PENGUJIAN KADAR AIR TANAH

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 4 Maret 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Kadar Air Tanah Asli

No.Cawan		W1	W2	W3	Berat Air	Tanah Kering	Kadar Air	Kadar Air Rata -Rata
Cawan 1	Karung 1	15.86	91.62	77.42	14.20	61.56	23.07	21.02
Cawan 2		16.17	80.43	70.18	10.25	54.01	18.98	
Cawan 1	karung 2	16.08	72.61	62.17	10.44	46.09	22.65	19.95
Cawan 2		16.89	78.81	69.70	9.11	52.81	17.25	
Cawan 1	Karung 3	16.78	97.87	85.28	12.59	68.50	18.38	18.93
Cawan 2		16.06	90.81	78.62	12.19	62.56	19.49	
Cawan 1	Karung 4	16.66	104.67	90.51	14.16	73.85	19.17	20.28
Cawan 2		17.51	111.19	94.69	16.50	77.18	21.38	
Cawan 1	Karung 5	16.58	96.99	83.41	13.58	66.83	20.32	20.01
Cawan 2		16.56	95.60	82.59	13.01	66.03	19.70	

Catatan W1 = Berat Cawan

W2 = Berat cawan + Berat tanah basah

W3 = Berat cawan + Berat tanah kering oven

PENGUJIAN BERAT JENIS *(SPECIFIC GRAVITY)*

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 31 Maret 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Pengujian Berat Jenis Tanah 0% Pasir

No. Test		7	8
No. piknometer		22	12
Berat piknometer + contoh (W2)	gr	48.53	62.33
Berat Piknometer (W1)	gr	36.79	50.79
Berat contoh (Wt)	gr	11.74	11.54
Berat piknometer + air (W3)	gr	85.88	149.26
Berat piknometer +air+contoh (W4)	gr	92.90	156.21
Gs = $\frac{? \; ? \; \overline{?} \; ?}{?? \; ? \; \overline{?} \; ?? \; ?? \; ? \; \overline{?} \; ??}$		2.49	2.51
Rata-rata		2.50	

Pengujian Berat Jenis Tanah 10% Pasir

No. Test		1	2
No. piknometer		8	7
Berat piknometer + contoh (W2)	gr	43.98	61.49
Berat Piknometer (W1)	gr	33.89	50.44
Berat contoh (Wt)	gr	10.09	11.05
Berat piknometer + air (W3)	gr	82.43	147.69
Berat piknometer +air+contoh (W4)	gr	88.54	154.28
Gs = $\frac{? \; ? \; \overline{?} \; ?}{?? \; ? \; \overline{?} \; ?? \; ?? \; ? \; \overline{?} \; ??}$		2.54	2.48
Rata-rata		2.51	

Pengujian Berat Jenis Tanah 20% Pasir

No. Test		5	6
No. piknometer		1	7
Berat piknometer + contoh (W2)	gr	60.85	42.30
Berat Piknometer (W1)	gr	50.72	31.82
Berat contoh (Wt)	gr	10.13	10.48
Berat piknometer + air (W3)	gr	152.65	80.37
Berat piknometer +air+contoh (W4)	gr	158.76	86.69
$Gs = \frac{? \; ? \; \overline{?} \; ?}{?? \; ? \; \blacksquare \; ? \; ?? \; ?? \; ? \; \blacksquare \; ? \; ??}$		2.52	2.52
Rata-rata		2.52	

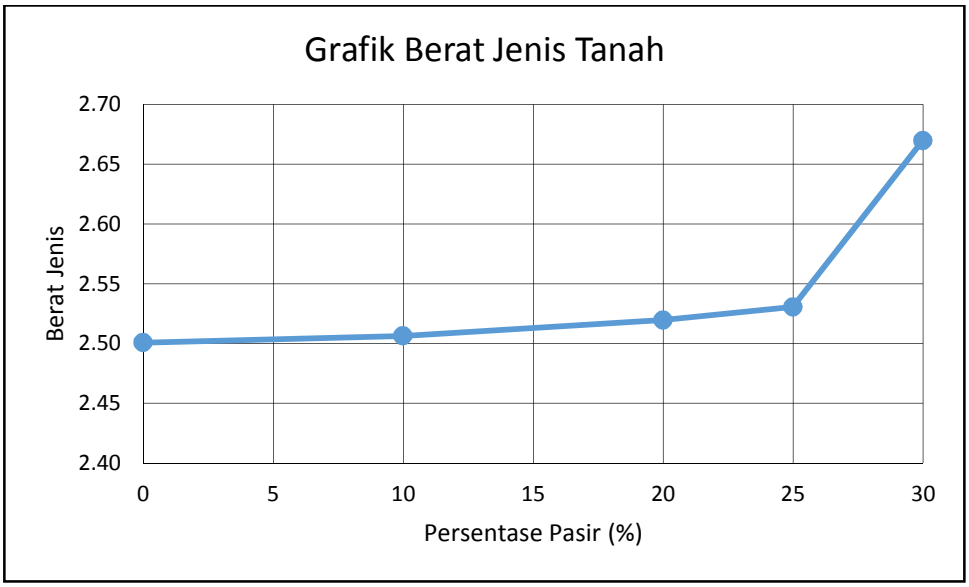
Pengujian Berat Jenis Tanah 25% Pasir

No. Test		9	10
No. piknometer		7	8
Berat piknometer + contoh (W2)	gr	62.81	43.43
Berat Piknometer (W1)	gr	50.65	31.70
Berat contoh (Wt)	gr	12.16	11.73
Berat piknometer + air (W3)	gr	147.72	81.23
Berat piknometer +air+contoh (W4)	gr	155.10	88.30
$Gs = \frac{? \; ? \; \overline{?} \; ?}{?? \; ? \; \blacksquare \; ? \; ?? \; ?? \; ? \; \blacksquare \; ? \; ??}$		2.54	2.52
Rata-rata		2.53	

Pengujian Berat Jenis Tanah 30% Pasir

No. Test		3	4
No. piknometer		1	5
Berat piknometer + contoh (W2)	gr	39.28	47.48
Berat Piknometer (W1)	gr	29.09	37.10
Berat contoh (Wt)	gr	10.19	10.38
Berat piknometer + air (W3)	gr	79.06	86.76
Berat piknometer +air+contoh (W4)	gr	85.58	93.09
$Gs = \frac{? \; ? \; \overline{?} \; ?}{?? \; ? \; \blacksquare \; ? \; ?? \; ?? \; ? \; \blacksquare \; ? \; ??}$		2.78	2.56
Rata-rata		2.67	

Hasil Grafik Berat Jenis Tanah



PENGUJIAN BATAS-BATAS KONSISTENSI *(ATTERBERG LIMIT)*

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 31 Maret 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

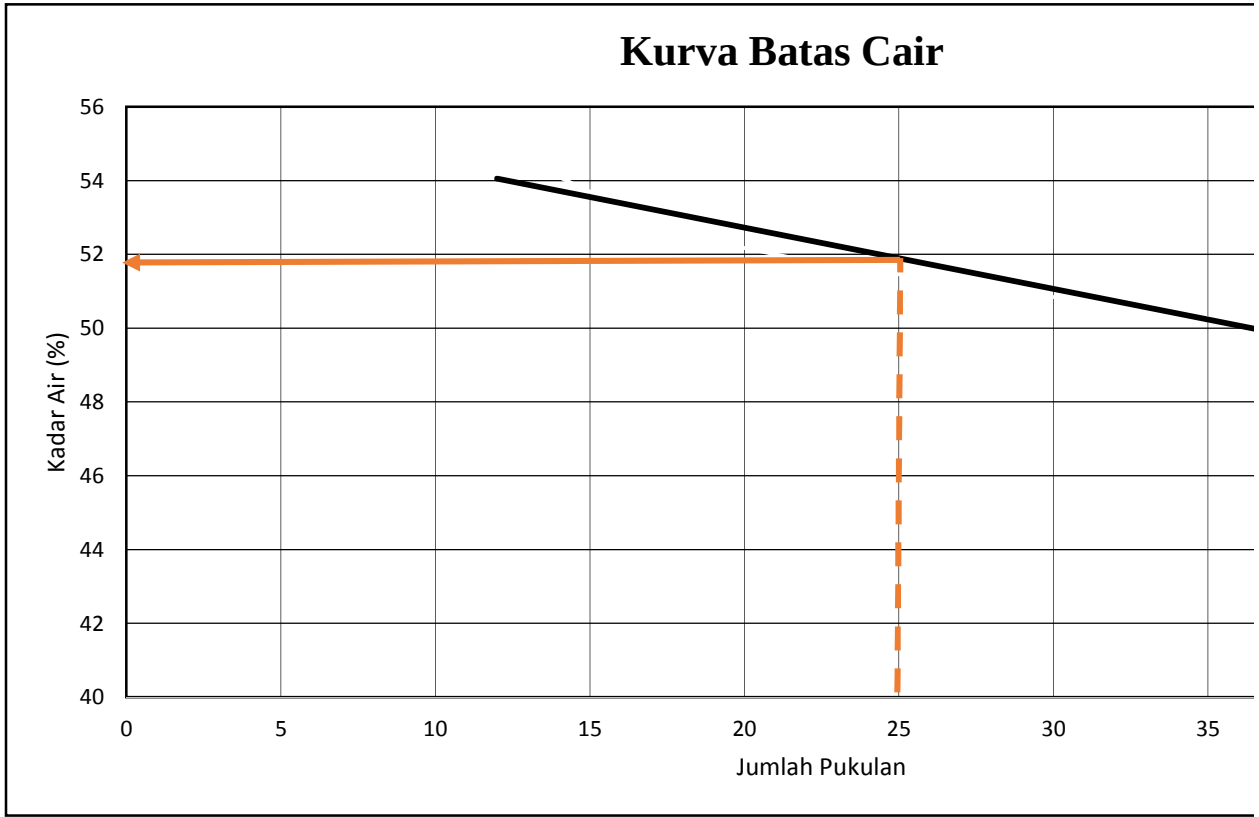
Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

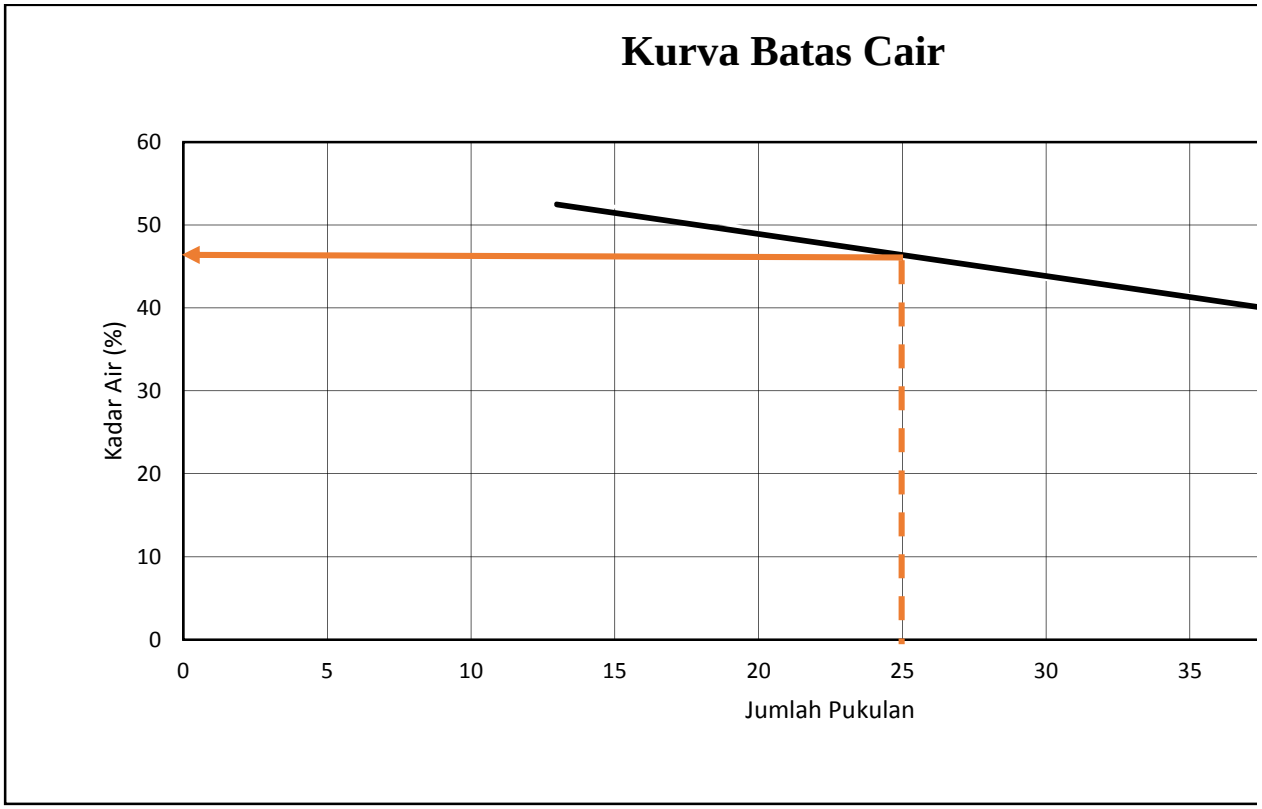
Pengujian *Atterberg Limit* 0% Pasir

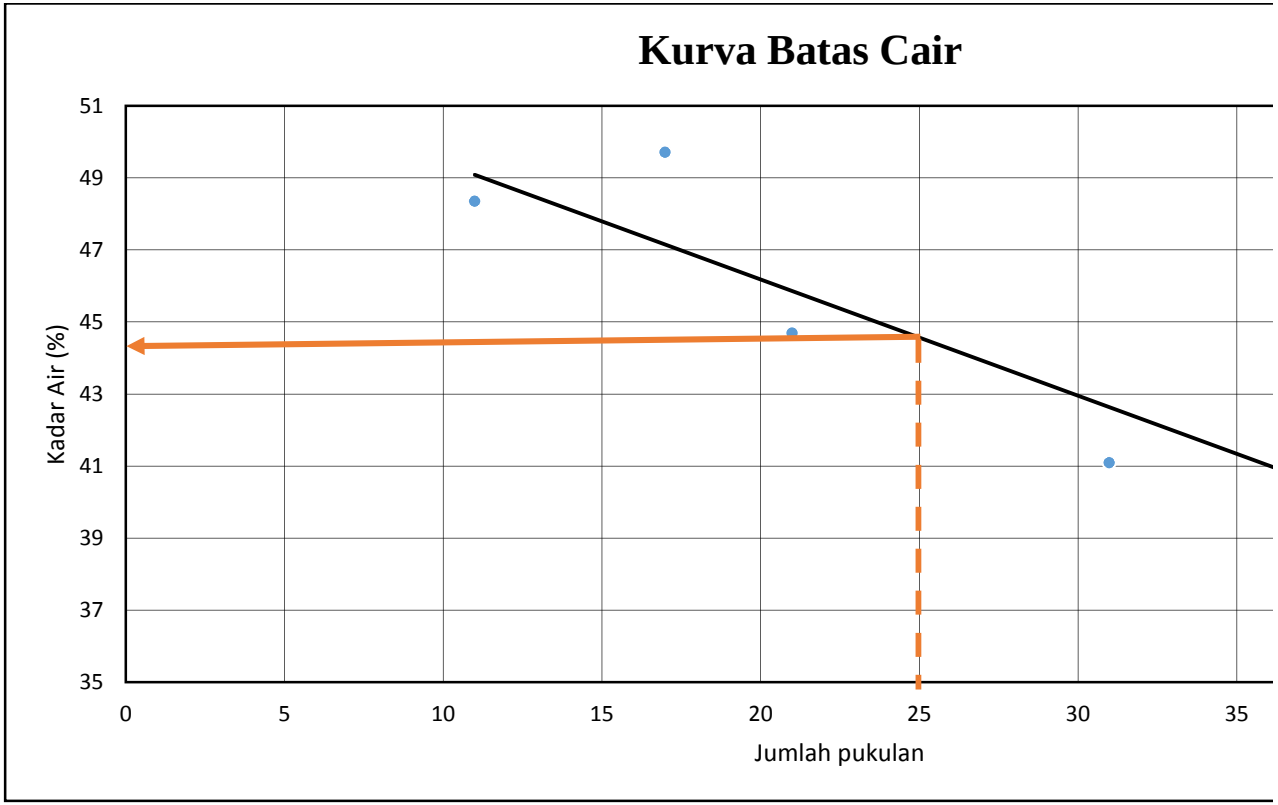
Variasi 0 %									
		batas cair					batas plastis		Batas
No. cawan		1	2	3	4	5	1	2	
Jumlah pukulan		12	18	22	32	41			
Berat cawan + tanah basah	gr	66.99	52.43	58.82	51.56	60.99	32.60	50.99	
Berat cawan + tanah kering	gr	48.94	40.07	44.38	39.79	46.05	27.66	46.05	
Berat cawan	gr	16.05	16.53	16.52	16.53	15.95	16.13	15.95	51
Berat air	gr	18.05	12.36	14.44	11.77	14.94	4.94	4.94	
Berat tanah kering	gr	32.89	23.54	27.86	23.26	30.10	11.53	30.10	
kadar air	%	54.88	52.51	51.83	50.60	49.63	42.84	16.41	
Rata-rata							29.63		

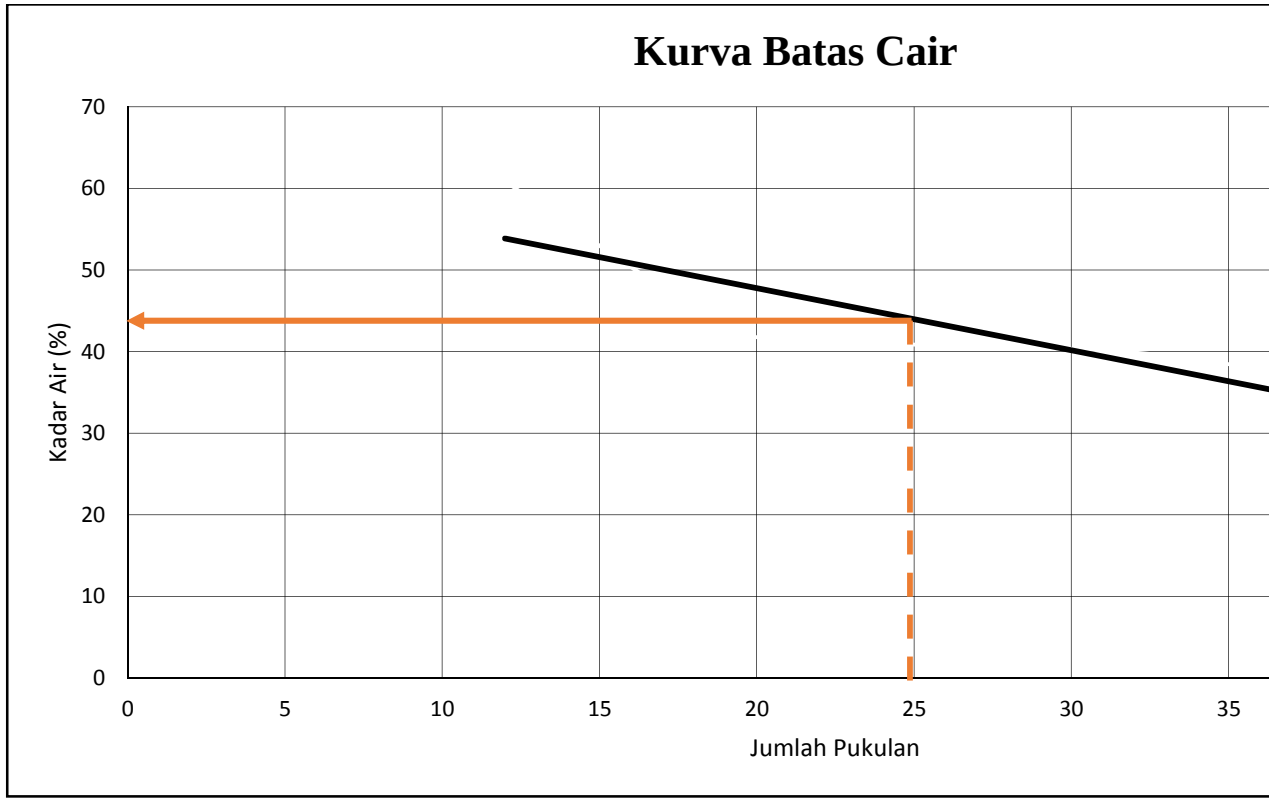
Pengujian Batas Susut 0% Pasir

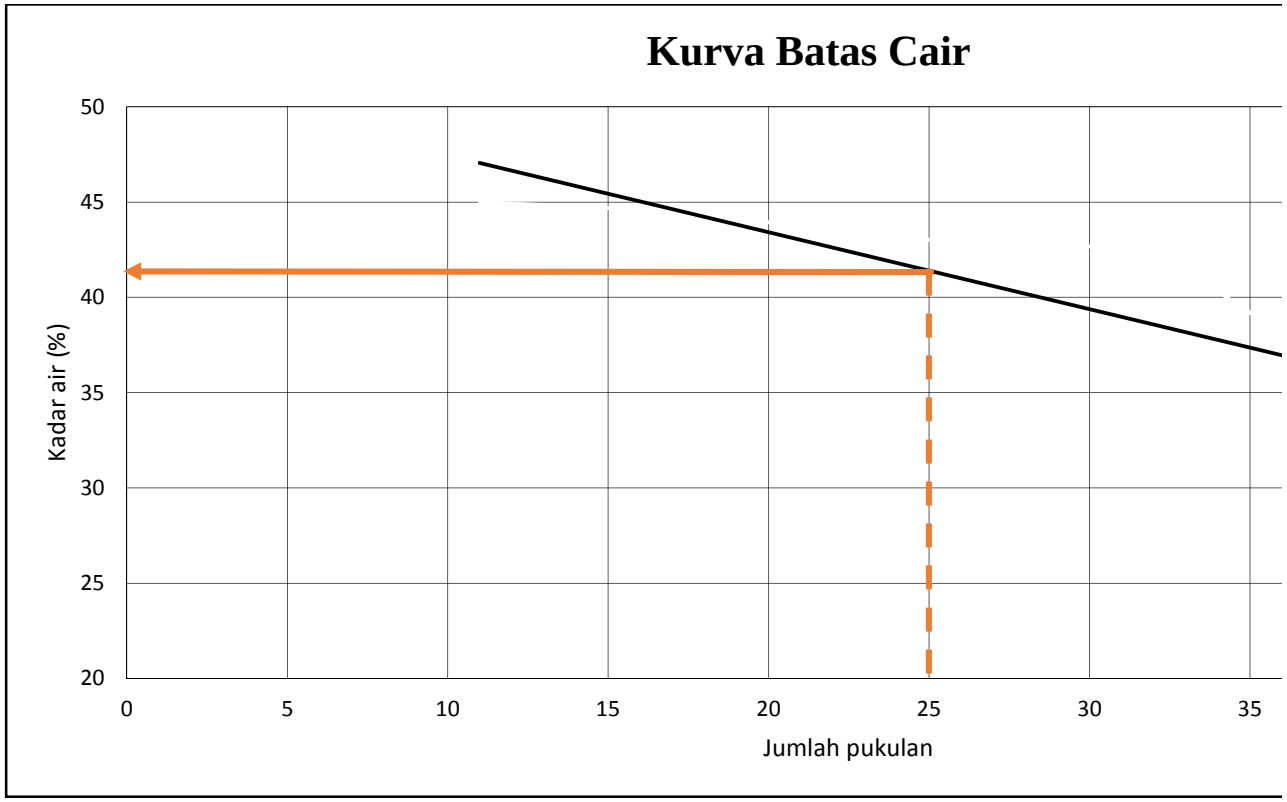
Berat Cawan Susut	W1 (gr)
Berat cawan susut + Tanah basah	W2 (gr)
Berat cawan susut + Tanah kering	W3 (gr)
Berat tanah kering	W0 = W3 - W1 (gr)
Berat cawan gelas	W4 (gr)
Massa air raksa yang didesakoleh tanah kering + cawan	W5 (gr)
Massa air raksa	W6 = W5 - W4 (gr)
Volume tanah kering	V0 = W6 / 13.6 (cm3)
Batas susut tanah	SL = (V0/W0 - 1/Gs) x 100%




Kurva Batas Cair
60
50
40
30
20
10
0
Kadar Air (%)
0
5
10
15
20
25
30
35
Jumlah Pukulan


Kurva Batas Cair
Kadar Air (%)
51
49
47
45
43
41
39
37
35
0
5
10
15
20
25
30
35
Jumlah pukulan


Kurva Batas Cair
Kadar Air (%)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
Jumlah Pukulan


Kurva Batas Cair
Kadar air (%)
50
45
40
35
30
25
20
0
5
10
15
20
25
30
35
Jumlah pukulan

Pengujian *Atterberg Limit* 10% Pasir

Variasi 10%									
		batas cair					batas plastis		Batas
No. cawan		1	2	3	4	5	1	2	
Jumlah pukulan		13	19	23	32	41			
Berat cawan + tanah basah	gr	45.88	47.66	49.89	44.32	49.30	30.75	31.49	
Berat cawan + tanah kering	gr	35.73	37.30	39.75	35.92	40.14	27.18	27.69	
Berat cawan	gr	16.63	16.60	17.54	16.30	16.53	16.02	16.29	46
Berat air	gr	10.15	10.36	10.14	8.40	9.16	3.57	3.80	
Berat tanah kering	gr	19.10	20.70	22.21	19.62	23.61	11.16	11.40	
kadar air	%	53.14	50.05	45.66	42.81	38.80	31.99	33.33	
Rata-rata							32.66		

Pengujian Batas Susut 10% Pasir

Berat Cawan Susut	W1 (gr)
Berat cawan susut + Tanah basah	W2 (gr)
Berat cawan susut + Tanah kering	W3 (gr)
Berat tanah kering	W0 = W3 - W1 (gr)
Berat cawan gelas	W4 (gr)
Massa air raksa yang didesakoleh tanah kering + cawan	W5 (gr)
Massa air raksa	W6 = W5 - W4 (gr)
Volume tanah kering	V0 = W6 / 13.6 (cm3)
Batas susut tanah	SL = (V0/W0 - 1/Gs) x 100%

Pengujian *Atterberg Limit* 20% Pasir

Variasi 20%									
		batas cair					batas plastis		Bata
No. cawan		1	2	3	4	5	1	2	
Jumlah pukulan		11	17	21	31	42			
Berat cawan + tanah basah	Gr	49.20	42.47	48.68	45.26	48.21	34.79	34.80	
Berat cawan + tanah kering	Gr	38.36	33.83	39.09	36.82	39.13	30.06	29.92	
Berat cawan	Gr	15.94	16.45	17.63	16.28	16.40	16.52	16.02	44
Berat air	Gr	10.84	8.64	9.59	8.44	9.08	4.73	4.88	
Berat tanah kering	Gr	22.42	17.38	21.46	20.54	22.73	13.54	13.90	
kadar air	%	48.35	49.71	44.69	41.09	39.95	34.93	35.11	
Rata-rata							35.02		

Pengujian Batas Susut 20% Pasir

Berat Cawan Susut	W1 (gr)
Berat cawan susut + Tanah basah	W2 (gr)
Berat cawan susut + Tanah kering	W3 (gr)
Berat tanah kering	W0 = W3 - W1 (gr)
Berat cawan gelas	W4 (gr)
Massa air raksa yang didesakoleh tanah kering + cawan	W5 (gr)
Massa air raksa	W6 = W5 - W4 (gr)
Volume tanah kering	V0 = W6 / 13.6 (cm3)
Batas susut tanah	SL = (V0/W0 - 1/Gs) x100%

Pengujian *Atterberg Limit* 25% Pasir

Variasi 25%									
		batas cair					batas plastis		Batas
No. cawan		1	2	3	4	5	1	2	
Jumlah pukulan		12	19	22	33	42			
Berat cawan + tanah basah	gr	43.58	49.19	49.15	51.69	44.57	30.56	30.42	
Berat cawan + tanah kering	gr	33.43	39.24	39.55	41.86	37.67	26.73	26.92	
Berat cawan	gr	16.74	16.19	16.27	16.98	16.62	16.17	16.62	43
Berat air	gr	10.15	9.95	9.60	9.83	6.90	3.83	3.50	
Berat tanah kering	gr	16.69	23.05	23.28	24.88	21.05	10.56	10.30	
kadar air	%	60.81	43.17	41.24	39.51	32.78	36.27	33.98	
Rata-rata							35.12		

Pengujian Batas Susut 25% Pasir

Berat Cawan Susut	W1 (gr)
Berat cawan susut + Tanah basah	W2 (gr)
Berat cawan susut + Tanah kering	W3 (gr)
Berat tanah kering	W0 = W3 - W1 (gr)
Berat cawan gelas	W4 (gr)
Massa air raksa yang didesakoleh tanah kering + cawan	W5 (gr)
Massa air raksa	W6 = W5 - W4 (gr)
Volume tanah kering	V0 = W6 / 13.6 (cm3)
Batas susut tanah	SL = (V0/W0 - 1/Gs) x 100%

Pengujian *Atterberg Limit* 30% Pasir

Variasi 30 %									
		batas cair					batas plastis		Bata
No. cawan		1	2	3	4	5	1	2	
Jumlah pukulan		11	18	23	32	42			
Berat cawan + tanah basah	Gr	43.28	42.58	44.67	45.51	45.07	30.80	31.30	
Berat cawan + tanah kering	Gr	35.00	34.49	36.33	36.87	38.23	26.46	28.35	
Berat cawan	Gr	16.60	16.29	17.01	16.55	16.47	16.38	16.94	41
Berat air	Gr	8.28	8.09	8.34	8.64	6.84	4.34	2.95	
Berat tanah kering	Gr	18.40	18.20	19.32	20.32	21.76	10.08	11.41	
kadar air	%	45.00	44.45	43.17	42.52	31.43	43.06	25.85	
Rata-rata							34.46		

Pengujian Batas Susut 30% Pasir

Berat Cawan Susut	W1 (gr)
Berat cawan susut + Tanah basah	W2 (gr)
Berat cawan susut + Tanah kering	W3 (gr)
Berat tanah kering	W0 = W3 - W1 (gr)
Berat cawan gelas	W4 (gr)
Massa air raksa yang didesakoleh tanah kering + cawan	W5 (gr)
Massa air raksa	W6 = W5 - W4 (gr)
Volume tanah kering	V0 = W6 / 13.6 (cm3)
Batas susut tanah	SL = (V0/W0 - 1/Gs) x 100%

PENGUJIAN ANALISA SARINGAN DAN HIDROMETER

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 31 Maret 2016 / 11 Mei 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Pengujian analisa saringan 0% pasir

Sieve No.	Opening (mm)	Mass retained (gr)	Mass passing (gr)	% finer by mass e/W x 100%	
4	4,75	d_1 = 0,00	e_1= 50,00	100,00	e_7=W-Sd
10	2,36	d_2 = 0,01	e_2= 49,99	99,98	e_6=d_7+e_7
20	1,18	d_3 = 0,02	e_3= 49,97	99,94	e_5=d_6+e_6
40	0,425	d_4 = 0,13	e_4= 49,84	99,68	e_4=d_5+e_5
60	0,300	d_5 = 0,35	e_5= 49,49	98,98	e_3=d_4+e_4
140	0,150	d_6 = 0,44	e_6= 49,05	98,10	e_2=d_3+e_3
200	0,075	d_7 = 0,70	e_7= 48,35	96,70	e_1=d_2+e_2
		Σd= 1,65			

Pengujian analisa saringan 10% pasir

Sieve No.	Opening (mm)	Mass retained (gr)	Mass passing (gr)	% finer by mass e/W x 100%	
4	4,75	d_1= 0,00	e_1= 50,00	100,00	e_7=W-Sd
10	2,36	d_2= 0,02	e_2= 49,98	99,96	e_6=d_7+e_7
20	1,18	d_3= 0,07	e_3= 49,91	99,82	e_5=d_6+e_6
40	0,425	d_4= 0,33	e_4= 49,58	99,16	e_4=d_5+e_5
60	0,300	d_5= 0,49	e_5= 49,09	98,18	e_3=d_4+e_4
140	0,150	d_6= 0,67	e_6= 48,42	96,84	e_2=d_3+e_3
200	0,075	d_7= 0,96	e_7= 47,46	94,92	e_1=d_2+e_2
		Σd= 2,54			

Pengujian analisa saringan 20% pasir

Sieve No.	Opening (mm)	Mass retained (gr)	Mass passing (gr)	% finer by mass e/W x 100%	
4	4,75	d_1= 0,00	e_1= 50,00	100,00	e_7=W-Sd
10	2,36	d_2= 0,03	e_2= 49,97	99,94	e_6=d_7+e_7
20	1,18	d_3= 0,08	e_3= 49,89	99,78	e_5=d_6+e_6
40	0,425	d_4= 0,35	e_4= 49,54	99,08	e_4=d_5+e_5
60	0,300	d_5= 0,66	e_5= 48,88	97,76	e_3=d_4+e_4
140	0,150	d_6= 0,83	e_6= 48,05	96,10	e_2=d_3+e_3
200	0,075	d_7= 1,05	e_7= 47,00	94,00	e_1=d_2+e_2
		Σd= 3,0			

Pengujian analisa saringan 25% pasir

Sieve No.	Opening (mm)	Mass retained (gr)	Mass passing (gr)	% finer by mass e/W x 100%	
4	4,75	d_1 = 0	e_1= 50,00	100,00	e_7=W-Sd
10	2,36	d_2 = 0,03	e_2= 49,97	99,94	e_6=d_7+e_7
20	1,18	d_3 = 0,25	e_3= 49,72	99,44	e_5=d_6+e_6
40	0,425	d_4 = 0,53	e_4= 49,19	98,38	e_4=d_5+e_5
60	0,300	d_5 = 0,76	e_5= 48,43	96,86	e_3=d_4+e_4
140	0,150	d_6 = 0,94	e_6= 47,49	94,98	e_2=d_3+e_3
200	0,075	d_7 = 1,12	e_7= 46,37	92,74	e_1=d_2+e_2
		Σd = 3,63			

Pengujian analisa saringan 30% pasir

Sieve No.	Opening (mm)	Mass retained (gr)	Mass passing (gr)	% finer by mass e/W x 100%	
4	4,75	d_1= 0,00	e_1= 50,00	100,00	e_7=W-Sd
10	2,36	d_2= 0,13	e_2= 49,87	99,74	e_6=d_7+e_7
20	1,18	d_3= 0,34	e_3= 49,53	99,06	e_5=d_6+e_6
40	0,425	d_4= 0,64	e_4= 48,89	97,78	e_4=d_5+e_5
60	0,300	d_5= 0,85	e_5= 48,04	96,08	e_3=d_4+e_4
140	0,150	d_6= 0,88	e_6= 47,16	94,32	e_2=d_3+e_3
200	0,075	d_7= 1,18	e_7= 45,98	91,96	e_1=d_2+e_2
		Σd= 4,0			

ANALISA PENGENDAPAN HIDROMETER

Tipe hydrometer : 152 H

Koreksi miniskus hidrometer m = 1

Berat jenis tanah G = 2.51

Koreksi hidrometer 152 H a = 1,03

K2 = (a/M) x 100

Raegen (NaSi03/NaP03) : 1 ml/gr

Pasir : 0%

K2 = 2,060

Massa total kering Oven y untuk hidrometer 152 H

Waktu T (Menit)	Pembacaan Hidrometer dalam suspensi R1	Pembacaan Hidrometer dalam suspensi R2	Temperatur (◦C)	Pembacaan Hidrometer Terkoreksi meniskus R' =R1+m	Kedalaman L (*)	Konstan K (**)	Diameter butir D = K √(L/T)	
2	23	-1	28	24	12,4	0,01304	0,03247	
5	22	-1	28	23	12,5	0,01304	0,02062	
15	20	-1	28	21	12,0	0,01304	0,01166	
30	18	-1	28	19	13,2	0,01304	0,00865	
60	16,5	-1	28	17,5	13,4	0,01304	0,00616	
120	15	-1	28	16	13,7	0,01304	0,00441	
250	13	-1	28	14	14,0	0,01304	0,00309	
1440	11	-1	28	12	14,3	0,01304	0,00130	

(*) dibaca dari daftar 2 berdasarkan R'

(**) dibaca dari daftar 3 berdasarkan t dan G

(***) dihitung berdasarkan rumus : untuk hidromter 152 H : P = K2 x R

ANALISA PENGENDAPAN/HIDROMETER

Tipe hidrometer : 152 H

Koreksi miniskus hidrometer m = 1

Berat jenis tanah G = 2,51

Koreksi hidrometer 152 H a = 1,028

K2 = (a/M) x 100

Raegen (NaSi03/NaP03) : 1 ml/gr

Pasir : 10%

K2 = 2,056

Massa total kering Oven ya untuk hidrometer 152 H

Waktu T (Menit)	Pembacaan Hidrometer dalam suspensi R1	Pembacaan Hidrometer dalam suspensi R2	Temperatur (◦C)	Pembacaan Hidrometer Terkoreksi meniskus R' =R1+m	Kedalaman L (*)	Konstan K (**)	Diameter butir D = K √(L/T)	Pe Hi te R
2	21	-1	28	22	12,687	0,01300	0,03274	
5	20	-1	28	21	12,851	0,01300	0,02084	
15	16,5	-1	28	17,5	13,425	0,01300	0,01230	
30	16	-1	28	17	13,507	0,01300	0,00872	
60	13	-1	28	14	13,999	0,01300	0,00628	
120	12,5	-1	28	13,5	14,081	0,01300	0,00445	
250	11,5	-1	28	12,5	14,245	0,01300	0,00310	
1440	9	-1	28	10	14,655	0,01300	0,00131	

(*) dibaca dari daftar 2 berdasarkan R'

(**) dibaca dari daftar 3 berdasarkan t dan G

(***) dihitung berdasarkan rumus : untuk hidromter 152 H : P = K2 x R

ANALISA PENGENDAPAN/HIDROMETER

Tipe hidrometer : 152 H

Koreksi miniskus hidrometer m = 1

Berat jenis tanah G = 2.52

Koreksi hidrometer 152 H a = 1.026

K2 = (a/M)

Raegen (NaSi03/NaP03) : 1 ml/gr x 100

Pasir : 20% K2 = 2,052

Massa total kering Oven ya
untuk hidrometer 152 H

Waktu T (Menit)	Pembacaan Hidrometer dalam suspensi R1	Pembacaan Hidrometer dalam suspensi R2	Temperatur (◦C)	Pembacaan Hidrometer Terkoreksi meniskus R' =R1+m	Kedalaman L (*)	Konstan K (**)	Diameter butir D = K √(L/T)	P P
2	17	-1	28	18	13,5	0,01296	0,03367	
5	17	-1	28	18	13,5	0,01296	0,02130	
15	16	-1	28	17	13,7	0,01296	0,01239	
30	15	-1	28	16	13,8	0,01296	0,00879	
60	12,5	-1	28	13,5	14,1	0,01296	0,00628	
120	11	-1	28	12	14,5	0,01296	0,00451	
250	10	-1	28	11	14,7	0,01296	0,00314	
1440	8	-1	28	9	15	0,01296	0,00132	

(*) dibaca dari daftar 2 berdasarkan R'

(**) dibaca dari daftar 3 berdasarkan t dan G

(***) dihitung berdasarkan rumus : untuk hidromter 152 H : P = K2 x R

ANALISA PENGENDAPAN/HIDROMETER

Tipe hidrometer	: 152 H		Massa total kerin
Koreksi miniskus hidrometer		m = 1	untuk hidrometer
Berat jenis tanah		G = 2.53	
Koreksi hidrometer 152 H		a = 1.024	
Raegen (NaSi03/NaP03)	: 1 ml/gr	K2 = (a/M) x 100	
Pasir	: 25%	K2 = 2.048	

Waktu T (Menit)	Pembacaan Hidrometer dalam suspensi R1	Pembacaan Hidrometer dalam suspensi R2	Temperatur (◦C)	Pembacaan Hidrometer Terkoreksi meniskus R' =R1+m	Kedalaman L (*)	Konstan K (**)	Diameter bu D = K √(L/
2	16,5	-1	28	17,5	13,6	0,012910	0,03367
5	16	-1	28	17	13,7	0,012910	0,02137
15	15,5	-1	28	16,5	13,75	0,012910	0,01236
30	13	-1	28	14	14,2	0,012910	0,00888
60	10,5	-1	28	11,5	14,6	0,012910	0,00637
120	9	-1	28	10	14,8	0,012910	0,00453
250	7,5	-1	28	8,5	15,1	0,012910	0,00317
1440	6	-1	28	7	15,3	0,012910	0,00133

(*) dibaca dari daftar 2 berdasarkan R'

(**) dibaca dari daftar 3 berdasarkan t dan G

(***) dihitung berdasarkan rumus : untuk hidromter 152 H : P = K2 x R

Tipe hydrometer	: 152 H		Massa total ker
Koreksi miniskus hidrometer		m = 1	untuk hidromet
Berat jenis tanah		G = 2,67	
Koreksi hidrometer 152 H		a = 0,996	
Raegen (NaSi03/NaP03)	: 1 ml/gr	K2 = (a/M) x 100	
Pasir	: 30%	K2 = 1,992	

Waktu T (Menit)	Pembacaan Hidrometer dalam suspensi R1	Pembacaan Hidrometer dalam suspensi R2	Temperatur (◦C)	Pembacaan Hidrometer Terkoreksi meniskus R' =R1+m	Kedalaman L (*)	Konstan K (**)	Diameter b D = K √(L
2	17,5	-1	28	18,5	13,25	0,012360	0,0318
5	17	-1	28	18	13,3	0,012360	0,0201
15	14,5	-1	28	15,5	13,75	0,012360	0,0118
30	14	-1	28	15	13,8	0,012360	0,0083
60	12	-1	28	13	14,2	0,012360	0,0060
120	10	-1	28	11	14,5	0,012360	0,0043
250	8,5	-1	28	9,5	14,75	0,012360	0,0030
1440	6,5	-1	28	7,5	15,1	0,012360	0,0012

(*) dibaca dari daftar 2 berdasarkan R'

(**) dibaca dari daftar 3 berdasarkan t dan G

(***) dihitung berdasarkan rumus : untuk hidromter 152 H : P = K2 x R

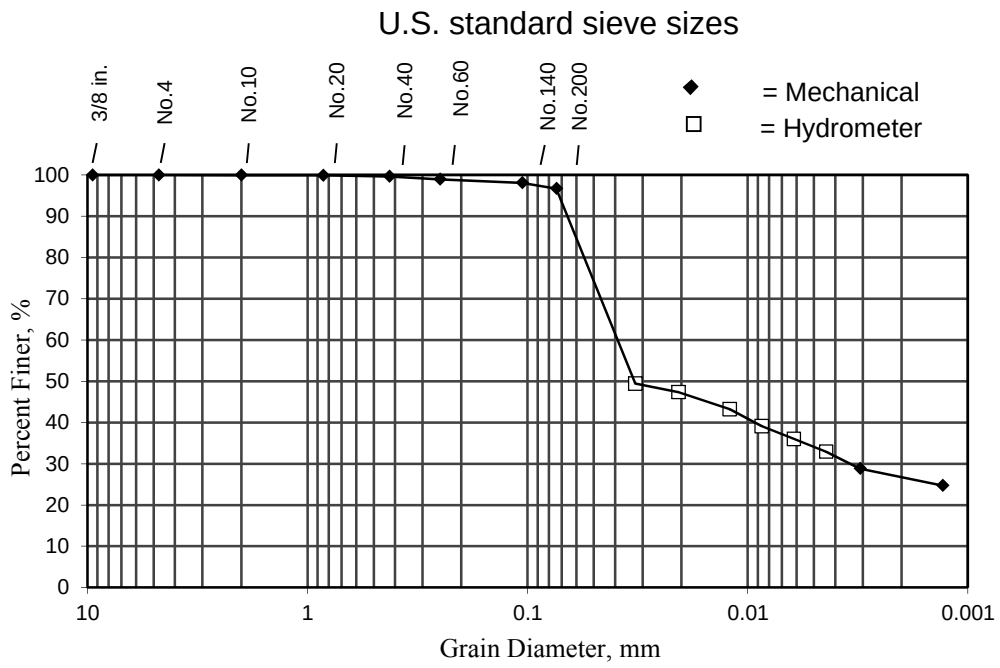
Grafik Grain Size Analysis 0% Pasir

GRAIN SIZE ANALYSIS

Specific Gravity 2,50

Description of soil bahan tambah 0%

Gravel	Sand		Fines
	Coarse to medium	Fine	



Finer # 200	=	96,70	%
Gravel	=	0,00	%
Sand	=	3,30	%
Silt/Clay	=	96,70	%

SOIL MECHANICS LABORATORY - CIVIL ENGINEERING DEPT- STATE POLYTECHIC OF SRIWIJAYA

PENGUJIAN PEMADATAN

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 5 April 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Pengujian pemadatan 0% Pasir		I	II	III	
Kadar air asumsi	%	0	2	4	
Kadar air, w	%	23.36	25.46	26.48	2
Berat tanah + cetakan	gr	3520	3565	3600	
Berat cetakan	gr	2000	2000	2000	
Berat tanah	gr	1520	1565	1600	
Berat isi basah	gr/cm^3	1.624	1.672	1.710	
Berat isi kering	gr/cm^3	**1.317**	**1.333**	**1.352**	1
Berat tanah kering	Gr	1232	1247	1265	
Volume tanah kering	cm^3	493	499	506	
Volume pori	cm^3	443	437	430	
Angka pori	-	0.90	0.88	0.85	
Porositas	%	0.47	0.47	0.46	
Derajat kejenuhan	%	64.99	72.71	77.94	8
ZAV	gr/cm^3	1.578	1.528	1.504	

Perhitungan kadar air 0% pasir		I		II		III		
No. Cawan		1	2	1	2	1	2	1
B. cawan + t. basah	gr	95.38	104.00	93.80	97.64	94.28	94.30	97.91
B. cawan + t. kering	gr	79.60	88.58	78.17	81.31	78.11	77.91	79.08
Berat air	gr	15.78	15.42	15.63	16.33	16.17	16.39	18.83
Berat cawan	gr	17.22	16.63	17.19	16.74	16.32	16.71	16.42
Berat tanah kering	gr	62.38	71.95	60.98	64.57	61.79	61.20	62.66
Kadar air, w	%	25.30	21.43	25.63	25.29	26.17	26.78	30.05
Kadar air rata-rata, w	%	23.36		25.46		26.48		

Pengujian pemadatan 10% pasir		I	II	III	
Kadar air asumsi	%	2	4	6	
Kadar air, w	%	22.51	23.77	25.30	2
Berat tanah + cetakan	Gr	3580	3610	3670	3
Berat cetakan	Gr	2010	2010	2010	2
Berat tanah	Gr	1570	1600	1660	1
Berat isi basah	gr/cm^3	1.678	1.710	1.774	1
Berat isi kering	gr/cm^3	**1.369**	**1.381**	**1.416**	**1**
Berat tanah kering	Gr	1282	1293	1325	1
Volume tanah kering	cm^3	511	515	528	5
Volume pori	cm^3	425	421	408	4
Angka pori		0.83	0.82	0.77	0
Porositas		0.45	0.45	0.44	0
Derajat kejenuhan	%	67.84	73.03	82.17	8
ZAV	gr/cm^3	1.604	1.572	1.535	1

Perhitungan kadar air 10% pasir		I		II		III		
No. Cawan		1	2	1	2	1	2	1
B. cawan + t. basah	Gr	98.16	114.35	96.78	110.29	82.21	91.70	106.25
B. cawan + t. kering	Gr	82.74	96.79	81.41	92.19	69.06	76.44	86.30
Berat air	Gr	15.42	17.56	15.37	18.10	13.15	15.26	19.95
Berat cawan	Gr	16.43	16.12	16.45	16.39	16.69	16.59	16.63
Berat tanah kering	Gr	66.31	80.67	64.96	75.80	52.37	59.85	69.67
Kadar air, w	%	23.25	21.77	23.66	23.88	25.11	25.50	28.63
Kadar air rata-rata, w	%	22.51		23.77		25.30		2

Pengujian pemadatan 20% Pasir		I	II	III	
Kadar air asumsi	%	0	2	4	
Kadar air, w	%	19.92	21.85	23.13	2
Berat tanah + cetakan	gr	3520	3630	3700	3
Berat cetakan	gr	2010	2010	2010	2
Berat tanah	gr	1510	1620	1690	1
Berat isi basah	gr/cm^3	1.614	1.731	1.806	1
Berat isi kering	gr/cm^3	**1.346**	**1.421**	**1.467**	1
Berat tanah kering	gr	1259	1329	1373	1
Volume tanah kering	cm^3	500	528	545	
Volume pori	cm^3	436	408	391	
Angka pori	-	0.87	0.77	0.72	
Porositas	-	0.47	0.44	0.42	
Derajat kejenuhan	%	57.52	71.17	81.17	8
ZAV	gr/cm^3	1.678	1.625	1.592	1

Perhitungan Kadar Air 20% Pasir		I		II		III		
No. Cawan		1	2	1	2	1	2	1
B. cawan + t. basah	gr	74.28	107.73	83.06	98.50	85.44	96.27	93.
B. cawan + t. kering	gr	63.80	94.16	71.01	83.87	72.59	81.20	77.
Berat air	gr	10.48	13.57	12.05	14.63	12.85	15.07	16.
Berat cawan	gr	17.00	16.40	16.32	16.35	16.57	16.58	16.
Berat tanah kering	gr	46.80	77.76	54.69	67.52	56.02	64.62	61.
Kadar air, w	%	22.39	17.45	22.03	21.67	22.94	23.32	26.
Kadar air rata-rata, w	%	19.92		21.85		23.13		

Pengujian pemadatan 25% pasir		I	II	III	
Kadar air asumsi	%	2	4	6	
Kadar air, w	%	20.11	22.36	24.01	2
Berat tanah + cetakan	Gr	3690	3745	3775	3
Berat cetakan	Gr	2010	2010	2010	2
Berat tanah	Gr	1680	1735	1765	1
Berat isi basah	gr/cm^3	1.795	1.854	1.886	1
Berat isi kering	gr/cm^3	**1.495**	**1.515**	**1.521**	**1**
Berat tanah kering	Gr	1399	1418	1423	1
Volume tanah kering	cm^3	553	560	563	5
Volume pori	cm^3	383	375	373	3
Angka pori		0.69	0.67	0.66	0
Porositas		0.41	0.40	0.40	0
Derajat kejenuhan	%	73.46	84.47	91.56	9
ZAV	gr/cm^3	1.677	1.616	1.574	1

Perhitungan kadar air 25% pasir		I		II		III		
No. Cawan		1	2	1	2	1	2	1
B. cawan + t. basah	Gr	103.97	85.82	118.26	101.58	108.34	100.17	92.04
B. cawan + t. kering	Gr	89.49	74.05	99.75	86.11	90.52	84.35	76.34
Berat air	Gr	14.48	11.77	18.51	15.47	17.82	15.82	15.70
Berat cawan	gr	16.88	16.02	18.01	16.01	16.51	18.28	16.34
Berat tanah kering	gr	72.61	58.03	81.74	70.10	74.01	66.07	60.00
Kadar air, w	%	19.94	20.28	22.64	22.07	24.08	23.94	26.17
Kadar air rata-rata, w	%	20.11		22.36		24.01		2

Pengujian pemadatan 30% pasir		I	II	III	
Kadar air asumsi	%	0	2	4	
Kadar air, w	%	17.73	20.19	22.50	2
Berat tanah + cetakan	gr	3580	3635	3740	3
Berat cetakan	gr	2010	2010	2010	2
Berat tanah	gr	1570	1625	1775	1
Berat isi basah	gr/cm^3	1.678	1.737	1.897	1
Berat isi kering	gr/cm^3	**1.425**	**1.445**	**1.548**	**1**
Berat tanah kering	gr	1334	1352	1449	1
Volume tanah kering	cm^3	499	506	543	
Volume pori	cm^3	436	429	393	
Angka pori		0.87	0.85	0.72	0
Porositas		0.47	0.46	0.42	0
Derajat kejenuhan	%	54.18	63.57	82.94	8
ZAV	gr/cm^3	1.812	1.735	1.668	1

Perhitungan kadar air 30% pasir		I		II		III		
No. Cawan		1	2	1	2	1	2	1
B. cawan + t. basah	gr	83.94	78.98	112.35	106.25	78.09	97.94	83.25
B. cawan + t. kering	gr	73.63	69.65	96.15	91.28	66.73	83.01	70.07
Berat air	gr	10.31	9.33	16.20	14.97	11.36	14.93	13.18
Berat cawan	gr	16.39	16.15	16.84	16.25	16.40	16.44	16.39
Berat tanah kering	gr	57.24	53.50	79.31	75.03	50.33	66.57	53.68
Kadar air, w	%	18.01	17.44	20.43	19.95	22.57	22.43	24.55
Kadar air rata-rata, w	%	17.73		20.19		22.50		2

PENGUJIAN KUAT TEKAN BEBAS *(UNCONFINED TEST)*

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 26 April 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

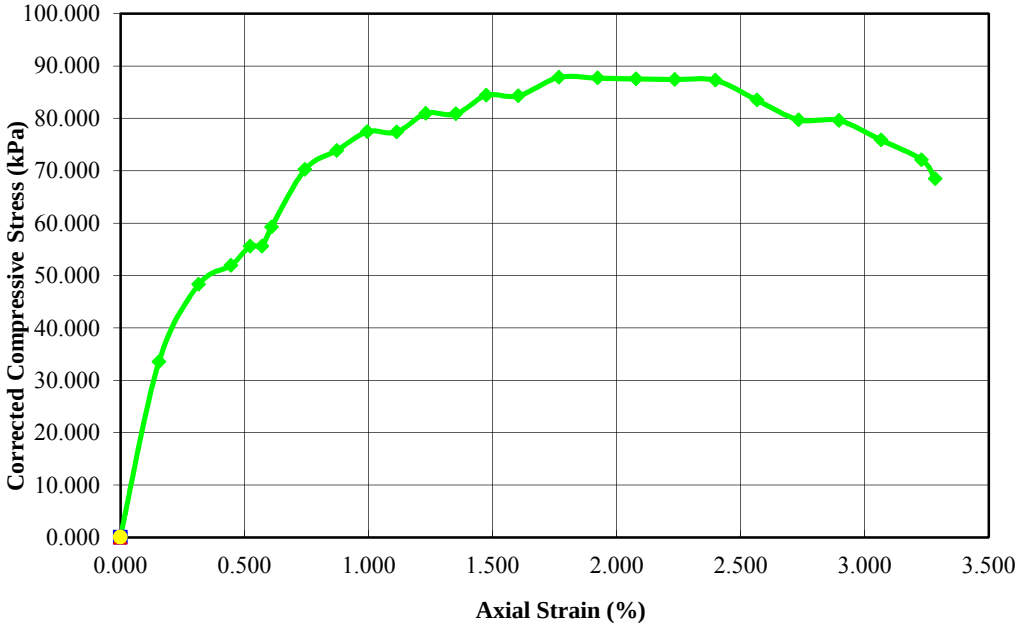
Pengujian kuat tekan bebas 0% pasir

Read Number	Disp (mm)	Load (Kn)	Strain (%)	Corr. Comp. Stress (kPa)
0	0.099	0.162	0.000	0.000
1	0.255	0.228	0.155	33.463
2	0.416	0.257	0.316	48.257
3	0.546	0.264	0.446	51.902
4	0.624	0.272	0.524	55.566
5	0.671	0.272	0.571	55.539
6	0.710	0.279	0.610	59.219
7	0.845	0.301	0.745	70.227
8	0.973	0.308	0.873	73.828
9	1.097	0.316	0.996	77.423
10	1.215	0.316	1.114	77.330
11	1.333	0.323	1.232	80.916
12	1.455	0.323	1.353	80.817
13	1.578	0.33	1.476	84.385
14	1.707	0.33	1.605	84.275
15	1.871	0.338	1.768	87.793
16	2.027	0.338	1.924	87.653
17	2.182	0.338	2.079	87.515
18	2.339	0.338	2.235	87.375
19	2.503	0.338	2.400	87.228
20	2.671	0.33	2.567	83.451
21	2.839	0.323	2.735	79.685
22	3.002	0.323	2.898	79.551
23	3.173	0.316	3.068	75.803
24	3.336	0.308	3.230	72.072
25	3.391	0.301	3.285	68.429

***Peak corrected compressive test* : 87,793 kPa** ***At reading number* :15**

Unconfined Compression Test Report (ASTM D2166)

Compressive Stress Axial Strain Curve



Test Data	A
Height (mm)	100.200
Diameter (mm)	50.100
Unconfined Strength (kPa)	87.793
Undrained Shear Strength (kgf/cm^2)	0.448
Undrained Shear Strength (kPa)	43.896
Rate of Strain (mm/min)	1.000000
Strain at Failure (%)	1.77

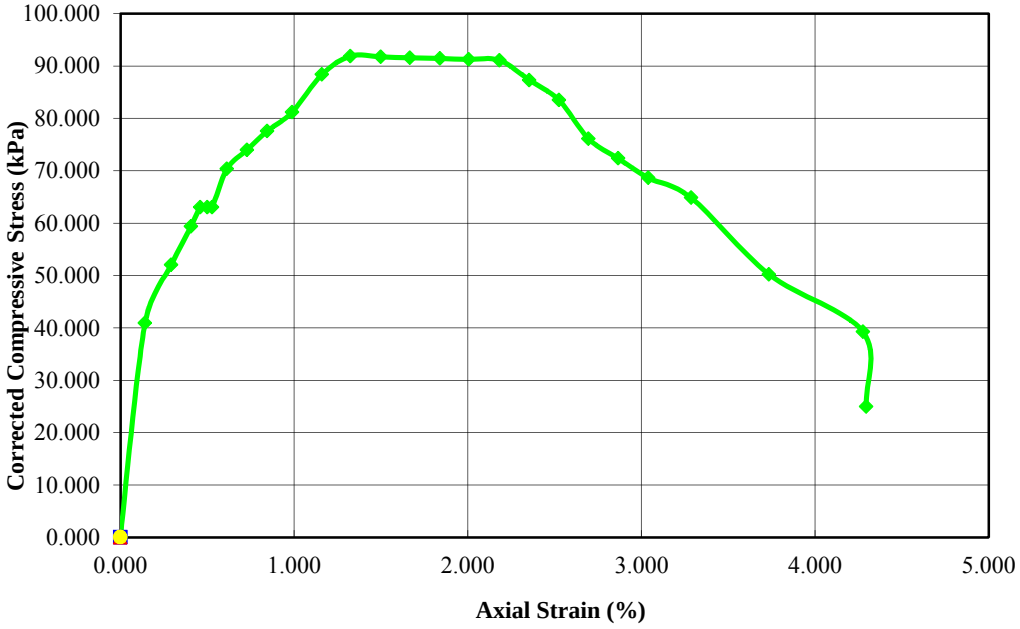
Pengujian kuat tekan bebas 10% pasir

Read Number	Disp (mm)	Load (Kn)	Strain (%)	Corr. Comp. Stress (kPa)
0	0.476	0.125	0.000	0.000
1	0.619	0.206	0.143	40.904
2	0.770	0.228	0.293	51.981
3	0.885	0.242	0.408	59.339
4	0.938	0.25	0.461	63.014
5	0.978	0.25	0.501	62.989
6	1.005	0.25	0.528	62.972
7	1.091	0.264	0.614	70.319
8	1.207	0.272	0.729	73.935
9	1.324	0.279	0.846	77.540
10	1.467	0.286	0.989	81.115
11	1.639	0.301	1.161	88.336
12	1.804	0.308	1.325	91.863
13	1.979	0.308	1.500	91.701
14	2.147	0.308	1.668	91.544
15	2.321	0.308	1.841	91.383
16	2.488	0.308	2.008	91.228
17	2.665	0.308	2.184	91.064
18	2.836	0.301	2.355	87.269
19	3.007	0.294	2.526	83.486
20	3.178	0.279	2.697	76.093
21	3.349	0.272	2.867	72.343
22	3.522	0.264	3.040	68.603
23	3.770	0.257	3.287	64.827
24	4.219	0.228	3.736	50.187
25	4.762	0.206	4.278	39.210
26	4.781	0.176	4.296	24.947

***Peak corrected compressive test* : 91,863 kPa** ***At reading number* :12**

Unconfined Compression Test Report (ASTM D2166)

Compressive Stress Axial Strain Curve



Test Data	A
Height (mm)	100.200
Diameter (mm)	50.100
Unconfined Strength (kPa)	91.863
Undrained Shear Strength (kgf/cm^2)	0.468
Undrained Shear Strength (kPa)	45.932
Rate of Strain (mm/min)	1.000000
Strain at Failure (%)	1.33

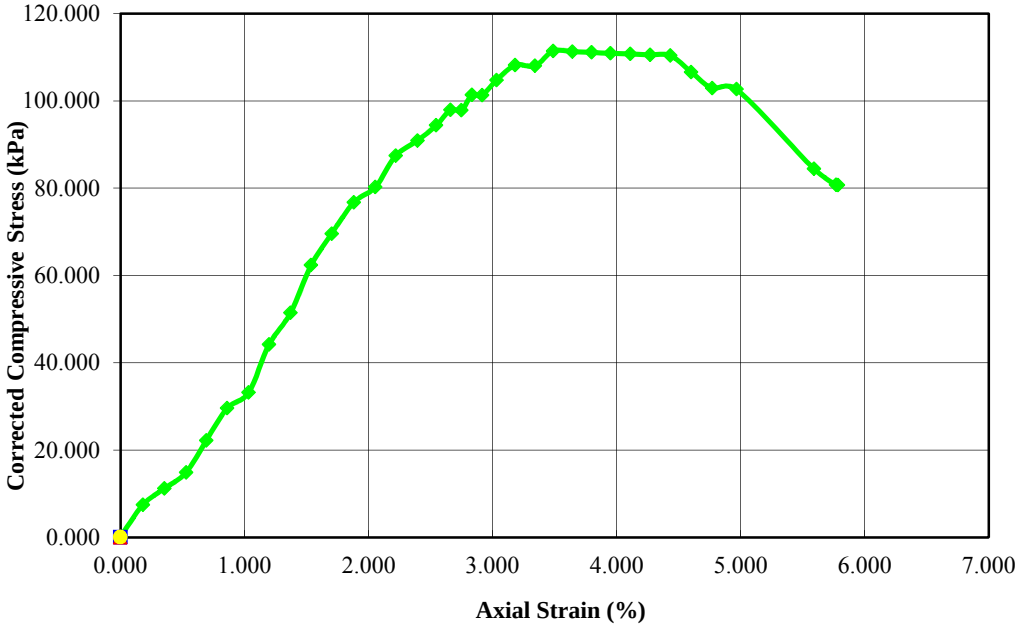
Pengujian kuat tekan bebas 20% pasir

Read Number	Disp (mm)	Load (Kn)	Strain (%)	Corr. Comp. Stress (kPa)
0	0.191	0.022	0.000	0.000
1	0.374	0.037	0.182	7.434
2	0.547	0.044	0.355	11.132
3	0.722	0.051	0.530	14.817
4	0.886	0.066	0.694	22.188
5	1.054	0.081	0.861	29.535
6	1.228	0.088	1.034	33.168
7	1.393	0.11	1.199	44.151
8	1.568	0.125	1.373	51.418
9	1.732	0.147	1.538	62.332
10	1.899	0.162	1.704	69.548
11	2.079	0.176	1.883	76.729
12	2.252	0.184	2.056	80.241
13	2.416	0.198	2.221	87.389
14	2.592	0.206	2.396	90.866
15	2.743	0.213	2.547	94.355
16	2.859	0.22	2.662	97.868
17	2.947	0.22	2.751	97.779
18	3.033	0.228	2.836	101.312
19	3.115	0.228	2.918	101.226
20	3.231	0.235	3.034	104.716
21	3.381	0.242	3.183	108.161
22	3.541	0.242	3.343	107.982
23	3.688	0.25	3.490	111.412
24	3.845	0.25	3.646	111.231
25	3.999	0.25	3.800	111.054
26	4.152	0.25	3.952	110.878
27	4.312	0.25	4.112	110.693
28	4.472	0.25	4.272	110.509
29	4.636	0.25	4.436	110.320
30	4.803	0.242	4.603	106.574
31	4.974	0.235	4.773	102.838
32	5.171	0.235	4.969	102.626
33	5.796	0.198	5.593	84.374
34	5.976	0.191	5.773	80.705
35	5.991	0.191	5.788	80.692

***Peak corrected compressive test* : 111,412 kPa** ***At reading number* :23**

Unconfined Compression Test Report (ASTM D2166)

Compressive Stress Axial Strain Curve



Test Data	A
Height (mm)	100.200
Diameter (mm)	50.100
Unconfined Strength (kPa)	111.412
Undrained Shear Strength (kgf/cm^2)	0.568
Undrained Shear Strength (kPa)	55.706
Rate of Strain (mm/min)	1.000000
Strain at Failure (%)	3.49

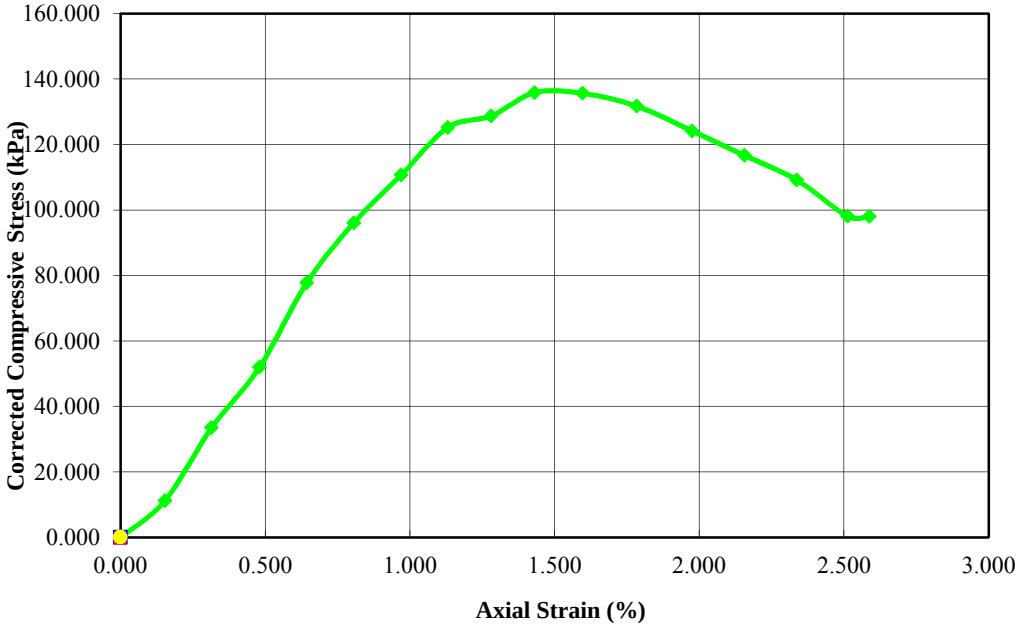
Pengujian kuat tekan bebas 25% pasir

Read Number	Disp (mm)	Load (Kn)	Strain (%)	Corr. Comp. Stress (kPa)
0	0.194	0.059	0.000	0.000
1	0.349	0.081	0.154	11.154
2	0.510	0.125	0.315	33.409
3	0.676	0.162	0.481	51.884
4	0.840	0.213	0.644	77.698
5	1.003	0.25	0.807	96.040
6	1.167	0.279	0.970	110.632
7	1.329	0.308	1.132	125.178
8	1.478	0.316	1.281	128.666
9	1.629	0.33	1.432	135.811
10	1.796	0.33	1.598	135.581
11	1.982	0.323	1.785	131.667
12	2.174	0.308	1.976	124.111
13	2.356	0.294	2.158	116.593
14	2.536	0.279	2.338	109.105
15	2.712	0.257	2.513	98.018
16	2.788	0.257	2.589	97.942

Peak corrected compressive test **: 135,811 kPa** ***At reading number*** **: 9**

Unconfined Compression Test Report (ASTM D2166)

Compressive Stress Axial Strain Curve



Test Data	A
Height (mm)	100.200
Diameter (mm)	50.100
Unconfined Strength (kPa)	135.811
Undrained Shear Strength (kgf/cm^2)	0.692
Undrained Shear Strength (kPa)	67.9905
Rate of Strain (mm/min)	1.000000
Strain at Failure (%)	1.43

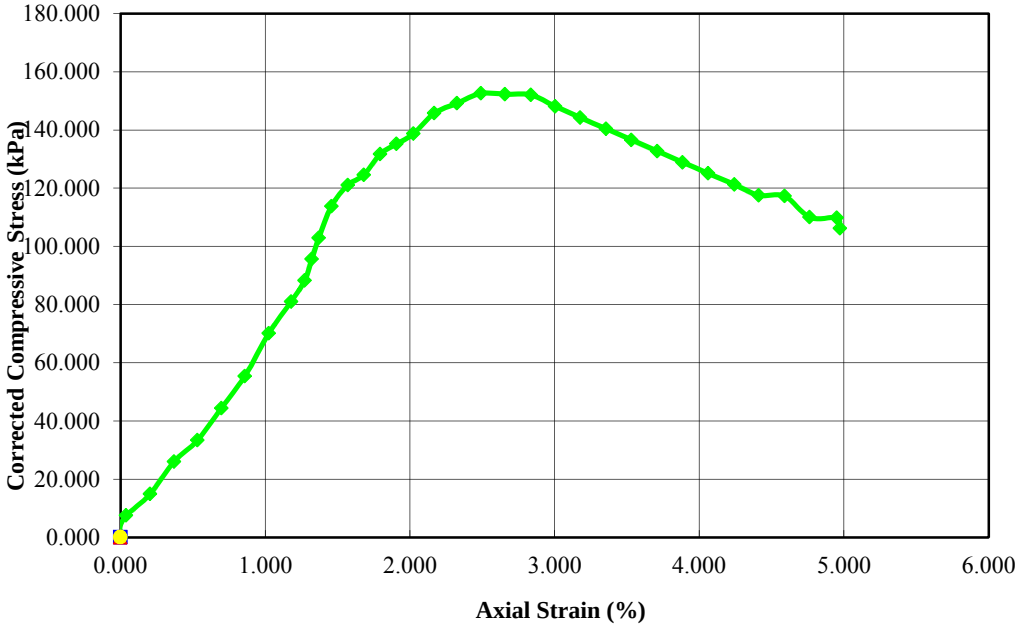
Pengujian kuat tekan bebas 30% pasir

Read Number	Disp (mm)	Load (Kn)	Strain (%)	Corr. Comp. Stress (kPa)
0	0.062	0.029	0.000	0.000
1	0.061	0.037	0.001	3.724
2	0.103	0.044	0.040	7.445
3	0.268	0.059	0.206	14.865
4	0.434	0.081	0.371	25.970
5	0.597	0.095	0.534	33.336
6	0.762	0.117	0.698	44.375
7	0.925	0.139	0.861	55.377
8	1.090	0.169	1.025	70.028
9	1.244	0.191	1.180	80.959
10	1.340	0.206	1.275	88.234
11	1.388	0.22	1.323	95.540
12	1.437	0.235	1.372	102.839
13	1.524	0.257	1.458	113.757
14	1.637	0.272	1.572	120.957
15	1.748	0.279	1.682	124.482
16	1.862	0.294	1.796	131.652
17	1.974	0.301	1.908	135.155
18	2.092	0.308	2.026	138.641
19	2.237	0.323	2.170	145.722
20	2.394	0.33	2.327	149.126
21	2.559	0.338	2.492	152.506
22	2.726	0.338	2.658	152.245
23	2.905	0.338	2.837	151.965
24	3.074	0.33	3.006	148.090
25	3.247	0.323	3.178	144.221
26	3.425	0.316	3.356	140.357
27	3.602	0.308	3.533	136.508
28	3.781	0.301	3.711	132.670
29	3.957	0.294	3.886	128.850
30	4.132	0.286	4.062	125.042
31	4.315	0.279	4.244	121.239
32	4.484	0.272	4.413	117.465
33	4.662	0.272	4.590	117.247
34	4.836	0.257	4.765	109.940
35	5.023	0.257	4.951	109.725
36	5.045	0.25	4.973	106.161

Peak corrected compressive test **: 152,506 kPa** ***At reading number*** **: 21**

Unconfined Compression Test Report (ASTM D2166)

Compressive Stress Axial Strain Curve



Test Data	A
Height (mm)	100.200
Diameter (mm)	50.100
Unconfined Strength (kPa)	1152.506
Undrained Shear Strength (kgf/cm^2)	0.778
Undrained Shear Strength (kPa)	76.253
Rate of Strain (mm/min)	1.000000
Strain at Failure (%)	2.49

PENGUJIAN CBR *UNSOAKED*

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 12 April 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

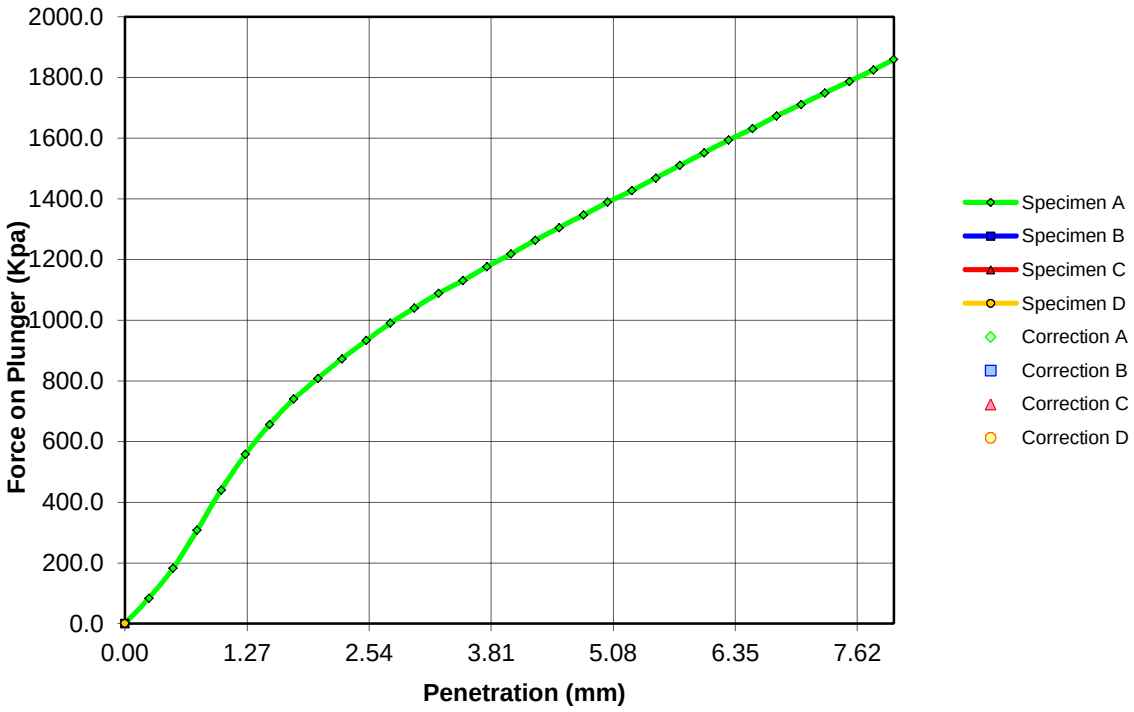
Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Pengujian CBR *Unsoaked* 0% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.162	0.126	0.0	0.000	
1	0.323	0.375	83.4	0.249	
2	0.514	0.628	182.1	0.502	
3	0.756	0.877	307.2	0.751	
4	1.013	1.128	440.0	1.002	
5	1.241	1.381	557.6	1.254	
6	1.432	1.634	656.2	1.507	
7	1.593	1.883	739.6	1.757	
8	1.725	2.134	807.9	2.008	
9	1.850	2.384	872.4	2.258	
10	1.967	2.639	933.1	2.513	13.53
11	2.078	2.887	989.9	2.761	
12	2.173	3.139	1039.3	3.012	
13	2.268	3.392	1088.6	3.266	
14	2.349	3.645	1130.3	3.519	
15	2.437	3.893	1175.8	3.767	
16	2.518	4.143	1217.5	4.017	
17	2.606	4.396	1263.0	4.270	
18	2.687	4.645	1304.8	4.519	
19	2.768	4.901	1346.5	4.774	
20	2.848	5.149	1388.2	5.022	13.42
21	2.922	5.402	1426.1	5.276	
22	3.002	5.651	1467.9	5.525	
23	3.083	5.902	1509.6	5.776	
24	3.164	6.154	1551.3	6.028	
25	3.245	6.407	1593.0	6.280	
26	3.318	6.659	1631.0	6.532	
27	3.399	6.909	1672.7	6.782	
28	3.472	7.163	1710.6	7.037	
29	3.546	7.412	1748.5	7.286	
30	3.619	7.666	1786.5	7.539	13.64
31	3.693	7.917	1824.4	7.790	
32	3.759	8.127	1858.5	8.001	

Load Penetration Curve



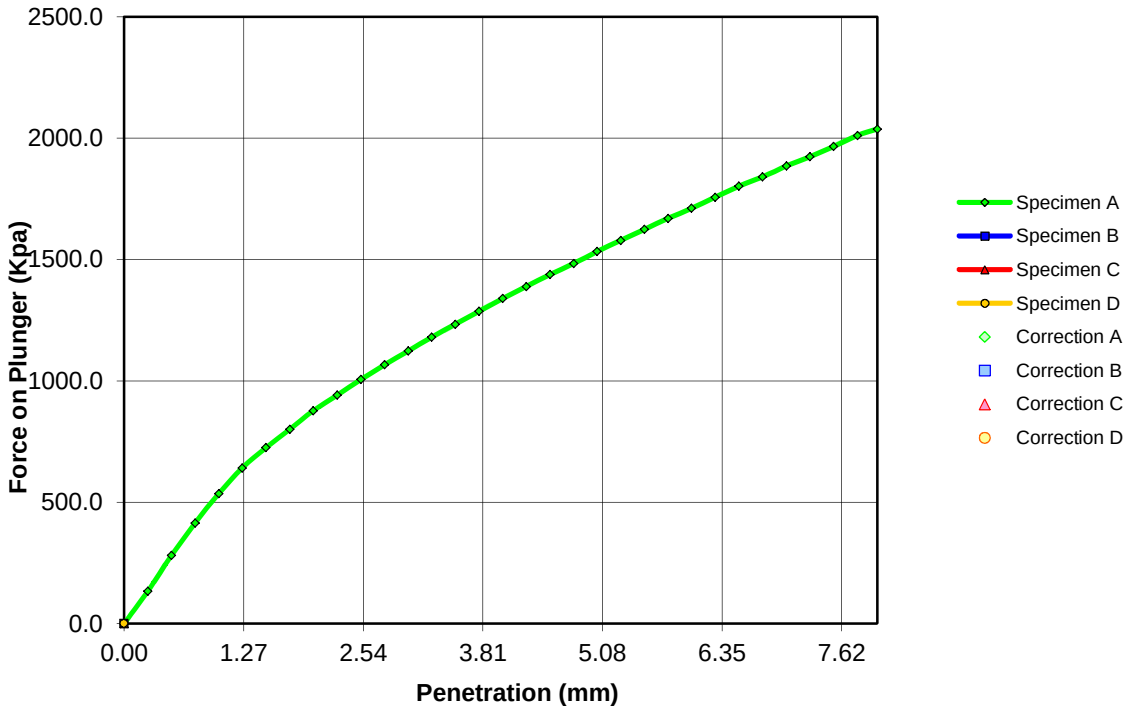
	2.54 mm Pen.	5.08 mm Pen.	
CBR:	13.5	13.4	(%)

Pengujian CBR *Unsoaked* 10% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.257	0.232	0.0	0.000	
1	0.514	0.483	132.8	0.252	
2	0.800	0.736	280.7	0.505	
3	1.057	0.985	413.4	0.754	
4	1.292	1.237	534.8	1.005	
5	1.498	1.487	641.0	1.255	
6	1.659	1.738	724.4	1.506	
7	1.806	1.993	800.3	1.762	
8	1.953	2.241	876.2	2.009	
9	2.078	2.494	940.6	2.263	
10	2.202	2.746	1005.1	2.514	
11	2.320	2.999	1065.8	2.767	15.46
12	2.430	3.250	1122.7	3.018	
13	2.540	3.499	1179.6	3.267	
14	2.643	3.750	1232.7	3.518	
15	2.746	4.000	1285.8	3.769	
16	2.848	4.254	1338.9	4.022	
17	2.944	4.505	1388.2	4.273	
18	3.039	4.756	1437.5	4.524	
19	3.127	5.009	1483.0	4.777	
20	3.223	5.256	1532.3	5.024	14.82
21	3.311	5.506	1577.9	5.274	
22	3.399	5.758	1623.4	5.526	
23	3.487	6.011	1668.9	5.780	
24	3.568	6.258	1710.6	6.027	
25	3.656	6.509	1756.1	6.278	
26	3.744	6.762	1801.6	6.530	
27	3.817	7.013	1839.6	6.781	
28	3.905	7.268	1885.1	7.037	
29	3.979	7.517	1923.0	7.286	
30	4.060	7.767	1964.7	7.536	15.00
31	4.148	8.022	2010.2	7.790	
32	4.199	8.233	2036.8	8.001	

Load Penetration Curve



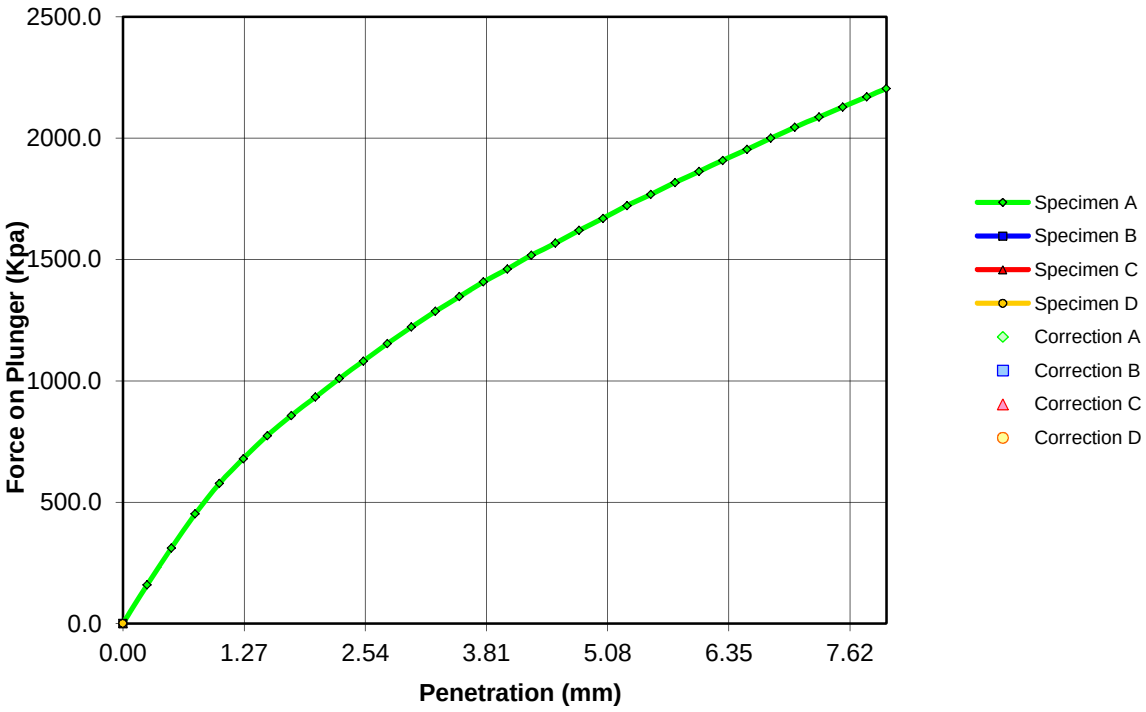
	2.54 mm Pen.	5.08 mm Pen.	
CBR:	15.5	14.8	(%)

Pengujian CBR *Unsoaked* 20% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.250	0.085	0.0	0.000	
1	0.558	0.339	159.3	0.254	
2	0.852	0.593	311.0	0.508	
3	1.123	0.842	451.4	0.757	
4	1.365	1.096	576.5	1.011	
5	1.564	1.347	678.9	1.262	
6	1.747	1.599	773.8	1.514	
7	1.909	1.852	857.2	1.767	
8	2.055	2.103	933.1	2.018	
9	2.202	2.354	1008.9	2.269	
10	2.342	2.606	1081.0	2.521	15.68
11	2.481	2.857	1153.0	2.772	
12	2.613	3.110	1221.3	3.025	
13	2.738	3.361	1285.8	3.276	
14	2.856	3.613	1346.5	3.528	
15	2.973	3.862	1407.2	3.777	
16	3.076	4.114	1460.3	4.029	
17	3.186	4.368	1517.2	4.282	
18	3.281	4.618	1566.5	4.532	
19	3.384	4.868	1619.6	4.782	
20	3.480	5.118	1668.9	5.033	16.14
21	3.582	5.371	1722.0	5.286	
22	3.671	5.618	1767.5	5.533	
23	3.766	5.874	1816.8	5.789	
24	3.854	6.125	1862.3	6.040	
25	3.942	6.373	1907.8	6.288	
26	4.030	6.627	1953.3	6.541	
27	4.118	6.877	1998.9	6.792	
28	4.206	7.128	2044.4	7.043	
29	4.287	7.382	2086.1	7.297	
30	4.368	7.631	2127.8	7.546	16.24
31	4.449	7.882	2169.5	7.797	
32	4.515	8.089	2203.7	8.004	

Load Penetration Curve



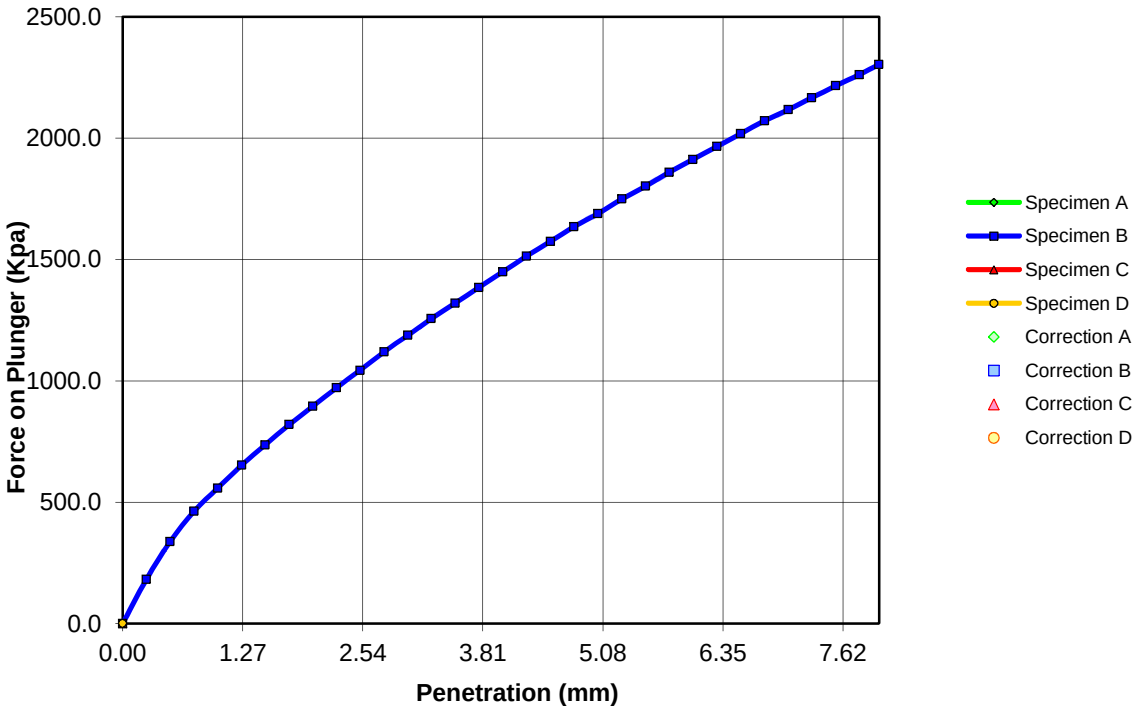
	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	15.7	16.1	(%)

Pengujian CBR *Unsoaked* 25% Pasir

Specimen B Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.257	0.702	0.0	0.000	
1	0.609	0.954	182.1	0.252	
2	0.910	1.206	337.6	0.504	
3	1.153	1.459	462.7	0.756	
4	1.336	1.708	557.6	1.005	
5	1.520	1.962	652.4	1.260	
6	1.681	2.211	735.8	1.509	
7	1.843	2.465	819.3	1.763	
8	1.989	2.715	895.1	2.013	
9	2.136	2.966	971.0	2.263	
10	2.276	3.215	1043.1	2.513	15.13
11	2.423	3.468	1118.9	2.766	
12	2.555	3.720	1187.2	3.018	
13	2.687	3.968	1255.5	3.266	
14	2.812	4.222	1319.9	3.520	
15	2.936	4.471	1384.4	3.769	
16	3.061	4.725	1448.9	4.022	
17	3.186	4.977	1513.4	4.275	
18	3.303	5.230	1574.1	4.528	
19	3.421	5.478	1634.7	4.776	
20	3.524	5.730	1687.8	5.028	16.32
21	3.641	5.984	1748.5	5.281	
22	3.744	6.236	1801.6	5.533	
23	3.854	6.486	1858.5	5.784	
24	3.957	6.736	1911.6	6.034	
25	4.060	6.991	1964.7	6.289	
26	4.162	7.240	2017.8	6.538	
27	4.265	7.495	2070.9	6.793	
28	4.353	7.747	2116.4	7.045	
29	4.449	7.994	2165.8	7.292	
30	4.544	8.248	2215.1	7.546	16.91
31	4.632	8.496	2260.6	7.794	
32	4.713	8.704	2302.3	8.002	

Load Penetration Curve



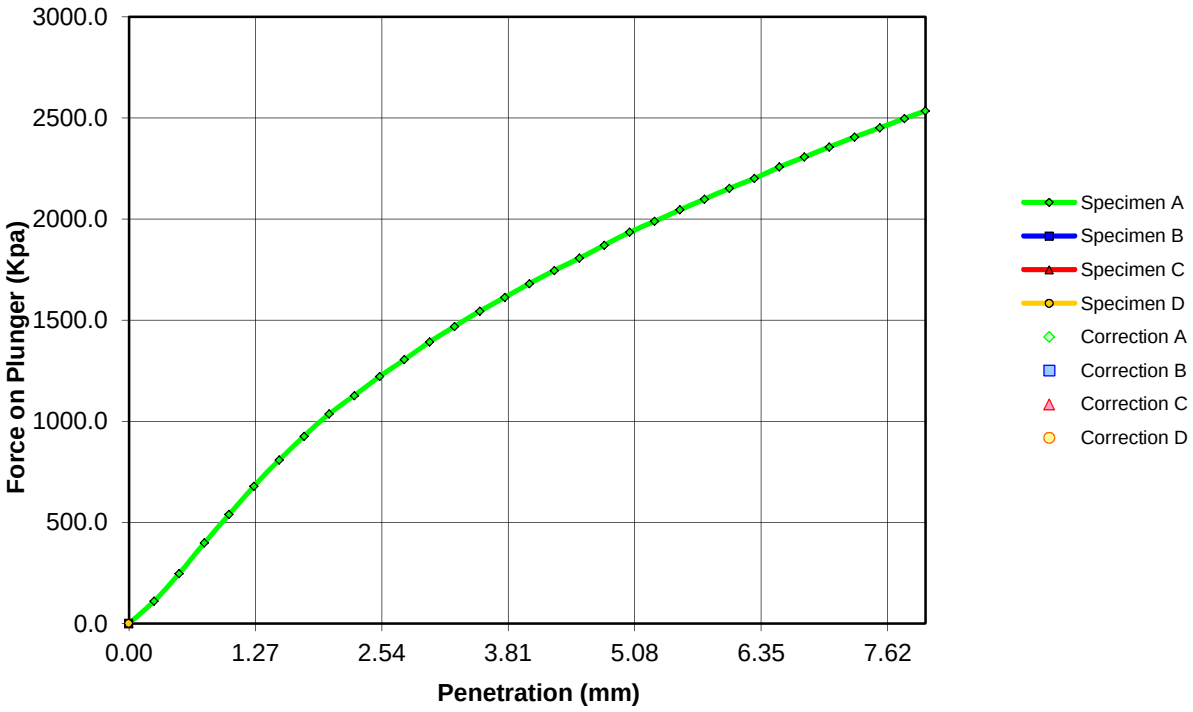
	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	16.30	16.91	(%)

Pengujian CBR *Unsoaked* 30% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.191	0.273	0.0	0.000	
1	0.404	0.526	110.0	0.254	
2	0.668	0.777	246.5	0.505	
3	0.962	1.031	398.3	0.758	
4	1.233	1.278	538.6	1.005	
5	1.505	1.529	678.9	1.256	
6	1.755	1.782	807.9	1.509	
7	1.982	2.033	925.5	1.760	
8	2.195	2.284	1035.5	2.011	
9	2.371	2.537	1126.5	2.264	
10	2.555	2.792	1221.3	2.519	
11	2.716	3.040	1304.8	2.767	18.92
12	2.885	3.293	1392.0	3.020	
13	3.032	3.544	1467.9	3.271	
14	3.179	3.798	1543.7	3.525	
15	3.311	4.049	1612.0	3.776	
16	3.443	4.296	1680.3	4.023	
17	3.568	4.548	1744.7	4.275	
18	3.685	4.800	1805.4	4.527	
19	3.810	5.050	1869.9	4.777	
20	3.935	5.303	1934.4	5.031	18.70
21	4.038	5.554	1987.5	5.281	
22	4.148	5.807	2044.4	5.534	
23	4.250	6.057	2097.5	5.784	
24	4.353	6.307	2150.6	6.034	
25	4.449	6.558	2199.9	6.285	
26	4.559	6.808	2256.8	6.535	
27	4.654	7.058	2306.1	6.785	
28	4.750	7.310	2355.4	7.037	
29	4.845	7.562	2404.7	7.289	
30	4.933	7.816	2450.2	7.543	18.70
31	5.021	8.064	2495.7	7.791	
32	5.095	8.275	2533.7	8.002	

Load Penetration Curve



	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	18.9	18.7	(%)

PENGUJIAN CBR *SOAKED*

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 15 April 2016 – 19 April 2016 dan 21 April 2016 – 25 April 2016

Peneliti : Ade Septayani / Dwi Albiah Owens

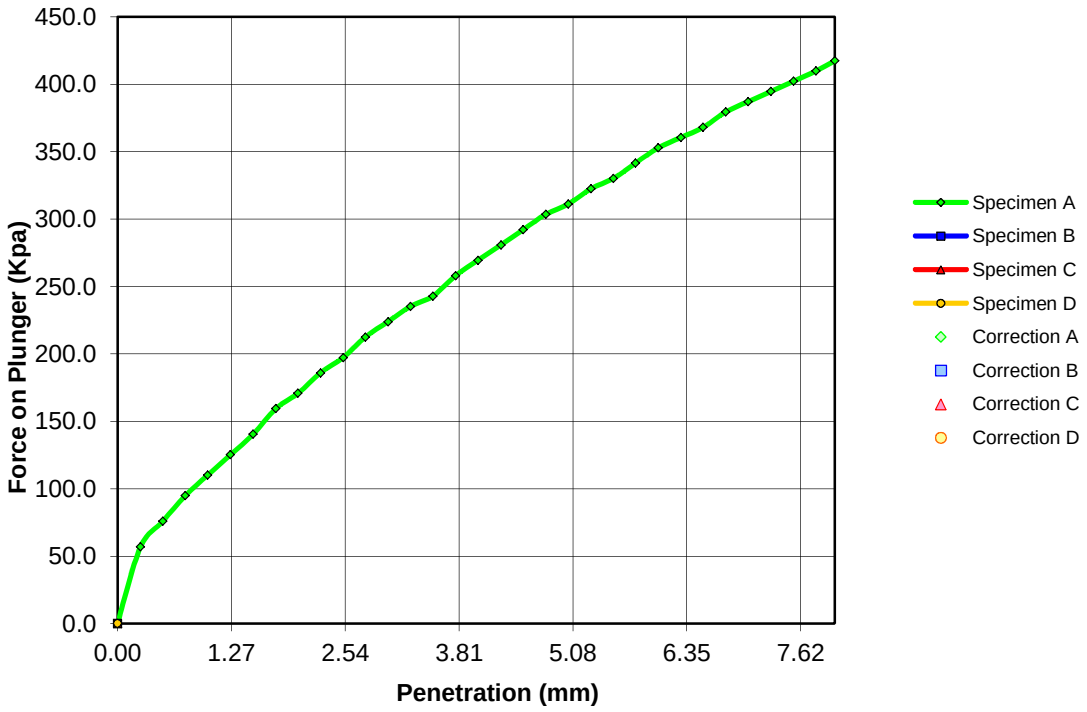
Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Peengujian CBR *Soaked* 0% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.147	0.320	0.0	0.000	
1	0.257	0.576	56.9	0.256	
2	0.294	0.826	75.9	0.506	
3	0.330	1.075	94.8	0.755	
4	0.360	1.326	110.0	1.006	
5	0.389	1.579	125.2	1.260	
6	0.418	1.833	140.3	1.514	
7	0.455	2.084	159.3	1.764	
8	0.477	2.333	170.7	2.014	
9	0.507	2.584	185.9	2.264	
10	0.529	2.839	197.2	2.519	2.86
11	0.558	3.086	212.4	2.766	
12	0.580	3.338	223.8	3.018	
13	0.602	3.589	235.2	3.270	
14	0.617	3.839	242.7	3.520	
15	0.646	4.092	257.9	3.772	
16	0.668	4.342	269.3	4.022	
17	0.690	4.597	280.7	4.278	
18	0.712	4.846	292.1	4.526	
19	0.734	5.099	303.4	4.780	
20	0.749	5.350	311.0	5.031	3.01
21	0.771	5.601	322.4	5.281	
22	0.785	5.851	330.0	5.531	
23	0.808	6.099	341.4	5.780	
24	0.830	6.353	352.7	6.033	
25	0.844	6.605	360.3	6.286	
26	0.859	6.854	367.9	6.534	
27	0.881	7.105	379.3	6.786	
28	0.896	7.355	386.9	7.036	
29	0.910	7.609	394.5	7.289	
30	0.925	7.861	402.0	7.541	3.07
31	0.940	8.112	409.6	7.792	
32	0.954	8.321	417.2	8.002	

Load Penetration Curve



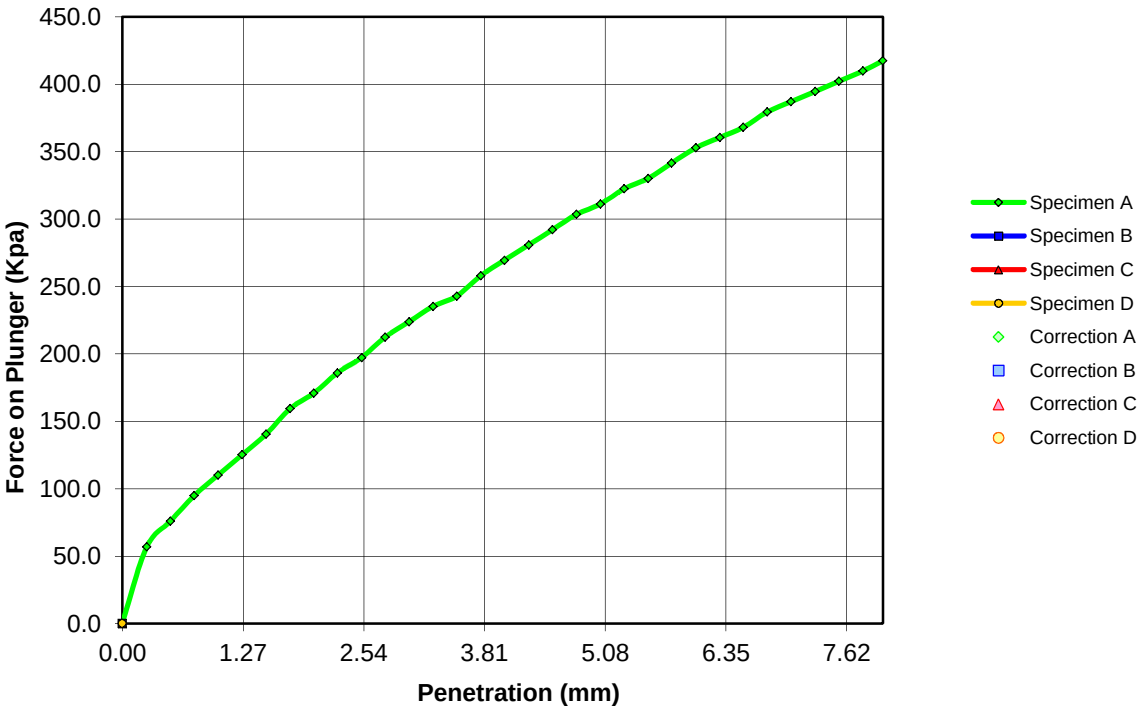
	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	2.9	3.0	(%)

Pengujian CBR *Soaked* 10% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.147	0.320	0.0	0.000	
1	0.257	0.576	56.9	0.256	
2	0.294	0.826	75.9	0.506	
3	0.330	1.075	94.8	0.755	
4	0.360	1.326	110.0	1.006	
5	0.389	1.579	125.2	1.260	
6	0.418	1.833	140.3	1.514	
7	0.455	2.084	159.3	1.764	
8	0.477	2.333	170.7	2.014	
9	0.507	2.584	185.9	2.264	
10	0.529	2.839	197.2	2.519	2.86
11	0.558	3.086	212.4	2.766	
12	0.580	3.338	223.8	3.018	
13	0.602	3.589	235.2	3.270	
14	0.617	3.839	242.7	3.520	
15	0.646	4.092	257.9	3.772	
16	0.668	4.342	269.3	4.022	
17	0.690	4.597	280.7	4.278	
18	0.712	4.846	292.1	4.526	
19	0.734	5.099	303.4	4.780	
20	0.749	5.350	311.0	5.031	3.01
21	0.771	5.601	322.4	5.281	
22	0.785	5.851	330.0	5.531	
23	0.808	6.099	341.4	5.780	
24	0.830	6.353	352.7	6.033	
25	0.844	6.605	360.3	6.286	
26	0.859	6.854	367.9	6.534	
27	0.881	7.105	379.3	6.786	
28	0.896	7.355	386.9	7.036	
29	0.910	7.609	394.5	7.289	
30	0.925	7.861	402.0	7.541	3.07
31	0.940	8.112	409.6	7.792	
32	0.954	8.321	417.2	8.002	

Load Penetration Curve



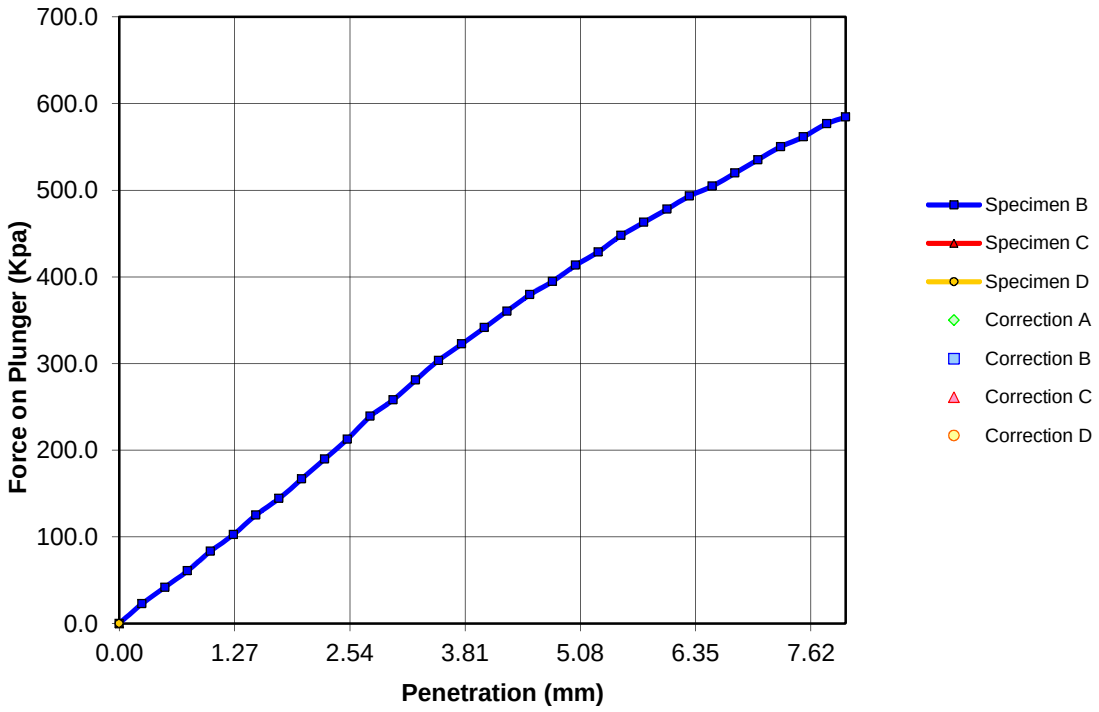
	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	3.01	3.07	(%)

Pengujian CBR *Soaked* 20% Pasir

Specimen B Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.073	0.691	0.0	0.000	
1	0.117	0.943	22.8	0.252	
2	0.154	1.195	41.7	0.504	
3	0.191	1.444	60.7	0.753	
4	0.235	1.699	83.4	1.007	
5	0.272	1.949	102.4	1.258	
6	0.316	2.198	125.2	1.507	
7	0.352	2.453	144.1	1.762	
8	0.396	2.704	166.9	2.013	
9	0.440	2.955	189.6	2.263	
10	0.485	3.205	212.4	2.513	3.08
11	0.536	3.457	239.0	2.765	
12	0.573	3.710	257.9	3.019	
13	0.617	3.958	280.7	3.267	
14	0.661	4.211	303.4	3.520	
15	0.697	4.467	322.4	3.775	
16	0.734	4.716	341.4	4.025	
17	0.771	4.965	360.3	4.273	
18	0.808	5.217	379.3	4.526	
19	0.837	5.468	394.5	4.777	
20	0.874	5.723	413.4	5.031	4.00
21	0.903	5.971	428.6	5.280	
22	0.940	6.222	447.6	5.530	
23	0.969	6.474	462.7	5.782	
24	0.998	6.729	477.9	6.038	
25	1.028	6.978	493.1	6.287	
26	1.050	7.227	504.5	6.536	
27	1.079	7.478	519.6	6.787	
28	1.109	7.732	534.8	7.040	
29	1.138	7.981	550.0	7.289	
30	1.160	8.233	561.4	7.542	4.29
31	1.189	8.489	576.5	7.798	
32	1.204	8.697	584.1	8.005	

Load Penetration Curve



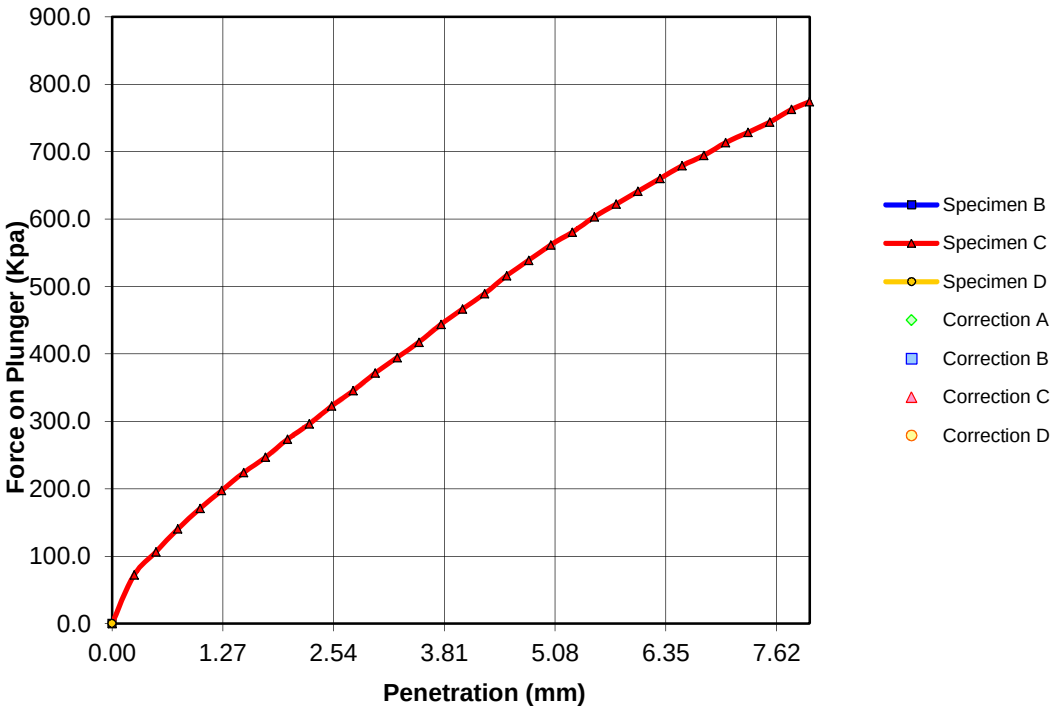
	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	3.1	4.0	(%)

Pengujian CBR *Soaked* 25% Pasir

Specimen C Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.198	0.266	0.0	0.000	
1	0.338	0.519	72.1	0.254	
2	0.404	0.768	106.2	0.503	
3	0.470	1.020	140.3	0.754	
4	0.529	1.275	170.7	1.009	
5	0.580	1.524	197.2	1.258	
6	0.631	1.775	223.8	1.510	
7	0.675	2.025	246.5	1.760	
8	0.727	2.278	273.1	2.013	
9	0.771	2.528	295.8	2.263	
10	0.822	2.784	322.4	2.518	4.68
11	0.866	3.033	345.2	2.767	
12	0.918	3.285	371.7	3.020	
13	0.962	3.537	394.5	3.272	
14	1.006	3.786	417.2	3.521	
15	1.057	4.040	443.8	3.774	
16	1.101	4.288	466.5	4.022	
17	1.145	4.541	489.3	4.275	
18	1.197	4.792	515.8	4.526	
19	1.241	5.045	538.6	4.780	
20	1.285	5.298	561.4	5.032	5.43
21	1.321	5.544	580.3	5.279	
22	1.365	5.799	603.1	5.533	
23	1.402	6.047	622.0	5.781	
24	1.439	6.299	641.0	6.033	
25	1.476	6.551	660.0	6.285	
26	1.512	6.805	678.9	6.540	
27	1.542	7.054	694.1	6.789	
28	1.578	7.305	713.1	7.039	
29	1.608	7.560	728.2	7.294	
30	1.637	7.810	743.4	7.544	5.67
31	1.674	8.059	762.4	7.793	
32	1.696	8.266	773.8	8.001	

Load Penetration Curve



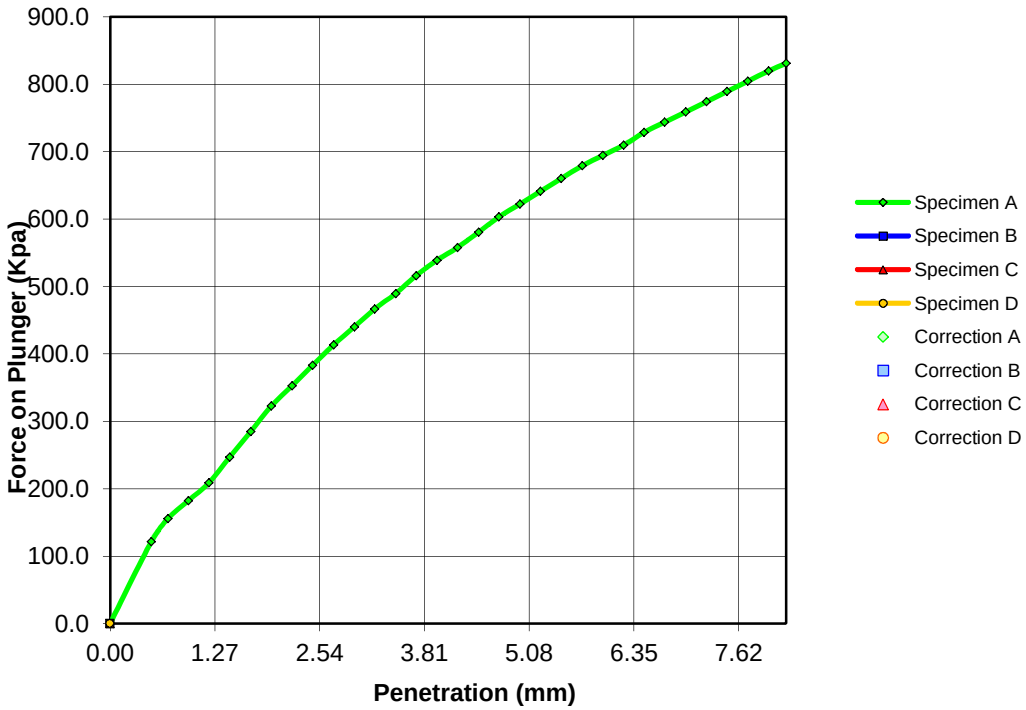
	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	4.7	5.4	(%)

Pengujian CBR *Soaked* 30% Pasir

Specimen A Test Data

Read Number	Load (Kn)	Disp. (mm)	Force on Plunger (Kpa)	Penetration (mm)	CBR
0	0.154	0.196	0.0	0.000	
1	0.235	0.000	121.4	0.500	
2	0.301	0.700	155.5	0.700	
3	0.352	0.949	182.1	0.949	
4	0.404	1.199	208.6	1.199	
5	0.477	1.449	246.5	1.449	
6	0.551	1.705	284.5	1.705	
7	0.624	1.953	322.4	1.953	
8	0.683	2.208	352.7	2.208	
9	0.741	2.457	383.1	2.457	5.56
10	0.800	2.710	413.4	2.710	
11	0.852	2.962	440.0	2.962	
12	0.903	3.208	466.5	3.208	
13	0.947	3.464	489.3	3.464	
14	0.998	3.711	515.8	3.711	
15	1.042	3.965	538.6	3.965	
16	1.079	4.214	557.6	4.214	
17	1.123	4.468	580.3	4.468	
18	1.167	4.716	603.1	4.716	
19	1.204	4.970	622.0	4.970	6.01
20	1.241	5.217	641.0	5.217	
21	1.277	5.472	660.0	5.472	
22	1.314	5.726	678.9	5.726	
23	1.343	5.975	694.1	5.975	
24	1.373	6.226	709.3	6.226	
25	1.409	6.475	728.2	6.475	
26	1.439	6.726	743.4	6.726	
27	1.468	6.981	758.6	6.981	
28	1.498	7.232	773.8	7.232	
29	1.527	7.481	788.9	7.481	
30	1.556	7.734	804.1	7.734	6.14
31	1.586	7.987	819.3	7.987	
32	1.608	8.199	830.6	8.199	

Load Penetration Curve



	2.54 mm Pen.	5.08 mm Pen.	
Maximum CBR:	6.01	6.14	(%)

PENGUJIAN KUAT GESER

Lokasi : Laboratorium Teknik Sipil Politeknik Negeri Sriwijaya

Tanggal : 3 Mei 2016

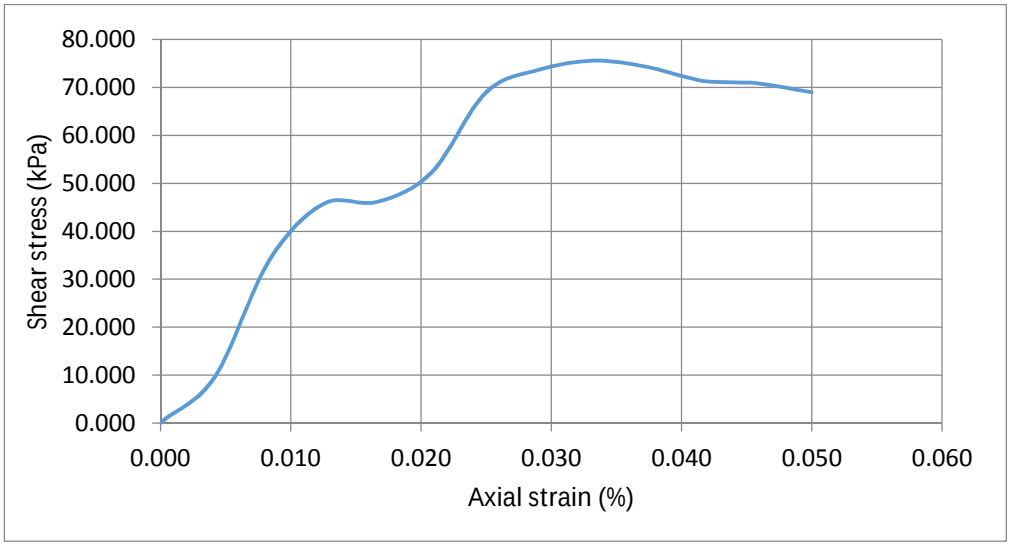
Peneliti : Ade Septayani / Dwi Albiah Owens

Dosen Pembimbing : Ibrahim,S.T.,M.T / Sri Rezki Artini,S.T.,M.Eng

Pengujian Kuat Geser 0% Pasir

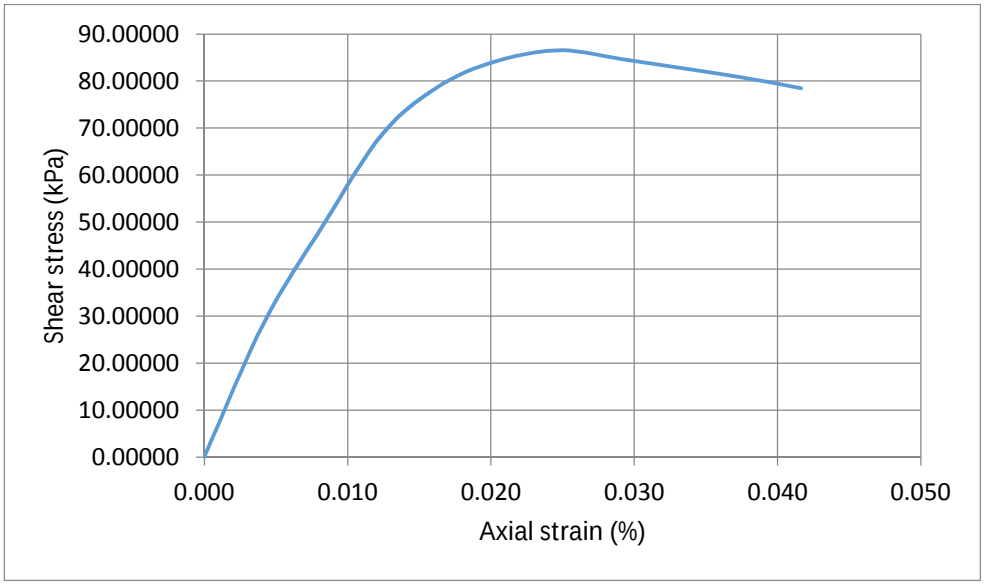
Beban normal 1 kg = 63.55

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	20.000	0.0172	9.556
2	0.500	0.83%	71.000	0.0608	33.778
3	0.750	1.25%	96.000	0.0822	45.667
4	1.000	1.67%	97.000	0.0830	46.111
5	1.250	2.08%	110.000	0.0941	52.278
6	1.500	2.50%	145.000	0.1241	68.944
7	1.750	2.92%	155.000	0.1327	73.722
8	2.000	3.33%	159.000	0.1360	75.556
9	2.250	3.75%	156.000	0.1335	74.167
10	2.500	4.17%	150.000	0.1284	71.333
11	2.750	4.58%	149.000	0.1275	70.833
12	3.000	5.00%	145.000	0.1241	68.944



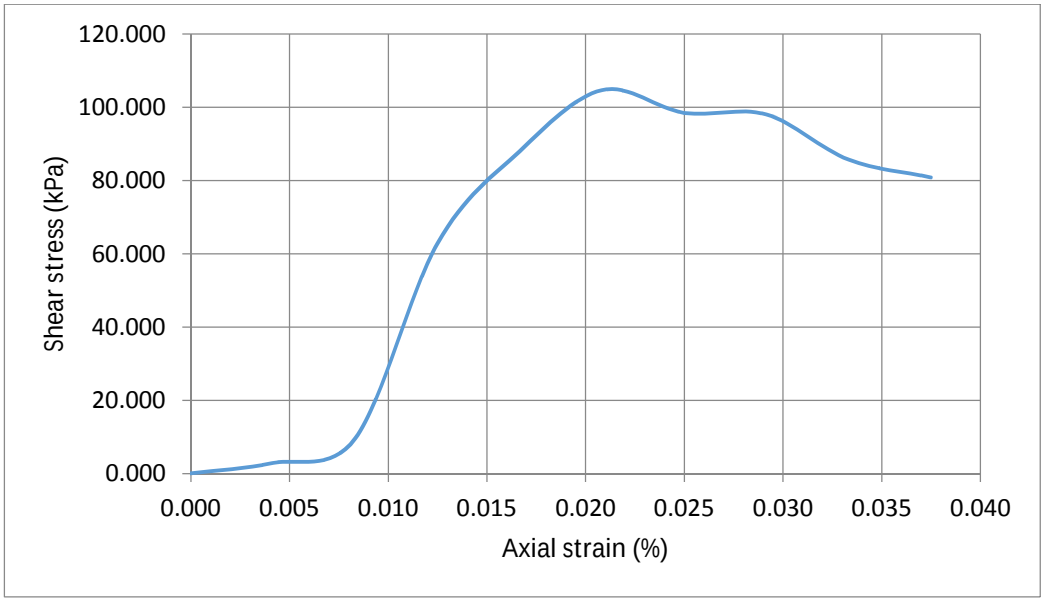
Beban normal	2	kg	=	127.1	kPa

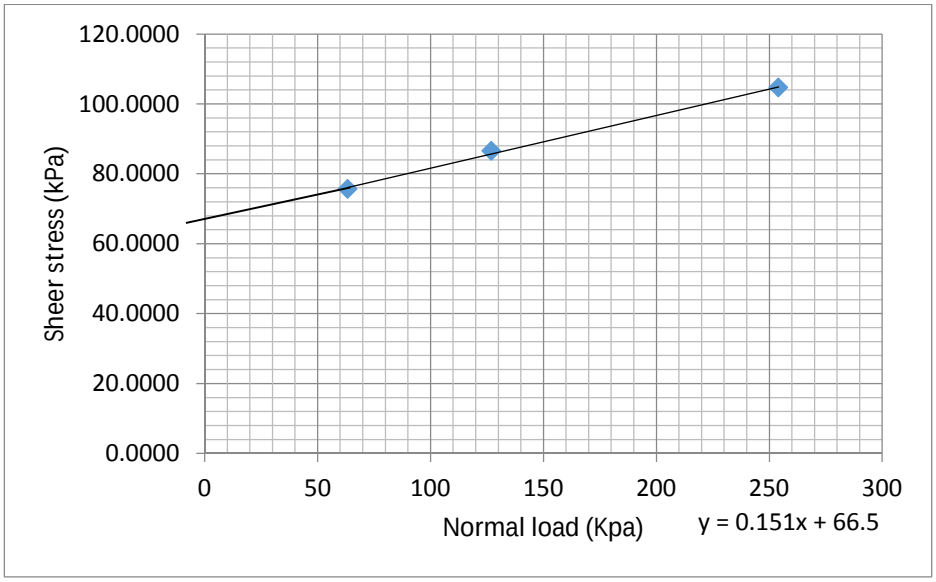
Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.00000	0.00000
1	0.250	0.42%	60.000	0.05140	28.55556
2	0.500	0.83%	104.000	0.08900	49.44444
3	0.750	1.25%	145.000	0.12410	68.94444
4	1.000	1.67%	167.000	0.14290	79.38889
5	1.250	2.08%	178.000	0.15230	84.61111
6	1.500	2.50%	182.000	0.15570	86.50000
7	1.750	2.92%	178.000	0.15230	84.61111
8	2.000	3.33%	174.000	0.14890	82.72222
9	2.250	3.75%	170.000	0.14540	80.77778
10	2.500	4.17%	165.000	0.14120	78.44444



Beban normal 4 kg = 254.2 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	6.000	0.0051	2.833
2	0.500	0.83%	20.000	0.0172	9.556
3	0.750	1.25%	132.000	0.1130	62.778
4	1.000	1.67%	185.000	0.1583	87.944
5	1.250	2.08%	220.000	0.1883	104.611
6	1.500	2.50%	207.000	0.1771	98.389
7	1.750	2.92%	206.000	0.1763	97.944
8	2.000	3.33%	180.000	0.1541	85.611
9	2.250	3.75%	170.000	0.1454	80.778





p	60	mm
l	60	mm
t	30	mm
t	30	mm
A	3600	mm^2
V	108000	mm^3

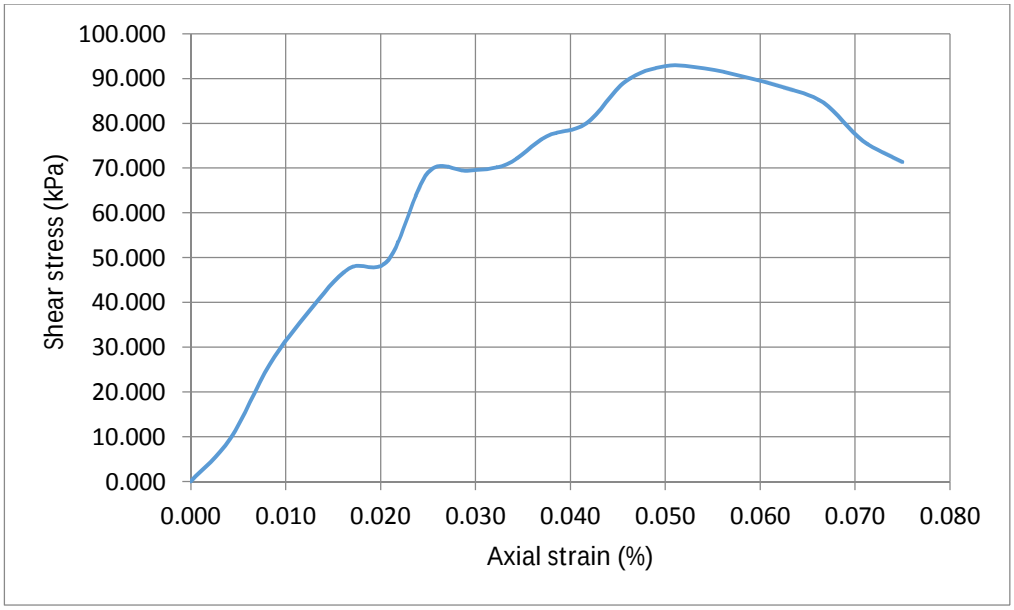
Normal Sress (kPa)	Peak Stress (kPa)
63.55	75.5556
127.1	86.5000
254.2	104.6111

kohesi (c)	66.5	kPa
sudut geser (ϕ)	8.5867924	°

Pengujian Kuat Geser 10% Pasir

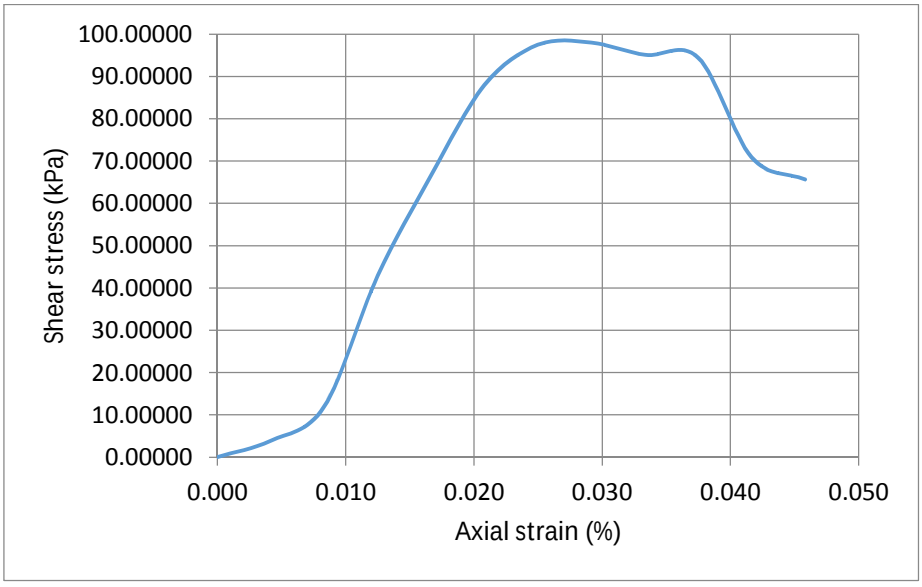
Beban normal 1 kg = 63.55 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan dial gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	20.000	0.0172	9.556
2	0.500	0.83%	55.000	0.0471	26.167
3	0.750	1.25%	80.000	0.0685	38.056
4	1.000	1.67%	100.000	0.0856	47.556
5	1.250	2.08%	104.000	0.0890	49.444
6	1.500	2.50%	145.000	0.1241	68.944
7	1.750	2.92%	146.000	0.1249	69.389
8	2.000	3.33%	149.000	0.1275	70.833
9	2.250	3.75%	162.000	0.1387	77.056
10	2.500	4.17%	168.000	0.1438	79.889
11	2.750	4.58%	188.000	0.1608	89.333
12	3.000	5.00%	195.000	0.1669	92.722
13	3.250	5.42%	194.000	0.1660	92.222
14	3.500	5.83%	190.000	0.1626	90.333
15	3.750	6.25%	185.000	0.1583	87.944
16	4.000	6.67%	179.000	0.1523	84.611
17	4.250	7.08%	160.000	0.1369	76.056
18	4.500	7.50%	150.000	0.1284	71.333



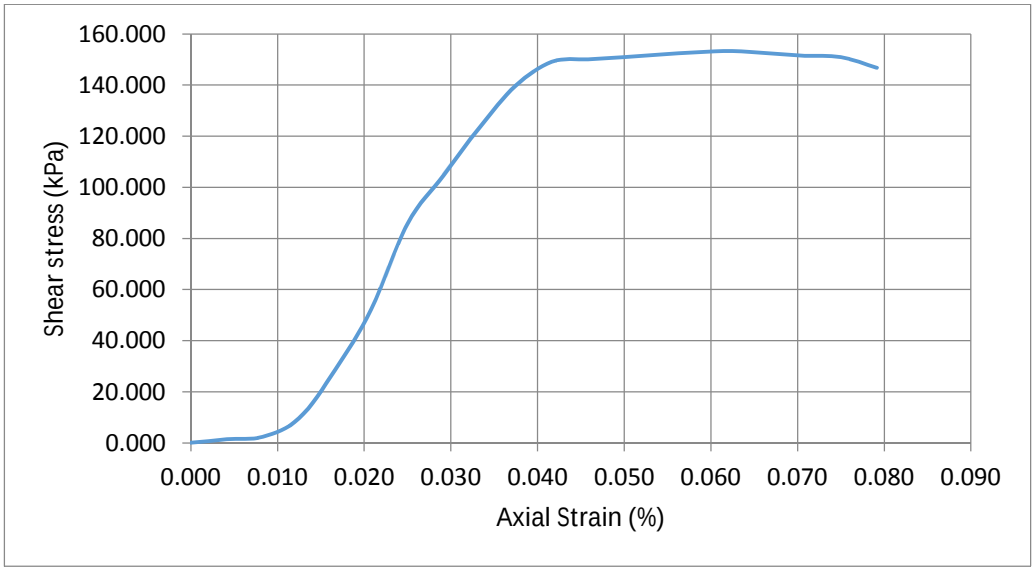
Beban normal 2 kg = 127.1 kPa

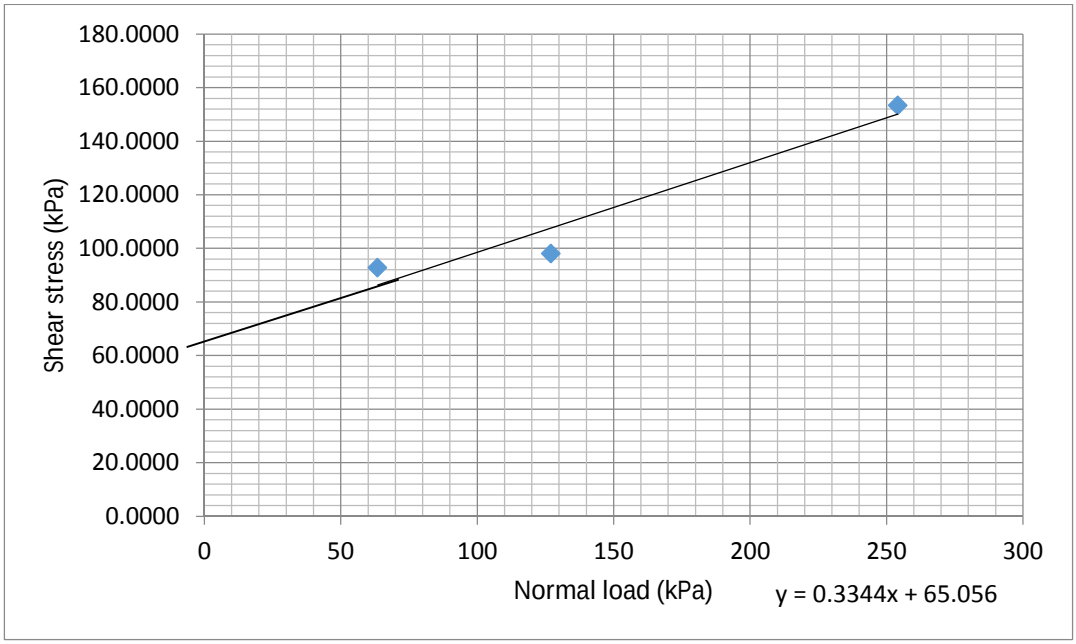
Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan dial gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.00000	0.00000
1	0.250	0.42%	8.000	0.00690	3.83333
2	0.500	0.83%	25.000	0.02140	11.88889
3	0.750	1.25%	90.000	0.07700	42.77778
4	1.000	1.67%	140.000	0.11980	66.55556
5	1.250	2.08%	185.000	0.15830	87.94444
6	1.500	2.50%	205.000	0.17540	97.44444
7	1.750	2.92%	206.000	0.17630	97.94444
8	2.000	3.33%	200.000	0.17110	95.05556
9	2.250	3.75%	195.000	0.1699	94.38889
10	2.500	4.17%	149.000	0.1275	70.83333
11	2.750	4.58%	138.000	0.1181	65.61111



Beban normal 4 kg = 254.2 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan dial gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	3.000	0.0025	1.389
2	0.500	0.83%	5.000	0.0043	2.389
3	0.750	1.25%	20.000	0.0172	9.556
4	1.000	1.67%	60.000	0.0514	28.556
5	1.250	2.08%	110.000	0.0941	52.278
6	1.500	2.50%	180.000	0.1541	85.611
7	1.750	2.92%	220.000	0.1883	104.611
8	2.000	3.33%	260.000	0.2221	123.389
9	2.250	3.75%	295.000	0.2515	139.722
10	2.500	4.17%	315.000	0.2683	149.056
11	2.750	4.58%	317.000	0.2700	150.000
12	3.000	5.00%	319.000	0.2716	150.889
13	3.250	5.42%	321.000	0.2733	151.833
14	3.500	5.83%	323.000	0.2750	152.778
15	3.750	6.25%	324.000	0.2759	153.278
16	4.000	6.67%	322.000	0.2742	152.333
17	4.250	7.08%	320.000	0.2725	151.389
18	4.500	7.50%	319.000	0.2716	150.889
19	4.750	7.92%	310.000	0.2641	146.722





p	60	mm
l	60	mm
t	30	mm
t	30	mm
A	3600	mm^2
V	108000	mm^3

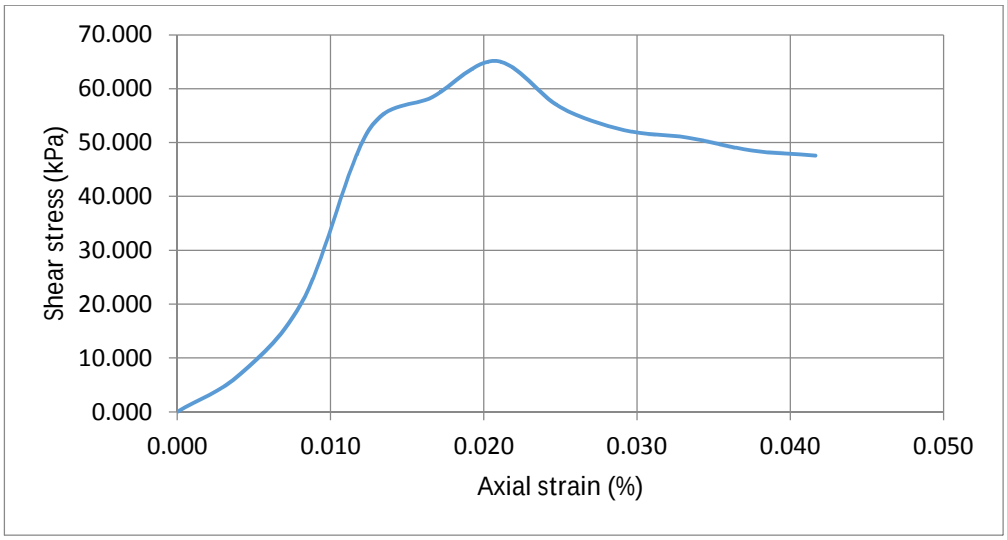
Normal Stress (kPa)	Peak Stress (kPa)
63.55	92.7222
127.1	97.9444
254.2	153.2778

kohesi (c)	65.056	kPa
sudut geser (ϕ)	18.489935	O

Perhitungan Kuat Geser 20% Pasir

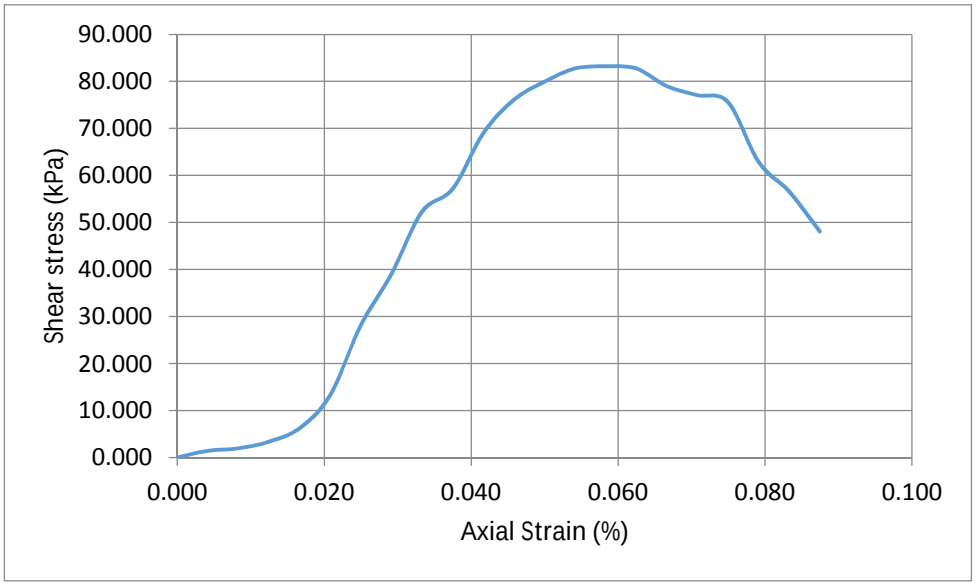
beban normal 1 kg = 63.55 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	15.000	0.0128	7.111
2	0.500	0.83%	45.000	0.0385	21.389
3	0.750	1.25%	110.000	0.0941	52.278
4	1.000	1.67%	123.000	0.1052	58.444
5	1.250	2.08%	137.000	0.1172	65.111
6	1.500	2.50%	119.000	0.1018	56.556
7	1.750	2.92%	110.000	0.0941	52.278
8	2.000	3.33%	107.000	0.0916	50.889
9	2.250	3.75%	102.000	0.087	48.500
10	2.500	4.17%	100.000	0.086	47.556



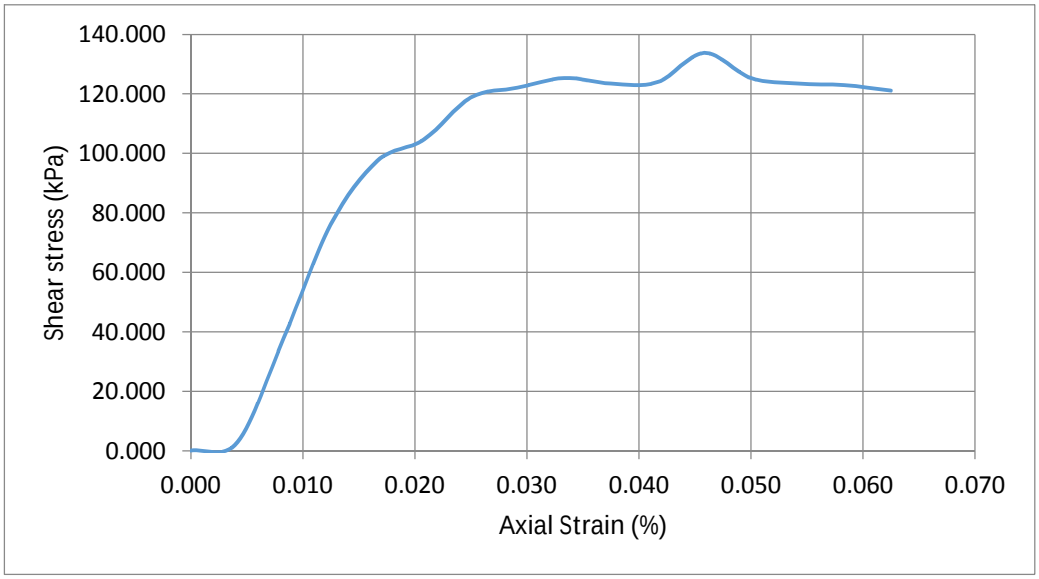
beban normal	2	kg	=	127.1	kPa

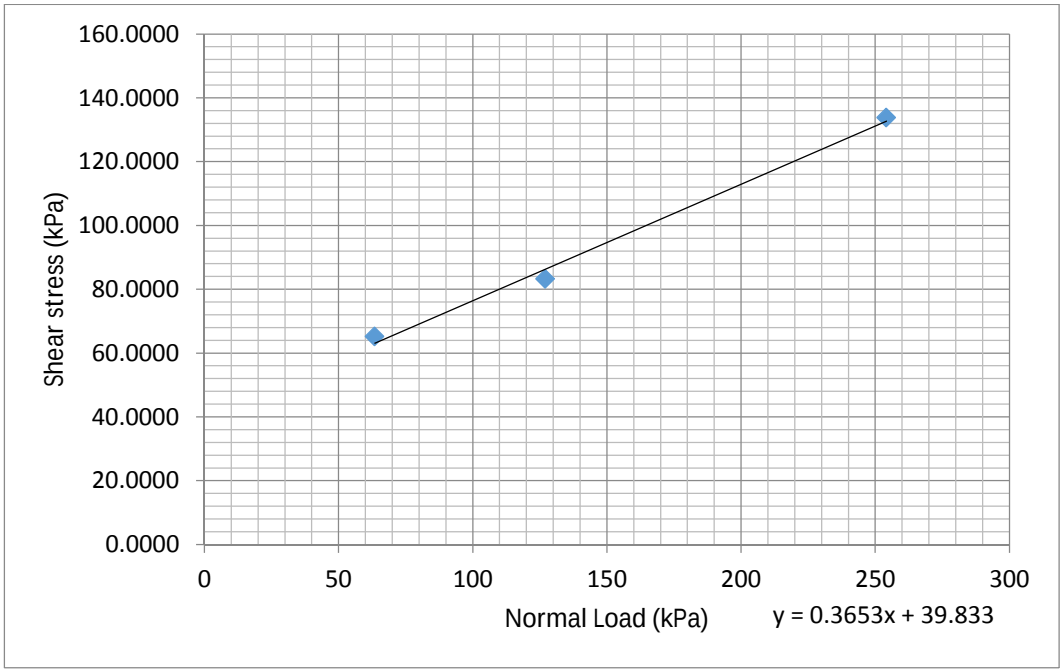
Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	3.000	0.0025	1.389
2	0.500	0.83%	4.000	0.0034	1.889
3	0.750	1.25%	7.000	0.0060	3.333
4	1.000	1.67%	13.000	0.0111	6.167
5	1.250	2.08%	28.000	0.0239	13.278
6	1.500	2.50%	59.000	0.0505	28.056
7	1.750	2.92%	82.000	0.0702	39.000
8	2.000	3.33%	110.000	0.0941	52.278
9	2.250	3.75%	120.000	0.1027	57.056
10	2.500	4.17%	145.000	0.1241	68.944
11	2.750	4.58%	160.000	0.1369	76.056
12	3.000	5.00%	168.000	0.1438	79.889
13	3.250	5.42%	174.000	0.1489	82.722
14	3.500	5.83%	175.000	0.1497	83.167
15	3.750	6.25%	174.000	0.1489	82.722
16	4.000	6.67%	166.000	0.1421	78.944
17	4.250	7.08%	162.000	0.1387	77.056
18	4.500	7.50%	159.000	0.1360	75.556
19	4.750	7.92%	132.000	0.1130	62.778
20	5.000	8.33%	119.000	0.1018	56.556
21	5.250	8.75%	101.000	0.0864	48.000



beban normal	4	kg	=	254.2	kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.00000	0.000
1	0.250	0.42%	5.000	0.00510	2.833
2	0.500	0.83%	80.000	0.06850	38.056
3	0.750	1.25%	160.000	0.13690	76.056
4	1.000	1.67%	205.000	0.17540	97.444
5	1.250	2.08%	220.000	0.18830	104.611
6	1.500	2.50%	250.000	0.21370	118.722
7	1.750	2.92%	257.000	0.21960	122.000
8	2.000	3.33%	264.000	0.22550	125.278
9	2.2500	3.75%	260.000	0.2221	123.389
10	2.5000	4.17%	261.000	0.2230	123.889
11	2.7500	4.58%	282.000	0.2407	133.722
12	3.0000	5.00%	264.000	0.2255	125.278
13	3.2500	5.42%	260.000	0.2221	123.389
14	3.5000	5.83%	259.000	0.2212	122.889
15	3.7500	6.25%	255.000	0.2179	121.056





p	60	mm
l	60	mm
t	30	mm
t	30	mm
A	3600	mm^2
V	108000	mm^3

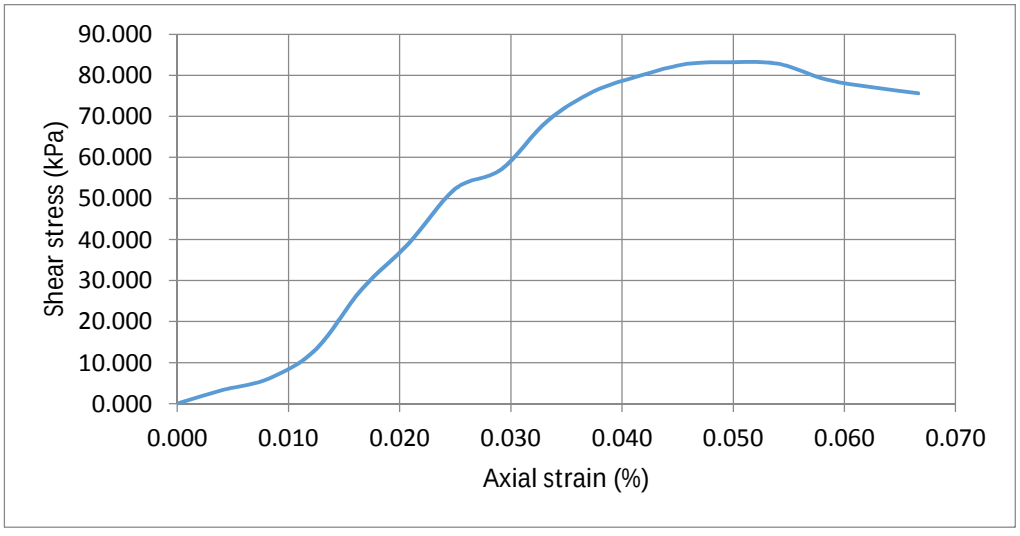
Normal Stress (kPa)	Peak Stress (kPa)
63.55	65.1111
127.1	83.1667
254.2	133.7222

kohesi (c)	44.056	kPa
sudut geser (ϕ)	20.067249	O

Perhitungan Kuat Geser 25% Pasir

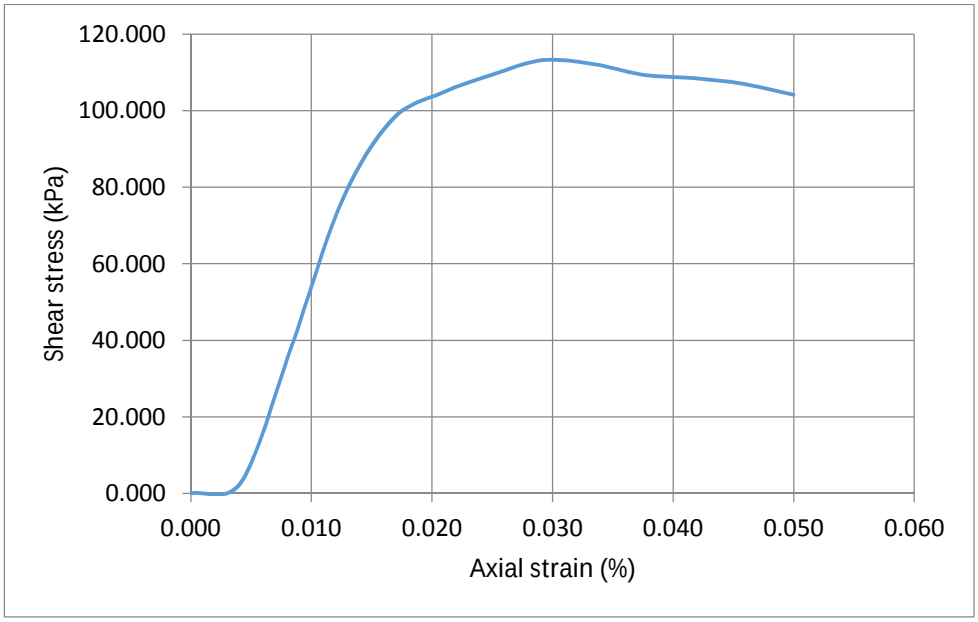
beban normal 1 kg = 63.55 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	7.000	0.0060	3.333
2	0.500	0.83%	13.000	0.0111	6.167
3	0.750	1.25%	28.000	0.0239	13.278
4	1.000	1.67%	59.000	0.0505	28.056
5	1.250	2.08%	82.000	0.0702	39.000
6	1.500	2.50%	110.000	0.0941	52.278
7	1.750	2.92%	120.000	0.1027	57.056
8	2.000	3.33%	145.000	0.1241	68.944
9	2.250	3.75%	160.000	0.1369	76.056
10	2.500	4.17%	168.000	0.1438	79.889
11	2.750	4.58%	174.000	0.1489	82.722
12	3.000	5.00%	175.000	0.1497	83.167
13	3.250	5.42%	174.000	0.1489	82.722
14	3.500	5.83%	166.000	0.1421	78.944
15	3.750	6.25%	162.000	0.1387	77.056
16	4.000	6.67%	159.000	0.1360	75.556



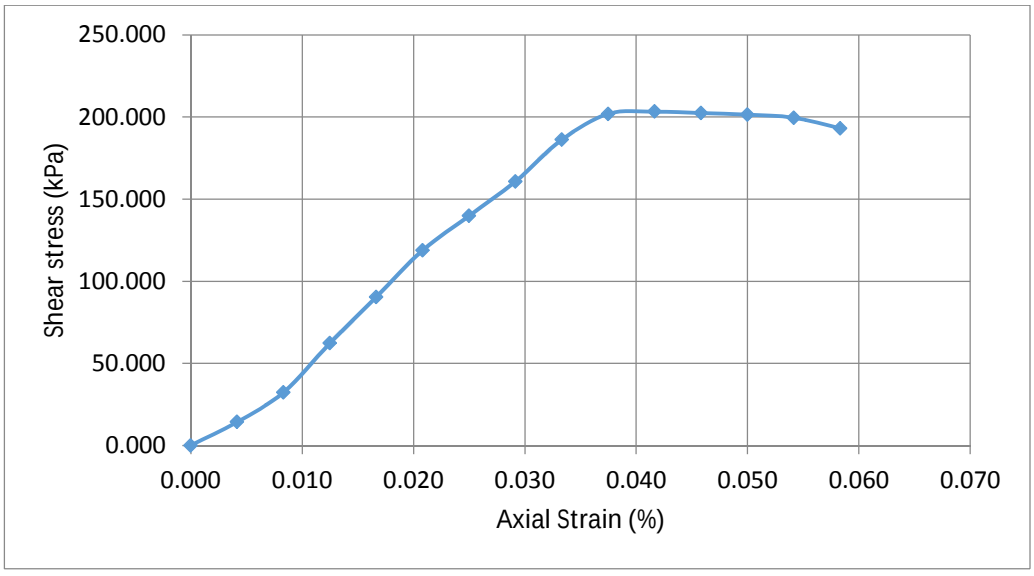
beban normal 2 kg = 127.1 kPa

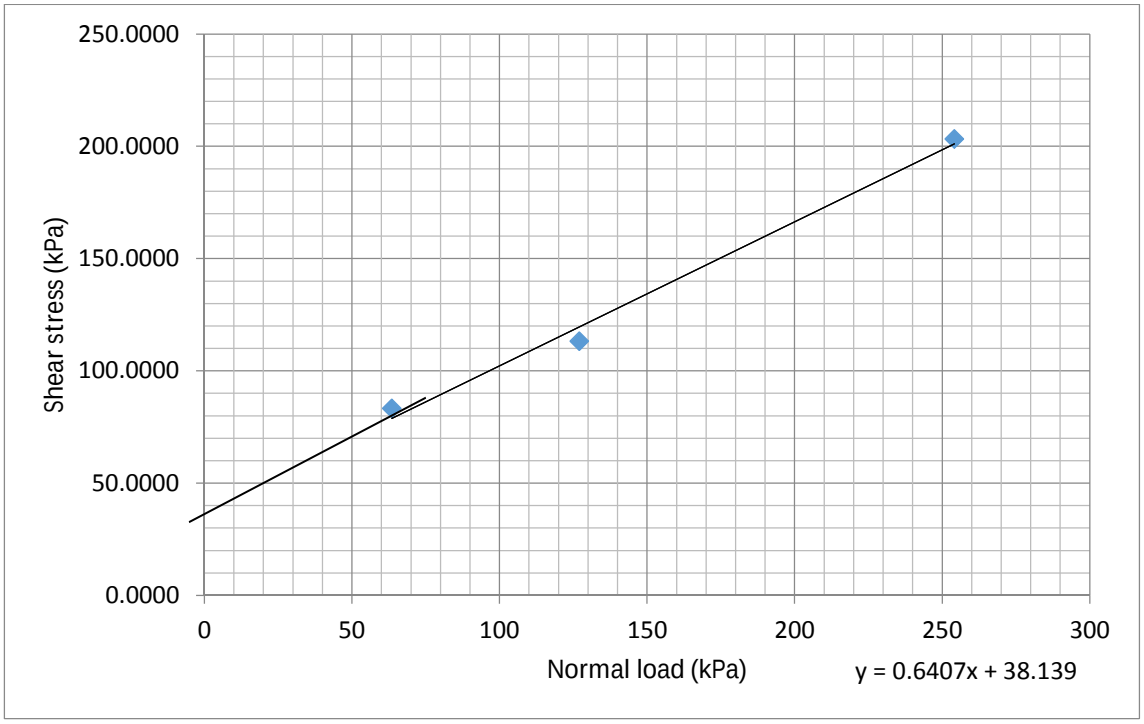
Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	5.000	0.0051	2.833
2	0.500	0.83%	80.000	0.0685	38.056
3	0.750	1.25%	160.000	0.1369	76.056
4	1.000	1.67%	205.000	0.1754	97.444
5	1.250	2.08%	220.000	0.1883	104.611
6	1.500	2.50%	230.000	0.1968	109.333
7	1.750	2.92%	238.000	0.2036	113.111
8	2.000	3.33%	236.000	0.2019	112.167
9	2.250	3.75%	230.000	0.1968	109.333
10	2.500	4.17%	228.000	0.1952	108.444
11	2.750	4.58%	225.000	0.1925	106.944
12	3.000	5.00%	219.000	0.1874	104.111



beban normal 4 kg = 254.2 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.00000	0.000
1	0.250	0.42%	30.000	0.02570	14.278
2	0.500	0.83%	68.000	0.05820	32.333
3	0.750	1.25%	131.000	0.11210	62.278
4	1.000	1.67%	190.000	0.16260	90.333
5	1.250	2.08%	250.000	0.21370	118.722
6	1.500	2.50%	295.000	0.25150	139.722
7	1.750	2.92%	340.000	0.28920	160.667
8	2.000	3.33%	395.000	0.33500	186.111
9	2.2500	3.75%	429.000	0.3632	201.778
10	2.5000	4.17%	432.000	0.3657	203.167
11	2.7500	4.58%	430.000	0.3640	202.222
12	3.000	5.00%	428.000	0.3624	201.333
13	3.250	5.42%	424.000	0.3590	199.444
14	3.500	5.83%	410.000	0.3474	193.000





p	60	mm
l	60	mm
t	30	mm
t	30	mm
A	3600	mm^2
V	108000	mm^3

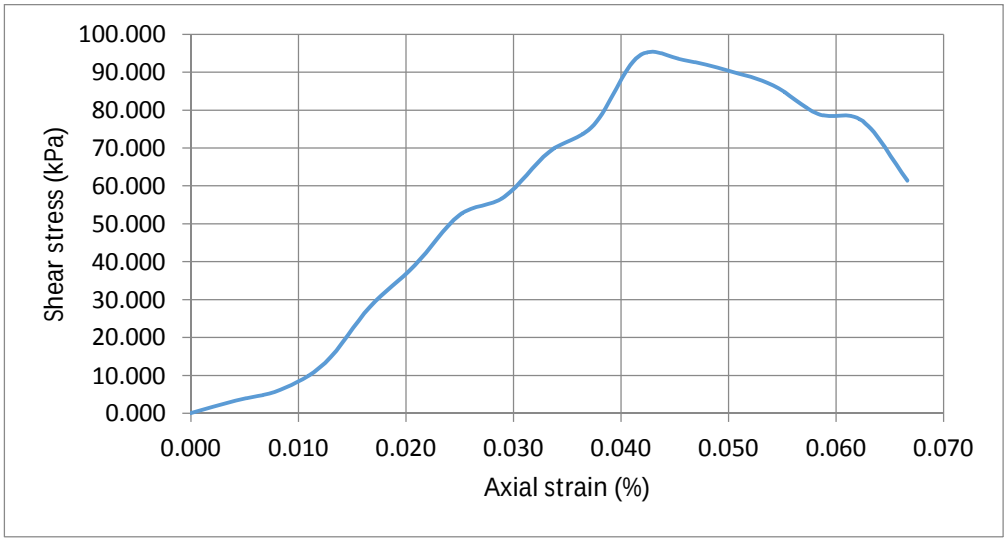
Normal Stress (kPa)	Peak Stress (kPa)
63.55	83.1667
127.1	113.1111
254.2	203.1667

kohesi (c)	38.139	kPa
sudut geser (ϕ)	32.647687	O

Pengujian Kuat Geser 30% Pasir

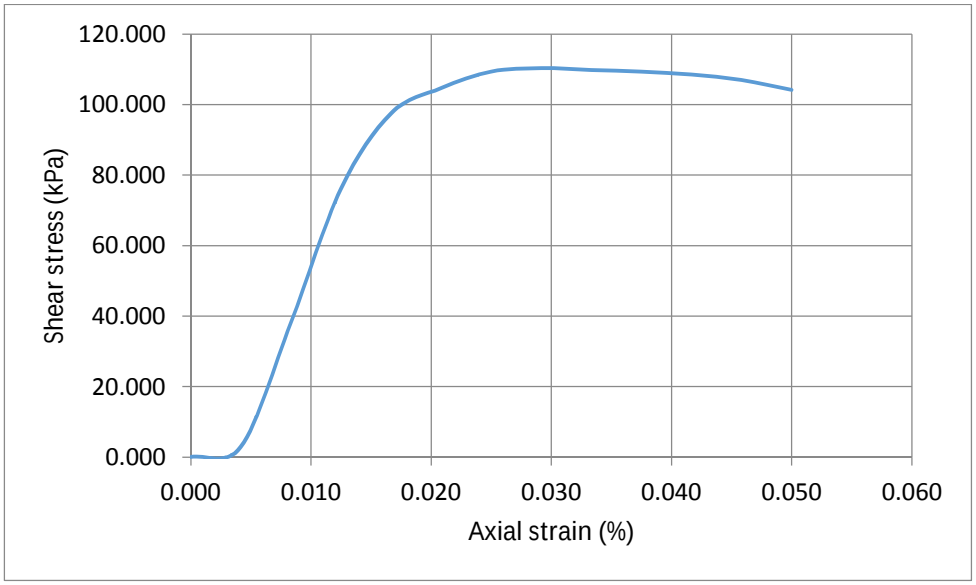
beban normal 1 kg = 63.55 kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	7.000	0.0060	3.333
2	0.500	0.83%	13.000	0.0111	6.167
3	0.750	1.25%	28.000	0.0239	13.278
4	1.000	1.67%	59.000	0.0505	28.056
5	1.250	2.08%	82.000	0.0702	39.000
6	1.500	2.50%	110.000	0.0941	52.278
7	1.750	2.92%	120.000	0.1027	57.056
8	2.000	3.33%	145.000	0.1241	68.944
9	2.250	3.75%	160.000	0.1369	76.056
10	2.500	4.17%	198.000	0.1695	94.167
11	2.750	4.58%	196.000	0.1677	93.167
12	3.000	5.00%	190.000	0.1626	90.333
13	3.250	5.42%	182.000	0.1557	86.500
14	3.500	5.83%	166.000	0.1421	78.944
15	3.750	6.25%	162.000	0.1387	77.056
16	4.000	6.67%	129.000	0.1104	61.333



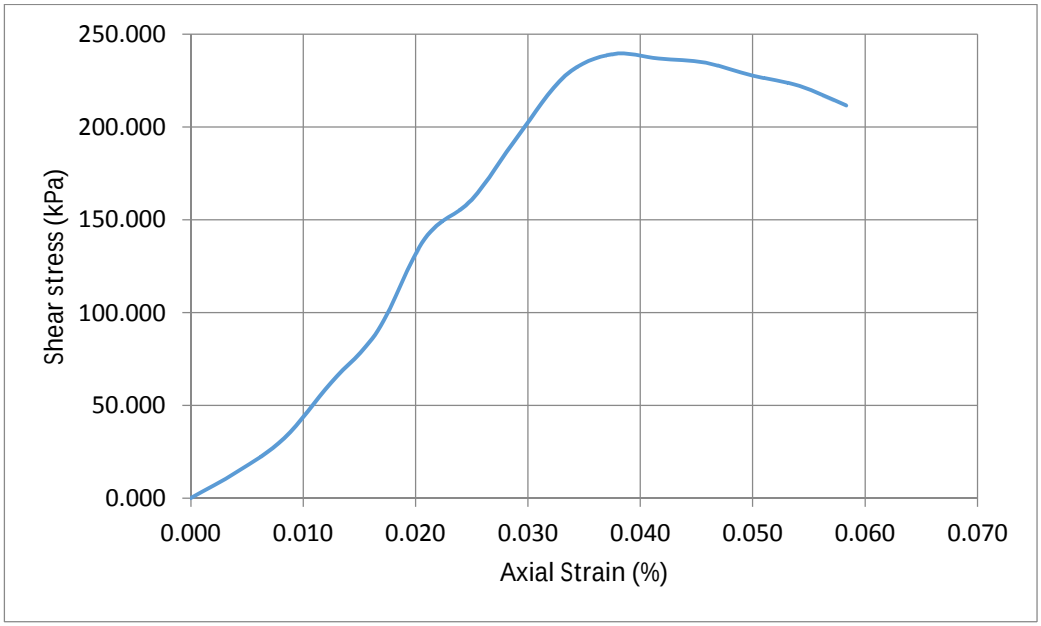
beban normal 2 kg = 127.1 kPa

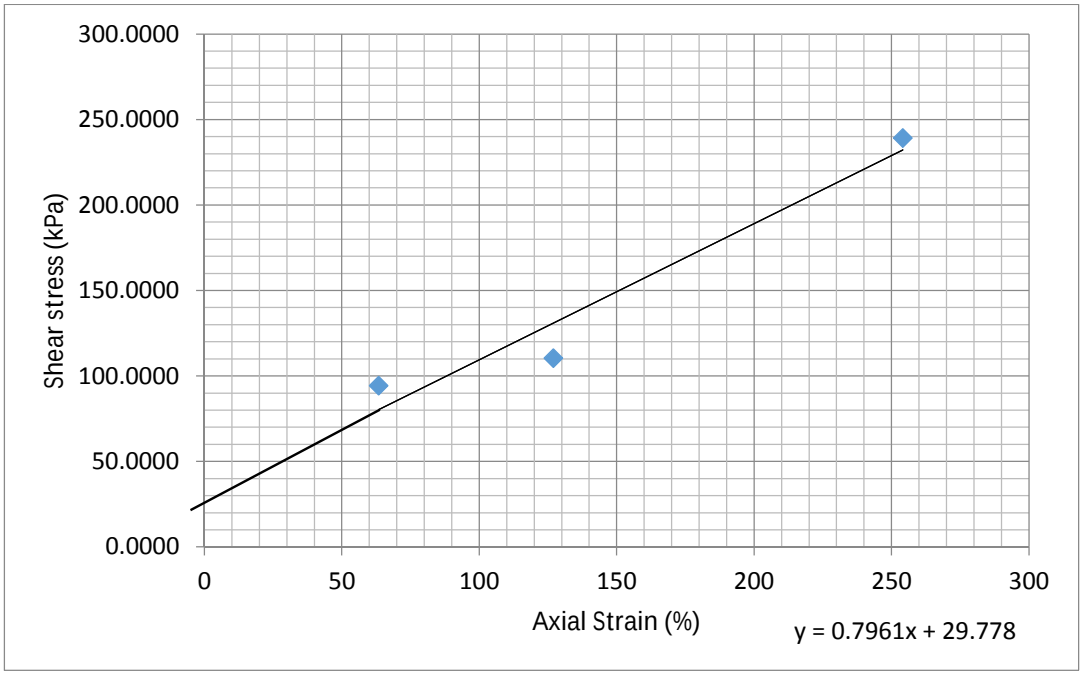
Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	5.000	0.0051	2.833
2	0.500	0.83%	80.000	0.0685	38.056
3	0.750	1.25%	160.000	0.1369	76.056
4	1.000	1.67%	205.000	0.1754	97.444
5	1.250	2.08%	220.000	0.1883	104.611
6	1.500	2.50%	230.000	0.1968	109.333
7	1.750	2.92%	232.000	0.1985	110.278
8	2.000	3.33%	231.000	0.1976	109.778
9	2.250	3.75%	230.000	0.1968	109.333
10	2.500	4.17%	228.000	0.1952	108.444
11	2.750	4.58%	225.000	0.1925	106.944
12	3.000	5.00%	219.000	0.1874	104.111



beban normal	4	kg	=	254.2	kPa

Reading Number	Horizontal Deformation (mm)	Axial Strain (%)	Pembacaan Dial Gauge	Shear Force (kN)	Stress (kPa)
0	0.000	0.000	0.000	0.0000	0.000
1	0.250	0.42%	30.000	0.0257	14.278
2	0.500	0.83%	68.000	0.0582	32.333
3	0.750	1.25%	131.000	0.1121	62.278
4	1.000	1.67%	190.000	0.1626	90.333
5	1.250	2.08%	295.000	0.2515	139.722
6	1.500	2.50%	340.000	0.2892	160.667
7	1.750	2.92%	415.000	0.3516	195.333
8	2.000	3.33%	485.000	0.4095	227.500
9	2.2500	3.75%	510.000	0.4303	239.056
10	2.5000	4.17%	505.000	0.4261	236.722
11	2.7500	4.58%	500.000	0.4220	234.444
12	3.000	5.00%	485.000	0.4095	227.500
13	3.250	5.42%	473.000	0.3996	222.000
14	3.500	5.83%	450.000	0.3806	211.444





p	60	mm
l	60	mm
t	30	mm
t	30	mm
A	3600	mm^2
V	108000	mm^3

Normal Stress (kPa)	Peak Stress (kPa)
63.55	94.1667
127.1	110.2778
254.2	239.0556

kohesi (c)	29.778	kPa
sudut geser (ϕ)	38.523297	o