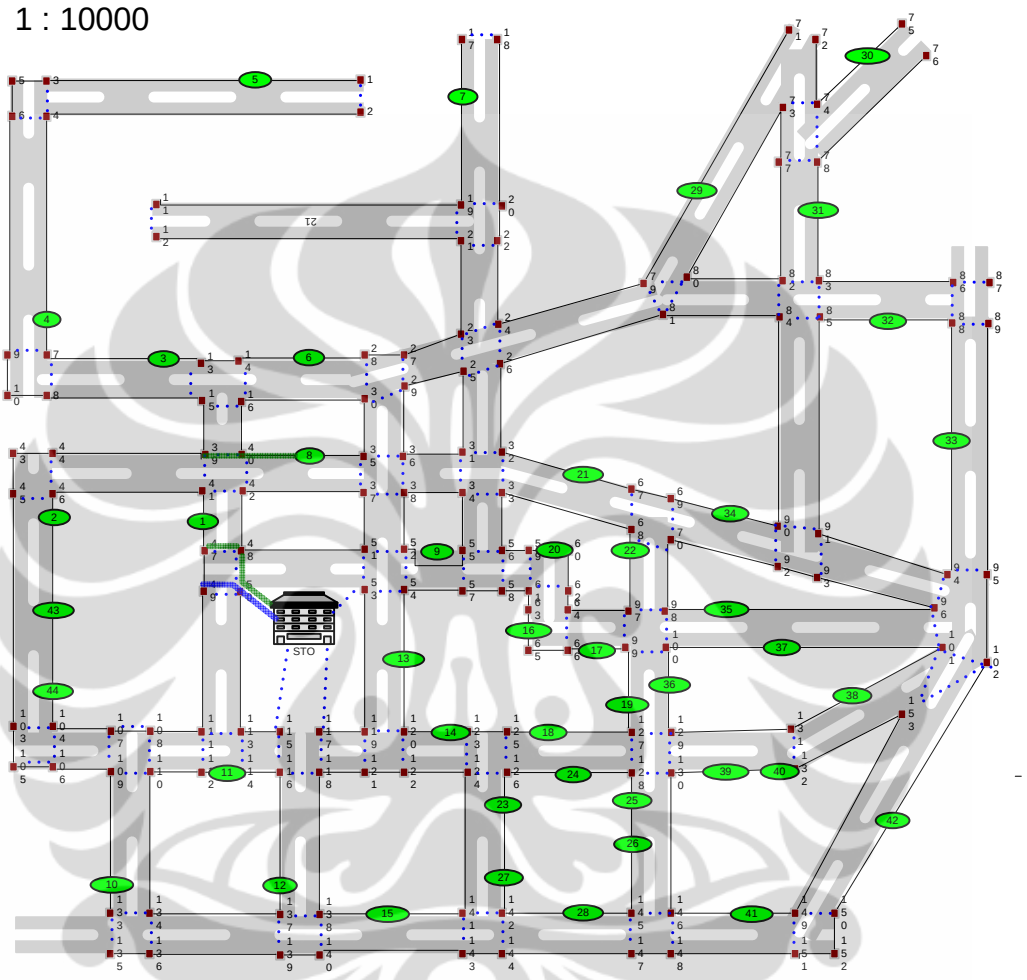
LAMPIRAN

Lampiran 1 : Gambar RX Sebagai RK Model



Lampiran 2 : Tabel Koordinat Titik Jalan Untuk RX

X	Y	type	ID
75	831	1	1
75	780	1	2
-408	828	1	3
-408	774	1	4
-462	828	1	5
-462	774	1	6
-408	405	1	7
-408	342	1	8
-471	405	1	9
-471	342	1	10
-240	639	1	11
-240	588	1	12
-171	393	1	13

-111	396	1	14
-168	336	1	15
-108	333	1	16
231	894	1	17
285	894	1	18
228	636	1	19
291	636	1	20
228	582	1	21
285	582	1	22
228	438	1	23
285	453	1	24
234	381	1	25
288	393	1	26
141	405	1	27
81	405	1	28
141	357	1	29
81	339	1	30
231	255	1	31
291	255	1	32
291	192	1	33
231	192	1	34
78	249	1	35
138	249	1	36
78	192	1	37
141	192	1	38
-162	252	1	39
-108	252	1	40
-168	195	1	41
-105	195	1	42
-462	255	1	43
-399	255	1	44
-462	192	1	45
-399	162	1	46
-165	102	1	47
-108	102	1	48
-165	42	1	49
-111	39	1	50
81	105	1	51
141	105	1	52
81	42	1	53
141	42	1	54
231	105	1	55
291	105	1	56
231	42	1	57
291	42	1	58
333	105	1	59
396	105	1	60
333	42	1	61
396	42	1	62
333	12	1	63

393	12	1	64
333	-48	1	65
393	-48	1	66
492	198	1	67
492	135	1	68
552	183	1	69
552	120	1	70
735	909	1	71
777	894	1	72
726	789	1	73
780	792	1	74
912	918	1	75
948	867	1	76
720	705	1	77
780	705	1	78
510	516	1	79
585	525	1	80
540	468	1	81
726	522	1	82
783	522	1	83
720	465	1	84
783	465	1	85
1008	519	1	86
1047	519	1	87
999	456	1	88
1044	453	1	89
720	141	1	90
780	129	1	91
720	78	1	92
780	63	1	93
981	66	1	94
1041	66	1	95
960	15	1	96
489	9	1	97
543	9	1	98
483	-42	1	99
546	-42	1	100
975	-44.7	1	101
1041	-67.8	1	102
-461.7	-165	1	103
-400.8	-165	1	104
-459	-228	1	105
-399	-228	1	106
-310.8	-174	1	107
-249	-174	1	108
-309	-234	1	109
-249	-234	1	110
-171	-174	1	111
-171	-237	1	112
-108	-174	1	113

-108	-237	1	114
-49.8	-174	1	115
-49.8	-237	1	116
10.8	-174.9	1	117
10.8	-237	1	118
81	-174	1	119
141	-174	1	120
81	-237	1	121
141	-237	1	122
240	-174	1	123
240	-237	1	124
300	-174	1	125
300	-237	1	126
492	-174	1	127
492	-237	1	128
555	-174	1	129
555	-237	1	130
738	-168	1	131
747	-232.2	1	132
-312	-453	1	133
-249	-453	1	134
-312.3	-516	1	135
-249	-516	1	136
-49.2	-456	1	137
11.7	-457.2	1	138
-48	-519	1	139
9	-519	1	140
231	-453	1	141
291	-453	1	142
231	-516	1	143
291	-516	1	144
492	-453	1	145
552	-453	1	146
492	-516	1	147
552	-516	1	148
747	-453	1	149
807	-453	1	150
747	-516	1	151
807	-516	1	152
912	-147	1	153

Lampiran 3 : Tabel Link Jalan Untuk RX

A	B
1	3
2	4
3	5
5	6
6	9
4	7
9	10

7	13
10	8
8	15
13	14
17	19
19	11
18	20
21	12
20	22
21	23
22	24
14	28
28	27
27	23
24	79
79	71
80	73
72	74
74	75
76	78
77	73
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16	30
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29	36
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25	31
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84	90
85	91
88	94
89	95
32	67
67	69
69	90
91	94
95	102
96	93
93	92
92	70
33	68
96	98

101	131
100	101
102	150
131	129
132	130
100	129
130	146
149	146
150	152
152	151
148	151
148	147
145	128
127	99
147	144
145	142
144	143
142	126
143	140
141	124
141	138
140	139
138	118
139	136
137	116
137	134
134	110
136	135
133	109
109	106
106	105
105	103
103	45
45	43
43	44
44	39
46	41
104	46
40	35
36	31
42	37
38	34
41	47
42	48
48	51
37	51
38	52
34	55
52	55
33	56

56	59
59	60
60	62
62	64
64	97
97	68
98	70
47	49
49	111
50	113
113	115
117	119
119	53
120	54
54	57
57	58
58	61
61	63
63	65
65	66
66	99
104	107
107	108
108	111
120	123
123	125
125	127
110	112
112	114
114	116
118	121
121	122
122	124
126	128
132	153
149	153

Lampiran 4 : Tabel Koordinat DP Untuk RX

xx	yy	type	ID
-169	150	2	1
-399	157	2	2
-230	401	2	3
-411	463	2	4
-88	833	2	5
-5	404	2	6
234	807	2	7
-4	251	2	8

194	104	2	9
-310	-412	2	10
-132	-240	2	11
-50	-413	2	12
142	-63	2	13
215	-177	2	14
117	-457	2	15
336	-19	2	16
418	-49	2	17
366	-177	2	18
488	-134	2	19
375	106	2	20
420	223	2	21
493	106	2	22
296	-288	2	23
404	-242	2	24
496	-282	2	25
497	-349	2	26
297	-401	2	27
420	-455	2	28
596	661	2	29
860	870	2	30
783	631	2	31
891	460	2	32
990	275	2	33
647	163	2	34
642	15	2	35
554	-103	2	36
727	-45	2	37
836	-120	2	38
640	-238	2	39
724	-237	2	40
681	-457	2	41
898	-313	2	42
-400	-13	2	43
-401	-113	2	44

Lampiran 5 : Tabel Kebutuhan Bit Rate DP Untuk RX

DP	Rate
1	450
2	450
3	450
4	450
5	450
6	450
7	450
8	450

9	450
10	450
11	450
12	450
13	450
14	450
15	450
16	450
17	450
18	450
19	450
20	450
21	450
22	450
23	450
24	450
25	450
26	450
27	450
28	450
29	450
30	450
31	450
32	450
33	450
34	450
35	450
36	450
37	450
38	450
39	450
40	450
41	450
42	450
43	450
44	450

Lampiran 6 : Tabel Link Menyeberang Jalan Untuk RX

A	B
1	2
3	4
4	6
7	9
7	8
11	12
17	18
19	20
19	21
21	22
13	15

15	16
14	16
44	46
45	46
40	42
39	41
39	40
41	42
47	48
48	50
49	50
103	104
104	106
105	106
107	108
109	110
107	109
108	110
133	134
133	135
134	136
111	112
113	114
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154	115
154	117
115	116
117	118
116	118
154	53
137	138
137	139
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119	120
121	119
120	122
141	143
141	142
142	144
28	30
27	29
30	29
35	36
35	37
36	38
37	38
51	52
52	53
52	54
53	54

23	25
24	26
23	24
25	26
31	32
31	34
32	33
34	33
55	56
55	57
56	58
124	126
123	124
125	126
59	61
61	62
64	66
73	74
77	78
74	78
79	80
79	81
80	81
82	83
83	85
82	84
84	85
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96	101
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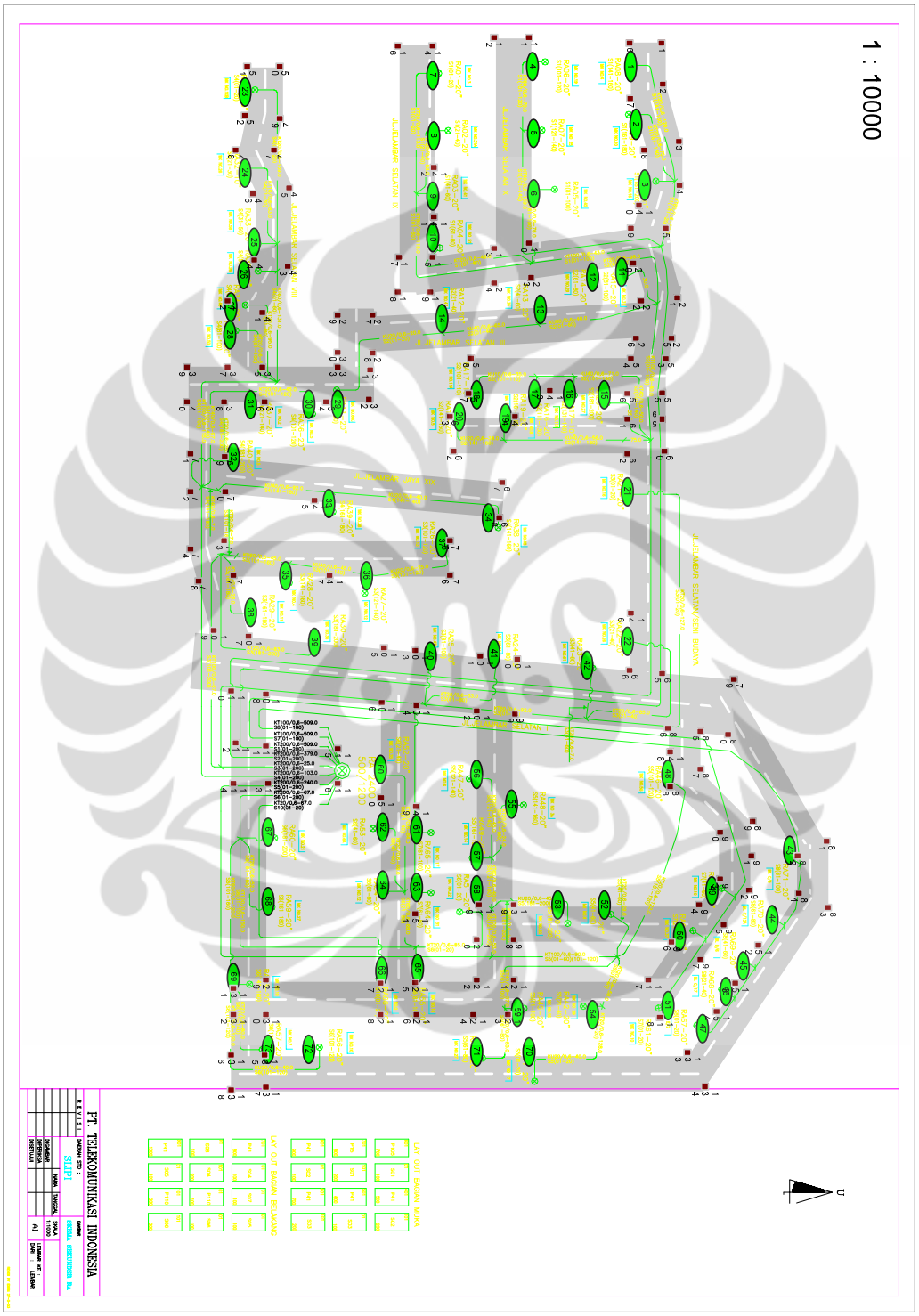
90	92
91	93
67	68
69	70
68	70
97	98
97	99
98	100
99	100
127	129
127	128
129	130
128	130
145	146

145	147
146	148
131	132
149	151
149	150
101	153
102	153

Lampiran 7 : Tabel Link Keluar Sentral Untuk RX

A	B
	50
	53
	115
	117

Lampiran 8 : Gambar RA (RK pada STO SLIPI)



Lampiran 9 : Tabel Koordinat Titik Jalan RA

X	Y	type	ID
-1480	519	1	1
-1410	521	1	2
-1310	549	1	3
-1235	550	1	4
-1160	526	1	5
-1480	464	1	6
-1385	465	1	7
-1295	489	1	8
-1160	466	1	9
-1135	290	1	10
-1490	290	1	11
-1490	230	1	12
-1125	230	1	13
-1475	124	1	14
-1110	124	1	15
-1475	64	1	16
-1110	66	1	17
-1050	64	1	18
-1050	120	1	19
-1100	470	1	20
-1040	546	1	21
-1035	484	1	22
-1075	294	1	23
-1065	230	1	24
-970	536	1	25
-970	476	1	26
-1010	20	1	27
-945	20	1	28
-1010	-40	1	29
-945	-40	1	30
-915	16	1	31
-865	14	1	32
-920	-40	1	33
-860	-60	1	34
-920	-170	1	35
-860	-160	1	36
-920	-230	1	37
-860	-236	1	38
-920	-300	1	39
-860	-300	1	40
-1015	-170	1	41
-1035	-230	1	42
-1095	-126	1	43
-1105	-184	1	44
-1230	-124	1	45
-1220	-186	1	46
-1295	-150	1	47

-1295	-216	1	48
-1350	-140	1	49
-1440	-140	1	50
-1440	-196	1	51
-1355	-200	1	52
-935	526	1	53
-935	466	1	54
-875	520	1	55
-875	460	1	56
-875	186	1	57
-935	190	1	58
-830	520	1	59
-775	524	1	60
-830	460	1	61
-770	460	1	62
-835	154	1	63
-775	160	1	64
-390	520	1	65
-395	464	1	66
-720	244	1	67
-660	239	1	68
-765	-235	1	69
-705	-234	1	70
-770	-294	1	71
-705	-294	1	72
-620	-236	1	73
-605	-294	1	74
-620	154	1	75
-560	154	1	76
-560	-220	1	77
-550	-280	1	78
-380	644	1	79
-285	634	1	80
-100	804	1	81
-75	754	1	82
15	806	1	83
-10	756	1	84
-290	586	1	85
-295	530	1	86
-225	586	1	87
-195	534	1	88
-135	676	1	89
-115	620	1	90
-75	674	1	91
-15	670	1	92
-35	620	1	93
10	584	1	94
45	626	1	95
75	536	1	96
105	586	1	97

70	264	1	98
-320	266	1	99
-415	270	1	100
-420	206	1	101
-325	200	1	102
-430	94	1	103
-335	96	1	104
-435	40	1	105
-340	36	1	106
-455	-194	1	107
-355	-164	1	108
-465	-254	1	109
-360	-224	1	110
-265	-164	1	111
-270	-216	1	112
-200	-160	1	113
-200	-220	1	114
-260	-40	1	115
-200	-40	1	116
140	496	1	117
205	516	1	118
10	204	1	119
70	200	1	120
140	264	1	121
140	200	1	122
200	254	1	123
200	194	1	124
145	94	1	125
200	96	1	126
145	34	1	127
200	34	1	128
140	-164	1	129
200	-164	1	130
155	-220	1	131
200	-220	1	132
265	564	1	133
325	594	1	134
270	-166	1	135
270	-224	1	136
325	-164	1	137
330	-224	1	138
10	264	1	139
-1200	480	1	140
-1180	126	1	141
-1265	126	1	142
-880	326	1	143
-835	266	1	144
-690	-80	1	145
-495	466	1	146
-560	-54	1	147

-255	534	1	148
-160	95	1	149
-175	35	1	150
25	94	1	151
80	686	1	152
145	646	1	153
195	614	1	154

Lampiran 10 : Tabel Link Jalan Untuk RA

A	B
1	2
6	7
2	3
3	4
4	5
7	8
8	9
10	11
13	12
14	15
16	17
17	18
18	19
19	24
24	23
23	20
21	5
20	22
21	25
22	27
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26	28
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64	62
32	34
33	35

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50	49
49	47
47	45
45	43
43	41
41	35
51	52
52	48
48	46
46	44
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71	72
70	73
72	74
75	76
73	75
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62	66
79	65
66	100
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101	103
103	105
105	107
109	110
108	106
104	102
99	86
80	85
79	81
81	83
80	82
82	84
83	134
84	133

133	135
134	137
137	138
136	138
135	130
136	132
132	131
131	114
113	129
127	129
128	130
126	124
123	118
117	121
122	125
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97	118
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13	15
87	89
123	124
126	128
108	111
111	115
110	112
112	114
113	116
92	95
140	9
140	8
141	142
141	15
142	14

143	56
143	57
144	63
144	61
145	70
145	68
146	66
146	62
147	76
147	77
148	86
148	88
149	104
149	151
150	106
150	127
151	149
151	125
152	84
152	153
153	154
154	133

Lampiran 11 : Tabel Koordinat Titik DP Untuk RA

X	Y	type	ID
-1440	466	2	1
-1340	475	2	2
-1235	490	2	3
-1440	296	2	4
-1324	298	2	5
-1220	298	2	6
-1424	124	2	7
-1320	126	2	8
-1216	124	2	9
-1144	124	2	10
-1084	450	2	11
-1076	400	2	12
-1020	310	2	13
-1004	140	2	14
-872	420	2	15
-874	360	2	16
-874	300	2	17
-872	200	2	18
-832	250	2	19
-834	170	2	20
-704	460	2	21
-466	460	2	22
-1396	-200	2	23
-1256	-200	2	24
-1136	-184	2	25

-1080	-202	2	26
-1024	-224	2	27
-976	-226	2	28
-856	-40	2	29
-855	-190	2	30
-856	-90	2	31
-764	-220	2	32
-684	-55	2	33
-659	220	2	34
-559	-130	2	35
-559	10	2	36
-616	140	2	37
-496	-190	2	38
-444	-80	2	39
-420	120	2	40
-424	230	2	41
-404	390	2	42
-84	740	2	43
36	710	2	44
116	660	2	45
160	630	2	46
224	590	2	47
-216	530	2	48
-14	606	2	49
-1440	-140	2	50
184	530	2	51
10	420	2	52
10	340	2	53
200	400	2	54
-164	260	2	55
-216	200	2	56
-74	200	2	57
-16	200	2	58
196	270	2	59
-224	34	2	60
-120	96	2	61
-124	38	2	62
-20	96	2	63
-24	38	2	64
120	98	2	65
124	36	2	66
-116	-160	2	67
4	-160	2	68
136	-220	2	69
264	290	2	70
264	200	2	71
260	-90	2	72
260	-160	2	73

Lampiran 12 : Tabel Kebutuhan Bit Rate DP Untuk RA

DP	Rate
1	450
2	450
3	450
4	450
5	450
6	450
7	450
8	450
9	450
10	450
11	450
12	450
13	450
14	450
15	450
16	450
17	450
18	450
19	450
20	450
21	450
22	450
23	450
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26	450
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33	450
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35	450
36	450
37	450
38	450
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40	450
41	450
42	450
43	450
44	450
45	450
46	450
47	450
48	450

49	450
50	450
51	450
52	450
53	450
54	450
55	450
56	450
57	450
58	450
59	450
60	450
61	450
62	450
63	450
64	450
65	450
66	450
67	450
68	450
69	450
70	450
71	450
72	450
73	450

Lampiran 13 : Tabel Link Menyeberang Jalan Untuk RA

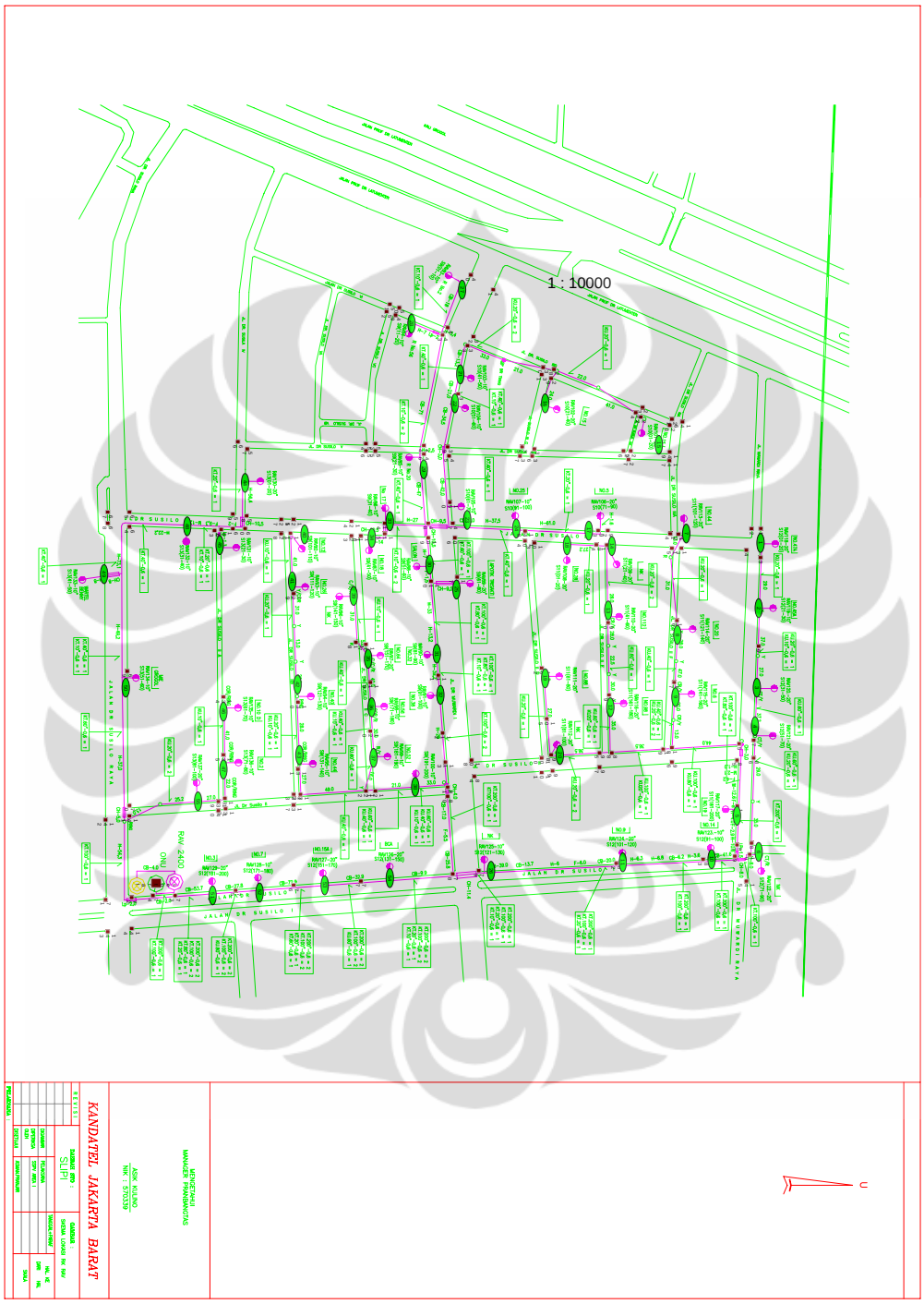
A	B
5	9
9	20
10	23
10	13
13	24
15	19
15	17
21	22
22	26
25	26
27	28
28	30
33	34
35	36
35	37
37	38
38	40
53	54
54	56
55	56
59	60

59	61
61	62
60	62
69	70
69	71
69	70
70	72
73	77
73	74
73	77
77	78
107	108
109	110
103	104
105	106
100	99
101	102
65	86
86	85
79	80
87	88
111	113
111	112
114	113
81	82
83	84
133	134
94	96
94	95
96	97
117	118
139	98
119	139
98	120
121	123
122	124
125	126
125	127
125	126
127	128
129	130
129	131
130	132
135	136
135	137

Lampiran 14 : Tabel Link Keluar Semtral Untuk RA

A	B
	115
	116

Lampiran 15 : Gambar RAV (RK pada STO SLIPI)



Lampiran 16 : Tabel Koordinat Titik Jalan Untuk RAV

X	Y	type	ID
-980	1661	1	1
-980	1635	1	2
-900	1660	1	3
-920	1621	1	4
-385	1601	1	5
-655	1655	1	6
-395	1641	1	7
-110	1635	1	8
-75	1589	1	9
-82	1641	1	10
-220	1596	1	11
-965	1431	1	12
-925	1441	1	13
-965	1409	1	14
-925	1415	1	15
-725	1429	1	16
-555	1421	1	17
-375	1415	1	18
-370	1391	1	19
-1265	1409	1	20
-1280	1415	1	21
-1295	1329	1	22
-1315	1334	1	23
-1300	1315	1	24
-1195	1301	1	25
-1195	1281	1	26
-1170	1295	1	27
-1420	1089	1	28
-1395	1081	1	29
-1425	1089	1	30
-1405	1055	1	31
-1510	866	1	32
-1485	850	1	33
-1200	1035	1	34
-1205	1001	1	35
-1180	1029	1	36
-1180	995	1	37
-1360	824	1	38
-1205	795	1	39
-1680	859	1	40
-1640	921	1	41
-1535	795	1	42
-1515	781	1	43
-1210	729	1	44
-1183	810	1	45
-1185	729.5	1	46
-995	809	1	47
-995	741	1	48

-1573	662	1	49
-1590	661	1	50
-1600	635	1	51
-1580	626	1	52
-1215	595	1	53
-1215	569	1	54
-1195	595	1	55
-1195	569	1	56
-1200	241	1	57
-1015	239	1	58
-1020	201	1	59
-980	235	1	60
-980	201	1	61
-975	169	1	62
-975	149	1	63
-985	-85	1	64
-1025	-85	1	65
-1220	215	1	66
-1025	-145	1	67
-995	-145	1	68
-585	-91	1	69
-215	-85	1	70
45	-151	1	71
40	-79	1	72
35	41	1	73
35	-20	1	74
20	209	1	75
5	369	1	76
-5	555	1	77
-25	809	1	78
-35	881	1	79
-240	795	1	80
-265	795	1	81
-55	1261	1	82
-65	1501	1	83
-295	869	1	84
-340	1595	1	85
-345	1641	1	86
-105	1595	1	87
-360	1249	1	88
-520	1241	1	89
-720	1239	1	90
-935	1235	1	91
-975	1236	1	92
-975	1211	1	93
-935	1206	1	94
-360	1215	1	95
-335	1415	1	96
-320	1215	1	97
-355	1081	1	98

-310	1085	1	99
-345	1055	1	100
-305	1055	1	101
-595	1055	1	102
-940	1035	1	103
-945	1009	1	104
-455	1069	1	105
-955	815	1	106
-845	815	1	107
-340	861	1	108
-955	741	1	109
-835	749	1	110
-575	769	1	111
-415	781	1	112
-335	789	1	113
-995	621	1	114
-965	621	1	115
-960	555	1	116
-660	569	1	117
-665	541	1	118
-555	581	1	119
-420	581	1	120
-255	595	1	121
-255	569	1	122
-960	529	1	123
-1000	529	1	124
-1005	369	1	125
-965	361	1	126
-1005	335	1	127
-965	335	1	128
-800	369	1	129
-500	381	1	130
-315	381	1	131
-245	389	1	132
-245	369	1	133
-515	175	1	134
-355	175	1	135
-235	181	1	136
-215	369	1	137
-205	181	1	138
-225	161	1	139
-200	161	1	140
-185	-85	1	141
-175	-151	1	142
135	-340	1	143
125	-79	1	144
-5	1621	1	145
-1275	1441	1	146
-1170	1419	1	147
-975	1020	1	148

-1195	1420	1	149
-1055	812	1	150

Lampiran 17 : Tabel Link Jalan Untuk RAV

A	B
1	3
1	2
3	6
6	7
7	86
86	8
8	10
10	145
2	12
4	13
146	12
14	92
21	23
23	28
28	30
30	32
32	41
41	40
40	42
42	50
50	51
51	52
52	54
54	66
66	59
59	65
65	67
67	68
68	142
142	71
71	143
143	144
144	145
145	10
4	5
5	18
17	18
16	17
13	16
4	13
14	147
147	27
27	36
36	37

37	45
45	150
47	148
148	93
93	92
92	14
14	147
20	149
20	22
22	25
25	149
24	26
26	34
34	29
29	24
35	39
31	35
39	38
38	33
33	31
44	43
43	49
49	53
53	44
46	55
55	56
56	57
57	58
58	127
127	125
125	124
124	114
114	48
46	48
4	13
13	16
16	17
17	18
18	5
5	4
15	19
19	88
88	89
89	90
90	91
91	15
94	95
95	98
98	103
103	94

104	100
108	107
106	107
106	104
109	110
111	112
112	113
113	81
81	121
121	120
120	119
117	119
116	117
116	115
115	109
114	115
123	118
118	122
122	132
132	131
131	130
130	129
129	126
126	123
128	60
60	61
61	62
62	134
134	135
135	136
136	133
133	128
63	64
64	69
70	139
139	63
80	78
78	77
77	76
76	75
75	73
73	74
74	72
72	141
141	140
140	138
137	138
137	80
69	70
110	111

100	108
85	96
96	97
97	99
99	101
85	11
11	87
87	9
9	83
83	82
82	79
79	84
84	101
101	99
99	97
97	96
47	150
146	21
102	105
103	102

Lampiran 18 : Tabel Koordinat Titik DP Untuk RAV

X	Y	type	ID
-940	1660	2	1
-760	1655	2	2
-540	1650	2	3
-434	1645	2	4
-186	1595	2	5
-80	1655	2	6
-966	1445	2	7
-686	1430	2	8
-514	1425	2	9
-66	1525	2	10
-54	1275	2	11
-486	1245	2	12
-706	1240	2	13
-934	1245	2	14
-1274	1345	2	15
-1326	1065	2	16
-974	1185	2	17
-934	1125	2	18
-566	1065	2	19
-354	1105	2	20
-1406	830	2	21
-1326	815	2	22
-1026	805	2	23
-980	985	2	24
-814	825	2	25
-34	915	2	26
-1640	835	2	27

-1546	695	2	28
-1166	715	2	29
-880	745	2	30
-634	765	2	31
-520	775	2	32
-1000	635	2	33
-954	585	2	34
-620	575	2	35
-486	585	2	36
-346	590	2	37
-266	705	2	38
-794	535	2	39
-966	375	2	40
-834	365	2	41
-549	380	2	42
-354	385	2	43
-1106	235	2	44
-934	165	2	45
-474	175	2	46
-314	175	2	47
-986	75	2	48
-854	-155	2	49
-540	-95	2	50
34	145	2	51
26	275	2	52
6	455	2	53
-14	635	2	54
-226	105	2	55

Lampiran 19 : Tabel Kebutuhan Bit Rate Untuk RAV

DP	Rate
1	450
2	450
3	450
4	450
5	450
6	450
7	450
8	450
9	450
10	450
11	450
12	450
13	450
14	450
15	450
16	450
17	450
18	450

19	450
20	450
21	450
22	450
23	450
24	450
25	450
26	450
27	450
28	450
29	450
30	450
31	450
32	450
33	450
34	450
35	450
36	450
37	450
38	450
39	450
40	450
41	450
42	450
43	450
44	450
45	450
46	450
47	450
48	450
49	450
50	450
51	450
52	450
53	450
54	450
55	450

Lampiran 20 : Tabel Link Menyeberang Jalan Untuk RAV

A	B
1	2
2	4
3	4
7	5
5	85
86	85
10	145
146	21
21	20
149	147

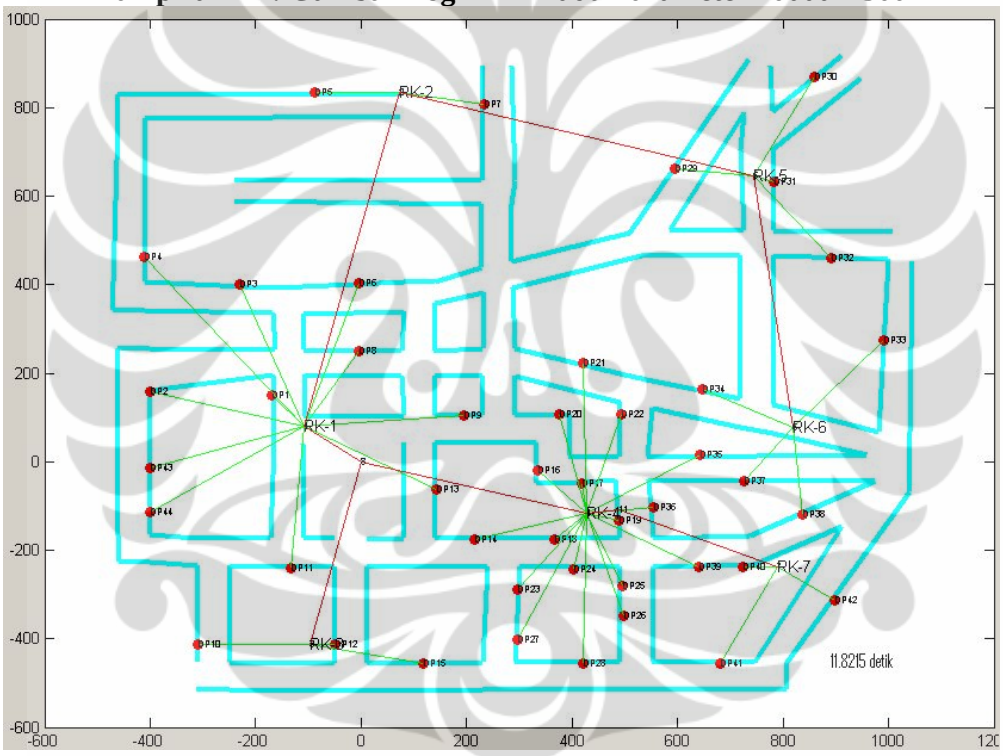
12	13
14	15
12	14
13	15
18	96
18	19
23	22
22	24
25	27
25	26
92	93
93	94
91	94
88	95
95	97
28	29
30	31
29	31
34	36
35	37
148	104
103	104
99	98
98	100
100	101
32	33
42	43
39	45
39	44
44	46
47	48
48	109
107	110
108	84
113	108
79	78
50	49
53	55
114	115
124	123
116	123
117	118
121	122
127	128
125	126
132	133
133	137
57	66
58	60
60	61

62	63
65	67
65	64
64	68
70	141
136	139
136	138
139	140

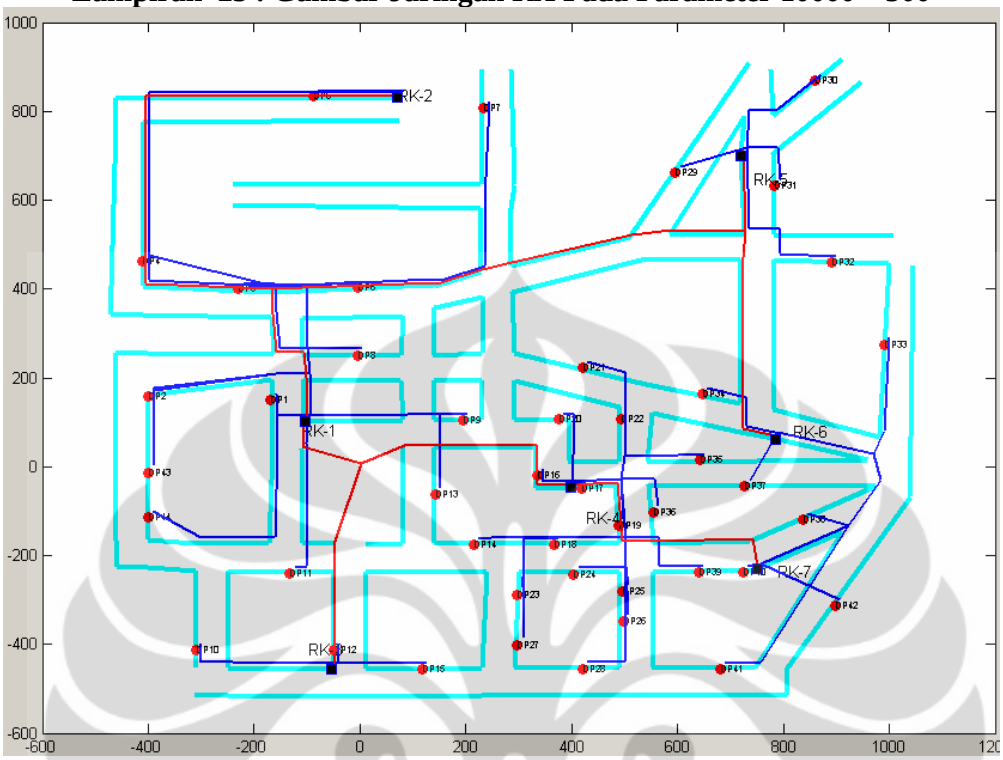
Lampiran 21 : Tabel Link Keluar Sentral Untuk RAV

A	B
	74

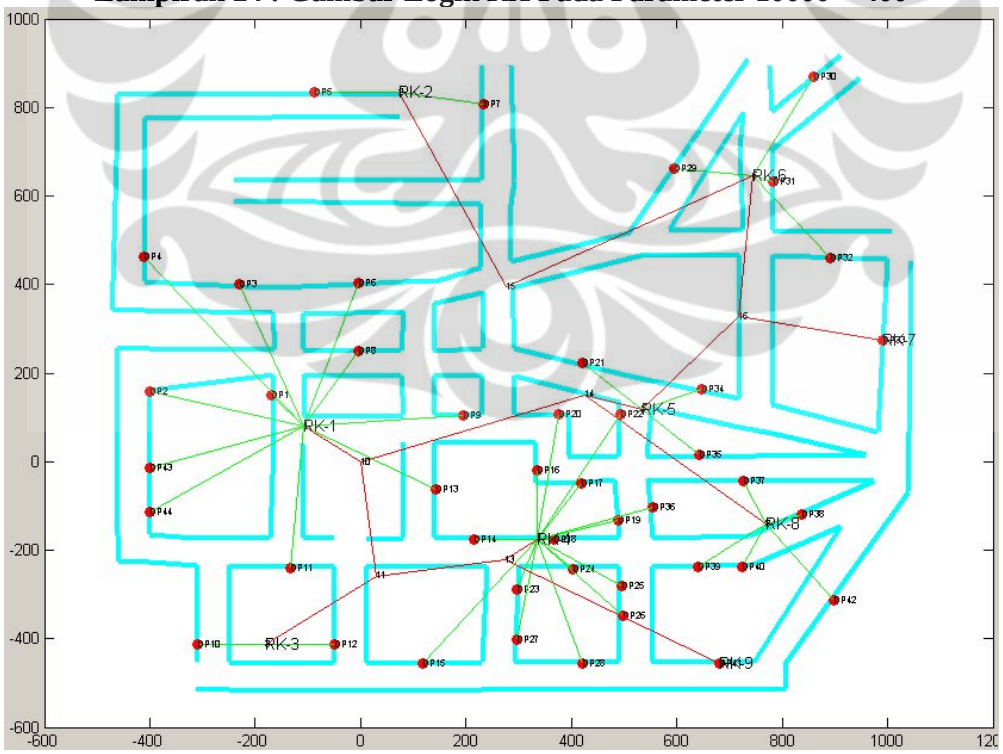
Lampiran 22 : Gambar Logik RX Pada Parameter 10000 – 500



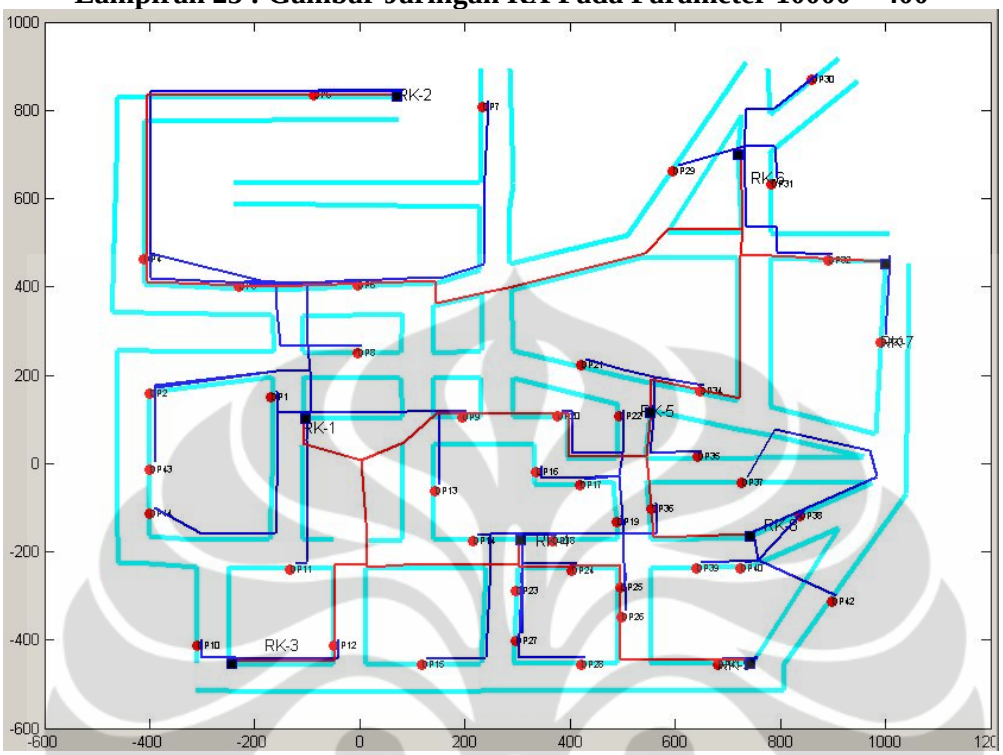
Lampiran 23 : Gambar Jaringan RX Pada Parameter 10000 – 500



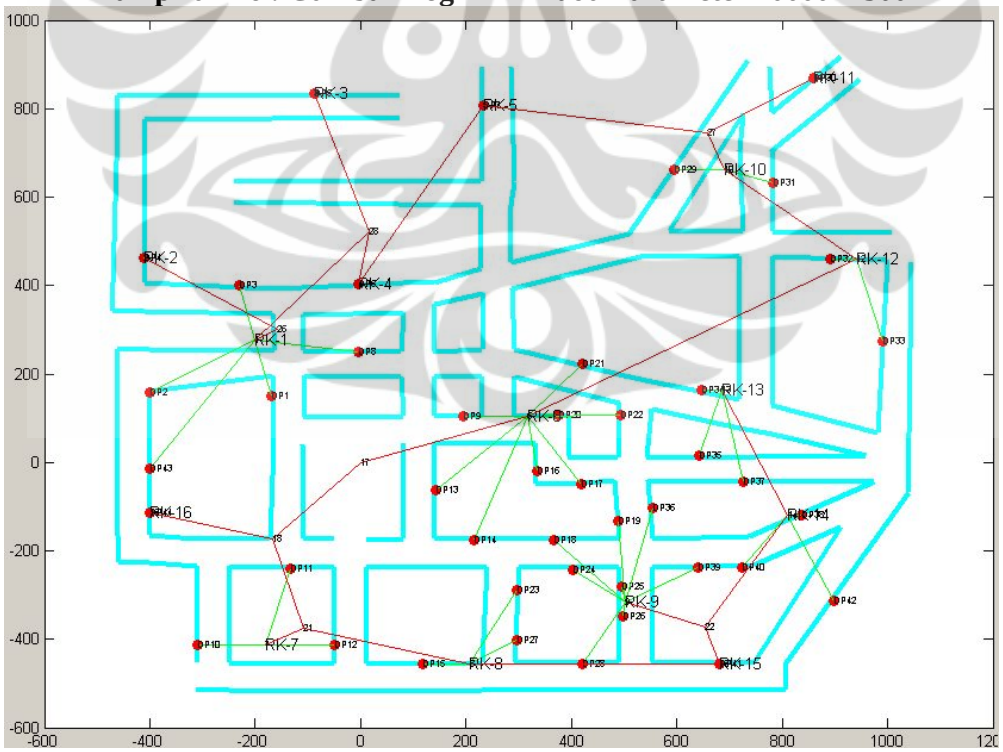
Lampiran 24 : Gambar Logik RX Pada Parameter 10000 - 400



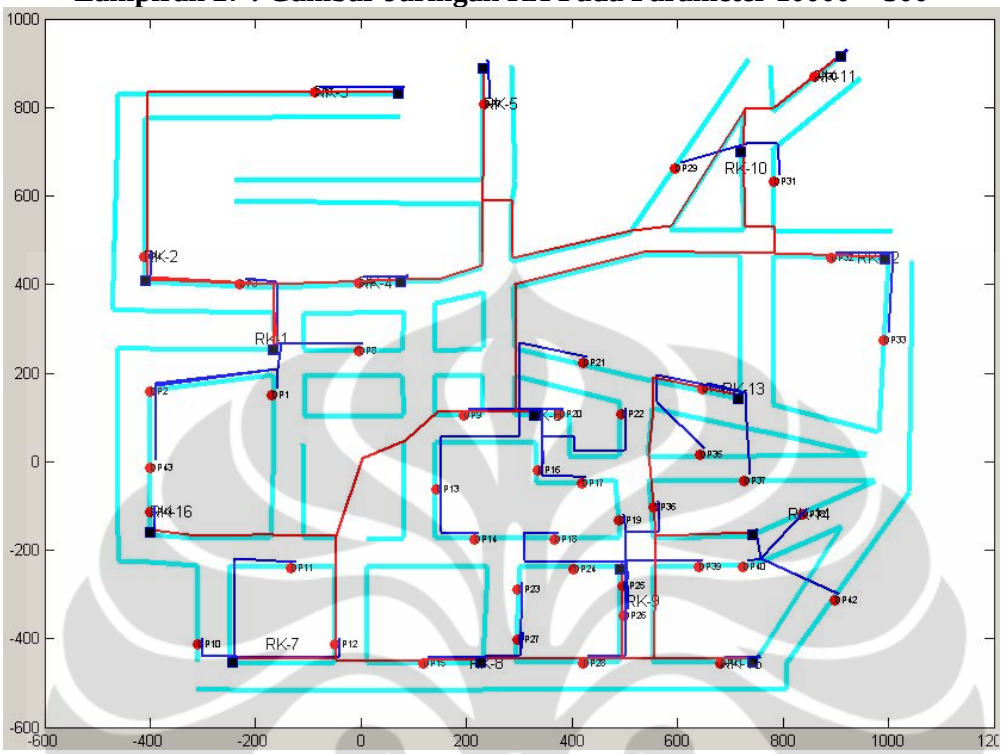
Lampiran 25 : Gambar Jaringan RX Pada Parameter 10000 - 400



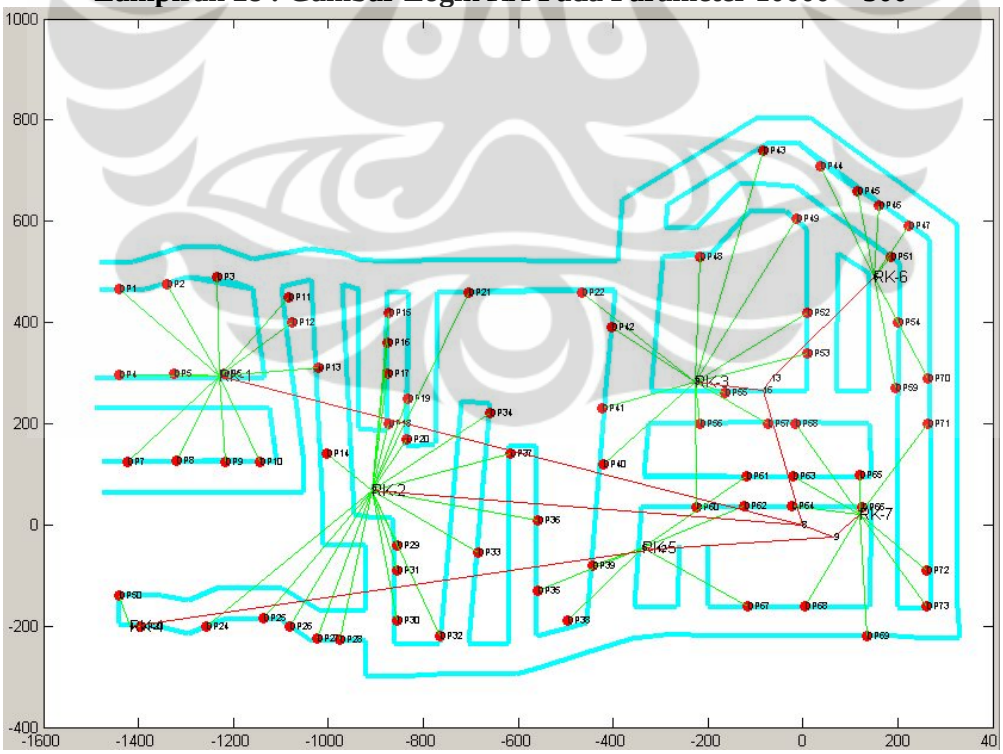
Lampiran 26 : Gambar Logik RX Pada Parameter 10000 - 300



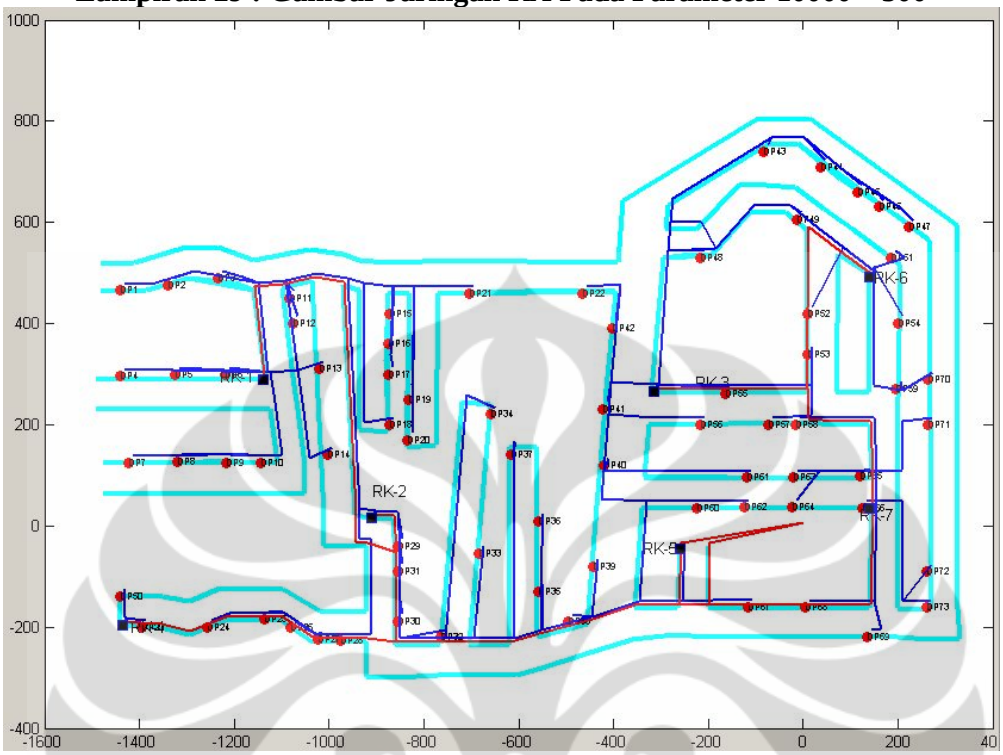
Lampiran 27 : Gambar Jaringan RX Pada Parameter 10000 - 300



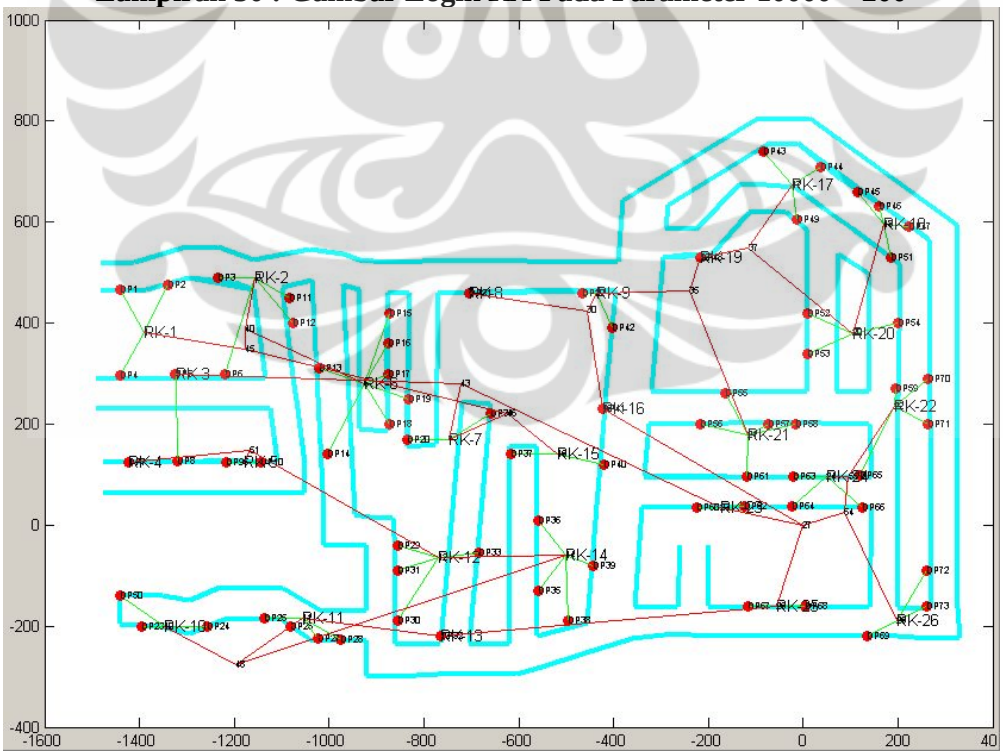
Lampiran 28 : Gambar Logik RA Pada Parameter 10000 - 500



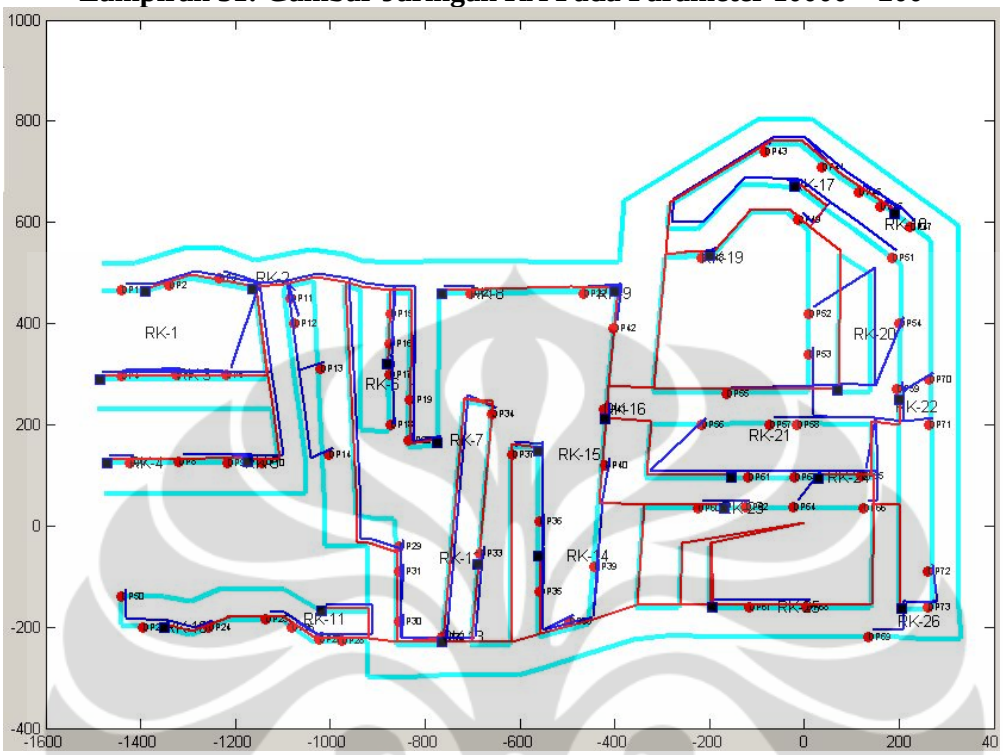
Lampiran 29 : Gambar Jaringan RA Pada Parameter 10000 – 500



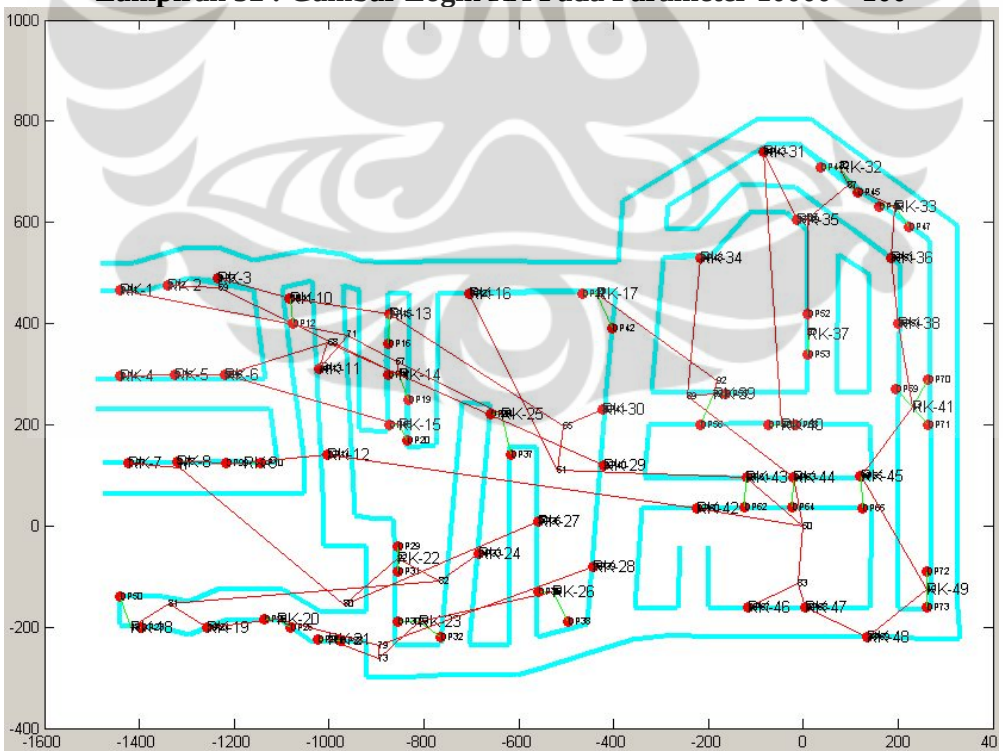
Lampiran 30 : Gambar Logik RA Pada Parameter 10000 – 200



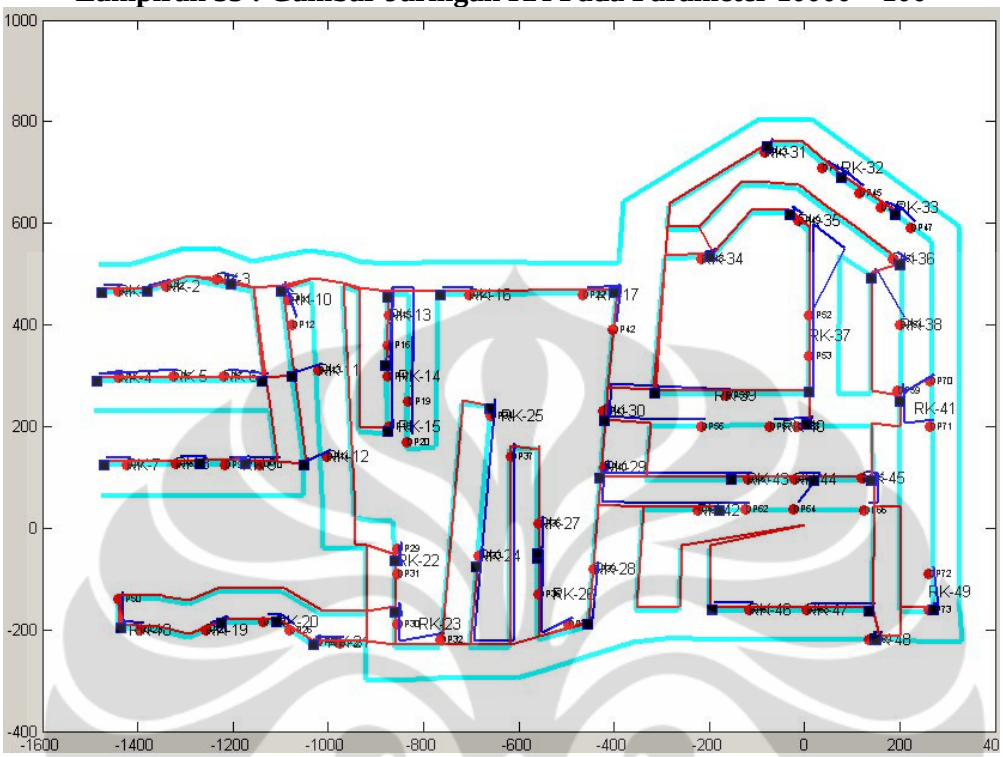
Lampiran 31: Gambar Jaringan RA Pada Parameter 10000 – 200



Lampiran 32 : Gambar Logik RA Pada Parameter 10000 – 100



Lampiran 33 : Gambar Jaringan RA Pada Parameter 10000 – 100



Lampiran 34 : Tabel Report Jaringan RA Pada Parameter 10000 – 200

A	B	Connection-ID	Distance	Path
155	228	DP-RK	378.9611362	155,-,7,-,228
156	228	DP-RK	377.0367523	156,-,7,-,228
157	229	DP-RK	397.9373836	157,-,140,-,9,-,229
158	228	DP-RK	968.0007916	158,-,10,-,9,-,8,-,7,-,228
159	230	DP-RK	441.6083309	159,-,11,-,230
160	229	DP-RK	453.7879564	160,-,9,-,229
161	231	DP-RK	372.6656532	161,-,14,-,231
162	230	DP-RK	867.1041378	162,-,141,-,15,-,13,-,10,-,230
163	232	DP-RK	133.4084617	163,-,141,-,232
164	232	DP-RK	379.376206	164,-,15,-,232
165	229	DP-RK	428.4449961	165,-,20,-,9,-,229
166	229	DP-RK	444.8825805	166,-,20,-,9,-,229
167	233	DP-RK	821.1635066	167,-,23,-,20,-,22,-,26,-,54,-,56,-,143,-,233
168	233	DP-RK	999.3204918	168,-,19,-,24,-,23,-,20,-,22,-,26,-,54,-,56,-,143,-,233
169	233	DP-RK	369.9171089	169,-,56,-,143,-,233
170	233	DP-RK	134.0015876	170,-,143,-,233
171	233	DP-RK	128.8520514	171,-,143,-,233
172	233	DP-RK	337.7685249	172,-,57,-,233

173	233	DP-RK	539.6218852	173,-,144,-,61,-,56,-,143,-,233
174	234	DP-RK	293.7490658	174,-,63,-,234
175	235	DP-RK	303.9501388	175,-,62,-,235
176	236	DP-RK	301.0738218	176,-,66,-,236
177	237	DP-RK	316.6344335	177,-,52,-,237
178	237	DP-RK	334.1137585	178,-,48,-,237
179	238	DP-RK	689.7074311	179,-,44,-,42,-,37,-,35,-,41,-,238
180	238	DP-RK	615.2358284	180,-,42,-,37,-,35,-,41,-,238
181	238	DP-RK	606.972032	181,-,42,-,37,-,35,-,41,-,238
182	238	DP-RK	507.7889646	182,-,37,-,35,-,41,-,238
183	239	DP-RK	718.9381416	183,-,34,-,36,-,38,-,69,-,70,-,239
184	239	DP-RK	545.6590604	184,-,38,-,69,-,70,-,239
185	239	DP-RK	633.200763	185,-,36,-,38,-,69,-,70,-,239
186	240	DP-RK	289.0508711	186,-,69,-,240
187	239	DP-RK	143.4085704	187,-,145,-,239
188	234	DP-RK	2139.042426	188,-,67,-,69,-,38,-,36,-,34,-,33,-,30,-,28,-,26,-,54,-,56,-,61,-,63,-,234
189	241	DP-RK	180.9988179	189,-,147,-,241
190	241	DP-RK	171.2709235	190,-,147,-,241
191	242	DP-RK	294.4475942	191,-,75,-,242
192	241	DP-RK	364.8170851	192,-,77,-,241
193	241	DP-RK	485.309465	193,-,107,-,77,-,241
194	242	DP-RK	1007.815445	194,-,105,-,107,-,77,-,76,-,242
195	243	DP-RK	239.205114	195,-,101,-,243
196	236	DP-RK	319.9452073	196,-,66,-,236
197	244	DP-RK	821.6315359	197,-,82,-,80,-,85,-,87,-,89,-,91,-,244
198	244	DP-RK	901.749921	198,-,84,-,82,-,80,-,85,-,87,-,89,-,91,-,244
199	245	DP-RK	163.0406374	199,-,153,-,245
200	245	DP-RK	151.1425324	200,-,154,-,245
201	245	DP-RK	151.3837811	201,-,154,-,245
202	246	DP-RK	274.0831245	202,-,88,-,246
203	244	DP-RK	395.0039254	203,-,94,-,95,-,92,-,244
204	237	DP-RK	433.1077356	204,-,51,-,52,-,237
205	245	DP-RK	1275.6153	205,-,97,-,95,-,92,-,91,-,89,-,87,-,85,-,80,-,82,-,84,-,152,-,153,-,245
206	247	DP-RK	551.1521001	206,-,117,-,121,-,247
207	247	DP-RK	323.7530659	207,-,139,-,98,-,247
208	247	DP-RK	316.432987	208,-,121,-,247
209	248	DP-RK	814.4428652	209,-,139,-,119,-,120,-,122,-,125,-,151,-,248

210	248	DP-RK	470.1419971	210,-,104,-,149,-,248
211	248	DP-RK	673.8045431	211,-,120,-,122,-,125,-,151,-,248
212	248	DP-RK	629.3982999	212,-,120,-,122,-,125,-,151,-,248
213	249	DP-RK	217.6191251	213,-,123,-,249
214	250	DP-RK	180.7612705	214,-,150,-,250
215	248	DP-RK	176.3344384	215,-,149,-,248
216	250	DP-RK	183.613452	216,-,150,-,250
217	251	DP-RK	180.0573471	217,-,151,-,251
218	251	DP-RK	200.279804	218,-,151,-,251
219	249	DP-RK	339.0880069	219,-,122,-,124,-,249
220	251	DP-RK	378.3302924	220,-,127,-,125,-,151,-,251
221	252	DP-RK	275.9289828	221,-,113,-,252
222	252	DP-RK	370.4006241	222,-,113,-,252
223	253	DP-RK	290.4099931	223,-,132,-,130,-,253
224	249	DP-RK	250.9909653	224,-,123,-,249
225	249	DP-RK	256.3043313	225,-,124,-,249
226	253	DP-RK	253.7342471	226,-,135,-,253
227	253	DP-RK	227.4884293	227,-,135,-,253
245	247	RK-RK	1547.339739	245,-,153,-,152,-,84,-,82,-,80,-,85,-,86,-,99,-,139,-,98,-,247
247	259	RK-Steiner	745.4499916	247,-,98,-,96,-,94,-,93,-,259
259	244	Steiner-RK	524.7134426	259,-,93,-,94,-,95,-,92,-,244
259	246	Steiner-RK	444.6657086	259,-,90,-,88,-,246
246	262	RK-Steiner	357.0935847	246,-,88,-,148,-,262
236	262	RK-Steiner	910.374498	236,-,66,-,100,-,99,-,86,-,262
262	248	Steiner-RK	1086.057909	262,-,86,-,99,-,100,-,101,-,102,-,104,-,149,-,248
236	257	RK-Steiner	383.4366262	236,-,66,-,257
243	257	RK-Steiner	566.1016989	243,-,100,-,66,-,257
257	235	Steiner-RK	571.8424751	257,-,146,-,62,-,235
243	254	RK-Sentral	1116.261247	243,-,101,-,103,-,105,-,106,-,108,-,111,-,115,-,254
229	267	RK-Steiner	478.1317823	229,-,9,-,267
267	233	Steiner-RK	807.5909655	267,-,9,-,20,-,22,-,26,-,54,-,56,-,143,-,233
272	228	Steiner-RK	765.8494102	272,-,9,-,8,-,7,-,228
267	272	Steiner-Steiner	572.7503806	267,-,9,-,272
234	273	RK-Steiner	2216.105947	234,-,63,-,61,-,56,-,54,-,26,-,28,-,30,-,33,-,34,-,36,-,38,-,69,-,67,-,273
273	242	Steiner-RK	1332.837549	273,-,68,-,70,-,73,-,75,-,242

273	272	Steiner-Steiner	2084.881129	273,-,67,-,69,-,38,-,36,-,34,-,33,-,30,-,28,-,26,-,22,-,20,-,9,-,272
234	270	RK-Steiner	2204.507113	234,-,63,-,61,-,56,-,54,-,26,-,28,-,30,-,33,-,34,-,36,-,38,-,69,-,67,-,270
250	270	RK-Steiner	1471.908169	250,-,106,-,108,-,107,-,77,-,73,-,70,-,68,-,270
270	230	Steiner-RK	2349.772681	270,-,67,-,69,-,38,-,36,-,34,-,33,-,30,-,28,-,26,-,22,-,20,-,9,-,10,-,230
250	254	RK-Sentral	935.141213	250,-,106,-,108,-,111,-,115,-,254
232	232	RK-RK	0	232
232	231	RK-RK	399.6689985	232,-,141,-,142,-,231
232	239	RK-RK	1939.253591	232,-,15,-,13,-,10,-,9,-,20,-,22,-,26,-,28,-,30,-,33,-,34,-,36,-,38,-,69,-,70,-,239
239	241	RK-RK	609.6773999	239,-,70,-,73,-,77,-,241
241	275	RK-Steiner	1140.392304	241,-,77,-,73,-,70,-,69,-,38,-,37,-,42,-,44,-,46,-,275
238	275	RK-Steiner	895.2992852	238,-,41,-,35,-,37,-,42,-,44,-,46,-,275
275	237	Steiner-RK	440.0222529	275,-,48,-,237
238	240	RK-RK	636.1161902	238,-,41,-,35,-,37,-,38,-,240
240	252	RK-RK	889.3732297	240,-,69,-,70,-,73,-,77,-,107,-,108,-,111,-,113,-,252
252	254	RK-Sentral	427.7838771	252,-,116,-,254
254	281	Sentral-Steiner	1058.913337	254,-,116,-,113,-,129,-,127,-,281
281	253	Steiner-RK	530.2473707	281,-,127,-,128,-,130,-,253
251	282	RK-Steiner	380.0375018	251,-,151,-,125,-,282
282	249	Steiner-RK	388.8625741	282,-,122,-,124,-,249
282	281	Steiner-Steiner	371.2519171	282,-,125,-,127,-,281

Lampiran 35 : Tabel Kebutuhan Catuan RA

No	Kbth RK
1	1350
2	1800
3	900
4	450
5	900
6	3150
7	900
8	450
9	900

10	1350
11	1800
12	1800
13	450
14	1800
15	900
16	450
17	1350
18	1800
19	450
20	1350
21	2250
22	1800
23	900
24	1350
25	900
26	1350

Lampiran 36 : Tabel Koordinat Semua Titik Pada RA

Index	X	Y	Type
1	-1480	519	1
2	-1410	521	1
3	-1310	549	1
4	-1235	550	1
5	-1160	526	1
6	-1480	464	1
7	-1385	465	1
8	-1295	489	1
9	-1160	466	1
10	-1135	290	1
11	-1490	290	1
12	-1490	230	1
13	-1125	230	1
14	-1475	124	1
15	-1110	124	1
16	-1475	64	1
17	-1110	66	1
18	-1050	64	1
19	-1050	120	1
20	-1100	470	1
21	-1040	546	1
22	-1035	484	1

23	-1075	294	1
24	-1065	230	1
25	-970	536	1
26	-970	476	1
27	-1010	20	1
28	-945	20	1
29	-1010	-40	1
30	-945	-40	1
31	-915	16	1
32	-865	14	1
33	-920	-40	1
34	-860	-60	1
35	-920	-170	1
36	-860	-160	1
37	-920	-230	1
38	-860	-236	1
39	-920	-300	1
40	-860	-300	1
41	-1015	-170	1
42	-1035	-230	1
43	-1095	-126	1
44	-1105	-184	1
45	-1230	-124	1
46	-1220	-186	1
47	-1295	-150	1
48	-1295	-216	1
49	-1350	-140	1
50	-1440	-140	1
51	-1440	-196	1
52	-1355	-200	1
53	-935	526	1
54	-935	466	1
55	-875	520	1
56	-875	460	1
57	-875	186	1
58	-935	190	1
59	-830	520	1
60	-775	524	1
61	-830	460	1
62	-770	460	1
63	-835	154	1
64	-775	160	1
65	-390	520	1

66	-395	464	1
67	-720	244	1
68	-660	239	1
69	-765	-235	1
70	-705	-234	1
71	-770	-294	1
72	-705	-294	1
73	-620	-236	1
74	-605	-294	1
75	-620	154	1
76	-560	154	1
77	-560	-220	1
78	-550	-280	1
79	-380	644	1
80	-285	634	1
81	-100	804	1
82	-75	754	1
83	15	806	1
84	-10	756	1
85	-290	586	1
86	-295	530	1
87	-225	586	1
88	-195	534	1
89	-135	676	1
90	-115	620	1
91	-75	674	1
92	-15	670	1
93	-35	620	1
94	10	584	1
95	45	626	1
96	75	536	1
97	105	586	1
98	70	264	1
99	-320	266	1
100	-415	270	1
101	-420	206	1
102	-325	200	1
103	-430	94	1
104	-335	96	1
105	-435	40	1
106	-340	36	1
107	-455	-194	1
108	-355	-164	1

109	-465	-254	1
110	-360	-224	1
111	-265	-164	1
112	-270	-216	1
113	-200	-160	1
114	-200	-220	1
115	-260	-40	1
116	-200	-40	1
117	140	496	1
118	205	516	1
119	10	204	1
120	70	200	1
121	140	264	1
122	140	200	1
123	200	254	1
124	200	194	1
125	145	94	1
126	200	96	1
127	145	34	1
128	200	34	1
129	140	-164	1
130	200	-164	1
131	155	-220	1
132	200	-220	1
133	265	564	1
134	325	594	1
135	270	-166	1
136	270	-224	1
137	325	-164	1
138	330	-224	1
139	10	264	1
140	-1200	480	1
141	-1180	126	1
142	-1265	126	1
143	-880	326	1
144	-835	266	1
145	-690	-80	1
146	-495	466	1
147	-560	-54	1
148	-255	534	1
149	-160	95	1
150	-175	35	1
151	25	94	1

152	80	686	1
153	145	646	1
154	195	614	1
155	-1440	466	2
156	-1340	475	2
157	-1235	490	2
158	-1440	296	2
159	-1324	298	2
160	-1220	298	2
161	-1424	124	2
162	-1320	126	2
163	-1216	124	2
164	-1144	124	2
165	-1084	450	2
166	-1076	400	2
167	-1020	310	2
168	-1004	140	2
169	-872	420	2
170	-874	360	2
171	-874	300	2
172	-872	200	2
173	-832	250	2
174	-834	170	2
175	-704	460	2
176	-466	460	2
177	-1396	-200	2
178	-1256	-200	2
179	-1136	-184	2
180	-1080	-202	2
181	-1024	-224	2
182	-976	-226	2
183	-856	-40	2
184	-855	-190	2
185	-856	-90	2
186	-764	-220	2
187	-684	-55	2
188	-659	220	2
189	-559	-130	2
190	-559	10	2
191	-616	140	2
192	-496	-190	2
193	-444	-80	2
194	-420	120	2

195	-424	230	2
196	-404	390	2
197	-84	740	2
198	36	710	2
199	116	660	2
200	160	630	2
201	224	590	2
202	-216	530	2
203	-14	606	2
204	-1440	-140	2
205	184	530	2
206	10	420	2
207	10	340	2
208	200	400	2
209	-164	260	2
210	-216	200	2
211	-74	200	2
212	-16	200	2
213	196	270	2
214	-224	34	2
215	-120	96	2
216	-124	38	2
217	-20	96	2
218	-24	38	2
219	120	98	2
220	124	36	2
221	-116	-160	2
222	4	-160	2
223	136	-220	2
224	264	290	2
225	264	200	2
226	260	-90	2
227	260	-160	2
228	-1389.999723	464.9473713	3
229	-1164.719292	467.6517521	3
230	-1485	290	3
231	-1470	124	3
232	-1175.00204	125.8572011	3
233	-879.8215423	321.0031857	3
234	-774.9166782	164.9993057	3

235	-765.0011897	460.109065	3
236	-399.9997156	463.9466697	3
237	-1350.168825	-201.2883133	3
238	-1019.38108	-167.5904063	3
239	-689.5318462	-75.02196504	3
240	-764.5323306	-230.0219195	3
241	-560	-59	3
242	-560	149	3
243	-419.6105617	210.9848107	3
244	-19.98892579	670.3325951	3
245	190.788643	616.6952685	3
246	-199.9960048	533.8001598	3
247	70.09189624	268.9991554	3
248	-155.000073	94.97297337	3
249	200	249	3
250	-170.0000244	34.98437508	3
251	30	94	3
252	-195.000346	-160.0588195	3
253	-204.9979604	-164.1427989	3
254	0	0	5
255	-499.9988103	465.890935	4
256	10	579	4
257	-490.0009997	465.90002	4
258	-110	620	4
259	-118.4055197	616.3390663	4
260	-199.9960048	533.8001598	4
261	-118.4055197	616.3390663	4
262	-250	534	4
263	-118.4055197	616.3390663	4

264	-118.4055197	616.3390663	4
265	-1075.703169	298.9503084	4
266	-765.0011897	460.109065	4
267	-1164.928977	466.8397517	4
268	-664.9827288	239.4152274	4
269	-1140	290	4
270	-715.0172712	243.5847726	4
271	-1140	290	4
272	-1135.703169	294.9503084	4
273	-660.4681538	234.021965	4
274	-1269.999773	125.9523831	4
275	-1215.000756	-185.9130566	4
276	-1185	126	4
277	-1185	126	4
278	-1175.00204	125.8572011	4
279	144.8737776	29.00159346	4
280	144.7644129	98.99444679	4
281	140.0000244	34.01562492	4
282	140	94	4

Lampiran 37 : Tabel Link Jalan RA Parameter 10000 – 200

Index	Ruas A	Ruas B	Index	Ruas A	Ruas B	Index	Ruas A	Ruas B
1	1	2	201	174	63	401	275	46
2	6	7	202	174	61	402	275	48
3	2	3	203	175	62	403	276	141
4	3	4	204	175	64	404	276	15
5	4	5	205	176	146	405	277	141
6	7	8	206	176	66	406	277	15
7	8	9	207	177	52	407	278	141
8	10	11	208	177	51	408	278	15
9	13	12	209	178	46	409	279	127
10	14	15	210	178	48	410	279	106
11	16	17	211	179	44	411	280	125
12	17	18	212	179	46	412	280	122
13	18	19	213	180	44	413	281	127

14	19	24	214	180	42	414	281	106
15	24	23	215	181	42	415	282	125
16	23	20	216	181	44	416	282	122
17	21	5	217	182	37	417	5	9
18	20	22	218	182	42	418	9	20
19	21	25	219	183	34	419	10	23
20	22	27	220	183	32	420	10	13
21	29	30	221	184	36	421	13	24
22	27	29	222	184	38	422	15	19
23	26	28	223	185	34	423	15	17
24	28	31	224	185	36	424	21	22
25	31	32	225	186	69	425	22	26
26	30	33	226	186	38	426	25	26
27	25	53	227	187	145	427	27	28
28	26	54	228	187	70	428	28	30
29	53	55	229	188	68	429	33	34
30	54	58	230	188	67	430	35	36
31	58	57	231	189	147	431	35	37
32	57	56	232	189	77	432	37	38
33	55	59	233	190	147	433	38	40
34	59	60	234	190	76	434	53	54
35	56	61	235	191	75	435	54	56
36	61	63	236	191	76	436	55	56
37	63	64	237	192	107	437	59	60
38	64	62	238	192	77	438	59	61
39	32	34	239	193	107	439	61	62
40	33	35	240	193	105	440	60	62
41	34	36	241	194	103	441	69	70
42	50	51	242	194	105	442	69	71
43	50	49	243	195	101	443	69	70
44	49	47	244	195	100	444	70	72
45	47	45	245	196	66	445	73	77
46	45	43	246	196	62	446	73	74
47	43	41	247	197	82	447	73	77
48	41	35	248	197	84	448	77	78
49	51	52	249	198	152	449	107	108
50	52	48	250	198	84	450	109	110
51	48	46	251	199	153	451	103	104
52	46	44	252	199	152	452	105	106
53	44	42	253	200	153	453	100	99
54	42	37	254	200	154	454	101	102
55	37	39	255	201	154	455	65	86
56	36	38	256	201	133	456	86	85

57	39	40
58	38	69
59	40	71
60	69	67
61	67	68
62	68	70
63	71	72
64	70	73
65	72	74
66	75	76
67	73	75
68	76	77
69	74	78
70	77	107
71	78	109
72	60	65
73	62	66
74	79	65
75	66	100
76	100	101
77	101	103
78	103	105
79	105	107
80	109	110
81	108	106
82	104	102
83	99	86
84	80	85
85	79	81
86	81	83
87	80	82
88	82	84
89	83	134
90	84	133
91	133	135
92	134	137
93	137	138
94	136	138
95	135	130
96	136	132
97	132	131
98	131	114
99	113	129

257	202	88
258	202	86
259	203	93
260	203	94
261	204	50
262	204	51
263	205	118
264	205	97
265	206	96
266	206	117
267	207	139
268	207	94
269	208	117
270	208	121
271	209	99
272	209	139
273	210	102
274	210	104
275	211	119
276	211	120
277	212	119
278	212	120
279	213	123
280	213	124
281	214	150
282	214	106
283	215	149
284	215	151
285	216	150
286	216	106
287	217	151
288	217	149
289	218	151
290	218	149
291	219	125
292	219	122
293	220	127
294	220	106
295	221	113
296	221	116
297	222	129
298	222	113
299	223	131

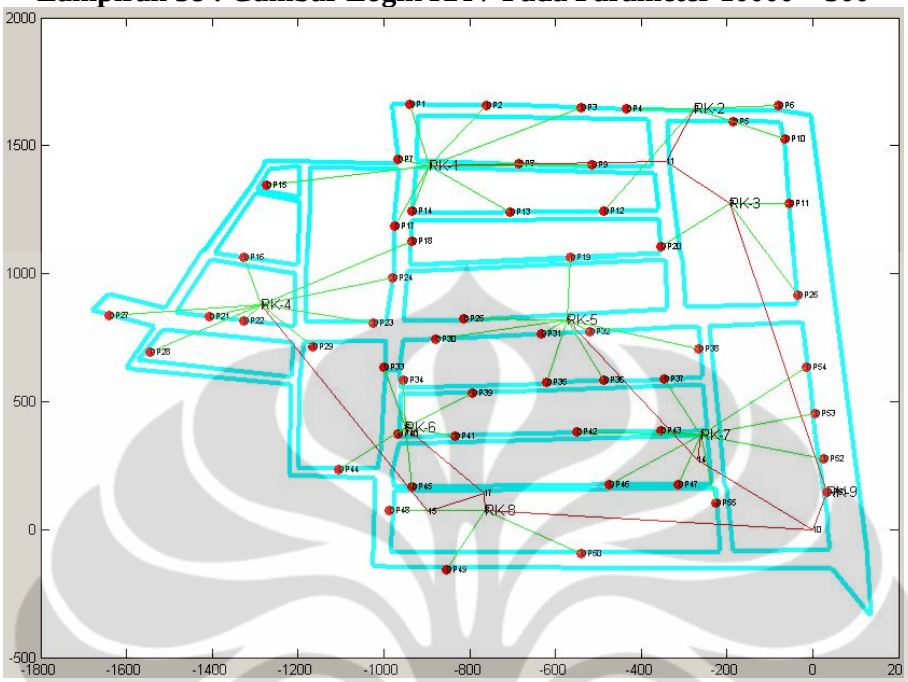
457	79	80
458	87	88
459	111	113
460	111	112
461	114	113
462	81	82
463	83	84
464	133	134
465	94	96
466	94	95
467	96	97
468	117	118
469	139	98
470	119	139
471	98	120
472	121	123
473	122	124
474	125	126
475	125	127
476	125	126
477	127	128
478	129	130
479	129	131
480	130	132
481	135	136
482	135	137
483	254	115
484	254	116

100	127	129	300	223	132
101	128	130	301	224	123
102	126	124	302	224	124
103	123	118	303	225	124
104	117	121	304	225	123
105	122	125	305	226	135
106	85	87	306	226	130
107	89	91	307	227	135
108	97	118	308	227	130
109	91	92	309	228	7
110	95	97	310	228	6
111	86	88	311	229	9
112	88	90	312	229	8
113	90	93	313	230	11
114	93	94	314	230	10
115	96	117	315	231	14
116	139	94	316	231	142
117	96	98	317	232	141
118	99	139	318	232	15
119	102	119	319	233	143
120	98	121	320	233	57
121	119	120	321	234	64
122	120	122	322	234	63
123	104	125	323	235	62
124	106	127	324	235	64
125	9	10	325	236	66
126	13	15	326	236	62
127	87	89	327	237	52
128	123	124	328	237	48
129	126	128	329	238	41
130	108	111	330	238	43
131	111	115	331	239	145
132	110	112	332	239	70
133	112	114	333	240	69
134	113	116	334	240	38
135	92	95	335	241	147
136	140	9	336	241	77
137	140	8	337	242	76
138	141	142	338	242	75
139	141	15	339	243	101
140	142	14	340	243	100
141	143	56	341	244	92
142	143	57	342	244	91

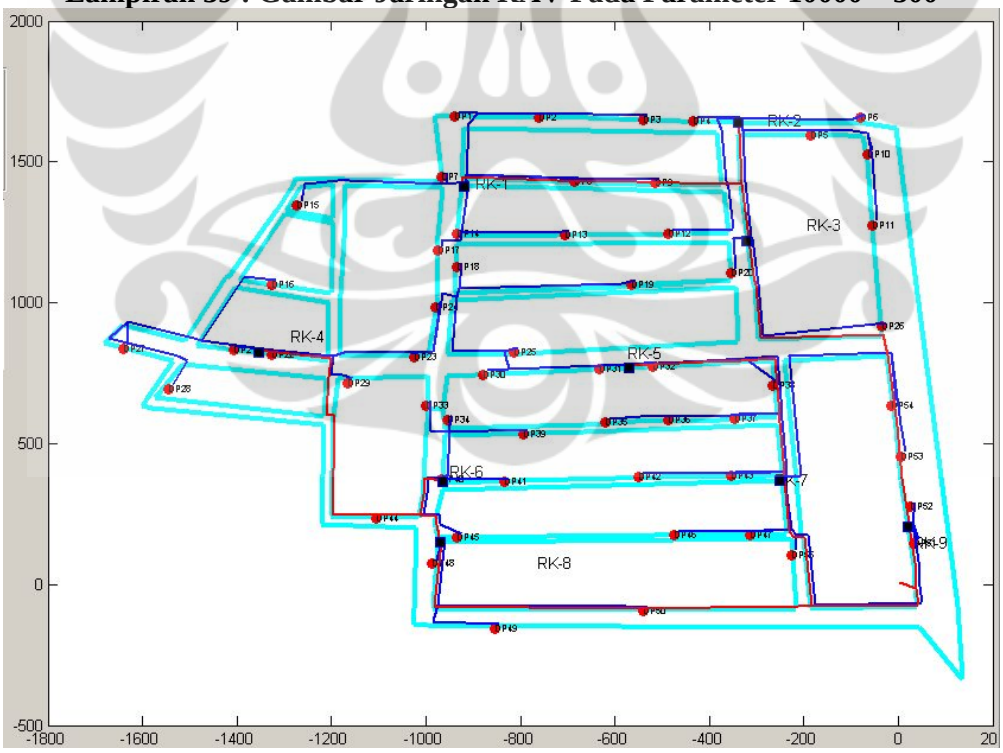
143	144	63	343	245	154
144	144	61	344	245	153
145	145	70	345	246	88
146	145	68	346	246	86
147	146	66	347	247	98
148	146	62	348	247	121
149	147	76	349	248	149
150	147	77	350	248	151
151	148	86	351	249	123
152	148	88	352	249	124
153	149	104	353	250	150
154	149	151	354	250	106
155	150	106	355	251	151
156	150	127	356	251	149
157	151	149	357	252	113
158	151	125	358	252	116
159	152	84	359	253	130
160	152	153	360	253	135
161	153	154	361	255	146
162	154	133	362	255	66
163	155	6	363	256	94
164	155	7	364	256	93
165	156	7	365	257	146
166	156	8	366	257	66
167	157	140	367	258	90
168	157	8	368	258	93
169	158	11	369	259	90
170	158	10	370	259	93
171	159	11	371	260	88
172	159	10	372	260	86
173	160	10	373	261	90
174	160	9	374	261	93
175	161	14	375	262	148
176	161	142	376	262	86
177	162	142	377	263	90
178	162	141	378	263	93
179	163	141	379	264	90
180	163	142	380	264	93
181	164	15	381	265	23
182	164	14	382	265	24
183	165	20	383	266	62
184	165	22	384	266	64
185	166	20	385	267	9

186	166	22		386	267	8
187	167	23		387	268	68
188	167	24		388	268	67
189	168	19		389	269	10
190	168	18		390	269	9
191	169	56		391	270	67
192	169	57		392	270	68
193	170	143		393	271	10
194	170	56		394	271	9
195	171	143		395	272	10
196	171	57		396	272	9
197	172	57		397	273	68
198	172	58		398	273	67
199	173	144		399	274	142
200	173	63		400	274	141

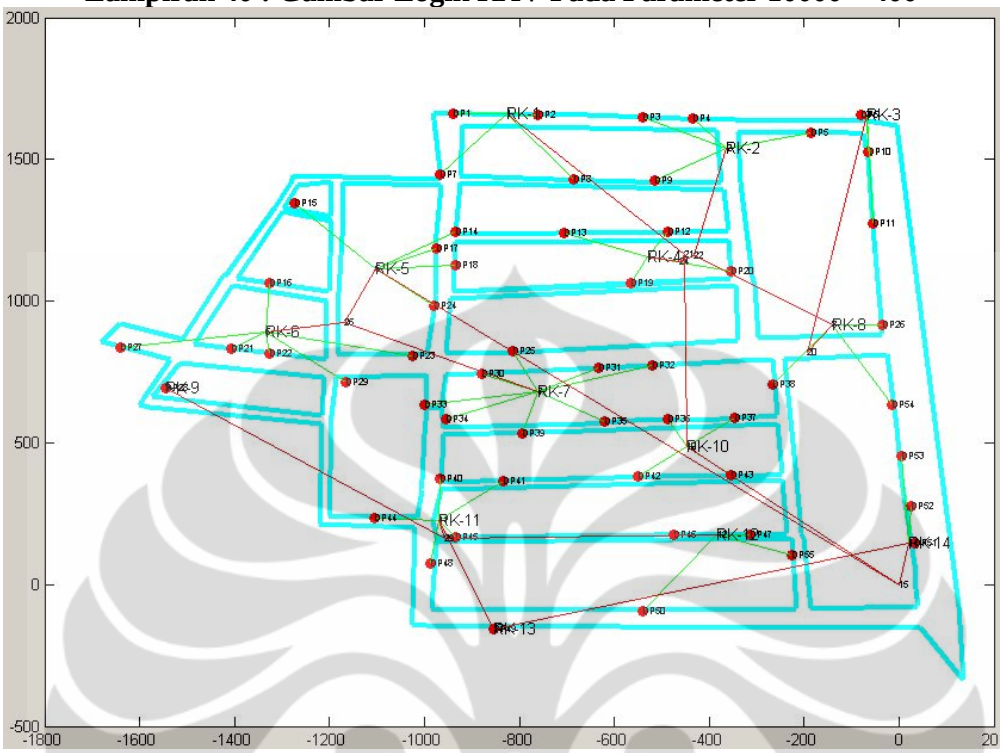
Lampiran 38 : Gambar Logik RAV Pada Parameter 10000 – 500



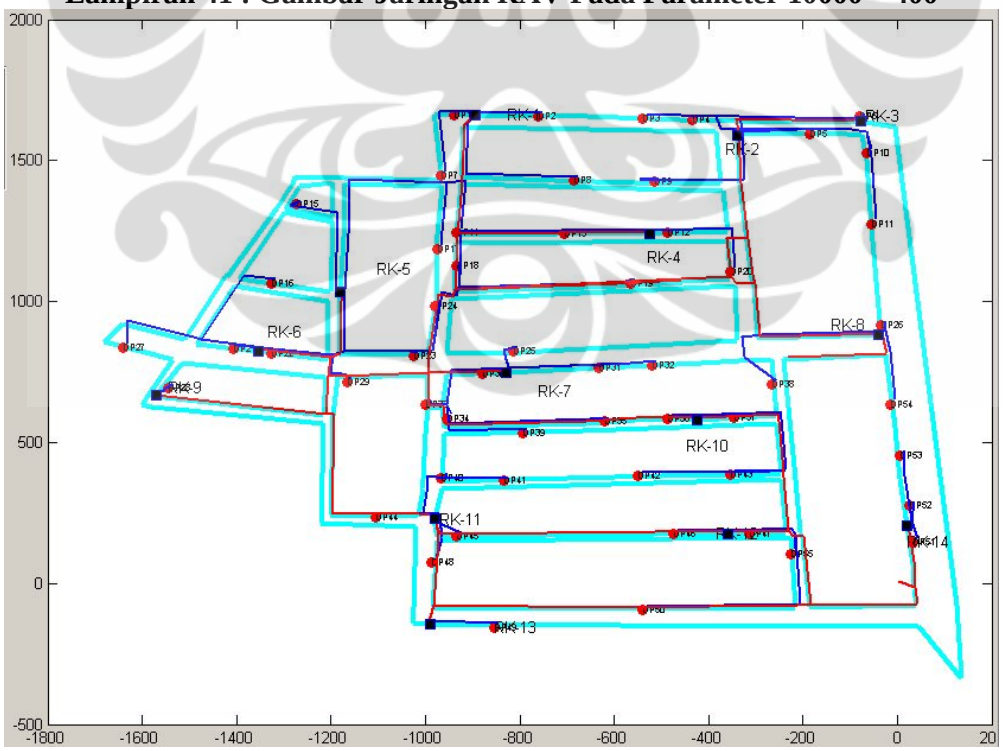
Lampiran 39 : Gambar Jaringan RAV Pada Parameter 10000 – 500



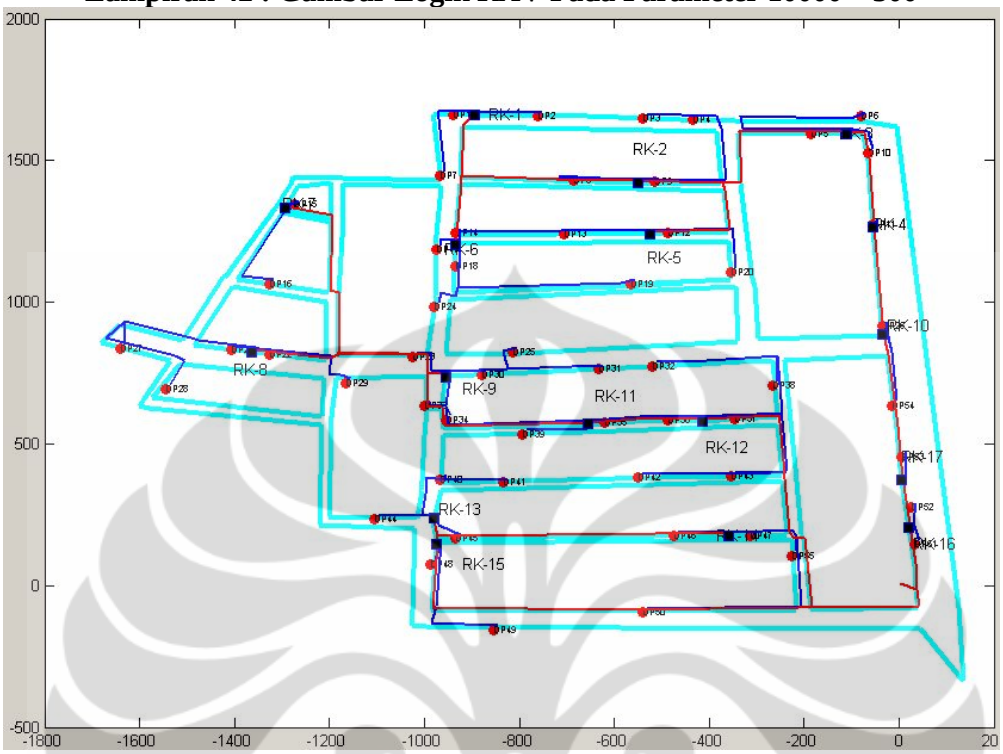
Lampiran 40 : Gambar Logik RAV Pada Parameter 10000 – 400



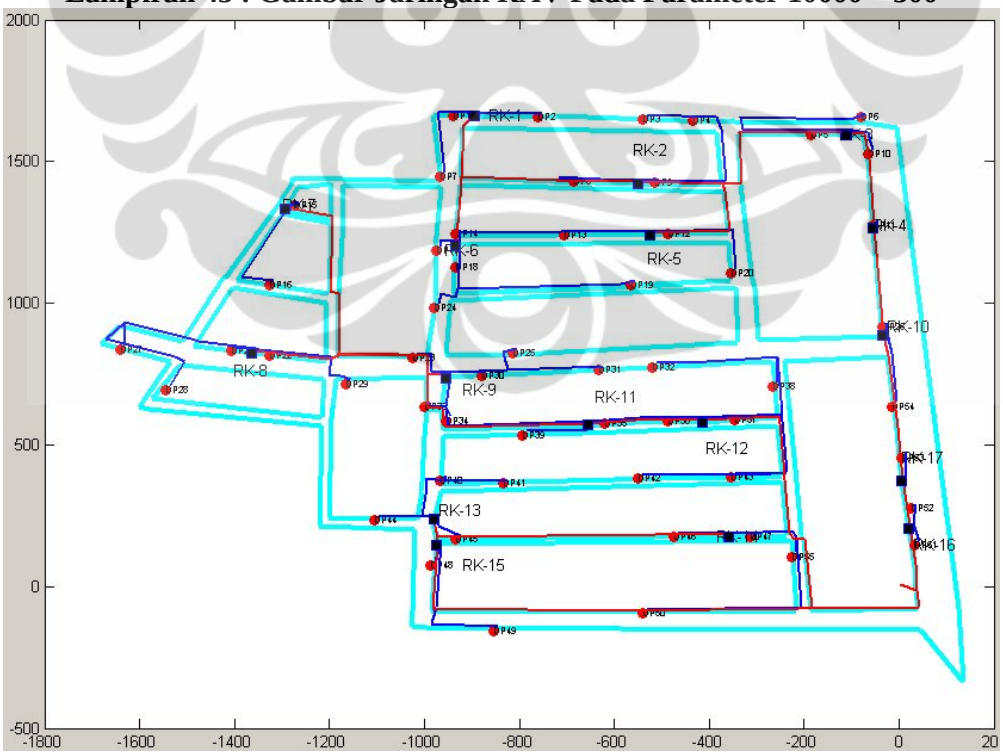
Lampiran 41 : Gambar Jaringan RAV Pada Parameter 10000 – 400



Lampiran 42 : Gambar Logik RAV Pada Parameter 10000 – 300



Lampiran 43 : Gambar Jaringan RAV Pada Parameter 10000 – 300



Lampiran 44 : Tabel Report RAV Pada Parameter 10000 – 300

A	B	Connection-ID	Distance	Path
151	206	DP-RK	356.3848205	151,-,3,-,206
152	206	DP-RK	407.587919	152,-,3,-,206
153	207	DP-RK	804.1487461	153,-,7,-,5,-,18,-,17,-,207
154	207	DP-RK	750.3216835	154,-,7,-,5,-,18,-,17,-,207
155	208	DP-RK	226.8836634	155,-,87,-,208
156	208	DP-RK	846.2461808	156,-,8,-,86,-,85,-,11,-,87,-,208
157	206	DP-RK	493.5593577	157,-,2,-,1,-,206
158	207	DP-RK	406.4478627	158,-,16,-,207
159	207	DP-RK	337.9343405	159,-,17,-,207
160	208	DP-RK	366.4075233	160,-,9,-,208
161	209	DP-RK	207.3575017	161,-,82,-,209
162	210	DP-RK	201.7547554	162,-,89,-,210
163	210	DP-RK	321.3046899	163,-,89,-,210
164	211	DP-RK	219.9739442	164,-,91,-,94,-,211
165	212	DP-RK	335.4963816	165,-,22,-,212
166	212	DP-RK	611.9051433	166,-,29,-,24,-,22,-,212
167	211	DP-RK	235.894991	167,-,93,-,94,-,211
168	211	DP-RK	226.846243	168,-,94,-,211
169	210	DP-RK	1155.912216	169,-,102,-,103,-,94,-,91,-,90,-,89,-,210
170	210	DP-RK	373.3594134	170,-,95,-,88,-,210
171	213	DP-RK	315.9444718	171,-,38,-,213
172	213	DP-RK	313.6252498	172,-,38,-,213
173	214	DP-RK	375.9134984	173,-,47,-,48,-,109,-,214
174	211	DP-RK	322.8829545	174,-,148,-,104,-,103,-,211
175	214	DP-RK	367.6347585	175,-,107,-,110,-,109,-,214
176	215	DP-RK	238.9024902	176,-,79,-,215
177	213	DP-RK	549.8917331	177,-,41,-,32,-,33,-,213
178	213	DP-RK	808.7541538	178,-,43,-,42,-,40,-,41,-,32,-,33,-,213
179	213	DP-RK	559.3723324	179,-,46,-,44,-,39,-,38,-,213
180	214	DP-RK	208.4966036	180,-,109,-,214
181	216	DP-RK	920.2802947	181,-,110,-,109,-,115,-,116,-,117,-,216
182	216	DP-RK	928.5743497	182,-,112,-,113,-,81,-,121,-,120,-,119,-,216
183	214	DP-RK	252.6788566	183,-,114,-,115,-,214
184	214	DP-RK	230.6784424	184,-,115,-,214
185	216	DP-RK	178.2728375	185,-,117,-,216
186	216	DP-RK	236.0871635	186,-,119,-,216
187	217	DP-RK	197.3840941	187,-,120,-,217
188	217	DP-RK	606.7759323	188,-,81,-,121,-,120,-,217

189	216	DP-RK	274.9805301	189,-,118,-,117,-,216
190	218	DP-RK	452.4146409	190,-,126,-,125,-,127,-,58,-,60,-,218
191	218	DP-RK	533.183663	191,-,126,-,125,-,127,-,58,-,60,-,218
192	217	DP-RK	781.6062602	192,-,131,-,132,-,122,-,121,-,120,-,217
193	217	DP-RK	594.2951854	193,-,132,-,122,-,121,-,120,-,217
194	218	DP-RK	357.065032	194,-,58,-,60,-,218
195	218	DP-RK	307.9535746	195,-,61,-,218
196	219	DP-RK	217.8997766	196,-,135,-,219
197	219	DP-RK	158.5095122	197,-,135,-,219
198	220	DP-RK	311.4393412	198,-,63,-,220
199	220	DP-RK	530.9545766	199,-,68,-,64,-,220
200	219	DP-RK	778.6101388	200,-,70,-,139,-,136,-,219
201	221	DP-RK	288.1168859	201,-,75,-,221
202	221	DP-RK	289.3542987	202,-,75,-,221
203	222	DP-RK	299.4844175	203,-,76,-,222
204	215	DP-RK	423.9185047	204,-,78,-,79,-,215
205	219	DP-RK	259.3088129	205,-,139,-,136,-,219
223	222	Sentral-RK	605.6115779	223,-,74,-,73,-,75,-,222
222	215	RK-RK	795.9633175	222,-,76,-,77,-,78,-,79,-,215
215	209	RK-RK	643.7584752	215,-,79,-,82,-,209
209	208	RK-RK	584.4057221	209,-,83,-,9,-,208
208	207	RK-RK	1038.195909	208,-,87,-,11,-,85,-,96,-,18,-,17,-,207
207	224	RK-Steiner	467.2645103	207,-,16,-,224
224	210	Steiner-RK	946.4762907	224,-,16,-,17,-,18,-,19,-,88,-,210
211	224	RK-Steiner	662.4507299	211,-,94,-,91,-,15,-,13,-,224
224	206	Steiner-RK	721.659004	224,-,13,-,4,-,3,-,206
224	224	Steiner-Steiner	0	224
223	217	Sentral-RK	1420.746362	223,-,74,-,72,-,141,-,140,-,139,-,136,-,133,-,132,-,122,-,121,-,120,-,217
217	216	RK-RK	310.7112451	217,-,119,-,216
216	227	RK-Steiner	965.0449992	216,-,117,-,116,-,115,-,114,-,48,-,47,-,150,-,227
227	212	Steiner-RK	982.4529314	227,-,45,-,37,-,36,-,34,-,26,-,25,-,22,-,212
213	228	RK-Steiner	543.1631375	213,-,38,-,39,-,45,-,228
228	214	Steiner-RK	515.2139145	228,-,150,-,47,-,48,-,109,-,214
228	227	Steiner-Steiner	295.0421131	228,-,150,-,227

219	218	RK-RK	903.9907964	219,-,135,-,134,-,62,-,61,-,218
218	220	RK-RK	371.2931979	218,-,61,-,62,-,63,-,220
220	229	RK-Steiner	1587.624683	220,-,64,-,69,-,70,-,141,-,72,-,74,-,229
223	229	Sentral-Steiner	322.8946998	223,-,74,-,229
229	221	Steiner-RK	376.7790903	229,-,73,-,221

Lampiran 45 : Tabel Kebutuhan Catu RAV Pada Parameter 10000 – 300

RK	Kbth RK
1	1350
2	1800
3	1350
4	450
5	1800
6	1800
7	900
8	2250
9	2250
10	900
11	2250
12	1800
13	1800
14	1800
15	900
16	900
17	450

Lampiran 46 : Tabel Koordinat Titik RAV Pada Parameter 10000 – 300

Index	X	Y	Type
1	-980	1661	1
2	-980	1635	1
3	-900	1660	1
4	-920	1621	1
5	-385	1601	1
6	-655	1655	1
7	-395	1641	1
8	-110	1635	1
9	-75	1589	1
10	-82	1641	1
11	-220	1596	1
12	-965	1431	1
13	-925	1441	1
14	-965	1409	1

15	-925	1415	1
16	-725	1429	1
17	-555	1421	1
18	-375	1415	1
19	-370	1391	1
20	-1265	1409	1
21	-1280	1415	1
22	-1295	1329	1
23	-1315	1334	1
24	-1300	1315	1
25	-1195	1301	1
26	-1195	1281	1
27	-1170	1295	1
28	-1420	1089	1
29	-1395	1081	1
30	-1425	1089	1
31	-1405	1055	1
32	-1510	866	1
33	-1485	850	1
34	-1200	1035	1
35	-1205	1001	1
36	-1180	1029	1
37	-1180	995	1
38	-1360	824	1
39	-1205	795	1
40	-1680	859	1
41	-1640	921	1
42	-1535	795	1
43	-1515	781	1
44	-1210	729	1
45	-1183	810	1
46	-1185	729.5	1
47	-995	809	1
48	-995	741	1
49	-1573	662	1
50	-1590	661	1
51	-1600	635	1
52	-1580	626	1
53	-1215	595	1
54	-1215	569	1
55	-1195	595	1
56	-1195	569	1
57	-1200	241	1

58	-1015	239	1
59	-1020	201	1
60	-980	235	1
61	-980	201	1
62	-975	169	1
63	-975	149	1
64	-985	-85	1
65	-1025	-85	1
66	-1220	215	1
67	-1025	-145	1
68	-995	-145	1
69	-585	-91	1
70	-215	-85	1
71	45	-151	1
72	40	-79	1
73	35	41	1
74	35	-20	1
75	20	209	1
76	5	369	1
77	-5	555	1
78	-25	809	1
79	-35	881	1
80	-240	795	1
81	-265	795	1
82	-55	1261	1
83	-65	1501	1
84	-295	869	1
85	-340	1595	1
86	-345	1641	1
87	-105	1595	1
88	-360	1249	1
89	-520	1241	1
90	-720	1239	1
91	-935	1235	1
92	-975	1236	1
93	-975	1211	1
94	-935	1206	1
95	-360	1215	1
96	-335	1415	1
97	-320	1215	1
98	-355	1081	1
99	-310	1085	1
100	-345	1055	1

101	-305	1055	1
102	-595	1055	1
103	-940	1035	1
104	-945	1009	1
105	-455	1069	1
106	-955	815	1
107	-845	815	1
108	-340	861	1
109	-955	741	1
110	-835	749	1
111	-575	769	1
112	-415	781	1
113	-335	789	1
114	-995	621	1
115	-965	621	1
116	-960	555	1
117	-660	569	1
118	-665	541	1
119	-555	581	1
120	-420	581	1
121	-255	595	1
122	-255	569	1
123	-960	529	1
124	-1000	529	1
125	-1005	369	1
126	-965	361	1
127	-1005	335	1
128	-965	335	1
129	-800	369	1
130	-500	381	1
131	-315	381	1
132	-245	389	1
133	-245	369	1
134	-515	175	1
135	-355	175	1
136	-235	181	1
137	-215	369	1
138	-205	181	1
139	-225	161	1
140	-200	161	1
141	-185	-85	1
142	-175	-151	1
143	135	-340	1

144	125	-79	1
145	-5	1621	1
146	-1275	1441	1
147	-1170	1419	1
148	-975	1020	1
149	-1195	1420	1
150	-1055	812	1
151	-940	1660	2
152	-760	1655	2
153	-540	1650	2
154	-434	1645	2
155	-186	1595	2
156	-80	1655	2
157	-966	1445	2
158	-686	1430	2
159	-514	1425	2
160	-66	1525	2
161	-54	1275	2
162	-486	1245	2
163	-706	1240	2
164	-934	1245	2
165	-1274	1345	2
166	-1326	1065	2
167	-974	1185	2
168	-934	1125	2
169	-566	1065	2
170	-354	1105	2
171	-1406	830	2
172	-1326	815	2
173	-1026	805	2
174	-980	985	2
175	-814	825	2
176	-34	915	2
177	-1640	835	2
178	-1546	695	2
179	-1166	715	2
180	-880	745	2
181	-634	765	2
182	-520	775	2
183	-1000	635	2
184	-954	585	2
185	-620	575	2
186	-486	585	2

187	-346	590	2
188	-266	705	2
189	-794	535	2
190	-966	375	2
191	-834	365	2
192	-549	380	2
193	-354	385	2
194	-1106	235	2
195	-934	165	2
196	-474	175	2
197	-314	175	2
198	-986	75	2
199	-854	-155	2
200	-540	-95	2
201	34	145	2
202	26	275	2
203	6	455	2
204	-14	635	2
205	-226	105	2
206	-895.0010409	1659.89798	3
207	-550.0027755	1420.833426	3
208	-109.999811	1595.043477	3
209	-55.20815272	1265.995665	3
210	-524.99975	1240.950002	3
211	-935.1461364	1201.002136	3
212	-1293.244383	1333.681646	3
213	-1364.895228	825.0182074	3
214	-955.4152274	736.0172712	3
215	-35.26279417	885.9930891	3
216	-655.0323366	569.567733	3
217	-415.0179016	581.4227235	3
218	-979.2582977	239.9446818	3
219	-360	175	3
220	-975.2134804	144.0045595	3
221	20.44465969	204.0198115	3
222	4.731570465	373.9927894	3
223	0	0	5
224	-720.0055272	1428.764966	4
225	-720.0055272	1428.764966	4
226	-720.0055272	1428.764966	4
227	-1178.00061	810.0781155	4
228	-1182.91893	814.9993427	4
229	34.55534031	45.98018853	4

Lampiran 47 : Tabel Link Jalan RAV Pada Parameter 10000 – 300

Index	Ruas A	Ruas B
1	1	3
2	1	2
3	3	6
4	6	7
5	7	86
6	86	8
7	8	10
8	10	145
9	2	12
10	4	13
11	146	12
12	14	92
13	21	23
14	23	28
15	28	30
16	30	32
17	32	41
18	41	40
19	40	42
20	42	50
21	50	51
22	51	52
23	52	54
24	54	66
25	66	59
26	59	65
27	65	67
28	67	68
29	68	142
30	142	71
31	71	143
32	143	144
33	144	145
34	145	10
35	4	5
36	5	18
37	17	18
38	16	17
39	13	16
40	4	13

Index	Ruas A	Ruas B
131	80	78
132	78	77
133	77	76
134	76	75
135	75	73
136	73	74
137	74	72
138	72	141
139	141	140
140	140	138
141	137	138
142	137	80
143	69	70
144	110	111
145	100	108
146	85	96
147	96	97
148	97	99
149	99	101
150	85	11
151	11	87
152	87	9
153	9	83
154	83	82
155	82	79
156	79	84
157	84	101
158	101	99
159	99	97
160	97	96
161	47	150
162	146	21
163	102	105
164	103	102
165	151	3
166	151	1
167	152	6
168	152	3
169	153	6
170	153	7

Index	Ruas A	Ruas B
261	199	68
262	199	67
263	200	69
264	200	70
265	201	75
266	201	73
267	202	75
268	202	76
269	203	76
270	203	77
271	204	77
272	204	78
273	205	139
274	205	70
275	206	3
276	206	1
277	207	17
278	207	16
279	208	87
280	208	9
281	209	82
282	209	83
283	210	89
284	210	88
285	211	94
286	211	103
287	212	22
288	212	20
289	213	38
290	213	33
291	214	109
292	214	115
293	215	79
294	215	84
295	216	117
296	216	119
297	217	120
298	217	119
299	218	60
300	218	61

41	14	147		171	154	7		301	219	135
42	147	27		172	154	86		302	219	136
43	27	36		173	155	11		303	220	63
44	36	37		174	155	87		304	220	64
45	37	45		175	156	10		305	221	75
46	45	150		176	156	8		306	221	73
47	47	148		177	157	12		307	222	76
48	148	93		178	157	2		308	222	75
49	93	92		179	158	16		309	224	16
50	92	14		180	158	13		310	224	13
51	14	147		181	159	17		311	225	16
52	20	149		182	159	16		312	225	13
53	20	22		183	160	83		313	226	16
54	22	25		184	160	9		314	226	13
55	25	149		185	161	82		315	227	45
56	24	26		186	161	83		316	227	150
57	26	34		187	162	89		317	228	45
58	34	29		188	162	88		318	228	150
59	29	24		189	163	90		319	229	73
60	35	39		190	163	89		320	229	74
61	31	35		191	164	91		321	1	2
62	39	38		192	164	15		322	2	4
63	38	33		193	165	22		323	3	4
64	33	31		194	165	20		324	7	5
65	44	43		195	166	29		325	5	85
66	43	49		196	166	34		326	86	85
67	49	53		197	167	93		327	10	145
68	53	44		198	167	92		328	146	21
69	46	55		199	168	94		329	21	20
70	55	56		200	168	103		330	149	147
71	56	57		201	169	102		331	12	13
72	57	58		202	169	105		332	14	15
73	58	127		203	170	98		333	12	14
74	127	125		204	170	95		334	13	15
75	125	124		205	171	38		335	18	96
76	124	114		206	171	33		336	18	19
77	114	48		207	172	38		337	23	22
78	46	48		208	172	39		338	22	24
79	4	13		209	173	150		339	25	27
80	13	16		210	173	47		340	25	26
81	16	17		211	174	148		341	92	93
82	17	18		212	174	47		342	93	94
83	18	5		213	175	107		343	91	94

84	5	4	214	175	106	344	88	95
85	15	19	215	176	79	345	95	97
86	19	88	216	176	84	346	28	29
87	88	89	217	177	40	347	30	31
88	89	90	218	177	41	348	29	31
89	90	91	219	178	49	349	34	36
90	91	15	220	178	43	350	35	37
91	94	95	221	179	46	351	148	104
92	95	98	222	179	55	352	103	104
93	98	103	223	180	110	353	99	98
94	103	94	224	180	109	354	98	100
95	104	100	225	181	111	355	100	101
96	108	107	226	181	110	356	32	33
97	106	107	227	182	111	357	42	43
98	106	104	228	182	112	358	39	45
99	109	110	229	183	114	359	39	44
100	111	112	230	183	124	360	44	46
101	112	113	231	184	116	361	47	48
102	113	81	232	184	115	362	48	109
103	81	121	233	185	117	363	107	110
104	121	120	234	185	119	364	108	84
105	120	119	235	186	120	365	113	108
106	117	119	236	186	119	366	79	78
107	116	117	237	187	120	367	50	49
108	116	115	238	187	121	368	53	55
109	115	109	239	188	81	369	114	115
110	114	115	240	188	113	370	124	123
111	123	118	241	189	118	371	116	123
112	118	122	242	189	123	372	117	118
113	122	132	243	190	126	373	121	122
114	132	131	244	190	123	374	127	128
115	131	130	245	191	129	375	125	126
116	130	129	246	191	126	376	132	133
117	129	126	247	192	130	377	133	137
118	126	123	248	192	131	378	57	66
119	128	60	249	193	131	379	58	60
120	60	61	250	193	132	380	60	61
121	61	62	251	194	58	381	62	63
122	62	134	252	194	57	382	65	67
123	134	135	253	195	62	383	65	64
124	135	136	254	195	61	384	64	68
125	136	133	255	196	134	385	70	141
126	133	128	256	196	135	386	136	139

127	63	64
128	64	69
129	70	139
130	139	63

257	197	135
258	197	136
259	198	63
260	198	64

387	136	138
388	139	140
389	223	74

Lampiran 48 : Spesifikasi MDU ZTE

ZXDSL 9806H[MDU]

Network Interface

- 1 GPON/1 EPON/1 GE port
- 2.488Gbit/s downstream with 1490 nm wavelength
- 1.244Gbit/s upstream with 1310 nm wavelength

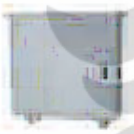
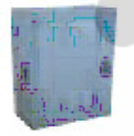
Subscriber Interface

- 96 ADSL/ADSL2+/SHDSL or 64 VDSL2 interfaces

Physical specification

Dimensions: 482.6mm(W) ×88.9mm(H) ×240mm(D)

Lampiran 49 : Spesifikasi RK ZTE

Photograp	Model	Physical parameters	Interface	Capability indices
	Standard Rack	Open rack Dimensions: 2000mm(H)*600mm(W)*600mm(D) Operating voltage -57V~-40V Weight(max): 220kg Ambient teperature: 0℃~40℃ Ambient humidity: 20%~80%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	1056POTS, 528ADSL+528POTS(rear access) 1056POTS,528ADSL+528POTS(front access) Uplink: GE, FE, E1, Supports 256 VLANs or 4K 50K BHCA 8.8G/12.8G/48G switching capacity for Data service
	ONU100	Indoor Dimensions: 421mm(H)*218mm(W)*456mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max): 18kg Ambient teperature: 0℃~40℃ Ambient humidity: 20%~80%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	96POTS, 48ADSL+48POTS, Uplink: GE, FE, E1 Supports 256 VLANs or 4K 50K BHCA 8G/12.8G/48G switching capacity for Data service
	OUT30	Outdoor Dimensions: 1992mm(H)*1350mm(W)*710mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max): 600kg Ambient teperature: -35℃~55℃ Ambient humidity: 5%~95%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	1088POTS, 544ADSL+544POTS, Uplink: GE, FE, E1 Supports 256 VLANs or 4K 50K BHCA 8.8G/12.8G/48G switching capacity for Data service
	OUT30E	Outdoor Dimensions: 2073mm(H)*1400mm(W)*650mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max): 600kg Ambient teperature: -35℃~55℃ Ambient humidity: 5%~95%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	1088POTS, 544ADSL+544POTS, Uplink: GE, FE, E1 Supports 256 VLANs or 4K 50K BHCA 8.8G/12.8G/48G switching capacity for Data service
	OUT30F	Outdoor Dimensions: 1900mm(H)*1850mm(W)*650mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max): 750kg Ambient teperature: -35℃~55℃ Ambient humidity: 5%~95%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	2048POTS, 1024ADSL+1024POTS, Uplink: GE, FE, E1 Supports 256 VLANs or 4K 50K BHCA 8.8G/12.8G/48G switching capacity for Data service
	OUT40	Outdoor Dimensions: 1450mm(H)*1500mm(W)*500mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max): 520kg Ambient teperature: -35℃~55℃ Ambient humidity: 5%~95%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	704POTS, 352ADSL+352POTS, Uplink: GE, FE, E1 Supports 256 VLANs or 4K 50K BHCA 8.8G/12.8G/48G switching capacity for Data service
	OUT50	Outdoor/Indoor Dimensions:1100mm(H)*700mm(W)*400mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max):140kg Ambient teperature:-35℃~60℃ Ambient humidity:5%~95%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	192POTS, 96ADSL+96POTS, Uplink: GE, FE, E1 Supports 256 VLANs or 4K 50K BHCA 8G/12.8G/48G switching capacity for Data service
	OUT60	Outdoor/Front access Dimensions: 1600mm(H)*1594mm(W)*780mm(D) Operating voltage -57V~-40V or 220VAC±30% Weight(max): 620kg Ambient teperature: -35℃~55℃ Ambient humidity: 5%~95%	POTS, ADSL/ADSL2+, VDSL, SHDSL, FE, BRI/PRI, DDN; Build-in MSTP/EPON/GPON	1056POTS, 528ADSL+528POTS, Uplink: GE, FE E1 Supports 256 VLANs or 4K 50K BHCA 8.8G/12.8G/48G switching capacity for Data service

Lampiran 50 : Sumber Kode Aplikasi

Fungsi gui utama :

```
function varargout = gui_utama(varargin)
% GUI_UTAMA M-file for gui_utama.fig
%      GUI_UTAMA, by itself, creates a new GUI_UTAMA or raises the
existing
%      singleton*.
%
```

```
%      H = GUI_UTAMA returns the handle to a new GUI_UTAMA or the
handle to
%      the existing singleton*.
%
%      GUI_UTAMA('CALLBACK',hObject,eventData,handles,...) calls
the local
%      function named CALLBACK in GUI_UTAMA.M with the given input
arguments.
%
%      GUI_UTAMA('Property','Value',...) creates a new GUI_UTAMA
or raises the
%      existing singleton*.  Starting from the left, property
value pairs are
%      applied to the GUI before gui_utama_OpeningFunction gets
called.  An
%      unrecognized property name or invalid value makes property
application
%      stop.  All inputs are passed to gui_utama_OpeningFcn via
varargin.
%
%      *See GUI Options on GUIDE's Tools menu.  Choose "GUI allows
only one
%      instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Copyright 2002-2003 The MathWorks, Inc.

% Edit the above text to modify the response to help gui_utama

% Last Modified by GUIDE v2.5 21-May-2008 06:39:34

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn', @gui_utama_OpeningFcn, ...
                   'gui_OutputFcn',  @gui_utama_OutputFcn, ...
                   'gui_LayoutFcn',  [] , ...
                   'gui_Callback',   []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT


% --- Executes just before gui_utama is made visible.
function gui_utama_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
```

```
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to gui_utama (see VARARGIN)

% Choose default command line output for gui_utama
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes gui_utama wait for user response (see UIRESUME)
% uiwait(handles.figure1);


% --- Outputs from this function are returned to the command line.
function varargout = gui_utama_OutputFcn(hObject, eventdata,
handles)
% varargout  cell array for returning output args (see VARARGOUT);
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;


% --- Executes on button press in petadasar.
function petadasar_Callback(hObject, eventdata, handles)
% hObject    handle to petadasar (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of petadasar


% --- Executes on button press in dp.
function dp_Callback(hObject, eventdata, handles)
% hObject    handle to dp (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of dp


% --- Executes on button press in gl.
function gl_Callback(hObject, eventdata, handles)
% hObject    handle to gl (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of gl
```

```
% --- Executes on button press in hubunganlogik.
function hubunganlogik_Callback(hObject, eventdata, handles)
% hObject    handle to hubunganlogik (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of hubunganlogik


% --- Executes on button press in primer.
function primer_Callback(hObject, eventdata, handles)
% hObject    handle to primer (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of primer


% --- Executes on button press in sekunder.
function sekunder_Callback(hObject, eventdata, handles)
% hObject    handle to sekunder (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of sekunder


% --- Executes on button press in jalankan.
function jalankan_Callback(hObject, eventdata, handles)
% hObject    handle to jalankan (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
global LinkJalan KoordinatTitikJalan KoordinatDP KebutuhanDPRate
LinkSentral Nyebrang
tic
Q=str2num(get(handles.Q,'string'));
RadiusGrup=str2num(get(handles.RadiusGrup,'string'));
axes(handles.axes1)
if get(handles.petadasar,'value')==1
gambarpetadasar(handles,LinkJalan,KoordinatTitikJalan)
%pause;
end
if get(handles.dp,'value')==1
axes(handles.axes1)
    for i=1:size(KoordinatDP,1)

plot(KoordinatDP(:,1),KoordinatDP(:,2),'ro','markerfacecolor','r')
        hold on
    end
end
```

```
if get(handles.hubunganlogik,'value')==1
hublogik = 1
else
hublogik = 0
end

[KoordinatRK, NamaRK, KoordinatTitikJalan,
LinkJalan]=ScatterSteiner(handles, hublogik, RadiusGrup,
KoordinatDP,KebutuhanDPRate,Q, KoordinatTitikJalan,
LinkJalan,LinkSentral,Nyebrang);
%[KoordinatTitikJalan,LinkJalan, KoordinatRK, NamaRK]=...
%KoordinatRK_dipeta(KoordinatTitikJalan,LinkJalan,KoordinatRK,Nama
RK, MatrikKoneksi);

T=toc;

set(handles.waktu,'string',num2str(T))


% --- Executes on button press in bersihkan.
function bersihkan_Callback(hObject, eventdata, handles)
% hObject    handle to bersihkan (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
axes(handles.axes1)
cla

% --- Executes on button press in tutup.
function tutup_Callback(hObject, eventdata, handles)
% hObject    handle to tutup (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)



function Q_Callback(hObject, eventdata, handles)
% hObject    handle to Q (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of Q as text
%        str2double(get(hObject,'String')) returns contents of Q
as a double


% --- Executes during object creation, after setting all
properties.
function Q_CreateFcn(hObject, eventdata, handles)
% hObject    handle to Q (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
```

```
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end



function edit2_Callback(hObject, eventdata, handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
%        str2double(get(hObject,'String')) returns contents of
edit2 as a double


% --- Executes during object creation, after setting all
properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end



function edit3_Callback(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit3 as text
%        str2double(get(hObject,'String')) returns contents of
edit3 as a double
```

```
% --- Executes during object creation, after setting all
properties.
function edit3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end



function edit4_Callback(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit4 as text
%        str2double(get(hObject,'String')) returns contents of
edit4 as a double


% --- Executes during object creation, after setting all
properties.
function edit4_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end
```

```
% --- Executes on button press in filedata.
function filedata_Callback(hObject, eventdata, handles)
% hObject    handle to filedata (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
global LinkJalan KoordinatTitikJalan KoordinatDP KebutuhanDPRate
LinkSentral Nyebrang
[file,path]=uigetfile('*.xls');

if file==0
    return
end
 h = waitbar(0,'Mohon Tunggu...');
[numk,txtk]=xlsread([path file],'Koordinat');
 waitbar(1/7,h)
[numl,txtl]=xlsread([path file],'LinkJalan');
 waitbar(2/7,h)
[numdp,txtdp]=xlsread([path file],'KoordinatDP');
 waitbar(3/7,h)

[numdprate,txtdprate]=xlsread([path file],'KebutuhanDPRate');
 waitbar(4/7,h)

[numlinkDP,txtlinkDP]=xlsread([path file],'LinkDP');
 waitbar(5/7,h)

[numlinksentral,txtlinksentral]=xlsread([path
file],'KeluarSentral');
 waitbar(6/7,h)

[numlinknyebrang,txtlinknyebrang]=xlsread([path
file],'NyeberangJalan');
 waitbar(7/7,h)

close(h)
LinkJalan=numl;
KoordinatTitikJalan=numk;
KoordinatDP=numdp;
KebutuhanDPRate=numdprate;
LinkDP = numlinkDP;
LinkSentral= numlinksentral;
Nyebrang= numlinknyebrang;


function edit5_Callback(hObject, eventdata, handles)
% hObject    handle to edit5 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit5 as text
%        str2double(get(hObject,'String')) returns contents of
edit5 as a double
```

```
% --- Executes during object creation, after setting all
properties.
function edit5_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit5 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end




function edit6_Callback(hObject, eventdata, handles)
% hObject    handle to edit6 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit6 as text
%        str2double(get(hObject,'String')) returns contents of
edit6 as a double


% --- Executes during object creation, after setting all
properties.
function edit6_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit6 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end



function waktu_Callback(hObject, eventdata, handles)
```

```
% hObject    handle to waktu (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of waktu as text
%        str2double(get(hObject,'String')) returns contents of
waktu as a double


% --- Executes during object creation, after setting all
properties.
function waktu_CreateFcn(hObject, eventdata, handles)
% hObject    handle to waktu (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc
    set(hObject,'BackgroundColor','white');
else

set(hObject,'BackgroundColor',get(0,'defaultUicontrolBackgroundCol
or'));
end




% --- Executes on button press in br.
function br_Callback(hObject, eventdata, handles)
% hObject    handle to br (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of br




function RadiusGrup_Callback(hObject, eventdata, handles)
% hObject    handle to RadiusGrup (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of RadiusGrup as
text
%        str2double(get(hObject,'String')) returns contents of
RadiusGrup as a double
```

```
% --- Executes during object creation, after setting all
properties.
function RadiusGrup_CreateFcn(hObject, eventdata, handles)
% hObject    handle to RadiusGrup (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
```

Fungsi Scatter Steiner :

```
function [KoordinatRK, NamaRK, KoordinatTitikJalan,
LinkJalan]=ScatterSteiner(handles,hublogik,RGrup,
KoordinatDP,KebutuhanDPRate,Q, KoordinatTitikJalan,
LinkJalan,LinkSentral,Nyebrang);

% ScatterSteiner(handles,X,Y,Q)
global MatrikSteiner
global N
global titiksteinerpertama

%Diatas adalah DP, dibawah mempersiapkan RK untuk di steiner
[KoordinatRK, NamaRK,MatrikTeman ] = CariTitikRK(hublogik,RGrup,
KoordinatDP,KebutuhanDPRate, KoordinatTitikJalan, LinkJalan);

KoordinatSwitch = [0 0];
KoordinatRK = [KoordinatRK; KoordinatSwitch];
sizeRK = size(NamaRK);
sizeRK = sizeRK(1,1);
BitRateSwitch = [(sizeRK+1) 0];
NamaRK = [NamaRK; BitRateSwitch];
%Persiapak RK selesai

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%JANGAN DILAKUKAN
%Memasukkan Koordinat DP pada Koordinat Titik Jalab
% KoordinatTitikJalan = [KoordinatTitikJalan; KoordinatDP];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if Q<max(NamaRK(:,2))
    warndlg(['Maksimum Kapasitas PON Primer Kurang, Minimum = '
num2str(max(NamaRK(:,2)))])
    return
end
%Q adalah kapasitas PON untuk kabel primer RK
Q = Q;
PanjangJalurTerbaik = 999999;
IndeksTerbaik = 0;
```

```
%cari indeks
N = size(KoordinatRK,1);
Indeks = 1:1:N;

%Menghitung jarak antar kota, langsung di tampilkan di solusi awal
D = zeros(N,N);
for i=1:(N-1)
    for j=i+1:N,
        D(i,j)=D(i,j)+sqrt((KoordinatRK(Indeks(i),1)-
KoordinatRK(Indeks(j),1))^2 ...
            + (KoordinatRK(Indeks(i),2)-
KoordinatRK(Indeks(j),2))^2);
        D(j,i)=D(i,j);
    end;
end;

%Mencari Koordinat Polar setiap titik
KoordinatPolar = 0;
for i=1:N-1
    [Theta, Rho] = cart2pol(KoordinatRK(i,1),KoordinatRK(i,2));
    KoordinatPolar(i,1)=Theta;
    KoordinatPolar(i,2)=Rho;
end;

%Menggabung Matrik ThetaRho dgn Matrik BitRate
for i=1:N-1
    MatrikUmum(i,1)=KoordinatPolar(i,1);
    MatrikUmum(i,2)=KoordinatPolar(i,2);
    MatrikUmum(i,3)=NamaRK(i,1);
    MatrikUmum(i,4)=NamaRK(i,2);
end

%Mencari Klusterisasi, hasilnya SortMatrikUmum
SortMatrikUmum = sortrows(MatrikUmum)
SortMatrikUmum(N,1)=0;
SortMatrikUmum(N,2)=0;
SortMatrikUmum(N,3)=N;
SortMatrikUmum(N,4)=0;

%Disini harusnya adalah function, ada fungsi shifted
%Proses shifted (Heuristic), LOOP BESAR
%Terpaksa N dikopi dulu
TotalElemen = N;
%Dikopi di awal sebagai acuan, dgn loop dibawah baru di obok2
SortMatrikUmumKopi= SortMatrikUmum;
%Mari kita catat SOlusi
KumpulanIndeks = zeros(1,60);
CounterIndeks = 1;

for CounterLoopBesar = 1:N
    if CounterLoopBesar ==1
        %SortMatrikUmum = SortMatrikUmum;
    end
    MatrikSementara = 0;
    if CounterLoopBesar >1 %Ambil 1 geser 39, taruh 1 di 39 dan
digeser terus menerus selama 39x
        %BaruMatrikDitukar
        MatrikSementara(1,1)=SortMatrikUmumKopi(1,1);
```

```
        MatrikSementara(1,2)=SortMatrikUmumKopi(1,2);
        MatrikSementara(1,3)=SortMatrikUmumKopi(1,3);
        MatrikSementara(1,4)=SortMatrikUmumKopi(1,4);
        for CounterJ=1:N-2

SortMatrikUmumKopi(CounterJ,1)=SortMatrikUmumKopi(CounterJ+1,1);

SortMatrikUmumKopi(CounterJ,2)=SortMatrikUmumKopi(CounterJ+1,2);

SortMatrikUmumKopi(CounterJ,3)=SortMatrikUmumKopi(CounterJ+1,3);

SortMatrikUmumKopi(CounterJ,4)=SortMatrikUmumKopi(CounterJ+1,4);
        end
        SortMatrikUmumKopi(N-1,1)=MatrikSementara(1,1);
        SortMatrikUmumKopi(N-1,2)=MatrikSementara(1,2);
        SortMatrikUmumKopi(N-1,3)=MatrikSementara(1,3);
        SortMatrikUmumKopi(N-1,4)=MatrikSementara(1,4);
        %kopi Kembali SortMatrikUmum
        %SortMatrikUmum = 0;
        SortMatrikUmum = SortMatrikUmumKopi;
    end;

    %Dibawah ini mulai baganProgram
    %Kabel yang akan di deploy adalah Q Mbps.
    %
    %Membuat Clusterisasi

    i = 1; j = 2; kaps = 0; IsiCluster =0;
    SortMatrikUmumKaps = 0;
    while kaps <= Q
        IsiCluster(1,1) = 0; IsiCluster(1,2) = 0; IsiCluster(1,3)
= TotalElemen; IsiCluster(1,4) = 0;
        kaps = kaps + SortMatrikUmum(i,4);

        if (kaps <= Q) && ((i ~= TotalElemen))
            IsiCluster(j,1) = SortMatrikUmum(i,1);
            IsiCluster(j,2) = SortMatrikUmum(i,2);
            IsiCluster(j,3) = SortMatrikUmum(i,3);
            IsiCluster(j,4) = SortMatrikUmum(i,4);
            j = j + 1;
            i = i + 1;
            IsiCluster(j,1) = 0; IsiCluster(j,2) = 0;
IsiCluster(j,3) = TotalElemen; IsiCluster(j,4) = 0;
        end
        if (kaps >= Q) && (i ~= TotalElemen)
            j = 2; kaps = 0;
            if SortMatrikUmumKaps == 0
                SortMatrikUmumKaps = IsiCluster;
            else
                SortMatrikUmumKaps = [SortMatrikUmumKaps;
IsiCluster];
            end
            IsiCluster = 0;
        end
        if (i == TotalElemen)
            if SortMatrikUmumKaps == 0
                SortMatrikUmumKaps = IsiCluster;
            else
```

```
                SortMatrikUmumKaps = [SortMatrikUmumKaps;
IsiCluster];
            end
            break
        end
    end
    SortMatrikUmum = SortMatrikUmumKaps;

    %Extract Indeks
    A = size(SortMatrikUmum);
    Indeks=1;
    A= A(1,1);
    for i=1:A
        Indeks(i,1)=SortMatrikUmum(i,3);
    end;
    Indeks=Indeks';


    %Menggambar semua titik dan dihubungkan dengan garis
    %matrik Koordinat adalah x,y, Indeks adalah urutan titiknya
    Koordinat = KoordinatRK;
    KbthBR = NamaRK;

    %Membuat analisa jarak
    Counter = size(Indeks);
    Counter = Counter(1,2);
    PanjangJalur = 0;
    for i=1:Counter-1
        PanjangJalur = PanjangJalur +
D(Indeks(1,i),Indeks(1,i+1));
    end;

    %Pengingat siapa yg terbaik
    PanjangJalurLoop = PanjangJalur;
    IndeksLoop = Indeks;

    if PanjangJalurTerbaik > PanjangJalurLoop
        PanjangJalurTerbaik = PanjangJalurLoop;
        IndeksTerbaik = IndeksLoop;
        SortMatrikUmumTerbaik = SortMatrikUmum;
    end;

    %Catat Solusi
    A = size(IndeksLoop);
    A = A(1,2);
    for l = 1:A
        KumpulanIndeks(CounterIndeks,l) = IndeksLoop(1,l);
    end
    KumpulanIndeks(CounterIndeks,60)=PanjangJalurLoop;
    CounterIndeks = CounterIndeks+1;

    %Akhir Loop Besar
    %pause;
end

IndeksTerbaik;
```

```
%Flower Petal Terbaik selesai

%.......... Proses selanjutnya mengerti sudut, Gunakan Indeks
Terbaik
UkuranIndeks = size(IndeksTerbaik);
UkuranIndeks =UkuranIndeks(1,2);
SortMatrikUmumTerbaik(1,6)=NaN;
SortMatrikUmumTerbaik(UkuranIndeks,6)=NaN;
for i = 2 : UkuranIndeks-1
    TitikPertama = IndeksTerbaik(1,i-1);
    TitikKedua   = IndeksTerbaik(1,i);
    TitikKetiga  = IndeksTerbaik(1,i+1);
    x1=Koordinat(TitikPertama,1); y1=Koordinat(TitikPertama,2);
    x2=Koordinat(TitikKedua,1); y2=Koordinat(TitikKedua,2);
    x3=Koordinat(TitikKetiga,1); y3=Koordinat(TitikKetiga,2);
    %SekarangMencariCos Alpha
    Atas = ((x1-x2)*(x3-x2))+((y1-y2)*(y3-y2));
    Bawah = sqrt((x1-x2)^2+(y1-y2)^2)*sqrt((x3-x2)^2+(y3-y2)^2);
    Alpha = acosd(Atas/Bawah);
    SortMatrikUmumTerbaik(i,6)=Alpha;
end

%------------------ BATAS SORT MATRIK UMUM-----
%_____________________________BIG
FOR_____________________________
UkuranIndeksTerbaik = size(IndeksTerbaik);
UkuranIndeksTerbaik = UkuranIndeksTerbaik(1,2);
j = 1
for i = 1: UkuranIndeksTerbaik
    if IndeksTerbaik(1,i) == N
        MatrikN(j,1)= i;
        j = j + 1;
    end
end
UkuranMatrikN = size(MatrikN);
UkuranMatrikN = UkuranMatrikN(1,1);
%Start BIG FOR
MSUbuf=[];
for LoopCluster = 1:2:UkuranMatrikN
    BatasAtasCluster = MatrikN(LoopCluster,1);
    BatasBawahCluster = MatrikN(LoopCluster+1,1);
    IndeksCluster = 0;
    jj = 1;
    for IsiCluster = BatasAtasCluster : BatasBawahCluster
        IndeksCluster(1,jj) = IndeksTerbaik(1,IsiCluster);
        jj = jj + 1;
    end
    %........... BIG FOR CONTINUES
    %Buat Matrik Steiner = [Row TtkA TtkB Xa Ya Xb Yb Derajat
Status]
    jumlahanggota = size(IndeksCluster);
    jumlahanggota = jumlahanggota(1,2);
    banyakruassudut = (jumlahanggota-2);
    MatrikSteiner = 0;
    MatrikSteiner = zeros(2*banyakruassudut,9);
    for i = 1 : banyakruassudut
        MatrikSteiner(2*i-1,1) = 2*i-1;
        MatrikSteiner(2*i-1,2) = IndeksCluster(1,(1+i)-1);
```

```
        MatrikSteiner(2*i-1,3) = IndeksCluster(1,(1+i));
        MatrikSteiner(2*i-1,4) = Koordinat(IndeksCluster(1,(1+i)-
1),1);
        MatrikSteiner(2*i-1,5) = Koordinat(IndeksCluster(1,(1+i)-
1),2);
        MatrikSteiner(2*i-1,6) =
Koordinat(IndeksCluster(1,(1+i)),1);
        MatrikSteiner(2*i-1,7) =
Koordinat(IndeksCluster(1,(1+i)),2);
        MatrikSteiner(2*i-1,8) = 0;
        MatrikSteiner(2*i-1,9) = 0;
        MatrikSteiner(2*i,1) = 2*i;
        MatrikSteiner(2*i,2) = IndeksCluster(1,(1+i));
        MatrikSteiner(2*i,3) = IndeksCluster(1,(1+i)+1);
        MatrikSteiner(2*i,4) = Koordinat(IndeksCluster(1,(1+i)),1)
        MatrikSteiner(2*i,5) = Koordinat(IndeksCluster(1,(1+i)),2)
        MatrikSteiner(2*i,6) =
Koordinat(IndeksCluster(1,(1+i)+1),1)
        MatrikSteiner(2*i,7) =
Koordinat(IndeksCluster(1,(1+i)+1),2)
        MatrikSteiner(2*i,8) = 0;
        MatrikSteiner(2*i,9) = 0;
        MatrikSteiner(2*i-
1,8)=hitungsudut3titik(MatrikSteiner(2*i-1,4),MatrikSteiner(2*i-
1,5),MatrikSteiner(2*i-1,6),MatrikSteiner(2*i-
1,7),MatrikSteiner(2*i,6),MatrikSteiner(2*i,7));
        MatrikSteiner(2*i,8) = MatrikSteiner(2*i-1,8);
    end;
    %Mencari Sudut NaN
    UkuranMS = size(MatrikSteiner);
    UkuranMS = UkuranMS(1,1);
    for i = 1: UkuranMS
        if isnan(MatrikSteiner(i,8)) == 1
            MatrikSteiner(i,8) = 0;
        end
    end
    %---------------------MatrikSteinerAwalSelesai

    %---------Optimizing Steiner
    urut_e=1;
    quitoptimizing = 0;
    titiksteiner=size(KoordinatRK);
    titiksteiner = titiksteiner(1,1)+1;
    titiksteinerpertama = titiksteiner;
    while quitoptimizing ~= 1
        clear MSA; clear MST; clear MSB;
        if urut_e == 1
            %pause
            ukuranloop = size(MatrikSteiner);
            ukuranloop = ukuranloop(1,1);
            for i=1:2:ukuranloop
                if (MatrikSteiner(i,9) == 1)
                    i = i + 2;
                end
                if (MatrikSteiner(i,8) >= 120) &&
(MatrikSteiner(i,9) == 0) && (ukuranloop ~= 4)
                    MatrikSteiner(i,9) = 1;
                    MatrikSteiner(i+1,9) = 1;
                    urut_e = 2;
```

```
                    break
                end
                if (MatrikSteiner(i,8)) < 120 &&
(MatrikSteiner(i,9) == 0)
                    [Xd,Yd,PjgKabelSteiner] = carititiksteiner(...
                        MatrikSteiner(i,4),MatrikSteiner(i,5),...
                        MatrikSteiner(i,6),MatrikSteiner(i,7),...

MatrikSteiner(i+1,6),MatrikSteiner(i+1,7));
                    PjgKabelExisting = sqrt((MatrikSteiner(i,4)-
MatrikSteiner(i,6))^2+(MatrikSteiner(i,5)-
MatrikSteiner(i,7))^2)+...
                        sqrt((MatrikSteiner(i,6)-
MatrikSteiner(i+1,6))^2+(MatrikSteiner(i,7)-
MatrikSteiner(i+1,7))^2);

                    %Apabila i==1 & Ukuran Loop =4
                    %KASUS KHUSUS
                    if (PjgKabelSteiner > PjgKabelExisting) &&
(i==1) && (ukuranloop == 4)
                        [MSB] =
MatrikSteinerBawah(i,MatrikSteiner,urut_e,ukuranloop);
                        MatrikSteiner = MSB;
                        MatrikSteiner(i,9) = 1;
                        MatrikSteiner(i+1,9) = 1;
                        urut_e = 2;
                        break
                    end


                    if PjgKabelSteiner > PjgKabelExisting
                        MatrikSteiner(i,9) = 1;
                        MatrikSteiner(i+1,9) = 1;
                        urut_e = 2;
                        break
                    end

                    if PjgKabelSteiner < PjgKabelExisting
                        % Apabila i == 1 & ukuran  MatrikSteiner=2
(9-1-9)
                        %KASUS KHUSUS
                        if (i == 1) && (ukuranloop == 2)
                            MatrikSteiner(1,9)=1;
                            MatrikSteiner(2,9)=1;
                            break
                        end

                        if i == 1
                            a=0;b=0;c=0;
                            %MatrikSteinerAtas =
MatrikSteinerTengah
                            a =
MatrikSteiner(i,2);b=MatrikSteiner(i,3);c=MatrikSteiner(i+1,3);
                            [MST KoordinatRK
NamaRK]=MatrikSteinerTengah(a,b,c,titiksteiner,Xd,Yd,urut_e,
KoordinatRK, NamaRK);
                            %Merubah dulu sisa dari b dengan titik
steiner pada
```

```
                            %sisa MatrikSteiner sebelum di proses
kebih lanjut
                            for ii = (i+2) : ukuranloop
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %MembetulkanSudut lagi
                            for ii = (i+2):2:ukuranloop

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));

MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if MatrikSteiner(ii,8)>=120
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                else
                                end
                            end
                            %MatrikSteinerBawah
                            [MSB] =
MatrikSteinerBawah(i,MatrikSteiner,urut_e,ukuranloop);
                            %rapikan parameter kontrol
                            urut_e = 2;
                            titiksteiner = titiksteiner + 1;
                            MatrikSteiner = [MST; MSB];
                            break
                        end

                        if (i ~= 1) && (i ~= ukuranloop-1)
                            a=0;b=0;c=0;
                            %MembuatMatrikTengah
(a,b,c,titiksteiner,Xd,Yd,urut)
                            a =
MatrikSteiner(i,2);b=MatrikSteiner(i,3);c=MatrikSteiner(i+1,3);
                            [MST KoordinatRK
NamaRK]=MatrikSteinerTengah(a,b,c,titiksteiner,Xd,Yd,urut_e,
KoordinatRK, NamaRK);
                            %Merubah dulu sisa dari b dengan titik
steiner pada
```

```
                            %sisa MatrikSteiner sebelum di proses
kebih lanjut
                            for ii = 1 : (i-1) %Before
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %MembetulkanSudut lagi
                            for ii = 1:2:(i-1)

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));

MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if MatrikSteiner(ii,8)>=120
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                else
                                end
                            end
                            for ii =(i+2): ukuranloop %after
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %MembetulkanSudut lagi
                            for ii = (i+2):2:ukuranloop

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));
```

```
MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if MatrikSteiner(ii,8)>=120
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                else
                                end
                            end
                            %MembuatMatrikAtas
                            [MSA] =
MatrikSteinerAtas(i,MatrikSteiner,urut_e);
                            %MembuatMatrikBawah
                            [MSB] =
MatrikSteinerBawah(i,MatrikSteiner,urut_e,ukuranloop);
                            %rapikan parameter kontrol
                            urut_e = 2;
                            titiksteiner = titiksteiner + 1;
                            MatrikSteiner = [MSA; MST; MSB];
                            break
                        else
                            %MembuatMatrikTengah
(a,b,c,titiksteiner,Xd,Yd,urut)
                            a =
MatrikSteiner(i,2);b=MatrikSteiner(i,3);c=MatrikSteiner(i+1,3);
                            [MST KoordinatRK
NamaRK]=MatrikSteinerTengah(a,b,c,titiksteiner,Xd,Yd,urut_e,
KoordinatRK, NamaRK);
                            %Merubah dulu sisa dari b dengan titik
steiner pada
                            %sisa MatrikSteiner sebelum di proses
kebih lanjut
                            for ii = 1 : (i-1)
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %Mengecek Sudut Lagi
                            for ii = 1:2:ukuranloop-2

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));
```

```
MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if MatrikSteiner(ii,8)>=120
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                else
                                end
                            end
                            %MembuatMatrikAtas
                            [MSA] =
MatrikSteinerAtas(i,MatrikSteiner,urut_e);
                            %MembuatMatrikBawah, tdk perlu
dilakukan
                            %rapikan parameter kontrol
                            urut_e = 2;
                            titiksteiner = titiksteiner + 1;
                            MatrikSteiner = [MSA; MST];
                            break
                        end
                    end

                end
            end
            %pause;
        end
        % -----------------
        if urut_e == 2
            %pause
            ukuranloop = size(MatrikSteiner);
            ukuranloop = ukuranloop(1,1);
            for i=ukuranloop:-2:0
                if (MatrikSteiner(i,9) == 1)
                    i = i - 2;
                    if i == 0
                        break
                    end
                end
                if (MatrikSteiner(i,8) >= 120) &&
(MatrikSteiner(i,9) == 0)
                    MatrikSteiner(i,9) = 1;
                    MatrikSteiner(i-1,9) = 1;
                    urut_e = 1;
                    break
                end
                if (MatrikSteiner(i,8) < 120) &&
(MatrikSteiner(i,9) == 0)
                    [Xd,Yd,PjgKabelSteiner] = carititiksteiner(...
                        MatrikSteiner(i,6),MatrikSteiner(i,7),...
                        MatrikSteiner(i-1,6),MatrikSteiner(i-
1,7),...
```

```
                        MatrikSteiner(i-1,4),MatrikSteiner(i-
1,5));
                    PjgKabelExisting = sqrt((MatrikSteiner(i-1,4)-
MatrikSteiner(i-1,6))^2+(MatrikSteiner(i-1,5)-MatrikSteiner(i-
1,7))^2)+...
                        sqrt((MatrikSteiner(i-1,6)-
MatrikSteiner(i,6))^2+(MatrikSteiner(i-1,7)-
MatrikSteiner(i,7))^2);
                    if PjgKabelSteiner > PjgKabelExisting
                        MatrikSteiner(i,9) = 1;
                        MatrikSteiner(i-1,9) = 1;
                        urut_e = 1;
                        break
                    end
                    if PjgKabelSteiner < PjgKabelExisting
                        if i == ukuranloop
                            %MatrikSteinerTengah =
MatrikSteinerBawh
                            a =
MatrikSteiner(i,3);b=MatrikSteiner(i,2);c=MatrikSteiner(i-1,2);
                            [MST KoordinatRK
NamaRK]=MatrikSteinerTengah(a,b,c,titiksteiner,Xd,Yd,urut_e,
KoordinatRK, NamaRK);
                            %Merubah dulu sisa dari b dengan titik
steiner pada
                            %sisa MatrikSteiner sebelum di proses
kebih lanjut
                            for ii = 1 : (i-2)
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %Mengecek Sudut Lagi
                            for ii = 1:2:ukuranloop-2

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));

MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if (MatrikSteiner(ii,8)>=120) &&
(MatrikSteiner(ii,9) == 0)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
```

```
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                else
                                end
                            end
                            %MatrikSteinerAtas
                            [MSA] =
MatrikSteinerAtas(i,MatrikSteiner,urut_e);
                            %rapikan parameter kontrol
                            titiksteiner = titiksteiner + 1;
                            MatrikSteiner = [MSA; MST];
                            urut_e = 1;
                            break
                        end
                        if (i ~= ukuranloop) && (i ~= 2)
                            %MembuatMatrikTengah
(a,b,c,titiksteiner,Xd,Yd,urut)
                            a =
MatrikSteiner(i,3);b=MatrikSteiner(i,2);c=MatrikSteiner(i-1,2);
                            [MST KoordinatRK
NamaRK]=MatrikSteinerTengah(a,b,c,titiksteiner,Xd,Yd,urut_e,
KoordinatRK, NamaRK);
                            %Merubah dulu sisa dari b dengan titik
steiner pada
                            %sisa MatrikSteiner sebelum di proses
kebih lanjut
                            for ii = 1 : (i-2)%Before
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %Mengecek Sudut Lagi
                            for ii = 1:2:(i-2)

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));

MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if MatrikSteiner(ii,8)>=120
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
```

```
                                    else
                                    end
                                end
                                for ii = (i+1) : ukuranloop%After
                                    if MatrikSteiner(ii,2) == b
                                        MatrikSteiner(ii,2) =
titiksteiner;
                                        MatrikSteiner(ii,4) = Xd;
                                        MatrikSteiner(ii,5) = Yd;
                                    end
                                    if MatrikSteiner(ii,3) == b
                                        MatrikSteiner(ii,3) =
titiksteiner;
                                        MatrikSteiner(ii,6) = Xd;
                                        MatrikSteiner(ii,7) = Yd;
                                    end
                                end
                                %Mengecek Sudut Lagi
                                for ii =(i+1):2:ukuranloop

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));

MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                    if MatrikSteiner(ii,8)>=120
                                        MatrikSteiner(ii,9)=1;
                                        MatrikSteiner(ii+1,9)=1;
                                    elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                        MatrikSteiner(ii,9)=0;
                                        MatrikSteiner(ii+1,9)=0;
                                    elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                        MatrikSteiner(ii,9)=1;
                                        MatrikSteiner(ii+1,9)=1;
else
                                    end
                                end
                                %MembuatMatrikAtas
                                [MSA] =
MatrikSteinerAtas(i,MatrikSteiner,urut_e);
                                %MembuatMatrikBawah
                                [MSB] =
MatrikSteinerBawah(i,MatrikSteiner,urut_e,ukuranloop);
                                %rapikan parameter kontrol
                                urut_e = 1;
                                titiksteiner = titiksteiner + 1;
                                MatrikSteiner = [MSA; MST; MSB];
                                break
                            else
                                a=0;b=0;c=0;
                                %MembuatMatrikAtas Tdk perlu
                                %MembuatMatrikTengah
(a,b,c,titiksteiner,Xd,Yd,urut)
                                a =
MatrikSteiner(i,3);b=MatrikSteiner(i,2);c=MatrikSteiner(i-1,2);
```

```
                            [MST KoordinatRK
NamaRK]=MatrikSteinerTengah(a,b,c,titiksteiner,Xd,Yd,urut_e,
KoordinatRK, NamaRK);
                            %Merubah dulu sisa dari b dengan titik
steiner pada
                            %sisa MatrikSteiner sebelum di proses
kebih lanjut
                            for ii = (i+1):ukuranloop
                                if MatrikSteiner(ii,2) == b
                                    MatrikSteiner(ii,2) =
titiksteiner;
                                    MatrikSteiner(ii,4) = Xd;
                                    MatrikSteiner(ii,5) = Yd;
                                end
                                if MatrikSteiner(ii,3) == b
                                    MatrikSteiner(ii,3) =
titiksteiner;
                                    MatrikSteiner(ii,6) = Xd;
                                    MatrikSteiner(ii,7) = Yd;
                                end
                            end
                            %Mengecek Sudut Lagi
                            for ii = (i+1):2:ukuranloop

MatrikSteiner(ii,8)=hitungsudut3titik(MatrikSteiner(ii,4),MatrikSt
einer(ii,5),MatrikSteiner(ii,6),MatrikSteiner(ii,7),MatrikSteiner(
ii+1,6),MatrikSteiner(ii+1,7));

MatrikSteiner(ii+1,8)=MatrikSteiner(ii,8);
                                if MatrikSteiner(ii,8)>=120
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==0)
                                    MatrikSteiner(ii,9)=0;
                                    MatrikSteiner(ii+1,9)=0;
                                elseif (MatrikSteiner(ii,8)<120)
&& (MatrikSteiner(ii,9)==1)
                                    MatrikSteiner(ii,9)=1;
                                    MatrikSteiner(ii+1,9)=1;
                                else
                                end
                            end
                            %MembuatMatrikBawah
                            [MSB] =
MatrikSteinerBawah(i,MatrikSteiner,urut_e,ukuranloop);
                            %rapikan parameter kontrol
                            urut_e = 1;
                            titiksteiner = titiksteiner + 1;
                            MatrikSteiner = [MST; MSB];
                            break
                        end
                    end
                end
            end
        end
        %serangkaian re CHECK ing
        %-------------------------------------------------
        %Mendeteksi sdt optimal yg belum di patenkan "1"
```

```
        UkuranMS = size(MatrikSteiner);
        UkuranMS = UkuranMS(1,1);
        for k = 1:UkuranMS
            if (MatrikSteiner(k,8) >= 120)
                MatrikSteiner(k,9)= 1;
            end
        end


        %Menentukan apakah masih berlanjut loopnya
        %----------------------------------------
        UkuranMS = size(MatrikSteiner);
        UkuranMS = UkuranMS(1,1);
        Total = 0;
        for k = 1:UkuranMS
            Total = Total + MatrikSteiner(k,9);
        end
        if Total == UkuranMS
            quitoptimizing = 1;
        else
            quitoptimizing = 0;
        end

    end

    %Menggambar Ruas Total
    [MSU MSUX] =
BuatMSU(handles,MatrikSteiner,N,titiksteinerpertama,
IndeksTerbaik);
    MSUbuf=[MSUbuf;MSUX(:,1:2)];
    %_____________________BIG FOR _____________________
    test = 0;


end


% KoordinatRK = [
%  -108.5 80.5
%  73 833
%  -96.5 -412
%  428.5 -116
%  743.5 646
%  818.5 77.5
%  789.5 -237
%  0 0
% ];
% NamaRK = [
%  1 4950
%  2 900
%  3 1350
%  4 7650
%  5 1800
%  6 1800
%  7 1350
%  8 0
% ];
```

```
%Sekarang Mencari titik terdekat ke RK
A = size(NamaRK); A = A(1,1);
B = size(KoordinatTitikJalan); B = B(1,1);
TitikPilihan = 0; Jarak = 0;
TitikPilihanTerbaik = 0; JarakTerbaik = 0;
for i = 1 : A
    for j = 1 : B
        TitikPilihan = j;
        Jarak = sqrt((KoordinatTitikJalan(j,1)-KoordinatRK(i,1))^2
+ (KoordinatTitikJalan(j,2)-KoordinatRK(i,2))^2);
        if TitikPilihanTerbaik == 0
            TitikPilihanTerbaik = j; JarakTerbaik = Jarak;
            NamaRK(i,3) = j; NamaRK(i,4) = JarakTerbaik;
            KoordinatRK(i,3) = KoordinatTitikJalan(j,1);
            KoordinatRK(i,4) = KoordinatTitikJalan(j,2);
            KoordinatRK(i,5) = JarakTerbaik;
        elseif TitikPilihanTerbaik > 0
            if JarakTerbaik > Jarak
                TitikPilihanTerbaik = j; JarakTerbaik = Jarak;
                NamaRK(i,3) = j; NamaRK(i,4) = JarakTerbaik;
                KoordinatRK(i,3) = KoordinatTitikJalan(j,1);
                KoordinatRK(i,4) = KoordinatTitikJalan(j,2);
                KoordinatRK(i,5) = JarakTerbaik;
            else
            end
        else
        end
    end
    TitikPilihanTerbaik = 0;
    Jarak = 0;
end

%Sekarang cari 2 teman yang mengapit si titik terdekat ke RK
B = size(LinkJalan);
B = B(1,1);
for i = 1 : A %Counter A untuk size NamaRK
    mencariteman = NamaRK(i,3);
    NamaRK(i,5) = 0;
    NamaRK(i,6) = 0;
    for j = 1 : B
        if LinkJalan(j,1) == mencariteman
            if NamaRK(i,5) == 0
                NamaRK(i,5)= LinkJalan(j,2);
            end
            if NamaRK(i,5) > 0
                NamaRK(i,6)= LinkJalan(j,2);
            end
        elseif LinkJalan(j,2) == mencariteman
            if NamaRK(i,5) == 0
                NamaRK(i,5)= LinkJalan(j,1);
            end
            if NamaRK(i,5) > 0
                NamaRK(i,6)= LinkJalan(j,1);
            end
        else
        end
    end
end
```

```
%Mencari Koordinat RK sesuai peta
C = size(KoordinatTitikJalan);
C = C(1,1) + 1; %(Counter utk Koordinat)
D = size(LinkJalan);
D = D(1,1) + 1; %(Counter utk link jalan)
for i = 1 : A %Counter A untuk size NamaRK
    KoordinatRKnya = [KoordinatRK(i,1) KoordinatRK(i,2)];
    KoordinatReff = [KoordinatRK(i,3) KoordinatRK(i,4)];
    % try
    KoordinatKiri = [KoordinatTitikJalan(NamaRK(i,5),1)
KoordinatTitikJalan(NamaRK(i,5),2)];
    % catch
    %    save datasementara
    %    return
    % end
    KoordinatKanan = [KoordinatTitikJalan(NamaRK(i,6),1)
KoordinatTitikJalan(NamaRK(i,6),2)];
    KoordinatRKnya = KoordinatRKnya - KoordinatReff;
    KoordinatKiri = KoordinatKiri - KoordinatReff;
    KoordinatKanan = KoordinatKanan - KoordinatReff;
    [THEkiri,RHOkiri] =
cart2pol(KoordinatKiri(1,1),KoordinatKiri(1,2));
    [THEkanan,RHOkanan] =
cart2pol(KoordinatKanan(1,1),KoordinatKanan(1,2));
    [XRKkiri,YRKkiri] = pol2cart(THEkiri,5);
    [XRKkanan,YRKkanan] = pol2cart(THEkanan,5);
    JarakKiri = sqrt((XRKkiri - KoordinatRKnya(1,1))^2 + (YRKkiri
- KoordinatRKnya(1,2))^2);
    JarakKanan = sqrt((XRKkanan - KoordinatRKnya(1,1))^2 +
(YRKkanan - KoordinatRKnya(1,2))^2);
    if JarakKiri < JarakKanan
        XRKkiri = XRKkiri+KoordinatReff(1,1);
        YRKkiri = YRKkiri+KoordinatReff(1,2);
        KoordinatRK(i,6) = XRKkiri; KoordinatRK(i,7) = YRKkiri;
        KoordinatRK(i,8) = sqrt((XRKkiri-
KoordinatRK(i,1))^2+(YRKkiri-KoordinatRK(i,2))^2);
        %        LinkJalan(D,1) = C; LinkJalan(D,2) =
NamaRK(i,3);
        D = D + 1;
        %        LinkJalan(D,1) = C; LinkJalan(D,2) =
NamaRK(i,5);
        D = D + 1;
        C = C + 1;
    elseif JarakKiri > JarakKanan
        XRKkanan = XRKkanan+KoordinatReff(1,1);
        YRKkanan = YRKkanan+KoordinatReff(1,2);
        KoordinatRK(i,6) = XRKkanan; KoordinatRK(i,7) = YRKkanan;
        KoordinatRK(i,8) = sqrt((XRKkanan-
KoordinatRK(i,1))^2+(YRKkanan-KoordinatRK(i,2))^2);
        %        LinkJalan(D,1) = C; LinkJalan(D,2) =
NamaRK(i,3);
        D = D + 1;
        %        LinkJalan(D,1) = C; LinkJalan(D,2) =
NamaRK(i,6);
        D = D + 1;
        C = C + 1;
    elseif JarakKiri == JarakKanan
        XRKkiri = XRKkiri+KoordinatReff(1,1);
```

```
        YRKkiri = YRKkiri+KoordinatReff(1,2);
        KoordinatRK(i,6) = XRKkiri; KoordinatRK(i,7) = YRKkiri;
        KoordinatRK(i,8) = sqrt((XRKkiri-
KoordinatRK(i,1))^2+(YRKkiri-KoordinatRK(i,2))^2);
        %         LinkJalan(D,1) = C; LinkJalan(D,2) =
NamaRK(i,3);
        D = D + 1;
        %         LinkJalan(D,1) = C; LinkJalan(D,2) =
NamaRK(i,5);
        D = D + 1;
        C = C + 1;
    else
    end
    %
end

[x,y]=find(and(KoordinatRK(:,1)==0,KoordinatRK(:,2)==0));
KoordinatRK(x,6:8)=0;


B=size(KoordinatTitikJalan,1);
KoordinatTitikJalan=[KoordinatTitikJalan;KoordinatDP];
% for i=1:size(KoordinatDP)
%
% end
A=size(KoordinatDP,1);
for i=1:A
    MatrikTeman(i,1)=MatrikTeman(i,1)+B;
end
A=max(MatrikTeman);

for i=1:size(MatrikTeman,1)
    MatrikTeman(i,3)= MatrikTeman(i,3)+A(1,1);
end

status=1;
for i=1:size(KoordinatRK,1)
    if status==1
        if and(KoordinatRK(i,1)~=0,KoordinatRK(i,2)~=0)==1
            KoordinatTitikJalanX=[KoordinatRK(i,6)
KoordinatRK(i,7) 3 i];

KoordinatTitikJalan=[KoordinatTitikJalan;KoordinatTitikJalanX];
            status=1;
        elseif and(KoordinatRK(i,1)==0,KoordinatRK(i,2)==0)==1
            %Sentral
            KoordinatTitikJalanX=[0 0 5 i];

KoordinatTitikJalan=[KoordinatTitikJalan;KoordinatTitikJalanX];
            status=0;
        end
    elseif status==0
        %Steiner
        KoordinatTitikJalanX=[KoordinatRK(i,6) KoordinatRK(i,7) 4
i];

KoordinatTitikJalan=[KoordinatTitikJalan;KoordinatTitikJalanX];
    end
```

```
end


KoordinatTitikJalan(:,4)=(1:size(KoordinatTitikJalan,1))';

LinkJalanDP=TambahLinkJalan(KoordinatTitikJalan,1,2,LinkJalan);

LinkJalanRK=TambahLinkJalan(KoordinatTitikJalan,1,3,LinkJalan);

LinkJalanSteiner=TambahLinkJalan(KoordinatTitikJalan,1,4,LinkJalan
);


for i=1:size(LinkSentral,1)
    [v,pos]=find(KoordinatTitikJalan(:,3)==5);
    LinkSentralBaru(i,:)=[KoordinatTitikJalan(v,4)
LinkSentral(i,1)];
end

LinkJalanBaru=[LinkJalan;LinkJalanDP;LinkJalanRK;LinkJalanSteiner;
Nyebrang;LinkSentralBaru];
MatrikKoneksi=[MatrikTeman(:,1) MatrikTeman(:,3)];

for i=1:size(MSUbuf,1)
    Koord=KoordinatRK(MSUbuf(i,1),6:7);
    [x,y]=find(and(KoordinatTitikJalan(:,1)==Koord(1,1),...
        KoordinatTitikJalan(:,2)==Koord(1,2)));
    if size(x,1) > 1
        x = x(1,1);
    end
    MSUXA(i,1)=KoordinatTitikJalan(x,4);

    Koord=KoordinatRK(MSUbuf(i,2),6:7);
    [x,y]=find(and(KoordinatTitikJalan(:,1)==Koord(1,1),...
        KoordinatTitikJalan(:,2)==Koord(1,2)));
    if size(x,1) > 1
        x = x(1,1);
    end
    MSUXA(i,2)=KoordinatTitikJalan(x,4);
end

v=find(KoordinatTitikJalan(:,3)==3);
for i=1:size(v,1)
    [x,y]=find(KoordinatTitikJalan(:,3)==5);
    MatrixSentralRK(i,1)=KoordinatTitikJalan(x,4);
end
MatrixSentralRK=[MatrixSentralRK v];

% MatrikKoneksiBaru=[MatrikKoneksi;MSUXA;MatrixSentralRK];
MatrikKoneksiBaru=[MatrikKoneksi;MSUXA];
% for i=1:3
MatrikKoneksiBaru(1:size(MatrikKoneksi,1),3)=1;
MatrikKoneksiBaru(size(MatrikKoneksi,1)+1:size(MatrikKoneksi,1)+si
ze(MSUXA,1),3)=2;
%
MatrikKoneksiBaru(size(MatrikKoneksi,1)+size(MSUXA,1)+1:end,3)=2;
```

```
% end
LinkJalanBaru=[(1:size(LinkJalanBaru,1))' LinkJalanBaru];
KoordinatTitikJalanBaru(:,1)=(1:size(KoordinatTitikJalan,1))';
KoordinatTitikJalanBaru=[KoordinatTitikJalanBaru
KoordinatTitikJalan];
for i=1:size(MatrikKoneksiBaru,1)
    [dist,path] =
dijkstra(KoordinatTitikJalanBaru,LinkJalanBaru,MatrikKoneksiBaru(i
,1),MatrikKoneksiBaru(i,2),handles);
    axes(handles.axes1)
    if MatrikKoneksiBaru(i,3)==2
        warna='r-';tebal=2;geserx=3;gesery=7;
    else
        warna='b-';tebal=2;geserx=10; gesery=14;
    end
    if get(handles.gl,'value')==1
        for n = 2:length(path)
            plot(KoordinatTitikJalanBaru(path(n-
1:n),2)+geserx,gesery+KoordinatTitikJalanBaru(path(n-
1:n),3),warna,'linewidth',tebal);
        end
    end
    if get(handles.br,'value')==1
        Path='';
        for k=1:size(path,2)
            if k~=1
                Path=[Path ',-,' num2str(path(1,k))];
            else
                Path=[num2str(path(1,k))];
            end
        end
        %         MatrixReport
        %         for i=1:size(MatrikKoneksiBaru,1)
        MatrikReport(i,1)={MatrikKoneksiBaru(i,1)};
        MatrikReport(i,2)={MatrikKoneksiBaru(i,2)};
        %
[x,y]=find(MatrikKoneksiBaru(i,1)==KoordinatTitikJalanBaru(:,4));
% KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,1),4)
        if KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,1),4)==3
            A='RK';
        elseif
KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,1),4)==2
            A='DP';
        elseif
KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,1),4)==4
            A='Steiner';
        elseif
KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,1),4)==5
            A='Sentral';
        end
        if KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,2),4)==3
            B='RK';
        elseif
KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,2),4)==2
            B='DP';
        elseif
KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,2),4)==4
            B='Steiner';
```

```
        elseif
KoordinatTitikJalanBaru(MatrikKoneksiBaru(i,2),4)==5
            B='Sentral';
        end
        MatrikReport(i,3)={[A '-' B]};
        MatrikReport(i,4)={dist};
        MatrikReport(i,5)={Path};
    end
end
if get(handles.br,'value')==1
    MatrikReport=[{'A'} {'B'} {'Connection-ID'} {'Distance'}
{'Path'};
        MatrikReport];
    [s,m]=xlswrite('Report.xls',MatrikReport,'Report');
    %ID-RK dan Catuan Primer
    [s,m]=xlswrite('Report.xls',NamaRK,'CatPrimer');
    for i=1:size(KoordinatTitikJalanBaru,1)
        for j=1:size(KoordinatTitikJalanBaru,2)
            ReportKoordinat(i,j)={KoordinatTitikJalanBaru(i,j)};
        end
    end
    for i=1:size(LinkJalanBaru,1)
        for j=1:size(LinkJalanBaru,2)
            ReportLinkJalan(i,j)={LinkJalanBaru(i,j)};
        end
    end
    ReportKoordinat=[{'Index'} {'X'} {'Y'} {'Type'} {''};...
        ReportKoordinat];
    ReportLinkJalan=[{'Index'} {'Ruas A'} {'Ruas B'} ;...
        ReportLinkJalan];

[s,m]=xlswrite('Report.xls',ReportKoordinat(:,1:4),'KoordinatBaru'
);
    [s,m]=xlswrite('Report.xls',ReportLinkJalan,'LinkJalan');
end

if get(handles.gl,'value')==1
    [x,y]=find(KoordinatTitikJalanBaru(:,4)==3);
    for i=1:size(x,1)

plot(KoordinatTitikJalanBaru(x(i,1),2),KoordinatTitikJalanBaru(x(i
,1),3),'s','MarkerFaceColor','k')
    end
%     [x,y]=find(KoordinatTitikJalanBaru(:,4)==4);
%     for i=1:size(x,1)
%
plot(KoordinatTitikJalanBaru(x(i,1),2),KoordinatTitikJalanBaru(x(i
,1),3),'s','MarkerFaceColor','y')
%     end

end
% s=gca;
% h=figure(1);
%
% saveas()

return
```

RIWAYAT PENULIS

ANDRI KURNIA RIYADI lahir di Surakarta 8 September 1978. Menyelesaikan sekolah di SDN Dukuh 01 Pagi Jakarta Timur tahun 1991, SMPN 24 Jakarta Timur tahun 1994, SMUN 14 Jakarta Timur tahun 1997, S1 Teknik Telekomunikasi STTTelkom Bandung tahun 2003 dan Manajemen Telekomunikasi Universitas Indonesia tahun 2008. Riwayat pekerjaan yang pernah ditekuni : Staff Entry PT. Surveyor Indonesia tahun 2003 – 2004, Staff Administrasi Kredit Bank BNI 46 Kantor Cabang Utama Mayestik tahun 2004 – 2005, dan mulai 2005 sampai dengan sekarang aktif sebagai Officer Ordering & Provisioning Telkom Divisi Carrier Interconnetion Service (Telkom CIS).