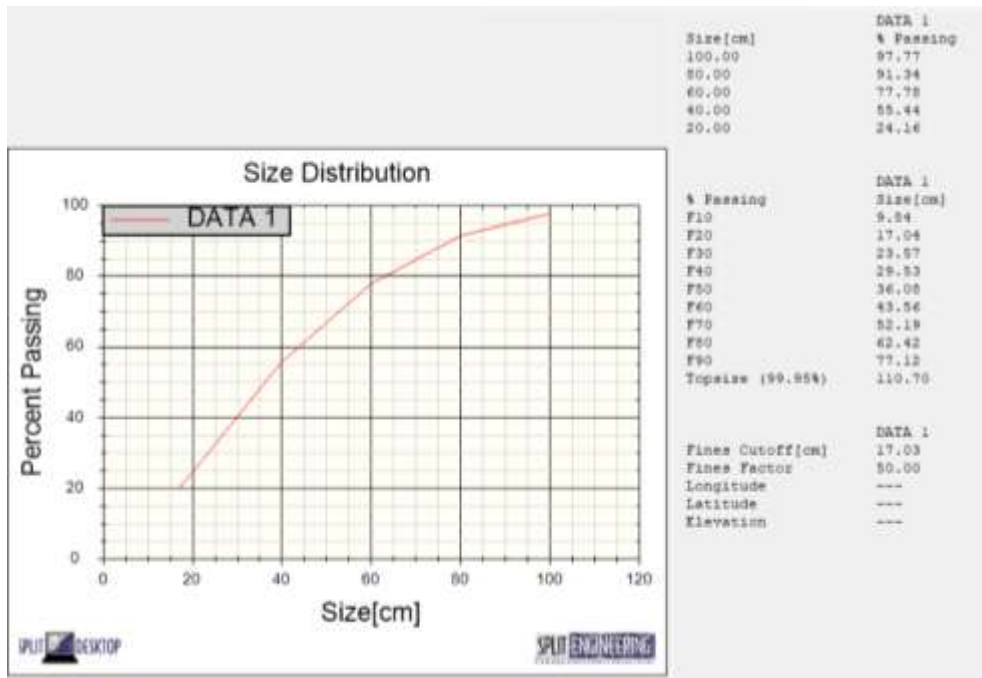
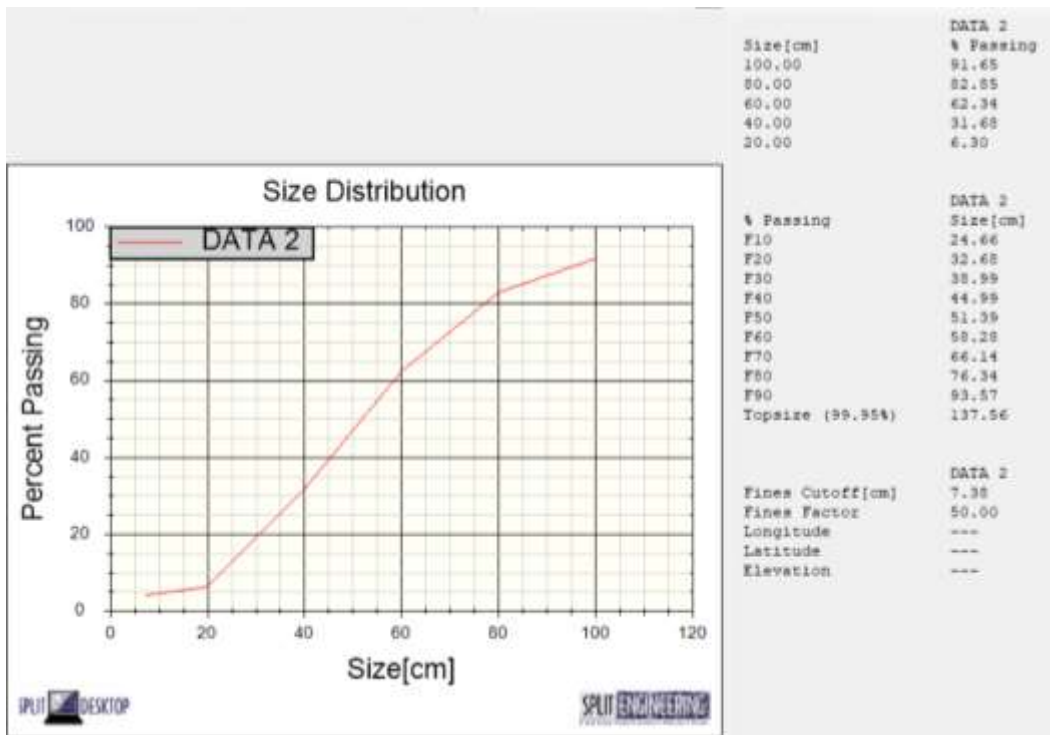


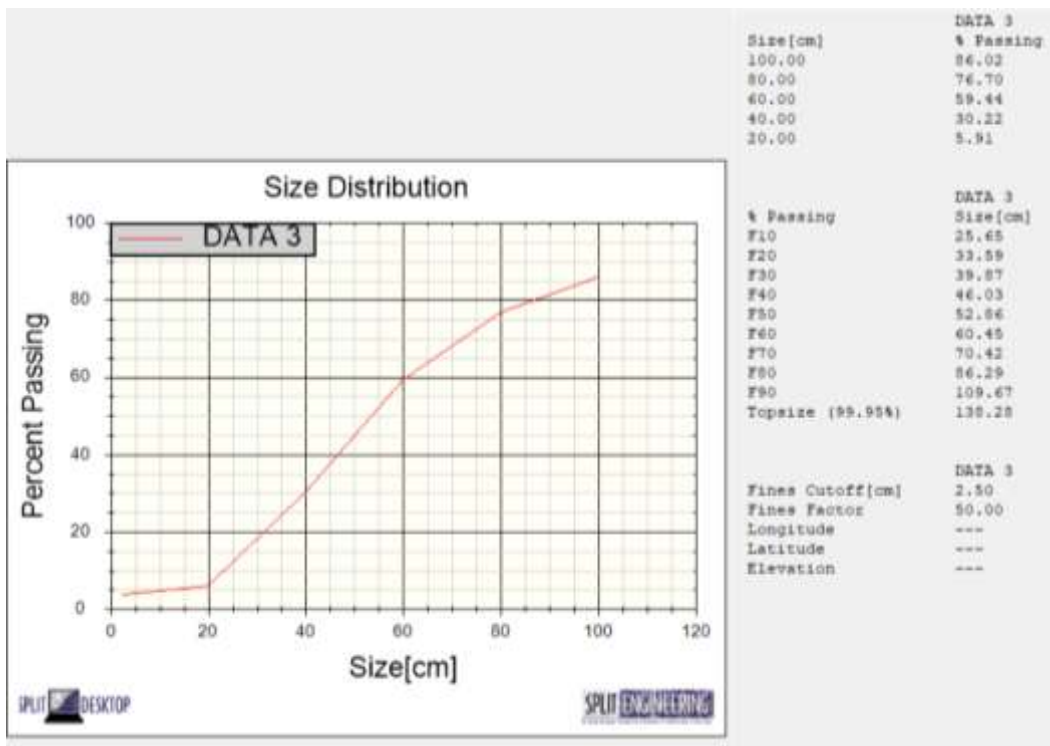
**LAMPIRAN A**  
**HASIL *SPLIT DESKTOP* 4.0**



Gambar A.1. Hasil Pengolahan Gambar *Split Desktop* data 1

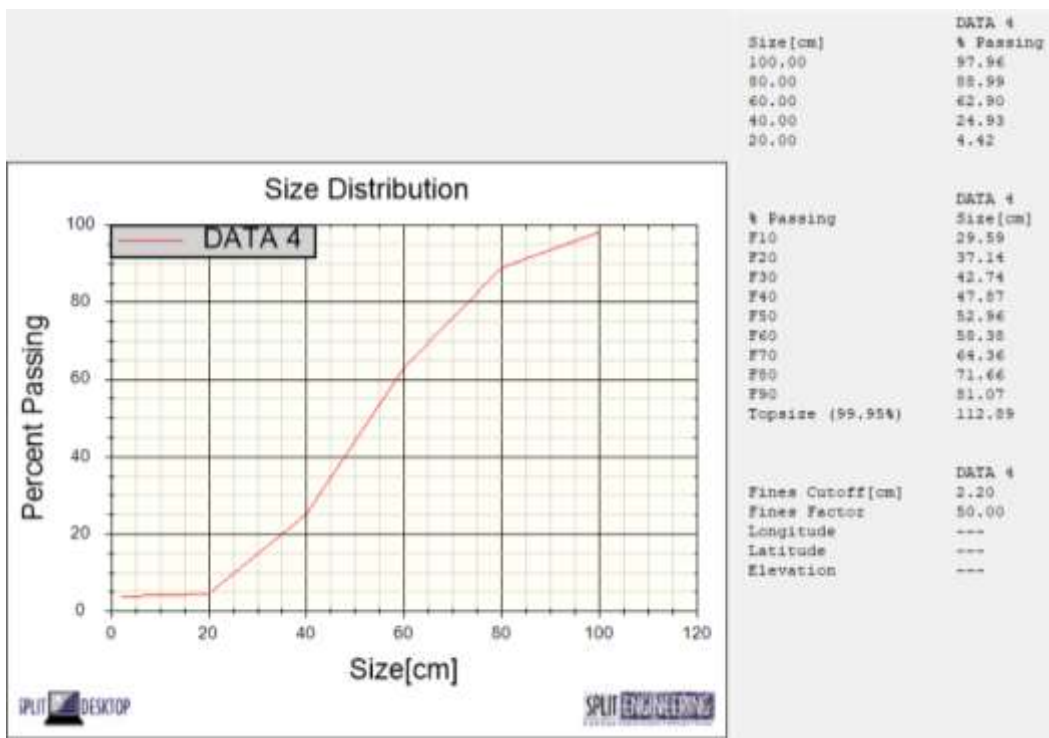


Gambar A.2. Hasil Pengolahan Gambar *Split Desktop* data 2

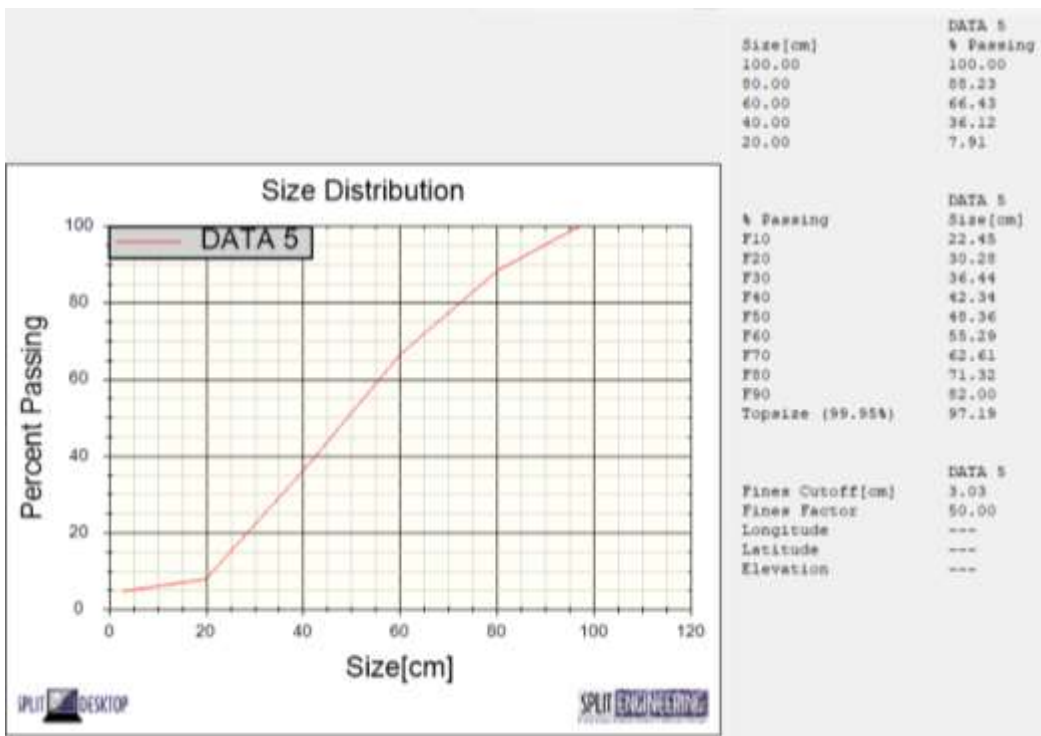


Gambar A.3. Hasil Pengolahan Gambar *Split Desktop* data 3



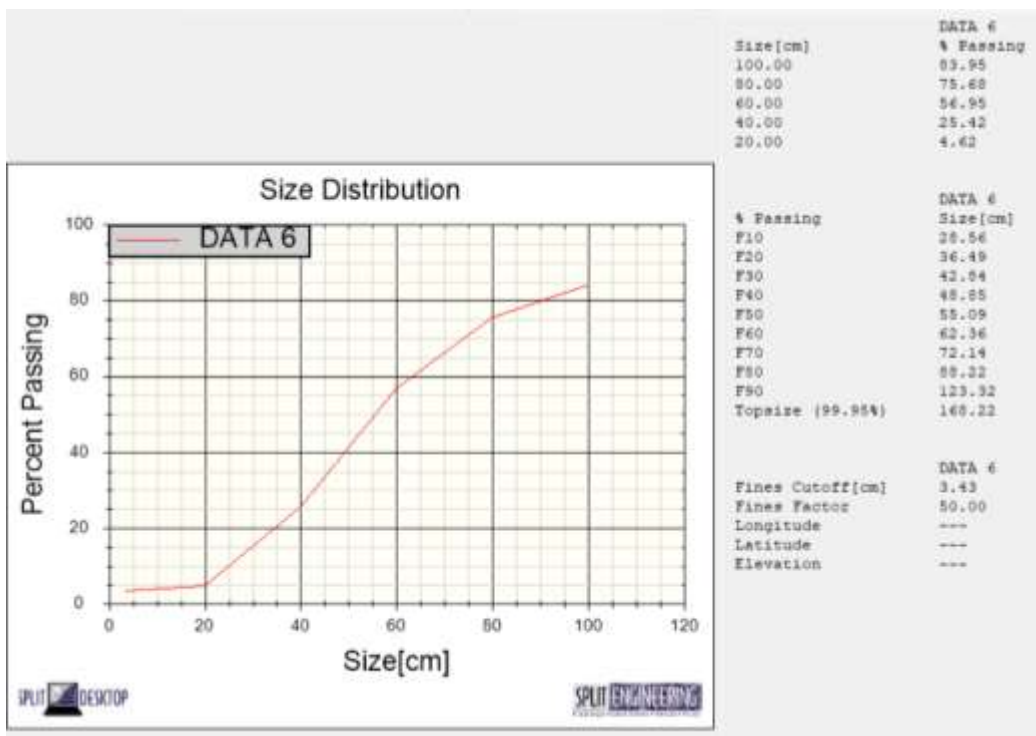


Gambar A.4. Hasil Pengolahan Gambar *Split Desktop* data 4

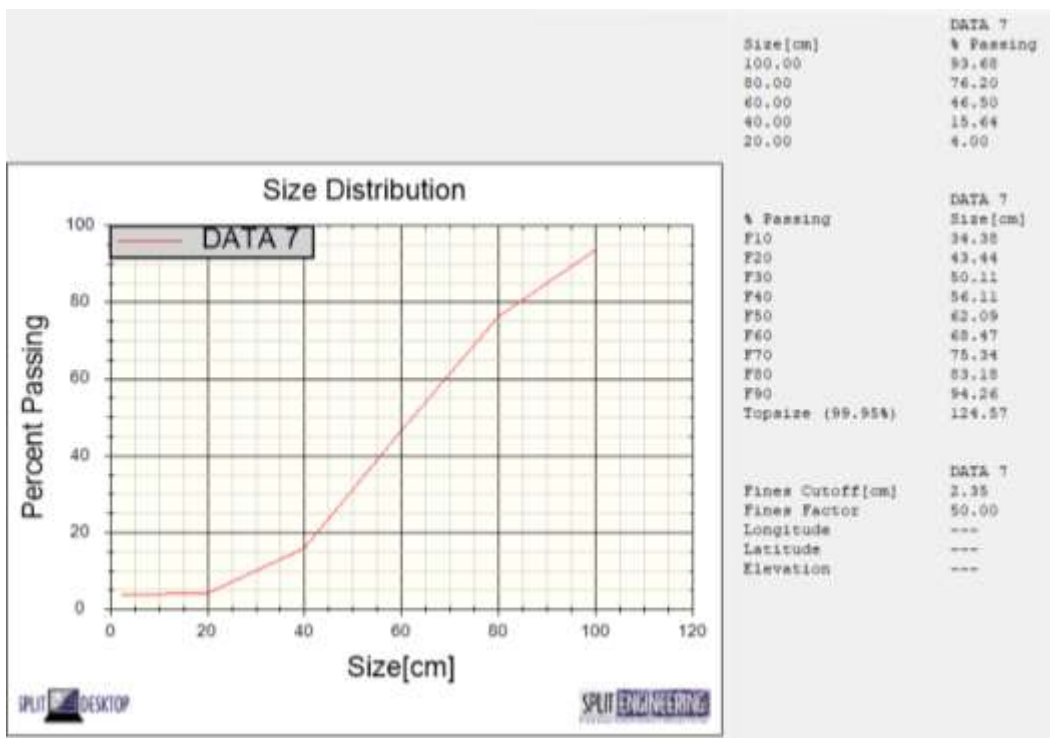


Gambar A.5. Hasil Pengolahan Gambar *Split Desktop* data 5



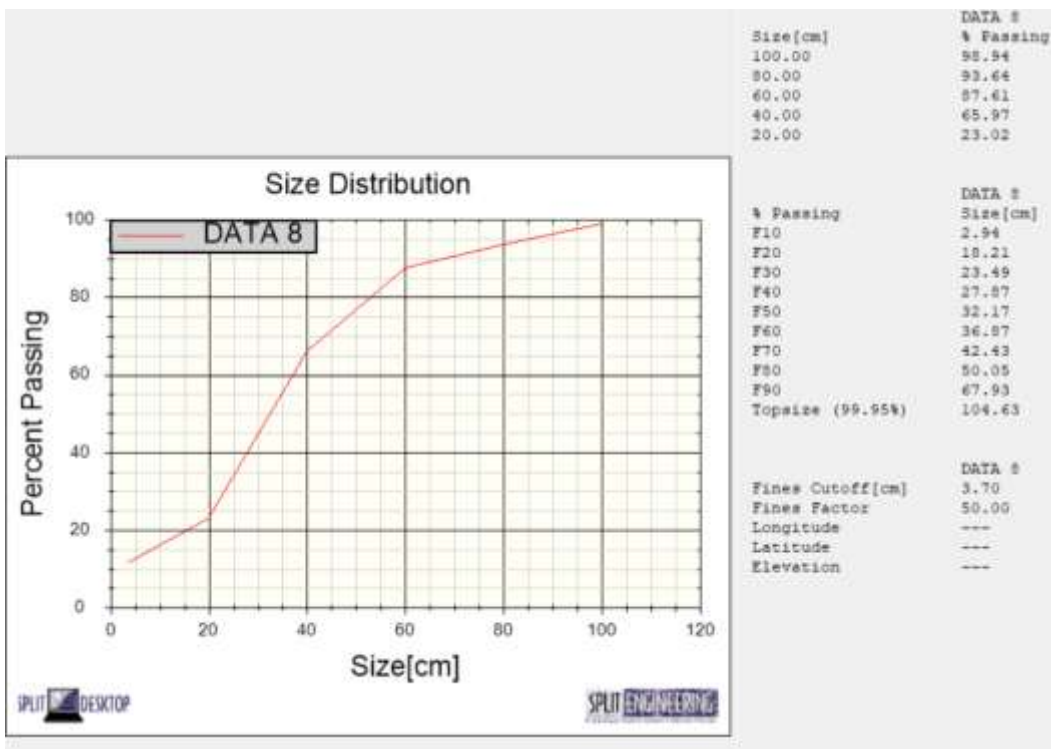


Gambar A.6. Hasil Pengolahan Gambar *Split Desktop* data 6



Gambar A.7. Hasil Pengolahan Gambar *Split Desktop* data 7



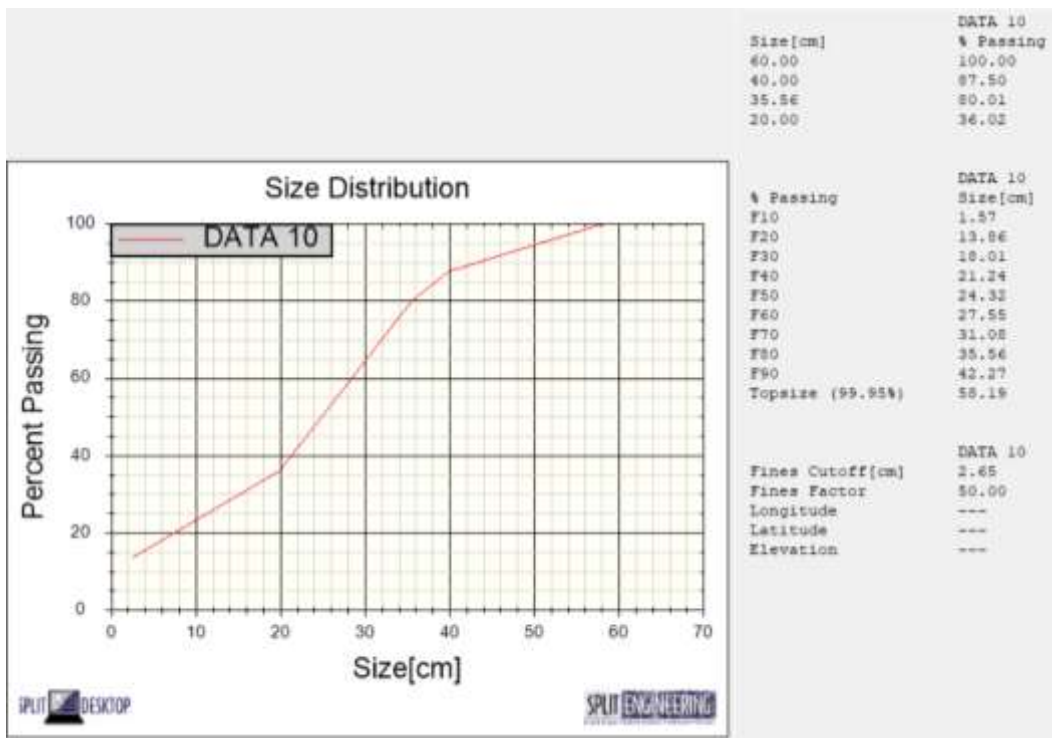


Gambar A.8. Hasil Pengolahan Gambar *Split Desktop* data 8



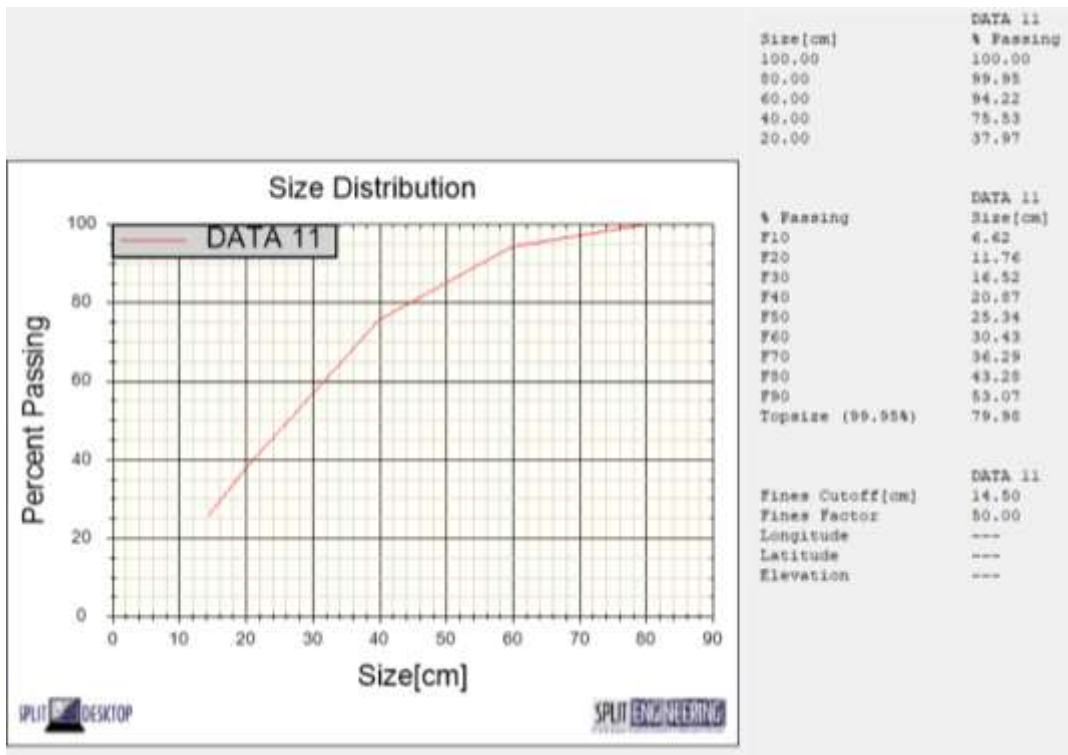


Gambar A.9. Hasil Pengolahan Gambar *Split Desktop* data 9



Gambar A.10. Hasil Pengolahan Gambar *Split Desktop* data 10





Gambar A.11. Hasil Pengolahan Gambar *Split Desktop* data 11

**LAMPIRAN B**  
**LOADING SHEET**

Tabel B.1. *Loading Sheet 9 x 10 Powder Factor 0,21 kg/m<sup>3</sup>*

B (m)	S (m)	H (m)	T (m)	PC	de (kg/m)	E (Kgs)	Vol (m <sup>3</sup> )	PF
9	10	3	1.5	1.5	37.7	57	270	0.21
9	10	3.1	1.5	1.6	37.7	59	279	0.21
9	10	3.2	1.6	1.6	37.7	61	288	0.21
9	10	3.3	1.6	1.7	37.7	63	297	0.21
9	10	3.4	1.7	1.7	37.7	65	306	0.21
9	10	3.5	1.7	1.8	37.7	67	315	0.21
9	10	3.6	1.8	1.8	37.7	69	324	0.21
9	10	3.7	1.8	1.9	37.7	70	333	0.21
9	10	3.8	1.9	1.9	37.7	72	342	0.21
9	10	3.9	1.9	2	37.7	74	351	0.21
9	10	4	2	2	37.7	76	360	0.21
9	10	4.1	2	2.1	37.7	78	369	0.21
9	10	4.2	2.1	2.1	37.7	80	378	0.21
9	10	4.3	2.1	2.2	37.7	82	387	0.21
9	10	4.4	2.2	2.2	37.7	84	396	0.21
9	10	4.5	2.2	2.3	37.7	86	405	0.21
9	10	4.6	2.3	2.3	37.7	87	414	0.21
9	10	4.7	2.3	2.4	37.7	89	423	0.21
9	10	4.8	2.4	2.4	37.7	91	432	0.21
9	10	4.9	2.4	2.5	37.7	93	441	0.21
9	10	5	2.5	2.5	37.7	95	450	0.21
9	10	5.1	2.5	2.6	37.7	97	459	0.21
9	10	5.2	2.6	2.6	37.7	99	468	0.21
9	10	5.3	2.6	2.7	37.7	101	477	0.21
9	10	5.4	2.7	2.7	37.7	103	486	0.21
9	10	5.5	2.7	2.8	37.7	104	495	0.21
9	10	5.6	2.8	2.8	37.7	106	504	0.21
9	10	5.7	2.8	2.9	37.7	108	513	0.21
9	10	5.8	2.9	2.9	37.7	110	522	0.21
9	10	5.9	2.9	3	37.7	112	531	0.21
9	10	6	3	3	37.7	114	540	0.21
9	10	6.1	3	3.1	37.7	116	549	0.21
9	10	6.2	3.1	3.1	37.7	118	558	0.21
9	10	6.3	3.1	3.2	37.7	120	567	0.21
9	10	6.4	3.2	3.2	37.7	121	576	0.21
9	10	6.5	3.2	3.3	37.7	123	585	0.21



9	10	6.6	3.3	3.3	37.7	125	594	0.21
9	10	6.7	3.3	3.4	37.7	127	603	0.21
9	10	6.8	3.4	3.4	37.7	129	612	0.21
9	10	6.9	3.4	3.5	37.7	131	621	0.21
9	10	7	3.5	3.5	37.7	133	630	0.21
9	10	7.1	3.5	3.6	37.7	135	639	0.21
9	10	7.2	3.6	3.6	37.7	137	648	0.21
9	10	7.3	3.6	3.7	37.7	138	657	0.21
9	10	7.4	3.7	3.7	37.7	140	666	0.21
9	10	7.5	3.7	3.8	37.7	142	675	0.21
9	10	7.6	3.8	3.8	37.7	144	684	0.21
9	10	7.7	3.8	3.9	37.7	146	693	0.21
9	10	7.8	3.9	3.9	37.7	148	702	0.21
9	10	7.9	3.9	4	37.7	150	711	0.21
9	10	8	4	4	37.7	152	720	0.21
9	10	8.1	4	4.1	37.7	154	729	0.21
9	10	8.2	4.1	4.1	37.7	155	738	0.21
9	10	8.3	4.1	4.2	37.7	157	747	0.21
9	10	8.4	4.2	4.2	37.7	159	756	0.21
9	10	8.5	4.2	4.3	37.7	161	765	0.21
9	10	8.6	4.3	4.3	37.7	163	774	0.21
9	10	8.7	4.3	4.4	37.7	165	783	0.21
9	10	8.8	4.4	4.4	37.7	167	792	0.21
9	10	8.9	4.4	4.5	37.7	169	801	0.21
9	10	9	4.5	4.5	37.7	171	810	0.21
9	10	9.1	4.5	4.6	37.7	173	819	0.21
9	10	9.2	4.6	4.6	37.7	175	828	0.21
9	10	9.3	4.6	4.7	37.7	177	837	0.21
9	10	9.4	4.7	4.7	37.7	179	846	0.21
9	10	9.5	4.7	4.8	37.7	181	855	0.21

Tabel B.2. Loading Sheet 8 x 9 Powder Factor 0,21 kg/m<sup>3</sup>

B (m)	S (m)	H (m)	T (m)	PC	de (kg/m)	E (Kgs)	Vol (m3)	PF
8	9	3	1.8	1.2	37.7	46	216	0.21
8	9	3.1	1.9	1.2	37.7	47	223.2	0.21
8	9	3.2	1.9	1.3	37.7	49	230.4	0.21
8	9	3.3	2	1.3	37.7	50	237.6	0.21
8	9	3.4	2	1.4	37.7	52	244.8	0.21
8	9	3.5	2.1	1.4	37.7	53	252	0.21
8	9	3.6	2.1	1.5	37.7	55	259.2	0.21
8	9	3.7	2.2	1.5	37.7	56	266.4	0.21
8	9	3.8	2.3	1.5	37.7	58	273.6	0.21
8	9	3.9	2.3	1.6	37.7	59	280.8	0.21
8	9	4	2.4	1.6	37.7	61	288	0.21
8	9	4.1	2.5	1.6	37.7	62	295.2	0.21
8	9	4.2	2.5	1.7	37.7	64	302.4	0.21
8	9	4.3	2.5	1.8	37.7	66	309.6	0.21
8	9	4.4	2.6	1.8	37.7	67	316.8	0.21
8	9	4.5	2.7	1.8	37.7	69	324	0.21
8	9	4.6	2.7	1.9	37.7	70	331.2	0.21
8	9	4.7	2.8	1.9	37.7	72	338.4	0.21
8	9	4.8	2.9	1.9	37.7	73	345.6	0.21
8	9	4.9	2.9	2	37.7	75	352.8	0.21
8	9	5	3	2	37.7	76	360	0.21
8	9	5.1	3	2.1	37.7	78	367.2	0.21
8	9	5.2	3.1	2.1	37.7	79	374.4	0.21
8	9	5.3	3.2	2.1	37.7	81	381.6	0.21
8	9	5.4	3.2	2.2	37.7	82	388.8	0.21
8	9	5.5	3.3	2.2	37.7	84	396	0.21
8	9	5.6	3.3	2.3	37.7	85	403.2	0.21
8	9	5.7	3.4	2.3	37.7	87	410.4	0.21
8	9	5.8	3.5	2.3	37.7	88	417.6	0.21
8	9	5.9	3.5	2.4	37.7	90	424.8	0.21
8	9	6	3.6	2.4	37.7	91	432	0.21
8	9	6.1	3.6	2.5	37.7	93	439.2	0.21
8	9	6.2	3.7	2.5	37.7	94	446.4	0.21
8	9	6.3	3.8	2.5	37.7	96	453.6	0.21
8	9	6.4	3.8	2.6	37.7	97	460.8	0.21
8	9	6.5	3.9	2.6	37.7	99	468	0.21
8	9	6.6	3.9	2.7	37.7	100	475.2	0.21
8	9	6.7	4	2.7	37.7	102	482.4	0.21
8	9	6.8	4.1	2.7	37.7	103	489.6	0.21



8	9	6.9	4.1	2.8	37.7	105	496.8	0.21
8	9	7	4.2	2.8	37.7	106	504	0.21
8	9	7.1	4.2	2.9	37.7	108	511.2	0.21
8	9	7.2	4.3	2.9	37.7	109	518.4	0.21
8	9	7.3	4.4	2.9	37.7	111	525.6	0.21
8	9	7.4	4.4	3	37.7	112	532.8	0.21
8	9	7.5	4.5	3	37.7	114	540	0.21
8	9	7.6	4.5	3.1	37.7	115	547.2	0.21
8	9	7.7	4.6	3.1	37.7	117	554.4	0.21
8	9	7.8	4.7	3.1	37.7	118	561.6	0.21
8	9	7.9	4.7	3.2	37.7	120	568.8	0.21
8	9	8	4.8	3.2	37.7	121	576	0.21
8	9	8.1	4.8	3.3	37.7	123	583.2	0.21
8	9	8.2	4.9	3.3	37.7	124	590.4	0.21
8	9	8.3	5	3.3	37.7	126	597.6	0.21
8	9	8.4	5	3.4	37.7	128	604.8	0.21
8	9	8.5	5.1	3.4	37.7	129	612	0.21
8	9	8.6	5.1	3.5	37.7	131	619.2	0.21
8	9	8.7	5.2	3.5	37.7	132	626.4	0.21
8	9	8.8	5.2	3.6	37.7	134	633.6	0.21
8	9	8.9	5.3	3.6	37.7	135	640.8	0.21
8	9	9	5.4	3.6	37.7	137	648	0.21
8	9	9.1	5.4	3.7	37.7	138	655.2	0.21
8	9	9.2	5.5	3.7	37.7	140	662.4	0.21
8	9	9.3	5.6	3.7	37.7	141	669.6	0.21
8	9	9.4	5.6	3.8	37.7	143	676.8	0.21
8	9	9.5	5.7	3.8	37.7	144	684	0.21

## LAMPIRAN C

### *DIGGING TIME*

Tabel C.1. *Digging Time* Data 1

No	Digging (dtk)	Swing Isi (dtk)	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	11.04	15.31	5.67	9.35	41.37
2	11.68	9.8	5.24	9.93	36.65
3	10.57	3.72	3.81	7.63	25.73
4	20.32	3.48	3.17	9.18	36.15
5	11.03	4.57	4.7	22.05	42.35
6	15.31	8.65	5.46	10.76	30.04
7	12.23	5.86	5.47	8.42	28.63
8	14.57	7.17	4.31	10.56	28.04
9	14.23	5.26	2.32	9.23	31.04
10	13.15	7.43	3.57	8.93	33.08
11	17.21	6.56	5.42	6.52	35.71
12	16.49	4.78	3.35	7.12	31.74
13	10.89	7.43	6.71	8.6	33.63
14	13.24	5.68	3.54	5.73	28.19
15	9.66	4.2	3.57	11.57	29
16	12.34	3.41	5.12	7.31	28.18
17	12.35	6.89	3.73	12.4	35.37
18	10.54	7.56	3.94	7.37	29.41
19	9.88	6.59	2.85	11.85	31.17
20	24.67	14.35	81.95	14.51	15.48
Rata-Rata	13.57000	6.54000	4.31000	9.71000	61.55000

Tabel C.2. *Digging Time* Data 2

No	Digging (dtk)	swing	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	16.66	7.94	2.61	7.76	34.97
2	15.26	9.62	2.64	9.74	37.26
3	14.5	5.19	3.24	9.79	32.72
4	14.81	7.41	3.54	9.39	35.15
5	12.93	5.65	3.77	7.74	30.09
6	14.16	6.23	3.43	9.27	33.09
7	13.32	6.68	4.81	8.41	33.22
8	14.97	7.18	2.13	6.93	31.21
9	13.95	5.54	2.22	6.73	28.44
10	13.74	4.79	2.32	6.04	26.89
11	14.87	4.78	2.99	9.2	31.84
12	12.69	4.15	3.25	5.57	25.66
13	13.81	8.98	3.8	6.19	32.78
14	12.74	5.61	4.5	10.84	33.69
15	13.73	6.6	3.75	9.07	33.15
16	15.35	8.02	3.04	7.59	34
17	16.67	7.59	2.64	7.34	34.24
18	13.22	6.09	3.34	11.32	33.97
rata-rata	14.29889	6.55833	3.22333	8.27333	32.35389

Tabel C.3. *Digging Time Data 3*

No	Digging (dtk)	swing	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	16.08	7.39	4.01	8.14	35.62
2	15.74	7.04	4.87	7.5	35.15
3	16.05	9.67	6.1	10.22	42.04
4	14.71	5.54	2.71	9.62	32.58
5	16.71	6.17	3.2	8.8	34.88
6	15.05	8.22	4.83	9.8	37.9
7	15.67	9.77	4.61	9.81	39.86
8	14.93	6.43	4.78	8.97	35.11
9	15.27	7.32	2.18	9.09	33.86
10	14.93	5.52	3.18	8.15	31.78
11	16.05	8.2	2.87	9.49	36.61
12	15.78	4.83	3.09	10.17	33.87
13	14.49	6.93	3.34	11.32	36.08
14	14.75	9.7	3.01	4.43	31.89
15	15.4	5.21	2.43	7.24	30.28
16	14.75	5.86	3.03	5.49	29.13
17	15.73	4.87	2.11	8.69	31.4
18	14.63	7.14	3.11	8.23	33.11
19	15.24	7.07	3.93	6.87	33.11
rata rata	15.36632	6.99368	3.54684	8.52789	34.43474



Tabel C.4. *Digging Time Data 4*

No	Digging (dtk)	swing	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	9.51	5.36	2.72	5.94	23.53
2	9.69	5.78	3.33	5.38	24.18
3	13.31	11.87	4.48	6.97	36.63
4	11.38	6.54	3.24	7.08	28.24
5	18.38	5.57	3.3	6.39	33.64
6	13.76	5.94	3.16	7.18	30.04
7	11.25	4.95	2.99	6.68	25.87
8	15.21	3.95	2.87	6.67	28.7
9	10.69	6.12	2.61	6.75	26.17
10	14.46	10.01	2.72	7.43	34.62
11	16.31	6.51	3.7	6.4	32.92
12	14.91	6.4	4.04	9.16	34.51
13	10.01	7.72	2.99	6.63	27.35
14	16.25	5.41	2.43	8.02	32.11
15	15.74	4.17	3.63	8.72	32.26
16	16.78	9.12	3.26	6.29	35.45
17	13.39	6.68	4.76	7.2	32.03
18	14.84	6.02	3.79	5.76	30.41
19	13.99	6.23	3.19	7.6	31.01
20	13.32	8.16	3.55	5.4	30.43
21	14.32	7.87	4.43	6.86	33.48
22	12.75	10.25	4.2	7.42	34.62
23	14.71	6.44	3.01	6.96	31.12
24	13.32	6.52	3.47	7.44	30.75
25	16.76	9.13	4.13	6.45	36.47
26	16.28	5.81	4.08	5.22	31.39
27	15.59	4.11	2.89	7.34	29.93
28	14.97	4.84	3.33	5.12	28.26
29	13.78	4.22	2.76	6.93	27.69
30	16.61	6.08	2.9	6.39	31.98
31	15.73	10.14	3.08	6.46	35.41
rata rata	14.12903226	6.707097	3.388387097	6.781935484	31.00645161

Tabel C.5. *Digging Time Data 5*

No	Digging (dtk)	swing	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	15.87	7.13	5.86	4.91	33.77
2	14.39	7.14	21.13	4.26	46.92
3	13.3	19.35	3.51	5.4	41.56
4	18.56	8.13	3.9	5.17	35.76
5	10.99	8.22	5.16	6.26	30.63
6	17.01	9.42	6.71	5.22	38.36
7	10.87	8.03	12.08	5.06	36.04
8	12.7	5.36	6.34	24.59	48.99
9	12.43	20.36	4.3	7.24	44.33
10	15.7	6.43	5.52	5.31	32.96
11	10.03	8.63	15.6	8.2	42.46
12	13.3	6.36	5.13	4.68	29.47
13	11.84	5.61	5.59	4.72	27.76
14	13.86	12.69	7.67	13.56	47.78
15	13.76	5.29	4.29	11.02	34.36
16	14.58	20.39	9.07	4.95	48.99
17	13.8	8.08	9.31	5.81	37
18	11.85	7.54	9.14	4.99	33.52
19	14.08	7.81	10.64	4.95	37.48
20	13.19	7.4	7.66	6.6	34.85
21	14.62	6.8	17.28	6.51	45.21
22	18.51	17.36	6.64	6.05	48.56
23	14.92	7.9	6.67	5.9	35.39
24	16.88	7.12	5.91	5.03	34.94
25	13.81	8.27	8.11	4.05	34.24
rata rata	14.03400	9.47280	8.12880	6.81760	38.45320

Tabel C.6. *Digging Time Data 6*

No	Digging (dtk)	swing	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	23.21	7.99	8.23	11.22	50.65
2	16.1	8.64	4.12	21.27	50.13
3	17.13	8.3	2.73	6.85	35.01
4	14.78	6.59	3.67	6.82	31.86
5	14.73	5.59	4.94	7.6	32.86
6	13.47	5.87	6.27	11.59	37.2
7	14.62	17.31	4.3	6.46	42.69
8	17.82	16.18	3.89	5.51	43.4
9	18.04	11.32	4.61	5.62	39.59
10	15.26	8.78	4.15	6.6	34.79
11	14.32	8.03	4.5	7.84	34.69
12	14.77	7.09	3.86	7.03	32.75
13	18.17	7.58	9.35	11.7	46.8
14	13.32	6.52	3.47	7.44	30.75
15	14.02	7.72	2.99	6.63	31.36
16	16.84	5.61	5.59	4.72	32.76
17	17.86	12.69	7.67	13.56	51.78
18	16.76	5.29	4.29	11.02	37.36
19	18.58	20.39	9.07	4.95	52.99
20	13.8	8.08	9.31	5.81	37
rata rata	16.18000	9.27850	5.35050	8.51200	39.32100

Tabel C.7. *Digging Time Data 7*

No	Digging (dtk)	Swing Isi (dtk)	Dumping (dtk)	Swing Kosong (dtk)	Cycle Time (Dtk)
1	17.75	6.87	3.52	10.53	38.67
2	15.66	6.74	3.43	7.32	33.15
3	15.07	5.53	3.51	8.84	32.95
4	14.27	5.14	3.26	7.12	29.79
5	16.39	6.25	2.65	9.64	34.93
6	15.88	7.64	2.71	6.23	32.46
7	14.53	4.91	2.33	5.76	27.53
8	16.14	6.75	2.93	8.83	34.65
9	14.31	5.53	3.24	5.68	28.76
10	15.81	5.12	2.11	4.5	27.54
11	14.19	6.92	2.73	9.19	33.03
12	15.98	7.02	2.43	6.36	31.79
13	16.63	4.31	2.25	8.04	31.23
14	15.75	5.23	3.16	5.27	29.41
15	13.37	5.82	2.54	7.5	29.23
16	14.93	4.96	3.78	8.43	32.1
17	13.73	6.25	3.82	5.15	28.95
18	15.59	15.34	5.78	11.56	48.27
19	13.53	8.71	5.37	7	34.61
20	14.67	7.54	4.56	9.77	36.54
Rata-Rata	15.20900	6.62900	3.30550	7.63600	32.77950

Tabel C.8. *Digging Time Data 8*



NO	digging	swing isi	dump	swing kosong	cycle time
1	13.92	7.83	3.98	6.75	32.48
2	12.42	6.28	4.91	5.22	28.83
3	9.77	5.82	5.19	6.54	27.32
4	10.61	5.93	4.23	6.53	27.3
5	11.49	7.77	5.13	6.71	31.1
6	12.69	6.78	4.8	3.93	28.2
7	13.55	7.12	4.98	5.41	31.06
8	12.8	6.68	4.93	4.71	29.12
9	13.02	5.51	4.46	6.12	29.11
10	12.35	6.23	5.13	6.53	30.24
11	12.6	7.47	4.34	6.54	30.95
12	13.37	6.76	4.88	6.34	31.35
13	14.32	7.75	5.19	6.5	33.76
14	12.59	7.77	4.28	6.13	30.77
15	13.4	7.34	5.09	6.67	32.5
16	12.58	6.96	4.84	5.43	29.81
17	9.03	7.23	4.71	5.78	26.75
18	11.33	6.94	5.02	5.83	29.12
19	6.81	7.03	4.35	6.13	24.32
20	7.62	7.46	5.73	6.6	27.41
21	6.44	7.45	4.54	6.35	24.78
22	15.66	6.54	4.88	6.1	33.18
23	9.38	7.54	5.01	6.34	28.27
24	8.36	6.78	4.94	6.13	26.21
25	7.88	7.85	4.98	6.02	26.73
26	9.51	6.88	4.93	5.53	26.85
27	10.97	7.52	4.54	5.97	29
28	9.98	6.9	5.25	6.14	28.27
29	10.98	7.32	4.95	5.95	29.2
30	6.58	7.32	5.03	6.32	25.25
31	6.34	6.5	4.2	5.5	22.54
Rata-Rata	10.91452	7.00839	4.82000	6.02419	28.76710

Tabel C.9. *Digging Time Data 9*

No	digging	swing isi	dump	swing kosong	cycle time
1	14.98	7.83	3.98	7.12	33.91
2	13.86	6.28	4.91	5.22	30.27
3	12.19	5.82	5.19	6.54	29.74
4	9.76	5.93	4.23	6.53	26.45
5	10.03	7.77	5.13	6.71	29.64
6	11.08	6.78	4.8	3.93	26.59
7	11.57	7.12	4.98	5.41	29.08
8	14.76	6.68	4.93	5.7	32.07
9	10.45	5.51	4.46	6.12	26.54
10	10.63	7.32	5.13	6.53	29.61
11	11.16	6.45	4.78	6.3	28.69
12	12.3	7.25	5.23	6.12	30.9
13	11.38	6.45	5.12	6.25	29.2
14	12.38	6.74	4.71	6.42	30.25
15	9.06	7.13	5.01	5.86	27.06
16	12.5	7.42	5.01	5.23	30.16
17	12.5	7.12	4.55	5.64	29.81
18	12.76	7.12	4.97	6.23	31.08
19	11.52	6.86	4.32	6.31	29.01
20	11.81	6.89	5.45	6.86	31.01
21	12.32	8.34	4.94	5.73	31.33
22	9.95	7.42	4.43	5.86	27.66
23	10.76	6.97	5.03	6.44	29.2
24	9.31	7.02	4.96	4.23	25.52
25	11.89	7.43	4.6	5.12	29.04
26	10.09	7.27	5.13	4.95	27.44
27	12.74	7.29	4.98	5.64	30.65
Rata-rata	11.62000	6.97074	4.85037	5.88889	29.33000

Tabel C.10. *Digging Time* Data 10

No	digging	swing isi	dump	swing kosong	cycle time
1	9.17	6.7	3.98	7.12	26.97
2	8.61	5.89	4.91	5.22	24.63
3	10.56	5.82	5.19	6.54	28.11
4	9.18	5.93	4.23	6.53	25.87
5	7.57	6.56	5.13	6.71	25.97
6	6.43	6.78	4.8	3.93	21.94
7	7.98	7.12	4.98	5.41	25.49
8	8.54	6.68	4.93	4.71	24.86
9	11.58	5.51	4.46	6.12	27.67
10	10.34	6.81	5.13	6.53	28.81
11	7.23	6.33	4.19	5.03	22.78
12	9.56	5.96	4.67	5.36	25.55
13	7.99	6.2	5.16	5.43	24.78
14	6.98	5.94	4.75	6.38	24.05
15	8.58	6.5	5.08	6.58	26.74
16	5.56	6.06	4.88	4.52	21.02
17	9.05	6.73	4.81	5.37	25.96
18	8.83	6.37	5.13	4.94	25.27
19	8.85	6.58	4.2	6.15	25.78
20	7.06	6.73	5.09	6.57	25.45
21	6.24	6.4	4.45	4.82	21.91
22	8.26	6.5	4.71	5.37	24.84
23	9.33	6.3	5.1	4.94	25.67
24	5.2	6.41	4.83	6.34	22.78
25	5.56	6.4	4.95	6.57	23.48
26	6.04	6.35	5.07	4.55	22.01
Rata-rata	8.087692	6.367692	4.800385	5.682308	24.938077

Tabel C.11. *Digging Time* Data 11

No	digging	swing isi	dump	swing kosong	cycle time
1	16.71	7.83	3.98	7.12	35.64
2	12.345	6.28	4.91	5.22	28.755
3	13.09	5.82	5.19	6.54	30.64
4	12.33	5.93	4.23	6.53	29.02
5	11.8	7.77	5.13	6.71	31.41
6	12.79	6.78	4.8	3.93	28.3
7	9.92	7.12	4.98	5.41	27.43
8	8.89	6.68	4.93	4.71	25.21
9	12.26	5.51	4.46	6.12	28.35
10	11.14	6.81	5.13	6.34	29.42
11	9.12	6.6	4.67	5.64	26.03
12	10.15	7.21	4.74	6.23	28.33
13	8.14	7.12	5.14	5.24	25.64
14	8.54	7.01	4.62	4.64	24.81
15	8.46	6.64	5.13	5.23	25.46
16	7.02	6.75	4.83	6.2	24.8
17	10.09	6.71	4.58	6.34	27.72
18	6.36	7.12	5.34	4.34	23.16
19	8.96	7.54	5.64	5.53	27.67
20	8.45	6.98	6.23	6.35	28.01
21	6.19	8.54	4.99	6.18	25.9
22	11.59	7.42	4.64	4.64	28.29
23	7.15	6.98	5.14	5.45	24.72
24	11.46	7.04	4.7	5.4	28.6
25	12.06	8.23	4.86	5.7	30.85
26	11.03	7.34	5.23	6.2	29.8
27	10.03	6.94	6.53	6.18	29.68
28	8.39	7.34	7.05	4.42	27.2
29	7.66	6.75	5.1	5.42	24.93
30	12.26	7.34	5.34	6.34	31.28
31	9.95	6.45	3.2	6.32	25.92
32	14.64	5.67	5.4	5.34	31.05
Rata-rata	10.28046875	6.9453125	5.02625	5.68625	27.938281



**LAMPIRAN D**  
**SURAT KETERANGAN PENELITIAN**



Nomor : 070/AMNK-KTT-E/IX/2022  
Lampiran :-

Desa Langap, 05 September 2022

Kepada Yth.  
Dekan Fakultas Teknologi Mineral  
Institut Teknologi Nasional Yogyakarta  
di : -  
Tempat

Perihal : Surat Keterangan Telah Menyelesaikan Kegiatan Kerja Praktek Lapangan

Dengan hormat,  
Dengan ini kami menerangkan bahwa Mahasiswa Institut Teknologi Nasional Yogyakarta di bawah ini :

Nama : Livy C Putri  
NIM : 710018042

Telah melakukan dan menyelesaikan kerja praktek di PT. Atha Marth Naha Kramo, Pertambangan Batubara di kabupaten Malinau, Kalimantan Utara, dari tanggal 4 juli s/d. 4 September 2022 , dengan judul penelitian : "Analisis Pengaruh Hasil Fragmentasi Terhadap Digging Time Untuk Mencapai Target Produktivitas Yang Optimal Di PT. Atha Marth Naha Kramo"

Demikian surat keterangan ini kami sampaikan untuk menjadi laporan dan dipergunakan sebagaimana mestinya.

Hormat Kami,  
PT. ATHA MARTH NAHA KRAMO

  
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