TESTANA ENGINEERING, Inc.

A.2.2. BORING LOG

BOREHOLE # : **DB - 2**

PROJECT : **Ged. Kampus Univ. Muhammadiyah, 13 Lantai.**

DATE OF TESTING : **15 to 19 February 2014**

GROUND WATER LEVEL : **- 0.20 m**

LOCATION : **Jl. Sutorejo No. 59, Surabaya.**

DEPTH OF BORING : **45.5 m**

GROUND SURFACE LEVEL : **± 0.00 m**

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST (0 10 20 30 40)	STRENGTH TEST TYPE	C	φ	ATTERBERG LIMITS (0 20 40 60 80 100)	γ	Gs	eo	Sr
0	Fill material (sand and gravel, brown, contain crushed brick).	≥50								
1		1								
2	Clay and silt, brown, inorganic, trace to little of sand, very soft consistency.									
3		<1								
4	Clay and silt, grey, inorganic, some sand, very soft consistency.									
5		<1								
6	Clay and fine sand, grey.									
7	Clay and silt, grey, inorganic, little to some fine sand, contain crushed shells at some depth, very soft to stiff consistency.	4								
8		8								
9										
10										
11		16								
12	Silt and fine sand, yellowish brown, contain gravel at some depths, contain crushed shells at some depth, medium dense.									
13										
14		29								
15										
16	Silt and clay, yellowish brown, inorganic, trace of sand.	19								
17										
18	Silt and fine sand, yellowish brown to brown, inorganic, trace sand, contain crushed shell at some depths, medium dense.	12								
19										
20		27								
21										
22	Sand, fine to coarse grained, brown, contain crushed shell, dense to very dense.	44								
23										
24		>50								
25										
26		40								
27	Silt and clay, yellowish brown, inorganic, trace sand, very stiff consistency.									
28		35								
29										
30		23								
31										
32		36								
33	Silt and clay, greenish grey, inorganic, some sand, trace of gravel, hard consistency.									
34		32								
35										
36	Sand, fine to coarse grained, grey.	31								
37										
38		29								
39	Clay and silt, greyish brown, inorganic, trace of fine sand, very stiff to hard consistency.									
40		30								
41										
42		31								
43	Sand, fine to coarse grained, grey, trace of gravel, contain crushed shell at some depths, dense to very dense.									
44		49								
45										
46	**End of Boring**	>50								
47										
48										
49										
50										

NOTE :

0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

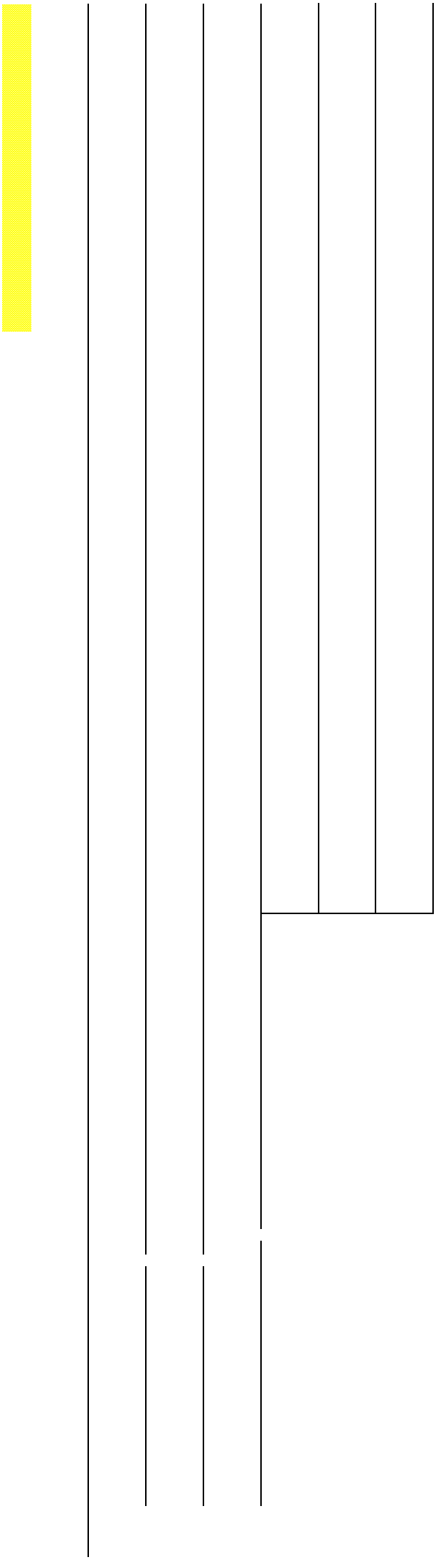
= Undisturbed sample
= SPT
= Fairly Undisturbed

c = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

SPT = Standard penetration test (blows / ft)
UU = Triaxial, Unconsolidated undrained
CU = Triaxial. Consolidated undrained
Vane = Vane shear test
UCT = Unconfined compression strength, kg/cm²
QT = Direct shear, quick test.

O = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wt = Liquid limit, %
γ = Bulk density, t/m ³
Gs = Specific gravity
eo = Void ratio
Sr = Saturation, %

1.25	1
3.25	1
5.25	1
7.25	4
9.25	8
11.25	16
13.25	29
15.25	19
17.25	12
19.25	27
21.25	44
23.25	50
25.25	40
27.25	35
29.25	23
31.25	36
33.25	32
35.25	31
37.25	29
39.25	30
41.25	31
43.25	49
45.25	50
47.25	
49.25	



TESTANA ENGINEERING, Inc.

A.2.1. BORING LOG

BOREHOLE # : **DB - 1**

PROJECT : **Ged. Kampus Univ. Muhammadiyah, 13 Lantai.**
DATE OF TESTING : **15 to 19 February 2014**
GROUND WATER LEVEL : **- 0.20 m**

LOCATION : **Jl. Sutorejo No. 59, Surabaya.**
DEPTH OF BORING : **45.5 m**
GROUND SURFACE LEVEL : **± 0.00 m**

DEPTH, m,	SOIL DESCRIPTION	STANDARD PENETRATION TEST (0 10 20 30 40)	STRENGTH TEST TYPE	C	φ	ATTERBERG LIMITS (0 20 40 60 80 100)	γ	Gs	eo	Sr
0	Fill material (sand and gravel, brown, contain crushed brick).									
1		<1								
2	Clay and silt, brown, inorganic, trace to little of sand, very soft consistency.									
3		3								
4	Clay and silt, grey, inorganic, some fine sand, soft consistency.									
5		<1								
6										
7	Clay and silt, grey, inorganic, little to some fine sand, contain crushed shells at some depth, very soft to stiff consistency.	3								
8										
9		8								
10										
11	Silt and fine sand, yellowish brown, contain gravel at some depths, contain crushed shells at some depth, medium dense.	20								
12										
13		27								
14	Fine sand, brown, trace of gravel.									
15	Silt and clay, yellowish brown, inorganic, trace sand, very stiff consistency.	22								
16										
17	Fine sand, brown.	17								
18										
19	Silt and clay, yellowish brown, inorganic, trace sand, very stiff to hard consistency.									
20		31								
21										
22	Sand, fine to coarse grained, brown, contain crushed shell, medium to dense.	24								
23										
24		35								
25	Silt and clay, yellowish brown, inorganic, trace sand, very stiff consistency.									
26		26								
27	Fine sand, brown.									
28		28								
29										
30		33								
31	Silt and clay, greenish grey, inorganic, trace to little of sand, very stiff to hard consistency.									
32		26								
33										
34		29								
35										
36	Clay and silt, greyish brown, inorganic, little to some fine sand, hard consistency.	28								
37										
38		33								
39										
40	Sand, fine to coarse grained, grey, trace of gravel, contain crushed shell at some depths, dense to very dense.	>50								
41										
42		42								
43										
44		>50								
45										
46	**End of Boring**	>50								
47										
48										
49										
50										

NOTE :

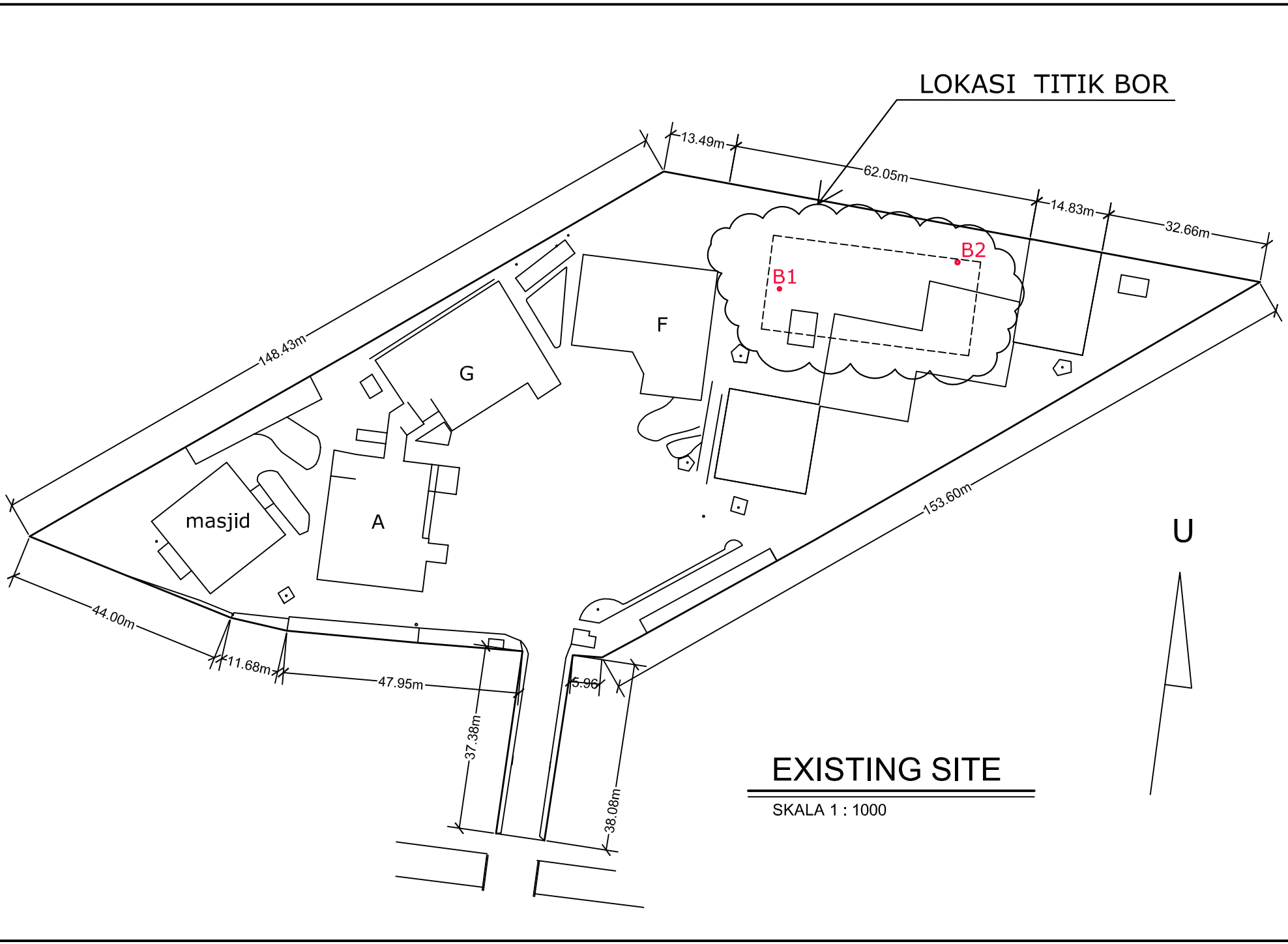
0 to 10 % = Trace
10 to 20 % = Little
20 to 35 % = Some
35 to 50 % = And

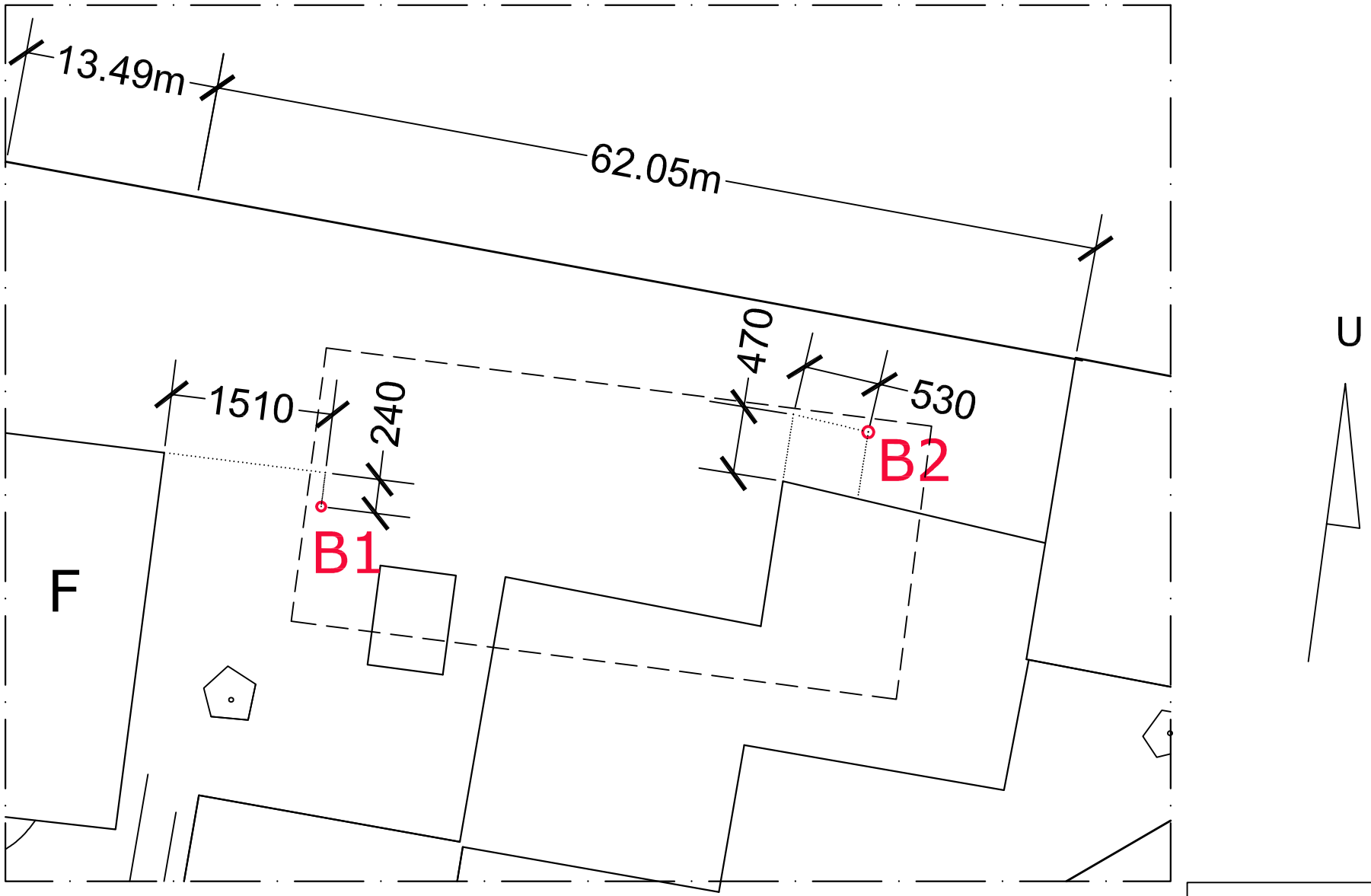
= Undisturbed sample
= SPT
= Fairly Undisturbed

c = Cohesion intercept, kg/cm²
φ = Internal friction angle, deg

SPT = Standard penetration test (blows / ft)
UU = Triaxial, Unconsolidated undrained
CU = Triaxial. Consolidated undrained
Vane = Vane shear test
UCT = Unconfined compression strength, kg/cm²
QT = Direct shear, quick test.

O = Wn = Moisture content, %
● = Wp = Plastic limit, %
Δ = Wt = Liquid limit, %
γ = Bulk density, t/m ³
Gs = Specific gravity
eo = Void ratio
Sr = Saturation, %


LOKASI TITIK BOR
13.49m
62.05m
14.83m
32.66m
148.43m
B1
B2
F
G
masjid
A
153.60m
U
44.00m
11.68m
47.95m
37.38m
5.96
38.08m
EXISTING SITE
SKALA 1 : 1000



DENAH TITIK BOR

SKALA 1 : 400

KETERANGAN :

B1 : TITIK BOR 1
B2 : TITIK BOR 2

UNIVERSITAS MUHAMMADIYAH SURABAYA

PUSAT BAHASA

Jl. Sutorejo 59 Surabaya 60113 Telp. 031-3811966, 3811967 Ext (130) Gd. A Lt 2

Email: pusba.umsby@gmail.com

ENDORSEMENT LETTER

597/PB-UMS/EL/VIII/2016

This letter is to certify that the abstract of the thesis below

Tittle	:	The Effectiveness of Theoretical Calculation of Soil Carrying Capacity With NSPT Method (Case Study of Building Construction At-Tauhid Muhammadiyah University Of Surabaya)
Student's name	:	Defi Lisa Fahmawati
Reg. Number	:	20111333002
Department	:	S1 Teknik Sipil

has been endorsed by Pusat Bahasa *UMSurabaya* for further approval by the examining committee of the faculty.

Surabaya, 24 August 2016

Chair

Waode Hamsia, M.Pd.

LAMPIRAN 1

LAMPIRAN 2

LAMPIRAN 3

Tabel 1. Nilai NSPT DB-1 dan DB-2

No.	Depth (m)	Nilai Nspt (bpf)	
		DB-1	DB-2
1	1.00	1	1
2	2.00	2	1
3	3.00	3	1
4	4.00	2	1
5	5.00	1	1
6	6.00	2	2
7	7.00	3	4
8	8.00	3	5
9	9.00	8	8
10	10.00	13	8
11	11.00	20	16
12	12.00	23	22
13	13.00	27	29
14	14.00	25	25
15	15.00	22	19
16	16.00	20	16
17	17.00	17	12
18	18.00	17	18
19	19.00	31	27
20	20.00	27	35
21	21.00	24	44
22	22.00	29	47
23	23.00	35	50
24	24.00	32	45
25	25.00	26	40
26	26.00	26	38
27	27.00	28	35
28	28.00	28	28
29	29.00	33	23
30	30.00	33	30
31	31.00	26	36
32	32.00	26	35
33	33.00	29	32
34	34.00	29	31
35	35.00	28	31
36	36.00	30	30
37	37.00	33	29
38	38.00	39	29
39	39.00	50	30
40	40.00	47	30
41	41.00	42	31
42	42.00	46	39
43	43.00	50	49
44	44.00	50	50
45	45.00	50	50

LAMPIRAN 4

Tabel 2. Perhitungan Daya Dukung Pondasi Tiang dengan teori L'Decourt DB-1 dan DB-2

Dimensi	0.5	0.5	0.5
Depth	20	22	24
Borehole	DB-1	DB-1	DB-1
Average of three N Values, N	25.60	29.40	29.80
Type of Soil	Sand	Sand	Sand
K	40	40	40
qp = Np x K	1024	1176	1192
Qp = Ap x qp	200.96	230.79	233.93
N Average along shaft, N avg	12.71	13.91	15.48
qs = (N avg/ 3) + 1	5.24	5.64	6.16
Qs = As x qs	164.48	194.73	232.11
Qult (Ton)	***365.44***	***425.52***	***466.04***
Q izin = Qult/3	***121.81***	***141.84***	***155.35***

Dimensi	0.5	0.5	0.5
Depth	20	22	24
Borehole	DB-2	DB-2	DB-2
Average of three N Values, N	34.20	44.20	44.00
Type of Soil	Sand	Sand	Sand
K	40	40	40
qp = Np x K	1368	1768	1760
Qp = Ap x qp	268.47	346.97	345.40
N Average along shaft, N avg	12.55	15.55	18.21
qs = (N avg/ 3) + 1	5.18	6.18	7.07
Qs = As x qs	162.76	213.52	266.38
Qult (Ton)	***431.23***	***560.49***	***611.78***
Q izin = Qult/3	***143.74***	***186.83***	***203.93***

Tabel 3. Perhitungan Daya Dukung Pondasi Tiang dengan teori Mayerhof DB-1 dan DB-2

Dimensi	0.5	0.5	0.5
Depth	20	22	24
Borehole	DB-1	DB-1	DB-1
Nb (Nilai dasar Nspt dasar tiang)	27.00	29.00	32.00
Ap (m^2)	0.20	0.20	0.20
Qp	211.95	227.65	251.20
N (N Average along shaft)	12.71	13.91	15.48
As (m^2)	31.40	34.54	37.68
Qs	79.85	96.11	116.66
Qult (Ton)	***291.80***	***323.76***	***367.86***
Q izin = Qult/3	***97.27***	***107.92***	***122.62***

Dimensi	0.5	0.5	0.5
Depth	20	22	24
Borehole	DB-2	DB-1	DB-1
Nb (Nilai dasar Nspt dasar tiang)	35.00	47.00	45.00
Ap (m^2)	0.20	0.20	0.20
Qp	274.75	368.95	353.25
N (N Average along shaft)	12.55	15.55	18.21
As (m^2)	31.40	34.54	37.68
Qs	78.81	107.39	137.22
Qult (Ton)	***353.56***	***476.34***	***490.47***
Q izin = Qult/3	***117.85***	***158.78***	***163.49***

Tabel 4. Perhitungan Daya Dukung Pondasi Tiang dengan teori Brown DB-1 dan DB-2

Borhole	DB-1	DB-1	DB-1
Dimensi	0.5	0.5	0.5
Depth	20	22	24
Borehole	DB-1	DB-1	DB-1
Nb (Nilai dasar Nspt dasar tiang)	27.00	29.00	32.00
Ap (m^2)	0.20	0.20	0.20
Qp	90.08	96.75	150.13
N (N Average along shaft)	12.71	13.91	15.48
As (m^2)	31.40	34.54	37.68
Qs	160.18	184.14	212.22
Qult (Ton)	***250.25***	***280.89***	***362.35***
Q izin = Qult/3	***83.42***	***93.63***	***120.78***

Borhole	DB-2	DB-2	DB-2
Dimensi	0.5	0.5	0.5
Depth	20	22	24
Borehole	DB-2	DB-1	DB-1
Nb (Nilai dasar Nspt dasar tiang)	35.00	47.00	45.00
Ap (m^2)	0.20	0.20	0.20
Qp	116.77	156.80	150.13
N (N Average along shaft)	12.55	15.55	18.21
As (m^2)	31.40	34.54	37.68
Qs	159.19	194.97	231.96
Qult (Ton)	***275.95***	***351.77***	***382.09***
Q izin = Qult/3	***91.98***	***117.26***	***127.36***

LAMPIRAN 5

Lembar Asistensi Tugas Akhir

Nama	**:**	**Defi Lisa Fahmawati**
NIM	**:**	**20111333002**

No	Tanggal Asistensi	Uraian	Paraf
		Lanjut abstrak.	
-	3/8.'16	Perbaiki abstrak : abstrak	
		hrs menunjukkan hasil secara	
		kwantitas (angka).	
-	4/8.'16 (pagi)	Sempurnakan semua redaksi	
		di TA sesuaikan format yg ada	
		→ lihat contoh.	
-	8.'16 (sore).	ACC ujian TA →	
		persiapkan bahan presentasi	
		u/ ujian.	

Surabaya,.....

(.....)

Dosen Pembimbing

Lembar Asistensi Tugas Akhir

Nama	**:**	**Defi Lisa Fahmawati**
NIM	**:**	**20111333002**

No	Tanggal Asistensi	Uraian	Paraf
-	23/7.'16	Check teori Brown dgn menggunakan faktor koreksi N_{60}	
		dibandingkan tanpa koreksi N_{60}	
		→ lihat grafiknya.	
.	25/7.'16	Check perhitungan teori yg	
		digunakan u/ memastikan	
		tren hasil grafik	
.	28/7.'16	Grafik ok, Lanjut analisa hasil.	
-	30/7.'16	Perbaiki analisa hasil, dlm	
		menganalisa hasil alasan yg	
		digunakan sesuaikan rumus yg	
		dipakai ... dicoba 1 thn bar dulu.	
-	1/8.'16	Perbaiki analisa hasil lagi, belum	
		dihubungkan dgn teori yg dipakai	
		→ Lanjut kesimpulan.	
-	2/8.'16	Perbaiki kesimpulan	
		- Q_p, Q_s, Q_{ult}.	

Surabaya,.....

(.....)

Dosen Pembimbing

Lembar Asistensi Tugas Akhir

Nama	**:**	**Defi Lisa Fahmawati**
NIM	**:**	**20111333002**

No	Tanggal Asistensi	Uraian	Paraf
.	2/2-'16	Perbaiki proposal sesuai hasil sidang p	[signature]
-	4/3-'16	ACC proposal & Lanjutkan	[signature]
.	5-/4-'16	Bab IV contoh perhitungan	
		perbaiki : buat ... secara	[signature]
		sistematis (Qp, Qs, & Qult, Q1).	
-	29 -/4-'16	Perbaiki contoh perhitungan	[signature]
		u/ Qp pd "Meyerhof" ⇒ Nb.	
.	19 -/5-'16	Perbaiki teori & contoh perhit	
		u/. "Brown" serta pahami betul	[signature]
		definisi & satuan daya dukung	
		→ tdk asal ambil dari buku.	
		Lanjutkan ke tabel perhitungan	
-	3 - /6-'16	ACC tabel, Lanjutkan tampilan	[signature]
		grafik.	
-	30 - /6-'16	Tampak terdapat kesalahan	[signature]
		pd tampilan grafik (check	
		satuan yg dipakai)	

Surabaya,......................

(...................................)

Dosen Pembimbing

Lembar Asistensi Tugas Akhir

Nama	**:**	**Defi Lisa Fahmawati**
NIM	**:**	**20111333002**

No	Tanggal Asistensi	Uraian	Paraf
-	7 /10-'16	Sesuaikan latar belakang sesuai judul yg str buat	
-	27 /10-'16	Acc latar belakang, perumusan masalah berupa kata tanya & lengkapi batasan masalah	
-	23 /11-'16	Gunakan teori yg dipakai dalam penelitian ini saja	
-	17 /12-'16	Bab III Metode penelitian harus ada flowchart	
-	/1-'16	Acc sidang proposal.	

Surabaya,.....

(.....)

Dosen Pembimbing

FAKULTAS TEKNIK

UNIVERSITAS MUHAMMADIYAH SURABAYA

LEMBAR REVISI TUGAS AKHIR

1.	**NAMA**	: Defi Lisa Fahmawati
2.	**NIM**	: 20111333002
3.	**Judul Tugas Akhir**	: Efektifitas Teori Perhitungan Daya Dukung Tanah Dengan Metode NSPT (Studi Kasus Pembangunan Gedung At-Tauhid Universitas Muhammadiyah Surabaya

No	Halaman	Masalah yang Direvisi	Penyempurnaan
1.	63.	Daftar pustaka	kaitkan dgn tinjauan pustaka.
2	Bab IV	Tabel Perhitungan di	
		buat pada Perhitungan	
		daya dukung tanah	
3	Bab II	Tinjauan Pustaka.	
		Latar akhir tdk	
		terkait	

Surabaya, ...2016

Diketahui,

Dosen Penguji

(.....)

FAKULTAS TEKNIK

UNIVERSITAS MUHAMMADIYAH SURABAYA

LEMBAR REVISI TUGAS AKHIR

1.	**NAMA**	: Defi Lisa Fahmawati
2.	**NIM**	: 20111333002
3.	**Judul Tugas Akhir**	: Efektifitas Teori Perhitungan Daya Dukung Tanah Dengan Metode NSPT (Studi Kasus Pembangunan Gedung At-Tauhid Universitas Muhammadiyah Surabaya

No	Halaman	Masalah yang Direvisi	Penyempurnaan
1	Abstrak.	%Abstrack di akhir	
		upayakan dlm %	
2	Bab. IV	tampilkan semua	
		hitungan yg terkait	
		SPT, QS, QP, Qult	
3	Bab II	Alasan knp ambil	
		judul ini	
4	Bab II	upayakan ada keterkaitan	
		antara judul & bab 2	
5		di setiap tabel/gambar	
		harus ada rujukannya.	

Surabaya, ...2016

Diketahui,

Dosen Penguji

(....................................)

FAKULTAS TEKNIK

UNIVERSITAS MUHAMMADIYAH SURABAYA

LEMBAR REVISI TUGAS AKHIR

1.	**NAMA**	: Defi Lisa Fahmawati
2.	**NIM**	: 20111333002
3.	**Judul Tugas Akhir**	: Efektifitas Teori Perhitungan Daya Dukung Tanah Dengan Metode NSPT (Studi Kasus Pembangunan Gedung At-Tauhid Universitas Muhammadiyah Surabaya

No	Halaman	Masalah yang Direvisi	Penyempurnaan
1	Abstrak	Paragraf ke-2 di	
		Jarft	
2	Abstrak	Abstrak Paragraf	
		terakhir dipertelas	
3	Hal. 1	Update infor tahun	
4	Daftar pustaka.	kertipan tulis daftar	
		Pustaka.	
5	kesimpulan	kesimpulan di perluasan	
		lingkup masalah	
6	Bab IV	Hasil perhitungan	
		di grafik / tabel	
		dilengkapi dgn nomor	

Surabaya, 22 - 8 - 2016

Diketahui,

Dosen Penguji

(Miftachul Huda)