BAB VI

KESIMPULAN DAN SARAN

6.1 Kesimpulan

Dari hasil perhitungan uji sondir/*Dust Cone Penetration Test* (DCPT) dan uji penetrasi standar/*standar penetration test* (SPT) yang dilakukan pada proyek Gedung 4 – 5 Lantai + 1 Basement Jl. Wolter Monginsidi-Jakarta Selatan dapat disimpulkan:

a) Kapasitas daya dukung sondir titik S-01 yaitu 241,937 ton dengan kapasitas ijin tiangnya yaitu 80,645 ton, kapasitas daya dukung sondir titik S-02 yaitu 192,9627 ton dengan kapasitas ijin tiangnya yaitu 64,3209 ton dan kapasitas daya dukung sondir titik S-03 yaitu 213,2326 ton dengan kapasitas ijin tiangnya yaitu 71,0775 ton.
b) Kapasitas daya dukung SPT titik DB-01 yaitu 256,212 ton dengan kapasitas ijin tiangnya yaitu 88,404 ton.

Secara umum analisis daya dukung tiang pancang berdasarkan uji Sondir lebih besar dibanding daya dukung tiang pancang berdasarkan uji SPT.

6.2 Saran

Dengan demikian dalam merencanakan suatu pondasi disarankan menggunakan uji Sondir/*Dust Cone Penetration Test* kerena lebih aman dibandingkan menggunakan uji SPT/*Standar Penetration Test*.

DAFTAR PUSTAKA

____. 2017. Laporan Penyelidikan Tanah Proyek Gedung 4-5 Lantai + 1 Basement Jl. Wolter Monginsidi – Jakarta Selatan. PT. TARUMANEGARA bumiyasa

Anugrah, P. dan Erny, H., 2013, *Desain Pondasi Tahan Gempa Sesuai SNI 03-1726-2002 dan SNI 03-2847-2002*, Andi Offset, Yogyakarta.

Hardiyatmo, H. C. 2003. "TeknikPondasi II". Jakarta: PT. Gramedia Pustaka Utama

Meyerhof G.G. 1956. "Penetration Test and Bearing Capacity of Cohesi on less Soil." *Journal of the Soil Mechanics and Foundation Division.* American Society of Civil Engineers. Vol. 82 No. SM-1. pp. 1-19.

Titi, H.H and Farsakh, M.A.Y., 1999, *Evaluation of Bearing Capacity of Pile from Cone Penetraton Test Data*, Lousiana Research Center.

Ahmad, Lilik Gani dan Maman Surahman. 2016. *Jurnal Konstruksia Analisis Daya Dukung Tiang Pancang Menggunakan Data Insitu Test, Parameter Laboratoriam Terhadap Loading Test Kantledge Volume 7 Nomer 2.*

Andayana, Amoria. 2016, *Analisis Perbandingan Daya Dukung Tiang Pancang Berdasatkan Uji SPT Dan Daya Dukung Tiang Pancang Berdasarkan Alat HSPD 120T.* Bandar Lampung. Universitas Lampung

Marbun, Boyke. 2009, *Analisa Penurunan Elastis Pondasi Tiang Pancang Proyek Pembangunan Rusunawa Medan Area*. Medan. Universitas Sumatra Utara

Standar Nasional Indonesia. SNI 2827-2008. 2008. *Cara Uji Penetrasi Lapangan dengan Alat Sondir. 2008*

LAMPIRAN

Lampiran 1. Perhitungan Perlawanan Konus Selimut Tiang dari masing-masing Titik Uji Sondir menggunakan Microsoft Excel

LAPORAN PENYELIDIKAN TANAH
PROYEK GEDUNG 4-5 LANTAI + 1 BASEMENT
JL. WOLTER MONGINSIDI

JAKARTA SELATAN

JOB : 1S.16133

JANUARI 2017

PT. TARUMANEGARA bumiyasa

Soil Investigation & Geotechnical Services
Survey & Supervision

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Kepada Yth,

Jakarta, 12 Januari 2017

Bapak Adi Tjundawan
Jl. Wolter Monginsidi
Jakarta Selatan

Perihal : Laporan Penyelidikan Tanah Proyek **Gedung 4 -5 Lantai + 1 Basement**
Jl. Wolter Monginsidi – Jakarta Selatan

Dengan hormat,

Sesuai permintaan **Bapak Adi Tjundawan, maka PT. TARUMANEGARA bumiyasa** Jakarta, pada tanggal 4 – 7 Desember 2017, telah melakukan penyelidikan tanah dilokasi proyek **Gedung 4 – 5 Lantai + 1 Basement** yang berlokasi di Jl. Wolter Monginsidi – Jakarta Selatan. Adapun jumlah dan macam pengujian ditentukan oleh pemberi tugas.

Dari hasil penyelidikan yang ada, dengan pengamatan secara langsung di lapangan dilakukan analisa dan evaluasi data untuk menentukan daya dukung tanah yang hasilnya dapat dilihat dalam laporan ini.

Semoga hasil penyelidikan ini bermanfaat adanya. Atas kepercayaan dan kerjasama yang baik, kami ucapkan banyak terima kasih.

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DAFTAR ISI

1.0
PENDAHULUAN

1.1 UMUM

Sesuai permintaan **Bapak Adi Tjundawan** untuk melakukan penyelidikan tanah yang meliputi 3 titik Sondir 2.5 Ton dan 1 titik bor dalam dilokasi rencana bangunan **GEDUNG 4-5 LANTAI + 1 BASEMENT** yang berlokasi di Jl. Wolter Monginsidi – Jakarta Selatan, maka **PT. TARUMANEGARA Bumiyasa** Jakarta pada tanggal 4 – 7 Desember 2016, telah melakukan pekerjaan tersebut diatas, dimana letak titik Sondir 2.5 Ton dan Bor dapat dilihat pada denah titik uji terlampir dalam laporan ini.

1.2 TUJUAN

Tujuan dari penyelidikan tanah ini adalah untuk mengevaluasi kondisi tanah setempat yang akan digunakan untuk keperluan perencanaan pondasi bangunan **GEDUNG 4-5 LANTAI + 1 BASEMENT.**

1.3 TEMPAT DAN LOKASI PENYELIDIKAN

Penyelidikan dilakukan pada lokasi rencana bangunan yang telah ditentukan oleh perencana dan letak titik penyelidikan ditempatkan didaerah yang diperkirakan dapat mewakili kondisi tanah setempat.

2.0

LINGKUP PEKERJAAN PENYELIDIKAN TANAH

2.1 DISTRIBUSI TITIK PENGUJIAN SONDIR DAN BOR MESIN

Pengujian Sondir 2.5 Ton dilakukan pada 3 titik dan 1 titik Bor dalam yang merupakan bagian dari rencana bangunan **GEDUNG 4-5 LANTAI + 1 BASEMENT** dimana letak titik pengujian dapat dilihat pada **Denah Titik Uji** terlampir. Elevasi lapisan tanah diukur dari elevasi permukaan masing – masing titik uji tanah setempat.

Hasil pengujian Sondir 2.5 Ton dan bor mesin masing – masing mencapai kedalaman sebagai berikut :

Tabel 2.1 Kedalaman yang dicapai pada masing-masing titik pengujian.

Sondir 2.5 Ton

No.	Sondir 2.5 ton	Kedalaman (m)	Muka Air Tanah (m)
1.	S1	-19.80	-10.60
2.	S2	-19.00	-10.00
3.	S3	-18.00	-10.20

Bor Mesin

No.	Bor Mesin	Kedalaman (m)	Muka Air Tanah (m)
1.	DB1	-30.00	-10.20

2.2 PROSEDUR SONDIR DAN BOR

2.2.1 Dutch Cone Penetration Test (Sondir)

Pekerjaan Sondir dilakukan dengan alat tipe *Begemann* dengan peralatan yang terkalibrasi, termasuk pemeriksaan dimensi konus, selakup, piston dan kevakuman hidrolis untuk mendapatkan nilai Sondir yang tepat dan benar. Hasil tegangan konus dan selakup dihitung berdasarkan dimensi konus dan selakup yang dipergunakan. Kecepatan penekanan penetrasi berkisar 1 - 2 cm / detik, sesuai dengan Standard **ASTM D-3441-86.**

2.2.2 Boring Machine (Bor Mesin)

Pemboran dilakukan dengan menggunakan mesin bor **YBM Type YSO-1H** dengan menggunakan *Single Tube Core Barrel* berdiameter 73 mm, dengan panjang 1.00 meter, serta menggunakan casing berdiameter 89 mm, dimana pengeboran dihentikan sesuai permintaan pemberi tugas. Metode pengeboran dilakukan sesuai dengan Standard **ASTM D-2113-87**.

2.2.3 Standard Penetration Test (Pengujian Penetrasi Standard)

Standard Penetration Test dilakukan dengan menggunakan *"Standard Split Barrel Sampler Asembly"* yang dilengkapi dengan alat *Automatic Trip Hammer*. Pengetesan dilakukan dengan Standard **ASTM D-1586-92**.

2.3 PENGUJIAN LABORATORIUM

Pengujian Laboratorium dilakukan sesuai dengan permintaan pemberi tugas, yaitu:

1. Index Properties Test (ASTM D-854-92 & ASTM D-2216-90)
2. Grain Size Analysis Test (ASTM D-421 & ASTM D-422)
3. Atterberg Limits Test (ASTM D-4318-84)
4. Unconfined Compression Test (ASTM D-2166-91)
5. Unconsolidated Undrained Triaxial Test (ASTM D-2850-87)
6. Consolidated Undrained Triaxial Test (ASTM D-4767-02)
7. Consolidation Test (ASTM D-2435-03)
8. Direct Shear Test (ASTM D-3080-03)

Semua prosedur pengujian dilakukan sesuai dengan Standard ASTM.

2.4 PROFIL LAPISAN TANAH DAN LOG BOR

Profil lapisan tanah berdasarkan deskripsi secara visual dari lubang bor, dapat dilihat pada Borlog terlampir.

2.5 MUKA AIR TANAH

Pada saat pekerjaan lapangan dilakukan, muka air tanah dijumpai pada kedalaman sekitar -10.00 meter hingga -10.60 meter dari permukaan tanah setempat.

3.0

EVALUASI DATA

3.1 UMUM

Secara umum, dari hasil penyelidikan tanah di lapangan meliputi **3 titik Sondir** dan **1 titik Deep Boring** dan pengujian **SPT** pada proyek **Gedung 4-5 Lantai dan 1 Basement** di lokasi **Jl. Wolter Monginsidi, Jakarta Selatan** yang telah dilakukan dapat dilihat sebagai berikut:

S1-S3: Lapisan pertama sampai kedalaman sekitar -0.60 meter sampai -1.00 meter berupa lapisan timbunana. Lapisan selanjutnya sampai kedalaman sekitar -13.00 meter terindikasi berupa lapisan lempung, lempung kelanauan dan lanau kelempungan dengan konsistensi lunak sampai sangat kaku. Lapisan selanjutnya sampai akhir pengujian Sondir di kedalaman -18.00 meter sampai -19.80 meter terindikasi berupa lapisan lanau dan lanau kepasiran dengan konsistensi sangat kaku sampai keras.

DB1: Lapisan pertama sampai kedalaman sekitar -2.90 meter berupa material timbunan. Lapisan selanjutnya sampai kedalaman sekitar -18.40 meter berupa lapisan lempung, lanau tersementasi, lempung kelanauan, lanau kelempungan dan lanau dengan konsistensi sangat lunak sampai keras. Lapisan selanjutnya sampai kedalaman sekitar -24.75 meter berupa lapisan pasir tersementasi dan pasir dengan kepadatan sedang sampai padat. Lapisan selanjutnya sampai akhir pengujian SPT di kedalaman -30.00 meter berupa lapisan lanau tersementasi dan lanau dengan konsistensi keras.

Lapisan tanah keras dengan N-SPT > 40 jumpai pada pekerjaan bor pada kedalaman -20.00 meter sampai dengan -22.00 meter dan pada pekerjaan Sondir, lapisan tanah keras dengan qc > 200 kg/cm^2 dijumpai pada kedalaman -18.00 meter sampai dengan -19.80 meter. Menurut hasil pengamatan, muka air tanah rata-rata terdapat pada kedalaman –10.20 meter.

3.2 PONDASI DANGKAL

Berdasarkan evaluasi di atas, pondasi dangkal dengan lebar dasar antara 1.0 - 2.0 m di kedalaman -1.0 m dan -2.0 m dari permukaan tanah setempat menghasilkan daya dukung ijin seperti yang tercantum pada **Tabel 4.1.**

3.3 PONDASI DALAM

Melihat kondisi lapisan tanah yang ada sebaiknya pondasi dalam bertumpu di lapisan tanah dengan nilai N-SPT > 40 atau qc > 200 kg/cm^2 di kedalaman seperti yang tercantum pada **Tabel 4.1.**

Dengan tiang pancang Δ 28 cm, Δ 32 cm, □ 20 x 20 cm^2, □ 25 x 25 cm^2, □ 30 x 30 cm^2, □ 35 x 35 cm^2, □ 40 x 40 cm^2, □ 45 x 45 cm^2 dan □ 50 x 50 cm^2 tersebut akan menghasilkan daya dukung ijin sebesar $\bar{\mathbf{Q}}$ seperti pada **Tabel 4.1.**

Sebagai alternatif dapat menggunakan Tiang Bor pada kedalaman yang sama dengan diameter ∅ 30 cm, 40 cm, 50 cm, 60 cm, 70 cm, 80 cm, 90 cm dan 100 cm atau Spun Pile dengan diameter ∅ 30 cm, 35 cm, 40 cm, 45 cm, 50 cm, dan 60 cm, yang akan menghasilkan daya dukung ijin sebesar $\bar{\mathbf{Q}}$ seperti pada **Tabel 4.1.**

4.0
KESIMPULAN DAN REKOMENDASI

4.1 UMUM

Berdasarkan hasil evaluasi di atas dapat disimpulkan secara umum lapisan pertama sampai kedalaman sekitar -2.90 meter berupa material timbunan. Lapisan selanjutnya sampai kedalaman sekitar -18.40 meter berupa lapisan lempung, lanau tersementasi, lempung kelanauan, lanau kelempungan dan lanau dengan konsistensi sangat lunak sampai keras. Lapisan selanjutnya sampai kedalaman sekitar -24.75 meter berupa lapisan pasir tersementasi dan pasir dengan kepadatan sedang sampai padat. Lapisan selanjutnya sampai akhir pengujian SPT di kedalaman -30.00 meter berupa lapisan lanau tersementasi dan lanau dengan konsistensi keras.

Lapisan tanah keras dengan N-SPT > 40 jumpai pada pekerjaan bor pada kedalaman -42.00 meter sampai dengan -45.00 meter dan pada pekerjaan Sondir, lapisan tanah keras dengan qc > 200 kg/cm^2 dijumpai pada kedalaman -18.00 meter sampai dengan -19.80 meter. Menurut hasil pengamatan, muka air tanah rata-rata terdapat pada kedalaman –10.20 meter.

4.2 DAYA DUKUNG

Berdasarkan evaluasi tersebut di atas, disajikan jenis pondasi berikut daya dukung ijin yang direkomendasikan untuk dipilih dalam perencanaan adalah sebagai berikut:

TABEL 4.1. DAYA DUKUNG IJIN

Jenis Pondasi	Kedalaman (m)	Daya Dukung Ijin	
1. Pondasi dangkal	-1.00 m	Q = 0.45 kg/cm^2	
B = 1.0 - 2.0 m	-2.00 m	Q = 0.50 kg/cm^2	
2. Tiang Pancang	**S1-S3, DB1**	**DB1**	
	L = 19.00 m s/d 21.00 m	**L = 24.00 m**	**L = 30.00 m**
Δ 28 cm	31 ton [b]	-	-
Δ 32 cm	39 ton	-	-
□ 20 x 20 cm^2	35 ton	-	-
□ 25 x 25 cm^2	48 ton	-	-
□ 30 x 30 cm^2	62 ton	-	-
□ 35 x 35 cm^2	78 ton	-	-
□ 40 x 40 cm^2	95 ton	-	-
□ 45 x 45 cm^2	113 ton	-	-
□ 50 x 50 cm^2	134 ton	-	-
3. Tiang Bor	**L = 19.00 m s/d 21.00 m**	**L = 24.00 m**	**L = 30.00 m**
Ø 30 cm	22 ton	44 ton [b]	59 ton [b]
Ø 40 cm	33 ton	64 ton	84 ton [b]
Ø 50 cm	46 ton	85 ton	111 ton
Ø 60 cm	62 ton	110 ton	140 ton
Ø 70 cm	80 ton	136 ton	172 ton
Ø 80 cm	99 ton	165 ton	206 ton
Ø 90 cm	121 ton	195 ton	242 ton
Ø 100 cm	145 ton	228 ton	281 ton
4. Tiang Spun	**L = 19.00 m s/d 21.00 m**	**L = 24.00 m**	**L = 30.00 m**
Ø 30 cm	49 ton	-	-
Ø 35 cm	61 ton	-	-
Ø 40 cm	74 ton	-	-
Ø 45 cm	89 ton	-	-
Ø 50 cm	105 ton	-	-
Ø 60 cm	140 ton	-	-

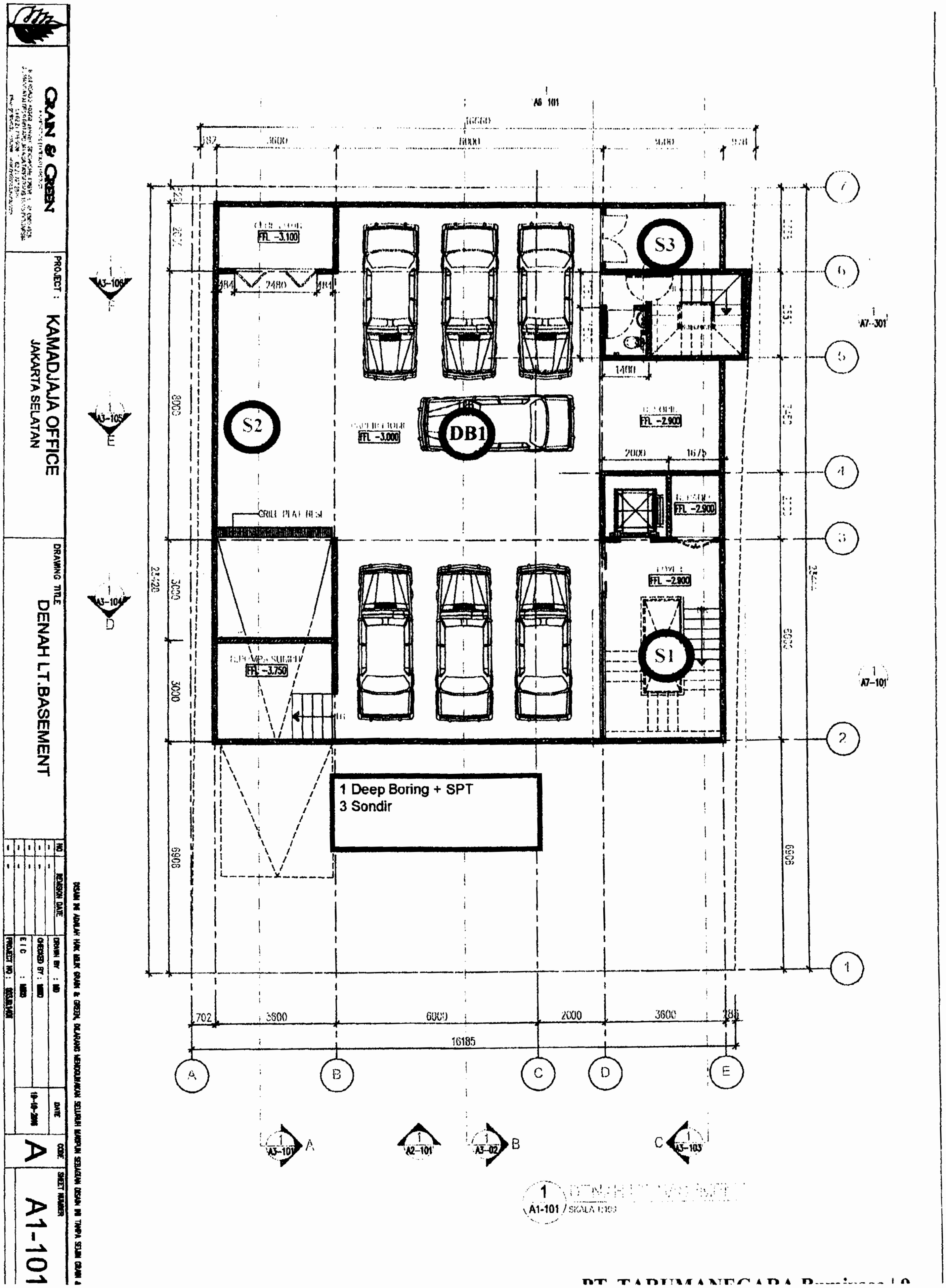
Catatan :

- *[a] tiang terlalu langsing.; [b] kapasitas bahan tiang terlampaui (asumsi K-500 untuk tiang pancang, K-300 untuk tiang bor dan K-600 untuk tiang spun) ; [c] tidak efisien (diameter terlalu besar atau diperlukan preboring).*
- *Ujung tiang harus bertumpu pada lapisan tanah keras dengan nilai N-SPT>40 blows/ft dan qc > 200 kg/cm.*
- *Daya dukung di otas merupakan daya dukung tanah dan tidak boleh melebihi kapasitas bahan tiang yang digunakan.*
- *Panjang tiang diukur dari level muka tanah asli saat pekerjaan di lapangan berlangsung.*
- *Perhitungan daya dukung diatas sudah memperhitungkan adanya galian basement ±4.0 meter.*
- *Untuk penggunaan jack-in pile di lapangan. Pressure minimal 250% daya dukung ijin.*
- *Untuk pemancangan tiang pancang harus mencapai final set (25 mm/10 blows) dengan tinggi jatuh hammer maksimum.*
- *Disarankan untuk melakukan preliminary pemancangan atau jack-in.*
- *Disarankan untuk melakukan Loading Test baik statis maupun dinamis.*

Penggunaan pondasi tiang secara kelompok disarankan untuk direncanakan dengan jarak antar tiang tidak lebih kecil dari 3 x diameter atau lebar penampang tiang untuk kedalaman tiang tersebut diatas dan dihitung Efisiensi Kelompok Tiang sesuai dengan jenis, dimensi, jarak, jumlah dan susunan kelompok tiang yang direncanakan.

Disarankan untuk melakukan Tes Pembebanan baik secara Statik maupun secara Dinamis untuk mengoptimasikan dan mengkonfirmasi daya dukung *ultimate* dilapangan. Dengan mengetahui besarnya daya dukung *ultimate* tersebut secara aktual, selain dapat menghasilkan perencanaan yang efisien dan efektif sehingga biaya *"Sub Structure"* menjadi ekonomis.

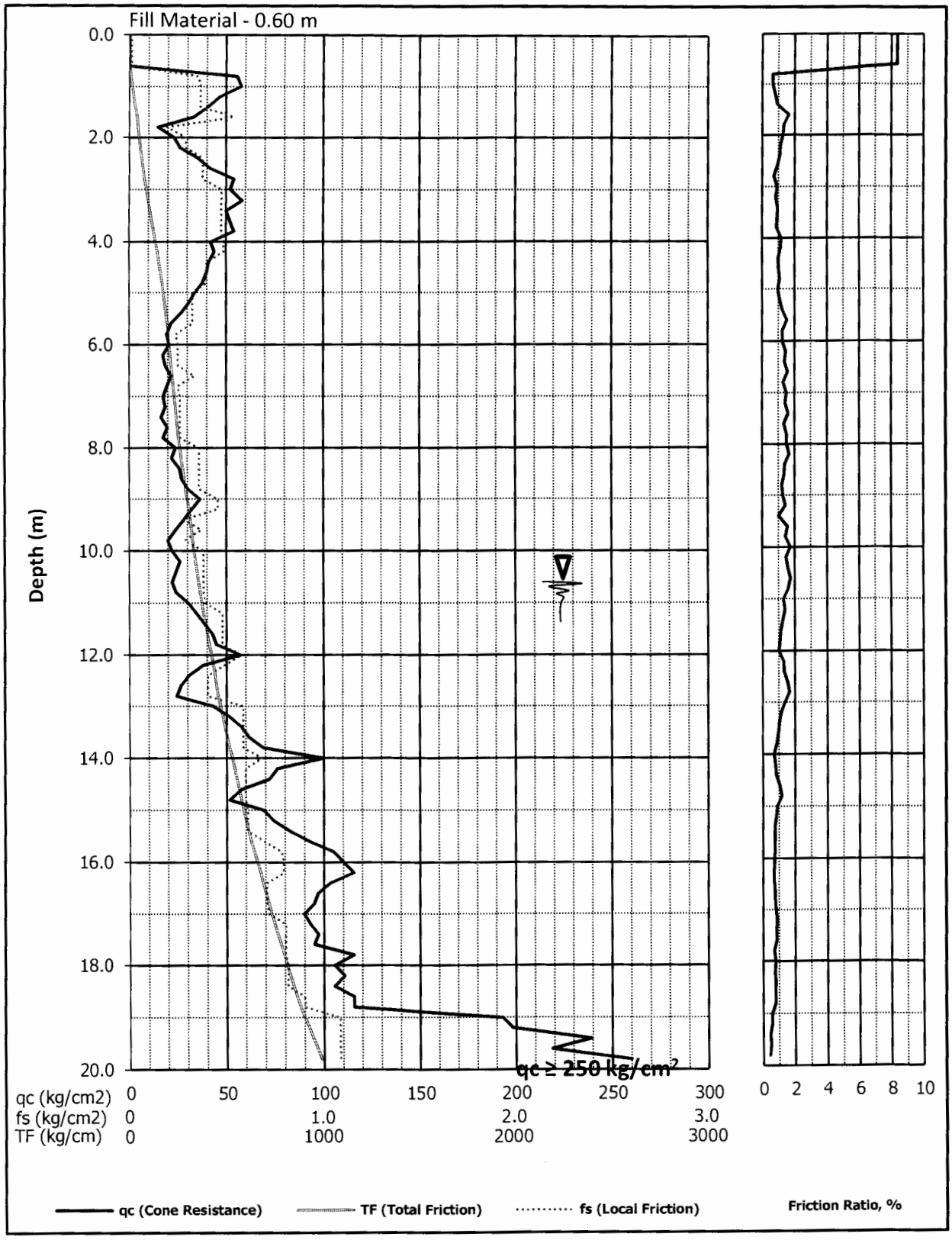
DENAH TITIK UJI SONDIR DAN BOR MESIN


GRAIN & GREEN
PROJECT : KAMADJAJA OFFICE
JAKARTA SELATAN
DRAWING TITLE DENAH LT.BASEMENT
A
A1-101
FFL -3.100
FFL -3.000
FFL -2.900
FFL -3.750
S1
S2
S3
DB1
1 Deep Boring + SPT
3 Sondir
16185
702
3600
6000
2000
285
A
B
C
D
E
1
2
3
4
5
6
7

GRAFIK SONDIR 2.5 TON
ASTM D-3441-86

DUTCH CONE PENETRATION TEST (DCPT)

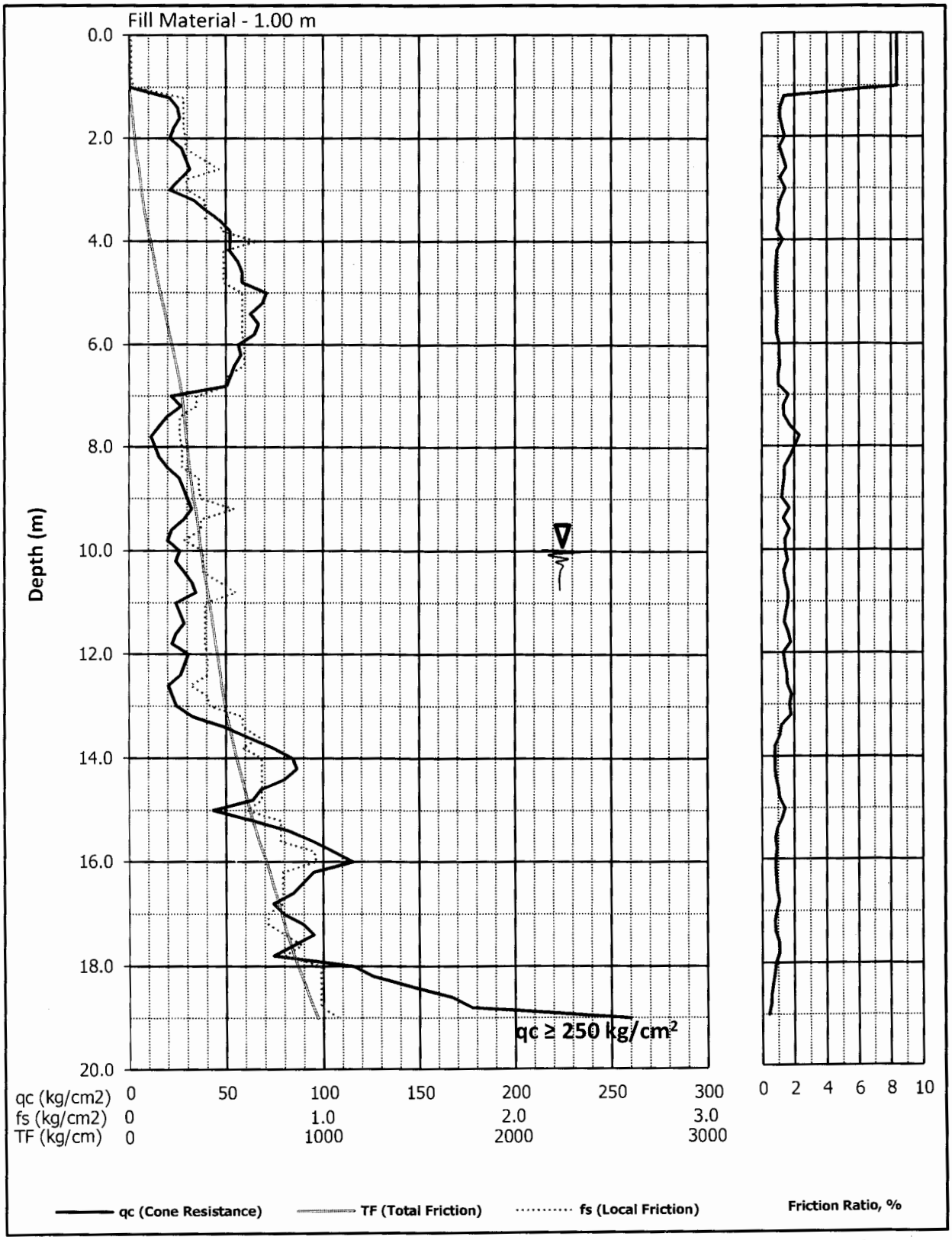
No. Job	: 1S.16133	**Test By**	: Manaf CS
Project	: GEDUNG 4-5 LANTAI + 1 BASEMENT	**Date**	: December 4, 2016.
Location	: Jl. Wolter Monginsidi - Jakarta Selatan	**End of test**	: 19.80 m
Point	: **S.1**		



PT TARUMANEGARA Bumiyasa

DUTCH CONE PENETRATION TEST (DCPT)

No. Job	: 1S.16133	**Test By**	: Manaf CS
Project	: GEDUNG 4-5 LANTAI + 1 BASEMENT	**Date**	: December 5, 2016.
Location	: Jl. Wolter Monginsidi - Jakarta Selatan	**End of test**	: 19.00 m
Point	: **S.2**		

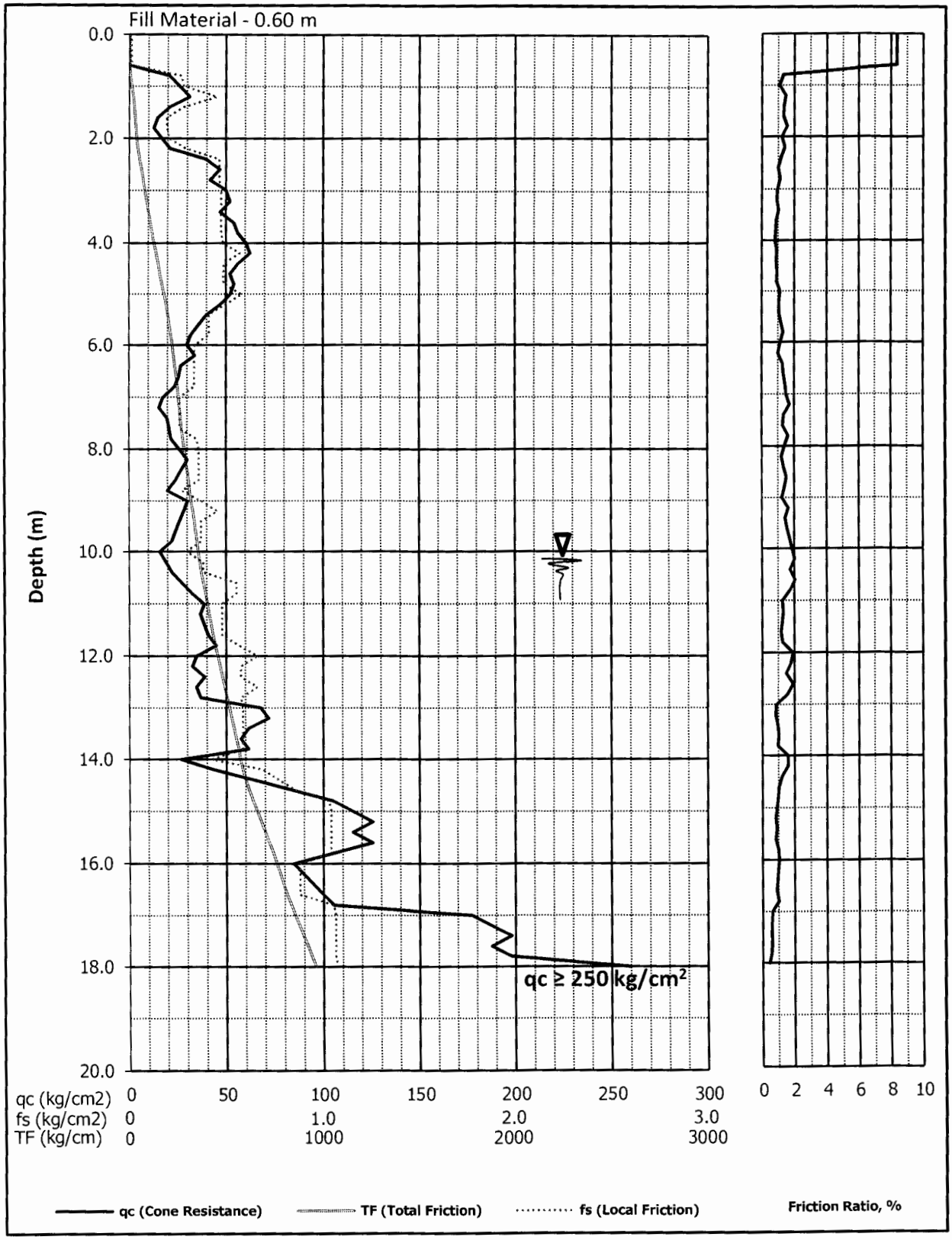


PT TARUMANEGARA Bumiyasa

DUTCH CONE PENETRATION TEST (DCPT)

No. Job : 1S.16133
Project : GEDUNG 4-5 LANTAI + 1 BASEMENT
Location : Jl. Wolter Monginsidi - Jakarta Selatan
Point : **S.3**

Test By : Manaf CS
Date : December 5, 2016.
End of test : 18.00 m



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LOG BOR
ASTM D-1452-80 & D-1586-92)

BORING LOG

Project No. : 1S.16133
Project : GEDUNG 4-5 LANTAI + 1 BASEMENT
Location : Jl. Wolter Monginsidi, Jakarta Selatan

Sta & Offset : -
Elevation : -
GWL : -10.20 m
Start Date : 05/12/2016
Finish Date : 08/12/2016
Bore Depth : 30.00 m
Core Dia. : 7.30 cm
Casing Dia. : 8.90 cm

Borhole Coor. : -
Driller : Farid Cs
Hammer Type : Automatic Trip Hammer
Energy (65 % - 75 %)

Log No. DB 1

Remarks :
Shelby Tube (UD) | Rock Core | Casing | Mazier Sample (MZ) | Split Spoon | Bag Sample

GWL / Date of Boring	Depth (m)	Legend	Symbol	Description	Sampling Depth (m)	Sampling Sample	Blows Per Each 15 cm N1	N2	N3	N	N - Value (10 20 30 40 50 60)	Laboratory Test: Strength Test Type	c / c' (kg/cm²)	ϕu / ϕ' (°)	dr (kg/cm³)	γt t/m³	Gs	e	Atterberg Limit (%) Wn	LL	PL	LI
05/12/2016	1			Fill Material - 2.90 m	1	☒	5	5	6	11												
	2				2	☒	4	4	1	5												
	3				3																	
	4		CH	SILTY CLAY Light brown, moist, medium stiff, high plasticity DB1 - UD1 : 3.00 - 3.50 m DB1 - UD2 : 4.50 - 5.00 m	4	☒	1	2	3	5		UU CU	0.41 0.11	17.74 21.40	-	1.74	2.64	1.22	46.02	112.35	38.72	0.10
	5				5								0.10	25.90								
												UU CU	0.24 0.14	15.38 15.80	0.88	1.70	2.67	1.35	49.89	104.20	37.06	0.19
06/12/2016	6		MH	CLAYEY SILT Reddish brown, moist, soft, high plasticity DB1 - UD3 : 6.50 - 7.00 m DB1 - UD4 : 7.00 - 7.50 m	6	☒	1	1	1	2		& UCT	0.11	21.10								
	7				7							CU & UCT	0.10 0.07	17.50 22.60	0.38	1.58	2.62	1.69	61.86	85.73	45.33	0.41
	8				8	☒	1	2	2	4		UU & UNC	0.32	10.03	0.13	1.51	2.59	1.86	66.70	72.70	34.76	0.84
	9		CH	CLAY Brown, moist, medium stiff to stiff, high plasticity	9																	
	10				10	☒	2	3	3	6												
	11				11																	
	12				12	☒	5	5	6	11												
07/12/2016	13		CH	CLAY Brownish grey, moist, very stiff, containing a few of fine sand, high plasticity	13																	
	14				14	☒	6	9	14	23												
	15		ML	CEMENTED SILT Brown, moist, hard, containing a few of fine sand, low plasticity	15																	
	16		CH	SILTY CLAY Brownish grey, moist, very stiff, high plasticity	16	☒	5	8	12	20												
	17		ML	CEMENTED SILT Brown, moist, hard, low plasticity	17																	
	18		ML	SILT Brown, moist, hard, containing a few of fine sand, low plasticity	18	☒	8	13	18	31												
	19		SP	CEMENTED SAND Greyish brown, moist, dense, poorly graded	19																	
	20				20	☒	11	17	25	42												
	21				21																	
	22				22	☒	12	19	26	45												
	23		SP	SAND Brown, moist, medium dense, poorly graded	23																	
	24				24	☒	6	9	14	23												
08/12/2016	25		SP	CEMENTED SAND Black, moist, dense, poorly graded	25																	
	26		ML	CEMENTED SILT Grey, moist, hard, containing a few of fine sand, low plasticity	26	☒	9	15	21	36												
	27		ML	SILT Greenish grey, moist, very stiff, containing a few of fine sand, low plasticity	27																	
	28				28	☒	7	12	18	30												
	29		ML	CEMENTED SILT Brownish grey, moist, hard, containing a few of fine sand, low plasticity	29																	
	30				30	☒	15	19	25	44												
				End of Boring																		

RINGKASAN HASIL TES LABORATORIUM

RINGKASAN HASIL TES LABORATORIUM

PROJECT : **Gedung 4-5 Lantai + 1 Basement**
LOCATION : **Jl. Wolter Monginsidi - Jakarta Selatan**

Boring No.				DB1			
Sample No				UD1	UD2	UD3	UD4
Depth (m)			m	3.00-3.50	4.50-5.00	6.50-7.00	7.00-7.50
Pocket Torvane			kg/cm^2	0.70	0.70	0.23	0.25
Gradation	Gravel		%	0.00	0.00	0.00	0.00
	Sand		%	1.44	0.62	6.34	3.08
	Silt		%	65.08	62.75	65.26	67.10
	Clay		%	33.48	36.63	28.40	29.82
	Classified Grading Pass	No.10 (2.00 mm) %		99.74	100.00	99.20	100.00
		No.40 (0.425 mm) %		98.94	99.88	96.72	99.86
		No.200 (0.075 mm) %		98.56	99.38	93.66	96.92
Liquid Limits			LL %	112.35	104.20	85.73	72.70
Plasticity Index			PI %	73.63	67.14	40.40	37.94
Liquidity Index			LI	0.10	0.19	0.41	0.84
Classification				CH	CH	MH	MH
Specific Gravity			Gs	2.64	2.67	2.62	2.59
Natural State	Water Content		ωn %	46.02	49.89	61.86	66.70
	Wet Density		γt gr/cm^3	1.74	1.70	1.58	1.51
	Void Ratio		e	1.22	1.35	1.69	1.86
	Degree Saturaion		Sr %	99.77	98.68	96.04	92.78
Unconfined Compression Test	Compressive Strength		qu (kg/cm^2)	-	0.88	0.38	0.13
	Remolded Strength		qr (kg/cm^2)	-	0.75	0.31	0.11
	Sensitivity Ration		St	-	1.17	1.23	1.18
Triaxial Compression Test	Type of Test			UU			
	Cohesion		C (kg/cm2)	0.41	0.24	-	0.32
	Angle of Internal Friction		Ø (deg)	17.74	15.38	-	10.03
	Type of Test			CU			
	Total	Cohesion C (Kg/cm^2)		0.11	0.14	0.10	-
		Angle of Int Frict. Ø (deg)		21.40	15.80	17.50	-
	Effective	Cohesion C' (Kg/cm^2)		0.10	0.11	0.07	-
		Angle of Int Frict. Ø' (deg)		25.90	21.10	22.60	-
Consolidation Test	Yield of Consolidation		Pc (kg/cm^2)	1.80	1.45	2.05	1.75
	Compression Index		Cc	0.30	0.46	0.75	0.70
	Swelling Index		Cs	0.07	0.11	0.05	0.06
	Psw		(kg/cm^2)	0.30	0.09	0.02	0.03
	Percent Heave		%	1.71	1.23	0.32	0.76
Direct Shear Test	Type Test			Peak			
	Cohesion		C (kg/cm^2)	-	-	0.13	0.06
	Angle of Internal Friction		Ø (deg)	-	-	27.92	31.59
	Type Test			Residual			
	Cohesion		C (kg/cm^2)	-	-	0.11	0.04
	Angle of Internal Friction		Ø (deg)	-	-	26.34	30.92

INDEX PROPERTIES
ASTM D-854-92 & D-2216-90

INDEX PROPERTIES

Job No. : **1S.16133**
Project : **Gedung 4-5 Lantai + 1 Basement**
Location : **Jl. Wolter Monginsidi - Jakarta Selatan**
Date : **14 Desember 2016**
Tested By : **Muryadi**

Boring No.	**DB1**			
Sample No	**UD1**	**UD2**	**UD3**	**UD4**
Depth (m)	**3.00-3.50**	**4.50-5.00**	**6.50-7.00**	**7.00-7.50**
Wt. of can + wet soil + ring (gr)	85.42	83.02	87.05	83.25
Wt. of can + dry soil + ring (gr)	71.50	69.33	72.89	69.15
Wt. of can + ring (gr)	41.25	41.89	50.00	48.01
Wt. of dry soil (gr)	30.25	27.44	22.89	21.14
Wt. of water (gr)	13.92	13.69	14.16	14.10
Wt. of wet soil (gr)	44.17	41.13	37.05	35.24
Volume of ring (cm^3)	25.41	24.15	23.48	23.36
w %	**46.02**	**49.89**	**61.86**	**66.70**
Gs	**2.64**	**2.67**	**2.62**	**2.59**
γ wet (gr/cm^3)	1.74	1.70	1.58	1.51
γ dry (gr/cm^3)	1.19	1.14	0.97	0.90
γ sat (gr/cm^3)	1.74	1.71	1.60	1.56
Sr	99.77	98.68	96.04	92.78
e	1.22	1.35	1.69	1.86
n	0.55	0.57	0.63	0.65

GRAIN SIZE ANALYSIS
ASTM D-421-63 & D-422-63

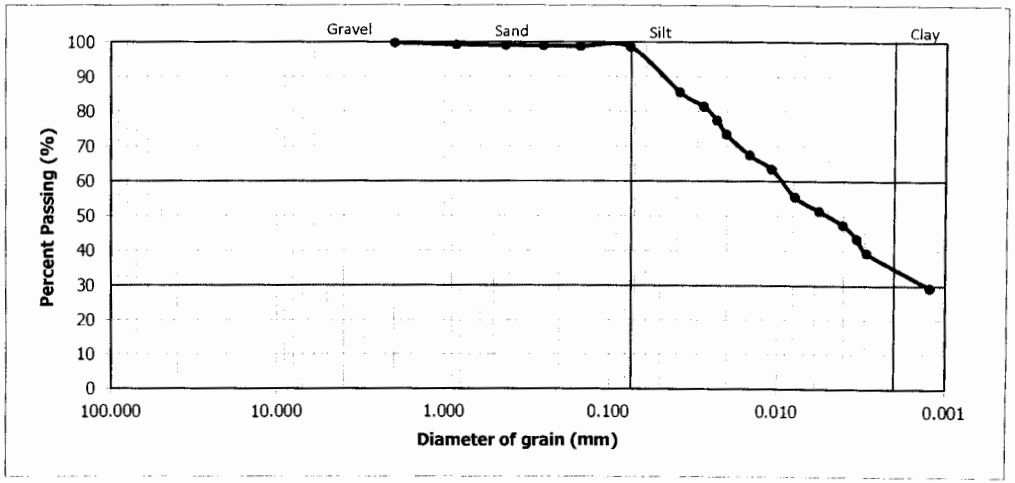
PT. TARUMANEGARA Bumiyasa

GRAIN SIZE ANALYSIS

Project	: Gedung 4 - 5 Lantai	Date tested	: December 14 ,2016
Location	: Jl. Wolter Mongosidi	Boring	: DB 1 - UD 1
Tested By	: Ershad	Depth Spt	: 3.0 - 3.50 m
Project No	: 1s. 16133		

Weight of soil = **50.00** gram

Sieve No	Diameter of grain	Mass Retained	Percent Retained	Percent Cumulative Retained	Percent Passing
#	(mm)	(gr)	(%)	(%)	(%)
	49.900	**0.00**	0.00	0.00	100.00
1	25.000	**0.00**	0.00	0.00	100.00
.3/4	19.000	**0.00**	0.00	0.00	100.00
.1/2	12.500	**0.00**	0.00	0.00	100.00
.3/8	9.500	**0.00**	0.00	0.00	100.00
4	4.750	**0.00**	0.00	0.00	100.00
10	2.000	**0.13**	0.26	0.26	99.74
20	0.840	**0.28**	0.56	0.82	99.18
40	0.425	**0.12**	0.24	1.06	98.94
60	0.250	**0.03**	0.06	1.12	98.88
100	0.150	**0.06**	0.12	1.24	98.76
200	0.075	**0.10**	0.20	1.44	98.56
		0.72			



Gs	**2.64**									
a (Table 6-2)	**1.0023**	**Result**			D_{10}	=	-	Cu	=	-
Ws (Wt of soil)	49.28	Gravel	=	0.00	D_{30}	=	0.001	Cc	=	-
Zero correction	-2	Sand	=	1.44	D_{60}	=	0.010			
Meniscus correction	0.8	Silt	=	65.08						
Retained On # 200	98.56	Clay	=	33.48						

Time of Reading	Temp (C)	Actual Hydro Readnig	Table 6-3 Temp (Ct)	Corr Hydro (RC)	% Finer	Hyd. Corr Only for Meniscus R	L from Table 6-5	L / t	L from Table 6-4	Diam (mm)	Final Finer %
1	**28**	**41**	**2.50**	42.70	86.85	40.20	**9.68**	9.68	**0.01240**	0.0386	85.60
2	28	**39**	2.50	40.70	82.78	38.20	**10.06**	5.03	0.01240	0.0278	81.59
3	28	**37**	2.50	38.70	78.71	36.20	**10.36**	3.45	0.01240	0.0230	77.58
4	28	**35**	2.50	36.70	74.64	34.20	**10.66**	2.67	0.01240	0.0202	73.57
8	28	**32**	2.50	33.70	68.54	31.20	**11.18**	1.40	0.01240	0.0147	67.56
15	28	**30**	2.50	31.70	64.47	29.20	**11.48**	0.77	0.01240	0.0108	63.55
30	28	**26**	2.50	27.70	56.34	25.20	**12.16**	0.41	0.01240	0.0079	55.53
60	28	**24**	2.50	25.70	52.27	23.20	**12.48**	0.21	0.01240	0.0057	51.52
120	28	**22**	2.50	23.70	48.20	21.20	**12.86**	0.11	0.01240	0.0041	47.51
180	28	**20**	2.50	21.70	44.14	19.20	**13.16**	0.07	0.01240	0.0034	43.50
240	28	**18**	2.50	19.70	40.07	17.20	**13.46**	0.06	0.01240	0.0029	39.49
1440	28	**13**	2.50	14.70	29.90	12.20	**14.28**	0.01	0.01240	0.0012	29.47

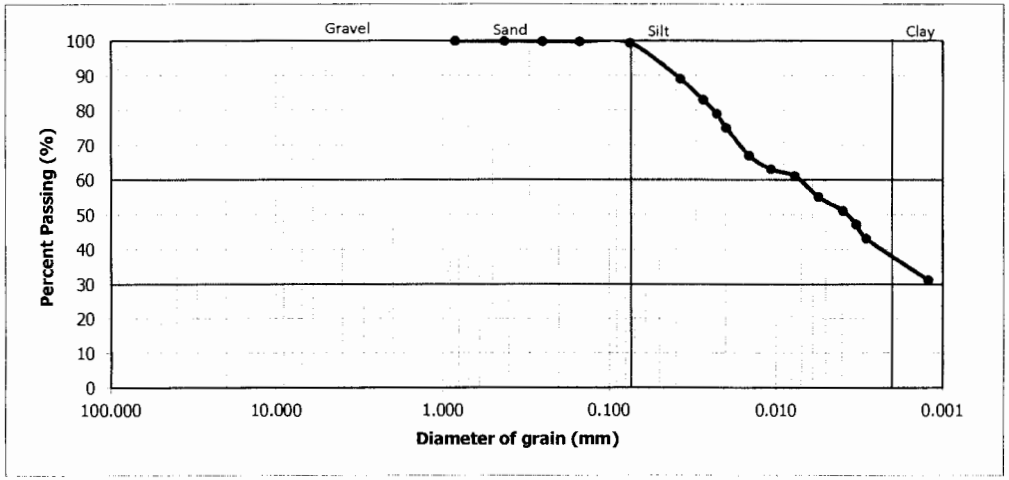
PT. TARUMANEGARA Bumiyasa

GRAIN SIZE ANALYSIS

Project	: Gedung 4 - 5 Lantai	Date tested	: December 14 ,2016
Location	: Jl. Wolter Mongosidi	Boring	: DB 1 - UD 2
Tested By	: Ershad	Depth Spt	: 4.50 - 5.0 m
Project No	: 1s. 16133		

Weight of soil = **50.00** gram

Sieve No	Diameter of grain	Mass Retained	Percent Retained	Percent Cumulative Retained	Percent Passing
#	(mm)	(gr)	(%)	(%)	(%)
	49.900	**0.00**	0.00	0.00	100.00
1	25.000	**0.00**	0.00	0.00	100.00
.3/4	19.000	**0.00**	0.00	0.00	100.00
.1/2	12.500	**0.00**	0.00	0.00	100.00
.3/8	9.500	**0.00**	0.00	0.00	100.00
4	4.750	**0.00**	0.00	0.00	100.00
10	2.000	**0.00**	0.00	0.00	100.00
20	0.840	**0.03**	0.06	0.06	99.94
40	0.425	**0.03**	0.06	0.12	99.88
60	0.250	**0.04**	0.08	0.20	99.80
100	0.150	**0.05**	0.10	0.30	99.70
200	0.075	**0.16**	0.32	0.62	99.38
		0.31			



Gs	**2.67**					D_{10}	=	-	Cu	= -
a (Table 6-2)	**0.9955**	**Result**				D_{30}	=	-	Cc	= -
Ws (Wt of soil)	49.69	Gravel	=	0.00		D_{60}	=	0.007		
Zero correction	-2	Sand	=	0.62						
Meniscus correction	0.8	Silt	=	62.75						
Retained On # 200	99.38	Clay	=	36.63						

Time of Reading	Temp (C)	Actual Hydro Readnig	Table **6-3** Temp (Ct)	Corr Hydro (RC)	% Finer	Hyd. Corr Only for Meniscus R	L from Table **6-5**	L / t	L from Table **6-4**	Diam (mm)	Final Finer %
1	**28**	**43**	**2.50**	44.70	89.55	42.20	**9.36**	9.36	**0.01230**	0.0376	89.00
2	28	**40**	2.50	41.70	83.54	39.20	**9.86**	4.93	0.01230	0.0273	83.02
3	28	**38**	2.50	39.70	79.54	37.20	**10.18**	3.39	0.01230	0.0227	79.04
4	28	**36**	2.50	37.70	75.53	35.20	**10.48**	2.62	0.01230	0.0199	75.06
8	28	**32**	2.50	33.70	67.52	31.20	**11.18**	1.40	0.01230	0.0145	67.10
15	28	**30**	2.50	31.70	63.51	29.20	**11.48**	0.77	0.01230	0.0108	63.11
30	28	**29**	2.50	30.70	61.51	28.20	**11.65**	0.39	0.01230	0.0077	61.12
60	28	**26**	2.50	27.70	55.49	25.20	**12.16**	0.20	0.01230	0.0055	55.15
120	28	**24**	2.50	25.70	51.49	23.20	**12.48**	0.10	0.01230	0.0040	51.17
180	28	**22**	2.50	23.70	47.48	21.20	**12.98**	0.07	0.01230	0.0033	47.19
240	28	**20**	2.50	21.70	43.47	19.20	**13.16**	0.05	0.01230	0.0029	43.20
1440	28	**14**	2.50	15.70	31.45	13.20	**14.16**	0.01	0.01230	0.0012	31.26

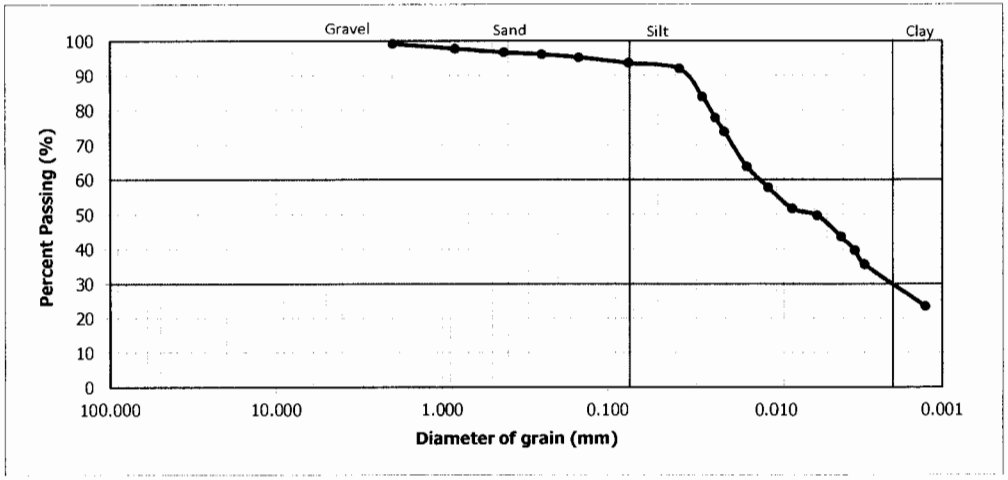
PT. TARUMANEGARA Bumiyasa

GRAIN SIZE ANALYSIS

Project	: Gedung 4 - 5 Lantai	Date tested	: December 14 ,2016
Location	: Jl. Wolter Mongosidi	Boring	: DB 1 - UD 3
Tested By	: Ershad	Depth Spt	: 6.50 - 7.0 m
Project No	: 1s. 16133		

Weight of soil = **50.00** gram

Sieve No	Diameter of grain	Mass Retained	Percent Retained	Percent Cumulative Retained	Percent Passing
#	(mm)	(gr)	(%)	(%)	(%)
	49.900	**0.00**	0.00	0.00	100.00
1	25.000	**0.00**	0.00	0.00	100.00
.3/4	19.000	**0.00**	0.00	0.00	100.00
.1/2	12.500	**0.00**	0.00	0.00	100.00
.3/8	9.500	**0.00**	0.00	0.00	100.00
4	4.750	**0.00**	0.00	0.00	100.00
10	2.000	**0.40**	0.80	0.80	99.20
20	0.840	**0.69**	1.38	2.18	97.82
40	0.425	**0.55**	1.10	3.28	96.72
60	0.250	**0.28**	0.56	3.84	96.16
100	0.150	**0.44**	0.88	4.72	95.28
200	0.075	**0.81**	1.62	6.34	93.66
		3.17			



Gs	**2.62**				D_{10}	=	-	Cu = -
a (Table 6-2)	**1.0070**	**Result**			D_{30}	=	0.002	Cc = -
Ws (Wt of soil)	46.83	Gravel	=	0.00	D_{60}	=	0.012	
Zero correction	-2	Sand	=	6.34				
Meniscus correction	0.8	Silt	=	65.26				
Retained On # 200	93.66	Clay	=	28.40				

Time of Reading	Temp (C)	Actual Hydro Readnig	Table **6-3** Temp (Ct)	Corr Hydro (RC)	% Finer	Hyd. Corr Only for Meniscus R	L from Table **6-5**	L / t	L from Table **6-4**	Diam (mm)	Final Finer %
1	**28**	**44**	**2.50**	**45.70**	98.27	43.20	**9.17**	9.17	**0.01250**	0.0379	92.04
2	28	**40**	2.50	**41.70**	89.67	39.20	**9.86**	4.93	0.01250	0.0278	83.98
3	28	**37**	2.50	38.70	83.22	36.20	**10.36**	3.45	0.01250	0.0232	77.94
4	28	**35**	2.50	36.70	78.92	34.20	**10.66**	2.67	0.01250	0.0204	73.91
8	28	**30**	2.50	31.70	68.17	29.20	**11.48**	1.44	0.01250	0.0150	63.84
15	28	**27**	2.50	28.70	61.71	26.20	**11.98**	0.80	0.01250	0.0112	57.80
30	28	**24**	2.50	25.70	55.26	23.20	**12.48**	0.42	0.01250	0.0081	51.76
60	28	**23**	2.50	24.70	53.11	22.20	**12.66**	0.21	0.01250	0.0057	49.75
120	28	**20**	2.50	21.70	46.66	19.20	**13.16**	0.11	0.01250	0.0041	43.70
180	28	**18**	2.50	19.70	42.36	17.20	**13.46**	0.07	0.01250	0.0034	39.68
240	28	**16**	2.50	17.70	38.06	15.20	**13.78**	0.06	0.01250	0.0030	35.65
1440	28	**10**	2.50	11.70	25.16	9.20	**14.78**	0.01	0.01250	0.0013	23.56

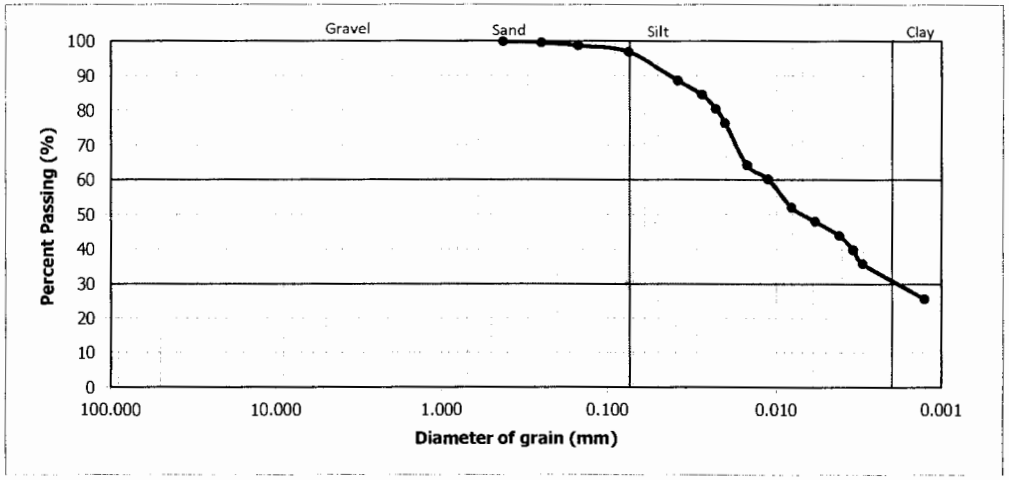
PT. TARUMANEGARA Bumiyasa

GRAIN SIZE ANALYSIS

Project	: Gedung 4 - 5 Lantai	Date tested	: December 14 ,2016
Location	: Jl. Wolter Mongosidi	Boring	: DB 1 - UD 4
Tested By	: Ershad	Depth Spt	: 7.0 - 7.50 m
Project No	: 1s. 16133		

Weight of soil = **50.00** gram

Sieve No	Diameter of grain	Mass Retained	Percent Retained	Percent Cumulative Retained	Percent Passing
#	(mm)	(gr)	(%)	(%)	(%)
	49.900	**0.00**	0.00	0.00	100.00
1	25.000	**0.00**	0.00	0.00	100.00
.3/4	19.000	**0.00**	0.00	0.00	100.00
.1/2	12.500	**0.00**	0.00	0.00	100.00
.3/8	9.500	**0.00**	0.00	0.00	100.00
4	4.750	**0.00**	0.00	0.00	100.00
10	2.000	**0.00**	0.00	0.00	100.00
20	0.840	**0.00**	0.00	0.00	100.00
40	0.425	**0.07**	0.14	0.14	99.86
60	0.250	**0.13**	0.26	0.40	99.60
100	0.150	**0.44**	0.88	1.28	98.72
200	0.075	**0.90**	1.80	3.08	96.92
		1.54			



Gs	**2.59**							
a (Table 6-2)	**1.0142**	**Result**			D_{10}	=	-	Cu = -
Ws (Wt of soil)	48.46	Gravel	=	0.00	D_{30}	=	0.002	Cc = -
Zero correction	-2	Sand	=	3.08	D_{60}	=	0.011	
Meniscus correction	0.8	Silt	=	67.10				
Retained On # 200	96.92	Clay	=	29.82				

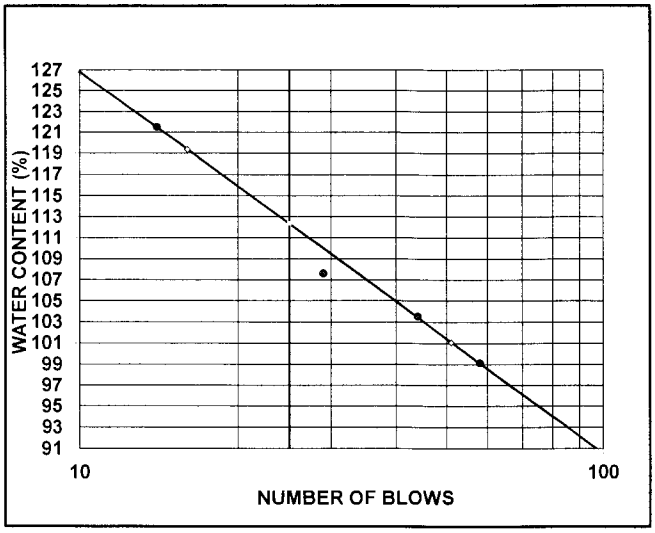
Time of Reading	Temp (C)	Actual Hydro Readnig	Table **6-3** Temp (Ct)	Corr Hydro (RC)	% Finer	Hyd. Corr Only for Meniscus R	L from Table **6-5**	L / t	L from Table **6-4**	Diam (mm)	Final Finer %
1	**28**	**42**	**2.50**	43.70	91.46	41.20	**9.56**	9.56	**0.01260**	0.0390	88.64
2	28	**40**	2.50	41.70	87.27	39.20	**9.86**	4.93	0.01260	0.0280	84.58
3	28	**38**	2.50	39.70	83.09	37.20	**10.18**	3.39	0.01260	0.0232	80.53
4	28	**36**	2.50	37.70	78.90	35.20	**10.48**	2.62	0.01260	0.0204	76.47
8	28	**30**	2.50	31.70	66.34	29.20	**11.48**	1.44	0.01260	0.0151	64.30
15	28	**28**	2.50	29.70	62.16	27.20	**12.06**	0.80	0.01260	0.0113	60.24
30	28	**24**	2.50	25.70	53.79	23.20	**12.48**	0.42	0.01260	0.0081	52.13
60	28	**22**	2.50	23.70	49.60	21.20	**12.86**	0.21	0.01260	0.0058	48.07
120	28	**20**	2.50	21.70	45.42	19.20	**13.16**	0.11	0.01260	0.0042	44.02
180	28	**18**	2.50	19.70	41.23	17.20	**13.46**	0.07	0.01260	0.0034	39.96
240	28	**16**	2.50	17.70	37.04	15.20	**13.78**	0.06	0.01260	0.0030	35.90
1440	28	**11**	2.50	12.70	26.58	10.20	**14.66**	0.01	0.01260	0.0013	25.76

ATTERBERG LIMITS
ASTM D-4318-05

JOB NAME : GEDUNG 4 - 5 LANTAI
LOCATION : JL WOLTER MONGINSIDI - JAKARTA SELATAN
DATE : DECEMBER 17, 2016.

JOB NO. : 1S.16133
BORING NO. : DB1 - UD1
DEPTH OF SAMPLE : 03.00 - 03.50 m

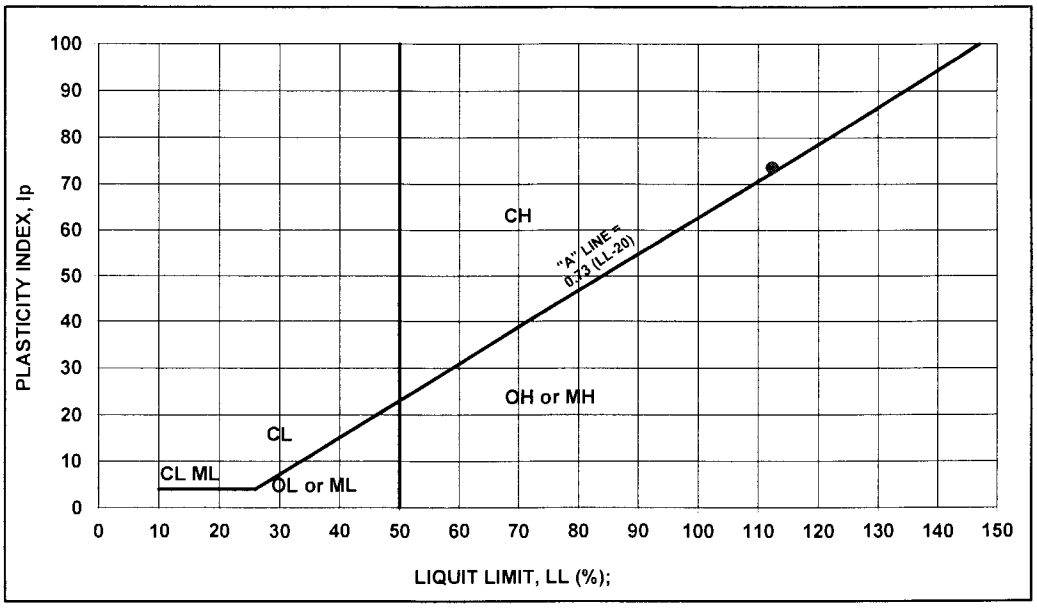
ATTERBERG LIMITS



NATURAL MOISTURE CONTENT

	Wn	=	46.02 %
FLOW INDEX	Fi	=	36.29 %
LIQUID LIMIT	LL	=	112.35 %
PLASTIC LIMIT	PL	=	38.72 %
PLASTICITY INDEX	Pi	=	73.63 %
LIQUID INDEX	Li	=	0.10

CLASSIFICATION = CH

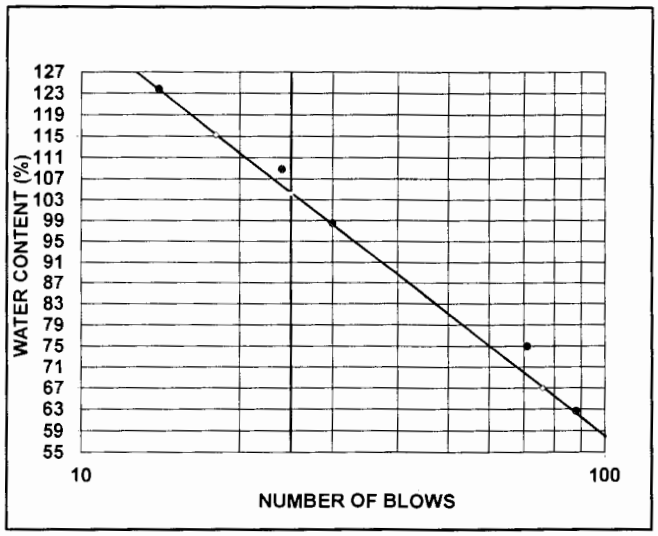


Tested By : FAHMI

JOB NAME : GEDUNG 4 - 5 LANTAI
LOCATION : JL WOLTER MONGINSIDI - JAKARTA SELATAN
DATE : DECEMBER 17, 2016.

JOB NO. : 1S.16133
BORING NO. : DB1 - UD2
DEPTH OF SAMPLE : 04.50 - 05.00 m

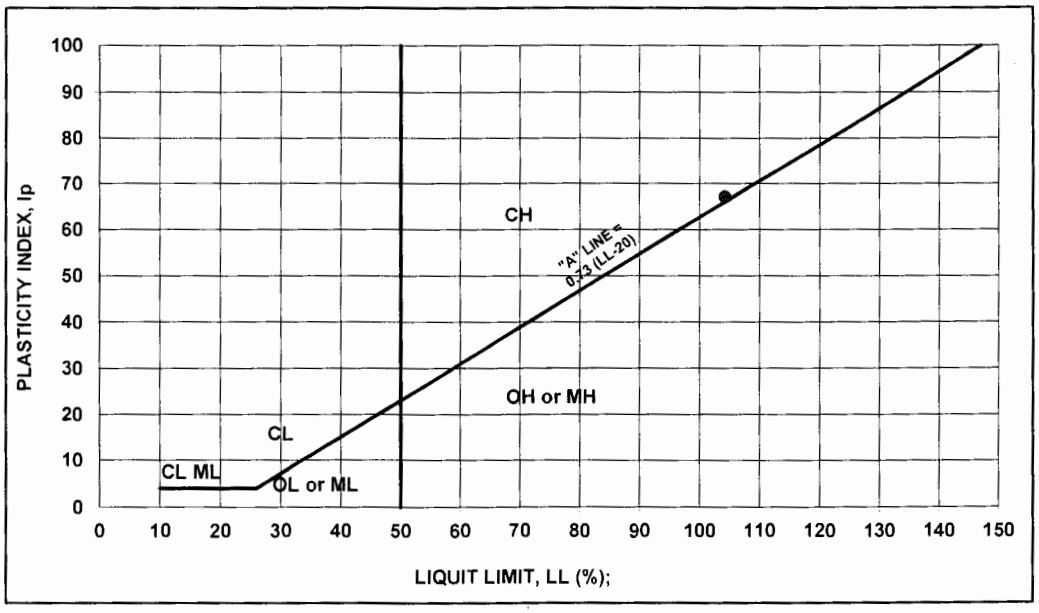
ATTERBERG LIMITS



NATURAL MOISTURE CONTENT

	Wn	=	49.89 %
FLOW INDEX	Fi	=	77.13 %
LIQUID LIMIT	LL	=	104.20 %
PLASTIC LIMIT	PL	=	37.06 %
PLASTICITY INDEX	Pi	=	67.14 %
LIQUID INDEX	Li	=	0.19

CLASSIFICATION = CH

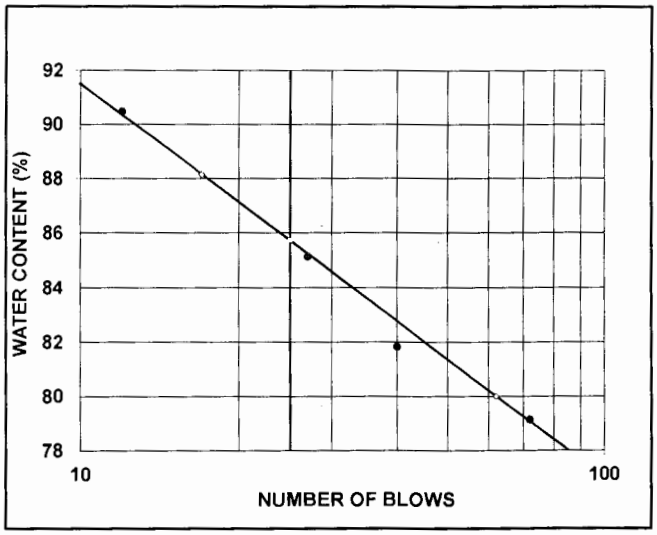


Tested By : FAHMI

JOB NAME : GEDUNG 4 - 5 LANTAI
LOCATION : JL WOLTER MONGINSIDI - JAKARTA SELATAN
DATE : DECEMBER 17, 2016.

JOB NO. : 1S.16133
BORING NO. : DB1 - UD3
DEPTH OF SAMPLE : 06.50 - 07.00 m

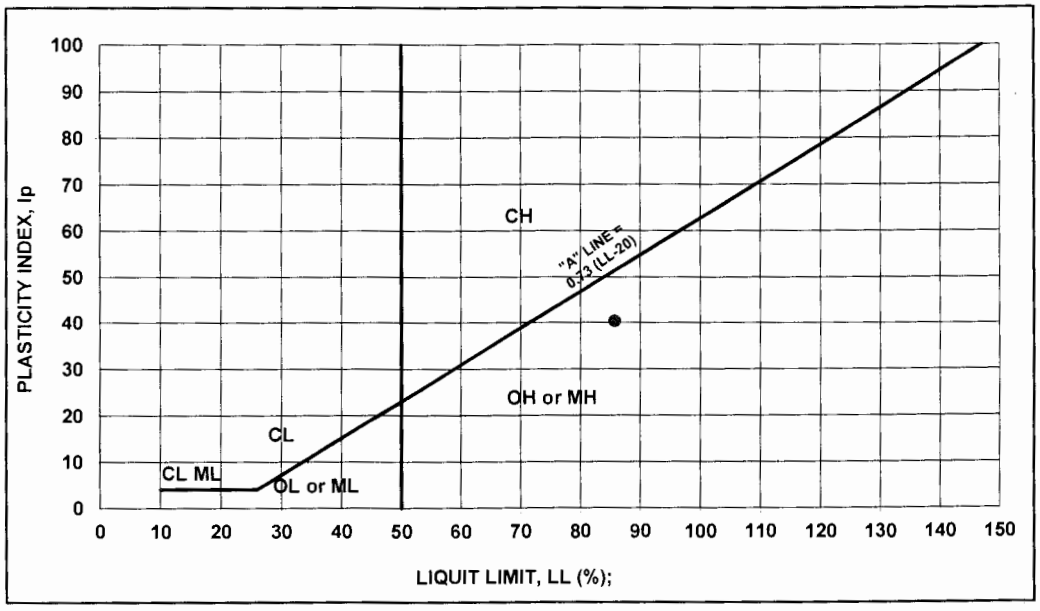
ATTERBERG LIMITS



NATURAL MOISTURE CONTENT

	Wn	=	61.86 %
FLOW INDEX	Fi	=	14.50 %
LIQUID LIMIT	LL	=	85.73 %
PLASTIC LIMIT	PL	=	45.33 %
PLASTICITY INDEX	Pi	=	40.40 %
LIQUID INDEX	Li	=	0.41

CLASSIFICATION = MH

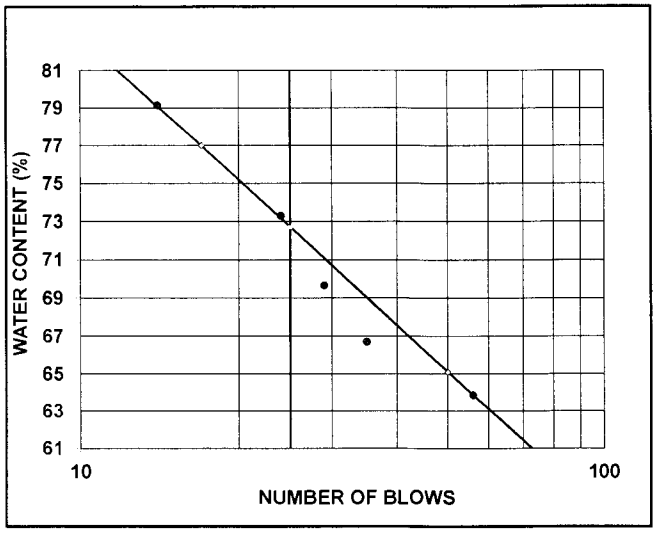


Tested By : FAHMI

JOB NAME : GEDUNG 4 - 5 LANTAI
LOCATION : JL WOLTER MONGINSIDI - JAKARTA SELATAN
DATE : DECEMBER 19, 2016.

JOB NO. : 1S.16133
BORING NO. : DB1 - UD4
DEPTH OF SAMPLE : 07.00 - 07.50 m

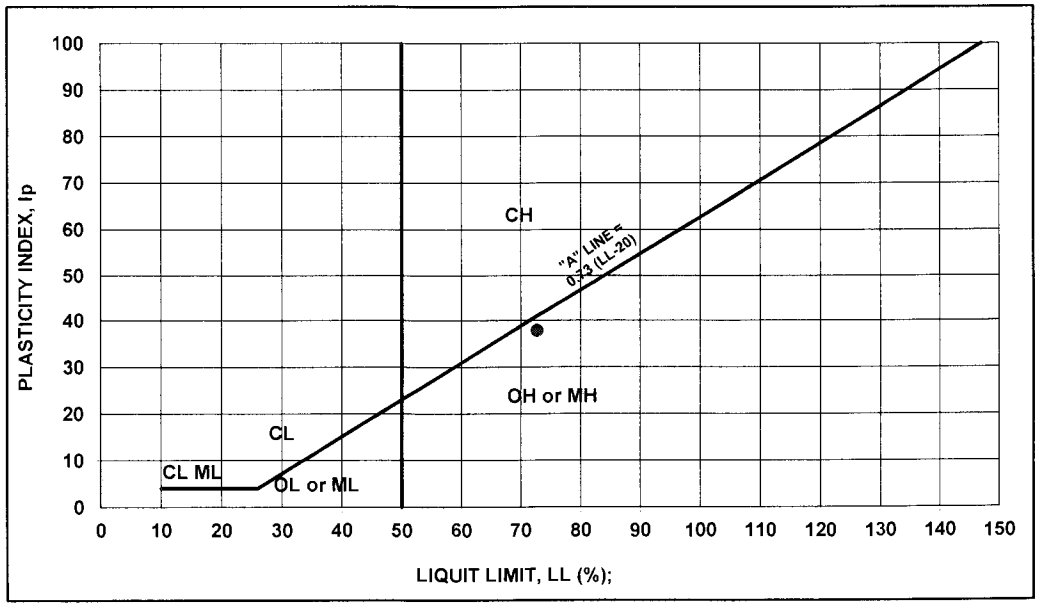
ATTERBERG LIMITS



NATURAL MOISTURE CONTENT

	Wn	=	66.70 %
FLOW INDEX	Fi	=	25.40 %
LIQUID LIMIT	LL	=	72.70 %
PLASTIC LIMIT	PL	=	34.76 %
PLASTICITY INDEX	Pi	=	37.94 %
LIQUID INDEX	Li	=	0.84

CLASSIFICATION = MH



Tested By : FAHMI

UNCONFINED COMPRESSION TEST
ASTM D-2166-91

Unconfined Compression Test

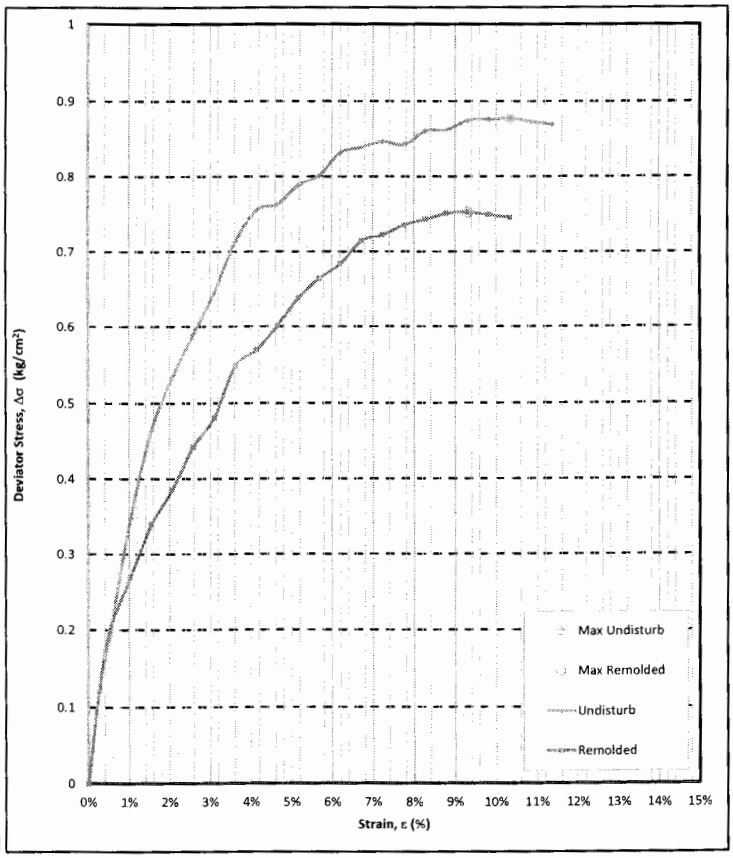
Project No. : 1S.16133
Project name : GEDUNG 4-5 LANTAI
Location : Jl. Walter Monginsidi

Hole No. : DB 1 - UD2
Depth : 4.50 - 5.00 m
Test by : EKA
Date of Testing : 20/12/2016

Specimen Geometrical:

Diameter (cm)	3.83 cm
Height (cm)	7.35 cm
Initial Sample Area (cm^2)	11.52 cm^2

Undisturbed Sample		Remolded	
ε	Deviator Stress	ε	Deviator Stress
(%)	(kg/cm^2)	(%)	(kg/cm^2)
0.00%	0.0000	0.00%	0.0000
0.26%	0.1207	0.26%	0.1207
0.52%	0.1926	0.52%	0.1986
1.03%	0.3473	1.03%	0.2695
1.55%	0.4647	1.55%	0.3396
2.07%	0.5335	2.07%	0.3853
2.59%	0.5897	2.59%	0.4423
3.10%	0.6455	3.10%	0.4812
3.62%	0.7123	3.62%	0.5488
4.14%	0.7552	4.14%	0.5693
4.65%	0.7631	4.65%	0.6012
5.17%	0.7881	5.17%	0.6385
5.69%	0.8014	5.69%	0.6640
6.20%	0.8317	6.20%	0.6836
6.72%	0.8390	6.72%	0.7143
7.24%	0.8462	7.24%	0.7221
7.76%	0.8422	7.76%	0.7355
8.27%	0.8605	8.27%	0.7432
8.79%	0.8620	8.79%	0.7507
9.31%	0.8745	9.31%	0.7527
9.82%	0.8759	9.82%	0.7492
10.34%	0.8773	10.34%	0.7457
10.86%	0.8732		
11.37%	0.8691		



Unconfined Test Results	Undisturbed Sample	Remolded Sample
Kuat Tekan Bebas, q_u (kg/cm^2)	0.8773	0.7527
Kuat Geser Undrained, c_u (kg/cm^2)	0.4386	0.3764
Regangan Runtuh ($\varepsilon_{failure}$%)	10.34%	9.31%
Sensitivity, $St=q_{u\text{-undisturbed}}/q_{u\text{-remolded}}$	1.1654	
Initial Tangent Modulus, $E_i=\Delta\sigma_i/\Delta\varepsilon_i$ (kg/cm^2)	26.61	16.94
Secant Modulus at Failure, $E_s=q_u/\varepsilon_{failure}$	8.48	8.09

Soil Properties	
w (%) :	46.75%
γ_t (gr/cm^3) :	1.68
γ_d (gr/cm^3) :	1.14

Soil Sample sketch

Undisturb

Remolded

Unconfined Compression Test

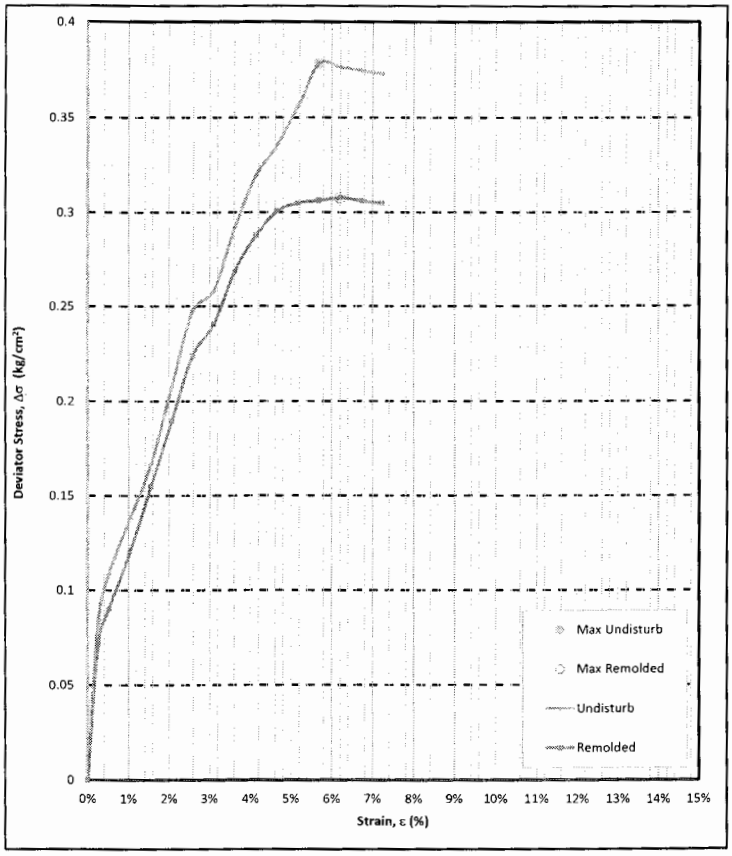
Project No. : 15.16133
Project name : GEDUNG 4-5 LANTAI
Location : Jl. Walter Monginsidi

Hole No. : DB 1 - UD3
Depth : 6.50 - 7.00 m
Test by : EKA
Date of Testing : 20/12/2016

Specimen Geometrical:

Diameter (cm)	3.83 cm
Height (cm)	7.35 cm
Initial Sample Area (cm^2)	11.52 cm^2

Undisturbed Sample		Remolded	
ε	Deviator Stress	ε	Deviator Stress
(%)	(kg/cm^2)	(%)	(kg/cm^2)
0.00%	0.0000	0.00%	0.0000
0.26%	0.0845	0.26%	0.0724
0.52%	0.1083	0.52%	0.0903
1.03%	0.1377	1.03%	0.1198
1.55%	0.1668	1.55%	0.1549
2.07%	0.2075	2.07%	0.1897
2.59%	0.2477	2.59%	0.2241
3.10%	0.2582	3.10%	0.2406
3.62%	0.2919	3.62%	0.2686
4.14%	0.3195	4.14%	0.2876
4.65%	0.3353	4.65%	0.3006
5.17%	0.3567	5.17%	0.3049
5.69%	0.3778	5.69%	0.3063
6.20%	0.3760	6.20%	0.3076
6.72%	0.3741	6.72%	0.3061
7.24%	0.3723	7.24%	0.3046



Unconfined Test Results	Undisturbed Sample	Remolded Sample
Kuat Tekan Bebas, q_u (kg/cm^2)	0.3778	0.3076
Kuat Geser Undrained, c_u (kg/cm^2)	0.1889	0.1538
Regangan Runtuh ($\varepsilon_{failure}$%)	5.69%	6.20%
Sensitivity, $St=q_{u\text{-undisturbed}}/q_{u\text{-remolded}}$	1.2282	
Initial Tangent Modulus, $E_i=\Delta\sigma_i/\Delta\varepsilon_i$ (kg/cm^2)	6.37	6.38
Secant Modulus at Failure, $E_s=q_u/\varepsilon_{failure}$	6.64	4.96

Soil Properties

w (%) :	57.30%
γ_t (gr/cm^3) :	1.55
γ_d (gr/cm^3) :	0.99

Soil Sample sketch

Undisturb

Remolded

Unconfined Compression Test

Project No. : 15.16133

Project name : GEDUNG 4-5 LANTAI
Location : Jl. Walter Monginsidi

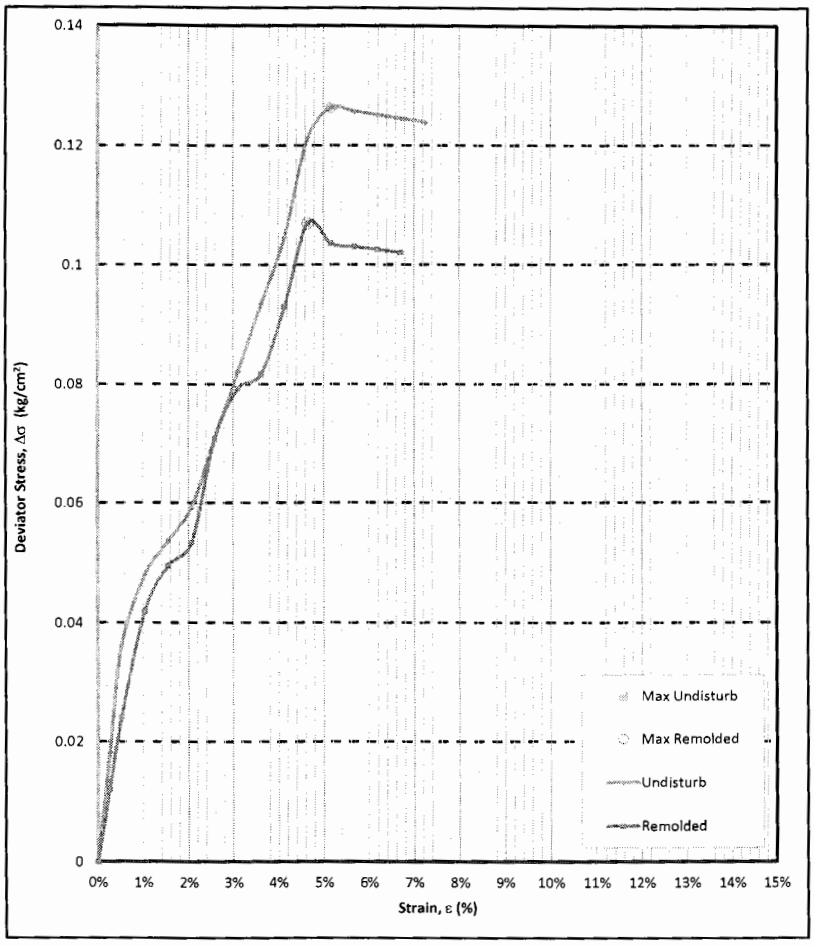
Hole No. : DB 1 - UD4
Depth : 7.00 - 7.50 m
Test by : EKA

Date of Testing : 22/12/2016

Specimen Geometrical:

Diameter (cm) 3.83 cm
Height (cm) 7.35 cm
Initial Sample Area (cm^2) 11.52 cm^2

Undisturbed Sample		Remolded	
ε	Deviator Stress	ε	Deviator Stress
(%)	(kg/cm^2)	(%)	(kg/cm^2)
0.00%	0.0000	0.00%	0.0000
0.26%	0.0181	0.26%	0.0121
0.52%	0.0361	0.52%	0.0241
1.03%	0.0479	1.03%	0.0419
1.55%	0.0536	1.55%	0.0494
2.07%	0.0593	2.07%	0.0533
2.59%	0.0708	2.59%	0.0708
3.10%	0.0821	3.10%	0.0792
3.62%	0.0934	3.62%	0.0817
4.14%	0.1046	4.14%	0.0930
4.65%	0.1214	4.65%	0.1069
5.17%	0.1266	5.17%	0.1035
5.69%	0.1259	5.69%	0.1030
6.20%	0.1253	6.20%	0.1025
6.72%	0.1247	6.72%	0.1020
7.24%	0.1241		



Unconfined Test Results	Undisturbed Sample	Remolded Sample
Kuat Tekan Bebas, q_u (kg/cm^2)	0.1266	0.1069
Kuat Geser Undrained, c_u (kg/cm^2)	0.0633	0.0535
Regangan Runtuh ($\varepsilon_{failure}$%)	5.17%	4.65%
Sensitivity, $St=q_{u\text{-undisturbed}}/q_{u\text{-remolded}}$	1.1833	
Initial Tangent Modulus, $E_t=\Delta\sigma_i/\Delta\varepsilon_i$ (kg/cm^2)	2.75	2.89
Secant Modulus at Failure, $E_s=q_u/\varepsilon_{failure}$	2.45	2.30

Soil Properties

w (%) :	68.18%
γ_t (gr/cm^3) :	1.54
γ_d (gr/cm^3) :	0.92

Soil Sample sketch

Undisturb

Remolded

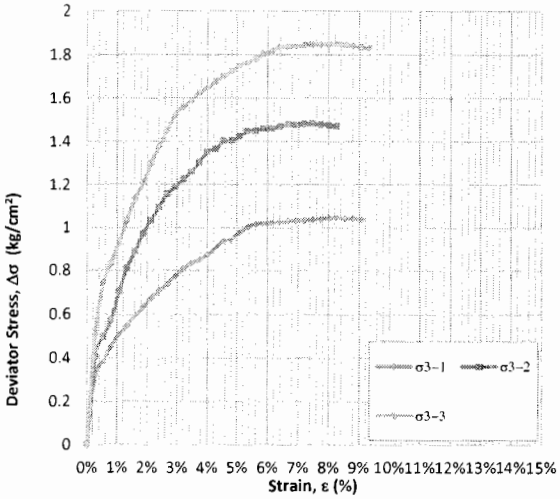
UNCONSOLIDATED UNDRAINED TRIAXIAL TEST
ASTM D-2850-87

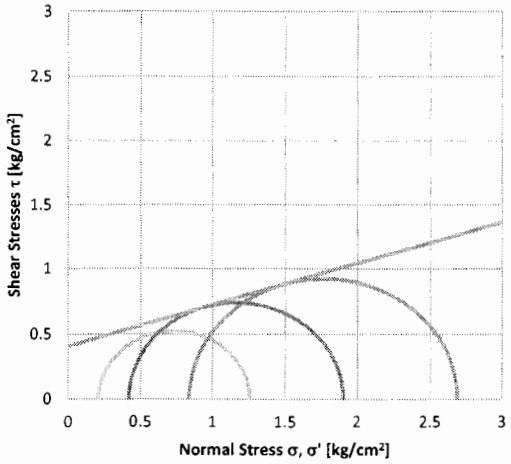
TRIAXIAL UU

Project No. : 1S. 16133
Project name : GEDUNG 4 - 5 LANTAI + 1 BASEMENT
Location : JL. WOLTER MONGINSIDI - JAKARTA SELATAN

Hole No. : DB 1 - UD 1
Depth : 3.00 - 3.50 M
Test by : Bibit Santoso

Date of Testing : 17/12/ 2016





Triaxial UU Test Result

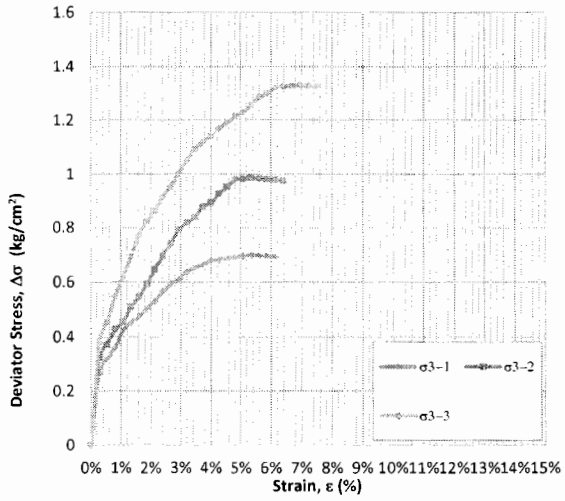
Specimen No.		1	2	3
Natural Moisture content, %		45.96%	46.09%	46.45%
Specific Gravity		2.64	2.64	2.64
Density		1.64	1.63	1.66
Void Ratio		1.35	1.37	1.34
Saturation, %		90%	89%	92%
Strain rate, mm/minute		0.60	0.60	0.60
Confining Pressure, kg/cm^2		0.21	0.42	0.84
Deviator Stress, kg/cm^2		**1.05**	**1.48**	**1.85**
Strain at failure, %		8.27%	7.47%	8.27%
Shear Strength Parameters	c [kg/cm^2]	0.41		
	ϕ [^{0}]	17.74		
Modulus of Elasticity	E (kg/cm^2)	121.87	153.47	189.58

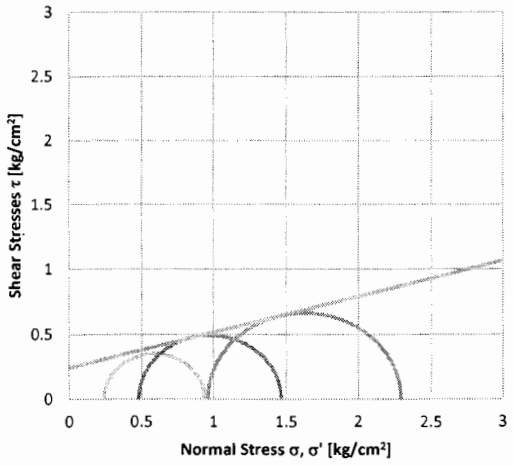
TRIAXIAL UU

Project No. : 1S. 16133
Project name : GEDUNG 4 - 5 LANTAI + 1 BASEMENT
Location : JL. WOLTER MONGINSIDI - JAKARTA SELATAN

Hole No. : DB 1 - UD 2
Depth : 4.50 - 5.00 m
Test by : Bibit Santoso

Date of Testing : 17/12/ 2016





Triaxial UU Test Result

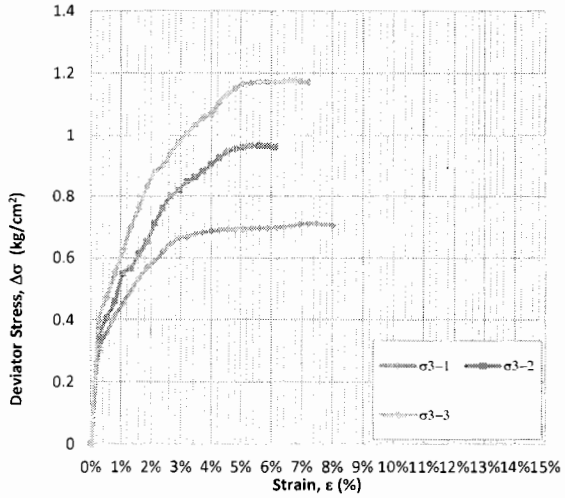
Specimen No.		1	2	3
Natural Moisture content, %		48.13%	49.41%	48.18%
Specific Gravity		2.67	2.67	2.67
Density		1.70	1.70	1.65
Void Ratio		1.33	1.34	1.40
Saturation, %		97%	98%	92%
Strain rate, mm/minute		0.60	0.60	0.60
Confining Pressure, kg/cm^2		0.24	0.48	0.96
Deviator Stress, kg/cm^2		**0.70**	**0.99**	**1.33**
Strain at failure, %		5.33%	5.33%	6.93%
Shear Strength Parameters	c [kg/cm^2]	0.24		
	ϕ [^{0}]	15.38		
Modulus of Elasticity	E (kg/cm^2)	99.30	120.74	142.18

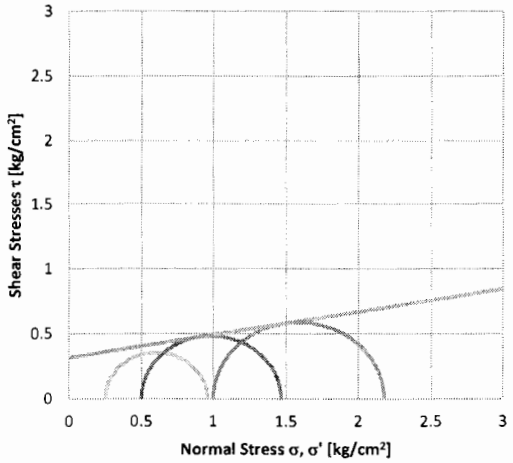
TRIAXIAL UU

Project No. : 1S. 16133
Project name : GEDUNG 4 - 5 LANTAI + 1 BASEMENT
Location : JL. WOLTER MONGINSIDI - JAKARTA SELATAN

Hole No. : DB 1 - UD 4
Depth : 7.00 - 7.50 M
Test by : Bibit Santoso

Date of Testing : 17/12/ 2016

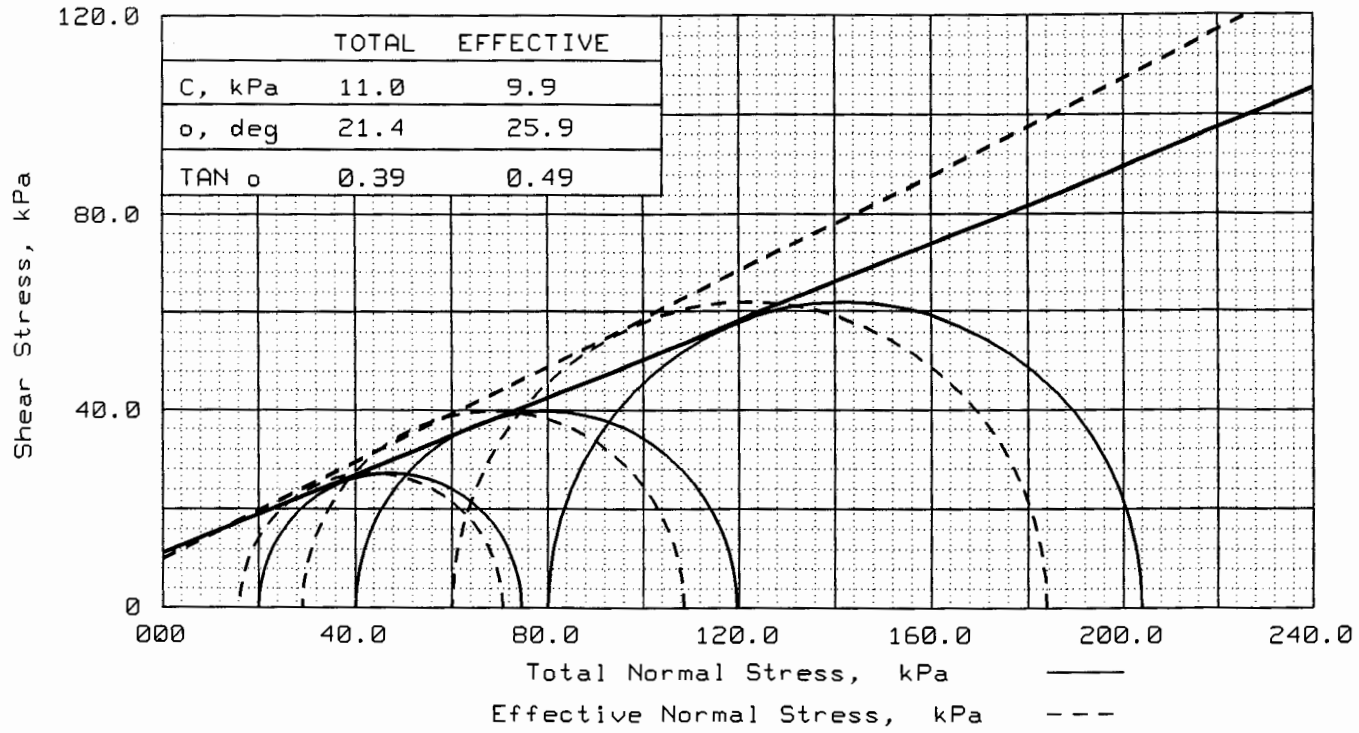


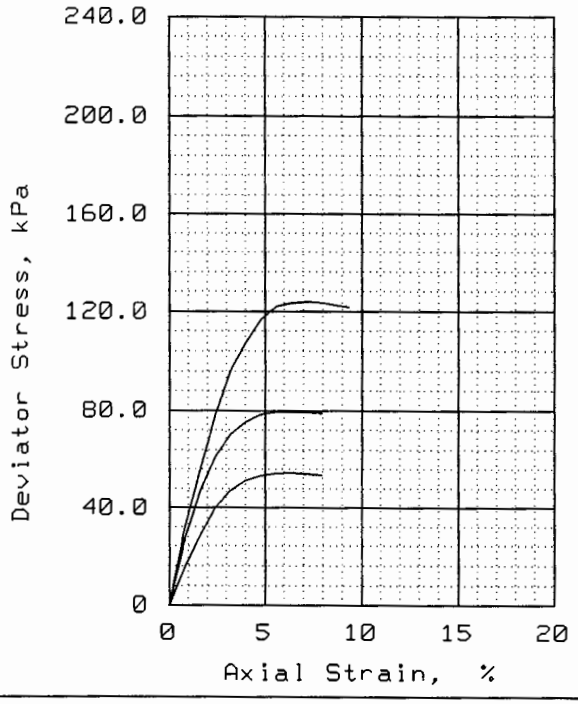


Triaxial UU Test Result

Specimen No.		1	2	3
Natural Moisture content, %		62.12%	63.23%	63.67%
Specific Gravity		2.59	2.59	2.59
Density		1.77	1.75	1.73
Void Ratio		1.37	1.42	1.46
Saturation, %		117%	116%	113%
Strain rate, mm/minute		0.60	0.60	0.60
Confining Pressure, kg/cm^2		0.25	0.5	1
Deviator Stress, kg/cm^2		**0.71**	**0.97**	**1.18**
Strain at failure, %		7.20%	5.60%	6.67%
Shear Strength Parameters	c [kg/cm^2]	0.32		
	ϕ [^{0}]	10.03		
Modulus of Elasticity	E (kg/cm^2)	112.84	128.64	148.95

CONSOLIDATED UNDRAINED TRIAXIAL TEST
ASTM D-4767-00





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	46.0	45.9	45.7
	DRY DENSITY, kN/cu.m	11.2	11.2	11.3
	SATURATION, %	92.3	92.5	92.6
	VOID RATIO	1.315	1.309	1.302
	DIAMETER, cm	3.80	3.80	3.80
	HEIGHT, cm	7.60	7.60	7.60
AT TEST	WATER CONTENT, %	44.8	43.9	42.9
	DRY DENSITY, kN/cu.m	11.9	12.0	12.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.182	1.160	1.133
	DIAMETER, cm	3.70	3.69	3.68
	HEIGHT, cm	7.57	7.54	7.52
Strain rate, %/min		0.050	0.050	0.050
BACK PRESSURE, kPa		200.0	200.0	200.0
CELL PRESSURE, kPa		220.0	240.0	280.0
FAILURE STRESS, kPa		54.5	79.5	123.8
PORE PRESSURE, kPa		204.0	211.0	220.0
ULTIMATE STRESS, kPa				
PORE PRESSURE, kPa				
$\bar{\sigma}_1$ FAILURE, kPa		70.5	108.5	183.8
$\bar{\sigma}_3$ FAILURE, kPa		16	29	60

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: UDS
DESCRIPTION:

LL= PL= PI=
SPECIFIC GRAVITY= 2.64
REMARKS: TESTED BY :SIS

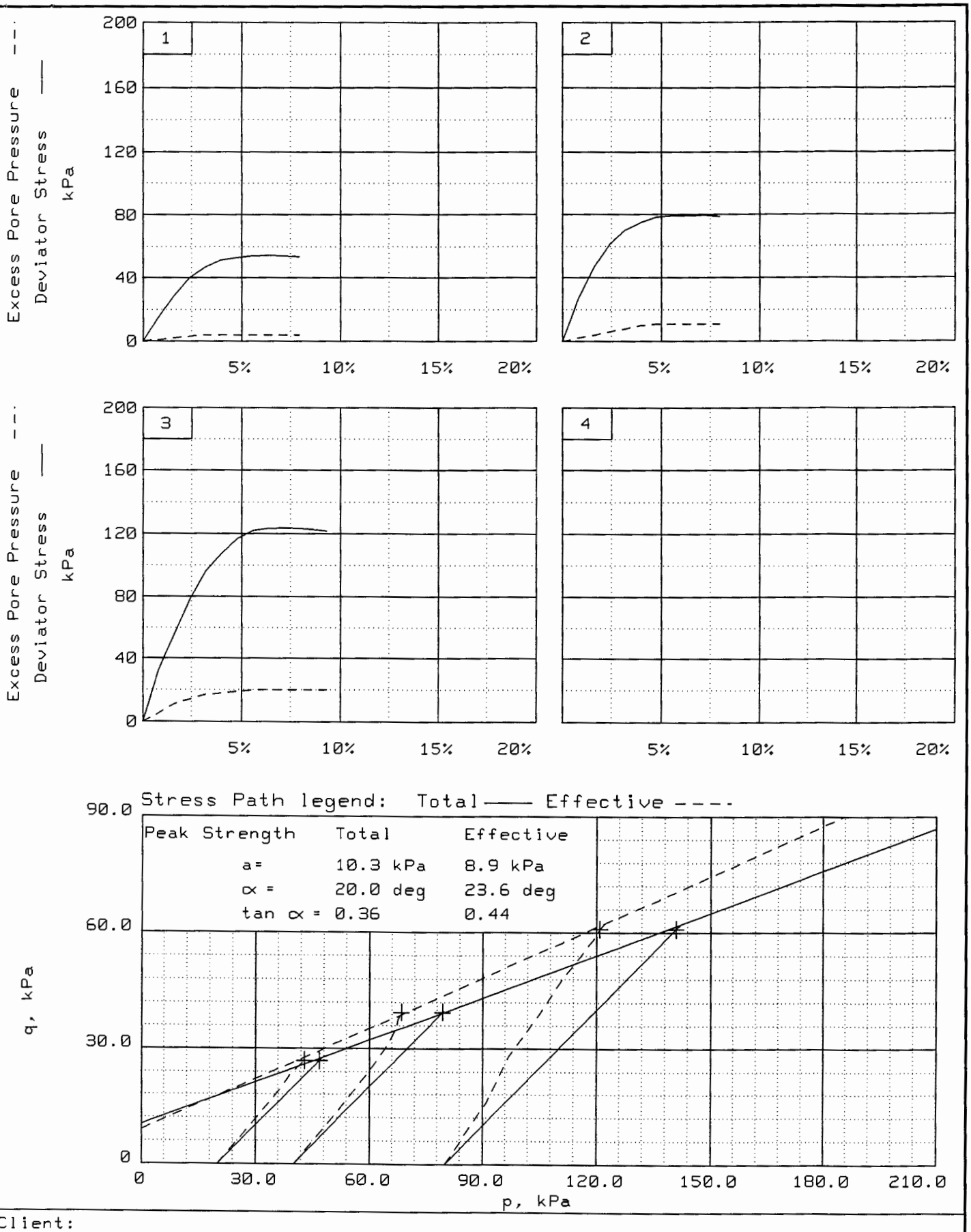
CHECKED BY:SUDIRMAN

CLIENT:

PROJECT: GEDUNG 4-5 LANTAI
JL.WOLTER MONGINSIDI, JAKSEL
SAMPLE LOCATION: DB1-UD1 (3.00-3.50 M)

PROJ. NO.: 15.16133 DATE: 26-12-2016

TRIAXIAL SHEAR TEST REPORT



Client:

Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI, JAKSEL

Location: DB1-UD1 (3.00-3.50 M)

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:50 pm

Project Data

Project No.: 1S.16133 Date: 26-12-2016 Data file: CU-11703
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI, JAKSEL
Sample location: DB1-UD1 (3.00-3.50 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 1 Data

Type of sample: UDS
Specific Gravity= 2.64 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.70	
Height change, cm		0.04	
Height, cm	7.60	7.57	
Weight, grams	143.5		
Water volume change, cc		1.20	
Moisture, %	46.0	44.8	44.8
Dry density, kN/cu.m	11.2	11.9	
Saturation, %	92.3	100.0	
Void ratio	1.315	1.182	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 8.8E-04 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.050
Consolidation cell pressure = 220 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 20 kPa
Peak deviator stress = 54.49 kPa at reading no. 8
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	20.00	20.00	1.00	200.0
1	60.0	0.060	19	0.0	0.8	15.45	19.00	34.45	1.81	201.0
2	120.0	0.120	35	0.0	1.6	28.23	18.00	46.23	2.57	202.0
3	180.0	0.180	50	0.0	2.4	40.00	17.00	57.00	3.35	203.0
4	240.0	0.240	59	0.1	3.2	46.82	16.00	62.82	3.93	204.0
5	300.0	0.300	65	0.1	4.0	51.16	16.00	67.16	4.20	204.0
6	360.0	0.360	68	0.1	4.8	53.07	16.00	69.07	4.32	204.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	70	0.1	5.6	54.18	16.00	70.18	4.39	204.0
8	480.0	0.480	71	0.1	6.3	54.49	16.00	70.49	4.41	204.0
9	540.0	0.540	71	0.1	7.1	54.03	16.00	70.03	4.38	204.0
10	600.0	0.600	71	0.1	7.9	53.57	16.00	69.57	4.35	204.0

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:50 pm

Project Data

Project No.: 1S.16133 Date: 26-12-2016 Data file: CU-11703
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI, JAKSEL
Sample location: DB1-UD1 (3.00-3.50 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 2 Data

Type of sample: UDS
Specific Gravity= 2.64 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.69	
Height change, cm		0.06	
Height, cm	7.60	7.54	
Weight, grams	143.8		
Water volume change, cc		1.90	
Moisture, %	45.9	43.9	43.9
Dry density, kN/cu.m	11.2	12.0	
Saturation, %	92.5	100.0	
Void ratio	1.309	1.160	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 8.8E-04 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.050
Consolidation cell pressure = 240 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 40 kPa
Peak deviator stress = 79.50 kPa at reading no. 9
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	40.00	40.00	1.00	200.0
1	60.0	0.060	33	0.0	0.8	26.95	38.00	64.95	1.71	202.0
2	120.0	0.120	58	0.1	1.6	47.00	36.00	83.00	2.31	204.0
3	180.0	0.180	76	0.1	2.4	61.08	34.00	95.08	2.80	206.0
4	240.0	0.240	88	0.1	3.2	70.15	32.00	102.15	3.19	208.0
5	300.0	0.300	95	0.1	4.0	75.11	30.00	105.11	3.50	210.0
6	360.0	0.360	100	0.1	4.8	78.41	29.00	107.41	3.70	211.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Effective Stresses Major kPa	Effective Stresses 1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	102	0.1	5.6	79.31	29.00	108.31	3.73	211.0
8	480.0	0.480	103	0.1	6.4	79.41	29.00	108.41	3.74	211.0
9	540.0	0.540	104	0.1	7.2	79.50	29.00	108.50	3.74	211.0
10	600.0	0.600	104	0.1	8.0	78.82	29.00	107.82	3.72	211.0

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:50 pm

Project Data

Project No.: 1S.16133 Date: 26-12-2016 Data file: CU-11703
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI, JAKSEL
Sample location: DB1-UD1 (3.00-3.50 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 3 Data

Type of sample: UDS
Specific Gravity= 2.64 LL= PL= PI=

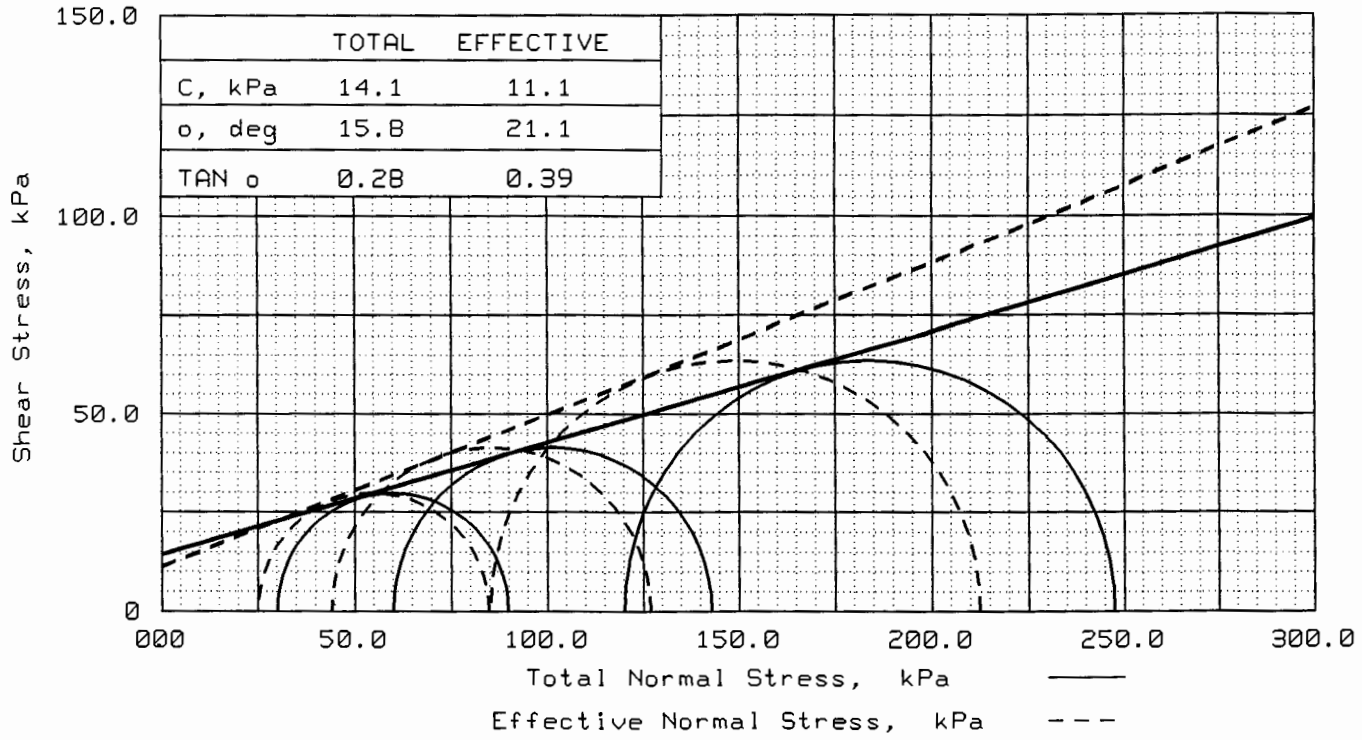
Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.68	
Height change, cm		0.08	
Height, cm	7.60	7.52	
Weight, grams	144.0		
Water volume change, cc		2.70	
Moisture, %	45.7	42.9	42.9
Dry density, kN/cu.m	11.3	12.1	
Saturation, %	92.6	100.0	
Void ratio	1.302	1.133	

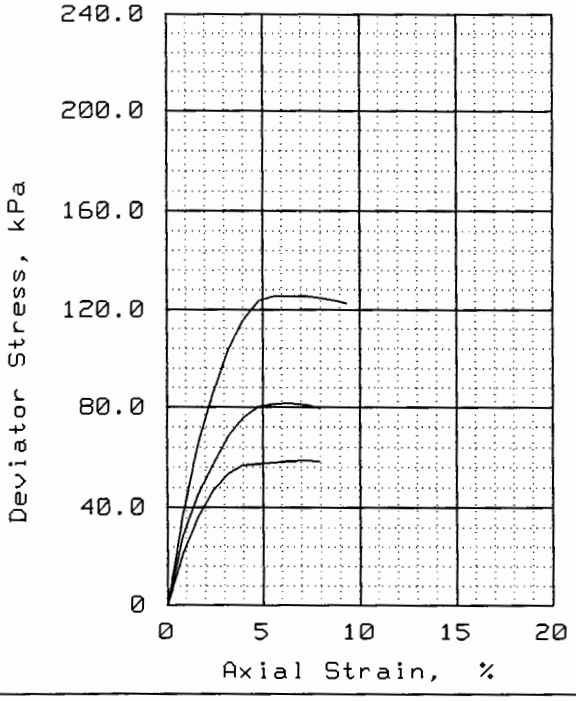
Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 8.8E-04 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.050
Consolidation cell pressure = 280 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 80 kPa
Peak deviator stress = 123.81 kPa at reading no. 9
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Effective Stresses Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	80.00	80.00	1.00	200.0
1	60.0	0.060	39	0.0	0.8	32.05	75.00	107.05	1.43	205.0
2	120.0	0.120	68	0.1	1.6	55.44	69.00	124.44	1.80	211.0
3	180.0	0.180	97	0.1	2.4	78.44	66.00	144.44	2.19	214.0
4	240.0	0.240	120	0.1	3.2	96.25	63.00	159.25	2.53	217.0
5	300.0	0.300	135	0.1	4.0	107.39	62.00	169.39	2.73	218.0
6	360.0	0.360	148	0.1	4.8	116.75	61.00	177.75	2.91	219.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Effective Stresses Major kPa	Effective Stresses 1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	156	0.1	5.6	122.03	60.00	182.03	3.03	220.0
8	480.0	0.480	159	0.1	6.4	123.33	60.00	183.33	3.06	220.0
9	540.0	0.540	161	0.1	7.2	123.81	60.00	183.81	3.06	220.0
10	600.0	0.600	162	0.1	8.0	123.51	60.00	183.51	3.06	220.0
11	660.0	0.660	162	0.1	8.8	122.44	60.00	182.44	3.04	220.0
12	700.0	0.700	162	0.1	9.3	121.73	60.00	181.73	3.03	220.0





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	49.9	49.7	49.6
	DRY DENSITY, kN/cu.m	10.9	10.9	11.0
	SATURATION, %	94.7	95.1	95.2
	VOID RATIO	1.407	1.394	1.391
	DIAMETER, cm	3.80	3.80	3.80
	HEIGHT, cm	7.60	7.60	7.60
AT TEST	WATER CONTENT, %	48.5	47.5	46.6
	DRY DENSITY, kN/cu.m	11.4	11.6	11.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.294	1.267	1.244
	DIAMETER, cm	3.72	3.71	3.70
	HEIGHT, cm	7.56	7.54	7.52
Strain rate, %/min		0.045	0.050	0.045
BACK PRESSURE, kPa		200.0	200.0	200.0
CELL PRESSURE, kPa		230.0	260.0	320.0
FAILURE STRESS, kPa		59.6	82.8	127.3
PORE PRESSURE, kPa		205.0	216.0	235.0
ULTIMATE STRESS, kPa				
PORE PRESSURE, kPa				
$\bar{\sigma}_1$ FAILURE, kPa		84.6	126.8	212.3
$\bar{\sigma}_3$ FAILURE, kPa		25	44	85

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: UDS
DESCRIPTION:

LL= PL= PI=
SPECIFIC GRAVITY= 2.67
REMARKS: TESTED BY :SIS

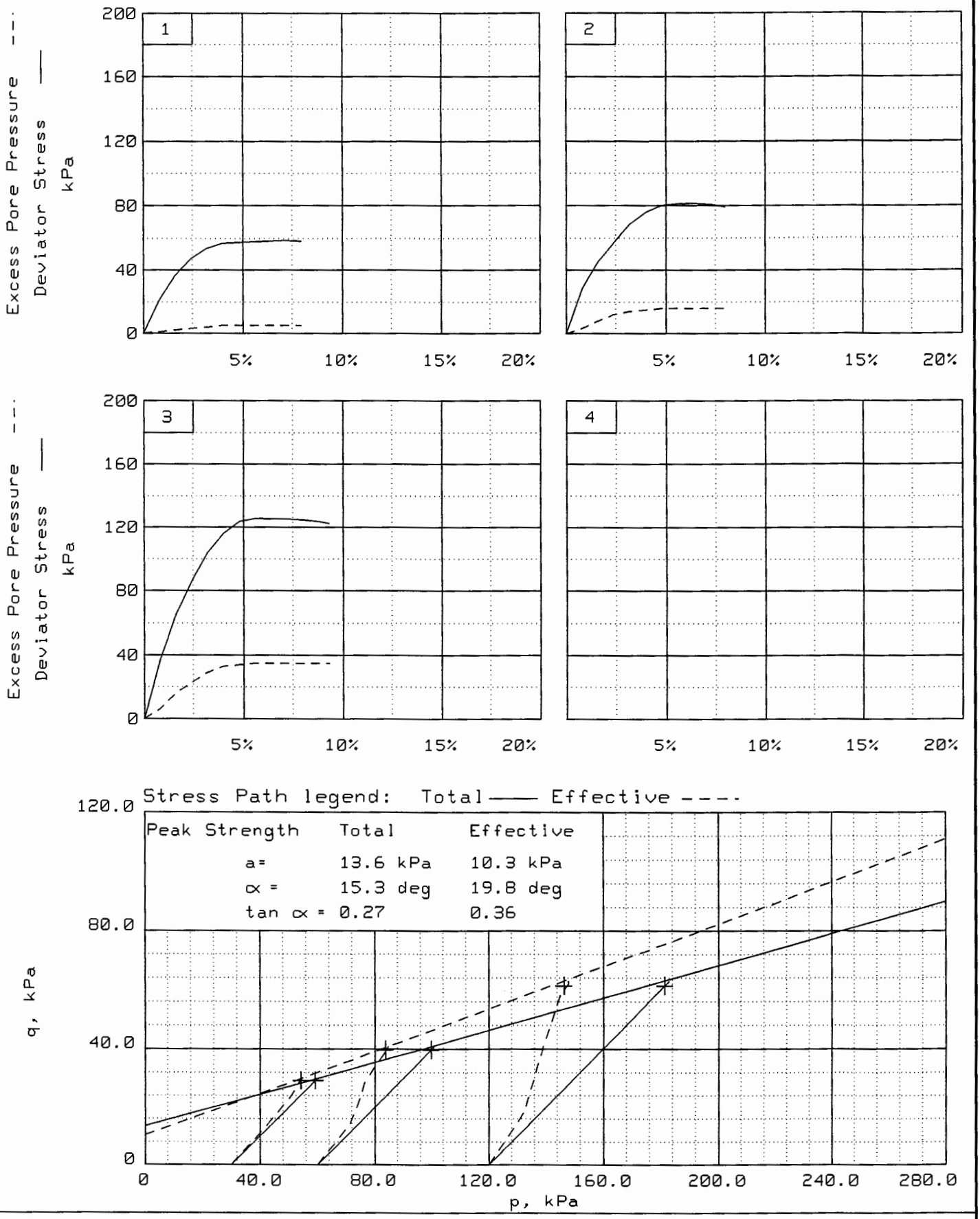
CHECKED BY:SUDIRMAN

CLIENT:

PROJECT: GEDUNG 4-5 LANTAI
JL.WOLTER MONGINSIDI-JAKSEL
SAMPLE LOCATION: DB1-UD2 (4.50-5.00 M)

PROJ. NO.: 15.16133 DATE: 26-12-2016

TRIAXIAL SHEAR TEST REPORT



Client:

Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL

Location: DB1-UD2 (4.50-5.00 M)

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:52 pm

Project Data

Project No.: 1S.16133 Date: 26-12-2016 Data file: CU-11701
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL
Sample location: DB1-UD2 (4.50-5.00 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 1 Data

Type of sample: UDS
Specific Gravity= 2.67 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.72	
Height change, cm		0.04	
Height, cm	7.60	7.56	
Weight, grams	143.3		
Water volume change, cc		1.40	
Moisture, %	49.9	48.5	48.6
Dry density, kN/cu.m	10.9	11.4	
Saturation, %	94.7	100.0	
Void ratio	1.407	1.294	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 1.11E-03 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.045
Consolidation cell pressure = 230 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 30 kPa
Peak deviator stress = 59.61 kPa at reading no. 9
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	30.00	30.00	1.00	200.0
1	60.0	0.060	21	0.0	0.8	21.28	29.00	50.28	1.73	201.0
2	120.0	0.120	36	0.0	1.6	36.19	28.00	64.19	2.29	202.0
3	180.0	0.180	47	0.1	2.4	46.86	27.00	73.86	2.74	203.0
4	240.0	0.240	54	0.1	3.2	53.41	26.00	79.41	3.05	204.0
5	300.0	0.300	58	0.1	4.0	56.89	25.00	81.89	3.28	205.0
6	360.0	0.360	59	0.1	4.8	57.39	25.00	82.39	3.30	205.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Effective Stresses Major kPa	Effective Stresses 1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	60	0.1	5.6	57.88	25.00	82.88	3.32	205.0
8	480.0	0.480	61	0.1	6.4	58.35	25.00	83.35	3.33	205.0
9	540.0	0.540	62	0.1	7.1	58.80	25.00	83.80	3.35	205.0
10	600.0	0.600	62	0.1	7.9	58.30	25.00	83.30	3.33	205.0

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:52 pm

Project Data

Project No.: 1S.16133 Date: 26-12-2016 Data file: CU-11701
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL
Sample location: DB1-UD2 (4.50-5.00 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 2 Data

Type of sample: UDS
Specific Gravity= 2.67 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.71	
Height change, cm		0.06	
Height, cm	7.60	7.54	
Weight, grams	143.9		
Water volume change, cc		2.10	
Moisture, %	49.7	47.5	47.5
Dry density, kN/cu.m	10.9	11.6	
Saturation, %	95.1	100.0	
Void ratio	1.394	1.267	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 1.11E-03 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.050
Consolidation cell pressure = 260 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 60 kPa
Peak deviator stress = 82.76 kPa at reading no. 8
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	60.00	60.00	1.00	200.0
1	60.0	0.060	28	0.0	0.8	28.47	57.00	85.47	1.50	203.0
2	120.0	0.120	45	0.0	1.6	45.39	52.00	97.39	1.87	208.0
3	180.0	0.180	57	0.1	2.4	57.03	48.00	105.03	2.19	212.0
4	240.0	0.240	69	0.1	3.2	68.48	46.00	114.48	2.49	214.0
5	300.0	0.300	77	0.1	4.0	75.79	45.00	120.79	2.68	215.0
6	360.0	0.360	82	0.1	4.8	80.04	44.00	124.04	2.82	216.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Effective Stresses Major kPa	Effective Stresses 1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	84	0.1	5.6	81.31	44.00	125.31	2.85	216.0
8	480.0	0.480	85	0.1	6.4	81.58	44.00	125.58	2.85	216.0
9	540.0	0.540	85	0.1	7.2	80.89	44.00	124.89	2.84	216.0
10	600.0	0.600	84	0.1	8.0	79.25	44.00	123.25	2.80	216.0

Project Data

Project No.: 1S.16133 Date: 26-12-2016 Data file: CU-11701
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL
Sample location: DB1-UD2 (4.50-5.00 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 3 Data

Type of sample: UDS
Specific Gravity= 2.67 LL= PL= PI=

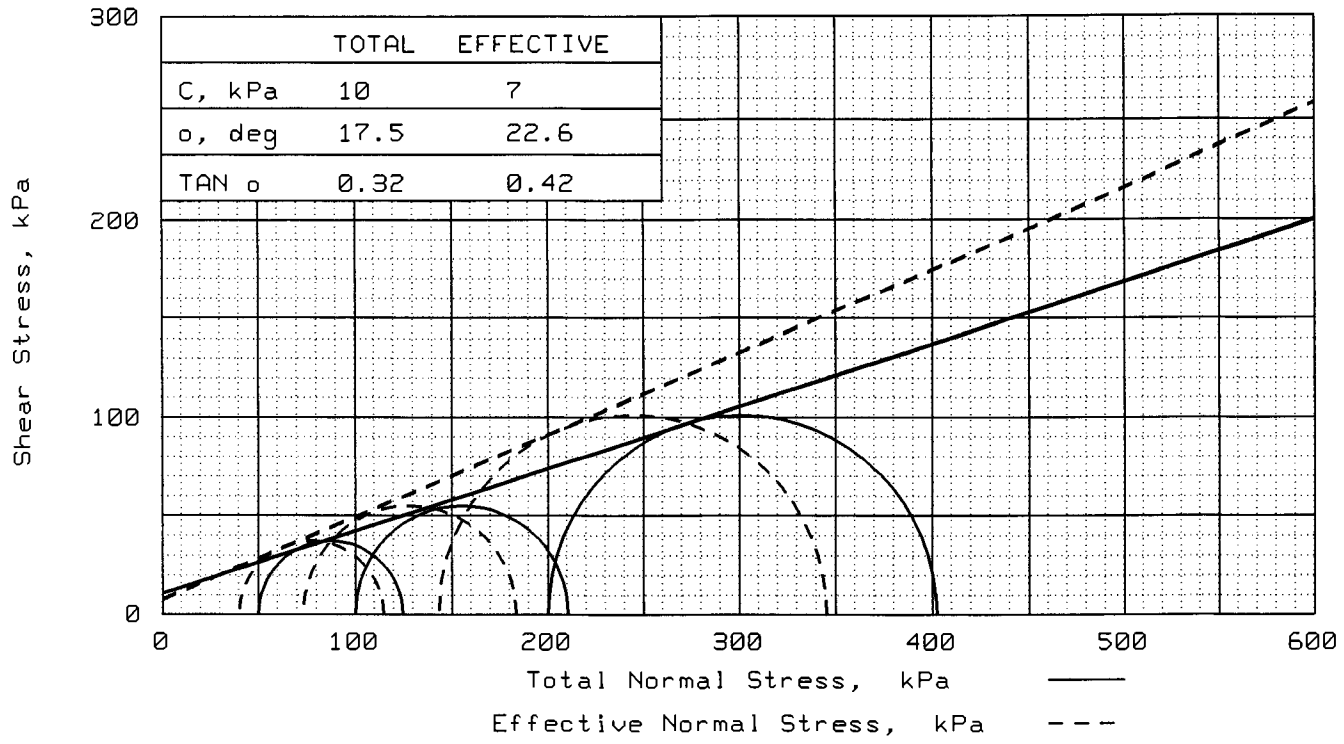
Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.70	
Height change, cm		0.09	
Height, cm	7.60	7.52	
Weight, grams	144.0		
Water volume change, cc		2.90	
Moisture, %	49.6	46.6	46.6
Dry density, kN/cu.m	11.0	11.7	
Saturation, %	95.2	100.0	
Void ratio	1.391	1.244	

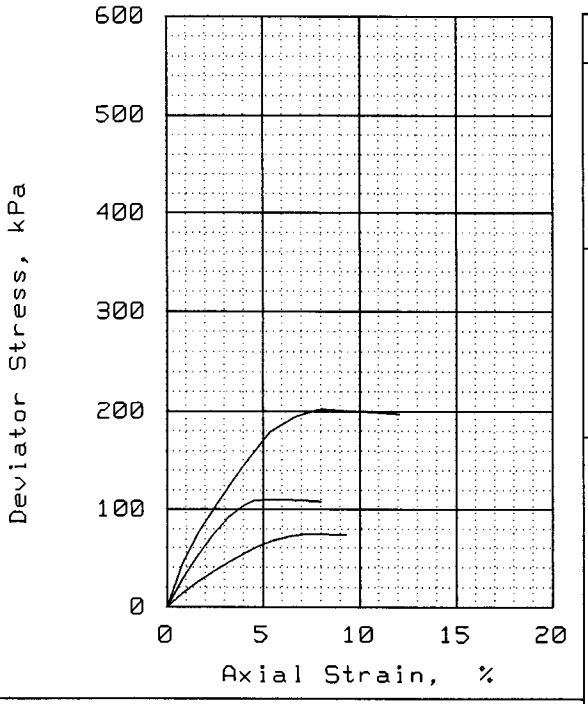
Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 1.11E-03 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.045
Consolidation cell pressure = 320 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 120 kPa
Peak deviator stress = 127.34 kPa at reading no. 7
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	120.00	120.00	1.00	200.0
1	60.0	0.060	36	0.0	0.8	36.82	114.00	150.82	1.32	206.0
2	120.0	0.120	64	0.1	1.6	64.93	104.00	168.93	1.62	216.0
3	180.0	0.180	85	0.1	2.4	85.54	97.00	182.54	1.88	223.0
4	240.0	0.240	104	0.1	3.2	103.80	91.00	194.80	2.14	229.0
5	300.0	0.300	117	0.1	4.0	115.81	87.00	202.81	2.33	233.0
6	360.0	0.360	126	0.1	4.8	123.68	86.00	209.68	2.44	234.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	129	0.1	5.6	125.57	85.00	210.57	2.48	235.0
8	480.0	0.480	130	0.1	6.4	125.47	85.00	210.47	2.48	235.0
9	540.0	0.540	131	0.1	7.2	125.36	85.00	210.36	2.47	235.0
10	600.0	0.600	132	0.1	8.0	124.77	85.00	209.77	2.47	235.0
11	660.0	0.660	132	0.1	8.8	123.67	85.00	208.67	2.45	235.0
12	700.0	0.700	131	0.1	9.3	122.48	85.00	207.48	2.44	235.0





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	61.8	61.6	61.5
	DRY DENSITY, kN/cu.m	9.5	9.5	9.6
	SATURATION, %	94.9	95.2	95.4
	VOID RATIO	1.706	1.697	1.689
	DIAMETER, cm	3.80	3.80	3.80
	HEIGHT, cm	7.60	7.60	7.60
AT TEST	WATER CONTENT, %	59.3	57.8	56.4
	DRY DENSITY, kN/cu.m	10.1	10.2	10.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.553	1.515	1.476
	DIAMETER, cm	3.71	3.69	3.68
	HEIGHT, cm	7.54	7.51	7.47
Strain rate, %/min		0.047	0.047	0.047
BACK PRESSURE, kPa		200	200	200
CELL PRESSURE, kPa		250	300	400
FAILURE STRESS, kPa		75	110	202
PORE PRESSURE, kPa		210	227	257
ULTIMATE STRESS, kPa				
PORE PRESSURE, kPa				
$\bar{\sigma}_1$ FAILURE, kPa		115	183	345
$\bar{\sigma}_3$ FAILURE, kPa		40	73	143

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: UDS
DESCRIPTION:

LL= PL= PI=
SPECIFIC GRAVITY= 2.62
REMARKS: TESTED BY :SIS

CHECKED BY:SUDIRMAN

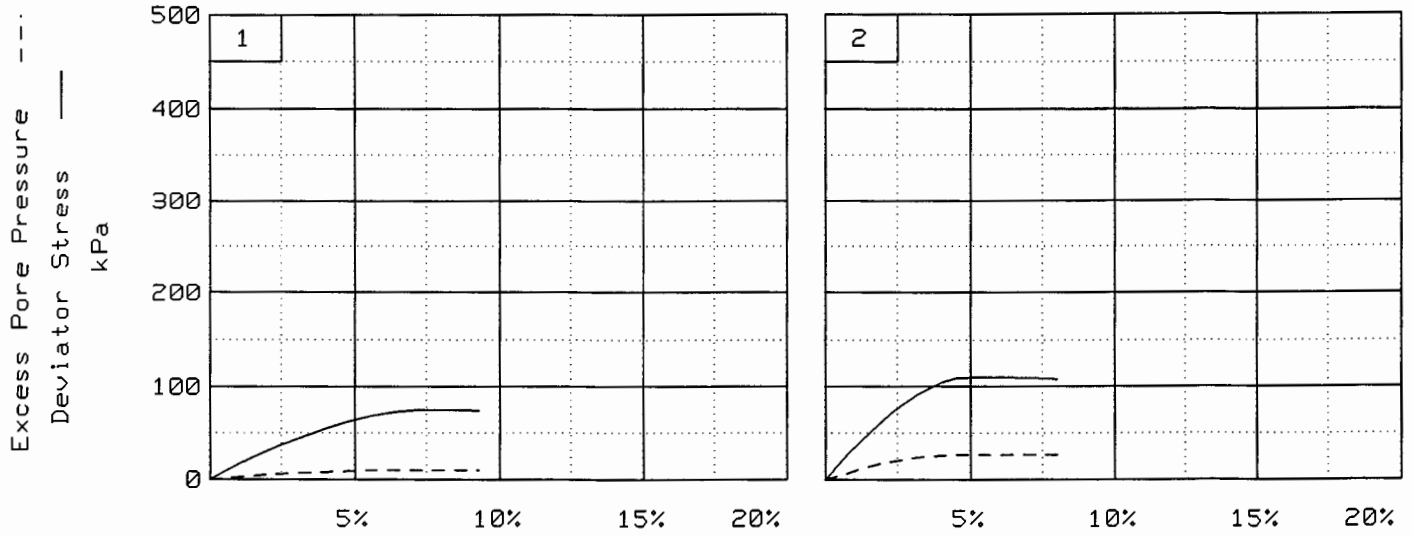
CLIENT:

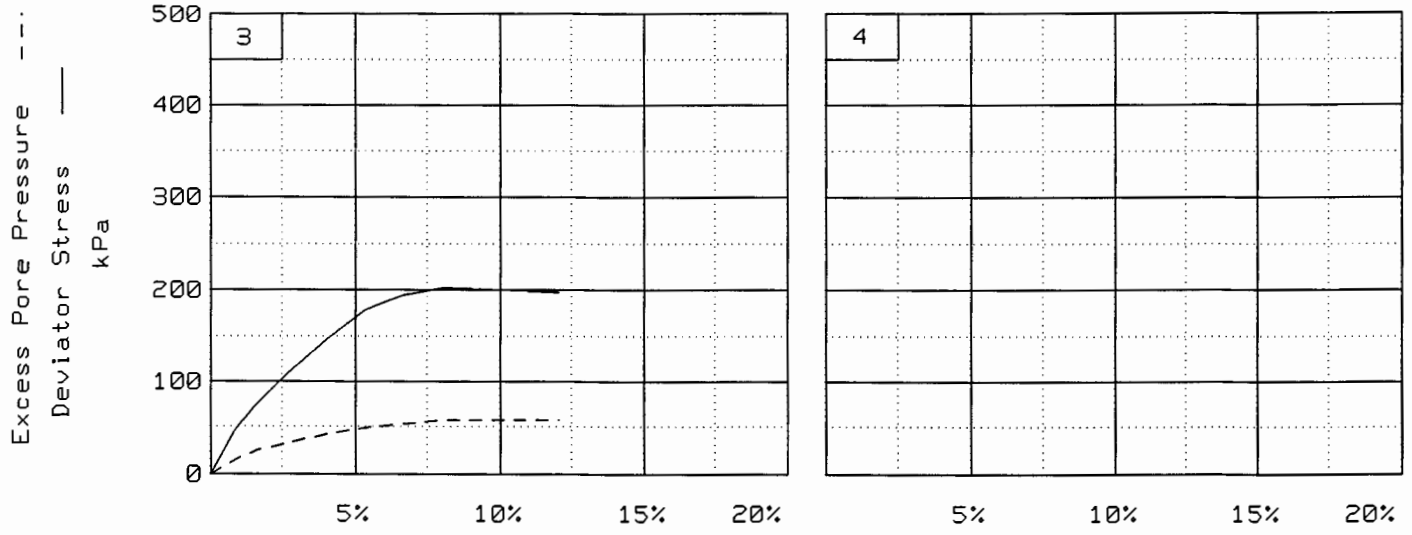
PROJECT: GEDUNG 4-5 LANTAI
JL.WOLTER MONGINSIDI-JAKSEL
SAMPLE LOCATION: DB1-UD3 (6.50-7.00 M)

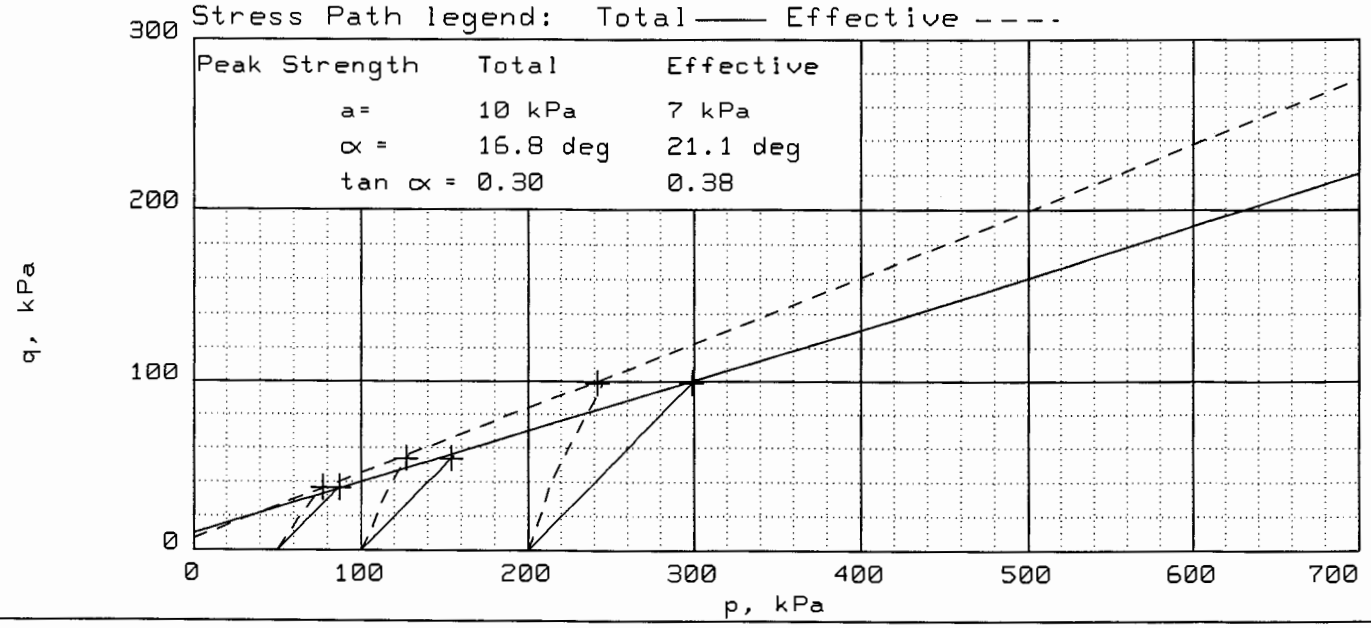
PROJ. NO.: 1SW.16133 DATE: 26-12-2016

TRIAXIAL SHEAR TEST REPORT

SOIL LABORATORY







Client:

Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL

Location: DB1-UD3 (6.50-7.00 M)

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:51 pm

Project Data

Project No.: 1SW.16133 Date: 26-12-2016 Data file: CU-11702
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL
Sample location: DB1-UD3 (6.50-7.00 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 1 Data

Type of sample: UDS
Specific Gravity= 2.62 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.71	
Height change, cm		0.06	
Height, cm	7.60	7.54	
Weight, grams	135.0		
Water volume change, cc		2.10	
Moisture, %	61.8	59.3	59.3
Dry density, kN/cu.m	9.5	10.1	
Saturation, %	94.9	100.0	
Void ratio	1.706	1.553	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 3.7E-04 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.047
Consolidation cell pressure = 250 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 50 kPa
Peak deviator stress = 74.52 kPa at reading no. 9
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	50.00	50.00	1.00	200.0
1	60.0	0.060	40	0.0	0.8	13.61	48.00	61.61	1.28	202.0
2	120.0	0.120	75	0.0	1.6	25.32	46.00	71.32	1.55	204.0
3	180.0	0.180	106	0.0	2.4	35.50	44.00	79.50	1.81	206.0
4	240.0	0.240	135	0.0	3.2	44.84	43.00	87.84	2.04	207.0
5	300.0	0.300	163	0.1	4.0	53.69	42.00	95.69	2.28	208.0
6	360.0	0.360	190	0.1	4.8	62.07	41.00	103.07	2.51	209.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
7	420.0	0.420	210	0.1	5.6	68.03	40.00	108.03	2.70	210.0
8	480.0	0.480	225	0.1	6.4	72.27	40.00	112.27	2.81	210.0
9	540.0	0.540	234	0.1	7.2	74.52	40.00	114.52	2.86	210.0
10	600.0	0.600	236	0.1	8.0	74.52	40.00	114.52	2.86	210.0
11	660.0	0.660	237	0.1	8.8	74.18	40.00	114.18	2.85	210.0
12	700.0	0.700	237	0.1	9.3	73.75	40.00	113.75	2.84	210.0

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:51 pm

Project Data

Project No.: 1SW.16133 Date: 26-12-2016 Data file: CU-11702
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL
Sample location: DB1-UD3 (6.50-7.00 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 2 Data

Type of sample: UDS
Specific Gravity= 2.62 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.69	
Height change, cm		0.09	
Height, cm	7.60	7.51	
Weight, grams	135.3		
Water volume change, cc		3.20	
Moisture, %	61.6	57.8	57.8
Dry density, kN/cu.m	9.5	10.2	
Saturation, %	95.2	100.0	
Void ratio	1.697	1.515	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 3.7E-04 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.047
Consolidation cell pressure = 300 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 100 kPa
Peak deviator stress = 110.25 kPa at reading no. 7
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	100.00	100.00	1.00	200.0
1	60.0	0.060	82	0.0	0.8	28.11	93.00	121.11	1.30	207.0
2	120.0	0.120	153	0.1	1.6	52.03	85.00	137.03	1.61	215.0
3	180.0	0.180	220	0.1	2.4	74.20	80.00	154.20	1.93	220.0
4	240.0	0.240	275	0.1	3.2	91.99	76.00	167.99	2.21	224.0
5	300.0	0.300	314	0.1	4.0	104.17	74.00	178.17	2.41	226.0
6	340.0	0.340	332	0.1	4.5	109.53	73.00	182.53	2.50	227.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
7	400.0	0.400	337	0.1	5.3	110.25	73.00	183.25	2.51	227.0
8	460.0	0.460	339	0.1	6.1	109.97	73.00	182.97	2.51	227.0
9	520.0	0.520	340	0.1	6.9	109.35	73.00	182.35	2.50	227.0
10	580.0	0.580	340	0.1	7.7	108.41	73.00	181.41	2.49	227.0
11	600.0	0.600	339	0.1	8.0	107.78	73.00	180.78	2.48	227.0

TRIAXIAL COMPRESSION TEST 6-04-19;6
CU with pore pressures 12:51 pm

Project Data

Project No.: 1SW.16133 Date: 26-12-2016 Data file: CU-11702
Client:
Project: GEDUNG 4-5 LANTAI JL.WOLTER MONGINSIDI-JAKSEL
Sample location: DB1-UD3 (6.50-7.00 M)
Sample description:
Remarks: TESTED BY :SIS
CHECKED BY:SUDIRMAN Fig No.

Sample No. 3 Data

Type of sample: UDS
Specific Gravity= 2.62 LL= PL= PI=

Sample Parameters	Before Test	At Testing	After Test
Diameter, cm	3.80	3.68	
Height change, cm		0.13	
Height, cm	7.60	7.47	
Weight, grams	135.6		
Water volume change, cc		4.30	
Moisture, %	61.5	56.4	56.4
Dry density, kN/cu.m	9.6	10.4	
Saturation, %	95.4	100.0	
Void ratio	1.689	1.476	

Test Data

Deformation dial constant= 0.001 cm per input unit
Primary load ring constant= 3.7E-04 kN per input unit
Secondary load ring constant= 0 kN per input unit
Crossover reading for secondary load ring= 0 input units
Strain rate, %/min = 0.047
Consolidation cell pressure = 400 kPa
Consolidation back pressure = 200 kPa
Consolidation effective confining stress = 200 kPa
Peak deviator stress = 202.16 kPa at reading no. 7
Ult. deviator stress =

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Major kPa	1:3 Ratio	Pore Pres. kPa
0	0.0	0.000	0	0.0	0.0	0.00	200.00	200.00	1.00	200.0
1	60.0	0.060	127	0.0	0.8	43.88	186.00	229.88	1.24	214.0
2	120.0	0.120	219	0.1	1.6	75.06	175.00	250.06	1.43	225.0
3	200.0	0.200	320	0.1	2.7	108.49	167.00	275.49	1.65	233.0
4	300.0	0.300	437	0.2	4.0	146.11	158.00	304.11	1.92	242.0
5	400.0	0.400	542	0.2	5.4	178.70	151.00	329.70	2.18	249.0
6	500.0	0.500	599	0.2	6.7	194.70	147.00	341.70	2.32	253.0

No.	Def. Dial Units	Def. cm	Load Dial Units	Load kN	Strain %	Deviator Stress kPa	Effective Stresses Minor kPa	Effective Stresses Major kPa	Effective Stresses 1:3 Ratio	Pore Pres. kPa
7	600.0	0.600	631	0.2	8.0	202.16	143.00	345.16	2.41	257.0
8	700.0	0.700	635	0.2	9.4	200.48	143.00	343.48	2.40	257.0
9	800.0	0.800	640	0.2	10.7	199.08	143.00	342.08	2.39	257.0
10	900.0	0.900	644	0.2	12.0	197.32	143.00	340.32	2.38	257.0

CONSOLIDATION TEST
ASTM D-2435-03

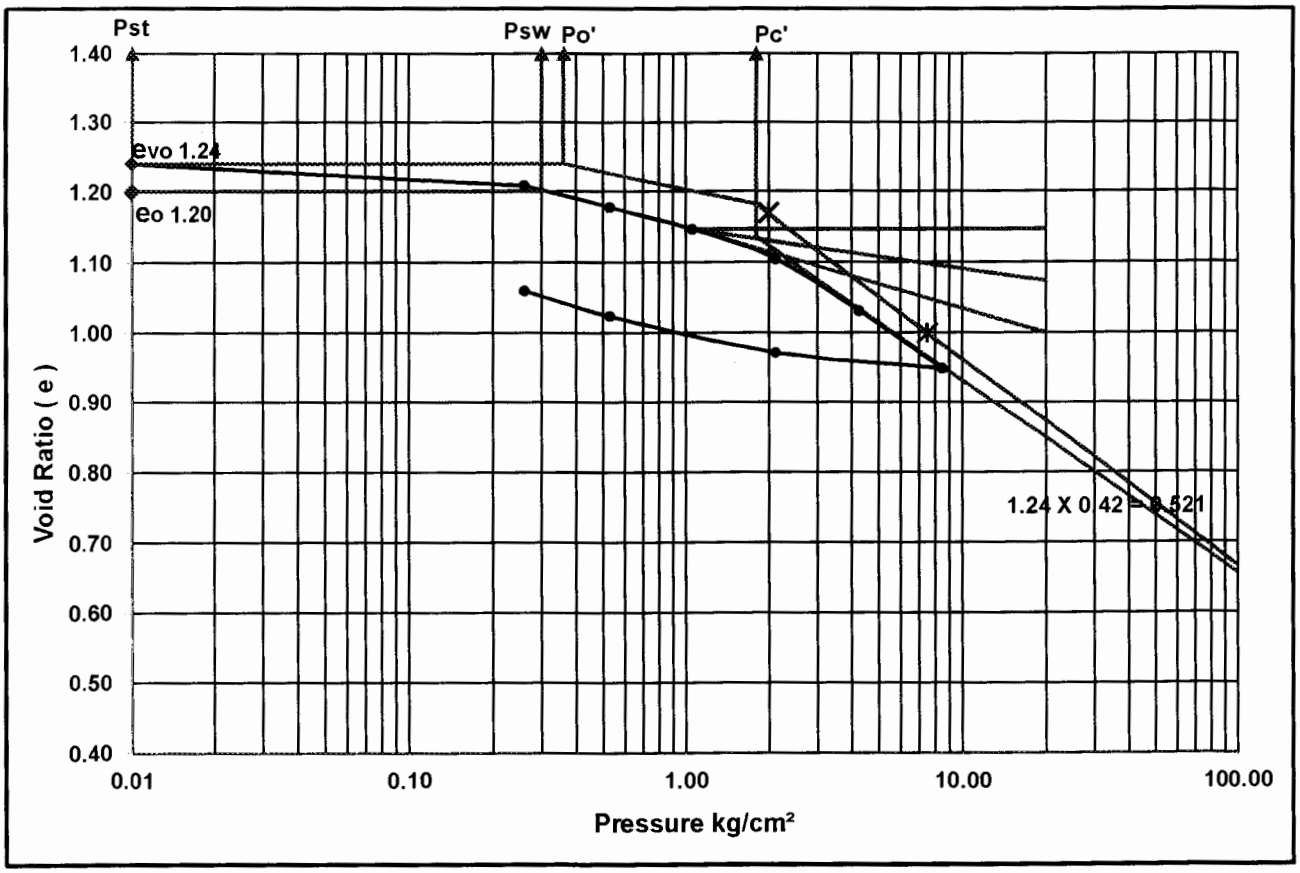
JOB NAME : GEDUNG 4-5 LANTAI + 1 BASEMENT
LOCATION : Jl. Wolter Monginsidi - Jakarta Selatan
DATE : December 28, 2016

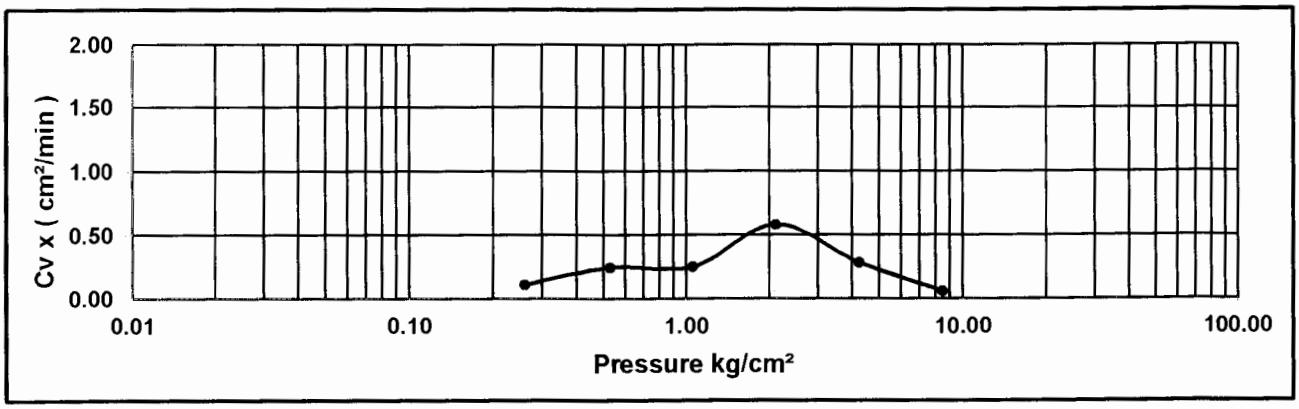
JOB NO. : 1S.16133
BORING NO. : DB1 – UD1
DEPTH OF SAMPLE : 3.00 – 3.50 m

Pst = 0.010 kg/cm^2 Cc = 0.30
Psw = 0.300 kg/cm^2 Cs = 0.07
Po' = 0.360 kg/cm^2
Pc' = 1.800 kg/cm^2

Pst = Seating Pressure
Psw = Swelling Pressure
Percent Heave = 1.71%

CONSOLIDATION TEST





Tested By : EKA

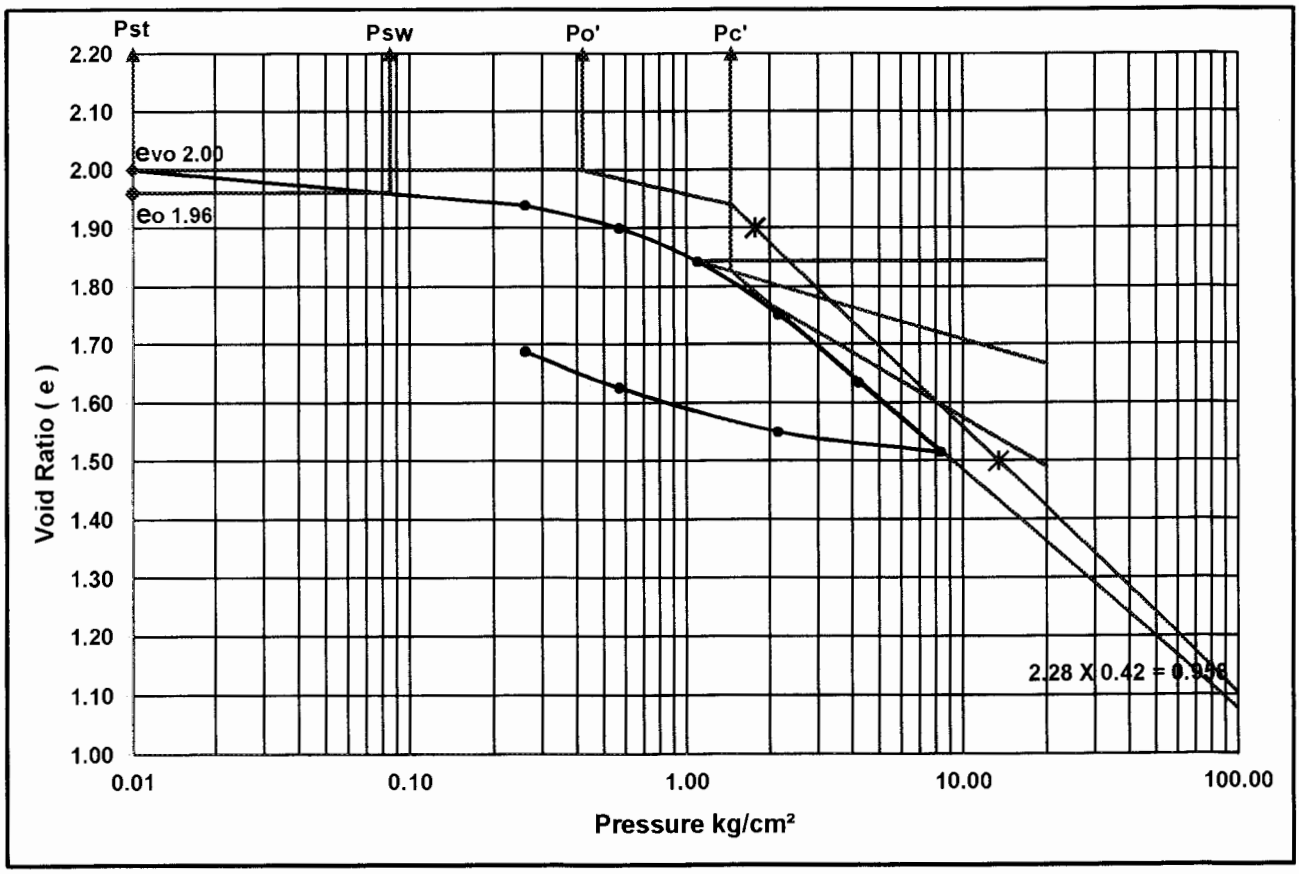
JOB NAME : GEDUNG 4-5 LANTAI + 1 BASEMENT
LOCATION : Jl. Wolter Monginsidi - Jakarta Selatan
DATE : December 28, 2016

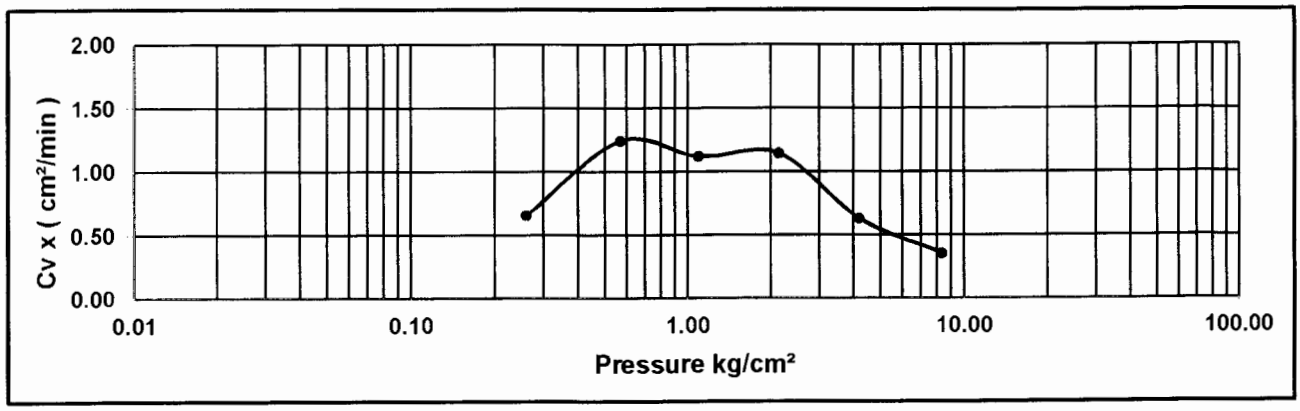
JOB NO. : 1S.16133
BORING NO. : DB1 – UD2
DEPTH OF SAMPLE : 4.50 – 5.00 m

Pst = 0.010 kg/cm^2 Cc = 0.46
Psw = 0.085 kg/cm^2 Cs = 0.11
Po' = 0.420 kg/cm^2
Pc' = 1.450 kg/cm^2

Pst = Seating Pressure
Psw = Swelling Pressure
Percent Heave = 1.23%

3





Tested By : EKA

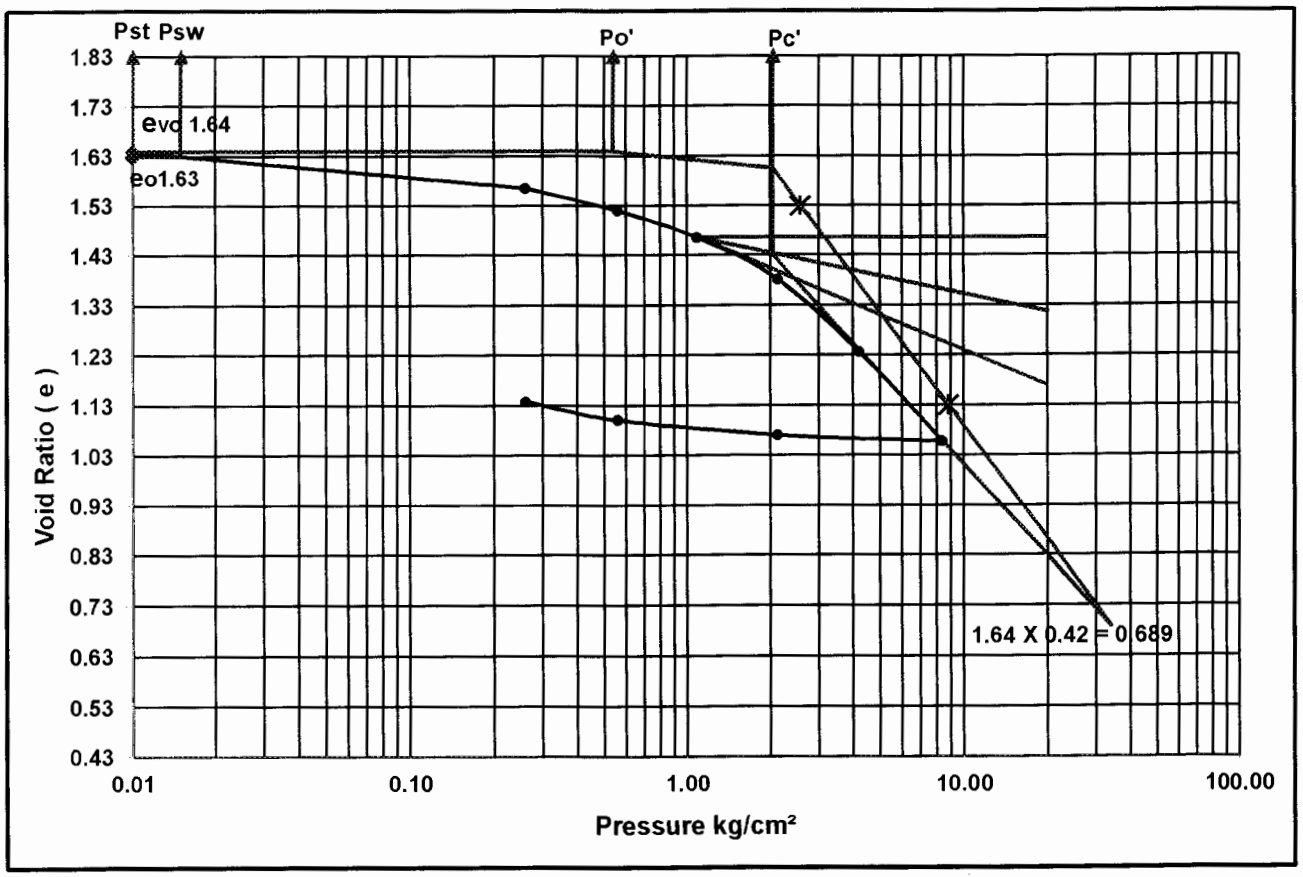
JOB NAME : GEDUNG 4-5 LANTAI + 1 BASEMENT
LOCATION : Jl. Wolter Monginsidi - Jakarta Selatan
DATE : December 28, 2016

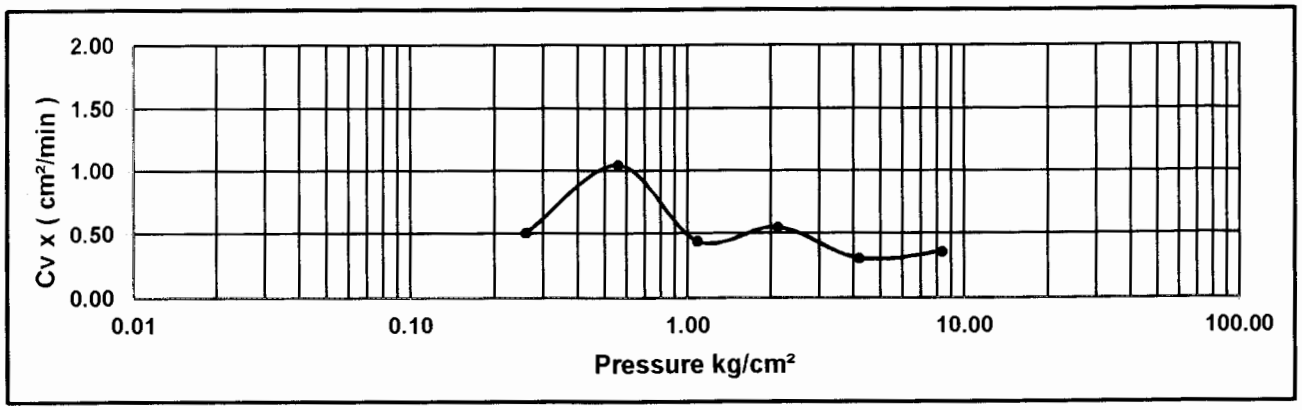
JOB NO. : 1S.16133
BORING NO. : DB1 – UD3
DEPTH OF SAMPLE : 6.50 – 7.00 m

Pst = 0.010 kg/cm^2 Cc = 0.75
Psw = 0.015 kg/cm^2 Cs = 0.05
Po' = 0.540 kg/cm^2
Pc' = 2.050 kg/cm^2

Pst = Seating Pressure
Psw = Swelling Pressure
Percent Heave = 0.32%

CONSOLIDATION TEST





Tested By : EKA

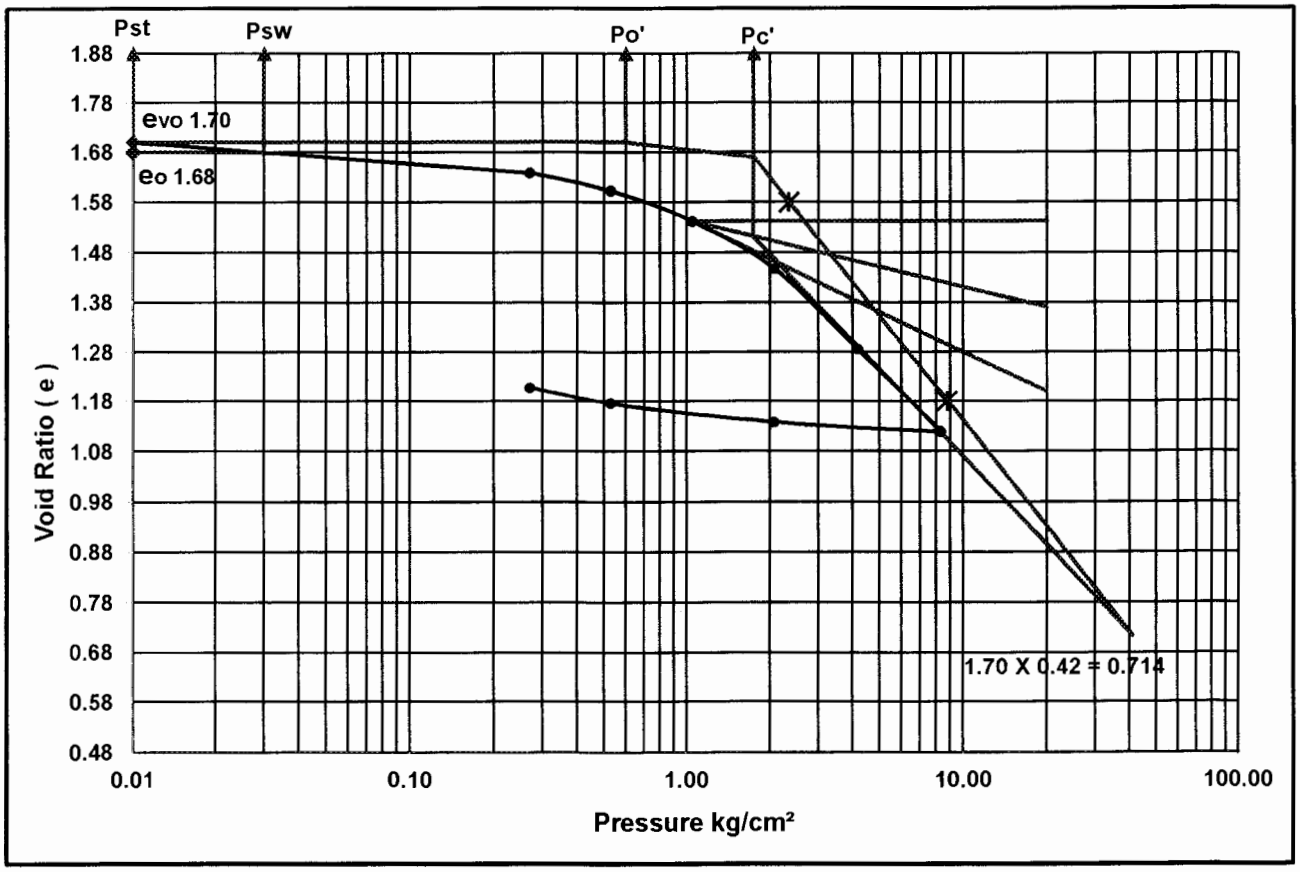
JOB NAME : GEDUNG 4-5 LANTAI + 1 BASEMENT
LOCATION : Jl. Wolter Monginsidi - Jakarta Selatan
DATE : December 28, 2016

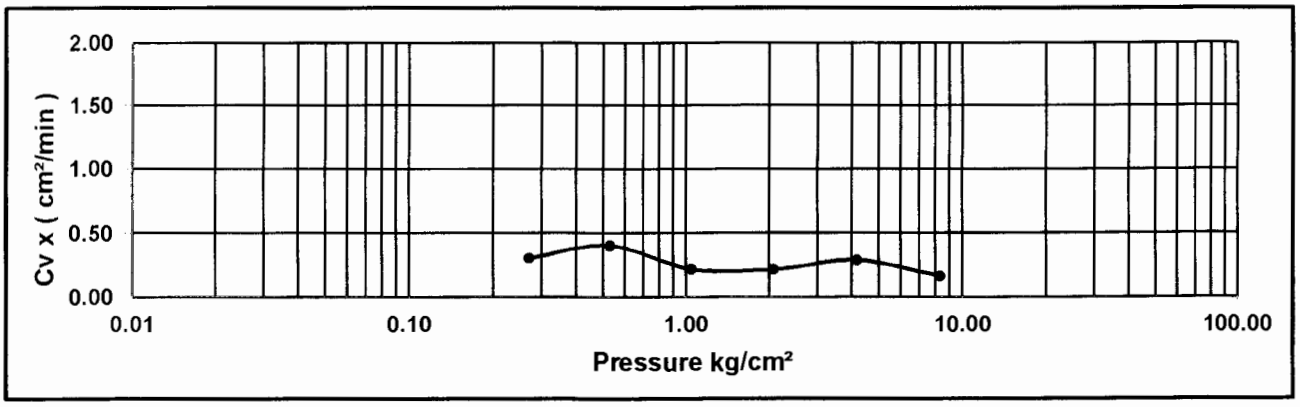
JOB NO. : 1S.16133
BORING NO. : DB1 – UD4
DEPTH OF SAMPLE : 7.00 – 7.50 m

Pst = 0.010 kg/cm^2 Cc = 0.70
Psw = 0.030 kg/cm^2 Cs = 0.06
Po' = 0.600 kg/cm^2
Pc' = 1.750 kg/cm^2

Pst = Seating Pressure
Psw = Swelling Pressure
Percent Heave = 0.76%

CONSOLIDATION TEST





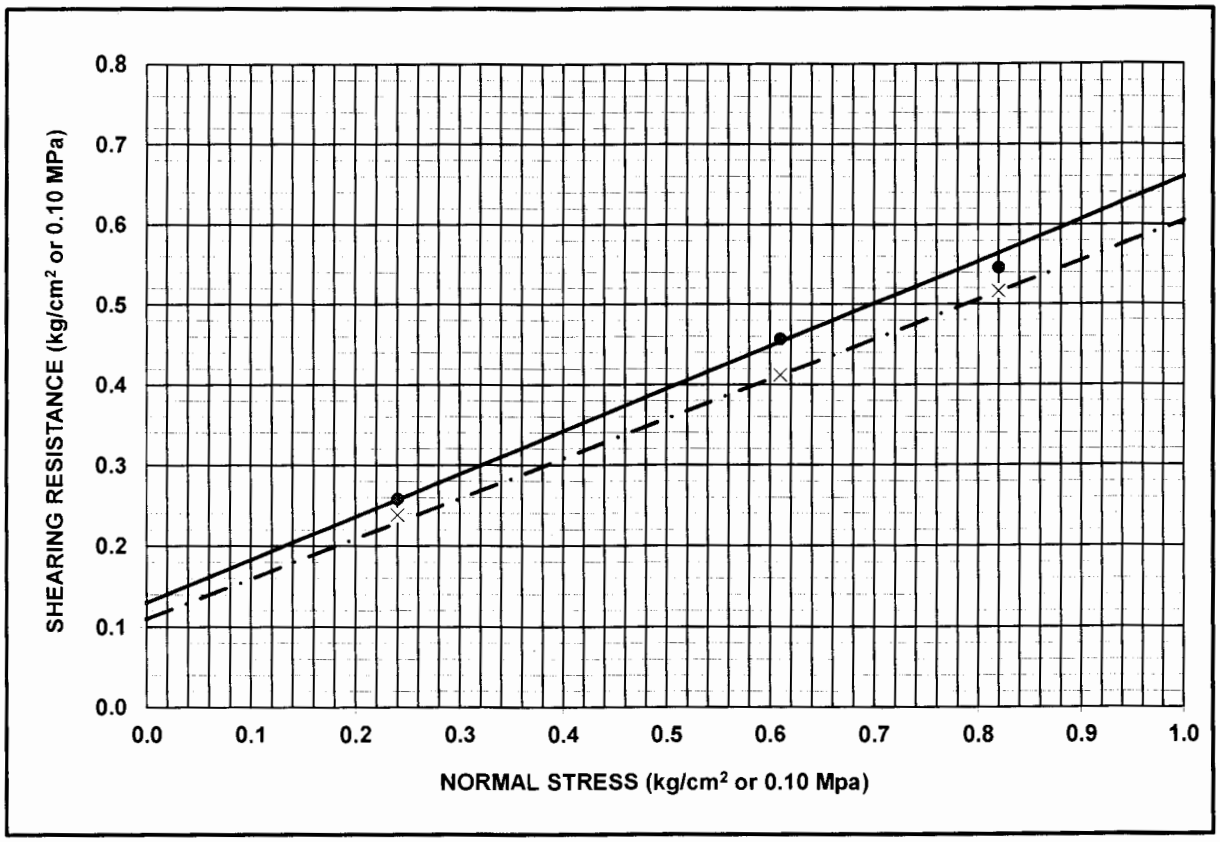
Tested By : EKA

DIRECT SHEAR TEST
ASTM D-3080-03

JOB NAME: GEDUNG
LOCATION: Jl. Wolter Monginsidi - Jakarta Selatan

JOB NO : 1S.16133
BORING NO. : DB1 - UD3
DEPTH : 6.50 - 7.00 m

DIRECT SHEAR TEST



	Peak	Residual
APPARENT COHESION (kg/cm^2 or x 0.10 Mpa	0.13	0.11
ANGLE OF SHEARING RESISTANCE (Ø°)	27.92	26.34

SAMPLE NO.	1	2	3
NATURAL WATER CONTENT (%)	52.47	59.39	60.05
NATURAL UNIT WEIGHT, γ t (t/m^3)	1.57	1.54	1.62
DRY UNIT WEIGHT, γ d (t/m^3)	1.03	0.97	1.01

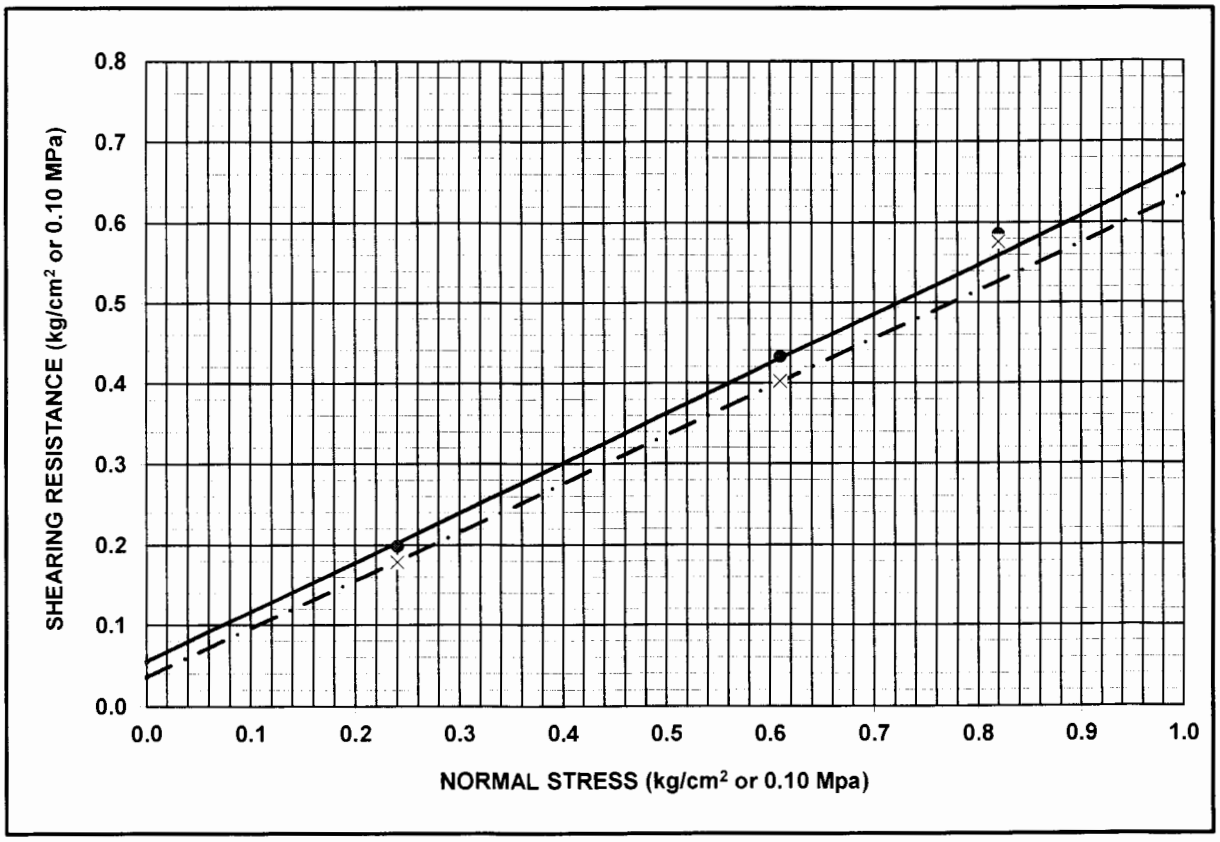
REMARKS :	UNCONSOLIDATED UNDRAINED TEST —●— : P e a k —X— : Residual

Tested By : Muryadi
Date : December 29, 2016

JOB NAME: GEDUNG
LOCATION: Jl. Wolter Monginsidi - Jakarta Selatan

JOB NO : 1S.16133
BORING NO. : DB1 - UD4
DEPTH : 7.00 - 7.50 m

DIRECT SHEAR TEST



	Peak	Residual
APPARENT COHESION (kg/cm^2 or x 0.10 Mpa	0.06	0.04
ANGLE OF SHEARING RESISTANCE (Ø°)	31.59	30.92

SAMPLE NO.	1	2	3
NATURAL WATER CONTENT (%)	79.79	76.31	73.56
NATURAL UNIT WEIGHT, γ t (t/m^3)	1.52	1.52	1.48
DRY UNIT WEIGHT, γ d (t/m^3)	0.84	0.86	0.85

REMARKS :	UNCONSOLIDATED UNDRAINED TEST —●— : P e a k —X— : Residual

Tested By : Muryadi
Date : December 29, 2016

DOKUMENTASI

FOTO TITIK UJI SONDIR S1

FOTO TITIK UJI SONDIR S2

FOTO TITIK UJI SONDIR S3

FOTO TITIK UJI BOR MESIN DB1

FOTO SAMPLE KEDALAMAN 0.00 – 6.50 M

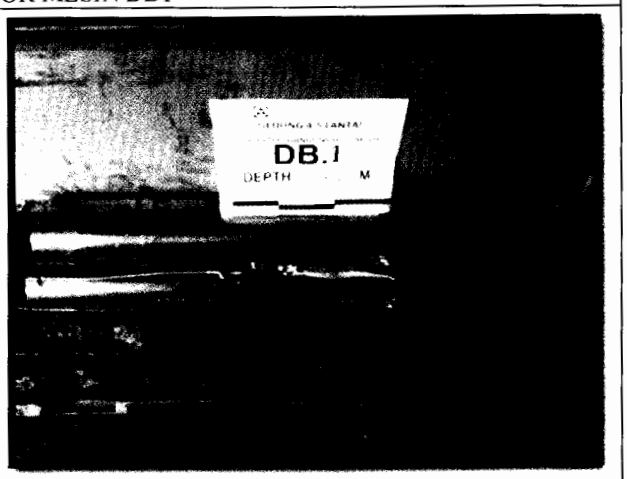


FOTO SAMPLE KEDALAMAN 6.50 – 12.00 M

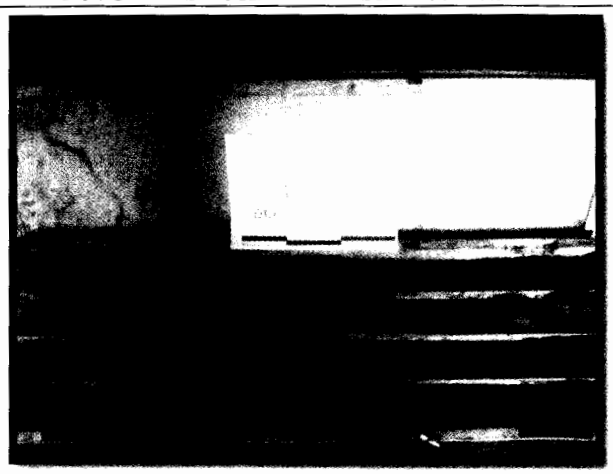


FOTO SAMPLE KEDALAMAN 12.00 – 20.00 M

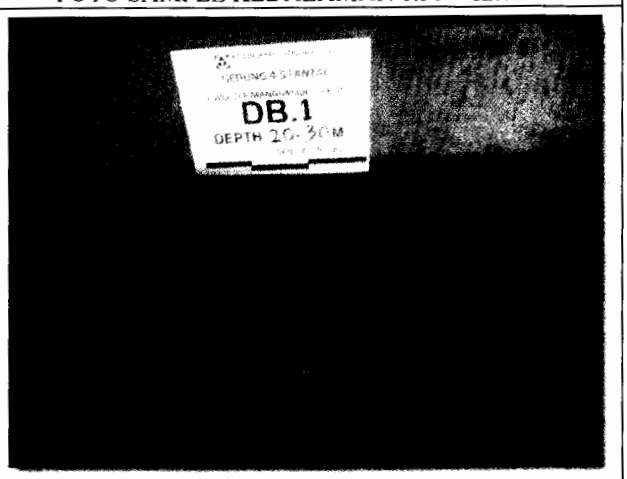


FOTO SAMPLE KEDALAMAN 20.00 – 30.00 M