



YAYASAN PERGURUAN "CIKINI"
INSTITUT
SAINS DAN TEKNOLOGI
NASIONAL

FAKULTAS TEKNIK SIPIL
DAN PERENCANAAN
JURUSAN TEKNIK SIPIL

PENUGASAN
No : 07-10/PM/LM/X/94

Ketua Program Studi Teknik Sipil, Fakultas Teknik Sipil dan Perencanaan Institut Sains dan Teknologi Nasional Jakarta menugaskan kepada :

Ir. Idrus, MSc Staff Jurusan Teknik Sipil

Untuk melakukan pekerjaan Penyelidikan Tanah sebagai bentuk kegiatan **Pengabdian Pada Masyarakat** pada :

- Nama Pekerjaan : Penyelidikan Tanah GIS 150 KV
- Lokasi : Jl. Rawamangun Muka Barat, Pulo Mas, Jakarta
- Pemberi Tugas : PT. EMEKON PRAKASITA

Dengan jadwal pelaksanaan pekerjaan selama 12 hari kerja (96 Jam), 2 hari di lapangan dan 10 hari di Laboratorium

Kepada Ir. Idrus MSc diberikan kepercayaan penuh untuk melakukan pekerjaan Pengabdian Pada Masyarakat tersebut dan bertanggung jawab atas segala sesuatu mengenai pekerjaan tersebut

Kepada pelaksana tugas ini akan diberikan honorarium sesuai dengan ketentuan yang berlaku di Laboratorium Mekanika Tanah Institut Sains dan Teknologi Nasional.

Penugasan ini berlaku sejak dikeluarkan sampai dengan berakhirnya jangka waktu penyusunan Laporan Akhir (Final Report) diterima oleh pemberi kerja dengan baik.

Jakarta, 6 Oktober 1994
Kaprodik Teknik Sipil



Ir. Ari Mulyo Diah Utami MT
NIP : 01.83332

- Tembusan :
1. Dekan FTSP-ISTN (sbg laporan)
 2. Ka. Lab. Mekanika Tanah ISTN
 3. Arsip

**LEMBAR PENGESAHAN
PENGABDIAN PADA MASYARAKAT**



**PENYELIDIKAN TANAH GIS 150 kV
Lokasi : Jl. Rawamangun Muka Barat, Pulo Mas, Jakarta**

Oleh :
Idrus Ir, M.Sc

Mengetahui :
Ketua Jurusan Teknik Sipil



Ir. Arimulyo Diah Utami, M.T

**Program Studi Teknik Sipil
Institut Sain dan Teknologi Nasional
Jakarta 1994**

SURAT PERJANJIAN KERJASAMA

SPK No : 05-10.1/ME/X/94

Pada hari ini, Rabu tanggal Lima bulan Oktober tahun Seribu Sembilan Ratus Sembilan Puluh Empat (05-10-1994) yang bertanda tangan dibawah ini :

PIHAK I

Dalam hal ini bertindak sebagai Pemilik PT. Emekon Prakasita yang beralamat di Jl. Karang Tengah Raya, Bona Indah Plaza A2-C5, Lebak Bulus, Cilandak, Jakarta
Selanjutnya dalam perjanjian ini disebut sebagai **Pihak Pertama**

PIHAK II

Dalam hal ini bertindak sebagai Pelaksana Soil Investigasi yaitu Laboratorium Mekanika Tanah ISTN
Selanjutnya disebut sebagai **Pihak Kedua**

Kedua belah pihak telah sepakat untuk mengadakan perjanjian kerja pengujian Soil Investigasi pada :

Proyek : GIS 150 kV Pulomas

Lokasi : Jl. Rawamangun Muka Barat, Jakarta Timur

Demikian surat perjanjian kerja sama ini kami buat dengan sebenar-benarnya.

Jakarta, 05 Oktober 1994

PIHAK KEDUA
Laboratorium Mekanika Tanah ISTN



Ir. Idrus MSc
Kepala Laboratorium

PIHAK PERTAMA
PT. Emekon Prakasita



(.....)

61/94

FINAL REPORT

SOIL INVESTIGATION

PROJECT : GARDU INDUK SEKUNDER 150 KV

LOKASI : JL. RAWAMANGUN MUKA BARAT, PULOMAS
JAKARTA TIMUR



LABORATORIUM MEKANIKA TANAH
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4/11



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04-11.3/FR/LM/XI/94

Page 1

Jakarta, November 4 th 1994

No : 04-11.1/FR/LM/XI/94
Atch : 1 (one) document
Subject : Submittal letter of the soil investigation
work at GIS 150 KV Pulomas (Final Report)

To:

Director of PT. EMEKON PRAKASITA

at

Jakarta.

Dear Sir,

We are pleased to submit herewith our Final Report on Soil Investigation for The Secondary Relay Station (Gardu Induk Sekunder) 150 KV at your plant in Pulomas Jl. Rawamangun Muka Barat, East Jakarta.

This soil investigation was performed in accordance with our agreement between PT. EMEKOM PRAKASITA and Soil Mechanics Laboratory of ISTN Jakarta..

We appreciated the opportunity to work on this project and please do not hesitate to call us if you have any question regarding this final report.

Thank you for your kind attention and cooperation.

Your sincerelly,

SOIL MECHANICS LABORATORY OF I.S.T.N
Chief Executive

Ir. Idrus M.Sc
Geotechnical Engineers

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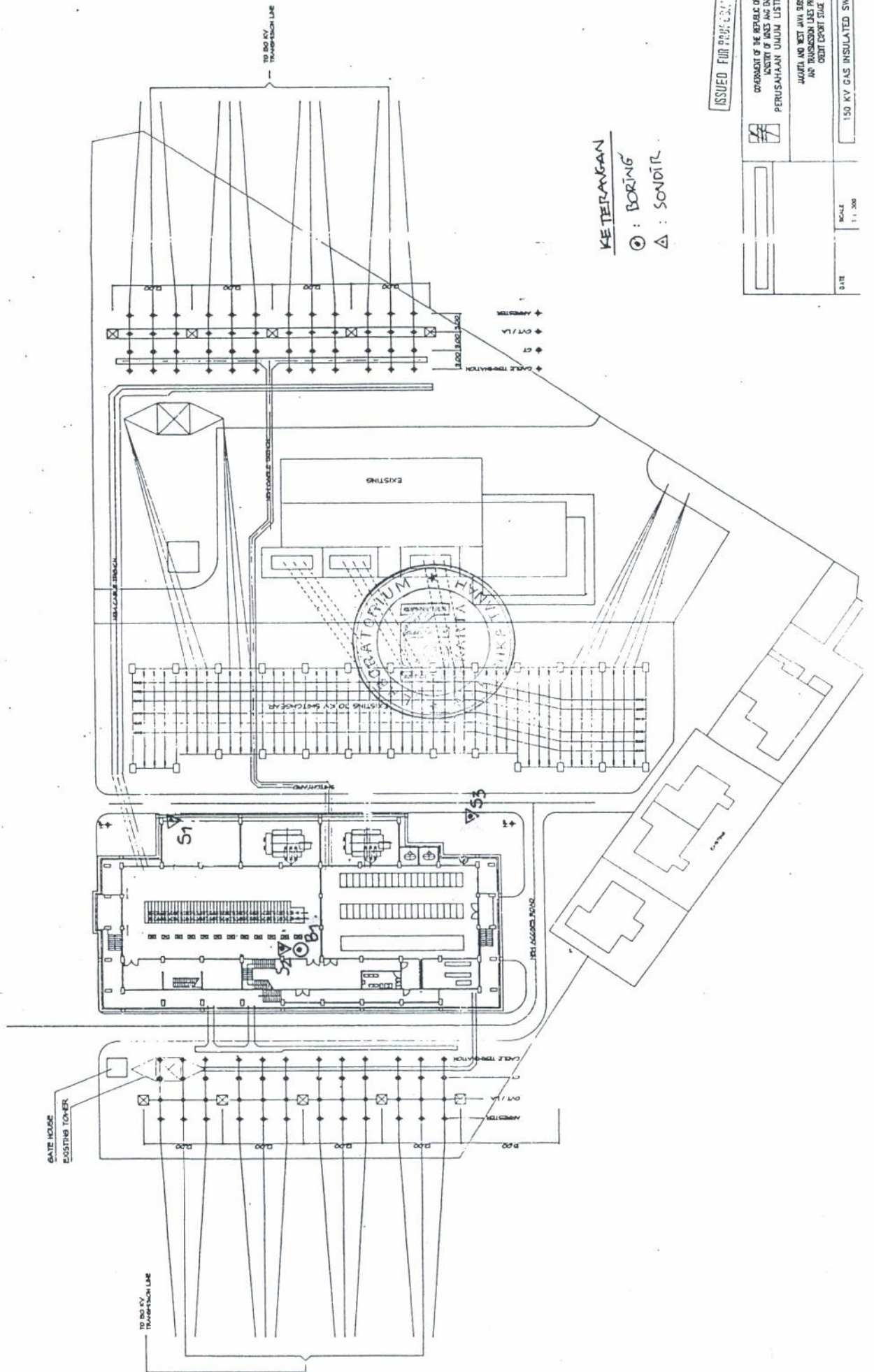


LIST OF FIGURE

FIGURE 1 : LOCATION OF CPT AND BORING POINTS



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KETERANGAN
 ○ : BORING
 △ : SONDIR

ISSUED FOR PERMITS

ORGANIZATION GOVERNMENT OF THE REPUBLIC OF INDONESIA DEPARTMENT OF ENERGY AND ELECTRICITY PERUSAHAAN LISTRIK NEGARA	
PROJECT JAWAII AND WEST JAVA SUBSTATIONS AIR TRANSMISSION LINES PROJECT GREAT EXPERT STAGE I	
DATE	SCALE 1 : 1,000
PROJECT 150 KV GAS INSULATED SWITCHGEAR	

LIST OF APPENDIX

1. Geological Boring Log
2. Diagram of Cone Penetrometer Test
3. Summary of Laboratory Result Test
4. Index Properties of Soil
5. Atterberg limits of Soil
6. Grained Sizes Distribution of Soil
7. Plastisity Chart
8. Triaxial UU Test
9. Consolidation Test



I. INTRODUCTION

This Soil Investigation was meant to fulfil a work agreement between Soil Mechanics Laboratory of ISTN Jakarta and PT. EMEKON PRAKASITA Jkt, to carry out site and laboratory investigation for The Secondary Relay Station (Gardu Induk Sekunder) 150 KV project in Pulomas, Jl. Rawamangun Muka Barat, East Jakarta.

This soil investigation is to obtain the technical data result of subsurface soil condition especially surrounding the bearing capacity of soil to Foundation design of the Secondary Relay Station (Gardu Induk Sekunder) 150 KV project in Pulomas, East Jakarta.

The soil investigation consisted of 3 (three) points of CPT Test with 2,5 tons capacity and 1 (one) points of The shallow boring (Hand boring).

The duties of Soil Mechanics Laboratory of ISTN were to carry out Geotechnical Investigation such as field work, laboratory testing and also evaluate the soil condition and parameter design.

Field investigation activities had be done on October 6 th 1994



II. SCOPE OF WORK

The scope of work consist of 3 (three) points of 2,5 tons CPT Test (Cone Penetration Test) and 1 (one) points of the Shallow Boring and taking undisturbed and disturbed samples for soil description and laboratory test.

1 (one) points of the shallow boring.

Code	Depth (m)	UD Sampling
B-1	-3.45	2

3 (Three) points of CPT Test.

Code	The max.depth qc > 100 kg/cm ²	Total Friction kg/cm ²
S 1	-13.80 m	1400
S 2	-13.80 m	1320
S 3	-14.20 m	1800



III. METHODE OF TESTING

In generally this investigation were carry out in two stage of work in example : Field work and laboratory testing.

Detail of investigation methods were as follows :

3.1. Field Work.

To Achieve the representative geotechnical properties, 1 (one) points of booring and 3 (three) points of CPT test were carry out which the location were shown in figure 1 .

a. Boring by using the coring system (iwan auger)

The aim of this boring was to obtain the accurate information on the soil condition beneath the surface regarding it's engineering viewpoint either obtained from visual description, and taking undisturbed samples for laboratory testing on an undisturbed samples to find out the visual description.

The mentioned boring was carry out by using rotary boring / manual (hand booring) with iwan auger.

During boring, the following testings were executed :

- Taking Undisturbed sample.
- Taking Disturbed sample from auger Iwan



b. Taking of Undisturbed Samples.

The taking of undisturbed samples were meant to obtain relative original soil samples. samples were taken by using special equipment, passed to the desired soil depth by using the pressure from the manual equipment).

Equipment used was the thin wall tube sample, according to ASTM Standard No: D.1587.

Sealing was immediately effected on obtained soil samples, by applying parafine at both ends of the tube.

c. Cone Penetration Test (CPT).

Dutch Cone Penetration Test had been carried out in accordance with the requirements of ASTM Standard D.3441, of 2,5 tonf capacity, equipped with rod and friction cone. The CPT had been performed continuously from the ground surface to the top of hard layer soil with cone penetration resistance (q_c) value exceeding 200 kg/cm² or 20 meters maximum depth.

The recording had been taken every 20 cm penetration rate.

The data obtained from the test had been of cone penetration resistance and total friction as well.



3.2. Laboratory Test and Analysis

All laboratory test had been performed in Soil Mechanics Laboratory of National Institute of Science and Technology at Jakarta (ISTN). The all test had been conducted in accordance with ASTM requirements.

For Undisturbed sampling, following index properties tests had been carried out :

- . Determination of Natural water content
- . Determination of Specific gravity
- . Determination of Atterberg limits.
- . Determination of Plasticity index
- . Determination of Grained sizes distribution by sieve analysis and Hydrometer analysis.

And also the engineering properties test had been carried out in addition to the test listed above :

- . Determination of wet density and dry density
- . Determination of degree of saturation
- . Determination shear strength by Triaxial UU Test.
- . Determination of Compression Index with Consolidation test



IV. GEOTECHNICAL CONDITION

4.1. The subsoil condition

From the field exploratory test data with CPT test and boring test, the subsoil condition could be explained as follows :

- From the top of soil below to - 3.00 meter (average) was found Clayey silt or silty clay with medium to stiff consistency and highly plasticity.
- From -3.00 meter to -6.00 meter the consistency has to be medium .
- A hard layer , where the cones resistance > 100 kg/cm² was found in - 3.80 to 14.20 meter.
- The existing ground water surface was found in -11.80 meter depth from ground surface when the site job has been done.



V. RECOMMENDATION

With the subsoil condition as described above, it was recommended to use parameter design, especially the allowable bearing capacity to use the foundation design.

Using Mini Precast Driven Pile :

- The total of pile length is various between -15.00 meter (until a hard layer)
- Driven to hard layer (final set max 1 cm / last 10 (ten) blow) .
- Allowable Axial Load / 1 (one) pile is :
Used formula :

$$P_{all} = \frac{Q_c \cdot A}{3} + \frac{T_f \cdot S}{5}$$

Dimension of Pile (cm)	(A) cm ²	(S) cm	Soil Parameter will be recommended		P all (Kg)
			Qc Kg/cm ²	Tf Kg/cm ²	
20x20	400	80	100	1000	29333 P = 27.5 t
28x28x28	339	84	100	1000	28100 P = 27.5 t



Where :

A = Cross section in cm²

(S) = Circumference in cm

Qc = The qonus resistance at soil bearing layer
(Kg/cm²)

Tf = Total friction from top to soil bearing layer
(Kg/cm²)

- For goup pile, the distance beetwen pile to pile is minimum 3ϕ , where ϕ is diameter of pile.

Using the Shallow Foundation

Soil Parameter will be recommended :

Cohession	= 0.4 t/m ²	Nc	= 19
ϕ	= 21 degree	Nq	= 9
γ	= 0.72 t/m ³	N γ	= 6

Used formula from Terzaghi :

For square footing (B x B)

$$q_u = 1.3 C N_c + \gamma D N_q + 0.4 \gamma B N_\gamma$$

For strip footing

$$q_u = C N_c + \gamma D N_q + 0.5 \gamma B N_\gamma$$

Where : Nc Nq and N γ is bearing capacity factor .

C = Cohession (Kg/cm²)

γ = Unit weight of soil ,effective. (Kg/cm³)

D = Depth of base foundation from groun surface (m)

B = Width of foundation (m)



Type of Foundation : Square footing

Depth (D)	Allowable Bearing Capacity (t/m ²)	
	Width of Foundation (m)	
1.00	1.50	2.00
1.00	6.32	6.61

Type of Foundation : Continuous footing

Depth (D)	Allowable Bearing Capacity (t/m ²)	
	Width of Foundation (m)	
1.00	1.50	2.00
1.00	5.77	6.13

Remarks :

- Below the base foundation , should be added 20 cm thick of compacted gravel.
- The consolidation settlement should be calculated below the base foundation until the depth of 3 times of foundation width. ($D = 3 B$)

SOIL MECHANICS LABORATORY OF ISTN

Chief Executive

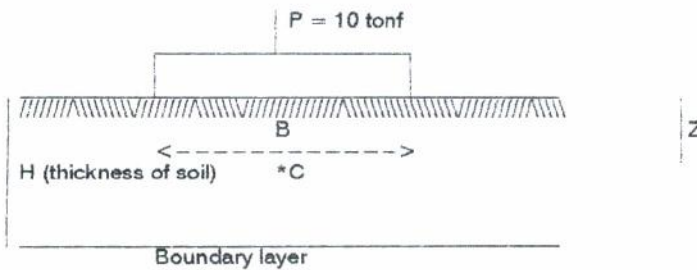
 Ir. Idrus M.Sc
 Geotechnical Engineer



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CONSOLIDATION SETTLEMENT ANALYSIS (Estimated)

Project : G.I.S 150 KV Pulomas, Rawamangun.



Soil Parameter :

Initial Void Ratio (e _o) =	1.3100
Effective Volume Weigth of soil (t/m ³)	0.7400
Compression Index, C _c	0.5000
Coefficient of Consolidation, C _v in cm ² /sec	0.0085
Thickness of soil layer in meter (H)	6.0000
Depth of the middle layer Z, in meter	3.0000
Swelling Index, C _s	0.0400
Preconsolidation pressure, P _c (t/m ²)	13.0000 to 15.0000

26.4384 (m²/years)

Foundation Data :

Axial Load in ton	10	Time of Settlement : $t = \frac{Tv \times Hdr^2}{Cv}$
Width of Foundation (B) in meter	2.00	
Depth of Boundary Layer in meter	6.00	

$$Sc = \frac{H \times Cc}{1 + eo} \log \frac{Po + dq}{Po} \quad (\text{Normally consolidation})$$

$$Sc = \frac{H \times Cs}{1 + eo} \log \frac{Po + dq}{Po} \quad (\text{Over consolidation, where } Po + dq < Pc)$$

$$Sc = \frac{H \times Cs}{1 + eo} \log \frac{Pc}{Po} + \frac{H \times Cc}{1 + eo} \log \frac{Po + dq}{Pc}$$

(Over consolidation, where $Po + dq > Pc$)

$$\frac{dq}{lr} = \frac{lr \times Q \times 4}{0.06}$$

(Normally consolidation)

Q (t/m ²)	dq (t/m ²)	Po (t/m ²)	H (meter)	Cc	eo	Sc (meter)
2.50	0.60	2.22	0.00	0.50	1.31	0.0000

(Over consolidation, where $Po + dq < Pc$)

Q (t/m ²)	dq (t/m ²)	Po (t/m ²)	H (meter)	Cs	eo	Sc (meter)
2.50	0.60	2.22	6.00	0.04	1.31	0.0108

(Over consolidation, where $Po + dq > Pc$)

Q (t/m ²)	Pc (t/m ²)	Po (t/m ²)	H (meter)	Cs	eo	Sc (meter)
2.50	13.00	2.22	0.00	0.04	1.31	0.0000

Q (t/m ²)	dq (t/m ²)	Po (t/m ²)	H (meter)	Cc	eo	Sc (meter)
2.50	0.60	2.22	0.00	0.50	1.31	0.0000

Settlement (Sc) = 1.08 Cm

Tv 90	Hdr (meter)	Cv m ² /yr	t year
0.848	6.00	26.44	1.15



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LABORATORY TESTING RESULTS

PROJECT : GARDU INDIK 150 KV PULO MAS
 LOCATION : JL. Rw. MANGUN MUKA BARAT JAK-TM.
 BORING : B. I .

SAMPLE DEPTH (m)	sample type U/D	classification symbol	INDEX PROPERTIES									
			W _n %	$\gamma_{m \text{ wet}}^{\text{dry}}$ t/m ³	G _s	e	S _r %	W _p %	W _L %	P _I %	GRAIN SIZE	
											SIEVE %	HYDRO %
B.I 2,00 s/d 2,45	U		48,393	$\frac{1,701}{1,130}$	2,61	1,3187	95,78	40,92	103,67	62,75	19	81
B.I 3,00 s/d 3,45	U		48,44	$\frac{1,726}{1,164}$	2,634	1,2717	100,33	33,72	115,01	81,29	5	95



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LABORATORY TESTING RESULTS

PROJECT : GARDU INDUK 150 KV PULO MAS
 LOCATION : JL. RAWA MANGUN MUKA BARAT JAK-TM.
 BORING : B. I .

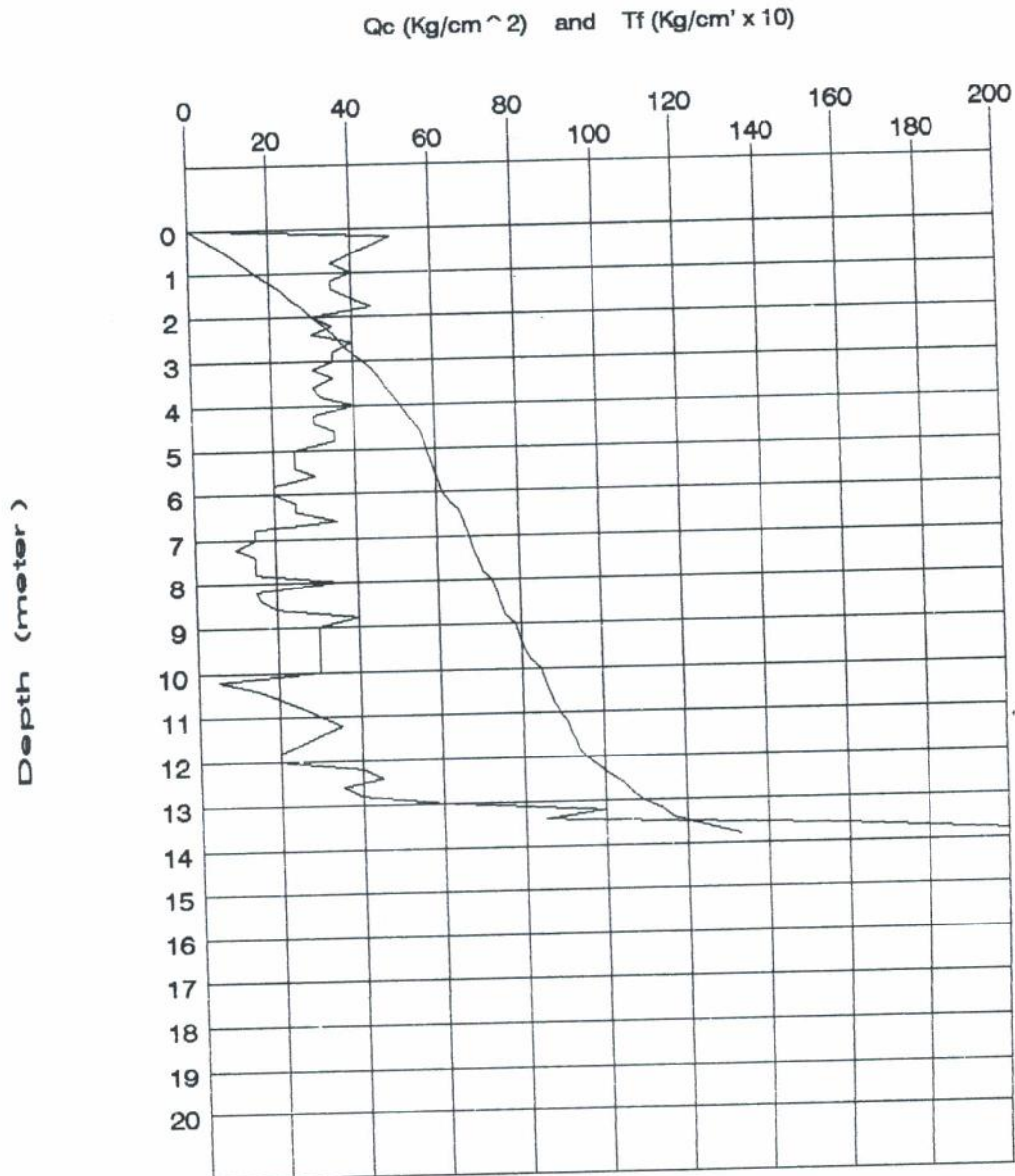
Sample Depth (m)	sample type		classifica- tion symbol	ENGINEERING PROPERTIES					
				Shear strength				Compressibility	
				C , C' (kg/cm ²)	Ø , Ø' (°)	q _{uu} (kg/cm ²)	St	C _c	C _v (cm ² /sec)
B.I 2,00 s/d 2,45	U		0,02	21°	-	-	0,61	6 x 10 ⁻³	
B.I 3,00 s/d 3,45.	U		0,04	26°	-	-	0,42	11 x 10 ⁻³	



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CONE PENETRATION TEST

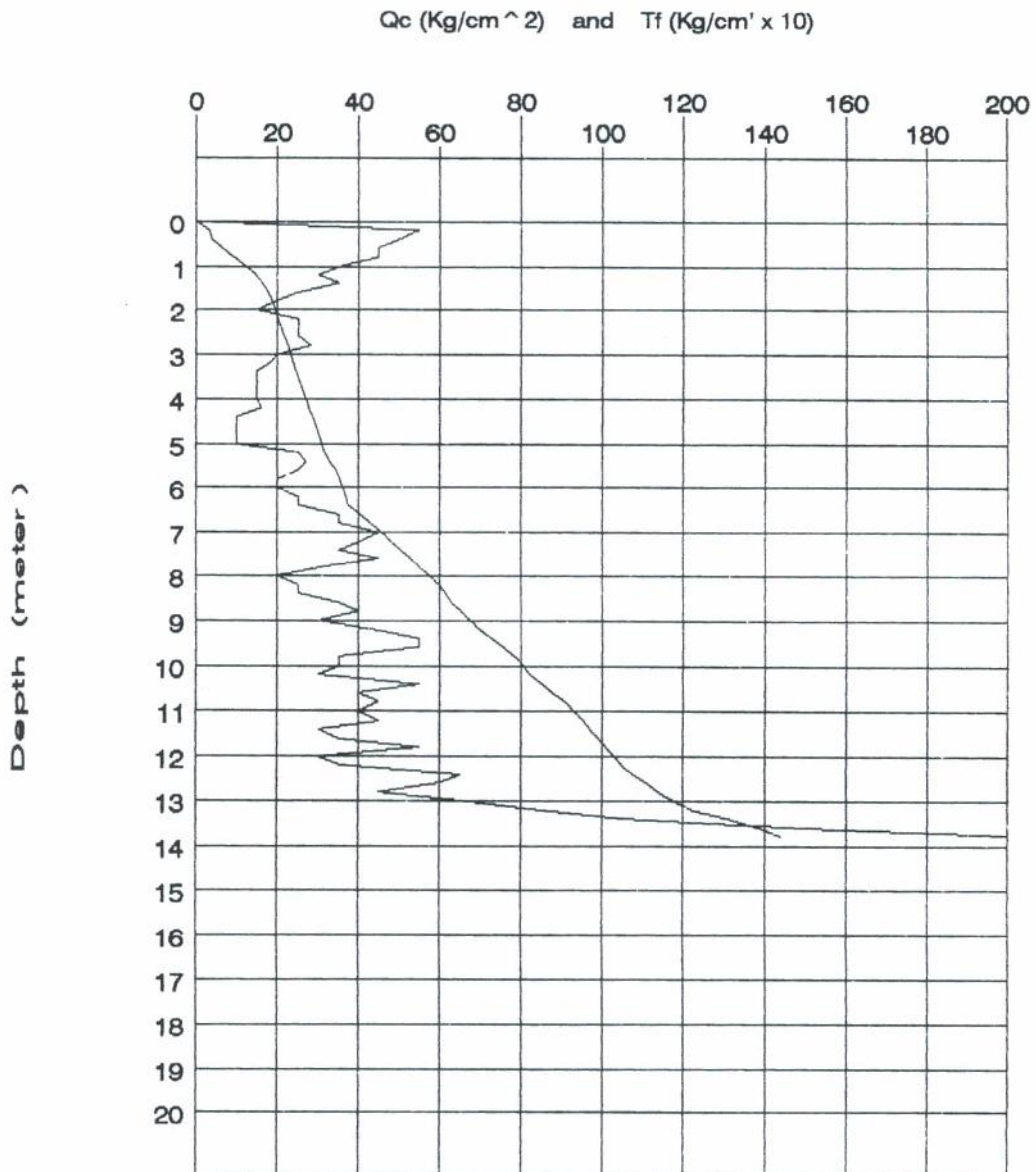
SONDIR NO : S-2	D1. qonus : 3.45
PROJECT : GIS 150 KV PULOMAS	D2. jacket : 3.50
LOCATION : JL. RAWAMANGUN MUKA BARAT	H. jacket : 10.71
DATE OF TESTED : Oktober 08 1994	Ratio (R) : 12.96
TESTED BY : AMIN .S	Elevation (-mt) :
CHECKED BY : MA ONTOWIRYO Ir.	GWL : 11.60



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CONE PENETRATION TEST

SONDIR NO : S-1	D1. qonus : 3.45
PROJECT : GIS 150 KV PULOMAS	D2. jacket : 3.60
LOCATION : JL. RAWAMANGUN MUKA BARAT	H. jacket : 10.71
DATE OF TESTED : Oktober 08 1994	Ratio (R) : 12.96
TESTED BY : AMIN .S	Elevation (-mt) :
CHECKED BY : MA ONTOWIRYO Ir.	GWL : 11.60

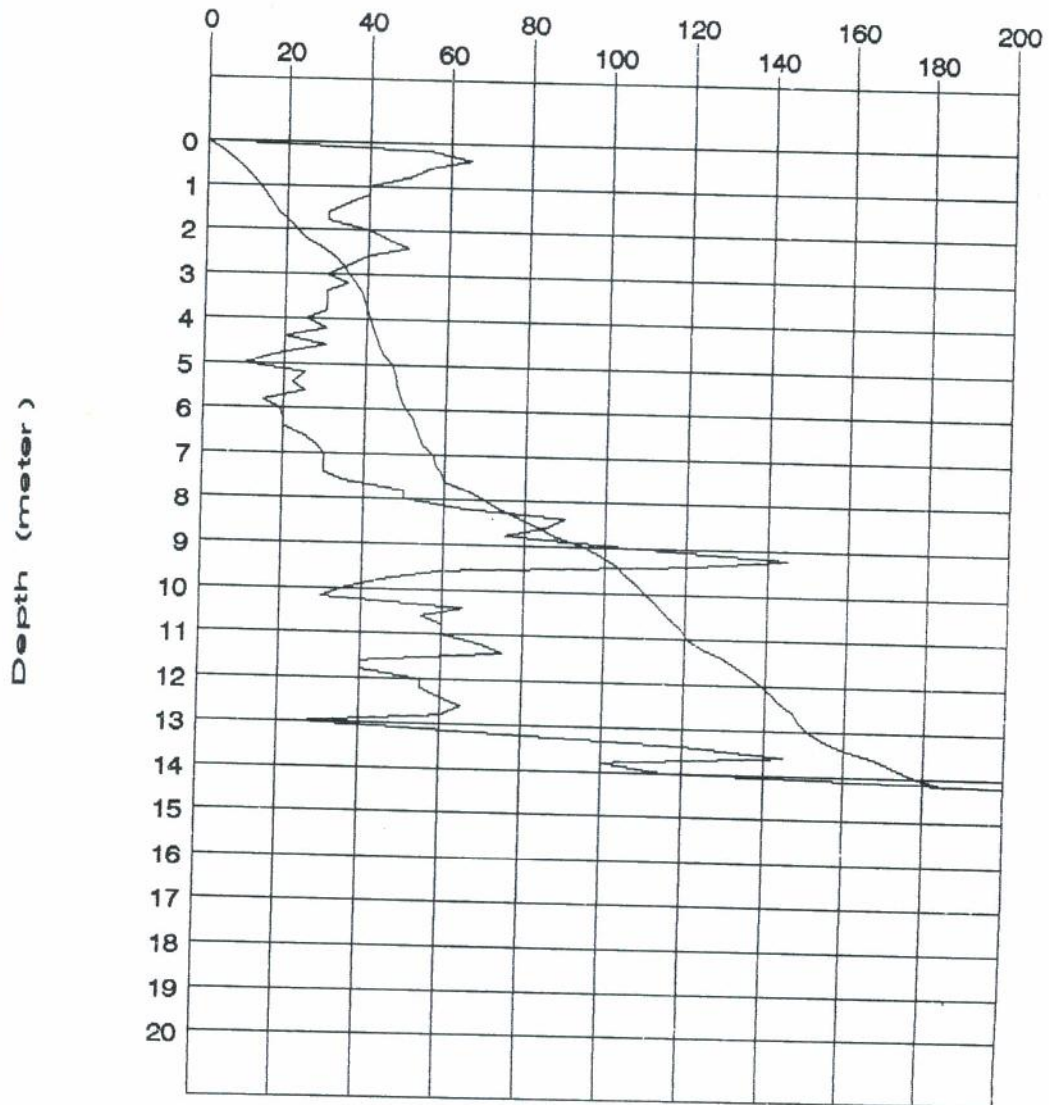


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CONE PENETRATION TEST

SONDIR NO	: 8-3	D1. qonus	3.45
PROJECT	: GIS 150 KV PULOMAS	D2. jacket	3.60
LOCATION	: JL. RAWAMANGUN MUKA BARAT	H. jacket	10.71
DATE OF TESTED	: Oktober 08 1994	Ratio (R)	12.96
TESTED BY	: AMIN .S	Elevation (-mt)	
CHECKED BY	: MA ONTOWIRYO Ir.	GWL	11.80

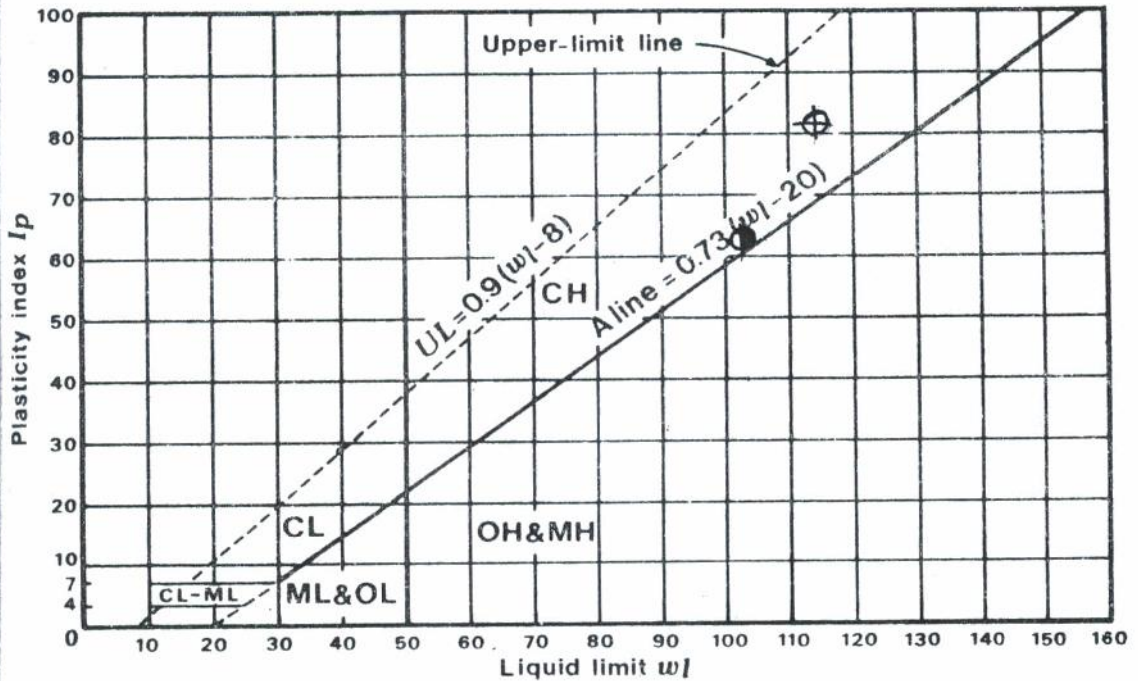
Q_c (Kg/cm²) and T_f (Kg/cm' x 10)



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Project : GARIDU, INDUK 150 KV PULO MAS
Location : JL. Rw. MANGUN MUKA BARAT JAK-TIM .
Test By : IR. S HANNY E
Date of Test : OKTOBER 1994 .

PLASTICITY CHART

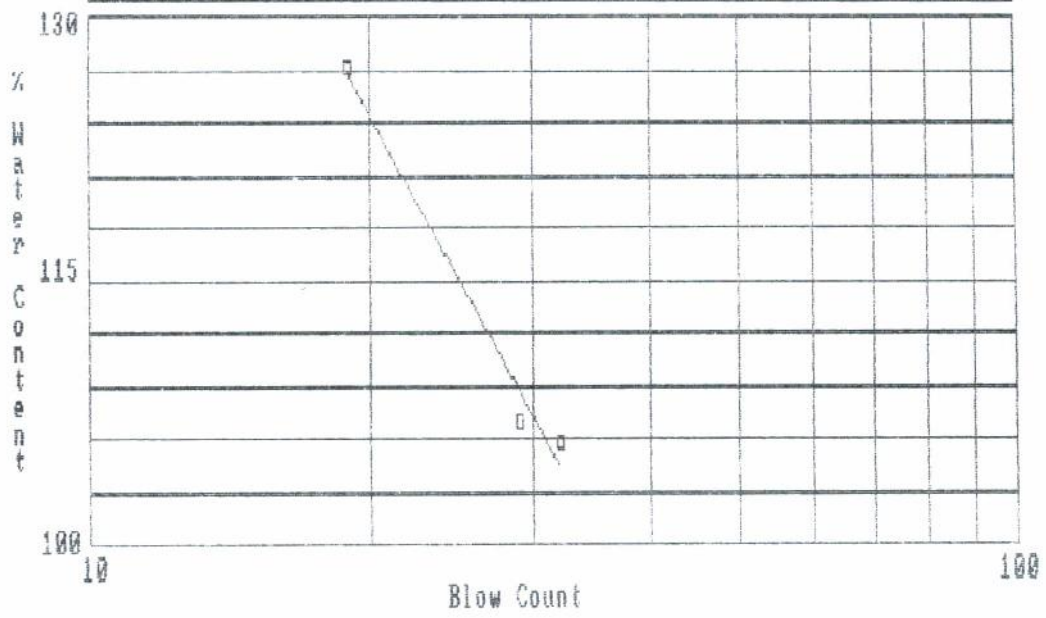


Boring No.	Depth (M)	Symbol	WL (%)	WP (%)	IP (%)	Unified Classification
B.I	200 - 245	●	103,67	40,92	62,75	CH
	300 - 345	⊕	115,01	33,72	81,29	CH



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Boring No. = B 1	Depth = 300-345	Number = GI PULOMAS
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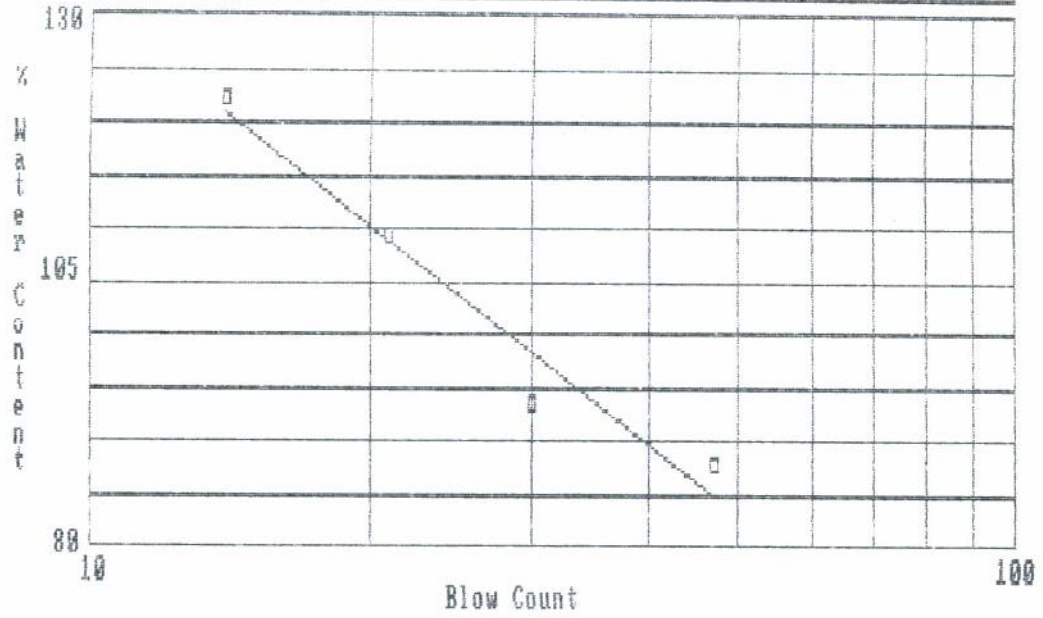


Sample no.	1	2	3						
% Water content	105.90	106.93	127.05						
Blow count	32	29	19						
Regression equation					Coefficient of determination				
W = -98.2229 * logN + 252.3214					R ² = .9817 ** Excellent Test				
Liquid limit = 115.01					Flow index = -98.22				
Input plastic limit = 33.72					Toughness index = -.83				
Plasticity index = 81.29					Shrinkage limit = 14.18				
Input natural water content = 48.44					Liquidity index = .18				
Boring No. = B 1			Depth = 300-345			Number = GI PULOMAS			



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Boring No. = B 1.	Depth = 200-245	Number = GI PULOMAS
-------------------	-----------------	---------------------



Sample no.	1	2	3	4				
% Water content	87.67	93.58	109.35	122.30				
Blow count	47	30	21	14				
Regression equation					Coefficient of determination			
$W = -68.4543 * \log N + 199.3632$					$R^2 = .957$ ** Excellent Test			
Liquid limit = 103.67					Flow index = -68.45			
Input plastic limit = 40.92					Toughness index = -.92			
Plasticity index = 62.75					Shrinkage limit = 19.14			
Input natural water content = 48.393					Liquidity index = .12			
Boring No. = B 1.			Depth = 200-245		Number = GI PULOMAS			

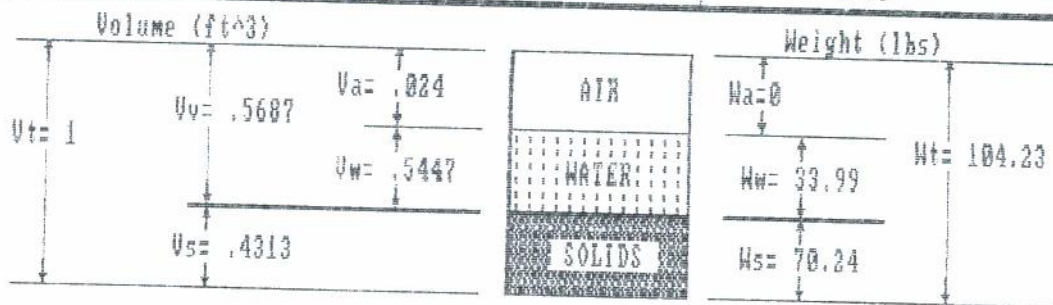


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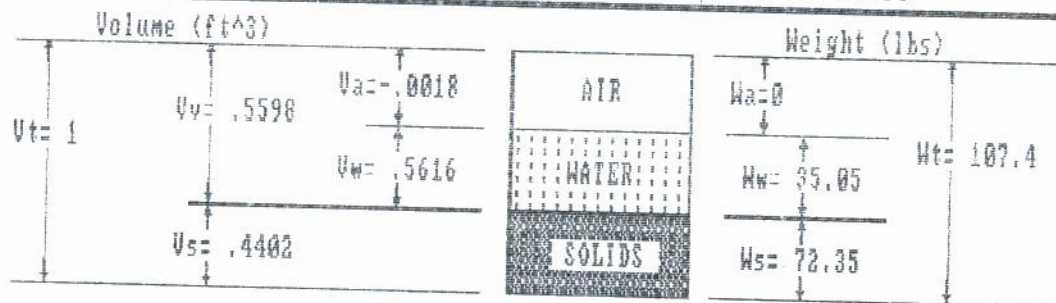
LABORATORIUM MEKANIKA TANAH
JURUSAN TEKNIK SIPIL - FTSP.
INSTITUT SAINS DAN TEKNOLOGI NASIONAL - JAKARTA
 Kampus ISTN Bhumi Srengseng Telp. 7270092

Boring No. = 1	Depth = 200-245	Number = GI. PULOMAS
Mass Unit Weight (pcf)	Water Content (%)	Specific Gravity of Solids
104.231	48.393	2.61



Void Ratio	1.3187	% Saturation	95.78
Porosity (%)	56.87	Dry Unit Wt (pcf)	70.24
Sat. Unit Wt (pcf)	105.73	Bouy. Unit Wt (pcf)	43.33

Boring No. = 1	Depth = 300-345	Number = GI. PULOMAS
Mass Unit Weight (pcf)	Water Content (%)	Specific Gravity of Solids
107.398	48.44	2.634



Void Ratio	1.2717	% Saturation	100.33
Porosity (%)	55.98	Dry Unit Wt (pcf)	72.35
Sat. Unit Wt (pcf)	107.28	Bouy. Unit Wt (pcf)	44.88

TRIAXIAL TEST.

Project : GARDU INDUK 150 KV PULO MAS
 Location : JL. WAWA MANGUN MUKA BARAT JAKARTA TIMUR .
 Boring no : B. I (200-245)cm.
 Test By : Ir. Rahardjo S

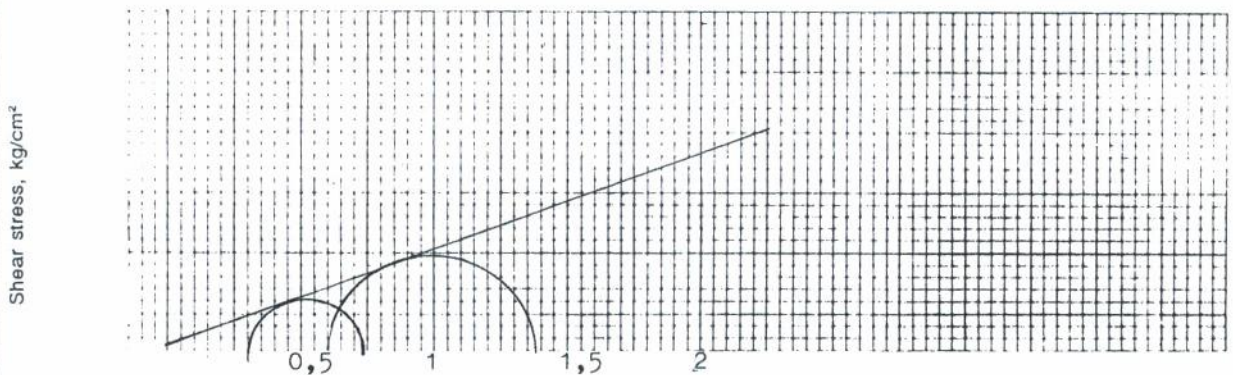
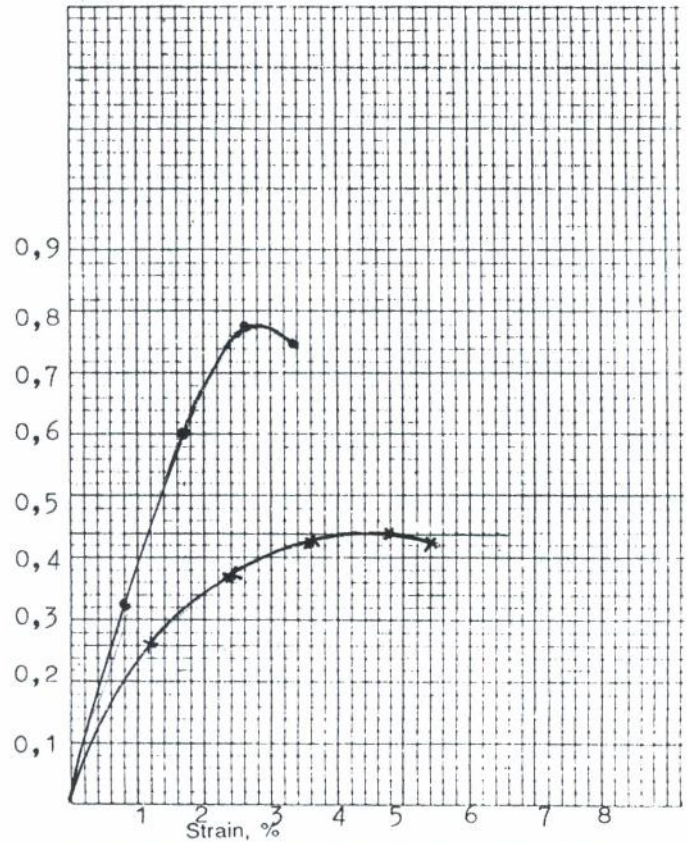
Data :

1. Machine LRC :
2. Sample dia : 3,50 cm.
 Sample ht : 6,78 cm .

	1	2	3	4
σ_3	0,3	0,6		
σ	0,44	0,78		
σ_1	0,79	1,38		
U				

γ wet :		ton/m ³
γ dry :		ton/m ³
w :		%
c :	0,02,	kg/cm ²
ϕ :	21 ^o	
Sr :		%

Deviator stress, ΔU



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TRIAXIAL TEST.

Project : GARDU INDIK 150 KV PULO MAS
 Location : JL. RAWA MANGUN MUKA BARAT
 Boring no : B.I (300-345)cm
 Test By : Ir. Rahardjo S

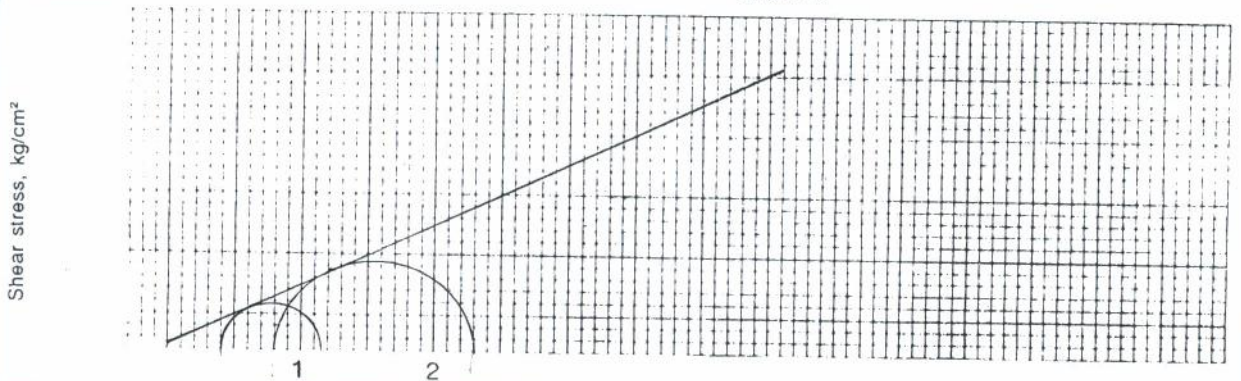
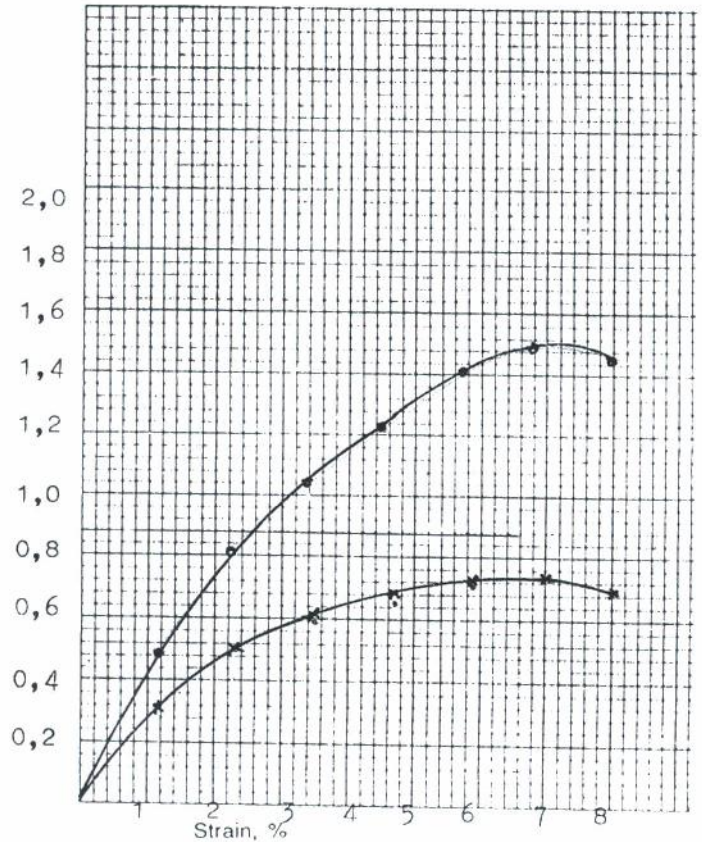
Data :

1. Machine LRC :
2. Sample dia : 3,50 cm.
- Sample ht : 6,99 cm .

	1	2	3	4
σ_3	0,4	0,8		
σ	0,73	1,5		
σ_1	1,13	2,3		
U				

γ wet :		ton/m ³
γ dry :		ton/m ³
w :		%
c :	0,04	kg/cm ²
ϕ :	26 ^o	
Sr :		%

Deviator stress, ΔU
 ——— ΔU

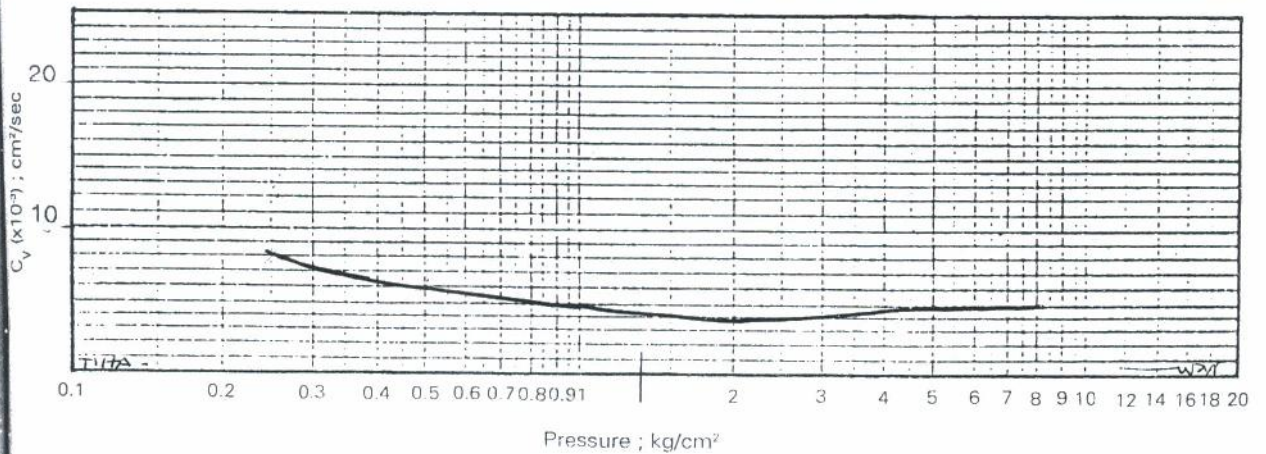
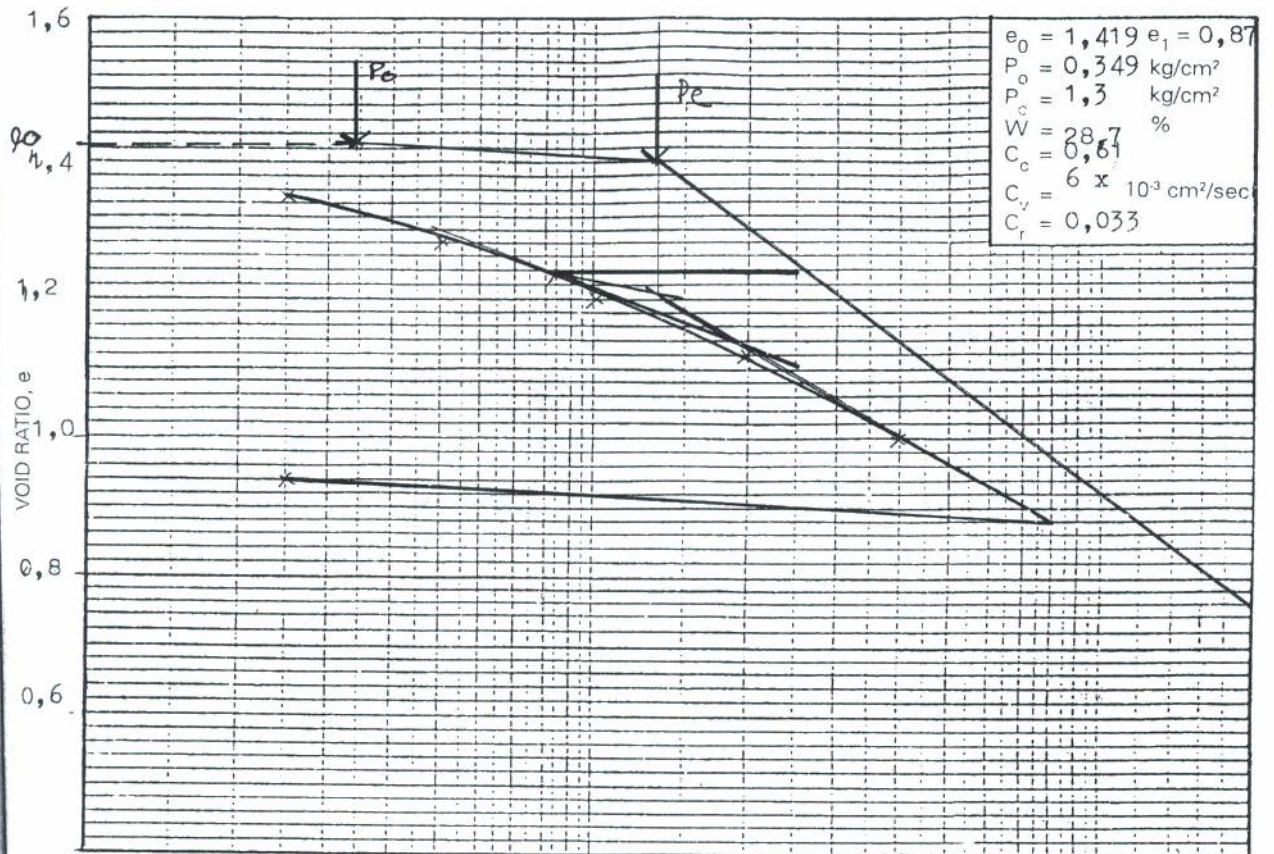


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CONSOLIDATION TEST

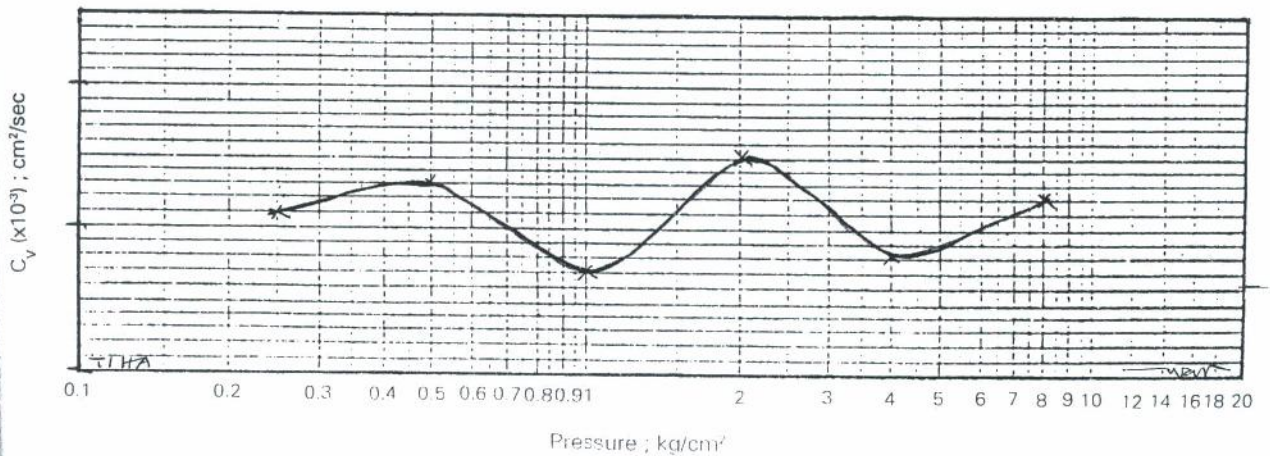
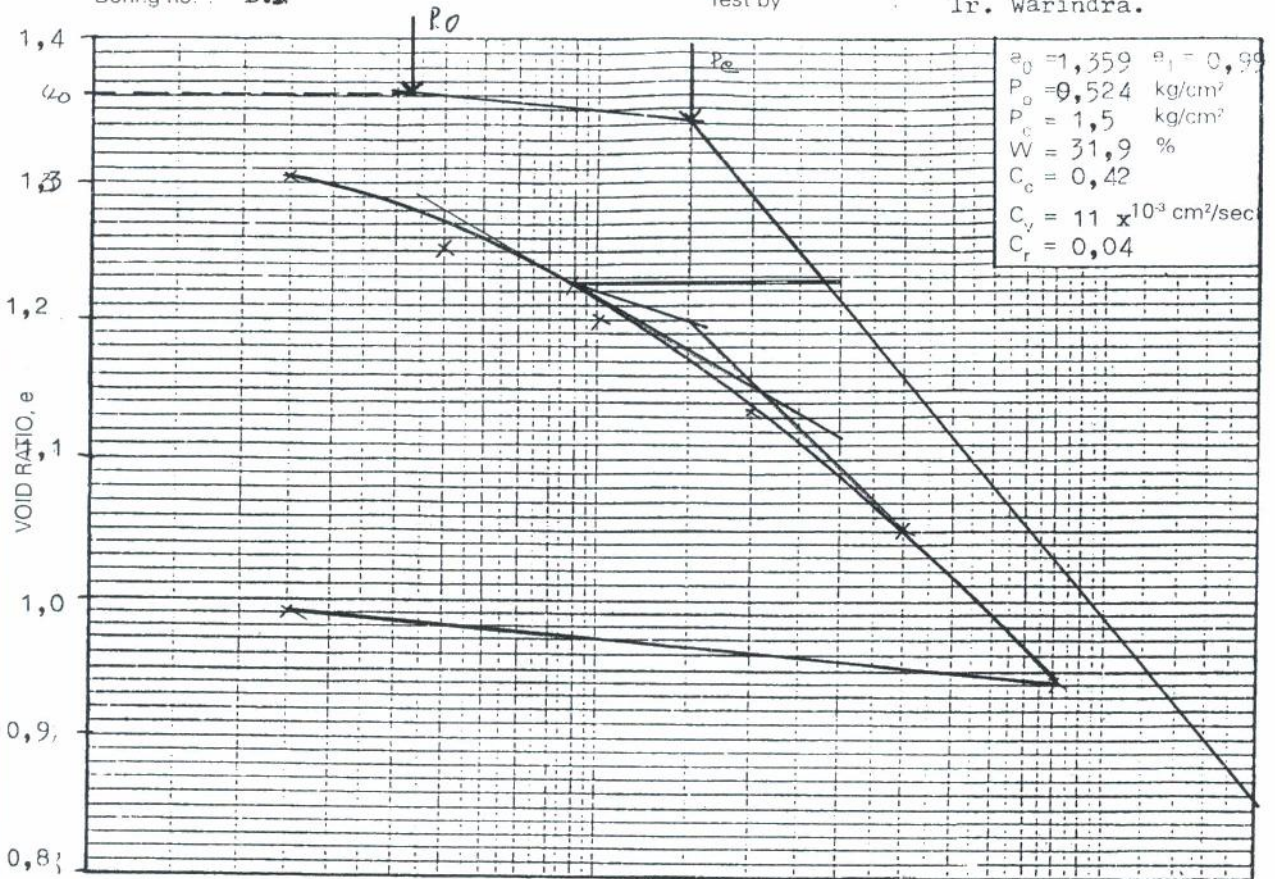
Project : GARLU INDUK 150 KV PULO MAS Depth of Sample : 200-245
 Location : JL. Rw. MANGUN MUKA BARAT Date of test : Nopember 1994
 Boring no. : E.B.I Test by : Ir. Warindra.





CONSOLIDATION TEST

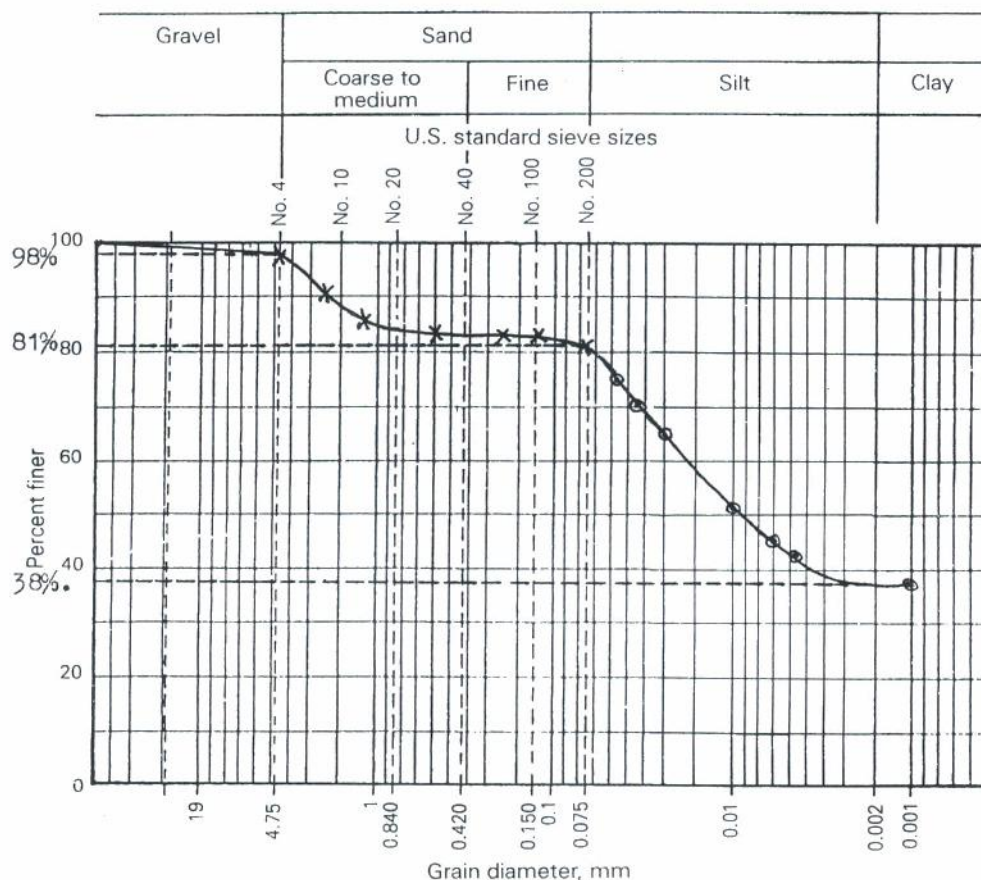
Project : GARDU INDUK 150KV PULO MAS Depth of Sample : 300-345.
 Location : Jl. Rw. MANGUN MUKA BARAT Date of test : Nopember 1994
 Boring no. : B.1 Test by : Ir. Warindra.





GRAIN SIZE DISTRIBUTION

Project GI 150 KV PULO MAS Job No. _____
 Location of Project Jakarta Timur Boring No. B.1 Sample No. 1
 Description of Soil _____ Depth of Sample 200-245.
 Tested By Rr Prihadini Date of Testing Oktober 1994



Visual soil description _____

Soil classification _____

System _____

Gravel : 2 % .

Sand : 17 %.

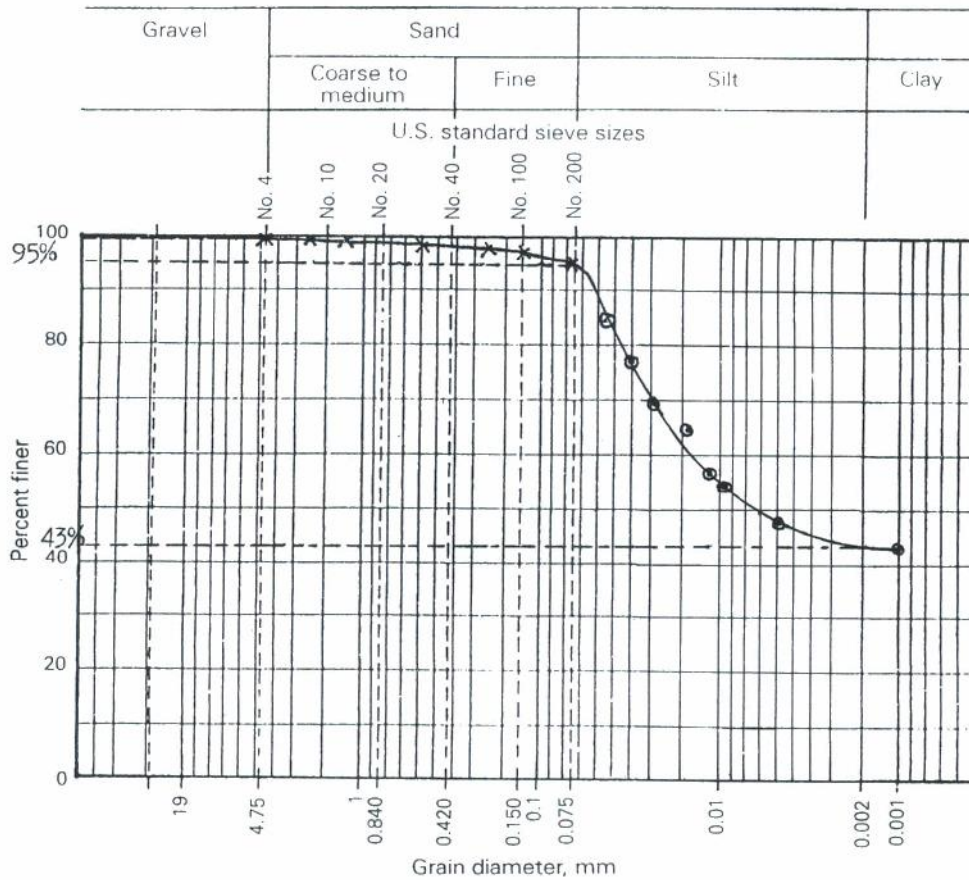
Silt : 43 %.

Clay : 38 %.



GRAIN SIZE DISTRIBUTION

Project GI INDUK 150 KV PULO MAS Job No. _____
 Location of Project JAKARTA TIMUR Boring No. B.I Sample No. 2
 Description of Soil _____ Depth of Sample 300-345
 Tested By Rr Prihadini Date of Testing Oktober 1994



Visual soil description _____

Soil classification _____

System Sieve analysis and hydrometer

Gravel : 0 % Sand : 5 %
 Silt : 52 % Clay : 43 %