LAMPIRAN
PENGUJIAN UNCONFINED

WATER CONTENT AND DENSITY DETERMINATION
ASSUMSED WATER CONTENT 100 % FOR UNCONFINED COMPRESSION TEST

Water Content Determination

Assumed Water Content	100%			
SAMPLE	Kondisi Polos	Kondisi 1	Kondisi 2	Kondisi 3
Wt. of can (gr)	18.59	22.04	25.53	19.58
Wt. of soil + can (gr)	131.14	78.69	64.56	111.63
Wt. of dry soil + can (gr)	75.32	50.68	45.21	65.86
Wt. of water (gr)	112.55	56.65	39.03	92.05
Wt. of dry soil (gr)	56.73	28.64	19.68	46.28
Water content (%)	98,40	97,80	98,32	98,90

Density Determination

Water content (%)	98,40	97,80	98,32	98,90
Wt. of mold (gr)	1507	1507	1507	1507
Wt. of soil + mold (gr)	1779,50	1778,00	1777,00	1776,50
Wt. of soil (gr)	272,50	271,00	270,00	269,50
Diameter of mold (cm)	6	6	6	6
Height of mold (cm)	12	12	12	12
Volume of mold (cm^3)	339,12	339,12	339,12	339,12
Wet density γwet (gr/cm^3)	0,804	0,799	0,796	0,795
Dry density γdry (gr/cm^3)	0,405	0,404	0,401	0,400

WATER CONTENT AND DENSITY DETERMINATION
ASSUMSED WATER CONTENT 120 % FOR UNCONFINED COMPRESSION TEST

Water Content Determination

Assumed Water Content	120%			
SAMPLE	Kondisi Polos	Kondisi 1	Kondisi 2	Kondisi 3
Wt. of can (gr)	18.59	22.04	25.53	19.58
Wt. of soil + can (gr)	143.11	82.87	140.52	115.17
Wt. of dry soil + can (gr)	75.71	49.88	77.94	63.25
Wt. of water (gr)	124.52	60.83	114.99	95.59
Wt. of dry soil (gr)	57.12	27.84	52.41	43.67
Water content (%)	118,00	118,50	119,40	118,89

Density Determination

Water content (%)	118,00	118,50	119,40	118,89
Wt. of mold (gr)	1507	1507	1507	1507
Wt. of soil + mold (gr)	1791,71	1797,00	1794,00	1796,00
Wt. of soil (gr)	284,71	290,00	287,00	289,00
Diameter of mold (cm)	6	6	6	6
Height of mold (cm)	12	12	12	12
Volume of mold (cm^3)	339,12	339,12	339,12	339,12
Wet density γwet (gr/cm^3)	0,840	0,855	0,846	0,852
Dry density γdry (gr/cm^3)	0,385	0,391	0,386	0,389

WATER CONTENT AND DENSITY DETERMINATION
ASSUMSED WATER CONTENT 140 % FOR UNCONFINED COMPRESSION TEST

Water Content Determination

Assumed Water Content	140%			
SAMPLE	Kondisi Polos	Kondisi 1	Kondisi 2	Kondisi 3
Wt. of can (gr)	18.59	22.04	25.53	19.58
Wt. of soil + can (gr)	150.89	133.46	162.14	132.61
Wt. of dry soil + can (gr)	73.97	68.58	82.88	67.09
Wt. of water (gr)	132.30	111.42	136.61	113.03
Wt. of dry soil (gr)	55.38	46.54	57.35	47.51
Water content (%)	138,89	139,41	138,20	137,91

Density Determination

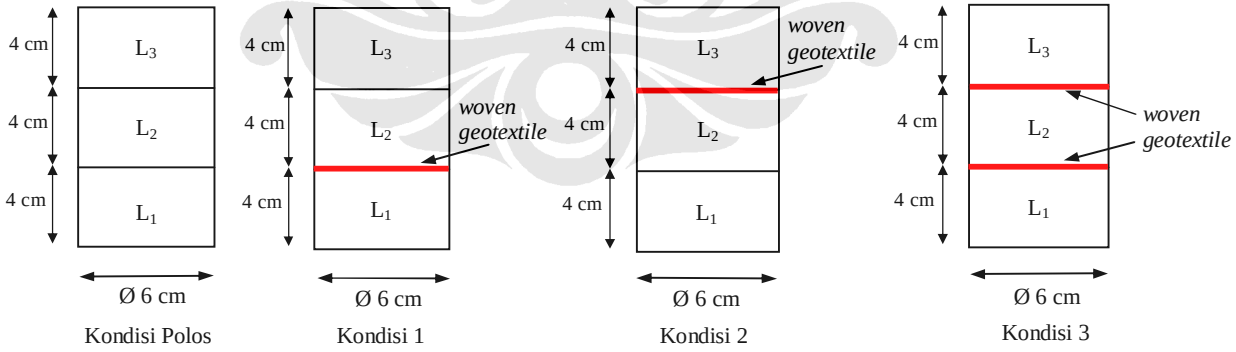
Water content (%)	138,89	139,41	138,20	137,91
Wt. of mold (gr)	1507	1507	1507	1507
Wt. of soil + mold (gr)	1841,50	1846,00	1844,00	1844,50
Wt. of soil (gr)	334,50	339,00	337,00	337,50
Diameter of mold (cm)	6	6	6	6
Height of mold (cm)	12	12	12	12
Volume of mold (cm^3)	339,12	339,12	339,12	339,12
Wet density γwet (gr/cm^3)	0,986	1,000	0,994	0,995
Dry density γdry (gr/cm^3)	0,413	0,418	0,417	0,418

UNCONFINED COMPRESSION TEST
FOR ASSUMSED WATER CONTENT 100 %

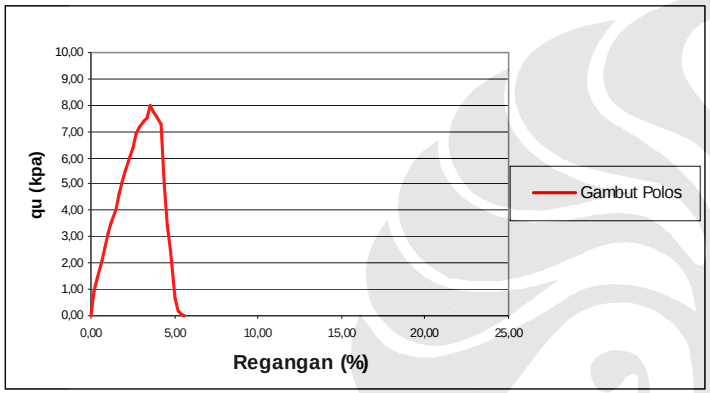
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
0	0,00	0,000	0,00	0,000	0,00	0,000	0,00	0,000
25	14,00	0,920	15,00	0,985	8,00	0,525	10,00	0,657
50	22,00	1,442	25,00	1,639	13,00	0,852	15,00	0,983
75	32,00	2,093	33,00	2,158	20,00	1,308	21,00	1,374
100	40,00	2,611	42,00	2,741	26,00	1,697	27,00	1,762
125	48,00	3,126	50,00	3,257	32,00	2,084	35,00	2,280
150	55,00	3,575	59,00	3,835	40,00	2,600	41,00	2,665
175	62,00	4,021	68,00	4,410	47,00	3,048	47,00	3,048
200	71,00	4,595	76,00	4,919	53,00	3,430	55,00	3,560
225	79,00	5,102	84,00	5,425	61,00	3,940	62,00	4,004
250	85,00	5,478	92,00	5,929	69,00	4,447	69,00	4,447
275	94,00	6,045	100,00	6,431	76,00	4,887	75,00	4,823
300	100,00	6,417	108,00	6,931	84,00	5,390	84,00	5,390
325	108,00	6,916	114,00	7,300	90,00	5,763	92,00	5,891
350	112,00	7,157	118,00	7,540	97,00	6,198	99,00	6,326
375	116,00	7,396	120,00	7,651	104,00	6,631	105,00	6,695
400	118,00	7,508	120,00	7,635	110,00	6,999	112,00	7,126
425	126,00	7,999	123,00	7,809	116,00	7,364	120,00	7,618
450	122,00	7,729	124,00	7,855	122,00	7,729	125,00	7,919
475	120,00	7,585	128,00	8,091	128,00	8,091	131,00	8,281
500	115,00	7,254	134,00	8,452	132,00	8,326	137,00	8,641
525	80,00	5,035	139,00	8,748	135,00	8,497	143,00	9,000
550	55,00	3,454	143,00	8,981	141,00	8,855	147,00	9,232
575	40,00	2,507	135,00	8,460	145,00	9,086	150,00	9,400
600	10,00	0,625	127,00	7,941	147,00	9,191	149,00	9,316
625	3,00	0,187	122,00	7,612	150,00	9,358	153,00	9,546
650	1,00	0,062	119,00	7,408	151,00	9,400	155,00	9,649
675	0,00	0,000	111,00	6,895	150,00	9,317	157,00	9,752
700			70,00	4,338	145,00	8,987	158,00	9,793
725			55,00	3,401	143,00	8,843	160,00	9,895
750			40,00	2,468	140,00	8,639	157,00	9,688
775			32,00	1,970	135,00	8,312	155,00	9,543
800			25,00	1,536	105,00	6,450	148,00	9,092

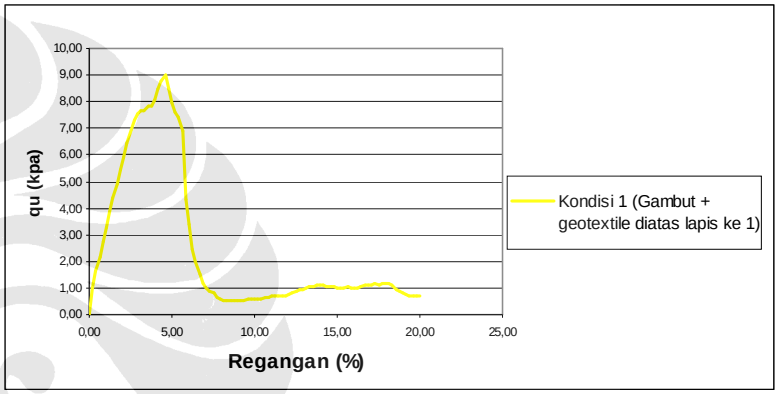
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
825			19,00	1,165	77,00	4,720	144,00	8,826
850			16,00	0,978	67,00	4,097	140,00	8,562
875			14,00	0,854	56,00	3,417	132,00	8,054
900			13,00	0,791	45,00	2,740	124,00	7,549
925			11,00	0,668	39,00	2,369	119,00	7,229
950			10,00	0,606	34,00	2,061	117,00	7,091
975			9,00	0,544	28,00	1,693	115,00	6,954
1000			9,00	0,543	27,00	1,629	112,00	6,757
1025			9,00	0,542	26,00	1,565	109,00	6,561
1050			9,00	0,541	26,00	1,562	105,00	6,306
1075			9,00	0,539	25,00	1,498	99,00	5,932
1100			9,00	0,538	25,00	1,495	89,00	5,321
1125			9,00	0,537	25,00	1,491	86,00	5,130
1150			9,50	0,565	24,00	1,428	82,00	4,880
1175			9,50	0,564	24,00	1,425	79,00	4,690
1200			10,00	0,592	24,00	1,422	76,00	4,502
1225			10,00	0,591	24,00	1,418	68,00	4,019
1250			10,00	0,590	24,00	1,415	52,00	3,066
1275			11,00	0,647	25,00	1,471	40,00	2,353
1300			11,00	0,646	26,00	1,526	34,00	1,995
1325			12,00	0,703	27,50	1,610	32,00	1,874
1350			12,00	0,701	28,00	1,636	32,50	1,898
1375			12,00	0,699	29,00	1,690	33,00	1,923
1400			12,00	0,698	29,00	1,686	33,00	1,919
1425			12,50	0,725	29,00	1,682	35,00	2,030
1450			13,00	0,752	29,50	1,707	35,00	2,025
1475			14,00	0,808	30,00	1,732	36,00	2,078
1500			15,00	0,864	30,50	1,757	37,00	2,131
1525			16,00	0,919	30,50	1,752	38,00	2,183
1550			16,50	0,946	31,00	1,777	38,00	2,178
1575			17,00	0,972	30,00	1,715	38,00	2,173
1600			18,00	1,027	26,00	1,483	37,00	2,111
1625			19,00	1,081	26,00	1,480	36,00	2,049
1650			20,00	1,135	27,00	1,533	37,50	2,129
1675			20,00	1,133	28,00	1,586	39,00	2,209
1700			20,00	1,130	28,00	1,582	40,50	2,288
1725			19,00	1,071	29,00	1,634	42,00	2,367
1750			19,00	1,068	29,00	1,630	44,00	2,474
1775			18,50	1,038	29,50	1,654	45,00	2,524
1800			18,00	1,007	29,00	1,622	46,00	2,573

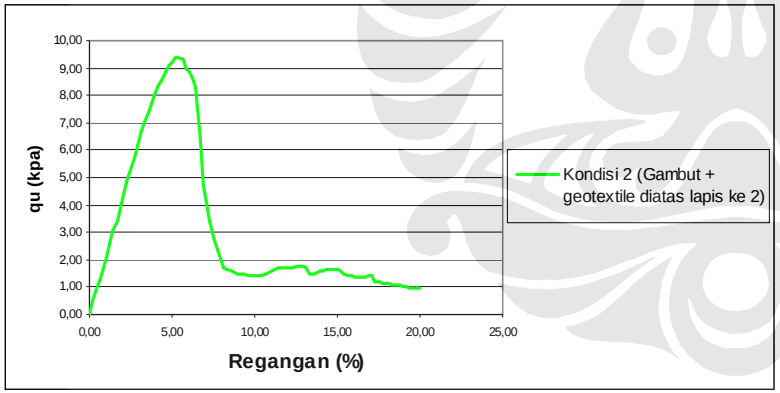
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
1825			18,00	1,005	28,00	1,563	48,00	2,679
1850			18,00	1,002	27,00	1,503	49,00	2,728
1875			19,00	1,055	26,00	1,444	48,00	2,666
1900			18,00	0,997	26,00	1,440	46,00	2,548
1925			18,00	0,995	25,00	1,381	43,00	2,376
1950			18,00	0,992	25,00	1,378	42,50	2,343
1975			19,00	1,045	24,50	1,347	42,50	2,337
2000			20,00	1,097	25,00	1,371	42,50	2,331
2025			20,00	1,094	26,00	1,422	43,00	2,353
2050			20,00	1,091	26,00	1,419	42,50	2,319
2075			21,00	1,143	22,00	1,198	42,00	2,286
2100			21,00	1,140	22,00	1,195	41,50	2,253
2125			21,50	1,164	21,00	1,137	41,00	2,221
2150			22,00	1,189	21,00	1,135	40,50	2,188
2175			22,00	1,186	21,00	1,132	40,00	2,156
2200			21,00	1,129	20,00	1,075	39,00	2,096
2225			17,00	0,911	20,00	1,072	38,00	2,037
2250			16,00	0,856	20,00	1,070	38,00	2,032
2275			15,00	0,800	19,00	1,013	38,00	2,027
2300			14,00	0,745	19,00	1,011	37,50	1,995
2325			13,00	0,690	18,50	0,982	37,50	1,990
2350			13,00	0,688	18,50	0,979	37,50	1,985
2375			13,00	0,686	18,00	0,950	37,00	1,953
2400			13,00	0,685	18,00	0,948	38,00	2,001

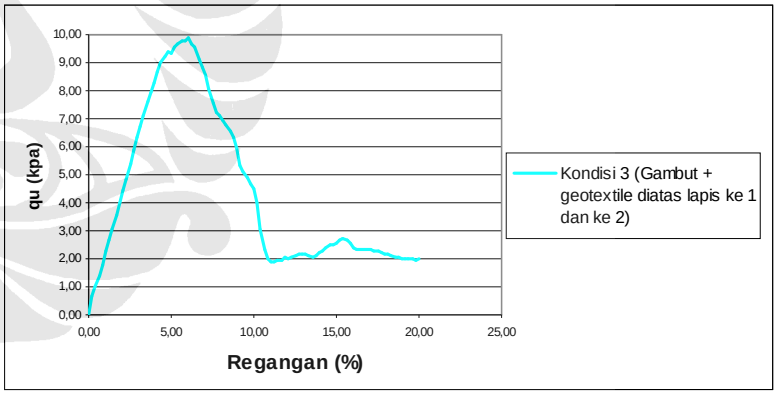


GRAFIK HUBUNGAN q_u DAN REGANGAN (%)
KADAR AIR RENCANA 100 %







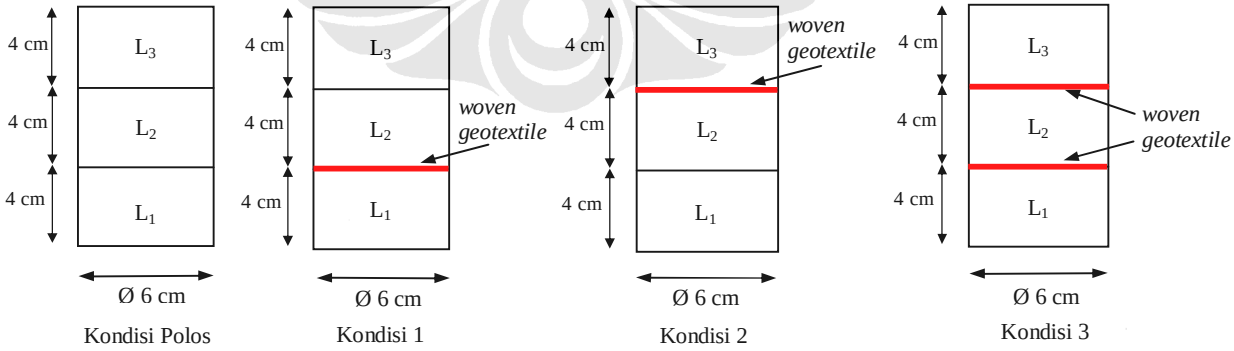


UNCONFINED COMPRESSION TEST
FOR ASSUMSED WATER CONTENT 120 %

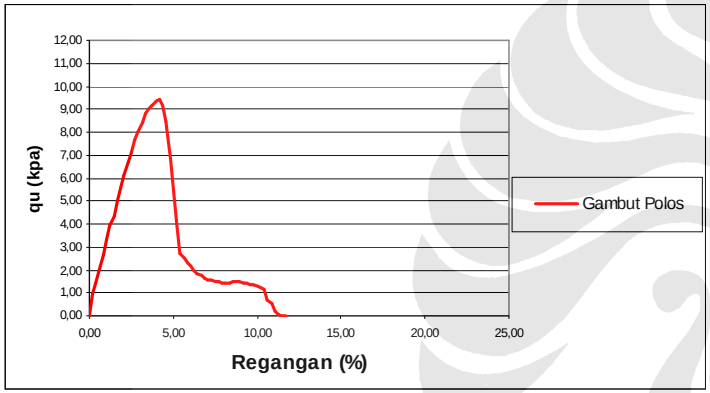
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
0	0,00	0,000	0,00	0,000	0,00	0,000	0,00	0,000
25	14,00	0,920	16,00	1,051	12,00	0,788	9,00	0,591
50	22,00	1,442	23,00	1,507	21,00	1,376	17,00	1,114
75	33,00	2,158	36,00	2,355	30,00	1,962	25,00	1,635
100	41,00	2,676	46,00	3,002	37,00	2,415	32,00	2,089
125	51,00	3,322	55,00	3,582	46,00	2,996	40,00	2,605
150	60,00	3,900	66,00	4,290	54,00	3,510	48,00	3,120
175	67,00	4,345	73,00	4,735	64,00	4,151	55,00	3,567
200	77,00	4,983	83,00	5,372	71,00	4,595	64,00	4,142
225	86,00	5,554	93,00	6,006	79,00	5,102	71,00	4,585
250	95,00	6,122	102,00	6,574	87,00	5,607	80,00	5,156
275	104,00	6,688	112,00	7,203	96,00	6,174	87,00	5,595
300	111,00	7,123	123,00	7,893	103,00	6,610	95,00	6,096
325	120,00	7,684	132,00	8,453	112,00	7,172	104,00	6,660
350	125,00	7,987	140,00	8,946	120,00	7,668	112,00	7,157
375	132,00	8,416	150,00	9,564	126,00	8,034	120,00	7,651
400	138,00	8,780	156,00	9,925	135,00	8,589	127,00	8,080
425	142,00	9,015	160,00	10,158	140,00	8,888	137,00	8,698
450	144,00	9,122	156,00	9,882	145,00	9,186	144,00	9,122
475	148,00	9,355	157,00	9,924	150,00	9,482	150,00	9,482
500	149,00	9,398	159,00	10,029	157,00	9,903	158,00	9,966
525	145,00	9,126	159,00	10,007	158,00	9,944	164,00	10,322
550	135,00	8,478	159,00	9,985	160,00	10,048	167,00	10,488
575	109,00	6,830	160,00	10,026	164,00	10,277	173,00	10,841
600	87,00	5,440	155,00	9,692	165,00	10,317	178,00	11,130
625	64,00	3,993	143,00	8,922	167,00	10,419	182,00	11,355
650	44,00	2,739	110,00	6,848	167,00	10,396	186,00	11,579
675	40,00	2,485	70,00	4,348	166,00	10,311	188,00	11,678
700	37,00	2,293	40,00	2,479	164,00	10,164	188,00	11,652
725	35,00	2,164	25,00	1,546	161,00	9,956	186,00	11,502
750	32,00	1,975	25,00	1,543	155,00	9,564	180,00	11,107
775	30,00	1,847	25,00	1,539	146,00	8,989	175,00	10,774
800	29,00	1,781	25,00	1,536	138,00	8,477	169,00	10,382

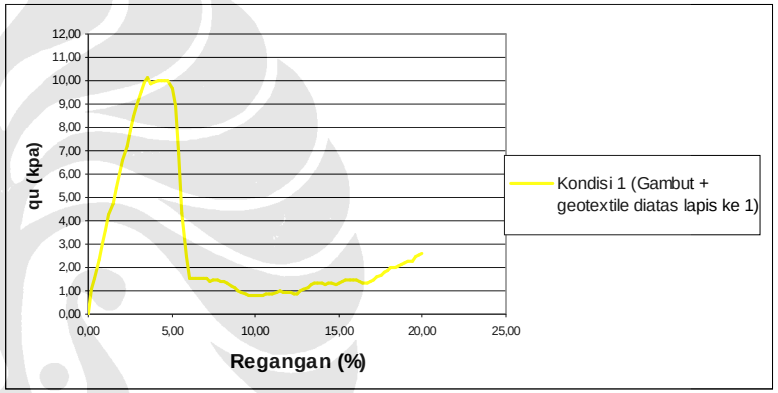
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
825	27,00	1,655	25,00	1,532	124,00	7,600	167,00	10,236
850	26,00	1,590	25,00	1,529	96,00	5,871	164,00	10,029
875	25,00	1,525	23,00	1,403	91,00	5,553	160,00	9,763
900	24,00	1,461	24,00	1,461	89,00	5,418	156,00	9,497
925	25,00	1,519	24,00	1,458	85,00	5,163	153,00	9,294
950	24,00	1,455	23,00	1,394	82,00	4,970	150,00	9,091
975	24,00	1,451	23,00	1,391	79,00	4,777	146,00	8,829
1000	24,00	1,448	22,00	1,327	74,00	4,465	143,00	8,628
1025	25,00	1,505	20,00	1,204	66,00	3,973	140,00	8,427
1050	25,00	1,501	19,00	1,141	61,00	3,664	136,00	8,168
1075	25,00	1,498	17,00	1,019	56,00	3,356	131,00	7,850
1100	24,00	1,435	16,00	0,957	53,00	3,169	126,00	7,533
1125	24,00	1,432	14,00	0,835	50,00	2,982	124,00	7,396
1150	23,00	1,369	14,00	0,833	48,00	2,856	120,00	7,141
1175	23,00	1,366	14,00	0,831	44,00	2,612	115,00	6,828
1200	22,00	1,303	14,00	0,829	40,00	2,369	110,00	6,516
1225	21,00	1,241	14,00	0,827	31,00	1,832	104,00	6,146
1250	19,00	1,120	14,00	0,825	27,00	1,592	90,00	5,307
1275	11,00	0,647	14,50	0,853	25,00	1,471	75,00	4,412
1300	9,00	0,528	15,00	0,880	24,00	1,408	64,00	3,756
1325	4,00	0,234	15,00	0,878	23,00	1,347	59,00	3,454
1350	1,00	0,058	16,00	0,935	23,00	1,343	57,00	3,330
1375	0,50	0,029	17,00	0,991	23,00	1,340	56,00	3,263
1400	0,00	0,000	16,50	0,959	22,50	1,308	54,00	3,139
1425			16,00	0,928	21,00	1,218	53,00	3,074
1450			16,00	0,926	21,00	1,215	52,00	3,009
1475			15,00	0,866	21,00	1,212	51,00	2,944
1500			15,50	0,893	20,00	1,152	51,00	2,937
1525			17,00	0,977	20,00	1,149	51,00	2,930
1550			19,00	1,089	20,00	1,146	51,50	2,952
1575			20,00	1,144	20,00	1,144	51,50	2,945
1600			22,00	1,255	20,00	1,141	52,00	2,966
1625			23,00	1,309	20,00	1,138	52,00	2,959
1650			23,00	1,306	21,00	1,192	52,50	2,980
1675			23,00	1,302	21,00	1,189	52,00	2,945
1700			23,00	1,299	21,00	1,186	52,00	2,938
1725			24,00	1,353	22,00	1,240	52,50	2,959
1750			24,00	1,349	22,00	1,237	53,00	2,980
1775			23,00	1,290	22,00	1,234	53,50	3,000
1800			24,00	1,343	23,00	1,287	54,00	3,021

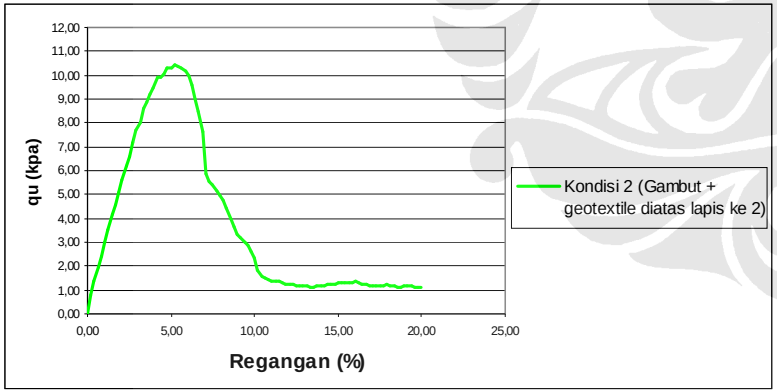
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
1825			25,00	1,395	23,00	1,284	54,00	3,014
1850			26,00	1,447	24,00	1,336	55,00	3,062
1875			26,00	1,444	24,00	1,333	56,00	3,110
1900			26,00	1,440	24,00	1,330	56,50	3,130
1925			26,00	1,437	24,50	1,354	57,00	3,150
1950			25,00	1,378	24,00	1,323	58,00	3,197
1975			24,00	1,320	23,00	1,265	58,00	3,189
2000			24,00	1,316	22,00	1,207	59,00	3,236
2025			26,00	1,422	22,00	1,204	60,00	3,283
2050			27,00	1,473	21,50	1,173	61,00	3,329
2075			29,00	1,579	21,00	1,143	61,00	3,321
2100			31,00	1,683	22,00	1,195	62,00	3,367
2125			33,00	1,787	22,00	1,192	63,00	3,412
2150			35,00	1,891	22,50	1,216	64,00	3,458
2175			37,00	1,994	22,00	1,186	65,00	3,503
2200			37,00	1,989	21,50	1,156	67,00	3,601
2225			39,00	2,091	21,00	1,126	67,00	3,592
2250			40,00	2,139	21,00	1,123	67,00	3,583
2275			41,00	2,187	21,50	1,147	71,00	3,787
2300			43,00	2,288	22,00	1,170	72,00	3,831
2325			43,00	2,282	22,00	1,167	74,00	3,927
2350			46,00	2,435	21,00	1,111	75,00	3,970
2375			48,00	2,534	21,00	1,109	75,00	3,959
2400			50,00	2,633	21,00	1,106	76,00	4,002

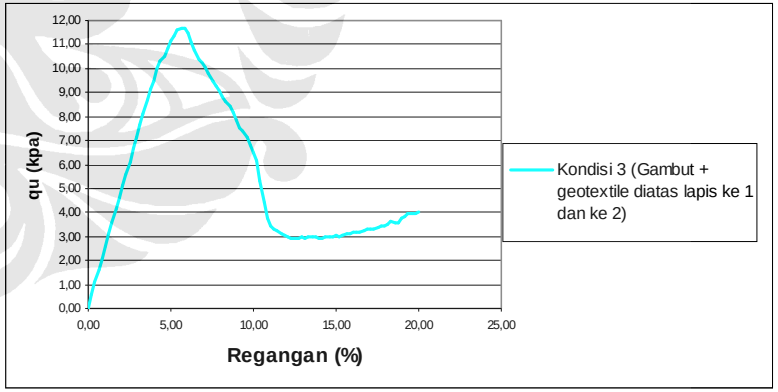


GRAFIK HUBUNGAN q_u DAN REGANGAN (%)
KADAR AIR RENCANA 120 %







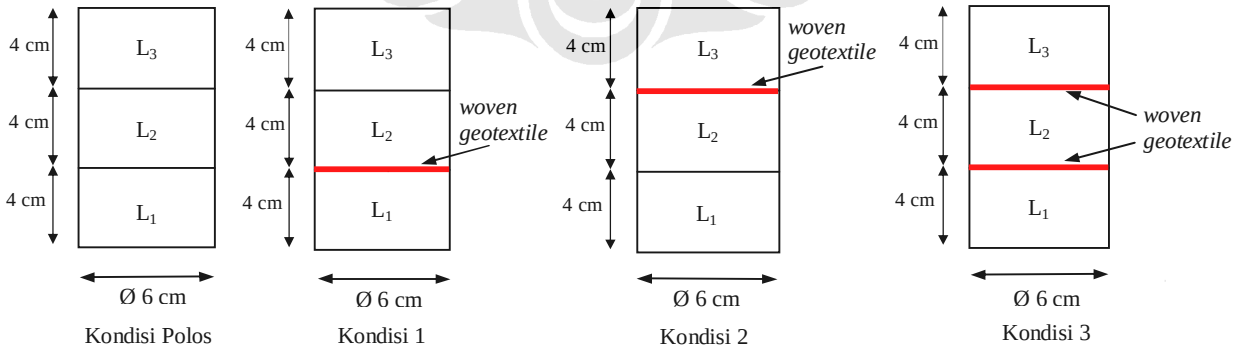


UNCONFINED COMPRESSION TEST
FOR ASSUMSED WATER CONTENT 140 %

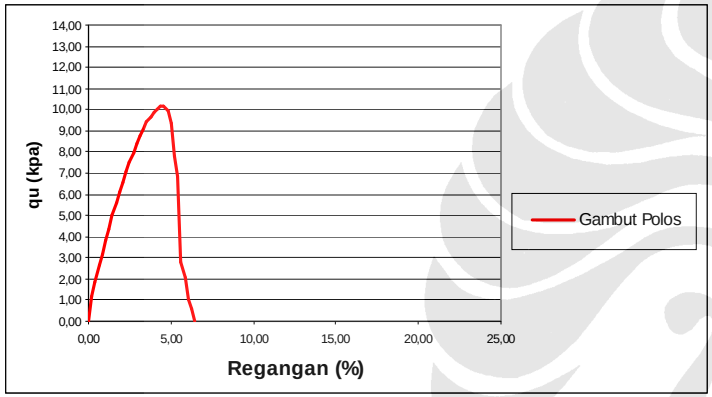
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
0	0,00	0,000	0,00	0,000	0,00	0,000	0,00	0,000
25	18,00	1,182	9,00	0,591	19,00	1,248	14,00	0,920
50	28,00	1,835	17,00	1,114	29,00	1,901	24,00	1,573
75	40,00	2,616	24,00	1,570	39,00	2,551	33,00	2,158
100	48,00	3,133	32,00	2,089	48,00	3,133	42,00	2,741
125	59,00	3,843	39,50	2,573	58,00	3,778	51,00	3,322
150	67,00	4,355	48,00	3,120	67,00	4,355	59,00	3,835
175	77,00	4,994	55,00	3,567	77,00	4,994	70,00	4,540
200	86,00	5,566	64,00	4,142	86,00	5,566	78,00	5,048
225	95,00	6,135	71,00	4,585	95,00	6,135	87,00	5,619
250	102,00	6,574	79,00	5,091	104,00	6,702	97,00	6,251
275	110,00	7,074	87,00	5,595	113,00	7,267	107,00	6,881
300	117,00	7,508	96,00	6,161	121,00	7,765	114,00	7,316
325	124,00	7,940	103,00	6,596	129,00	8,260	125,00	8,004
350	131,00	8,371	111,00	7,093	137,00	8,754	133,00	8,498
375	137,00	8,735	119,00	7,588	144,00	9,182	140,00	8,926
400	142,00	9,035	127,00	8,080	151,00	9,607	147,00	9,353
425	148,00	9,396	134,00	8,507	157,00	9,967	155,00	9,840
450	152,00	9,629	142,00	8,996	163,00	10,326	161,00	10,199
475	156,00	9,861	147,00	9,292	169,00	10,683	167,00	10,556
500	159,00	10,029	154,00	9,714	173,00	10,912	174,00	10,975
525	161,00	10,133	158,00	9,944	176,00	11,077	179,00	11,266
550	162,00	10,174	164,00	10,299	180,00	11,304	185,00	11,618
575	159,00	9,964	165,00	10,340	181,50	11,373	189,00	11,843
600	150,00	9,379	169,00	10,567	182,00	11,380	194,00	12,130
625	125,00	7,799	170,00	10,606	181,50	11,324	198,00	12,353
650	110,00	6,848	171,00	10,645	181,00	11,268	202,00	12,575
675	45,00	2,795	170,00	10,560	179,50	11,150	205,00	12,734
700	33,00	2,045	167,00	10,350	178,00	11,032	207,00	12,829
725	17,00	1,051	161,00	9,956	172,00	10,637	209,00	12,925
750	10,00	0,617	150,00	9,256	160,00	9,873	210,00	12,958
775	0,00	0,000	124,00	7,634	133,00	8,188	209,00	12,867
800			84,00	5,160	118,00	7,249	203,00	12,470

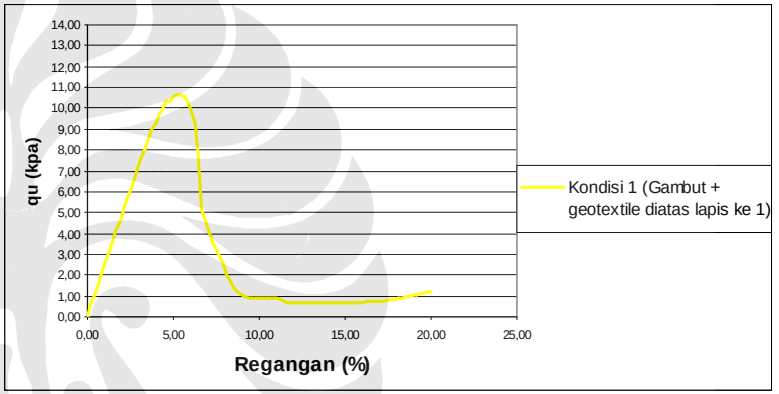
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
825			73,00	4,474	80,00	4,903	197,00	12,075
850			66,00	4,036	65,00	3,975	192,00	11,742
875			59,00	3,600	64,00	3,905	188,00	11,471
900			52,00	3,166	61,00	3,714	180,00	10,959
925			47,00	2,855	60,50	3,675	168,00	10,205
950			42,00	2,545	59,00	3,576	162,00	9,818
975			33,00	1,996	59,00	3,568	154,00	9,312
1000			27,00	1,629	58,00	3,499	148,00	8,929
1025			23,00	1,384	57,00	3,431	144,00	8,668
1050			20,50	1,231	56,00	3,363	140,00	8,408
1075			17,00	1,019	56,00	3,356	137,00	8,209
1100			16,00	0,957	56,00	3,348	133,00	7,951
1125			15,50	0,925	56,50	3,370	127,00	7,575
1150			15,00	0,893	57,00	3,392	126,00	7,498
1175			15,00	0,891	57,50	3,414	124,00	7,362
1200			15,00	0,889	58,00	3,436	121,00	7,168
1225			15,50	0,916	58,50	3,457	118,00	6,974
1250			15,50	0,914	59,50	3,508	114,00	6,722
1275			15,00	0,882	60,50	3,559	110,00	6,471
1300			15,00	0,880	61,50	3,609	104,00	6,103
1325			15,00	0,878	62,00	3,630	98,00	5,738
1350			14,00	0,818	63,00	3,680	93,00	5,432
1375			13,00	0,758	63,50	3,701	90,00	5,245
1400			12,00	0,698	64,50	3,750	88,00	5,116
1425			11,00	0,638	65,00	3,770	82,00	4,756
1450			11,00	0,637	65,50	3,790	80,00	4,629
1475			11,50	0,664	65,00	3,752	78,00	4,503
1500			12,00	0,691	64,50	3,715	77,00	4,434
1525			12,00	0,689	64,00	3,677	75,00	4,309
1550			12,00	0,688	64,00	3,668	74,00	4,241
1575			12,00	0,686	63,00	3,602	73,00	4,174
1600			12,00	0,685	63,00	3,594	72,00	4,107
1625			12,00	0,683	63,00	3,585	72,00	4,097
1650			12,00	0,681	64,70	3,673	71,00	4,030
1675			12,00	0,680	64,00	3,624	71,00	4,021
1700			12,00	0,678	63,00	3,559	71,00	4,011
1725			12,00	0,676	61,50	3,466	71,00	4,001
1750			12,00	0,675	61,00	3,429	71,00	3,992
1775			12,00	0,673	59,50	3,337	71,00	3,982
1800			12,00	0,671	56,00	3,133	71,00	3,972

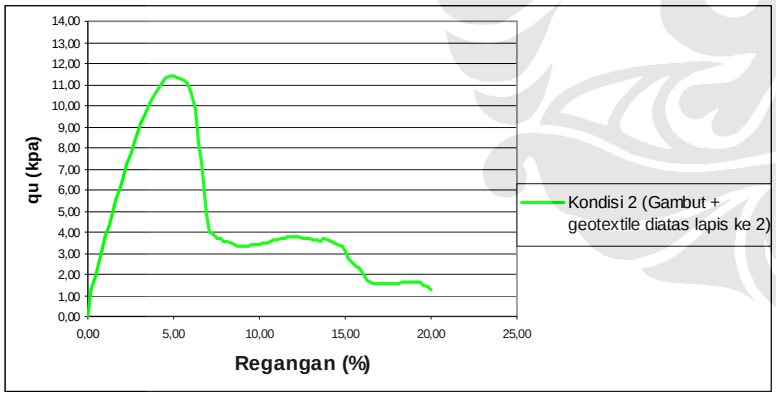
Deformation Dial Reading (x10-3)	Kondisi Polos		Kondisi 1		Kondisi 2		Kondisi 3	
	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)	Load Dial Reading	Sample Unit Load (Kpa)
1825			12,00	0,670	49,00	2,735	71,00	3,962
1850			12,00	0,668	45,00	2,505	71,00	3,953
1875			12,00	0,666	43,00	2,388	71,00	3,943
1900			12,00	0,665	41,50	2,299	71,00	3,933
1925			12,50	0,691	38,00	2,100	71,00	3,923
1950			13,00	0,717	31,00	1,709	70,50	3,886
1975			13,00	0,715	29,00	1,595	70,50	3,876
2000			13,00	0,713	28,00	1,536	70,50	3,867
2025			13,50	0,739	28,00	1,532	70,00	3,830
2050			13,50	0,737	28,00	1,528	69,50	3,793
2075			14,00	0,762	28,00	1,524	69,00	3,756
2100			14,50	0,787	28,50	1,548	69,00	3,747
2125			15,00	0,812	29,00	1,571	69,00	3,737
2150			15,50	0,837	29,00	1,567	69,00	3,728
2175			16,00	0,862	29,50	1,590	68,00	3,664
2200			17,00	0,914	30,00	1,613	68,00	3,655
2225			17,50	0,938	30,50	1,635	67,50	3,619
2250			18,50	0,989	30,75	1,644	67,50	3,610
2275			19,00	1,013	31,00	1,654	67,00	3,574
2300			20,00	1,064	31,00	1,649	67,00	3,565
2325			21,00	1,114	30,50	1,618	67,00	3,555
2350			21,50	1,138	28,00	1,482	67,00	3,546
2375			22,50	1,188	26,00	1,373	67,00	3,537
2400			23,00	1,211	24,00	1,264	66,75	3,515

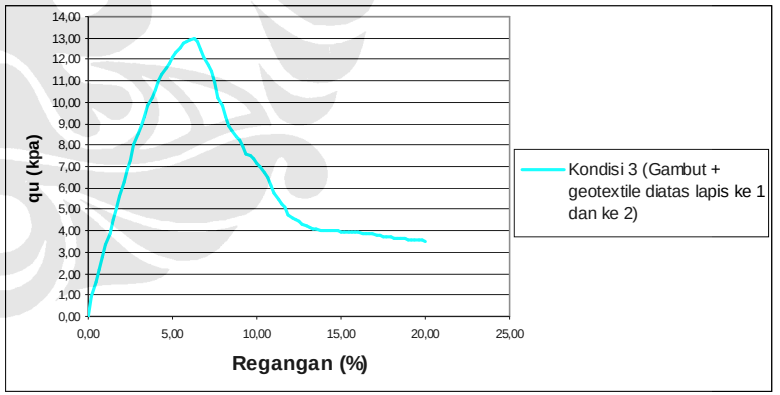


GRAFIK HUBUNGAN q_u DAN REGANGAN (%)
KADAR AIR RENCANA 140%

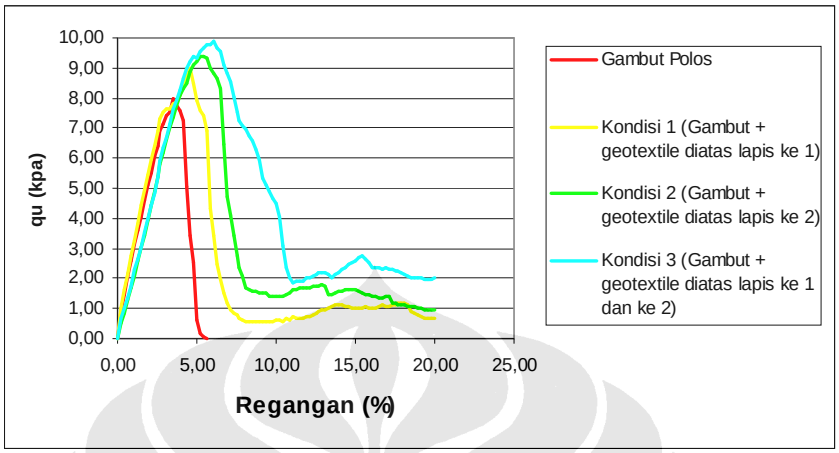




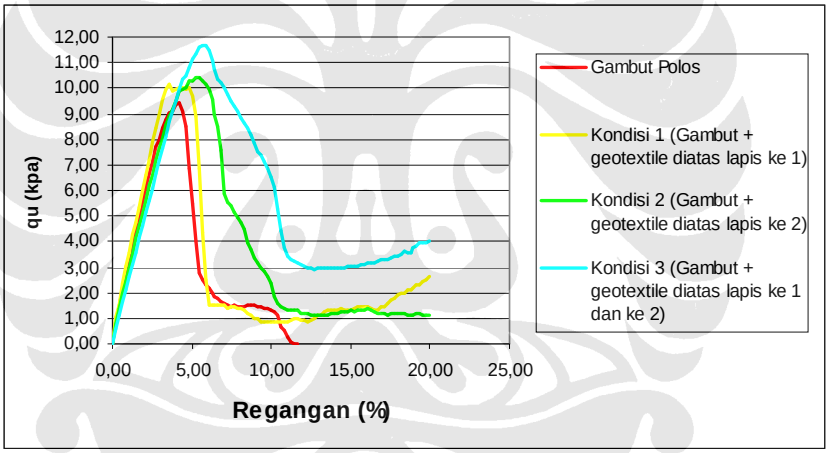




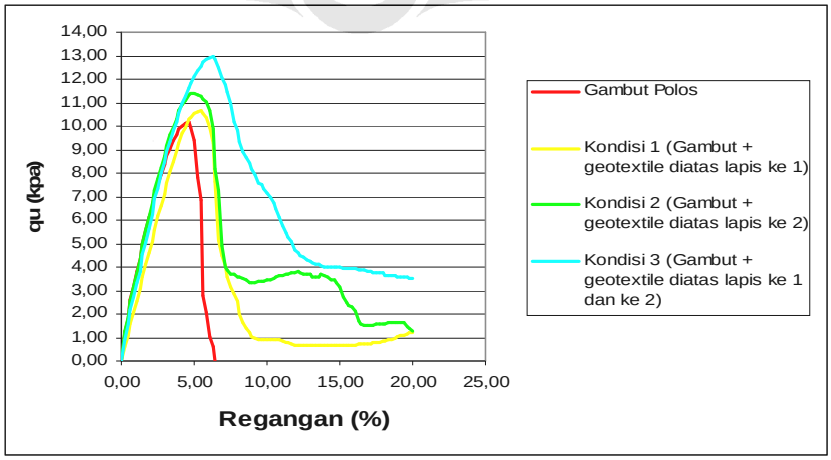
GRAFIK HUBUNGAN q_u DAN REGANGAN (%) PERKADAR AIR RENCANA



KADAR AIR RENCANA 100%



KADAR AIR RENCANA 120%



KADAR AIR RENCANA 140%

LAMPIRAN
PENGUJIAN CBR

WATER CONTENT AND DENSITY DETERMINATION
ASSUMSED WATER CONTENT 100 % FOR CBR TESTING

Water Content Determination

Assumed Water Content	100%			
SAMPLE	Kondisi Polos	Kondisi 1	Kondisi 2	Kondisi 3
Wt. of can (gr)	18.59	22.04	25.53	19.58
Wt. of soil + can (gr)	149.09	125.39	116.41	104.58
Wt. of dry soil + can (gr)	84.32	74.01	71.09	62.45
Wt. of water (gr)	130.50	103.35	90.88	85.00
Wt. of dry soil (gr)	65.73	51.97	45.56	42.87
Water content (%)	98.54	98.86	99.47	98.28

Density Determination

Water content (%)	98.54	98.86	99.47	98.28
Wt. of mold (gr)	4061.50	3816.00	4061.50	3816.00
Wt. of soil + mold (gr)	5902.00	5667.00	6023.50	5767.00
Wt. of soil (gr)	1840.5	1851	1962	1951
Diameter of mold (cm)	15.21	15.275	15.21	15.275
Height of mold (cm)	11.55	11.48	11.55	11.48
Volume of mold (cm^3)	2097.54	2102.68	2097.54	2102.68
Wet density γwet (gr/cm^3)	0.877	0.880	0.935	0.928
Dry density γdry (gr/cm^3)	0.442	0.443	0.469	0.468

WATER CONTENT AND DENSITY DETERMINATION
ASSUMSED WATER CONTENT 120 % FOR CBR TESTING

Water Content Determination

Assumed Water Content	120%			
SAMPLE	Kondisi Polos	Kondisi 1	Kondisi 2	Kondisi 3
Wt. of can (gr)	18.59	22.04	25.53	19.58
Wt. of soil + can (gr)	172.75	175.18	196.66	110.82
Wt. of dry soil + can (gr)	89.12	92.01	103.76	61.44
Wt. of water (gr)	154.16	153.14	171.13	91.24
Wt. of dry soil (gr)	70.53	69.97	78.23	41.86
Water content (%)	118.57	118.87	118.75	117.96

Density Determination

Water content (%)	118.57	118.87	118.75	117.96
Wt. of mold (gr)	4061.50	3816.00	4061.50	3816.00
Wt. of soil + mold (gr)	5848.00	5550.00	5683.50	5937.50
Wt. of soil (gr)	1786.5	1734	1867.5	1876
Diameter of mold (cm)	15.21	15.275	15.21	15.275
Height of mold (cm)	11.55	11.48	11.55	11.48
Volume of mold (cm^3)	2097.54	2102.68	2097.54	2102.68
Wet density γwet (gr/cm^3)	0.852	0.825	0.888	0.894
Dry density γdry (gr/cm^3)	0.390	0.377	0.406	0.410

WATER CONTENT AND DENSITY DETERMINATION
ASSUMSED WATER CONTENT 140 % FOR CBR TESTING

Water Content Determination

Assumed Water Content	140%			
SAMPLE	Kondisi Polos	Kondisi 1	Kondisi 2	Kondisi 3
Wt. of can (gr)	18.59	22.04	25.53	19.58
Wt. of soil + can (gr)	154.10	176.62	129.86	143.86
Wt. of dry soil + can (gr)	75.37	86.56	69.22	71.43
Wt. of water (gr)	135.51	154.58	104.33	124.28
Wt. of dry soil (gr)	56.78	64.52	43.69	51.85
Water content (%)	138.65	139.58	138.8	139.7

Density Determination

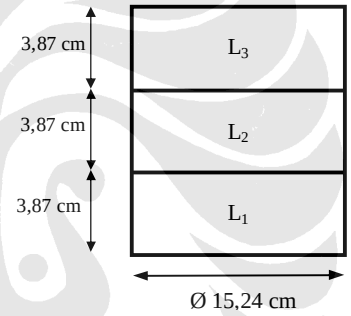
Water content (%)	138.65	139.58	138.8	139.7
Wt. of mold (gr)	4061.50	3816.00	4061.50	3816.00
Wt. of soil + mold (gr)	5872.00	5981.00	6124.00	6174.00
Wt. of soil (gr)	1810.5	2094.5	2308	2112.5
Diameter of mold (cm)	15.21	15.275	15.21	15.275
Height of mold (cm)	11.55	11.48	11.55	11.48
Volume of mold (cm^3)	2097.54	2102.68	2097.54	2102.68
Wet density γwet (gr/cm^3)	0.863	0.977	1.098	1.007
Dry density γdry (gr/cm^3)	0.362	0.408	0.460	0.420

CBR TEST
TANAH GAMBUT POLOS (TANPA WOVEN GEOTEXTILE)
KADAR AIR RENCANA 100 %

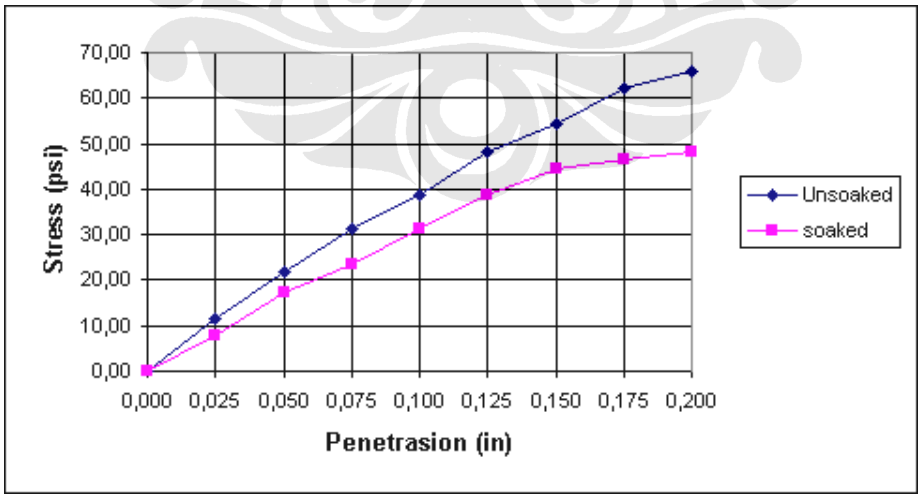
Penetrasion (in)	Kondisi Polos			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	1,50	1,00	11,66	7,77
0,050	2,80	2,20	21,77	17,10
0,075	4,00	3,00	31,10	23,32
0,100	5,00	4,00	38,87	31,10
0,125	6,20	5,00	48,20	38,87
0,150	7,00	5,70	54,42	44,31
0,175	8,00	6,00	62,19	46,64
0,200	8,50	6,20	66,08	48,20

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	3,87	3,10
0,200	4,39	3,20

sample	Kondisi Polos
Swelling (%)	1,19
γ_{kering} (gr/m^3)	0,44



(Kondisi polos)

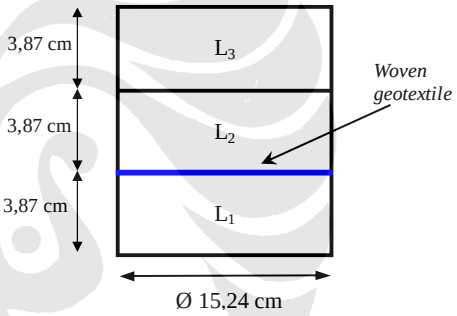


CBR TEST
TANAH GAMBUT KONDISI 1
KADAR AIR RENCANA 100 %

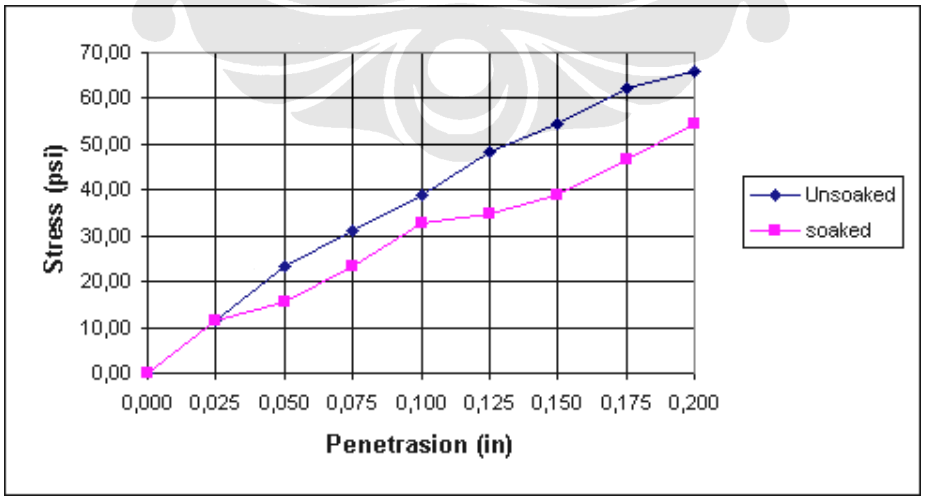
Penetrasion (in)	Kondisi 1			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	1,50	1,50	11,66	11,66
0,050	3,00	2,00	23,32	15,55
0,075	4,00	3,00	31,10	23,32
0,100	5,00	4,20	38,87	32,65
0,125	6,20	4,50	48,20	34,98
0,150	7,00	5,00	54,42	38,87
0,175	8,00	6,00	62,19	46,64
0,200	8,50	7,00	66,08	54,42

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	3,87	3,25
0,200	4,39	3,62

sample	Kondisi 1
Swelling (%)	1,00
γ_{kering} (gr/m^3)	0,44



(Kondisi 1)

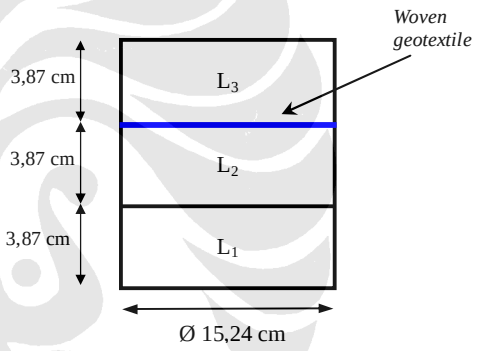


CBR TEST
TANAH GAMBUT KONDISI 2
KADAR AIR RENCANA 100 %

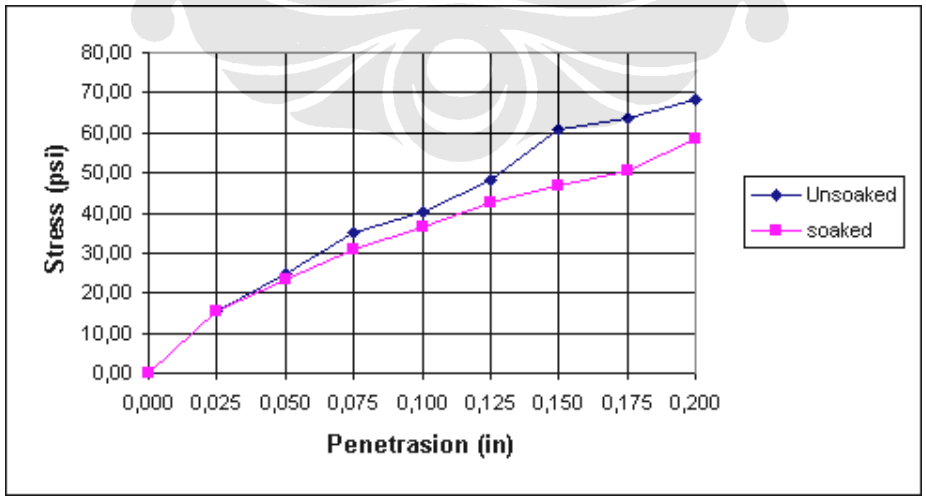
Penetrasion (in)	Kondisi 2			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,00	2,00	15,55	15,55
0,050	3,20	3,00	24,88	23,32
0,075	4,50	4,00	34,98	31,10
0,100	5,20	4,70	40,42	36,54
0,125	6,20	5,50	48,20	42,76
0,150	7,80	6,00	60,64	46,64
0,175	8,20	6,50	63,75	50,53
0,200	8,80	7,50	68,41	58,31

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,03	3,64
0,200	4,55	3,87

sample	Kondisi 2
Swelling (%)	0,97
γ_{kering} (gr/m^3)	0,47



(Kondisi 2)

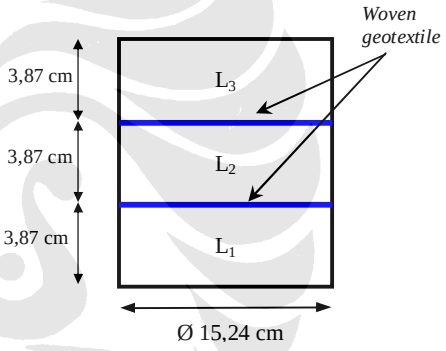


CBR TEST
TANAH GAMBUT KONDISI 3
KADAR AIR RENCANA 100 %

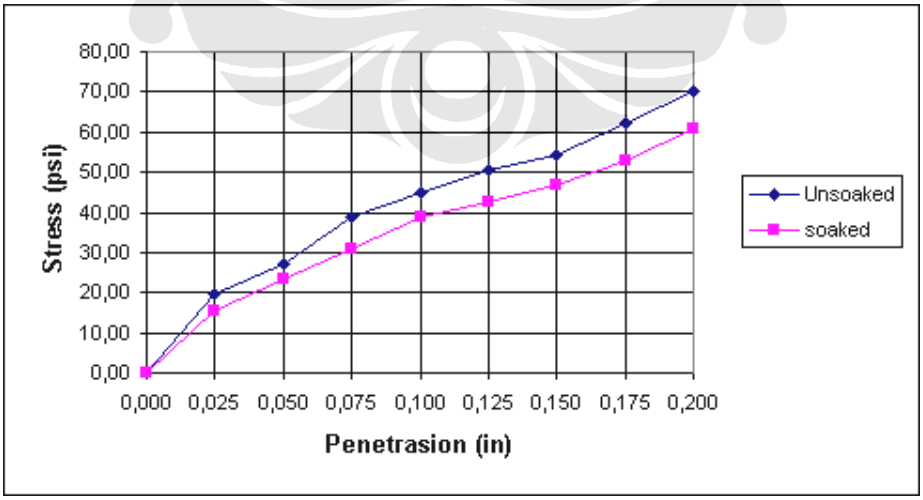
Penetrasion (in)	Kondisi 3			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,50	2,00	19,44	15,55
0,050	3,50	3,00	27,21	23,32
0,075	5,00	4,00	38,87	31,10
0,100	5,80	5,00	45,09	38,87
0,125	6,50	5,50	50,53	42,76
0,150	7,00	6,00	54,42	46,64
0,175	8,00	6,80	62,19	52,86
0,200	9,00	7,80	69,97	60,64

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,49	3,87
0,200	4,65	4,03

sample	Kondisi 3
Swelling (%)	0,86
γ_{kering} (gr/m^3)	0,47



(Kondisi 3)

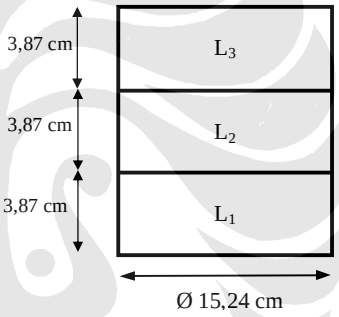


CBR TEST
TANAH GAMBUT POLOS (TANPA WOVEN GEOTEXTILE)
KADAR AIR RENCANA 120 %

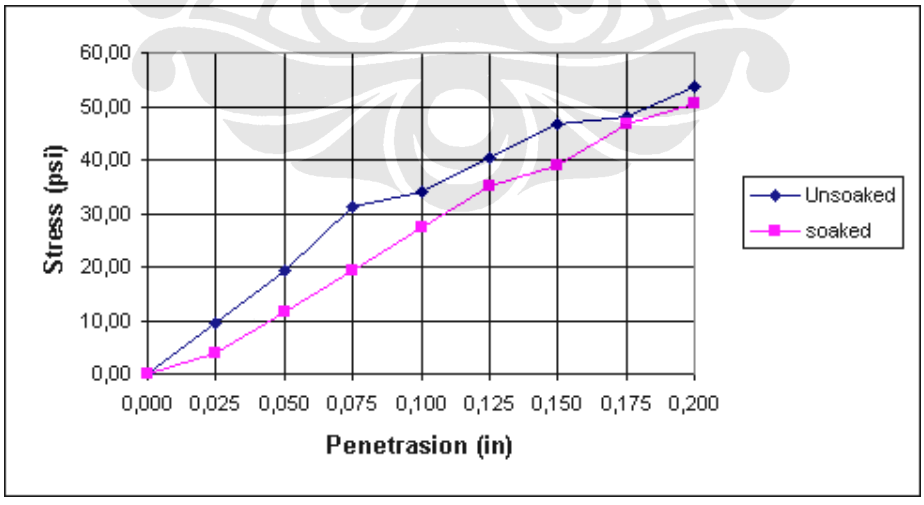
Penetrasion (in)	Kondisi Polos			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	1,20	0,50	9,33	3,89
0,050	2,50	1,50	19,44	11,66
0,075	4,00	2,50	31,10	19,44
0,100	4,40	3,50	34,21	27,21
0,125	5,20	4,50	40,42	34,98
0,150	6,00	5,00	46,64	38,87
0,175	6,20	6,00	48,20	46,64
0,200	6,90	6,50	53,64	50,53

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	3,41	2,71
0,200	3,56	2,84

sample	Kondisi Polos
Swelling (%)	1,28
γ_{kering} (gr/m^3)	0,39



(Kondisi polos)

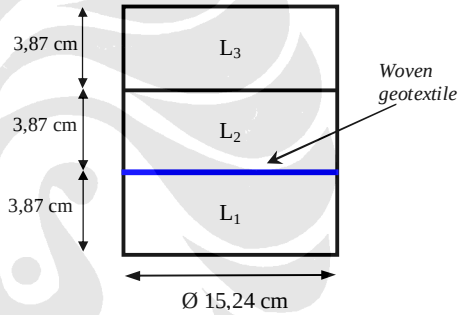


CBR TEST
TANAH GAMBUT KONDISI 1
KADAR AIR RENCANA 120 %

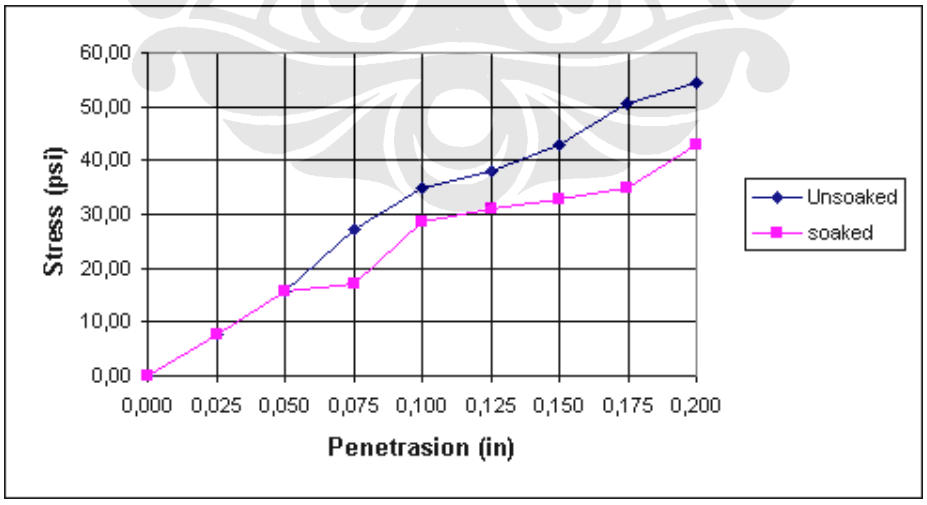
Penetrasion (in)	Kondisi 1			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	1,00	1,00	7,77	7,77
0,050	2,00	2,00	15,55	15,55
0,075	3,50	2,20	27,21	17,10
0,100	4,50	3,70	34,98	28,76
0,125	4,90	4,00	38,09	31,10
0,150	5,50	4,20	42,76	32,65
0,175	6,50	4,50	50,53	34,98
0,200	7,00	5,50	54,42	42,76

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	3,49	2,87
0,200	3,62	3,36

sample	Kondisi 1
Swelling (%)	1,18
γ_{kering} (gr/m^3)	0,38



(Kondisi 1)

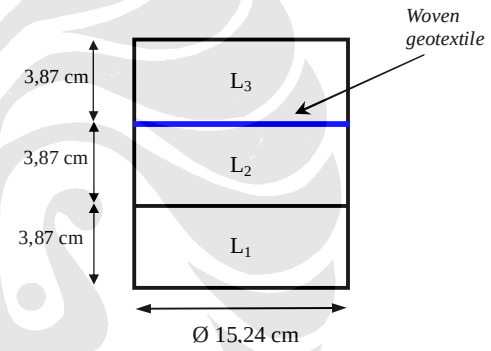


CBR TEST
TANAH GAMBUT KONDISI 2
KADAR AIR RENCANA 120 %

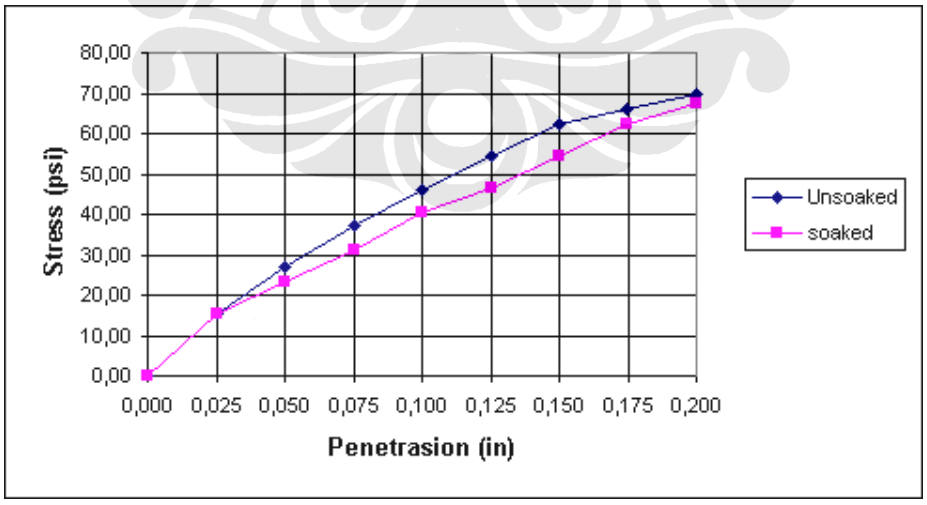
Penetrasion (in)	Kondisi 2			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,00	2,00	15,55	15,55
0,050	3,50	3,00	27,21	23,32
0,075	4,80	4,00	37,32	31,10
0,100	5,90	5,20	45,87	40,42
0,125	7,00	6,00	54,42	46,64
0,150	8,00	7,00	62,19	54,42
0,175	8,50	8,00	66,08	62,19
0,200	9,00	8,70	69,97	67,63

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,57	4,03
0,200	4,65	4,49

sample	Kondisi 2
Swelling (%)	1,10
γ_{kering} (gr/m^3)	0,41



(Kondisi 2)

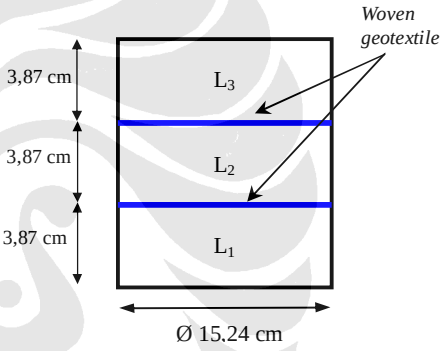


CBR TEST
TANAH GAMBUT KONDISI 3
KADAR AIR RENCANA 120 %

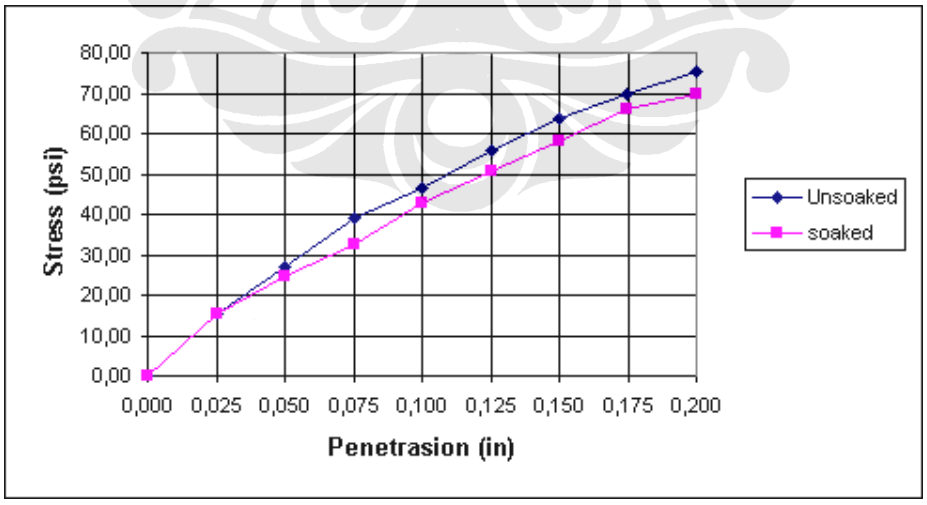
Penetrasion (in)	Kondisi 3			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,00	2,00	15,55	15,55
0,050	3,50	3,20	27,21	24,88
0,075	5,00	4,20	38,87	32,65
0,100	6,00	5,50	46,64	42,76
0,125	7,20	6,50	55,97	50,53
0,150	8,20	7,50	63,75	58,31
0,175	9,00	8,50	69,97	66,08
0,200	9,70	9,00	75,41	69,97

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,65	4,26
0,200	5,01	4,65

sample	Kondisi 3
Swelling (%)	0,99
γ_{kering} (gr/m^3)	0,41



(Kondisi 3)

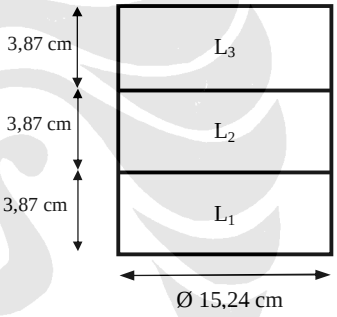


CBR TEST
TANAH GAMBUT POLOS (TANPA WOVEN GEOTEXTILE)
KADAR AIR RENCANA 140 %

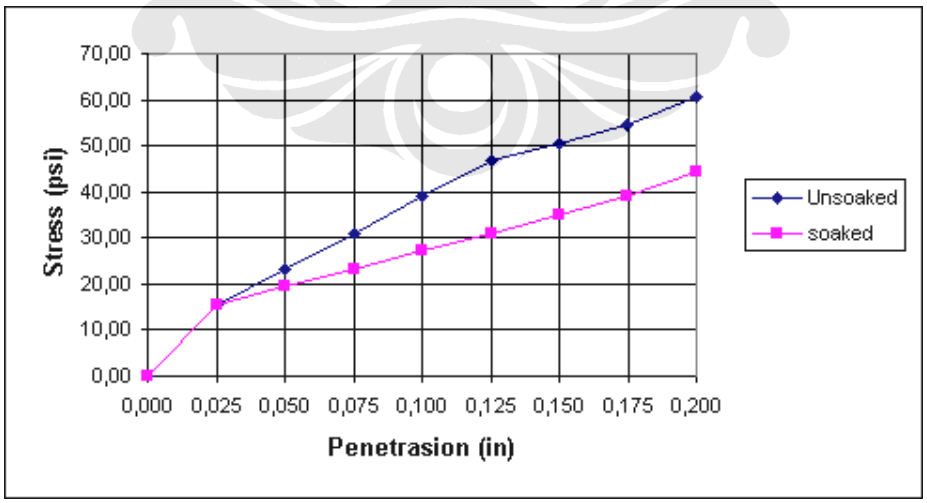
Penetrasion (in)	Kondisi Polos			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,00	2,00	15,55	15,55
0,050	3,00	2,50	23,32	19,44
0,075	4,00	3,00	31,10	23,32
0,100	5,00	3,50	38,87	27,21
0,125	6,00	4,00	46,64	31,10
0,150	6,50	4,50	50,53	34,98
0,175	7,00	5,00	54,42	38,87
0,200	7,80	5,70	60,64	44,31

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	3,87	2,71
0,200	4,03	2,94

sample	Kondisi Polos
Swelling (%)	1,06
γ_{kering} (gr/m^3)	0,36



(Kondisi polos)

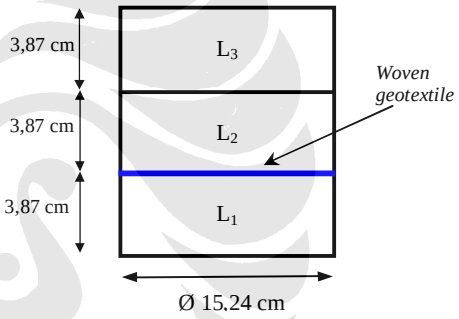


CBR TEST
TANAH GAMBUT KONDISI 1
KADAR AIR RENCANA 140 %

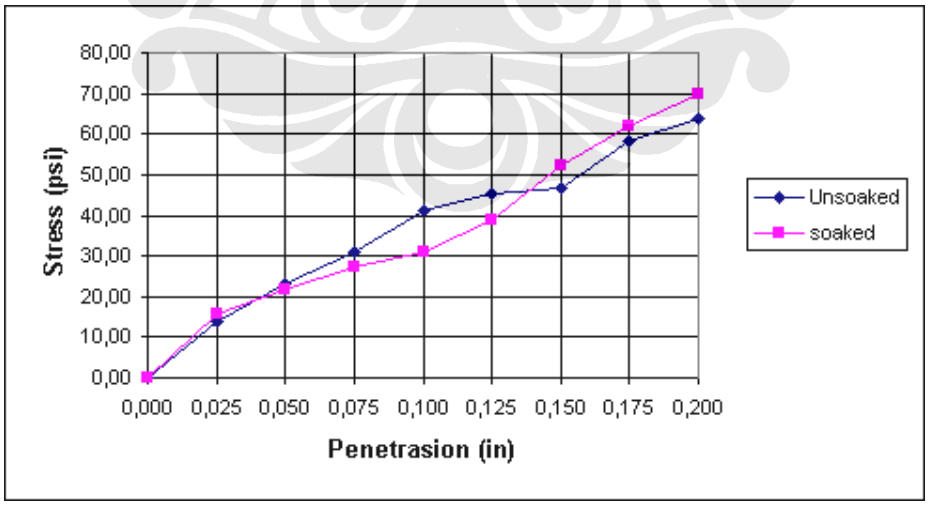
Penetrasion (in)	Kondisi 1			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	1,80	2,00	13,99	15,55
0,050	3,00	2,80	23,32	21,77
0,075	4,00	3,50	31,10	27,21
0,100	5,30	4,00	41,20	31,10
0,125	5,80	5,00	45,09	38,87
0,150	6,00	6,70	46,64	52,09
0,175	7,50	8,00	58,31	62,19
0,200	8,20	9,00	63,75	69,97

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,11	3,10
0,200	4,24	4,65

sample	Kondisi 1
Swelling (%)	0,93
γ_{kering} (gr/m^3)	0,41



(Kondisi 1)

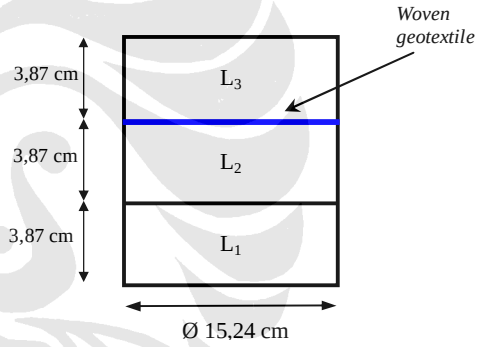


CBR TEST
TANAH GAMBUT KONDISI 2
KADAR AIR RENCANA 140 %

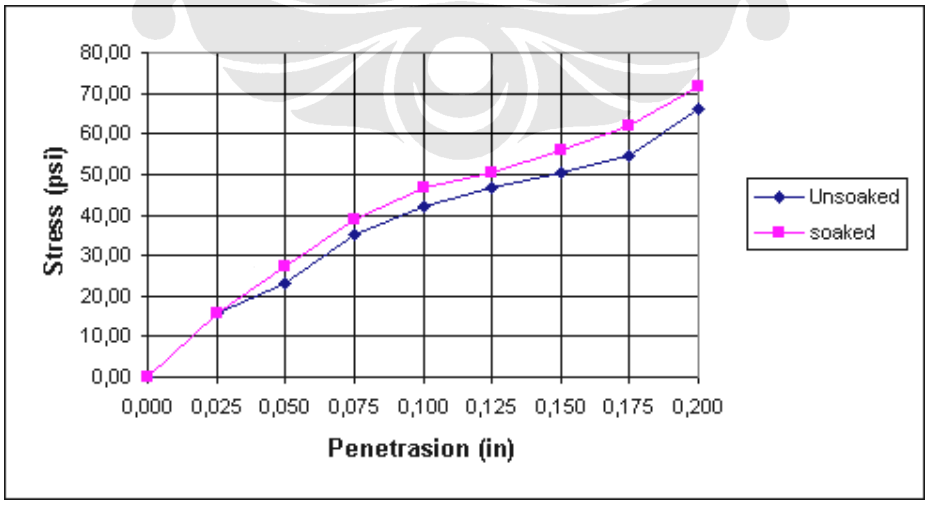
Penetrasion (in)	Kondisi 2			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,00	2,00	15,55	15,55
0,050	3,00	3,50	23,32	27,21
0,075	4,50	5,00	34,98	38,87
0,100	5,40	6,00	41,98	46,64
0,125	6,00	6,50	46,64	50,53
0,150	6,50	7,20	50,53	55,97
0,175	7,00	8,00	54,42	62,19
0,200	8,50	9,20	66,08	71,52

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,18	4,65
0,200	4,39	4,75

sample	Kondisi 2
Swelling (%)	0,86
γ_{kering} (gr/m^3)	0,46



(Kondisi 2)

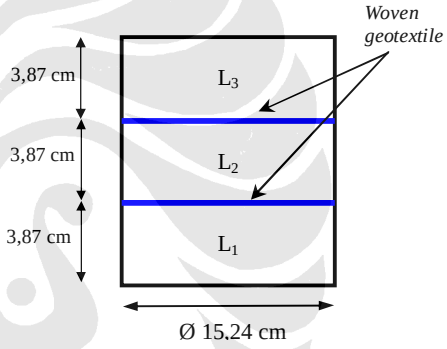


CBR TEST
TANAH GAMBUT KONDISI 3
KADAR AIR RENCANA 140 %

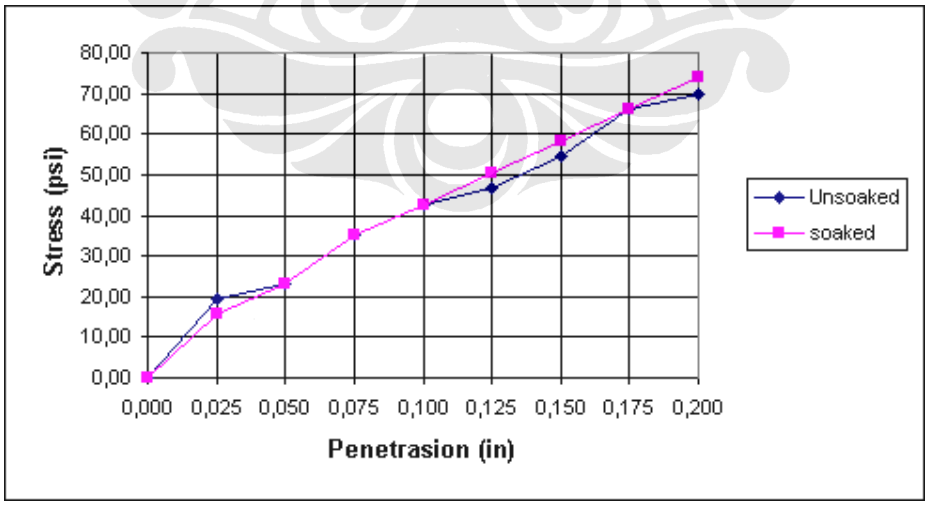
Penetrasion (in)	Kondisi 3			
	Dial Reading		Stress (psi)	
	Unsoaked	Soaked	Unsoaked	Soaked
0,000	0,00	0,00	0,00	0,00
0,025	2,50	2,00	19,44	15,55
0,050	3,00	3,00	23,32	23,32
0,075	4,50	4,50	34,98	34,98
0,100	5,50	5,50	42,76	42,76
0,125	6,00	6,50	46,64	50,53
0,150	7,00	7,50	54,42	58,31
0,175	8,50	8,50	66,08	66,08
0,200	9,00	9,50	69,97	73,85

Penetrasion (in)	CBR %	
	Unsoaked	Soaked
0,100	4,26	4,26
0,200	4,65	4,91

sample	Kondisi 3
Swelling (%)	0,78
γ_{kering} (gr/m^3)	0,42



(Kondisi 3)



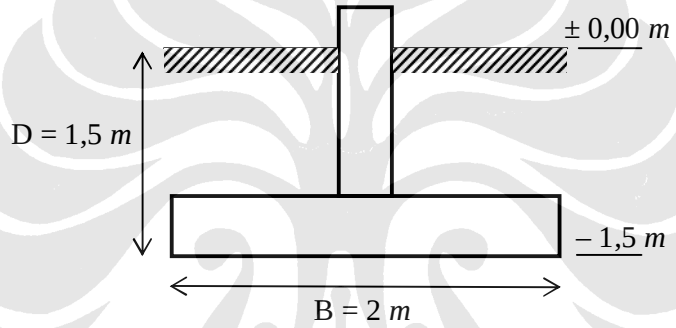
LAMPIRAN
APLIKASI GEOTEXTILE

APLIKASI PENGGUNAAN *WOVEN GEOTEXTILE* DALAM PERHITUNGAN PONDASI DANGKAL.

Perhitungan Kondisi Tanah Tanpa Perkuatan *Woven Geotextile*.

Sebuah pondasi bujur sangkar dengan sisi-sisi 2 *m* ditempatkan pada kedalaman 1,5 *m*. Dari hasil pengujian tanah gambut diasumsikan sebagai tanah lempung keras dengan berat isi tanah 0,413 *gr/cm*^{3}. Kekuatan tak-terdrainase lempung pada kedalaman 1,5 *m* diberikan oleh parameter-parameter q_u = 10,174 *kpa* dan $Ø_u$ = 0. Faktor keamanan sebesar 3 akibat keruntuhan geser, muka air tanah berada 2 m di bawah pondasi telapak, berapakah daya dukung yang diijinkan (q_a) untuk pondasi tersebut ?

Diketahui :



$q_u = 10{,}174\ kpa = 10{,}174\ kN/m^2$

$c_u = \frac{q_u}{2} = \frac{10{,}174}{2} = 5{,}087\ kN/m^2$

$\gamma = 0{,}413\ gr/cm^3 = 4{,}13\ kN/m^3$

$FK = 3$

$\phi = 0$

Ditanya :

Berapa daya dukung yang diijinkan (q_a) untuk pada pondasi tersebut

Penyelesaian:

$q_f = 0,4\gamma BN_\gamma + 1,2c_u N_c + \gamma DN_q$

$q_a = \frac{q_f}{FK}$

mencari :

$N_q = e^{\pi \tan\phi}.\tan^2\left(45 + \frac{\phi}{2}\right)$

$N_c = \frac{\left(N_q - 1\right)}{\tan\phi}$ untuk $\phi = 0 \rightarrow N_c = 5,14$

$N_y = 1,80\left(N_q - 1\right)\tan\phi$

jika $\phi = 0$ maka : $N_q = 1$, $N_c = 5,14$, dan $N_y = 0$

Untuk bujur sangkar dengan $N_y = 0$ maka persamaannya :

$q_f = 1,2c_u N_c + \gamma DN_q$

$q_f = \left(1,2 \times 5,087 \times 5,14\right) + \left(4,13 \times 1,5 \times 1\right)$

$= 31,376 + 6,195$

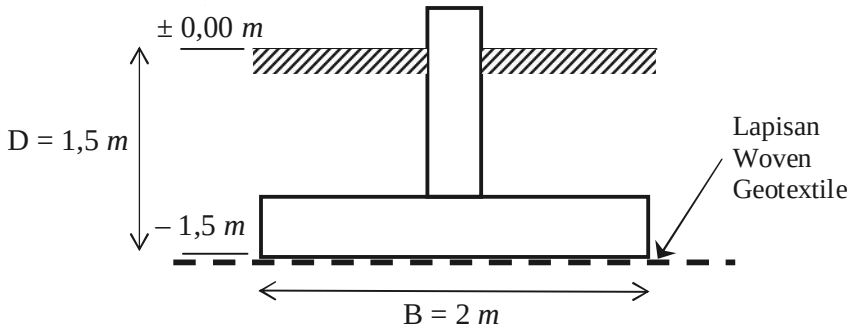
$= 37,571\ kN/m^2$

$q_a = \frac{q_f}{FK} = \frac{37,571}{3} = 12,524\ kN/m^2$

Perhitungan Kondisi Tanah Dengan Perkuatan *Woven Geotextile.*

Sebuah pondasi bujur sangkar dengan sisi-sisi 2 *m* ditempatkan pada kedalaman 1,5 *m.* Dari hasil pengujian tanah gambut diasumsikan sebagai tanah lempung keras dengan berat isi tanah 0,418 *gr/cm*^{3}. Pada bagian bawah pondasi diberikan perkuatan lapisan *Woven Geotextile* mengakibatkan meningkatnya niliai q_u = 12,958 *kpa* dan $Ø_u$ = 0. Untuk faktor keamanan sebesar 3 akibat keruntuhan geser, muka air tanah berada 2 m di bawah pondasi telapak, berapakah daya dukung yang diijinkan (q_a) untuk pondsi tersebut?

Diketahui :



$q_u = 12,958\ kpa\ = 12,958\ kN/m^2$

$c_u = \frac{q_u}{2} = \frac{12,958}{2} = 6,479\ kN/m^2$

$\gamma = 0,418\ gr/cm^3 = 4,18\ kN/m^3$

$FK = 3$

$\phi = 0$

Ditanya :

Berapa daya dukung yang diijinkan (q_a) untuk pada pondasi tersebut

Penyelesaian:

$q_f = 0,4\gamma BN_\gamma + 1,2c_u N_c + \gamma DN_q$

$q_a = \frac{q_f}{FK}$

mencari :

$N_q = e^{\pi \tan\phi}.\tan^2\left(45 + \frac{\phi}{2}\right)$

$N_c = \frac{\left(N_q - 1\right)}{\tan\phi}$ untuk $\phi = 0 \rightarrow N_c = 5,14$

$N_y = 1,80\left(N_q - 1\right)\tan\phi$

jika $\phi = 0$ maka : $N_q = 1$, $N_c = 5,14$, dan $N_y = 0$

Untuk bujur sangkar dengan $N_y = 0$ maka persamaannya :

$q_f = 1,2c_u N_c + \gamma DN_q$

$q_f = \left(1,2 \times 6,479 \times 5,14\right) + \left(4,18 \times 1,5 \times 1\right)$

$= 39,962 + 6,270$

$= 46,232\ kN/m^2$

$q_a = \frac{q_f}{FK}$

$= \frac{46,232}{3} = 15,410\ kN/m^2$

LAMPIRAN
KONTUR TEGANGAN BOUSSINESQ

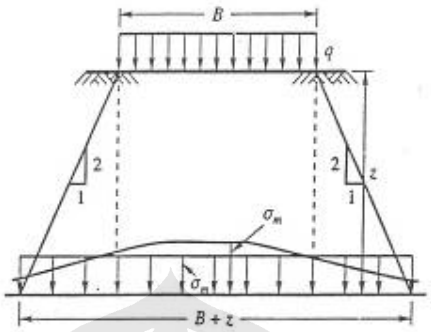


Figure 6.18 σ_m 2 : 1 method

Fig. 6.17. In this figure the abscissa of the curve C_1 represents the vertical stress σ_z at different depths z below the center of a square area $B \times B$ which carries a surcharge q per unit area or a total surcharge load of B^2q. This curve is obtained by the exact method explained under Sect. 6.6. The abscissa of the curve C_2 represents the corresponding stresses due to a concentrated load $Q = B^2q$ acting at the center of the square area. The figure shows that the difference between the two curves becomes very small for values of z/B in excess of three. Hence in a computation of the vertical stress σ_z at a depth z below an area, the area should be divided into convenient squares or rectangles such that the least width of any block is not greater than $z/3$.

2 : 1 Method

In this method, the stress is assumed to be distributed uniformly over areas lying below the foundation. The size of the area at any depth is obtained by assuming that the stresses spread out at an angle of 2 (vertical) to 1 (horizontal) from the edges of the loaded areas shown in Fig. 6.18. The average stress at any depth z is

$$\sigma_a = \frac{Q}{(B+z)(L+z)} \tag{6.33}$$

The maximum stress σ_m by an exact method below the loaded area is different from the average stress σ_a at the same depth. The value of σ_m/σ_a reaches a maximum of about 1.6 at z/b = 0-5, where b = half width.

6.11 PRESSURE ISOBARS

Definition

An *isobar* is a line which connects all points of equal stress below the ground surface. In other words, an isobar is a stress contour. We may draw any number of isobars as shown in Fig. 6.19 for any given load system. Each isobar represents a fraction of the load applied at the surface. Since these isobars form closed figures and resemble the form of a bulb, they are also termed *bulb of pressure* or simply the *pressure bulb*. Normally isobars are drawn for vertical, horizontal and shear stresses. The one that is most important in the calculation of settlements of footings is the vertical pressure isobar.

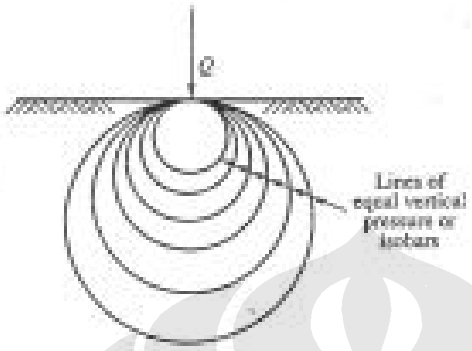


Figure 6.19 Bulb of pressure

Significant Depth

In his opening discussion on settlement of structures at the First International Conference on Soil Mechanics and Foundation Engineering (held in 1936 at Harvard University in Cambridge, Mass, USA), Terzaghi stressed the importance of the bulb of pressure and its relationship with the seat of settlement. As stated earlier we may draw any number of isobars for any given load system, but the one that is of practical significance is the one which encloses a soil mass which is responsible for the settlement of the structure. The depth of this stressed zone may be termed as the *significant depth* D_s which is responsible for the settlement of the structure. Terzaghi recommended that for all practical purposes one can take a *stress contour* which represents 20 per cent of the foundation contact pressure q, i.e, equal to $0.2q$. The depth of such an isobar can be taken as the *significant depth* D_s which represents the seat of settlement for the foundation. Terzaghi's recommendation was based on his observation that direct stresses are considered of negligible magnitude when they are smaller than 20 per cent of the intensity of the applied stress from structural loading, and that most of the settlement, approximately 80 per cent of the total, takes place at a depth less than D_s. The depth D_s is approximately equal to 1.5 times the width of square or circular footings [Fig. 6.20(a)].

If several loaded footings are spaced closely enough, the individual isobars of each footing in question would combine and merge into one large isobar of the intensity as shown in [Fig. 6.20(b)]. The combined significant depth D_s is equal to about $1.5\ \bar{B}$.

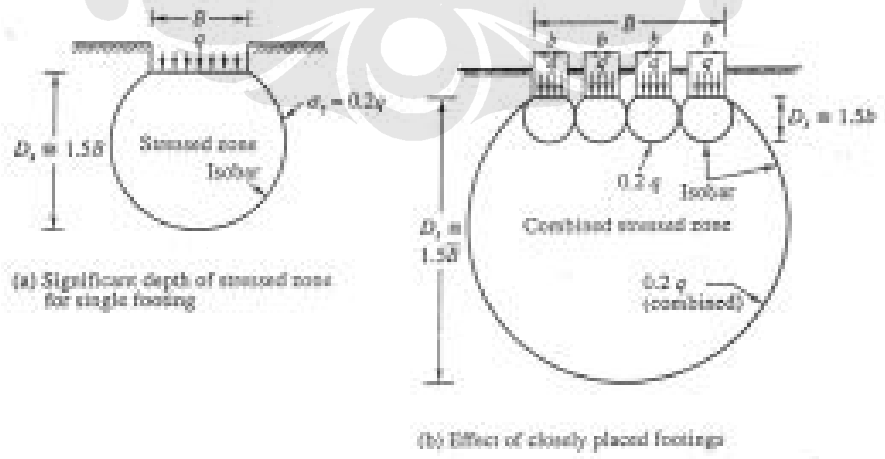


Figure 6.20 Significant depth of stressed zone

Pressure Isobars for Footings

Pressure isobars of square, rectangular and circular footings may conveniently be used for determining vertical pressure, σ_z at any depth, z, below the base of the footings. The depths z from the ground surface, and the distance r (or x) from the center of the footing are expressed as a function of the width of the footing B. In the case of circular footing B represents the diameter.

The following pressure isobars are given based on either Boussinesq or Westergaard's equations:

1. Boussinesq isobars for square and continuous footings, Fig. 6.21.
2. Boussinesq isobar for circular footings, Fig. 6.22.
3. Westergaard isobars for square and continuous footings, Fig. 6.23.

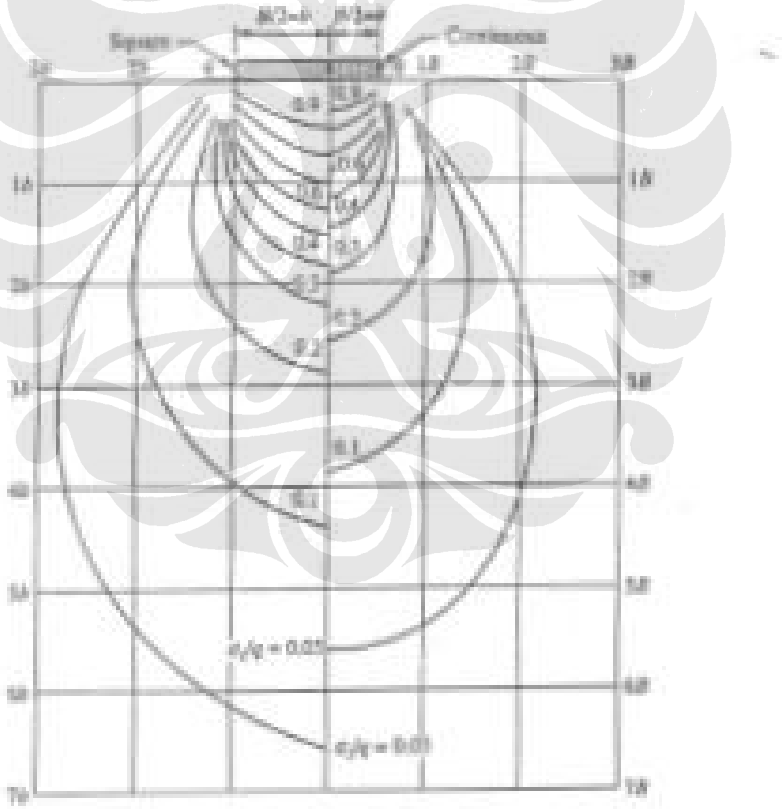


Figure 6.21 Pressure isobars based on Boussinesq equation for square and continuous footings

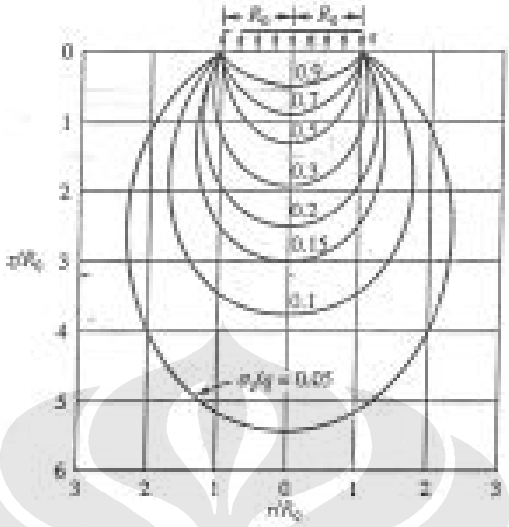


Figure 6.22 Pressure isobars based on Boussinesq equation for uniformly loaded circular footings

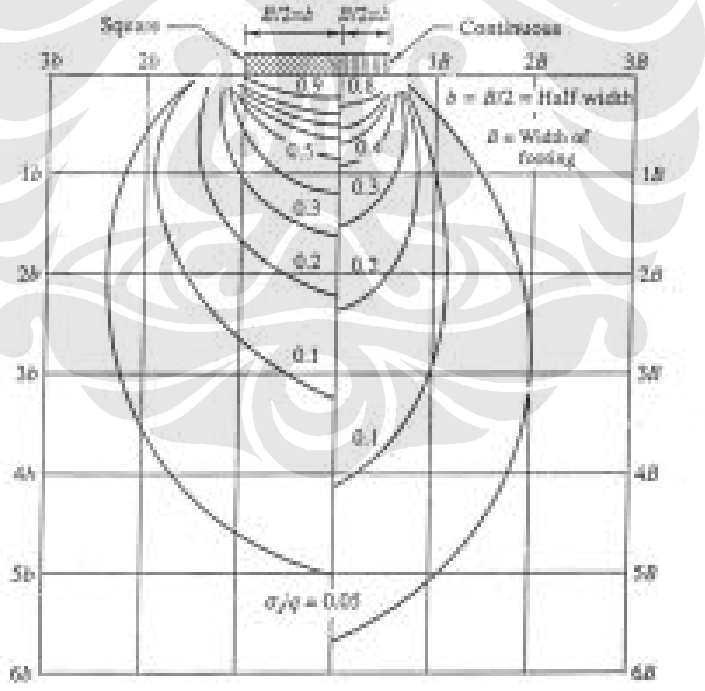


Figure 6.23 Pressure isobars based on Westergaard equation for square and continuous footing