KADAR AIR TANAH TIDAK TERUSIK					
SAMPEL LAPISAN ATAS					
No	URAIAN	SATUAN	BENDA UJI		
			17	18	16
1	Berat Cawan kosong (W1)	gram	9,85	8,79	9,42
2	Berat Cawan + Tanah Basah (W2)	gram	29,85	28,79	29,42
3	Berat Cawan + Tanah Kering (W3)	gram	22,44	22,67	23,24
4	Berat Air, Ww = (W2-W3)	gram	7,41	6,12	6,18
5	Berat Tanah Kering, Ws = (W3-W1)	gram	12,59	13,88	13,82
6	Kadar Air, w = (Ww/Ws) x 100 %	%	58,9	44,1	44,7
7	Kadar Air rata-rata, w	%	49,2		
SAMPEL LAPISAN TENGAH					
No	URAIAN	SATUAN	BENDA UJI		
			20	21	22
1	Berat Cawan kosong (W1)	gram	9,4	9,2	9,78
2	Berat Cawan + Tanah Basah (W2)	gram	29,4	29,2	29,78
3	Berat Cawan + Tanah Kering (W3)	gram	24,12	23,86	23,57
4	Berat Air, Ww = (W2-W3)	gram	5,28	5,34	6,21
5	Berat Tanah Kering, Ws = (W3-W1)	gram	14,72	14,66	13,79
6	Kadar Air, w = (Ww/Ws) x 100 %	%	35,9	36,4	45,0
7	Kadar Air rata-rata, w	%	39,1		
SAMPEL LAPISAN LONGSOR					
No	URAIAN	SATUAN	BENDA UJI		
			7	8	9
1	Berat Cawan kosong (W1)	gram	9,86	9,75	9,26
2	Berat Cawan + Tanah Basah (W2)	gram	29,86	29,75	29,26
3	Berat Cawan + Tanah Kering (W3)	gram	22,77	23,32	22,67
4	Berat Air, Ww = (W2-W3)	gram	7,09	6,43	6,59
5	Berat Tanah Kering, Ws = (W3-W1)	gram	12,91	13,57	13,41
6	Kadar Air, w = (Ww/Ws) x 100 %	%	54,9	47,4	49,1
7	Kadar Air rata-rata, w	%	50,5		

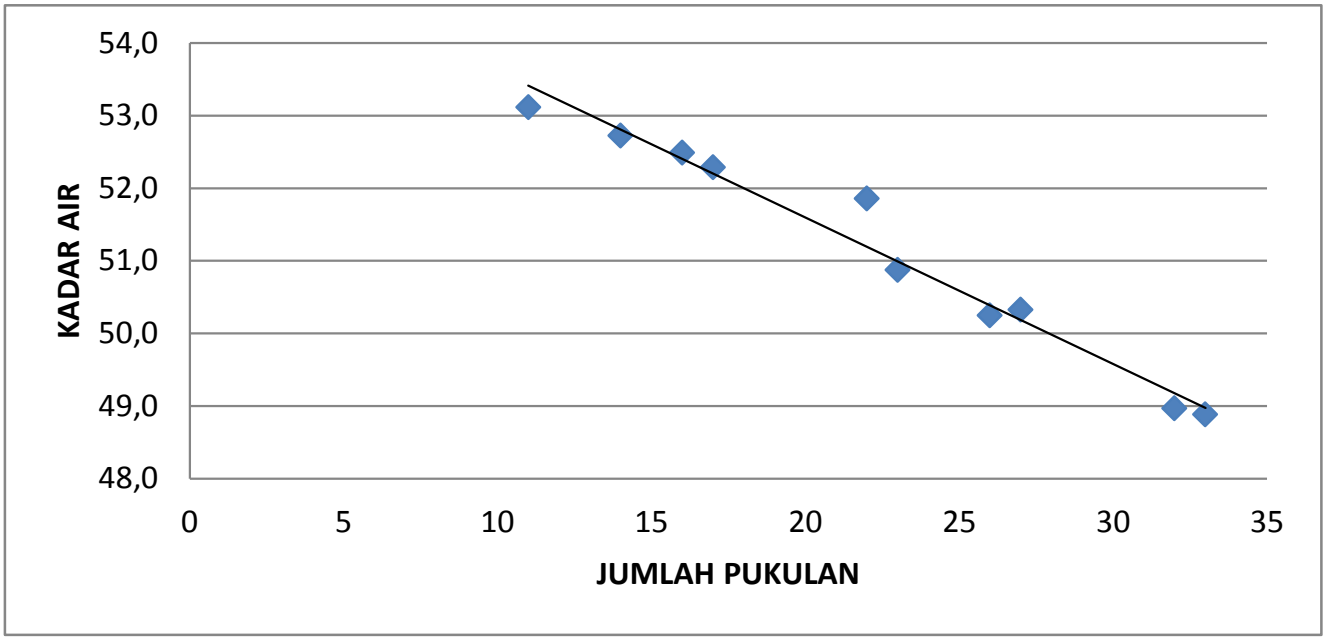
BERAT JENIS TANAH TIDAK TERUSIK					
KALIBRASI PIKNOMETER					
NO	URAIAN	SATUAN	1	2	
1	Berat Piknometer kosong (Wp)	g	30,61	29,45	
2	Berat piknometer + air (Wpw,c)	g	80,36	79,17	
3	Temperatur dalam piknometer (T)	℃	29	29	
4	Berat volume air (γw,c)		0,99621	0,9969	
5	Volume piknometer, Vp	ml	49,94	49,87	
PERHITUNGAN BERAT JENIS ATAS					
NO	URAIAN	SATUAN	1	2	
1	Berat Piknometer kosong (Wp)	g	30,61	29,45	
2	Berat piknometer + tanah kering (Wps)	g	42,8	41,68	
3	Berat piknometer + tanah + air (Wpws,t)	g	87,93	86,72	K
4	Berat piknometer + air (Wpw,t)	g	80,36	79,17	0,99744
5	Temperatur (T)	℃	30	30	
6	Berat Jenis, Gs,t		2,64	2,61	
7	Rata-rata berat jenis		2,63		
8	Berat jenis pada T, Gs		2,63		
9	Berat jenis tanah, Gs		2,63		
KALIBRASI PIKNOMETER					
NO	URAIAN	SATUAN	1	2	
1	Berat Piknometer kosong (Wp)	g	29,73	30,35	
2	Berat piknometer + air (Wpw,c)	g	79,17	80,24	
3	Temperatur dalam piknometer (T)	℃	29	29	
4	Berat volume air (γw,c)		0,99621	0,9969	
5	Volume piknometer, Vp	ml	49,63	50,05	
PERHITUNGAN BERAT JENIS TENGAH					
NO	URAIAN	SATUAN	1	2	
1	Berat Piknometer kosong (Wp)	g	29,73	30,35	
2	Berat piknometer + tanah kering (Wps)	g	41,8	41,68	
3	Berat piknometer + tanah + air (Wpws,t)	g	86,51	87,14	K
4	Berat piknometer + air (Wpw,t)	g	79,17	80,24	0,99729
5	Temperatur (T)	℃	30	30	
6	Berat Jenis, Gs,t		2,55	2,56	
7	Rata-rata berat jenis		2,55		
8	Berat jenis pada T, Gs		2,56		
9	Berat jenis tanah, Gs		2,56		

KALIBRASI PIKNOMETER					
NO	URAIAN	SATUAN	1	2	
1	Berat Piknometer kosong (Wp)	g	29,82	30,12	
2	Berat piknometer + air (Wpw,c)	g	80,25	80,26	
3	Temperatur dalam piknometer (T)	℃	29	29	
4	Berat volume air (γw,c)		0,99595	0,99595	
5	Volume piknometer, Vp	ml	50,64	50,34	
PERHITUNGAN BERAT JENIS LONGSOR					
NO	URAIAN	SATUAN	1	2	
1	Berat Piknometer kosong (Wp)	g	29,82	30,12	
2	Berat piknometer + tanah kering (Wps)	g	42,27	42,29	
3	Berat piknometer + tanah + air (Wpws,t)	g	87,97	87,83	K
4	Berat piknometer + air (Wpw,t)	g	80,25	80,26	0,99744
5	Temperatur (T)	℃	30,5	30,5	
6	Berat Jenis, Gs,t		2,63	2,65	
7	Rata-rata berat jenis		2,64		
8	Berat jenis pada T, Gs		2,65		
9	Berat jenis tanah, Gs		2,65		

HASIL PENGUJIAN BATAS PLASTIS LAPISAN ATAS				
NO	URAIAN	SATUAN	NOMOR CAWAN	
			7	9
1	Berat cawan kosong	g	9,86	9,09
2	Berat cawan + tanah basah	g	32,6	29,09
3	Berat cawan + tanah kering	g	26,79	24,47
4	Berat air	g	5,81	4,62
5	Berat tanah kering	g	16,93	15,38
6	Kadar air	%	34,3	30,0
7	Kadar air rata-rata	%	32,2	
8	Batas Plastis (PL)	%	32,2	
9	Indeks Plastisitas (PI)	%	-32,2	

HASIL PENGUJIAN BATAS PLASTIS LAPISAN TENGAH				
NO	URAIAN	SATUAN	NOMOR CAWAN	
			21	22
1	Berat cawan kosong	g	9,2	9,37
2	Berat cawan + tanah basah	g	29,2	29,37
3	Berat cawan + tanah kering	g	25,83	25,6
4	Berat air	g	3,37	3,77
5	Berat tanah kering	g	16,63	16,23
6	Kadar air	%	20,3	23,2
7	Kadar air rata-rata	%	21,7	
8	Batas Plastis (PL)	%	21,7	
9	Indeks Plastisitas (PI)	%	-21,7	

HASIL PENGUJIAN BATAS PLASTIS LONGSOR				
NO	URAIAN	SATUAN	NOMOR CAWAN	
			72	73
1	Berat cawan kosong	g	8,94	9,28
2	Berat cawan + tanah basah	g	28,94	29,28
3	Berat cawan + tanah kering	g	24,19	24,07
4	Berat air	g	4,75	5,21
5	Berat tanah kering	g	15,25	14,79
6	Kadar air	%	31,1	35,2
7	Kadar air rata-rata	%	33,2	
8	Batas Plastis (PL)	%	33,2	
9	Indeks Plastisitas (PI)	%	-33,2	


54,0
53,0
52,0
51,0
50,0
49,0
48,0
KADAR AIR
0
5
10
15
20
25
30
35
JUMLAH PUKULAN

ANALISIS SARINGAN

LAPISAN ATAS				
Nomor Saringan ASTM	Ukuran butir (mm)	Berat tertahan pada saringan	Persen berat tertahan pada	Persen lolos Saringan (%)
#4	4,75	0	0	100
No. 10	2	0,27	0,530660377	99,4693396
No. 20	0,85	5,14	10,10220126	89,3671384
No. 40	0,425	8,23	16,17531447	73,1918239
No. 60	0,25	5,87	11,53694969	61,6548742
No. 140	0,105	15,22	29,91352201	31,7413522
No. 200	0,075	8,88	17,45283019	14,288522
Wadah (*pan*)	<0,075	7,27		
Berat butiran <0,075 mm, (B2)		7,27		
Jumlah berat tanah tertahan (W)		50,88		

LAPISAN TENGAH				
Nomor Saringan ASTM	Ukuran butir (mm)	Berat tertahan pada saringan	Persen berat tertahan pada	Persen lolos Saringan (%)
#4	4,75	0	0	100
No. 10	2	0,16	0,318915687	99,6810843
No. 20	0,85	8,66	17,26131154	82,4197728
No. 40	0,425	10,44	20,80924855	61,6105242
No. 60	0,25	7,44	14,82957943	46,7809448
No. 140	0,105	9,62	19,17480566	27,6061391
No. 200	0,075	8,73	17,40083715	10,205302
Wadah (*pan*)	<0,075	5,12		
Berat butiran <0,075 mm, (B2)		5,12		
Jumlah berat tanah tertahan (W)		50,17		

LAPISAN LONGSOR				
Nomor Saringan ASTM	Ukuran butir (mm)	Berat tertahan pada saringan	Persen berat tertahan pada	Persen lolos Saringan (%)
#4	4,75	0	0	100
No. 10	2	0,1	0,197589409	99,8024106
No. 20	0,85	5,48	10,82789962	88,974511
No. 40	0,425	8,28	16,36040308	72,6141079
No. 60	0,25	10,28	20,31219127	52,3019166
No. 140	0,105	7,65	15,1155898	37,1863268
No. 200	0,075	8,05	15,90594744	21,2803794
Wadah (*pan*)	<0,075	10,77		
Berat butiran <0,075 mm, (B2)		10,77		
Jumlah berat tanah tertahan (W)		50,61		

SWCC Kedungrong Hitam
Measured

			Wetting			Drying
Suction (ψ, kPa	θ (m^3/m^3)	Head (h, m)	θ (m^3/m^3)	Suction (ψ, kPa)	Head (h, m)	θ (m^3/m^3)
193,5309055	0,160426868	19,72792105	16,04269	13,31757495	1,357550964	19,063
69,79214309	0,162867184	7,114387674	16,28672	17,03713449	1,736710957	18,61231
64,53638655	0,165362808	6,578632676	16,53628	24,19845896	2,466713451	17,41494
61,82348832	0,174960388	6,302088514	17,49604	21,12932407	2,153855665	17,12345
54,12911567	0,21352336	5,517748794	21,35234	25,86208195	2,636297855	16,93921
49,46461322	0,238088336	5,042264345	23,80883	28,96052403	2,952143122	16,41228
47,91924975	0,238720651	4,884734938	23,87207	32,46569464	3,309448995	15,90927
43,07976284	0,238967298	4,391413133	23,89673	34,00090258	3,465943178	15,61741
39,24805883	0,239552152	4,000821491	23,95522	40,29148292	4,107184804	14,99705
35,60360008	0,240710274	3,629317032	24,07103	37,44239636	3,816758039	14,53907
34,50165683	0,244069166	3,516988464	24,40692	38,14802965	3,888688038	14,32325
33,88486517	0,245912669	3,454114696	24,59127	47,42914746	4,83477548	13,9133
30,30493514	0,24666756	3,089188087	24,66676	61,56685068	6,275927694	13,79221
27,32696982	0,24714217	2,785623834	24,71422	62,67744973	6,389138607	13,66665
19,43815052	0,247373869	1,981462846	24,73739	66,30646819	6,759069133	13,50371
19,77924444	0,247748699	2,016232869	24,77487	66,89799446	6,819367427	13,24735
17,91889884	0,248427727	1,826595193	24,84277	68,72802409	7,00591479	13,00518
16,08056679	0,249653491	1,639201508	24,96535	76,64197495	7,812637609	12,78346
11,96895786	0,249994686	1,220077254	24,99947	79,71074685	8,125458395	11,43374
11,31066189	0,250368395	1,15297267	25,03684	88,07833185	8,978423227	11,21363
156,1874159	0,160766219	15,92124525	16,07662	13,31757495	1,357550964	19,11035
56,95584677	0,173139704	5,805896714	17,31397	17,03713449	1,736710957	18,7776
59,1268491	0,188421389	6,027201743	18,84214	24,19845896	2,466713451	16,86421
79,2726338	0,195517365	8,080798552	19,55174	21,12932407	2,153855665	16,53759
54,24715207	0,222919535	5,529781047	22,29195	25,86208195	2,636297855	15,90117
44,37144624	0,235499308	4,523083205	23,54993	28,96052403	2,952143122	15,49121
42,9136937	0,23590665	4,374484577	23,59066	32,46569464	3,309448995	14,96577
41,3654251	0,236288954	4,216659032	23,6289	34,00090258	3,465943178	14,47696
39,59155923	0,236995263	4,035836823	23,69953	40,29148292	4,107184804	14,44856
27,57003875	0,238859694	2,810401504	23,88597	37,44239636	3,816758039	14,03748
24,88582466	0,243006363	2,536781311	24,30064	38,14802965	3,888688038	13,79495
21,72988906	0,244294909	2,215075337	24,42949	47,42914746	4,83477548	13,36481
23,19531416	0,244878642	2,364456082	24,48786	61,56685068	6,275927694	13,13909
23,90715332	0,245066991	2,437018687	24,5067	62,67744973	6,389138607	12,79303
20,20456223	0,24556477	2,059588403	24,55648	66,30646819	6,759069133	12,19884
18,63732241	0,246157846	1,899828992	24,61578	66,89799446	6,819367427	12,08299
18,13835537	0,246455691	1,848965889	24,64557	68,72802409	7,00591479	11,97611
15,40322712	0,246590974	1,57015567	24,6591	76,64197495	7,812637609	11,71675
14,97855187	0,246997569	1,526865634	24,69976	79,71074685	8,125458395	11,63939
11,36840246	0,247416122	1,158858559	24,74161	88,07833185	8,978423227	11,51495

Estimated SWCC

VGM	Wetting						
θ_r	0	α_w	0,156270643				
θ_m	26,03684	n	1,508182542				
Head (h, m)	θ' (m^3/m^3)	$(\theta' - \theta)^2$		Head (h, m)	θ' (m^3/m^3)	Pressure (ψ	θ' (m^3/m^3)
19,727921	13,88385	4,660561		0,001	26,03682353	0,00981	0,260368
7,11438767	20,04461	14,12173		0,01	26,03632545	0,0981	0,260363
6,57863268	20,46783	15,45711		0,1	26,02029536	0,981	0,260203
6,30208851	20,69346	10,22349		1	25,52377658	9,81	0,255238
5,51774879	21,35983	5,61E-05		2	24,67341321	19,62	0,246734
5,04226434	21,78229	4,106894		3	23,71758719	29,43	0,237176
4,88473494	21,92516	3,790435		4	22,75132357	39,24	0,227513
4,39141313	22,38123	2,296746		5	21,82048092	49,05	0,218205
4,00082149	22,75054	1,451242		6	20,94550671	58,86	0,209455
3,62931703	23,10709	0,92917		7	20,13343852	68,67	0,201334
3,51698846	23,21566	1,419093		8	19,38443206	78,48	0,193844
3,4541147	23,27654	1,728498		9	18,69531522	88,29	0,186953
3,08918809	23,63091	1,072987		10	18,06149574	98,1	0,180615
2,78562383	23,92563	0,621862		20	13,80227503	196,2	0,138023
1,98146285	24,69054	0,002194		30	11,50837067	294,3	0,115084
2,01623287	24,65839	0,013569		40	10,04989634	392,4	0,100499
1,82659519	24,83223	0,000111		50	9,024320388	490,5	0,090243
1,63920151	24,99973	0,001182		60	8,254666402	588,6	0,082547
1,22007725	25,35348	0,125327		70	7,650425409	686,7	0,076504
1,15297267	25,40673	0,136819		80	7,160134444	784,8	0,071601
15,9212452	15,18542	0,794234		90	6,752173822	882,9	0,067522
5,80589671	21,11051	14,41375		100	6,405936219	981	0,064059
6,02720174	20,92257	4,328205		200	4,519500446	1962	0,045195
8,08079855	19,32658	0,050694		300	3,681076424	2943	0,036811
5,52978105	21,34931	0,888571		400	3,181546419	3924	0,031815
4,52308321	22,25828	1,668349		500	2,841004691	4905	0,02841
4,37448458	22,39709	1,42461		600	2,589897136	5886	0,025899
4,21665903	22,54565	1,173412		700	2,394933784	6867	0,023949
4,03583682	22,71718	0,965013		800	2,237924597	7848	0,022379
2,8104015	23,90162	0,000245		900	2,107982489	8829	0,02108
2,53678131	24,16585	0,018166		1000	1,998141377	9810	0,019981
2,21507534	24,47243	0,001843		10000	0,620173634	98100	0,006202
2,36445608	24,3308	0,024671					
2,43701869	24,26152	0,060113					
2,0595884	24,61813	0,003801					
1,89982899	24,76556	0,022432					
1,84896589	24,81193	0,027675					
1,57015567	25,06018	0,160866					
1,52686563	25,09769	0,158348					
1,15885856	25,4021	0,436249					
	$\Sigma(\theta' - \theta)^2$	88,78032					
		9,422331					

Estimated SWCC

VGM Drying

θ_r	2,75	α	1,437786589
θ_s	26,03684	n	1,373115923

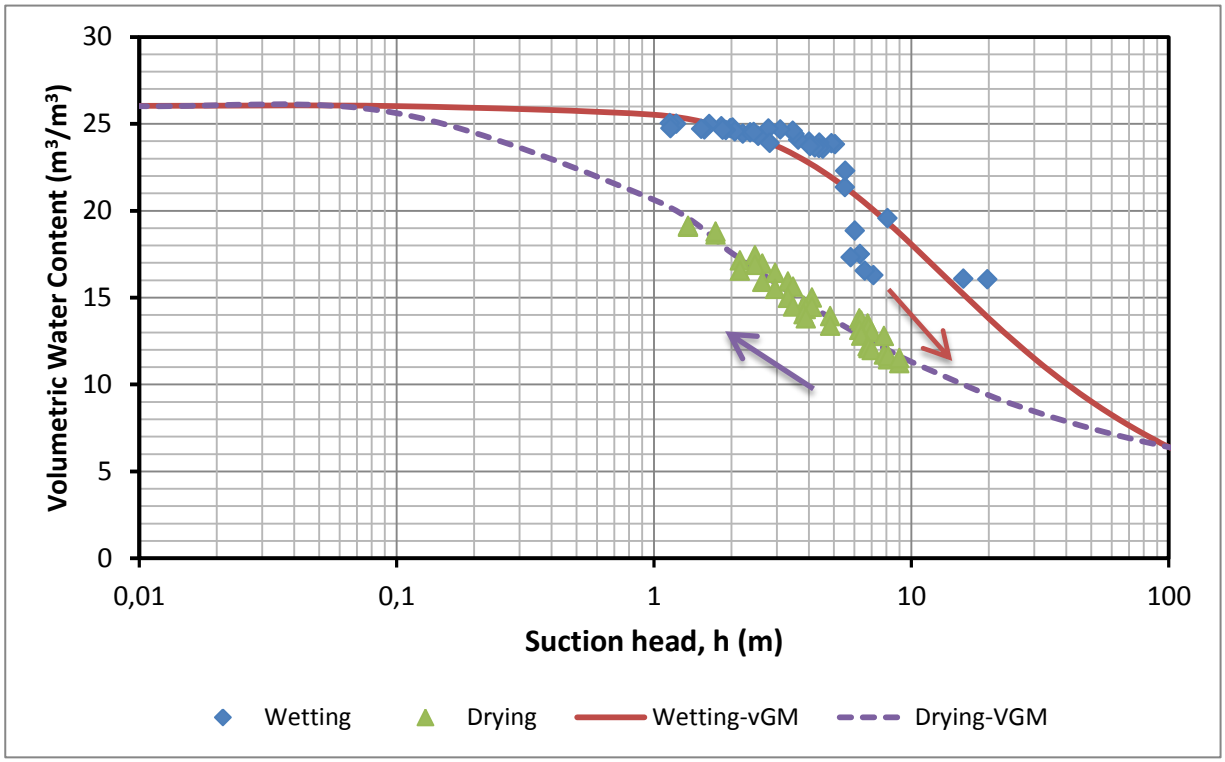
Head (h, m)	θ' (m^3/m^3)	$(\theta' - \theta)^2$
1,35755096	19,31151	0,061759
1,73671096	18,21205	0,160204
2,46671345	16,64485	0,593044
2,15385566	17,24684	0,015225
2,63629785	16,35284	0,343833
2,95214312	15,8619	0,302923
3,309449	15,37525	0,285175
3,46594318	15,18135	0,19015
4,1071848	14,48471	0,262496
3,81675804	14,78251	0,059263
3,88868804	14,70623	0,146668
4,83477548	13,84073	0,005265
6,27592769	12,86641	0,857117
6,38913861	12,80223	0,747217
6,75906913	12,60238	0,812396
6,81936743	12,57115	0,457242
7,00591479	12,47676	0,279229
7,81263761	12,1034	0,462481
8,12545839	11,97198	0,289698
8,97842323	11,64508	0,186149
1,35755096	19,31151	0,040466
1,73671096	18,21205	0,319845
2,46671345	16,64485	0,04812
2,15385566	17,24684	0,503035
2,63629785	16,35284	0,20401
2,95214312	15,8619	0,137413
3,309449	15,37525	0,167675
3,46594318	15,18135	0,496154
4,1071848	14,48471	0,001306
3,81675804	14,78251	0,555069
3,88868804	14,70623	0,830435
4,83477548	13,84073	0,226505
6,27592769	12,86641	0,074354
6,38913861	12,80223	8,46E-05
6,75906913	12,60238	0,162849
6,81936743	12,57115	0,238305
7,00591479	12,47676	0,250658
7,81263761	12,1034	0,149499
8,12545839	11,97198	0,11061
8,97842323	11,64508	0,016933
	$\Sigma(\theta' - \theta)^2$	11,05086
		3,324283

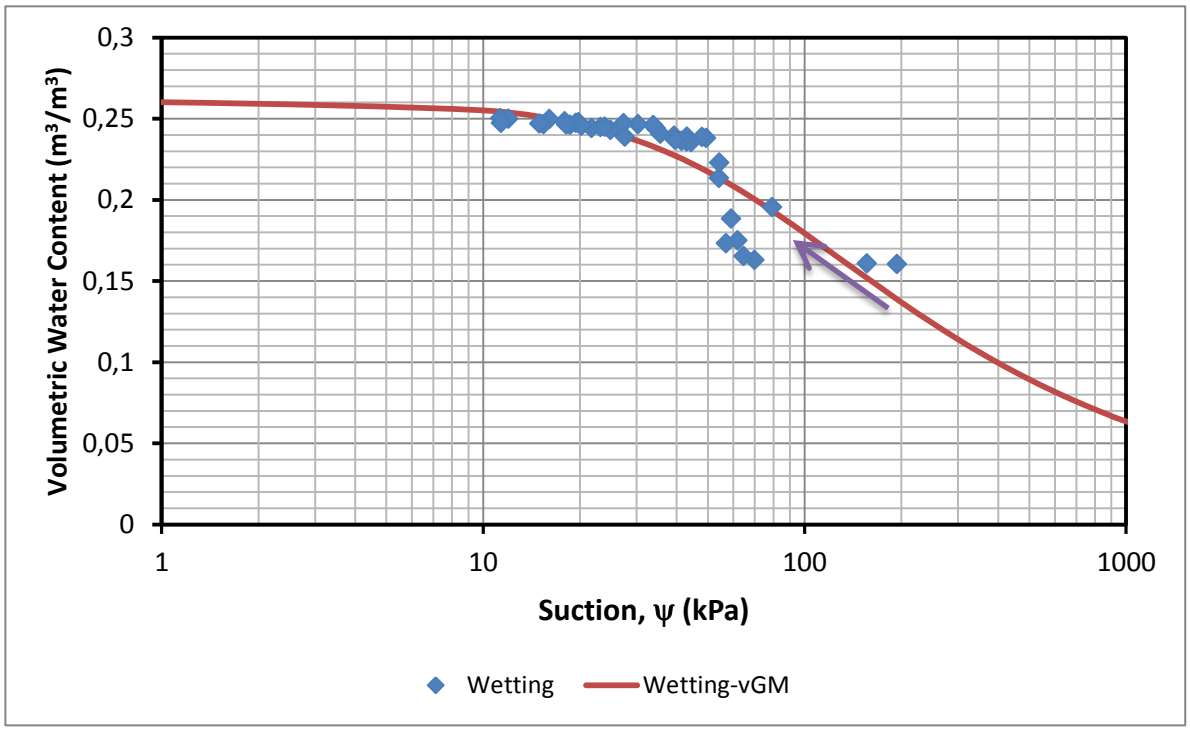
Head (h, m)	θ' (m^3/m^3)	Pressure (ψ)	θ' (m^3/m^3)
0,001	26,03604808	0,00981	0,26036
0,01	26,01818714	0,0981	0,260182
0,1	25,61419666	0,981	0,256142
1	20,62570112	9,81	0,206257
2	17,57837696	19,62	0,175784
3	15,79282081	29,43	0,157928
4	14,59151747	39,24	0,145915
5	13,71131652	49,05	0,137113
6	13,0292894	58,86	0,130293
7	12,47970591	68,67	0,124797
8	12,02387444	78,48	0,120239
9	11,63734346	88,29	0,116373
10	11,30379664	98,1	0,113038
20	9,382404919	196,2	0,093824
30	8,457751562	294,3	0,084578
40	7,879399984	392,4	0,078794
50	7,4709229	490,5	0,074709
60	7,1611995	588,6	0,071612
70	6,91511648	686,7	0,069151
80	6,713004142	784,8	0,06713
90	6,542842019	882,9	0,065428
100	6,396799578	981	0,063968
200	5,566253142	1962	0,055663
300	5,17097565	2943	0,05171
400	4,924618459	3924	0,049246
500	4,750918767	4905	0,047509
600	4,619342146	5886	0,046193
700	4,514866985	6867	0,045149
800	4,429096858	7848	0,044291
900	4,356908074	8829	0,043569
1000	4,294966376	9810	0,04295
10000	3,404347313	98100	0,034043

$$\theta(h) = \begin{cases} \theta_r + \dfrac{\theta_s - \theta_r}{[1 + |\alpha h|^n]^m} & h < 0 \\ \theta_s & h \geq 0 \end{cases}$$

$$K(h) = K_s S_e^l [1 - (1 - S_e^{1/m})^m]^2$$

$$m = 1 - 1/n \quad , \quad n > 1$$


30
25
20
15
10
5
0
Volumetric Water Content (m³/m³)
0,01
0,1
1
10
100
Suction head, h (m)
Wetting
Drying
Wetting-vGM
Drying-VGM


0,3
0,25
0,2
0,15
0,1
0,05
0
Volumetric Water Content (m³/m³)
1
10
100
1000
Suction, ψ (kPa)
Wetting
Wetting-vGM

Kadar air	13,6	**Volume**	267,5883	cm^3	g	1,340036188	g/cm3	
Gs	2,63	Wo	358,578	g		1,342870767		
			359,3365	g	gd	1,179609321	g/cm3	
		Wd	315,6496479	g		1,182104548		
			316,3173415	g				

State	Hari	Berat Benda Uji		Massa Filter Paper, W_{fp} (g) Sebelum		Sesudah		Massa Air Δw_{fp} (g)	
		A	B	A	B	A	B	A	B
Wetting	1	358,578	359,3365	0,3044	0,3232	0,4232	0,4532	0,119	0,130
Wetting	2	359,231	362,6475	0,3122	0,3106	0,4436	0,453	0,131	0,142
Wetting	3	359,899	366,7367	0,3143	0,3066	0,4545	0,452	0,140	0,145
Wetting	4	362,467	368,6355	0,3166	0,3285	0,4622	0,4533	0,146	0,125
Wetting	5	372,786	375,9680	0,3026	0,3088	0,4547	0,4638	0,152	0,155
Wetting	6	379,359	379,3342	0,3177	0,3041	0,4866	0,4764	0,169	0,172
Wetting	7	379,529	379,4432	0,3047	0,3071	0,4698	0,4844	0,165	0,177
Wetting	8	379,595	379,5455	0,3154	0,3062	0,4971	0,4866	0,182	0,180
Wetting	9	379,751	379,7345	0,3168	0,307	0,5088	0,4922	0,192	0,185
Wetting	10	380,061	380,2334	0,3122	0,30372	0,5112	0,5223	0,199	0,219
Wetting	11	380,960	381,3430	0,3274	0,3044	0,5394	0,5335	0,212	0,229
Wetting	12	381,453	381,6878	0,3124	0,3043	0,5165	0,5466	0,204	0,242
Wetting	13	381,655	381,8440	0,3144	0,3088	0,5311	0,5482	0,217	0,239
Wetting	14	381,782	381,8944	0,3121	0,3122	0,5376	0,5512	0,226	0,239
Wetting	15	381,844	382,0276	0,3127	0,3244	0,5729	0,5903	0,260	0,266
Wetting	16	381,944	382,1863	0,3176	0,3155	0,5801	0,5823	0,263	0,267
Wetting	17	382,126	382,2660	0,3119	0,3248	0,5796	0,6023	0,268	0,278
Wetting	18	382,454	382,3022	0,3106	0,3106	0,588	0,5923	0,277	0,282
Wetting	19	382,545	382,4110	0,3195	0,3248	0,6352	0,6223	0,316	0,298
Wetting	20	382,645	382,5230	0,3172	0,3214	0,6364	0,6443	0,319	0,323
Drying	1	366,660	367,4544	0,3006	0,3111	0,5873	0,6181	0,287	0,307
Drying	2	365,454	366,5640	0,3132	0,3244	0,5871	0,6178	0,274	0,293
Drying	3	362,250	361,4440	0,3222	0,3328	0,5676	0,6032	0,245	0,270
Drying	4	361,470	360,5700	0,3112	0,3688	0,5618	0,5643	0,251	0,196
Drying	5	360,977	358,8670	0,32254	0,3265	0,5613	0,5254	0,239	0,199
Drying	6	359,567	357,7700	0,32544	0,356	0,5545	0,5616	0,229	0,206
Drying	7	358,221	356,3640	0,31288	0,3289	0,5216	0,5642	0,209	0,235
Drying	8	357,440	355,0560	0,314	0,3233	0,5188	0,5565	0,205	0,233
Drying	9	355,780	354,9800	0,3109	0,3218	0,4967	0,5375	0,186	0,216
Drying	10	354,555	353,8800	0,3036	0,3235	0,4922	0,5345	0,189	0,211
Drying	11	353,977	353,2310	0,3012	0,3255	0,4865	0,4932	0,185	0,168
Drying	12	352,880	352,0800	0,3001	0,3118	0,4637	0,4636	0,164	0,152
Drying	13	352,556	351,4760	0,3234	0,3237	0,47256	0,4656	0,149	0,142
Drying	14	352,220	350,5500	0,3234	0,3377	0,4707	0,4578	0,147	0,120
Drying	15	351,784	348,9600	0,3265	0,3237	0,4693	0,4361	0,143	0,112
Drying	16	351,098	348,6500	0,3176	0,3218	0,4556	0,4287	0,138	0,107
Drying	17	350,450	348,3640	0,3175	0,3129	0,4527	0,4151	0,135	0,102

Drying	18	349,857	347,6700	0,3227	0,3276	0,4488	0,3952	0,126	0,068
Drying	19	346,245	347,4630	0,3229	0,3274	0,445	0,3822	0,122	0,055
Drying	20	345,656	347,1300	0,3231	0,3271	0,4349	0,3766	0,112	0,050

Do	5,2	cm	Hs	5,651360243	cm	eo	1,229552
Ho	12,6	cm		5,663314565	cm		1,224846
Ao	21,23716634	cm2	Hv	6,948639757	cm		
				6,936685435	cm		

Data Filter Paper

Data Kadar Air Tanah

Kadar Air w_{fp} (%)		Log Suction		Suction (kPa)		ΔW_w (g)	
A	B	A	B	A	B	A	B
39,0	40,2	2,286750329	2,19364604	193,5309055	156,1874159	0,00	0,00
42,1	45,8	1,843806534	1,755538313	69,79214309	56,95584677	0,65	3,31
44,6	47,4	1,809804645	1,771784736	64,53638655	59,1268491	1,32	7,40
46,0	38,0	1,791153506	1,899123288	61,82348832	79,2726338	3,89	9,30
50,3	50,2	1,733430932	1,734376943	54,12911567	54,24715207	14,21	16,63
53,2	56,7	1,694294618	1,647103584	49,46461322	44,37144624	20,78	20,00
54,2	57,7	1,68051001	1,632595897	47,91924975	42,9136937	20,95	20,11
57,6	58,9	1,634273304	1,616637492	43,07976284	41,3654251	21,02	20,21
60,6	60,3	1,593818182	1,597602606	39,24805883	39,59155923	21,17	20,40
63,7	72,0	1,551493914	1,440437377	35,60360008	27,57003875	21,48	20,90
64,8	75,3	1,537839951	1,395952037	34,50165683	24,88582466	22,38	22,01
65,3	79,6	1,530005762	1,337057509	33,88486517	21,72988906	22,88	22,35
68,9	77,5	1,481513359	1,365400259	30,30493514	23,19531416	23,08	22,51
72,3	76,6	1,436591477	1,378527867	27,32696982	23,90715332	23,20	22,56
83,2	82,0	1,288654941	1,305449445	19,43815052	20,20456223	23,27	22,69
82,7	84,6	1,296209698	1,270383518	19,77924444	18,63732241	23,37	22,85
85,8	85,4	1,253311318	1,258597906	17,91889884	18,13835537	23,55	22,93
89,3	90,7	1,206301352	1,187611719	16,08056679	15,40322712	23,88	22,97
98,8	91,6	1,078056338	1,175469828	11,96895786	14,97855187	23,97	23,07
100,6	100,5	1,05348802	1,05569944	11,31066189	11,36840246	24,07	23,19
95,4	98,7	1,12442515	1,079791707	13,31757495	12,01687952	8,08	8,12
87,5	90,4	1,231396552	1,191007398	17,03713449	15,52413455	6,88	7,23
76,2	81,3	1,383787709	1,315125	24,19845896	20,65974706	3,67	2,11
80,5	53,0	1,324885604	1,696368221	21,12932407	49,70135411	2,89	1,23
74,0	60,9	1,412663484	1,589595712	25,86208195	38,86831485	2,40	-0,47
70,4	57,8	1,461806416	1,632337079	28,96052403		0,99	-1,57
66,7	71,5	1,5114247	1,446189723	32,46569464	27,93764042	-0,36	-2,97
65,2	72,1	1,531490446	1,438229508	34,00090258	27,43023373	-1,14	-4,28
59,8	67,0	1,605213252	1,507105656	40,29148292	32,14442457	-2,80	-4,36
62,1	65,2	1,573363636	1,531474498	37,44239636	33,99965402	-4,02	-5,46
61,5	51,5	1,581472112	1,716470046	38,14802965	52,05591039	-4,60	-6,11
54,5	48,7	1,676045318	1,754751764	47,42914746	56,85278762	-5,70	-7,26
46,1	43,8	1,789346939	1,820202039	61,56685068	66,10008819	-6,02	-7,86
45,5	35,6	1,797111317	1,931884513	62,67744973	85,48393647	-6,36	-8,79
43,7	34,7	1,821555896	1,943232623	66,30646819	87,74706982	-6,79	-10,38
43,5	33,2	1,825413098	1,963538222	66,89799446	91,94713944	-7,48	-10,69
42,6	32,7	1,837133858	1,971060403	68,72802409	93,55357816	-8,13	-10,97

39,1	20,6	1,884466687	2,133428571	76,64197495	135,9654522	-8,72	-11,67
37,8	16,7	1,901516878	2,186037874	79,71074685	153,475082	-12,33	-11,87
34,6	15,1	1,944869081	2,207704677	88,07833185	161,3261158	-12,92	-12,21

$$e = \frac{G_s \gamma_w}{\gamma_d} - 1$$

$$S = \frac{V_w}{V_V} = \frac{wG_s}{e}$$

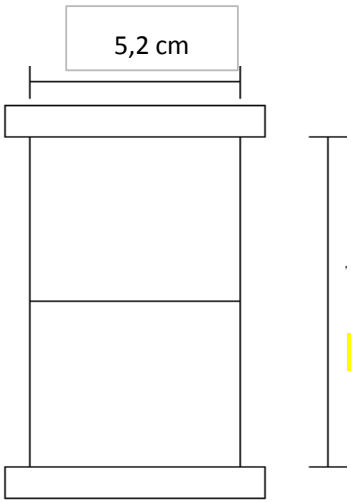
$$n = \frac{V_v}{V} =$$

w (%)		gd (g/cm3)		e		S (%)		r
A	B	A	B	A	B	A	B	A
13,6	13,6	1,179609	1,182105	1,229552	1,224846	29,09028	29,20205	0,551479
13,8068749	14,64673	1,179609	1,182105	1,229552	1,224846	29,53278	31,44961	0,551479
14,0184386	15,93949	1,179609	1,182105	1,229552	1,224846	29,98531	34,22542	0,551479
14,8320622	16,53977	1,179609	1,182105	1,229552	1,224846	31,72565	35,51435	0,551479
18,101193	18,85785	1,179609	1,182105	1,229552	1,224846	38,71829	40,49176	0,551479
20,1836601	19,92204	1,179609	1,182105	1,229552	1,224846	43,17267	42,77679	0,551479
20,2372639	19,9565	1,179609	1,182105	1,229552	1,224846	43,28732	42,85078	0,551479
20,2581731	19,98884	1,179609	1,182105	1,229552	1,224846	43,33205	42,92022	0,551479
20,3077534	20,04859	1,179609	1,182105	1,229552	1,224846	43,4381	43,04852	0,551479
20,4059319	20,20631	1,179609	1,182105	1,229552	1,224846	43,6481	43,38718	0,551479
20,690678	20,5571	1,179609	1,182105	1,229552	1,224846	44,25717	44,14039	0,551479
20,8469588	20,6661	1,179609	1,182105	1,229552	1,224846	44,59146	44,37445	0,551479
20,9109538	20,71548	1,179609	1,182105	1,229552	1,224846	44,72834	44,48048	0,551479
20,9511883	20,73141	1,179609	1,182105	1,229552	1,224846	44,8144	44,51469	0,551479
20,9708303	20,77352	1,179609	1,182105	1,229552	1,224846	44,85642	44,60511	0,551479
21,0026061	20,8237	1,179609	1,182105	1,229552	1,224846	44,92438	44,71284	0,551479
21,0601699	20,84889	1,179609	1,182105	1,229552	1,224846	45,04751	44,76694	0,551479
21,1640826	20,86034	1,179609	1,182105	1,229552	1,224846	45,26978	44,79151	0,551479
21,193007	20,89473	1,179609	1,182105	1,229552	1,224846	45,33165	44,86537	0,551479
21,2246877	20,93014	1,179609	1,182105	1,229552	1,224846	45,39941	44,94139	0,551479
16,1604337	16,16638	1,179609	1,182105	1,229552	1,224846	34,56702	34,7126	0,551479
15,7783645	15,88489	1,179609	1,182105	1,229552	1,224846	33,74978	34,10819	0,551479
14,7633151	14,26626	1,179609	1,182105	1,229552	1,224846	31,5786	30,63265	0,551479
14,5162057	13,98996	1,179609	1,182105	1,229552	1,224846	31,05003	30,03937	0,551479
14,3600199	13,45157	1,179609	1,182105	1,229552	1,224846	30,71595	28,88335	0,551479
13,9133221	13,10477	1,179609	1,182105	1,229552	1,224846	29,76047	28,13869	0,551479
13,4868999	12,66028	1,179609	1,182105	1,229552	1,224846	28,84836	27,18427	0,551479
13,2394737	12,24677	1,179609	1,182105	1,229552	1,224846	28,31911	26,29638	0,551479
12,7135742	12,22274	1,179609	1,182105	1,229552	1,224846	27,19422	26,24479	0,551479
12,3253273	11,87499	1,179609	1,182105	1,229552	1,224846	26,36376	25,4981	0,551479
12,1423713	11,66982	1,179609	1,182105	1,229552	1,224846	25,97242	25,05755	0,551479
11,794834	11,30594	1,179609	1,182105	1,229552	1,224846	25,22904	24,27623	0,551479
11,6921886	11,115	1,179609	1,182105	1,229552	1,224846	25,00949	23,86622	0,551479
11,5857415	10,82225	1,179609	1,182105	1,229552	1,224846	24,7818	23,23764	0,551479
11,4476136	10,31959	1,179609	1,182105	1,229552	1,224846	24,48634	22,15833	0,551479
11,2302841	10,22159	1,179609	1,182105	1,229552	1,224846	24,02148	21,94789	0,551479
11,0249932	10,13117	1,179609	1,182105	1,229552	1,224846	23,58236	21,75375	0,551479

10,8370316	9,911774	1,179609	1,182105	1,229552	1,224846	23,18031	21,28265	0,551479
9,69281997	9,846333	1,179609	1,182105	1,229552	1,224846	20,73285	21,14214	0,551479
9,50622068	9,741059	1,179609	1,182105	1,229552	1,224846	20,33372	20,91609	0,551479

$$\frac{e}{1+e}$$

$$\theta_w = nS = \frac{V_v}{V} \cdot \frac{V_w}{V_v} = \frac{V_w}{V}$$



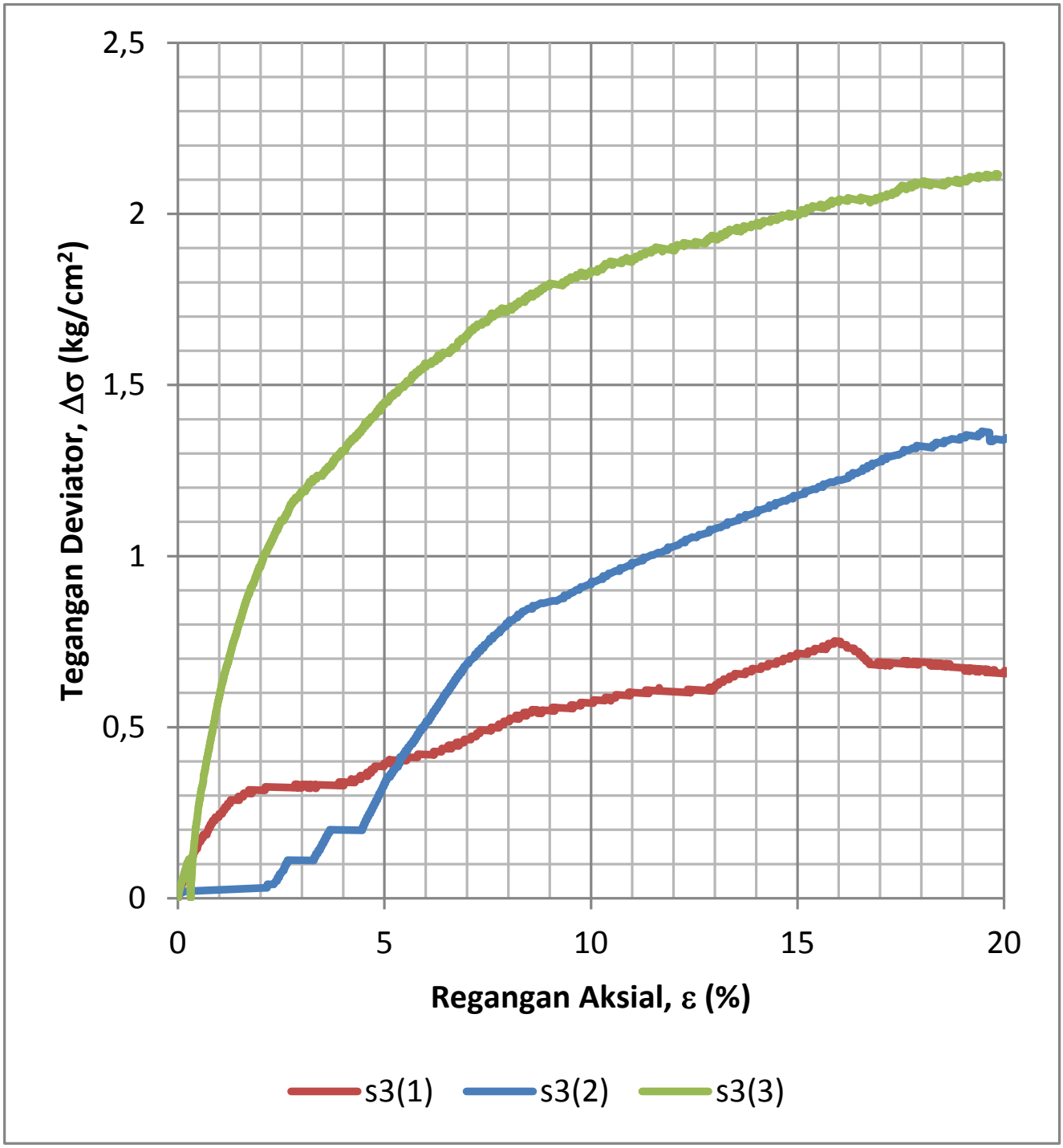
	θ_w	
B	A	B
0,550531	16,04269	16,07662
0,550531	16,28672	17,31397
0,550531	16,53628	18,84214
0,550531	17,49604	19,55174
0,550531	21,35234	22,29195
0,550531	23,80883	23,54993
0,550531	23,87207	23,59066
0,550531	23,89673	23,6289
0,550531	23,95522	23,69953
0,550531	24,07103	23,88597
0,550531	24,40692	24,30064
0,550531	24,59127	24,42949
0,550531	24,66676	24,48786
0,550531	24,71422	24,5067
0,550531	24,73739	24,55648
0,550531	24,77487	24,61578
0,550531	24,84277	24,64557
0,550531	24,96535	24,6591
0,550531	24,99947	24,69976
0,550531	25,03684	24,74161
0,550531	19,063	19,11035
0,550531	18,61231	18,7776
0,550531	17,41494	16,86421
0,550531	17,12345	16,53759
0,550531	16,93921	15,90117
0,550531	16,41228	15,49121
0,550531	15,90927	14,96577
0,550531	15,61741	14,47696
0,550531	14,99705	14,44856
0,550531	14,53907	14,03748
0,550531	14,32325	13,79495
0,550531	13,9133	13,36481
0,550531	13,79221	13,13909
0,550531	13,66665	12,79303
0,550531	13,50371	12,19884
0,550531	13,24735	12,08299
0,550531	13,00518	11,97611

0,550531	12,78346	11,71675
0,550531	11,43374	11,63939
0,550531	11,21363	11,51495

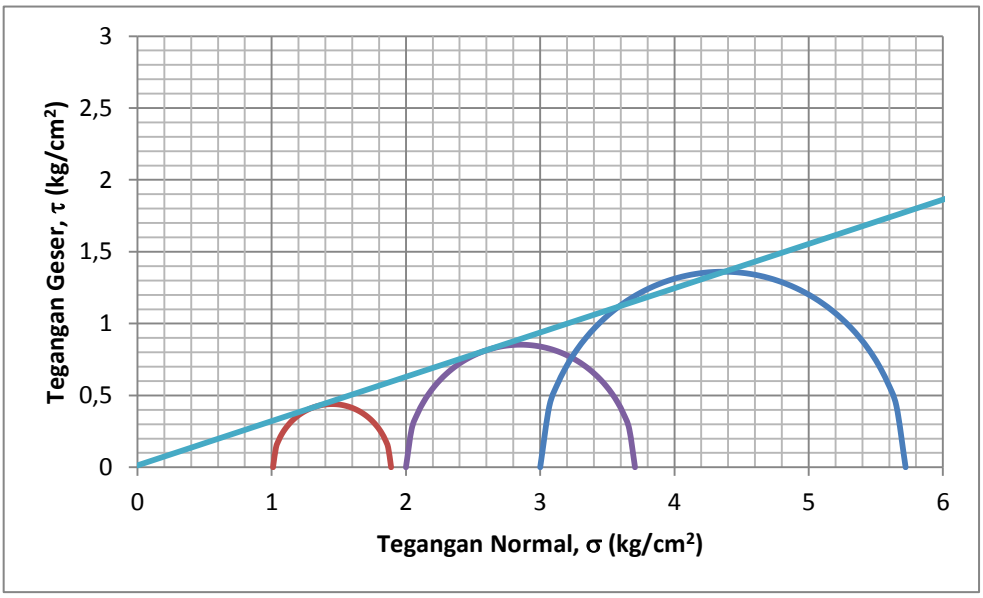
A

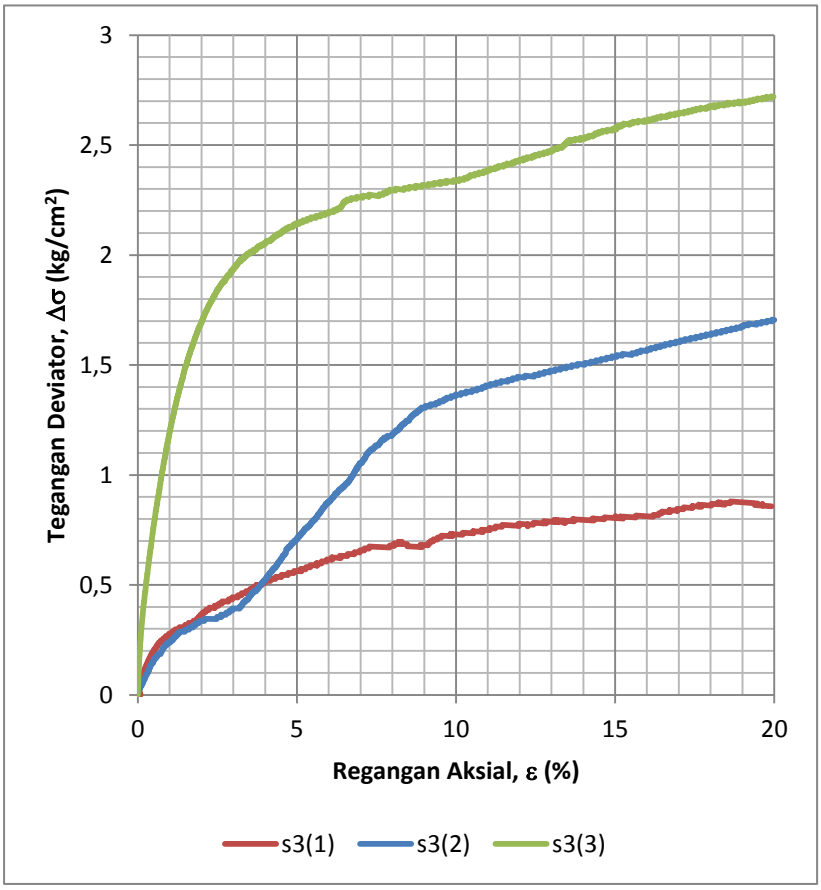
Wetting		**Drying**	
Suction (kP	qw (%)	Suction (kP	qw (%)
193,5309	16,04269	13,31757	19,063
69,79214	16,28672	17,03713	18,61231
64,53639	16,53628	24,19846	17,41494
61,82349	17,49604	21,12932	17,12345
54,12912	21,35234	25,86208	16,93921
49,46461	23,80883	28,96052	16,41228
47,91925	23,87207	32,46569	15,90927
43,07976	23,89673	34,0009	15,61741
39,24806	23,95522	40,29148	14,99705
35,6036	24,07103	37,4424	14,53907
34,50166	24,40692	38,14803	14,32325
33,88487	24,59127	47,42915	13,9133
30,30494	24,66676	61,56685	13,79221
27,32697	24,71422	62,67745	13,66665
19,43815	24,73739	66,30647	13,50371
19,77924	24,77487	66,89799	13,24735
17,9189	24,84277	68,72802	13,00518
16,08057	24,96535	76,64197	12,78346
11,96896	24,99947	79,71075	11,43374
11,31066	25,03684	88,07833	11,21363
156,1874	16,07662	13,31757	19,11035
56,95585	17,31397	17,03713	18,7776
59,12685	18,84214	24,19846	16,86421
79,27263	19,55174	21,12932	16,53759
54,24715	22,29195	25,86208	15,90117
44,37145	23,54993	28,96052	15,49121
42,91369	23,59066	32,46569	14,96577
41,36543	23,6289	34,0009	14,47696
39,59156	23,69953	40,29148	14,44856
27,57004	23,88597	37,4424	14,03748
24,88582	24,30064	38,14803	13,79495
21,72989	24,42949	47,42915	13,36481
23,19531	24,48786	61,56685	13,13909
23,90715	24,5067	62,67745	12,79303
20,20456	24,55648	66,30647	12,19884
18,63732	24,61578	66,89799	12,08299
18,13836	24,64557	68,72802	11,97611

15,40323	24,6591	76,64197	11,71675
14,97855	24,69976	79,71075	11,63939
11,3684	24,74161	88,07833	11,51495


2,5
2
1,5
1
0,5
0
0
5
10
15
20
Tegangan Deviator, Δσ (kg/cm²)
Regangan Aksial, ε (%)
s3(1)
s3(2)
s3(3)

SPECIEMENTS	dsf	S3	S1	P	Q	b	
SAMPEL 1	0,879634355	1,01	1,889634	1,449817	0,439817		
SAMPEL 2	1,706156807	1,999976	3,706132	2,853054	0,853078		0,298938226
SAMPEL 3	2,721922235	2,999972	5,721894	4,360933	1,360961		





ϕ	a	c		LINGKARAN MOHR		LINGKARAN MC
				X1	Y1	X2
17,1279	0,012838	0,013433553	1	1,01	0	1,999976
			2	1,031991	0,13733287	2,04263
		0,131783154	3	1,053982	0,191711863	2,085283
ASTM D4767 - 11			4	1,075973	0,231688075	2,127937
			5	1,097963	0,263890307	2,170591
			6	1,119954	0,290911719	2,213245
			7	1,141945	0,31409229	2,255899
	s	t	8	1,163936	0,334232118	2,298553
	0	0,013433553	9	1,185927	0,351853742	2,341207
	1	0,32160681	10	1,207918	0,367319761	2,383861
	2	0,629780067	11	1,229909	0,380892849	2,426515
	3	0,937953324	12	1,251899	0,392769299	2,469169
	4	1,246126581	13	1,27389	0,403099102	2,511823
	5	1,554299838	14	1,295881	0,411998609	2,554477
	6	1,862473095	15	1,317872	0,419558847	2,59713
	7	2,170646352	16	1,339863	0,425851151	2,639784
			17	1,361854	0,430931066	2,682438
			18	1,383845	0,434841085	2,725092
			19	1,405835	0,437612566	2,767746
			20	1,427826	0,439267062	2,8104
			21	1,449817	0,439817178	2,853054
			22	1,471808	0,439267062	2,895708
			23	1,493799	0,437612566	2,938362
			24	1,51579	0,434841085	2,981016
			25	1,537781	0,430931066	3,02367
			26	1,559771	0,425851151	3,066324
			27	1,581762	0,419558847	3,108978
			28	1,603753	0,411998609	3,151631
			29	1,625744	0,403099102	3,194285
			30	1,647735	0,392769299	3,236939
			31	1,669726	0,380892849	3,279593
			32	1,691717	0,367319761	3,322247
			33	1,713707	0,351853742	3,364901
			34	1,735698	0,334232118	3,407555
			35	1,757689	0,31409229	3,450209
			36	1,77968	0,290911719	3,492863
			37	1,801671	0,263890307	3,535517
			38	1,823662	0,231688075	3,578171
			39	1,845653	0,191711863	3,620825
			40	1,867643	0,13733287	3,663478
			41	1,889634	#NUM!	3,706132

OHR		LINGKARAN MOHR	
	Y2	x3	y3
	1,49012E-08	2,999972	#NUM!
	0,266373646	3,06802	0,42496
	0,371848255	3,136068	0,593229
	0,449386934	3,204116	0,716931
	0,511847042	3,272164	0,816577
	0,564258326	3,340212	0,900191
	0,609219836	3,408261	0,971921
	0,64828346	3,476309	1,034241
	0,682462723	3,544357	1,088769
	0,71246093	3,612405	1,136627
	0,738787569	3,680453	1,178627
	0,761823374	3,748501	1,215377
	0,781859271	3,816549	1,247341
	0,799120938	3,884597	1,27488
	0,813784931	3,952645	1,298274
	0,825989612	4,020693	1,317745
	0,835842719	4,088741	1,333464
	0,843426671	4,156789	1,345563
	0,848802294	4,224837	1,354139
	0,852011388	4,292885	1,359259
	0,853078403	4,360933	1,360961
	0,852011388	4,428981	1,359259
	0,848802294	4,497029	1,354139
	0,843426671	4,565077	1,345563
	0,835842719	4,633126	1,333464
	0,825989612	4,701174	1,317745
	0,813784931	4,769222	1,298274
	0,799120938	4,83727	1,27488
	0,781859271	4,905318	1,247341
	0,761823374	4,973366	1,215377
	0,738787569	5,041414	1,178627
	0,71246093	5,109462	1,136627
	0,682462723	5,17751	1,088769
	0,64828346	5,245558	1,034241
	0,609219836	5,313606	0,971921
	0,564258326	5,381654	0,900191
	0,511847042	5,449702	0,816577
	0,449386934	5,51775	0,716931
	0,371848255	5,585798	0,593229
	0,266373646	5,653846	0,42496
	#NUM!	5,721894	#NUM!

SEBELUM	
BERAT CAWAN	9,2
BERAT TANAH BASAH + CAWAN	67,6
BERAT TANAH KERING + CAWAN (gr)	55,92
BERAT TANAH BASAH (gr)	58,4
BERAT TANAH KERING (gr)	46,72
KADAR AIR (gr)	20

SESUDAH

No. Benda Uji :	I	II	III
Diameter, d (cm)	3,5	3,5	3,5
Tinggi, L_0 (cm)	7	7	6,9
Luas, A_0 (cm^2)	9,62113	9,621127502	9,62113
Volume, V_0 (cm^3)	67,3479	67,34789251	66,3858
Berat benda uji mula-mula, W_o (g)	115,2	114,5	115,45
Berat benda uji setelah dioven	91,4	91,21	91,21
Berat Volume, ɣ (kN/m^3)	16,7802	16,67825017	17,0603
Kadar Air Mula-mula, W_o (%)	20,6597	20,34061135	20,9961
Derajat Kejenuhan, S (%)	2,4261	2,374108053	2,47095
Berat benda uji sesudah pengujian, W_f (g)	114,9	114,22	115,5
Kadar air sesudah pengujian, W_f (%)	20,4526	20,14533357	21,0303

SEBELUM	
BERAT CAWAN	9,2
BERAT TANAH BASAH + CAWAN	63,53
BERAT TANAH KERING + CAWAN	52,59
BERAT TANAH BASAH	54,33
BERAT TANAH KERING	43,39
KADAR AIR	20,1362

SESUDAH

No. Benda Uji :	I	II	III	
Diameter, d (cm)	3,5	3,5	3,5	
Tinggi, L_0 (cm)	7	6,9	6,9	
Luas, A_0 (cm^2)	9,62113	9,621127502	9,62113	
Volume, V_0 (cm^3)	67,3479	66,38577976	66,3858	
Berat benda uji mula-mula, W_o (g)	113,78	114,24	115,45	
Berat benda uji setelah dioven	91,4	91,21	91,21	
Berat Volume, ɣ (kN/m^3)	16,5734	16,88154307	17,0603	16,83842
Kadar Air Mula-mula, W_o (%)	19,6695	20,15931373	20,9961	
Derajat Kejenuhan, S (%)	2,28135	2,347604485	2,47095	
Berat benda uji sesudah pengujian, W_f (g)	113,97	114,2	115,5	
Kadar air sesudah pengujian, W_f (%)	19,8035	20,13134851	21,0303	