

## LAMPIRAN

### Lampiran 1. Perhitungan Berat Jenis

Tabel 1 Kalibrasi piknometer

No	Uraian	Kadar Semen			
		0%		10%	
		1	2	1	2
1	Berat Piknometer Kosong ( $W_p$ )	23.08	24.95	25.33	26.86
2	Berat Piknometer + Air ( $W_{pw,c}$ )	73.41	75.55	75.48	77.33
3	Temperatur dalam piknometer (T)	29.1	29.1	29.5	29.5
4	Berat Volume air ( $P_{w,c}$ )	1.00	1.00	1.00	1.00
5	Volume Piknometer ( $V_p$ )	50.54	50.81	50.36	50.68

Tabel 2 Perhitungan berat jenis

No	Uraian	Kadar semen 0%		Kadar semen 10%	
		1	2	1	2
		1	Berat Piknometer Kosong ( $W_p$ )	23.08	24.95
2	Berat Piknometer + tanah kering ( $W_{ps}$ )	33.09	34.96	35.35	36.88
3	Berat Piknometer + tanah + air ( $W_{pws,t}$ )	79.57	81.67	81.83	83.71
4	Berat Piknometer + Air ( $W_{pw,t}$ )	73.41	75.54	75.49	77.34
5	Temperatur (T)	29.4	29.5	28.8	28.8
6	Berat Jenis ( $G_{s,t}$ )	2.60	2.58	2.72	2.74
7	Berat Jenis pada $T=20^\circ\text{C}$ ( $G_s$ )	2.60	2.57	2.72	2.74
8	Berat Jenis Rata-rata ( $G_s$ )	2.58		2.73	

Tabel 3 Data lain

Temperatur saat pengujian ( $T_p$ )	28.8	28.8
Berat volume dalam $T_p$ ( $P_{w,c}$ )	0.99601	0.99601
Koefisien Temperatur (K)	0.9978	0.9978

Tabel 4 Rapat massa air terhadap temperatur dan koefisien temperatur (K)

T (°C)	$\rho_w$ (g/mL)	K	T (°C)	$\rho_w$ (g/mL)	K	T (°C)	$\rho_w$ (g/mL)	K	T (°C)	$\rho_w$ (g/mL)	K
15.0	0.99910	1.00090	16.0	0.99895	1.00074	17.0	0.99878	1.00057	18.0	0.99860	1.00039
.1	0.99909	1.00088	.1	0.99893	1.00072	.1	0.99876	1.00055	.1	0.99858	1.00037
.2	0.99907	1.00087	.2	0.99891	1.00071	.2	0.99874	1.00054	.2	0.99856	1.00035
.3	0.99906	1.00085	.3	0.99890	1.00069	.3	0.99872	1.00052	.3	0.99854	1.00034
.4	0.99904	1.00084	.4	0.99888	1.00067	.4	0.99871	1.00050	.4	0.99852	1.00032
.5	0.99902	1.00082	.5	0.99886	1.00066	.5	0.99869	1.00048	.5	0.99850	1.00030
.6	0.99901	1.00080	.6	0.99885	1.00064	.6	0.99867	1.00047	.6	0.99848	1.00028
.7	0.99899	1.00079	.7	0.99883	1.00062	.7	0.99865	1.00045	.7	0.99847	1.00026
.8	0.99898	1.00077	.8	0.99881	1.00061	.8	0.99863	1.00043	.8	0.99845	1.00024
.9	0.99896	1.00076	.9	0.99879	1.00059	.9	0.99862	1.00041	.9	0.99843	1.00022
19.0	0.99841	1.00020	20.0	0.99821	1.00000	21.0	0.99799	0.99979	22.0	0.99777	0.99957
.1	0.99839	1.00018	.1	0.99819	0.99998	.1	0.99797	0.99977	.1	0.99775	0.99954
.2	0.99837	1.00016	.2	0.99816	0.99996	.2	0.99795	0.99974	.2	0.99773	0.99952
.3	0.99835	1.00014	.3	0.99814	0.99994	.3	0.99793	0.99972	.3	0.99770	0.99950
.4	0.99833	1.00012	.4	0.99812	0.99992	.4	0.99791	0.99970	.4	0.99768	0.99947
.5	0.99831	1.00010	.5	0.99810	0.99990	.5	0.99789	0.99968	.5	0.99766	0.99945
.6	0.99829	1.00008	.6	0.99808	0.99987	.6	0.99786	0.99966	.6	0.99764	0.99943
.7	0.99827	1.00006	.7	0.99806	0.99985	.7	0.99784	0.99963	.7	0.99761	0.99940
.8	0.99825	1.00004	.8	0.99804	0.99983	.8	0.99782	0.99961	.8	0.99759	0.99938
.9	0.99823	1.00002	.9	0.99802	0.99981	.9	0.99780	0.99959	.9	0.99756	0.99936
23.0	0.99754	0.99933	24.0	0.99730	0.99909	25.0	0.99705	0.99884	26.0	0.99679	0.99858
.1	0.99752	0.99931	.1	0.99727	0.99907	.1	0.99702	0.99881	.1	0.99676	0.99855
.2	0.99749	0.99929	.2	0.99725	0.99904	.2	0.99700	0.99879	.2	0.99673	0.99852
.3	0.99747	0.99926	.3	0.99723	0.99902	.3	0.99697	0.99876	.3	0.99671	0.99850
.4	0.99745	0.99924	.4	0.99720	0.99899	.4	0.99694	0.99874	.4	0.99668	0.99847
.5	0.99742	0.99921	.5	0.99717	0.99897	.5	0.99692	0.99871	.5	0.99665	0.99844
.6	0.99740	0.99919	.6	0.99715	0.99894	.6	0.99689	0.99868	.6	0.99663	0.99842
.7	0.99737	0.99917	.7	0.99712	0.99892	.7	0.99687	0.99866	.7	0.99660	0.99839
.8	0.99735	0.99914	.8	0.99710	0.99889	.8	0.99684	0.99863	.8	0.99657	0.99836
.9	0.99732	0.99912	.9	0.99707	0.99887	.9	0.99681	0.99860	.9	0.99654	0.99833
27.0	0.99652	0.99831	28.0	0.99624	0.99803	29.0	0.99595	0.99774	30.0	0.99565	0.99744
.1	0.99649	0.99828	.1	0.99621	0.99800	.1	0.99592	0.99771	.1	0.99562	0.99741
.2	0.99646	0.99825	.2	0.99618	0.99797	.2	0.99589	0.99768	.2	0.99559	0.99738
.3	0.99643	0.99822	.3	0.99615	0.99794	.3	0.99586	0.99765	.3	0.99556	0.99735
.4	0.99641	0.99820	.4	0.99612	0.99791	.4	0.99583	0.99762	.4	0.99553	0.99732
.5	0.99638	0.99817	.5	0.99609	0.99788	.5	0.99580	0.99759	.5	0.99550	0.99729
.6	0.99635	0.99814	.6	0.99607	0.99785	.6	0.99577	0.99756	.6	0.99547	0.99726
.7	0.99632	0.99811	.7	0.99604	0.99783	.7	0.99574	0.99753	.7	0.99544	0.99723
.8	0.99629	0.99808	.8	0.99601	0.99780	.8	0.99571	0.99750	.8	0.99541	0.99720
.9	0.99627	0.99806	.9	0.99598	0.99777	.9	0.99568	0.99747	.9	0.99538	0.99716

Keterangan:  $\rho_w$  = rapat massa air; T = temperatur, K = koefisien temperatur

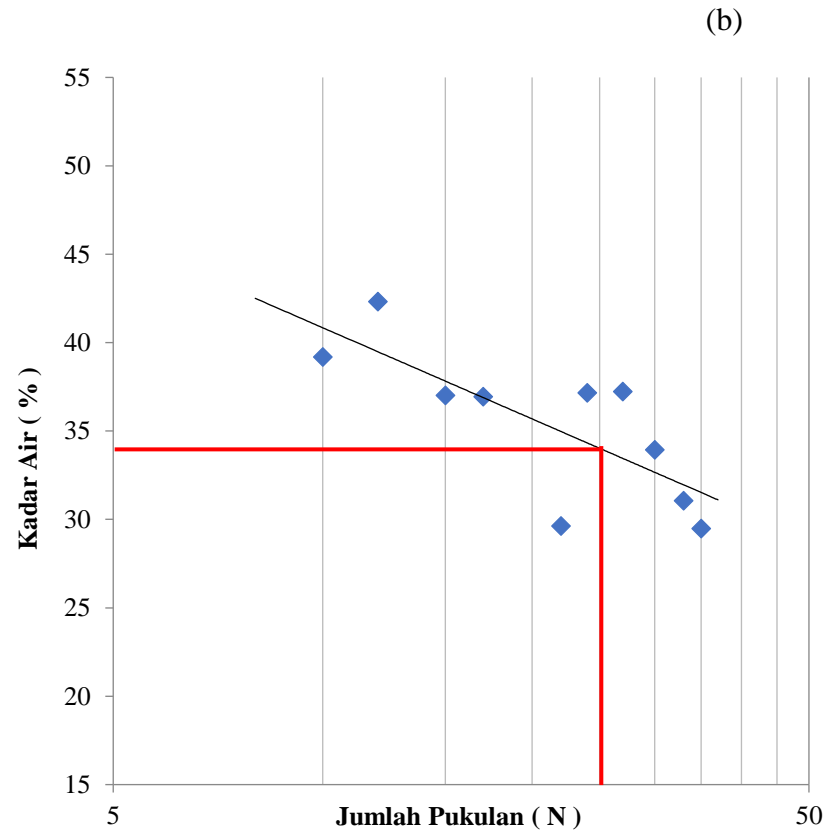
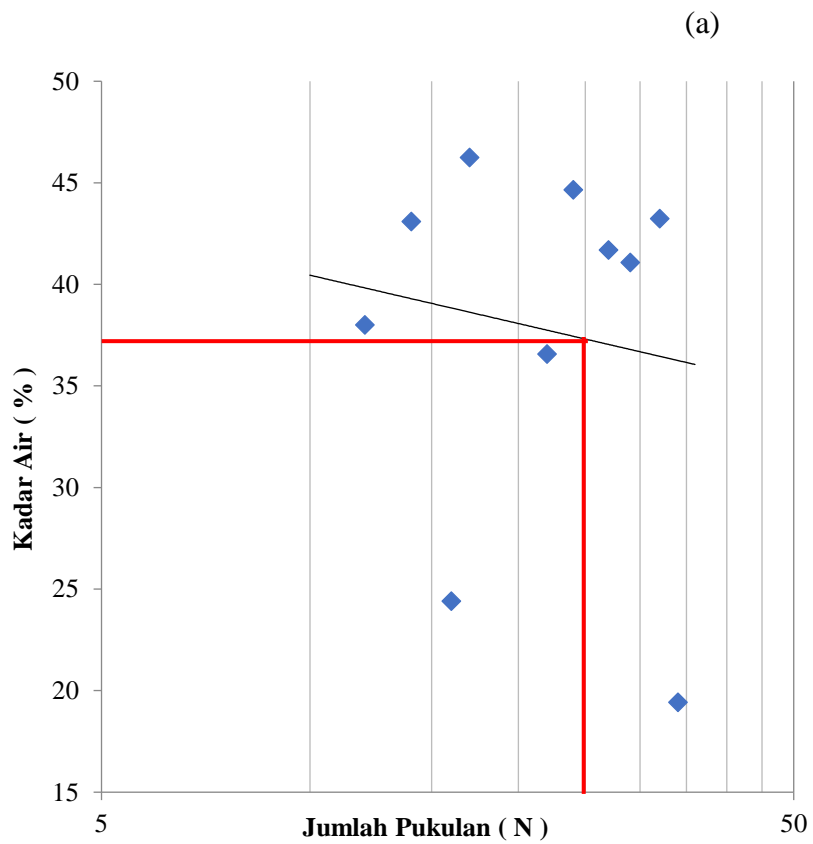
Lampiran 2. Perhitungan *Atteberg Limit*

Tabel 1 Perhitungan batas cair benda uji kadar semen 0%

No	Parameter	Kadar semen 0%									
		A	B	A	B	A	B	A	B	A	B
1	Jumlah pukulan	34	32	29	27	24	22	17	16	14	12
2	Nomor cawan	1	2	3	4	5	6	7	8	9	10
3	Berat cawan kosong (W1), g	9.01	8.99	9.25	10.3	8.89	9.13	9.06	9.11	9.81	9.43
4	Berat cawan + tanah basah (W2), g	25.98	29.73	29.55	29.13	29.56	28.66	29.87	26.75	29.8	28.97
5	Berat cawan + tanah kering (W3), g	23.22	23.47	23.64	23.59	23.18	23.43	23.29	23.29	23.78	23.59
6	Berat air, $W = W2 - W3$ , g	2.76	6.26	5.91	5.54	6.38	5.23	6.58	3.46	6.02	5.38
7	Berat tanah kering, $W_s = W3 - W1$ , g	14.21	14.48	14.39	13.29	14.29	14.30	14.23	14.18	13.97	14.16
8	Kadar air, $W = W_w / W_s$ , %	19.42	43.23	41.07	41.69	44.65	36.57	46.24	24.40	43.09	37.99
9	Rata - rata kadar air, %	31.33		41.38		40.61		35.32		40.54	
10	Batas cair, %	37.5									
11	<i>Flow Index</i>	3.13									

Tabel 2 Perhitungan batas cair benda uji kadar semen 10%

No	Parameter	Kadar semen 10%									
		A	B	A	B	A	B	A	B	A	B
1	Jumlah pukulan	35	33	30	27	24	22	17	15	12	10
2	Nomor cawan	1	2	3	4	5	6	7	8	9	10
3	Berat cawan kosong (W1 ), g	9.35	9.49	9.37	9.45	9.18	9.27	9.23	9.22	10.53	9.47
4	Berat cawan + tanah basah (W2), g	29.55	30.25	30.6	30.5	30	29.66	30.4	30.69	32.69	30.5
5	Berat cawan + tanah kering (W3 ), g	24.95	25.33	25.22	24.79	24.36	25	24.69	24.89	26.1	24.58
6	Berat air, $W = W2 - W3$ , g	4.60	4.92	5.38	5.71	5.64	4.66	5.71	5.80	6.59	5.92
7	Berat tanah kering, $W_s = W3 - W1$ , g	15.60	15.84	15.85	15.34	15.18	15.73	15.46	15.67	15.57	15.11
8	Kadar air, $W = W_w / W_s$ , %	29.49	31.06	33.94	37.22	37.15	29.62	36.93	37.01	42.32	39.18
9	Rata - rata kadar air, %	30.27		35.58		33.39		36.97		40.75	
10	Batas cair, %	34									
11	<i>Flow Index</i>	0.18									



Gambar 1 Kurva batas cair (a) kadar semen 0% (b) kadar semen 10%

Tabel 3 Perhitungan batas plastis

No	Uraian	Kadar semen 0%			Kadar semen 10%		
		1	2	3	1	2	3
1	Berat cawan kosong ( $W_1$ ), g	10.41	11.82	8.97	9.13	9.37	9.33
2	Berat cawan + tanah basah ( $W_2$ ), g	28.6	29.89	28.66	30.89	29.73	30.59
3	Berat cawan + tanah kering ( $W_3$ ), g	25.34	26.66	25.06	24.74	25.22	25.38
4	Berat air ( $W_w$ ), g	3.26	3.23	3.6	6.15	4.51	5.21
5	Berat tanah kering ( $W_s$ ), g	14.93	14.84	16.09	15.61	15.85	16.05
6	Kadar air ( $W$ ), %	21.84	21.77	22.37	39.40	28.45	32.46
7	Kadar air rata – rata, %	21.99			33.44		
8	Batas plastis, %	21.99			33.44		
9	Indek plastisitas, %	15.51			0.56		

Tabel 4 Kalibrasi cawan susut

No	Uraian	Hasil pengukuran		
		1	2	3
1	Berat cawan susut + pelat kaca ( $W_2$ ), g	19.61	19.69	19.72
2	Berat cawan susut + pelat kaca + air ( $W_1$ ), g	31.96	32.1	33.14
3	Berat air ( $W_w$ ), g	12.35	12.41	13.42
4	Volume cawan susut, $v = w_w/\rho_w$ , $\text{cm}^3$	12.35	12.41	13.42
5	Volume cawan susut rata-rata, $\text{cm}^3$	12.73		
6	Deviasi volume cawan susut, $\text{cm}^3$	0.23		

Tabel 5 Kalibrasi rapat massa lilin

No	Uraian	Hasil pengukuran		
		1	2	3
1	Diameter silinder lilin, $d_{wp}$ , cm	4.74	4.75	4.68
2	Tinggi silinder lilin, $h_{wp}$ , cm	1.27	1.18	1.23
3	Volume silinder lilin, $\text{cm}^3$	22.41	20.91	21.16
4	Volume silinder lilin rata-rata ( $V_{wp}$ ), $\text{cm}^3$	21.49		
5	Berat silinder lilin ( $W_{wp}$ ), g	19.06		
6	Rapat massa lilin ( $\rho_x = w_{wp}/v_{wp}$ ), $\text{g}/\text{cm}^3$	0.89		

Tabel 6 Perhitungan batas susut

No	Uraian	Kadar semen 0%		Kadar semen 10%	
		1	2	1	2
1	Berat cawan susut (wsd), g	13.39	14.93	15.44	13.84
2	Berat cawan susut + pasta tanah (w sdw), g	35.76	37.87	42.05	36.88
3	Berat cawan susut + tanah kering, (w sdd), g	29.80	34.04	36.93	32.70
4	Berat tanah kering, (Ws = W sdd - W sd), g	16.41	19.11	21.49	18.86
5	Kadar air tanah awal (w), %	36.32	20.04	23.83	22.16
6	Berat tanah kering + lilin (Wsx), g	24.10	27.39	26.51	24.28
7	Berat tanah kering + lilin dalam air (W sxw), g	5.08	6.81	5.00	5.00
8	Berat air yang didesak oleh tanah kering + lilin (W wsx), g	19.02	20.58	21.51	19.28
9	Volume tanah kering + lilin (V dx), cm <sup>3</sup>	19.02	20.58	21.51	19.28
10	Berat lapisan lilin pada tanah kering (Wx), g	7.69	8.28	5.02	5.42
11	Volume lapisan lilin pada tanah kering (Vx), cm <sup>3</sup>	8.67	9.34	5.66	6.11
12	Volume tanah kering (Vd), cm <sup>3</sup>	10.35	11.24	15.85	13.17
13	Batas susut (SL), %	21.83	12.28	38.35	24.50
14	Batas susut tanah rata-rata (SL), %	17.05		31.43	
15	Angka susut tanah (SR)	1.59		1.36	
16	Susut volumetric (VS)	0.31		0.1	
17	Susut linier (LS)	0.1		0.03	

Lampiran 3. Perhitungan Ukuran Butir Tanah

Tabel 1 Berat tanah

Uraian	Hasil	
	Kadar semen 0%	Kadar semen 10%
Berat total contoh tanah kering (w), g	65.00	65.00
Berat tanah berdiameter <0.075 mm (B2), g	8.20	32.27
Berat tanah berdiameter >0.075 mm (B1), g	56.80	32.73

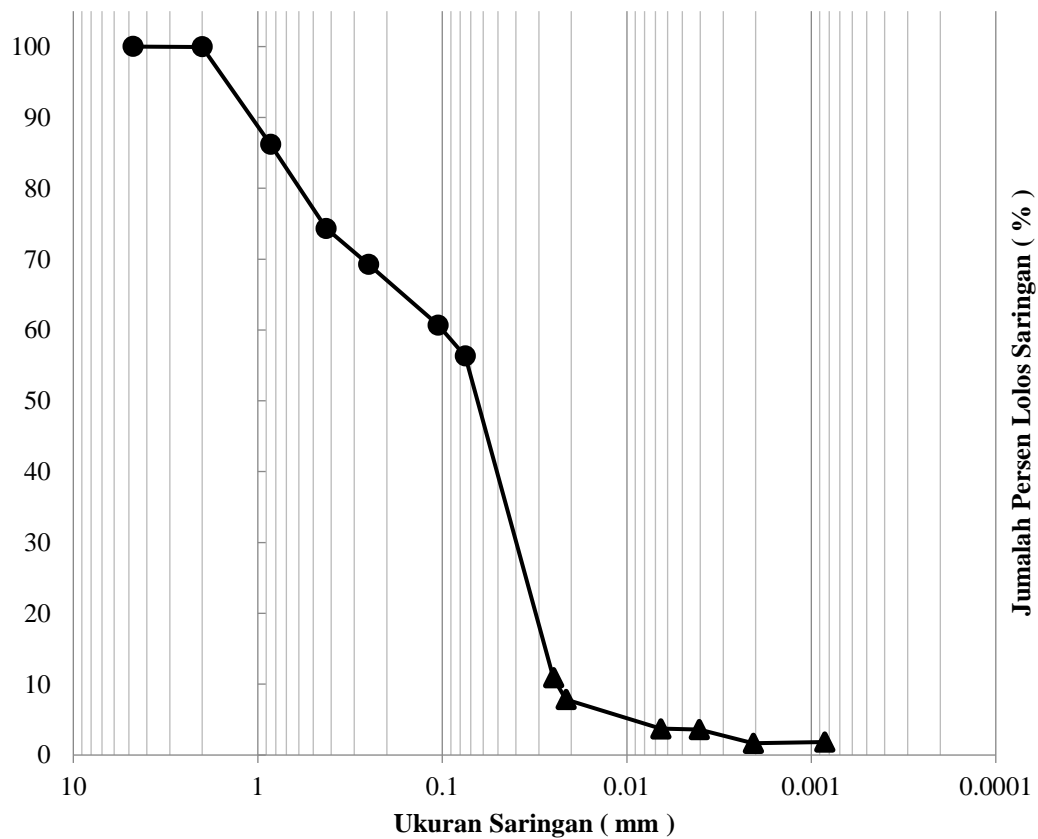
Tabel 2 Hasil analisis pengendapan tanah kadar semen 0%

Waktu pembacaan t (menit)	Larutan tanah (R <sub>1</sub> )	Larutan <i>reagent</i> (R <sub>2</sub> )	Temperature t(°C)	R' = R <sub>1</sub> + m m=1	Kedalaman L (mm)	Konstanta	Diameter Butiran D (mm)	Skala Hidrometer R=R'- R <sub>2</sub> +C <sub>T</sub>	Persen Berat P	Adjust Percent Pa
2	0	-8	26.5	1	7.5682	0.01284	0.0249774	10.83	16.82	10.93
5	-4	-9	26.4	-3	7.0506	0.01802	0.0213985	7.79	12.10	7.87
30	-9	-10	26.1	-8	6.4036	0.01419	0.0065559	3.69	5.73	3.72
60	-9	-8	29.7	-8	6.4036	0.01240	0.004051	3.58	5.56	3.61
250	-9	-8	26.0	-8	6.4036	0.01291	0.0020662	1.65	2.56	1.67
1440	-10	-9	26.5	-9	6.2742	0.01284	0.0008475	1.83	2.84	1.84



Tabel 3 Hasil analisis saringan tanah kadar semen 0%

Nomor Saringan ASTM	Ukuran Butir (mm)	Berat Tertahan pada Saringan (g)	Persen Berat Tertahan pada Saringan (%)	Persen Lolos Saringan (%)
#4	4.47	0	0	100
10	2	0.04	0.06	99.94
20	0.85	8.95	13.77	86.17
40	0.425	7.71	11.86	74.31
60	0.25	3.31	5.09	69.22
140	0.105	5.56	8.55	60.66
200	0.075	2.83	4.35	56.31
pan	<0,075	28.4	43.69	36.60
Jumlah		56.8		



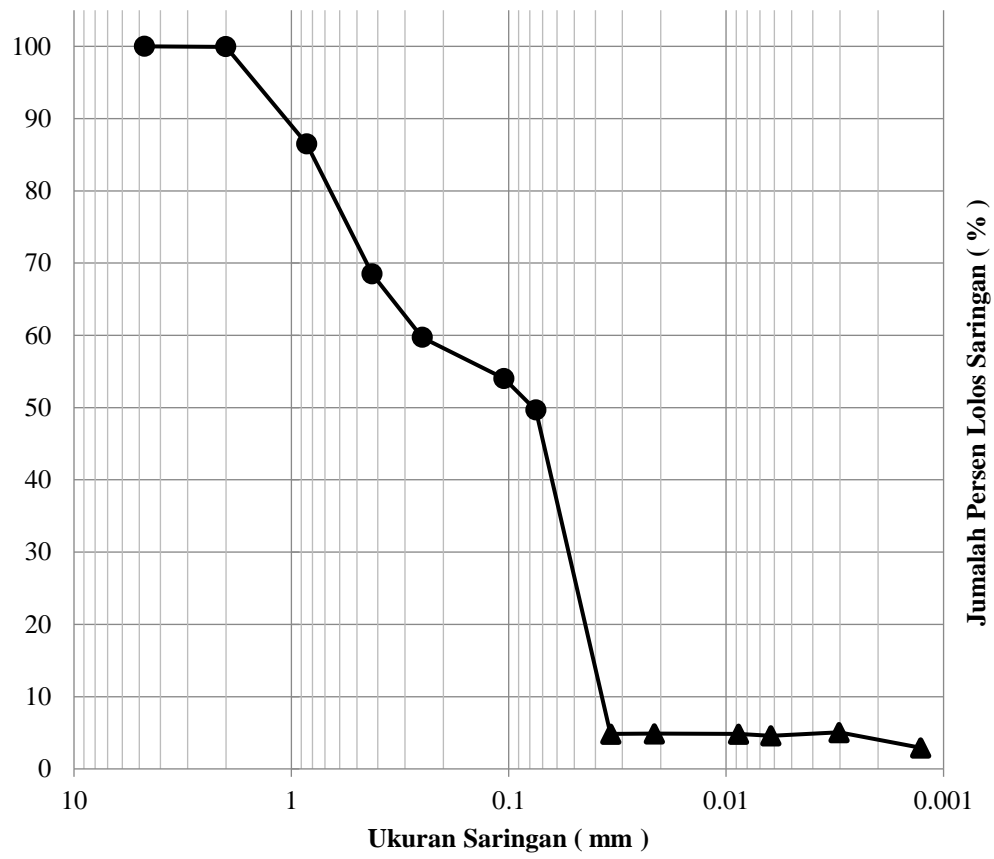
Gambar 1 Kurva gradasi ukuran butir tanah kadar semen 0%

Tabel 4 Hasil analisis pengendapan tanah kadar semen 10%

Waktu pembacaan t (menit)	Larutan tanah (R <sub>1</sub> )	Larutan reagent (R <sub>2</sub> )	Temperature t(°C)	$R' = R_1 + m$ m=1	Kedalaman L (mm)	Konstanta	Diameter Butiran D (mm)	Skala Hidrometer $R=R' - R_2 + C_T$	Persen Berat P	Adjust Percent Pa
2	-5	-6	28.5	-4	14.6430	0.01257	0.0340123	4.78	7.42	4.82
5	-5	-6	28.6	-4	14.6430	0.01255	0.021477	4.83	7.51	4.88
30	-5	-6	28.5	-4	14.6430	0.01257	0.0087819	4.78	7.42	4.82
60	-5	-6	28.1	-4	14.6430	0.01263	0.0062394	4.55	7.07	4.60
250	-5	-6	28.9	-4	14.6430	0.01251	0.0030276	5.00	7.76	5.04
1440	-5	-4	27.8	-4	14.6430	0.01267	0.0012776	2.90	4.51	2.93

Tabel 5 Hasil analisis saringan tanah kadar semen 10%

Nomor Saringan ASTM	Ukuran Butir (mm)	Berat Tertahan pada Saringan (g)	Persen Berat Tertahan pada Saringan (%)	Persen Lolos Saringan (%)
#4	4.47	0	0	100
10	2	0.04	0.06	99.94
20	0.85	8.75	13.46	86.48
40	0.425	11.7	18.00	68.48
60	0.25	5.7	8.77	59.71
140	0.105	3.71	5.71	54.00
200	0.075	2.83	4.35	49.65
pan	<0,075	32.73	50.35	32.27
Jumlah		32.73		



Gambar 2 Kurva gradasi ukuran butir tanah kadar semen 10%

## Lampiran 4. Perhitungan CBR Rendaman

Tabel 1 Data pemadatan

Parameter	Benda uji dengan rendaman			
	Kadar semen 0%		Kadar semen 10%	
	BU 1	BU 2	BU 1	BU 2
Nama silinder	15.00	12A	15.00	15.00
Diamter silinder (cm)	15.11	15.11	15.19	15.03
Tinggi silinde (cm)	17.84	18.17	17.98	17.25
Volume silinder (cm <sup>3</sup> )	3199	3258.17	3258.33	3060.53
Berat penumbuk (kg)	7598	7598	7598	7598
Kadar air tanah, w (%)	0.25	0.25	24.70	24.80
Berat silinder, wc (g)	7545	7255	7520	6854
Berat silinder+tanah basah, wcb (g)	11803	11255	12685	11225
Berat tanah basah, wb (g)	4258	4000	5165	4371
Berat volume tanah basah, $\gamma_b$ (g/cm <sup>3</sup> )	1.33	1.23	1.59	1.43
Berat volume tanah kering, $\gamma_d$ (g/cm <sup>3</sup> )	1.06	0.98	0.06	0.06
Berat tanah kering (ws) (g)	3406.40	3200	200.97	169.42

Tabel 2 Data pengembangan

Interval waktu (jam)	Pembacaan arloji	Pengembangan (S/H)*100%			
		Kadar semen 0%		Kadar semen 10%	
		BU 1	BU 2	BU 1	BU 2
0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
4	0	0	0	0	0
8	0	0	0	0	0

Interval waktu (jam)	Pembacaan arloji	Pengembangan (S/H)*100%	Interval waktu (jam)	Pembacaan arloji	Pengembangan (S/H)*100%
12	0	0	0	0	0
24	0	0	0	0	0
36	0	0	0	0	0
48	0	0	0	0	0
72	0	0	0	0	0
96	0	0	0	0	0

Tabel 3 Data setelah selesai rendaman

Parameter	Benda uji dengan rendaman			
	Kadar semen 0%		Kadar semen 10%	
	BU 1	BU 2	BU 1	BU 2
Beban di atas tanah (kg)	4	4	4	4
Berat silinder+tanah sebelum direndam, wcb (g)	11803	11255	12685	11225
Berat silinder+tanah setelah direndam, wcbs (g)	11880	11447	12750	11295
Berat air tersiap tanah, ww (g)	77	192	65	70
Kadar air tersiap (%)	2.26	6.00	32.34	41.32
Tinggi plat ganjal	5.05	5.05	5.05	5.05
Berat tanah basah, wb (g)	4335	4192	5230	4441
Berat volume tanah basah, $\gamma_b$ (g/cm <sup>3</sup> )	0.74	0.78	0.62	0.69
Berat volume tanah kering, $\gamma_d$ (g/cm <sup>3</sup> )	0.23	0.11	0.02	0.02
Berat tanah kering (ws) (g)	724.04	361.77	60.88	49.84

Tabel 4 Hasil pembacaan penetrasi benda uji I kadar semen 0%

Penetrasi		Beban			Tekanan	Tekanan terkoreksi *
Pembacaan arloji	$\Delta$	Pembacaan arloji (x)	P1 (kg)	P2=K1.P1 (lbs)	P=P1/3 (psi)	P' (psi)
0	0	0	0	-	0	0
38"	0.025	0.9	8.30	-	2.77	2.6
1.16	0.05	1	9.22	-	3.07	5.6
1.54	0.075	1.5	13.84	-	4.61	8.6
2.32	0.1	2	18.45	-	6.15	11.7
3.1	0.125	3	27.67	-	9.22	14.5
3.48	0.15	3.9	35.98	-	11.99	17.4
4.26	0.175	4.8	44.28	-	14.76	20.3
5.04	0.2	5.7	52.58	-	17.53	23.3
5.42	0.225	6.6	60.88	-	20.29	26
6.2	0.25	7.5	69.19	-	23.06	29
6.58	0.275	8.5	78.41	-	26.14	31.8
7.36	0.3	9.5	87.63	-	29.21	34.5
8.14	0.325	10.5	96.86	-	32.29	37
8.52	0.35	11.3	104.24	-	34.75	39
9.3	0.375	12.1	111.62	-	37.21	40.7
10.08	0.4	13	119.92	-	39.97	42.5
10.46	0.425	13.9	128.22	-	42.74	44
11.24	0.45	14	129.15	-	43.05	45
12.02	0.475	14.5	133.76	-	44.59	45.8

Tabel 5 Hasil pembacaan penetrasi benda uji II kadar semen 0%

Penetrasi		Beban			Tekanan	Tekanan terkoreksi *
Pembacaan arloji	$\Delta$	Pembacaan arloji (x)	P1 (kg)	P2=K1.P1 (lbs)	P=P1/3 (psi)	P' (psi)
0	0	0	0	-	0	0
38"	0.025	1.9	17.53	-	5.843	9
1.16	0.05	4	36.90	-	12.30	18.5
1.54	0.075	6.5	59.96	-	19.99	27.8
2.32	0.1	9.3	85.79	-	28.60	37.5
3.1	0.125	12.5	115.31	-	38.44	47.3
3.48	0.15	15.5	142.99	-	47.66	56.8
4.26	0.175	18.9	174.35	-	58.12	66.5
5.04	0.2	21.9	202.03	-	67.34	76
5.42	0.225	24.5	226.01	-	75.34	86
6.2	0.25	27	249.07	-	83.02	96
6.58	0.275	29.8	274.90	-	91.63	105
7.36	0.3	32	295.20	-	98.40	111
8.14	0.325	34	313.65	-	104.55	116
8.52	0.35	35.9	331.18	-	110.39	120
9.3	0.375	36.9	340.40	-	113.47	122
10.08	0.4	38	350.55	-	116.85	124
10.46	0.425	38.9	358.85	-	119.62	125
11.24	0.45	39.2	361.62	-	120.54	126
12.02	0.475	39.9	368.08	-	122.69	127
12.4	0.5	36	332.10	-	110.70	127.5

Tabel 6 Hasil pembacaan penetrasi benda uji I kadar semen 10%

Penetrasi		Beban			Tekanan	Tekanan terkoreksi *
Pembacaan arloji	$\Delta$	Pembacaan arloji (x)	P1 (kg)	P2=K1.P1 (lbs)	P=P1/3 (psi)	P' (psi)
0	0	0	0	-	0	0
38"	0.025	8	73.8	-	24.60	150
1.16	0.05	30	276.75	-	92.25	300
1.54	0.075	62	571.95	-	190.65	440
2.32	0.1	99	913.275	-	304.43	590
3.1	0.125	140	1291.5	-	430.50	720
3.48	0.15	184	1697.4	-	565.80	866
4.26	0.175	232	2140.2	-	713.40	1000
5.04	0.2	278	2564.55	-	854.85	1130
5.42	0.225	328	3025.8	-	1008.60	1280
6.2	0.25	370	3413.25	-	1137.75	1430
6.58	0.275	420	3874.5	-	1291.50	1570
7.36	0.3	468	4317.3	-	1439.10	1675
8.14	0.325	518	4778.55	-	1592.85	1800
8.52	0.35	556	5129.1	-	1709.70	1900
9.3	0.375	602	5553.45	-	1851.15	1980
10.08	0.4	650	5996.25	-	1998.75	2050
10.46	0.425	668	6162.3	-	2054.10	2100
11.24	0.45	680	6273	-	2091.00	2150
12.02	0.475	700	6457.5	-	2152.50	2200
12.4	0.5	721	6651.225	-	2217.08	2217.1

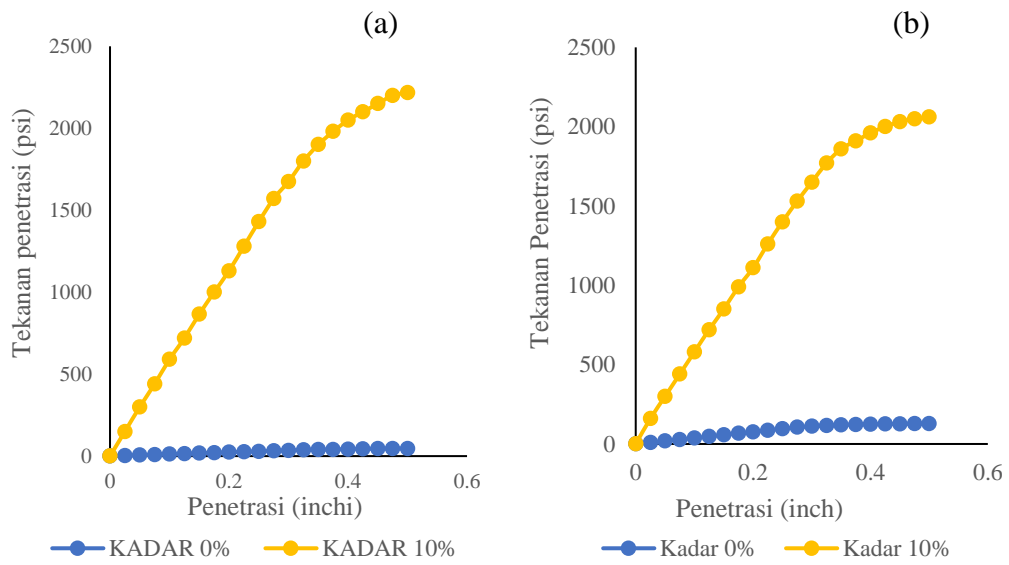


Tabel 6 Hasil pembacaan penetrasi benda uji I kadar semen 10%

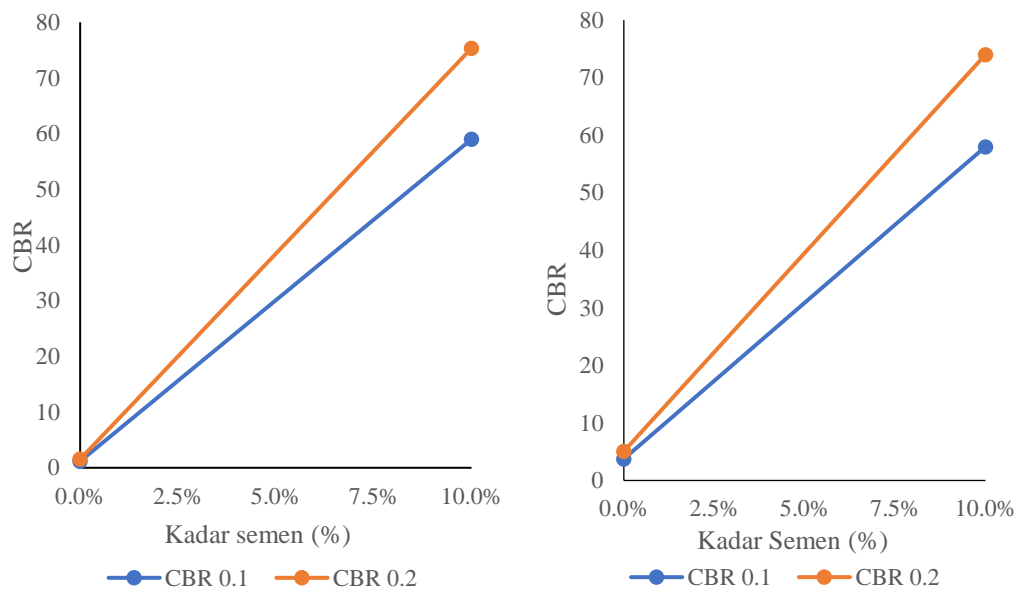
Penetrasi		Beban			Tekanan	Tekanan terkoreksi *
Pembacaan arloji	$\Delta$	Pembacaan arloji (x)	P1 (kg)	P2=K1.P1 (lbs)	P=P1/3 (psi)	P' (psi)
0	0	0	0	-	0	0
38"	0.025	8	73.80	-	24.60	150
1.16	0.05	30	276.75	-	92.25	300
1.54	0.075	62	571.95	-	190.65	440
2.32	0.1	99	913.28	-	304.43	590
3.1	0.125	140	1291.50	-	430.50	720
3.48	0.15	184	1697.40	-	565.80	866
4.26	0.175	232	2140.20	-	713.40	1000
5.04	0.2	278	2564.55	-	854.85	1130
5.42	0.225	328	3025.80	-	1008.60	1280
6.2	0.25	370	3413.25	-	1137.75	1430
6.58	0.275	420	3874.50	-	1291.50	1570
7.36	0.3	468	4317.30	-	1439.10	1675
8.14	0.325	518	4778.55	-	1592.85	1800
8.52	0.35	556	5129.10	-	1709.70	1900
9.3	0.375	602	5553.45	-	1851.15	1980
10.08	0.4	650	5996.25	-	1998.75	2050
10.46	0.425	668	6162.30	-	2054.10	2100
11.24	0.45	680	6273.00	-	2091.00	2150
12.02	0.475	700	6457.50	-	2152.50	2200
12.4	0.5	721	6651.23	-	2217.08	2217.1

Tabel 7 Hasil pembacaan penetrasi benda uji II kadar semen 10%

Penetrasi		Beban			Tekanan	Tekanan terkoreksi *
Pembacaan arloji	$\Delta$	Pembacaan arloji (x)	P1 (kg)	P2=K1.P1 (lbs)	P=P1/3 (psi)	P' (psi)
0	0	0	0	-	0	0
38"	0.025	19	175.28	-	58.43	160
1.16	0.05	49	452.03	-	150.68	300
1.54	0.075	87	802.58	-	267.53	440
2.32	0.1	125	1153.13	-	384.38	580
3.1	0.125	169	1559.03	-	519.68	720
3.48	0.15	215	1983.38	-	661.13	850
4.26	0.175	255	2352.38	-	784.13	990
5.04	0.2	308	2841.30	-	947.10	1110
5.42	0.225	351	3237.98	-	1079.33	1260
6.2	0.25	407	3754.58	-	1251.53	1400
6.58	0.275	440	4059.00	-	1353.00	1530
7.36	0.3	483	4455.68	-	1485.23	1650
8.14	0.325	529	4880.03	-	1626.68	1770
8.52	0.35	568	5239.80	-	1746.60	1860
9.3	0.375	580	5350.50	-	1783.50	1910
10.08	0.4	602	5553.45	-	1851.15	1960
10.46	0.425	606	5590.35	-	1863.45	2000
11.24	0.45	630	5811.75	-	1937.25	2030
12.02	0.475	661	6097.73	-	2032.58	2050
12.4	0.5	670	6180.75	-	2060.25	2060.25



Gambar 1 Kurva penetrasi a) benda uji I b) benda uji II



Gambar 2 Kurva perbandingan nilai CBR 0,1” dan 0,2”a) benda uji I b) benda uji II