

Tabel 4.3
Data Waktu Siklus Tiap Elemen Kerja

No	Elemen Kerja (Detik)														
	O - 01	O - 02	O - 03	O - 04	O - 05	O - 06	O - 07	O - 08	O - 09	O - 10	O - 11	O - 12	O - 13	O - 14	O - 15
1	19.70	28.42	44.50	10.94	46.79	77.79	20.00	53.35	23.20	23.70	28.44	42.32	9.10	48.79	80.42
2	19.27	29.44	43.59	10.03	49.40	78.58	18.18	53.76	22.77	23.27	28.66	41.97	9.16	46.84	79.82
3	17.84	30.59	43.18	9.62	49.25	77.61	17.36	51.27	21.34	21.84	28.15	43.09	9.53	47.79	80.46
4	18.94	30.59	43.92	10.36	48.34	78.18	18.84	53.61	22.44	22.94	28.20	43.97	9.59	46.89	81.14
5	18.22	28.30	42.07	8.51	50.46	76.60	15.14	51.43	21.72	22.22	26.30	43.61	9.59	47.43	81.47
6	19.61	28.50	42.29	8.73	51.94	78.52	15.58	52.67	23.11	23.61	28.82	42.04	9.49	46.50	80.09
7	17.99	28.77	43.59	10.03	47.28	76.46	18.18	52.93	21.49	21.99	28.79	42.81	10.25	48.33	81.08
8	17.41	28.67	42.70	9.14	51.07	78.47	16.40	53.22	20.91	21.41	28.28	43.94	9.28	47.20	80.44
9	19.78	30.59	43.38	9.82	49.26	78.02	17.76	51.38	23.28	23.78	27.90	42.42	9.47	49.55	81.13
10	19.95	28.07	42.68	9.12	50.21	77.57	16.36	52.04	23.45	23.95	28.66	42.59	9.26	48.80	80.64
11	17.30	30.39	43.40	9.84	49.06	77.86	17.80	52.84	20.80	21.30	27.48	42.66	9.27	47.48	79.70
12	19.86	28.10	42.68	9.12	49.33	76.69	16.36	52.57	23.36	23.86	26.82	42.68	9.53	47.45	79.50
13	18.73	30.25	42.53	8.97	50.53	77.59	16.06	53.80	22.23	22.73	27.73	42.52	9.20	49.23	80.11
14	19.75	29.18	44.66	11.10	46.61	77.93	20.32	52.39	23.25	23.75	26.41	42.17	10.11	47.77	80.65
15	17.09	30.31	43.12	9.56	48.95	77.19	17.24	53.47	20.59	21.09	26.35	42.98	10.18	46.64	79.09
16	19.57	28.43	44.71	11.15	45.85	77.27	20.42	51.82	23.07	23.57	28.76	43.03	10.20	48.11	79.71
17	19.33	30.28	43.02	9.46	48.36	76.40	17.04	51.96	22.83	23.33	28.60	43.73	9.84	46.30	81.86
18	18.64	29.46	43.48	9.92	47.51	76.47	17.96	53.93	22.14	22.64	27.65	41.64	10.12	48.41	80.46
19	18.78	30.14	43.35	9.79	47.89	76.59	17.70	51.11	22.28	22.78	26.29	42.35	9.21	49.41	81.26
20	19.52	30.37	42.42	8.86	52.11	78.95	15.84	53.41	23.02	23.52	27.20	43.10	10.58	47.65	81.19
21	17.29	30.69	44.59	11.03	46.82	78.00	20.18	52.14	20.79	21.29	27.61	43.73	9.60	49.12	81.60
22	18.77	29.22	42.56	9.00	51.38	78.50	16.12	53.93	22.27	22.77	27.98	42.16	9.53	47.53	79.74
23	19.62	30.51	43.16	9.60	49.57	77.89	17.32	51.98	23.12	23.62	27.45	41.42	10.49	48.59	80.79
24	19.22	29.67	42.95	9.39	48.42	76.32	16.90	53.10	22.72	23.22	28.20	42.84	9.84	48.31	79.87
25	19.54	29.18	44.60	11.04	45.89	77.09	20.20	53.41	23.04	23.54	26.29	41.55	10.15	48.99	81.48
26	18.55	29.74	42.88	9.32	50.02	77.78	16.76	51.74	22.05	22.55	26.41	41.70	10.58	47.95	80.80
27	18.12	30.30	43.71	10.15	46.69	76.11	18.42	52.68	21.62	22.12	27.99	41.59	9.32	49.32	79.92
28	18.20	28.11	42.44	8.88	50.34	77.22	15.88	52.04	21.70	22.20	26.58	43.93	10.51	46.39	81.96
29	18.06	30.63	43.41	9.85	48.96	77.78	17.82	51.77	21.56	22.06	26.37	43.82	9.47	49.00	80.14
30	17.44	30.46	43.72	10.16	48.87	78.31	18.44	52.60	20.94	21.44	28.50	43.41	9.18	47.45	81.69
31	18.74	30.21	43.09	9.53	50.60	78.78	17.18	52.27	22.24	22.74	28.93	41.71	10.16	49.51	80.31
32	19.59	30.29	44.77	11.21	45.28	76.82	20.54	51.76	23.09	23.59	26.01	41.50	9.56	47.00	81.16
33	18.63	30.24	43.47	9.91	48.53	77.47	17.94	52.23	22.13	22.63	27.51	41.99	9.88	48.88	80.84
34	17.58	30.34	43.43	9.87	49.14	78.00	17.86	53.79	21.08	21.58	26.81	42.97	10.53	47.47	80.29
35	18.22	29.68	42.65	9.09	51.45	78.75	16.30	52.44	21.72	22.22	27.24	42.48	9.48	48.16	80.84
36	17.17	29.28	42.79	9.23	51.27	78.85	16.58	53.07	20.67	21.17	27.31	42.53	10.13	48.18	80.23
X	18.67	29.65	43.32	9.76	48.98	77.62	17.64	52.61	22.17	22.67	27.57	42.64	9.76	48.01	80.61

Tabel 4.3 (Lanjutan)
Data Waktu Siklus Tiap Elemen Kerja

No	Elemen Kerja (Detik)														
	O - 16	O - 17	O - 18	O - 19	O - 20	O - 21	O - 22	O - 23	O - 24	O - 25	O - 26	O - 27	O - 28	O - 29	O - 30
1	21.81	48.50	38.96	35.98	11.00	30.99	22.99	6.90	28.96	34.90	11.00	30.99	22.99	6.90	28.96
2	22.08	48.69	38.03	35.98	11.00	30.04	22.04	6.03	28.00	34.04	11.00	30.04	22.04	6.03	28.00
3	22.31	48.85	38.03	35.04	11.03	30.99	22.99	6.95	28.97	34.94	11.03	30.99	22.99	6.95	28.97
4	21.83	49.07	38.05	35.05	11.03	30.04	22.04	6.07	28.06	34.08	11.03	30.04	22.04	6.07	28.06
5	22.25	49.41	38.08	35.11	11.07	30.08	22.08	6.08	28.07	34.11	11.07	30.08	22.08	6.08	28.07
6	22.37	49.56	38.11	35.22	11.09	30.11	22.11	6.10	28.14	34.11	11.09	30.11	22.11	6.10	28.14
7	22.36	49.64	38.90	35.23	11.10	30.15	22.15	6.14	28.14	34.13	11.10	30.15	22.15	6.14	28.14
8	21.91	48.50	38.13	35.23	11.11	30.17	22.17	6.16	28.14	34.23	11.11	30.17	22.17	6.16	28.14
9	21.75	48.79	38.16	35.25	11.16	30.29	22.29	6.27	28.32	34.40	11.16	30.29	22.29	6.27	28.32
10	22.42	48.86	38.17	35.29	11.16	30.29	22.29	6.28	28.34	34.45	11.16	30.29	22.29	6.28	28.34
11	22.07	49.09	38.22	35.31	11.18	30.46	22.46	6.31	28.44	34.54	11.18	30.46	22.46	6.31	28.44
12	21.74	49.44	38.26	35.36	11.23	30.28	22.28	6.21	28.30	34.35	11.23	30.28	22.28	6.21	28.30
13	22.21	49.58	38.29	35.38	11.26	30.86	22.86	6.77	28.77	34.80	11.26	30.86	22.86	6.77	28.77
14	22.01	49.67	38.30	35.39	11.31	30.87	22.87	6.81	28.83	34.80	11.31	30.87	22.87	6.81	28.83
15	21.64	48.50	38.30	35.41	11.31	30.33	22.33	6.29	28.38	34.45	11.31	30.33	22.33	6.29	28.38
16	21.82	48.77	38.30	35.49	11.36	30.95	22.95	6.90	28.94	34.87	11.36	30.95	22.95	6.90	28.94
17	21.71	48.86	38.30	35.49	11.40	30.44	22.44	6.29	28.44	34.51	11.40	30.44	22.44	6.29	28.44
18	22.08	49.16	38.35	35.51	11.41	30.92	22.92	6.84	28.88	34.83	11.41	30.92	22.92	6.84	28.88
19	22.32	48.51	38.36	35.53	11.43	30.49	22.49	6.34	28.51	34.60	11.43	30.49	22.49	6.34	28.51
20	21.93	48.74	38.38	35.56	11.43	30.61	22.61	6.40	28.53	34.62	11.43	30.61	22.61	6.40	28.53
21	21.91	48.87	38.39	35.57	11.43	30.19	22.19	6.17	28.17	34.27	11.43	30.19	22.19	6.17	28.17
22	21.88	49.24	38.40	35.59	11.45	30.35	22.35	6.29	28.41	34.50	11.45	30.35	22.35	6.29	28.41
23	22.15	48.54	38.41	35.60	11.49	30.67	22.67	6.54	28.57	34.69	11.49	30.67	22.67	6.54	28.57
24	22.31	48.81	38.52	35.60	11.51	30.70	22.70	6.56	28.61	34.69	11.51	30.70	22.70	6.56	28.61
25	21.86	48.91	38.56	35.61	11.54	30.70	22.70	6.60	28.70	34.77	11.54	30.70	22.70	6.60	28.70
26	21.78	49.24	38.58	35.63	11.56	30.63	22.63	6.52	28.55	34.67	11.56	30.63	22.63	6.52	28.55
27	21.82	48.58	38.62	35.68	11.61	30.65	22.65	6.54	28.55	34.67	11.61	30.65	22.65	6.54	28.55
28	22.24	48.82	38.63	35.71	11.62	30.78	22.78	6.74	28.76	34.79	11.62	30.78	22.78	6.74	28.76
29	22.31	48.94	38.63	35.73	11.76	30.81	22.81	6.77	28.77	34.80	11.76	30.81	22.81	6.77	28.77
30	22.07	49.24	38.77	35.79	11.76	30.24	22.24	6.19	28.22	34.34	11.76	30.24	22.24	6.19	28.22
31	22.34	48.58	38.78	35.80	11.78	30.20	22.20	6.35	28.19	34.29	11.78	30.20	22.20	6.35	28.19
32	21.87	49.06	38.84	35.82	11.81	30.90	22.90	6.83	28.84	34.82	11.81	30.90	22.90	6.83	28.84
33	22.11	49.24	38.12	35.88	11.87	30.93	22.93	6.86	28.93	34.84	11.87	30.93	22.93	6.86	28.93
34	22.21	49.25	38.90	35.90	11.92	30.75	22.75	6.63	28.72	34.77	11.92	30.75	22.75	6.63	28.72
35	21.85	48.61	38.91	35.04	11.92	30.77	22.77	6.71	28.76	34.78	11.92	30.77	22.77	6.71	28.76
36	21.93	48.63	38.02	35.03	11.97	30.04	22.04	6.05	28.03	34.07	11.97	30.04	22.04	6.05	28.03
X	22.04	48.97	38.41	35.49	11.42	30.52	22.52	6.46	28.50	34.54	11.42	30.52	22.52	6.46	28.50

Tabel 4.3 (Lanjutan)
Data Waktu Siklus Tiap Elemen Kerja

No	Elemen Kerja (Detik)														
	O - 31	O - 32	O - 33	O - 34	O - 35	O - 36	O - 37	O - 38	O - 39	O - 40	O - 41	O - 42	I - 01	O - 43	O - 44
1	34.90	93.97	6.97	15.98	5.96	15.94	52.79	86.97	31.98	167.97	52.90	36.99	34.90	52.96	20.96
2	34.04	93.01	6.00	15.01	5.01	15.05	50.84	86.01	31.98	167.01	52.04	36.04	34.04	52.01	20.03
3	34.94	93.99	6.99	15.98	5.97	15.95	51.79	86.99	31.04	167.99	52.94	36.99	34.94	52.97	20.03
4	34.08	93.06	6.04	15.05	5.08	15.06	50.89	86.06	31.05	167.06	52.08	36.04	34.08	52.08	20.05
5	34.11	93.08	6.08	15.06	5.11	15.08	51.43	86.08	31.11	167.08	52.11	36.08	34.11	52.11	20.08
6	34.11	93.39	6.11	15.10	5.14	15.09	50.50	86.39	31.22	167.39	52.11	36.11	34.11	52.14	20.11
7	34.13	93.39	6.18	15.18	5.22	15.14	52.33	86.39	31.23	167.39	52.13	36.15	34.13	52.22	20.90
8	34.23	93.19	6.26	15.19	5.23	15.14	51.20	86.19	31.23	167.19	52.23	36.17	34.23	52.23	20.13
9	34.40	93.41	6.33	15.37	5.33	15.33	53.55	86.41	31.25	167.41	52.40	36.29	34.40	52.33	20.16
10	34.45	93.43	6.34	15.39	5.34	15.37	52.80	86.43	31.29	167.43	52.45	36.29	34.45	52.34	20.17
11	34.54	93.66	6.38	15.45	5.44	15.54	51.48	86.66	31.31	167.66	52.54	36.46	34.54	52.44	20.22
12	34.35	93.38	6.29	15.36	5.32	15.33	51.45	86.38	31.36	167.38	52.35	36.28	34.35	52.32	20.26
13	34.80	93.91	6.81	15.79	5.79	15.84	53.23	86.91	31.38	167.91	52.80	36.86	34.80	52.79	20.29
14	34.80	93.93	6.86	15.81	5.81	15.85	51.77	86.93	31.39	167.93	52.80	36.87	34.80	52.81	20.30
15	34.45	93.56	6.35	15.40	5.35	15.39	50.64	86.56	31.41	167.56	52.45	36.33	34.45	52.35	20.30
16	34.87	93.96	6.97	15.96	5.92	15.92	52.11	86.96	31.49	167.96	52.87	36.95	34.87	52.92	20.30
17	34.51	93.64	6.38	15.41	5.43	15.49	50.30	86.64	31.49	167.64	52.51	36.44	34.51	52.43	20.30
18	34.83	93.96	6.91	15.87	5.83	15.89	52.41	86.96	31.51	167.96	52.83	36.92	34.83	52.83	20.35
19	34.60	93.66	6.44	15.45	5.48	15.62	53.41	86.66	31.53	167.66	52.60	36.49	34.60	52.48	20.36
20	34.62	93.68	6.52	15.49	5.51	15.64	51.65	86.68	31.56	167.68	52.62	36.61	34.62	52.51	20.38
21	34.27	93.22	6.26	15.21	5.23	15.25	53.12	86.22	31.57	167.22	52.27	36.19	34.27	52.23	20.39
22	34.50	93.58	6.38	15.40	5.43	15.42	51.53	86.58	31.59	167.58	52.50	36.35	34.50	52.43	20.40
23	34.69	93.77	6.60	15.55	5.56	15.73	52.59	86.77	31.60	167.77	52.69	36.67	34.69	52.56	20.41
24	34.69	93.81	6.67	15.55	5.59	15.77	52.31	86.81	31.60	167.81	52.69	36.70	34.69	52.59	20.52
25	34.77	93.83	6.69	15.69	5.67	15.78	52.99	86.83	31.61	167.83	52.77	36.70	34.77	52.67	20.56
26	34.67	93.73	6.52	15.51	5.54	15.64	51.95	86.73	31.63	167.73	52.67	36.63	34.67	52.54	20.58
27	34.67	93.73	6.54	15.55	5.55	15.67	53.32	86.73	31.68	167.73	52.67	36.65	34.67	52.55	20.62
28	34.79	93.89	6.76	15.74	5.70	15.83	50.39	86.89	31.71	167.89	52.79	36.78	34.79	52.70	20.63
29	34.80	93.89	6.79	15.77	5.77	15.83	53.00	86.89	31.73	167.89	52.80	36.81	34.80	52.77	20.63
30	34.34	93.31	6.28	15.33	5.28	15.33	51.45	86.31	31.79	167.31	52.34	36.24	34.34	52.28	20.77
31	34.29	93.23	6.28	15.30	5.27	15.25	53.51	86.23	31.80	167.23	52.29	36.20	34.29	52.27	20.78
32	34.82	93.94	6.88	15.84	5.83	15.87	51.00	86.94	31.82	167.94	52.82	36.90	34.82	52.83	20.84
33	34.84	93.96	6.92	15.93	5.85	15.91	52.88	86.96	31.88	167.96	52.84	36.93	34.84	52.85	20.12
34	34.77	93.86	6.69	15.70	5.68	15.78	51.47	86.86	31.90	167.86	52.77	36.75	34.77	52.68	20.90
35	34.78	93.87	6.74	15.73	5.68	15.82	52.16	86.87	31.04	167.87	52.78	36.77	34.78	52.68	20.91
36	34.07	93.04	6.02	15.01	5.04	15.05	52.18	86.04	31.03	167.04	52.07	36.04	34.07	52.04	20.02
X	34.54	93.61	6.51	15.50	5.50	15.54	52.01	86.61	31.49	167.61	52.54	36.52	34.54	52.50	20.41

5.1.2.2 Kelonggaran

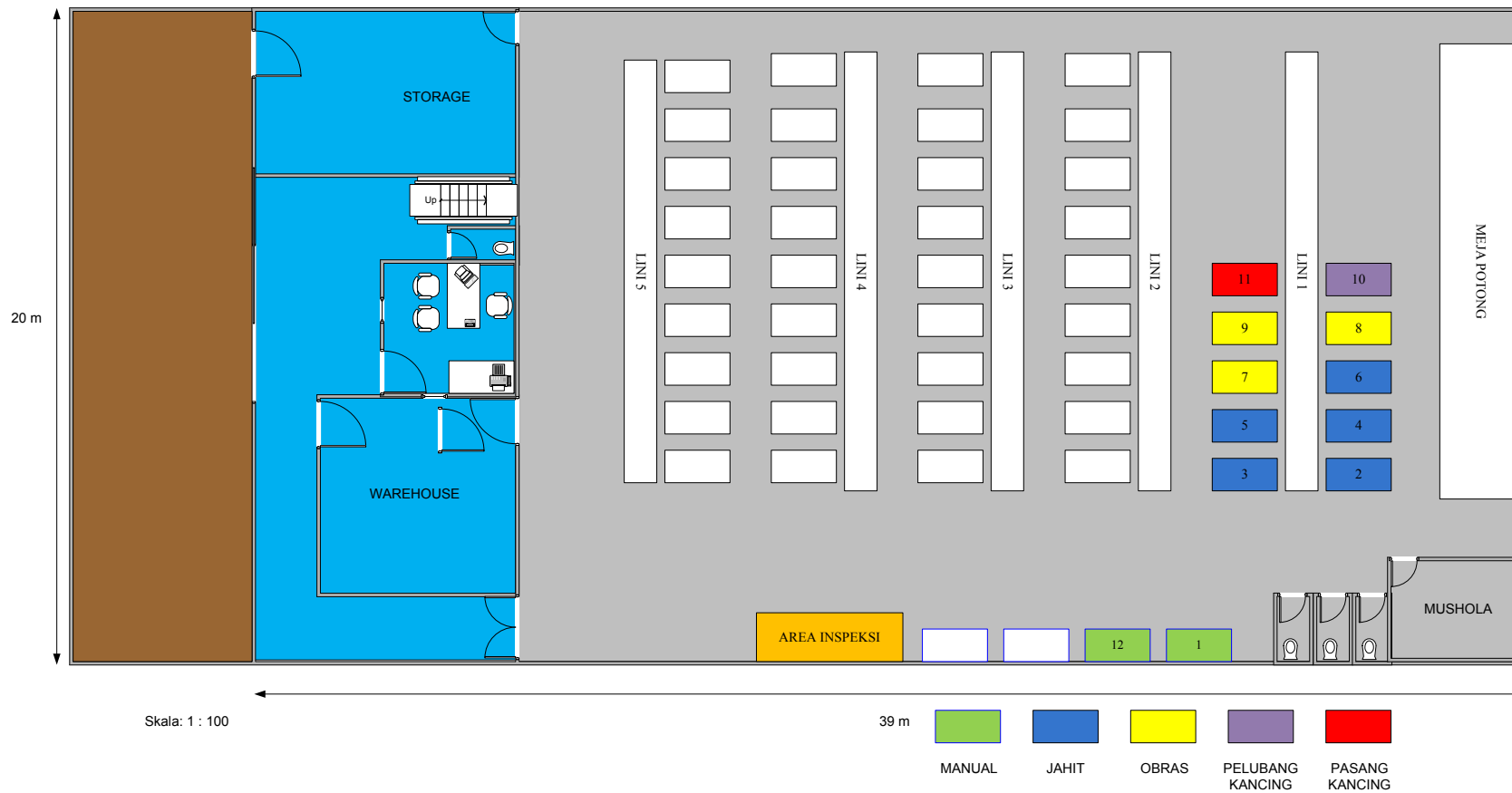
Tabel 5.7
Faktor Kelonggaran

No	Elemen Kerja	Tenaga yang dikeluarkan	Sikap Kerja	Gerakan Kerja	Kelelahan Mata	Keadaan Temperatur Kerja	Keadaan Atmosfer	Keadaan Lingkungan Yang Baik	Kelonggaran Pribadi	Kelonggaran Tak Terhindarkan	Total Kelonggaran
1	O - 01	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
2	O - 02	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
3	O - 03	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
4	O - 04	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
5	O - 05	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
6	O - 06	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
7	O - 07	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
8	O - 08	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
9	O - 09	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
10	O - 10	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
11	O - 11	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
12	O - 12	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
13	O - 13	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
14	O - 14	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
15	O - 15	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
16	O - 16	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
17	O - 17	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
18	O - 18	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
19	O - 19	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
20	O - 20	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
21	O - 21	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
22	O - 22	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
23	O - 23	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
24	O - 24	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
25	O - 25	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
26	O - 32	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
27	O - 33	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
28	O - 34	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
29	O - 35	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
30	O - 36	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
31	O - 37	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
32	O - 38	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
33	O - 39	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
34	O - 40	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
35	O - 41	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
36	O - 42	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
37	I - 01	0	0	0.02	0.075	0	0.01	0.02	0.02	0.01	0.155
38	O - 43	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14
39	O - 44	0	0	0.02	0.06	0	0.01	0.02	0.02	0.01	0.14

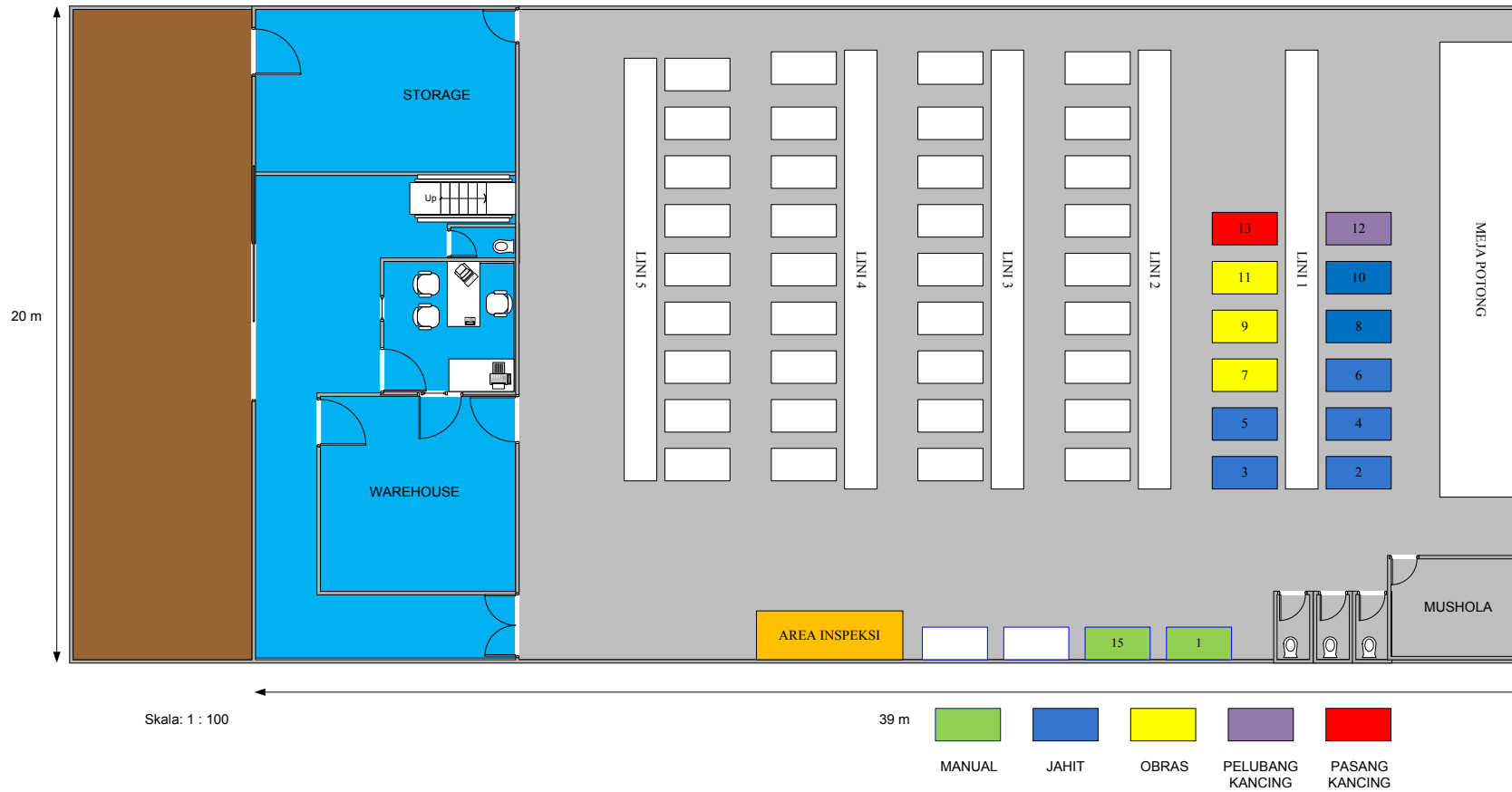
4.9 Layout Pabrik



Gambar 4.4
Layout Perusahaan Saat Ini



Gambar 5.5
Layout Usulan Algoritma Genetika



Gambar 5.7
Layout Usulan Jam Kerja Pemerintah