mm)	Sloshing breadth (mm)	Hatch length (mm)	Hatch breadth (mm)	Top of hatch (mm)	Top of air pipe (mm)	WL in dam'gd cond (mm)	Heated cargo?	Over- pressure dpDyn (kN/m2)
1		19500	0	0	0	0	0	9450	0	No	0.0
2		19500	0	0	0	0	0	9450	0	No	0.0
3		7200	0	0	0	0	0	1250	0	No	0.0
4		7200	0	0	0	0	0	1250	0	No	0.0
5		19500	0	0	0	0	0	7000	0	No	0.0
6		7200	0	0	0	0	0	1250	0	No	0.0
7		7200	0	0	0	0	0	9450	0	No	0.0
8		19500	0	0	0	0	0	9450	0	No	0.0
9		19500	0	0	0	0	0	9450	0	No	0.0

12.3 Compartment Data III

Ref.	Comp. No	Designed for BWE with flow- through?	Centre of gravity (m)			Accelerations in the centre of gravity (m/s ²)					
			From A.P. x	From CL y	Above baseline z	Full load			Ballast		
						Vert. a _v	Horz. a _t	Long. a _{lng}	Vert. a _v	Horz. a _t	Long. a _{lng}
1		No	50.100	3.450	8.850	3.594	4.680	2.172	3.594	4.680	2.172
2		No	50.100	8.950	8.850	3.594	4.680	2.172	3.594	4.680	2.172
3		No	43.800	0.350	0.625	3.594	4.048	2.167	3.594	4.048	2.167
4		No	43.800	3.450	0.625	3.594	4.048	2.167	3.594	4.048	2.167
5		No	2147513.648	6.200	4.750	7.700	4.364	1.478	7.700	4.364	1.478
6		No	42.175	8.950	0.625	3.594	4.048	2.167	3.594	4.048	2.167
7		No	42.175	12.078	0.666	3.594	4.051	2.160	3.594	4.051	2.160
8		No	2147513.648	12.100	5.350	7.700	4.410	1.576	7.700	4.410	1.576
9		No	50.100	0.000	5.350	3.594	4.410	1.576	3.594	4.410	1.576

12.4 Bulk Cargo and Liquid Loads

Ref.	Comp. group (Comp type)	Comp. No	Load No	Load type	Density t/m ³	Filling height mm	Pressure valve setting kN/m ²		Mass t	Angle of repose degrees	Perme- ability
							S	S+D			
1	pipes2										
2	pipes										
3	void										
4	void										
5	Fish hold		1	FW	1.025	8250	25.0	0.0			
6	void										
7	void										
8	skin										
9	pipes 3										

12.5 Double Bottom Stresses and Hull Girder Bending Moments

Ref.	Comp. group (Comp. type)	Comp. No	Load No	Load type	Dbl. bottom stresses		Still water bending moments - = sagging, + = hogging kNm
					Bottom N/mm ²	Inner bot. N/mm ²	
1	pipes2						
2	pipes						
3	void						
4	void						
5	Fish hold		1	FW	0	0	0.00
6	void						
7	void						
8	skin						
9	pipes 3						

13 Deck loads (general cargo)

Load No.	Stowage rate, ro t/m ³	Stowage height, H mm	Extent (dist. from CL)		Panel
			y_1 mm	y_2 mm	
1	1.00	2000	0	12500	Outer Shell
1	0.15	1200	700	11700	'tween deck 8250

14 Summary of data used in the Local Rule Requirements

Distance from AP to considered section	(m) :	42.175		
Moment of inertia about the horz. neutral axis, I_h	(m ⁴) :	22.138		
Moment of inertia about the vert. neutral axis, I_v	(m ⁴) :	105.889		
Section modulus, bottom	(m ³) :	5.312		
Section modulus, deck line ($z = 9450$ mm).....	(m ³) :	4.191		
Height from base line to the neutral axis	(mm) :	4168		
Section modulus ratio, Z_a/Z_r				
Z_a/Z_r , bottom.....	(Rules) :	2.405		
Z_a/Z_r , deck.....	(Rules) :	1.897		
DESIGN BENDING MOMENTS:				
Still water bending moment, sagging	(kNm) :	116872	(Rules)	
Still water bending moment, hogging	(kNm) :	206381	(Input)	
Wave bending moment, sagging	(kNm) :	195806	(Rules)	
Wave bending moment, hogging	(kNm) :	180168	(Rules)	
Wave bending moment for buckling check, sagging	(kNm) :	195806	(Rules)	
Wave bending moment for buckling check, hogging	(kNm) :	180168	(Rules)	
Shear forces, seagoing condition:				
Positive shear forces (still water / wave / total).....	(kN) :	0 /	0 /	0
Negative shear forces (still water / wave / total).....	(kN) :	0 /	-0 /	-0

NOTE - Sloshing pressure

There are tanks where the sloshing length $L_s > 0.13L$.
The sloshing pressure acc. to DNV Rules is valid for L_s in the range 10 m to $0.13L$,
so L_s is outside the range where the sloshing pressure is valid.
However, the sloshing pressure is included in the calculations.

The sloshing pressure is applicable within $L_s/4$ from the tank ends, but is used in this cross-section also.

NOTE - Impact pressure

The impact pressure is not included in the calculations (ref. DNV Rules Pt.3 Ch.1 Sec.4 C305).
Here the sloshing length $L_s > 0.13L$ and/or the sloshing breadth $B_s > 0.56B$.
The impact pressure should therefore be considered by the user.

15 Local Rule Requirements - Plates

Plate No	ACT	t _{act} mm	Steel	t _k mm	t _{kb} mm		Ω m ²	Eff (%)	Span mm	Spac mm	τ N/mm ²	σ _F N/mm ²	f ₁
LOC			t _{loc} mm	Pos		Load Ref.		Loc. ref.	y _l mm	z _l mm	Comp ref.	σ N/mm ²	p kN/m ²
BUC			t _{buc} mm	η	ψ	k	c	Buc. ref.	y _b mm	z _b mm	σ _L N/mm ²	σ _c or τ _c N/mm ²	σ _{cr} or τ _{cr} N/mm ²

Outer Shell

Bottom

1	ACT LOC BUC	11.0	std 11.22 7.31	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.43	100 Min compr	2400 350 700	700 0 0	0.0 72.8	235.0 120.0 159.6	1.00 85.8 80.9
2	ACT LOC BUC	8.5	std 8.37 6.27	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.21	100 Min compr	2400 2100 2400	600 0 0	0.0 72.8	235.0 120.0 142.2	1.00 85.8 80.9
3	ACT LOC BUC	8.5	std 8.37 6.27	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.21	100 Min compr	2400 3900 4200	600 0 0	0.0 72.8	235.0 120.0 142.2	1.00 85.8 80.9
4	ACT LOC BUC	10.5	std 10.72 8.35	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.32	100 Lat compr	2400 6600 6200	800 0 0	0.0 72.8	235.0 120.0 126.9	1.00 86.3 80.9
5	ACT LOC BUC	8.5	std 8.37 6.27	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.21	100 Min compr	2400 9000 7200	600 0 0	0.0 72.8	235.0 120.0 142.2	1.00 89.6 80.9
6	ACT LOC BUC	8.5	std 8.37 6.27	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.21	100 Min compr	2400 10800 9000	600 0 0	0.0 72.8	235.0 120.0 142.2	1.00 92.0 80.9
7	ACT LOC BUC	8.5	std 8.37 6.27	0.0 Bottom 0.90	0.0 1.00	Sea 4.00	- 1.21	100 Min compr	2400 10900 10800	600 0 0	0.0 72.8	235.0 120.0 142.2	1.00 92.1 80.9

Side

8	ACT LOC BUC	8.5	std 8.37 5.70	0.0 Side 0.90	0.0 0.82	Sea 4.13	- 1.10	100 Min compr	2400 12500 12500	600 1550 600	0.0 62.3	235.0 127.4 145.2	1.00 80.6 69.2
9	ACT LOC BUC	8.5	std 8.37 3.98	0.0 Side 1.00	0.0 0.85	Sea 4.30	- 1.10	100 Min compr	2400 12500 12500	600 2158 2158	0.0 35.1	235.0 130.4 148.7	1.00 75.3 35.1
10	ACT LOC BUC	8.5	std 8.37 3.15	0.0 Side 1.00	0.0 0.81	Sea 4.41	- 1.10	100 Min compr	2400 12500 12500	600 3958 5758	0.0 22.5	235.0 139.0 150.8	1.00 59.5 22.5
11	ACT LOC BUC	8.5	std 8.37 4.72	0.0 Side 1.00	0.0 0.91	Sea 4.18	- 1.10	100 Min compr	2400 12500 12500	600 5758 7558	0.0 47.9	235.0 134.0 146.2	1.00 43.6 47.9
12	ACT LOC BUC	8.5	std 8.37 5.61	0.0 Side 1.00	0.0 0.88	Sea 4.25	- 1.10	100 Min compr	2400 12500 12500	600 7558 9050	0.0 69.0	235.0 127.2 147.7	1.00 30.2 69.0

Strength deck

13	ACT LOC BUC	7.0	std 6.34 6.92	0.0 Strdk 1.00	0.0	Gen	-	100 Min compr	2400 10608 12500	600 9450 9450	0.0 74.6	235.0 120.0 76.4	1.00 25.5 74.6
14	ACT LOC BUC	6.5	std 6.34 6.02	0.0 Strdk 1.00	0.0 1.00	Gen 4.00	- 1.10	100 Min compr	2400 10600 10608	600 9450 9450	0.0 74.6	235.0 120.0 87.0	1.00 25.5 74.6
15	ACT LOC BUC	6.5	std 6.34 6.02	0.0 Strdk 1.00	0.0 1.00	Gen 4.00	- 1.10	100 Min compr	2400 8716 8716	600 9450 9450	0.0 74.6	235.0 120.0 87.0	1.00 25.5 74.6
16	ACT LOC BUC	7.5	std 6.34 7.02	0.0 Strdk 1.00	0.0 1.00	Gen 4.00	- 1.20	100 Min compr	2400 5850 5500	700 9450 9450	0.0 74.6	235.0 120.0 85.1	1.00 25.5 74.6

Local Rule Requirements - Plates (cont)

Plate No	ACT	t _{act} mm	Steel	t _k mm	t _{kb} mm		Ω m ²	Eff (%)	Span mm	Spac mm	τ N/mm ²	σ _F N/mm ²	f ₁
LOC			t _{loc} mm	Pos		Load Ref.		Loc. ref.	y _l mm	z _l mm	Comp ref.	σ N/mm ²	p kN/m ²
BUC			t _{buc} mm	η	ψ	k	c	Buc. ref.	y _b mm	z _b mm	σ _L N/mm ²	σ _c or τ _c N/mm ²	σ _{cr} or τ _{cr} N/mm ²
17	ACT	6.5	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		6.34	Strdk		Gen		Min	4600	9450		120.0	25.5
	BUC		6.02	1.00	1.00	4.00	1.10	compr	4300	9450	74.6	87.0	74.6
18	ACT	8.5	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		6.34	Strdk		Gen		Min	2800	9450		120.0	25.5
	BUC		6.02	1.00	1.00	4.00	1.10	compr	1300	9450	74.6	142.2	74.6
19	ACT	15.0	std	0.0	0.0		-	100	2400	1400	0.0	235.0	1.00
	LOC		9.28	Strdk		Gen		Lat	0	9450		120.0	25.5
	BUC		14.04	1.00	1.00	4.00	1.30	compr	0	9450	74.6	85.1	74.6

Inner Bottom

1	ACT	8.0	std	0.0	0.0		-	100	2400	700	0.0	235.0	1.00
	LOC		7.82	Inbot		Min		Lat	350	1250	9	140.0	70.0
	BUC		6.12	0.90	1.00	4.00	1.43	compr	700	1250	50.9	96.9	56.6
2	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		8.06	Inbot		FW rol 2		Lat	1500	1250	5	140.0	101.2
	BUC		5.24	0.90	1.00	4.00	1.21	compr	1250	1250	50.9	130.3	56.6
3	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		7.91	Inbot		FW rol 2		Lat	2700	1250	5	140.0	97.5
	BUC		5.24	0.90	1.00	4.00	1.21	compr	2500	1250	50.9	130.3	56.6
4	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		7.83	Inbot		FW tst 5		Lat	3900	1250	5	140.0	95.4
	BUC		5.24	0.90	1.00	4.00	1.21	compr	3750	1250	50.9	130.3	56.6
5	ACT	10.5	std	0.0	0.0		-	100	2400	800	0.0	235.0	1.00
	LOC		10.43	Inbot		FW tst 5		Lat	5800	1250	5	140.0	95.4
	BUC		6.99	0.90	1.00	4.00	1.32	compr	6200	1250	50.9	126.9	56.6
6	ACT	10.5	std	0.0	0.0		-	100	2400	800	0.0	235.0	1.00
	LOC		10.43	Inbot		FW tst 5		Lat	6600	1250	5	140.0	95.4
	BUC		6.99	0.90	1.00	4.00	1.32	compr	6250	1250	50.9	126.9	56.6
7	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		7.83	Inbot		FW tst 5		Lat	7900	1250	5	140.0	95.4
	BUC		5.24	0.90	1.00	4.00	1.21	compr	8200	1250	50.9	130.3	56.6
8	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		7.91	Inbot		FW rol 2		Lat	9700	1250	5	140.0	97.5
	BUC		5.24	0.90	1.00	4.00	1.21	compr	9400	1250	50.9	130.3	56.6
9	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		8.06	Inbot		FW rol 2		Lat	10900	1250	5	140.0	101.2
	BUC		5.24	0.90	1.00	4.00	1.21	compr	10600	1250	50.9	130.3	56.6
10	ACT	9.0	std	0.0	0.0		-	100	2400	800	0.0	235.0	1.00
	LOC		8.94	Inbot		Min		Lat	12100	1250	8	140.0	70.0
	BUC		6.99	0.90	1.00	4.00	1.43	compr	12500	1250	50.9	93.9	56.6

Inner Side 11700

1	ACT	11.5	std	0.0	0.0		-	100	2400	1250	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		11.46	1.00	0.70	4.67	1.30	compr	11700	0	72.8	73.2	72.8
2	ACT	8.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		8.19	Insid		FW rol 2		Lat	11700	1550	5	134.9	100.6
	BUC		4.72	1.00	0.79	4.43	1.20	compr	11700	1250	50.9	140.5	50.9
3	ACT	7.5	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		7.37	Insid		FW rol 2		Lat	11700	2750	5	146.4	88.5
	BUC		3.35	1.00	0.74	4.57	1.10	compr	11700	2650	26.5	130.8	26.5
4	ACT	6.5	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		6.53	Insid		FW rol 2		Lat	11700	4050	5	158.9	75.4
	BUC		2.61	1.00	0.53	5.15	1.10	compr	11700	5450	18.1	112.0	18.1
5	ACT	6.0	std	0.0	0.0		-	100	2400	600	0.0	235.0	1.00
	LOC		5.95	Insid		FW rol 2		Lat	11700	5750	5	148.0	58.3
	BUC		4.21	1.00	0.93	4.15	1.10	compr	11700	6850	37.9	76.9	37.9

Local Rule Requirements - Plates (cont)

Plate No	ACT	t _{act} mm	Steel	t _k mm	t _{kb} mm		Ω m ²	Eff (%)	Span mm	Spac mm	τ N/mm ²	σ _F N/mm ²	f ₁
LOC			t _{loc} mm	Pos		Load Ref.		Loc. ref.	y _l mm	z _l mm	Comp ref.	σ N/mm ²	p kN/m ²
BUC			t _{buc} mm	η	ψ	k	c	Buc. ref.	y _b mm	z _b mm	σ _L N/mm ²	σ _c or τ _c N/mm ²	σ _{cr} or τ _{cr} N/mm ²

6	ACT	6.0	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.84	Insid		FW rol 2		Min	11700	6950	5	138.9	46.3
	BUC		4.83	1.00	0.84	4.34	1.10	compr	11700	7850	52.0	80.4	52.0
7	ACT	6.0	std	0.0	0.0	-		100	2400	200	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		5.61	1.00	0.88	4.25	1.10	compr	11700	9050	69.0	78.8	69.0

Long. Bulkhead 6200

1	ACT	20.0	std	0.0	0.0	-		100	1250	600	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		7.85	1.00	0.70	2.30	1.30	compr	6200	0	72.8	205.8	72.8

'tween deck 8250

1	ACT	5.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW rol 2		Min	1000	8250	5	160.0	32.3
	BUC		5.29	1.00	1.00	4.00	1.20	compr	1300	8250	57.7	62.3	57.7
2	ACT	5.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW rol 2		Min	2200	8250	5	160.0	28.7
	BUC		5.29	1.00	1.00	4.00	1.10	compr	2075	8250	57.7	62.3	57.7
3	ACT	5.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW tst 5		Min	3450	8250	5	160.0	25.0
	BUC		5.29	1.00	1.00	4.00	1.10	compr	3450	8250	57.7	62.3	57.7
4	ACT	6.5	std	0.0	0.0	-		100	2400	700	0.0	235.0	1.00
	LOC		5.50	'twdk		FW tst 5		Min	5850	8250	5	160.0	25.0
	BUC		6.17	1.00	1.00	4.00	1.20	compr	6200	8250	57.7	63.9	57.7
5	ACT	5.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW tst 5		Min	7000	8250	5	160.0	25.0
	BUC		5.29	1.00	1.00	4.00	1.10	compr	7300	8250	57.7	62.3	57.7
6	ACT	5.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW tst 5		Min	7600	8250	5	160.0	25.0
	BUC		5.29	1.00	1.00	4.00	1.10	compr	7575	8250	57.7	62.3	57.7
7	ACT	5.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW rol 2		Min	10000	8250	5	160.0	28.1
	BUC		5.29	1.00	1.00	4.00	1.10	compr	8950	8250	57.7	62.3	57.7
8	ACT	6.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.50	'twdk		FW rol 2		Min	10600	8250	5	160.0	29.9
	BUC		6.08	1.00				compr	10900	8250	57.7	65.9	57.7

Long. Bulkhead 700

1	ACT	8.0	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		8.19	Lbhd		FW rol 2		Lat	700	1550	5	134.9	100.6
	BUC		4.72	1.00	0.79	4.43	1.20	compr	700	1250	50.9	140.5	50.9
2	ACT	7.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		7.37	Lbhd		FW rol 2		Lat	700	2750	5	146.4	88.5
	BUC		3.35	1.00	0.74	4.57	1.10	compr	700	2650	26.5	130.8	26.5
3	ACT	6.5	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		6.53	Lbhd		FW rol 2		Lat	700	4050	5	158.9	75.4
	BUC		2.61	1.00	0.53	5.15	1.10	compr	700	5450	18.1	112.0	18.1
4	ACT	6.0	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.95	Lbhd		FW rol 2		Lat	700	5750	5	148.0	58.3
	BUC		4.21	1.00	0.93	4.15	1.10	compr	700	6850	37.9	76.9	37.9
5	ACT	6.0	std	0.0	0.0	-		100	2400	600	0.0	235.0	1.00
	LOC		5.84	Lbhd		FW rol 2		Min	700	6950	5	138.9	46.3
	BUC		4.83	1.00	0.84	4.34	1.10	compr	700	7850	52.0	80.4	52.0

Local Rule Requirements - Plates (cont)

Plate No	ACT	t _{act} mm	Steel	t _k mm	t _{kb} mm		Ω m ²	Eff (%)	Span mm	Spac mm	τ N/mm ²	σ _F N/mm ²	f ₁
LOC			t _{loc} mm	Pos		Load Ref.		Loc. ref.	y _l mm	z _l mm	Comp ref.	σ N/mm ²	p kN/m ²
BUC			t _{buc} mm	η	ψ	k	c	Buc. ref.	y _b mm	z _b mm	σ _L N/mm ²	σ _c or τ _c N/mm ²	σ _{cr} or τ _{cr} N/mm ²

Long. Bulkhead 0

1	ACT	8.0	std	0.0	0.0		-	100	1250	600	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		7.85	1.00	0.70	2.30	1.30	compr	0	0	72.8	75.7	72.8

Long. Bulkhead 700

1	ACT	8.0	std	0.0	0.0		-	100	1250	600	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		7.85	1.00	0.70	2.30	1.30	compr	700	0	72.8	75.7	72.8

Long. Bulkhead 700

1	ACT	8.5	std	0.0	0.0		-	100	1200	600	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		8.67	1.00	0.77	1.93	1.10	compr	700	9450	74.6	71.7	74.6

Long. Bulkhead 6200

1	ACT	20.0	std	0.0	0.0		-	100	1200	600	0.0	235.0	1.00
	LOC		5.84					Min	0	0		0.0	0.0
	BUC		8.67	1.00	0.77	1.93	1.10	compr	6200	9450	74.6	200.2	74.6

16 Local Rule Requirements - Stiffeners

Stiff. No	ACT ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{conh} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f

Outer Shell

Bottom

2	ACT	Bottom	0.00	20	160	0	1200	235.0	12.0	0.0	11.0	2400
	ACT	146	0.0	HPbulb	11.5	0.0	0	1.00	1.00	0.0		550
	LOC		141	3	5.8	Sea		160.0	0.0	85.8		12.5
	FAT/BUC		0		0.0	0.0		72.8	221.4	0.0	0.0	0.0
3	ACT	Bottom	0.00	20	180	0	1800	235.0	12.0	0.0	8.5	2400
	ACT	155	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		600
	LOC		154	0	5.8	Sea		160.0	0.0	85.8		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.0	0.0	0.0	0.0
4	ACT	Bottom	0.00	20	180	0	2400	235.0	12.0	0.0	8.5	2400
	ACT	155	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		600
	LOC		154	0	5.8	Sea		160.0	0.0	85.8		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.0	0.0	0.0	0.0
5	ACT	Bottom	0.00	20	180	0	3000	235.0	12.0	0.0	8.5	2400
	ACT	155	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		600
	LOC		154	0	5.8	Sea		160.0	0.0	85.8		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.0	0.0	0.0	0.0
6	ACT	Bottom	0.00	20	180	0	3600	235.0	12.0	0.0	8.5	2400
	ACT	155	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		600
	LOC		154	0	5.8	Sea		160.0	0.0	85.8		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.0	0.0	0.0	0.0
7	ACT	Bottom	0.00	20	180	0	4200	235.0	12.0	0.0	8.5	2400
	ACT	155	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		600
	LOC		154	0	5.8	Sea		160.0	0.0	85.8		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.0	0.0	0.0	0.0
8	ACT	Bottom	0.00	20	180	0	4800	235.0	12.0	0.0	8.5	2400
	ACT	155	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		600
	LOC		154	0	5.8	Sea		160.0	0.0	85.8		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.0	0.0	0.0	0.0
9	ACT	Bottom	0.00	20	180	0	5400	235.0	12.0	0.0	10.5	2400
	ACT	189	0.0	HPbulb	11.0	0.0	0	1.00	1.00	0.0		700
	LOC		180	5	5.8	Sea		160.0	0.0	85.8		15.4
	FAT/BUC		0		0.0	0.0		72.8	224.0	0.0	0.0	0.0
11	ACT	Bottom	0.00	20	180	0	7000	235.0	12.0	0.0	10.5	2400
	ACT	189	0.0	HPbulb	11.0	0.0	0	1.00	1.00	0.0		700
	LOC		182	3	5.8	Sea		160.0	0.0	86.9		15.6
	FAT/BUC		0		0.0	0.0		72.8	224.0	0.0	0.0	0.0
12	ACT	Bottom	0.00	20	180	0	7600	235.0	12.0	0.0	8.5	2400
	ACT	164	0.0	HPbulb	9.0	0.0	0	1.00	1.00	0.0		600
	LOC		157	4	5.8	Sea		160.0	0.0	87.7		13.8
	FAT/BUC		0		0.0	0.0		72.8	225.2	0.0	0.0	0.0
13	ACT	Bottom	0.00	20	180	0	8200	235.0	12.0	0.0	8.5	2400
	ACT	164	0.0	HPbulb	9.0	0.0	0	1.00	1.00	0.0		600
	LOC		159	3	5.8	Sea		160.0	0.0	88.5		13.9
	FAT/BUC		0		0.0	0.0		72.8	225.2	0.0	0.0	0.0
14	ACT	Bottom	0.00	20	180	0	8800	235.0	12.0	0.0	8.5	2400
	ACT	164	0.0	HPbulb	9.0	0.0	0	1.00	1.00	0.0		600
	LOC		160	2	5.8	Sea		160.0	0.0	89.3		14.1
	FAT/BUC		0		0.0	0.0		72.8	225.2	0.0	0.0	0.0
15	ACT	Bottom	0.00	20	180	0	9400	235.0	12.0	0.0	8.5	2400
	ACT	164	0.0	HPbulb	9.0	0.0	0	1.00	1.00	0.0		600
	LOC		162	1	5.8	Sea		160.0	0.0	90.1		14.2
	FAT/BUC		0		0.0	0.0		72.8	225.2	0.0	0.0	0.0
16	ACT	Bottom	0.00	20	180	0	10000	235.0	12.0	0.0	8.5	2400
	ACT	164	0.0	HPbulb	9.0	0.0	0	1.00	1.00	0.0		600
	LOC		163	0	5.8	Sea		160.0	0.0	90.9		14.3
	FAT/BUC		0		0.0	0.0		72.8	225.2	0.0	0.0	0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{conh} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f
17	ACT	Bottom	0.00	20	180	0	10600	235.0	12.0	0.0	8.5	2400
	ACT	164	0.0	HPbulb	9.0	0.0	0	1.00	1.00	0.0		600
	LOC		164	0	5.8	Sea		160.0	0.0	91.7		14.4
	FAT/BUC		0		0.0	0.0		72.8	225.2	0.0	0.0	0.0
18	ACT	Bottom	0.00	20	180	0	11200	235.0	12.0	0.0	8.5	2400
	ACT	154	0.0	HPbulb	8.0	0.0	0	1.00	1.00	0.0		550
	LOC		152	1	5.8	Sea		160.0	0.0	92.5		13.5
	FAT/BUC		0		0.0	0.0		72.8	225.4	0.0	0.0	0.0
Side												
19	ACT	Side	0.00	20	160	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	139	0.0	HPbulb	11.0	0.0	1850	1.00	1.00	0.0		600
	LOC	*	140	0	5.3	Sea		160.0	0.0	78.0		12.3
	FAT/BUC		0		0.0	0.0		40.5	222.0	0.0	0.0	0.0
20	ACT	Side	0.00	20	160	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	139	0.0	HPbulb	11.0	0.0	2450	1.00	1.00	0.0		600
	LOC		130	6	5.3	Sea		160.0	0.0	72.7		11.5
	FAT/BUC		0		0.0	0.0		30.0	222.0	0.0	0.0	0.0
21	ACT	Side	0.00	20	160	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	124	0.0	HPbulb	9.0	0.0	3050	1.00	1.00	0.0		600
	LOC		121	2	5.3	Sea		160.0	0.0	67.4		10.6
	FAT/BUC		0		0.0	0.0		30.0	221.5	0.0	0.0	0.0
22	ACT	Side	0.00	20	160	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	116	0.0	HPbulb	8.0	0.0	3650	1.00	1.00	0.0		600
	LOC		111	3	5.3	Sea		160.0	0.0	62.2		9.8
	FAT/BUC		0		0.0	0.0		30.0	221.1	0.0	0.0	0.0
23	ACT	Side	0.00	20	160	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	108	0.0	HPbulb	7.0	0.0	4250	1.00	1.00	0.0		600
	LOC		102	5	5.3	Sea		160.0	0.0	56.9		9.0
	FAT/BUC		0		0.0	0.0		30.0	220.7	0.0	0.0	0.0
24	ACT	Side	0.00	20	140	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	91	0.0	HPbulb	9.0	0.0	4850	1.00	1.00	0.0		600
	LOC	*	93	-1	5.3	Sea		160.0	0.0	51.6		8.1
	FAT/BUC		0		0.0	0.0		30.0	215.6	0.0	0.0	0.0
25	ACT	Side	0.00	20	140	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	85	0.0	HPbulb	8.0	0.0	5450	1.00	1.00	0.0		600
	LOC		83	2	5.3	Sea		160.0	0.0	46.3		7.3
	FAT/BUC		0		0.0	0.0		30.0	215.0	0.0	0.0	0.0
26	ACT	Side	0.00	20	140	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	73	0.0	HPbulb	6.0	0.0	6050	1.00	1.00	0.0		600
	LOC	*	74	0	5.3	Sea		160.0	0.0	41.0		6.5
	FAT/BUC		0		0.0	0.0		30.0	213.4	0.0	0.0	0.0
27	ACT	Side	0.00	20	140	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	73	0.0	HPbulb	6.0	0.0	6650	1.00	1.00	0.0		600
	LOC		64	13	5.3	Sea		159.7	0.0	35.8		5.6
	FAT/BUC		0		0.0	0.0		35.1	213.4	0.0	0.0	0.0
28	ACT	Side	0.00	20	120	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	58	0.0	HPbulb	7.0	0.0	7250	1.00	1.00	0.0		600
	LOC		57	0	5.3	Sea		158.4	0.0	31.6		5.0
	FAT/BUC		0		0.0	0.0		43.5	203.7	0.0	0.0	0.0
29	ACT	Side	0.00	20	120	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	58	0.0	HPbulb	7.0	0.0	7850	1.00	1.00	0.0		600
	LOC		53	8	5.3	Sea		157.0	0.0	28.9		4.6
	FAT/BUC		0		0.0	0.0		52.0	203.7	0.0	0.0	0.0
30	ACT	Side	0.00	20	120	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	53	0.0	HPbulb	6.0	0.0	8450	1.00	1.00	0.0		600
	LOC		48	9	5.3	Sea		155.6	0.0	26.3		4.1
	FAT/BUC		0		0.0	0.0		60.5	202.1	0.0	0.0	0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kw} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{con} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f
31	ACT	Side	0.00	20	100	0	12500	235.0	12.0	0.0	8.5	2400
	ACT	40	0.0	HPbulb	7.0	0.0	9050	1.00	1.00	0.0		500
	LOC		37	9	5.3	Sea		154.2	0.0	23.7		3.2
	FAT/BUC		0		0.0	0.0		69.0	190.5	0.0	0.0	0.0

Strength deck

2	ACT	Strdk	0.00	20	140	0	10900	235.0	12.0	0.0	7.0	2400
	ACT	72	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		700
	LOC		56	29	5.3	Gen		153.3	0.0	25.5		4.6
	FAT/BUC		0		0.0	0.0		74.6	213.6	0.0	0.0	0.0
3	ACT	Strdk	0.00	20	120	0	10300	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
4	ACT	Strdk	0.00	20	120	0	9700	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
5	ACT	Strdk	0.00	20	120	0	9100	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
6	ACT	Strdk	0.00	20	120	0	8500	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
7	ACT	Strdk	0.00	20	120	0	7900	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
8	ACT	Strdk	0.00	20	120	0	7300	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
9	ACT	Strdk	0.00	20	120	0	6700	235.0	12.0	0.0	7.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		550
	LOC		44	19	5.3	Gen		153.3	0.0	25.5		3.7
	FAT/BUC		0		0.0	0.0		74.6	206.0	0.0	0.0	0.0
1	ACT	Strdk	0.00	20	120	0	5500	235.0	12.0	0.0	7.5	2400
	ACT	57	0.0	HPbulb	7.0	0.0	9450	1.00	1.00	0.0		650
	LOC		52	10	5.3	Gen		153.3	0.0	25.5		4.3
	FAT/BUC		0		0.0	0.0		74.6	204.3	0.0	0.0	0.0
2	ACT	Strdk	0.00	20	120	0	4900	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
3	ACT	Strdk	0.00	20	120	0	4300	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
4	ACT	Strdk	0.00	20	120	0	3700	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0
5	ACT	Strdk	0.00	20	120	0	3100	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	8	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	206.7	0.0	0.0	0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{conh} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f
6	ACT	Strdk	0.00	20	120	0	2500	235.0	12.0	0.0	8.5	2400
	ACT	53	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	10	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	202.1	0.0	0.0	0.0
7	ACT	Strdk	0.00	20	120	0	1900	235.0	12.0	0.0	8.5	2400
	ACT	53	0.0	HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	10	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	202.1	0.0	0.0	0.0
8	ACT	Strdk	0.00	20	120	0	1300	235.0	12.0	0.0	8.5	2400
	ACT	58	0.0	HPbulb	7.0	0.0	9450	1.00	1.00	0.0		600
	LOC		48	20	5.3	Gen		153.3	0.0	25.5		4.0
	FAT/BUC		0		0.0	0.0		74.6	203.7	0.0	0.0	0.0

Inner Bottom

33	ACT	Inbot	0.00	20	180	0	1200	235.0	12.0	0.0	8.0	2400
	ACT	171	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		550
	LOC		168	2	5.8	FW rol 2		160.0	0.0	102.1	5	14.9
	FAT/BUC		0		0.0	0.0		50.9	225.8	0.0	0.0	0.0
34	ACT	Inbot	0.00	20	180	0	1800	235.0	12.0	0.0	8.0	2400
	ACT	182	0.0	HPbulb	11.0	0.0	1250	1.00	1.00	0.0		600
	LOC		180	0	5.8	FW rol 2		160.0	0.0	100.3	5	15.8
	FAT/BUC		0		0.0	0.0		50.9	225.6	0.0	0.0	0.0
35	ACT	Inbot	0.00	20	180	0	2400	235.0	12.0	0.0	8.0	2400
	ACT	182	0.0	HPbulb	11.0	0.0	1250	1.00	1.00	0.0		600
	LOC		176	2	5.8	FW rol 2		160.0	0.0	98.4	5	15.5
	FAT/BUC		0		0.0	0.0		50.9	225.6	0.0	0.0	0.0
36	ACT	Inbot	0.00	20	180	0	3000	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		600
	LOC	*	173	0	5.8	FW rol 2		160.0	0.0	96.6	5	15.2
	FAT/BUC		0		0.0	0.0		50.9	225.5	0.0	0.0	0.0
37	ACT	Inbot	0.00	20	180	0	3600	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		600
	LOC		171	0	5.8	FW tst 5		160.0	0.0	95.4	5	15.0
	FAT/BUC		0		0.0	0.0		50.9	225.5	0.0	0.0	0.0
38	ACT	Inbot	0.00	20	180	0	4200	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		600
	LOC		171	0	5.8	FW tst 5		160.0	0.0	95.4	5	15.0
	FAT/BUC		0		0.0	0.0		50.9	225.5	0.0	0.0	0.0
39	ACT	Inbot	0.00	20	180	0	4800	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		600
	LOC		171	0	5.8	FW tst 5		160.0	0.0	95.4	5	15.0
	FAT/BUC		0		0.0	0.0		50.9	225.5	0.0	0.0	0.0
40	ACT	Inbot	0.00	20	200	0	5400	235.0	12.0	0.0	10.5	2400
	ACT	212	0.0	HPbulb	8.5	0.0	1250	1.00	1.00	0.0		700
	LOC		200	6	5.8	FW tst 5		160.0	0.0	95.4	5	17.1
	FAT/BUC		0		0.0	0.0		50.9	226.3	0.0	0.0	0.0
41	ACT	Inbot	0.00	20	200	0	7000	235.0	12.0	0.0	10.5	2400
	ACT	212	0.0	HPbulb	8.5	0.0	1250	1.00	1.00	0.0		700
	LOC		200	6	5.8	FW tst 5		160.0	0.0	95.4	5	17.1
	FAT/BUC		0		0.0	0.0		50.9	226.3	0.0	0.0	0.0
42	ACT	Inbot	0.00	20	180	0	7600	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		600
	LOC		171	0	5.8	FW tst 5		160.0	0.0	95.4	5	15.0
	FAT/BUC		0		0.0	0.0		50.9	225.5	0.0	0.0	0.0
43	ACT	Inbot	0.00	20	180	0	8200	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1250	1.00	1.00	0.0		600
	LOC		171	0	5.8	FW tst 5		160.0	0.0	95.4	5	15.0
	FAT/BUC		0		0.0	0.0		50.9	225.5	0.0	0.0	0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{conn} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f
44	ACT ACT LOC FAT/BUC	Inbot 172	0.00 0.0 171 0	20 HPbulb 0	180 10.0 5.8 0.0	0 0.0 FW tst 5 0.0	8800 1250	235.0 1.00 160.0 50.9	12.0 1.00 0.0 225.5	0.0 0.0 95.4 0.0	8.0 5 0.0	2400 600 15.0 0.0
45	ACT ACT LOC FAT/BUC	Inbot 172 *	0.00 0.0 173 0	20 HPbulb 0	180 10.0 5.8 0.0	0 0.0 FW rol 2 0.0	9400 1250	235.0 1.00 160.0 50.9	12.0 1.00 0.0 225.5	0.0 0.0 96.6 0.0	8.0 5 0.0	2400 600 15.2 0.0
46	ACT ACT LOC FAT/BUC	Inbot 182	0.00 0.0 176 0	20 HPbulb 2	180 11.0 5.8 0.0	0 0.0 FW rol 2 0.0	10000 1250	235.0 1.00 160.0 50.9	12.0 1.00 0.0 225.6	0.0 0.0 98.4 0.0	8.0 5 0.0	2400 600 15.5 0.0
47	ACT ACT LOC FAT/BUC	Inbot 182	0.00 0.0 180 0	20 HPbulb 0	180 11.0 5.8 0.0	0 0.0 FW rol 2 0.0	10600 1250	235.0 1.00 160.0 50.9	12.0 1.00 0.0 225.6	0.0 0.0 100.3 0.0	8.0 5 0.0	2400 600 15.8 0.0
48	ACT ACT LOC FAT/BUC	Inbot 171	0.00 0.0 168 0	20 HPbulb 2	180 10.0 5.8 0.0	0 0.0 FW rol 2 0.0	11200 1250	235.0 1.00 160.0 50.9	12.0 1.00 0.0 225.8	0.0 0.0 102.1 0.0	8.0 5 0.0	2400 550 14.9 0.0
Inner Side 11700												
49	ACT ACT LOC FAT/BUC	Insid 172 *	0.00 0.0 175 0	20 HPbulb -1	180 10.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 1850	235.0 1.00 160.0 40.5	12.0 1.00 0.0 225.5	0.0 0.0 97.5 0.0	8.0 5 0.0	2400 600 15.4 0.0
50	ACT ACT LOC FAT/BUC	Insid 163 *	0.00 0.0 164 0	20 HPbulb 0	180 9.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 2450	235.0 1.00 160.0 30.0	12.0 1.00 0.0 225.4	0.0 0.0 91.5 0.0	8.0 5 0.0	2400 600 14.4 0.0
51	ACT ACT LOC FAT/BUC	Insid 153	0.00 0.0 153 0	20 HPbulb 0	180 8.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 3050	235.0 1.00 160.0 30.0	12.0 1.00 0.0 225.5	0.0 0.0 85.5 0.0	7.5 5 0.0	2400 600 13.5 0.0
52	ACT ACT LOC FAT/BUC	Insid 140 *	0.00 0.0 142 0	20 HPbulb -1	160 11.5 5.3 0.0	0 0.0 FW rol 2 0.0	11700 3650	235.0 1.00 160.0 30.0	12.0 1.00 0.0 222.6	0.0 0.0 79.4 0.0	7.5 5 0.0	2400 600 12.5 0.0
53	ACT ACT LOC FAT/BUC	Insid 135	0.00 0.0 132 0	20 HPbulb 2	160 11.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 4250	235.0 1.00 160.0 30.0	12.0 1.00 0.0 223.0	0.0 0.0 73.4 0.0	6.5 5 0.0	2400 600 11.6 0.0
54	ACT ACT LOC FAT/BUC	Insid 120 *	0.00 0.0 121 0	20 HPbulb 0	160 9.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 4850	235.0 1.00 160.0 30.0	12.0 1.00 0.0 222.7	0.0 0.0 67.4 0.0	6.5 5 0.0	2400 600 10.6 0.0
55	ACT ACT LOC FAT/BUC	Insid 119	0.00 0.0 110 0	20 HPbulb 8	160 9.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 5450	235.0 1.00 160.0 30.0	12.0 1.00 0.0 223.1	0.0 0.0 61.3 0.0	6.0 5 0.0	2400 600 9.7 0.0
56	ACT ACT LOC FAT/BUC	Insid 105	0.00 0.0 99 0	20 HPbulb 5	160 7.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 6050	235.0 1.00 160.0 30.0	12.0 1.00 0.0 222.7	0.0 0.0 55.3 0.0	6.0 5 0.0	2400 600 8.7 0.0
57	ACT ACT LOC FAT/BUC	Insid 88	0.00 0.0 88 0	20 HPbulb 0	140 9.0 5.3 0.0	0 0.0 FW rol 2 0.0	11700 6650	235.0 1.00 160.0 35.1	12.0 1.00 0.0 218.2	0.0 0.0 49.3 0.0	6.0 5 0.0	2400 600 7.8 0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{conh} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f
58	ACT	Insid	0.00	20	140	0	11700	235.0	12.0	0.0	6.0	2400
	ACT	77	0.0	HPbulb	7.0	0.0	7250	1.00	1.00	0.0		600
	LOC	*	78	0	5.3	FW rol 2		160.0	0.0	43.2	5	6.8
	FAT/BUC		0		0.0	0.0		43.5	217.4	0.0	0.0	0.0
59	ACT	Insid	0.00	20	120	0	11700	235.0	12.0	0.0	6.0	2400
	ACT	59	0.0	HPbulb	8.0	0.0	7850	1.00	1.00	0.0		500
	LOC		56	6	5.3	FW rol 2		160.0	0.0	37.2	5	5.0
	FAT/BUC		0		0.0	0.0		52.0	211.7	0.0	0.0	0.0
60	ACT	Insid	0.00	20	60	0	11700	235.0	0.0	0.0	6.0	2400
	ACT	14	0.0	HPbulb	6.0	0.0	8450	1.00	1.00	0.0		400
	LOC	*	15	-9	5.3			0.0	0.0	0.0	2	0.0
	FAT/BUC		0		0.0	0.0		60.5	113.1	0.0	0.0	0.0
61	ACT	Insid	0.00	20	60	0	11700	235.0	0.0	0.0	6.0	2400
	ACT	14	0.0	HPbulb	6.0	0.0	9050	1.00	1.00	0.0		500
	LOC	*	15	-8	5.3			0.0	0.0	0.0	2	0.0
	FAT/BUC		0		0.0	0.0		69.0	97.3	0.0	0.0	0.0
'tween deck 8250												
73	ACT	'twdk	0.00	20	120	0	1300	235.0	12.0	0.0	5.5	2400
	ACT	55	0.0	HPbulb	7.0	0.0	8250	1.00	1.00	0.0		600
	LOC	*	56	-1	5.3	FW rol 2		160.0	0.0	31.4	5	4.9
	FAT/BUC		0		0.0	0.0		57.7	209.8	0.0	0.0	0.0
74	ACT	'twdk	0.00	20	120	0	1900	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC	*	53	-3	5.3	FW rol 2		160.0	0.0	29.6	5	4.7
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
75	ACT	'twdk	0.00	20	120	0	2500	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		50	2	5.3	FW rol 2		160.0	0.0	27.8	5	4.4
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
76	ACT	'twdk	0.00	20	120	0	3100	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
77	ACT	'twdk	0.00	20	120	0	3700	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
78	ACT	'twdk	0.00	20	120	0	4300	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
79	ACT	'twdk	0.00	20	120	0	4900	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	10	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	206.7	0.0	0.0	0.0
80	ACT	'twdk	0.00	20	120	0	5500	235.0	12.0	0.0	6.5	2400
	ACT	52	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		650
	LOC		51	2	5.3	FW tst 5		153.3	0.0	25.0	5	4.2
	FAT/BUC		0		0.0	0.0		57.7	205.2	0.0	0.0	0.0
82	ACT	'twdk	0.00	20	120	0	6700	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		550
	LOC		43	18	5.3	FW tst 5		153.3	0.0	25.0	5	3.7
	FAT/BUC		0		0.0	0.0		57.7	210.1	0.0	0.0	0.0
83	ACT	'twdk	0.00	20	120	0	7300	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
LOC			Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	σ _{DB} N/mm ²	p kN/m ²	Comp ref.	a _{conh} cm ²
FAT/BUC			Z _{rf} cm ³	excess (%)	p _d kN/m ²	σ _d N/mm ²		σ _L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b _f /t _f
84	ACT	'twdk	0.00	20	120	0	7900	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
85	ACT	'twdk	0.00	20	120	0	8500	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
86	ACT	'twdk	0.00	20	120	0	9100	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		47	8	5.3	FW tst 5		153.3	0.0	25.0	5	3.9
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
87	ACT	'twdk	0.00	20	120	0	9700	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		49	4	5.3	FW rol 2		160.0	0.0	27.1	5	4.3
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
88	ACT	'twdk	0.00	20	120	0	10300	235.0	12.0	0.0	5.5	2400
	ACT	51	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC	*	52	-1	5.3	FW rol 2		160.0	0.0	29.0	5	4.6
	FAT/BUC		0		0.0	0.0		57.7	209.0	0.0	0.0	0.0
89	ACT	'twdk	0.00	20	140	0	10900	235.0	12.0	0.0	6.5	2400
	ACT	72	0.0	HPbulb	6.0	0.0	8250	1.00	1.00	0.0		700
	LOC		64	11	5.3	FW rol 2		160.0	0.0	30.8	5	5.5
	FAT/BUC		0		0.0	0.0		57.7	214.4	0.0	0.0	0.0

Long. Bulkhead 700

62	ACT	Lbhd	0.00	20	180	0	700	235.0	12.0	0.0	8.0	2400
	ACT	172	0.0	HPbulb	10.0	0.0	1850	1.00	1.00	0.0		600
	LOC	*	175	-1	5.3	FW rol 2		160.0	0.0	97.5	5	15.4
	FAT/BUC		0		0.0	0.0		40.5	225.5	0.0	0.0	0.0
63	ACT	Lbhd	0.00	20	180	0	700	235.0	12.0	0.0	8.0	2400
	ACT	163	0.0	HPbulb	9.0	0.0	2450	1.00	1.00	0.0		600
	LOC	*	164	0	5.3	FW rol 2		160.0	0.0	91.5	5	14.4
	FAT/BUC		0		0.0	0.0		30.0	225.4	0.0	0.0	0.0
64	ACT	Lbhd	0.00	20	180	0	700	235.0	12.0	0.0	7.5	2400
	ACT	153	0.0	HPbulb	8.0	0.0	3050	1.00	1.00	0.0		600
	LOC		153	0	5.3	FW rol 2		160.0	0.0	85.5	5	13.5
	FAT/BUC		0		0.0	0.0		19.5	225.5	0.0	0.0	0.0
65	ACT	Lbhd	0.00	20	160	0	700	235.0	12.0	0.0	7.5	2400
	ACT	140	0.0	HPbulb	11.5	0.0	3650	1.00	1.00	0.0		600
	LOC	*	142	-1	5.3	FW rol 2		160.0	0.0	79.4	5	12.5
	FAT/BUC		0		0.0	0.0		9.0	222.6	0.0	0.0	0.0
66	ACT	Lbhd	0.00	20	160	0	700	235.0	12.0	0.0	6.5	2400
	ACT	135	0.0	HPbulb	11.0	0.0	4250	1.00	1.00	0.0		600
	LOC		132	2	5.3	FW rol 2		160.0	0.0	73.4	5	11.6
	FAT/BUC		0		0.0	0.0		1.2	223.0	0.0	0.0	0.0
67	ACT	Lbhd	0.00	20	160	0	700	235.0	12.0	0.0	6.5	2400
	ACT	120	0.0	HPbulb	9.0	0.0	4850	1.00	1.00	0.0		600
	LOC	*	121	0	5.3	FW rol 2		160.0	0.0	67.4	5	10.6
	FAT/BUC		0		0.0	0.0		9.6	222.7	0.0	0.0	0.0
68	ACT	Lbhd	0.00	20	160	0	700	235.0	12.0	0.0	6.0	2400
	ACT	105	0.0	HPbulb	7.0	0.0	5450	1.00	1.00	0.0		600
	LOC	*	110	-4	5.3	FW rol 2		160.0	0.0	61.3	5	9.7
	FAT/BUC		0		0.0	0.0		18.1	222.7	0.0	0.0	0.0
69	ACT	Lbhd	0.00	20	160	0	700	235.0	12.0	0.0	6.0	2400
	ACT	105	0.0	HPbulb	7.0	0.0	6050	1.00	1.00	0.0		600
	LOC		99	5	5.3	FW rol 2		160.0	0.0	55.3	5	8.7
	FAT/BUC		0		0.0	0.0		26.6	222.7	0.0	0.0	0.0

Local Rule Requirements - Stiffeners (cont.)

Stiff. No	ACT ACT	Pos Z_a cm ³	K c	Type Type	h t (mm)	b_f t_f (mm)	y z (mm)	σ_F f_1 N/mm ²	m w_k	t_{kw} t_{kf} (mm)	t_{pl} (mm)	span spac (mm)
LOC			Z_r cm ³	excess (%)	t_{min} (mm)	Load Ref.		σ N/mm ²	σ_{DB} N/mm ²	p kN/m ²	Comp ref.	a_{conn} cm ²
FAT/BUC			Z_{rf} cm ³	excess (%)	p_d kN/m ²	σ_d N/mm ²		σ_L N/mm ²	Lat N/mm ²	Torsion N/mm ²	Web N/mm ²	b_f/t_f
70	ACT	Lbhd	0.00	20	140	0	700	235.0	12.0	0.0	6.0	2400
	ACT	88	0.0	HPbulb	9.0	0.0	6650	1.00	1.00	0.0		600
	LOC		88	0	5.3	FW rol 2		160.0	0.0	49.3	5	7.8
	FAT/BUC		0		0.0	0.0		35.1	218.2	0.0	0.0	0.0
71	ACT	Lbhd	0.00	20	140	0	700	235.0	12.0	0.0	6.0	2400
	ACT	77	0.0	HPbulb	7.0	0.0	7250	1.00	1.00	0.0		600
	LOC	*	78	0	5.3	FW rol 2		160.0	0.0	43.2	5	6.8
	FAT/BUC		0		0.0	0.0		43.5	217.4	0.0	0.0	0.0
72	ACT	Lbhd	0.00	20	120	0	700	235.0	12.0	0.0	6.0	2400
	ACT	55	0.0	HPbulb	7.0	0.0	7850	1.00	1.00	0.0		500
	LOC		56	0	5.3	FW rol 2		160.0	0.0	37.2	5	5.0
	FAT/BUC		0		0.0	0.0		52.0	211.1	0.0	0.0	0.0

17 Local Rule Requirements - Transverse stiffeners

Stiff. No	ACT ACT	Pos Z _a cm ³	K c	Type Type	h t (mm)	b _f t _f (mm)	y z (mm)	σ _F f ₁ N/mm ²	m w _k	t _{kw} t _{kf} (mm)	t _{pl} (mm)	span spac (mm)
	LOC		Z _r cm ³	excess (%)	t _{min} (mm)	Load Ref.		σ N/mm ²	ang_PL deg	p kN/m ²	Comp ref.	a _{conn} cm ²

Outer Shell

1	Strength deck (Trv. stiffener). End points (y,z) = (12500, 9450)-(11700, 9450).											
	ACT	Strdk	0.00	20	120	0.0	12100	235.0	10.0	0.0	7.0	800
	ACT	52		HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		15	246	5.3	Gen		160.0	90	25.5		0.0
2	Strength deck (Trv. stiffener). End points (y,z) = (11700, 9450)-(10900, 9450).											
	ACT	Strdk	0.00	20	120	0.0	11300	235.0	10.0	0.0	7.0	800
	ACT	52		HPbulb	6.0	0.0	9450	1.00	1.00	0.0		600
	LOC		15	246	5.3	Gen		160.0	90	25.5		0.0

'tween deck 8250

1	'tween deck (Trv. stiffener). End points (y,z) = (10900, 8250)-(11700, 8250).											
	ACT	'twdk	0.00	20	120	0.0	11300	235.0	10.0	0.0	6.5	800
	ACT	52		HPbulb	6.0	0.0	8250	1.00	1.00	0.0		600
	LOC		15	244	5.3	FW rol 2		160.0	90	32.0	5	0.0

Long. Bulkhead 700

1	Longitudinal bulkhead ('tween deck frame). End points (y,z) = (700, 8250)-(700, 9450).											
	ACT	Lbhd	0.00	20	120	0.0	700	235.0	11.4	0.0	8.5	1200
	ACT	53		HPbulb	6.0	0.0	8850	1.00	1.00	0.0		600
	LOC		15	253	5.3				90	0.0	9	0.0

Long. Bulkhead 6200

1	Longitudinal bulkhead ('tween deck frame). End points (y,z) = (6200, 8250)-(6200, 9450).											
	ACT	Lbhd	0.00	20	120	0.0	6200	235.0	11.4	0.0	20.0	1200
	ACT	61		HPbulb	6.0	0.0	8850	1.00	1.00	0.0		600
	LOC		15	306	5.3				90	0.0	1	0.0

18 Local Rule Requirements - Main frames

ACT ACT	webPP alpha deg	Za cm ³	K c	Type Type	h t (mm)	bf tf (mm)	y z (mm)	sigF f ₁ N/mm ²	m wk	tkw tkf (mm)	tplate lb (mm)	span spac (mm)
LOC			Zr cm ³	excess %	tmin (mm)	Load Ref.		sigma N/mm ²	tweld (mm)	p kN/m ²	Comp ref.	lbmin (mm)
LOC			Zrf cm ³	excess %	pd kN/m ²	sigd N/mm ²						

Main frame

In foremost cargo hold? No
Adjacent plane trv. bulkhead? No

Mid-length

ACT	0			20	120	0	11800	235.0		0.0	8.5	200
ACT		53		HPbulb	6.0	0.0	0	1.00	1.00	0.0		600
LOC			1		5.8	Sea			2.5	93.3		

Upper end

ACT			0.00	43	0	0	11900	235.0		0.0	8.5	200
ACT	0	0	0.00	Tbar	0.0	0.0	0	1.00	1.00	0.0	0.0	600
LOC		*	2	-100	0.0	Sea			2.0	93.3		14
LOC			0		0.0	0.0						

Lower end

ACT			0.00	43	0	0	11700	235.0		0.0	8.5	200
ACT	0	0	0.00	Tbar	0.0	0.0	0	1.00	1.00	0.0	0.0	600
In foremost cargo hold? No*			2	-100	0.0	Sea			2.0	93.3		24
Adjacent plane trv. bulkhead? No			0		0.0	0.0						

Mid-length

ACT	0			20	120	0	12324	235.0		0.0	8.5	200
ACT		53		HPbulb	6.0	0.0	176	1.00	1.00	0.0		600
LOC			1		5.3	Sea			2.5	92.5		

Upper end

ACT			0.00	43	0	0	12500	235.0		0.0	8.5	200
ACT	90	0	0.00	Tbar	0.0	0.0	600	1.00	1.00	0.0	0.0	600
LOC		*	2	-100	0.0	Sea			2.0	92.5		14
LOC			0		0.0	0.0						

Lower end

ACT			0.00	43	0	0	11900	235.0		0.0	8.5	200
ACT	0	0	0.00	Tbar	0.0	0.0	0	1.00	1.00	0.0	0.0	600
In foremost cargo hold? No*			2	-100	0.0	Sea			2.0	92.5		24
Adjacent plane trv. bulkhead? No			0		0.0	0.0						

Mid-length

ACT	0			20	120	0	12500	235.0		0.0	8.5	200
ACT		53		HPbulb	6.0	0.0	925	1.00	1.00	0.0		600
LOC			1		5.3	Sea			2.5	86.1		

Upper end

ACT			0.00	43	0	0	12500	235.0		0.0	8.5	200
ACT	90	0	0.00	Tbar	0.0	0.0	1250	1.00	1.00	0.0	0.0	600
LOC		*	2	-100	0.0	Sea			2.0	86.1		14
LOC			0		0.0	0.0						

Lower end

ACT			0.00	43	0	0	12500	235.0		0.0	8.5	200
ACT	90	0	0.00	Tbar	0.0	0.0	600	1.00	1.00	0.0	0.0	600
LOC		*	2	-100	0.0	Sea			2.0	86.1		24
LOC			0		0.0	0.0						

RULE REFERENCE: DNV Rules for ships

Pt.3 Ch.1 Sec.7 C 400 (if L > 100 m),

Pt.3 Ch.2 Sec.6 C 400 (if L < 100 m).

ABBREVIATIONS

webPP	The angle between the web and a perpendicular to the plate (degrees). 0=web is perp. to plate.
alpha	The bracket connection angle with the vertical (degrees)
K	Stress concentration factor for the end connection. Used for the fatigue control.
c	The coating factor c, used in the fatigue strength calculations.
lb	Length of the end bracket (mm)
lbmin	Minimum length of the end bracket (mm)
tweld	Throat thickness requirement of the weld (mm)