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LAMPIRAN



Lampiran 1 : Skala Model

Lebar model harus disesuaikan dengan lebar tangki *towing tank* untuk menghindari *blockage effect*. Oleh karena itu lebar model harus dikoreksi dengan menggunakan persamaan dibawah :

$$B_m < \frac{1}{10} B \text{ tangki}$$

Diketahui :

$$B_m = 0,4\text{m menggunakan } 1 : 30$$

$$B \text{ tangki} = 4 \text{ m}$$

$$= \frac{1}{10} \times 4$$

$$= 0,4 \text{ m} < 0,4 \text{ m}$$



Lampiran 2 : *Inclining Test*

Inclining Test bertujuan untuk mengetahui letak titik KG model kapal dan disesuaikan dengan letak titik KG kapal yang sebenarnya. Berikut ini hasil *Inclining Test* pada setiap perubahan displacement model kapal

Tabel A. Titik stabilitas antara kapal sebenarnya dengan model kapal pada kondisi displacement 30,580 kg

Percobaan	Beban	Berat beban (P) kg	Jarak dari CL (d) cm	Sudut (θ) derajat	Sudut(θ) radian	GG' cm	MG cm	KG cm	Rata-rata
	1	1,8	13	6,80	0,12	0,77	6,46	17,43	
1	1	1,8	7	3,68	0,06	0,41	6,42	17,48	17,49
	1	1,8	3	1,60	0,03	0,18	6,32	17,57	

Sumber : Hasil analisis

○ Perhitungan displacement model untuk mengetahui berat beban yang akan ditambahkan pada model, ditentukan dengan persamaan sebagai berikut:

$$\Delta m = \rho_m \frac{\Delta k}{\lambda_3}$$

Keterangan:

Δm = Displacement model (kg)

ρ_m = Massa jenis air tawar, 1000 kg/m³

ρ_s = Massa jenis air laut, 1025 kg/m³

Δk = Displacement kapal

λ_3 = Faktor skala

Dari persamaan ini didapatkan nilai tiap displacement model kapal, sebagai



Displacement kapal 846,300 ton

$$\Delta m = \frac{1000 \text{ kg/m}^3}{1025 \text{ kg/m}^3} \frac{846,300 \text{ ton}}{27000} \times$$

$$\Delta m = 0,0306 \text{ ton}$$

$$\Delta m = 30,580 \text{ kg}$$

○ Untuk mengetahui berat beban yang akan ditambahkan pada model agar mencapai sarat model kapal maka terlebih dahulu model kapal harus ditimbang.

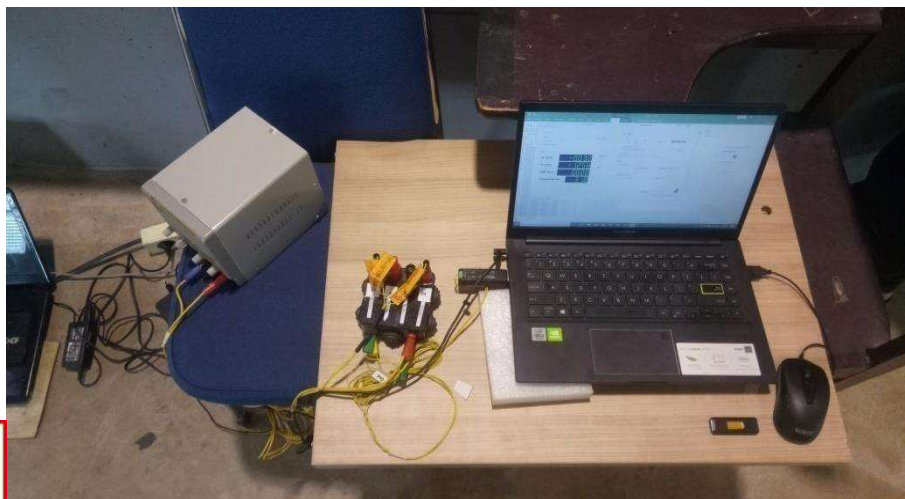
a. Displacement model 30,580 kg

Berat beban = 30,580 kg – 7,6 kg

Berat beban = 22,980 kg

Catatan : Sebelum melakukan pengujian peletakan beban perlu diatur agar sarat 62cena dan buritan model kapal sama.

Selanjutnya dilakukan *Inclining Test* dengan menggunakan alat-alat seperti *Inclinometer Digital (Solar-2 : Dual Axis Inclinometer)* yang memiliki kemampuan mengukur besaran sudut luruh (*decay*) yang terjadi pada model kapal selama pengujian secara akurat.



Alat ini akan dirangkai pada model kapal yang akan dites,selanjutnya lakukan proses *inclining test* pada model dengan cara mengatur beban pada kondisi tiap kondisi displacement yang akan di test.

Lampiran 3. *Roll decay test*

Berikut ini hasil percobaan *roll decay test* tiap displacement pada kondisi air tenang dalam bentuk kurva sudut *rolling* terhadap waktu.

Tabel Hasil percobaan *roll decay* pada skenario kecoboran 1 kemiringan 5°

No.	Run Time	Percobaan		
		1	2	3
1	00:00.0	-5.16	-5.411	-5.45
2	00:00.1	-4.666	-4.843	-4.712
3	00:00.2	-3.223	-3.746	-3.758
4	00:00.3	-1.869	-3.138	-1.89
5	00:00.4	1.743	0.889	2.61
6	00:00.5	5.562	6.035	7.738
7	00:00.6	8.022	9.762	10.978
8	00:00.7	8.262	10.314	10.266
9	00:00.8	6.621	7.632	6.423
10	00:00.9	4.189	3.632	2.174
11	00:01.0	2.511	0.906	0.098
12	00:01.1	2.517	0.898	1.094
13	00:01.2	4.071	3.377	4.367
14	00:01.3	5.071	6.47	7.507
15	00:01.4	7.384	8.691	9.146
16	00:01.5	6.884	8.597	8.189
17	00:01.6	6.171	6.411	5.465
18	00:01.7	5.248	3.712	2.92
19	00:01.8	4.112	2.152	1.893
20	00:01.9	3.236	2.374	2.755
21	00:02.0	3.515	4.225	4.926
22	00:02.1	4.616	6.434	6.922
23	00:02.2	6.08	7.701	7.663
24	00:02.3	6.734	7.435	6.814
25	00:02.4	6.47	5.82	5.034
	00:02.5	5.417	3.974	3.642
	00:02.6	4.305	2.976	3.099
	00:02.7	3.765	3.252	3.726
	00:02.8	4.049	4.658	5.098



30	00:02.9	4.965	6.238	6.297
31	00:03.0	5.912	7.024	6.659
32	00:03.1	6.322	6.715	6.046
33	00:03.2	5.988	5.483	4.944
34	00:03.3	5.177	4.165	4.134
35	00:03.4	4.438	3.522	3.895
36	00:03.5	4.17	3.853	4.376
37	00:03.6	4.504	4.928	5.232
38	00:03.7	5.183	6.034	5.907
39	00:03.8	5.741	6.552	6.032
40	00:03.9	5.938	6.174	5.571
41	00:04.0	5.638	6.174	4.885
42	00:04.1	5.085	5.225	4.39
43	00:04.2	4.636	4.306	4.36
44	00:04.3	4.535	3.935	4.775
45	00:04.4	4.804	4.268	5.349
46	00:04.5	5.255	5.106	5.7
47	00:04.6	5.59	5.898	5.644
48	00:04.7	5.631	6.171	5.272
49	00:04.8	5.369	5.794	4.861
50	00:04.9	5.049	5.074	4.636
51	00:05.0	4.817	4.475	4.72
52	00:05.2	4.81	4.324	5.064
53	00:05.3	5	4.685	5.412
54	00:05.4	5.27	5.292	5.527
55	00:05.5	5.439	5.744	5.368
56	00:05.6	5.424	5.814	5.056
57	00:05.6	5.255	5.49	4.809
58	00:05.7	5.044	5.016	4.777
59	00:05.8	4.936	4.668	4.777
60	00:05.9	4.961	4.642	4.975
61	00:06.0	5.102	4.902	5.267
62	00:06.1	5.28	5.292	5.457
63	00:06.2	5.379	5.567	5.404
64	00:06.3	5.33	5.578	5.157
65	00:06.4	5.179	5.343	4.914
66	00:06.5	5.179	5.053	4.842
67	00:06.6	5.022	4.835	4.942
68	00:06.7	4.963	4.819	5.128
69	00:06.8	5.043	4.995	5.279
	00:06.9	5.206	5.259	5.312
	00:07.0	5.345	5.445	5.23
	00:07.1	5.376	5.443	5.1
	00:07.2	5.284	5.274	5.024



74	00:07.3	5.137	5.058	5.037
75	00:07.4	4.997	4.924	5.115
76	00:07.5	4.966	4.95	5.182
77	00:07.6	5.063	5.099	5.187
78	00:07.7	5.226	5.273	5.136
79	00:07.8	5.349	5.374	5.087
80	00:07.9	5.372	5.35	5.082
81	00:08.0	5.289	5.215	5.127
82	00:08.1	5.141	5.064	5.169
83	00:08.2	5.021	4.988	5.196
84	00:08.3	5.004	5.037	5.202
85	00:08.4	5.088	5.158	5.172
86	00:08.5	5.232	5.266	5.115
87	00:08.6	5.323	5.299	5.05
88	00:08.7	5.334	5.244	5.021
89	00:08.8	5.247	5.149	5.052
90	00:08.9	5.126	5.09	5.157
91	00:09.0	5.047	5.102	5.272
92	00:09.1	5.057	5.17	5.328
93	00:09.2	5.155	5.17	5.285
94	00:09.3	5.282	5.237	5.123
95	00:09.4	5.343	5.247	4.959
96	00:09.5	5.301	5.2	4.889
97	00:09.6	5.168	5.139	4.972
98	00:09.7	5.044	5.096	5.167
99	00:09.8	5.012	5.095	5.386
100	00:09.9	5.104	5.151	5.461
101	00:10.0	5.251	5.233	5.338
102	00:10.1	5.374	5.29	5.08
103	00:10.2	5.39	5.285	4.858
104	00:10.4	5.276	5.219	4.833
105	00:10.5	5.104	5.135	5.026
106	00:10.6	4.982	5.076	5.296
107	00:10.7	4.988	5.063	5.472
108	00:10.8	5.122	5.12	5.443
109	00:10.8	5.288	5.214	5.225
110	00:10.9	5.397	5.289	4.959
111	00:11.0	5.382	5.297	4.959
112	00:11.1	5.271	5.244	4.982
113	00:11.2	5.129	5.15	4.988
	00:11.3	5.05	5.103	5.122
	00:11.4	5.058	5.11	5.288
	00:11.5	5.137	5.157	5.397
	00:11.6	5.137	5.213	5.382



118	00:11.7	5.238	5.242	5.271
119	00:11.8	5.308	5.235	5.129
120	00:11.9	5.317	5.216	5.05
121	00:12.0	5.263	5.192	5.058
122	00:12.1	5.185	5.173	5.137
123	00:12.2	5.122	5.163	5.137
124	00:12.3	5.106	5.153	5.238
125	00:12.4	5.144	5.159	5.308
126	00:12.5	5.212	5.188	5.317
127	00:12.6	5.276	5.238	5.263
128	00:12.7	5.288	5.273	5.185
129	00:12.8	5.253	5.257	5.122
130	00:12.9	5.196	5.186	5.106
131	00:13.0	5.148	5.106	5.144
132	00:13.1	5.128	5.074	5.212
133	00:13.2	5.164	5.129	5.276
134	00:13.3	5.213	5.245	5.288
135	00:13.4	5.272	5.333	5.253
136	00:13.5	5.299	5.322	5.196
137	00:13.6	5.278	5.225	5.148
138	00:13.7	5.221	5.115	5.128
139	00:13.8	5.15	5.068	5.164
140	00:13.9	5.115	5.109	5.213
141	00:14.0	5.13	5.204	5.272
142	00:14.1	5.196	5.284	5.299
143	00:14.2	5.277	5.303	5.278
144	00:14.3	5.322	5.303	5.221
145	00:14.4	5.313	5.266	5.15
146	00:14.5	5.245	5.208	5.115
147	00:14.6	5.159	5.156	5.13
148	00:14.7	5.1	5.141	5.196
149	00:14.8	5.114	5.156	5.277
150	00:14.9	5.202	5.187	5.322
151	00:15.0	5.297	5.223	4.959
152	00:15.1	5.35	5.247	4.959
153	00:15.2	5.319	5.267	4.982
154	00:15.3	5.231	5.243	4.988
155	00:15.4	5.125	5.203	5.122
156	00:15.6	5.097	5.163	5.288
157	00:15.7	5.142	5.155	5.397
158	00:15.8	5.243	5.177	5.382
159	00:15.9	5.325	5.229	5.271
160	00:15.9	5.345	5.267	5.129
161	00:16.0	5.307	5.267	5.05



162	00:16.1	5.22	5.216	5.058
163	00:16.2	5.144	5.152	5.137
164	00:16.3	5.106	5.123	5.137
165	00:16.4	5.136	5.167	5.238
166	00:16.5	5.216	5.258	5.308
167	00:16.6	5.303	5.334	5.317
168	00:16.7	5.354	5.341	5.263
169	00:16.8	5.32	5.259	5.185
170	00:16.9	5.235	5.131	5.122
171	00:17.0	5.16	5.053	5.106
172	00:17.1	5.13	5.08	5.144
173	00:17.2	5.168	5.199	5.212
174	00:17.3	5.168	5.326	5.276
175	00:17.4	5.245	5.377	5.288
176	00:17.5	5.294	5.331	5.253
177	00:17.6	5.3	5.216	5.196
178	00:17.7	5.264	5.132	5.148
179	00:17.8	5.215	5.112	5.128
180	00:17.9	5.188	5.165	5.164
181	00:18.0	5.195	5.234	5.213
182	00:18.1	5.236	5.28	5.272
183	00:18.2	5.274	5.273	5.299
184	00:18.3	5.278	5.236	5.278
185	00:18.4	5.26	5.202	5.221
186	00:18.5	5.239	5.188	5.15
187	00:18.6	5.225	5.191	5.115
188	00:18.7	5.219	5.227	5.13
189	00:18.8	5.222	5.268	5.196
190	00:18.9	5.219	5.294	5.277
191	00:19.0	5.23	5.276	5.322
192	00:19.1	5.16	5.22	4.959
193	00:19.2	5.13	5.169	4.959
194	00:19.3	5.168	5.145	4.982
195	00:19.4	5.168	5.157	4.988
196	00:19.5	5.245	5.157	5.122
197	00:19.6	5.294	5.219	5.288
198	00:19.7	5.3	5.297	5.397
199	00:19.8	5.264	5.34	5.382
200	00:19.9	5.215	5.319	5.271
201	00:20.0	5.168	5.253	5.129

hasil data



Tabel Hasil percobaan *roll decay* pada skenario kecoboran 1 kemiringan 10°

No.	Run Time	percobaan		
		1	2	3
1	00:00.0	11.407	11.522	11.601
2	00:00.2	10.788	11.029	9.453
3	00:00.2	8.597	9.111	8.927
4	00:00.3	4.926	5.491	7.367
5	00:00.4	2.016	2.288	4.86
6	00:00.5	1.374	1.37	2.99
7	00:00.6	3.136	3.026	2.712
8	00:00.7	5.917	6.111	2.709
9	00:00.8	8.384	8.546	4.03
10	00:00.9	8.927	9.264	6.138
11	00:01.0	7.367	7.711	7.757
12	00:01.1	4.86	5.103	7.979
13	00:01.2	2.99	3.078	6.781
14	00:01.3	2.712	2.709	5.03
15	00:01.4	2.712	4.03	3.811
16	00:01.5	3.997	6.138	3.626
17	00:01.6	5.997	7.757	4.551
18	00:01.7	7.482	7.979	5.911
19	00:01.8	7.651	6.781	6.86
20	00:01.9	6.488	5.03	6.885
21	00:02.0	4.854	3.811	6.033
22	00:02.1	3.79	3.626	4.933
23	00:02.2	3.633	4.558	4.234
24	00:02.3	4.551	6.068	4.265
25	00:02.4	5.911	7.183	4.955
26	00:02.5	6.86	7.264	5.858
27	00:02.6	6.885	6.331	6.426
28	00:02.7	6.033	5.055	6.341
29	00:02.8	4.933	4.208	5.718
30	00:02.9	4.234	4.249	5.159
31	00:03.0	4.265	5.064	4.677
32	00:03.1	4.955	6.11	4.784
33	00:03.2	5.858	6.737	5.331
34	00:03.3	6.426	6.621	5.956
35	00:03.4	6.341	5.914	6.3
	00:03.5	5.718	5.159	6.186
	00:03.6	5.007	4.677	5.864
	00:03.7	4.625	4.784	5.437
	00:03.8	4.786	5.331	5.04
	00:03.9	5.335	5.956	4.935



41	00:04.0	5.875	6.3	5.161
42	00:04.1	6.093	6.186	5.525
43	00:04.2	5.864	5.725	5.791
44	00:04.3	5.437	5.725	5.804
45	00:04.4	5.04	5.267	5.864
46	00:04.5	4.935	5.012	5.437
47	00:04.7	5.161	5.141	5.04
48	00:04.8	5.525	5.517	4.935
49	00:04.9	5.791	5.882	5.161
50	00:05.0	5.804	6.031	5.525
51	00:05.1	5.597	5.879	5.791
52	00:05.2	5.334	5.864	5.804
53	00:05.2	5.169	5.437	5.473
54	00:05.3	5.189	5.04	5.473
55	00:05.4	5.349	4.935	5.371
56	00:05.5	5.527	5.161	5.322
57	00:05.6	5.644	5.525	5.345
58	00:05.7	5.623	5.791	5.416
59	00:05.8	5.508	5.804	5.511
60	00:05.9	5.379	5.864	5.575
61	00:06.0	5.308	5.437	5.576
62	00:06.1	5.322	5.04	5.513
63	00:06.2	5.394	4.935	5.414
64	00:06.3	5.499	5.161	5.317
65	00:06.4	5.561	5.525	5.283
66	00:06.5	5.561	5.791	5.342
67	00:06.6	5.473	5.804	5.474
68	00:06.7	5.473	5.491	5.599
69	00:06.8	5.371	5.371	5.639
70	00:06.9	5.322	5.391	5.56
71	00:07.0	5.345	5.526	5.638
72	00:07.1	5.416	5.667	5.672
73	00:07.2	5.511	5.736	5.659
74	00:07.3	5.575	5.693	5.591
75	00:07.4	5.576	5.587	5.513
76	00:07.5	5.513	5.489	5.465
77	00:07.6	5.414	5.45	5.48
78	00:07.7	5.317	5.493	5.554
79	00:07.8	5.283	5.566	5.631
80	00:07.9	5.342	5.638	5.679
	00:08.0	5.474	5.672	5.654
	00:08.1	5.599	5.659	5.592
	00:08.2	5.639	5.591	5.506
	00:08.3	5.56	5.513	5.533



85	00:08.4	5.412	5.465	5.461
86	00:08.5	5.298	5.48	5.391
87	00:08.6	5.282	5.554	5.357
88	00:08.7	5.379	5.631	5.39
89	00:08.8	5.515	5.679	5.477
90	00:08.9	5.594	5.654	5.547
91	00:09.0	5.577	5.592	5.548
92	00:09.1	5.496	5.506	5.486
93	00:09.2	5.39	5.478	5.413
94	00:09.3	5.322	5.501	5.386
95	00:09.4	5.336	5.568	5.386
96	00:09.5	5.436	5.627	5.407
97	00:09.6	5.556	5.627	5.471
98	00:09.7	5.606	5.644	5.522
99	00:09.8	5.562	5.616	5.544
100	00:10.0	5.445	5.575	5.502
101	00:10.1	5.35	5.539	5.426
102	00:10.2	5.322	5.525	5.378
103	00:10.3	5.382	5.536	5.385
104	00:10.4	5.467	5.546	5.444
105	00:10.5	5.542	5.56	5.513
106	00:10.5	5.568	5.578	5.543
107	00:10.6	5.533	5.605	5.516
108	00:10.7	5.461	5.616	5.578
109	00:10.8	5.391	5.598	5.622
110	00:10.9	5.357	5.561	5.614
111	00:11.0	5.39	5.518	5.582
112	00:11.1	5.477	5.511	5.548
113	00:11.2	5.547	5.532	5.526
114	00:11.3	5.548	5.578	5.538
115	00:11.4	5.486	5.622	5.561
116	00:11.5	5.413	5.614	5.582
117	00:11.6	5.386	5.582	5.599
118	00:11.7	5.386	5.548	5.594
119	00:11.8	5.407	5.526	5.566
120	00:11.9	5.471	5.538	5.549
121	00:12.0	5.522	5.561	5.542
122	00:12.1	5.544	5.582	5.55
123	00:12.2	5.502	5.599	5.559
124	00:12.3	5.426	5.594	5.571
125	00:12.4	5.378	5.566	5.512
126	00:12.5	5.385	5.549	5.421
127	00:12.6	5.444	5.542	5.347
128	00:12.7	5.513	5.55	5.344



129	00:12.8	5.543	5.559	5.425
130	00:12.9	5.516	5.571	5.534
131	00:13.0	5.464	5.571	5.595
132	00:13.1	5.417	5.576	5.566
133	00:13.2	5.426	5.588	5.535
134	00:13.3	5.467	5.588	5.524
135	00:13.4	5.504	5.578	5.536
136	00:13.5	5.488	5.557	5.566
137	00:13.6	5.436	5.535	5.598
138	00:13.7	5.399	5.524	5.62
139	00:13.8	5.425	5.536	5.612
140	00:13.9	5.498	5.566	5.573
141	00:14.0	5.557	5.598	5.523
142	00:14.1	5.572	5.62	5.444
143	00:14.2	5.512	5.612	5.513
144	00:14.3	5.421	5.573	5.543
145	00:14.4	5.347	5.523	5.516
146	00:14.5	5.344	5.493	5.464
147	00:14.6	5.425	5.503	5.417
148	00:14.7	5.534	5.562	5.426

Sumber : olahan hasil

Tabel Hasil percobaan *roll decay* pada skenario kecoboran 2 kemiringan 2°

No.	Run Time	Percobaan		
		1	2	3
1	00:00.0	-2.834	-2.276	-2.105
2	00:00.1	-1.622	-1.575	-1.768
3	00:00.2	0.343	-0.444	-1.768
4	00:00.3	1.925	0.933	-0.401
5	00:00.4	1.906	1.768	1.139
6	00:00.5	1.689	1.768	1.548
7	00:00.6	0	1.622	1.216
8	00:00.7	-1.583	0.621	0.407
9	00:00.8	-2.204	-0.621	-0.913
10	00:00.9	-1.571	-1.401	-1.597
11	00:01.0	-0.123	-1.278	-1.298
12	00:01.1	1.245	-0.39	-0.254
13	00:01.2	1.7	0.739	0.891
	00:01.3	1.645	1.434	1.267
	00:01.4	0.428	1.323	1.066
	00:01.5	-0.946	0.515	0.394
	00:01.6	-1.721	-0.495	-0.601
	00:01.7	-1.516	-1.107	-1.154



19	00:01.8	-0.478	-1	-0.997
20	00:01.9	0.794	-0.337	-0.274
21	00:02.0	1.594	0.561	0.584
22	00:02.1	1.511	1.147	1.089
23	00:02.2	0.621	1.095	0.99
24	00:02.3	-0.543	0.461	0.383
25	00:02.4	-1.302	-0.347	-0.362
26	00:02.5	-1.379	-0.857	-0.834
27	00:02.7	-0.687	-0.798	-0.819
28	00:02.8	0.368	-0.225	-0.345
29	00:02.9	1.193	0.497	0.326
30	00:03.0	1.355	0.935	0.819
31	00:03.1	0.791	0.903	0.865
32	00:03.2	-0.145	0.399	0.467
33	00:03.3	-0.943	-0.265	-0.147
34	00:03.4	-1.17	-0.692	-0.622
35	00:03.5	-0.79	-0.639	-0.695
36	00:03.6	0.023	-0.17	-0.345
37	00:03.7	0.814	0.423	0.214
38	00:03.8	1.143	0.798	0.672
39	00:03.8	0.859	0.735	0.758
40	00:03.9	0.153	0.311	0.483
41	00:04.0	-0.582	-0.225	-0.031
42	00:04.1	-0.939	-0.548	-0.481
43	00:04.2	-0.761	-0.498	-0.611
44	00:04.3	-0.169	-0.111	-0.359
45	00:04.4	-0.169	0.332	0.12
46	00:04.5	0.901	0.651	0.546
47	00:04.6	0.901	0.639	0.677
48	00:04.7	0.803	0.315	0.46
49	00:04.8	0.351	-0.131	0.024
50	00:04.9	-0.258	-0.436	-0.374
51	00:05.0	-0.676	-0.434	-0.51
52	00:05.1	-0.688	-0.134	-0.347
53	00:05.2	-0.307	0.275	0.067
54	00:05.3	0.235	0.572	0.067
55	00:05.4	0.643	0.582	0.398
56	00:05.5	0.705	0.312	0.553
57	00:05.6	0.409	0.312	0.421
58	00:05.7	-0.06	-0.053	0.106
	00:05.8	-0.449	-0.353	-0.208
	00:05.9	-0.552	-0.405	-0.35
	00:06.0	-0.357	-0.181	-0.256
	00:06.1	0.043	0.185	0



63	00:06.2	0.423	0.48	0.262
64	00:06.3	0.571	0.549	0.39
65	00:06.4	0.437	0.349	0.339
66	00:06.5	0.098	0.008	0.147
67	00:06.6	-0.255	-0.274	-0.078
68	00:06.7	-0.431	-0.344	-0.211
69	00:06.8	-0.35	-0.178	-0.21
70	00:06.9	-0.058	0.107	-0.07
71	00:07.0	0.266	0.383	0.14
72	00:07.1	0.468	0.475	0.303
73	00:07.2	0.43	0.352	0.347
74	00:07.3	0.184	0.072	0.235
75	00:07.4	-0.129	-0.187	0.019
76	00:07.5	-0.338	-0.293	-0.162
77	00:07.6	-0.337	-0.177	-0.237
78	00:07.7	-0.145	0.069	-0.141
79	00:07.9	0.146	0.304	0.064
80	00:08.0	0.376	0.427	0.244
81	00:08.1	0.419	0.348	0.368
82	00:08.2	0.259	0.122	0.368
83	00:08.3	-0.011	-0.125	0.308
84	00:08.4	-0.242	-0.252	0.094
85	00:08.5	-0.315	-0.188	-0.137
86	00:08.6	-0.204	0.011	-0.276
87	00:08.7	0.042	0.257	-0.237
88	00:08.8	0.282	0.392	-0.023
89	00:08.9	0.388	0.352	0.226
90	00:08.9	0.302	0.169	0.371
91	00:09.0	0.068	-0.062	0.323
92	00:09.1	-0.172	-0.209	0.121
93	00:09.2	-0.287	-0.188	-0.121
94	00:09.3	-0.21	-0.022	-0.268
95	00:09.4	0.012	0.189	-0.226
96	00:09.5	0.244	0.334	-0.021
97	00:09.6	0.368	0.331	0.203
98	00:09.7	0.368	0.185	0.331
99	00:09.8	0.308	-0.013	0.307
100	00:09.9	0.094	-0.155	0.134
101	00:10.0	-0.137	-0.183	-0.077
102	00:10.1	-0.276	-0.057	-0.209
3	00:10.2	-0.237	0.145	-0.204
4	00:10.3	-0.023	0.293	-0.054
5	00:10.4	0.226	0.322	0.148
6	00:10.5	0.371	0.2	0.285



107	00:10.6	0.323	0	0.286
108	00:10.7	0.121	0	0.15
109	00:10.8	-0.121	-0.145	-0.02
110	00:10.9	-0.268	-0.034	-0.165
111	00:11.0	-0.226	-0.034	-0.187
112	00:11.1	-0.021	0.149	-0.075
113	00:11.2	0.203	0.274	0.093
114	00:11.3	0.331	0.279	0.23
115	00:11.4	0.307	0.164	0.261
116	00:11.5	0.134	0	0.169
117	00:11.6	-0.077	-0.108	0.024
118	00:11.7	-0.209	-0.107	-0.109
119	00:11.8	-0.204	-0.015	-0.15
120	00:11.9	-0.054	0.123	-0.101
121	00:12.0	0.148	0.222	0.027
122	00:12.1	0.285	0.232	0.162
123	00:12.2	0.286	0.151	0.234
124	00:12.3	0.15	0.033	0.202
125	00:12.4	-0.02	-0.06	0.082
126	00:12.5	-0.165	-0.071	-0.053
127	00:12.6	-0.187	0.002	-0.13
128	00:12.7	-0.075	0.109	-0.109
129	00:12.8	0.093	0.193	-0.006
130	00:12.9	0.23	0.261	0.119
131	00:13.0	0.261	0.169	0.119
132	00:13.1	0.169	0.024	0.2
133	00:13.2	0.024	-0.109	0.197
134	00:13.4	-0.109	-0.15	0.115
135	00:13.5	-0.15	-0.101	0.005
136	00:13.6	-0.101	0.027	-0.094
137	00:13.7	0.027	0.162	-0.111
138	00:13.8	0.162	0.234	-0.041
139	00:13.9	0.234	0.202	0.061
140	00:14.0	0.202	0.082	0.159
141	00:14.0	0.082	-0.053	0.197
142	00:14.1	-0.053	-0.13	0.152
143	00:14.3	-0.13	-0.109	0.052
144	00:14.3	-0.109	-0.006	-0.055
145	00:14.4	-0.006	0.119	-0.107
146	00:14.5	0.119	0.119	-0.086
147	00:14.6	0.119	0.2	0.016
148	00:14.7	0.2	0.197	0.118
149	00:14.8	0.197	0.115	0.203
150	00:14.9	0.115	0.005	0.193



151	00:15.0	0.005	-0.094	0.105
152	00:15.1	-0.094	-0.111	-0.018
153	00:15.2	-0.111	-0.041	-0.103
154	00:15.3	-0.041	0.061	-0.107
155	00:15.4	0.061	0.159	-0.033
156	00:15.5	0.159	0.197	0.082
157	00:15.6	0.197	0.152	0.182
158	00:15.7	0.152	0.052	0.204
159	00:15.8	0.052	-0.055	0.147
160	00:15.9	-0.055	-0.107	0.039
161	00:16.0	-0.107	-0.086	-0.065
162	00:16.1	-0.086	0.016	-0.119
163	00:16.2	0.016	0.118	-0.077
164	00:16.3	0.118	0.203	0.029
165	00:16.4	0.203	0.193	0.141
166	00:16.5	0.193	0.105	0.199
167	00:16.6	0.105	-0.018	0.18
168	00:16.7	-0.018	-0.103	0.08
169	00:16.8	-0.103	-0.107	-0.024
170	00:16.9	-0.107	-0.033	-0.094
171	00:17.0	-0.033	0.082	-0.086
172	00:17.1	0.082	0.182	-0.015
173	00:17.2	0.182	0.204	0.081
174	00:17.3	0.204	0.147	0.155
175	00:17.4	0.147	0.039	0.162
176	00:17.5	0.039	-0.065	0.11
177	00:17.6	-0.065	-0.119	0.033
178	00:17.7	-0.119	-0.077	-0.027
179	00:17.8	-0.077	0.029	-0.048
180	00:17.9	0.029	0.141	-0.023
181	00:18.0	0.141	0.199	0.028
182	00:18.1	0.199	0.18	0.075
183	00:18.2	0.18	0.08	0.108
184	00:18.3	0.08	-0.024	0.109
185	00:18.5	-0.024	-0.094	0.083
186	00:18.6	-0.094	-0.086	0.044
187	00:18.7	-0.086	-0.015	0.044
188	00:18.8	-0.015	0.081	0.015
189	00:18.9	0.081	0.155	0.001
190	00:19.0	0.155	0.162	0.004
191	00:19.1	0.162	0.11	0.028
192	00:19.2	0.11	0.033	0.05
193	00:19.3	0.033	-0.027	0.069
194	00:19.3	-0.027	-0.048	0.079



195	00:19.4	-0.048	-0.023	0.074
196	00:19.5	-0.023	0.028	0.045
197	00:19.6	0.028	0.075	0.016
198	00:19.7	0.075	0.108	0.006
199	00:19.8	0.108	0.109	0.023
200	00:19.9	0.109	0.083	0.058
201	00:20.0	0.083	0.044	0.077
202	00:20.1	0.044	0.044	0.08
203	00:20.2	0.044	0.015	0.06
204	00:20.3	0.015	0.001	0.027
205	00:20.4	0.001	0.004	-0.003
206	00:20.5	0.004	0.028	0.077
207	00:20.6	0.028	0.05	0.08
208	00:20.7	0.05	0.069	0.06
209	00:20.8	0.069	0.079	0.027
210	00:20.9	0.079	0.074	-0.003
211	00:21.0	0.074	0.045	0.077
212	00:21.1	0.045	0.016	0.08
213	00:21.2	0.016	0.006	0.06
214	00:21.3	0.006	0.023	0.027
215	00:21.4	0.023	0.058	0.06
216	00:21.5	0.058	0.077	0.027
217	00:21.6	0.077	0.08	-0.003
218	00:21.7	0.08	0.06	0.077
219	00:21.8	0.06	0.027	0.08
220	00:21.9	0.027	-0.003	0.06
221	00:22.0	-0.003	0.006	0.027
222	00:22.1	0	0.023	-0.003
223	00:22.2	0.022	0.058	0.077
224	00:22.3	0.058	0.077	0.08
225	00:22.4	0.087	0.08	0.022
226	00:22.5	0.098	0.06	0.058
227	00:22.6	0.077	0.027	0.02

Sumber : olahan hasil

Tabel Hasil percobaan *roll decay* pada skenario kecoboran 3 kemiringan 3°

No.	Run Time	Percobaan		
		1	2	3
1	00:00.0	3.6	3.501	3.782
	00:00.1	2.659	2.659	3.181
	00:00.2	0.821	0.821	1.592
	00:00.3	-0.75	-0.363	-0.201
	00:00.4	-0.839	-0.937	-0.816



6	00:00.5	-0.326	-0.656	-0.503
7	00:00.6	1.343	-0.499	0.304
8	00:00.7	2.68	-0.237	1.881
9	00:00.8	2.78	-0.078	2.832
10	00:00.9	2.126	2.176	2.648
11	00:01.0	0.663	2.792	1.418
12	00:01.1	-0.461	2.503	-0.001
13	00:01.2	-0.161	2.189	-0.58
14	00:01.3	0.154	1.6511	-0.49
15	00:01.4	1.409	0.821	0.679
16	00:01.5	2.336	-0.65	1.846
17	00:01.6	2.469	-0.656	2.503
18	00:01.7	1.748	-0.499	2.189
19	00:01.8	0.66	-0.126	1.145
20	00:01.9	-0.118	0.679	0.089
21	00:02.0	-0.118	1.846	-0.36
22	00:02.1	-0.177	2.503	0.017
23	00:02.2	0.482	2.189	0.927
24	00:02.3	1.383	1.748	0.927
25	00:02.4	2.017	1.145	1.78
26	00:02.5	2.047	0.66	2.09
27	00:02.7	1.473	0.089	1.742
28	00:02.8	0.699	-0.36	0.964
29	00:02.9	0.162	0.017	0.285
30	00:03.0	0.16	0.927	0.07
31	00:03.1	0.632	0.927	0.43
32	00:03.1	1.332	1.78	1.057
33	00:03.2	1.835	2.09	1.583
34	00:03.3	1.841	1.748	1.719
35	00:03.4	1.35	0.66	1.408
36	00:03.5	0.698	-0.118	0.934
37	00:03.6	0.294	-0.118	0.493
38	00:03.7	0.372	-0.177	0.374
39	00:03.8	0.875	0.162	0.629
40	00:03.9	1.416	0.632	1.084
41	00:04.0	1.762	1.332	1.469
42	00:04.1	1.645	1.835	1.554
43	00:04.2	1.165	1.841	1.284
44	00:04.3	0.645	1.35	0.86
45	00:04.4	0.412	0.934	0.544
	00:04.5	0.592	0.493	0.542
	00:04.6	1.06	0.374	0.836
	00:04.7	1.493	0.629	1.223
	00:04.8	1.648	1.084	1.45



50	00:04.9	1.436	1.469	1.403
51	00:05.0	1.013	1.554	1.097
52	00:05.1	0.679	1.284	0.769
53	00:05.2	0.567	0.86	0.639
54	00:05.3	0.772	0.544	0.781
55	00:05.4	1.133	0.542	1.071
56	00:05.5	1.43	0.836	1.296
57	00:05.6	1.519	1.223	1.327
58	00:05.7	1.341	1.341	1.136
59	00:05.8	1.026	1.026	0.902
60	00:05.9	0.757	0.757	0.753
61	00:06.0	0.693	0.693	0.831
62	00:06.1	0.871	0.871	1.057
63	00:06.2	1.179	1.179	1.266
64	00:06.3	1.41	1.41	1.296
65	00:06.4	1.45	1.45	1.138
66	00:06.5	1.281	1.281	0.926
67	00:06.6	0.997	0.997	0.78
68	00:06.7	0.786	0.786	0.824
69	00:06.8	0.78	0.78	1.026
70	00:06.9	0.98	0.98	1.254
71	00:07.0	1.247	1.247	1.34
72	00:07.1	1.247	1.247	1.222
73	00:07.2	1.404	1.404	0.986
74	00:07.3	1.374	1.374	0.803
75	00:07.4	1.173	1.173	0.8
76	00:07.5	0.938	0.938	0.964
77	00:07.6	0.816	0.816	1.187
78	00:07.7	0.876	0.876	1.318
79	00:07.8	1.077	1.077	1.318
80	00:07.9	1.292	1.292	1.129
81	00:08.1	1.378	1.378	1.129
82	00:08.2	1.317	1.317	0.929
83	00:08.3	1.134	1.134	0.825
84	00:08.3	0.946	0.926	0.873
85	00:08.4	0.871	0.78	1.027
86	00:08.5	0.952	0.824	1.198
87	00:08.6	1.126	1.026	1.303
88	00:08.7	1.284	1.254	1.282
89	00:08.8	1.342	1.34	1.156
	00:08.9	1.267	1.222	0.983
	00:09.0	1.115	0.986	0.868
	00:09.1	0.98	0.803	0.882
	00:09.2	0.925	0.8	1.011



94	00:09.3	0.996	0.964	1.187
95	00:09.4	1.155	1.187	1.305
96	00:09.5	1.285	1.318	1.3
97	00:09.6	1.316	1.318	1.18
98	00:09.7	1.24	1.129	1.023
99	00:09.8	1.096	1.129	0.9
100	00:09.9	0.99	0.929	0.88
101	00:10.0	0.968	0.825	0.986
102	00:10.1	1.063	0.873	1.285
103	00:10.2	1.21	1.027	1.316
104	00:10.3	1.304	1.198	1.24
105	00:10.4	1.294	1.303	1.096
106	00:10.5	1.184	1.282	0.99
107	00:10.6	1.058	1.156	0.968
108	00:10.7	1.003	0.983	1.063
109	00:10.8	1.03	1.155	1.21
110	00:10.9	1.127	1.285	1.304
111	00:11.0	1.217	1.316	1.294
112	00:11.1	1.276	1.24	1.184
113	00:11.2	1.269	1.096	1.058
114	00:11.3	1.196	0.99	1.003
115	00:11.4	1.096	0.968	1.03
116	00:11.5	1.036	1.063	1.127
117	00:11.6	1.06	1.21	1.217
118	00:11.7	1.15	1.304	1.276
119	00:11.8	1.241	1.294	1.269
120	00:11.9	1.269	1.184	1.196
121	00:12.0	1.218	1.058	1.096
122	00:12.1	1.137	1.003	1.036
123	00:12.2	1.083	1.03	1.06
124	00:12.3	1.092	1.127	1.15
125	00:12.4	1.15	1.217	1.241
126	00:12.5	1.206	1.276	1.269
127	00:12.6	1.206	1.269	1.218
128	00:12.7	1.224	1.196	1.137
129	00:12.8	1.203	1.217	1.083
130	00:12.9	1.181	1.276	1.092
131	00:13.0	1.162	1.269	1.15
132	00:13.1	1.152	1.196	1.206
133	00:13.3	1.148	1.096	1.206
134	00:13.3	1.144	1.036	1.224
135	00:13.5	1.167	1.06	1.203
136	00:13.6	1.193	1.15	1.181
137	00:13.6	1.217	1.241	1.162



138	00:13.7	1.215	1.269	1.152
139	00:13.8	1.182	1.218	1.148
140	00:13.9	1.152	1.137	1.144
141	00:14.0	1.146	1.083	1.167
142	00:14.1	1.171	1.092	1.193
143	00:14.2	1.199	1.15	1.217
144	00:14.3	1.223	1.206	1.215
145	00:14.4	1.219	1.206	1.182
146	00:14.5	1.197	1.224	1.152
147	00:14.6	1.17	1.152	1.146
148	00:14.7	1.151	1.146	1.171
149	00:14.8	1.154	1.171	1.199
150	00:14.9	1.186	1.199	1.223
151	00:15.0	1.216	1.223	1.219
152	00:15.1	1.231	1.219	1.197
153	00:15.2	1.219	1.197	1.17
154	00:15.3	1.213	1.17	1.151
155	00:15.4	1.211	1.151	1.154
156	00:15.5	1.197	1.154	1.186
157	00:15.6	1.186	1.186	1.216
158	00:15.7	1.168	1.216	1.231
159	00:15.8	1.162	1.231	1.219
160	00:15.9	1.183	1.219	1.213
161	00:16.0	1.222	1.17	1.211
162	00:16.1	1.256	1.151	1.197
163	00:16.2	1.258	1.154	1.186
164	00:16.3	1.229	1.186	1.168
165	00:16.4	1.182	1.216	1.162
166	00:16.5	1.169	1.231	1.183
167	00:16.6	1.183	1.219	1.181
168	00:16.7	1.152	1.213	1.162
169	00:16.8	1.146	1.211	1.152
170	00:16.9	1.171	1.197	1.148
171	00:17.0	1.199	1.186	1.144
172	00:17.1	1.223	1.168	1.167
173	00:17.2	1.219	1.162	1.193
174	00:17.3	1.197	1.183	1.217
175	00:17.4	1.17	1.181	1.215
176	00:17.5	1.151	1.162	1.182
177	00:17.6	1.154	1.229	1.152
178	00:17.7	1.186	1.182	1.146
179	00:17.8	1.216	1.169	1.171
180	00:17.9	1.231	1.183	1.199
181	00:18.0	1.219	1.215	1.223



182	00:18.1	1.213	1.237	1.219
183	00:18.2	1.211	1.238	1.197
184	00:18.3	1.197	1.229	1.17
185	00:18.5	1.186	1.217	1.151
186	00:18.5	1.168	1.216	1.154
187	00:18.7	1.162	1.211	1.186
188	00:18.8	1.183	1.216	1.216
189	00:18.8	1.222	1.215	1.231
190	00:19.0	1.256	1.182	1.219
191	00:19.0	1.258	1.152	1.213
192	00:19.1	1.229	1.146	1.211
193	00:19.2	1.182	1.171	1.197
194	00:19.3	1.169	1.199	1.186
195	00:19.4	1.183	1.223	1.168
196	00:19.5	1.186	1.219	1.162
197	00:19.6	1.168	1.197	1.092
198	00:19.7	1.162	1.17	1.15
199	00:19.8	1.183	1.151	1.206
200	00:19.9	1.222	1.154	1.206
201	00:20.0	1.256	1.186	1.224
202	00:20.1	1.258	1.182	1.203
203	00:20.2	1.229	1.152	1.181
204	00:20.3	1.182	1.146	1.162
205	00:20.4	1.169	1.171	1.152
206	00:20.5	1.183	1.199	1.148
207	00:20.6	1.186	1.223	1.144
208	00:20.7	1.168	1.219	1.167
209	00:20.8	1.162	1.197	1.193
210	00:20.9	1.183	1.17	1.217
211	00:21.0	1.222	1.151	1.215
212	00:21.1	1.256	1.154	1.182
213	00:21.2	1.258	1.186	1.152

Sumber : olahan hasil

Tabel Hasil percobaan *roll decay* pada skenario kecoboran 3 kemiringan 5°

No.	Run Time	Percobaan		
		1	2	3
1	00:00.0	-4.231	-4.507	-4.353
	00:00.1	-3.753	-4.119	-3.667
	00:00.2	-2.903	-3.824	-1.233
	00:00.3	-1.748	-3.487	1.651
	00:00.4	0.92	-1.21	2.808
	00:00.5	3.348	2.078	3.501



7	00:00.6	3.716	3	2.659
8	00:00.7	3.147	3.821	0.821
9	00:00.8	0.874	2.452	-0.363
10	00:00.9	-1.092	-0.363	-2.137
11	00:01.0	-1.792	-2.137	-1.937
12	00:01.1	-0.966	-1.937	-0.078
13	00:01.2	0.998	-0.078	2.176
14	00:01.3	2.808	2.176	3.292
15	00:01.4	3.301	3.282	3.011
16	00:01.5	2.659	3.181	0.821
17	00:01.6	0.821	1.592	-0.65
18	00:01.7	-0.75	-0.201	-0.956
19	00:01.8	-1.239	-1.216	-1.199
20	00:01.9	-0.326	-1.003	-0.326
21	00:02.0	1.343	0.304	0.679
22	00:02.1	2.68	1.881	1.846
23	00:02.2	2.98	2.832	2.503
24	00:02.3	2.126	2.648	2.189
25	00:02.4	0.663	1.418	1.145
26	00:02.5	-0.461	-0.001	0.089
27	00:02.6	-0.661	-0.78	-0.36
28	00:02.7	0.154	-0.49	0.017
29	00:02.8	1.409	0.679	0.927
30	00:02.9	2.336	1.846	0.927
31	00:03.0	2.469	2.503	1.78
32	00:03.1	1.748	2.189	2.09
33	00:03.2	0.66	1.145	1.748
34	00:03.3	-0.118	0.089	0.66
35	00:03.4	-0.118	-0.36	-0.118
36	00:03.6	-0.177	0.017	-0.118
37	00:03.7	0.482	0.927	-0.177
38	00:03.8	1.383	0.927	0.162
39	00:03.9	2.017	1.78	0.632
40	00:03.9	2.047	2.09	1.332
41	00:04.0	1.473	1.742	1.835
42	00:04.1	0.699	0.964	1.841
43	00:04.2	0.162	0.285	1.35
44	00:04.3	0.16	0.07	0.934
45	00:04.4	0.632	0.43	0.493
46	00:04.5	1.332	1.057	0.374
	00:04.6	1.835	1.583	0.629
	00:04.7	1.841	1.719	1.084
	00:04.8	1.35	1.408	1.469
	00:04.9	0.698	0.934	1.554



51	00:05.0	0.294	0.493	1.284
52	00:05.1	0.372	0.374	0.86
53	00:05.2	0.875	0.629	0.544
54	00:05.3	1.416	1.084	0.542
55	00:05.4	1.762	1.469	0.836
56	00:05.5	1.645	1.554	1.223
57	00:05.6	1.165	1.284	1.341
58	00:05.7	0.645	0.86	1.026
59	00:05.8	0.412	0.544	0.757
60	00:05.9	0.592	0.542	0.693
61	00:06.0	1.06	0.836	0.871
62	00:06.1	1.493	1.223	1.179
63	00:06.2	1.648	1.45	1.41
64	00:06.3	1.436	1.403	1.45
65	00:06.4	1.013	1.097	1.281
66	00:06.5	0.679	0.769	0.997
67	00:06.6	0.567	0.639	0.786
68	00:06.7	0.772	0.781	0.78
69	00:06.8	1.133	1.071	0.98
70	00:06.9	1.43	1.296	1.247
71	00:07.0	1.519	1.327	1.247
72	00:07.1	1.341	1.136	1.404
73	00:07.2	1.026	0.902	1.374
74	00:07.3	0.757	0.753	1.173
75	00:07.4	0.693	0.831	0.938
76	00:07.5	0.871	1.057	0.816
77	00:07.6	1.179	1.266	0.876
78	00:07.7	1.41	1.296	1.077
79	00:07.8	1.45	1.138	1.292
80	00:07.9	1.281	0.926	1.378
81	00:08.0	0.997	0.78	1.317
82	00:08.1	0.786	0.824	1.134
83	00:08.2	0.78	1.026	0.926
84	00:08.3	0.98	1.254	0.78
85	00:08.4	1.247	1.34	0.824
86	00:08.5	1.247	1.222	1.026
87	00:08.6	1.404	0.986	1.254
88	00:08.7	1.374	0.803	1.34
89	00:08.8	1.173	0.8	1.222
90	00:09.0	0.938	0.964	0.986
	00:09.0	0.816	1.187	0.803
	00:09.1	0.876	1.318	0.8
	00:09.2	1.077	1.318	0.964
	00:09.3	1.292	1.129	1.187



95	00:09.4	1.378	1.129	1.318
96	00:09.5	1.317	0.929	1.318
97	00:09.6	1.134	0.825	1.129
98	00:09.7	0.946	0.873	1.129
99	00:09.8	0.871	1.027	0.929
100	00:09.9	0.952	1.198	0.825
101	00:10.0	1.126	1.303	0.873
102	00:10.1	1.284	1.282	1.027
103	00:10.2	1.342	1.156	1.198
104	00:10.3	1.267	0.983	1.303
105	00:10.4	1.115	0.868	1.282
106	00:10.5	0.98	0.882	1.156
107	00:10.6	0.925	1.011	0.983
108	00:10.7	0.996	1.187	1.155
109	00:10.8	1.155	1.305	1.285
110	00:10.9	1.285	1.3	1.316
111	00:11.0	1.316	1.18	1.24
112	00:11.1	1.24	1.023	1.096
113	00:11.2	1.096	0.9	0.99
114	00:11.3	0.99	0.88	0.968
115	00:11.4	0.968	0.986	1.063
116	00:11.5	1.063	1.285	1.21
117	00:11.6	1.21	1.316	1.304
118	00:11.7	1.304	1.24	1.294
119	00:11.8	1.294	1.096	1.184
120	00:11.9	1.184	0.99	1.058
121	00:12.0	1.058	0.968	1.003
122	00:12.1	1.003	1.063	1.03
123	00:12.2	1.03	1.21	1.127
124	00:12.3	1.127	1.304	1.217
125	00:12.4	1.217	1.294	1.276
126	00:12.5	1.276	1.184	1.269
127	00:12.6	1.269	1.058	1.196
128	00:12.7	1.196	1.003	1.217
129	00:12.8	1.096	1.03	1.276
130	00:12.9	1.036	1.127	1.269
131	00:13.0	1.06	1.217	1.196
132	00:13.1	1.15	1.276	1.096
133	00:13.2	1.241	1.269	1.036
134	00:13.3	1.269	1.196	1.06
135	00:13.4	1.218	1.096	1.15
136	00:13.5	1.137	1.036	1.241
137	00:13.6	1.083	1.06	1.269
138	00:13.7	1.092	1.15	1.218



139	00:13.8	1.15	1.241	1.137
140	00:13.9	1.206	1.269	1.083
141	00:14.0	1.206	1.218	1.092
142	00:14.1	1.224	1.137	1.15
143	00:14.2	1.203	1.083	1.206
144	00:14.3	1.181	1.092	1.206
145	00:14.5	1.162	1.15	1.224
146	00:14.6	1.152	1.206	1.152
147	00:14.6	1.148	1.206	1.146
148	00:14.8	1.144	1.224	1.171
149	00:14.8	1.167	1.203	1.199
150	00:14.9	1.193	1.181	1.223
151	00:15.0	1.217	1.162	1.219
152	00:15.1	1.215	1.152	1.197
153	00:15.2	1.182	1.148	1.17
154	00:15.3	1.152	1.144	1.151
155	00:15.4	1.146	1.167	1.154
156	00:15.5	1.171	1.193	1.186
157	00:15.6	1.199	1.217	1.216
158	00:15.7	1.223	1.215	1.231
159	00:15.8	1.219	1.182	1.219
160	00:15.9	1.197	1.152	1.17
161	00:16.0	1.17	1.146	1.151
162	00:16.1	1.151	1.171	1.154
163	00:16.2	1.154	1.199	1.186
164	00:16.3	1.186	1.223	1.216
165	00:16.4	1.216	1.219	1.231
166	00:16.5	1.231	1.197	1.219
167	00:16.6	1.219	1.17	1.213
168	00:16.7	1.213	1.151	1.211
169	00:16.8	1.211	1.154	1.197
170	00:16.9	1.197	1.186	1.186
171	00:17.0	1.186	1.216	1.168
172	00:17.1	1.168	1.231	1.162
173	00:17.2	1.162	1.219	1.183
174	00:17.3	1.183	1.213	1.181
175	00:17.4	1.222	1.211	1.162
176	00:17.5	1.256	1.197	1.229
177	00:17.6	1.258	1.186	1.182
178	00:17.7	1.229	1.168	1.169
179	00:17.8	1.182	1.162	1.183
180	00:17.9	1.169	1.183	1.215
181	00:18.0	1.183	1.181	1.237
182	00:18.1	1.215	1.162	1.238



183	00:18.2	1.237	1.152	1.229
184	00:18.3	1.238	1.148	1.217
185	00:18.4	1.229	1.144	1.216
186	00:18.5	1.217	1.167	1.211
187	00:18.6	1.216	1.193	1.216
188	00:18.7	1.211	1.217	1.215
189	00:18.8	1.216	1.215	1.182
190	00:18.9	1.229	1.182	1.152
191	00:19.0	1.182	1.152	1.146
192	00:19.1	1.169	1.146	1.171
193	00:19.2	1.183	1.171	1.199
194	00:19.3	1.215	1.199	1.223
195	00:19.4	1.237	1.223	1.219
196	00:19.5	1.238	1.219	1.197
197	00:19.7	1.229	1.197	1.17
198	00:19.8	1.217	1.17	1.151
199	00:19.8	1.216	1.151	1.154
200	00:19.9	1.211	1.154	1.186
201	00:20.0	1.216	1.186	1.197

Sumber : olahan hasil



Lampiran 4 : Gambar Lines Plan dan Gambar General Arrangement

