BAB III
PENUTUP

Dengan selesainya penyusunan tugas merancang ini, maka penulis dapat mengambil kesimpulan yang berhubungan dengan perencanaan Kapal Tunda 2 x 750 HP Tipe Harbour, sebagai sarana penunjang armada perkapalan di Indonesia.

Adapun kesimpulan penulisan tersebut adalah sebagai berikut :

1. Ringkasan spesifikasi teknis kapal :

• Panjang seluruhnya	(Loa)	= 29,00	m
• Panjang antara garis tegak	(Lpp)	= 26,00	m
• Lebar	(B)	= 9,00	m
• Tinggi	(H)	= 3,70	m
• Sarat air	(T)	= 2,80	m
• Koefisien blok	(Cb)	= 0,577	
• Koefisien prismatik	(Cp)	= 0,629	
• Koefisien Garis air	(Cw)	= 0,871	
• Koefisien tengah kapal	(Cm)	= 0,916	
• Displacement	(Δ)	= 416,985	ton
• Volume	(∇)	= 214,142	ton
• Jumlah Anak Buah Kapal		= 7	orang
• Kecepatan dinas	(Vs)	= 12,52	Knot

- Alat penggerak yang digunakan :
  - Merk : YANMAR
  - Tipe : 6NY16A-ST
  - Daya : 2 x 760 HP / 2 x 559 kW
  - Putaran Mesin : 1600 rpm
  - Gear Ratio : 1 : 3,5
  - Bore x Stroke : 160 mm x 200 mm
  - Ukuran : Panjang x Lebar x Tinggi
    2413 mm x 1085 mm x 1360 mm
  - Jumlah : 2 (dua) buah
  - Berat : 3,555 Ton

2. Dalam rancangan, kapal dikontrol terhadap stabilitas, trim, panjang genangan dan rencana pemuatan serta berat kapal, dimana semua hasil perhitungan harus memenuhi ketentuan yang berlaku.

3. Dalam menentukan ukuran utama yang diambil dalam perencanaan kapal terlebih dahulu perlu diadakan pertimbangan-pertimbangan secara umum terutama dalam hal yang berhubungan dengan tahanan, stabilitas, free board, ruang muatan, kekuatan kapal, ekonomi dan teknologi pembutannya.

4. Jumlah sekat kedap air ditentukan berdasarkan aturan dalam klasifikasi yang digunakan.

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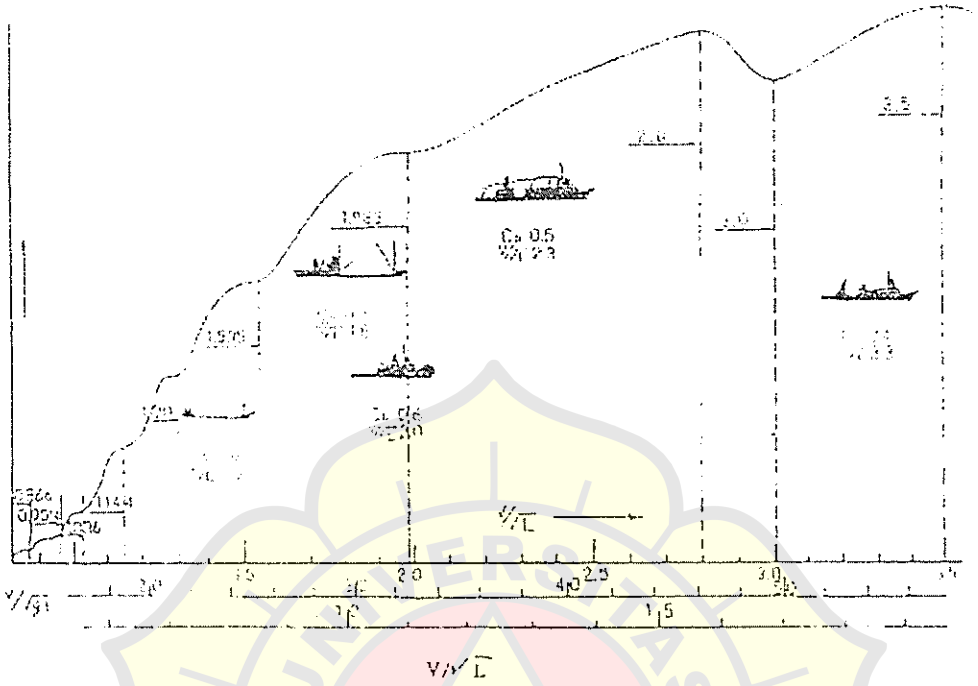
Series	Models	Number of Cylinders	Output kW (PS)	Engine Speed rpm	Reduction Ratio	Cylinder Bore mm	Stroke mm	Mean Effective Pressure MPa (kgf/cm²)	Mean Piston Speed m/s	Dimensions mm A	B	C	D	E	F	G	Engine Net Weight kg	Total Weight with Reduction Gear kg
										G Overhaul height for removing piston								
6NY16	6NY16-UT	6	331 (450)	1350	[illegible]	160	200	[illegible]	[illegible]	2413	[illegible]	[illegible]	1085	1013	245	1360	2880	3555
	6NY16-ST	6	405 (550)	1350	2.06/2.55/3.03/3.50	160	200	1.447 (14.7[illegible])	9.00	2413	269	[illegible]	1085	1013	245	1360	2880	3555
	6NY16A-UT	6	478 (650)	1600	2.06/2.55/3.03/3.50	160	200	1.480 (15.1[illegible])	10.70	2413	269	920	1085	1013	245	1360	2880	3555
	6NY16A-ST	6	559 (760)	1600	2.06/2.55/3.03/3.50	160	200	1.729 (17.6[illegible])	10.70	2413	269	920	1085	1013	245	1360	2880	3555
S165	S165	6	147 (200)	1200	2.06/2.55/3.03/3.50	165	210	0.546 (5.57)	8.40	2642	267.0	930	1070	1081	245	1420	2900	3400
	S165-T	6	221 (300)	1300	2.06/2.55/3.03/3.50	165	210	0.756 (7.7[illegible])	9.10	2642	267.0	930	1070	1081	245	1420	2950	3450
	S165-UT	6	331 (450)	1300	[illegible]	165	210	[illegible]	9.10	[illegible]	[illegible]	[illegible]	1070	[illegible]	245	1420	3050	3850
	S165-ST	6	405 (550)	1300	2.36/2.78/3.13	165	210	1.390 (14.1[illegible])	9.10	2764	310.6	550	1070	1081	245	1420	3050	3850
	S165-ET	6	441 (600)	1350	2.25/2.67/3.11/3.51/4.15	165	210	1.456 (14.85)	9.45	2914	138.0	930	1070	1081	245	1420	3050	3980
6N165	6N165-EN	6	588 (800)	1400	2.13/2.49/2.78/3.13	165	232	1.695 (17.28)	10.83	2628	310.6	930	1138	1164	245	1495	3793	4740
6N18A	6N18A-DN	6	441 (600)	900	1.80/2.25/2.60/3.04	180	280	1.376 (14.03)	8.40	3341	332.3	1050	1427	1280	400	2066	6200	7350
	6N18A-UN	6	588 (800)	900	2.02/2.34/2.74/3.10	180	280	1.835 (16.71)	8.40	3632	396	1050	1427	1345	400	2066	6250	8115
	6N18A-SN	6	662 (900)	900	2.02/2.34/2.74/3.10	180	280	2.064 (21.05)	8.40	3632	398	1050	1427	1345	400	2066	6250	8115
	6N18A-EN	6	735 (1000)	950	2.02/2.34/2.74/3.10	180	280	2.173 (22.15)	8.87	3632	398	1050	1427	1345	400	2066	6250	8115
S185	S185-ST	6	405 (550)	900	1.80/2.25/2.60/3.04/3.40	185	230	1.454 (14.83)	6.90	3457	332.3	820	1170	1324	240	1685	5000	6150
	S185-ET	6	441 (600)	900	1.80/2.25/2.60/3.04/3.40	185	230	1.587 (16.18)	6.90	3457	332.3	820	1170	1379	240	1685	5050	6200
	S185A-ET	6	478 (650)	950	1.80/2.25/2.60/3.04	185	230	1.628 (16.60)	7.28	3457	332.3	820	1170	1379	240	1685	5050	6200
M200	M200D-UN	6	441 (600)	750	1.52/1.94/2.31/2.80/3.10	200	260	1.441 (14.69)	6.50	3504	357.2	840	1121	1321	260	1880	5850	7200
	M200D-SN	6	485 (660)	750	1.52/1.94/2.31/2.80/3.10	200	260	1.555 (15.86)	6.50	3504	357.2	840	1121	1321	260	1880	5850	7200
	M200-DN	6	441 (600)	900	1.80/2.25/2.60/3.04/3.40	200	260	1.200 (12.24)	7.80	3411	332.3	840	1121	1321	260	1880	5650	7000
	M200-SN	6	588 (800)	900	1.52/1.94/2.31/2.80/3.10	200	260	1.600 (16.32)	7.80	3504	357.2	840	1121	1376	260	1880	5900	7250
	M200-EN	6	662 (900)	900	1.84/2.07/2.35/2.68/3.09	200	260	1.801 (18.36)	7.80	3636	359.0	840	1121	1376	260	1880	5900	7850
	M200-GN	6	736 (1000)	900	1.84/2.07/2.35/2.68	200	260	2.000 (20.40)	7.80	3636	359.0	840	1121	1376	260	1880	5900	7850
6N21A	6N21A-DN	6	662 (900)	800	1.84/2.07/2.35/2.68	210	290	1.648 (16.80)	7.73	3909	359.0	900	1524	1360	340	2142	8000	10250
	6N21A-UN	6	736 (1000)	800	2.03/2.36/2.78/3.32	210	290	1.831 (18.67)	7.73	3911	435.0	900	1524	1360	340	2142	8000	10750
	6N21A-SN	6	883 (1200)	850	2.03/2.36/2.78/3.32	210	290	2.067 (21.08)	8.22	3911	435.0	900	1544	1460	340	2142	8000	10750
	6N21A-EN	6	956 (1300)	850	2.03/2.36/2.78/3.32	210	290	2.240 (22.84)	8.22	3911	435.0	900	1544	1460	340	2142	8000	10750
M220	M220-UN	6	736 (1000)	800	1.84/2.07/2.35/2.68	220	300	1.612 (16.44)	8.00	4067	359.0	970	1162	1446	250	2015	7300	9515
	M220-SN	6	809 (1100)	800	2.13/2.51/2.86/3.28	220	300	1.774 (18.09)	8.00	4111	425.0	970	1162	1551	250	2015	7300	10100
	M220-EN	6	883 (1200)	800	2.13/2.51/2.86/3.28	220	300	1.935 (19.73)	8.00	4101	425.5	970	1162	1551	250	2015	7300	10100
T240	T240-ET	6	883 (1200)	750	2.13/2.51/2.86/3.28	240	310	1.678 (17.[illegible])	7.75	4350	425.0	1090	1203	1656	220	2151	9180	11950
	T240A-ET	6	1030 (1400)	800	2.02/2.24/2.49/2.79/3.01	240	310	1.836 (18.72)	8.27	4368	515.0	1090	1203	1656	220	2151	9140	12800
T260	T260-ST	6	1030 (1400)	700	2.02/2.24/2.49/2.79/3.01	260	330	1.679 (17.12)	7.70	4664	515.0	1090	1495	1746	275	2376	11530	15100
	T260-ET	6	1103 (1500)	700	2.02/2.24/2.49/2.79/3.01	260	330	1.800 (18.35)	7.70	4664	515.0	1090	1495	1665	275	2376	11750	15350
	T260A-EN	6	1324 (1800)	770	2.24/2.49/2.79/3.01	260	330	1.962 (20.[illegible])	8.47	4945	515.0	1090	1495	1665	275	2376	11750	16250
6N260	6N260-UN	6	1177 (1600)	750	2.28/2.57/2.84/3.02	260	360	1.642 (16.74)	9.00	5384	590.0	1090	1490	1886	380	2557	16200	21800
	6N260-SN	6	1324 (1800)	750	2.28/2.57/2.84/3.02	260	360	1.847 (18.83)	9.00	5384	590.0	1090	1490	1886	380	2557	16200	21800
	6N260-EN	6	1471 (2000)	750	2.28/2.57/2.84/3.02	260	360	2.053 (20.93)	9.00	5384	590.0	1090	1490	1886	380	2557	16200	21800
Z280	Z280-EN	6	1324 (1800)	650	2.24/2.49/2.79/3.01	280	360	1.838 (18.74)	7.80	5144	515.0	1160	1540	1985	250	2504	15600	20100
	Z280A-EN	6	1471 (2000)	720	2.24/2.49/2.79/3.01	280	360	1.855 (18.92)	8.64	5144	515.0	1160	1540	1985	250	2504	15600	20100
6N280	6N280-UN	6	1471 (2000)	720	2.23/2.49/2.80/3.07	280	380	1.747 (17.8[illegible])	9.12	6155	620.0	1140	1532	2078	410	2740	19000	26300
	6N280-SN	[illegible]	1618 (2200)	720	2.23/2.49/2.80/3.07	280	380	1.921 (19.59)	9.12	6155	620.0	1140	1532	2078	410	2740	19000	26300
	6N280-[illegible]	[illegible]	1839 (2500)	720	2.23/2.49/2.80/3.07	280	380	2.183 (22.26)	9.12	6155	620.0	1140	1532	2078	410	2740	19000	26300
8N280	8N280-[illegible]	[illegible]	[illegible] (2800)	720	2.55/2.80/3.09/3.31	280	380	1.702 (17.[illegible])	9.12	6811	776.5	1140	1550	2242	410	2740	26000	36100
	8N280-[illegible]	[illegible]	[illegible] (3000)	720	2.55/2.80/3.09/3.31	280	380	1.954 (19.9[illegible])	9.12	6811	776.5	1140	1550	2242	410	2740	26000	36100
	8N280-EN	[illegible]	[illegible] (3200)	720	2.55/2.80/3.09/3.31	280	380	2.096 (21.3[illegible])	9.12	6811	776.5	1140	1550	2242	410	2740	26000	36100
6N330	6N330-UN	[illegible]	[illegible] (3000)	620	2.55/2.80/3.09/3.31	330	440	1.992 (19.79)	9.09	6569	776.5	1420	1789	2427	520	2868	30000	40500
	6N330-SN	[illegible]	[illegible]27 (3300)	620	2.55/2.80/3.09/3.31	330	440	2.081 (21.22)	9.09	6569	776.5	1420	1789	2427	520	2868	30000	40500
	6N330-[illegible]	[illegible]	2574 (3500)	620	2.55/2.80/3.09/3.31	330	440	2.205 (22.50)	9.09	6569	776.5	1420	1789	2427	520	2868	30000	40500
8N330	8N330-[illegible]	8	2942 (4000)	620	2.400/2.687/3.023	330	440	1.892 (19.29)	9.09	8209	0	1420	1890	2533	520	2868	43000	56100
	8N330-S[illegible]	8	3163 (4300)	620	2.400/2.687/3.023	330	440	2.033 (20.73)	9.09	8209	0	1420	1890	2533	520	2868	43000	56100
	8N330-EN	8	3310 (4500)	620	2.400/2.687/3.023	330	440	2.128 (21.70)	9.09	8209	0	1420	1890	2533	520	2868	43000	56100
MF24	MF24-[illegible]	6	441 (600)	420	—	240	420	1.106 (11.28)	5.88	4203	0	1140	1288	1810	180	2455	10800	12450
	MF24-[illegible]	6	515 (700)	420	—	240	420	1.291 (13.16)	5.88	4203	0	1140	1361	1810	180	2455	10300	12450
	MF24-[illegible]T	[illegible]	588 (800)	420	—	240	420	1.475 (15.04)	5.88	4203	0	1140	1361	1810	180	2455	10300	12450
DY25	DY25-UN	[illegible]	625 (850)	420	—	250	440	1.379 (14.06)	6.16	4455	0	1222	1481	1854	380	2760	14000	15900
	DY25-SN	[illegible]	736 (1000)	420	—	250	440	1.621 (16.53)	6.16	4455	0	1222	1481	1854	380	2760	14000	15900
DY26	DY26-[illegible]	[illegible]	809 (1100)	420	—	260	440	1.649 (16.82)	6.16	4455	0	1222	1614	1854	380	2760	14000	15900
	DY26-SN	6	883 (1200)	420	—	260	440	1.800 (18.35)	6.16	4691	0	1222	1614	1854	380	2760	14000	17050
	DY26-EN	6	956 (1300)	420	—	260	440	1.949 (19.87)	6.16	4691	0	1222	1614	1854	380	2760	14000	17050
MF26	MF26-SD	6	588 (800)	380	—	260	500	[illegible] (11.[illegible])	6.33	4365	0	1150	1445	2157	265	2590	14500	16150
	MF26-HT	6	736 (1000)	350		260	500	1.583 (16.[illegible])	5.83	4420	0	1150	1475	2130	265	2550	14500	16350
	MF26-ST	[illegible]	883 (1200)	3[illegible]		[illegible]	500	1.750 ([illegible])	[illegible]	4560	0	1150	1475	2130	265	2590	14500	16650
	MF26-ET	[illegible]	956 (1300)	400		260	500	1.801 (18.[illegible])	6.67	4560	0	1150	1475	2130	265	2590	14500	16650
DY28	DY28-UN	6	1030 (1400)	395	—	280	530	1.598 (16.29)	6.98	5332	0	1400	1763	2140	410	2910	22000	25050
	DY28-SN	6	1177 (1600)	395	—	280	530	1.826 (18.62)	6.98	5332	0	1400	1763	2140	410	2910	22000	25050
	DY28-EN	6	1324 (1800)	395		280	530	2.054 (20.95)	6.98	5332	0	1400	1763	2140	410	2910	22000	25050
MF33	MF33-[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	620	[illegible]	[illegible]	[illegible]	0	[illegible]	1556	2708	300	3305	28500	31500
	MF33-[illegible]	6	[illegible]	[illegible]		[illegible]	620	1.664 ([illegible])	[illegible]	[illegible]	0	[illegible]	1556	2708	300	3305	28500	32400
	MF33-[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	620	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2708	300	3305	28500	32400
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3305	28500	32400

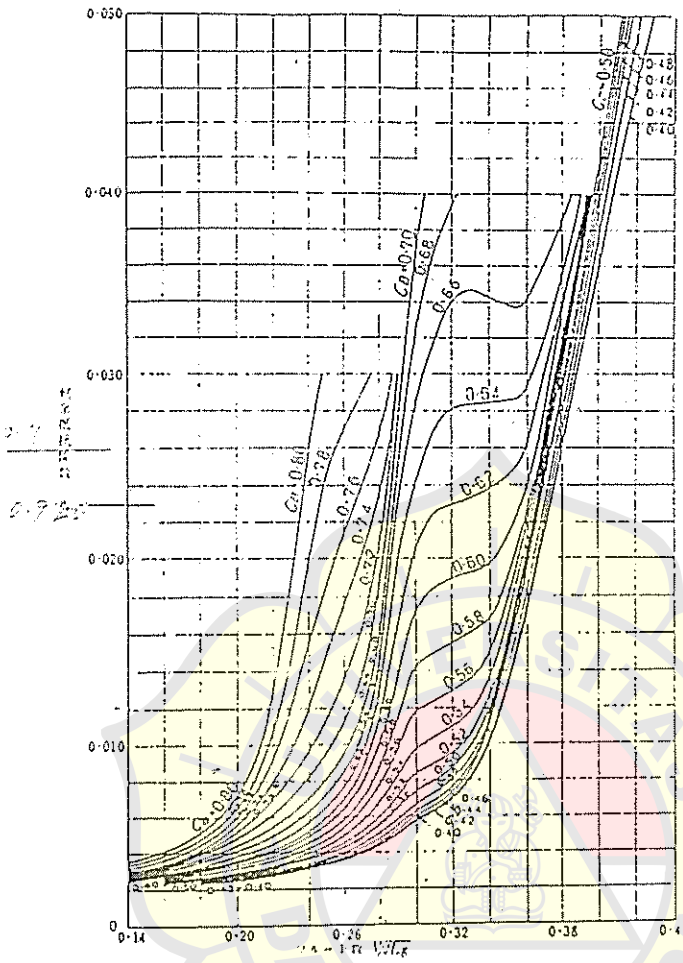
YANMAR MARINE AUXILIARY ENGINES

Series	Models	No. of Cyl.	Output kW (PS) Engine Speed 720 rpm	750 rpm	900 rpm	1000 rpm	1200 rpm	Cylinder Bore (mm)	Stroke (mm)	* Mean Effective Pressure MPa (kgf/cm²)	* Mean Piston Speed m/s	* Dimensions mm (Approx.) A	B	C	D	E	F	G	* Weight Engine Net Weight with Flywheel kg	Total Weight with Alternator (Approx.) kg
6NY16L	6NY16L-[illegible]	[illegible]				200 (272)	265 (360)	160	200	1.097 (11.19)	8.00	2530	1583	1665	940	1685	570	2591	2830	5450
	6NY16L-[illegible]	[illegible]				235 (320)	310 (421)	160	200	1.283 (13.09)	8.00	2530	1583	1635	940	1685	570	2591	2830	5450
	6NY16L-[illegible]	[illegible]				270 (367)	355 (483)	160	200	1.472 (15.01)	8.00	2530	1583	1635	940	1685	570	2591	2880	5500
	6NY16L-SN	[illegible]				310 (421)	400 (544)	160	200	1.658 (16.91)	8.00	2530	1583	[illegible]	940	1685	570	2591	2880	5500
S165L	[illegible]	[illegible]					147 (200)	165	210	0.545 (5.56)	8.40	2200	1842	[illegible]	940	1775	600	3060	2900	4650
	S165L-[illegible]	[illegible]					221 (300)	165	210	0.819 (8.35)	8.40	2200	1842	[illegible]	940	1775	600	3060	[illegible]	4700
	S165L-[illegible]	[illegible]				[illegible] (270)	265 (360)	165	210	0.983 (10.02)	8.40	2340	1842	[illegible]	940	1775	600	3209	3050	5230
	S165L-[illegible]	[illegible]				[illegible] (330)	309 (420)	165	210	1.146 (11.69)	8.40	2340	1842	[illegible]	940	1775	600	3209	3050	5230
	S165L-[illegible]	[illegible]				265 (360)	353 (480)	165	210	1.310 (13.36)	8.40	2390	1842	[illegible]	940	1775	600	3219	3050	[illegible]
	S165L-SN	[illegible]				309 (420)	397 (540)	165	210	1.474 (15.03)	8.40	2390	1842	[illegible]	940	1775	600	3249	3050	5680
	S165L-EN	[illegible]				[illegible] (480)	441 (600)	165	210	1.638 (16.70)	8.40	2390	1842	[illegible]	940	1775	600	3249	3050	5680
6N165L	6N165L-[illegible]	6				353 (480)	441 (600)	165	232	1.483 (15.12)	9.28	2700	1804	[illegible]	990	1890	640	3230	3860	6260
	6N165L-SN	6				397 (540)	485 (660)	165	232	1.631 (16.63)	9.28	2800	1804	[illegible]	990	1890	640	3330	4020	6960
	6N165L-EN	6				441 (600)	530 (720)	165	232	1.779 (18.14)	9.28	2800	1804	[illegible]	990	1890	640	3330	4020	6960
6N18L	6N18L-[illegible]	6	[illegible]	[illegible]				180	280	1.402 (14.30)	6.72	[illegible]	2235	[illegible]	1180	2586	920	4255	6500	10600
	6N18L-[illegible]	6	397 (541)	400 [illegible]				180	280	1.560 (15.91)	6.72	3600	2235	[illegible]	1180	2586	920	4255	6500	10600
	6N18L-[illegible]	[illegible]	450 (612)	[illegible]				180	280	1.754 (17.89)	6.72	3600	2235	[illegible]	1180	2586	920	4255	6500	10600
	6N18L-SN	6	500 (680)	500 [illegible]				180	280	1.950 (19.88)	6.72	3600	2235	[illegible]	1180	2586	920	[illegible]	6500	10600
	6N18L-EN	[illegible]	[illegible]	[illegible]				180	280	2.145 (21.87)	6.72	3600	2235	[illegible]	1180	2586	920	4255	6500	10600
6N18AL	6N18AL-[illegible]	6			[illegible]	500 (680)		180	280	1.560 (15.91)	8.40	3600	2235	[illegible]	1180	2586	920	4395	6500	11400
	6N18AL-[illegible]	6			550 [illegible]	550 (748)		180	280	1.716 (17.50)	8.40	3600	2235	[illegible]	1180	2586	920	4395	6500	11400
	6N18AL-SN	6			615 [illegible]	615 (836)		180	280	1.918 (19.56)	8.40	3600	2235	[illegible]	1180	2586	920	4395	6500	11400
	6N18AL-EN	[illegible]			660 [illegible]	660 (897)		180	280	2.058 (20.99)	8.40	3600	2265	[illegible]	1180	2586	920	4466	6500	11400
S185DL	S185DL-[illegible]	[illegible]	[illegible]	[illegible]				185	230	1.388 (14.15)	5.52	3650	2124	[illegible]	980	2245	800	[illegible]	5400	9400
	S185DL-ST	[illegible]	[illegible]	[illegible]				185	230	1.586 (16.17)	5.52	3650	2124	[illegible]	980	2245	800	[illegible]	5400	9400
	S185DL-[illegible]	[illegible]	[illegible]	[illegible]				185	230	1.785 (18.20)	5.52	3650	2179	[illegible]	980	2245	800	[illegible]	5400	9400
S185L	S185L-[illegible]	6			[illegible]	397 (540)		185	230	1.428 (14.56)	6.90	3550	2124	[illegible]	980	2245	[illegible]	[illegible]	5000	9200
	S185L-[illegible]	[illegible]			[illegible]	441 (600)		185	230	1.587 (16.18)	6.90	3550	2124	[illegible]	980	2245	800	4231	5000	9200
	S185L-[illegible]	6			[illegible]	485 (660)		185	230	1.745 (17.79)	6.90	3550	2179	[illegible]	980	2245	[illegible]	4231	5000	9200
S185AL	S185AL-[illegible]	[illegible]					441 (600)	185	230	1.190 (12.13)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2245	[illegible]	[illegible]	5000	9100
	S185AL-ST	[illegible]					485 (660)	185	230	1.309 (13.35)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2245	[illegible]	[illegible]	5000	9100
M200L	M200L-[illegible]	6	441 (600)	441 [illegible]				200	260	1.550 ([illegible])	6.24	[illegible]	2271	[illegible]	1040	2570	950	4550	5800	11000
	M200L-SN	6	485 (660)	485 [illegible]				200	260	1.650 (16.83)	6.24	[illegible]	2271	[illegible]	1040	2570	950	[illegible]	5800	11000
	M200L-EN	6	552 (750)	552 [illegible]				200	260	1.876 (19.13)	6.24	[illegible]	2326	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5800	11300
M200AL	M200AL-[illegible]	[illegible]			[illegible]	[illegible]		200	260	1.411 ([illegible])	[illegible]	[illegible]	2271	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11000
	M200AL-SN	[illegible]			[illegible]	[illegible]		200	260	1.661 (16.94)	[illegible]	[illegible]	2326	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11300
	M200AL-[illegible]	[illegible]			[illegible]	[illegible]		200	260	[illegible]	[illegible]	[illegible]	2326	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11300
6N21L	6N21L-[illegible]	6	615 (836)	615 (836)				210	290	1.700 (17.34)	6.96	4150	2430	[illegible]	1160	2852	1050	[illegible]	8700	14800
	6N21L-[illegible]	6	660 (897)	660 (897)				210	290	1.824 (18.60)	6.96	4150	2430	[illegible]	1160	2852	1050	[illegible]	8700	14800
	6N21L-SN	6	745 (1013)	745 (101[illegible])				210	290	2.060 (21.01)	6.96	4150	2430	[illegible]	1160	2852	[illegible]	[illegible]	8700	14800
	6N21L-EN	6	800 (1088)	800 (108[illegible])				210	290	2.213 (22.57)	6.96	4150	2430	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8700	14800
6N21AL	6N21AL-[illegible]	[illegible]			[illegible]	[illegible]		210	290	1.648 (16.81)	8.70	4150	2430	[illegible]	[illegible]	2852	[illegible]	[illegible]	[illegible]	14600
	6N21AL-[illegible]	[illegible]			[illegible]	[illegible]		210	290	1.770 (18.05)	8.70	4150	2430	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14600
	6N21AL-SN	[illegible]			[illegible]	[illegible]		210	290	1.948 (19.86)	8.70	4150	2510	[illegible]	1180	2852	[illegible]	[illegible]	[illegible]	14600
	6N21AL-EN	[illegible]			[illegible]	[illegible]		210	290	2.146 (21.89)	8.70	4150	2510	[illegible]	[illegible]	2852	[illegible]	[illegible]	[illegible]	14600
8N21L	8N21L-SN	8	880 (119[illegible])	880 (1[illegible])				210	290	1.826 (18.62)	6.96	5100	2510	[illegible]	1160	2852	1050	[illegible]	10200	18100
	8N21L-EN	[illegible]	970 (1319)	970 (1319)				210	290	2.012 (20.52)	6.96	5100	2510	[illegible]	1160	2852	1050	[illegible]	10200	18100
8N21AL	8N21AL-SN	[illegible]			[illegible]	1100 (1496)		210	290	1.826 (18.62)	8.70	5100	2510	[illegible]	[illegible]	2852	[illegible]	[illegible]	10200	18100
	8N21AL-EN	[illegible]			[illegible]	[illegible]		210	290	2.157 (22.00)	8.70	5100	2510	[illegible]	[illegible]	2852	[illegible]	[illegible]	[illegible]	18100
M220L	M220L-[illegible]	6	610 (830)	610 (830)				220	300	1.487 (15.16)	7.20	4150	2396	[illegible]	1180	2715	950	5200	7200	14000
	M220L-SN	6	662 (900)	662 (900)				220	300	1.612 (16.44)	7.20	4150	2396	[illegible]	1180	2715	950	5200	7200	14100
	M220L-EN	6	736 (1000)	736 (1000)				220	300	1.792 (18.27)	7.20	4150	2501	[illegible]	1180	2715	950	5200	7200	14300
M220AL	M220AL-[illegible]	[illegible]			[illegible]			220	300	1.433 (14.61)	9.00	4150	2396	[illegible]	[illegible]	2715	[illegible]	[illegible]	7200	13400
	M220AL-SN	[illegible]			[illegible]			220	300	1.577 (16.08)	9.00	4150	2501	[illegible]	[illegible]	2715	[illegible]	[illegible]	7200	13600
	M220AL-EN	[illegible]			[illegible]			220	300	1.720 (17.54)	[illegible]	4150	2501	[illegible]	[illegible]	2715	[illegible]	[illegible]	7200	[illegible]
T240L	T240L-ST	[illegible]	809 (1100)	809 (1100)				240	310	1.602 (16.34)	7.44	4260	2706	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9180	[illegible]
	T240L-[illegible]	6	883 (1200)	883 (1200)				240	310	1.749 (17.83)	7.44	4260	2706	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9180	17600
	T240L-ST	6	956 (1300)	956 (1300)				240	310	1.894 (19.31)	7.44	4260	2706	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9180	17600
T260L	T260L-ST	[illegible]	1030 (1400)	1030 (1400)				260	330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20500
	T260L-[illegible]	[illegible]	1103 (1500)	1103 (1500)				260	330	1.750 (17.84)	7.92	4600	3005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21000
	T260L-[illegible]	[illegible]	1214 (1650)	1214 (1650)				260	330	1.924 (19.62)	7.92	4600	3005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21000
6N260L	6N260L-[illegible]	[illegible]	1103 (1500)	1103 (1500)				260	360	1.603 (16.35)	8.64	5400	3157	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	27000
	6N260L-SN	6	1214 (1650)	1214 (1650)				260	360	1.763 (17.98)	8.64	5400	3157	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	27000
	6N260L-EN	6	1324 (1800)	1324 (1800)				260	360	1.924 (19.62)	8.64	5400	3157	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	27000
Z280L	Z280L-[illegible]	6	1177 (1600)	1177 (1600)				280	360	1.475 (15.04)	[illegible]	[illegible]	3185	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	28500
	Z280L-ST	[illegible]	1324 (1800)	1324 (1800)				280	360	1.659 (16.92)	[illegible]	[illegible]	3285	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Z280L-[illegible]	[illegible]	1471 (2000)	1471 (2000)				280	360	1.844 (18.80)	[illegible]	[illegible]	3285	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6N280L	6N280L-[illegible]	[illegible]	1324 (1800)	1324 (1800)				280	380	1.572 ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	35000
	6N280L-[illegible]	6	1471 (2000)	1471 (2000)				280	380	1.747 ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	35000
	6N280L-[illegible]	6	1618 (2200)	1618 (2200)				280	380	1.921 ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	35000
	6N280L-[illegible]	6	1728 (2350)	1728 (2350)				280	380	2.052 ([illegible])	[illegible]	[illegible]	3378	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	35500
8N280L	8N280L-[illegible]	[illegible]	[illegible]	[illegible]				280	380	1.572 (16.03)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	46500
	8N280L-SN	[illegible]	1912 (2600)	1912 (2600)				280	380	1.702 (17.36)	[illegible]	[illegible]	3378	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	46500
	8N280L-EN	[illegible]	2133 (2900)	2133 (2900)				280	380	1.900 (19.37)	[illegible]	[illegible]	3378	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	46500
	8N280L-[illegible]	[illegible]	2280 (3100)	2280 (3100)				280	380	2.030 (20.70)	[illegible]	[illegible]	3378	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	46500
6N330L	6N330L-[illegible]	6	2059 (2800)	2059 (2800)				330	380	1.670 (17.95)	9.12	6740	3927	[illegible]	1740	3858	[illegible]	7650	30500	49000
	6N330L-SN	6	2207 (3000)	2207 (3000)				330	380	1.886 (19.23)	9.12	6740	3927	[illegible]	1740	3858	[illegible]	7650	30500	49000
	6N330L-EN	6	2354 (3200)	2354 (3200)				330	380	2.011 (20.51)	9.12	6740	3927	[illegible]	1740	3858	[illegible]	7650	30500	49000
8N330L	8N330L-[illegible]	[illegible]	[illegible]	[illegible]				330	380	1.792 ([illegible])	[illegible]	[illegible]	4050	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	71000
	8N330L-SN	[illegible]	2942 (4000)	2942 (4000)				330	380	1.886 (19.23)	9.12	[illegible]	4050	[illegible]	[illegible]	3858	[illegible]	[illegible]	43560	71000
	8N330L-EN	8	3089 (4200)	3089 (4200)				330	380	1.980 (20.19)	9.12	[illegible]	4050	[illegible]	[illegible]	3858	[illegible]	[illegible]	43560	71000
	8N330L-[illegible]	8	3457 (4700)	3457 (4700)				330	380	2.216 (22.60)	9.12	[illegible]	4050	[illegible]	[illegible]	3858	[illegible]	[illegible]	[illegible]	71000

Lampiran 1. Diagram Speed Length Ration.



Lampiran 2. Grafik Untuk Menentukan Hambatan Sisa (C_R') oleh Dr. Yamagata



Lampiran 3. Grafik Dr. Yamagata Untuk $\frac{(\Delta C_R')_{B/LWL}}{(B/LWL)-0,1350}$

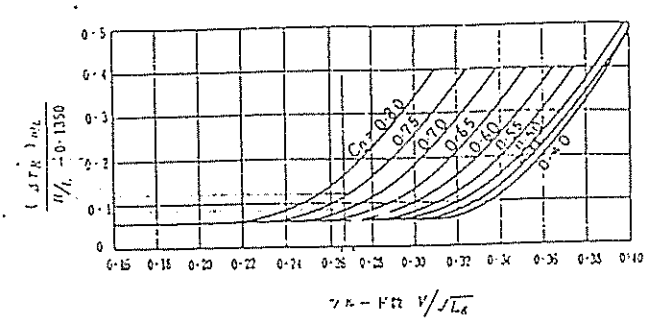


図 48 B/L が標準値と異なる場合の修正（曲線の図表）

Lampiran 4. Grafik Dr. Yamagata Untuk $\frac{(\Delta C_R')_{B/T}}{(B/T)-0,1350}$

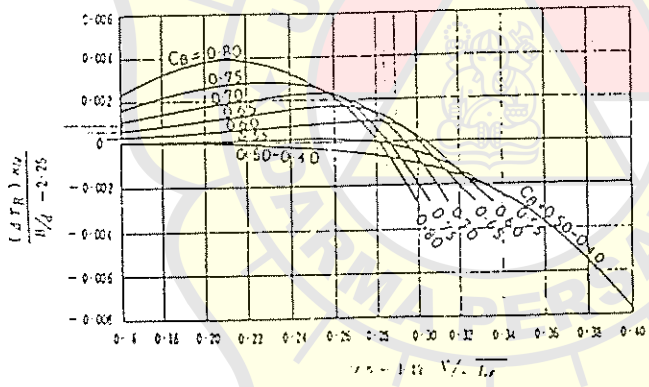
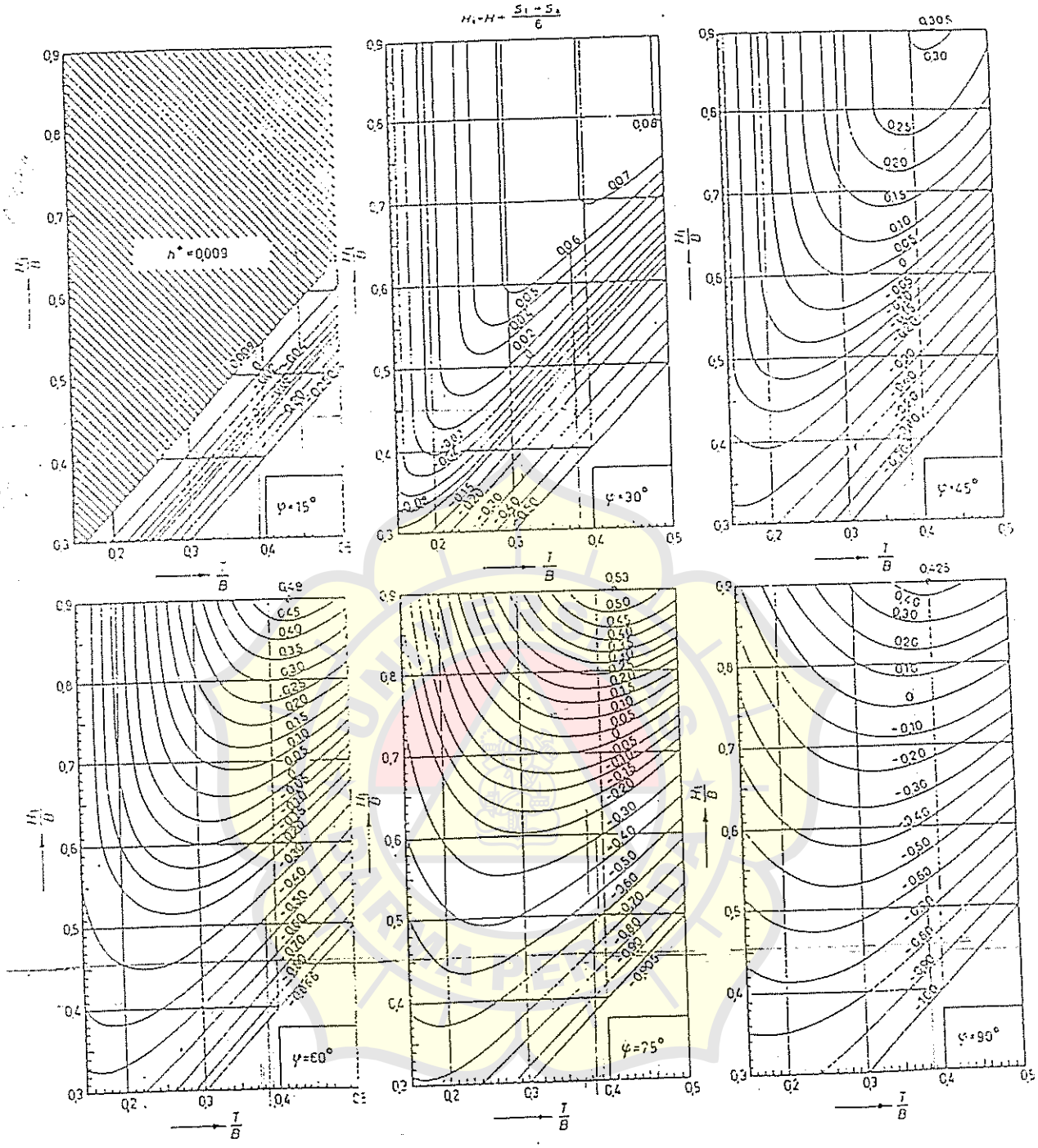
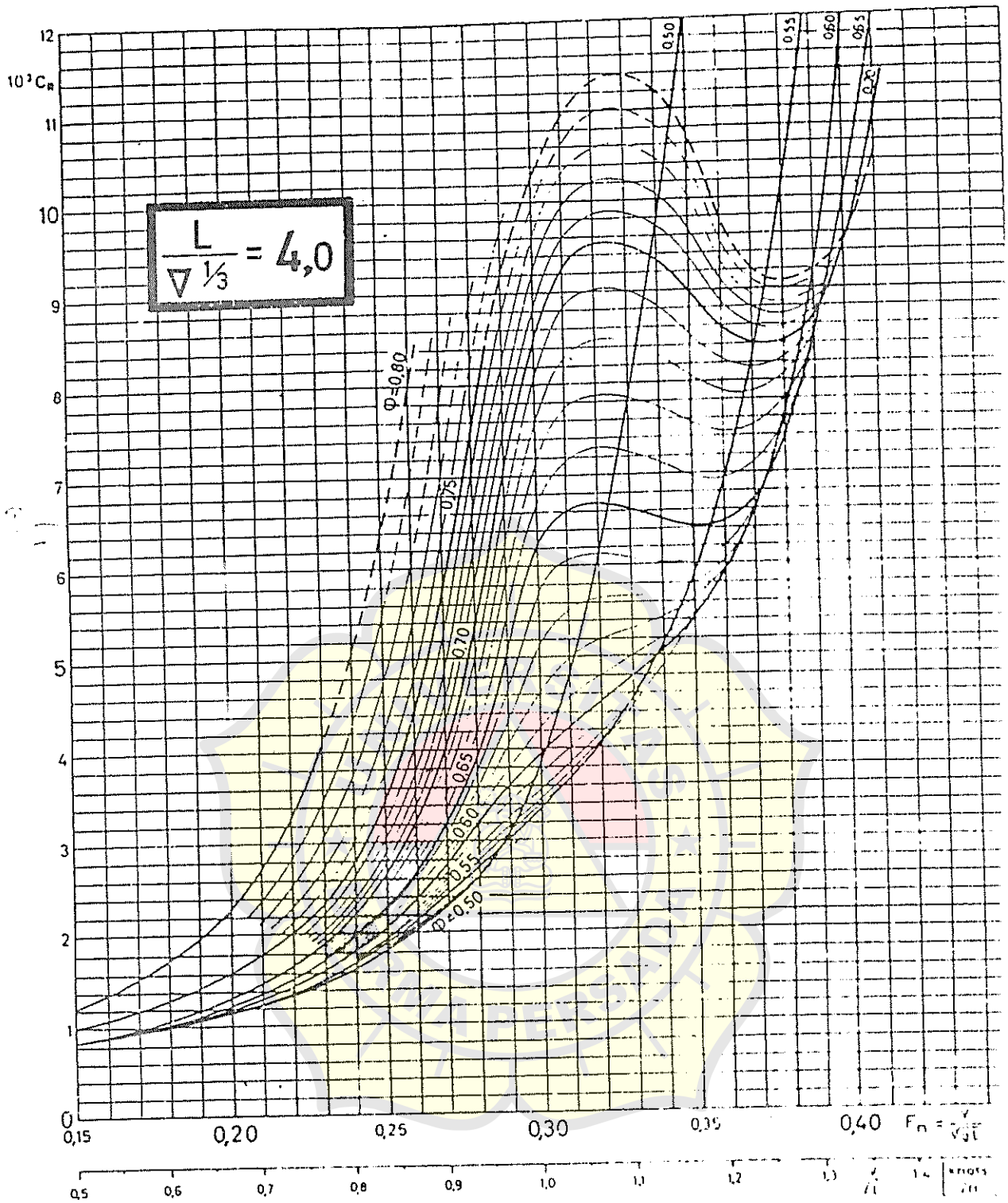


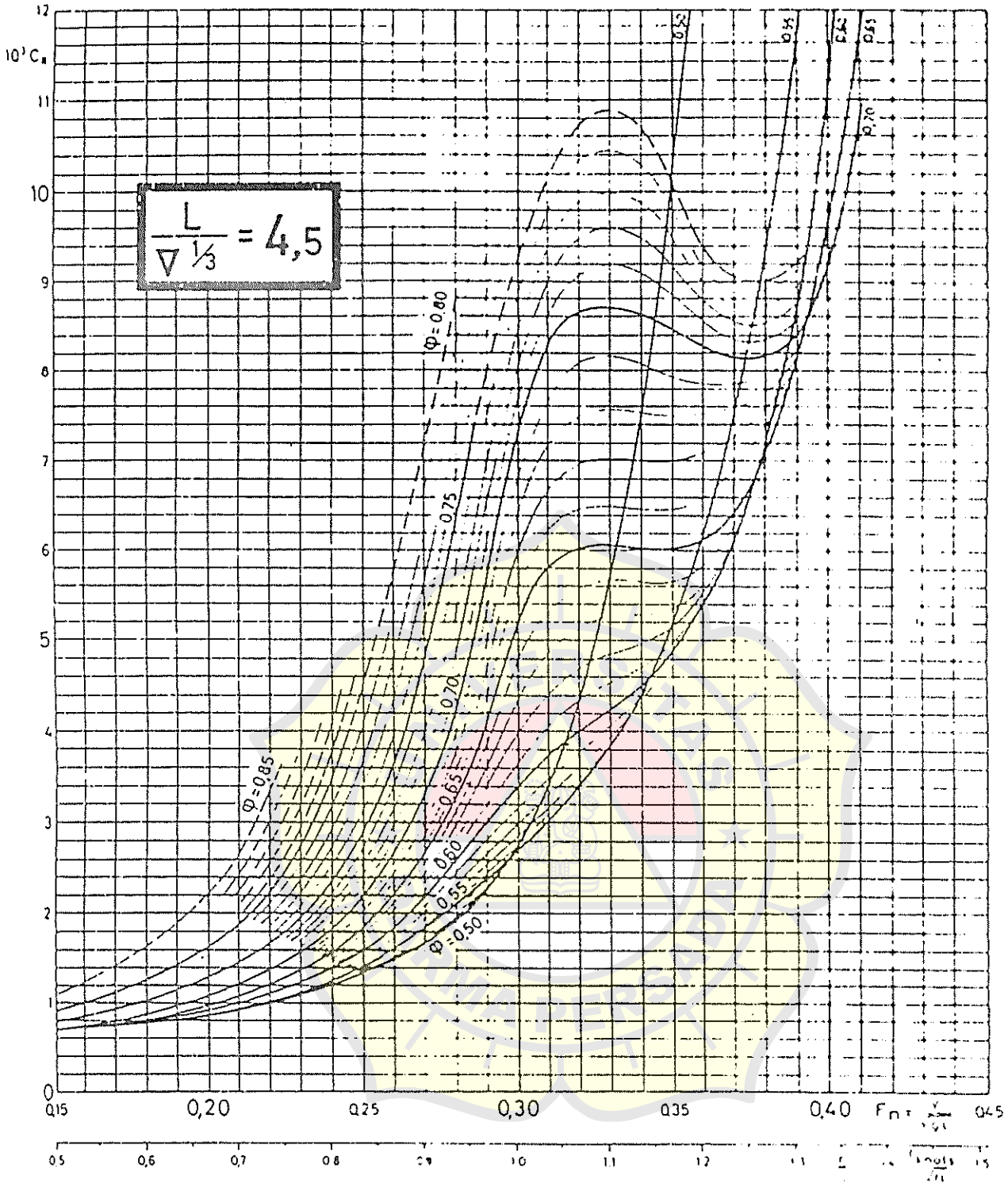
図 49 B/d が標準値と異なる場合の修正（曲線の図表）

Lampiran 5. Grafik Untuk Menentukan h*, Cara Prohaska





Gambar 5.5.5. Koefisien tahanan sisa terhadap rasio kecepatan - panjang untuk harga koefisien prismatik longitudinal yang berbeda-beda. $L/\nabla^{1/3} = 4{,}0$



Gambar 5.5.6. Koefisien tahanan sisa terhadap fasal kecepatan-panjang untuk harga koefisien prismatik longitudinal yang berbeda-beda. $L/\nabla^{1/3} = 4{,}5$

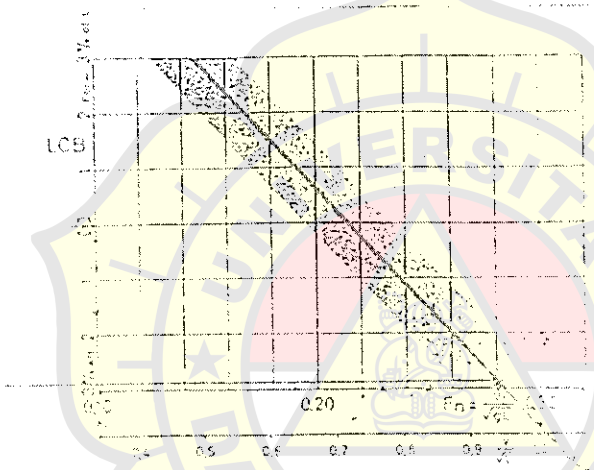


Figure 5.8.15. Standard LCB. The longitudinal position of the center of buoyancy that is considered the best practice.

Lampiran 9. Grafik Untuk Menentukan $LCB_{Koreksi}$ Cara Sv. Aa. Harvald & Guldhammer

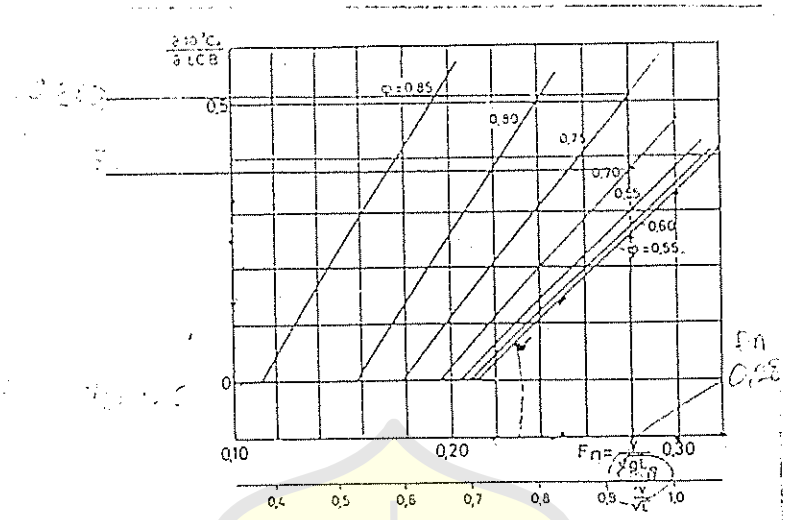


Figure 5.5.16. The correction of the residual resistance coefficient for LCB 1% forward of standard. The correction is thus $(\partial 10^3 C_R/\partial \mathrm{LCB})|\Delta \mathrm{LCB}|$, where ΔLCB is the longitudinal distance between actual and standard LCB in percent of L. There is no correction for LCB aft of standard. The correction is always positive.

Lampiran 10. Grafik Untuk Menentukan C_F' Cara Sv. Aa. Harvald Dan Guldhammer

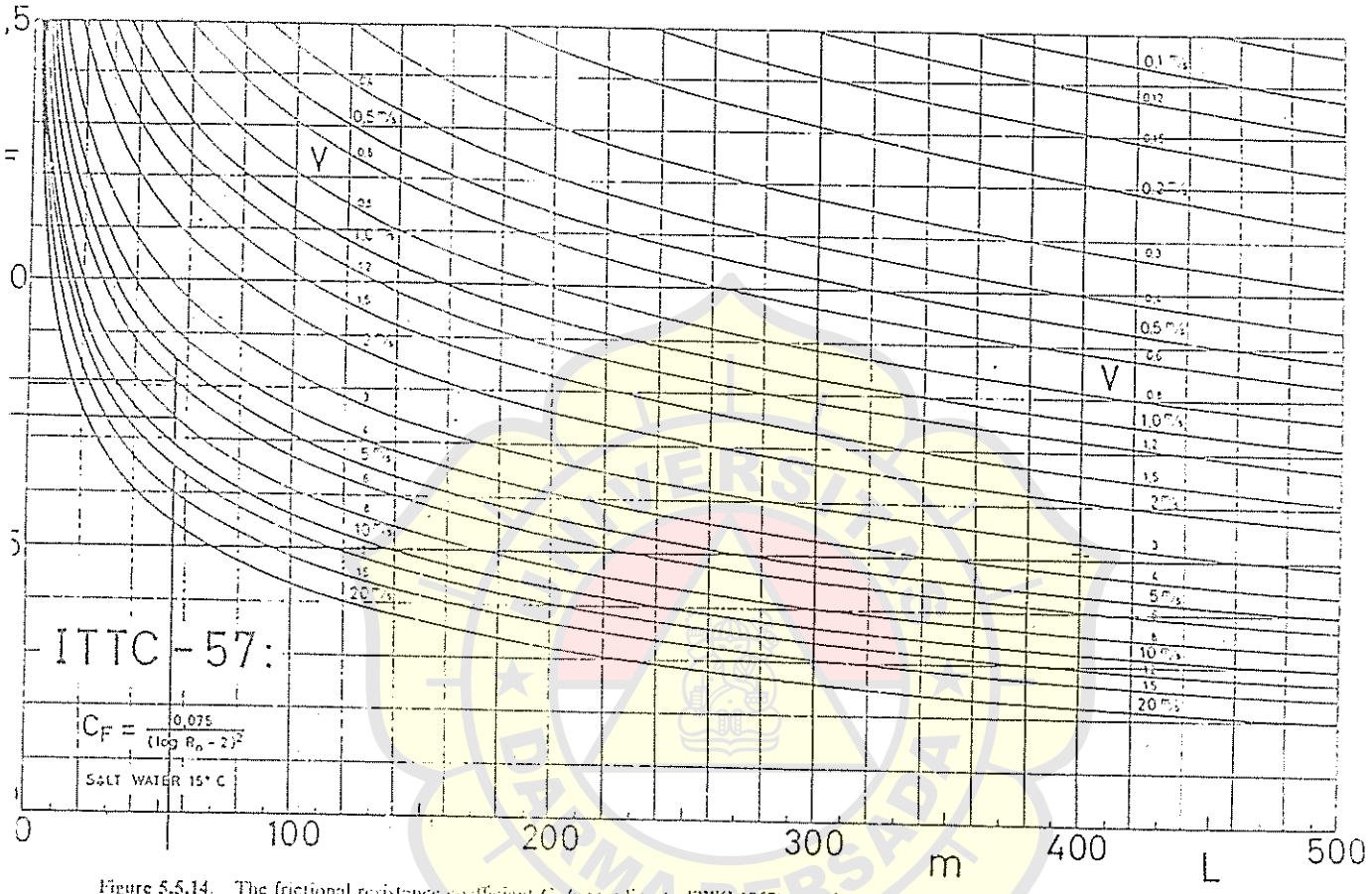


Figure 5.5.14. The frictional resistance coefficient C_F (according to ITTC 1957) as a function of ship length L and speed V.

Lampiran 14. Grafik Untuk Menentukan Kavitasi Cara Burril

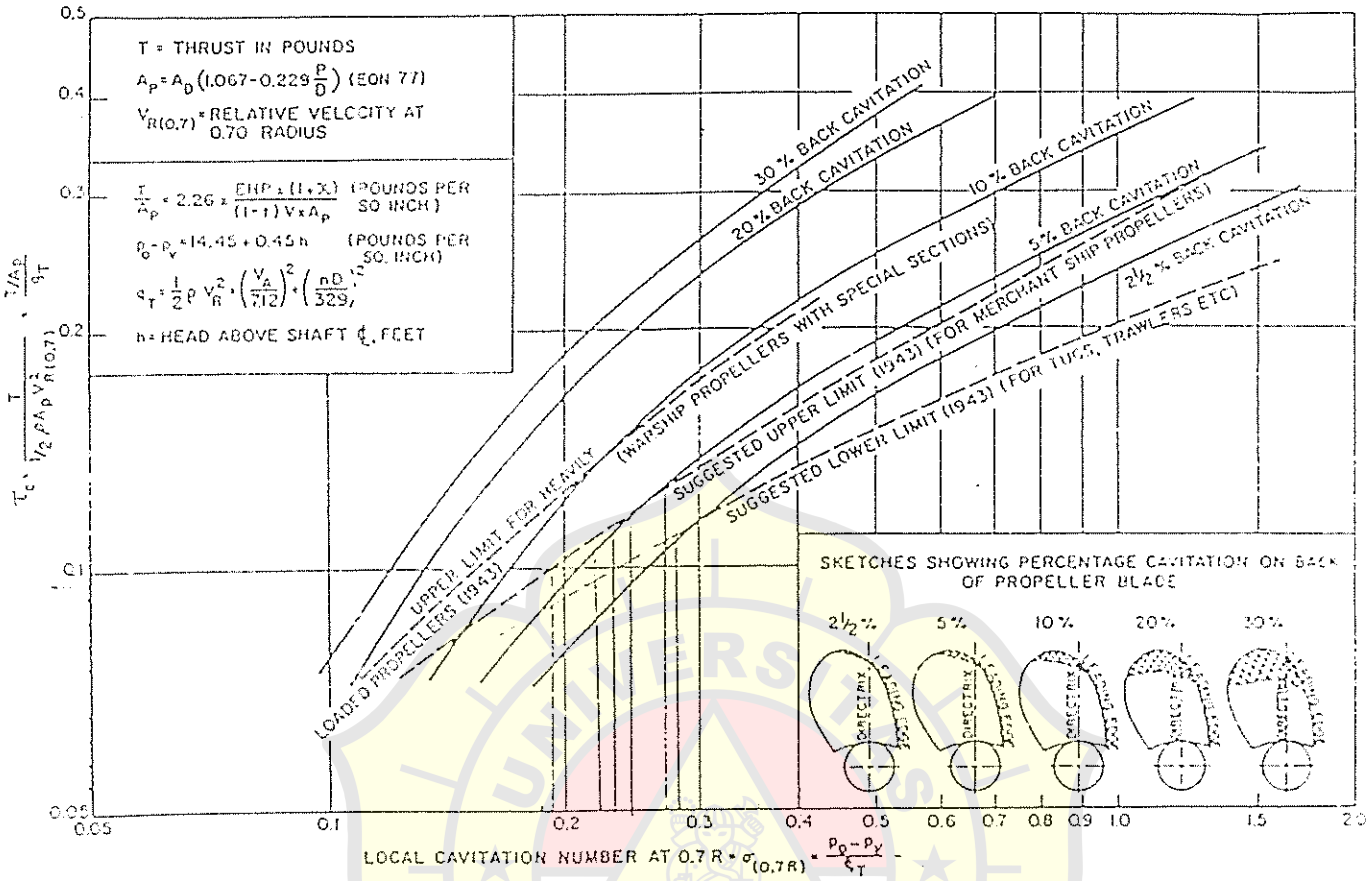


Fig. 110 Simple cavitation diagram

Lampiran 15. Diagram K_Q, K_T, J Untuk B4-55

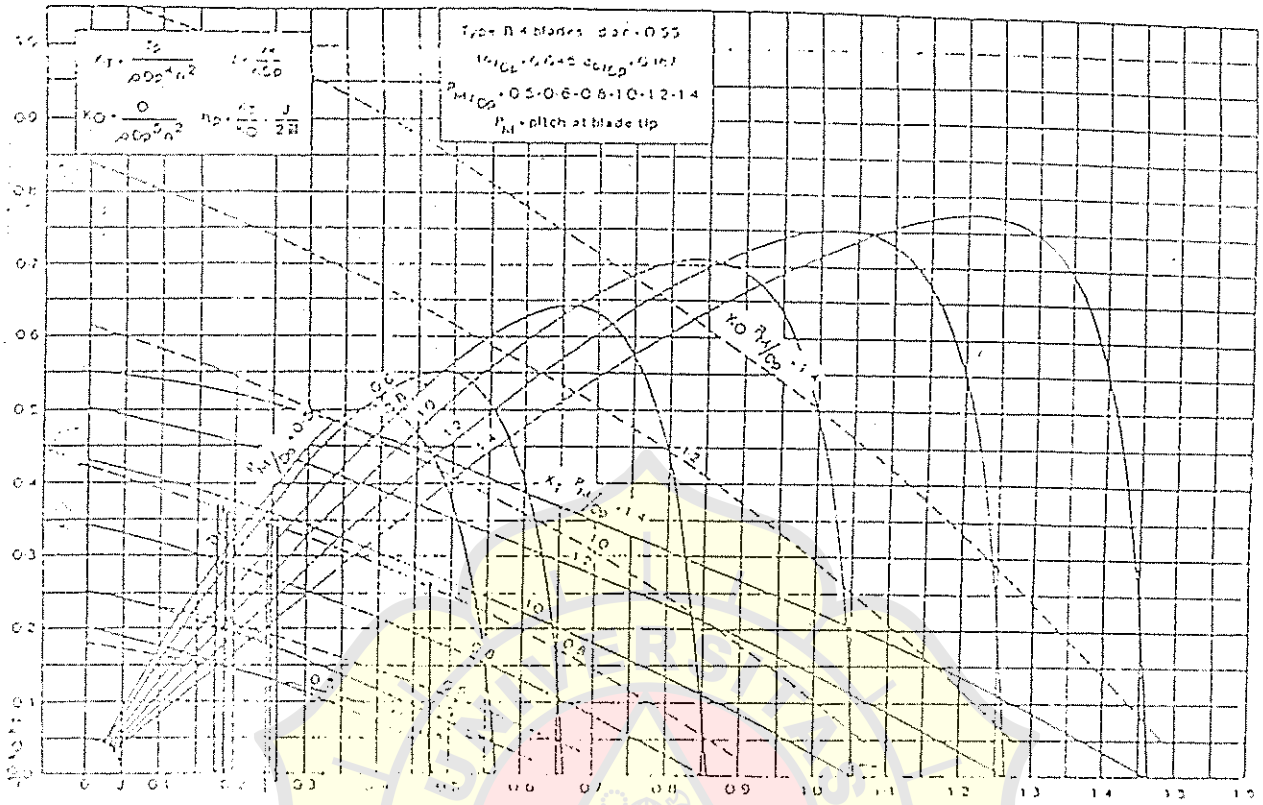
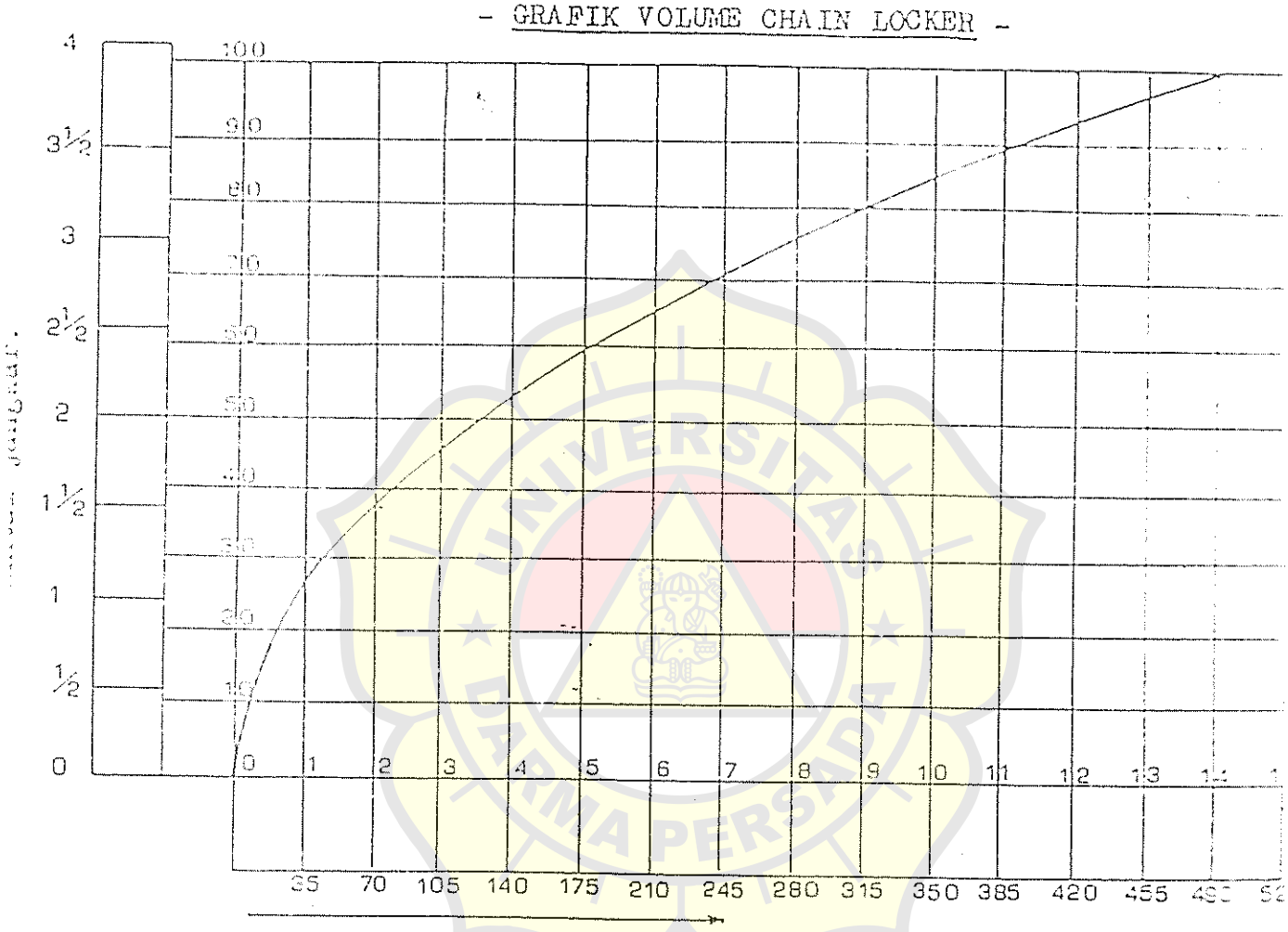


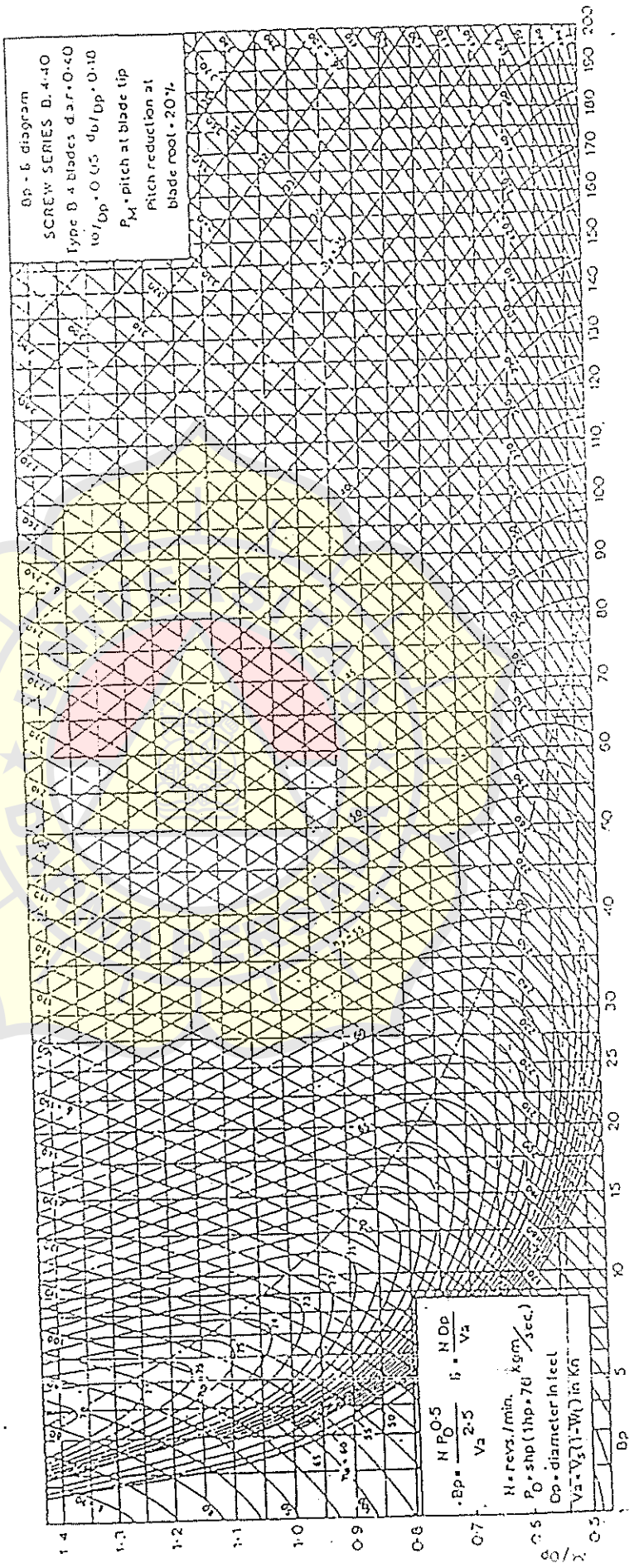
Figure 38 K_T-K_Q vs. η_o Chart for Type B propeller d a r 0·55

Lampiran 16. Grafik Untuk Menentukan Volume Chain Locker

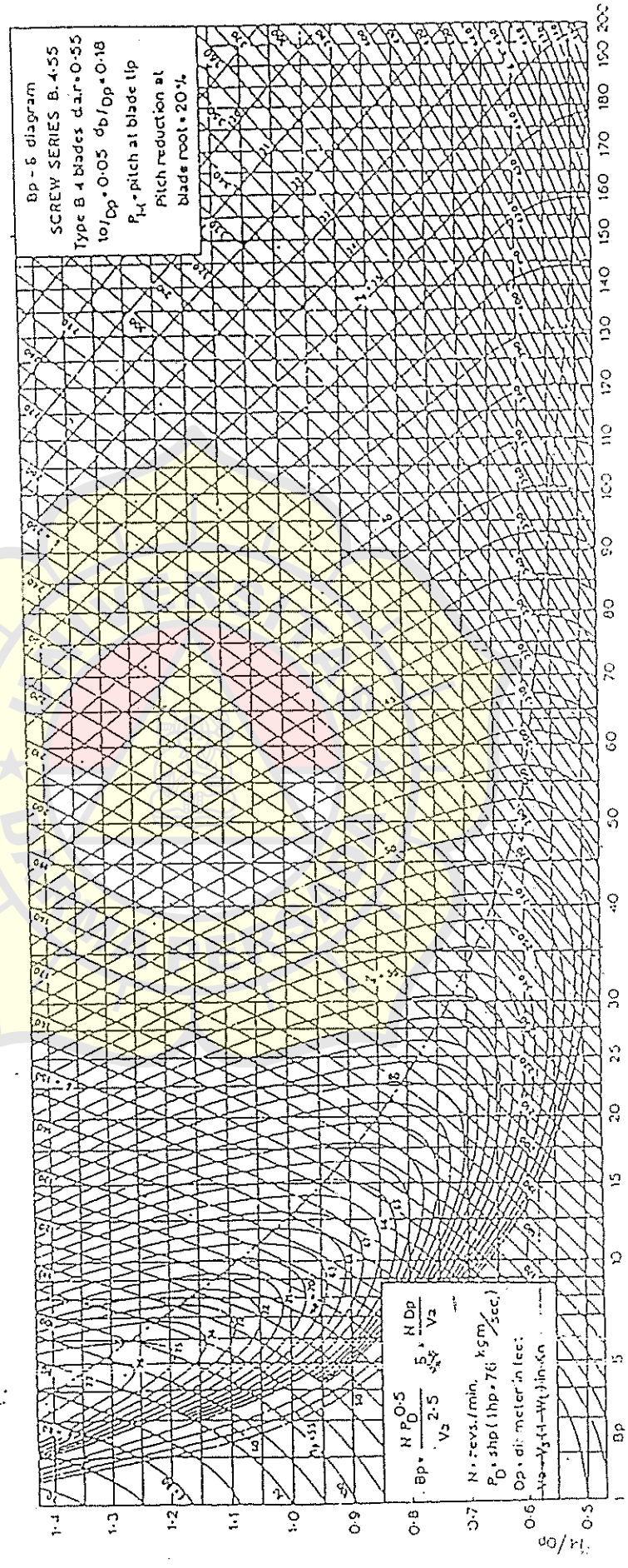


Volume Chain locker untuk setiap 100 fathoms panjang rantai

Lampiran 16. Diagram Bp – δ – Series B4-40



Lampiran 17. Diagram Bp – δ – Series B4-55



Lampiran 18. Diagram Ep – δ – Series B4-70