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LAMPIRAN



LAMPIRAN A

PETA LOKASI PENELITIAN





PETA DAERAH PENELITIAN BUMI PERMATA SUDIANG



Skala
1:150,000



Legend

- Titik Pengukuran Laju Infiltrasi
- Lintasan Geolistrik
- Bumi Permata Sudiang



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LAMPIRAN B

PETA GEOLOGI LOKASI PENELITIAN





PETA GEOLOGI LOKASI PENELITIAN



Skala
1:150,000



Legend

- Kontur
- Laut
- Bumi Permata Sudiang
- Formasi Tonasa (Tent)
- Formasi Salo Kalupang (Teos)
- Endapan Aluvium (Qac)
- Formasi Camba (Tmc)
- Basal dan Retas Basal (b1)



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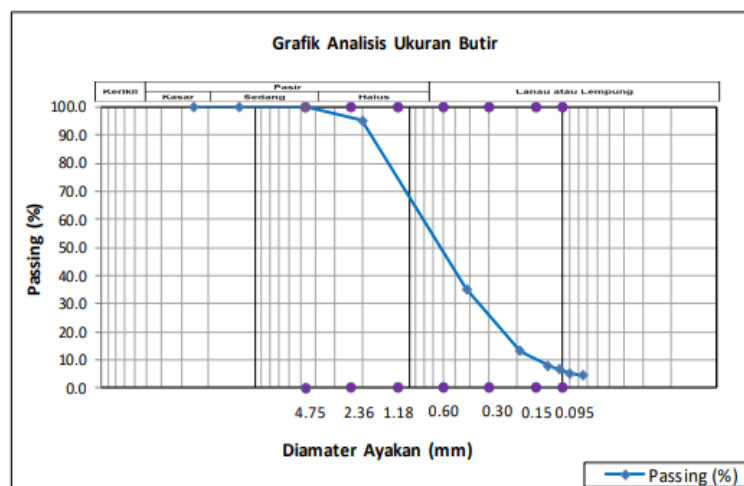
LAMPIRAN C

PERHITUNGAN DISTRIBUSI UKURAN



Titik 1

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	14.6	4.9	4.9	95.1
0.43	179.5	59.8	64.7	35.3
0.19	66.50	22.2	86.9	13.1
0.13	15.50	5.17	92.0	8.0
0.11	4.30	1.43	93.5	6.5
0.09	3.90	1.30	94.8	5.2
0.075	2.70	0.90	95.7	4.3
Pan	7.50	2.50	98.2	1.8
Total	294.50	FM	4.37	



$$D_{10} = 0.15$$

$$D_{30} = 0.36$$

$$D_{60} = 0.80$$

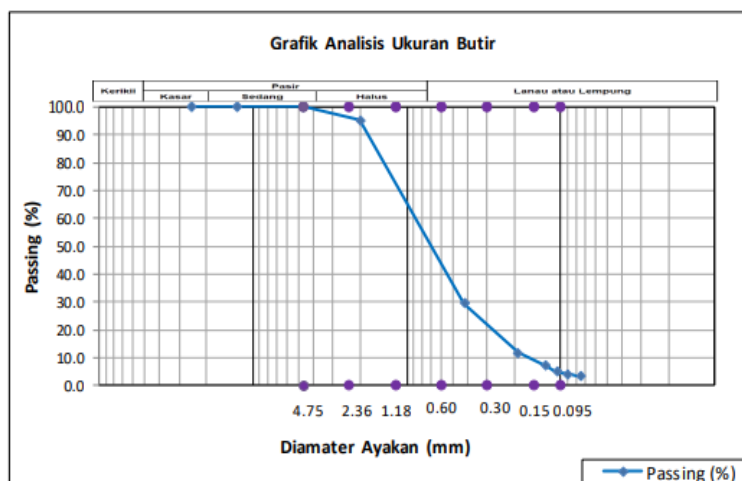
$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.80}{0.15} = 5.33$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.36)^2}{0.80 \times 0.15} = 1.08$$



Titik 2

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	14.4	4.8	4.8	95.2
0.43	197.2	65.7	70.5	29.5
0.19	53.20	17.7	88.3	11.7
0.13	14.00	4.67	92.9	7.1
0.11	5.90	1.97	94.9	5.1
0.09	3.10	1.03	95.9	4.1
0.075	1.80	0.60	96.5	3.5
Pan	1.20	0.40	96.9	3.1
Total	290.80	FM	4.47	



$$D_{10} = 0.18$$

$$D_{30} = 0.43$$

$$D_{60} = 0.90$$

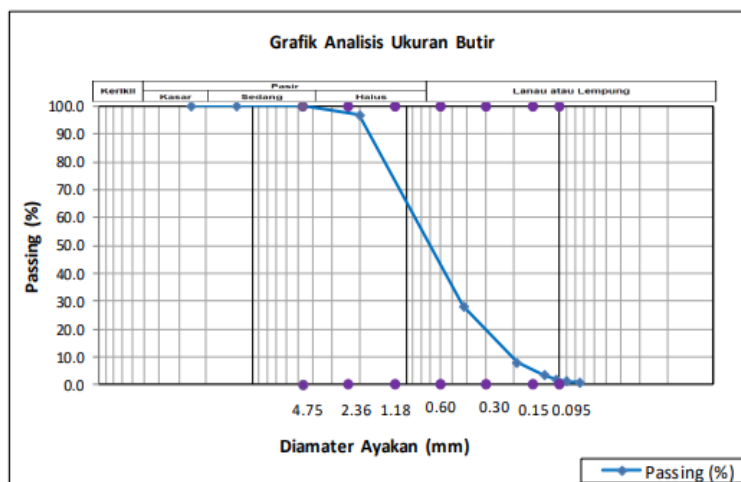
$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.90}{0.18} = 5$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.43)^2}{0.90 \times 0.18} = 1.14$$



Titik 3

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	9.6	3.2	3.2	96.8
0.43	206.0	68.7	71.9	28.1
0.19	60.50	20.2	92.0	8.0
0.13	13.50	4.50	96.5	3.5
0.11	4.20	1.40	97.9	2.1
0.09	2.70	0.90	98.8	1.2
0.075	0.70	0.23	99.1	0.9
Pan	0.60	0.20	99.3	0.7
Total	297.80	FM	4.60	



$$D_{10} = 0.20$$

$$D_{30} = 0.45$$

$$D_{60} = 0.89$$

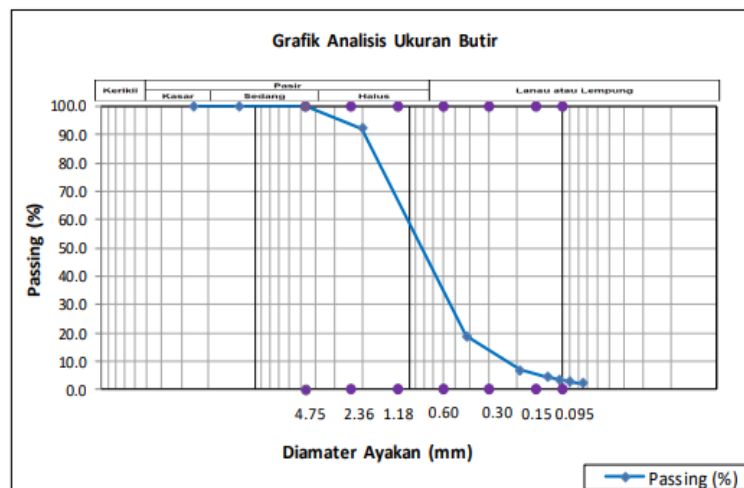
$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.89}{0.20} = 4.45$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.45)^2}{0.89 \times 0.20} = 1.14$$



Titik 4

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	23.7	7.9	7.9	92.1
0.43	220.0	73.3	81.2	18.8
0.19	35.50	11.8	93.1	6.9
0.13	7.70	2.57	95.6	4.4
0.11	2.50	0.83	96.5	3.5
0.09	2.20	0.73	97.2	2.8
0.075	1.30	0.43	97.6	2.4
Pan	4.50	1.50	99.1	0.9
Total	297.40	FM	4.72	



$$D_{10} = 0.24$$

$$D_{30} = 0.55$$

$$D_{60} = 1$$

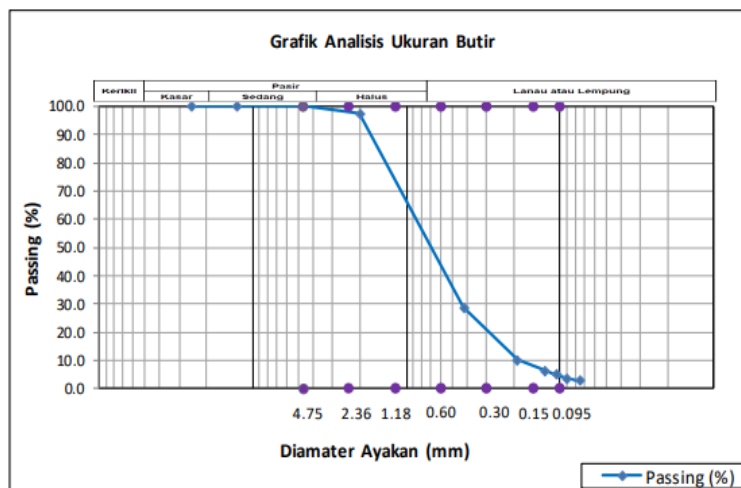
$$C_U = \frac{D_{60}}{D_{10}} = \frac{1}{0.24} = 4.17$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.55)^2}{1 \times 0.24} = 1.26$$



Titik 5

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	8.1	2.7	2.7	97.3
0.43	206.1	68.7	71.4	28.6
0.19	55.60	18.5	89.9	10.1
0.13	11.20	3.73	93.7	6.3
0.11	3.90	1.30	95.0	5.0
0.09	4.00	1.33	96.3	3.7
0.075	3.00	1.00	97.3	2.7
Pan	5.80	1.93	99.2	0.8
Total	297.70	FM	4.49	



$$D_{10} = 0.19$$

$$D_{30} = 0.45$$

$$D_{60} = 0.89$$

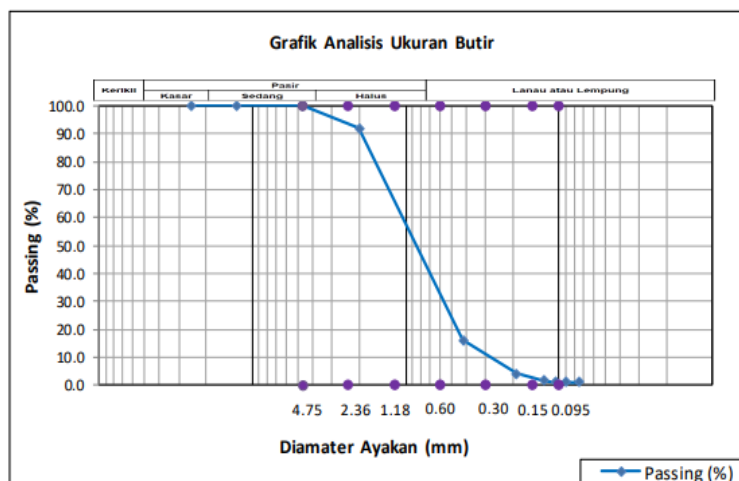
$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.89}{0.19} = 4.68$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.45)^2}{0.89 \times 0.19} = 1.20$$



Titik 6

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	24.0	8.0	8.0	92.0
0.43	227.4	75.8	83.8	16.2
0.19	36.00	12.0	95.8	4.2
0.13	7.50	2.50	98.3	1.7
0.11	1.30	0.43	98.7	1.3
0.09	0.40	0.13	98.9	1.1
0.075	0.20	0.07	98.9	1.1
Pan	0.30	0.10	99.0	1.0
Total	297.10	FM	4.84	



$$D_{10} = 0.29$$

$$D_{30} = 0.58$$

$$D_{60} = 1.10$$

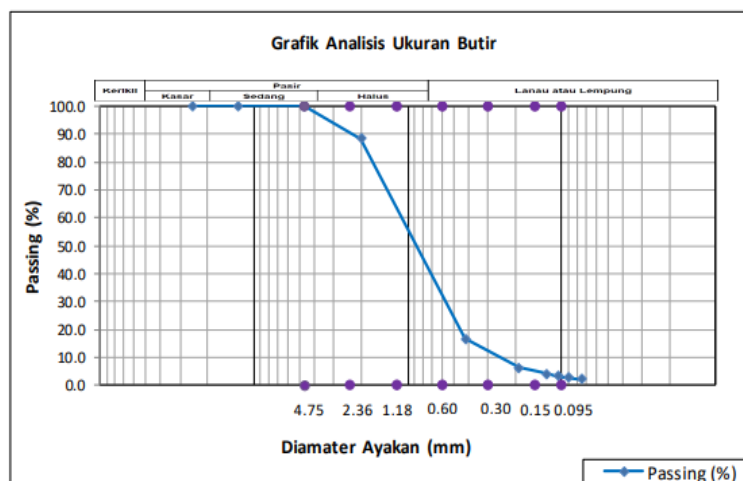
$$C_U = \frac{D_{60}}{D_{10}} = \frac{1.10}{0.29} = 3.79$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.58)^2}{1.10 \times 0.29} = 1.05$$



Titik 7

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	34.8	11.6	11.6	88.4
0.43	214.9	71.6	83.2	16.8
0.19	31.50	10.5	93.7	6.3
0.13	6.30	2.10	95.8	4.2
0.11	2.10	0.70	96.5	3.5
0.09	2.00	0.67	97.2	2.8
0.075	1.50	0.50	97.7	2.3
Pan	7.50	2.50	100.2	-0.2
Total	300.60	FM	4.78	



$$D_{10} = 0.25$$

$$D_{30} = 0.58$$

$$D_{60} = 1.20$$

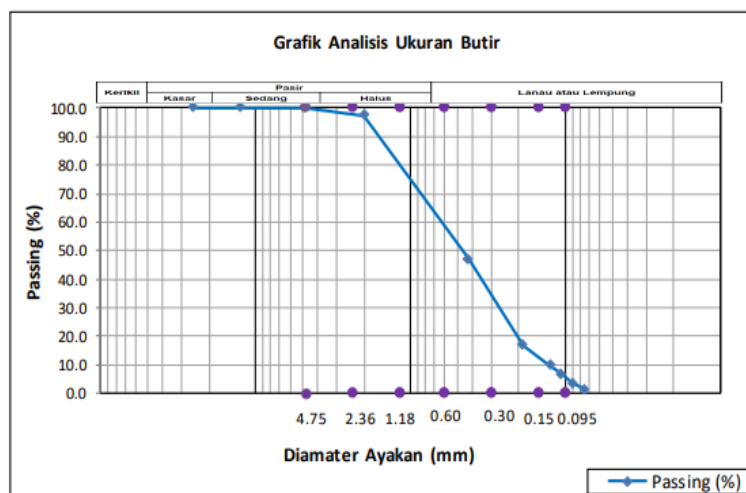
$$C_U = \frac{D_{60}}{D_{10}} = \frac{1.20}{0.25} = 4.80$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.58)^2}{1.20 \times 0.25} = 1.12$$



Titik 8

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	8.1	2.7	2.7	97.3
0.43	150.9	50.3	53.0	47.0
0.19	90.10	30.0	83.0	17.0
0.13	22.00	7.33	90.4	9.6
0.11	8.50	2.83	93.2	6.8
0.09	9.70	3.23	96.4	3.6
0.075	6.60	2.20	98.6	1.4
Pan	1.90	0.63	99.3	0.7
Total	297.80	FM	4.19	



$$D_{10} = 0.14$$

$$D_{30} = 0.27$$

$$D_{60} = 0.65$$

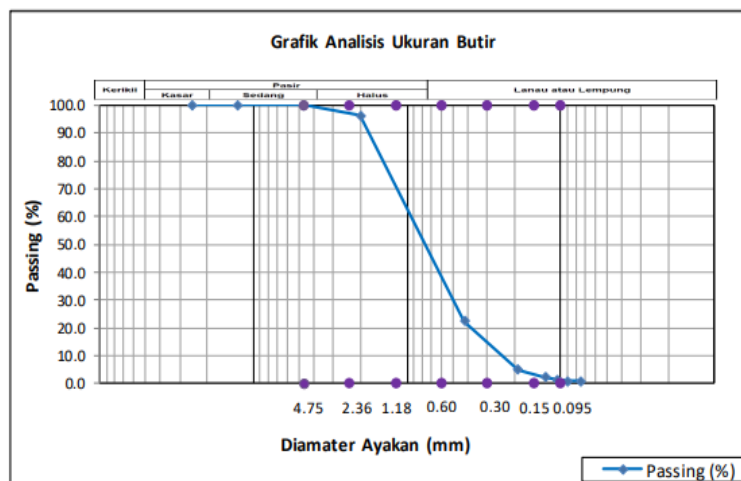
$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.65}{0.14} = 4.64$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.27)^2}{0.65 \times 0.14} = 0.80$$



Titik 9

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	11.0	3.7	3.7	96.3
0.43	221.9	74.0	77.6	22.4
0.19	52.10	17.4	95.0	5.0
0.13	8.30	2.77	97.8	2.2
0.11	2.20	0.73	98.5	1.5
0.09	1.40	0.47	99.0	1.0
0.075	0.40	0.13	99.1	0.9
Pan	0.40	0.13	99.2	0.8
Total	297.70	FM	4.72	



$$D_{10} = 0.25$$

$$D_{30} = 0.50$$

$$D_{60} = 0.95$$

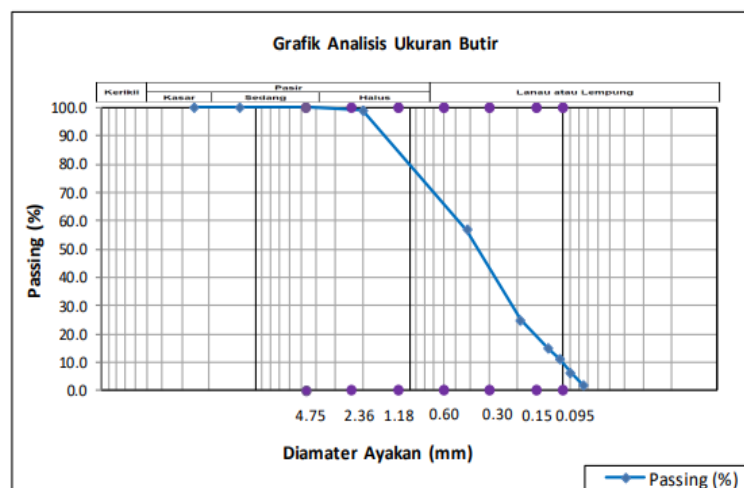
$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.95}{0.25} = 3.80$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.50)^2}{0.95 \times 0.25} = 1.05$$



Titik 10

Ukuran Ayakan (mm)	Berat Tertahan (gram)	Persen Tertahan (%)	Persen Kumulatif Tertahan (%)	Persen Total Lolos (%)
25.00	0.0	0.0	0.0	100.0
12.50	0.0	0.0	0.0	100.0
4.75	0.0	0.0	0.0	100.0
2.00	3.4	1.1	1.1	98.9
0.43	126.4	42.1	43.3	56.7
0.19	95.60	31.9	75.1	24.9
0.13	30.00	10.00	85.1	14.9
0.11	10.80	3.60	88.7	11.3
0.09	14.80	4.93	93.7	6.3
0.075	12.70	4.23	97.9	2.1
Pan	5.80	1.93	99.8	0.2
Total	299.50	FM	3.87	



$$D_{10} = 0.10$$

$$D_{30} = 0.23$$

$$D_{60} = 0.50$$

$$C_U = \frac{D_{60}}{D_{10}} = \frac{0.50}{0.10} = 5$$

$$C_c = \frac{(D_{30})^2}{D_{60} \times D_{10}} = \frac{(0.23)^2}{0.50 \times 0.10} = 1.06$$



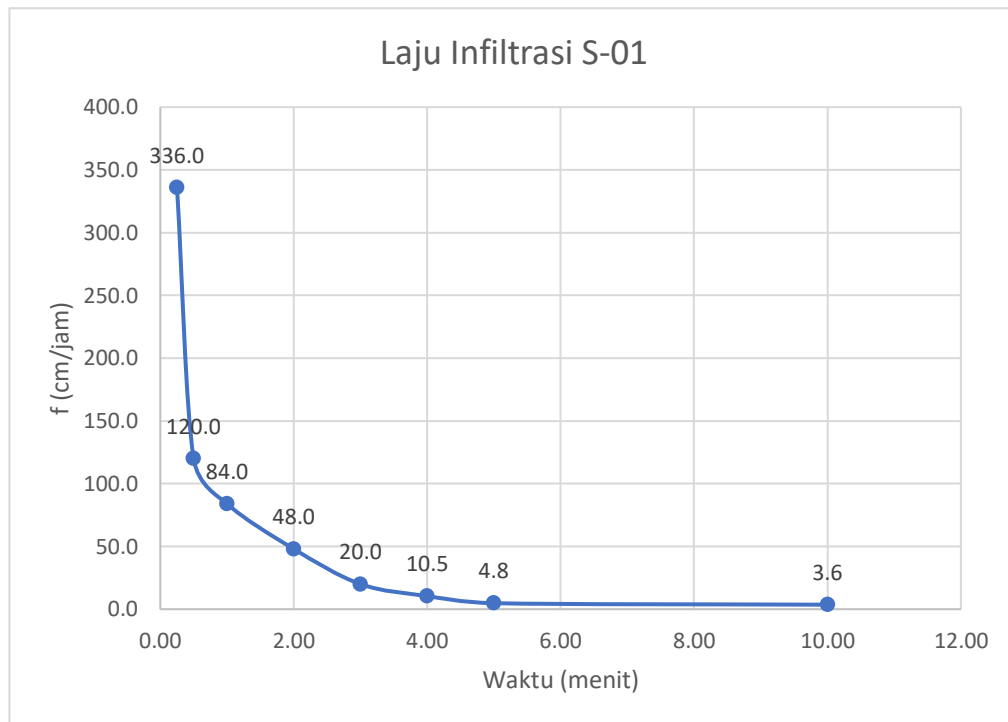
LAMPIRAN D

PENGUKURAN LAJU INFILTRASI



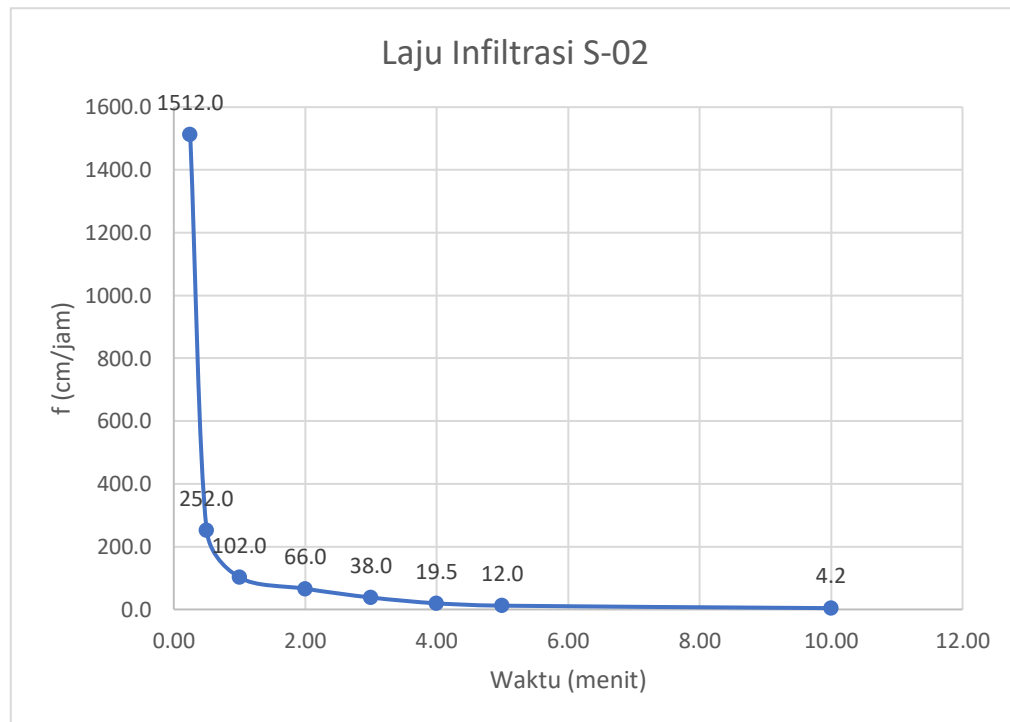
Titik 1

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	26	0	0	0	0	0	0
0.25	0.25	24.6	1.4	336.0	3.6	332.4	2.522	0.0042
0.5	0.5	23.6	1	120.0	3.6	116.4	2.066	0.0083
1	1	22.2	1.4	84.0	3.6	80.4	1.905	0.0167
2	1	20.6	1.6	48.0	3.6	44.4	1.647	0.0333
3	1	19.6	1	20.0	3.6	16.4	1.215	0.0500
4	1	18.9	0.7	10.5	3.6	6.9	0.839	0.0667
5	5	18.5	0.4	4.8	3.6	1.2	0.079	0.0833
10	5	17.9	0.6	3.6	3.6	0.0		0.1667



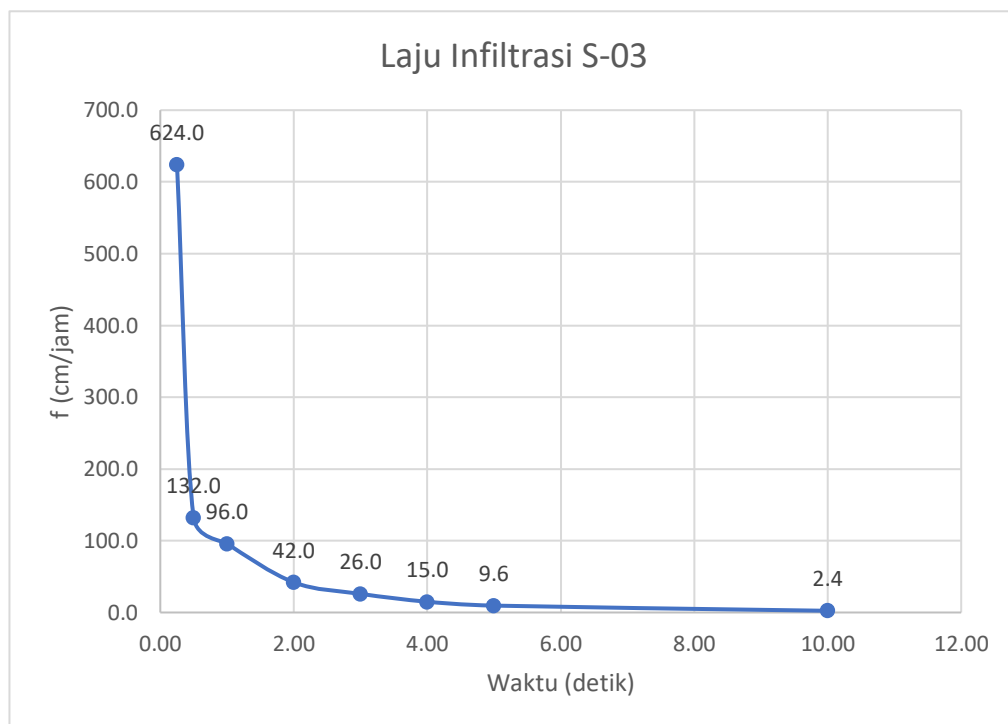
Titik 2

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	27.2	0	0	0	0	0	0
0.25	0.25	20.9	6.3	1512.0	4.2	1507.8	3.178	0.0042
0.5	0.5	18.8	2.1	252.0	4.2	247.8	2.394	0.0083
1	1	17.1	1.7	102.0	4.2	97.8	1.990	0.0167
2	1	14.9	2.2	66.0	4.2	61.8	1.791	0.0333
3	1	13	1.9	38.0	4.2	33.8	1.529	0.0500
4	1	11.7	1.3	19.5	4.2	15.3	1.185	0.0667
5	5	10.7	1	12.0	4.2	7.8	0.892	0.0833
10	5	10	0.7	4.2	4.2	0.0		0.1667



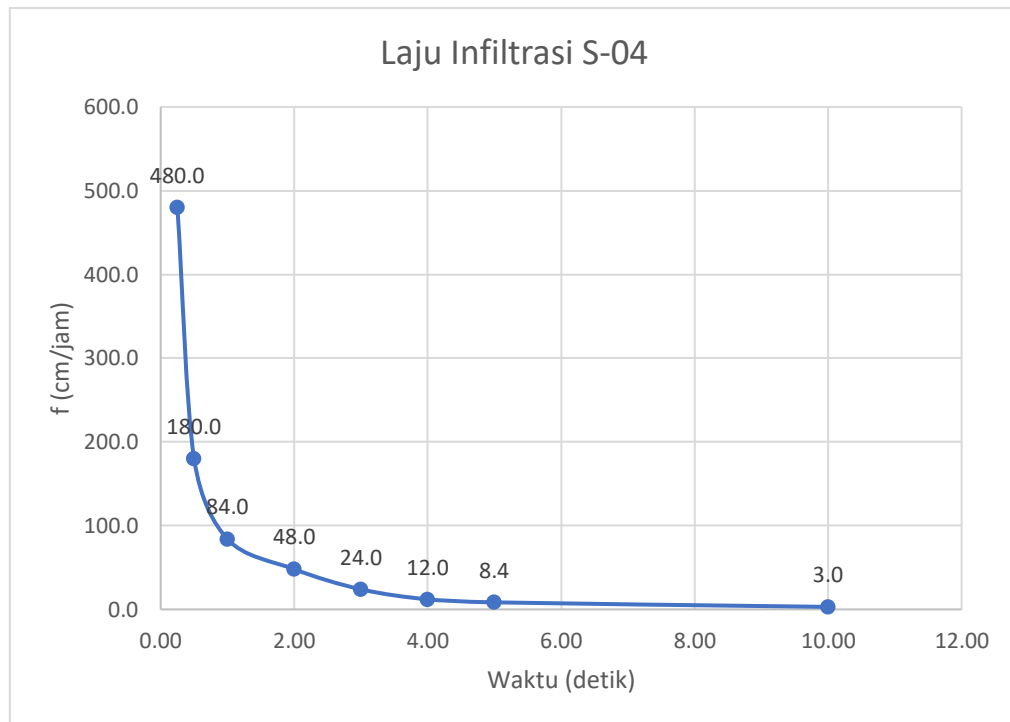
Titik 3

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	25.5	0	0	0	0	0	0
0.25	0.25	22.9	2.6	624.0	2.4	622	2.794	0.0042
0.5	0.5	21.8	1.1	132.0	2.4	130	2.113	0.0083
1	1	20.2	1.6	96.0	2.4	94	1.971	0.0167
2	1	18.8	1.4	42.0	2.4	40	1.598	0.0333
3	1	17.5	1.3	26.0	2.4	24	1.373	0.0500
4	1	16.5	1	15.0	2.4	13	1.100	0.0667
5	5	15.7	0.8	9.6	2.4	7	0.857	0.0833
10	5	15.3	0.4	2.4	2.4	0		0.1667



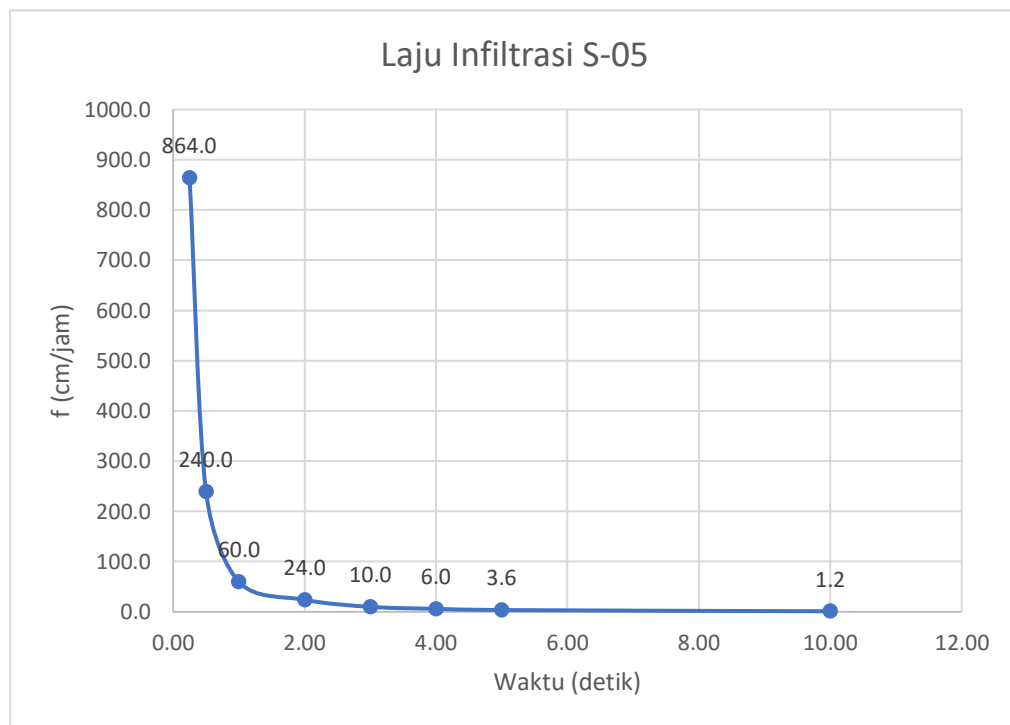
Titik 4

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	26	0	0	0	0	0	0
0.25	0.25	24	2	480.0	3.0	477	2.679	0.0042
0.5	0.5	22.5	1.5	180.0	3.0	177	2.248	0.0083
1	1	21.1	1.4	84.0	3.0	81	1.908	0.0167
2	1	19.5	1.6	48.0	3.0	45	1.653	0.0333
3	1	18.3	1.2	24.0	3.0	21	1.322	0.0500
4	1	17.5	0.8	12.0	3.0	9	0.954	0.0667
5	5	16.8	0.7	8.4	3.0	5	0.732	0.0833
10	5	16.3	0.5	3.0	3.0	0		0.1667



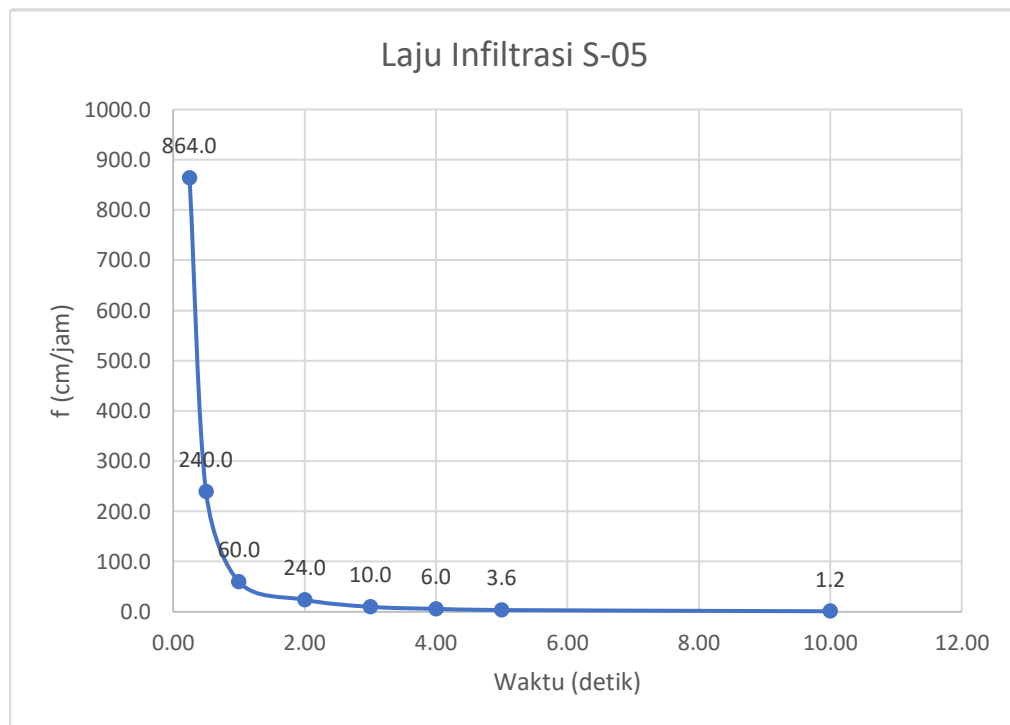
Titik 5

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	23.6	0	0	0	0	0	0
0.25	0.25	20	3.6	864.0	1.2	862.8	2.936	0.0042
0.5	0.5	18	2	240.0	1.2	238.8	2.378	0.0083
1	1	17	1	60.0	1.2	58.8	1.769	0.0167
2	1	16.2	0.8	24.0	1.2	22.8	1.358	0.0333
3	1	15.7	0.5	10.0	1.2	8.8	0.944	0.0500
4	1	15.3	0.4	6.0	1.2	4.8	0.681	0.0667
5	5	15	0.3	3.6	1.2	2.4	0.380	0.0833
10	5	14.8	0.2	1.2	1.2	0.0		0.1667



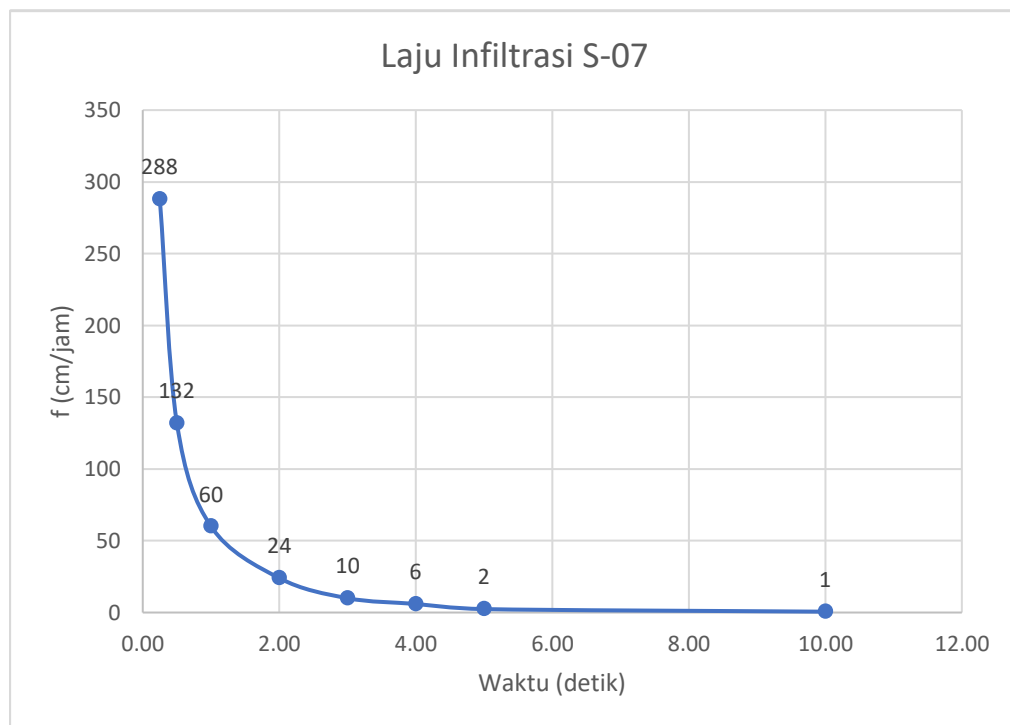
Titik 6

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	21	0	0	0	0	0	0
0.25	0.25	17.8	3.2	768	2.0	766.0	2.884	0.0042
0.5	0.5	16	1.8	216	2.0	214.0	2.330	0.0083
1	1	14.5	1.5	90	2.0	88.0	1.944	0.0167
2	1	11.7	2.8	84	2.0	82.0	1.914	0.0333
3	1	10.7	1	20	2.0	18.0	1.255	0.0500
4	1	9.8	0.9	14	2.0	11.5	1.061	0.0667
5	5	9.3	0.5	6	2.0	4.0	0.602	0.0833
10	5	9	0.3	2	2.0	-0.2		0.1667



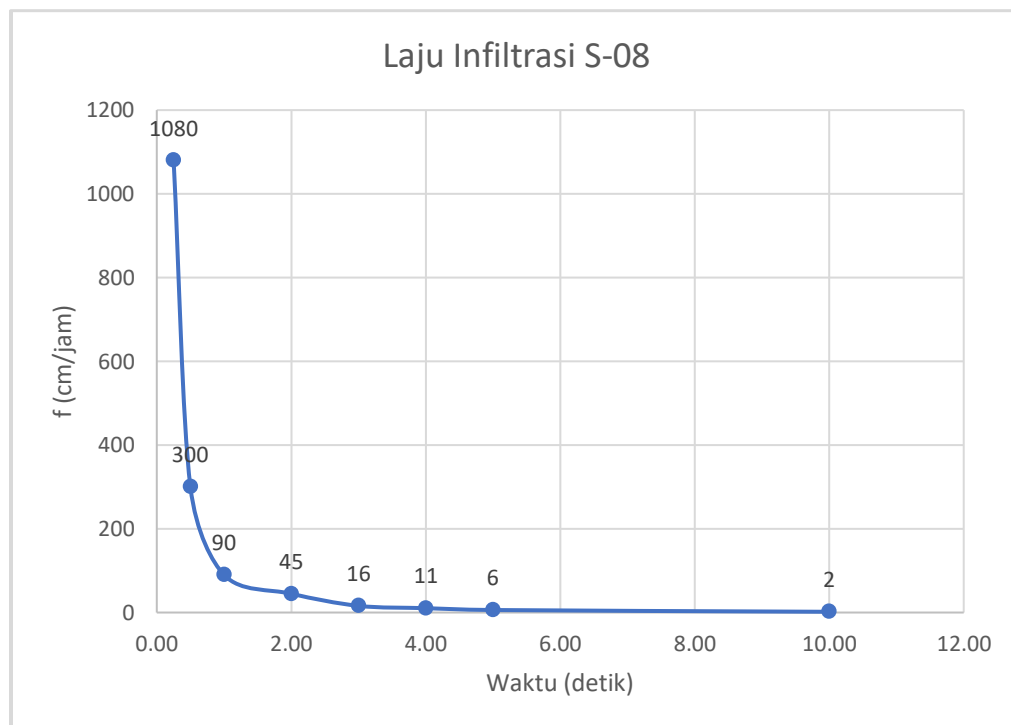
Titik 7

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	23.5	0	0	0	0	0	0
0.25	0.25	22.3	1.2	288	1.0	287.0	2.458	0.0042
0.5	0.5	21.2	1.1	132	1.0	131.0	2.117	0.0083
1	1	20.2	1	60	1.0	59.0	1.771	0.0167
2	1	19.4	0.8	24	1.0	23.0	1.362	0.0333
3	1	18.9	0.5	10	1.0	9.0	0.954	0.0500
4	1	18.5	0.4	6	1.0	5.0	0.699	0.0667
5	5	18.3	0.2	2	1.0	1.4	0.146	0.0833
10	5	18.2	0.1	1	1.0	-0.4		0.1667



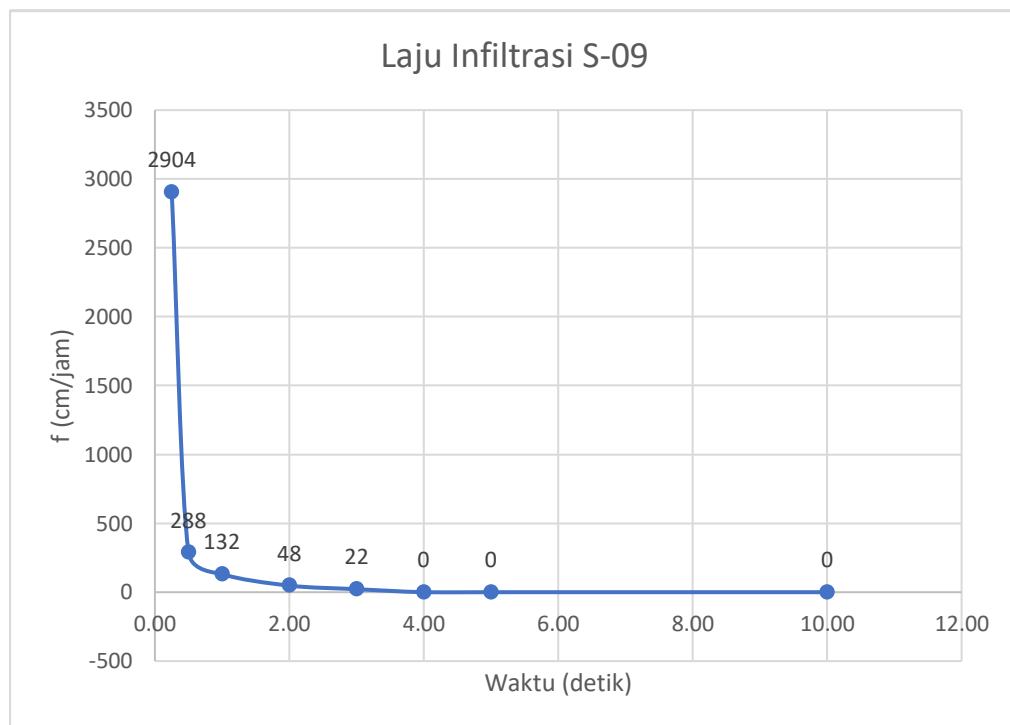
Titik 8

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	26	0	0	0	0	0	0
0.25	0.25	21.5	4.5	1080	2.0	1078.0	3.033	0.0042
0.5	0.5	19	2.5	300	2.0	298.0	2.474	0.0083
1	1	17.5	1.5	90	2.0	88.0	1.944	0.0167
2	1	16	1.5	45	2.0	43.0	1.633	0.0333
3	1	15.2	0.8	16	2.0	14.0	1.146	0.0500
4	1	14.5	0.7	11	2.0	8.5	0.929	0.0667
5	5	14	0.5	6	2.0	4.0	0.602	0.0833
10	5	13.7	0.3	2	2.0	-0.2		0.1667



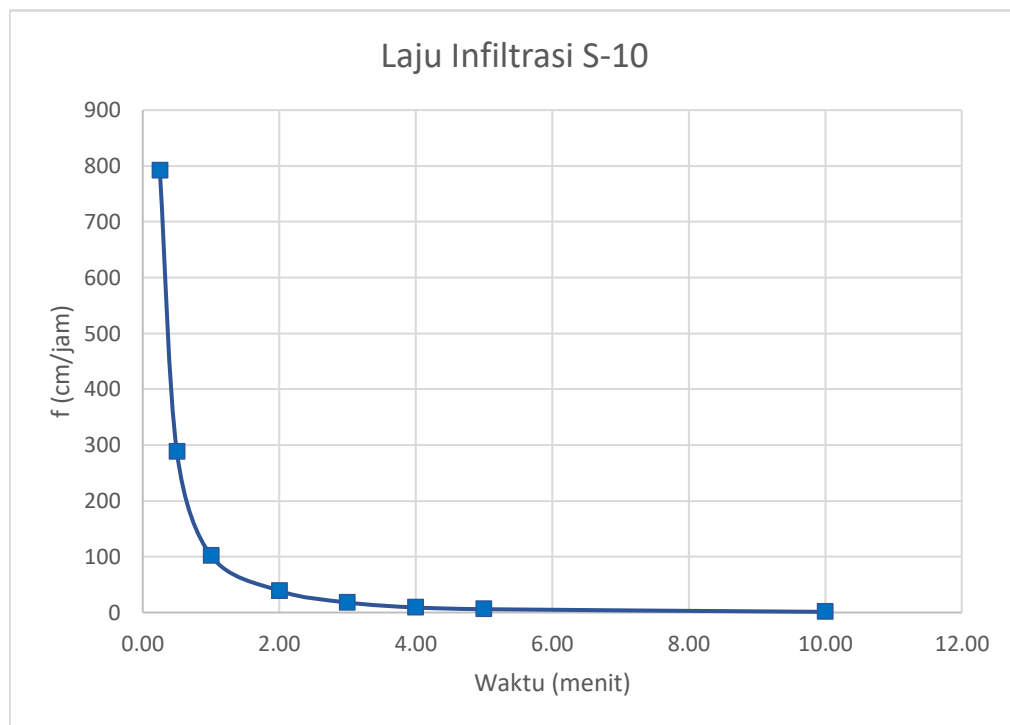
Titik 9

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	23.3	0	0	0	0	0	0
0.25	0.25	11.2	12.1	2904	22.0	2882.0	3.460	0.0042
0.5	0.5	8.8	2.4	288	22.0	266.0	2.425	0.0083
1	1	6.6	2.2	132	22.0	110.0	2.041	0.0167
2	1	5	1.6	48	22.0	26.0	1.415	0.0333
3	1	3.9	1.1	22	22.0	0.0		0.0500
4	1	-	-	-	-	-	-	-
5	5	-	-	-	-	-	-	-
10	5	-	-	-	-	-	-	-



Titik 10

Waktu (menit)	Periode (menit)	Tinggi Air (cm)	Penurunan (cm)	f (cm/jam)	fc	f-fc	log(f-fc)	T (jam)
0	0	27.7	0	0	0	0	0	0
0.25	0.25	24.4	3.3	792	1.0	791.0	2.898	0.0042
0.5	0.5	22	2.4	288	1.0	287.0	2.458	0.0083
1	1	20.3	1.7	102	1.0	101.0	2.004	0.0167
2	1	19	1.3	39	1.0	38.0	1.580	0.0333
3	1	18.1	0.9	18	1.0	17.0	1.230	0.0500
4	1	17.5	0.6	9	1.0	8.0	0.903	0.0667
5	5	17	0.5	6	1.0	5.0	0.699	0.0833
10	5	16.8	0.2	1	1.0	0.2		0.1667

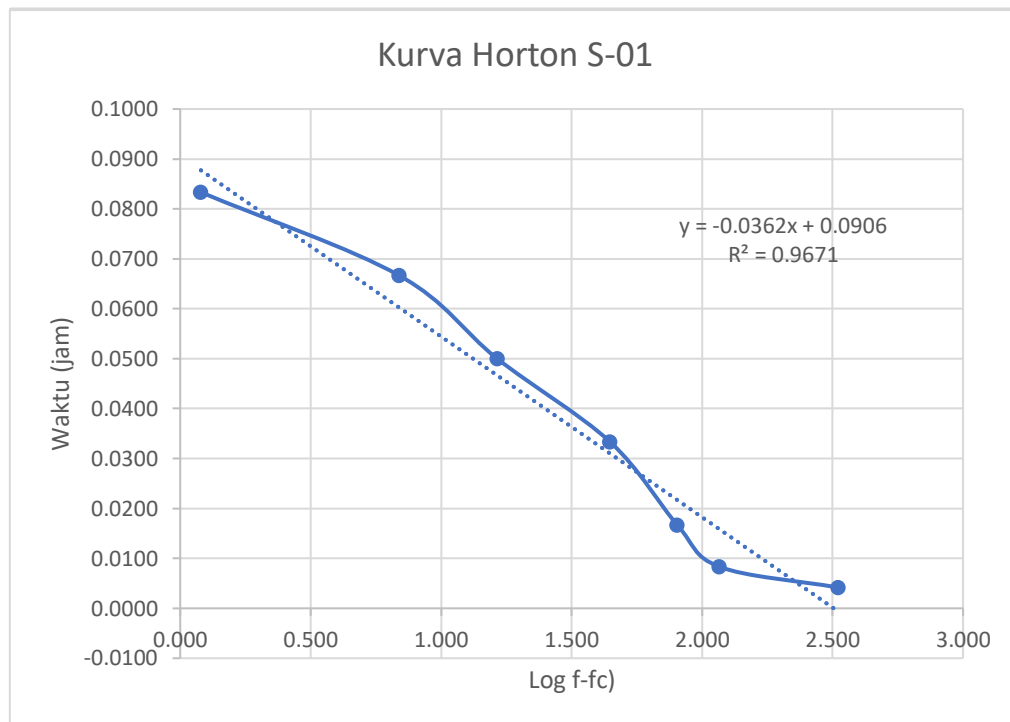


LAMPIRAN E

PERHITUNGAN LAJU INFILTRASI



Titik 1



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0362$ dan nilai konstanta jenis tanah (K) = 63.61 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 3.6 + (336 - 3.6) 2.718^{-63.61(0.1667)}$$

$$f = 3.608 \text{ cm/jam}$$

$$f = 36.08 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

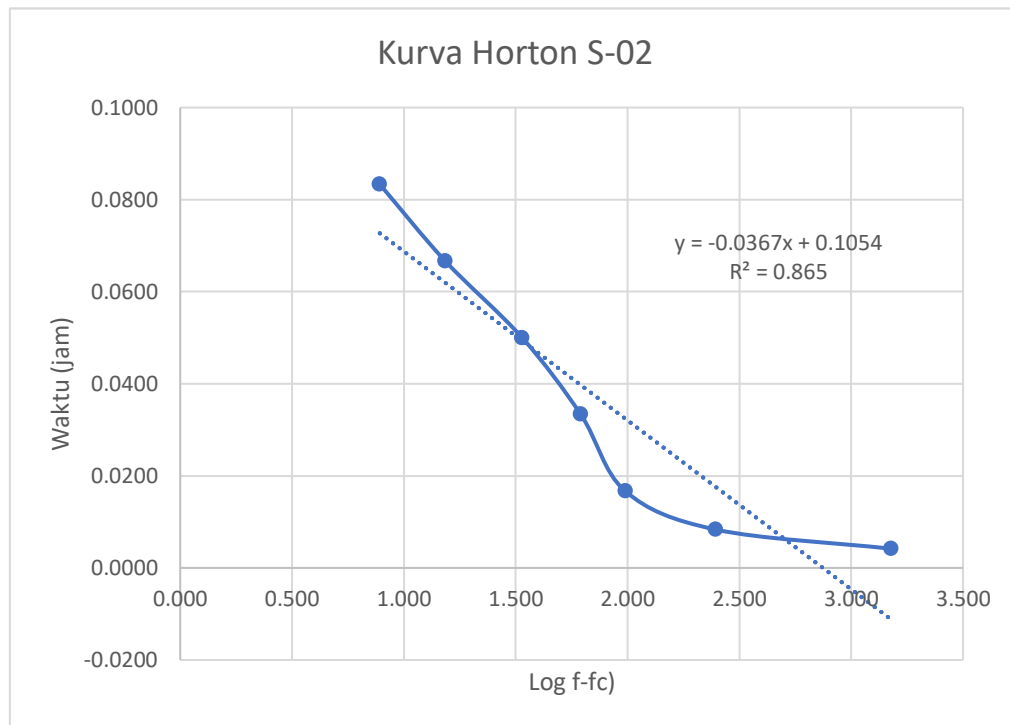
$$f(0.1667) = (3.6 \times 0.1667) + (1/63.61)(336 - 3.6)(1 - 2.718^{-63.61(0.1667)})$$

$$= 5.825 \text{ cm/jam}$$

$$= 58.25 \text{ mm/jam}$$



Titik 2



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0367$ dan nilai konstanta jenis tanah ($K = 62.75$ menggunakan rumus, $k = -1/(m \log 2.718)$).

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 4.2 + (1512 - 4.2) 2.718^{-62.75(0.1667)}$$

$$f = 4.243 \text{ cm/jam}$$

$$f = 42.43 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

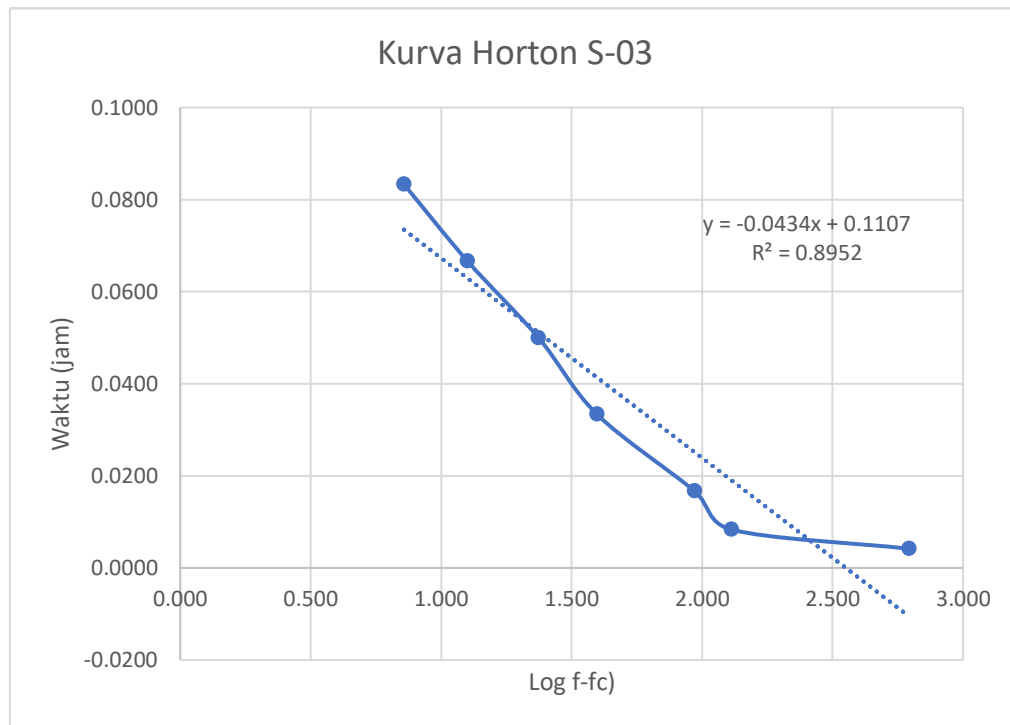
$$f(0.1667) = (4.2 \times 0.1667) + (1/62.75)(1512 - 4.2)(1 - 2.718^{-62.75(0.1667)})$$

$$= 24.729 \text{ cm/jam}$$

$$= 247.29 \text{ mm/jam}$$



Titik 3



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0434$ dan nilai konstanta jenis tanah (K) = 53.06 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 2.4 + (624 - 2.4) 2.718^{-53.06(0.1667)}$$

$$f = 2.490 \text{ cm/jam}$$

$$f = 24.90 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

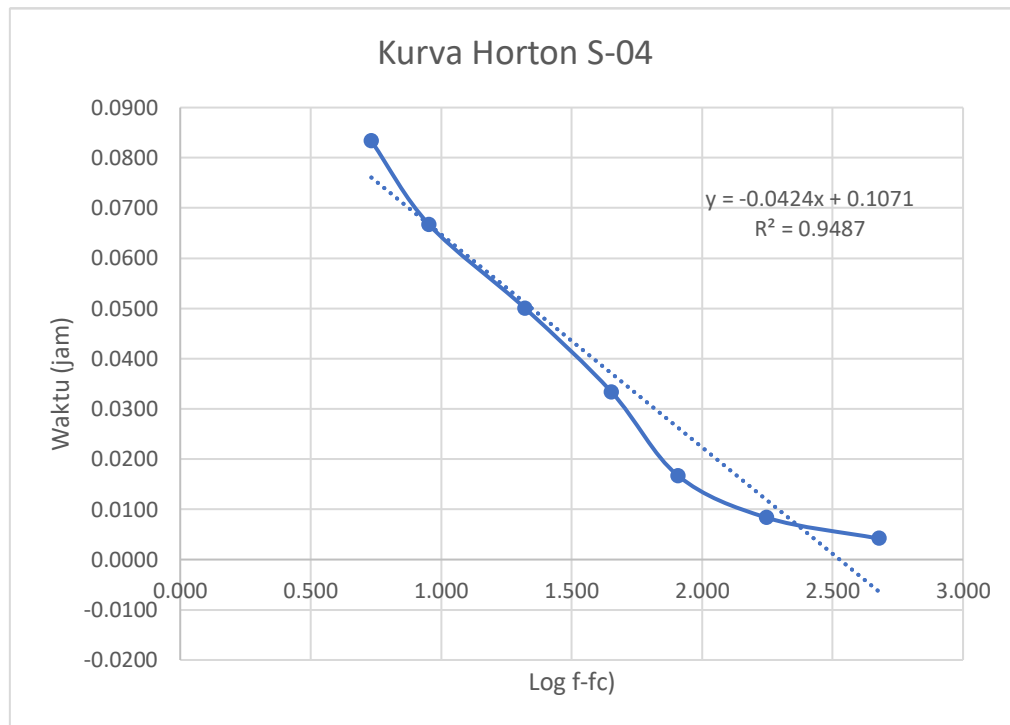
$$f(0.1667) = (2.4 \times 0.1667) + (1/53.06)(624 - 2.4)(1 - 2.718^{-53.06(0.1667)})$$

$$= 12.113 \text{ cm/jam}$$

$$= 121.13 \text{ mm/jam}$$



Titik 4



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0424$ dan nilai konstanta jenis tanah (K) = 54.31 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 3.0 + (480 - 3.0) 2.718^{-54.31(0.1667)}$$

$$f = 3.056 \text{ cm/jam}$$

$$f = 30.56 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

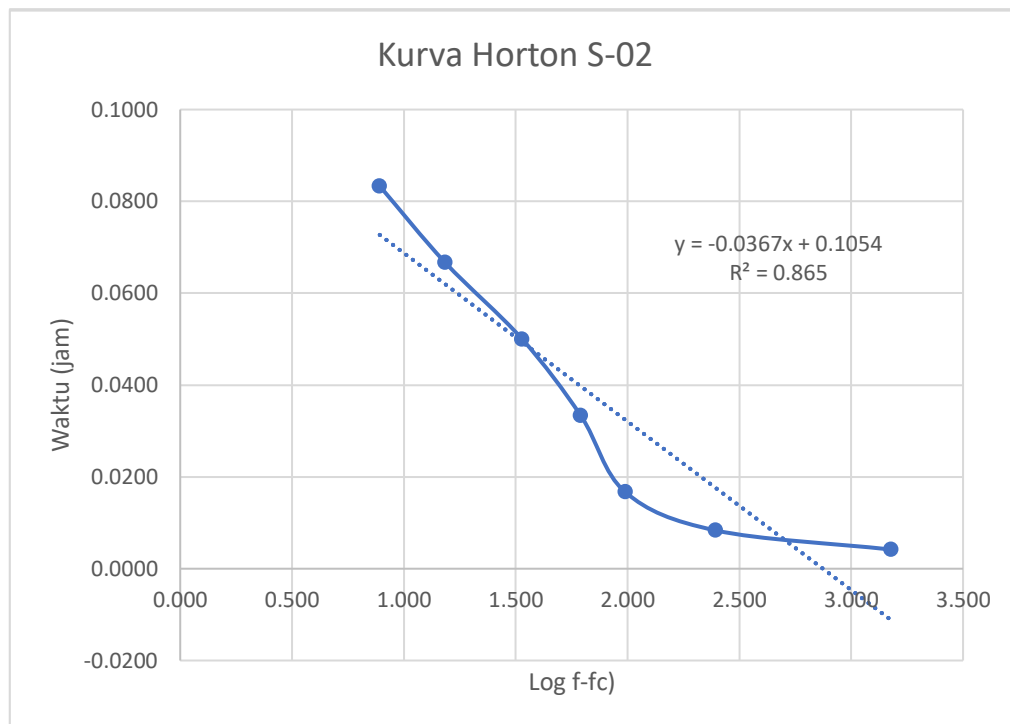
$$f(0.1667) = (3.0 \times 0.1667) + (1/54.31)(480 - 3.0)(1 - 2.718^{-54.31(0.1667)})$$

$$= 9.282 \text{ cm/jam}$$

$$= 92.82 \text{ mm/jam}$$



Titik 5



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0311$ dan nilai konstanta jenis tanah ($K = 74.05$ menggunakan rumus, $k = -1/(m \log 2.718)$).

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 1.2 + (864 - 1.2) 2.718^{-74.05(0.1667)}$$

$$f = 1.204 \text{ cm/jam}$$

$$f = 12.04 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

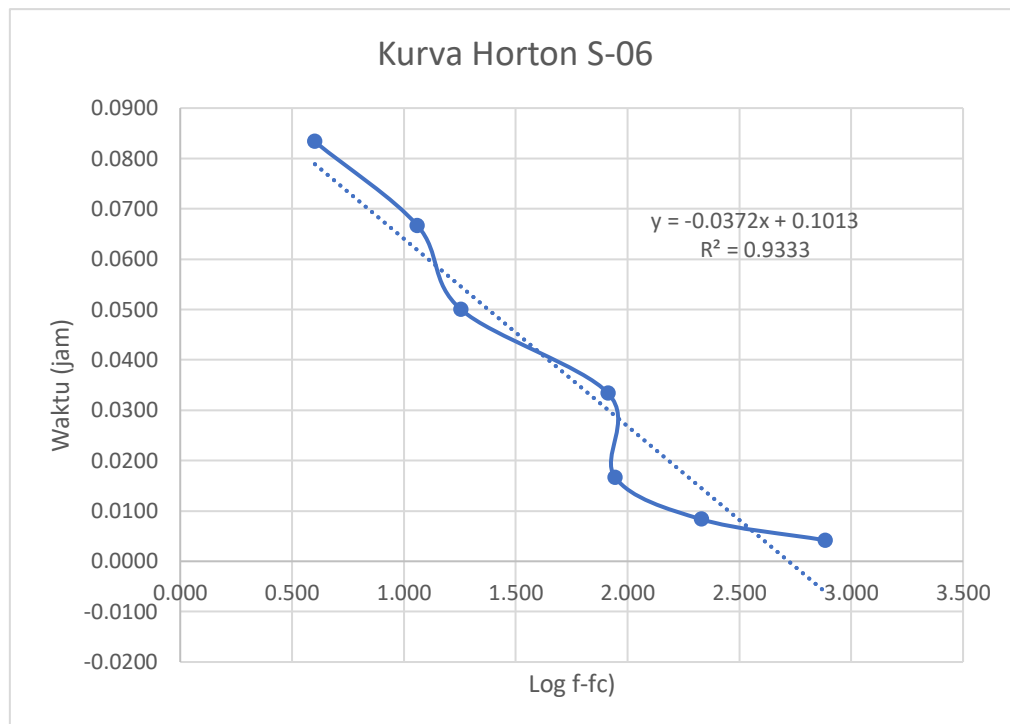
$$f(0.1667) = (1.2 \times 0.1667) + (1/74.05)(864 - 1.2)(1 - 2.718^{-74.05(0.1667)})$$

$$= 11.852 \text{ cm/jam}$$

$$= 118.52 \text{ mm/jam}$$



Titik 6



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0372$ dan nilai konstanta jenis tanah (K) = 61.90 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 2.0 + (768 - 2.0) 2.718^{-61.90(0.1667)}$$

$$f = 2.025 \text{ cm/jam}$$

$$f = 20.25 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

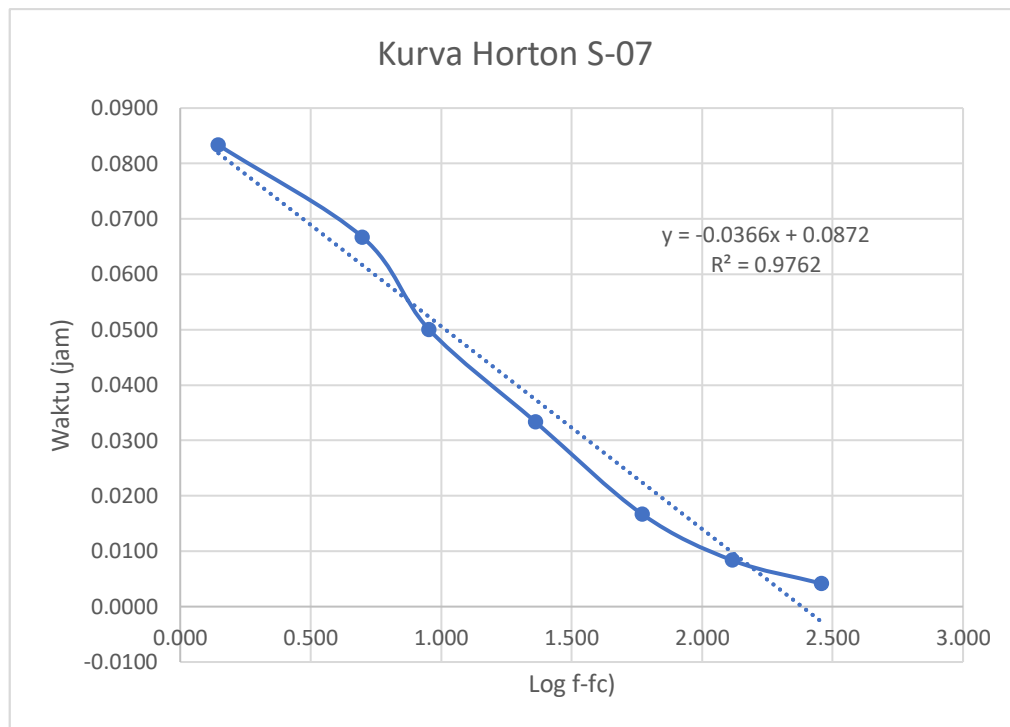
$$f(0.1667) = (2.0 \times 0.1667) + (1/61.90)(768 - 2.0)(1 - 2.718^{-61.90(0.1667)})$$

$$= 12.707 \text{ cm/jam}$$

$$= 127.07 \text{ mm/jam}$$



Titik 7



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0366$ dan nilai konstanta jenis tanah (K) = 62.92 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 1.0 + (288 - 1.0) 2.718^{-62.92(0.1667)}$$

$$f = 1.008 \text{ cm/jam}$$

$$f = 10.08 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

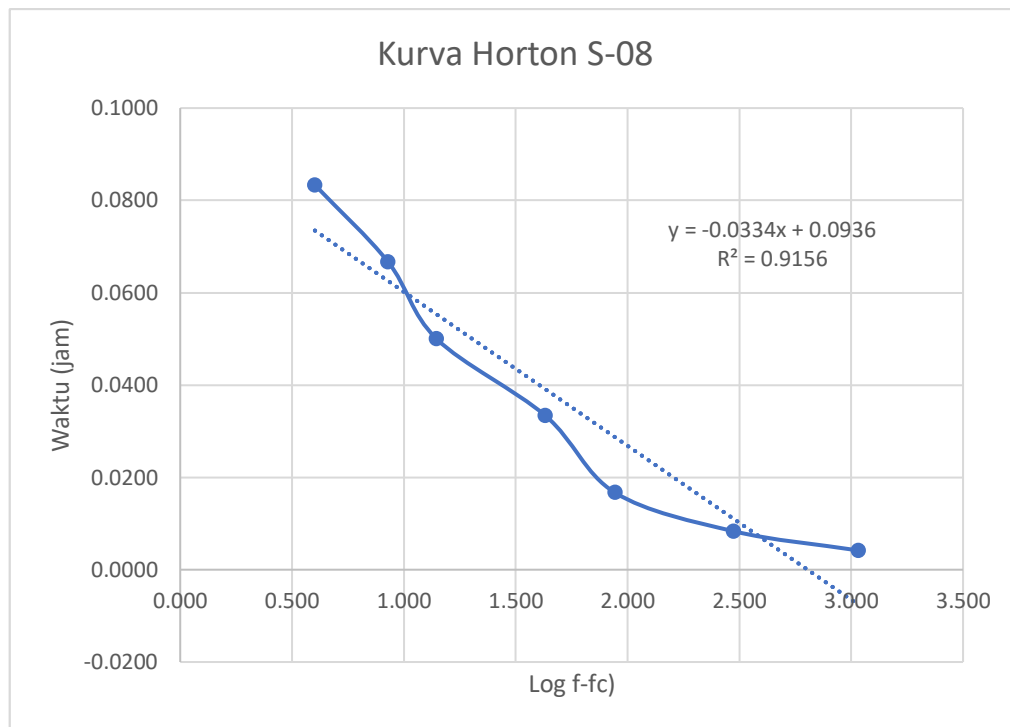
$$f(0.1667) = (1.0 \times 0.1667) + (1/62.92)(288 - 1.0)(1 - 2.718^{-62.92(0.1667)})$$

$$= 4.728 \text{ cm/jam}$$

$$= 47.28 \text{ mm/jam}$$



Titik 8



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0334$ dan nilai konstanta jenis tanah (K) = 68.95 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 2.0 + (1080 - 2.0) 2.718^{-68.95(0.1667)}$$

$$f = 2.011 \text{ cm/jam}$$

$$f = 20.11 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

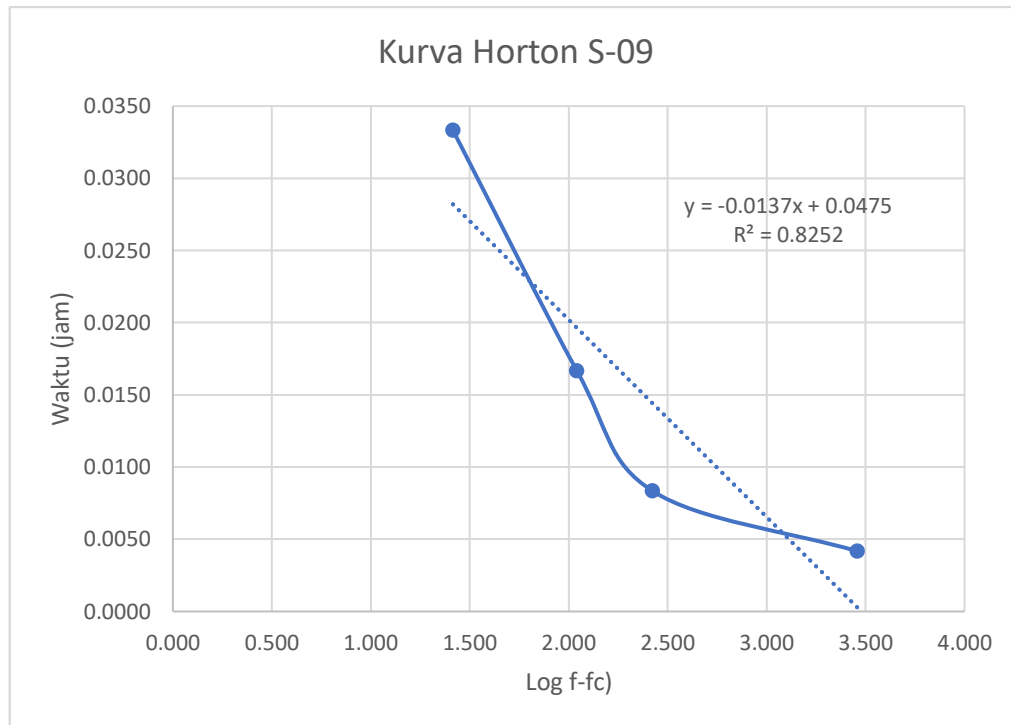
$$f(0.1667) = (2.0 \times 0.1667) + (1/68.95)(1080 - 2.0)(1 - 2.718^{-68.95(0.1667)})$$

$$= 15.968 \text{ cm/jam}$$

$$= 159.68 \text{ mm/jam}$$



Titik 9



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.0137$ dan nilai konstanta jenis tanah (K) = 168.09 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 22.0 + (2904 - 22.0) 2.718^{-168.09(0.05)}$$

$$f = 22.646 \text{ cm/jam}$$

$$f = 226.46 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

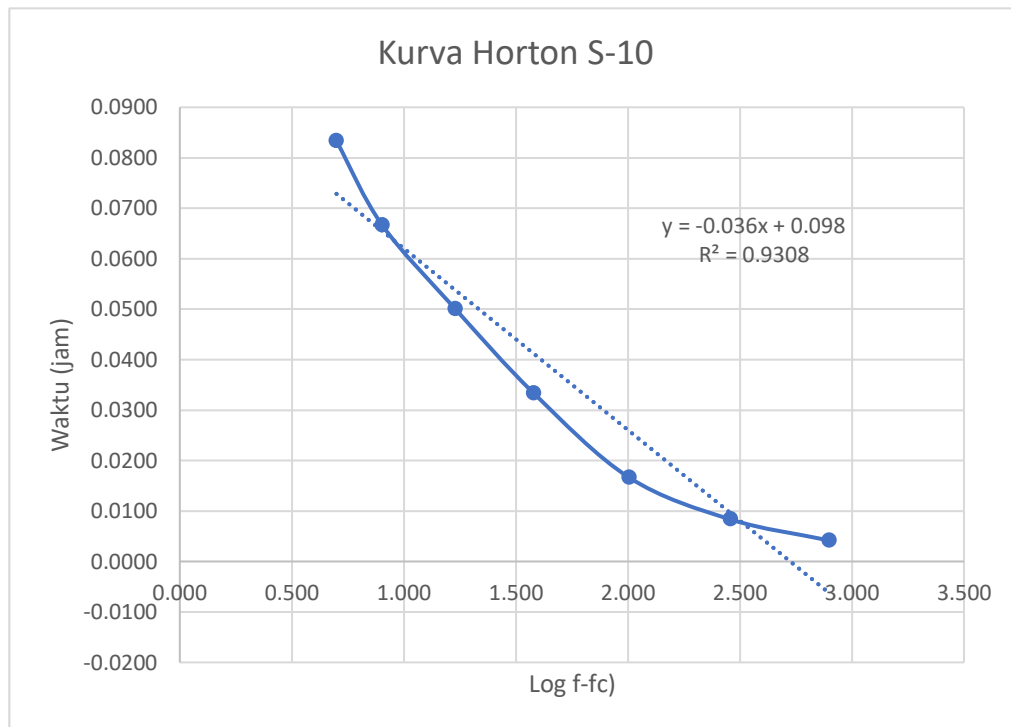
$$f(0.05) = (22.0 \times 0.05) + (1/168.09)(2904 - 22.0)(1 - 2.718^{-168.09(0.05)})$$

$$= 18.242 \text{ cm/jam}$$

$$= 182.42 \text{ mm/jam}$$



Titik 10



Berdasarkan persamaan linier diatas, maka didapatkan gradien, $m = -0.036$ dan nilai konstanta jenis tanah (K) = 63.97 menggunakan rumus, $k = -1/(m \log 2.718)$.

- Perhitungan laju infiltrasi pada saat waktu konstan

$$f = f_c + (f_0 - f_c) e^{-Kt}$$

$$f = 1.0 + (792 - 1.0) 2.718^{-63.97(0.1667)}$$

$$f = 1.019 \text{ cm/jam}$$

$$f = 10.19 \text{ mm/jam}$$

- Perhitungan volume infiltrasi

$$f(t) = f_c.t + 1/K (f_0 - f_c)(1 - e^{-Kt})$$

$$f(0.1667) = (1.0 \times 0.1667) + (1/63.97)(792 - 1.0)(1 - 2.718^{-63.97(0.1667)})$$

$$= 12.532 \text{ cm/jam}$$

$$= 125.32 \text{ mm/jam}$$



LAMPIRAN F

PERHITUNGAN CURAH HUJAN



Tahun/Bulan	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agu	Sep	Okt	Nov	Des	Curah Hujan Maksimal
2013	982	418	336	270	137	275	94	1	2	24	203	675	982
2014	836	313	311	282	105	134	30	6	-	-	117	673	836
2015	962	355	306	204	9	55	-	-	-	-	148	619	962
2016	384	724	221	119	44	47	13	0	79	425	149	545	724
2017	735	405	448	225	75	196	23	52	68	91	459	955	955
2018	787	714	574	167	32	121	49	1	1	12	156	858	858
2019	642	239	445	354	60	61	2	0	0	0	78	281	642
2020	572	539	264	100	186	73	9	16	23	54	249	924	924
2021	1195	434	680	430	65	75	43	64	115	108	328	964	1195

Pada nilai curah hujan maksimal, diambil curah hujan yang paling tinggi pada tiap-tiap tahun.



Tahun	Xi	X	Xi-X	(Xi-X) ²	(Xi-X) ³	(Xi-X) ⁴
2013	982	884.3	97.7	9545.3	932574.8	91112561.2
2014	836	884.3	-48.3	2332.9	-112678.6	5442375.8
2015	962	884.3	77.7	6037.3	469097.4	36448870.5
2016	724	884.3	-160.3	25696.1	-4119083.2	660289041.3
2017	955	884.3	70.7	4998.5	353393.2	24984902.3
2018	858	884.3	-26.3	691.7	-18191.4	478435.1
2019	642	884.3	-242.3	58709.3	-14225261.0	3446780732.3
2020	924	884.3	39.7	1576.1	62570.8	2484059.7
2021	1195	884.3	310.7	96534.5	29993266.0	9318907759.6
2022	765	884.3	-119.3	14232.5	-1697936.1	202563771.6

Perhitungan rata-rata (X) =

$$= \frac{\sum X_i}{n} = \frac{8843}{10} = 884.3$$

Perhitungan standar deviasi (S) (dalam excel) = SQRT ($\sum (X_i - X)^2 / 29$)

$$= \text{SQRT} (220354.1 / 29)$$

$$= 87.2$$

Hujan rencana tahun metode GUMBELL

Tahun	Yn	Sn	Yt	K	S	X	Xt
2	0.5	0.9	0.4	-0.1	87.2	884.3	872.5
5	0.5	0.9	1.5	1.1	87.2	884.3	976.5
10	0.5	0.9	2.3	1.8	87.2	884.3	1045.4
50	0.5	0.9	3.9	3.6	87.2	884.3	1197.0
100	0.5	0.9	4.6	4.3	87.2	884.3	1261.1

Perhitungan nilai K =

- Tahun 2 = $(0.4 - 0.5) / 0.9 = -0.1$

- Tahun 5 = $(1.5 - 0.5) / 0.9 = 1.1$

- Tahun 10 = $(2.3 - 0.5) / 0.9 = 1.8$

- Tahun 50 = $(3.9 - 0.5) / 0.9 = 3.6$

- Tahun 100 = $(4.6 - 0.5) / 0.9 = 4.3$



Perhitungan nilai curah hujan (X_t) =

- Tahun 2 = $884.3 + (-0.1 \times 87.2) = 872.5$
- Tahun 5 = $884.3 + (1.1 \times 87.2) = 976.5$
- Tahun 10 = $884.3 + (1.8 \times 87.2) = 1045.4$
- Tahun 50 = $884.3 + (3.6 \times 87.2) = 1197$
- Tahun 100 = $884.3 + (4.3 \times 87.2) = 1261.1$



LAMPIRAN G

DATA PENGUKURAN GEOLISTRIK



Titik 1

Koordinat : (-5.075614, 119.523908) Lokasi : Bumi Permata Sudiang

Arah lintasan : N 314° E

Tanggal : 12 September 2023

NO	MN/2 (m)	AB/2 (m)	K	V1 mVolt	V2 mVolt	V rata- rata mVolt	I1 mA	I2 mA	I Rata- rata mA	ρ_a ohm-m
1	0.5	1.5	6.286	364.8	355.0	359.9	98.4	98.3	98.4	23.00
2	0.5	2.5	18.857	195.9	284.7	240.3	87.9	87.6	87.8	51.64
3	0.5	4	49.500	66.9	67.7	67.3	101.4	101.3	101.4	32.87
4	0.5	6	112.357	7.8	7.1	7.5	84.8	85.9	85.4	9.81
5	0.5	8	200.357	1.3	2.2	1.8	95.8	95.5	95.7	3.67
6	2.5	8	36.300	38.9	38.8	38.9	95.3	95.5	95.4	14.78
7	2.5	10	58.929	14.9	15.9	15.4	102.8	102.8	102.8	8.83
8	2.5	15	137.500	3.5	2.7	3.1	81.2	80.0	80.6	5.29
9	2.5	20	247.500	0.9	0.6	0.8	95.4	95.0	95.2	1.95
10	2.5	30	561.786	0.2	0.7	0.5	78.5	79.9	79.2	3.19
11	10	30	125.714	1.0	1.8	1.4	74.2	74.5	74.4	2.37
12	10	40	235.714	0.2	0.3	0.3	103.2	103.2	103.2	0.57
13	10	50	377.143	1.4	0.1	0.8	106.4	106.4	106.4	2.66
14	10	60	550.000	0.2	0.1	0.2	108.3	107.3	107.8	0.77
15	10	75	868.214	0.8	0.3	0.6	108.5	108.5	108.5	4.40
		75	314.286	0.5	0.7	0.6	108.5	108.5	108.5	1.74
		100	589.286	0.9	0.1	0.5	109.4	109.3	109.4	2.69
		150	1375.000							
		200	2475.000							



Titik 2

Koordinat : (-5.081235, 119.530381) Lokasi : Bumi Permata Sudiang

Arah lintasan : N 269° E

Tanggal : 12 September 2023

NO	MN/2 (m)	AB/2 (m)	K	V1 mVolt	V2 mVolt	V rata- rata mVolt	I1 mA	I2 mA	I Rata- rata mA	ρ_a ohm-m
1	0.5	1.5	6.286	127.2	1,168.0	1,167.0	105.8	100.1	100.0	73.35
2	0.5	2.5	18.857	151.2	168.5	159.9	102.8	102.5	102.7	29.36
3	0.5	4	49.500	41.3	47.8	44.6	103.5	104.6	104.1	21.19
4	0.5	6	112.357	9.8	13.8	11.8	98.0	97.8	97.9	13.54
5	0.5	8	200.357	3.5	6.8	5.2	105.9	105.7	105.8	9.75
6	2.5	8	36.300	54.0	56.7	55.4	105.9	105.8	105.9	18.98
7	2.5	10	58.929	28.1	30.6	29.4	105.4	104.7	105.1	16.46
8	2.5	15	137.500	9.2	12.0	10.6	105.6	105.3	105.5	13.82
9	2.5	20	247.500	4.8	6.0	5.4	104.7	104.6	104.7	12.77
10	2.5	30	561.786	2.0	1.3	1.7	105.5	105.1	105.3	8.80
11	10	30	125.714	10.3	12.7	11.5	105.3	105.4	105.4	13.72
12	10	40	235.714	5.3	4.6	5.0	106.8	106.7	106.8	10.93
13	10	50	377.143	2.3	1.9	2.1	102.6	102.6	102.6	7.72
14	10	60	550.000	2.2	0.5	1.4	101.0	100.9	101.0	7.36
15	10	75	868.214	2.6	0.3	1.5	105.9	105.7	105.8	11.90
		75	314.286	1.1	1.9	1.5	105.8	105.7	105.8	4.46
		100	589.286	1.8	0.2	1.0	107.8	107.8	107.8	5.47
		150	1375.000							
		200	2475.000							



LAMPIRAN H

KARTU KONSULTASI TUGAS AKHIR

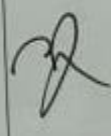


Lampiran B 10

Kartu Konsultasi Tugas Akhir

JUDUL: Analisis Laju Infiltrasi untuk Rancangan Sumur
Perapian di Daerah Bumi Permata Sudiang

(Konsultasi minimal 8 kali)

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
13/03/2024	- JUDUL - PETA LOKASI - DATA AYAKAN - PETA GEOLOGI - BAB IV (PENGOLAHAN DATA PADA GEOLINTAH DAN GEOSTUDIO)	
22/03/2024	- DATA AYAKAN (GRAFIK) - PETA GEOLOGI - PEMODELAN GEOSTUDIO	
28/03/2024	- BAGIAN ALIR - PETA GEOLOGI - PEMODELAN GEOSTUDIO	
29/03/2024	- ARTIKEL - POSTER	
30/03/2024	- ARTIKEL	
26/04/2024	- TYPD - BAGIAN ALIR - PETA GEOLOGI - TABEL - BAB 4 PEMBAHASAN - PEMODELAN BAGIAN GEOSTUDIO - LAMPIRAN	



TANGGAL	MATERI KONSULTASI	PARAF DOSEN
19/06/2024	- Kesimpulan - Peta Geologi - Pemodelan - Artikel	 
25/06/2024	- Grafik Perubahan Elevasi MAT - Judul - Artikel - Artikel - Artikel	 

