



**SOIL MECHANICS LABORATORY
CIVIL ENGINEERING OF DAPARTMENT
POLITEKNIK NEGERI SEMARANG**

CONE PENETROMETER TEST

DUTCH CONE TEST

SONDIR STA. NO. : **00+400**

PROYEK :
LOKASI / ALAMAT :
SONDIR STA. : **00+400**
KONTRAKTOR :
Date & Time Started : **25-Feb-18**

Depth of CPT : **20,00 m**
Elev. of Ground Surface : **- m**
Elev. of Ground Water Table : **- m**
Operator : **Samsudin**
Analysis : **Ir. Suparman, MT**

Depth (m)	Manometer Reading		Friction (Fr) (kg/cm ²)	Fr*20/10 (kg/cm ²)	Total Cumulative Friction (TCF) (kg/cm ²)	Local Friction (LF) (kg/cm ²)	Friction Ratio (FR) (%)
	Cone Resistance (qc) (kg/cm ²)	Total Resistance (TR) (kg/cm ²)					
A	B	C	D	E	F	G	H
0.00	0	0	0	0	0	0.00	0.00
-0.20	2	4	2	4	4	0.20	10.00
-0.40	2	4	2	4	8	0.20	10.00
-0.60	3	6	3	6	14	0.30	10.00
-0.80	3	6	3	6	20	0.30	10.00
-1.00	4	8	4	8	28	0.40	10.00
-1.20	5	9	4	8	36	0.40	8.00
-1.40	5	9	4	8	44	0.40	8.00
-1.60	8	13	5	10	54	0.50	6.25
-1.80	10	15	5	10	64	0.50	5.00
-2.00	10	15	5	10	74	0.50	5.00
-2.20	12	17	5	10	84	0.50	4.17
-2.40	9	15	6	12	96	0.60	6.67
-2.60	8	12	4	8	104	0.40	5.00
-2.80	8	12	4	8	112	0.40	5.00
-3.00	9	14	5	10	122	0.50	5.56
-3.20	9	14	5	10	132	0.50	5.56
-3.40	10	15	5	10	142	0.50	5.00
-3.60	11	16	5	10	152	0.50	4.55
-3.80	11	16	5	10	162	0.50	4.55
-4.00	13	18	5	10	172	0.50	3.85
-4.20	15	20	5	10	182	0.50	3.33
-4.40	15	20	5	10	192	0.50	3.33
-4.60	17	22	5	10	202	0.50	2.94
-4.80	17	22	5	10	212	0.50	2.94
-5.00	16	21	5	10	222	0.50	3.13
-5.20	16	21	5	10	232	0.50	3.13
-5.40	15	20	5	10	242	0.50	3.33
-5.60	16	21	5	10	252	0.50	3.13
-5.80	18	23	5	10	262	0.50	2.78
-6.00	20	30	10	20	282	1.00	5.00
-6.20	21	32	11	22	304	1.10	5.24
-6.40	21	32	11	22	326	1.10	5.24
-6.60	23	34	11	22	348	1.10	4.78
-6.80	25	35	10	20	368	1.00	4.00
-7.00	25	35	10	20	388	1.00	4.00
-7.20	25	35	10	20	408	1.00	4.00
-7.40	27	38	11	22	430	1.10	4.07
-7.60	27	38	11	22	452	1.10	4.07
-7.80	25	35	10	20	472	1.00	4.00
-8.00	20	30	10	20	492	1.00	5.00
-8.20	20	30	10	20	512	1.00	5.00
-8.40	22	34	12	24	536	1.20	5.45
-8.60	22	34	12	24	560	1.20	5.45
-8.80	24	34	10	20	580	1.00	4.17
-9.00	21	31	10	20	600	1.00	4.76
-9.20	21	31	10	20	620	1.00	4.76
-9.40	21	31	10	20	640	1.00	4.76
-9.60	17	22	5	10	650	0.50	2.94
-9.80	15	20	5	10	660	0.50	3.33
-10.00	18	23	5	10	670	0.50	2.78



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PROYEK :	Depth of CPT :	20,00 m
LOKASI / ALAMAT :	Elev. of Ground Surface :	- m
SONDIR STA. : 00+400	Elev. of Ground Water Table :	- m
KONTRAKTOR :	Operator :	Samsudin
Date & Time Started : 25-Feb-18	Analysis :	Ir. Suparman, MT

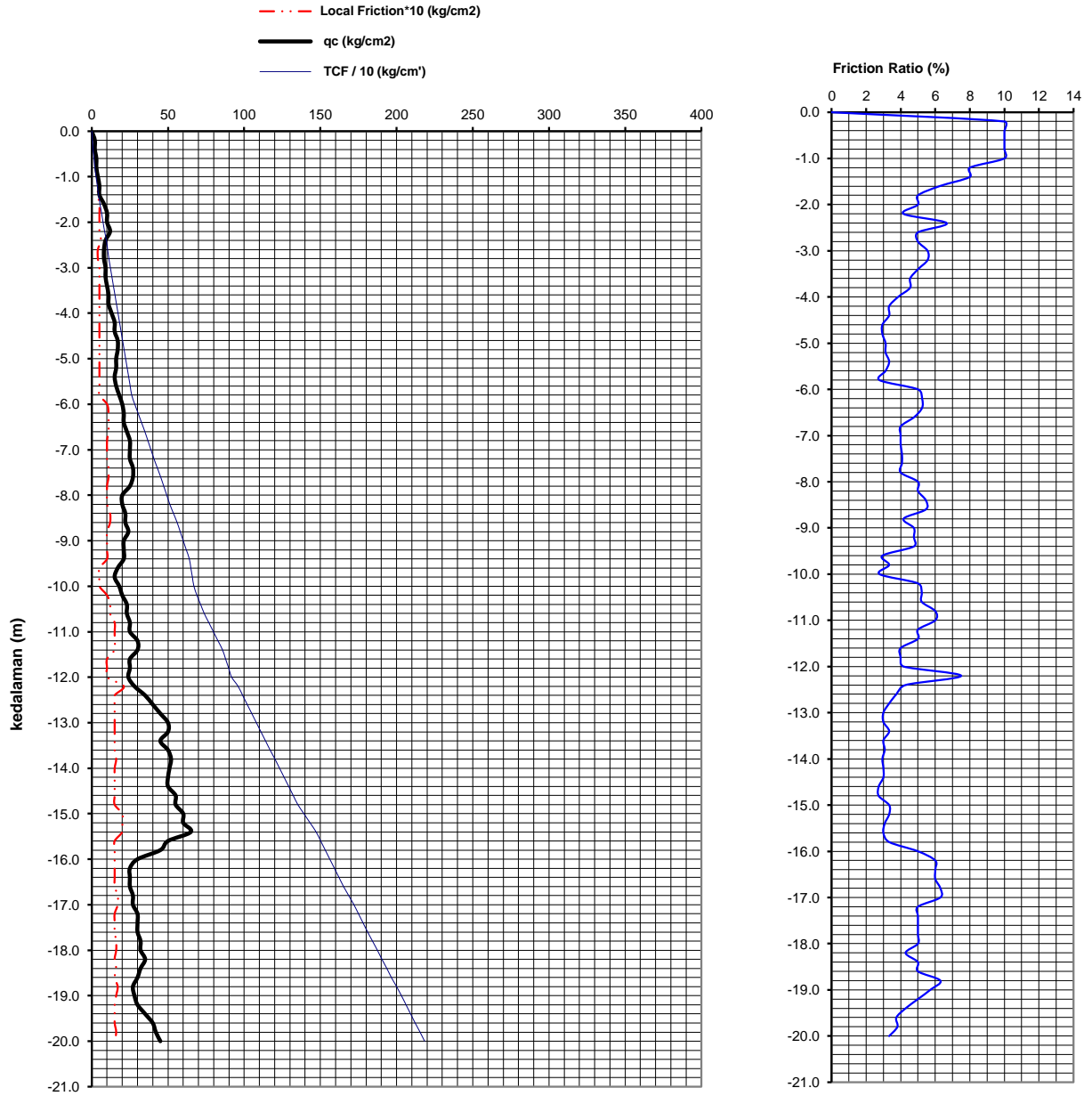
Depth (m)	Manometer Reading		Friction (Fr) (kg/cm ²)	Fr*20/10 (kg/cm ²)	Total Cumulative Friction (TCF) (kg/cm ²)	Local Friction (LF) (kg/cm ²)	Friction Ratio (FR) (%)
	Cone Resistance (qc) (kg/cm ²)	Total Resistance (TR) (kg/cm ²)					
	A	B					
-10.20	20	30	10	20	690	1.00	5.00
-10.40	23	35	12	24	714	1.20	5.22
-10.60	23	35	12	24	738	1.20	5.22
-10.80	25	40	15	30	768	1.50	6.00
-11.00	25	40	15	30	798	1.50	6.00
-11.20	30	45	15	30	828	1.50	5.00
-11.40	30	45	15	30	858	1.50	5.00
-11.60	25	35	10	20	878	1.00	4.00
-11.80	25	35	10	20	898	1.00	4.00
-12.00	24	34	10	20	918	1.00	4.17
-12.20	28	49	21	42	960	2.10	7.50
-12.40	35	50	15	30	990	1.50	4.29
-12.60	40	55	15	30	1020	1.50	3.75
-12.80	45	60	15	30	1050	1.50	3.33
-13.00	50	65	15	30	1080	1.50	3.00
-13.20	50	65	15	30	1110	1.50	3.00
-13.40	45	60	15	30	1140	1.50	3.33
-13.60	50	65	15	30	1170	1.50	3.00
-13.80	52	68	16	32	1202	1.60	3.08
-14.00	51	66	15	30	1232	1.50	2.94
-14.20	50	65	15	30	1262	1.50	3.00
-14.40	50	65	15	30	1292	1.50	3.00
-14.60	55	70	15	30	1322	1.50	2.73
-14.80	55	70	15	30	1352	1.50	2.73
-15.00	60	80	20	40	1392	2.00	3.33
-15.20	60	80	20	40	1432	2.00	3.33
-15.40	65	85	20	40	1472	2.00	3.08
-15.60	50	65	15	30	1502	1.50	3.00
-15.80	45	60	15	30	1532	1.50	3.33
-16.00	30	45	15	30	1562	1.50	5.00
-16.20	25	40	15	30	1592	1.50	6.00
-16.40	25	40	15	30	1622	1.50	6.00
-16.60	25	40	15	30	1652	1.50	6.00
-16.80	27	44	17	34	1686	1.70	6.30
-17.00	27	44	17	34	1720	1.70	6.30
-17.20	30	45	15	30	1750	1.50	5.00
-17.40	30	45	15	30	1780	1.50	5.00
-17.60	30	45	15	30	1810	1.50	5.00
-17.80	32	48	16	32	1842	1.60	5.00
-18.00	32	48	16	32	1874	1.60	5.00
-18.20	35	50	15	30	1904	1.50	4.29
-18.40	32	48	16	32	1936	1.60	5.00
-18.60	30	45	15	30	1966	1.50	5.00
-18.80	27	44	17	34	2000	1.70	6.30
-19.00	28	44	16	32	2032	1.60	5.71
-19.20	30	45	15	30	2062	1.50	5.00
-19.40	35	50	15	30	2092	1.50	4.29
-19.60	40	55	15	30	2122	1.50	3.75
-19.80	42	58	16	32	2154	1.60	3.81
-20.00	45	60	15	30	2184	1.50	3.33



LABORATORIUM MEKANIKA TANAH
JURUSAN TEKNIK SIPIL
POLITEKNIK NEGERI SEMARANG

LOKASI / ALAMAT	:		Y	:	355324.858
TOWER NO. / SONDIR NO.	:	00+400	Z	:	9234006.757
KONSULTAN/KONTRAKTOR	:	0	Operator	:	Samsudin
Date & Time Started	:	25-Feb-18	Analysis	:	Ir. Suparman, MT

CONE PENETROMETER TEST / SONDIR
Standart Test : ASTM D 3441 - 94





**LABORATORIUM MEKANIKA TANAH
JURUSAN TEKNIK SIPIL
POLITEKNIK NEGERI SEMARANG**

PROYEK :	Depth of CPT :	20,00 m
LOKASI / ALAMAT :	Elev. of Ground Surface :	- m
TOWER NO. / SONDIR NO. : 00+400	Elev. of Ground Water Table :	- m
KONSULTAN/KONTRAKTOR : 0	Operator :	Samsudin
Date & Time Started : 25-Feb-18	Analysis :	Ir. Suparman, MT

**SHALLOW FOUNDATION
BEARING CAPACITY**

DAYA DUKUNG DENGAN DATA SONDIR :

TERZAGHI : $Q_{ult} = C.N_c + q. N_q + 0,5 B \gamma N_\gamma$ → Strip Foundation
 $Q_{ult} = 1,3 C.N_c + q. N_q + 0,4 B \gamma N_\gamma$ → Square Foundation
 $Q_{ult} = 1,3 C.N_c + q. N_q + 0,3 B \gamma N_\gamma$ → Circle Foundation
 Sanglerat : $C_u = Q_c/20$

UNTUK TANAH KOHESIF ATAU LEMPUNG

$Q_{ult} = 5,7 \times C_u$ → Sanglerat

UNTUK TANAH NON KOHESIF ATAU PASIR DAN TANAH PADA UMUMNYA

$\frac{q_{allowable}}{q_c} = \frac{B}{40} \left(1 + \frac{D}{B}\right)$ → Meyerhof's dan Sanglerat

$Q_{Allowable} = \frac{q_c}{30}$ → Meyerhof's (untuk tanah pasir yg tidak ada GWL)

$Q_{Allowable} = \frac{q_c}{40}$ → Meyerhof's (untuk tanah pasir yg ada GWL)

Dimana :

C_u : *Streght Undrained*

B : *Lebar Pondasi (meter)*

D : *Kedalaman pondasi (meter)*

q_c : *Tahanan conus rata-rata sondir pada dasar pondasi*

$q_{allowable}$: *Daya dukung pondasi diijinkan dengan SF = 3.0 s/d 4,0*

$Q_{ultimate}$: *Daya Dukung kondisi Ultimate*

$Q_{ultimate} : Q_{allowable} \times SF$

Tabel Perhitungan Daya Dukung Ultimate Tanah Kohesif

SONDIR NO.	Foundation		Average Q_c (kg/cm ²)	Lebar (B) (m)	Q Ultimate (kg/cm ²)	SF	Q Allowable (kg/cm ²)	Keterangan
	Depth (m)	Type						
00+400	1.00		4.67	1.00		3.00	0.23	<i>non cohesive soil</i>
	2.00		9.50	1.00		3.00	0.48	<i>non cohesive soil</i>
	3.00		9.17	1.00		3.00	0.46	<i>non cohesive soil</i>