APPENDIX A

PARAMETRIC DESIGN DATA

Data sorted by DLR:

BOAT	J120	C+C121	Swan 45	B423	Grand Soleil GS40	Grand Soleil X43	Beneteau First 40.7	Beneteau B411	Jeanneau SF 43	X Yachts X40	Jeanneau SO 43	Beneteau B393	Catalina C400MkII	Catalina X412	Catalina C42MkII	Catalina X382	Jeanneau SO 40.3	Island Packet IP420	Catalina C387	Island Packet IP380
LOA (m)	12.19	12.19	13.83	13.16	11.99	12.94	11.98	12.74	12.83	12.19	12.83	12.00	12.34	12.51	12.75	11.50	11.76	13.62	11.81	12.06
LWL (m)	10.67	10.82	12.07	11.80	10.60	11.45	10.61	11.00	11.52	10.71	11.43	10.70	11.13	10.43	10.97	9.69	10.16	11.40	9.88	9.75
BEAM (m)	3.66	3.99	3.91	3.93	3.80	3.97	3.73	3.96	4.20	3.80	4.20	3.96	4.11	3.90	4.22	3.70	3.96	4.36	3.76	4.02
DRAFT (m)	2.13	1.98	2.88	1.71	2.15	2.20	2.36	1.45	2.54	2.10	1.98	1.55	2.11	2.10	1.83	2.00	1.93	1.47	1.47	1.43
DISP (kg)	5851.00	6395.00	9500.00	8978.00	6800.00	8600.00	6898.00	7798.00	9198.00	7450.00	9298.00	7778.00	8936.00	7400.00	9299.00	6500.00	7959.00	12879.00	8845.00	9523.00
BALLAST (kg)	2722.00	2494.00	4310.00		2500.00	4300.00			2800.00	3200.00	2955.00		3266.00	3500.00	3765.00	2950.00	2429.00	5759.00	3311.00	4081.00
100% SA (m^2)	72.46	78.58	127.20		85.00	93.57		81.93	95.86	86.68	75.80	71.62	75.06	81.36	74.04	70.10	67.10	101.00	66.80	82.20
I (m)	15.39	17.37	18.80						17.53		15.79		16.05		16.15		15.24		15.52	
J (m)	4.42	4.57	5.40						4.79		4.66		4.72		5.00		4.19		4.47	
P (m)	14.17	15.54	18.66						16.30		13.75		14.33		14.25		13.18		13.46	
E (m)	5.43	4.98	6.65						5.61		5.00		5.18		4.72		4.77		4.78	
MAIN AREA		38.83	76.40			53.40			53.88	50.20	39.01		37.16	39.20	33.63	33.90	35.20		32.14	
1.35						53.20				49.30				55.08		48.90				
1.10						43.40				40.13										
1.00		39.78	50.80			40.17			41.98	36.48	36.79			42.16		36.20	31.90			
SPINNAKER			153.00			132.00				120.30				135.80		122.90				
FRACTIONAL	Y	N				Y			Y	Y	N		N	N	N	N	Y		N	
L/DISP	5.97	5.88	5.75	5.72	5.64	5.63	5.62	5.59	5.54	5.53	5.48	5.45	5.41	5.40	5.26	5.24	5.13	4.90	4.82	4.64
DLR	134.36	140.83	150.71	152.43	159.27	159.82	161.11	163.43	167.83	169.17	173.70	177.12	180.80	181.94	196.50	199.29	211.70	242.50	255.84	286.62
SA/DISP	22.32	22.81	28.36		23.68	22.29		20.83	21.84	22.72	17.14	18.24	17.43	21.43	16.74	20.13	16.83	18.38	15.62	18.30
MAIN/100% SA	0.00	0.49	0.60			0.57			0.56	0.58	0.51		0.50	0.48	0.45	0.48	0.52		0.48	
100%JIB/SA	0.00	0.51	0.40			0.43			0.44	0.42	0.49		0.50	0.52	0.55	0.52	0.48		0.52	
LWL/BEAM	2.92	2.71	3.09	3.00	2.79	2.88	2.84	2.78	2.74	2.82	2.72	2.70	2.71	2.67	2.60	2.62	2.57	2.61	2.63	2.43
LOA/BEAM	3.33	3.06	3.54	3.35	3.16	3.26	3.21	3.22	3.05	3.21	3.05	3.03	3.00	3.21	3.02	3.11	2.97	3.12	3.14	3.00
LWL/DRAFT	5.01	5.46	4.19	6.90	4.93	5.20	4.50	7.59	4.54	5.10	5.77	6.90	5.27	5.96	5.99	4.85	5.26	7.76	6.72	6.82
BALLAST ratio	0.47	0.39	0.45		0.37	0.50			0.30	0.43	0.32		0.37	0.47	0.40	0.45	0.31	0.45	0.37	0.43
LOA/LWL	1.14	1.13	1.15	1.12	1.13	1.13	1.13	1.16	1.11	1.14	1.12	1.12	1.11	1.20	1.16	1.19	1.16	1.19	1.20	1.24
NOTES			cruise mode										2 cabin		2 cabin			cutter	wing keel	cutter

Mean:	Median:	Minimum	Maximum
12.46	12.27	11.50	13.83
10.84	10.77	9.69	12.07
3.96	3.96	3.66	4.36
1.97	1.99	1.43	2.88
8294.25	8279.50	5851.00	12879.00
3396.38	3233.00	2429.00	5759.00
82.58	79.97	66.80	127.20
16.43	16.05	15.24	18.80
4.69	4.66	4.19	5.40
14.85	14.25	13.18	18.66
5.24	5.00	4.72	6.65
43.58	38.92	32.14	76.40
51.62	51.25	48.90	55.08
41.77	41.77	40.13	43.40
39.58	39.78	31.90	50.80
132.80	132.00	120.30	153.00
5.43	5.50	4.64	5.97
183.25	171.43	134.36	286.62
20.28	20.48	15.62	28.36
0.48	0.50	0.00	0.60
0.44	0.49	0.00	0.55
2.74	2.72	2.43	3.09
3.15	3.13	2.97	3.54
5.74	5.37	4.19	7.76
0.41	0.42	0.30	0.50
1.15	1.14	1.11	1.24

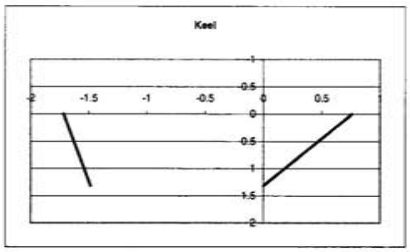
Running Aves:																				
L/DISP	5.97	5.92	5.86	5.83	5.79	5.77	5.74	5.73	5.71	5.69	5.67	5.65	5.63	5.61	5.59	5.57	5.54	5.51	5.47	5.43
DLR	134.36	137.60	141.97	144.58	147.52	149.57	151.22	152.75	154.42	155.90	157.51	159.15	160.81	162.32	164.60	166.77	169.41	173.47	177.81	183.25
SA/DISP	22.32	22.56	24.49	24.49	24.29	23.89	23.89	23.38	23.16	23.11	22.44	22.02	21.61	21.59	21.22	21.14	20.85	20.70	20.40	20.28
MAIN/100% SA	0.00	0.25	0.36	0.36	0.36	0.42	0.42	0.42	0.45	0.47	0.47	0.47	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
100%JIB/SA	0.00	0.25	0.30	0.30	0.30	0.33	0.33	0.33	0.35	0.37	0.38	0.38	0.40	0.41	0.42	0.43	0.44	0.44	0.44	0.44
LWL/BEAM	2.92	2.81	2.90	2.93	2.90	2.90	2.89	2.88	2.86	2.86	2.85	2.83	2.82	2.81	2.80	2.79	2.77	2.77	2.76	2.74
LOA/BEAM	3.33	3.19	3.31	3.32	3.29	3.28	3.27	3.26	3.24	3.24	3.22	3.21	3.19	3.19	3.18	3.18	3.16	3.16	3.16	3.15
LWL/DRAFT	5.01	5.24	4.89	5.39	5.30	5.28	5.17	5.47	5.37	5.34	5.38	5.51	5.49	5.52	5.55	5.51	5.50	5.62	5.68	5.74
BALLAST ratio	0.47	0.43	0.44	0.44	0.42	0.44	0.44	0.44	0.41	0.42	0.40	0.40	0.40	0.41	0.41	0.41	0.40	0.41	0.40	0.41

APPENDIX B
KEEL DESIGN

SHADED BOXES REQUIRE USER INPUT

Disp (kg)	7176
Ballast ratio:	0.45
Ballast (kg)	3229.2
rho Pb (kg/m^3):	11000
Volume of lead (m^3)	0.293564
Structure fraction:	0.05
Keel Vol. required (m^3)	0.308242
SA/D	20
SA	74.40777
Keel Area Req (m^2)	2.604272
average t/c	0.135
Area fraction:	0.6569
Total Draft (m)	1.829
Canoe Body draft (m)	0.514
Keel Span (m)	1.315
Root Chord (m)	2.475285
Taper Ratio (m)	0.6
Tip Chord (m)	1.485171
AR	0.664065
AReff	1.585994
Sweep angle (deg)	30

Vary this with Goalseek to match area or volume below



Station	y	c(y)	t(y)	A(y)	SRM	Volume (m^3)	VCB wrt WL	xTE	xLE	Area
0	0	2.475285	0.334163	0.543355	1	0.543354803	0.279284369	-1.71607	0.759216	2.475285
1	0.32875	2.227757	0.300747	0.440117	4	1.760469562	1.483635724	-1.65834	0.569412	8.911027
2	0.6575	1.980228	0.267331	0.347747	2	0.695494148	0.814771394	-1.60062	0.379608	3.960456
3	0.98625	1.7327	0.233914	0.266244	4	1.064975414	1.597729365	-1.5429	0.189804	6.930798
4	1.315	1.485171	0.200498	0.195608	1	0.195607729	0.357766537	-1.48517	0	1.485171
					sum	4.259901657	4.533187389			23.76274
					value	0.466814223	1.064153061			2.604

chord 2.475285
NACA 64-12

x	y (%)	y	SRM	Area	
0	0	0	1	0	
1.25	0.369	0.009134	4	0.036535	
2.5	0.726	0.017971	1	0.017971	
5	1.406	0.034803	4	0.13921	
7.5	2.039	0.050471	1	0.050471	
10	2.625	0.064976	1	0.064976	
15	3.656	0.090496	4	0.361986	
20	4.5	0.111388	2	0.222776	
25	5.156	0.127626	4	0.510503	
30	5.625	0.139235	1	0.139235	
40	6	0.148517	4	0.594068	
50	5.833	0.144383	2	0.288767	
60	5.333	0.132007	4	0.528028	
70	4.5	0.111388	2	0.222776	
80	3.333	0.082501	4	0.330005	
90	1.833	0.045372	1	0.045372	
95	0.958	0.023713	4	0.094853	
100	0	0	1	0	Area frac
				0.482982	0.6569

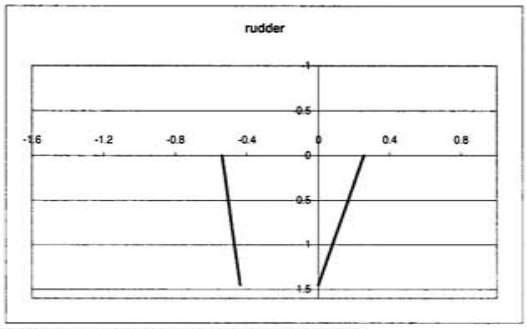
chord 1.485171
NACA 64-12

x	y (%)	y-15%	y	SRM	Area	
0	0	0	0	1	0	
1.25	0.369	0.5535	0.00822	4	0.032882	
2.5	0.726	1.089	0.016174	1	0.016174	
5	1.406	2.109	0.031322	4	0.125289	
7.5	2.039	3.0585	0.045424	1	0.045424	
10	2.625	3.9375	0.058479	1	0.058479	
15	3.656	5.484	0.081447	4	0.325787	
20	4.5	6.75	0.100249	2	0.200498	
25	5.156	7.734	0.114863	4	0.459453	
30	5.625	8.4375	0.125311	1	0.125311	
40	6	9	0.133665	4	0.534662	
50	5.833	8.7495	0.129945	2	0.25989	
60	5.333	7.9995	0.118806	4	0.475225	
70	4.5	6.75	0.100249	2	0.200498	
80	3.333	4.9995	0.074251	4	0.297005	
90	1.833	2.7495	0.040835	1	0.040835	
95	0.958	1.437	0.021342	4	0.085368	
100	0	0	0	1	0	Area frac
					0.26081	0.6569

SHADED BOXES REQUIRE USER INPUT

Disp (kg)	7176
SA/D	20
SA	74.40777
Rudder area required	0.892893
t/c	0.12
Area fraction:	0.665985
Rudder Span (m)	1.45
Root Chord (m)	0.794661
Taper Ratio (m)	0.55
Tip Chord (m)	0.437063
Sweep angle (deg)	10

Vary this to get area to match below



Station	y	c(y)	t(y)	A(y)	SRM	Volume (m^3)	VCB wrt WL	xTE	xLE	Area
0	0	0.794661	0.095359	0.050467	1	0.05046722	0	-0.538987	0.255674	0.794661
1	0.3625	0.705261	0.084631	0.039751	4	0.159003284	0.05763869	-0.513506	0.191756	2.821046
2	0.725	0.615862	0.073903	0.030312	2	0.060623748	0.043952217	-0.488025	0.127837	1.231724
3	1.0875	0.526463	0.063176	0.02215	4	0.088601513	0.096354145	-0.462544	0.063919	2.105851
4	1.45	0.437063	0.052448	0.015266	1	0.015266334	0.022136184	-0.437063	0	0.437063
					sum	0.373962098	0.220081237			7.390345
					value	0.045187087	0.588512146			0.893

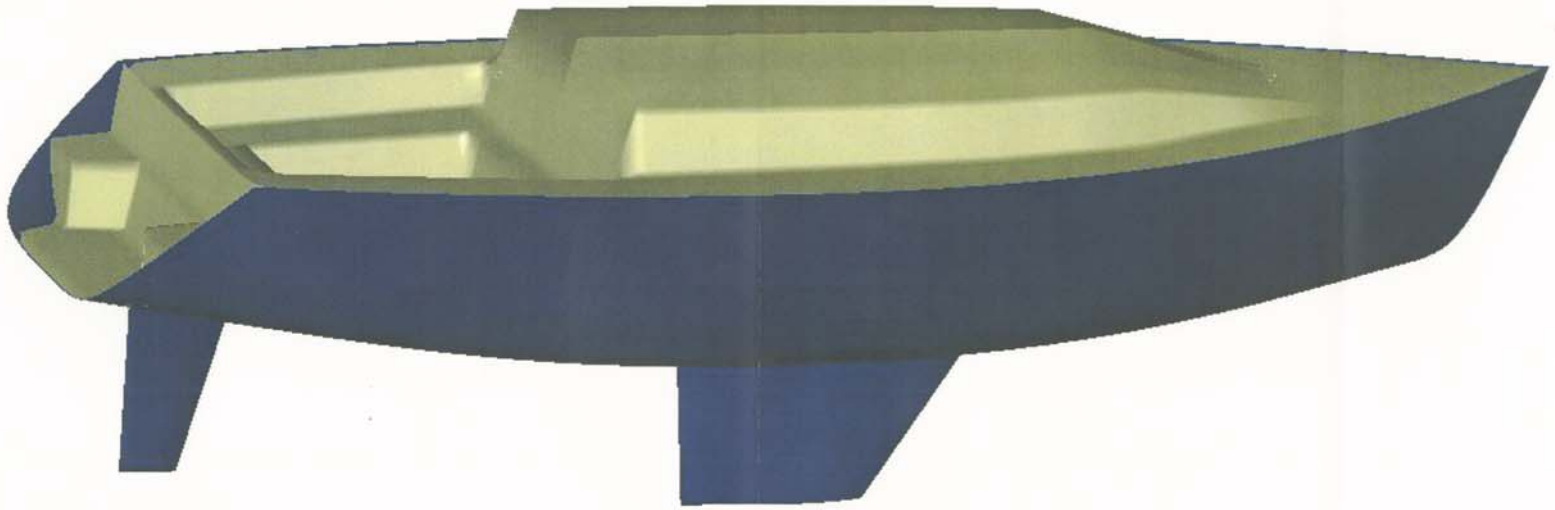
chord 0.794661
NACA 0010

x	y (%)	y (12%)	y	SRM	Area	
0	0	0	0	1	0	
1.25	1.578	1.8936	0.015048	4	0.060191	
2.5	2.178	2.6136	0.020769	1	0.020769	
5	2.962	3.5544	0.028245	4	0.112982	
7.5	3.5	4.2	0.033376	1	0.033376	
10	3.902	4.6824	0.037209	1	0.037209	
15	4.455	5.346	0.042483	4	0.16993	
20	4.782	5.7384	0.045601	2	0.091202	
25	4.952	5.9424	0.047222	4	0.188888	
30	5.002	6.0024	0.047699	1	0.047699	
40	4.837	5.8044	0.046125	4	0.184501	
50	4.412	5.2944	0.042073	2	0.084145	
60	3.803	4.5636	0.036265	4	0.145061	
70	3.053	3.6636	0.029113	2	0.058226	
80	2.187	2.6244	0.020855	4	0.08342	
90	1.207	1.4484	0.01151	1	0.01151	
95	0.672	0.8064	0.006408	4	0.025633	
100	0.105	0.126	0.001001	1	0.001001	Area frac
					0.050487	0.665985273

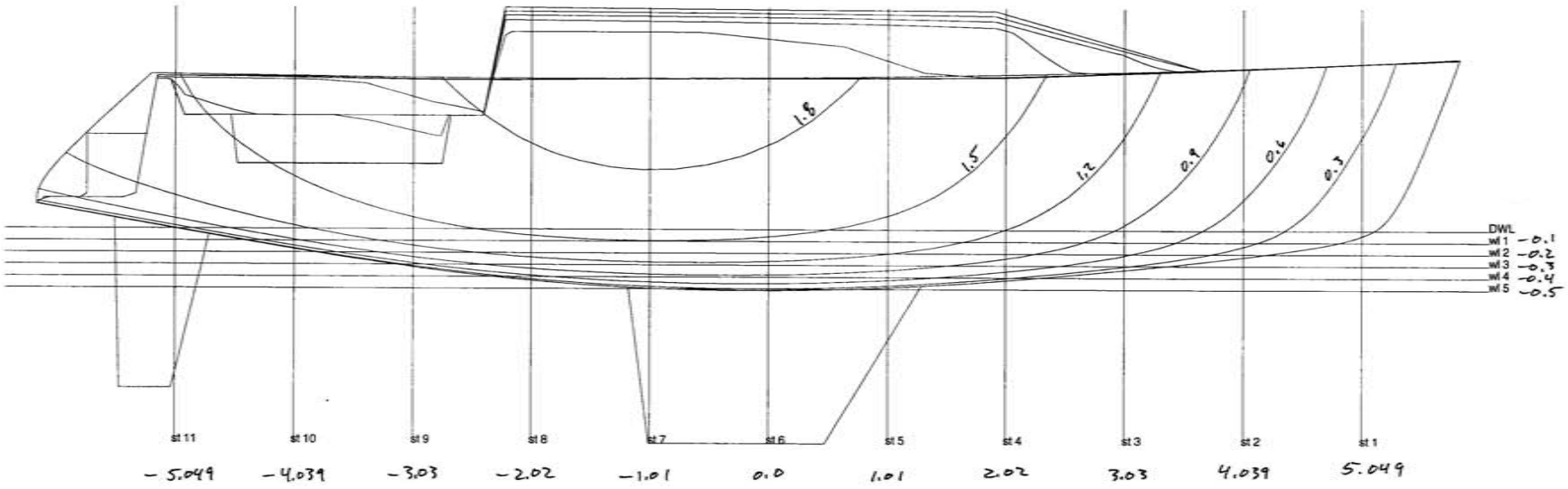
chord 0.437063
NACA 0010

x	y (%)	y (12%)	y	SRM	Area	
0	0	0	0	1	0	
1.25	1.578	1.8936	0.008276	4	0.033105	
2.5	2.178	2.6136	0.011423	1	0.011423	
5	2.962	3.5544	0.015535	4	0.06214	
7.5	3.5	4.2	0.018357	1	0.018357	
10	3.902	4.6824	0.020465	1	0.020465	
15	4.455	5.346	0.023365	4	0.093462	
20	4.782	5.7384	0.02508	2	0.050161	
25	4.952	5.9424	0.025972	4	0.103888	
30	5.002	6.0024	0.026234	1	0.026234	
40	4.837	5.8044	0.025369	4	0.101476	
50	4.412	5.2944	0.02314	2	0.04628	
60	3.803	4.5636	0.019946	4	0.079783	
70	3.053	3.6636	0.016012	2	0.032025	
80	2.187	2.6244	0.01147	4	0.045881	
90	1.207	1.4484	0.00633	1	0.00633	
95	0.672	0.8064	0.003524	4	0.014098	
100	0.105	0.126	0.000551	1	0.000551	Area frac
					0.015272	0.665985

APPENDIX B
RUDDER DESIGN



APPENDIX C - PROFILE



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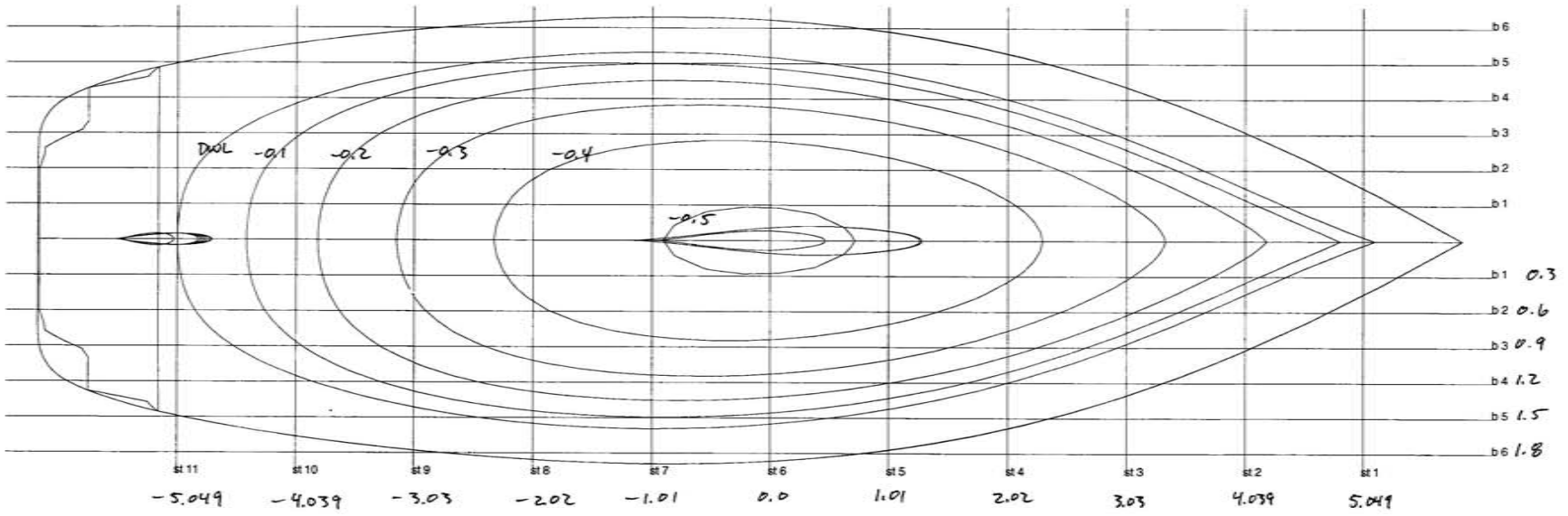
Profile View

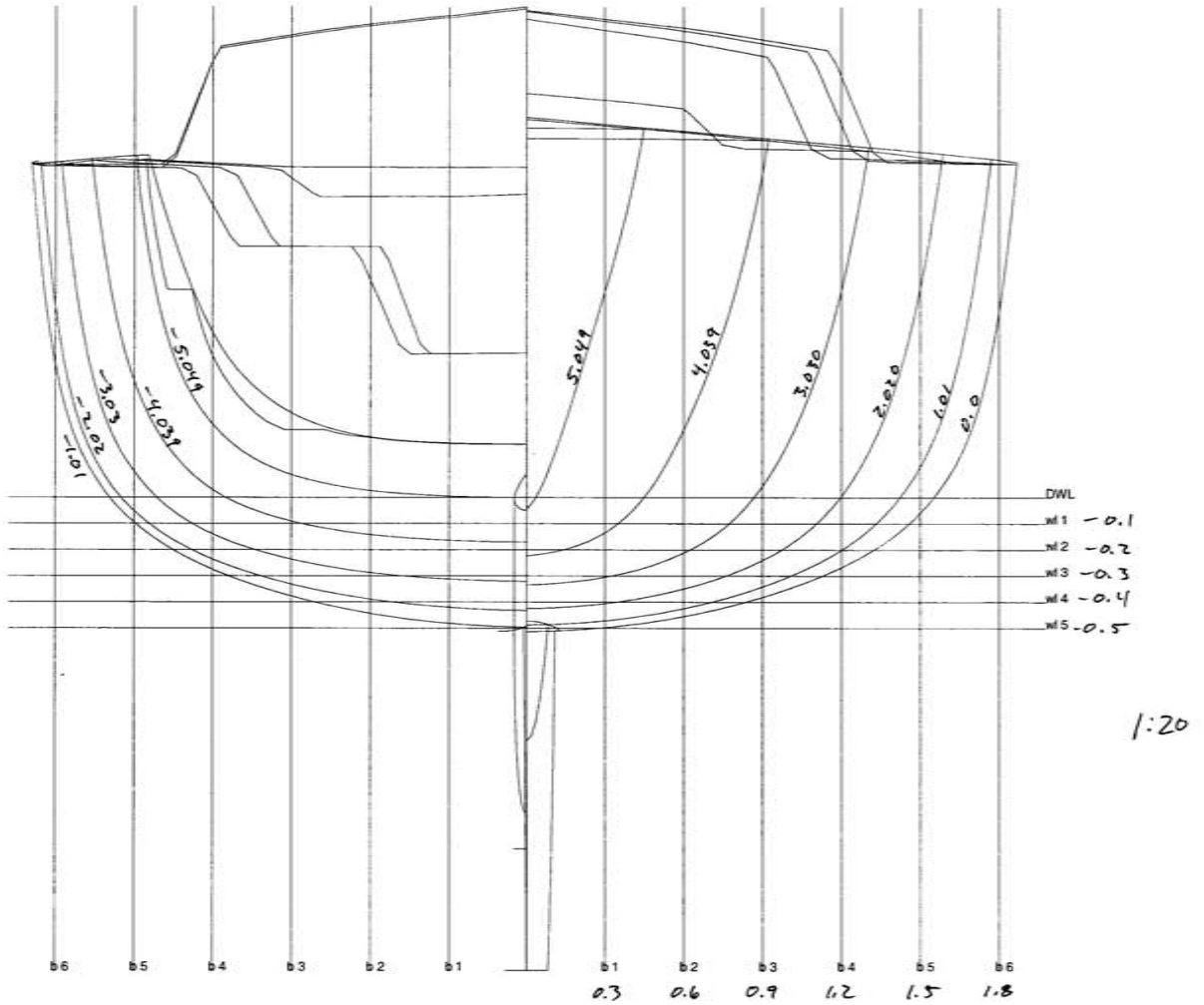
APPENDIX C - PLAN



1:40

Plan View

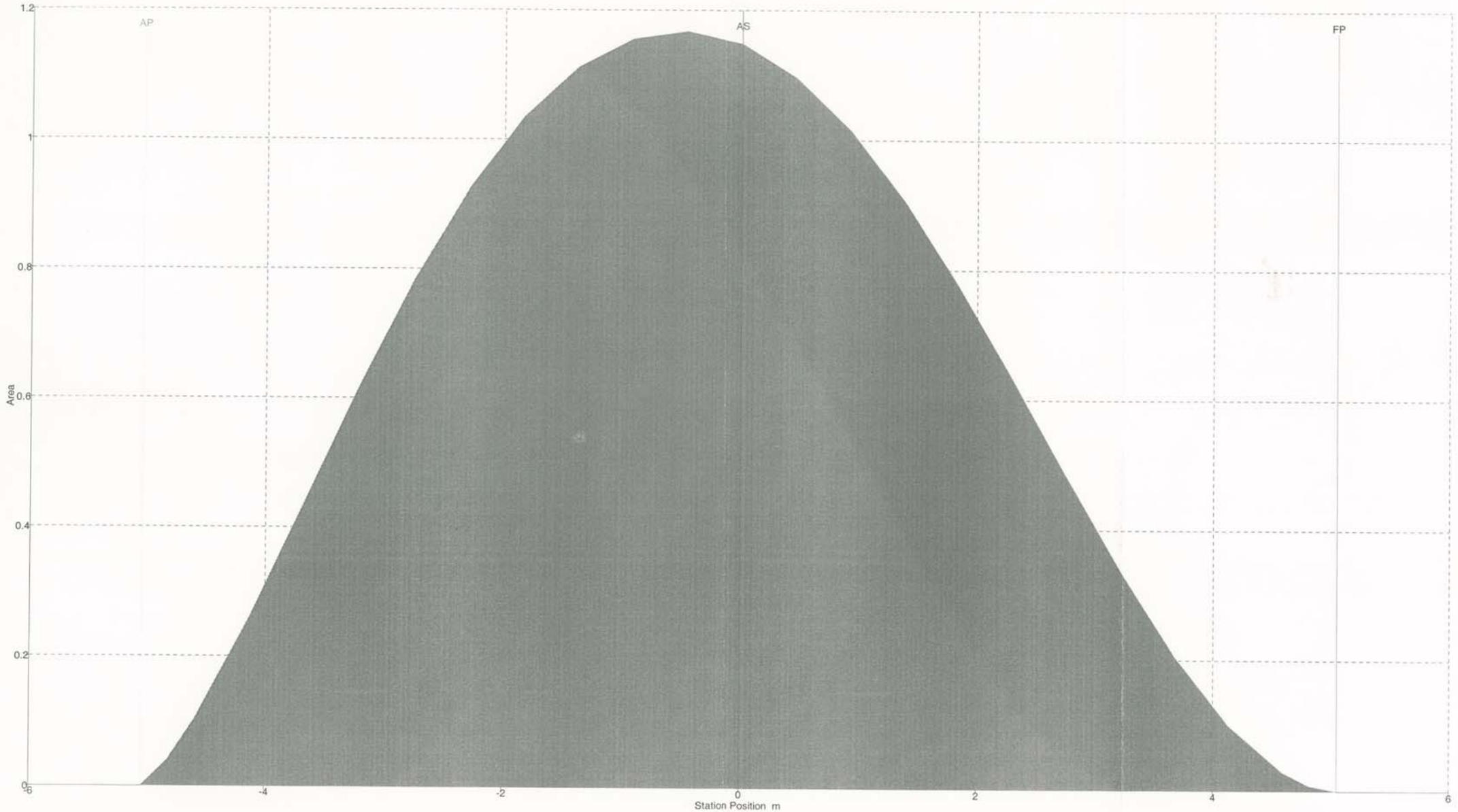
APPENDIX C BODY PLAN



1:20

Body Plan View

APPENDIX C
SECTIONAL AREA CURVE



Curve of Areas View

HYDROSTATIC DATA

Maxsurf data:	Without appendages	Appended	Keel	Rudder
Displacement	6743.44	7143.355	359.429	57.244
Volume	6.579	6.969	0.351	0.056
Draft to Baseline	0.515	0.515	0.515	0.515
Immersed depth	0.514	1.81	1.35	1.346
Lwl	10.099	10.604	0	0.547
Beam wl	3.184	3.184	0	0.095
WSA	24.996	32.117	5.413	1.708
Max cross sect area	1.168	1.401	0.271	0.128
Waterplane area	23.053	23.137	0	0.033
Cp	0.558	0.469	0	0.796
Cb	0.398	0.114	0	0.795
Cm	0.722	0.251	0	1.105
Cwp	0.717	0.685	0	0.628
LCB from zero pt	-0.363	-0.382	0.04	-5.177
LCF from zero pt	-0.61	-0.626	-0.216	-5.212
KB	0.337	0.291	-0.52	-0.104
KG	0.585	0.585	0.585	0.585
BMt	2.157	2.037	0	0
BMl	19.591	18.734	0	0.01
GMt	1.91	1.744	-1.105	-0.688
GMl	19.343	18.44	-1.105	-0.679
KMt	2.494	2.328	-0.52	-0.104
KMl	19.928	19.025	-0.52	-0.094
Immersion (TPc)	0.236	0.237	0	0
MTc	0.129	0.13	0	0
RM at 1deg = GMt.Disp.sin(1)	224.734	217.372	-6.929	-0.688
Precision	Medium	Medium	Medium	Medium

Hydromax data:	
Displacement kg	7105
Heel to Starboard degrees	0
Draft at FP m	0.515
Draft at AP m	0.515
Draft at LCF m	0.515
Trim (+ve by stern) m	0
WL Length m	10.103
WL Beam m	3.187
Wetted Area m^2	29.851
Waterpl. Area m^2	23.139
Prismatic Coeff.	0.488
Block Coeff.	0.119
Midship Area Coeff.	0.25
Waterpl. Area Coeff.	0.719
LCB from Amidsh. (+ve fwd) m	-0.343
LCF from Amidsh. (+ve fwd) m	-0.618
KB m	0.294
KG m	0.585
BMt m	2.055
BML m	18.782
GMt m	1.764
GML m	18.491
KMt m	2.349
KML m	19.076
Immersion (TPc) tonne/cm	0.237
MTc tonne.m	0.13
RM at 1deg = GMt.Disp.sin(1) kg.m	218.735
Max deck inclination deg	0
Trim angle (+ve by stern) deg	0

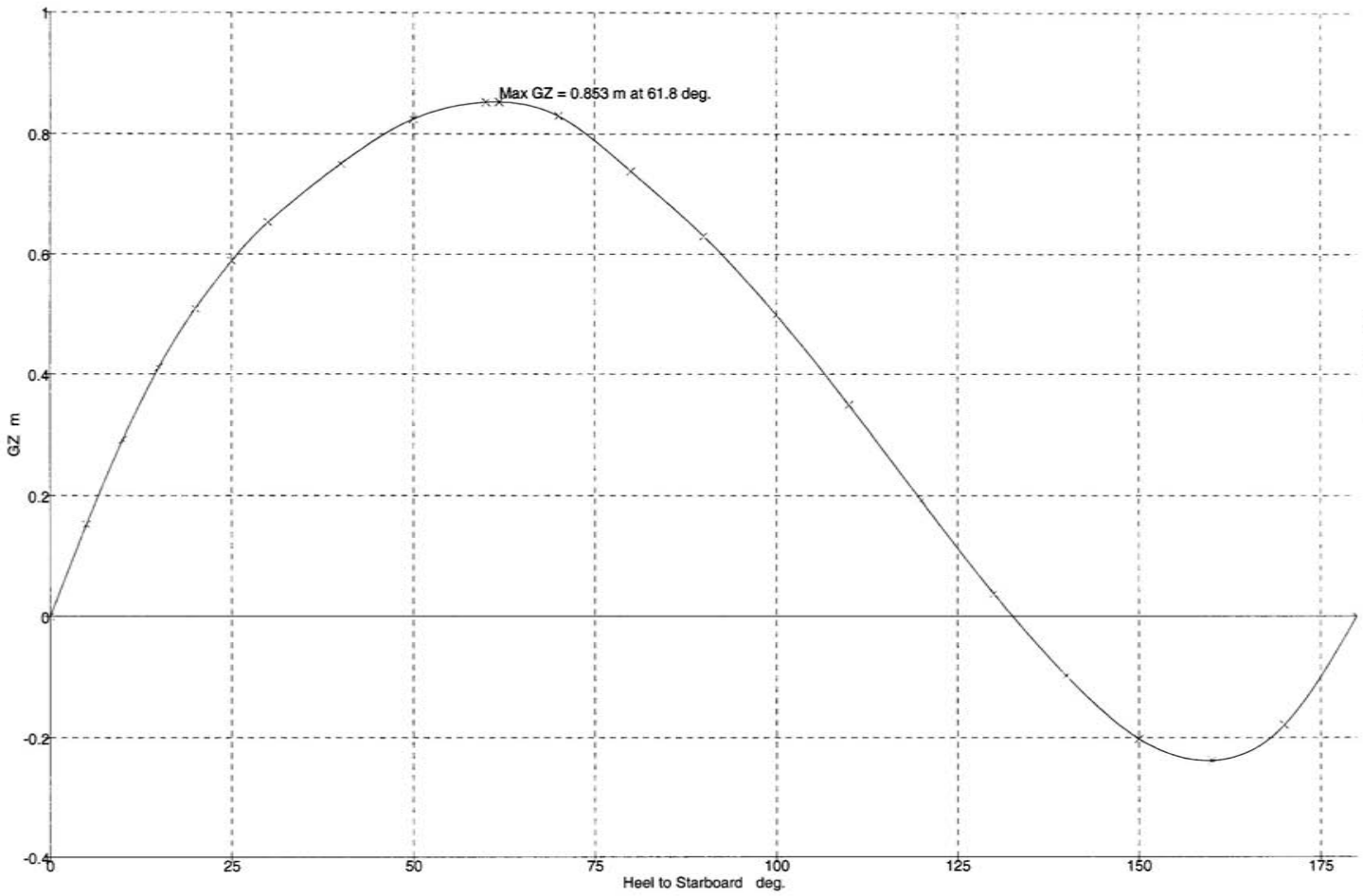
Maxsurf Areas:	Area	lcg	vcg	tcg	I roll	I pitch	I yaw
Hull	59.944	-0.465	0.239	0	99.288	590.497	655.297
Keel	5.211	-0.138	-1.102	0	0.757	2.6	1.899
Rudder	1.751	-5.222	-0.599	0	0.268	0.331	0.067
Deck	39.508	-0.789	1.372	0	40.461	283.219	314.184
Transom	4.878	-5.526	0.637	0	3.112	0.851	2.979
Total	111.291	-0.861	0.583	0	192.839	1078.185	1126.161

APPENDIX D

Hydromax Large Angle Stability:

Angle of Heel (deg)	0	5	10	15	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
Displacement kg	7140	7140	7140	7139	7139	7140	7139	7140	7140	7140	7140	7139	7140	7140	7140	7140	7140	7140	7139	7139	7140	7140
Draft at FP m	0.505	0.505	0.503	0.499	0.489	0.472	0.446	0.354	0.186	-0.085	-0.633	-2.407	N/A	-4.911	-3.12	-2.542	-2.272	-2.129	-2.048	-2.005	-1.99	-1.94
Draft at AP m	0.525	0.516	0.489	0.444	0.38	0.297	0.194	-0.09	-0.523	-1.21	-2.522	-6.391	N/A	-8.709	-4.814	-3.466	-2.758	-2.314	-2.009	-1.796	-1.647	-1.599
WL Length m	10.144	10.253	10.405	10.514	10.565	10.548	10.449	10.039	9.608	9.337	9.269	9.513	10.076	10.461	10.746	10.971	11.146	11.268	11.335	11.301	10.974	11.302
Immersed Depth m	1.813	1.807	1.779	1.727	1.653	1.556	1.438	1.144	0.785	0.772	0.767	0.794	0.883	0.967	1.012	1.014	0.971	0.881	0.782	0.767	0.696	0.699
WL Beam m	3.19	3.157	3.064	2.943	2.83	2.737	2.669	2.619	2.731	3.026	2.013	2.151	2.095	2.087	2.123	2.196	2.319	2.47	2.682	3.072	3.181	3.774
Wetted Area m^2	29.976	29.805	29.32	28.69	28.067	27.513	27.056	26.448	25.913	24.093	22.188	22.775	23.033	23.098	23.21	23.387	23.678	23.98	24.351	24.914	24.612	26.178
Waterpl. Area m^2	23.271	23.03	22.367	21.518	20.691	19.973	19.403	18.726	18.255	16.779	15.524	15.665	15.356	14.993	14.867	14.948	15.324	15.906	16.828	18.387	19.029	21.086
Prismatic Coeff.	0.488	0.482	0.475	0.469	0.466	0.465	0.466	0.477	0.502	0.551	0.608	0.593	0.558	0.538	0.525	0.515	0.505	0.49	0.468	0.425	0.391	0.367
Block Coeff.	0.119	0.119	0.123	0.13	0.141	0.155	0.174	0.232	0.342	0.393	0.474	0.429	0.374	0.33	0.302	0.285	0.278	0.284	0.293	0.261	0.287	0.233
LCB from Amidsh. (+ve fwd) m	-0.381	-0.38	-0.38	-0.379	-0.376	-0.373	-0.369	-0.359	-0.347	-0.33	-0.313	-0.299	-0.25	-0.289	-0.296	-0.31	-0.332	-0.358	-0.385	-0.408	-0.427	-0.428
VCB from DWL m	-0.221	-0.223	-0.228	-0.235	-0.241	-0.247	-0.251	-0.252	-0.249	-0.26	-0.282	-0.292	-0.294	-0.296	-0.296	-0.295	-0.288	-0.276	-0.259	-0.239	-0.229	-0.24
GZ m	0	0.152	0.292	0.411	0.509	0.588	0.653	0.751	0.825	0.852	0.83	0.738	0.63	0.498	0.349	0.192	0.038	-0.098	-0.202	-0.238	-0.179	0
LCF from Amidsh. (+ve fwd) m	-0.652	-0.638	-0.603	-0.561	-0.522	-0.485	-0.455	-0.415	-0.394	-0.39	-0.389	-0.351	-0.297	-0.245	-0.207	-0.172	-0.138	-0.118	-0.101	-0.073	-0.078	-0.632
TCF to zero pt. m	0	0.118	0.239	0.358	0.468	0.568	0.659	0.824	0.859	0.808	0.814	0.782	0.691	0.561	0.422	0.285	0.165	0.057	-0.032	-0.068	-0.186	0
Max deck inclination deg	0.1	5	10	15	20	25	30	40	50	60.1	70	80	90	100	110	120	130	140	150	160	169.8	178.1
Trim angle (+ve by stern) deg	0.1	0.1	-0.1	-0.3	-0.6	-1	-1.4	-2.5	-4	-6.4	-10.6	-21.5	-90	-20.6	-9.5	-5.2	-2.8	-1	0.2	1.2	1.9	1.9
RM (Kgm)	0	1085.28	2084.88	2934.129	3633.751	4198.32	4661.767	5362.14	5890.5	6063.28	5926.2	5268.582	4498.2	3555.72	2491.86	1370.88	271.32	-699.72	-1442.06	-1699.08	-1278.06	0

APPENDIX D



Graph View

APPENDIX D

APPENDIX E

WIND CALCULATIONS AND BALANCE PROCEDURE			
% of foretriangle area PCT	135		
I (m)	16.00		
J (m)	4.20		
100 % Jib AR (JAR)	7.62		
Mast section length ML (m)	0.22		
Boom ht. above deck BH (m)	1.95		
E (m)	5.10		
P (m)	14.00		
P/E	2.75		
Main AR	5.49		
Jib luff JL (m)	5.67		
Height of lower spreader HSL (m)	6.00		
Height of upper spreader HSU (m)	11.50		
Lower panel length (m)	6.00		
Middle panel length (m)	5.50		
Upper panel length (m)	4.50		
Max panel length (m)	6.00		
Freeboard at mast FR (m)	1.30		
Transverse Jib lead pos. (m)	1.18		
Transverse dist. To 12 deg line at mast	0.89		
Sail camber at mast (m)	0.54		
Min Chainplate width (m)	1.44		
Main SAM (m^2)	39.67	47%	
Jib SAJ (m^2)	45.36	53%	
Upwind Sail area SAU (m^2)	85.03		
100% SA (m2)	73.27		
Mainsail CE height above deck (m)	7.55		
Jib CE height above deck (m)	6.40		
Upwind CE height above deck (m)	6.94		
BALANCE			
Heeling Arm (m)	7.67		
Wind Velocity (knots)	19.74		
Wind Velocity (m/s)	10.15		
Air Density (kg/m^3)	1.23		
Average CL	1.00		
HM (Nm)	41182.38		
HM (Kg m)	4198.00		
Righting Moment at 25 degrees of heel (from Hydromax):			
RM (kg m)	4198.00		
Error	0%	This means the boat balances at 25 degrees of heel in 19.74 kts of wind Above 20 knots would require a reef	
Dellenbaugh Angle (deg) (100% SA)	13.79		
Dellenbaugh Angle (deg) (135% SA)	16.00		

WIND CALCULATIONS

zo (m)	0.004	
k	0.40	
U10 (kts)	15.00	
U10 (m/s)	7.72	
Ustar (m/s)	0.39	
Udeck (m/s)	5.58	
UHSL (m/s)	7.05	
UHSU (m/s)	7.68	
Boat speed (kts)	7.20	This data is taken from SPAN
Boat speed VB (m/s)	3.70	
True wind angle TWANG (deg)	45.00	
gamma	0.20	
r at HSL (m)	3.25	
r at HSU (m)	1.25	
genoa camber ratio	0.12	

	Deck	Lower Spreader	Upper Spreader	
Apparent Wind Speed (m/s)	8.61	10.02	10.63	
Apparent Wind Angle (deg)	27.28	29.85	30.73	
Jib Downwash (deg)	9.00	6.30	3.50	Glauert
gamma		1.40	0.75	
r (m)		3.25	1.25	
theta (deg)		26.42	19.67	
Main Upwash (deg)	0.00	7.77	5.87	
Ideal Angle of Attack (deg)	3.00	3.00	3.00	
Corrected Apparent Wind Angle (deg)	15.28	28.32	30.11	
Foretriangle distance (m)	4.20	2.63	1.18	
Jib position at mast (m)	1.73	1.78	0.85	

APPENDIX E

RIG CALCULATIONS

RIG DIMENSIONS

% of foretriangle area PCT	135.00	
I (m)	16.00	
J (m)	4.20	
100 % Jib AR (JAR)	7.62	
Mast section length ML (m)	0.22	
Boom ht. above cabintop (m)	1.45	
E (m)	5.10	
P (m)	14.00	
P/E	2.75	
Main AR	5.49	
Freeboard at mast FR (m)	1.30	
Cabintop ht at mast (m)	0.50	

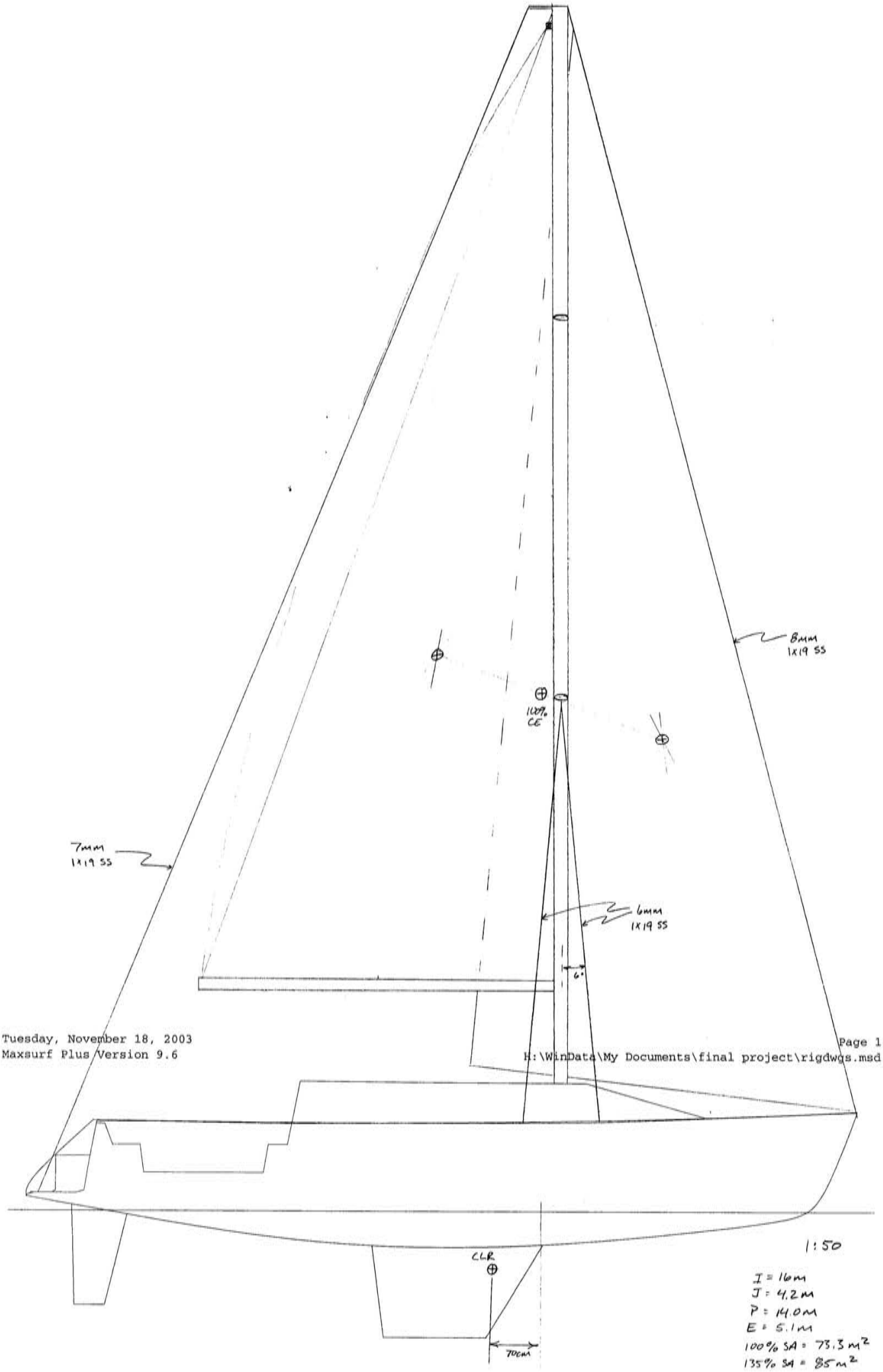
SAIL AREAS

Main SAM (m^2)	39.67	
Jib SAJ (m^2)	45.36	
100% Jib area (m2)	33.60	
100% Sail Area (m2)	73.27	
Upwind Sail area SAU (m^2)	85.03	
Mainsail CE height above deck (m)	7.55	
Jib CE height above deck (m)	6.40	
Upwind CE height above deck (m)	6.94	

MAST & RIGGING LOADS

Beam at Mast (m)	3.40	
RM30 (Nm)	47853.00	From Hydromax
Vertical load due to trans. Rig Pt (N)	42223.24	
Mast compression P (N)	78112.99	
Height of lower spreader HSL (m)	6.00	
Height of upper spreader HSU (m)	11.50	
Lower panel length (m)	6.00	
Middle panel length (m)	5.50	
Upper panel length (m)	4.50	
Max panel length (m)	6.00	
Deck beam at mast (m)	1.70	
Min Chainplate Width (m)	1.44	
Actual Chainplate Width (m)	1.50	
Width of lower spreader (m)	1.30	
Width of upper spreader (m)	0.85	

Angles from vertical: (deg)			
Vertical 1	1.91		
Diagonal 1	14.04		
Diagonal 1 (viewed in profile)	6.00	Set this for double lowers	
Vertical 2	4.68		
Diagonal 2	13.30		
Diagonal 3	10.70		
Shroud up angles from horiz (deg)			
Lower (from upper shroud)	3.29		
Lower (from lower shroud)	7.97		
Lower (average of two)	5.63		
Upper	7.69		
	From Henry and Miller Paper		
Shroud Loads: (N)		Wire size (mm)	
Vertical 1*	23209.89	6	
Diagonal 1	22405.99	6	
Vertical 2*	12624.78	6	
Diagonal 2	12327.30	5	
Diagonal 3*	12446.87	6	
Stay Loads:	From L&E	Wire size (mm)	
Forestay angle (deg)	14.71		
Backstay angle (deg)	23.53		
Forestay load (N)	41491.04	8	
Backstay Load (N)	26383.64	7	
Required transverse I for mast	(mm^4)	(in^4)	
Panel 1	4104098.47	9.862061	
Panel 2	3426845.74	8.234637	
Panel 3	2274821.65	5.466348	
Required longitudinal I for mast	(mm^4)	(in^4)	
Total	9129719.05	21.93852	Use the "205" mast section



Tuesday, November 18, 2003
Maxsurf Plus Version 9.6

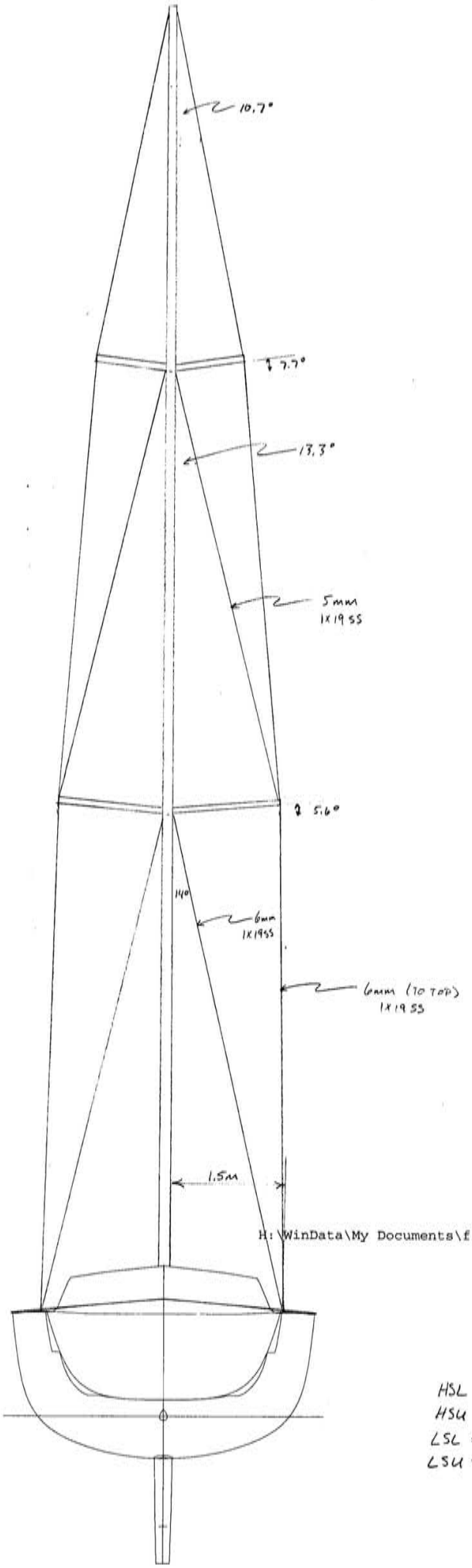
H:\WinData\My Documents\final project\rigdwgs.msd

1:50

I = 16m
J = 4.2m
P = 14.0m
E = 5.1m
100% SA = 73.3 m²
135% SA = 85 m²

APPENDIX E - RIG

Profile View

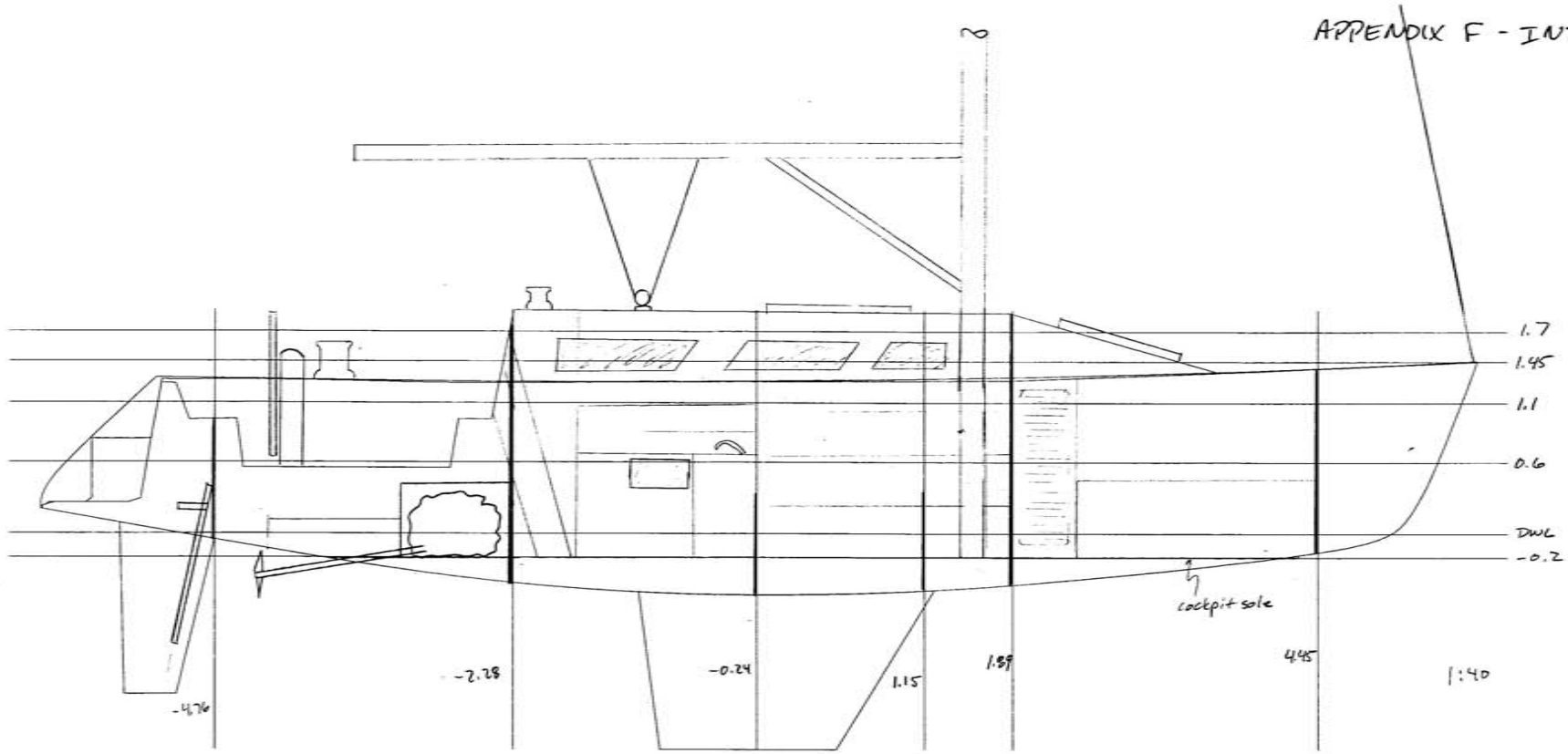


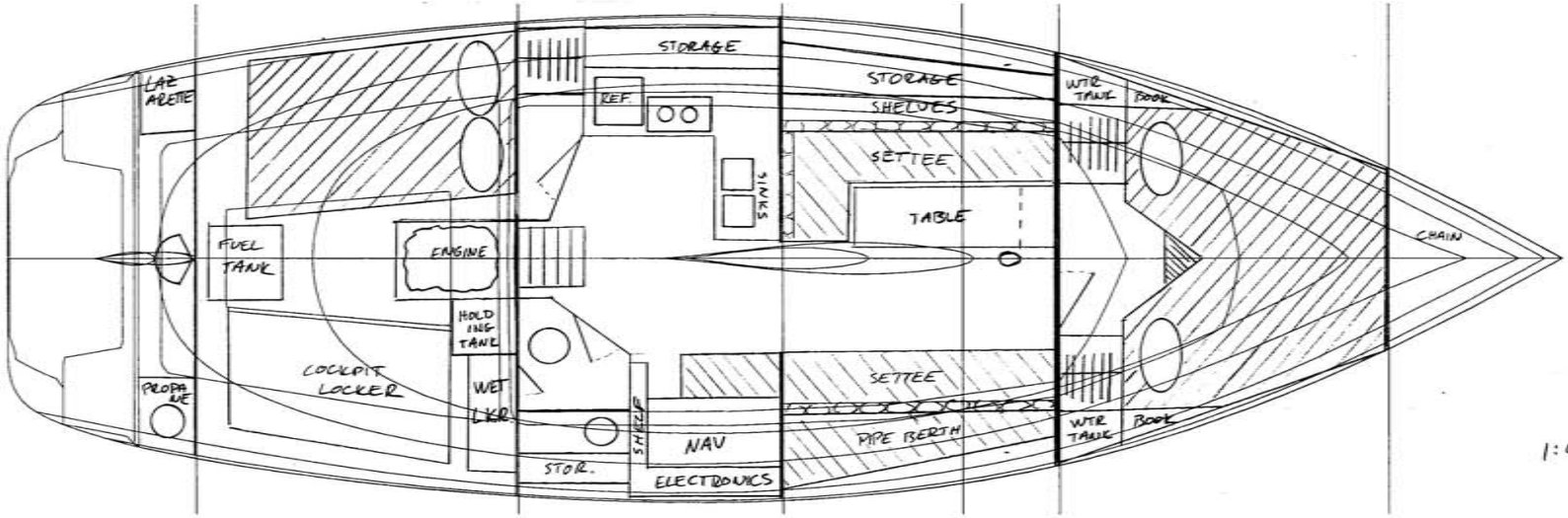
1:50

HSL = 6.0m
HSU = 11.5m
LSL = 1.3m
LSU = 0.85m

APPENDIX E-216

Body Plan View


1.7
1.45
1.1
0.6
DWL
-0.2
cockpit sole
-4.76
-2.28
-0.24
1.15
1.89
4.45
1:40


LAZARETTE
STORAGE
REF
STORAGE
SHELVES
WTR TANK
BOOK
SETTEE
SINKS
TABLE
FUEL TANK
ENGINE
CHAIN
HOLDING TANK
COCKPIT LOCKER
PROPANE
WET LKR
SETTEE
SHELF
NAV
WTR TANK
BOOK
STOR.
ELECTRONICS
PIPE BERTH
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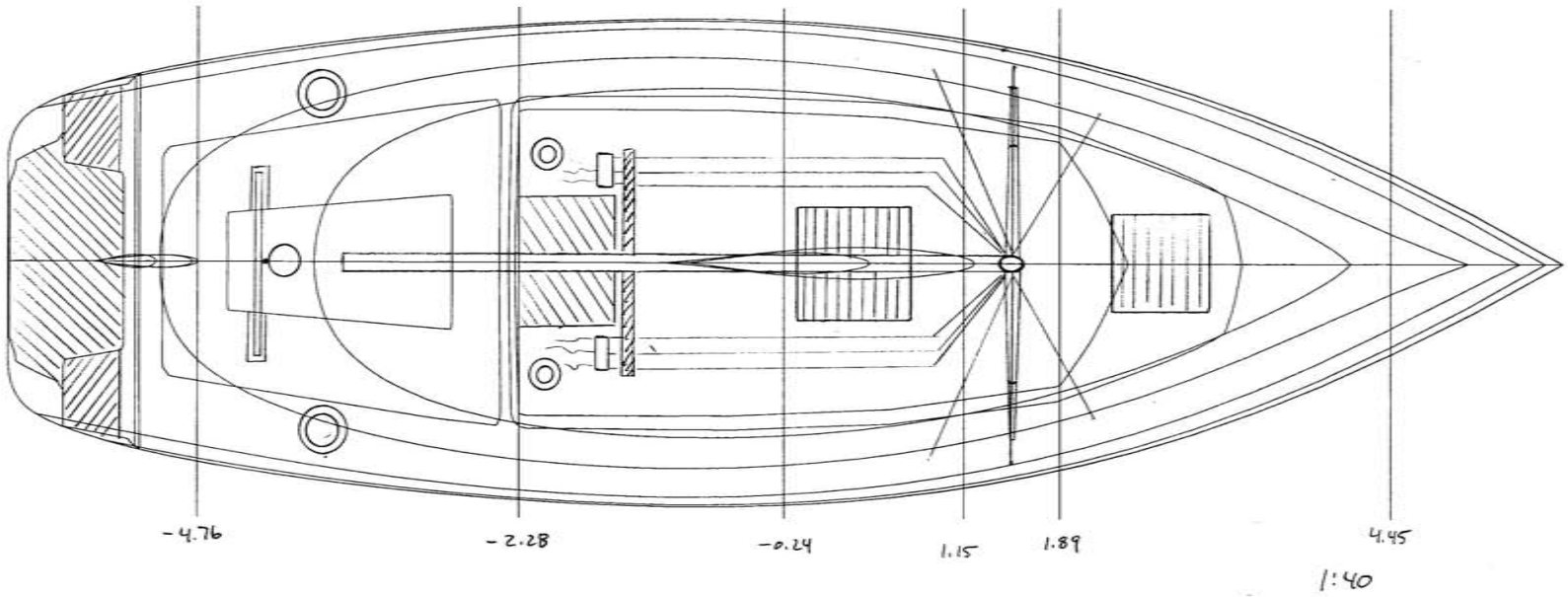

Plan View