社会開発協力部報告書

REPORT
FOR
THE FEASIBILITY STUDY
ON
THE CONSTRUCTION OF DRY DOCK
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

SUPPLEMENTARY DATA

1. SURVEYING
2. SOIL INVESTIGATION

MARCH,1984

JAPAN INTERNATIONAL COOPERATION AGENCY

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1. Objectives

Upon request by the Government of the Socialist Republic of the Union of Burma, a feasibility study for the construction of a dry dock was conducted by the Japan International Cooperation Agency (JICA). In order to obtain the data required to determine primary design costs for civil works and buildings, which form the basis for calculating the construction costs of this feasibility study, surveys and soil investigation were carried out between August and December 1982.

This document comprises supplementary data based on the results of the surveys and soil investigation undertaken for the feasibility study report. The surveys and soil investigation were conducted by the Waterways Department and the Construction Corporation (CC), respectively, under the guidance and supervision of the feasibility study team.

2. Surveys

2-1. Survey Area

The surveys were carried out at the proposed project site as designated by the Burma Dockyard Corporation (BDC), including in the area set aside for future expansion.

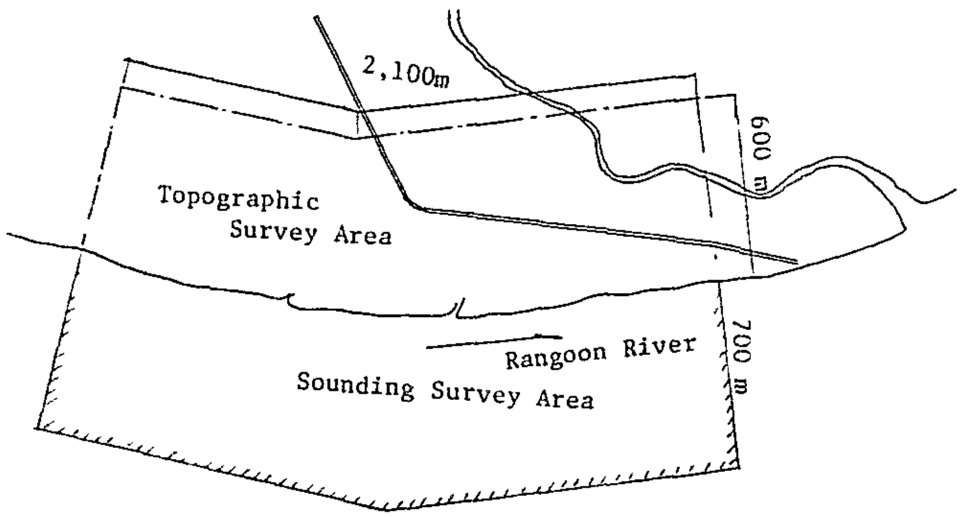


Fig. 2-1 Survey Area

2-2. Items to be Surveyed

(1) Control Point Surveying and Traversing
(2) Topographic Survey
(3) Sounding

2-3. Datum Level

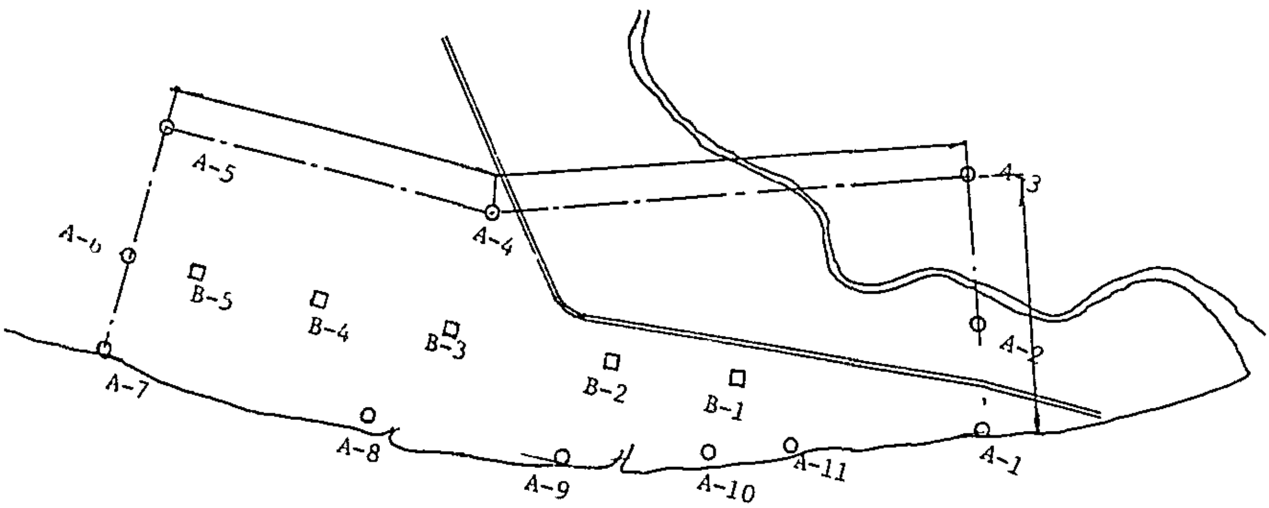
The Rangoon River has 4 tidal gauge points, one of which -- Chockey Point -- lies within the project site. The datum zero at Chockey Point is 0.216m lower than that for the Brooking Street Wharf Point in Rangoon Port.

This survey was performed with Chockey Point taken as datum 0.

2-4. Survey Methods

(1) Control Surveying and Traversing

Traverse points were established at eleven locations around the periphery of the project area, and the angle and distance between points were measured. In addition, six bench marks were established on the small embankment running north-south through the site. The traverse points and bench marks are shown in Fig. 2-2.



A: Traverse Piont
B: Bench Mark

Fig. 2-2. Location of Traverse Points and Bench Marks

(2) Topographic Survey (Cross-Leveling)

Following the establishment of the traverse points, a topographic map was prepared based on measurements of elevations and respective distances to the base points. The following items were included in this map:

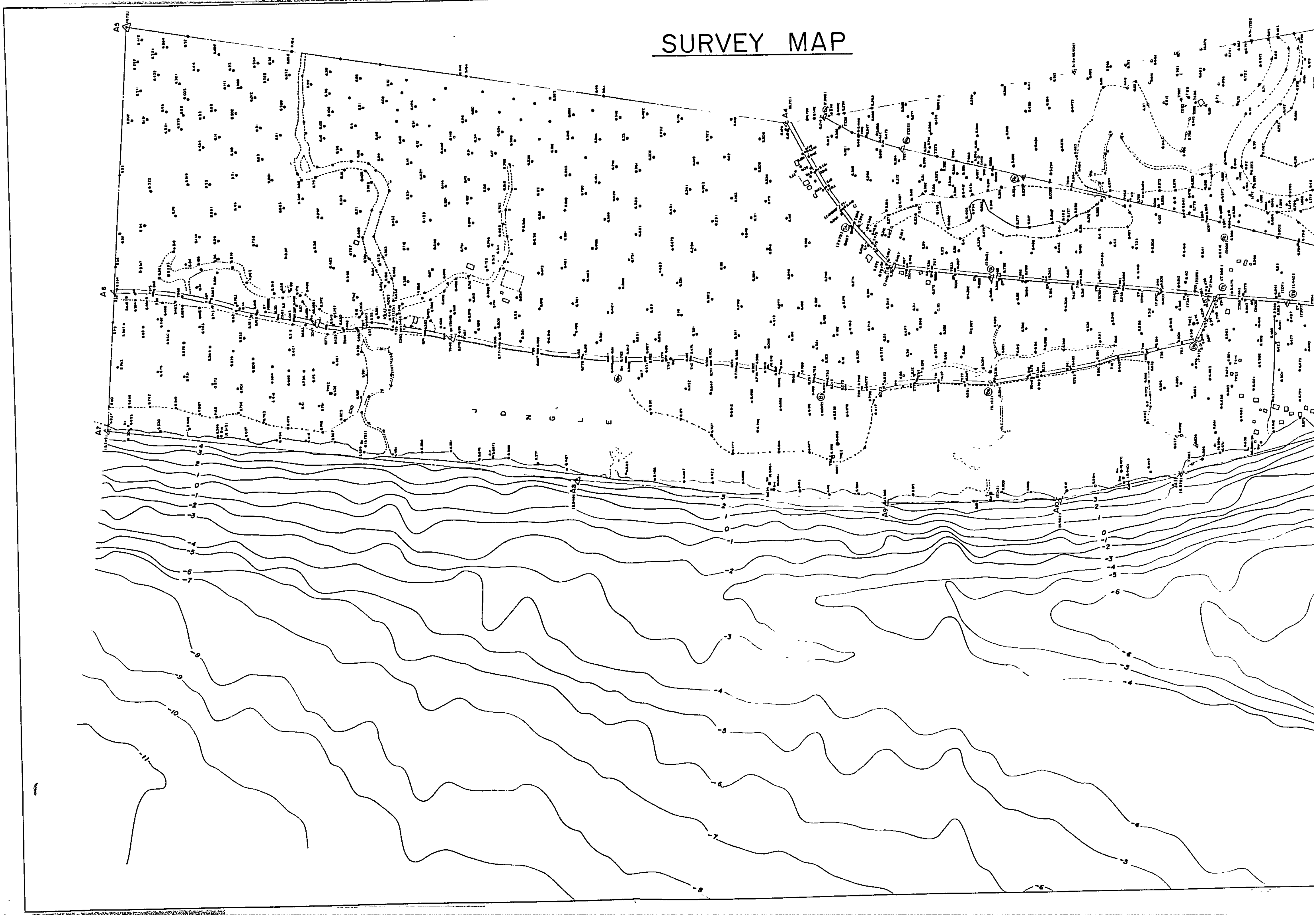
Offshore line
Road
Railway
Houses
Embankment
Paddy fields
Creeks
Concrete structures
Bridge
Traverse points, bench marks
Boring and Dutch cone points

(3) Sounding

Sounding was performed using an echo sounder at 50m intervals along the coastline. The survey boat proceeded forward in accordance with guide points set up on the shore line, and measurement of distances was performed by the intersection method relying on two transit points on the shore.

A survey map based on the results of the topographic survey and sounding is given in Fig. 2-3.

SURVEY MAP



SURVEY MAP

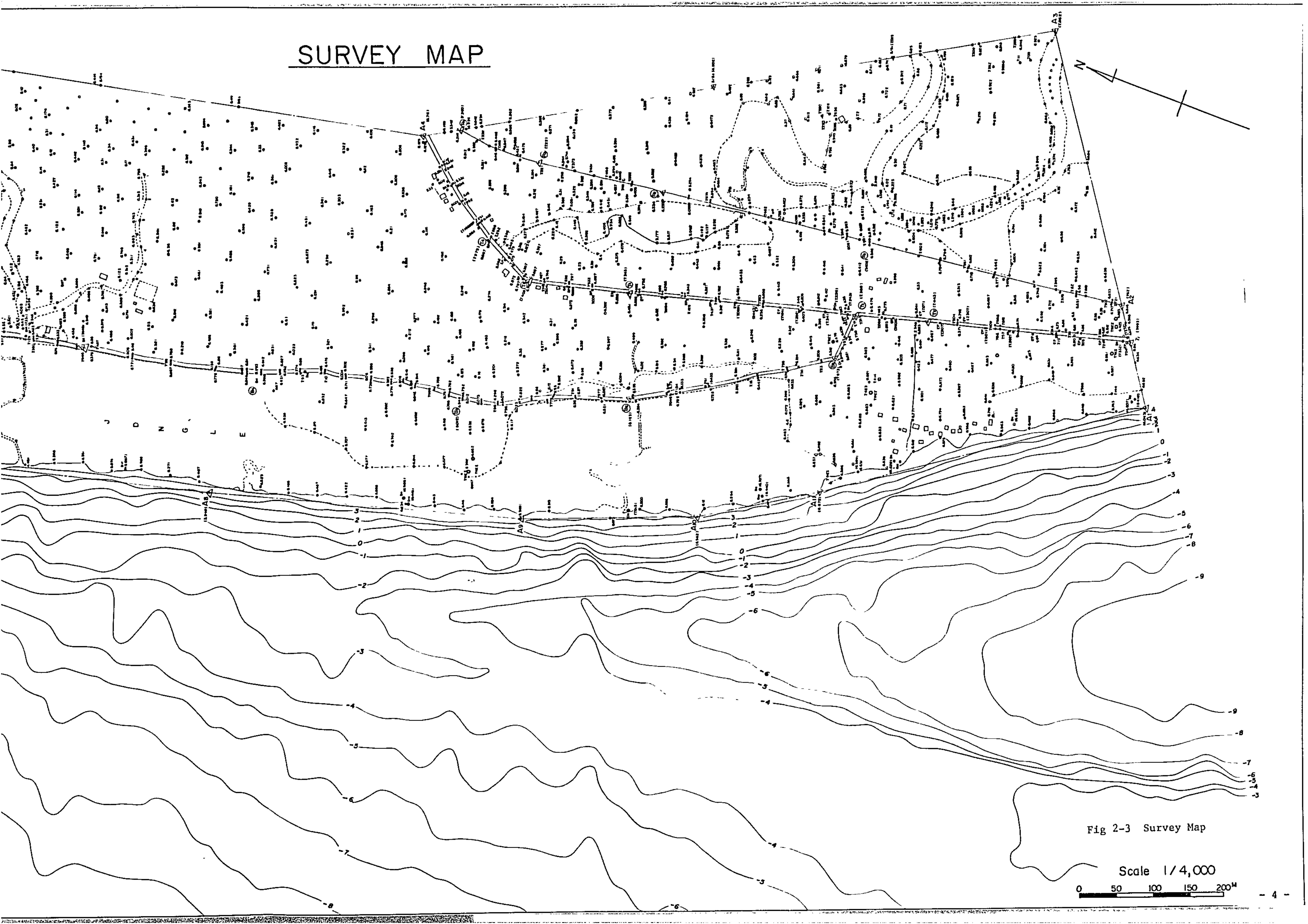


Fig 2-3 Survey Map

3. Soil Investigation

3-1. Investigation Items and Quantities

The investigation items and quantities are listed in Table 3-1 below.

Table 3-1. Investigation Items and Quantities

Items	Unit	Quantity	
Boring	m	337	10 locations
Standard penetration test	time	322	
Undisturbed sampling	time	19	
Dutch cone sounding	m	525	19 locations
Laboratory soil tests			
Natural moisture content	time	300	
LL, PL	time	50	
Grain size analysis	time	50	
Bulk density	time	13	
Unconfined compression	time	13	
Consolidation	time	10	

3-2. Investigation Site

Fig. 3-1 shows the location map for the soil investigation.

3-3. Investigation Methods

(1) Boring

Boring was conducted using 1 hand-feed boring machine and 1 hydraulic machine. The diameter of the bore holes was set at 66 to 88mm in places where standard penetration tests were performed, and 86 to 116mm in places where thin-walled sampling was performed.

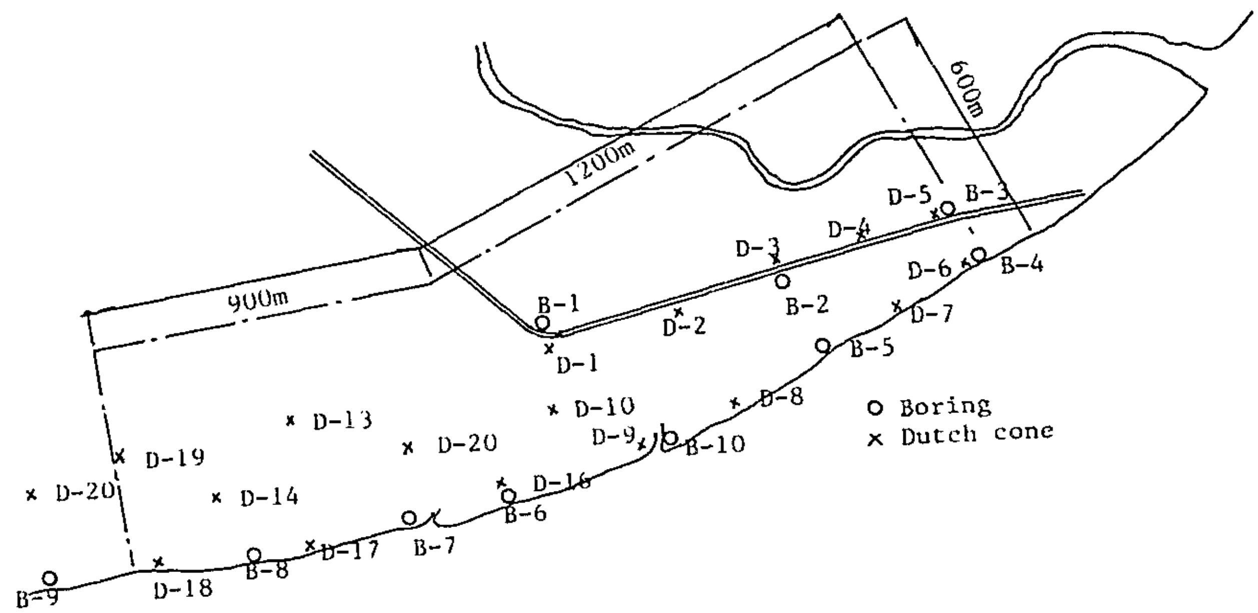


Fig 3-1 Location Map for the Soil Investigation

Bore holes No. 5 and No. 8, where thin-walled sampling was carried out, were drilled using the rotary method. All other bore holes were drilled by the percussion method.

In principle, boring was conducted to a depth exceeding 5m until the hard bearing layer was encountered. However, at bore hole No. 5 an object thought to be stone was hit at a depth of 30m, rendering drilling impossible. Boring was halted at that depth.

(2) Standard Penetration Test (SPT)

In order to extract soil samples and study relative soil strength, the Standard Penetration Test was conducted at all boring points at intervals of 1m.

The test method employed conformed to the standards given in ASTM-D-1586. The standard test method is as follows: the number of blows (N value) is measured so as to penetrate a sampler to a depth of 30cm by dropping a knocking hammer weighing 63.5kg from a height of 75cm. Measurement of the number of blows is taken at intervals of 15cm.

A portion of the samples obtained by the SPT were used for the physical tests, and the remainder were placed in sample bottles and stored at the CC Laboratory.

(3) Undisturbed Sampling

Thin-walled sampling is conducted in order to extract an undisturbed sample to serve as a specimen for mechanical test. A thin-walled sampler of fixed piston type, and a stainless sampling tube with an inside diameter of 75mm and a wall thickness of 1.5mm are used.

(4) Dutch Cone Penetration Test

The Dutch Cone Penetration test is performed as follows:

Cone shape:	Angle 60°; end area 10cm , friction sleeve attached
Measurement pitch:	10cm
Penetration speed:	1cm/sec.
Capacity of proving ring	500kg, 2t

(5) Laboratory Soil Tests

(a) Physical Tests

Physical tests are conducted on the items summarized in Table 4, in accordance with the standards specified in JIS and ASTM.

Table 4. Laboratory Soil Test

Item	Standards for Test
Specific gravity test	JIS-A-1202
Natural water content test	JIS-A-1203
Sieve analysis	JIS-A-1204
Liquid limit test	JIS-A-1205
Plastic limit test	JIS-A-1206

(b) Unconfined Compression Test

This test is performed in accordance with the method summarized below.

Testing method	Conformity with JIS-A-1216
Type of testing apparatus	Machine capable of controlling strain

Configuration and dimensions of specimen	Cylindrical shape, diameter: 5.0cm, height: 12.5cm
Rate of axial compression loading	1%/minute
Maximum strain	Breaking strain +2% or 3%
Summarized test results	The coefficient of deformation is calculated by a strain corresponding to E50 = 1/2qu

(c) Consolidation Test

This test is performed in accordance with the method described as follows.

Testing method	Conformity with JIS-A-1217
Type of consolidation box	Fixed ring
Dimensions of specimen	Diameter: 6.0cm, height: 2.0cm
Loading pattern	0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, 12.8 kg/cm^2
Loading time	1 hour per load

3-4. Results of Soil Investigation

(1) Subsoil Conditions

The subsoil conditions in the project area are poor owing to the present of a soft clay deposit with a thickness of approximately 20 to 25m. In preparing a preliminary design, it will therefore be necessary to take this unfavorable foundation into consideration. It should also be noted that construction of a dockyard on such a poor foundation generally involves higher construction costs compared with dockyard construction on a favorable foundation.

A sketch of the subsoil structure in the project area is shown in Fig. 3-2.

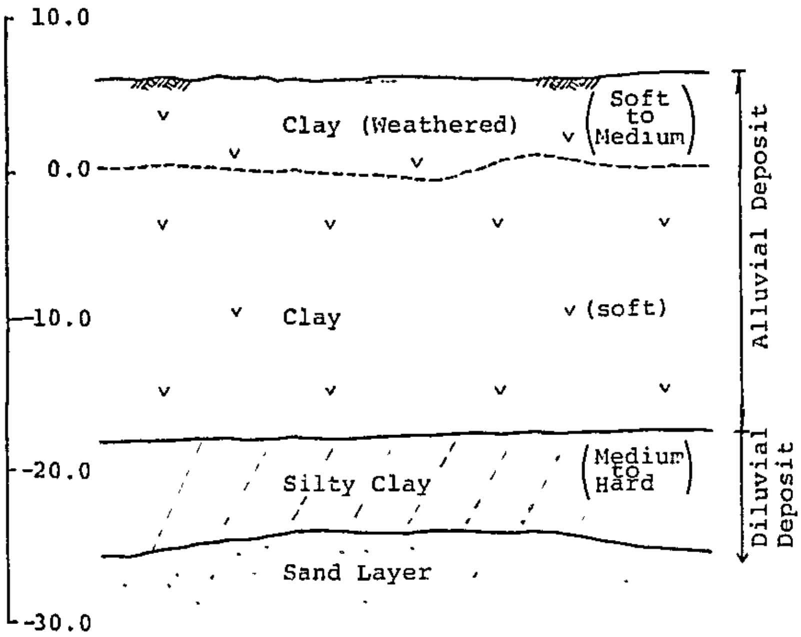


Fig. 3-2. A Sketch of Subsoil Structure

Fig. 3-3 shows a soil profile of the project area based on the results of boring and Dutch cone sounding. The subsoil of the project area comprises, from the top, a clay layer, silty clay layer and a sand layer.

(a) Clay layer

A clay layer deposit is found at a depth of 20 to 25m from the ground surface. The soil in this layer consists of clay featuring high plasticity and cohesiveness. A small amount of decayed plant material (humus) is present. A very thin layer of fine sand lies at the lower part of this layer. No shell fragments are detected. The soil layer is homogeneously composed of uniform clay, and the horizontal continuance of the soil layer is extremely good, thereby indicating that this is a marine or aqueous deposit layer from the alluvial era.

The uppermost portion of this layer is assumed to be a weathered layer to a depth of approximately 7m. While the material comprising this layer is identical to that of the lower portion, it is

relatively harder. Based on the Standard Penetration Test (SPT), the N value of the weathered layer is 2 to 5, while that of the lower part is 0 to 4, indicating that it is soft or medium soft.

(b) Silty clay layer

A relatively hard clay soil layer is found below the clay layer described above, with a thickness ranging from 5 to 10m throughout the project area. A small amount of fine sand is mixed in this layer, and this soil layer is uniform. The color of this layer is gray or milkish white. The upper portion of the subsoil is reddish brown owing to the influence of weathering, thus indicating that this layer at one time formed the ground surface. The N value of this layer ranges from 10 to 20, which is relatively hard for a clay layer. However, it does not have sufficient bearing capacity to support a pile foundation of heavier structures.

(c) Sand layer

The sand layer exists at a depth of approximately 30m from the ground surface. This layer is composed of fine to medium sand, with a small amount of silt mixed in. The soil particles are uniform. The N value of this layer exceeds 50, thus indicating that this layer possesses sufficient bearing capacity to serve as a bearing layer for a pile foundation.

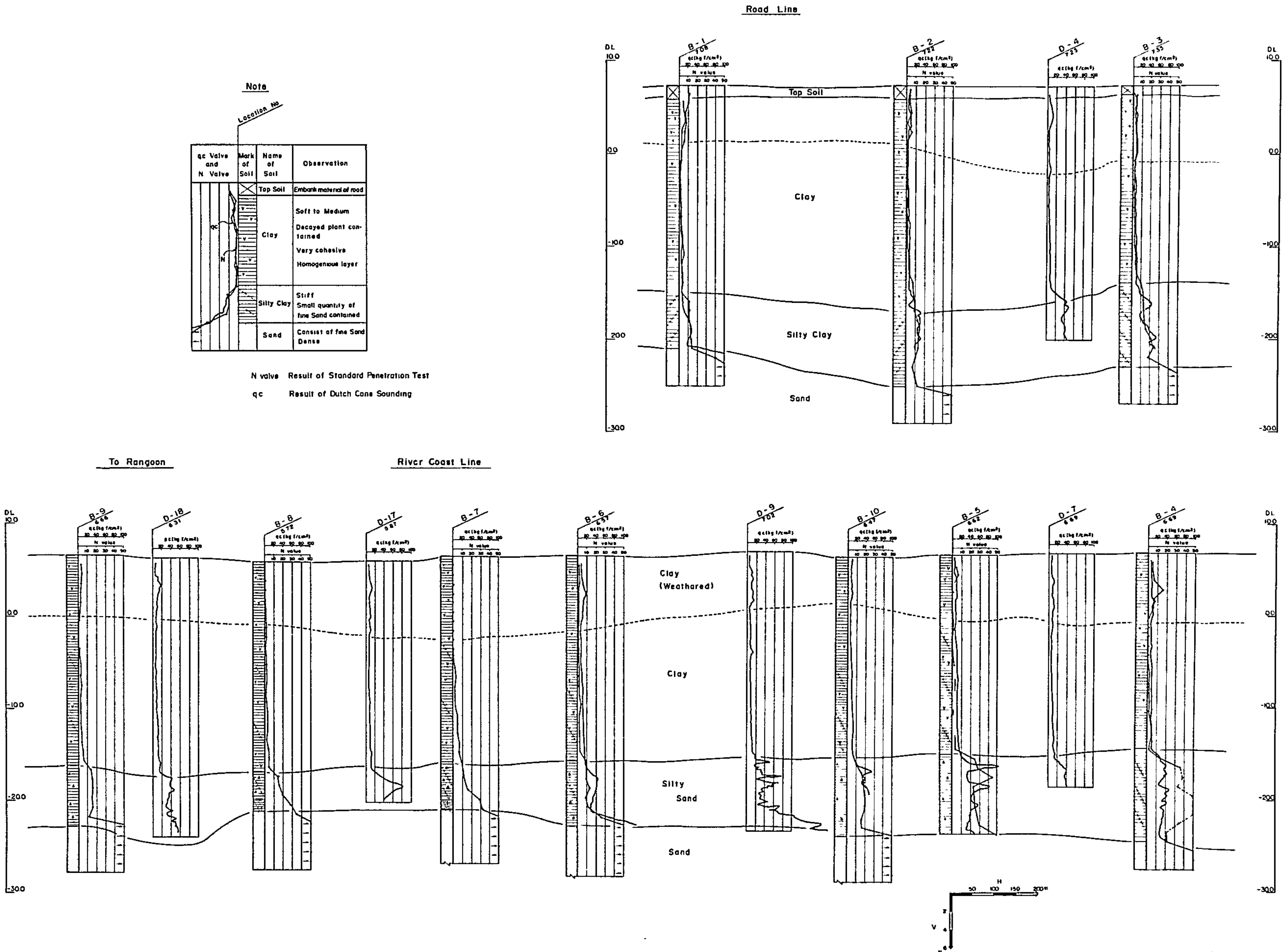


Fig 3-3 Soil Profile

(2) Results of Soil Test

(1) Dutch Cone Sounding

Fig. 3-4 shows the depth distribution of the qc values for the clay soil layer. A wide spread exists in qc values in the weathered layer, i.e., the upper area between 0 and approx. 7m deep. The qc values range from 0.5 to 1.5kg/cm^2.

In the area below a depth of 7m, the linear qc value increases with depth; the relationship between depth and qc value can be expressed using the formula qc = 2.8+0.35D.

A favorable correlation exists between the qc value and cohesion C: qc = λ x c. refers to the coefficient as determined by the shape of the cone being used. In the present test, a mantle cone was used with λ = approx. 15. When λ is 15, the cohesion depth distribution can then be expressed by the formula:

$$C = 0.19 + 0.023D \quad (C\ kg/cm^2,\ Dm).$$

This cohesion distribution will be discussed further in the next article. The qc value of the sand layer exceeds 200kg/cm^2, thereby indicating that this layer offers sufficient bearing capacity to support a pile bearing foundation.

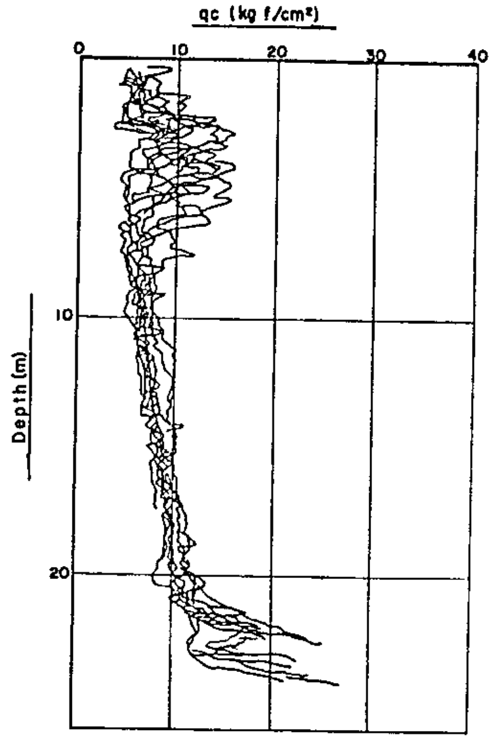


Fig. 3-4. Depth Distribution of qc

(2) Physical Tests

(a) Natural Moisture Content

Fig. 3-5 shows the depth distribution of the natural moisture content (Wn). The weathered upper portion of the clay layer has a Wn of 30 to 50%; the lower portion, 40 to 60%. In the lower silty clay layer, the Wn ranges from 20 to 30%. As a homogeneous clay layer, the spread is considerably large. The size of this spread is believed to be due to inaccuracy in measurement

resulting from non-uniformity in oven temperature during the drying of the test materials. The Wn of the clay layer is assumed to range between 50 and 60% except for the upper weathered portion; this Wn is relatively low compared with typical clay from the alluvial era. The reason for this low Wn is the disparity in minerals comprising the clay. The clay in the testing area is assumed to be kaolinite or some similar clay mineral.

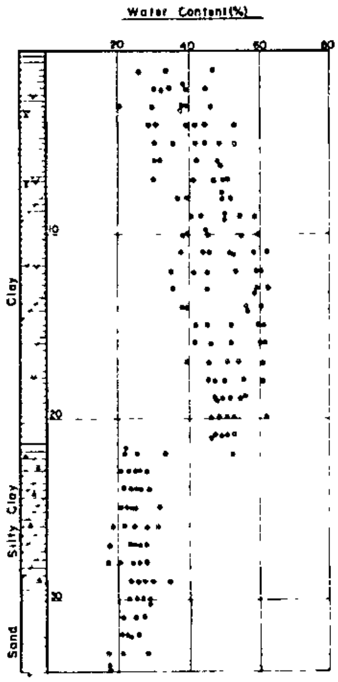


Fig. 3-5. Depth Distribution of Wn

(b) Consistency

Fig. 3-6 shows a plasticity chart based on the results of liquid limit (LL) and plastic limit (PL) tests. Because the measurement of the water content was inaccurate for the reason described above, it is possible that both WL and PL are measured too low. Based

on the test results, the portion of the plasticity chart above line A and with WL greater than 50 is categorized as CH (high-plasticity clay) according to unified classification.

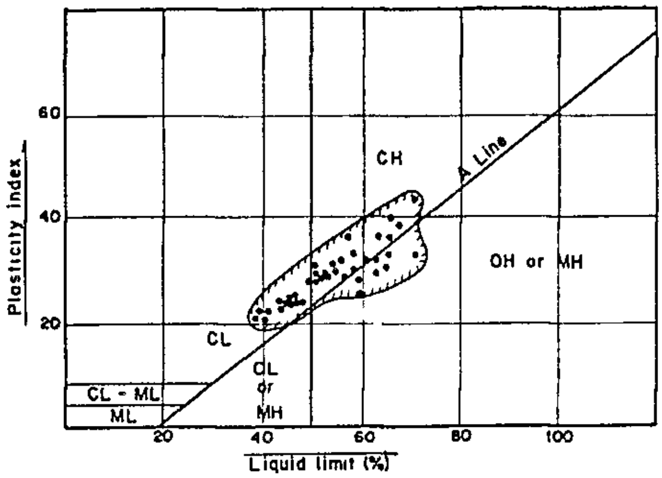


Fig. 3-6. Plasticity Chart

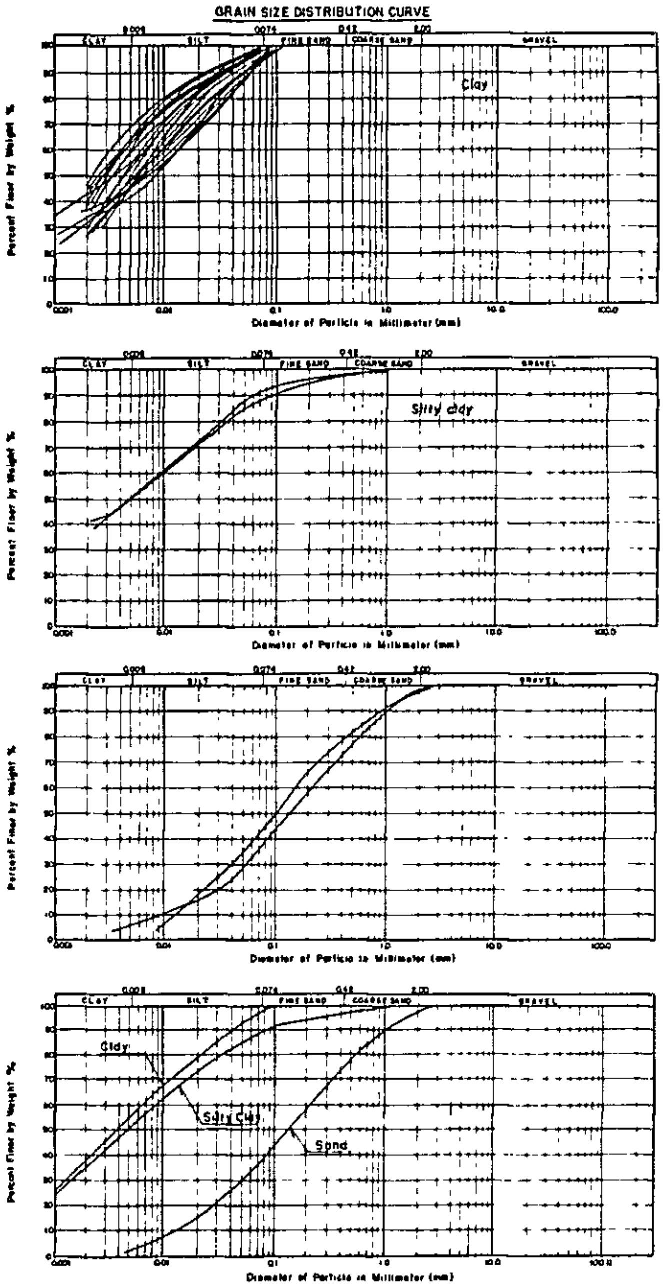
(c) Grain Size Distribution

The grain size distribution for soil in the various soil layers is shown in Fig. 3-7. The major features of the grain size in each soil layer are as follows:

Clay: Contains almost no sand with particle size exceeding 74 . Uniform clay mixed with greater than 50% of clay below 5 .

Silty clay: Contains approx. 10% fine sand and coarse sand. Shows almost identical distribution curve to that of above clay layer.

Sand: Consists of fine sand mixed with approx. 40% silt having particle size below 74 .



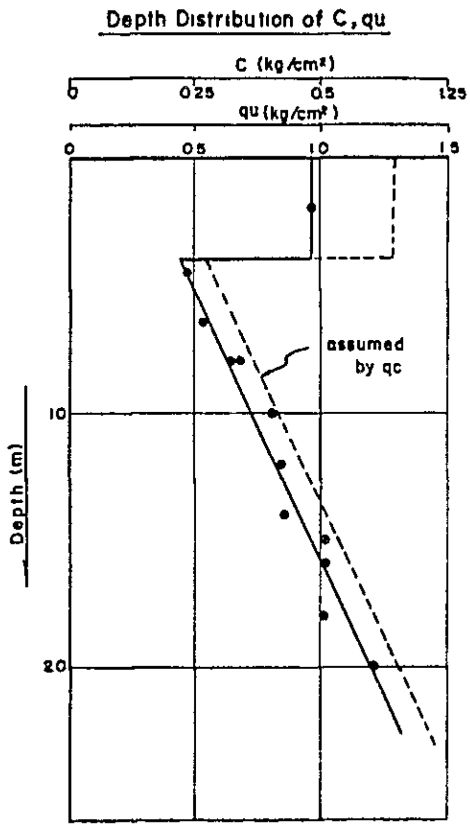
Soil layer	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	Colloid %	Dmax mm	D60 mm	D10 mm	Coeff of Uniformity Uc	2.0mm Under %	0.42mm Under %	0.074mm Under %
Clay	0	0	2	43	55	25	0.08	0.007		—	100	100	98
Silty Clay	0	5	5	43	47	25	1.0	0.009	—	—	100	95	90
Sand	3	23	37	24	3	—	3.0	0.2	0.015	13	97	77	40

Fig. 3-7. Grain Size Distribution

(3) Unconfined Compression Test

Fig. 3-8 shows the depth distribution of compression strength (qu) based on the results of the unconfined compression test. In the figure, in addition to the qu scale the C scale when cohesion is C = 1/2 qu is shown.

Fig. 3-8. Depth Distribution of qu



Cohesion C increases linearly as depth increases, according to the formula C = 0.13 + 0.024D (C kg/cm^2, Dm). The distribution curve of C as assumed from the qc value of the above Dutch cone sounding is also shown.

The distribution curve of C derived from qu is almost identical in shape to that of C derived from qc; however, the value of C is approximately $0.05 kg/cm^2$ larger in the case of qc. This is due to the fact that there is no disturbance involved in the case of the qc value as the testing is performed in-site. On the other hand, with the qu the sampling is believed to be unavoidably disturbed due to sampling and trimming of the specimen, thereby resulting in a relatively small measurement for qu.

(4) Consolidation Tests

(a) e-log P curve

A comparative chart of the e-log P curve is shown in Fig. 3-10. The value curve in the normal consolidation area, i.e., the compression index (Cc), ranges from 0.4 to 0.6. However, as discussed below, because this soil has a large consolidation yield stress (Py), it is necessary to take Py into consideration when using Cc to calculate the consolidation settlement.

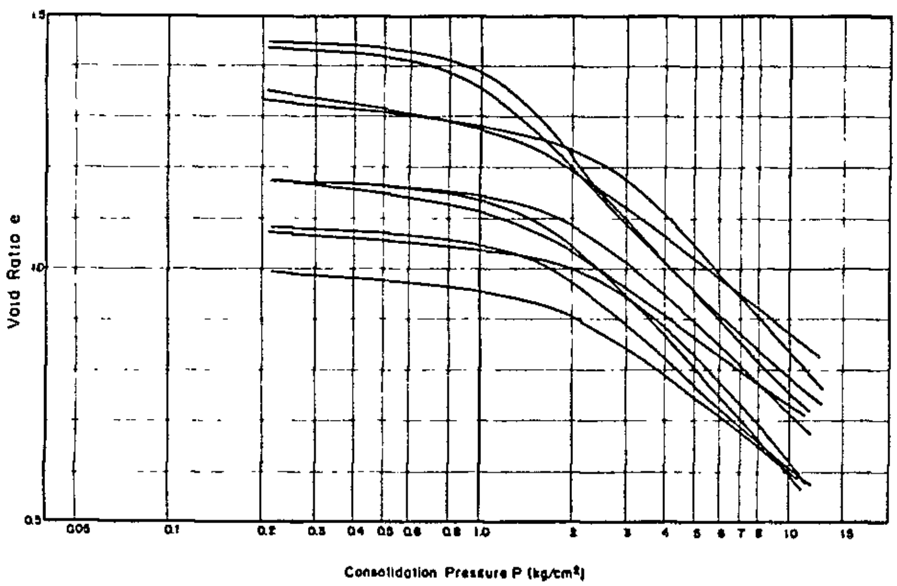


Fig. 3-10 Comparative Chart of e - log p Curve

(b) Coefficient of Consolidation (Cv)

Fig. 3-11 shows the comparative chart of Cv. The Cv for a consolidation yield stress (Py) of 1-2kg/cm^2 is 0.07-0.2cm^2/min, which is a normal value for a high-plasticity clay.

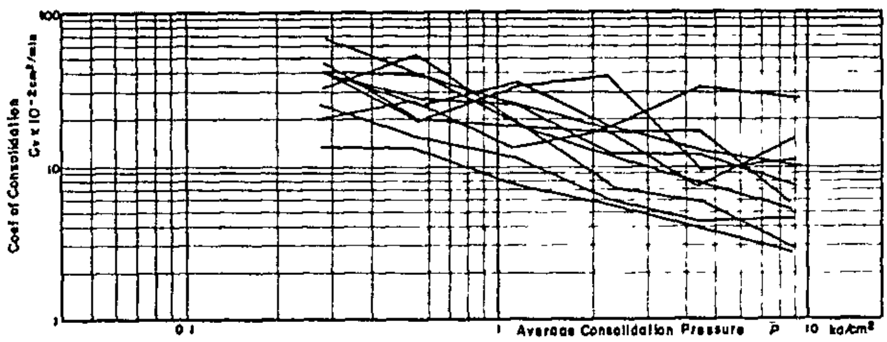


Fig. 3-11 Comparative Chart of Cv

(c) Coefficient of Volume Compressibility (Mv)

A comparative chart of Mv is shown in Fig. 3-12. The value of Mv for Py is 0.02-0.07cm^2, which is small for a high plasticity clay from the alluvial era. This indicates relatively small compressibility.

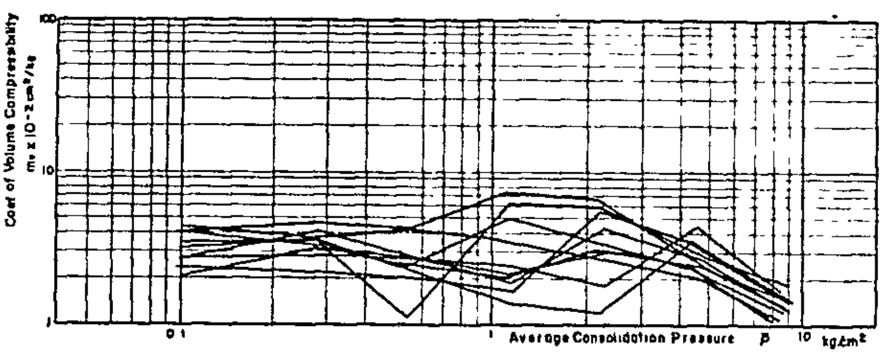


Fig. 3-12 Comparative Chart of Mv

(d) Consolidation Yield Stress (Py)

The depth distribution of Py is shown in Fig. 3-13. The figure shows the effective overburden load (Po) line when the bulk density of the soil is calculated at 1.70. It is generally assumed that Po and Py coincide in the case of normal consolidated clay. However, the Py and Po coincide for clay in which a short aging period has elapsed after sediment; normally, Py is only slightly larger than Po. The clay in this layer shows a Py considerably larger than its Po, and the clay appears to be preconsolidated.

In view of the geographical conditions of the site, however, it is improbable that a surcharge has been loaded on the site subsoil in the past. For this reason, it is theorized that the cause for the Py greatly exceeding the Po is either a lengthy aging period after sediment or quasi-preconsolidation effect due to secondary consolidation or chemicals in the clay minerals.

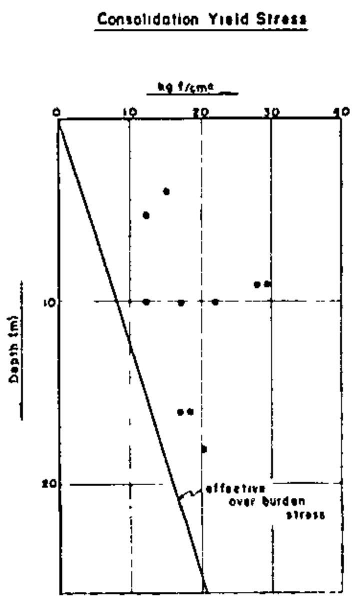


Fig. 3-13 Depth Distribution of Py

BORING LOGS

BORING LOG

TITLE Dry Dockyard Project

LOCATION Thilawa

DATE

GROUND ELEVATION 7.08

BORE HOLE NO. B -1

BORING METHOD Percussion

SAMPLING METHOD

OPERATED BY

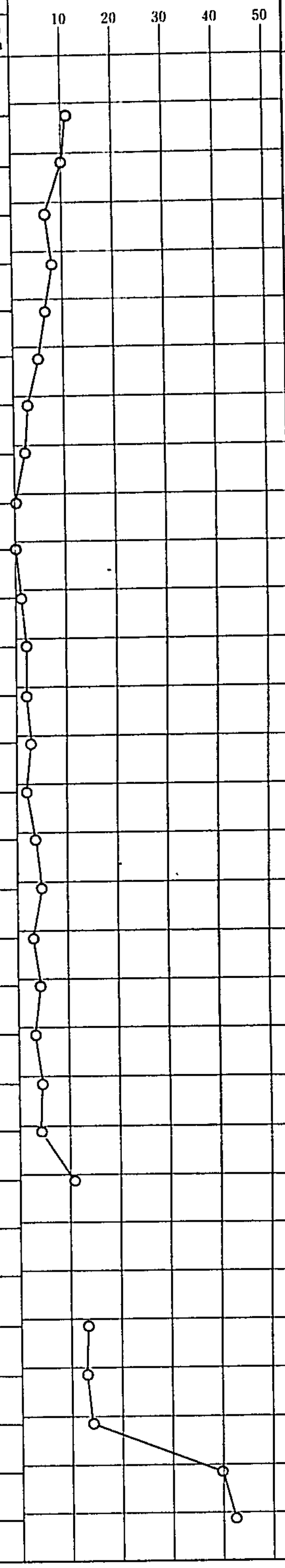
CHECKED BY Suzuki

ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
5.58	1.50	1.50	Top soil	Reddish Brown	Including some gravel	Stiff
14.92	22.00	20.50	Clay / Silty Clay / Clay	Reddish Brown; Bluish Gray; Bluish Gray	High plasticity. Very cohesive. High plasticity. Including small quantity of decayed plant. Very homogenious. Small quantity of fine sand contain. High plasticity.	Stiff to Soft; Soft; Stiff to Medium Stiff
20.92	28.00	8.00	Silty Clay	Reddish Brown; Milkish White and Bluish Gray	Very cohesive. Small quantity of gravel contain. Thin layer of fine sand contain.	Stiff
			Sand	Dark gray	Consist of fine to medium sand.	Very Dence

STANDARD PENETRATION TEST.

SCALE (m)	NUMBER OF BLOWS
1	11 / 30
2	10 / 30
3	7 / 30
4	8 / 30
5	6 / 30
6	5 / 30
7	2 / 30
8	2 / 30
9	0
10	0
11	1 / 30
12	2 / 30
13	2 / 30
14	3 / 30
15	2 / 30
16	4 / 30
17	5 / 30
18	3 / 30
19	4 / 30
20	3
21	5
22	4
23	11
26	13
27	13
28	14
29	40
30	43

N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH



SAMPLING: DEPTH(m) | SAMPLE NO

NOTE

BORING LOG

TITLE: Dry Dockyard Project

BORE HOLE NO.: B - 2

LOCATION: Thilawa

BORING METHOD: Percussion

OPERATED BY:

DATE:

SAMPLING METHOD:

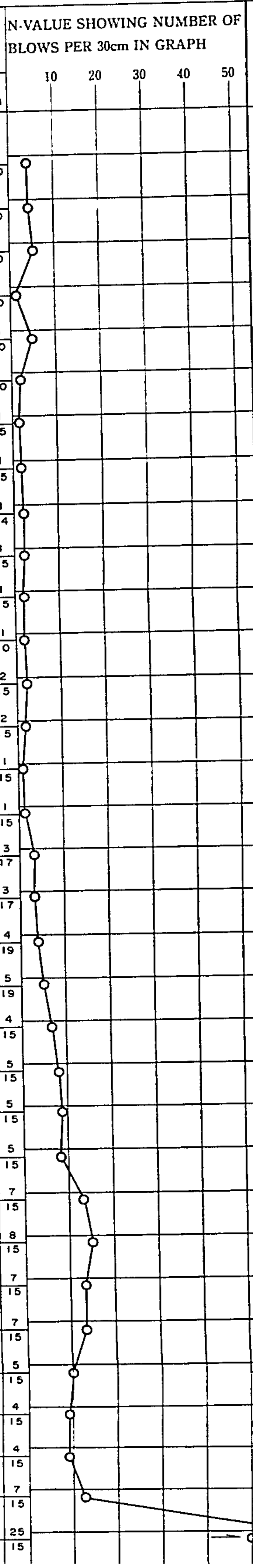
CHECKED BY: Suzuki

GROUND ELEVATION: 7.22

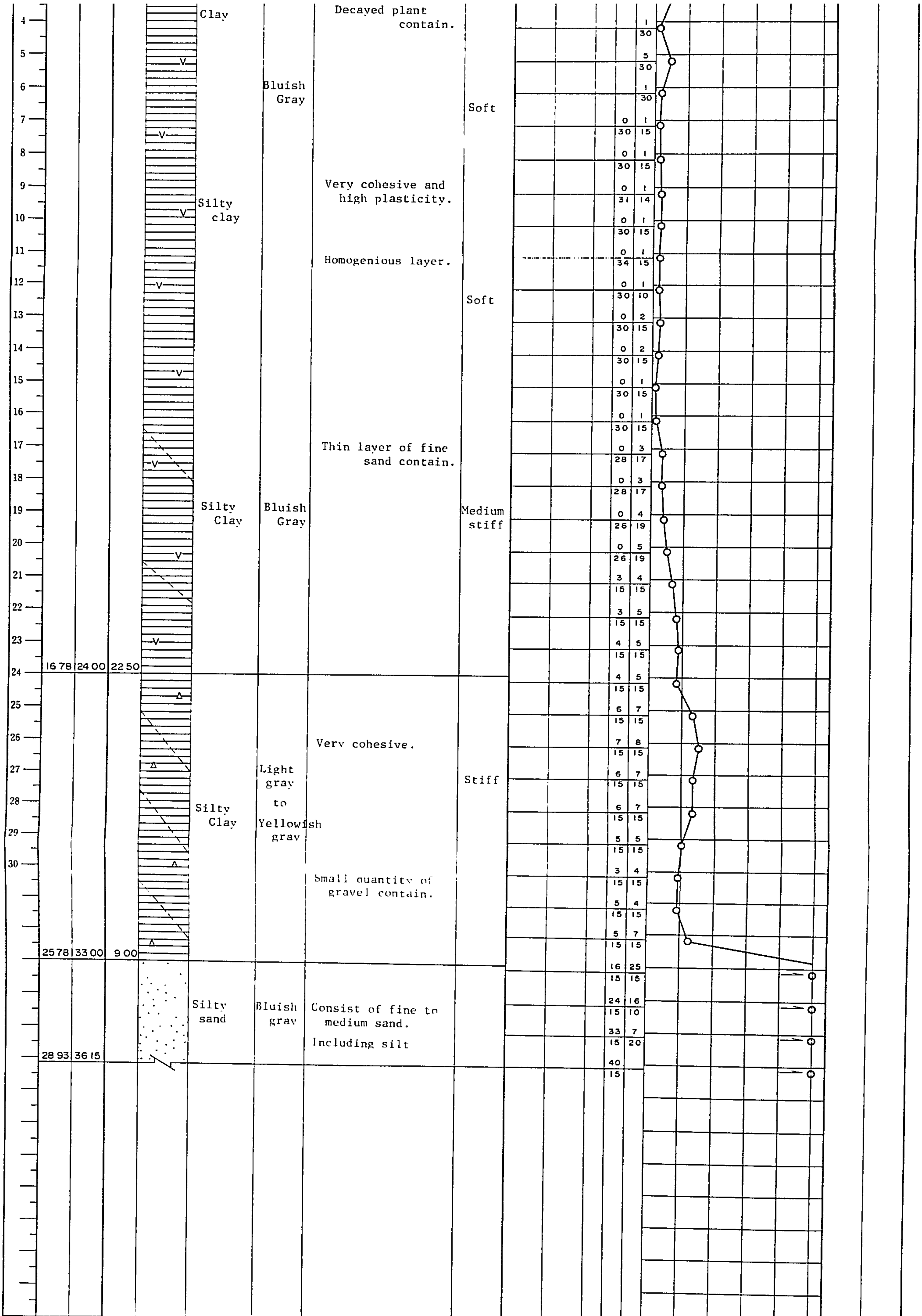
ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
5.72	1.50	1.50	Top Soil	Reddish Brown	Lateric soil	Stiff
16.78	24.00	22.50	Clay / Silty clay / Silty Clay	Reddish Brown; Bluish Gray; Bluish Gray	Very cohesive. Decayed plant contain. Very cohesive and high plasticity. Homogenious layer. Thin layer of fine sand contain.	Stiff; Soft; Soft; Medium stiff
25.78	33.00	9.00	Silty Clay	Light gray to Yellowish gray	Very cohesive. Small quantity of gravel contain.	Stiff

STANDARD PENETRATION TEST — NO OF BLOWS PER 10cm (blows / penetration in cm)

Test	10 cm	20 cm	30 cm
1			4 / 30
2			4 / 30
3			5 / 30
4			1 / 30
5			5 / 30
6			1 / 30
7		0 / 30	1 / 15
8		0 / 30	1 / 15
9		0 / 31	1 / 14
10		0 / 30	1 / 15
11		0 / 34	1 / 15
12		0 / 30	1 / 10
13		0 / 30	2 / 15
14		0 / 30	2 / 15
15		0 / 30	1 / 15
16		0 / 30	1 / 15
17		0 / 28	3 / 17
18		0 / 28	3 / 17
19		0 / 26	4 / 19
20		0 / 26	5 / 19
21		3 / 15	4 / 15
22		3 / 15	5 / 15
23		4 / 15	5 / 15
24		4 / 15	5 / 15
25		6 / 15	7 / 15
26		7 / 15	8 / 15
27		6 / 15	7 / 15
28		6 / 15	7 / 15
29		5 / 15	5 / 15
30		3 / 15	4 / 15
31		5 / 15	4 / 15
32		5 / 15	7 / 15
33		16 / 15	25 / 15



SAMPLING: DEPTH(m) | SAMPLE NO



Clay
Decayed plant contain.
Bluish Gray
Soft
Very cohesive and high plasticity.
Silty clay
Homogenious layer.
Soft
Thin layer of fine sand contain.
Silty Clay
Bluish Gray
Medium stiff
16 78
24 00
22 50
Very cohesive.
Light gray to Yellowish gray
Stiff
Silty Clay
Small quantity of gravel contain.
25 78
33 00
9 00
Silty sand
Bluish gray
Consist of fine to medium sand. Including silt
28 93
36 15
1 30
5 30
1 30
0 1 30 15
0 1 30 15
0 1 31 14
0 1 30 15
0 1 34 15
0 1 30 10
0 2 30 15
0 2 30 15
0 1 30 15
0 1 30 15
0 3 28 17
0 3 28 17
0 4 26 19
0 5 26 19
3 4 15 15
3 5 15 15
4 5 15 15
4 5 15 15
6 7 15 15
7 8 15 15
6 7 15 15
6 7 15 15
5 5 15 15
3 4 15 15
5 4 15 15
5 7 15 15
16 25 15 15
24 16 15 10
33 7 15 20
40 15

NOTE

BORING LOG

TITLE Dry Dockyard Project

LOCATION Thilawa

DATE

GROUND ELEVATION 7.33

BORING METHOD Percusson

SAMPLING METHOD

BORE HOLE NO. B - 3

OPERATED BY

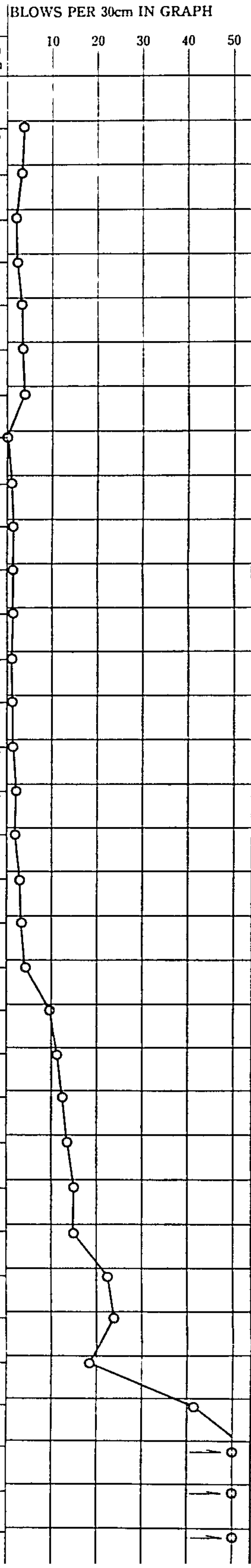
CHECKED BY Suzuki

SCALE (m)	ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
0–1	6.33	1.00	1.00	Top soil	Reddish Brown	Gravels contain	Stiff
1–21	13.67	21.00	20.00	Clay	Reddish Brown	Very cohesive.	Stiff to Soft
						Thin layer of fine sand contain.	
				Silty clay	Bluish gray	Decayed plant contain	Soft
						High plasticity and very cohesive.	
						Homogeneous layer.	
				Silty clay	Bluish gray		Stiff
21–30	22.67	30.00	11.00	Silty Clay	Bluish gray	High plasticity.	Stiff
					Light gray	Thin layer of fine sand between.	
						Gravels contain	
30–	26.67	34.00		Sand	Bluish gray	Mainly consist of fine sand including silt.	Dense

STANDARD PENETRATION TEST

SCALE (m)	NUMBER OF BLOWS	NO OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
1	4/30	1/15	2/15	2/15
2	3/30	0/15	1/15	2/15
3	2/30	0/15	1/15	1/15
4	2/30	0/15	1/15	1/15
5	3/30	0/15	1/15	2/15
6	3/30	1/15	1/15	2/15
7	4/30	1/15	2/15	2/15
8	0/30	0/30		
9	1/30		0/30	1/15
10	1/30		0/30	1/15
11	1/30		0/30	1/15
12	1/30		0/30	1/15
13	1/30		0/30	1/15
14	1/30		0/30	1/15
15	2/32		0/28	2/17
16	2/32		0/28	2/17
17	2/30		0/30	2/15
18	3/30	0/22	1/8	2/15
19	3/30	0/20	1/10	2/15
20	4/30	1/15	2/15	2/15
21	10/30	3/15	4/15	6/15
22	11/30	3/15	5/15	6/15
23	12/30	4/15	5/15	7/15
24	13/30	4/15	6/15	7/15
25	14/30	4/15	6/15	8/15
26	15/30	4/15	7/15	8/15
27	22/30	6/15	9/15	13/15
28	24/30	6/15	11/15	13/15
29	18/30	5/15	8/15	10/15
30	42/30	10/15	14/15	28/15
31	40/22	14/15	23/15	17/7
32	41/23	14/15	23/15	18/8
33	40/24	16/15	24/15	16/9

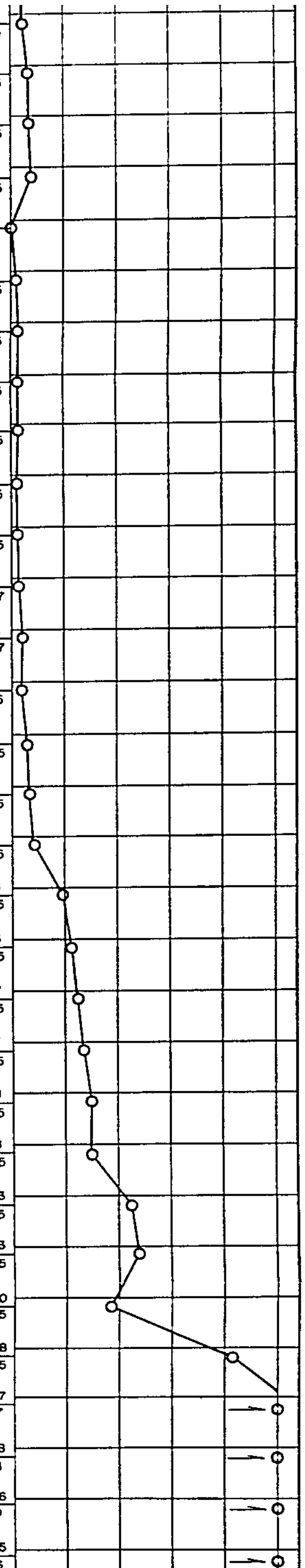
N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH



SAMPLING: DEPTH (m) | SAMPLE NO

Depth (m)				Soil	Color	Description	Consistency
4–21	13 67	2100	2000	Silty clay	Bluish gray	Thin layer of fine sand contain.	Stiff to Soft
				Silty clay	Bluish gray	Decayed plant contain	Soft
						High plasticity and very cohesive.	
				Silty clay	Bluish gray	Homogeneous layer.	Stiff
21–30	22 67	3000	1100	Silty Clay	Bluish gray / Light gray	High plasticity. Thin layer of fine sand between. Gravels contain	Stiff
30–34	26 67	3400		Sand	Bluish grav	Mainly consist of fine sand including silt.	Dense

Depth				
4	2 / 30	0 / 15	1 / 15	1 / 15
5	3 / 30	0 / 15	1 / 15	2 / 15
6	3 / 30	1 / 15	1 / 15	2 / 15
7	4 / 30	1 / 15	2 / 15	2 / 15
8	0 / 30	0 / 30		
9	1 / 30		0 / 30	1 / 15
10	1 / 30		0 / 30	1 / 15
11	1 / 30		0 / 30	1 / 15
12	1 / 30		0 / 30	1 / 15
13	1 / 30		0 / 30	1 / 15
14	1 / 30		0 / 30	1 / 15
15	2 / 32		0 / 28	2 / 17
16	2 / 32		0 / 28	2 / 17
17	2 / 30		0 / 30	2 / 15
18	3 / 30	0 / 22	1 / 8	2 / 15
19	3 / 30	0 / 20	1 / 10	2 / 15
20	4 / 30	1 / 15	2 / 15	2 / 15
21	10 / 30	3 / 15	4 / 15	6 / 15
22	11 / 30	3 / 15	5 / 15	6 / 15
23	12 / 30	4 / 15	5 / 15	7 / 15
24	13 / 30	4 / 15	6 / 15	7 / 15
25	14 / 30	4 / 15	6 / 15	8 / 15
26	15 / 30	4 / 15	7 / 15	8 / 15
27	22 / 30	6 / 15	9 / 15	13 / 15
28	24 / 30	6 / 15	11 / 15	13 / 15
29	18 / 30	5 / 15	8 / 15	10 / 15
30	42 / 30	10 / 15	14 / 15	28 / 15
31	40 / 22	14 / 15	23 / 15	17 / 7
32	41 / 23	14 / 15	23 / 15	18 / 8
33	40 / 24	16 / 15	24 / 15	16 / 9
34	40 / 21	16 / 15	25 / 15	15 / 6



NOTE

BORING LOG

TITLE Dry Dockyard Project

BORE HOLE NO. B - 4

LOCATION Thilawa

BORING METHOD Percussion

OPERATED BY

DATE

SAMPLING METHOD

CHECKED BY

GROUND ELEVATION 6.69

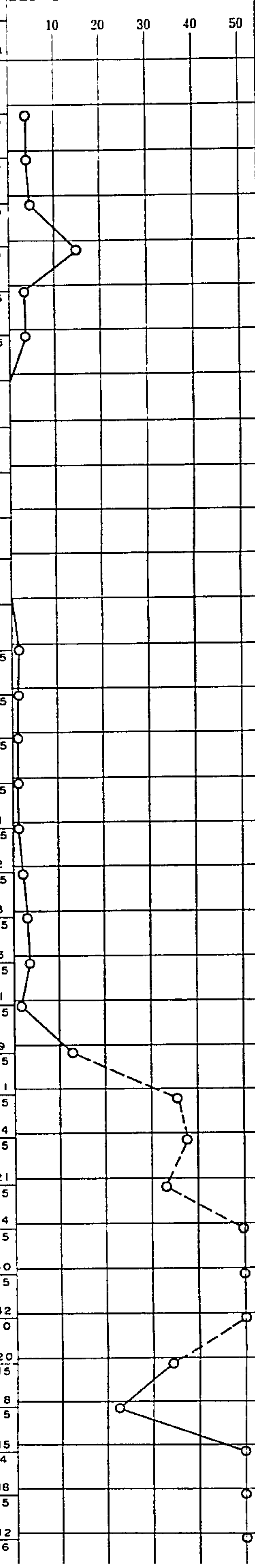
P

SCALE (m)	ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
0 – 22	15.31	22.00	22.00	Clay	Reddish brown	Weatherd layer High plasticity.	Stiff
				Silty clay	Bluish gray	Decayed plant contain	Soft
						High plasticity and very cohesive.	
				Silty clay	Dark gray	Thin layer of fine sand contain.	Medium stiff
22 – 30.50	23.81	30.50	7.50	Silty clay	Reddish clay Milkish white to Bluish gray	Small gravels contain High plasticity. Cohesive clay	Stiff
30.50 – 33.21	26.52	33.21		Silty sand	Dark gray	Consist of fine sand including silt.	Dense

STANDARD PENETRATION TEST

DEPTH (m)	NUMBER OF BLOWS	NO OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
1.15	4 / 30	1 / 15	2 / 15	2 / 15
2.15	4 / 30	1 / 15	2 / 15	2 / 15
3.15	5 / 30	1 / 15	2 / 15	3 / 15
4.15	15 / 30	3 / 15	6 / 15	9 / 15
5.15	4 / 30	1 / 15	2 / 15	2 / 15
6.15	4 / 30	1 / 15	2 / 15	2 / 15
7.15	0 / 28	0 / 28		
8.15	0 / 28	0 / 28		
9.15	0 / 28	0 / 28		
10.15	0 / 28	0 / 28		
11.15	0 / 22	0 / 22		
12.15	0 / 28	0 / 28		
13.15	1 / 30	0 / 15	0 / 15	1 / 15
14.15	1 / 30	0 / 15	0 / 15	1 / 15
15.15	1 / 30	0 / 15	0 / 15	1 / 15
16.15	1 / 30	0 / 15	0 / 15	1 / 15
17.15	1 / 30	0 / 15	0 / 15	1 / 15
18.15	2 / 30	0 / 15	0 / 15	2 / 15
19.15	3 / 30	0 / 15	0 / 15	3 / 15
20.15	3 / 30	0 / 15	0 / 15	3 / 15
21.15	1 / 30	0 / 15	0 / 15	1 / 15
22.15	13 / 30	2 / 15	4 / 15	9 / 15
23.15	36 / 30	7 / 15	15 / 15	21 / 15
24.15	38 / 30	7 / 15	14 / 15	24 / 15
25.15	33 / 30	7 / 15	12 / 15	21 / 15
26.15	54 / 30	8 / 15	20 / 15	34 / 15
27.15	64 / 30	10 / 15	24 / 15	40 / 15
28.15	62 / 25	12 / 15	22 / 15	42 / 10
29.15	34 / 30	7 / 15	14 / 15	20 / 15
30.15	23 / 30	4 / 15	5 / 15	18 / 15
31.15	50 / 19	23 / 15	35 / 15	15 / 4
32.15	50 / 20	30 / 15	32 / 15	18 / 5
33.15	50 / 21	25 / 15	38 / 15	12 / 6

N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH

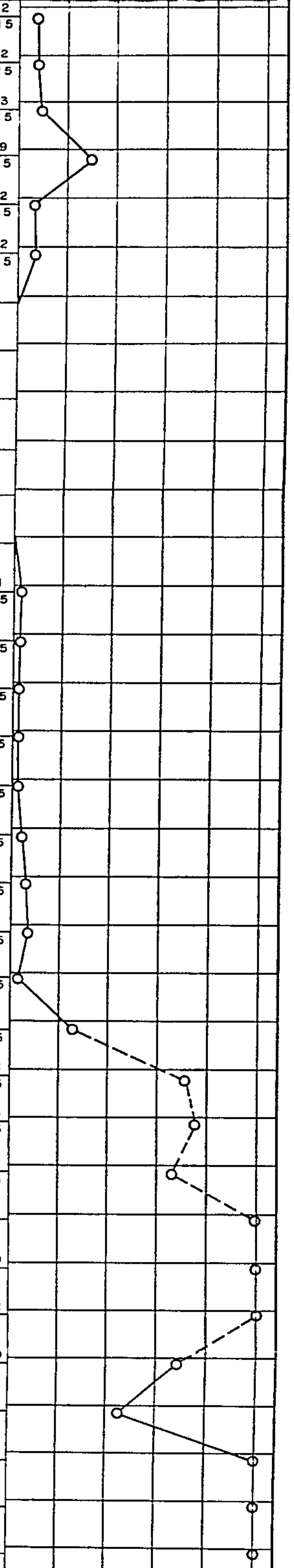


SAMPLING

DEPTH (m)	SAMPLE NO

Elevation	Depth	Thickness	Soil type	Color	Description	Consistency
15.31	22.00	22.00	Clay; Silty clay; Silty clay	Brown; Bluish gray; Dark gray	High plasticity. Decayed plant contain. High plasticity and very cohesive. Thin layer of fine sand contain.	Stiff; Soft; Medium stiff
23.81	30.50	7.50	Silty clay	Reddish clay; Milkish white to Bluish gray	Small gravels contain. High plasticity. Cohesive clay	Stiff
26.52	33.21		Silty sand	Dark gray	Consist of fine sand including silt.	Dense

Depth	N / Penetration	1st	2nd	3rd
1.15	4 / 30	1 / 15	2 / 15	2 / 15
2.15	4 / 30	1 / 15	2 / 15	2 / 15
3.15	5 / 30	1 / 15	2 / 15	3 / 15
4.15	15 / 30	3 / 15	6 / 15	9 / 15
5.15	4 / 30	1 / 15	2 / 15	2 / 15
6.15	4 / 30	1 / 15	2 / 15	2 / 15
7.15	0 / 28	0 / 28		
8.15	0 / 28	0 / 28		
9.15	0 / 28	0 / 28		
10.15	0 / 28	0 / 28		
11.15	0 / 22	0 / 22		
12.15	0 / 28	0 / 28		
13.15	1 / 30	0 / 15	0 / 15	1 / 15
14.15	1 / 30	0 / 15	0 / 15	1 / 15
15.15	1 / 30	0 / 15	0 / 15	1 / 15
16.15	1 / 30	0 / 15	0 / 15	1 / 15
17.15	1 / 30	0 / 15	0 / 15	1 / 15
18.15	2 / 30	0 / 15	0 / 15	2 / 15
19.15	3 / 30	0 / 15	0 / 15	3 / 15
20.15	3 / 30	0 / 15	0 / 15	3 / 15
21.15	1 / 30	0 / 15	0 / 15	1 / 15
22.15	13 / 30	2 / 15	4 / 15	9 / 15
23.15	36 / 30	7 / 15	15 / 15	21 / 15
24.15	38 / 30	7 / 15	14 / 15	24 / 15
25.15	33 / 30	7 / 15	12 / 15	21 / 15
26.15	54 / 30	8 / 15	20 / 15	34 / 15
27.15	64 / 30	10 / 15	24 / 15	40 / 15
28.15	62 / 25	12 / 15	22 / 15	42 / 10
29.15	34 / 30	7 / 15	14 / 15	20 / 15
30.15	23 / 30	4 / 15	5 / 15	18 / 15
31.15	50 / 19	23 / 15	35 / 15	15 / 4
32.15	50 / 20	30 / 15	32 / 15	18 / 5
33.15	50 / 21	25 / 15	38 / 15	12 / 6



NOTE

P. ______

BORING LOG

TITLE Thilawa Dry Dock Project

BORE HOLE NO. B - 5

LOCATION B- 5

BORING METHOD Rotary

OPERATED BY

DATE

SAMPLING METHOD Thin-wall Sampling

CHECKED BY Suzuki

GROUND ELEVATION 6.62

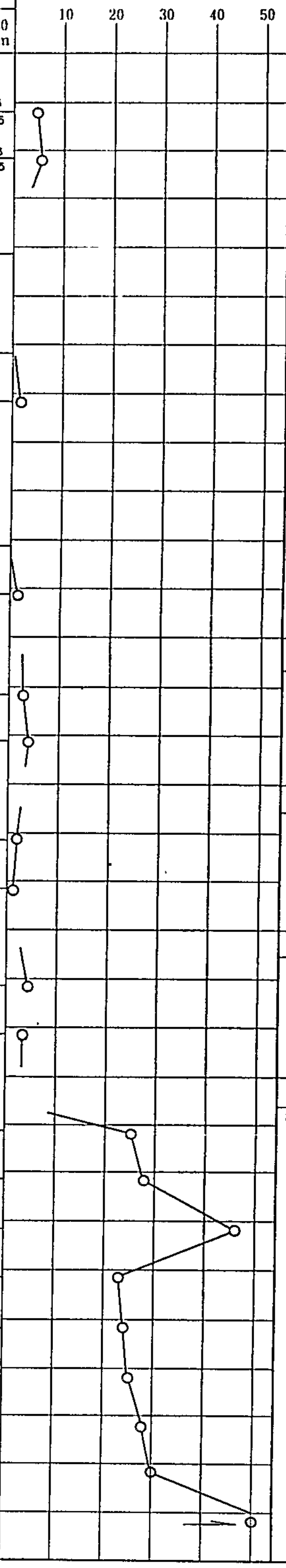
ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
			Clay	Reddish Brown		Medium Stiff
				Bluish Gray	High plasticity. Very cohesive.	Soft
					Decayed plant contain.	
			Silty Clay			Soft
				Bluish Gray	Thin layer of fine sand between.	Medium stiff
14 88	21 50	21 50	Silty Clay			
			Silty Clay	Reddish Brown	Small quantity of gravels contain.	Stiff
				Bluish Gray	High plasticity	
24 53	30 15					

Due to attached hard ston, boring can not be conducted.

STANDARD PENETRATION TEST

SCALE (m) (approx.)	NUMBER OF BLOWS	NO. OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
1		2 / 15	2 / 15	3 / 15
2		3 / 15	3 / 15	3 / 15
4		0 / 30		
6		0 / 30		
7		1 / 22	1 / 25	
10		0 / 30		
11		1 / 25	1 / 20	
13		0 / 32	2 / 13	
14		0 / 30	3 / 15	
16		0 / 35	1 / 10	
17		0 / 35	1 / 10	
19		0 / 15	2 / 15	2 / 15
20		0 / 37	1 / 15	2 / 15
22	26 / 30	7 / 15	11 / 15	15 / 15
23	28 / 30	8 / 15	12 / 15	16 / 15
24	46 / 30	11 / 15	21 / 15	25 / 15
25	22 / 30	10 / 15	10 / 15	12 / 15
26	24 / 30	10 / 15	11 / 15	13 / 15
27	26 / 30	9 / 15	12 / 15	14 / 15
28	28 / 30	10 / 15	13 / 15	15 / 15
29	30 / 30	10 / 15	13 / 15	17 / 15
30	70 / 11	70 / 11		

N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH



SAMPLING

DEPTH (m)	SAMPLE NO
3.00 – 3 50	TWS-1
4.00 – 4 45	TWS-2
8 50 – 9.20	TWS-3
12 00 – 12.60	TWS-4
15.00 – 15.50	TWS-5
18.00 – 18.60	TWS-6
21 00 – 21 50	TWS-7

NOTE

BORING LOG

TITLE Dry Dockyard Project

BORE HOLE NO. B - 6

LOCATION Thilawa

BORING METHOD Percussion

OPERATED BY

DATE

SAMPLING METHOD

CHECKED BY Suzuki

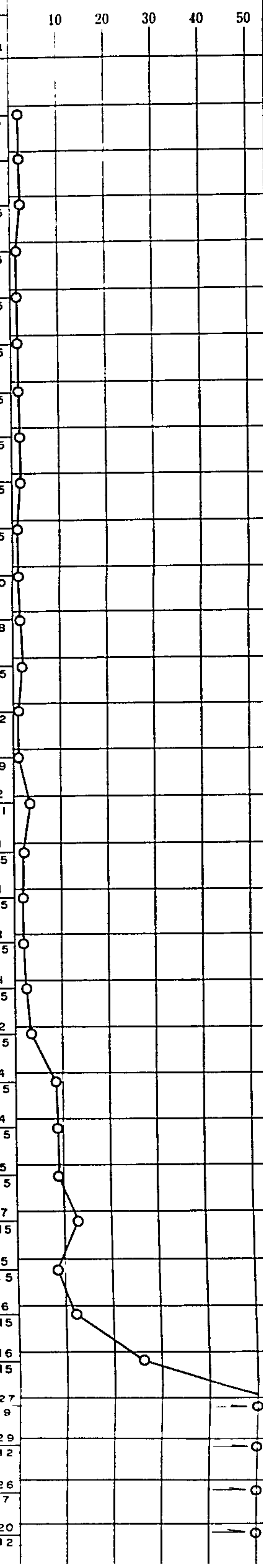
GROUND ELEVATION 6.57

ELEVATION(m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
15 43	2200	2200	Clay	Reddish brown	Highly weatherd	Medium stiff.
					Decayed plant contain.	
			Silty clay	Bluish gray	Very high plasticity and cohesive.	Soft
					Thin layer of fine sand contain.	
					Homogeneous layer	Soft
					High plasticity.	
			Silty Clay	Bluish Gray		Medium Stiff
					Including small quantity of fine sand.	
2243	2900	7 00	Silty Clay	Rddish Brown	Very cohesive.	Stiff
				Milkish White to Bluish Gray	Thin layer of fine sand between.	
					Small quantity of gravels contain	
			Sand	Darl gray	Consist of fine to medium sand.	Dense

STANDARD PENETRATION TEST.

DEPTH(m)	NUMBER OF BLOWS	NO OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
1 15 / 1 45	2 / 30	0 / 15	1 / 15	1 / 15
2 15 / 2 45	2 / 30	0 / 15	1 / 15	2 / 15
3 15 / 3.45	2 / 30	0 / 15	1 / 15	1 / 15
4 15 / 4 45	1 / 30		0 / 30	1 / 15
5 15 / 5 45	1 / 30		0 / 30	1 / 15
6 15 / 6 47	1 / 32		0 / 32	1 / 15
7 15 / 7.47	1 / 32		0 / 32	1 / 15
8 15 / 8.51	1 / 36		0 / 36	1 / 15
9 15 / 9 51	1 / 36		0 / 36	1 / 15
10 15 / 10 47	1 / 32		0 / 32	1 / 15
11 15 / 11 53	1 / 38		0 / 33	1 / 20
12 15 / 12 52	1 / 37		0 / 34	1 / 18
13 15 / 13 48	2 / 33	0 / 22	1 / 18	1 / 15
14 15 / 14 48	1 / 33		0 / 30	1 / 12
15 15 / 15 51	1 / 36		0 / 32	1 / 19
16 15 / 16 51	3 / 36	0 / 24	1 / 15	2 / 21
17 15 / 17 45	2 / 30	0 / 22	1 / 15	1 / 15
18 15 / 18 45	2 / 30	0 / 15	1 / 15	1 / 15
19 15 / 19 45	2 / 30	1 / 15	1 / 15	1 / 15
20 15 / 20 45	2 / 30	1 / 15	1 / 15	1 / 15
21 15 / 21 45	3 / 30	1 / 15	1 / 15	2 / 15
22 15 / 22 45	9 / 30	2 / 15	4 / 15	4 / 15
23 15 / 23 45	9 / 30	2 / 15	4 / 15	4 / 15
24 15 / 24 45	9 / 30	2 / 15	4 / 15	5 / 15
25 15 / 25 45	13 / 30	4 / 15	6 / 15	7 / 15
26 15 / 26 45	9 / 30	3 / 15	4 / 15	5 / 15
27 15 / 27.45	12 / 30	5 / 15	6 / 15	6 / 15
28 15 / 28 45	26 / 30	9 / 15	10 / 15	16 / 15
29 15 / 29 39	50 / 24	19 / 15	23 / 15	27 / 9
30 15 / 30 42	50 / 27	17 / 15	21 / 15	29 / 12
31 15 / 31 37	50 / 22	19 / 15	24 / 15	26 / 7
32 15 / 32 42	50 / 27	20 / 15	30 / 15	20 / 12

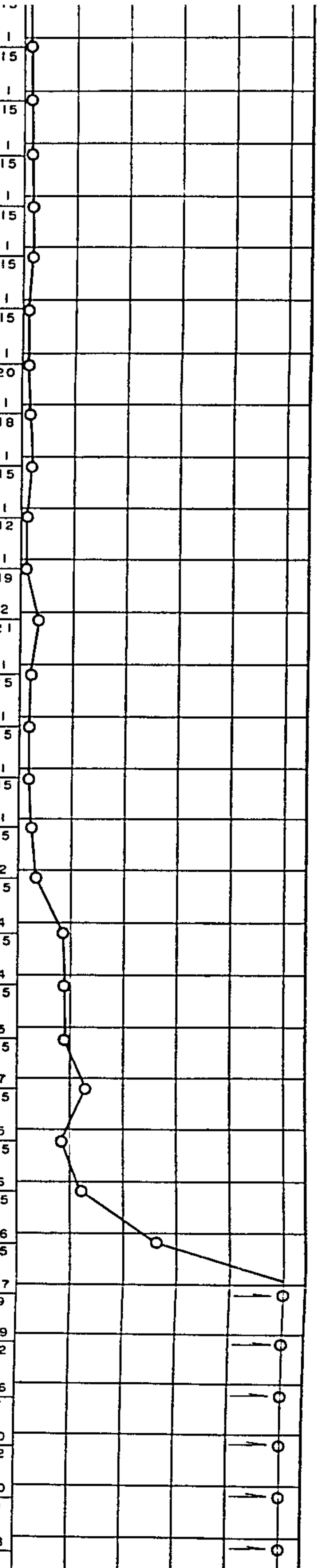
N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH



SAMPLING: DEPTH(m) | SAMPLE NO

Depth scale				Soil	Colour	Description	Consistency
5 – 22	15 43	22 00	22 00	Silty clay / Silty Clay	Bluish Gray	Thin layer of fine sand contain. Homogeneous layer. High plasticitv. Including small quantity of fine sand.	Soft; Soft; Medium Stiff
22 – 29	22 43	29 00	7 00	Silty Clav	Rddish Brown; Milkish White to Bluish Gray	Very cohesive. Thin layer of fine sand between. Small quantitv of gravels contain	Stiff
29 – 34.22	27 65	34.22		Sand	Dark gray	Consist of fine to medium sand.	Dense

5.15	1		0	1
5.45	30		30	15
6 15	1		0	1
6 47	32		32	15
7 15	1		0	1
7.47	32		32	15
8 15	1		0	1
8 51	36		36	15
9 15	1		0	1
9.51	36		36	15
10 15	1		0	1
10 47	32		32	15
11.15	1		0	1
11 53	38		33	20
12 15	1		0	1
12 52	37		34	18
13 15	2	0	1	1
13 48	33	22	18	15
14 15	1		0	1
14 48	33		30	12
15 15	1		0	1
15 51	36		32	19
16 15	3	0	1	2
16 51	36	24	15	21
17 15	2	0	1	1
17 45	30	22	15	15
18 15	2	0	1	1
18 45	30	15	15	15
19 15	2	1	1	1
19 45	30	15	15	15
20 15	2	1	1	1
20 45	30	15	15	15
21 15	3	1	1	2
21 45	30	15	15	15
22 15	9	2	4	4
22 45	30	15	15	15
23.15	9	2	4	4
23 45	30	15	15	15
24 15	9	2	4	5
24 45	30	15	15	15
25 15	13	4	6	7
25 45	30	15	15	15
26 15	9	3	4	5
26 45	30	15	15	15
27 15	12	5	6	6
27 45	30	15	15	15
28 15	26	9	10	16
28 45	30	15	15	15
29 15	50	19	23	27
29 39	24	15	15	9
30 15	50	17	21	29
30 42	27	15	15	12
31 15	50	19	24	26
31 37	22	15	15	7
32 15	50	20	30	20
32 42	27	15	15	12
33 15	50	19	30	20
33 39	24	15	15	9
34 15	50	20	32	18
34.37	22	15	15	7



NOTE

P

BORING LOG

TITLE Dry Dockyard Project

BORE HOLE NO. B - 7

LOCATION Thilawa

BORING METHOD Percussion

OPERATED BY

DATE

SAMPLING METHOD

CHECKED BY

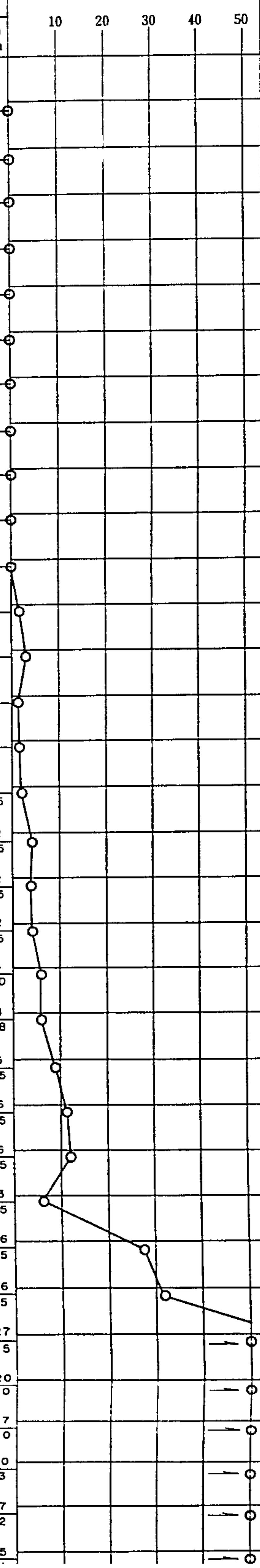
GROUND ELEVATION

SCALE (m)	ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
0–2.5				Clay	Bruish gray	Very cohesive and high plasticity	Soft
2.5–11				Silty clay		Homogeneous layer. Decayed plant contain.	Soft
11–22		22.0		Silty clay	Bluish gray to Dark gray	Thin layer of fine sand between	Soft to medium stiff; stiff
22–26		26.0		Silty clay	Bluish gray	High plasticity. Small quantity of gravels contain.	Stiff
26–		33.3		Silty sand	dark gray	Consist of fine sand including silt.	Dense

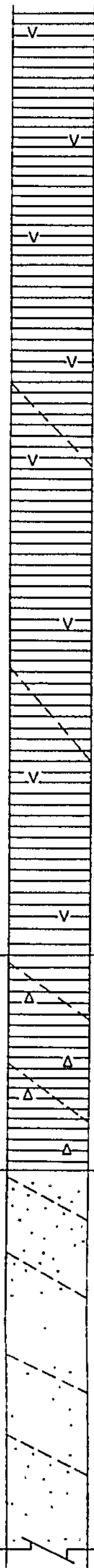
STANDARD PENETRATION TEST.

SCALE (m)	NUMBER OF BLOWS	NO OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
1	0 / 45	0 / 45		
2	0 / 45	0 / 45		
3	0 / 45	0 / 45		
4	0 / 45	0 / 45		
5	0 / 45	0 / 45		
6	0 / 45	0 / 45		
7	0 / 45	0 / 45		
8	0 / 45	0 / 45		
9	0 / 45	0 / 45		
10	0 / 45	0 / 45		
11	0 / 45	0 / 45		
12	1 / 35	0 / 40	1 / 10	
13	2 / 31	0 / 28	2 / 18	
14	1 / 30	0 / 35	1 / 10	
15	1 / 37	0 / 34	1 / 12	
16	2 / 30	0 / 20	1 / 15	1 / 15
17	4 / 30	0 / 18	2 / 15	2 / 15
18	4 / 30	0 / 15	2 / 15	2 / 15
19	4 / 33	0 / 15	2 / 18	2 / 15
20	6 / 30	0 / 10	2 / 15	4 / 20
21	6 / 30	0 / 9	2 / 15	4 / 18
22	9 / 30	3 / 15	4 / 15	5 / 15
23	11 / 30	4 / 15	5 / 15	6 / 15
24	12 / 30	4 / 15	6 / 15	6 / 15
25	6 / 30	2 / 15	3 / 15	3 / 15
26	28 / 30	6 / 15	12 / 15	16 / 15
27	31 / 30	7 / 15	15 / 15	16 / 15
28	50 / 30	15 / 15	23 / 15	27 / 15
29	50 / 25	15 / 15	30 / 15	20 / 10
30	50 / 25	15 / 15	33 / 15	17 / 10
	50 / 18	22 / 15	40 / 15	10 / 3
	50 / 17	20 / 15	43 / 15	7 / 2
	50	22	45	5

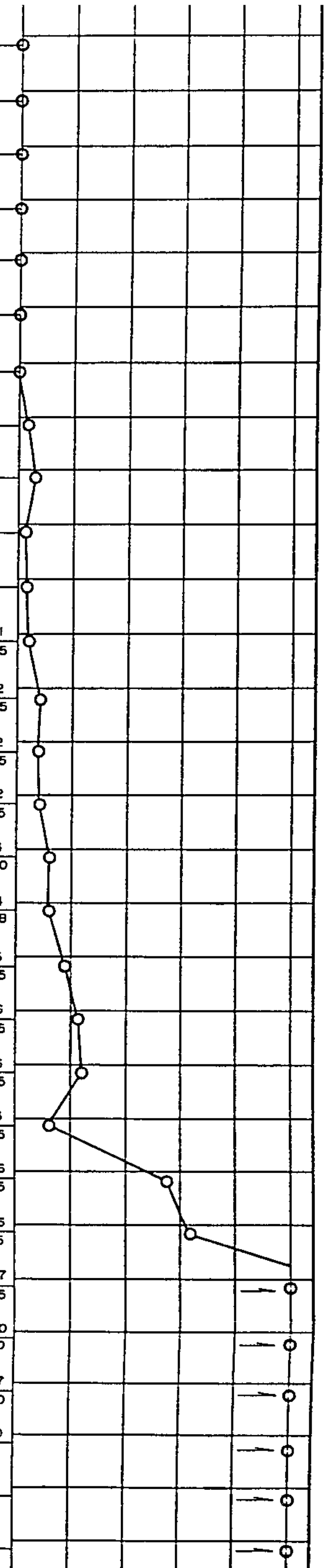
N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH



SAMPLING: DEPTH(m) | SAMPLE NO.



Depth (m)	Boundary depth	Soil	Colour	Description	Consistency	N / penetration	1st	2nd	3rd
5					Soft	0/45	0/45		
6						0/45	0/45		
7						0/45	0/45		
8		Silty clay		Homogeneous layer.		0/45	0/45		
9						0/45	0/45		
10						0/45	0/45		
11				Decayed plant contain.		0/45	0/45		
12					Soft to medium stiff	1/35	0/40	1/10	
13						2/31	0/28	2/18	
14			Bluish gray to Dark gray			1/30	0/35	1/10	
15				Thin layer of fine sand between		1/37	0/34	1/12	
16						2/30	0/20	1/15	1/15
17		Silty clay				4/30	0/18	2/15	2/15
18					stiff	4/30	0/15	2/15	2/15
19						4/33	0/15	2/18	2/15
20						6/30	0/10	2/15	4/20
21	22.0					6/30	0/9	2/15	4/18
22						9/30	3/15	4/15	5/15
23				High plasticity.		11/30	4/15	5/15	6/15
24		Silty clay	Bluish gray	Small quantity of gravels contain.	Stiff	12/30	4/15	6/15	6/15
25	26.0					6/30	2/15	3/15	3/15
26						28/30	6/15	12/15	16/15
27						31/30	7/15	15/15	16/15
28		Silty sand	dark gray	Consist of fine sand including silt.	Dense	50/30	15/15	23/15	27/15
29						50/25	15/15	30/15	20/10
30						50/25	15/15	33/15	17/10
						50/18	22/15	40/15	10/3
						50/17	20/15	43/15	7/2
	33.3					50/16	22/15	45/15	5/1



NOTE

P. ______

BORING LOG

TITLE: Dry Dockyard Project

BORE HOLE NO. B - 8

LOCATION: Thilawa

BORING METHOD: Rotary

OPERATED BY:

DATE:

SAMPLING METHOD:

CHECKED BY: Suzuki

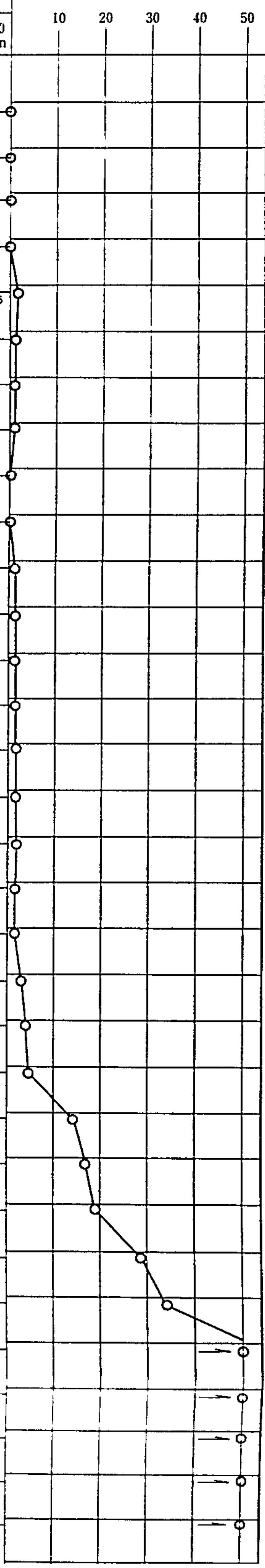
GROUND ELEVATION: 6.71

ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
			Clay	Reddish Brown / Bluish Gray	Very cohesive and plasticity.	Soft
					Decayed plant contain	
			Silty Clay		Very thin layer of fine sand between.	Soft
15 79	22 50	22.50	Silty Clay	Bluish Gray	Very homogeneous layer. Very plasticity.	Medium Stiff
18 79	25 50	3 00	Silty Clay	Reddish Brown	Very plasticity.	Stiff
26 44	33 15		Sand / Silt Sand	Bluish Gray	Consist of fine to medium sand	Hard

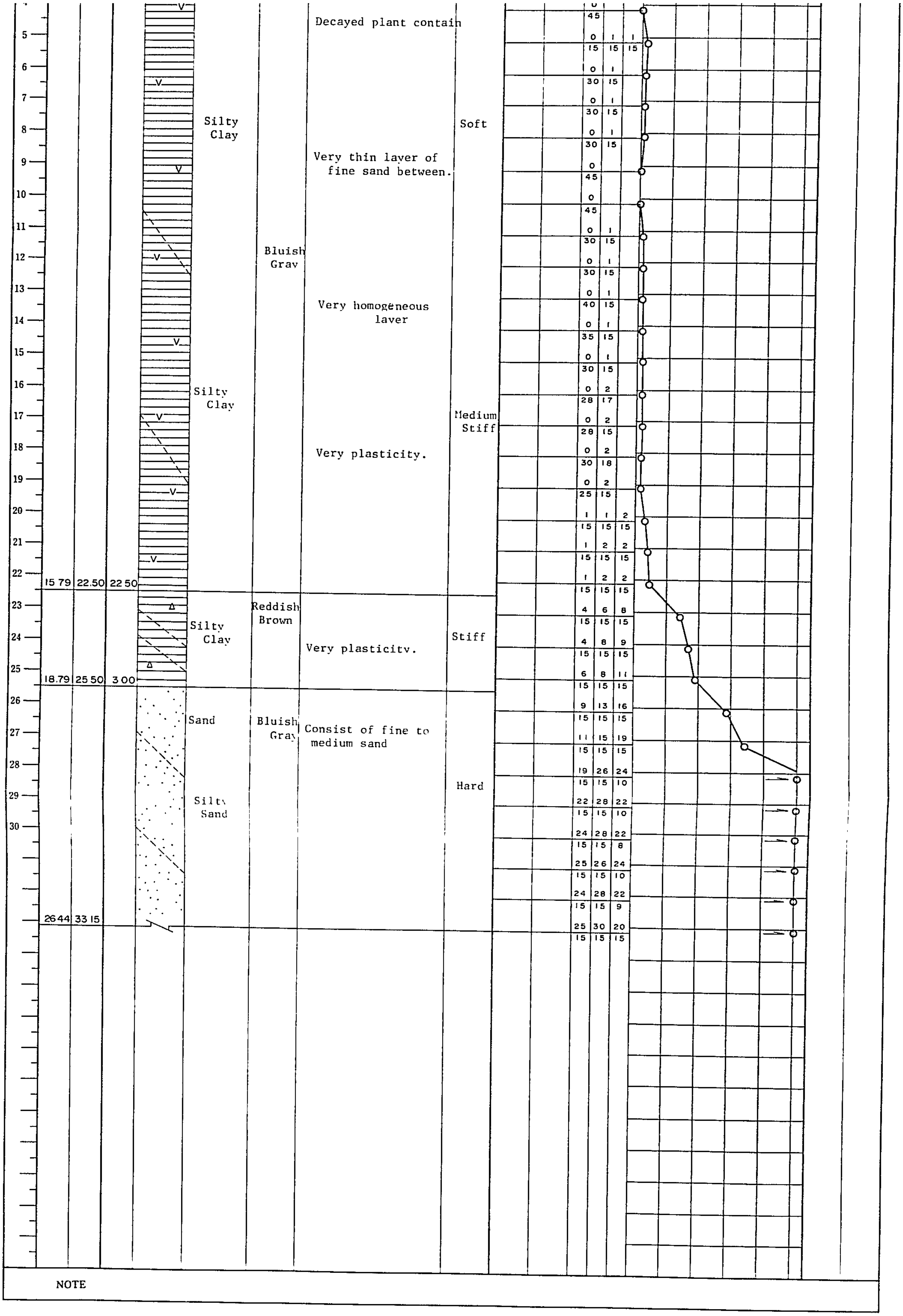
STANDARD PENETRATION TEST — NO. OF BLOWS PER 10 cm (blows / penetration cm)

No.	10 cm	20 cm	30 cm
1	0 / 45		
2	0 / 45		
3	0 / 45		
4	0 / 45		
5	0 / 15	1 / 15	1 / 15
6	0 / 30	1 / 15	
7	0 / 30	1 / 15	
8	0 / 30	1 / 15	
9	0 / 45		
10	0 / 45		
11	0 / 30	1 / 15	
12	0 / 30	1 / 15	
13	0 / 40	1 / 15	
14	0 / 35	1 / 15	
15	0 / 30	1 / 15	
16	0 / 28	2 / 17	
17	0 / 28	2 / 15	
18	0 / 30	2 / 18	
19	0 / 25	2 / 15	
20	1 / 15	1 / 15	2 / 15
21	1 / 15	2 / 15	2 / 15
22	1 / 15	2 / 15	2 / 15
23	4 / 15	6 / 15	8 / 15
24	4 / 15	8 / 15	9 / 15
25	6 / 15	8 / 15	11 / 15
26	9 / 15	13 / 15	16 / 15
27	11 / 15	15 / 15	19 / 15
28	19 / 15	26 / 15	24 / 10
29	22 / 15	28 / 15	22 / 10
30	24 / 15	28 / 15	22 / 8
31	25 / 15	26 / 15	24 / 10
32	24 / 15	28 / 15	22 / 9
33	25 / 15	30 / 15	20

N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH



SAMPLING: DEPTH (m) | SAMPLE NO



Silty Clay
Decayed plant contain
Soft
Very thin layer of fine sand between.
Bluish Grav
Very homogeneous laver
Silty Clay
Medium Stiff
Very plasticity.
15 79 22.50 22 50
Silty Clay
Reddish Brown
Very plasticitv.
Stiff
18.79 25 50 3 00
Sand
Bluish Gray
Consist of fine to medium sand
Hard
Silty Sand
26 44 33 15
NOTE

P

BORING LOG

TITLE Dry Dockyard Project

BORE HOLE NO. B-9

LOCATION Thilawa

BORING METHOD Percussion

OPERATED BY

DATE

SAMPLING METHOD

CHECKED BY

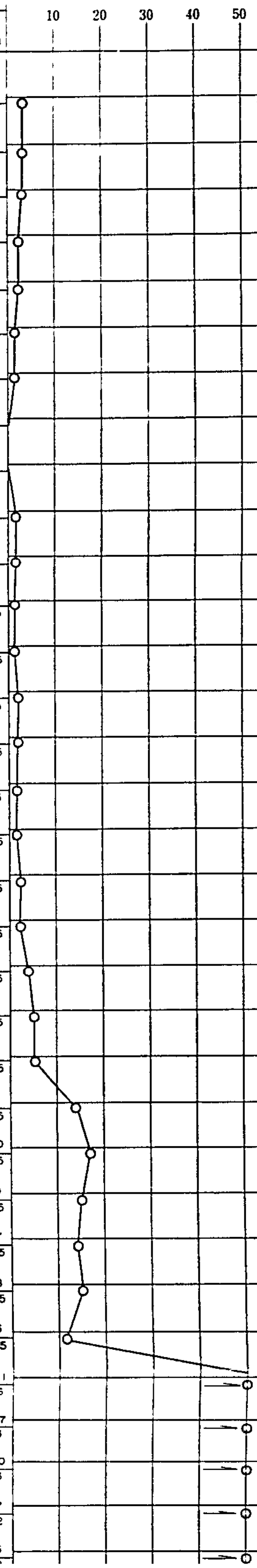
GROUND ELEVATION 6.66

ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
15.84	22.50	22.50	Clay Silty clay Silty Clay	Reddish brown Dark gray Greenish gray	Very cohesive and high plasticity. Decayed plant contain Thin layer of fine sand between. Homogeneous layer	Medium stiff Soft Soft Medium stiff
22.34	29.00	6.50	Silty clay	Reddish brown Milkish White	Very cohesive. Small quantity of gravels contain	Stiff
			Silty sand	Dark gray	Mainly consist of fine sand including	Dense

STANDARD PENETRATION TEST.

DEPTH (m)	NUMBER OF BLOWS	NO OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
1.15	3 / 30	0 / 15	1 / 15	2 / 15
2.15	3 / 30	0 / 15	1 / 15	2 / 15
3.15	3 / 30	0 / 15	1 / 15	2 / 15
4.15	2 / 30	0 / 15	1 / 15	1 / 15
5.15	2 / 30	0 / 15	1 / 15	1 / 15
6.15	1 / 30	0 / 26	1 / 15	
7.15	1 / 30	0 / 30	1 / 15	
8.15	0 / 43	0 / 43		
9.15	0 / 43	0 / 43		
10.15	1 / 34	0 / 34	1 / 15	
11.15	1 / 32	0 / 32	1 / 15	
12.15	2 / 40	0 / 25	1 / 15	1 / 15
13.15	2 / 34	0 / 19	1 / 15	1 / 15
14.15	3 / 32	0 / 17	1 / 15	2 / 15
15.15	2 / 35	0 / 20	1 / 15	1 / 15
16.15	2 / 38	0 / 23	1 / 15	1 / 15
17.15	2 / 35	0 / 20	1 / 15	1 / 15
18.15	3 / 35	0 / 20	1 / 15	2 / 15
19.15	3 / 33	0 / 18	1 / 15	2 / 15
20.15	4 / 30	0 / 15	2 / 15	2 / 15
21.15	5 / 30	1 / 15	2 / 15	3 / 15
22.15	5 / 30	2 / 15	2 / 15	3 / 15
23.15	14 / 30	4 / 15	6 / 15	8 / 15
24.15	17 / 30	5 / 15	7 / 15	10 / 15
25.15	15 / 30	4 / 15	6 / 15	9 / 15
26.15	14 / 30	5 / 15	7 / 15	7 / 15
27.15	15 / 30	7 / 15	7 / 15	8 / 15
28.15	11 / 30	4 / 15	5 / 15	6 / 15
29.15	50 / 21	10 / 15	29 / 15	21 / 6
30.15	50 / 19	12 / 15	33 / 15	17 / 4
31.15	50 / 18	14 / 15	40 / 15	10 / 3
32.15	50 / 17	16 / 15	43 / 15	7 / 2
33.15	50	16	44	6

N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH

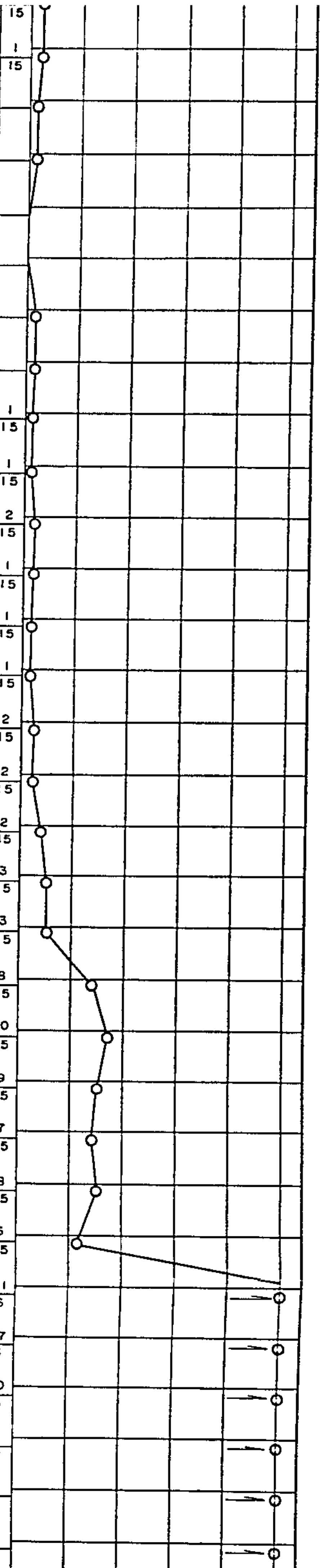


SAMPLING

DEPTH (m)	SAMPLE NO

Elevation	Depth	Thickness	Soil	Color	Description	Consistency
15.84	22.50	22.50	Silty clay / Silty Clay	Greenish gray	Decayed plant contain. Thin layer of fine sand between. Homogeneous layer	Soft / Soft / Medium stiff
22.34	29.00	6.50	Silty clay	Reddish brown / Milkish White	Very cohesive. Small quantity of gravels contain	Stiff
27.49	34.15		Silty sand	Dark gray	Mainly consist of fine sand including slit.	Dense

Depth	N	1st	2nd	3rd
	30	15	15	15
5.15	2	0	1	1
	30	15	15	15
6.15	1	0	1	
	30	26	15	
7.15	1	0	1	
	30	30	15	
8.15	0	0		
	43	43		
9.15	0	0		
	43	43		
10.15	1	0	1	
	34	34	15	
11.15	1	0	1	
	32	32	15	
12.15	2	0	1	1
	40	25	15	15
13.15	2	0	1	1
	34	19	15	15
14.15	3	0	1	2
	32	17	15	15
15.15	2	0	1	1
	35	20	15	15
16.15	2	0	1	1
	38	23	15	15
17.15	2	0	1	1
	35	20	15	15
18.15	3	0	1	2
	35	20	15	15
19.15	3	0	1	2
	33	18	15	15
20.15	4	0	2	2
	30	15	15	15
21.15	5	1	2	3
	30	15	15	15
22.15	5	2	2	3
	30	15	15	15
23.15	14	4	6	8
	30	15	15	15
24.15	17	5	7	10
	30	15	15	15
25.15	15	4	6	9
	30	15	15	15
26.15	14	5	7	7
	30	15	15	15
27.15	15	7	7	8
	30	15	15	15
28.15	11	4	5	6
	30	15	15	15
29.15	50	10	29	21
	21	15	15	6
30.15	50	12	33	17
	19	15	15	4
31.15	50	14	40	10
	18	15	15	3
32.15	50	16	43	7
	17	15	15	2
33.15	50	16	44	6
	17	15	15	2
34.15	50	17	45	5
	16	15	15	1



NOTE

BORING LOG

TITLE Dry Dockyard Project

BORE HOLE NO. B - 10

LOCATION Thilawa

BORING METHOD Rotary

OPERATED BY

DATE 6 47

SAMPLING METHOD Thin-walled

CHECKED BY

GROUND ELEVATION

ELEVATION (m)	DEPTH	THICKNESS OF LAYER (m)	NAME OF SOIL	COLOR	OBSERVATION	RELATIVE DENSITY OR CONSISTENCY
15.03	21.50	21.50	Clay Silty clay Silty clay	Reddish Brown Bluish gray Dark gray	Highly weatherd Very cohesive and high plasticity Decayed plan contain. Very homogeneous layer. Small quantity of fine sand contain.	Medium stiff Soft Soft Medium stiff
23.53	30.00	8.50	Silty Clay	Reddish brown Milkish white to bluish gray	Consist of high plasticity clay. Small quantity of gravels and fine sand contain	Stiff
			Sil...	Dark		

STANDARD PENETRATION TEST

(N-VALUE SHOWING NUMBER OF BLOWS PER 30cm IN GRAPH: 10, 20, 30, 40, 50)

DEPTH (m)	NUMBER OF BLOWS	NO OF BLOWS PER 10cm: 10 cm	20 cm	30 cm
	10	3	3	7
	30	15	15	15
	16	4	6	10
	30	15	15	15
	19	7	9	10
	30	15	15	15
	19	6	8	11
	30	15	15	15
	20	6	9	11
	30	15	15	15
	20	4	9	11
	30	15	15	15
	16	5	10	11
	30	15	15	15
	17	6	8	9
	30	15	15	15
	50	25	30	19
	30			8
	50	31	46	4
	50	33	50	
	15			
	50	50		

SAMPLING

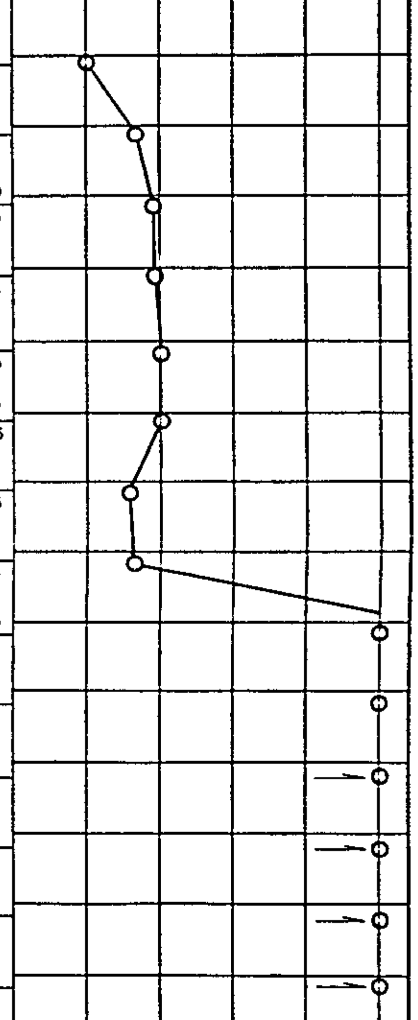
DEPTH (m)	SAMPLE NO
2.00 – 2.50	TWS-1
4.00 – 4.70	TWS-2
6.00 – 6.78	TWS-3
8.00 – 8.78	TWS-4
10.00 – 10.70	TWS-5
12.00 – 12.80	TWS-6
14.00 – 14.78	TWS-7
16.00 – 16.70	TWS-8
18.00 – 18.80	TWS-9
20.00 – 20.70	TWS-10

SCALE (m): 1 – 30

Elevation	Depth	Thickness	Soil	Colour	Description	Consistency
15.03	21.50	21.50	Silty clay Silty clay	Dark gray	Decayed plan contain. Very homogeneous layer. Small quantity of fine sand contain.	Soft Medium stiff
23.53	30.00	8.50	Silty Clay	Reddish brown Milkish white to bluish gray	Consist of high plasticity clay. Small quantity of gravels and fine sand contain	Stiff
28.68	35.15		Silty sand	Dark gray	Consist of fine to medium sand includ-ing some gravels.	Dense

Depth (m)	N / penetration	1st	2nd	3rd
22	10 / 30	3 / 15	3 / 15	7 / 15
23	16 / 30	4 / 15	6 / 15	10 / 15
24	19 / 30	7 / 15	9 / 15	10 / 15
25	19 / 30	6 / 15	8 / 15	11 / 15
26	20 / 30	6 / 15	9 / 15	11 / 15
27	20 / 30	4 / 15	9 / 15	11 / 15
28	16 / 30	5 / 15	10 / 15	11 / 15
29	17 / 30	6 / 15	8 / 15	9 / 15
30	50 / 30	25	30	19 / 8
31	50	31	46	4
32	50 / 15	33	50	
33	50 / 15	50 / 15		
34	50 / 14	50 / 14		
35	50 / 15	50 / 15		

Sample	From	To
	4.70	6.00
TWS-3	6.00	6.78
	6.78	8.00
TWS-4	8.00	8.78
	8.78	10.00
TWS-5	10.00	10.70
	10.70	12.00
TWS-6	12.00	12.80
	12.80	14.00
TWS-7	14.00	14.78
	14.78	16.00
TWS-8	16.00	16.70
	16.70	18.00
TWS-9	18.00	18.80
	18.80	20.00
TWS-10	20.00	20.70



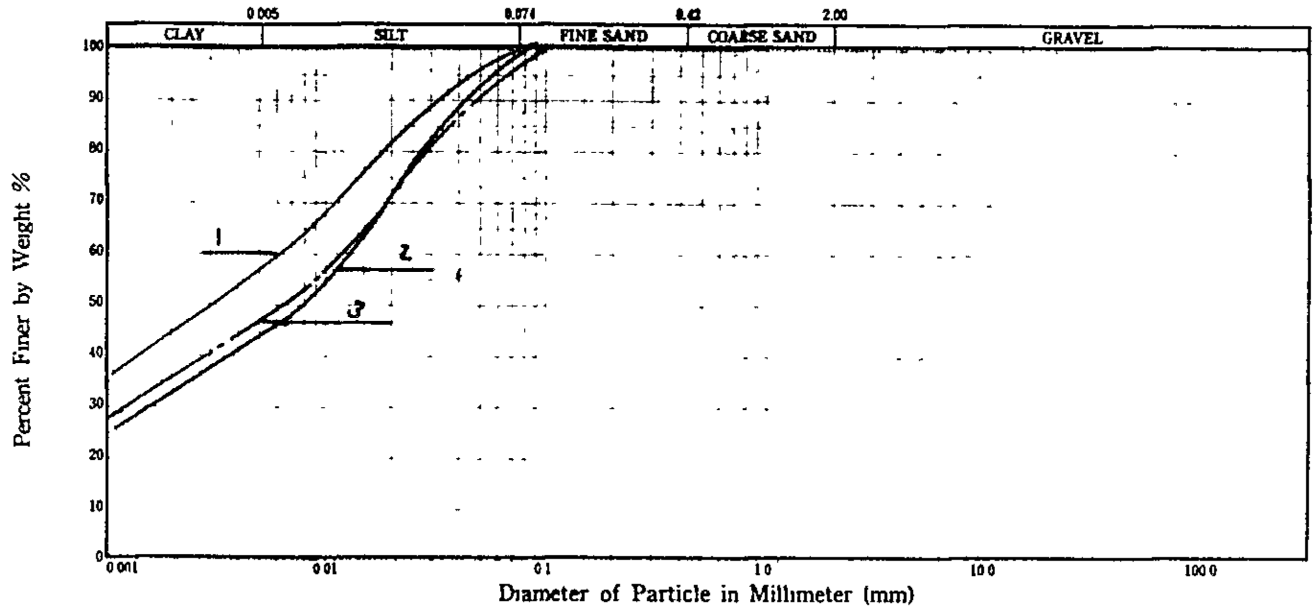
NOTE

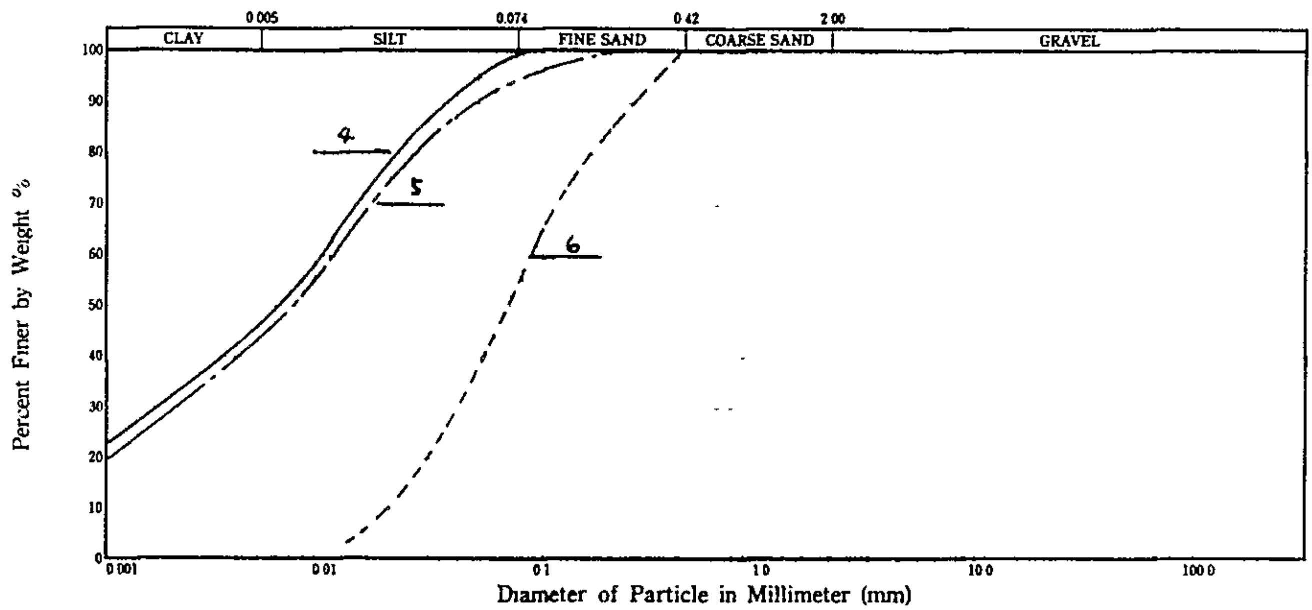
GRAIN SIZE ANALYSIS

MECHANICAL ANALYSIS

Title, Investigation Place: Thilawa Repair Dockyard Project   Bore Hole No. BH-1   Date

GRAIN SIZE DISTRIBUTION CURVE



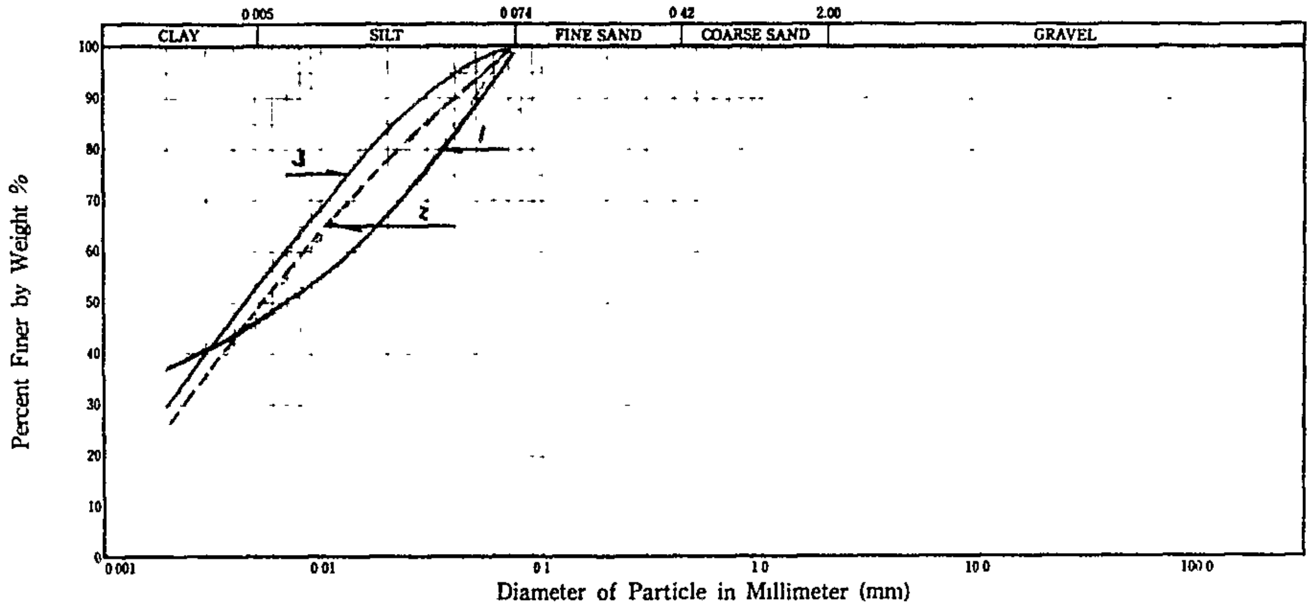


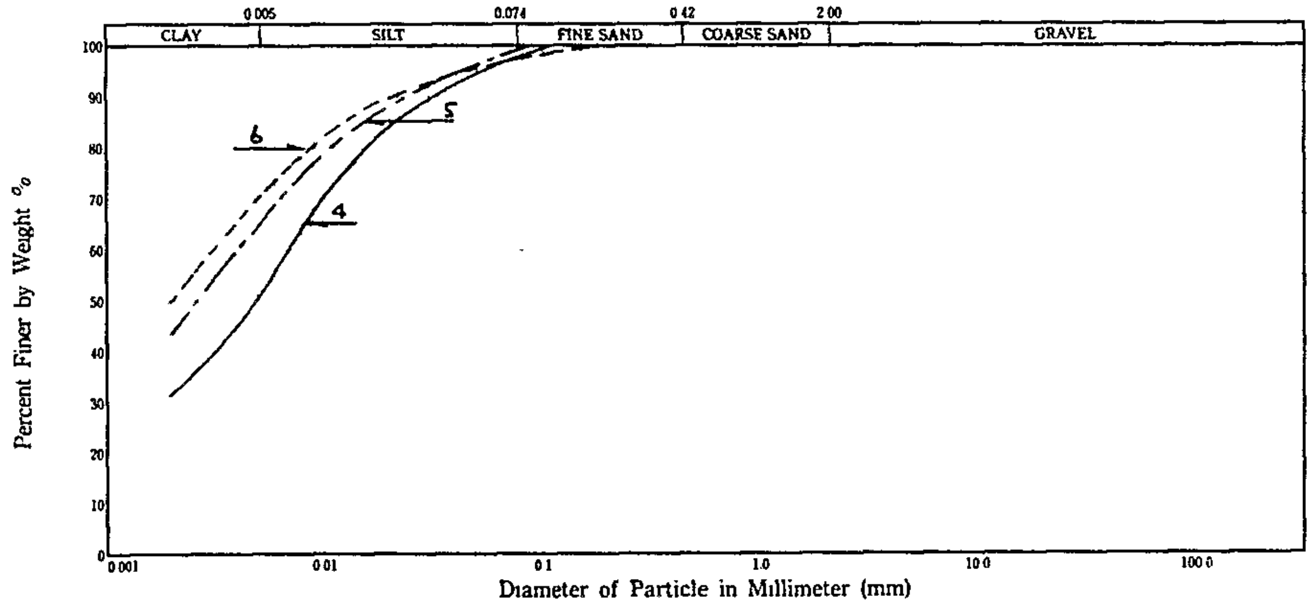
Sample No	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Colloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	4.0 ~ 4.5	0	0	1	42	57	40	0.074	0.006	–	–	100	100	99	
2	8.0 ~ 8.5	0	0	1	52	47	30	0.074	0.014	–	–	100	100	99	
3	11.0 ~ 11.5	0	0	3	53	44	27	0.1	0.014	–	–	100	100	97	
4	15.0 ~ 15.5	0	0	1	53	46	33	0.074	0.01	–	–	100	100	99	
5	20.0 ~ 20.5	0	0	6	49	45	29	0.3	0.01	–	–	100	100	94	
6	24.0 ~ 24.5	0	0	44	56	–		0.42	0.09	0.02	4.5	100	100	56	

MECHANICAL ANALYSIS

Title, Investigation Place: Thilawa-Repair Dockyard Project   Bore Hole No. BH-2   Date

GRAIN SIZE DISTRIBUTION CURVE



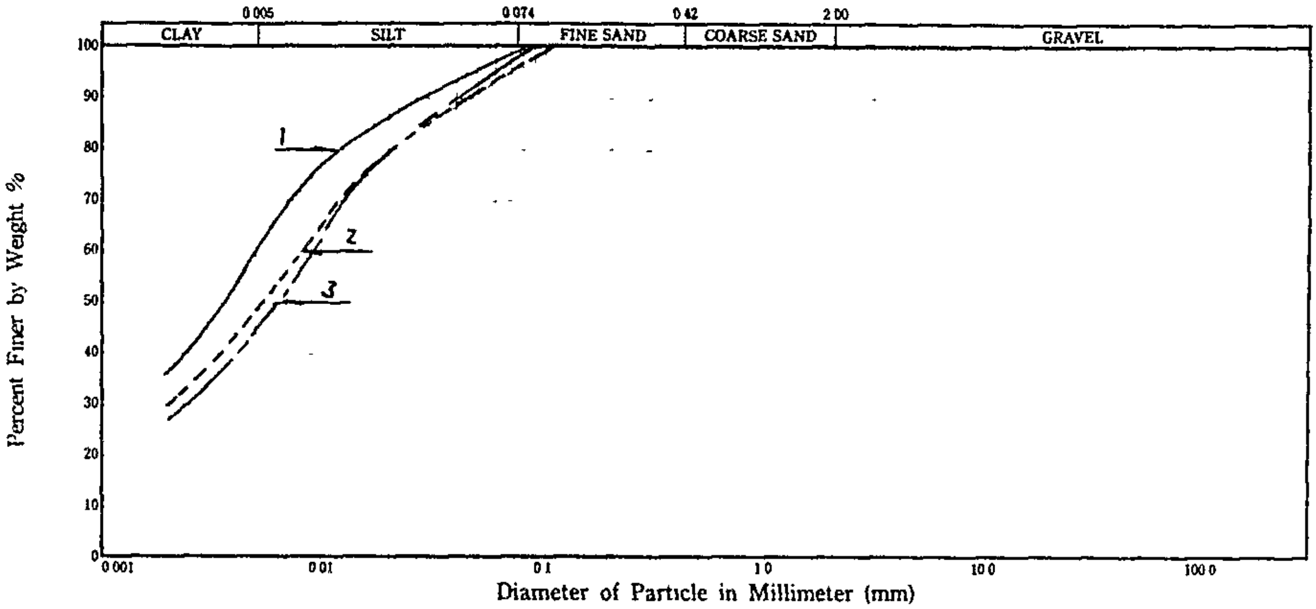


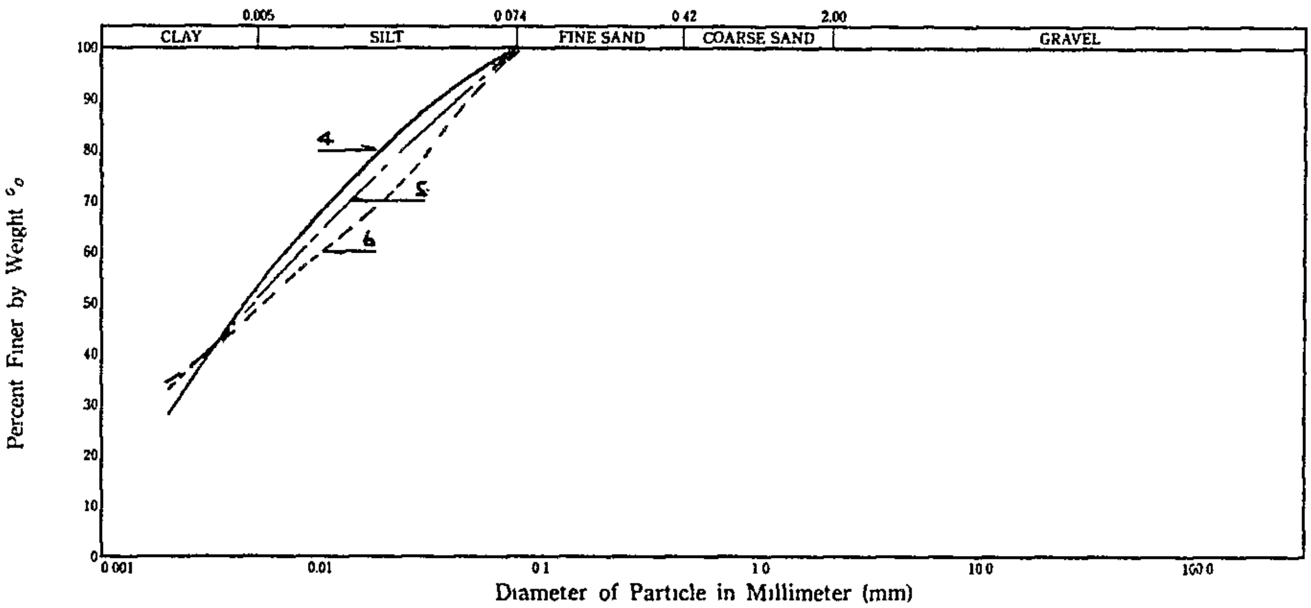
Sample No	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	4.0 ~ 4.5	0	0	0	55	45	37	0.74	0.015	–	–	100	100	100	
2	8.0 ~ 8.5	0	0	0	35	65	30	0.74	0.008	–	–	100	100	100	
3	11.0 ~ 11.5	0	0	0	46	54	30	0.74	0.007	–	–	100	100	100	
4	15.0 ~ 15.5	0	0	4	46	50	32	0.01	0.007	–	–	100	100	96	
5	20.0 ~ 20.5	0	0	4	32	64	43	0.2	0.004	–	–	100	100	96	
6	25.0 ~ 25.5	0	0	2	28	70	50	0.074				100	100	98	

MECHANICAL ANALYSIS

Title, Investigation Place Thilawa Repair Dockyard Project Bore Hole No BH-3 Date

GRAIN SIZE DISTRIBUTION CURVE



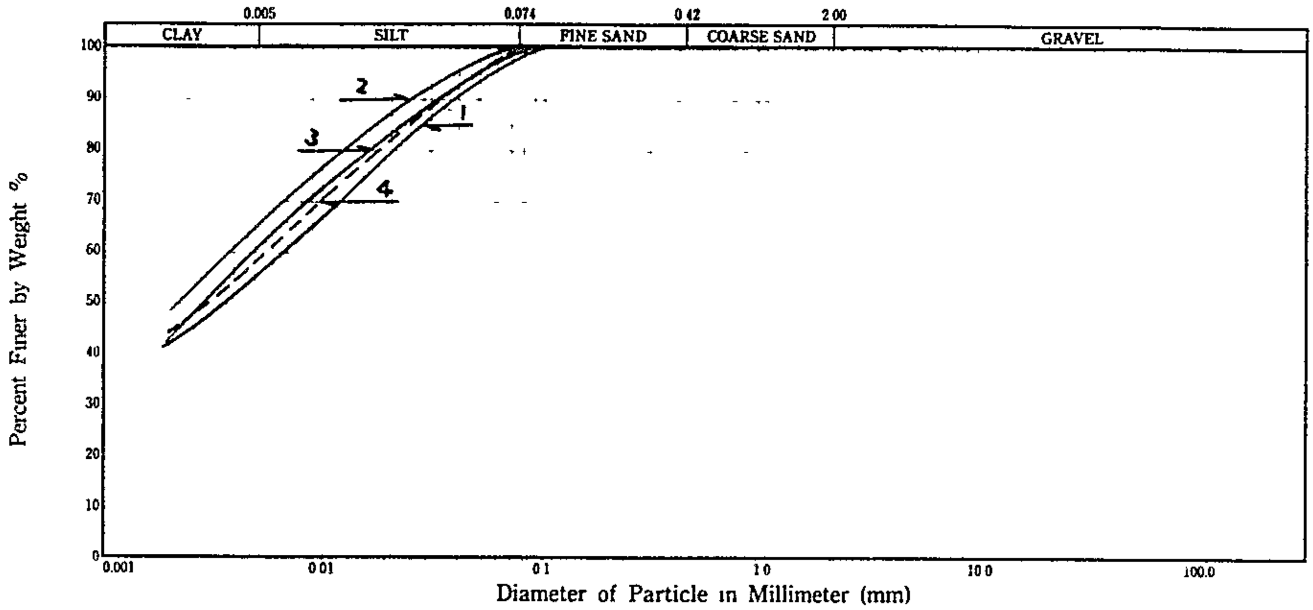


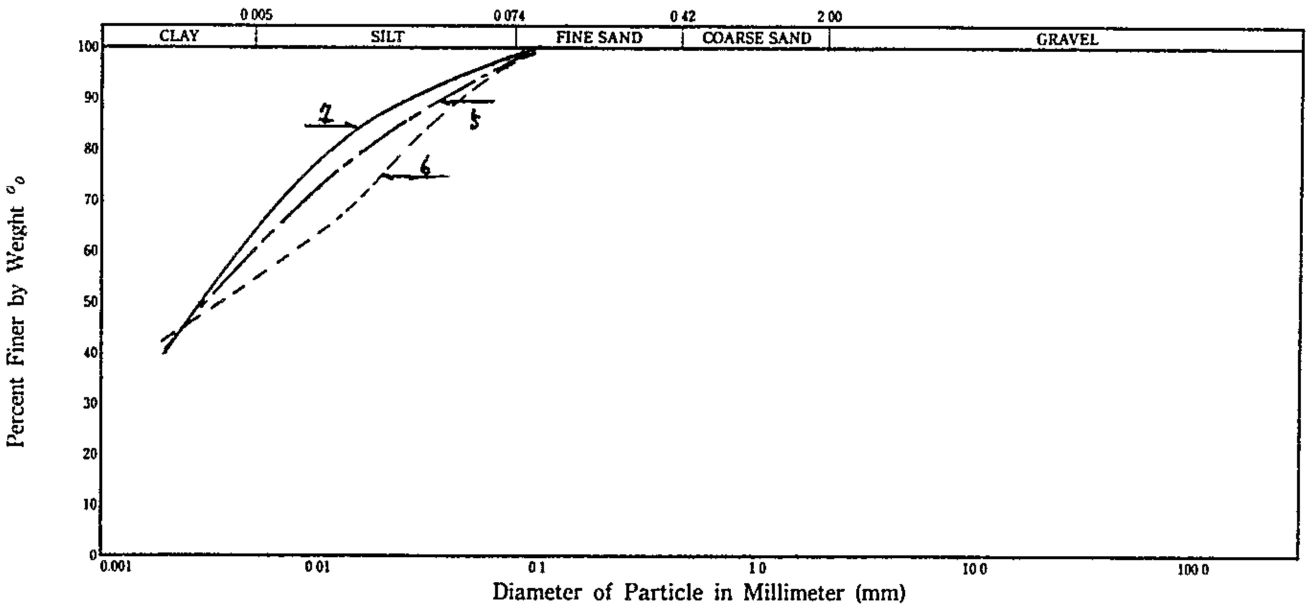
Sample No	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	4.0～4.5	0	0	2	38	60	36	0.074	0.005	–	–	100	100	98	
2	8.0～8.5	0	0	5	47	48	30	0.1	0.008	–	–	100	100	95	
[illegible]	12.0～12.5	0	0	3	54	43	27	0.1	0.009	–	–	100	100	97	
4	16.0～16.5	0	0	0	47	53	28	0.074	0.009	–	–	100	100	100	
5	21.0～21.5	0	0	0	50	50	34	0.074	0.008	–	–	100	100	100	
6	25.0～25.5	0	0	0	52	48	35	0.074	0.01	–	–	100	100	100	

MECHANICAL ANALYSIS

Title, Investigation Place: Thilawa Repair Dockyard Project   Bore Hole No: BH-4   Date:

GRAIN SIZE DISTRIBUTION CURVE



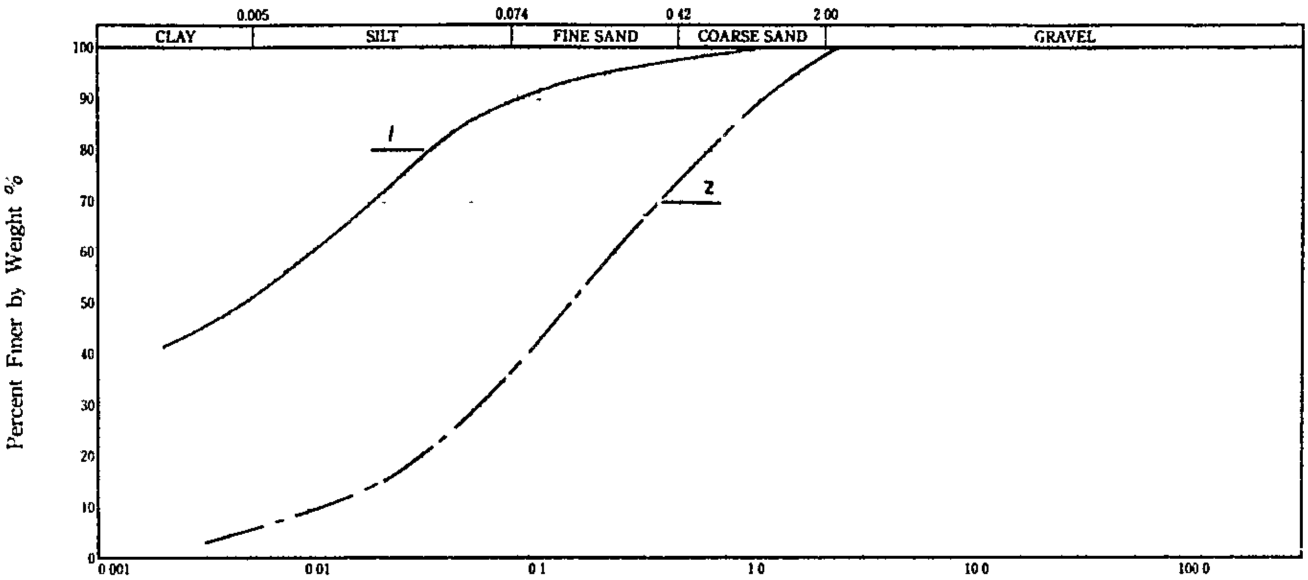


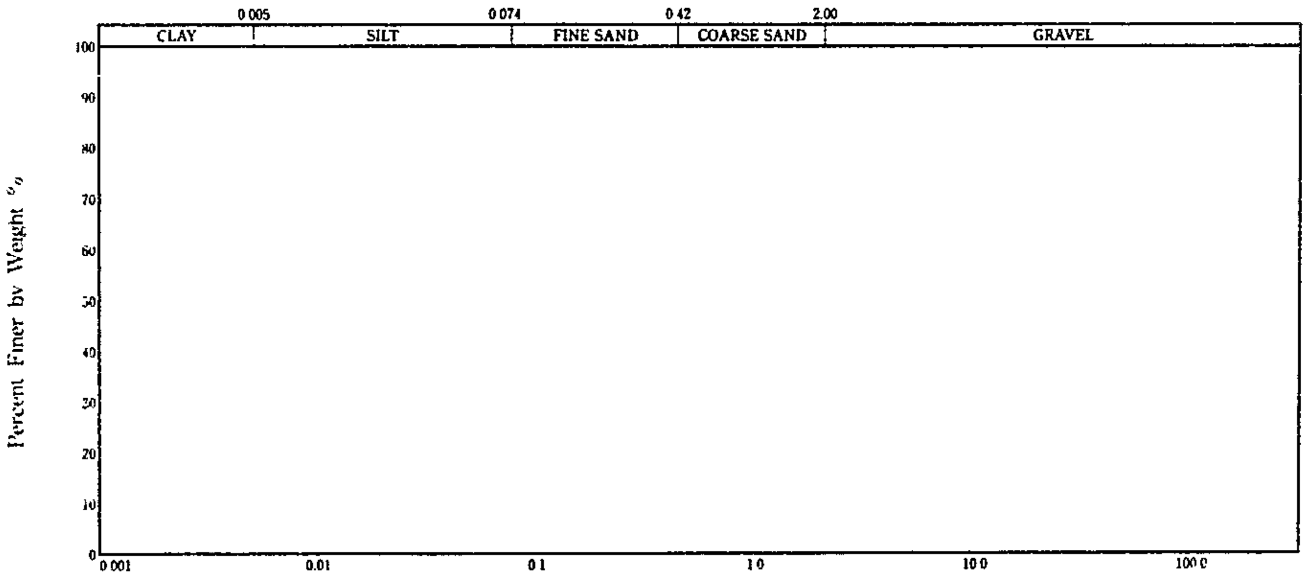
Sample No	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	3.0 ~ 3.5	0	0	3	42	55	42	0.1	0.008	-	-	100	100	97	
2	6.0 ~ 6.5	0	0	0	35	65	48	0.074	0.004	-	-	100	100	100	
3	9.0 ~ 10.5	0	0	2	38	60	42	0.1	0.005	-	-	100	100	98	
4	15.0 ~ 15.5	0	0	0	42	58	43	0.074	0.006	-	-	100	100	100	
5	18.0 ~ 18.5	0	0	2	38	60	40	0.1	0.005	-	-	100	100	98	
6	21.0 ~ 21.5	0	0	2	44	54	43	0.1	0.005	-	-	100	100	98	
7	24.0 ~ 24.5	0	0	2	34	64	40	0.1	0.004	-	-	100	100	98	

MECHANICAL ANALYSIS

Title, Investigation Place Thilawa Repair Dockyard Project Bore Hole No BH-4 Date

GRAIN SIZE DISTRIBUTION CURVE



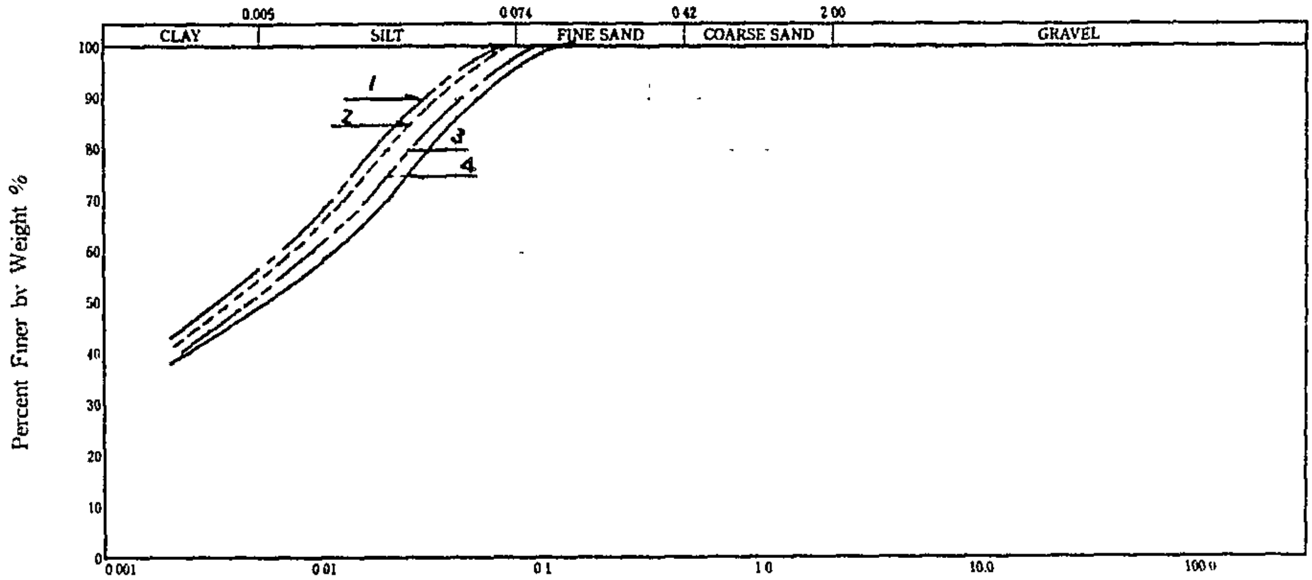


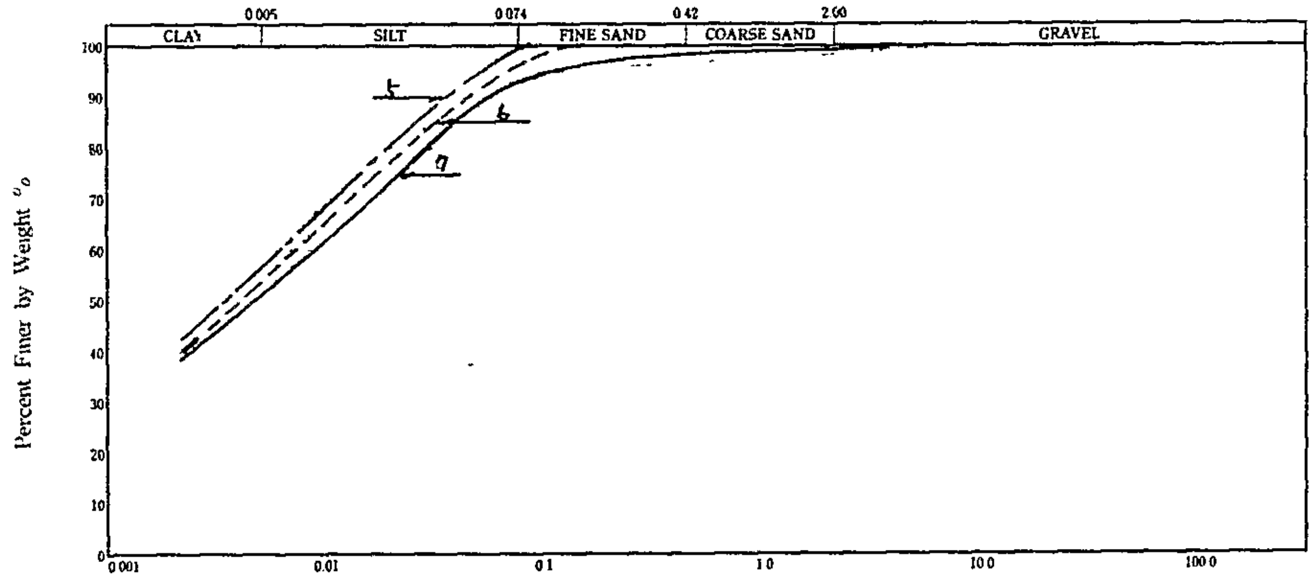
Sample No.	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074mm Under %	Specific Gravity Gs
1	27.0~27.5	0	2	8	40	50	42	1.0	0.009	–	–	100	98	90	
2	30.0~30.5	2	23	37	31	7	–	2.4	0.23	0.01	23	98	75	38	

MECHANICAL ANALYSIS

Title, Investigation Place Thilawa Repair Dockyard Project Bore Hole No. BH - 5 Date

GRAIN SIZE DISTRIBUTION CURVE



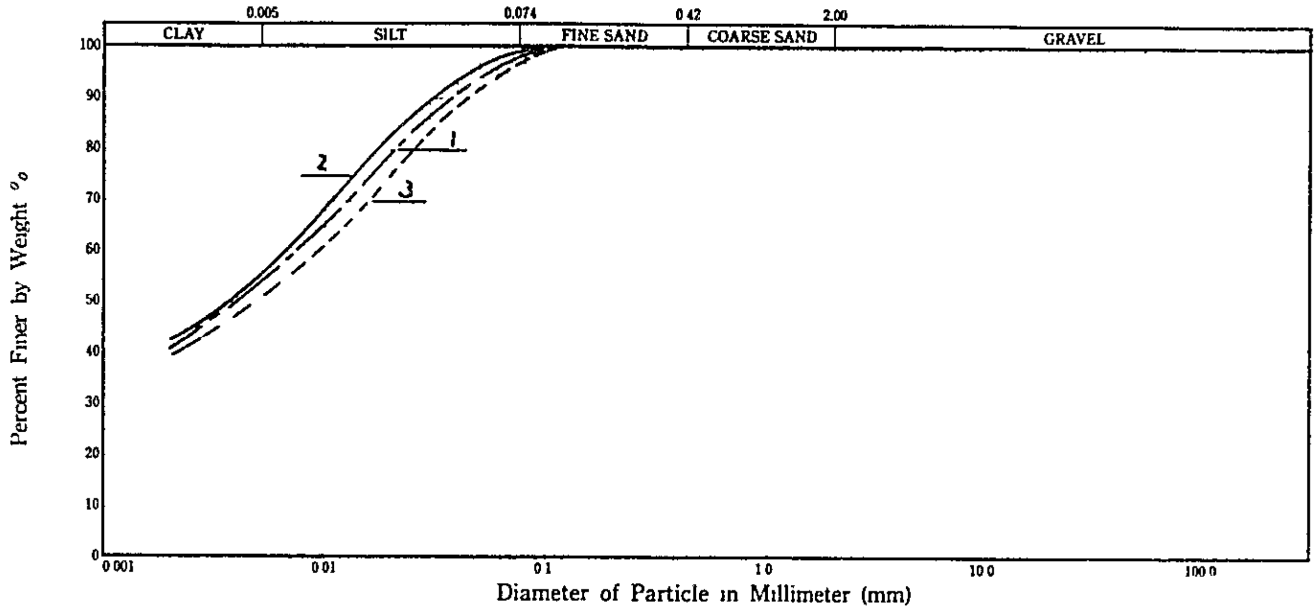


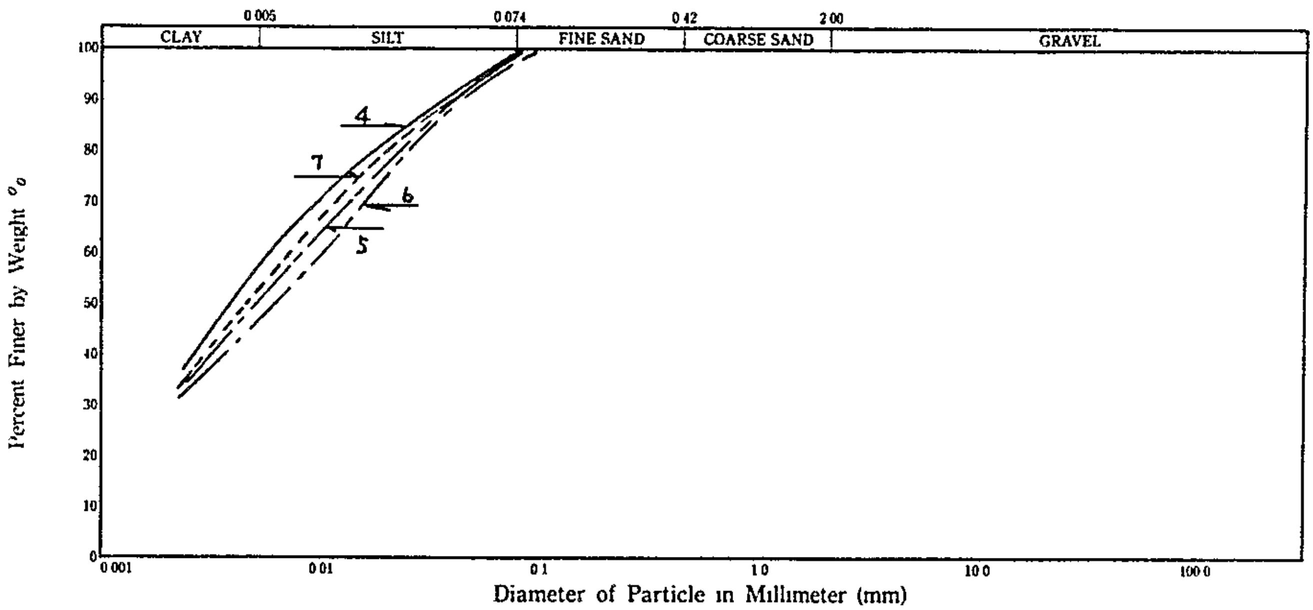
Sample No	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D60 mm	D10 mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	3.0 ~ 3.3	0	0	0	43	57	44	0.074	0.006	–	–	100	100	100	
2	5.0 ~ 5.5	0	0	0	45	55	43	0.074	0.008	–	–	100	100	100	
3	8.5 ~ 9.5	0	0	3	45	52	40	0.09	0.009	–	–	100	100	97	
4	12.0 ~ 12.5	0	0	4	48	48	38	0.15	0.01	–	–	100	100	96	
5	15.0 ~ 15.7	0	0	0	44	56	42	0.074	0.006	–	–	100	100	100	
6	18.0 ~ 18.7	0	0	4	43	53	40	0.15	0.007	–	–	100	100	96	
7	21.5 ~ 22.0	0	3	4	43	50	40	2.00	0.009	–	–	100	97	93	

MECHANICAL ANALYSIS

Title, Investigation Place Thilawa Repair Dockyard Project Bore Hole No BH-6 Date

GRAIN SIZE DISTRIBUTION CURVE



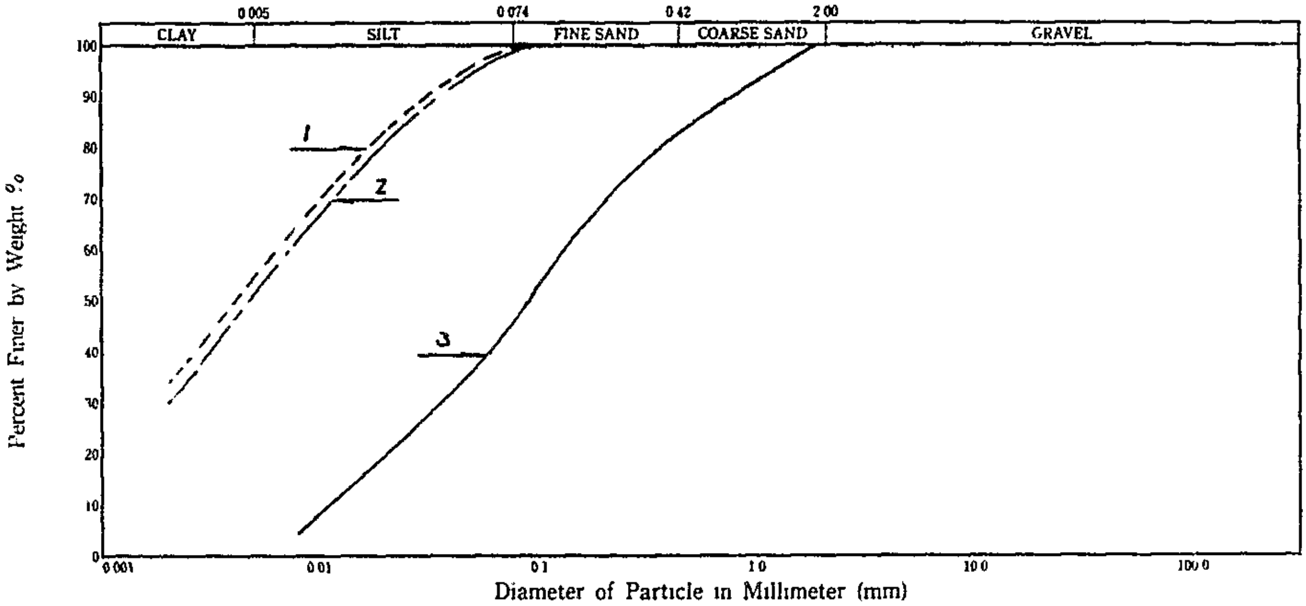


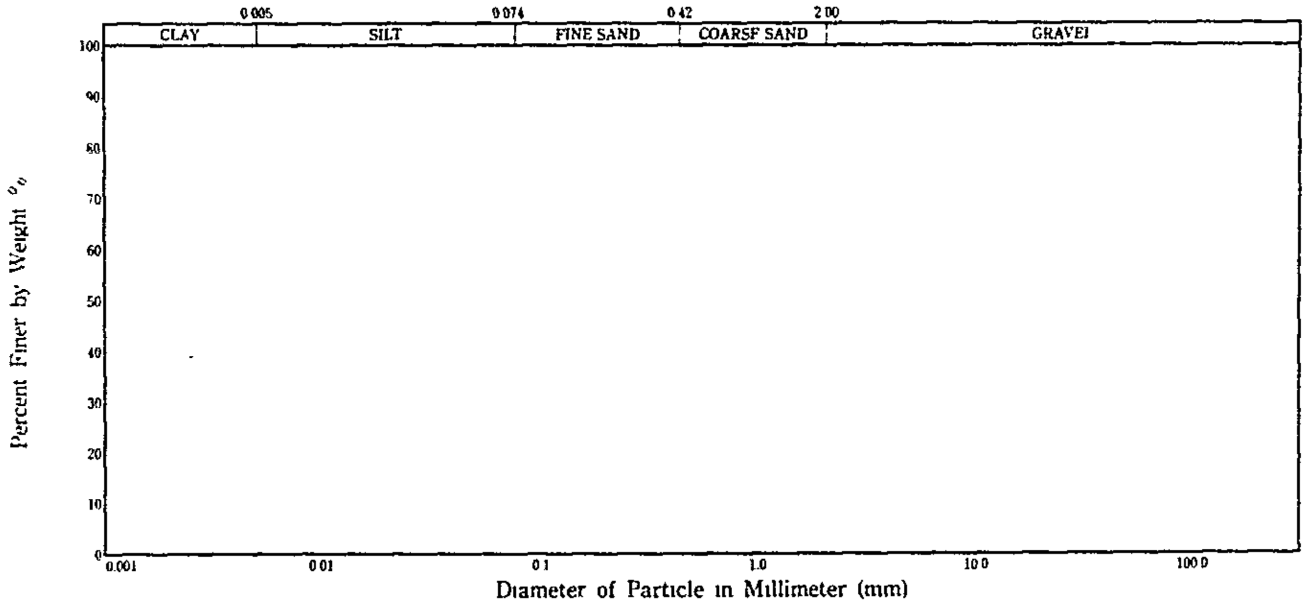
Sample No.	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff. of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	2.0 ~ 2.5	0	0	2	45	53	41	0.09	0.008	-	-	100	100	98	
2	5.0 ~ 5.5	0	0	1	45	54	41	0.09	0.006	-	-	100	100	99	
[illegible]	8.0 ~ 8.5	0	0	3	47	50	40	0.1	0.01	-	-	100	100	97	
4	11.0 ~ 11.5	0	0	0	43	57	35	0.074	0.006	-	-	100	100	100	
5	14.0 ~ 14.5	0	0	0	48	52	30	0.074	0.009	-	-	100	100	100	
6	17.0 ~ 17.5	0	0	0	55	45	30	0.074	0.008	-	-	100	100	100	
7	20.0 ~ 20.5	0	0	3	51	46	30	0.1	0.01	-	-	100	100	97	

MECHANICAL ANALYSIS

Title, Investigation Place Thilawa Repair Dockyard Project   Bore Hole No BH - 6   Date

GRAIN SIZE DISTRIBUTION CURVE





Sample No	Depth m	Gravel %	Coarse Sand %	Fine Sand %	Silt %	Clay %	(Coloid) %	Dmax mm	D_{60} mm	D_{10} mm	Coeff of Uniformity Uc	2.00mm Under %	0.42mm Under %	0.074m Under %	Specific Gravity Gs
1	23.0~23.5	0	0	0	45	55	35	0.074	0.006	–	–	100	100	100	
2	26.0~26.5	0	0	2	48	50	30	0.09	0.008	–	–	100	100	98	
3	30.0~30.5	0	17	40	43	–	–	2.00	0.13	0.01	13	100	83	43	

UNCONFINED COMPRESSION TEST

B-5

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点
Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日
Date: 年 月 日

試料採取位置(深度)
Sampling Place, Depth: 18.0 m ~ 18.6 m

土質名称
Soil Classification: clay

試料番号
Sample No.: TWS-6

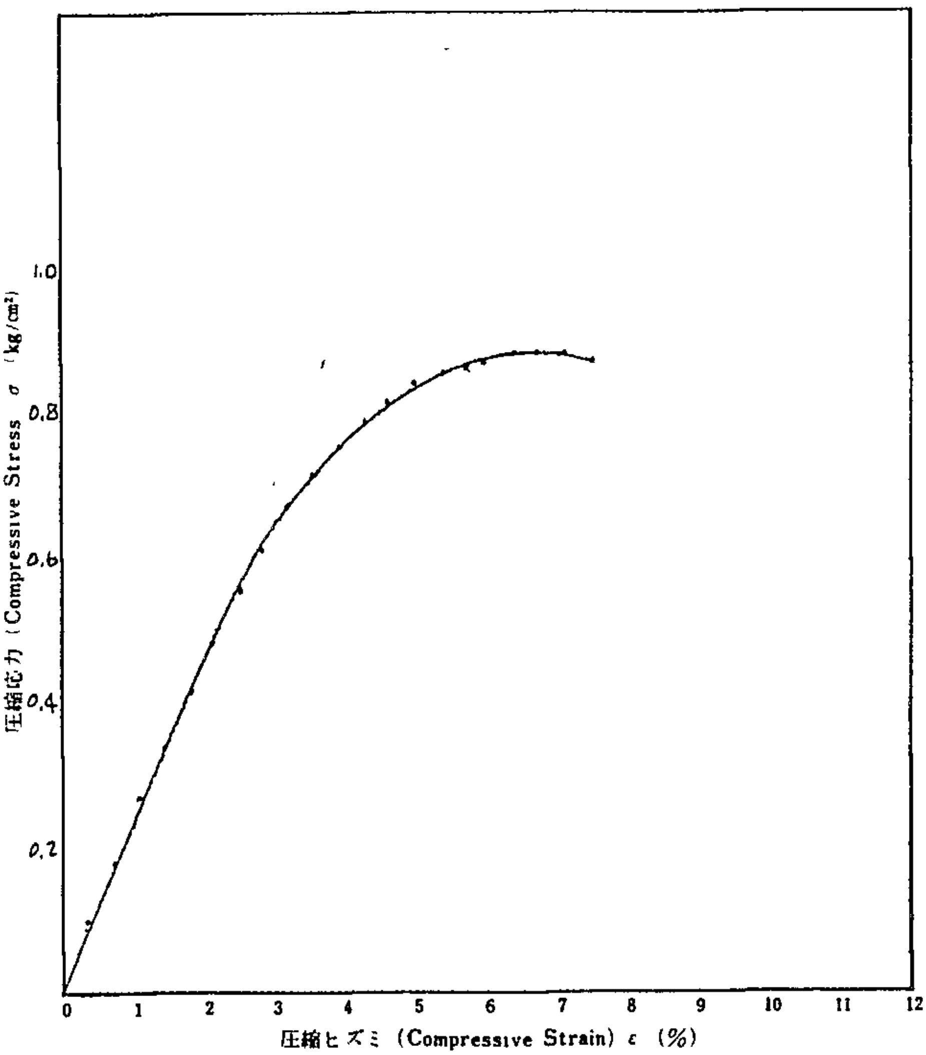
土粒子の比重
Specific Gravity:

応力制御法
Stress Control

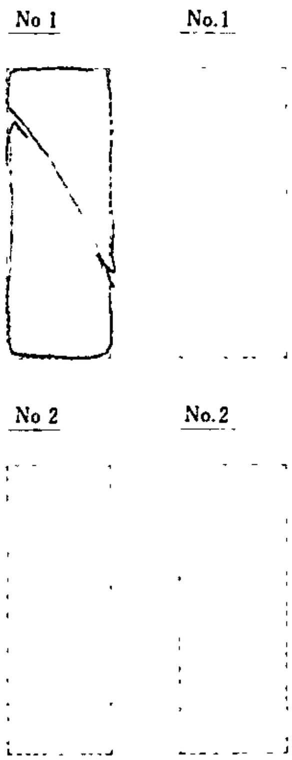
ヒズミ制御法
Strain Control

圧縮速さ
Compression Speed: %/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen: 高さ Height H cm	直径 Diameter φ cm	含水比 Moisture Content w %	湿潤密度 Wet Density γt g/cm³	間げき比 Void Ratio e	飽和度 Degree of Saturation Sr %	一軸圧縮強さ Unconfined Compressive Strength qu kg/cm²	破壊ひずみ Failure Strain εf %	変形係数 Deformation Coefficient E50 kg/cm²	鋭敏比 Sensitivity Ratio St
1	乱さない試料 Undisturbed Sample	14.0	7.5		1.73			0.88	6.5	23	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure



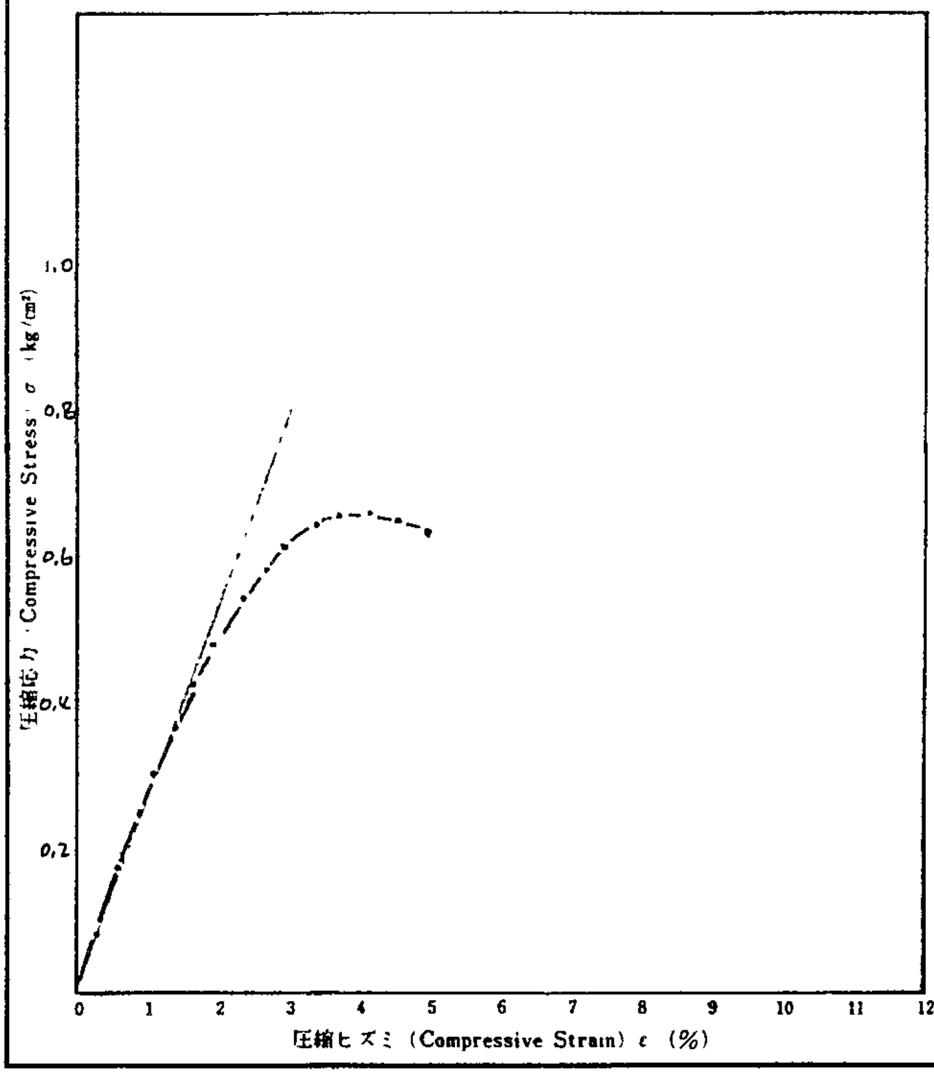
Note
Decayed plant contained.
The sample was slightly disturbed.

B-5

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place	Thilawa Repair Dockyard Project	試験年月日 Date	年　月　日
試料採取位置(深度) Sampling Place, Depth	8.50m ~ 9.20 m	土質名称 Soil Classification	Clay
試料番号 Sample No.	TWS - Ⅲ	土粒子の比重 Specific Gravity	
応力制御法 Stress Control	ヒズミ制御法 Strain Control	圧縮速さ Compression Speed	%/min　mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen 高さ Height H cm	直径 Diameter φ cm	含水比 Moisture Content w %	単位体積重量 Wet Density γ_t g/cm³	間ゲキ比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊ヒズミ Failure Strain ε %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	13.0	7.5		1.72			0.66	3.7	26	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure

No 1　No 1

No 2　No.2

7ㄑ-

B-5

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日 Date: 年 月 日

試料採取位置(深度) Sampling Place, Depth: 15.0 m ~ 15.5 m

土質名称 Soil Classification: Clay

試料番号 Sample No: TWS - V

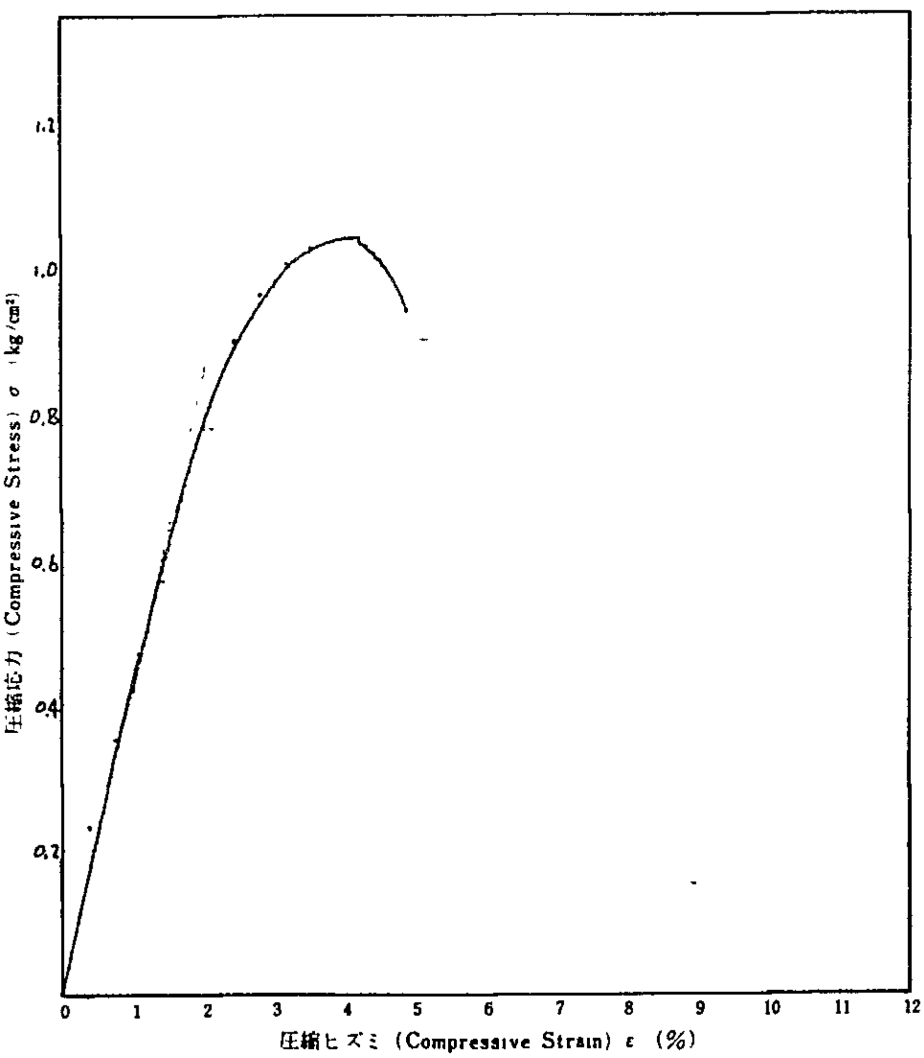
土粒子の比重 Specific Gravity:

応力制御法 Stress Control

ヒズミ制御法 Strain Control

圧縮速さ Compression Speed: %/min mm/min

Specimen No	Specimen Condition	Dimension of Specimen: Height H (cm)	Dimension of Specimen: Diameter φ cm	Moisture Content w %	Wet Density γ_t g/cm³	Void Ratio e	Degree of Saturation S %	Unconfined Compressive Strength q_u kg/cm²	Failure Strain ε_f %	Deformation Coefficient E_{50} kg/cm²	Sensitivity Ratio S_t
1	Undisturbed Sample	14.3	7.5		1.79			1.04	4.2	44	
1	Remolded Sample										
2	Undisturbed Sample										
2	Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure

No 1 No 1

No 2 No 2

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B-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点
Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日
Date: 年 月 日

試料採取位置(深度)
Sampling Place, Depth: 2.00 m ~ 2.50 m

土質名称
Soil Classification:

試料番号
Sample No.: TWS - 1

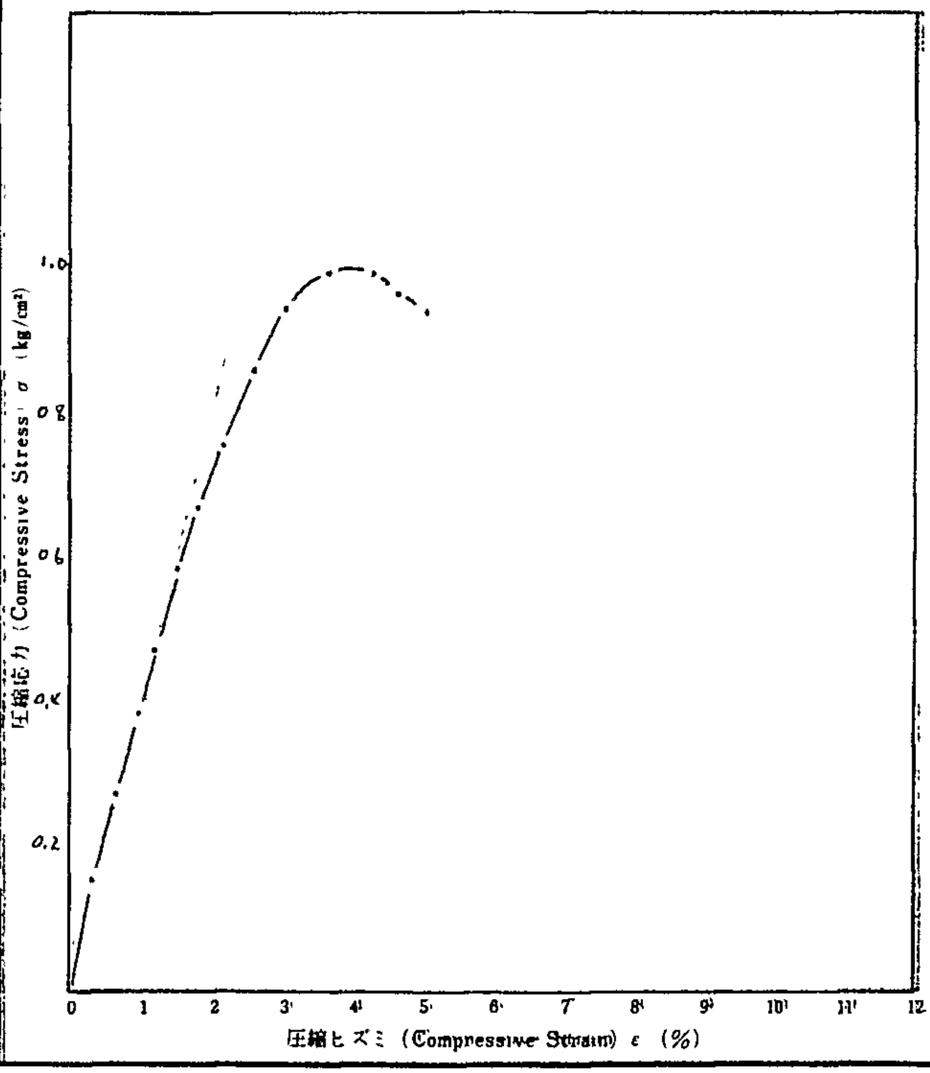
土粒子の比重
Specific Gravity:

応力制御法
~~Stress Control~~

ヒズミ制御法
Strain Control

圧縮速さ
Compression Speed: 1 %/min mm/min

供試体番号 Specimen No.	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen: 高さ Height H (cm)	直径 Diameter φ cm	含水比 Moisture Content w %	単位体積重量 Wet Density γ t g/cm³	間げき比 Void Ratio e	飽和度 Degree of Saturation S_r %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊ひずみ Failure Strain ε_f %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	13.4	7.5	44.5	1.82			0.98	3.7	42	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure

No 1 No. 1'

No 2 No. 2'

BH-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日 Date: 年 月 日

試料採取位置(深度) Sampling Place, Depth: 4.00 m ~ 4.70 m

土質名称 Soil Classification: clay

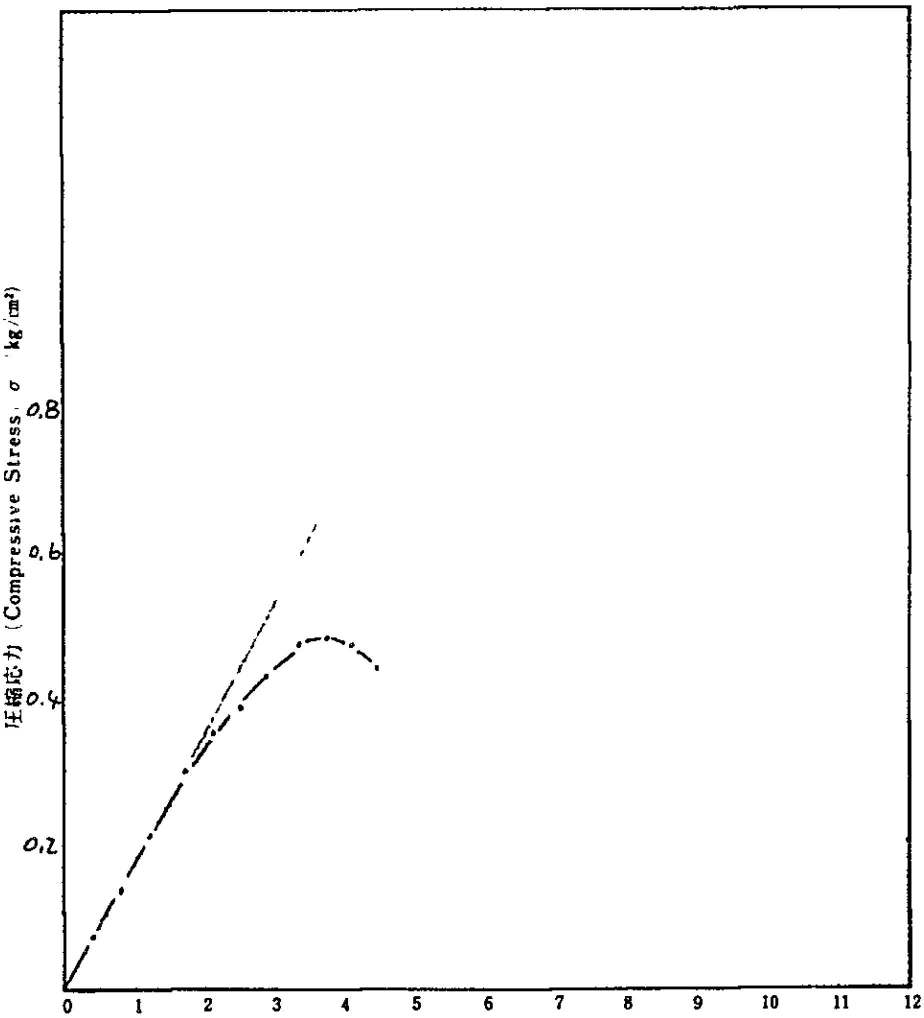
試料番号 Sample No: TWS - 2

土粒子の比重 Specific Gravity:

応力制御法 Stress Control　　ヒズミ制御法 Strain Control

圧縮速さ Compression Speed: %/min　mm/min

Specimen No	Specimen Condition	Dimension of Specimen: Height H cm	Dimension of Specimen: Diameter φ cm	Moisture Content w %	Wet Density γ_t g/cm³	Void Ratio e	Degree of Saturation S %	Unconfined Compressive Strength q_u kg/cm²	Failure Strain ε_f %	Deformation Coefficient E_{50} kg/cm²	Sensitivity Ratio S_t
1	Undisturbed Sample	7.5	15.0	42.2	1.78			0.48	3.8	18	
1	Remolded Sample										
2	Undisturbed Sample										
2	Remolded Sample										



圧縮応力 (Compressive Stress, σ kg/cm²)

圧縮ヒズミ (Compressive Strain) ε (%)

試料の破壊状況
Observation at Ultimate Failure

No 1　　No 1

No 2　　No.2

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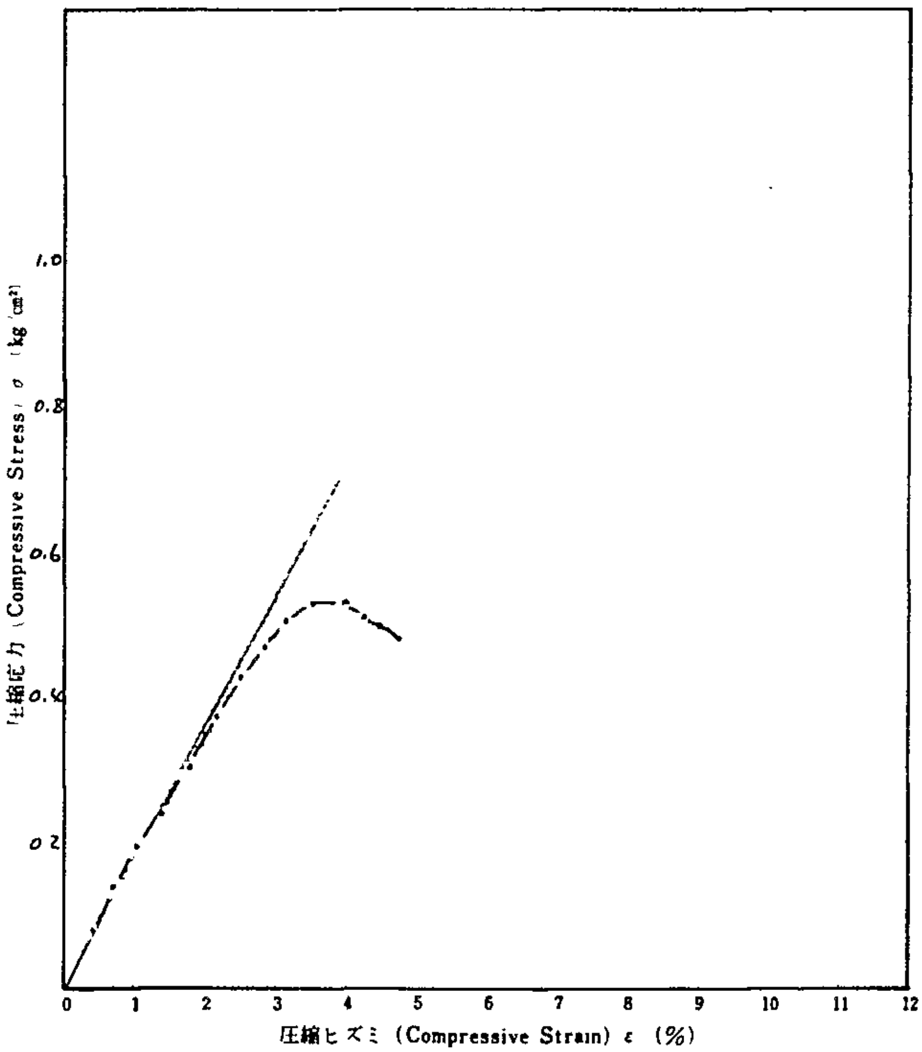
土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project	試験年月日 Date 年 月 日
試料採取位置(深度) Sampling Place, Depth: 6.00 m ~ 6.78 m	土質名称 Soil Classification
試料番号 Sample No.	土粒子の比重 Specific Gravity
応力制御法 Stress Control / ヒズミ制御法 Strain Control	圧縮速さ Compression Speed %/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen: 高さ Height H cm	直径 Diameter d cm	含水比 Moisture Content w %	湿潤密度 Wet Density	間ゲキ比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊時のヒズミ Failure Strain ε_f %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	15.0	7.5	46.9	1.75			0.53	3.5	18	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure

No 1 | No.1

No 2 | No 2

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BH-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日 Date: 年 月 日

試料採取位置(深度) Sampling Place, Depth: 8.00 m ~ 8.78 m

土質名称 Soil Classification: Clay

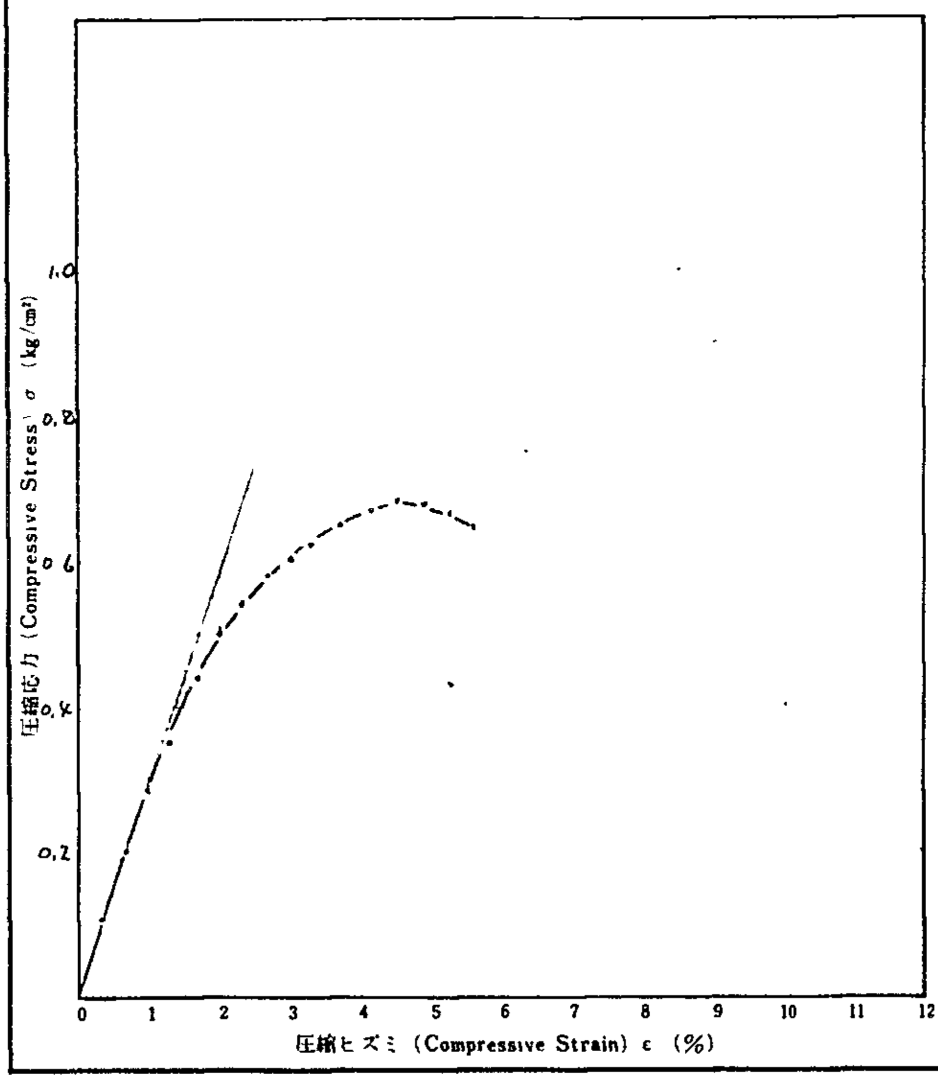
試料番号 Sample No.: TWS-4

土粒子の比重 Specific Gravity:

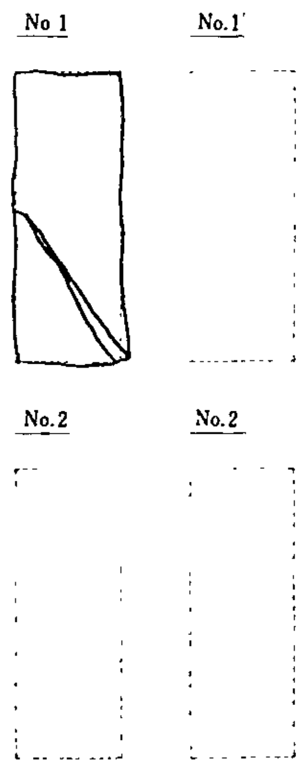
応力制御法 Stress Control — ヒズミ制御法 Strain Control

圧縮速さ Compression Speed: %/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen: 高さ Height H cm	直径 Diameter φ cm	含水比 Moisture Content w %	湿潤密度 Wet Density γ_t g/cm³	間ゲキ比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊ひずみ Failure Strain ε_f %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	15.0	7.5		1.81			0.68	4.5	30	
1	練り返し試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返し試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure



BH-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点
Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日
Date: 年 月 日

試料採取位置（深度）
Sampling Place, Depth: 10.0 m ~ 10.7 m

土質名称
Soil Classification:

試料番号
Sample No: TWS-5

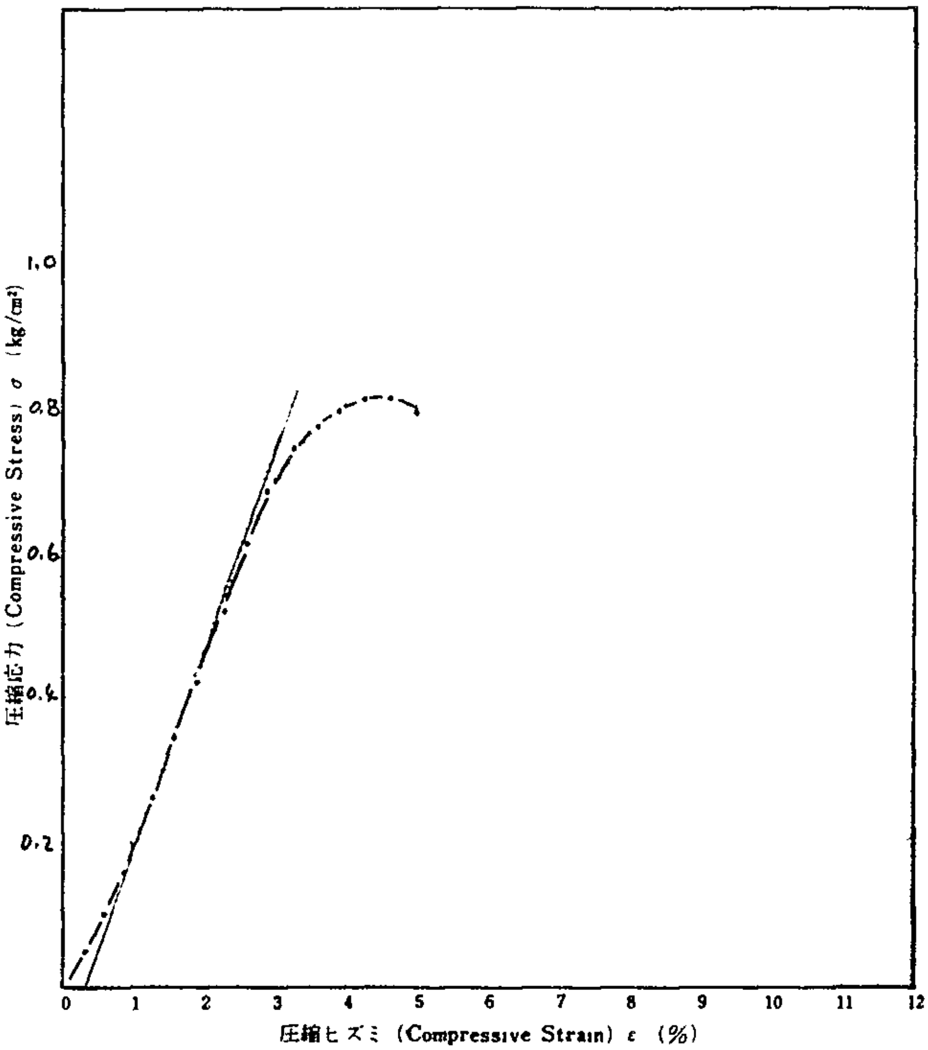
土粒子の比重
Specific Gravity:

応力制御法
Stress Control

ヒズミ制御法
Strain Control

圧縮速さ
Compression Speed: %/min mm/min

Specimen No	Specimen Condition	Dimension of Specimen: Height H (cm)	Dimension of Specimen: Diameter φ (cm)	Moisture Content w %	Wet Density γ_t g/cm³	Void Ratio e	Degree of Saturation S %	Unconfined Compressive Strength q_u kg/cm²	Failure Strain ε %	Deformation Coefficient E_{50} kg/cm²	Sensitivity Ratio S_t
1	Undisturbed Sample	15.2	7.5	37.3	1.83			0.81	4.2	35	
1	Remolded Sample										
2	Undisturbed Sample										
2	Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure

No 1 No.1

No 2 No 2

Very fine sand contained.

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BH - 10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日 Date: 年 月 日

試料採取位置(深度) Sampling Place, Depth: 12.0 m – 12.8 m

土質名称 Soil Classification:

試料番号 Sample No.: TWS – 6

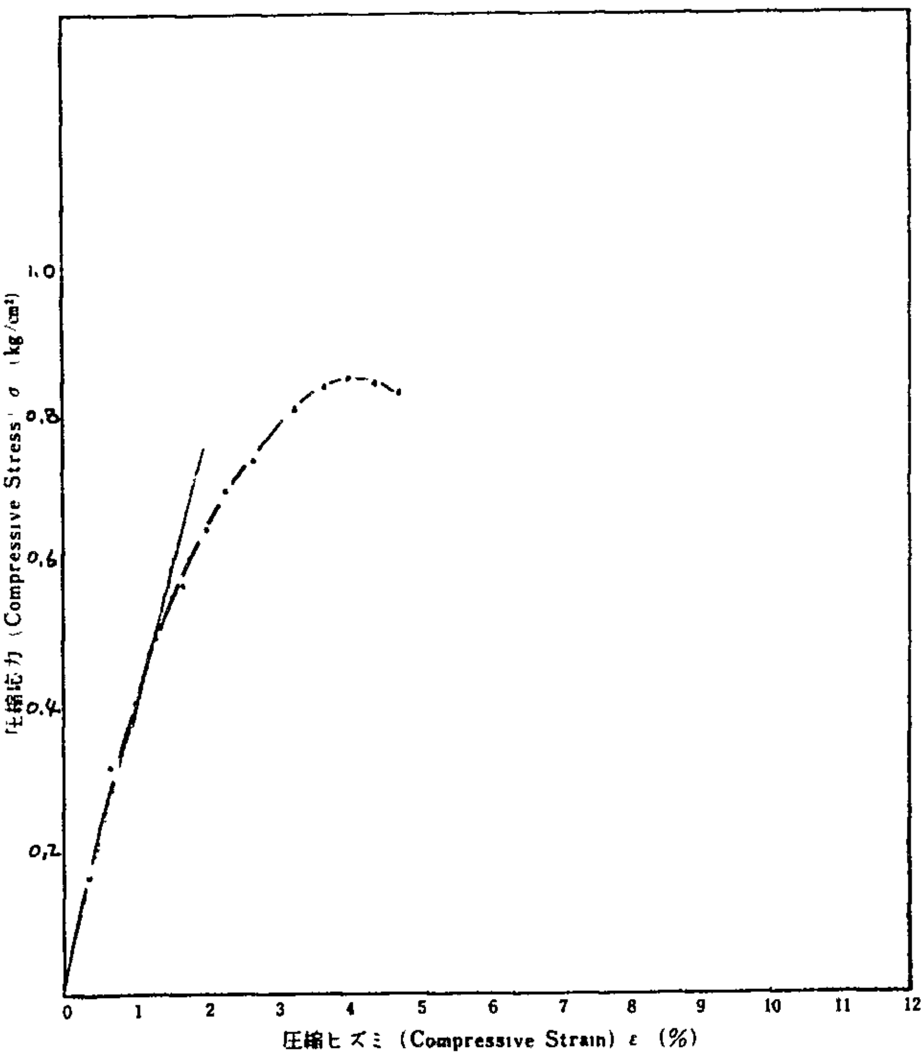
土粒子の比重 Specific Gravity:

応力制御法 Stress Control

ヒズミ制御法 Strain Control

圧縮速さ Compression Speed: %/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Demension of Specimen: 高さ Height H (cm)	直径 Diameter φ cm	含水比 Moisture Content w %	湿潤密度 Wet Density γ_t g/cm³	間ゲキ比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊ヒズミ Failure Strain ε_f %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	15.0	7.5	45	1.73			0.85	4.0	40	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況 Observation at Ultimate Failure

No.1 No.1

No 2 No 2

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BH-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点
Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日
Date: 年 月 日

試料採取位置(深度)
Sampling Place, Depth: 14.00 m ~ 14.78 m

土質名称
Soil Classification:

試料番号
Sample No.: TWS - 7

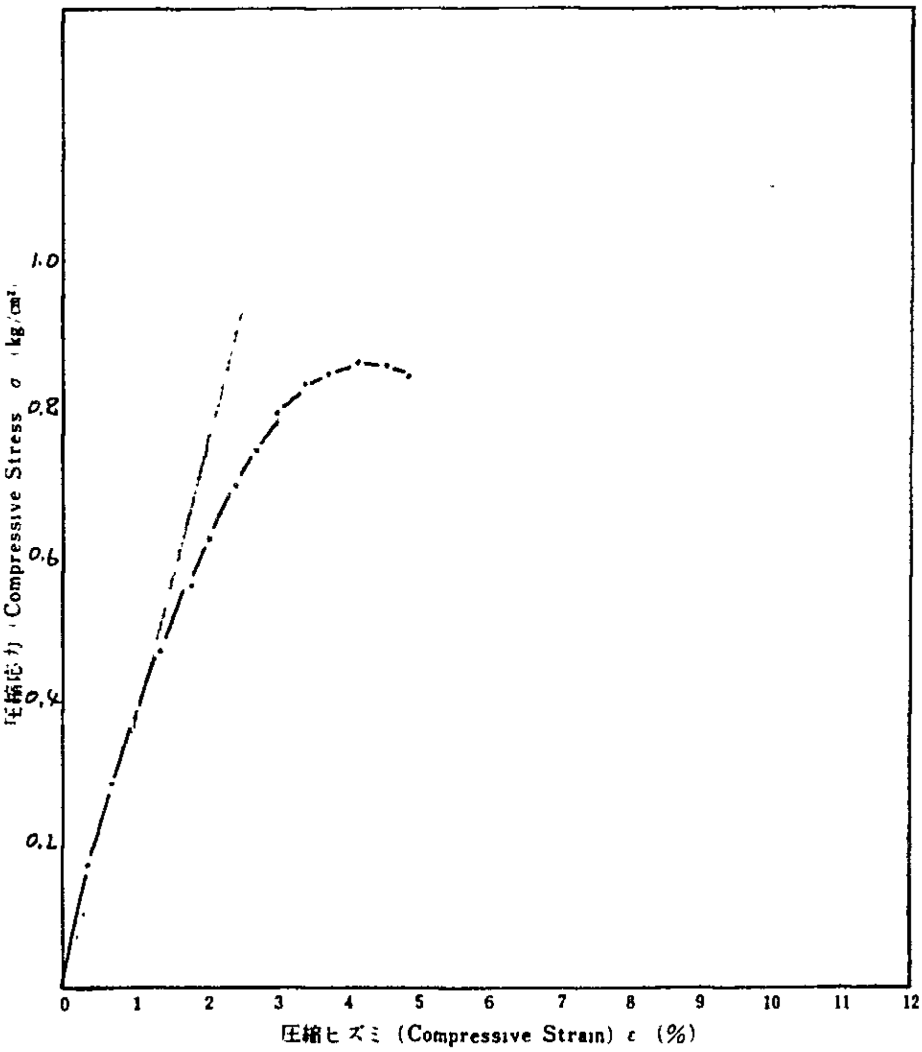
土粒子の比重
Specific Gravity:

応力制御法
Stress Control

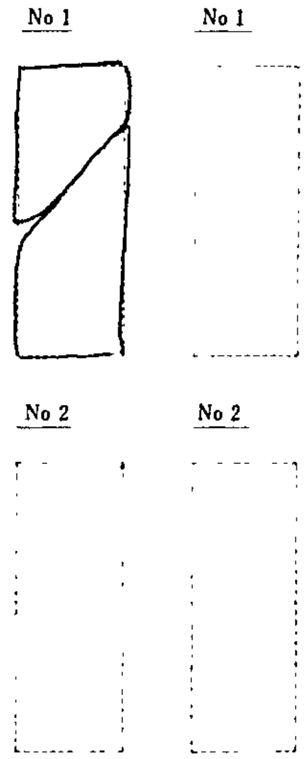
ヒズミ制御法
Strain Control

圧縮速さ
Compression Speed: %/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen 高さ Height H cm	直径 Diameter φ cm	含水比 Moisture Content w %	湿潤密度 Wet Density γt g/cm³	間ゲキ比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength qu kg/cm²	破壊ひずみ Failure Strain εf %	変形係数 Deformation Coefficient E50 kg/cm²	鋭敏比 Sensitivity Ratio St
1	乱さない試料 Undisturbed Sample	14.9	7.5		1.72			0.86	4.2	37	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure



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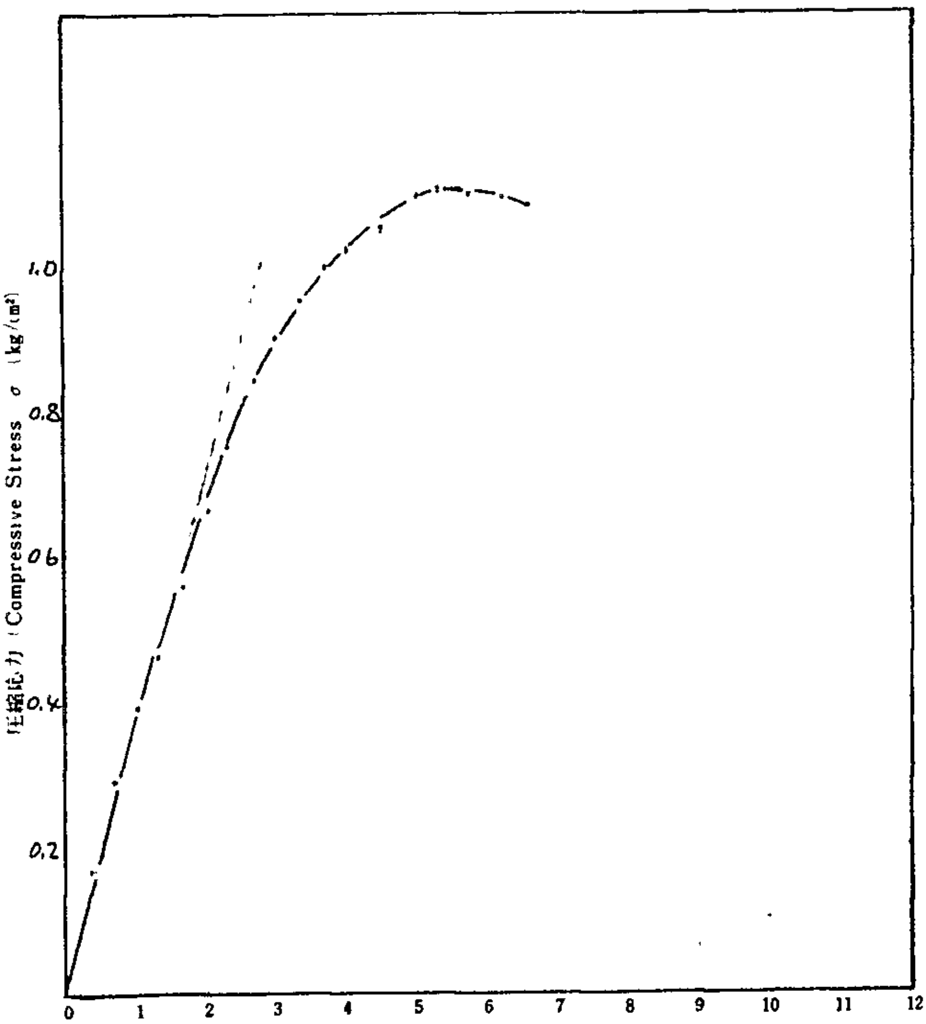
B-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

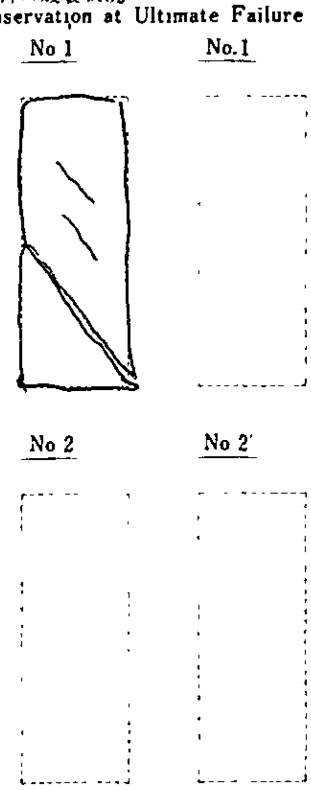
調査名・調査地点 Title, Investigation Place	Thilawa Repair Dockyard Project	試験年月日 Date	年 月 日
試料採取位置(深度) Sampling Place, Depth	16.0 m ~ 16.7 m	土質名称 Soil Classification	Clay
試料番号 Sample No.	TWS − 8	土粒子の比重 Specific Gravity	
応力制御法 Stress Control	ヒズミ制御法 Strain Control	圧縮速さ Compression Speed	%/min mm/min

Specimen No	Specimen Condition	Dimension of Specimen: Height H (cm)	Diameter φ cm	Moisture Content w %	Wet Density γ_t g/cm³	Void Ratio e	Degree of Saturation S %	Unconfined Compressive Strength q_u kg/cm²	Failure Strain ε_f %	Deformation Coefficient E_{50} kg/cm²	Sensitivity Ratio S_t
1	Undisturbed Sample	15.0	7.5		1.74			1.10	5.5	37	
1	Remolded Sample										
2	Undisturbed Sample										
2	Remolded Sample										



圧縮ヒズミ (Compressive Strain) ε (%)

試料の破壊状況
Observation at Ultimate Failure



Decayed wood contained

8-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

試験年月日 Date: 年 月 日

試料採取位置(深度) Sampling Place, Depth: 18.0 m ~ 18.8 m

土質名称 Soil Classification:

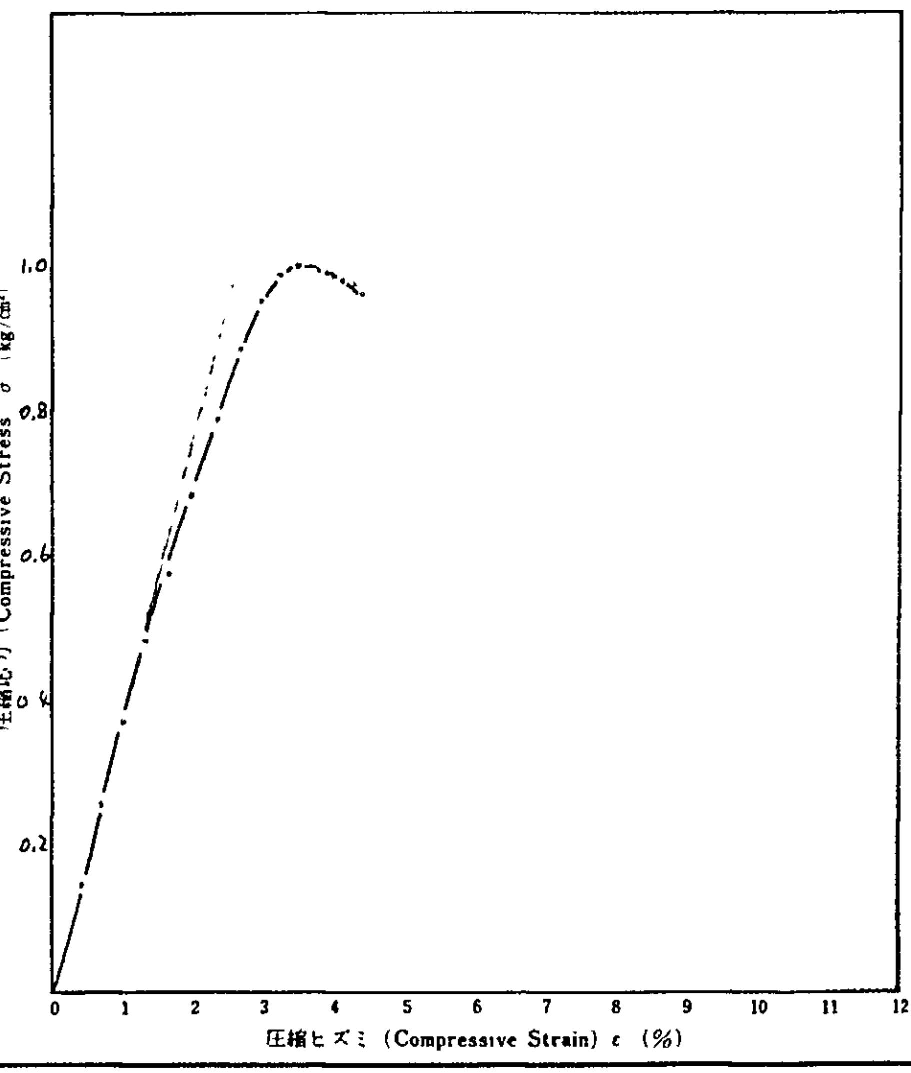
試料番号 Sample No.: TWS - 9

土粒子の比重 Specific Gravity:

応力制御法 Stress Control　　ヒズミ制御法 Strain Control

圧縮速さ Compression Speed: %/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen: 高さ Height H cm	直径 Diameter φ cm	含水比 Moisture Content w %	湿潤密度 Wet Density γ g/cm³	間げき比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊ひずみ Failure Strain ε %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	14.5	7.5		1.73			1.00	3.5	39	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況 Observation at Ultimate Failure

No.1　No.1

No.2　No.2

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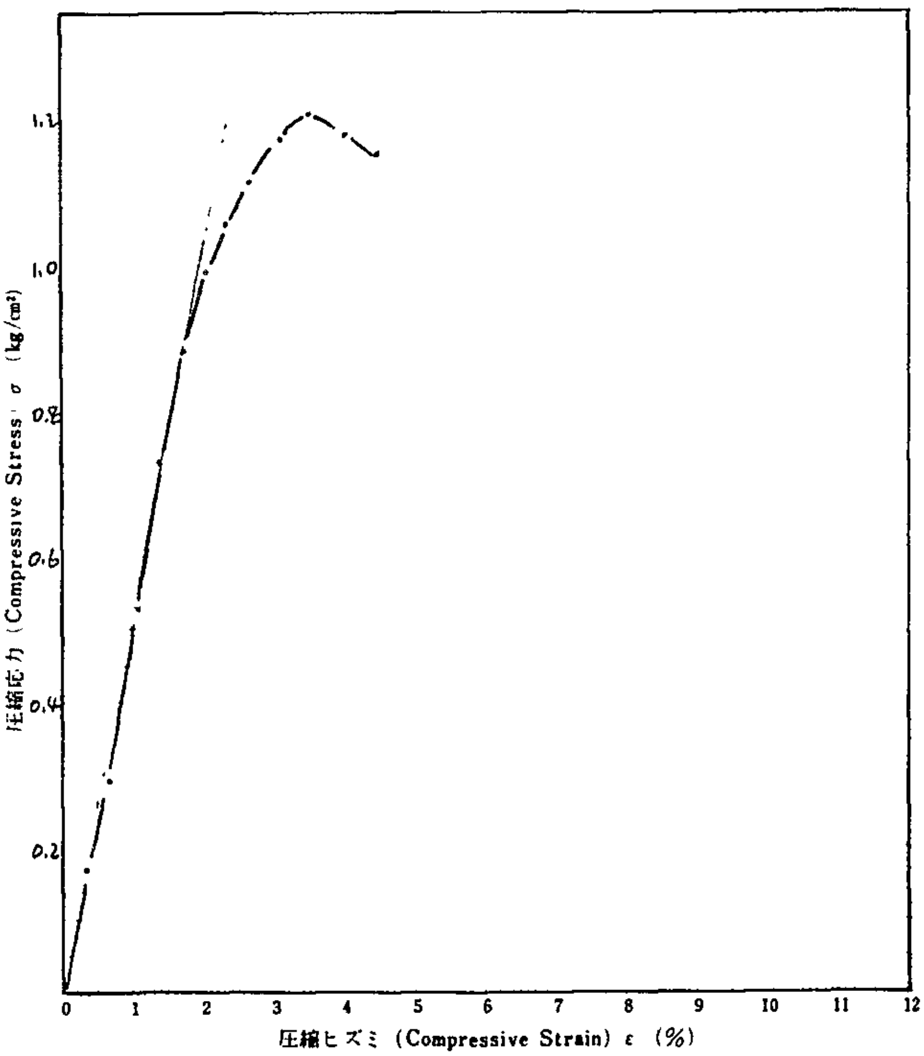
BH-10

土の一軸圧縮試験
UNCONFINED COMPRESSION TEST

調査名・調査地点 Title, Investigation Place	Thilawa Repair Dockyard Project	試験年月日 Date	年 月 日
試料採取位置(深度) Sampling Place, Depth	20.0 m ~ 20.7 m	土質名称 Soil Classification	
試料番号 Sample No	TWS - 10	土粒子の比重 Specific Gravity	clay
応力制御法 Stress Control	ヒズミ制御法 Strain Control	圧縮速さ Compression Speed	%/min mm/min

供試体番号 Specimen No	試料の状態 Specimen Condition	供試体寸法 Dimension of Specimen: 高さ Height H (cm)	直径 Diameter φ (cm)	含水比 Moisture Content w %	湿潤体積重量 Wet Density γ_t g/cm³	間ゲキ比 Void Ratio e	飽和度 Degree of Saturation S %	一軸圧縮強さ Unconfined Compressive Strength q_u kg/cm²	破壊時のヒズミ Failure Strain ε_f %	変形係数 Deformation Coefficient E_{50} kg/cm²	鋭敏比 Sensitivity Ratio S_t
1	乱さない試料 Undisturbed Sample	15.0	7.5		1.71			1.21	3.5	52	
1	練り返した試料 Remolded Sample										
2	乱さない試料 Undisturbed Sample										
2	練り返した試料 Remolded Sample										



試料の破壊状況
Observation at Ultimate Failure

No.1 No.1'

No.2 No.2'

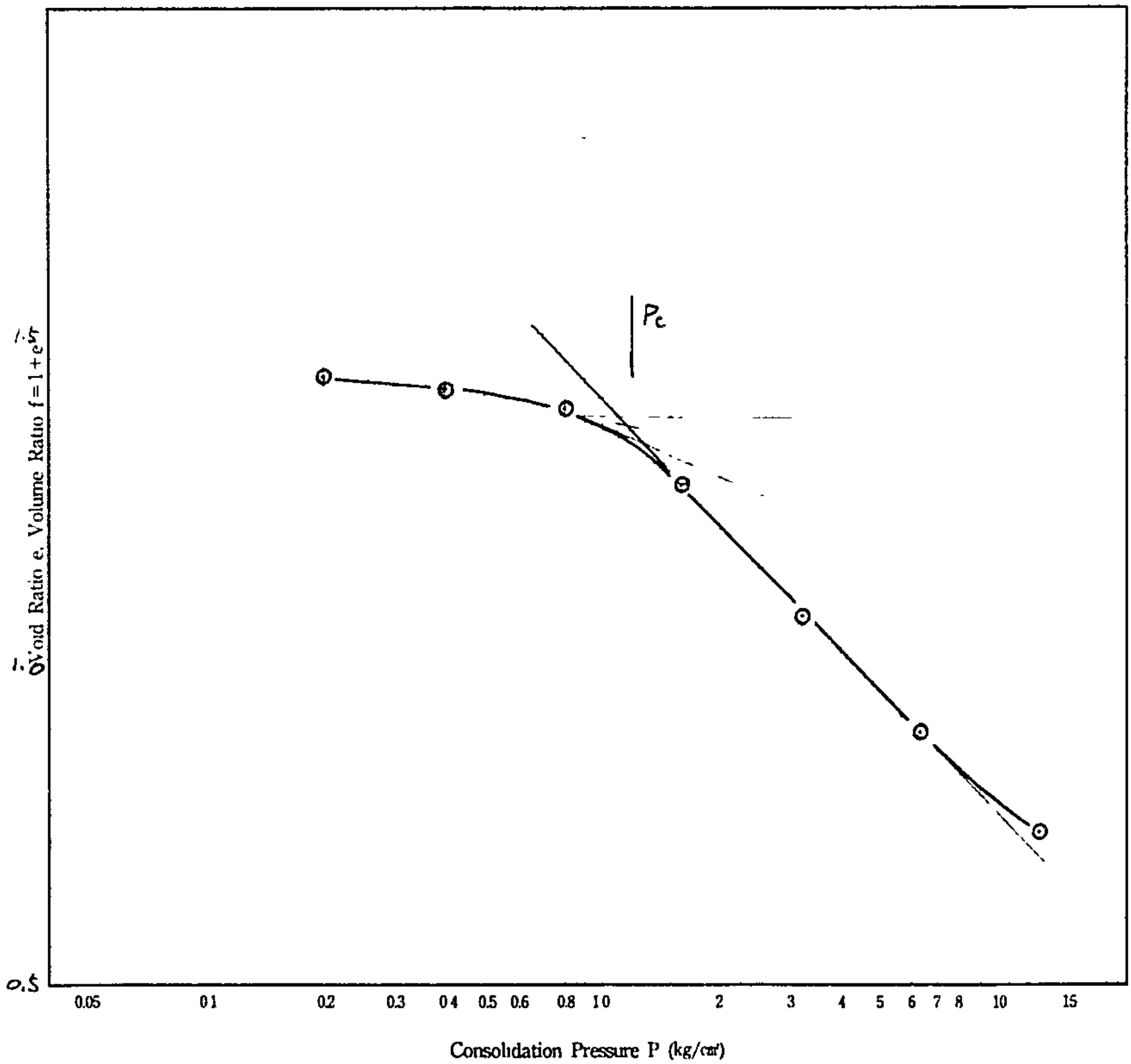
CONSOLIDATION TEST

CONSOLIDATION TEST (1)

Title, Investigation Place **Thilawa Repair Dockyard Project** Date

Sample No Sampling Elevation BH-5, D=5.0~5.7m

Specimen Dimension			Moisture Content						Compression Index
	Diameter	D 6.00 cm		Befor Test	Wo 55.4 %	Liquid Limit	LL %		
	Height	2H 2.00 cm		After Test	Wf %	Specific Gravity	Gs		Cc. 0.64
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	eo 1.44		Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf %	Initial Volume Ratio	fo 2.44		Py 1.2 kg/cm² Pc



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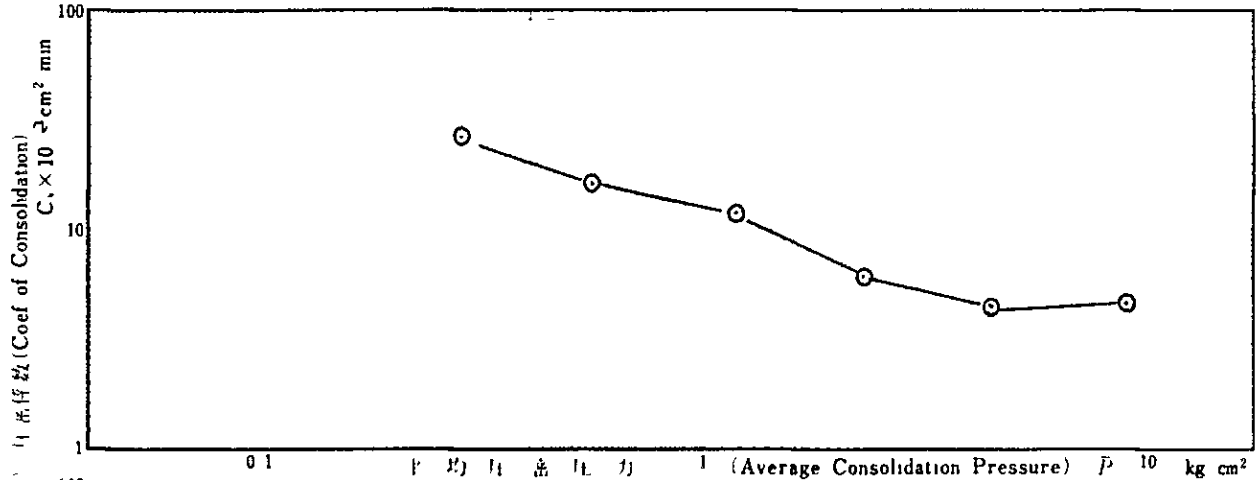
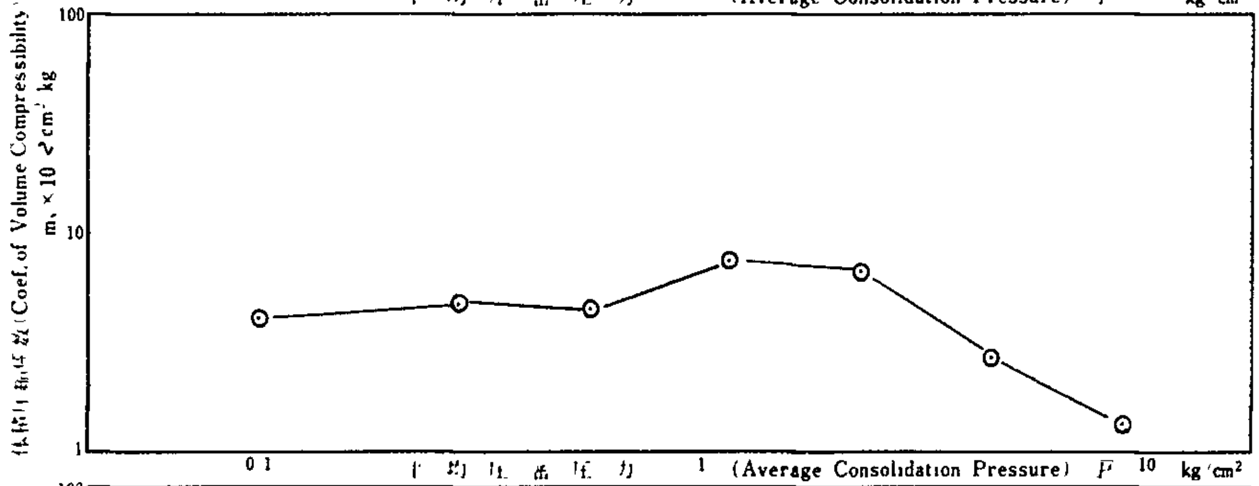
土の圧密試験（3－3）
CONSOLIDATION TEST

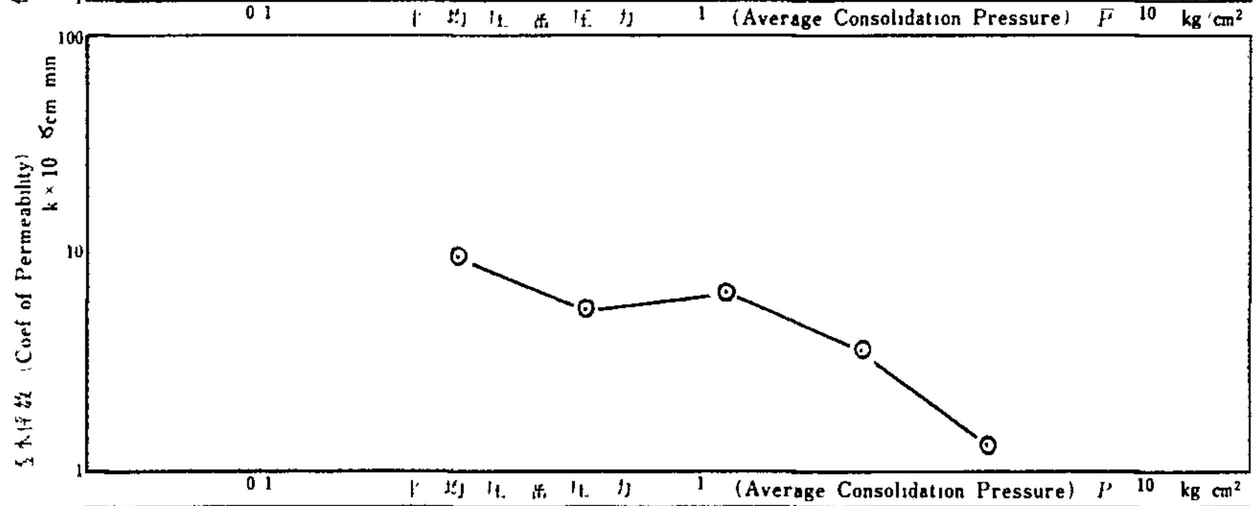
調査名 調査地点
Title. Investigation Place: Thilawa Repair Dockyard Project

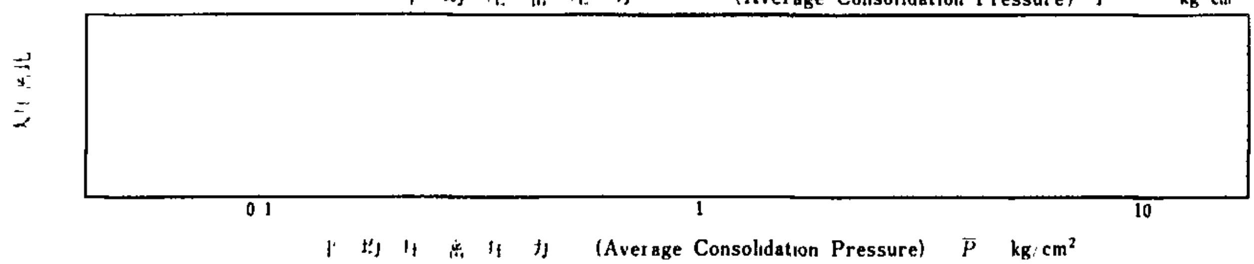
試料番号、採取標高
Sample No., Sampling Elevation: 5.0～5.7

試験年月日
Date: 年 月 日～ 年 月 日







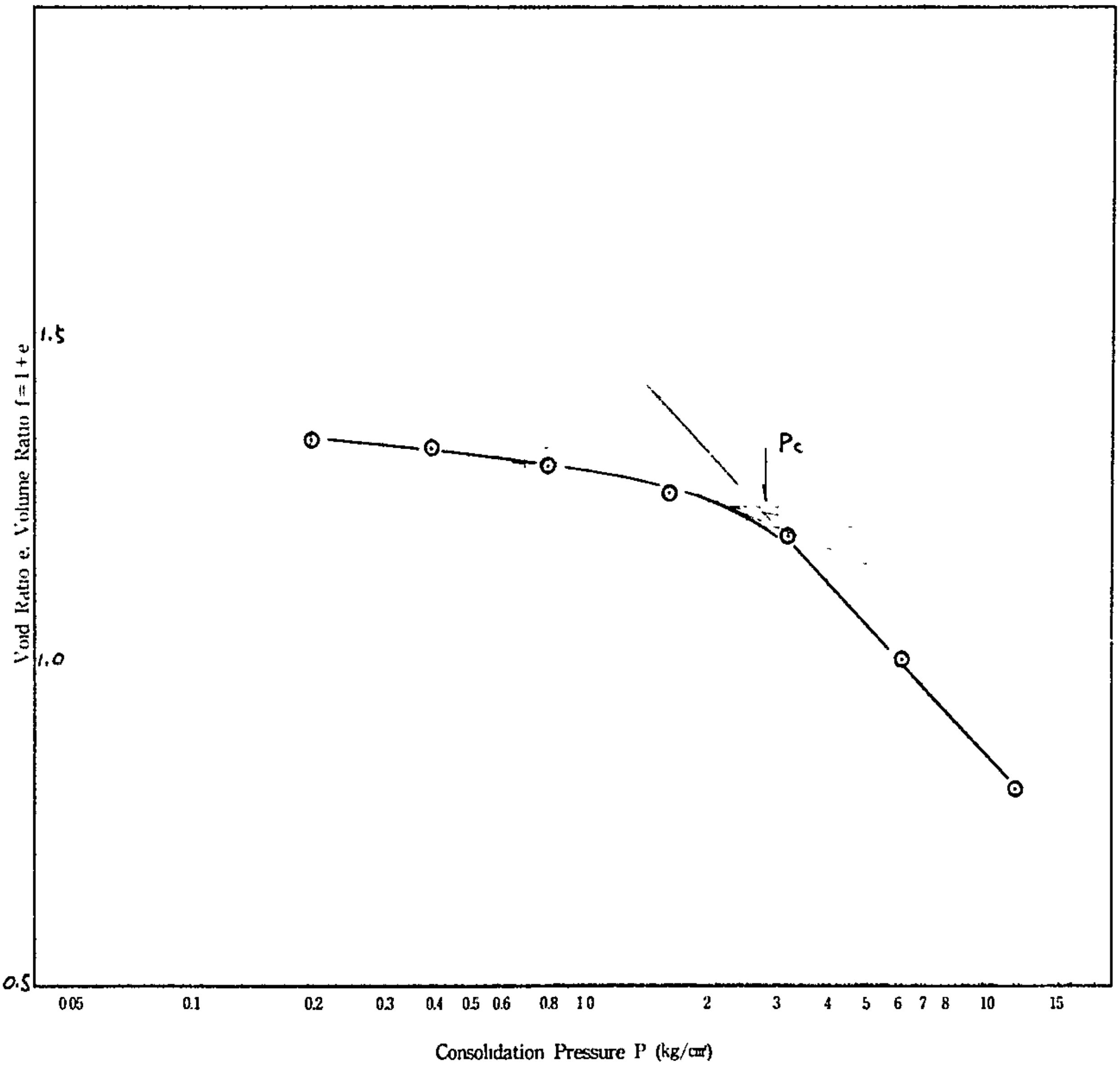


CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No Sampling Elevation B-5, 8.5 ~ 9.2 m

Specimen Dimension			Moisture Content						Compression Index
	Diameter	D. 6.00 cm		Befor Test	Wo 39.1 %	Liquid Limit	LL %		Cc 0.65
	Height	2H 2.00 cm		After Test	Wf %	Specific Gravity	Gs		
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro %	Initial Void Ratio	e_0 1.35		Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf %	Initial Volume Ratio	f_0 2.35		Py 2.8 kg/cm²



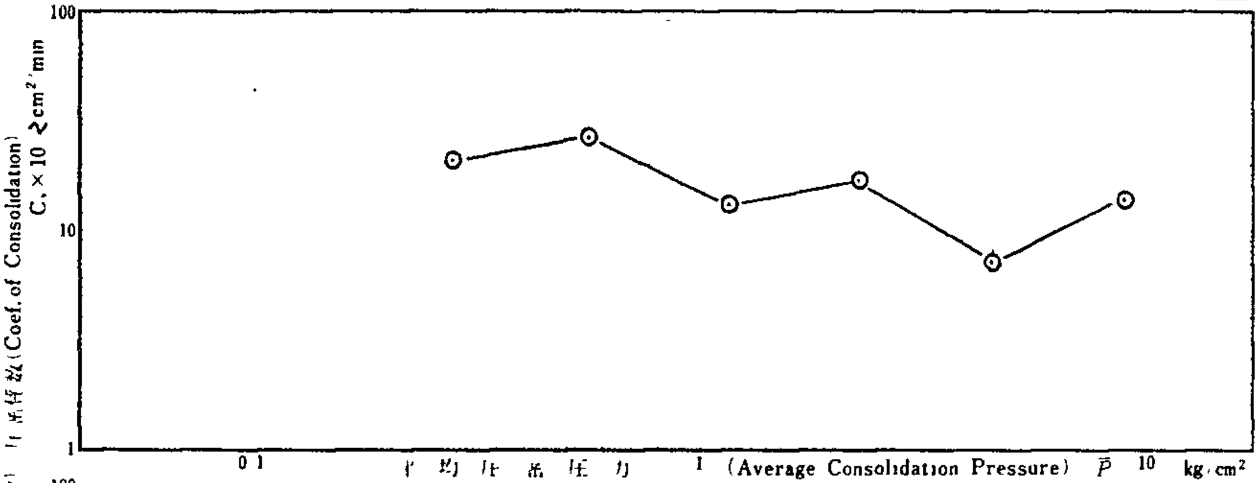
B-5

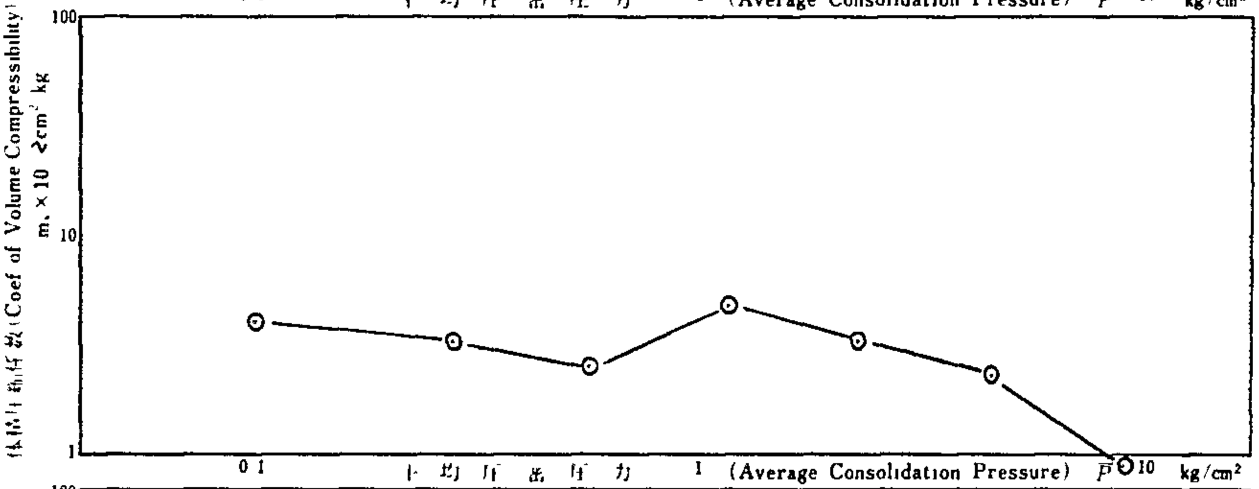
土の圧密試験（3－3）
CONSOLIDATION TEST

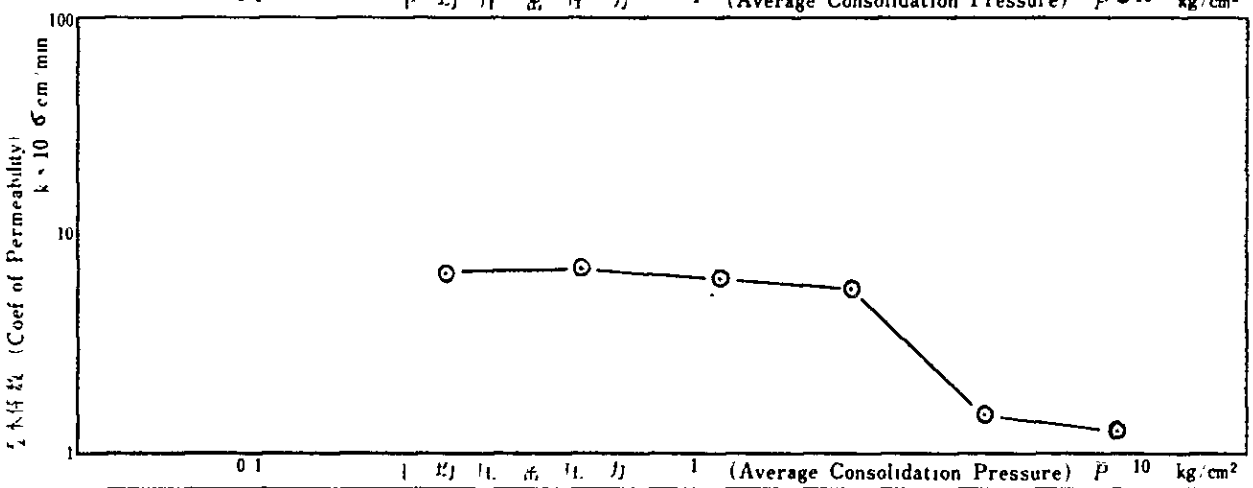
調査名 調査地点
Title, Investigation Place Thilawa Repair Dockyard Project

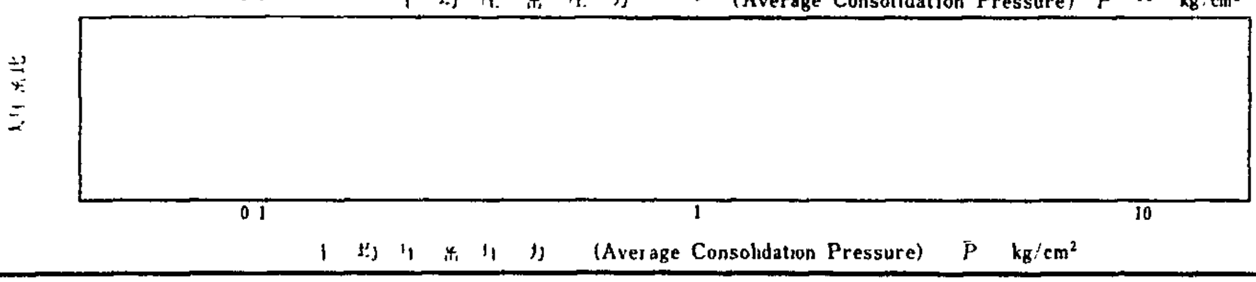
試料番号、採取標高
Sample No, Sampling Elevation 8.5 ~ 9.2

試験年月日
Date 年 月 日～ 年 月 日









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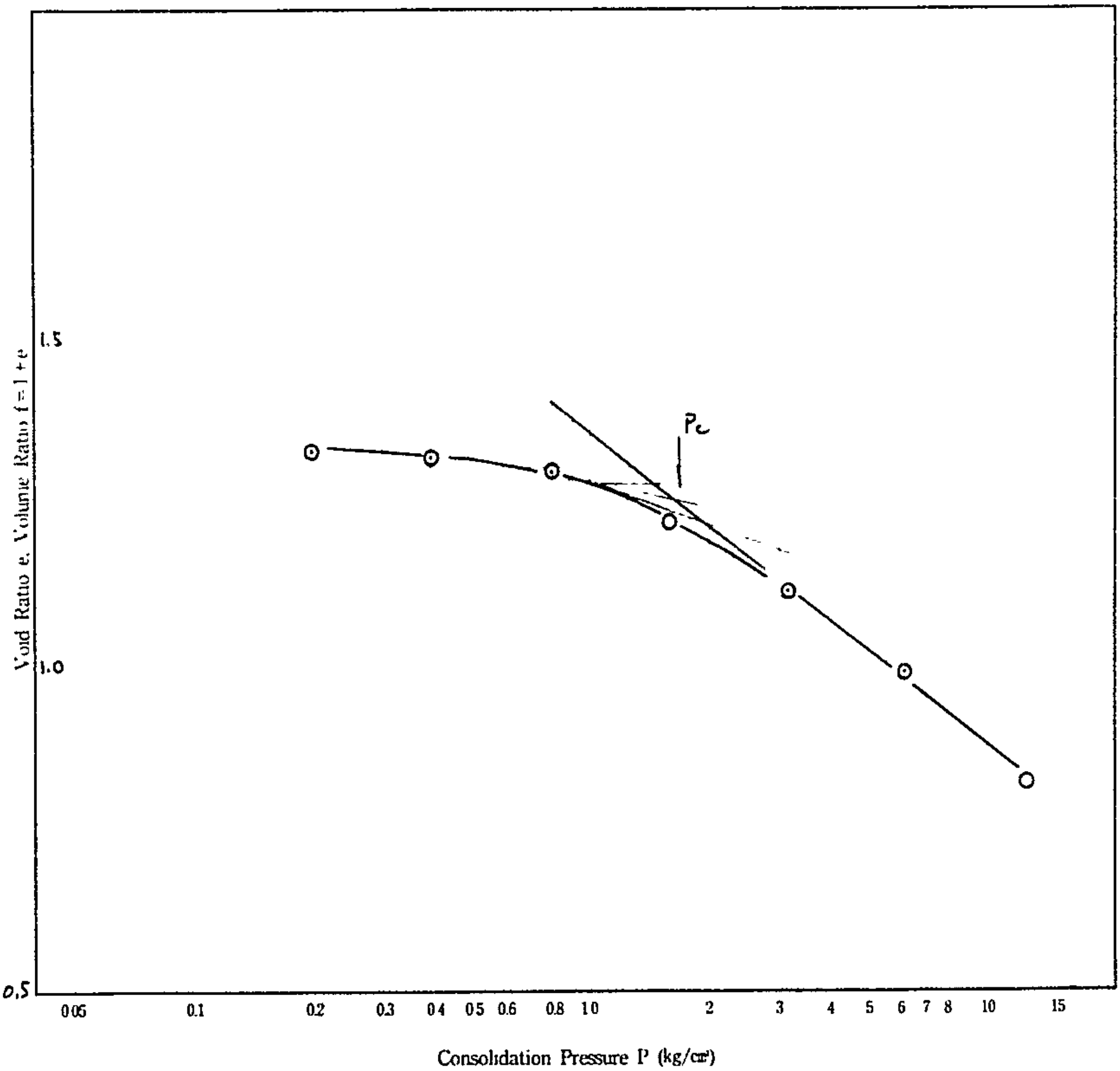
CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No Sampling Elevation BH-5 D= 12.0~12.7 m

Specimen Dimension	Diameter	D 6.0 cm	Moisture Content	Befor Test	Wo 45.7 %	Liquid Limit	LL %	Compression Index	
	Height	2H 2.0 cm		After Test	Wf %	Specific Gravity	Gs	Cc 0.48	
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro %	Initial Void Ratio	eo 1.35	Consolidation Yield Stress	
	Volume	V 56.52 cm³		After Test	Srf %	Initial Volume Ratio	fo 2.35	Py 1.7 kg/cm²	



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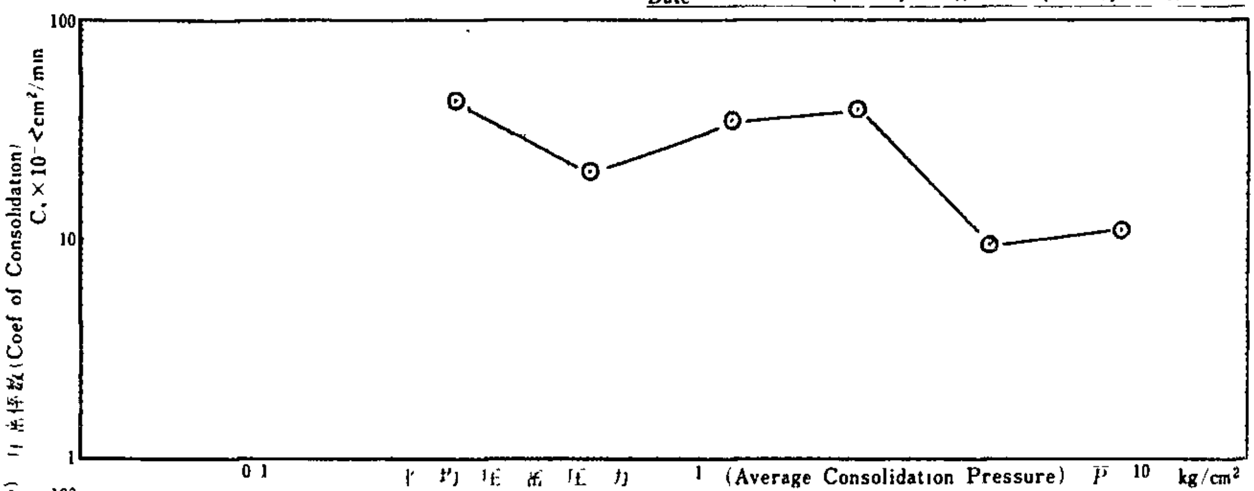
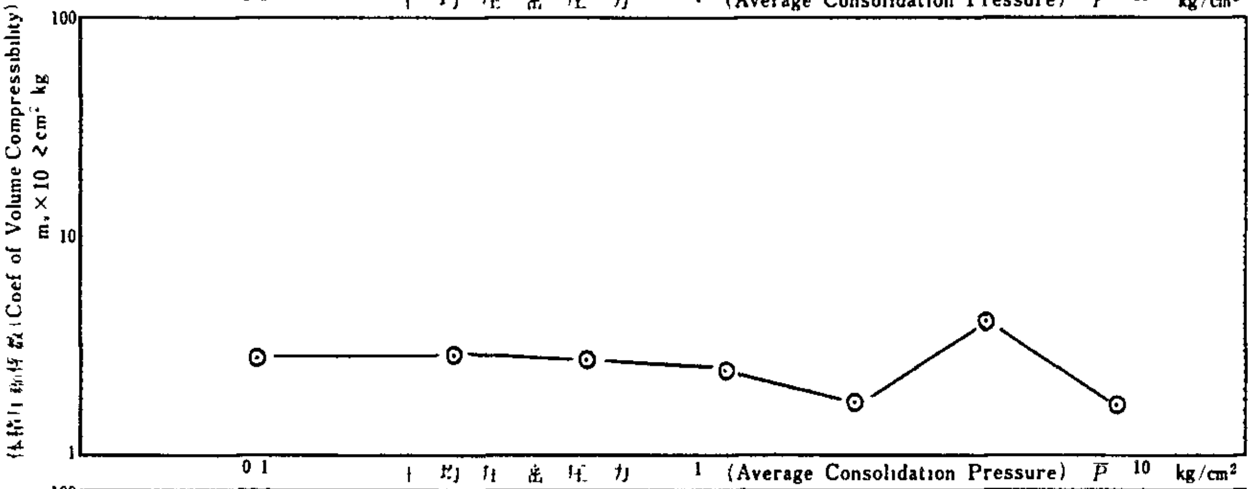
土の圧密試験（3－3）
CONSOLIDATION TEST

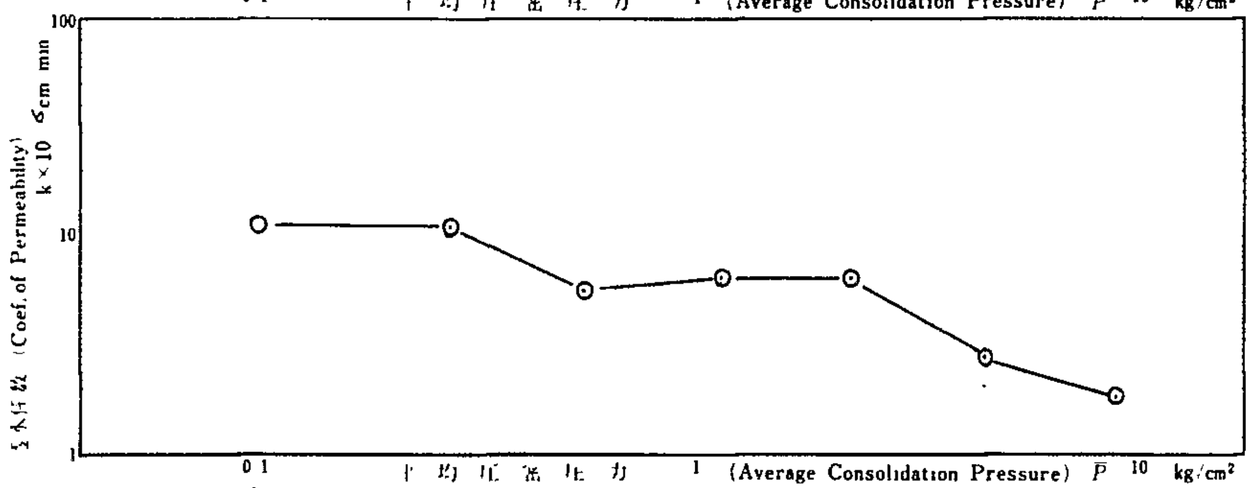
調査名 調査地点
Title, Investigation Place Thilawa Repair Dockyard Project

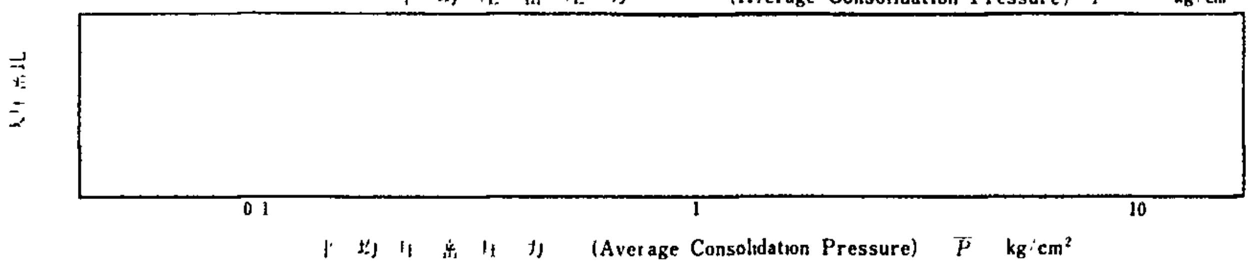
試料番号、採取標高
Sample No., Sampling Elevation 12.0 ~ 12.7

試験年月日
Date 年 月 日 ~ 年 月 日









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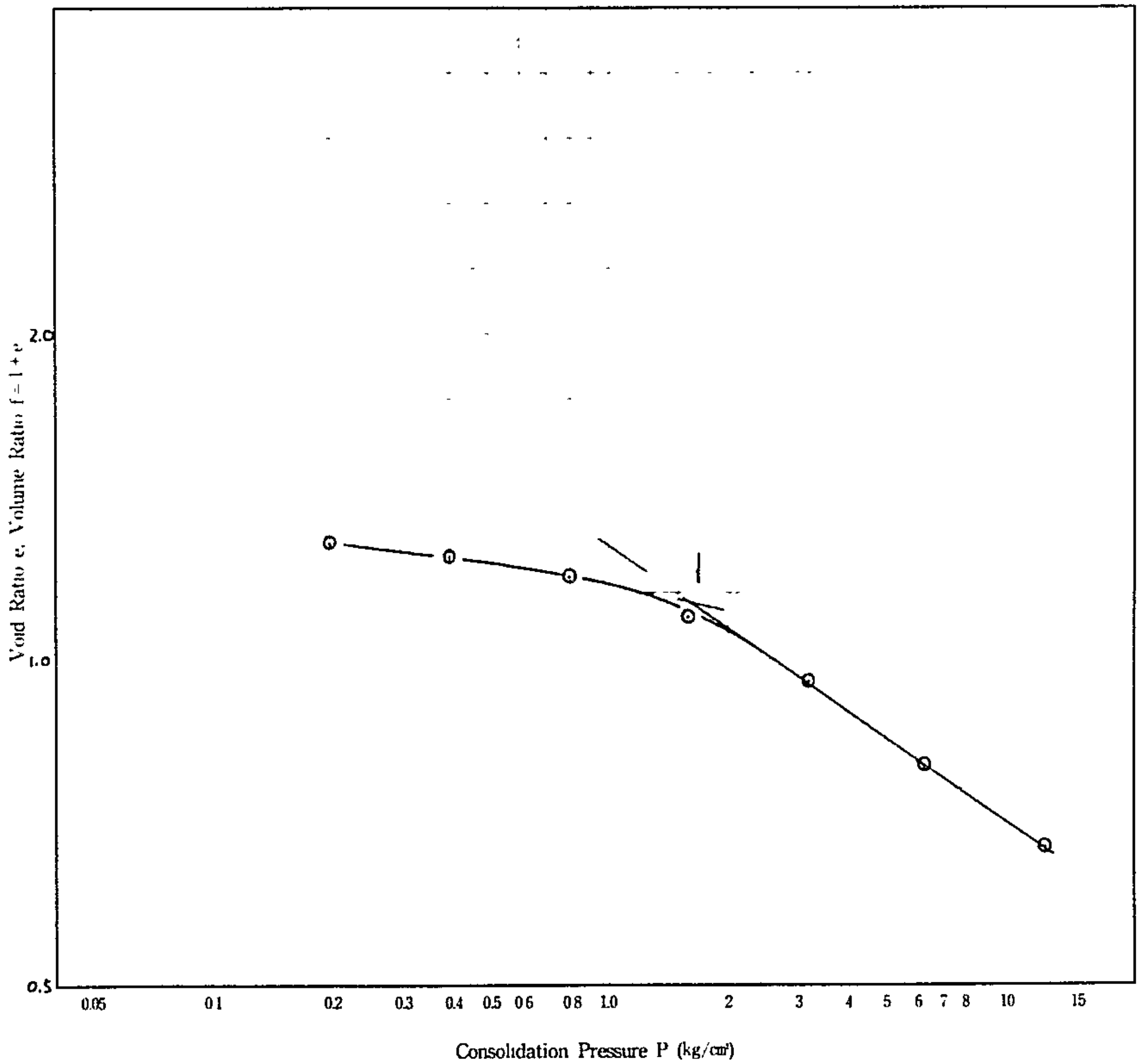
CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No Sampling Elevation B-5 TWS-6 18.0~18.7 m

Specimen Dimension			Moisture Content							
	Diameter	D 6.0 cm		Befor Test	Wo 47.8 %	Liquid Limit	LL %	Compression Index
	Height	2H 2.0 cm		After Test	Wf 20.6 %	Specific Gravity	Gs 2.60	Cc 0.42
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	e_0 1.19	Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	f_0 2.19	Py 1.7 kg/cm²



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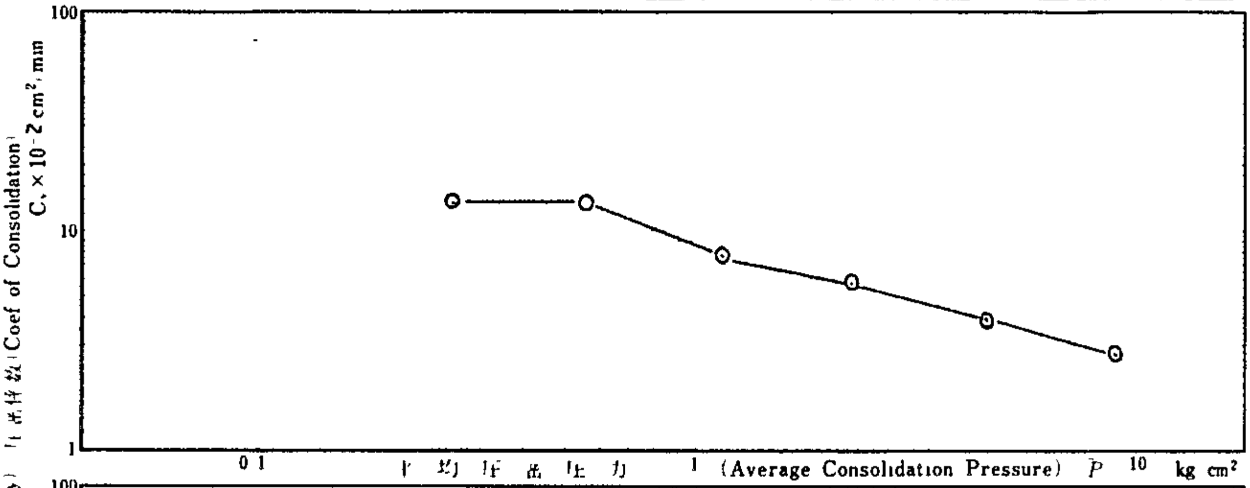
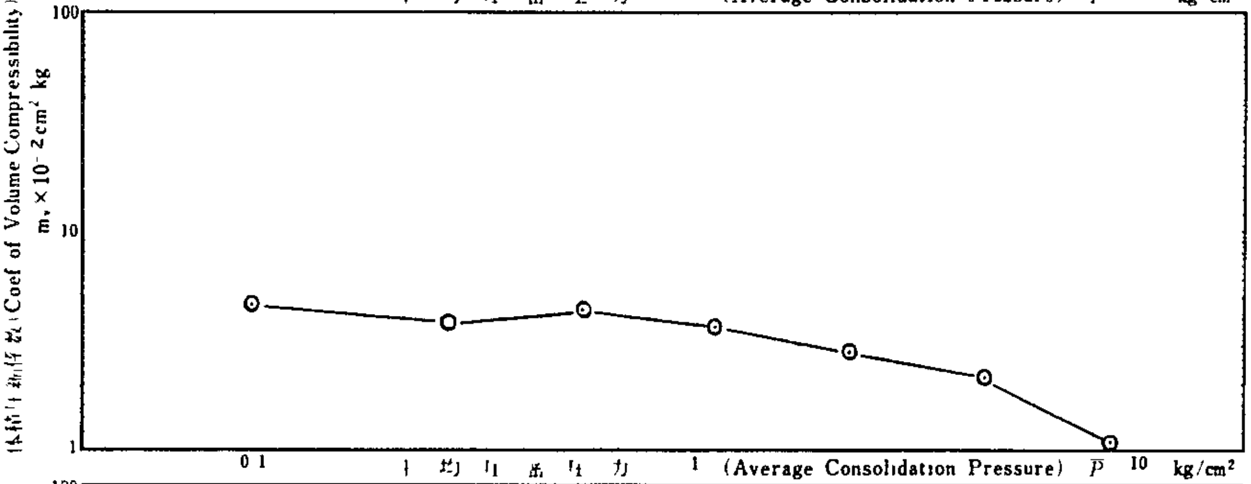
土の圧密試験（3－3）
CONSOLIDATION TEST

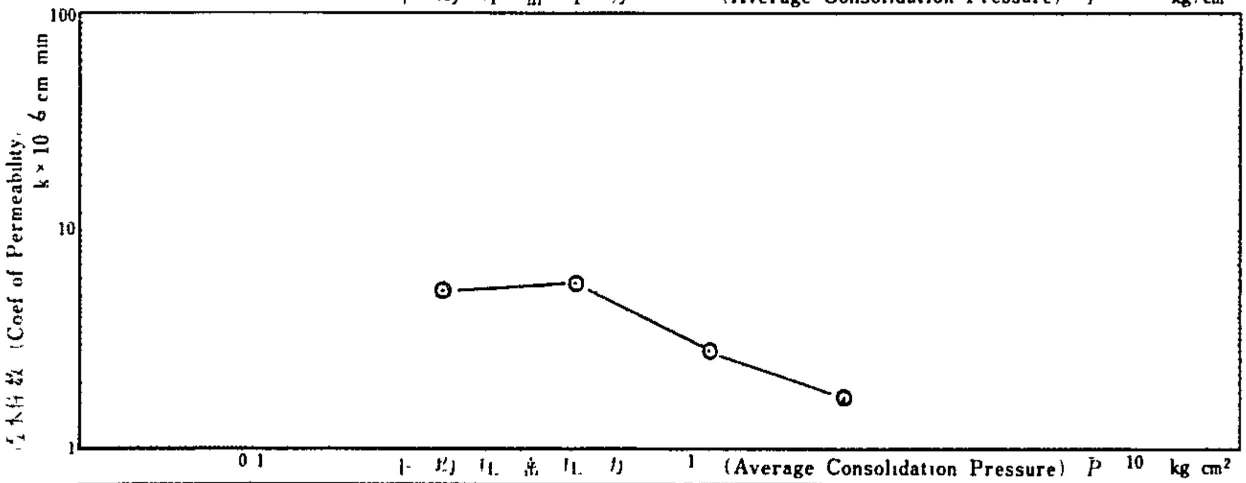
調査名、調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

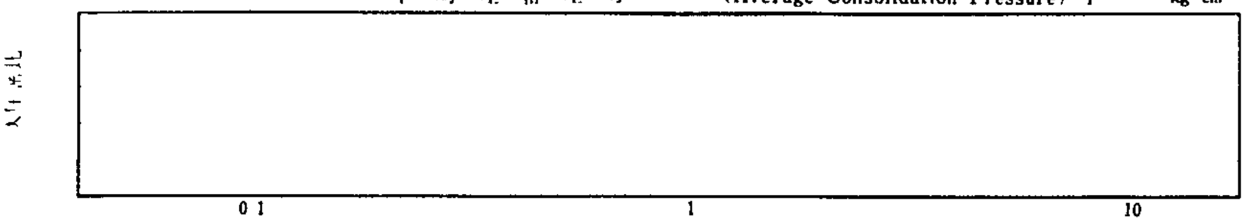
試料番号、採取標高 Sample No., Sampling Elevation: 18.0～18.7 m

試験年月日 Date: 年 月 日～ 年 月 日









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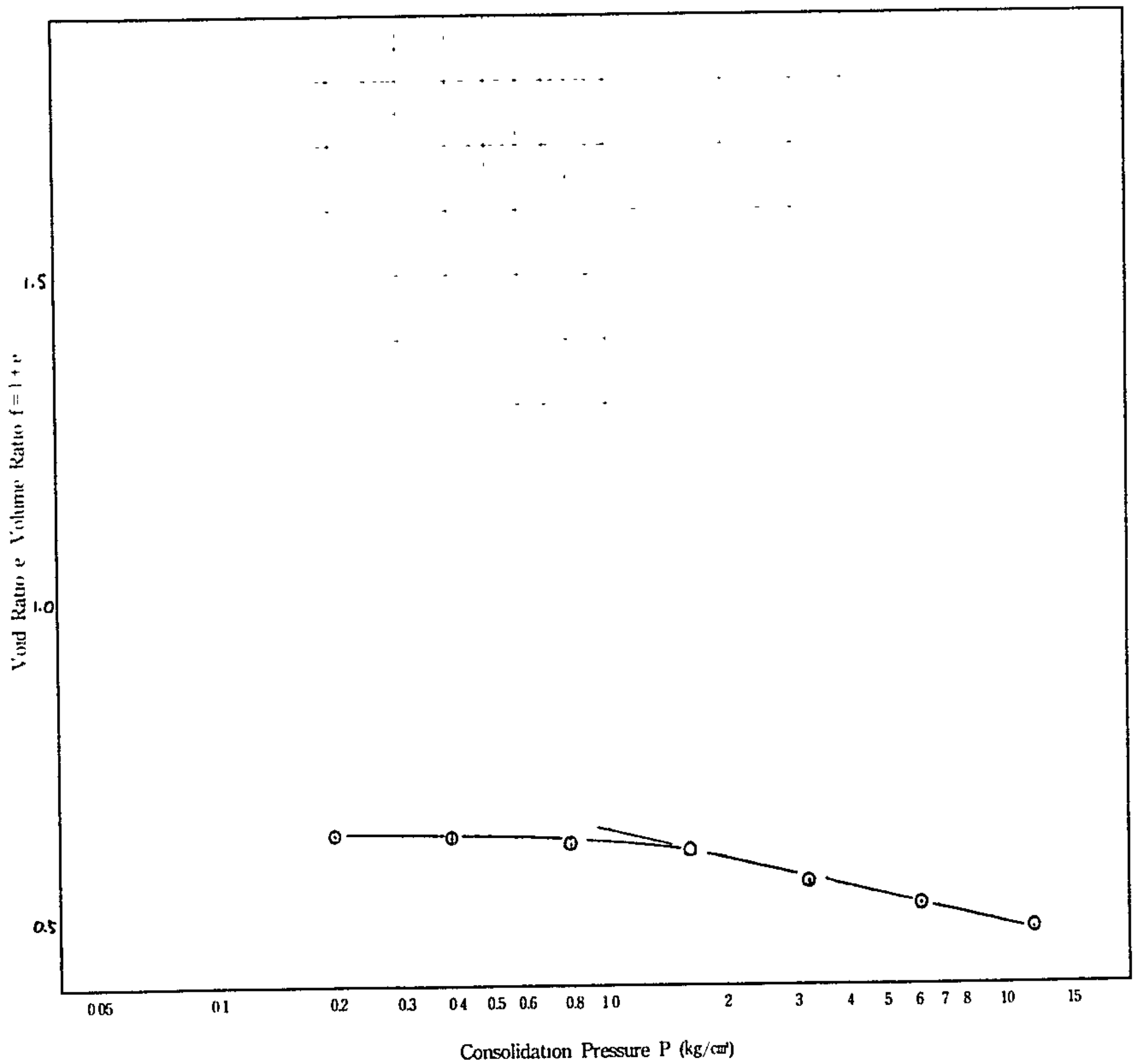
CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No. Sampling Elevation BH-5, 21.5～22.0 m

Specimen Dimension			Moisture Content / Degree of Saturation						Compression Index / Consolidation Yield Stress
	Diameter	D 6.0 cm	Moisture Content	Befor Test	Wo 23.7 %	Liquid Limit	LL %		Compression Index
	Height	2H 2.0 cm		After Test	Wf 18.6 %	Specific Gravity	Gs 2.60		Cc 0.14
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 96.7 %	Initial Void Ratio	eo 0.64		Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	fo 1.64		Py kg/cm²



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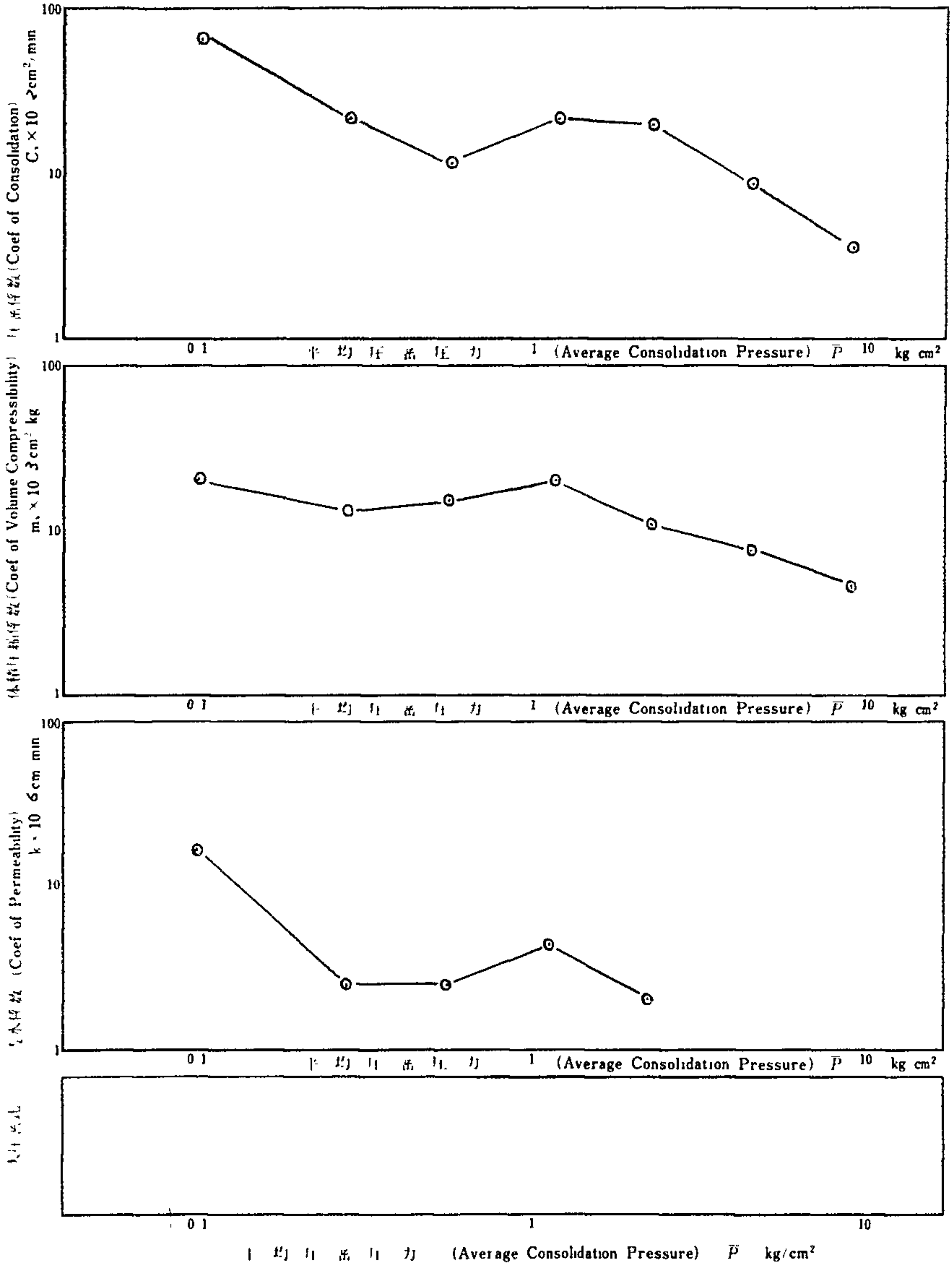
土の圧密試験（3－3）
CONSOLIDATION TEST

調査名 調査地点 Title Investigation Place: Thilawa Repair Dockyard Project

試料番号、採取標高 Sample No., Sampling Elevation: TWS - 7 21.5～22.0m

試験年月日 Date 年 月 日～ 年 月 日

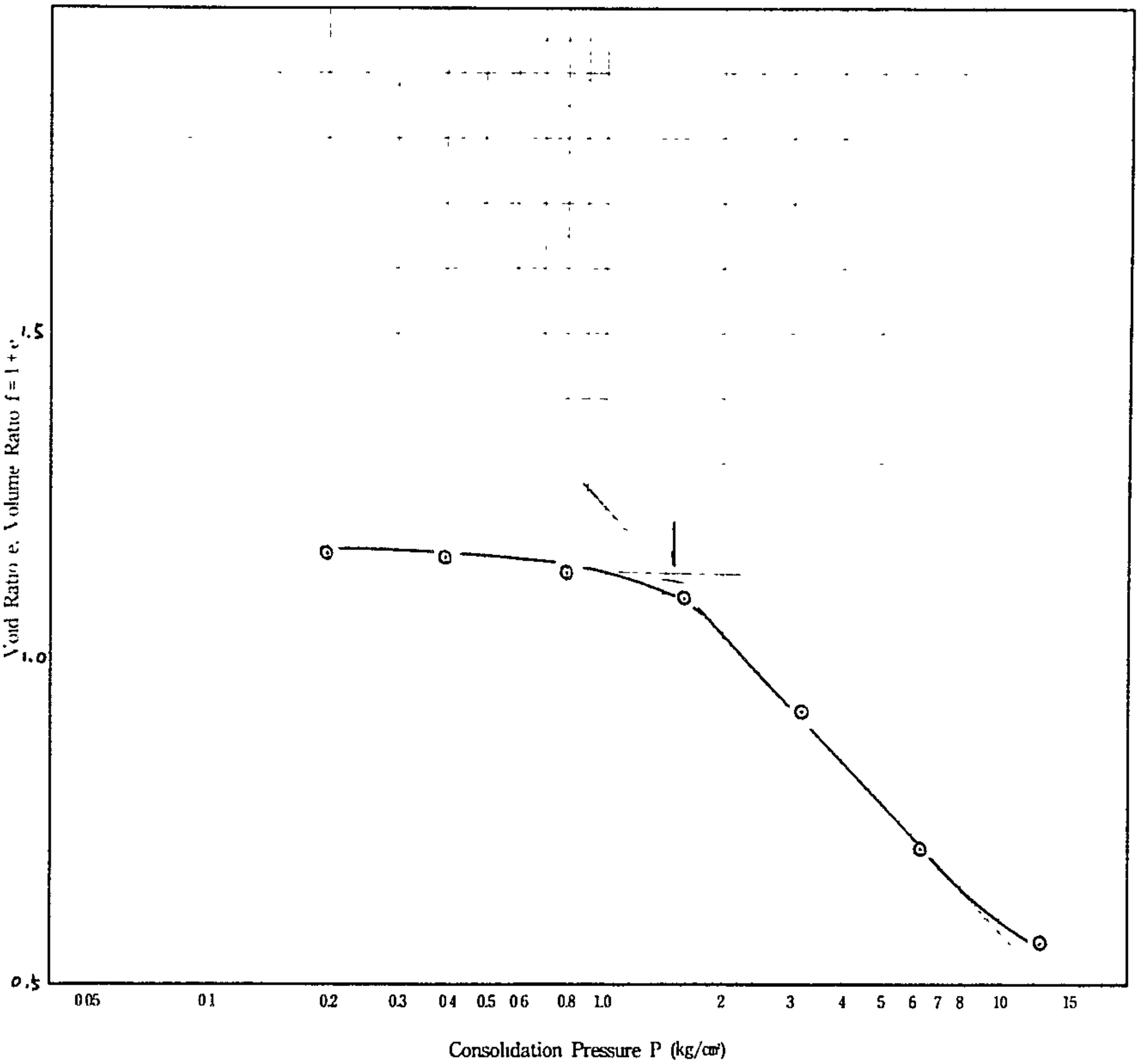


CONSOLIDATION TEST (1)

Title, Investigation Place **Thilawa Repair Dockyard Project** Date

Sample No Sampling Elevation B-10 , TWS-2 , 4.0~4.7m

Specimen Dimension	Diameter	D 6.0 cm	Moisture Content	Befor Test	Wo 47.8 %	Liquid Limit	LL %	Compression Index		
	Height	2H 2.0 cm		After Test	Wf 21.5 %	Specific Gravity	Gs 2.60	Cc 0.65		
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	e₀ 1.17	Consolidation Yield Stress		
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	f₀ 2.17	Py 1.5 kg/cm²		



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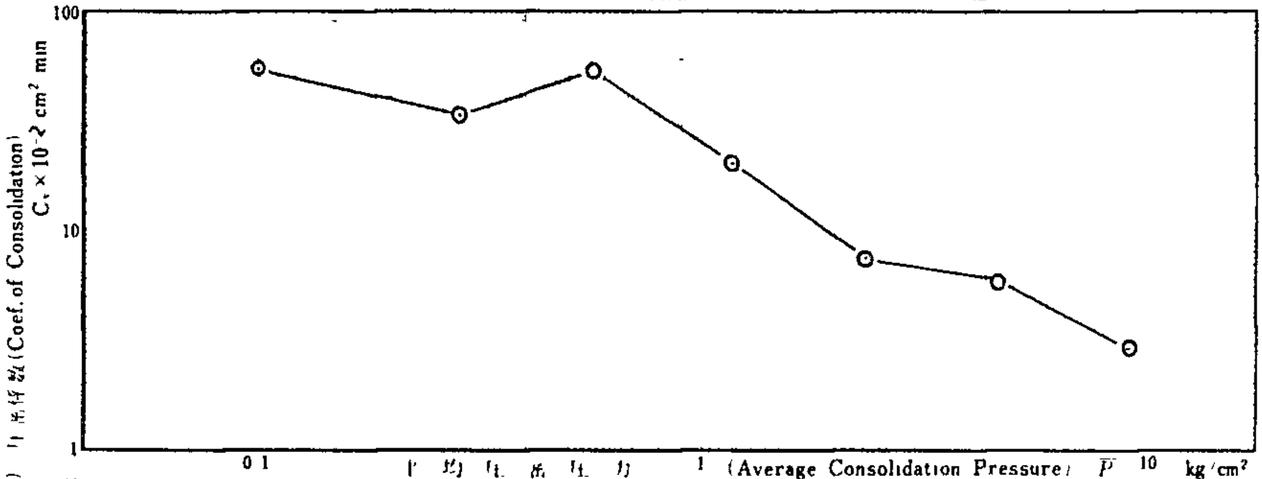
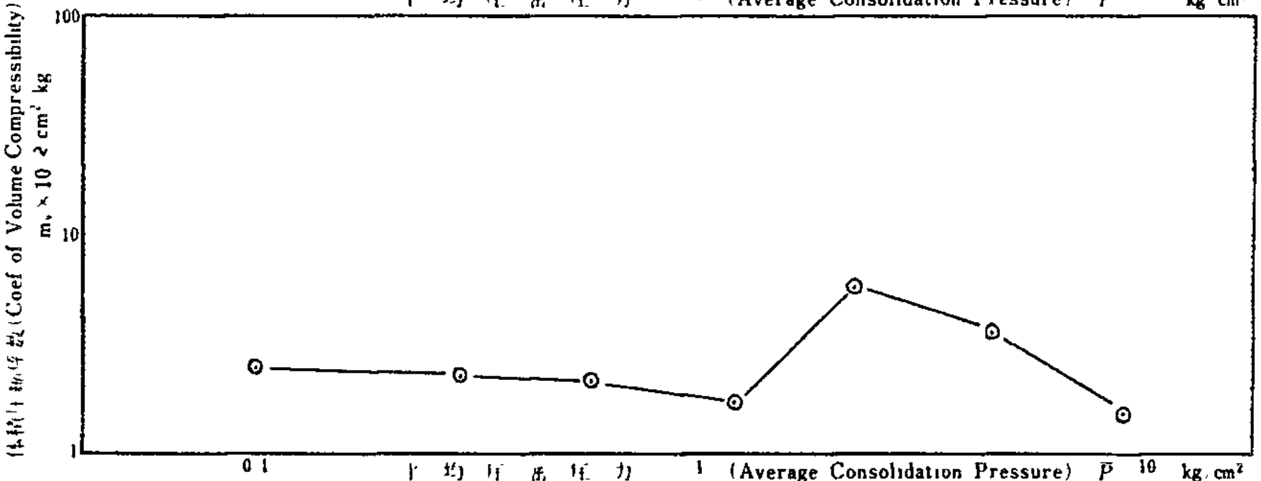
土の圧密試験 (3 − 3)
CONSOLIDATION TEST

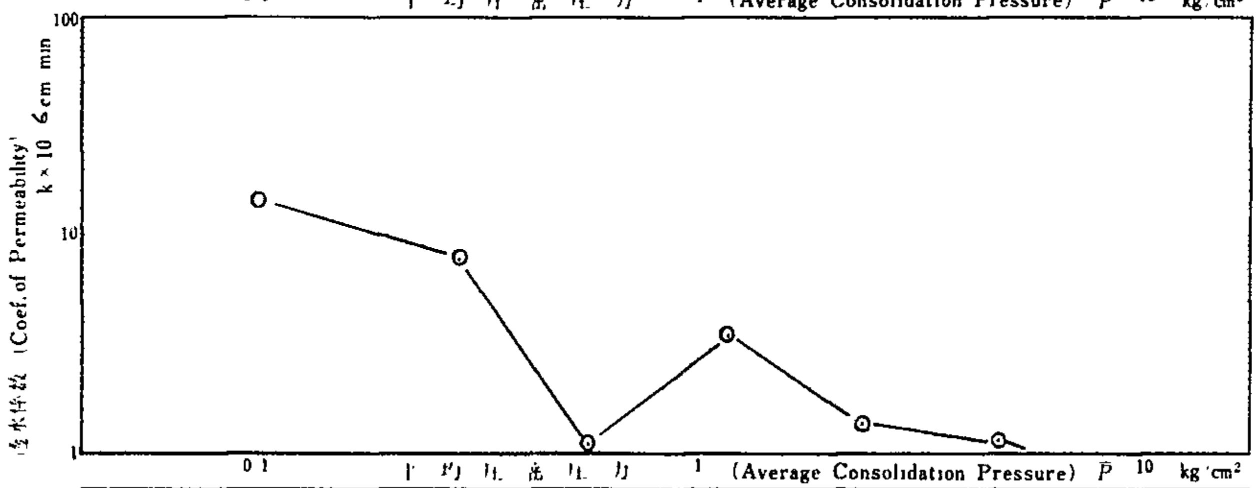
調査名、調査地点
Title, Investigation Place Thilawa Repair Dockyard Project

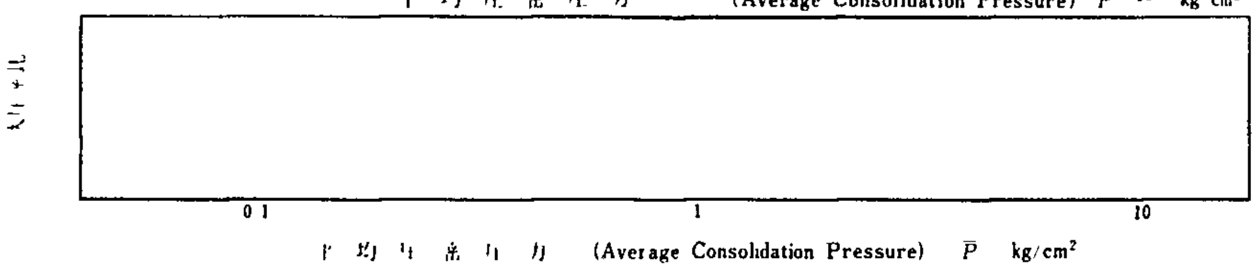
試料番号、採取標高
Sample No., Sampling Elevation TWS-2, 4.0～4.7m

試験年月日
Date 年 月 日～ 年 月 日









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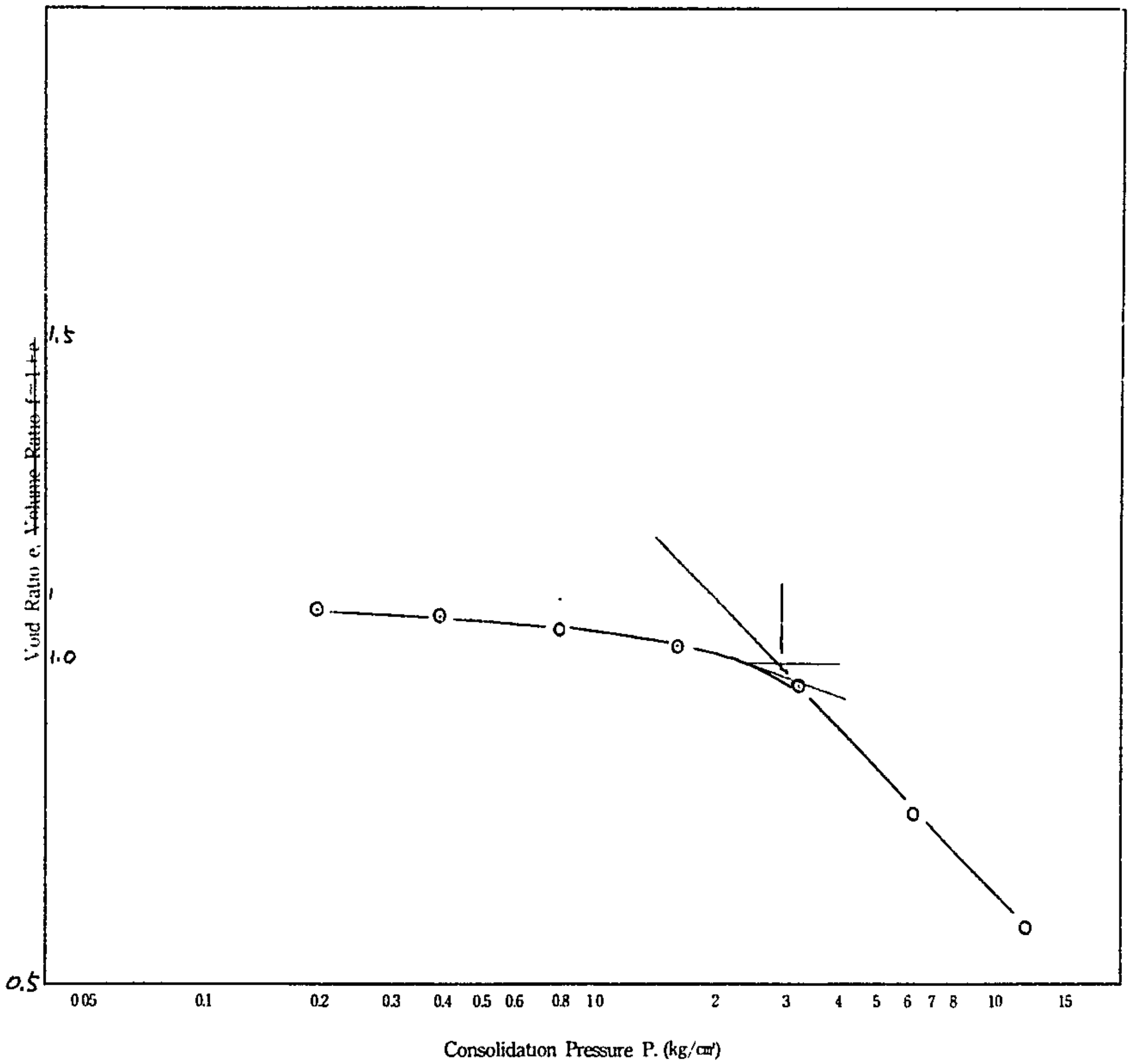
CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No. Sampling Elevation B-10 TWS・4 8.0～8.8

Specimen Dimension			Moisture Content			Liquid Limit		Compression Index
	Diameter	D 6.0 cm		Befor Test	Wo 40.5 %	Liquid Limit	LL %	Compression Index
	Height	2H 2.0 cm		After Test	Wf 21.3 %	Specific Gravity	Gs 2.60	Cc 0.69
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	e_0 0.99	Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	f_0 1.99	P_y 2.9 kg/cm²



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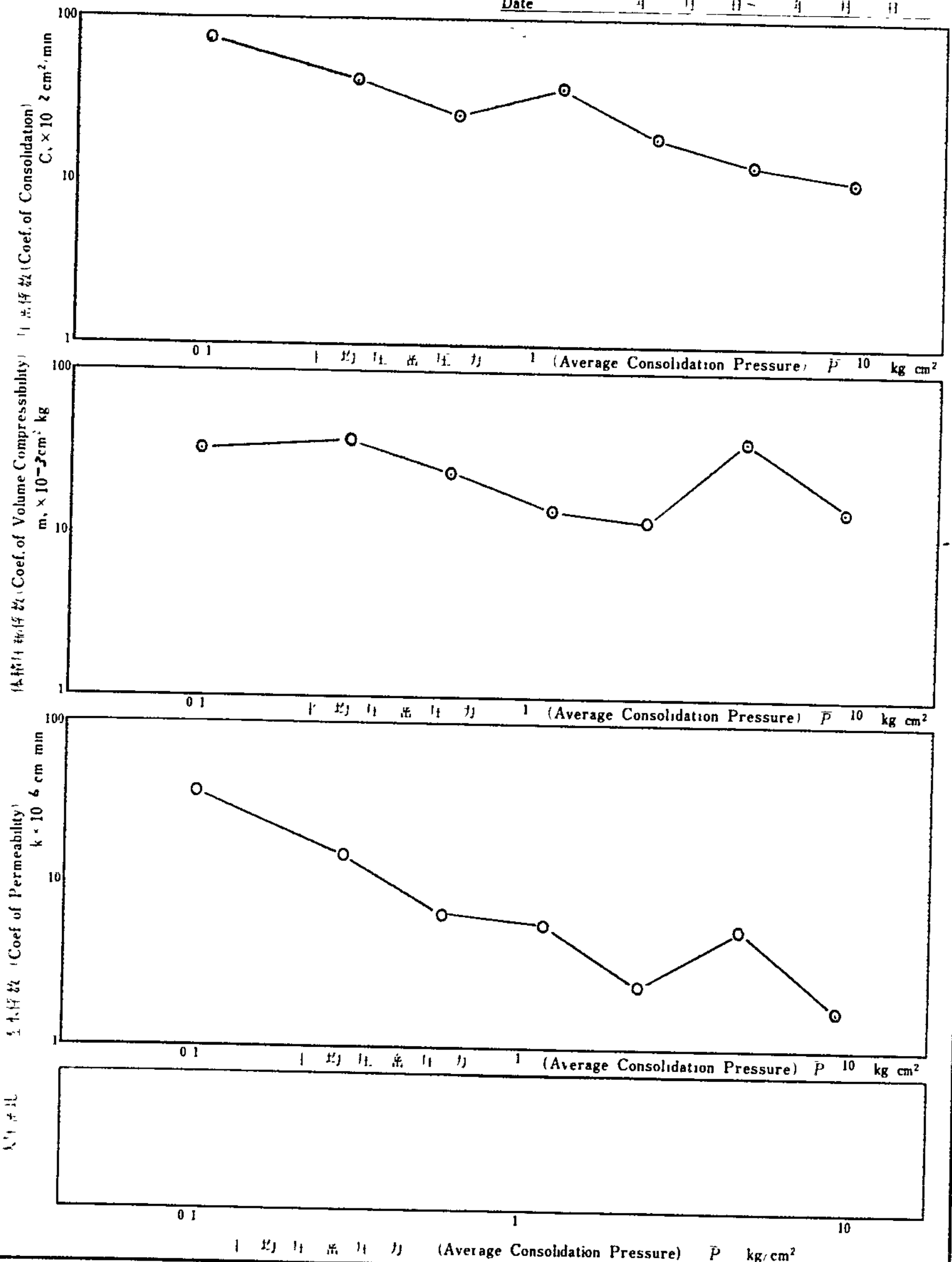
土の圧密試験（3－3）
CONSOLIDATION TEST

調査名、調査地点
Title, Investigation Place　Thilawa Repair Dockyard Project

試料番号、採取標高
Sample No., Sampling Elevation　TWS-4, 8.0～8.8

試験年月日
Date　年　月　日～　年　月　日



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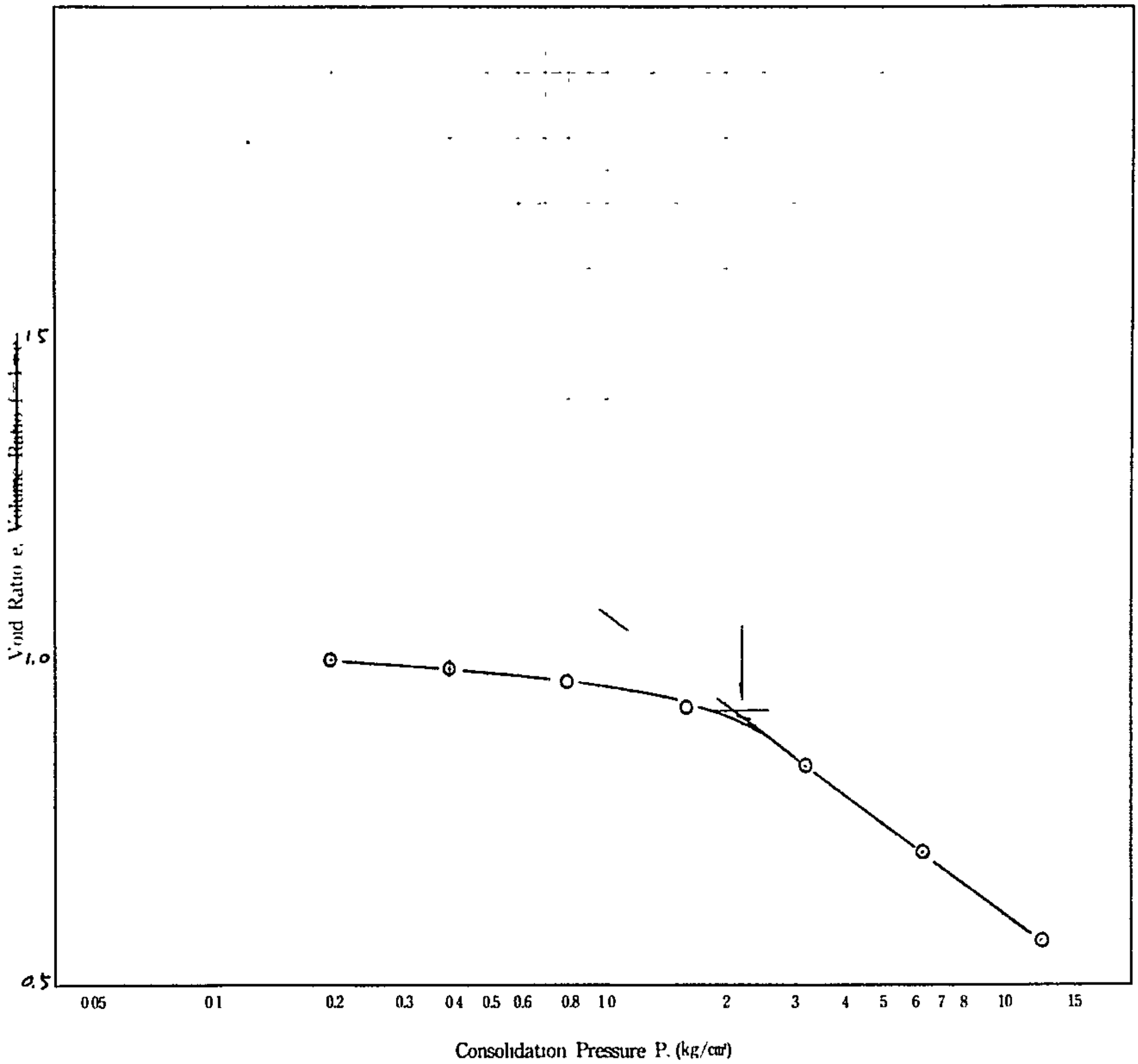
CONSOLIDATION TEST (1)

Title, Investigation Place **Thilawa Repair Dockyard Project** Date

Sample No. Sampling Elevation B-10, TWS-5, 10.0 ~ 10.7 m

Specimen Dimension	Diameter	D 6.0 cm	Moisture Content	Befor Test	Wo 39.5 %	Liquid Limit	LL %	Compression Index		
	Height	2H 2.0 cm		After Test	Wf 20.8 %	Specific Gravity	Gs 2.60	Cc 0.46		
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	eo 1.01	Consolidation Yield Stress		
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	fo 2.01	Py 2.2 kg/cm²		



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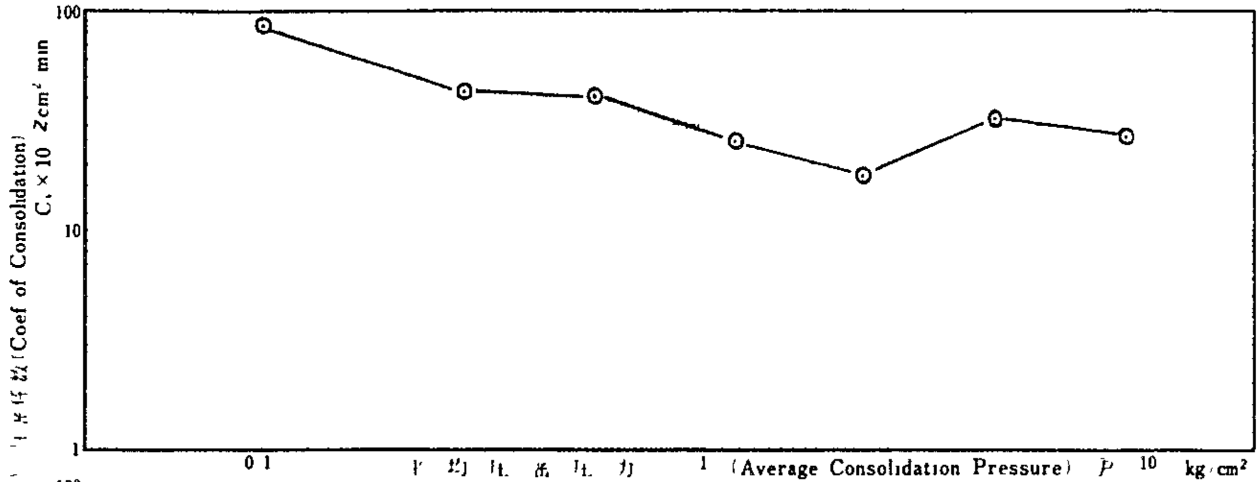
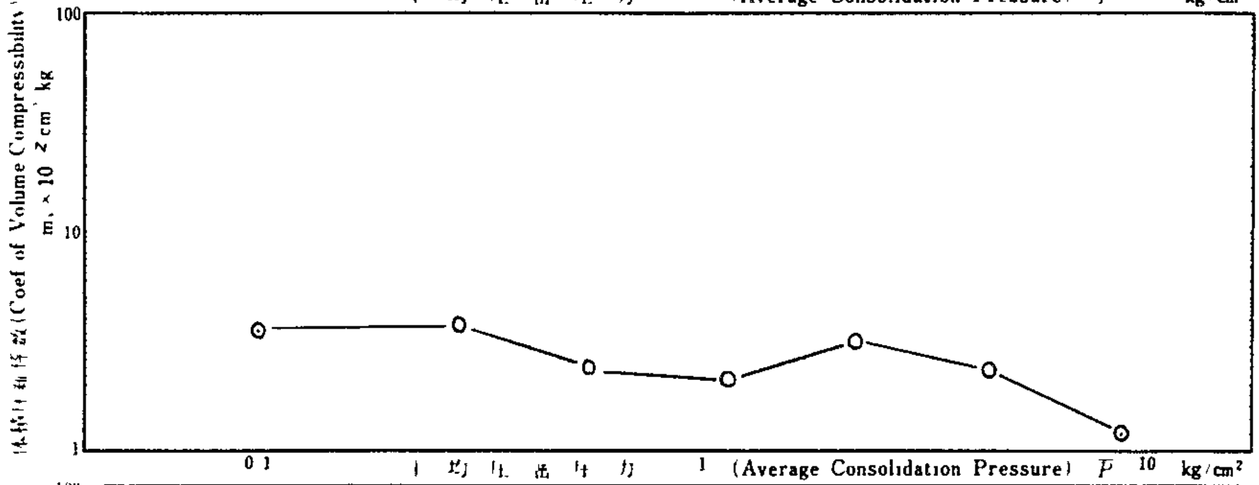
土の圧密試験（3－3）
CONSOLIDATION TEST

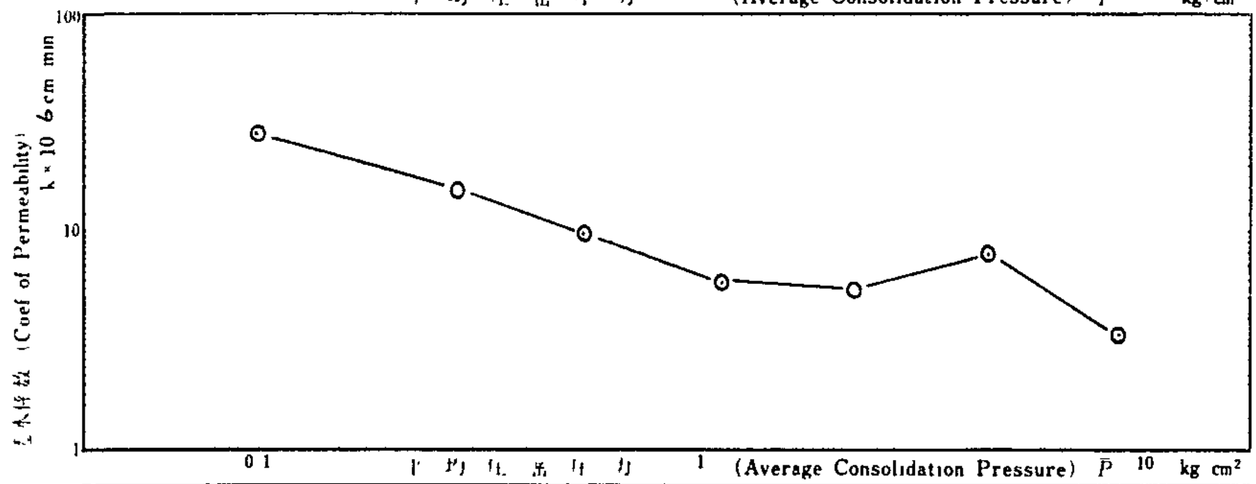
調査名、調査地点
Title, Investigation Place: Thilawa Repair Dockyard Project

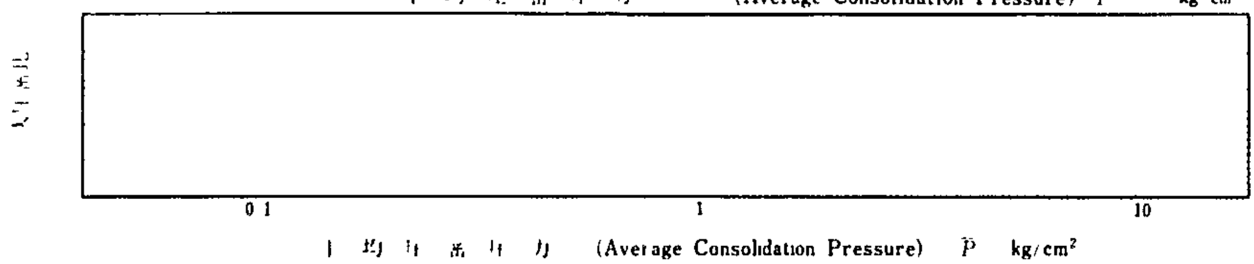
試料番号、採取標高
Sample No., Sampling Elevation: TWS-5 10.0 ～ 10.7

試験年月日
Date: 年 月 日～ 年 月 日









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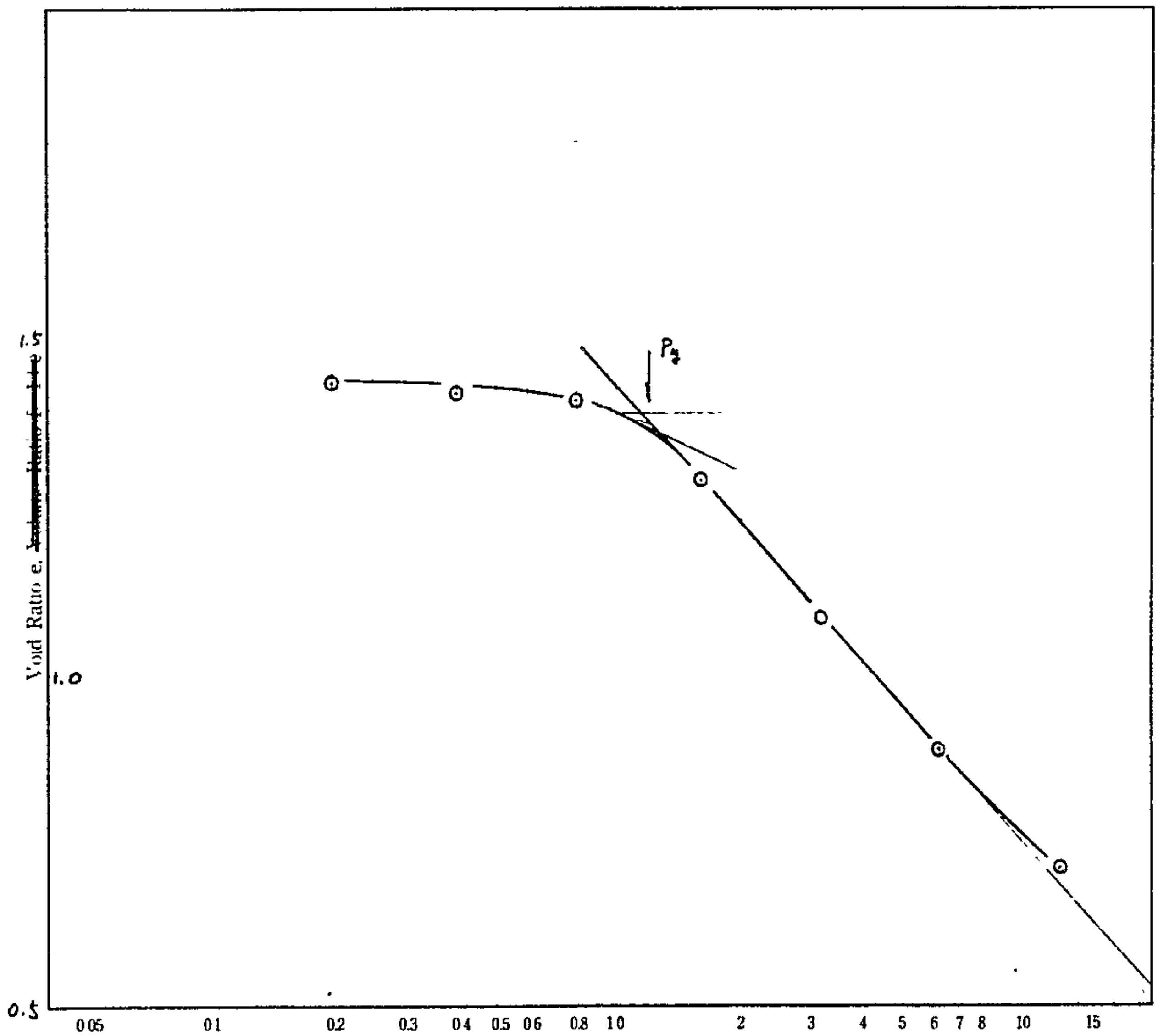
CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No Sampling Elevation B-10 TWS-6 12.0~12.8

Specimen Dimension			Moisture Content			Liquid Limit	LL %	Compression Index
	Diameter	D 6.0 cm		Befor Test	Wo 53.7 %	Liquid Limit	LL %	Cc 0.7
	Height	2H 2.0 cm		After Test	Wf 21.8 %	Specific Gravity	Gs 2.60	
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 96.3 %	Initial Void Ratio	eo 1.45	Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	fo 2.45	Py 1.2 kg/cm²



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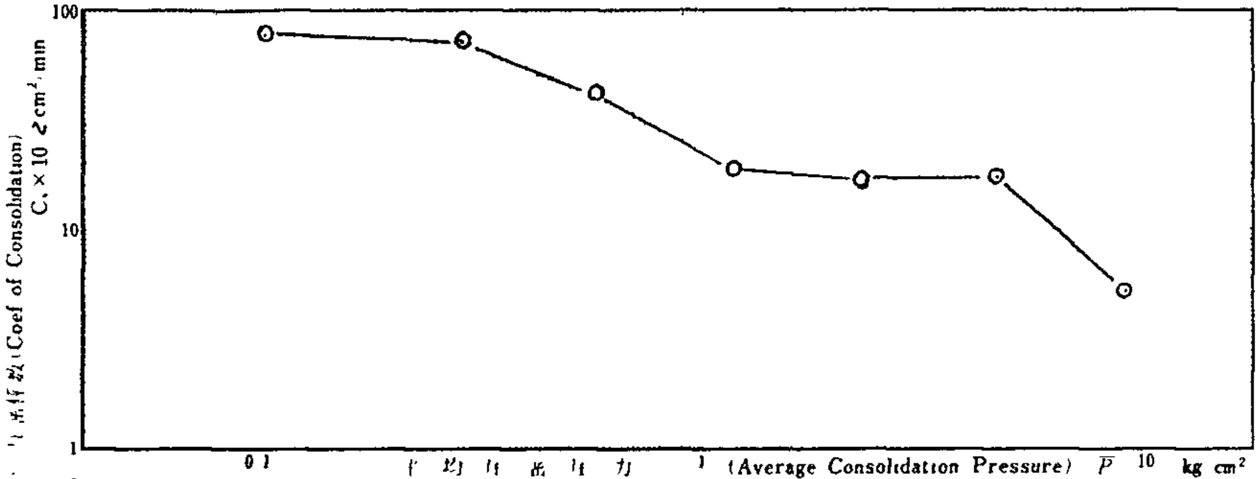
B-10

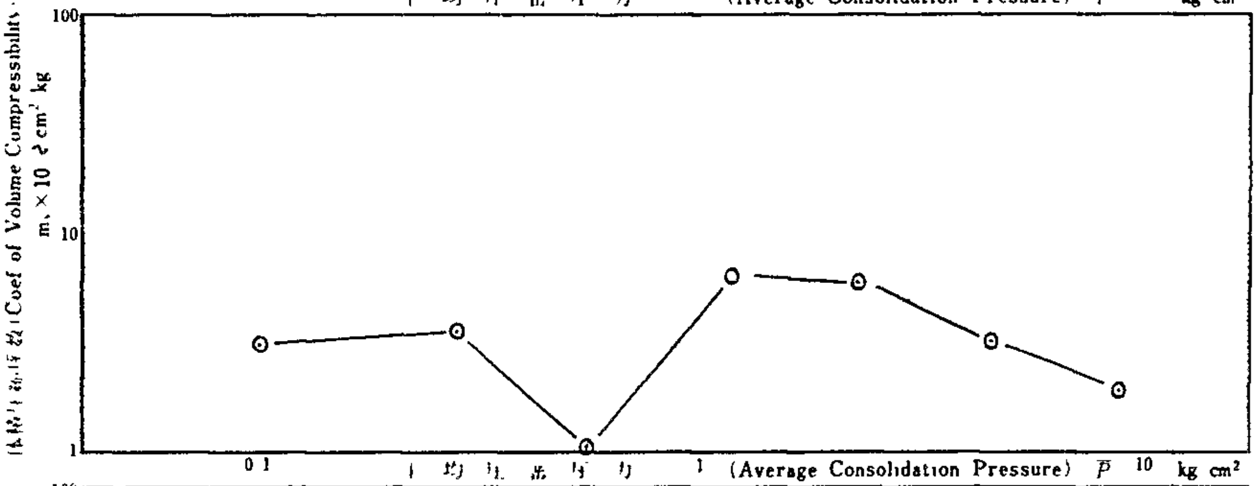
土の圧密試験（3－3）
CONSOLIDATION TEST

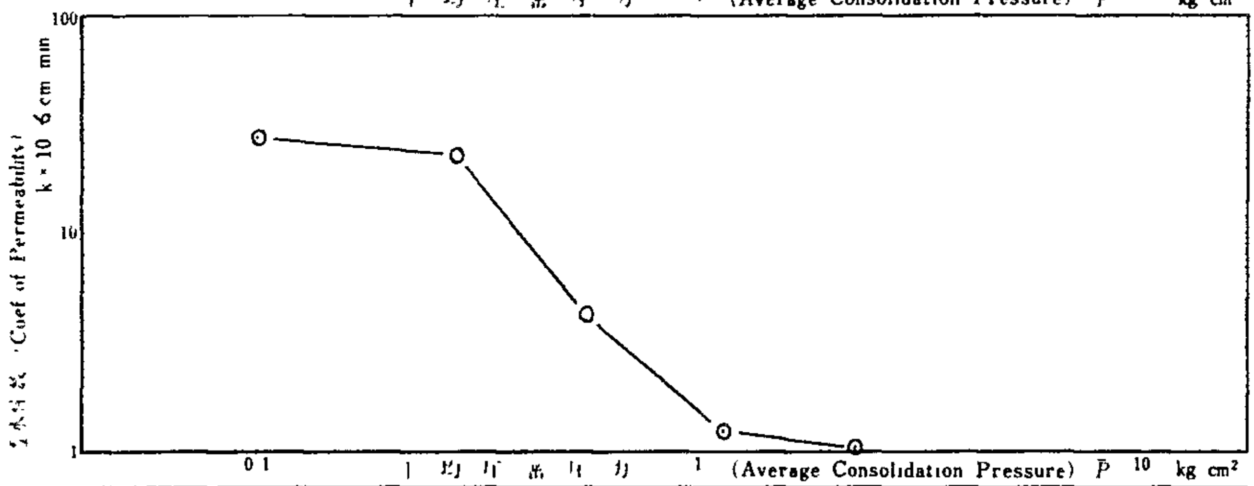
調査名、調査地点 Title, Investigation Place: Thilawa Repair Dockyard Project

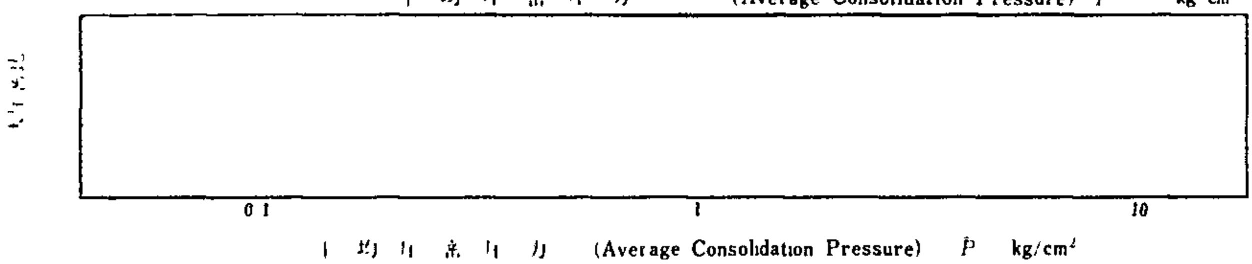
試料番号、採取標高 Sample No., Sampling Elevation: TWS-10, 12.0～12.8

試験年月日 Date: 年 月 日～ 年 月 日









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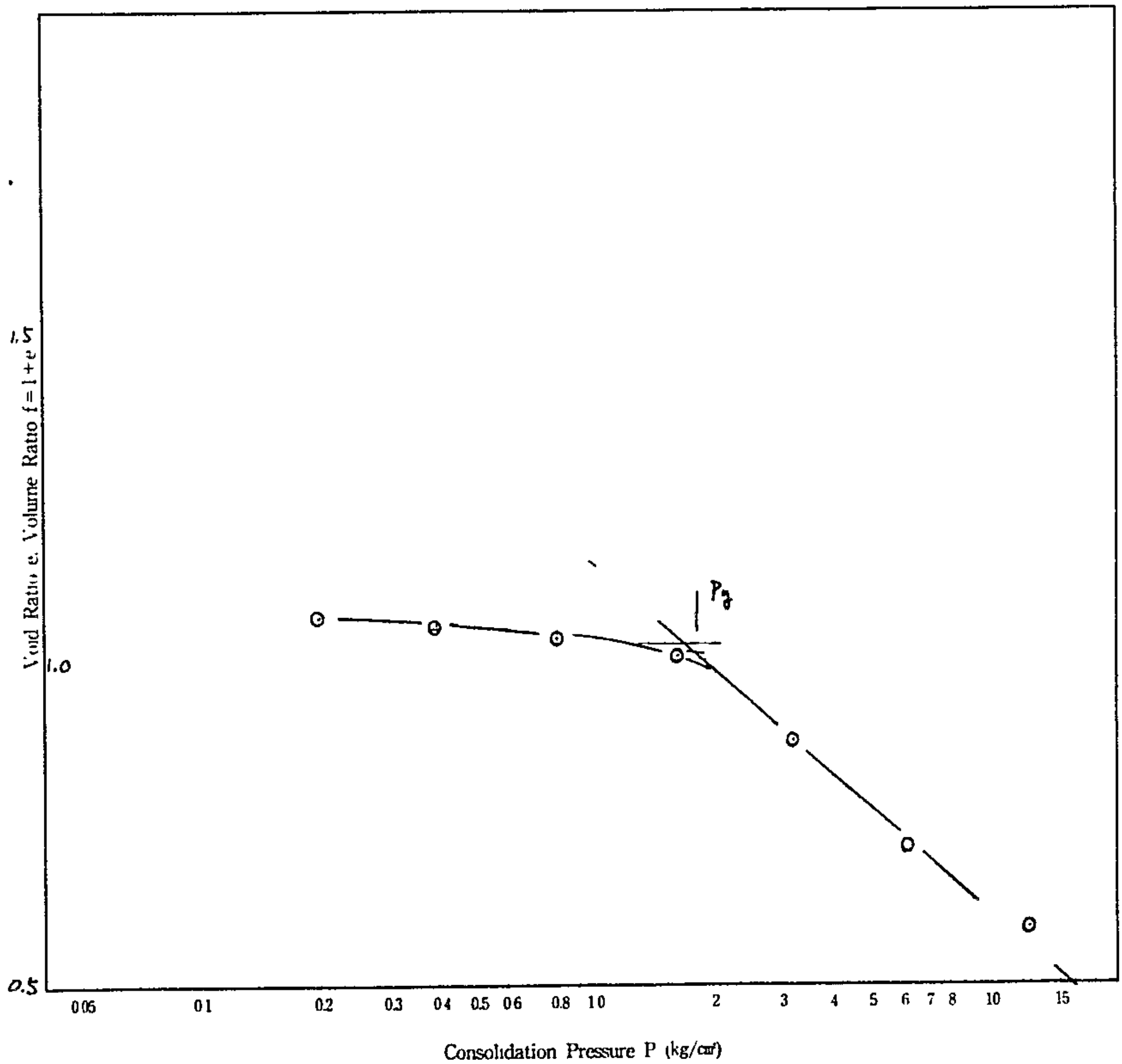
CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No. Sampling Elevation B-10 , 16.0 ~ 16.8

Specimen Dimension	Diameter	D 6.0 cm	Moisture Content	Befor Test	Wo 43.7 %	Liquid Limit	LL %	Compression Index
	Height	2H 2.0 cm		After Test	Wf 23.3 %	Specific Gravity	Gs 2.60	Cc 0.72
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	e_o 1.08	Consolidation Yield Stress
	Volume	V 56.52 cm³		After Test	Srf 100 %	Initial Volume Ratio	f_o 2.08	Py 1.8 kg/cm²



B-10

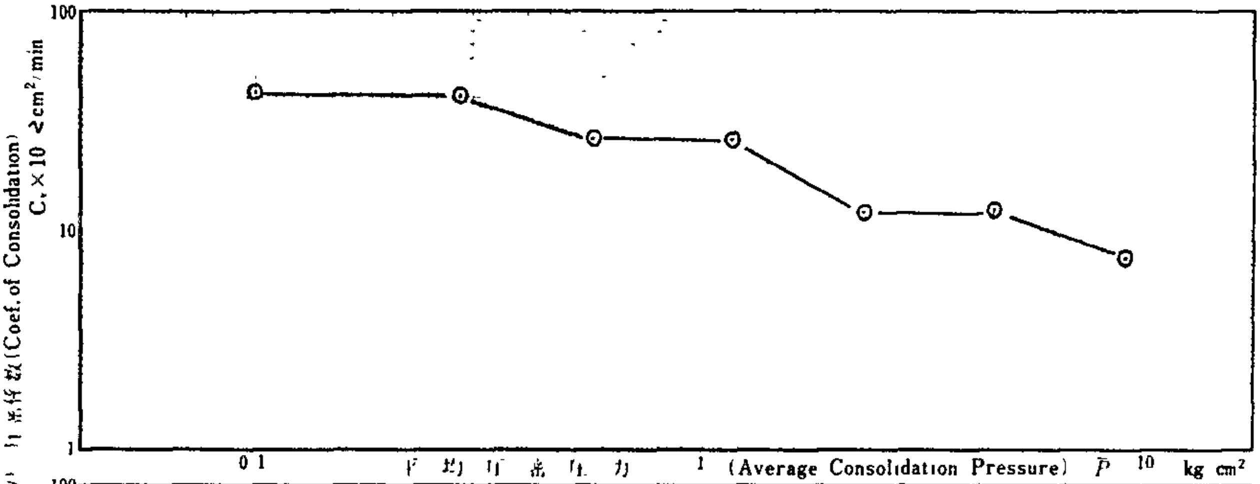
土の圧密試験（3－3）

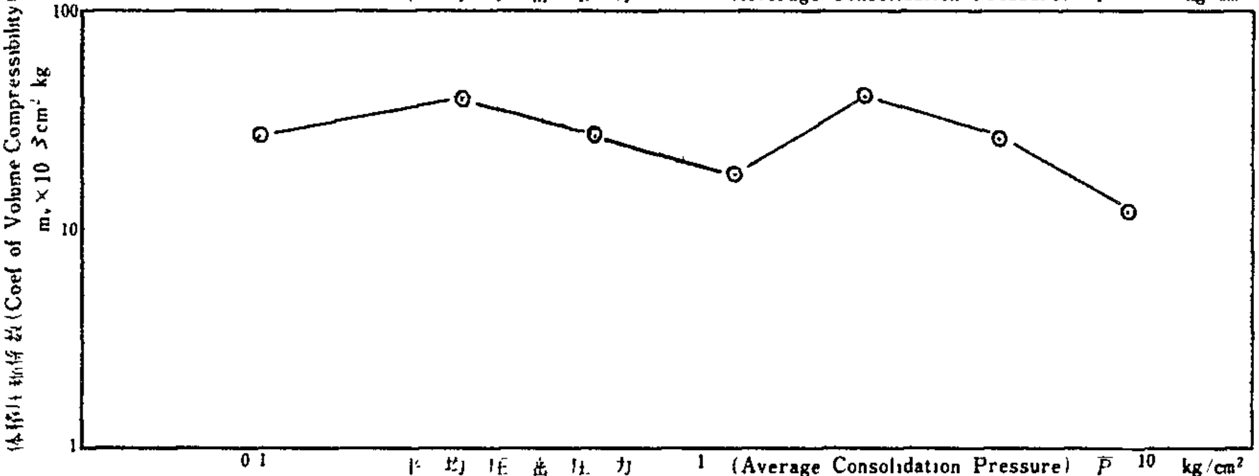
CONSOLIDATION TEST

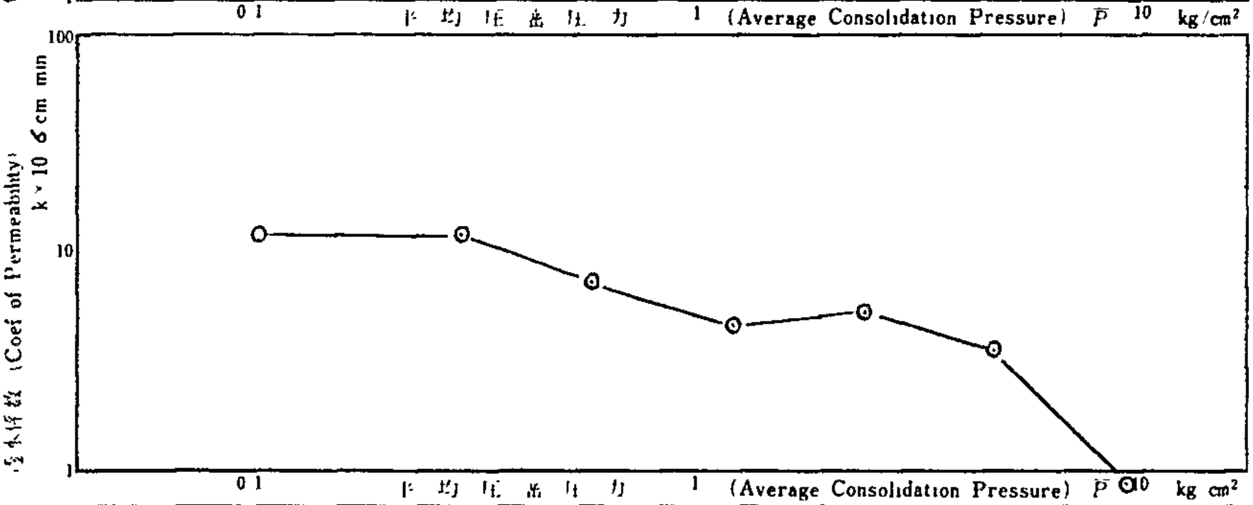
調査名、調査地点
Title, Investigation Place Thilawa Repair Dockyard Project

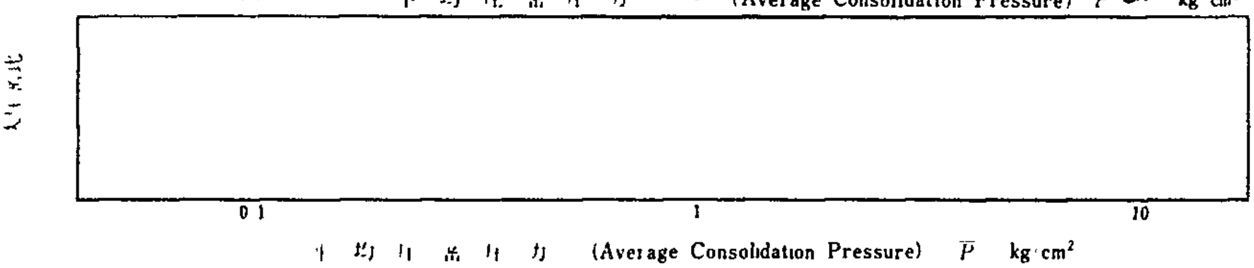
試料番号、採取標高
Sample No., Sampling Elevation TWS-8 16.0～16.8

試験年月日
Date 年 月 日～ 年 月 日







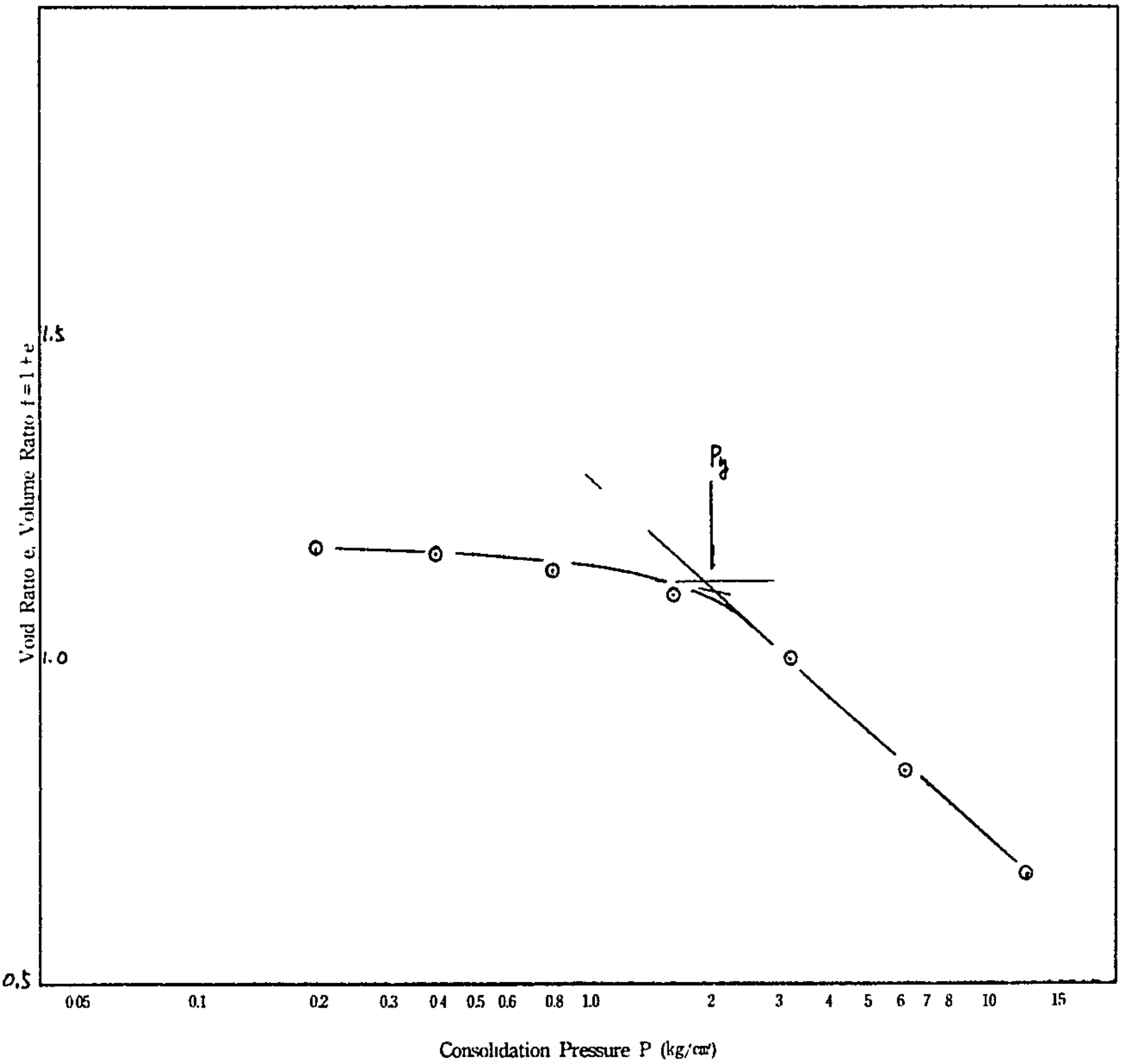


CONSOLIDATION TEST (1)

Title, Investigation Place Thilawa Repair Dockyard Project Date

Sample No. Sampling Elevation BH-10. 18.0 ~ 18.7 m

Specimen Dimension	Diameter	D 6.0 cm	Moisture Content	Befor Test	Wo. 48.8 %	Liquid Limit	LL %	Compression Index	
	Height	2H 2.0 cm		After Test	Wf 24.2 %	Specific Gravity	Gs 2.60	Cc 0.7	
	Section Area	A 28.26 cm²	Degree of Saturation	Befor Test	Sro 100 %	Initial Void Ratio	eo 1.18	Consolidation Yield Stress	
	Volume	V 56.52 cm³		After Test	Srf 106 %	Initial Volume Ratio	fo 2.18	Py 2.0 kg/cm²	



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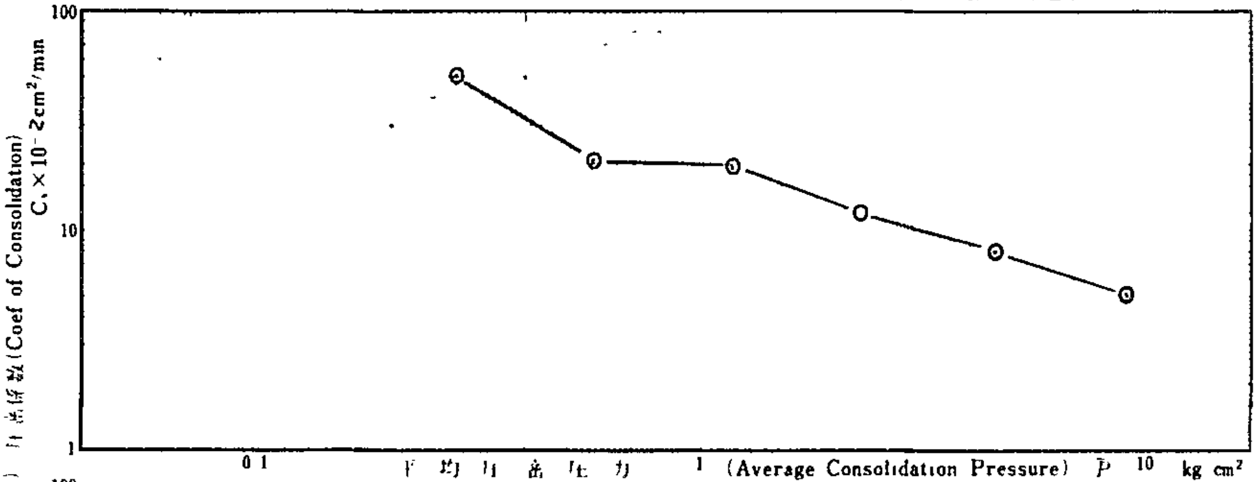
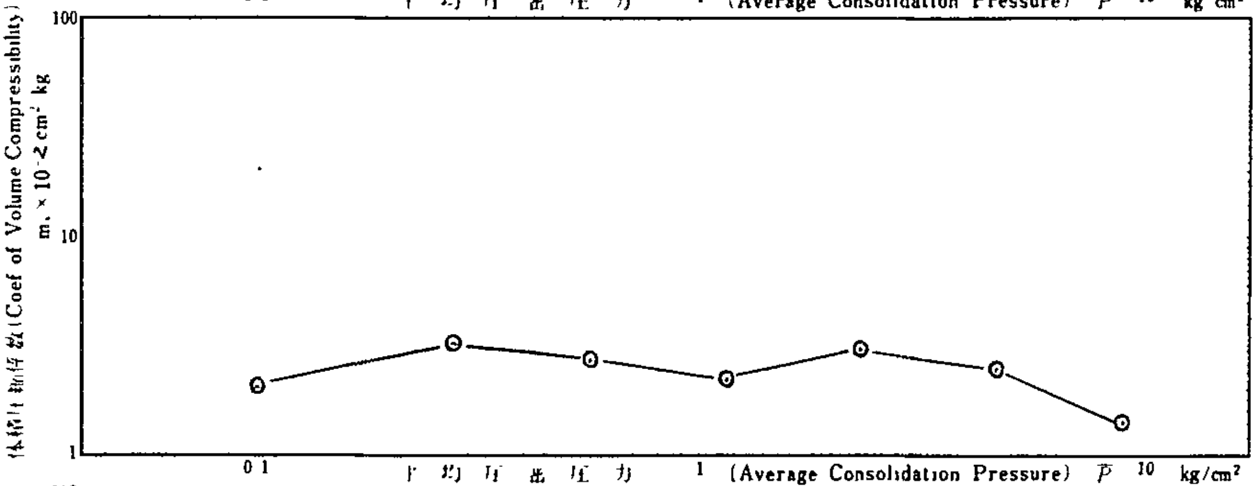
土の圧密試験（3－3）
CONSOLIDATION TEST

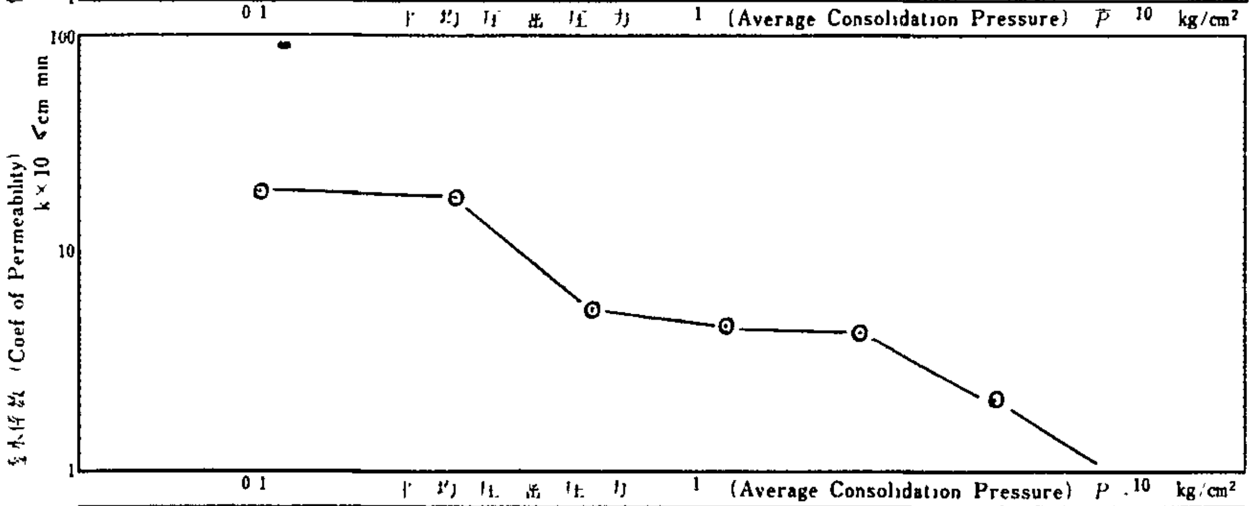
調査名　調査地点
Title, Investigation Place　Thilawa Repair Dockyard Project

試料番号、採取標高
Sample No., Sampling Elevation　BH-10　18.0～18.7

試験年月日
Date　年　月　日～　年　月　日







0.1　1　10

平均圧密圧力 (Average Consolidation Pressure) $\bar{P}$ kg/cm²

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DUTCH CONE SOUNDING

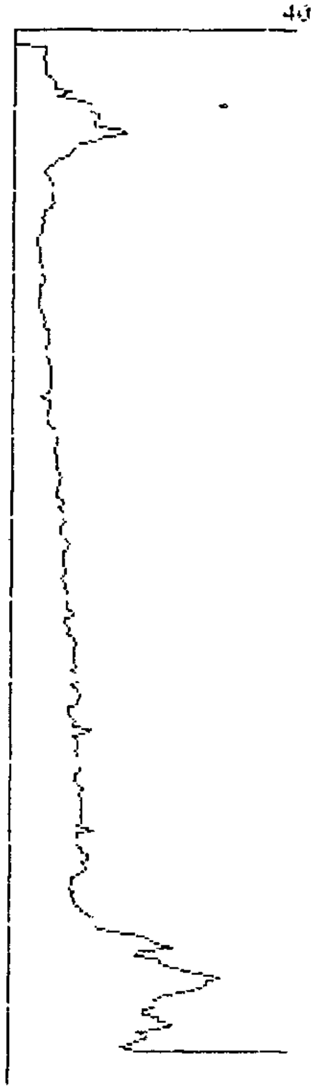
D-1

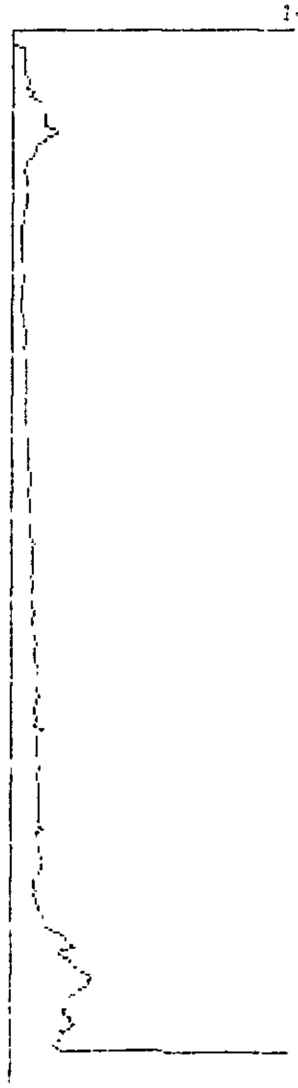
Depth	Dial	Oc
	500 g Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	20	4.3
0.6	19	4.1
0.7	19	4.1
0.8	18	3.9
0.9	20	4.3
1.0	19	4.2
1.1	18	4.0
1.2	19	4.2
1.3	21	4.6
1.4	25	5.5
1.5	25	5.5
1.6	24	5.3
1.7	35	7.6
1.8	26	5.7
1.9	36	7.8
2.0	47	10.2
2.1	52	11.2
2.2	52	11.2
2.3	50	10.8
2.4	50	10.8
2.5	66	14.1
2.6	70	15.0
2.7	55	11.9
2.8	50	10.8
2.9	40	8.7
3.0	36	8.0
3.1	35	7.8
3.2	32	7.2
3.3	26	6.0
3.4	23	5.3
3.5	21	4.9
3.6	18	4.3
3.7	18	4.3
3.8	20	4.7
3.9	20	4.7
4.0	21	5.1
4.1	21	5.1
4.2	21	5.1
4.3	22	5.3
4.4	21	5.1
4.5	16	4.0
4.6	17	4.2
4.7	15	3.8
4.8	17	4.2
4.9	15	3.8
5.0	14	3.7
5.1	14	3.7
5.2	12	3.3
5.3	11	3.1
5.4	12	3.3
5.5	13	3.5
5.6	13	3.5
5.7	13	3.5
5.8	13	3.5
5.9	13	3.5
6.0	14	3.9
6.1	15	4.1
6.2	16	4.3
6.3	13	3.7
6.4	12	3.5
6.5	12	3.5
6.6	12	3.5
6.7	13	3.7
6.8	12	3.5
6.9	12	3.5

7.0	13	3.8
7.1	15	4.2
7.2	15	4.2
7.3	16	4.4
7.4	15	4.2
7.5	17	4.6
7.6	17	4.6
7.7	18	4.8
7.8	18	4.8
7.9	18	4.8
8.0	16	4.6
8.1	17	4.8
8.2	17	4.8
8.3	18	5.0
8.4	19	5.2
8.5	19	5.2
8.6	19	5.2
8.7	19	5.2
8.8	19	5.2
8.9	18	5.0
9.0	16	4.7
9.1	12	3.9
9.2	18	5.1
9.3	18	5.1
9.4	18	5.1
9.5	16	4.7
9.6	17	4.9
9.7	18	5.1
9.8	16	4.7
9.9	18	5.1
10.0	21	5.9
10.1	21	5.9
10.2	21	5.9
10.3	20	5.7
10.4	20	5.7
10.5	21	5.9
10.6	21	5.9
10.7	22	6.1
10.8	21	5.9
10.9	22	6.1
11.0	23	6.4
11.1	24	6.6
11.2	22	6.2
11.3	22	6.2
11.4	21	6.0
11.5	21	6.0
11.6	21	6.0
11.7	25	6.9
11.8	25	6.9
11.9	23	6.4
12.0	24	6.8
12.1	26	7.2
12.2	23	6.6
12.3	23	6.6
12.4	23	6.6
12.5	24	6.8
12.6	28	7.6
12.7	29	7.8
12.8	28	7.6
12.9	25	7.0
13.0	24	6.9
13.1	24	6.9
13.2	24	6.9
13.3	24	6.9
13.4	25	7.1
13.5	25	7.1
13.6	23	6.7
13.7	24	6.9
13.8	25	7.1
13.9	25	7.1

14.0	26	7.5
14.1	26	7.5
14.2	27	7.7
14.3	29	8.1
14.4	30	8.3
14.5	25	7.3
14.6	25	7.3
14.7	26	7.5
14.8	28	7.9
14.9	27	7.7
15.0	30	8.4
15.1	30	8.4
15.2	31	8.7
15.3	30	8.4
15.4	30	8.4
15.5	30	8.4
15.6	30	8.4
15.7	30	8.4
15.8	31	8.7
15.9	29	8.2
16.0	33	9.2
16.1	28	9.2
16.2	32	9.0
16.3	33	9.2
16.4	34	9.4
16.5	33	9.2
16.6	33	9.1
16.7	27	8.0
16.8	27	8.0
16.9	27	8.0
17.0	29	8.5
17.1	30	8.7
17.2	28	8.3
17.3	40	10.8
17.4	35	9.8
17.5	29	8.5
17.6	32	9.1
17.7	32	9.1
17.8	31	8.9
17.9	30	8.7
18.0	31	9.1
18.1	32	9.3
18.2	32	9.3
18.3	30	8.9
18.4	30	8.9
19.5	30	8.9
18.6	33	9.5
18.7	35	9.9
18.8	32	9.3
18.9	32	9.3
19.0	33	9.6
19.1	34	9.8
19.2	34	9.8
19.3	34	9.8
19.4	34	9.7
19.5	34	9.8
19.6	33	9.6
19.7	30	9.0
19.8	40	11.1
19.9	30	9.0
20.0	30	9.1
20.1	32	9.6
20.2	33	9.8
20.3	37	10.6
20.4	37	10.6
20.5	33	9.8
20.6	35	10.2
20.7	35	10.2
20.8	31	9.3
20.9	27	8.5

21.0	26	8.4
21.1	26	8.4
21.2	25	8.2
21.3	27	8.7
21.4	26	8.4
21.5	27	8.7
21.6	28	8.9
21.7	30	9.3
21.8	32	9.7
21.9	37	10.7
22.0	40	11.5
22.1	42	11.9
22.2	61	15.9
22.3	72	18.2
22.4	76	19.0
22.5	80	19.8
22.6	90	21.9
22.7	68	17.3
22.8	66	16.9
22.9	80	19.8
23.0	81	20.2
23.1	86	21.2
23.2	97	23.5
23.3	105	25.2
23.4	120	28.3
23.5	110	26.2
23.6	110	26.2
23.7	106	25.4
23.8	95	23.1
23.9	85	21.0
24.0	77	19.5
24.1	70	18.0
24.2	70	18.0
24.3	80	20.1
24.4	80	20.1
24.5	90	22.2
24.6	80	20.1
24.7	65	17.0
24.8	73	18.6
24.9	70	18.0
25.0	60	16.1
25.1	55	15.0
25.2	65	17.1
	2 t Ring	
25.3	95	84.6
25.4	125	110.2
25.5	135	118.7





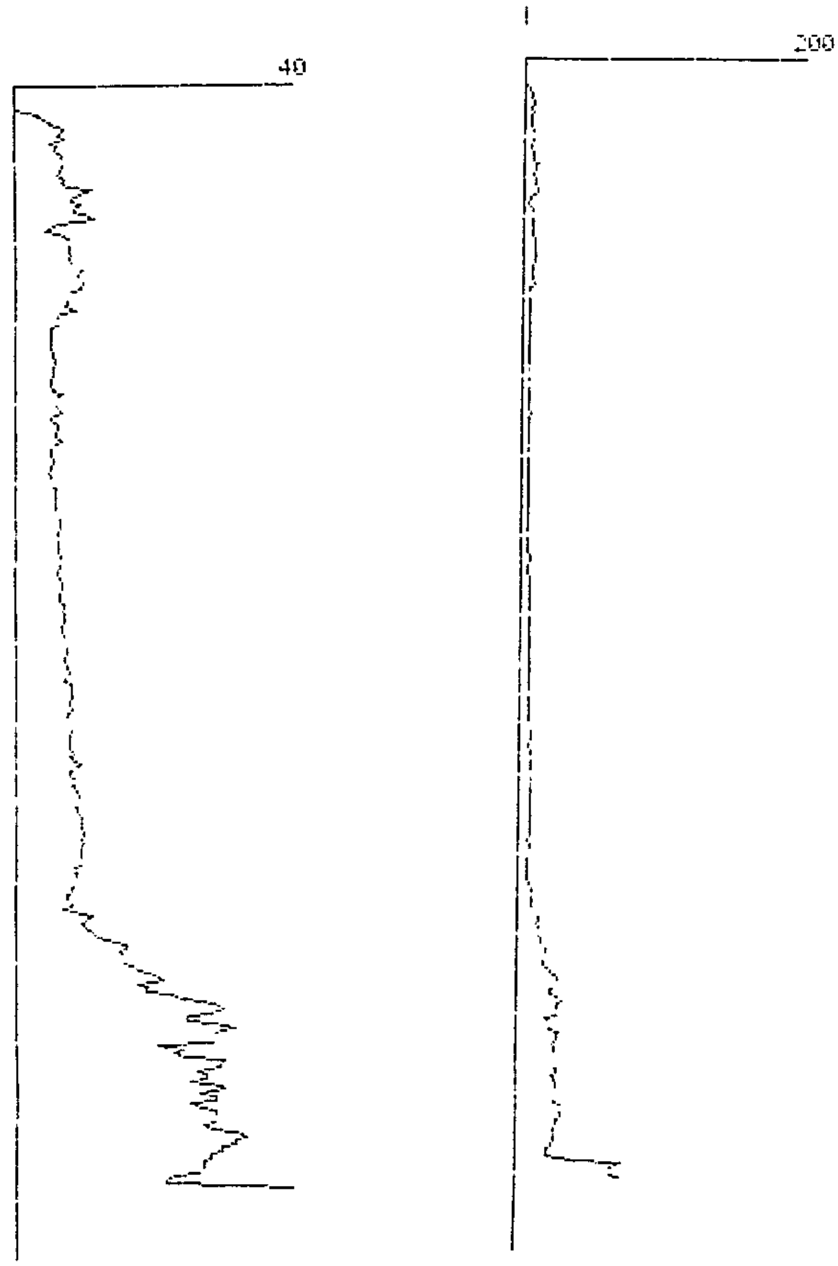
B-2

Depth	Dial	Qc	Depth	Dial	Qc	Depth	Dial	Qc
	500kg Ring							
			7.0	21	5.5	14.0	22	6.6
0.1	0	0.1	7.1	20	5.3	14.1	24	7.1
0.2	0	0.1	7.2	19	5.1	14.2	23	6.9
0.3	0	0.1	7.3	19	5.1	14.3	23	6.9
0.4	0	0.1	7.4	19	5.1	14.4	22	6.6
0.5	0	0.1	7.5	18	4.8	14.5	22	6.6
0.6	0	0.1	7.6	17	4.6	14.6	24	7.1
0.7	0	0.1	7.7	18	4.8	14.7	24	7.1
0.8	15	3.3	7.8	19	5.1	14.8	25	7.3
0.9	15	3.3	7.9	25	6.3	14.9	24	7.1
1.0	22	4.9	8.0	20	5.4	15.0	22	6.6
1.1	22	4.9	8.1	22	5.9	15.1	25	7.4
1.2	30	6.5	8.2	25	6.4	15.2	25	7.4
1.3	29	6.3	8.3	19	5.2	15.3	26	7.6
1.4	26	5.7	8.4	17	4.8	15.4	26	7.6
1.5	30	6.5	8.5	20	5.4	15.5	25	7.4
1.6	22	4.9	8.6	21	5.6	15.6	24	7.2
1.7	26	5.7	8.7	21	5.6	15.7	24	7.2
1.8	25	5.5	8.8	20	5.4	15.8	26	7.5
1.9	28	6.1	8.9	20	5.4	15.9	23	6.9
2.0	28	6.2	9.0	22	5.2	16.0	23	6.9
2.1	29	6.4	9.1	19	5.7	16.1	24	7.1
2.2	27	6.0	9.2	17	4.9	16.2	25	7.5
2.3	26	5.8	9.3	17	4.9	16.3	24	[illegible]
2.4	30	6.7	9.4	17	4.9	16.4	24	[illegible]
2.5	29	6.4	9.5	18	5.1	16.5	[illegible]	7.1
2.6	32	7.1	9.6	18	5.1	16.6	[illegible]	7.1
2.7	47	10.2	9.7	17	4.9	16.7	24	7.3
2.8	38	8.3	9.8	16	4.7	16.8	26	7.8
2.9	35	7.7	9.9	15	4.5	16.9	[illegible]	7.1
3.0	33	7.4	10.0	16	4.8	17.0	26	7.9
3.1	40	8.9	10.1	18	[illegible]	17.1	30	[illegible]
3.2	35	7.8	10.2	18	[illegible]	17.2	[illegible]	[illegible]
3.3	35	7.8	10.3	19	5.5	17.3	[illegible]	[illegible]
3.4	45	9.9	10.4	19	5.5	17.4	[illegible]	[illegible]
3.5	49	10.7	10.5	19	5.5	17.5	[illegible]	[illegible]
3.6	25	5.8	10.6	19	5.5	17.6	[illegible]	8.1
3.7	22	5.1	10.7	18	5.3	17.7	25	[illegible]
3.8	17	4.1	10.8	21	5.9	17.8	27	8.1
3.9	25	5.8	10.9	20	5.7	17.9	[illegible]	[illegible]
4.0	32	7.3	11.0	21	6.0	18.0	25	8.4
4.1	32	7.3	11.1	21	6.0	18.1	28	[illegible]
4.2	32	7.3	11.2	21	6.0	18.2	[illegible]	[illegible]
4.3	33	7.6	11.3	20	5.8	18.3	26	8.4
4.4	32	7.3	11.4	20	5.8	18.4	[illegible]	[illegible]
4.5	33	7.6	11.5	21	6.0	18.5	29	[illegible]
4.6	36	8.2	11.6	20	5.8	18.6	30	[illegible]
4.7	41	9.2	11.7	19	5.6	18.7	30	[illegible]
4.8	38	8.6	11.8	20	5.8	18.8	31	9.1
4.9	38	8.6	11.9	20	5.8	18.9	31	9.1
5.0	40	9.1	12.0	20	6.0	19.0	29	8.8
5.1	40	9.1	12.1	20	6.0	19.1	30	9.0
5.2	38	8.7	12.2	19	5.7	19.2	29	8.8
5.3	33	7.7	12.3	19	5.7	19.3	29	[illegible]
5.4	30	7.1	12.4	20	6.0	19.4	[illegible]	[illegible]
5.5	28	6.7	12.5	21	6.2	19.5	29	[illegible]
5.6	30	7.1	12.6	21	6.2	19.6	30	9.0
5.7	28	6.7	12.7	21	6.2	19.7	27	8.4
5.8	35	8.1	12.8	20	6.0	19.8	23	7.5
5.9	25	6.0	12.9	20	6.0	19.9	26	[illegible]
6.0	23	5.8	13.0	20	6.1	20.0	25	8.1
6.1	19	4.9	13.1	22	6.5	20.1	22	7.5
6.2	19	4.9	13.2	22	6.5	20.2	23	7.5
6.3	19	4.9	13.3	21	6.3	20.3	19	6.9
6.4	18	4.7	13.4	23	6.7	20.4	19	6.9
6.5	19	4.9	13.5	23	6.7	20.5	21	7.3
6.6	18	4.7	13.6	22	6.5	20.6	22	7.5
6.7	19	4.9	13.7	21	6.3	20.7	16	6.2
6.8	20	5.1	13.8	21	6.3	20.8	30	9.1
6.9	20	5.1	13.9	21	6.3	20.9	35	10.2

2 t Fins

25.6	27	26.6
25.7	23	23.3
25.8	25	24.9
25.9	27	26.6
26.0	27	26.8
26.1	25	25.1
26.2	26	25.9
26.3	30	29.3
26.4	32	31.0
26.5	30	29.3
26.6	30	29.7
26.7	28	27.6
26.8	28	27.6
26.9	26	25.9
27.0	26	26.0
27.1	25	25.2
27.2	25	25.2
27.3	25	25.2
27.4	24	24.3
27.5	20	20.9
27.6	19	20.1
27.7	19	20.1
27.8	42	38.0
27.9	78	70.4
28.0	68	62.0
28.1	75	68.0

21.0	30	9.3
21.1	27	8.7
21.2	31	9.5
21.3	34	10.1
21.4	37	10.7
21.5	38	10.9
21.6	49	13.2
21.7	55	14.5
21.8	55	14.5
21.9	51	13.6
22.0	53	14.2
22.1	60	15.7
22.2	62	16.1
22.3	73	18.2
22.4	75	18.5
22.5	80	19.3
22.6	62	16.1
22.7	70	17.7
22.8	68	17.3
22.9	85	20.9
23.0	92	22.4
23.1	105	25.2
23.2	115	27.2
23.3	115	27.9
23.4	109	26.0
23.5	95	23.1
23.6	95	23.1
23.7	110	26.2
23.8	125	29.7
23.9	115	27.2
24.0	110	26.3
24.1	75	19.1
24.2	90	22.2
24.3	85	21.1
24.4	92	22.6
24.5	118	28.0
24.6	115	27.4
24.7	115	27.4
24.8	100	24.3
24.9	105	25.3
25.0	105	25.4
25.1	95	23.3
25.2	115	27.5
25.3	117	27.9
25.4	100	24.4
25.5	110	26.5


40
200

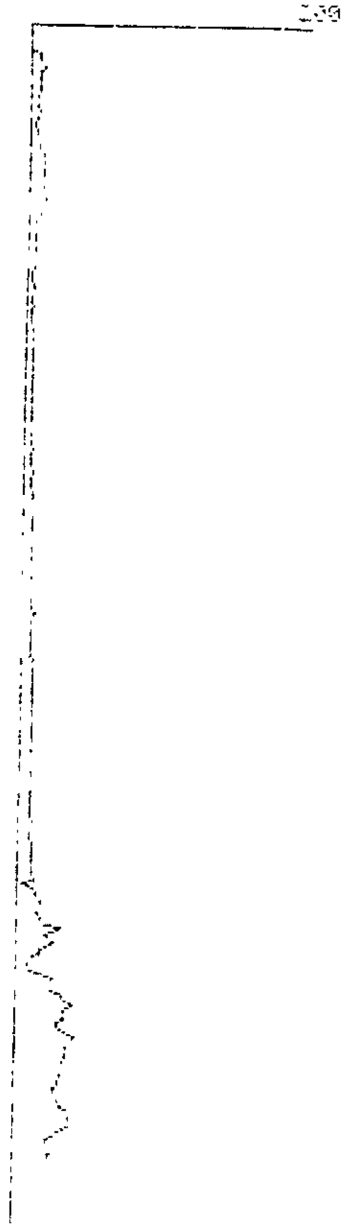
D-3

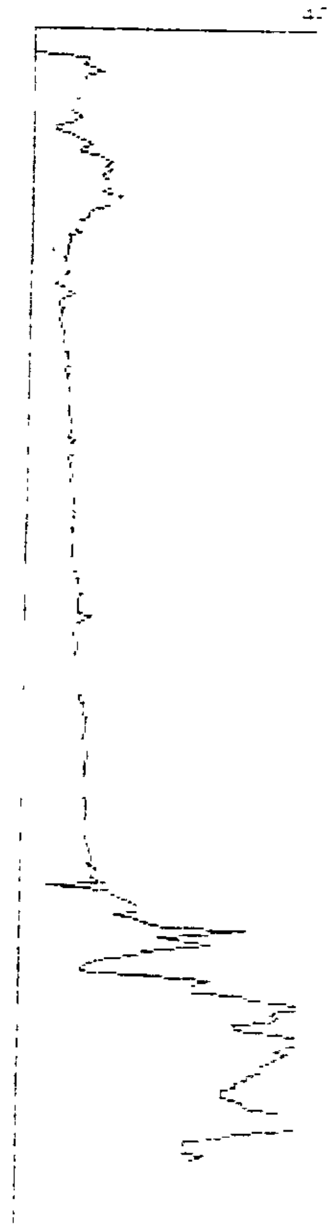
Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	0	0.1
0.6	0	0.1
0.7	0	0.1
0.8	35	7.4
0.9	35	7.4
1.0	32	6.9
1.1	40	8.6
1.2	45	9.6
1.3	35	7.6
1.4	34	7.3
1.5	35	7.6
1.6	32	6.9
1.7	34	7.3
1.8	30	6.5
1.9	30	6.5
2.0	26	5.8
2.1	24	5.4
2.2	30	6.7
2.3	30	6.7
2.4	22	5.0
2.5	13	3.1
2.6	14	3.3
2.7	22	5.0
2.8	27	6.0
2.9	33	7.3
3.0	36	8.0
3.1	31	7.0
3.2	29	6.6
3.3	40	8.9
3.4	47	10.3
3.5	50	11.0
3.6	45	9.9
3.7	50	11.0
3.8	44	9.7
3.9	44	9.7
4.0	48	10.7
4.1	44	9.8
4.2	55	12.1
4.3	53	11.7
4.4	50	11.1
4.5	46	10.3
4.6	36	8.2
4.7	34	7.8
4.8	35	8.0
4.9	29	6.5
5.0	25	6.0
5.1	24	5.8
5.2	30	7.1
5.3	21	5.2
5.4	22	5.4
5.5	22	5.4
5.6	20	5.0
5.7	20	5.0
5.8	20	5.0
5.9	18	4.6
6.0	18	4.7
6.1	21	5.3
6.2	17	4.5
6.3	15	4.1
6.4	13	3.7
6.5	18	4.7
6.6	21	5.3
6.7	25	6.2
6.8	17	4.5
6.9	15	4.1
7.0	14	4.0
7.1	17	4.6
7.2	16	4.4
7.3	16	4.4
7.4	15	4.2
7.5	16	4.4
7.6	16	4.4
7.7	17	4.6
7.8	17	4.6
7.9	16	4.4
8.0	17	4.8
8.1	20	5.4
8.2	20	5.4
8.3	20	5.4
8.4	23	6.0
8.5	20	5.4
8.6	19	5.2
8.7	21	5.6
8.8	20	5.4
8.9	18	5.0
9.0	21	5.7
9.1	21	5.7
9.2	21	5.7
9.3	20	5.5
9.4	18	5.1
9.5	19	5.3
9.6	20	5.5
9.7	20	5.5
9.8	21	5.7
9.9	22	6.0
10.0	21	5.9
10.1	21	5.9
10.2	20	5.7
10.3	24	6.5
10.4	20	5.7
10.5	22	6.1
10.6	24	6.5
10.7	22	6.1
10.8	20	5.7
10.9	21	5.9
11.0	21	6.0
11.1	20	5.9
11.2	22	6.2
11.3	23	6.4
11.4	21	6.0
11.5	20	5.8
11.6	21	6.0
11.7	20	5.9
11.8	22	6.2
11.9	24	6.6
12.0	23	6.6
12.1	24	6.8
12.2	23	6.6
12.3	21	6.2
12.4	25	7.0
12.5	22	6.4
12.6	23	6.6
12.7	21	6.2
12.8	23	6.6
12.9	24	6.8
13.0	23	6.7
13.1	23	6.7
13.2	23	6.7
13.3	23	6.7
13.4	25	7.1
13.5	25	7.1
13.6	22	6.5
13.7	25	7.1
13.8	29	8.0
13.9	26	7.3
14.0	27	7.7
14.1	29	8.1
14.2	27	7.7
14.3	27	7.7
14.4	27	7.7
14.5	26	7.5
14.6	27	7.7
14.7	35	9.3
14.8	29	8.1
14.9	27	7.7
15.0	27	7.7
15.1	21	6.5
15.2	27	7.7
15.3	27	7.8
15.4	26	7.4
15.5	26	7.4
15.6	26	7.4
15.7	24	7.2
15.8	24	7.2
15.9	26	7.5
16.0	27	7.9
16.1	31	8.8
16.2	31	8.8
16.3	31	8.9
16.4	29	8.4
16.5	29	8.4
16.6	29	8.4
16.7	27	8.0
16.8	26	7.5
16.9	33	9.3
17.0	30	8.5
17.1	30	8.5
17.2	32	8.9
17.3	31	8.8
17.4	30	8.5
17.5	30	8.5
17.6	30	8.5
17.7	30	8.5
17.8	29	8.5
17.9	29	8.5
18.0	31	9.1
18.1	31	9.1
18.2	31	9.1
18.3	32	9.3
18.4	32	9.3
18.5	30	9.3
18.6	32	9.1
18.7	32	9.1
18.8	33	8.9
18.9	31	9.1
19.0	31	8.9
19.1	27	9.4
19.2	28	9.3
19.3	30	9.3
19.4	31	9.3
19.5	31	9.3
19.6	30	9.0
19.7	30	9.0
19.8	31	9.1
19.9	31	9.1
20.0	31	9.1
20.1	30	9.1
20.2	30	9.1
20.3	30	9.1
20.4	31	9.3
20.5	32	9.5
20.6	33	9.5
20.7	34	10.0
20.8	34	10.0
20.9	31	9.3

21.0	[illegible]	10.7
21.1	[illegible]	10.5
21.2	[illegible]	10.1
21.3	34	10.1
21.4	42	11.8
21.5	4	[illegible]
21.6	44	[illegible]
21.7	46	12.6
21.8	50	1[illegible].4
21.9	55	14.5
22.0	61	15.9
22.1	47	[illegible]
22.2	6[illegible]	16.[illegible]
22.3	55	16.[illegible]
22.4	80	19.[illegible]
22.5	1[illegible]0	[illegible]0.2
22.6	100	24.0
22.7	75	18.8
22.8	95	22.9
22.9	108	25.6
23.0	[illegible]	19.[illegible]
23.1	[illegible]	16.[illegible]
23.2	[illegible]	1[illegible].[illegible]
23.3	4[illegible]	12.[illegible]
23.4	[illegible]	10.9
23.5	[illegible]	9.1
23.6	25	8.7
23.7	[illegible]	10.5
23.8	[illegible]	[illegible]
23.9	10[illegible]	[illegible]
24.0	[illegible]	[illegible]
24.1	[illegible]	[illegible]9.9
24.2	1[illegible]	[illegible]0.9
24.3	14[illegible]	[illegible]4.4
24.4	[illegible]4	[illegible]9.6
24.5	150	[illegible]4.6
24.6	145	[illegible]
24.7	150	[illegible]4.[illegible]
24.8	145	[illegible]
24.9	[illegible]	[illegible]
25.0	[illegible]	[illegible]
25.1	175	[illegible]1.[illegible]

2 t Ring

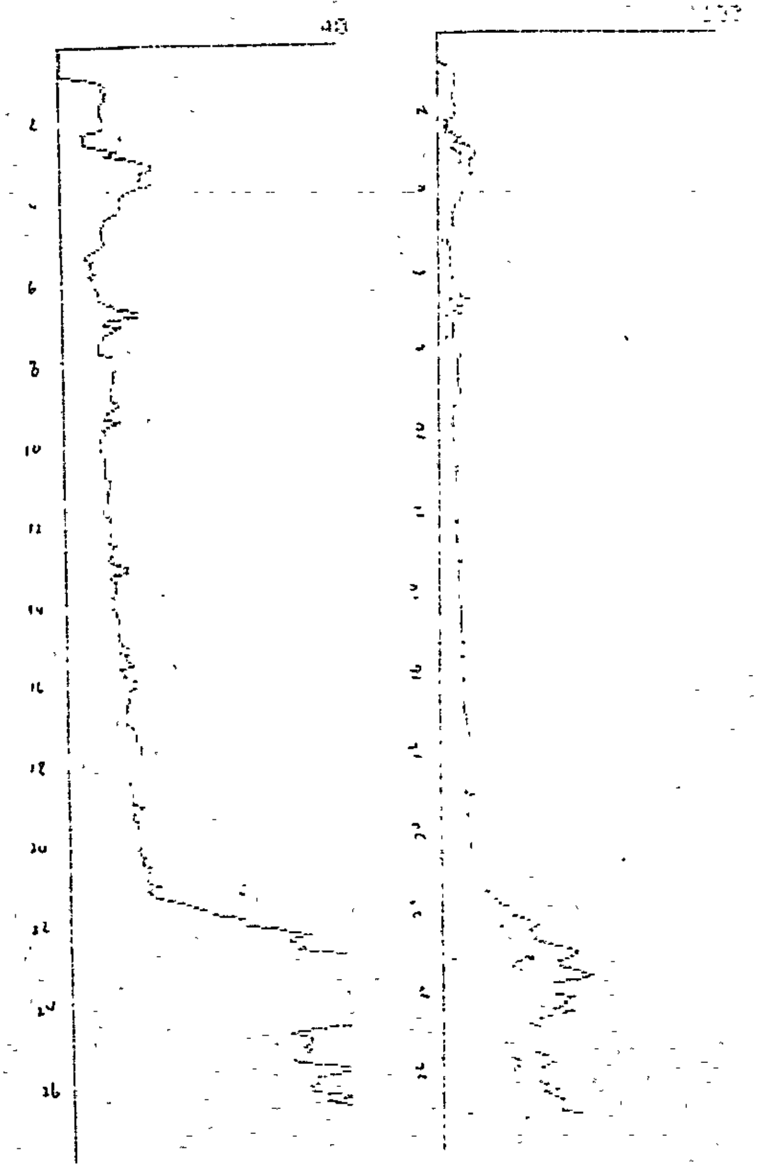
[illegible]	[illegible]	[illegible]
[illegible]	47	40.[illegible]
[illegible]	4[illegible]	[illegible]
[illegible]	[illegible]	[illegible]6.0
[illegible]	[illegible]	[illegible]4.[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]4.[illegible]
[illegible]	[illegible]	[illegible]4.[illegible]
[illegible].0	[illegible]4	[illegible]2.[illegible]
[illegible].1	[illegible]	[illegible]1.0
[illegible]	[illegible]	[illegible]1.0
[illegible]	[illegible]	[illegible]
[illegible].4	[illegible]0	[illegible]
[illegible].5	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]1	[illegible]
[illegible].0	[illegible]	[illegible]
[illegible].1	[illegible]	[illegible]5.4
27.2	41	[illegible]8.8
27.3	[illegible]	[illegible]7.1
[illegible].4	40	[illegible]8.0
[illegible].5	4[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]0	[illegible]9.5
[illegible]	[illegible]	[illegible]6.9
[illegible]	[illegible]	[illegible]
28.0	[illegible]	22.8
28.1	25	25.[illegible]
28.2	2[illegible]	[illegible].6





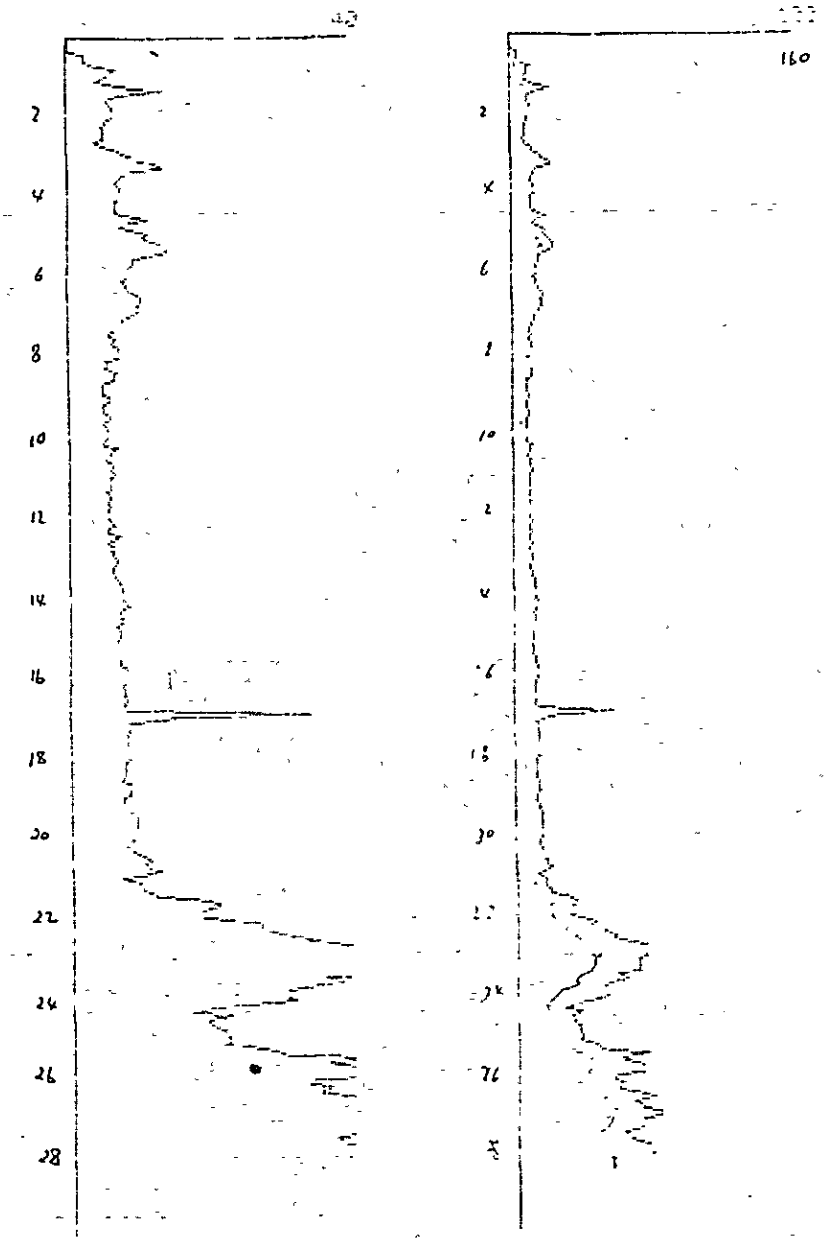
D-4

Depth	Dial	Cc
	50dks Pins	
0.1	1	0.0
0.2	1	0.0
0.3	1	0.[illegible]
0.4	1	[illegible]
0.5	1	[illegible]
0.6	1	[illegible]
0.7	1	[illegible]
0.8	1	[illegible]
0.9	1	[illegible]
1.0	26	[illegible]
[illegible]	[illegible]	[illegible]



D-5

Depth	Dist	Qc
	500lbs Pins	
0.1	1	0.[illegible]
0.2	1	0.[illegible]
0.3	1	0.3
0.4	1	0.3
0.5	11	2.6
0.6	12	2.6
0.7	13	[illegible]
0.8	18	4.1
0.9	[illegible]	[illegible]
1.0	27	5.9
1.1	25	5.5
1.2	19	4.[illegible]
1.3	22	5.7
1.4	43	9.[illegible]
1.5	60	12.8
1.6	[illegible]	7.1
1.7	[illegible]	5.[illegible]
1.8	[illegible]	5.[illegible]
1.9	[illegible]	5.[illegible]
2.0	[illegible]	6.[illegible]
2.1	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	17	4.0
2.9	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
4.5	[illegible]	[illegible]
4.6	[illegible]	10.[illegible]
4.7	[illegible]	[illegible]
[illegible]	41	[illegible]
5.1	46	10.4
[illegible]	52	11.6
[illegible]	56	12.5
[illegible]	60	13.[illegible]
[illegible]	60	[illegible]
[illegible]	48	[illegible]
[illegible]	40	9.1
[illegible]	40	9.1
[illegible]	38	[illegible]
6.1	[illegible]	[illegible]
[illegible]	34	8.0
6.3	34	8.0
6.4	[illegible]	8.7
6.5	42	9.7
6.6	44	10.1
6.7	43	9.9
6.8	43	9.7
6.9	43	9.9
7.0	38	9.[illegible]
7.1	[illegible]	[illegible]
7.4	[illegible]	7.1
7.5	[illegible]	[illegible]
[illegible]	[illegible]	6.[illegible]
8.0	[illegible]	[illegible]
8.5	[illegible]	[illegible]
9.1	[illegible]	4.[illegible]
9.4	16	4.7
[illegible]	[illegible]	[illegible]
10.0	[illegible]	[illegible]
10.2	[illegible]	[illegible]
10.4	20	[illegible]
10.6	17	5.1
[illegible]	20	[illegible]
10.8	21	[illegible]
10.9	[illegible]	[illegible]
11.0	[illegible]	[illegible]
11.1	19	[illegible]
[illegible]	20	[illegible]
11.4	[illegible]	[illegible]
11.5	[illegible]	[illegible]
11.6	19	[illegible]
11.8	18	[illegible]
[illegible]	21	[illegible]
[illegible]	18	[illegible]
12.5	24	[illegible]
[illegible]	19	5.7
12.7	19	[illegible]
13.0	[illegible]	[illegible]
[illegible]	21	[illegible]
13.4	20	[illegible]
13.5	19	[illegible]
13.6	21	6.3
13.7	23	[illegible]
13.8	24	6.9
13.9	25	7.1
14.0	[illegible]	[illegible]
14.1	[illegible]	[illegible]
14.4	[illegible]	[illegible]
14.5	[illegible]	[illegible]
14.8	[illegible]	[illegible]
14.9	[illegible]	[illegible]
15.0	[illegible]	[illegible]
15.5	[illegible]	[illegible]
16.1	[illegible]	[illegible]
16.6	[illegible]	[illegible]
[illegible]	40	[illegible]
[illegible]	[illegible]	8.1
18.0	[illegible]	[illegible]
18.1	[illegible]	[illegible]
19.0	[illegible]	[illegible]
19.1	[illegible]	[illegible]
19.5	50	[illegible]
19.8	[illegible]	[illegible]
20.3	[illegible]	[illegible]
20.4	29	[illegible]
20.5	34	10.0
20.6	38	11.0
20.7	34	10.0
[illegible]	[illegible]	[illegible]
20.9	[illegible]	11.[illegible]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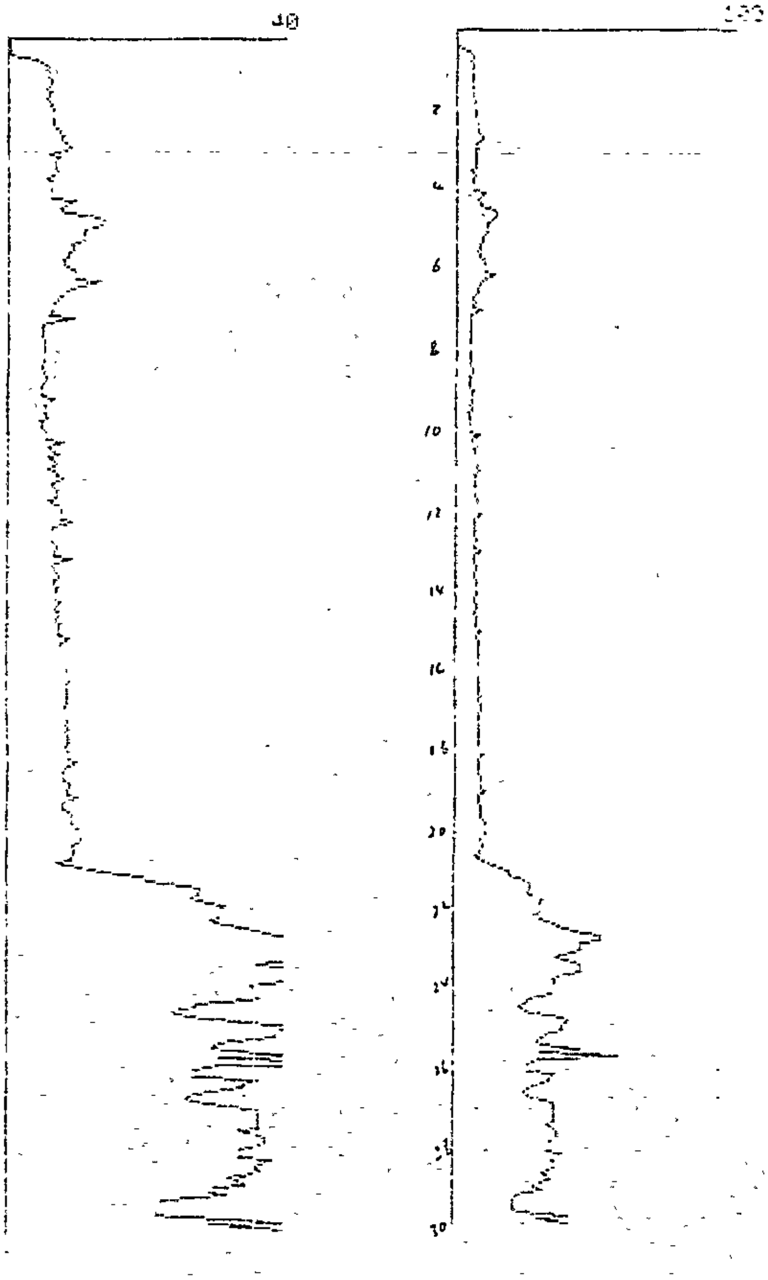
D-6

Depth	Dial	Qc	Depth	Dial	Qc	Depth	Dial	Qc
	500' = 2.ms		7.0	22	5.7	14.0	[illegible]	[illegible]
0.1	1	0.3	7.1	38	9.0	14.1	[illegible]	[illegible]
0.2	1	0.3	7.2	20	5.3	14.2	[illegible]	[illegible]
0.3	1	0.3	7.3	18	4.8	14.3	[illegible]	[illegible]
0.4	1	0.3	7.4	18	4.9	14.4	[illegible]	[illegible]
0.5	1	0.3	7.5	18	4.9	14.5	25	[illegible]
0.6	20	4.3	7.6	19	4.8	14.6	23	6.?
0.7	22	4.9	7.7	19	5.1	14.7	26	[illegible]
0.8	26	5.8	7.8	19	5.1	14.8	[illegible]	[illegible]
0.9	25	5.3	7.9	19	5.1	14.9	[illegible]	[illegible]
1.0	27	5.9	8.0	19	5.1	15.0	24	[illegible]
1.1	26	5.7	8.1	18	5.0	15.1	21	[illegible]
1.2	27	5.9	8.2	17	4.8	15.2	25	7.4
1.3	27	5.9	8.3	17	4.8	15.3	[illegible]	[illegible]
1.4	25	5.5	8.4	18	5.0	15.4	18	[illegible]
1.5	28	6.1	8.5	20	5.4	15.5	[illegible]	[illegible]
1.6	26	5.7	8.6	20	5.4	15.6	[illegible]	[illegible]
1.7	24	5.3	8.7	19	5.2	15.7	[illegible]	[illegible]
1.8	27	5.9	8.8	17	4.9	15.8	[illegible]	[illegible]
1.9	28	6.1	8.9	18	5.0	15.9	[illegible]	[illegible]
2.0	29	6.4	9.0	17	4.9	16.0	[illegible]	[illegible]
2.1	29	6.4	9.1	25	6.6	16.1	[illegible]	[illegible]
2.2	28	6.2	9.2	21	5.7	16.2	[illegible]	[illegible]
2.3	32	7.1	9.3	18	5.1	16.3	[illegible]	[illegible]
2.4	33	7.3	9.4	21	5.7	16.4	[illegible]	[illegible]
2.5	35	7.7	9.5	18	5.5	16.5	[illegible]	[illegible]
2.6	34	7.5	9.6	20	[illegible]	16.6	[illegible]	[illegible]
2.7	37	8.1	9.7	15	[illegible]	16.7	[illegible]	[illegible]
2.8	40	8.7	9.8	16	4.7	16.8	[illegible]	[illegible]
2.9	35	7.7	9.9	16	4.7	16.9	[illegible]	[illegible]
3.0	25	5.8	10.0	18	5.3	17.0	[illegible]	[illegible]
3.1	33	7.2	10.1	30	7.8	17.1	[illegible]	[illegible]
3.2	29	6.5	10.2	20	5.3	17.2	[illegible]	[illegible]
3.3	29	6.5	10.3	22	6.1	17.3	[illegible]	[illegible]
3.4	30	6.6	10.4	23	[illegible]	17.4	[illegible]	[illegible]
3.5	31	6.8	10.5	23	5.7	17.5	[illegible]	[illegible]
3.6	29	6.4	10.6	25	[illegible]	17.6	[illegible]	[illegible]
3.7	23	5.3	10.7	26	[illegible]	17.7	[illegible]	[illegible]
3.8	27	6.2	10.8	23	5.7	17.8	[illegible]	[illegible]
3.9	26	6.0	10.9	25	6.7	17.9	[illegible]	[illegible]
4.0	28	6.1	11.0	28	7.1	18.0	[illegible]	[illegible]
4.1	42	9.4	11.1	30	[illegible]	18.1	[illegible]	[illegible]
4.2	35	8.9	11.2	23	6.4	18.2	[illegible]	[illegible]
4.3	32	[illegible]	11.3	23	[illegible]	18.3	[illegible]	[illegible]
4.4	35	8.0	11.4	25	6.9	18.4	[illegible]	[illegible]
4.5	50	11.1	11.5	25	6.9	18.5	[illegible]	[illegible]
4.6	60	13.2	11.6	25	6.9	18.6	[illegible]	[illegible]
4.7	60	13.2	11.7	20	5.8	18.7	[illegible]	[illegible]
4.8	55	12.1	11.8	25	6.9	18.8	[illegible]	[illegible]
4.9	47	10.5	11.9	27	7.3	18.9	[illegible]	[illegible]
5.0	47	10.6	12.0	27	7.4	19.0	28	[illegible]
5.1	50	11.2	12.1	35	9.1	19.1	[illegible]	10.0
5.2	42	9.6	12.2	21	6.2	19.2	[illegible]	[illegible]
5.3	38	8.7	12.3	22	[illegible]	19.3	[illegible]	[illegible]
5.4	39	8.8	12.4	22	6.4	19.4	[illegible]	[illegible]
5.5	36	[illegible]	12.5	22	[illegible]	19.5	[illegible]	[illegible]
5.6	36	[illegible]	12.6	21	6.1	19.6	[illegible]	[illegible]
5.7	33	7.7	12.7	22	[illegible]	19.7	[illegible]	[illegible]
5.8	34	7.9	12.8	25	[illegible]	19.8	31	[illegible]
5.9	37	8.5	12.9	23	[illegible]	19.9	[illegible]	9.4
6.0	40	9.0	13.0	23	[illegible]	20.0	[illegible]	10.?
6.1	55	12.4	13.1	28	[illegible]	20.1	[illegible]	[illegible]
6.2	43	9.9	13.2	25	[illegible]	20.2	29	[illegible]
6.3	40	8.7	13.3	21	6.1	20.3	[illegible]	9.1
6.4	[illegible]	7.8	13.4	21	[illegible]	20.4	[illegible]	[illegible]
6.5	30	[illegible]	13.5	24	[illegible]	20.5	[illegible]	9.?
6.6	28	7.0	13.6	25	7.1	20.6	30	[illegible]
6.7	26	6.4	13.7	23	[illegible]	20.7	29	[illegible]
6.8	23	5.8	13.8	23	[illegible]	20.8	[illegible]	10.2
6.9	26	6.4	13.9	26	[illegible]	20.9	40	11.2

21.0	50	15.5
21.1	[illegible]	18.5
21.4	119	[illegible]
21.6	109	25.[illegible]
21.8	[illegible]	[illegible]
[illegible]	115	27.1
[illegible]	125	[illegible]
[illegible]	[illegible]	32.1
23.4	150	34.4
[illegible]	160	36.[illegible]
[illegible]	195	[illegible]
[illegible]	[illegible]	40.[illegible]
23.0	155	41.8
23.1	195	41.8
[illegible]	155	[illegible]
[illegible]	145	[illegible]
23.4	170	43.[illegible]
[illegible]	185	41.[illegible]
[illegible]	145	41.[illegible]
24.1	140	32.6
24.4	[illegible]	[illegible]
[illegible]	112	[illegible]
[illegible]	140	[illegible]
24.8	160	[illegible]
25.0	155	[illegible]
25.4	[illegible]	[illegible]
[illegible]	125	35.6
[illegible]	[illegible]	42.1
25.7	120	35.5
25.8	[illegible]	35.6

25.9	[illegible]	[illegible]
26.0	[illegible]	[illegible]
26.1	[illegible]	[illegible]
26.4	[illegible]	25.1
26.7	[illegible]	[illegible]
26.8	[illegible]	[illegible]
27.1	[illegible]	[illegible]
28.[illegible]	[illegible]	[illegible]
29.[illegible]	[illegible]	[illegible]
30.0	[illegible]	[illegible]

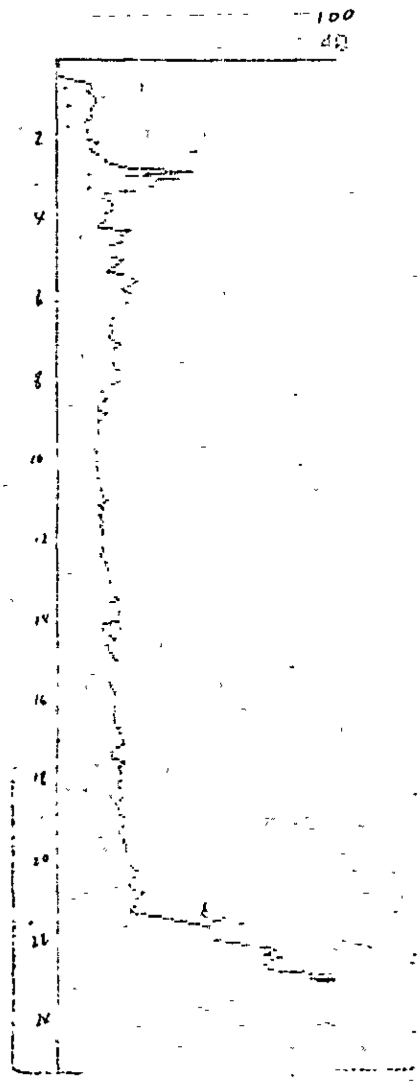


Depth	Dial	Qc
	523kg Ring	
0.1	1	0.3
0.2	1	0.3
0.3	1	0.3
0.4	1	0.3
0.5	1	0.3
0.6	15	3.3
0.7	22	4.[illegible]
0.8	2[illegible]	4.9
0.9	20	4.[illegible]
1.0	[illegible]	5.1
1.1	25	5.5
1.2	25	5.5
1.3	23	5.1
1.4	21	4.[illegible]
1.5	[illegible]	4.4
1.6	[illegible]	4.[illegible]
1.7	[illegible]	[illegible]
1.8	16	[illegible]
1.9	17	[illegible]
2.0	[illegible]	4.[illegible]
[illegible]	[illegible]	3.6
[illegible]	23	3.0
4.0	[illegible]	[illegible]
4.1	[illegible]	[illegible]
5.0	[illegible]	[illegible]
5.1	[illegible]	[illegible]
5.4	38	[illegible]
5.5	40	10.[illegible]
5.6	46	10.4
6.1	[illegible]	[illegible]
[illegible]	32	7.6
14.0	[illegible]	[illegible]
14.1	30	[illegible]
14.2	20	[illegible]
14.3	28	[illegible]
14.4	4[illegible]	[illegible]
14.5	[illegible]	[illegible]
14.6	[illegible]	[illegible]
14.7	[illegible]	[illegible]
14.8	[illegible]	[illegible]
14.9	[illegible]	[illegible]
15.0	[illegible]	[illegible]
18.1	[illegible]	[illegible]
19.8	[illegible]	[illegible]
20.0	[illegible]	[illegible]
[illegible]	42	11.6
10.9	[illegible]	[illegible]
11.1	[illegible]	[illegible]
13.5	[illegible]	[illegible]
13.8	30	9.2

21.0	36	10.9
21.1	37	10.7
21.2	40	11.4
21.3	[illegible]	9.9
21.4	34	10.1
21.5	[illegible]	11.1
21.6	[illegible]	14.5
21.7	65	[illegible]
21.8	82	20.1
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	35	[illegible]
[illegible]	[illegible]	[illegible]



D-8

500kg Ring

Depth	Dial	Qc
0.1	1	0.3
0.2	1	0.3
0.3	1	0.3
0.4	1	0.3
0.5	12	2.6
0.6	15	3.3
0.7	24	5.1
0.8	32	6.8
0.9	33	7.0
1.0	32	6.9
1.1	32	6.9
1.2	29	6.3
1.3	24	5.3
1.4	22	4.9
1.5	22	4.9
1.6	22	4.9
1.7	20	4.4
1.8	22	4.9
1.9	21	4.6
2.0	20	4.6
2.1	19	4.4
2.2	20	4.6
2.3	25	5.6
2.4	24	5.4
2.5	42	9.1
2.6	39	8.5
2.7	36	7.9
2.8	37	8.1
2.9	40	8.7
3.0	45	9.9
3.1	45	9.9
3.2	4	1.4
3.3	40	8.9
3.4	41	9.1
3.5	44	9.7
3.6	45	9.9
3.7	53	11.6
3.8	48	10.5
3.9	45	9.9
4.0	37	8.4
4.1	45	10.0
4.2	35	8.0
4.3	28	6.5
4.4	22	5.3
4.5	20	4.9
4.6	20	4.9
4.7	21	5.1
4.8	19	4.6
4.9	19	4.6
5.0	17	4.4
5.1	35	8.1
5.2	25	6.0
5.3	19	4.8
5.4	16	4.2
5.5	18	4.6
5.6	20	5.0
5.7	21	5.2
5.8	15	3.9
5.9	18	4.6
6.0	15	4.1
6.1	23	5.8
6.2	17	4.5
6.3	18	4.7
6.4	18	4.7
6.5	18	4.7
6.6	17	4.5
6.7	17	4.5
6.8	18	4.7
6.9	22	5.5
7.0	22	5.7
7.1	25	6.3
7.2	19	5.1
7.3	20	5.3
7.4	20	5.3
7.5	18	4.8
7.6	18	4.8
7.7	18	4.8
7.8	19	5.1
7.9	17	4.6
8.0	17	4.8
8.1	19	5.2
8.2	16	4.6
8.3	17	4.9
8.4	16	4.6
8.5	17	4.8
8.6	17	4.8
8.7	19	5.2
8.8	0	1.2
8.9	30	7.5
9.0	18	5.1
9.1	30	7.6
9.2	25	6.6
9.3	27	7.0
9.4	22	6.0
9.5	24	6.4
9.6	25	6.6
9.7	26	6.8
9.8	26	6.8
9.9	29	7.4
10.0	30	7.8
10.1	30	7.8
10.2	33	8.4
10.3	34	8.6
10.4	34	8.6
10.5	32	8.2
10.6	32	8.2
10.7	33	8.4
10.8	33	8.4
10.9	33	8.4
11.0	30	7.9
11.1	30	7.9
11.2	35	8.9
11.3	37	9.4
11.4	37	9.4
11.5	38	9.6
11.6	32	8.3
11.7	38	9.6
11.8	40	10.0
11.9	40	10.0
12.0	35	9.1
12.1	40	10.1
12.2	40	10.1
12.3	35	9.1
12.4	35	9.1
12.5	35	9.1
12.6	37	9.5
12.7	33	8.7
12.8	33	8.7
12.9	32	8.5
13.0	30	8.2
13.1	30	8.2
13.2	30	8.2
13.3	33	8.8
13.4	35	9.2
13.5	33	8.8
13.6	30	8.2
13.7	34	9.0
13.8	32	8.6
13.9	32	8.6
14.0	33	8.9
14.1	55	13.5
14.2	50	12.5
14.3	40	10.4
14.4	35	9.3
14.5	37	9.8
14.6	40	10.4
14.7	38	10.0
14.8	35	9.3
14.9	35	9.3
15.0	33	8.9
15.1	45	11.6
15.2	35	9.5
15.3	35	9.5
15.4	33	9.1
15.5	32	8.9
15.6	35	9.5
15.7	35	9.5
15.8	34	9.3
15.9	33	8.9
16.0	33	9.0
16.1	40	10.7
16.2	35	9.6
16.3	37	10.0
16.4	35	9.6
16.5	34	9.4
16.6	34	9.4
16.7	35	9.6
16.8	36	9.8
16.9	34	9.4
17.0	35	9.9
17.1	40	10.9
17.2	40	10.8
17.3	40	10.8
17.4	39	10.6
17.5	40	10.8
17.6	40	10.8
17.7	38	10.4
17.8	50	12.9
17.9	40	10.8
18.0	40	10.9
18.1	40	10.9
18.2	35	9.9
18.3	40	10.9
18.4	35	9.9
18.5	45	12.0
18.6	40	10.9
18.7	45	12.0
18.8	40	10.9
18.9	42	11.4
19.0	37	10.5
19.1	45	12.1
19.2	38	10.7
19.3	37	10.5
19.4	35	10.0
19.5	35	10.0
19.6	35	10.0
19.7	33	9.6
19.8	35	10.0
19.9	35	10.0
20.0	35	10.2
20.1	35	10.2
20.2	40	11.2
20.3	40	11.2
20.4	45	12.3
20.5	42	11.6
20.6	45	12.3
20.7	43	11.8
20.8	45	12.3
20.9	50	13.3

21.0	45	12.4
21.1	50	13.4
21.2	55	14.5
21.3	55	14.5
21.4	56	14.7
21.5	55	14.5
21.6	96	23.0
21.7	85	20.7
21.8	60	15.5
21.9	75	18.6
22.0	78	19.4
22.1	90	21.9
22.2	95	22.9
22.3	110	26.1
22.4	127	29.6
22.5	135	31.3
22.6	170	38.5
22.7	210	46.9

2 t Ring

22.8	60	54.4
22.9	55	50.1
23.0	69	62.2
23.1	45	41.7
23.2	39	36.6
23.3	30	28.9
23.4	38	35.7
23.5	42	39.1
23.6	37	34.9
23.7	38	35.7
23.8	42	39.1
23.9	38	35.7
24.0	32	30.7
24.1	30	29.0
24.2	35	33.7
24.3	35	33.3
24.4	32	30.7
24.5	33	31.6
24.6	40	37.6
24.7	41	38.4
24.8	45	41.8
24.9	55	50.4
25.0	40	37.7
25.1	50	46.2


40
200

D-9

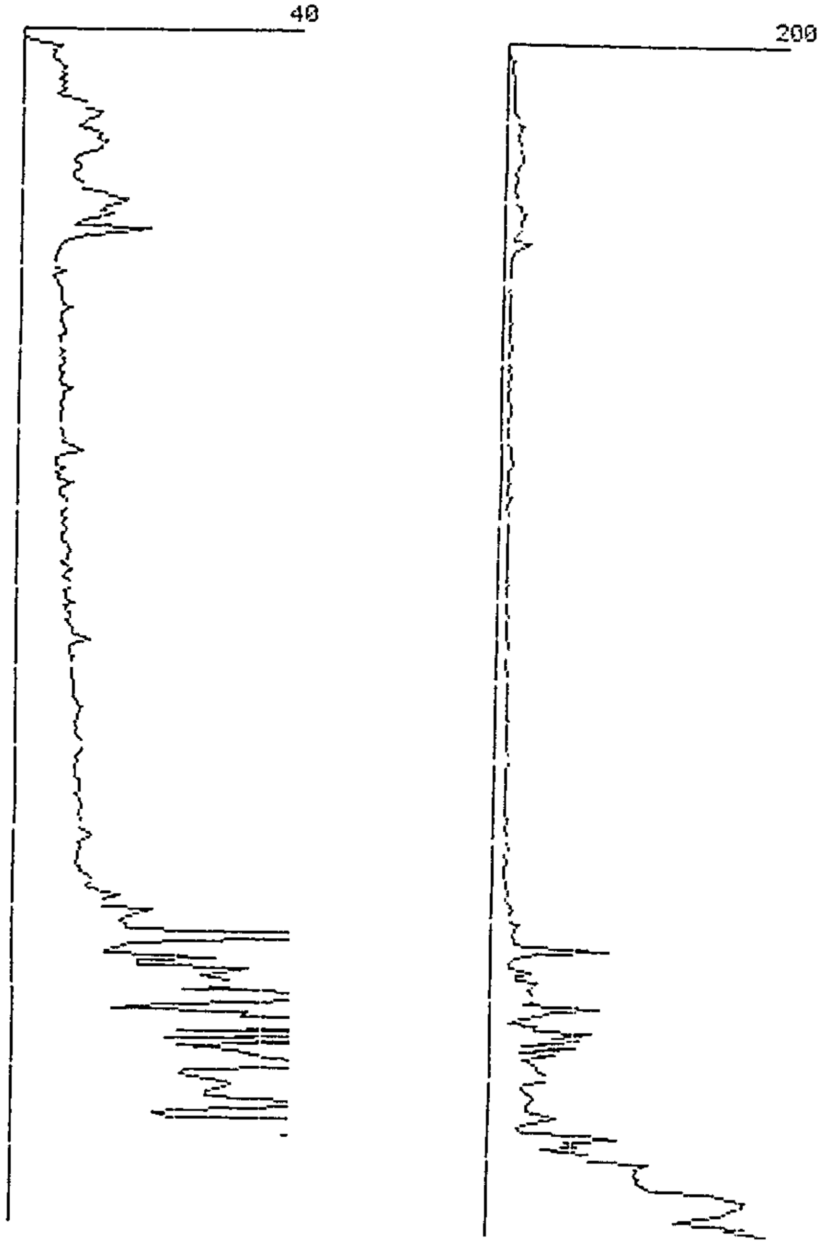
500kg Ring

Depth	Dial	Qc
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	14	3.1
0.5	25	5.3
0.6	20	4.3
0.7	21	4.5
0.8	19	4.1
0.9	22	4.7
1.0	25	5.5
1.1	27	5.9
1.2	25	5.5
1.3	27	5.9
1.4	23	5.1
1.5	27	5.9
1.6	24	5.3
1.7	27	5.9
1.8	22	4.9
1.9	27	5.9
2.0	40	8.7
2.1	50	10.8
2.2	48	10.4
2.3	42	9.1
2.4	38	8.3
2.5	35	7.7
2.6	47	10.2
2.7	50	10.8
2.8	48	10.4
2.9	53	11.4
3.0	50	11.0
3.1	50	11.0
3.2	40	8.9
3.3	35	7.8
3.4	32	7.2
3.5	35	7.8
3.6	37	8.2
3.7	34	7.6
3.8	32	7.2
3.9	32	7.2
4.0	37	8.4
4.1	50	11.1
4.2	54	11.9
4.3	65	14.2
4.4	60	13.2
4.5	52	11.5
4.6	49	10.9
4.7	57	12.5
4.8	45	10.0
4.9	37	8.4
5.0	33	7.7
5.1	80	17.5
5.2	60	13.3
5.3	39	8.9
5.4	30	7.1
5.5	25	6.0
5.6	22	5.4
5.7	22	5.4
5.8	20	5.0
5.9	19	4.8
6.0	18	4.7
6.1	25	6.2
6.2	17	4.5
6.3	18	4.7
6.4	20	5.1
6.5	21	5.3
6.6	22	5.5
6.7	22	5.5
6.8	23	5.8
6.9	23	5.8
7.0	24	6.1
7.1	30	7.3
7.2	22	5.7
7.3	22	5.7
7.4	22	5.7
7.5	22	5.7
7.6	24	6.1
7.7	25	6.3
7.8	25	6.3
7.9	21	5.5
8.0	22	5.8
8.1	25	6.4
8.2	22	5.8
8.3	24	6.2
8.4	25	6.4
8.5	22	5.8
8.6	21	5.6
8.7	24	6.2
8.8	23	6.0
8.9	22	5.8
9.0	22	6.0
9.1	30	7.6
9.2	24	6.4
9.3	24	6.4
9.4	24	6.4
9.5	22	6.0
9.6	22	6.0
9.7	23	6.2
9.8	22	6.0
9.9	22	6.0
10.0	22	6.1
10.1	23	6.3
10.2	23	6.3
10.3	24	6.5
10.4	23	6.3
10.5	30	7.8
10.6	36	9.0
10.7	27	7.1
10.8	18	5.3
10.9	18	5.3
11.0	18	5.4
11.1	24	6.6
11.2	18	5.4
11.3	21	6.0
11.4	20	5.8
11.5	30	7.9
11.6	22	6.2
11.7	21	6.0
11.8	21	6.0
11.9	24	6.6
12.0	25	7.0
12.1	21	6.2
12.2	22	6.4
12.3	24	6.8
12.4	21	6.2
12.5	23	6.6
12.6	25	7.0
12.7	22	6.4
12.8	21	6.2
12.9	22	6.4
13.0	25	7.1
13.1	25	7.1
13.2	27	7.5
13.3	25	7.1
13.4	26	7.3
13.5	21	6.3
13.6	25	7.1
13.7	28	7.8
13.8	24	6.9
13.9	23	6.7
14.0	26	7.5
14.1	22	6.6
14.2	23	6.9
14.3	23	6.9
14.4	29	8.1
14.5	22	6.6
14.6	24	7.1
14.7	26	7.5
14.8	26	7.5
14.9	24	7.1
15.0	26	7.6
15.1	27	7.8
15.2	27	7.8
15.3	30	8.4
15.4	39	10.3
15.5	30	8.4
15.6	26	7.6
15.7	26	7.6
15.8	26	7.6
15.9	29	8.2
16.0	26	7.8
16.1	26	7.8
16.2	26	7.8
16.3	26	7.8
16.4	28	8.2
16.5	28	8.2
16.6	28	8.2
16.7	28	8.2
16.8	28	8.2
16.9	30	8.6
17.0	30	8.7
17.1	33	9.3
17.2	32	9.1
17.3	30	8.7
17.4	30	8.7
17.5	28	8.3
17.6	28	8.3
17.7	30	8.7
17.8	29	8.5
17.9	30	8.7
18.0	33	9.5
18.1	33	9.5
18.2	30	8.9
18.3	28	8.4
18.4	29	8.7
18.5	28	8.4
18.6	28	8.4
18.7	28	8.4
18.8	28	8.4
18.9	31	9.1
19.0	31	9.2
19.1	31	9.2
19.2	30	9.0
19.3	28	8.6
19.4	31	9.2
19.5	31	9.2
19.6	32	9.4
19.7	32	9.4
19.8	31	9.2
19.9	31	9.2

20.0	31	9.3
20.1	33	9.8
20.2	40	11.2
20.3	35	10.2
20.4	30	9.1
20.5	31	9.3
20.6	31	9.3
20.7	30	9.1
20.8	30	9.1
20.9	30	9.1
21.0	28	8.9
21.1	30	9.3
21.2	31	9.5
21.3	35	10.3
21.4	38	10.9
21.5	40	11.4
21.6	35	10.3
21.7	38	10.9
21.8	45	12.4
21.9	55	14.5
22.0	45	12.5
22.1	75	18.8
22.2	65	16.7
22.3	60	15.7
22.4	55	14.6
22.5	60	15.7
22.6	60	15.7
22.7	110	26.1

2 t Ring

22.8	88	78.2
22.9	34	32.2
23.0	15	16.1
23.1	14	15.3
23.2	11	12.7
23.3	11	12.7
23.4	28	27.2
23.5	16	17.0
23.6	16	17.0
23.7	33	31.5
23.8	29	28.0
23.9	26	25.5
24.0	30	29.0
24.1	23	23.1
24.2	80	71.7
24.3	45	41.8
24.4	34	32.5
24.5	20	20.5
24.6	12	13.7
24.7	33	31.6
24.8	32	30.7
24.9	75	67.4
25.0	45	42.0
25.1	65	59.0
25.2	22	22.4
25.3	62	56.5
25.4	20	20.6
25.5	48	44.5
25.6	22	22.4
25.7	27	26.6
25.8	33	31.7
25.9	33	31.7
26.0	40	37.8
26.1	23	23.3
26.2	22	22.5
26.3	24	24.2
26.4	29	28.5
26.5	30	29.3
26.6	29	27.6
26.7	26	25.9
26.8	26	25.9
26.9	33	31.9
27.0	48	44.8
27.1	40	38.0
27.2	22	22.6
27.3	18	19.2
27.4	21	21.8
27.5	70	63.6
27.6	95	84.9
27.7	55	50.8
27.8	65	59.3
27.9	38	36.3
28.0	74	67.1
28.1	120	106.4
28.2	109	97.0
28.3	112	99.5
28.4	109	97.0
28.5	113	100.4
28.6	112	99.5
28.7	117	103.8
28.8	125	110.6
28.9	170	149.0
29.0	182	159.4
29.1	195	170.5
29.2	192	167.9
29.3	185	161.9
29.4	180	157.7
29.5	175	153.4
29.6	145	127.8
29.7	140	123.6
29.8	195	170.5
29.9	180	157.7
30.0	210	183.4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200

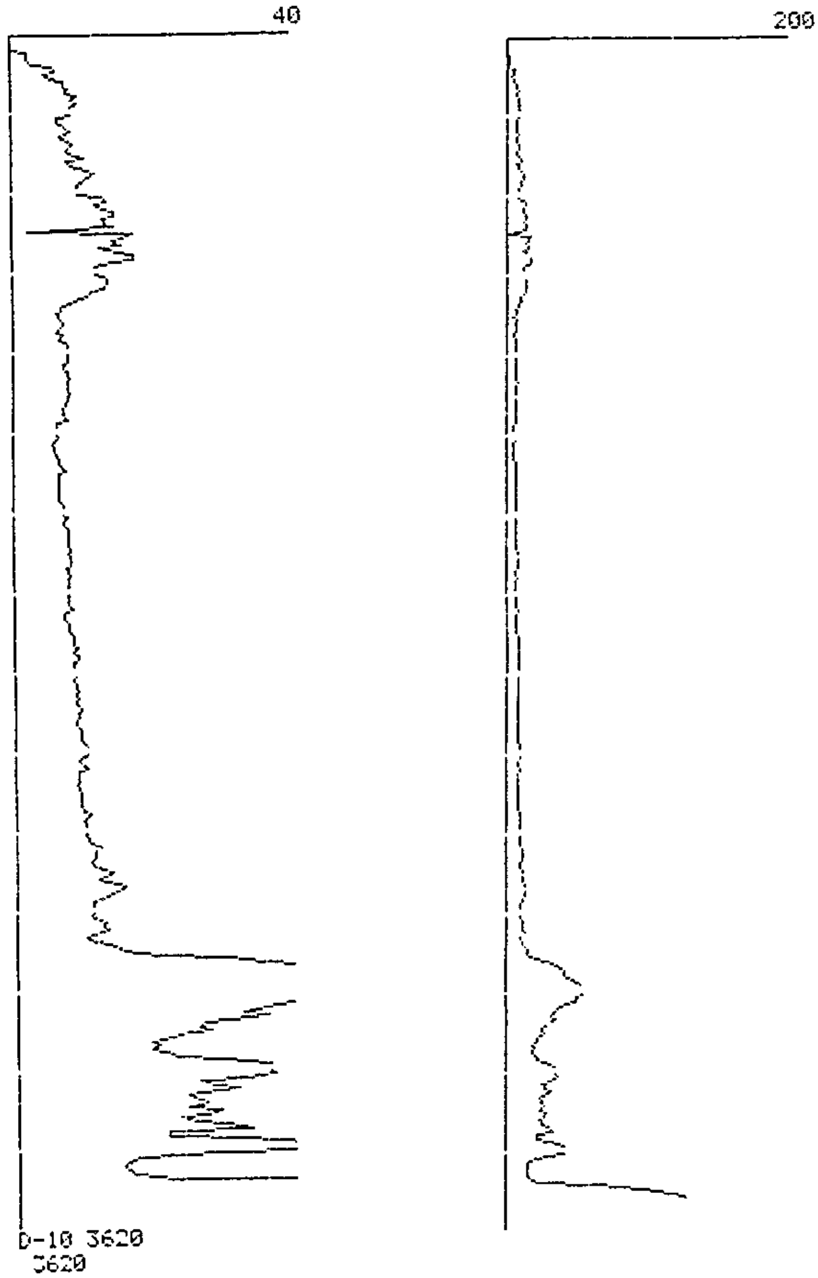
D-10

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	10	2.2
0.6	11	2.4
0.7	10	2.2
0.8	13	2.8
0.9	27	5.8
1.0	28	6.1
1.1	20	4.4
1.2	24	5.3
1.3	33	7.1
1.4	33	7.1
1.5	37	8.0
1.6	35	7.6
1.7	43	9.2
1.8	38	8.2
1.9	42	9.0
2.0	37	8.1
2.1	29	6.4
2.2	29	6.4
2.3	32	7.1
2.4	34	7.5
2.5	37	8.1
2.6	30	6.7
2.7	32	7.1
2.8	39	8.5
2.9	37	8.1
3.0	33	7.4
3.1	35	7.8
3.2	45	9.9
3.3	33	7.4
3.4	36	8.0
3.5	42	9.3
3.6	52	11.4
3.7	50	11.0
3.8	45	9.9
3.9	42	9.3
4.0	41	9.2
4.1	55	12.1
4.2	58	12.8
4.3	50	11.1
4.4	55	12.1
4.5	63	13.8
4.6	63	13.8
4.7	55	12.1
4.8	56	12.3
4.9	63	13.8
5.0	7	2.3
5.1	74	16.2
5.2	67	14.8
5.3	60	13.3
5.4	67	14.8
5.5	53	11.9
5.6	63	13.9
5.7	73	16.0
5.8	74	16.2
5.9	60	13.3
6.0	50	11.4
6.1	55	12.4
6.2	57	12.8
6.3	57	12.8
6.4	55	12.4
6.5	48	10.9
6.6	45	10.3
6.7	40	9.3
6.8	33	7.8
6.9	29	7.0
7.0	26	6.5
7.1	24	6.1
7.2	25	6.3
7.3	27	6.7
7.4	28	6.9
7.5	27	6.7
7.6	24	6.1
7.7	28	6.9
7.8	25	6.3
7.9	29	7.1
8.0	30	7.5
8.1	31	7.7
8.2	30	7.5
8.3	27	6.9
8.4	27	6.9
8.5	31	7.7
8.6	31	7.7
8.7	32	7.9
8.8	30	7.5
8.9	30	7.5
9.0	30	7.6
9.1	31	7.8
9.2	30	7.6
9.3	29	7.4
9.4	28	7.2
9.5	27	7.0
9.6	27	7.0
9.7	27	7.0
9.8	29	7.4
9.9	22	6.0
10.0	22	6.1
10.1	23	6.3
10.2	20	5.7
10.3	19	5.5
10.4	20	5.7
10.5	20	5.7
10.6	22	6.1
10.7	23	6.3
10.8	23	6.3
10.9	25	6.7
11.0	27	7.3
11.1	23	6.4
11.2	23	6.4
11.3	23	6.4
11.4	23	6.4
11.5	23	6.4
11.6	23	6.4
11.7	23	6.4
11.8	23	6.4
11.9	24	6.6
12.0	24	6.8
12.1	27	7.4
12.2	25	7.0
12.3	25	7.0
12.4	27	7.4
12.5	27	7.4
12.6	27	7.4
12.7	27	7.4
12.8	28	7.6
12.9	27	7.4
13.0	28	7.8
13.1	27	7.5
13.2	29	8.0
13.3	28	7.8
13.4	28	7.8
13.5	25	7.1
13.6	27	7.5
13.7	28	7.8
13.8	27	7.5
13.9	27	7.5
14.0	27	7.7
14.1	27	7.7
14.2	27	7.7
14.3	27	7.7
14.4	29	8.1
14.5	25	7.3
14.6	24	7.1
14.7	24	7.1
14.8	27	7.7
14.9	27	7.7
15.0	26	7.6
15.1	27	7.8
15.2	29	8.2
15.3	28	8.0
15.4	29	8.2
15.5	31	8.7
15.6	28	8.0
15.7	31	8.7
15.8	31	8.7
15.9	29	8.0
16.0	28	8.2
16.1	29	8.4
16.2	28	8.2
16.3	29	8.4
16.4	29	8.4
16.5	31	8.8
16.6	30	8.6
16.7	31	8.8
16.8	30	8.6
16.9	31	8.8
17.0	31	8.9
17.1	30	8.7
17.2	30	8.7
17.3	29	8.3
17.4	28	8.3
17.5	30	8.7
17.6	31	8.9
17.7	31	8.9
17.8	32	9.1
17.9	33	9.3
18.0	35	9.9
18.1	33	9.5
18.2	30	8.9
18.3	31	9.1
18.4	35	9.9
18.5	30	8.9
18.6	29	8.7
18.7	29	8.7
18.8	29	8.7
18.9	28	8.4
19.0	29	8.8
19.1	31	9.2
19.2	31	9.2
19.3	31	9.2
19.4	31	9.2
19.5	31	9.2
19.6	32	9.4
19.7	36	10.2
19.8	33	9.6
19.9	32	9.4
20.0	32	9.6
20.1	33	9.8
20.2	34	10.0
20.3	37	10.6
20.4	41	11.4
20.5	38	10.8
20.6	39	11.0
20.7	38	10.8
20.8	36	10.4
20.9	37	10.6

21.0	42	11.8
21.1	48	13.0
21.2	43	12.0
21.3	39	11.1
21.4	51	13.6
21.5	55	14.5
21.6	50	13.4
21.7	48	13.0
21.8	41	11.6
21.9	36	10.5
22.0	36	10.7
22.1	35	10.5
22.2	38	11.1
22.3	43	12.1
22.4	41	11.7
22.5	45	12.5
22.6	36	10.7
22.7	31	9.6
22.8	37	10.9
22.9	46	12.7
23.0	51	13.9
23.1	53	14.3
23.2	75	18.9
23.3	118	27.9
23.4	143	33.1
23.5	165	37.6
23.6	172	39.1
23.7	175	39.7
23.8	195	43.9
23.9	220	49.1

2 t Ring

24.0	56	51.2
24.1	51	47.0
24.2	51	47.0
24.3	42	39.3
24.4	36	34.2
24.5	35	33.3
24.6	31	29.9
24.7	35	33.3
24.8	29	28.2
24.9	25	24.8
25.0	24	24.1
25.1	26	25.8
25.2	21	21.5
25.3	20	20.6
25.4	17	18.1
25.5	18	18.9
25.6	17	18.1
25.7	19	19.8
25.8	21	21.5
25.9	28	27.5
26.0	35	33.6
26.1	36	34.4
26.2	31	30.2
26.3	24	24.2
26.4	26	25.9
26.5	30	29.3
26.6	24	24.2
26.7	22	22.5
26.8	24	24.2
26.9	25	25.1
27.0	22	22.6
27.1	27	26.9
27.2	25	25.2
27.3	21	21.8
27.4	27	27.5
27.5	29	27.7
27.6	32	31.2
27.7	19	20.1
27.8	19	20.1
27.9	31	30.3
28.0	41	39.0
28.1	27	27.0
28.2	14	15.9
28.3	13	15.1
28.4	12	14.2
28.5	12	14.2
28.6	13	15.1
28.7	14	15.9
28.8	20	21.1
28.9	65	59.4
29.0	107	92.0
29.1	115	102.2
29.2	135	119.3
29.3	137	121.0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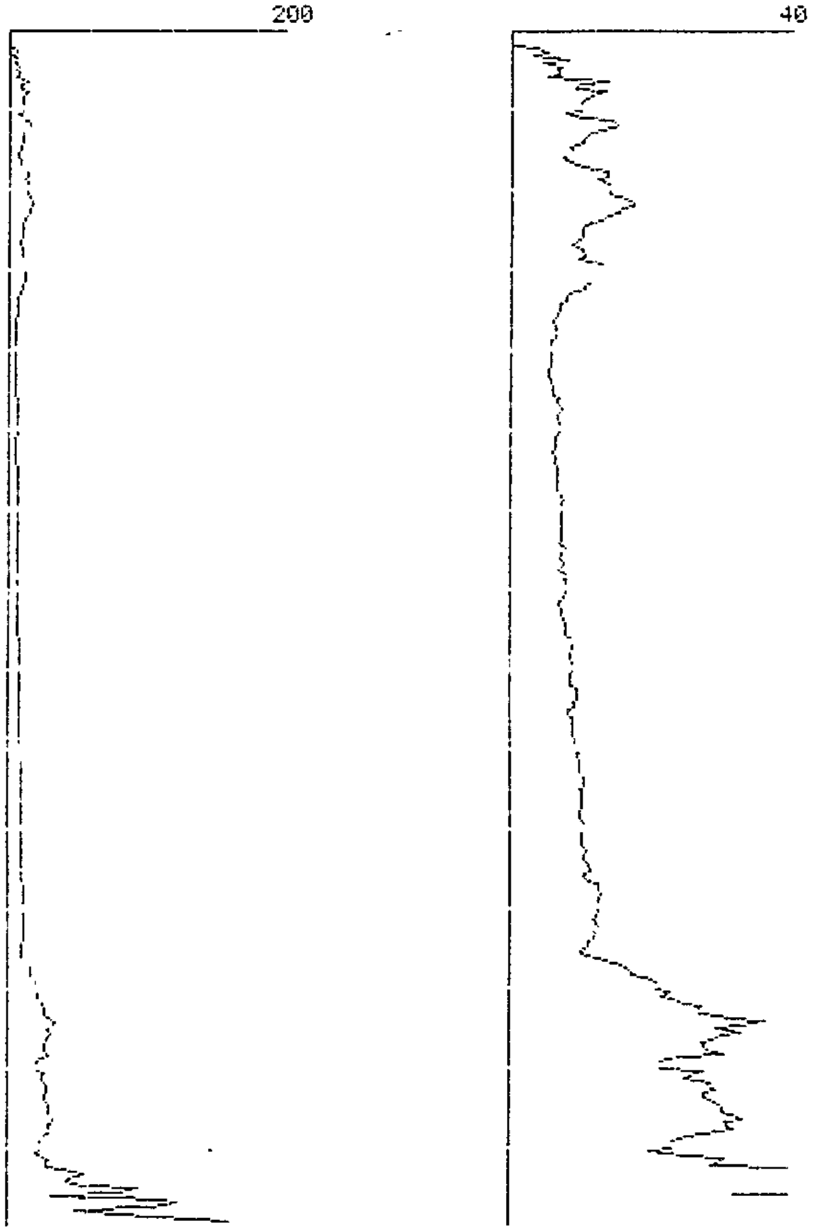
200
D-10 3620
3620

D-12

Depth	Dial 500kg Ring	Qc
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	17	3.7
0.6	22	4.7
0.7	13	2.8
0.8	35	7.4
0.9	20	4.3
1.0	30	6.5
1.1	27	5.9
1.2	29	6.3
1.3	21	4.6
1.4	60	12.8
1.5	43	9.2
1.6	40	8.6
1.7	58	12.3
1.8	49	10.5
1.9	47	10.1
2.0	43	9.4
2.1	33	7.3
2.2	44	9.6
2.3	62	13.3
2.4	66	14.1
2.5	62	13.3
2.6	49	10.6
2.7	48	10.4
2.8	45	9.8
2.9	44	9.6
3.0	35	7.8
3.1	36	8.0
3.2	33	7.4
3.3	31	7.0
3.4	35	7.8
3.5	40	8.9
3.6	52	11.4
3.7	58	12.6
3.8	59	12.8
3.9	53	11.6
4.0	60	13.2
4.1	60	13.2
4.2	70	15.2
4.3	73	15.9
4.4	74	16.1
4.5	67	14.6
4.6	65	14.2
4.7	58	12.8
4.8	55	12.1
4.9	47	10.5
5.0	42	9.6
5.1	43	9.8
5.2	43	9.8
5.3	42	9.6
5.4	38	8.7
5.5	35	8.1
5.6	42	9.6
5.7	42	9.6
5.8	44	10.0
5.9	40	9.1
6.0	54	12.2
6.1	52	11.8
6.2	50	11.4
6.3	48	10.9
6.4	43	9.9
6.5	43	9.9
6.6	33	7.8
6.7	31	7.4
6.8	31	7.4
6.9	27	6.6
7.0	26	6.5
7.1	27	6.7
7.2	25	6.3
7.3	24	6.1
7.4	22	5.7
7.5	23	5.9
7.6	23	5.9
7.7	22	5.7
7.8	24	6.1
7.9	21	5.5
8.0	20	5.4
8.1	20	5.4
8.2	20	5.4
8.3	20	5.4
8.4	20	5.4
8.5	19	5.2
8.6	19	5.2
8.7	19	5.2
8.8	20	5.4
8.9	20	5.4
9.0	20	5.5
9.1	20	5.5
9.2	21	5.7
9.3	25	6.6
9.4	23	6.2
9.5	25	6.6
9.6	26	6.8
9.7	25	6.6
9.8	23	6.2
9.9	24	6.4
10.0	25	6.7
10.1	23	6.3
10.2	22	6.1
10.3	22	6.1
10.4	22	6.1
10.5	22	6.1
10.6	20	5.7
10.7	21	5.9
10.8	21	5.9
10.9	21	5.9
11.0	22	6.2
11.1	22	6.2
11.2	22	6.2
11.3	22	6.2
11.4	22	6.2
11.5	22	6.2
11.6	22	6.2
11.7	24	6.6
11.8	25	6.9
11.9	27	7.3
12.0	25	7.0
12.1	24	6.8
12.2	25	7.0
12.3	24	6.8
12.4	24	6.8
12.5	25	7.0
12.6	24	6.8
12.7	25	7.0
12.8	25	7.0
12.9	23	6.6
13.0	27	7.5
13.1	25	7.1
13.2	24	6.9
13.3	23	6.7
13.4	26	7.3
13.5	26	7.3
13.6	23	6.7
13.7	26	7.3
13.8	28	7.8
13.9	26	7.3
14.0	27	7.7
14.1	27	7.7
14.2	25	7.3
14.3	22	6.6
14.4	22	6.6
14.5	23	6.9
14.6	23	6.9
14.7	23	6.9
14.8	25	7.3
14.9	26	7.5
15.0	25	7.4
15.1	26	7.6
15.2	26	7.6
15.3	29	8.2
15.4	31	8.7
15.5	30	8.4
15.6	30	8.4
15.7	28	8.0
15.8	28	8.0
15.9	28	8.0
16.0	30	8.6
16.1	28	8.2
16.2	28	8.2
16.3	28	8.2
16.4	28	8.2
16.5	32	9.0
16.6	32	9.0
16.7	33	9.2
16.8	33	9.2
16.9	29	8.4
17.0	30	8.7
17.1	26	7.9
17.2	26	7.9
17.3	28	8.3
17.4	28	8.3
17.5	28	8.3
17.6	29	8.5
17.7	28	8.3
17.8	29	8.5
17.9	30	8.7
18.0	30	8.9
18.1	32	9.3
18.2	31	9.1
18.3	32	9.3
18.4	32	9.3
18.5	33	9.5
18.6	33	9.5
18.7	34	9.7
18.8	35	9.9
18.9	35	9.9
19.0	35	10.0
19.1	32	9.4
19.2	33	9.6
19.3	33	9.6
19.4	33	9.6
19.5	33	9.6
19.6	33	9.6
19.7	32	9.4
19.8	32	9.4
19.9	32	9.4
20.0	34	10.0
20.1	33	9.9
20.2	33	9.8
20.3	33	9.8
20.4	32	9.6
20.5	34	10.0
20.6	35	10.2
20.7	34	10.0
20.8	34	10.0
20.9	35	10.2

21.0	37	10.7
21.1	40	11.4
21.2	34	10.1
21.3	34	10.1
21.4	37	10.7
21.5	42	11.8
21.6	42	11.8
21.7	42	11.8
21.8	44	12.2
21.9	43	12.0
22.0	41	11.7
22.1	41	11.7
22.2	40	11.5
22.3	38	11.1
22.4	40	11.5
22.5	41	11.7
22.6	39	11.3
22.7	40	11.5
22.8	39	11.3
22.9	36	10.7
23.0	35	10.6
23.1	33	10.0
23.2	30	9.6
23.3	35	10.6
23.4	46	12.9
23.5	52	14.1
23.6	59	15.6
23.7	60	15.8
23.8	62	16.2
23.9	70	17.9
24.0	78	19.7
24.1	86	21.3
24.2	90	20.1
24.3	87	21.5
24.4	95	23.2
24.5	106	25.5
24.6	103	24.9
24.7	105	25.3
24.8	125	29.5
24.9	145	33.6
25.0	130	30.6
25.1	114	27.3
25.2	130	30.6
25.3	117	27.9
25.4	111	26.7
25.5	105	25.4
25.6	107	25.8
25.7	108	26.1
25.8	120	28.5
25.9	90	22.3
26.0	79	20.2
26.1	106	25.8
26.2	97	23.9
26.3	94	23.3
26.4	110	26.6
26.5	109	26.4
26.6	113	27.2
26.7	106	25.8
26.8	105	25.6
26.9	110	26.6
27.0	115	27.8
27.1	117	28.2
27.2	117	28.2
27.3	123	29.4
27.4	130	30.9
27.5	118	28.4
27.6	120	28.8
27.7	124	29.7
27.8	105	25.7
27.9	95	23.6

28.0	85	21.7
28.1	70	18.6
28.2	93	23.3
28.3	118	28.5
28.4	113	27.5
28.5	109	26.7
28.6	210	47.7
	2 t Pine	
28.7	56	53.5
28.8	45	42.4
28.9	43	40.7
29.0	56	51.9
29.1	100	89.4
29.2	85	75.6
29.3	30	28.7
29.4	120	106.5
29.5	132	116.7
29.6	112	99.7
29.7	50	46.8
29.8	80	72.4
29.9	115	102.2
30.0	170	149.3



D-12 3823
3823

D-13

Depth	Dial	Qc	Depth	Dial	Qc	Depth	Dial	Qc
	500kg Ring							
0.1	0	0.1	7.0	43	10.0	14.0	32	8.7
0.2	0	0.1	7.1	40	9.4	14.1	28	7.9
0.3	0	0.1	7.2	42	9.8	14.2	25	7.3
0.4	0	0.1	7.3	41	9.6	14.3	27	7.7
0.5	0	0.1	7.4	41	9.6	14.4	28	7.9
0.6	0	0.1	7.5	40	9.4	14.5	28	7.9
0.7	0	0.1	7.6	35	8.4	14.6	28	7.9
0.8	40	8.5	7.7	29	7.1	14.7	29	8.1
0.9	42	8.9	7.8	26	6.5	14.8	31	8.5
1.0	40	8.6	7.9	25	6.3	14.9	29	8.1
1.1	36	7.8	8.0	24	6.2	15.0	30	8.4
1.2	36	7.8	8.1	24	6.2	15.1	29	8.2
1.3	33	7.1	8.2	25	6.4	15.2	30	8.4
1.4	33	7.1	8.3	25	6.4	15.3	30	8.4
1.5	30	6.5	8.4	25	6.4	15.4	29	8.2
1.6	32	6.9	8.5	26	6.7	15.5	30	8.4
1.7	26	5.7	8.6	24	6.2	15.6	31	8.7
1.8	24	5.3	8.7	25	6.4	15.7	31	8.7
1.9	26	5.7	8.8	23	6.0	15.8	30	8.4
2.0	28	6.2	8.9	22	5.8	15.9	30	8.4
2.1	36	7.9	9.0	23	6.1	16.0	30	8.6
2.2	45	9.8	9.1	22	6.0	16.1	29	8.4
2.3	42	9.1	9.2	24	6.4	16.2	29	8.4
2.4	45	9.9	9.3	21	5.7	16.3	30	8.6
2.5	46	10.0	9.4	21	5.7	16.4	30	8.6
2.6	55	11.9	9.5	23	6.2	16.5	29	8.4
2.7	57	12.3	9.6	23	6.2	16.6	29	8.4
2.8	54	11.6	9.7	23	6.2	16.7	30	8.6
2.9	41	8.9	9.8	23	6.2	16.8	30	8.6
3.0	36	8.0	9.9	21	5.7	16.9	30	8.6
3.1	30	6.8	10.0	23	6.1	17.0	29	8.5
3.2	29	6.6	10.1	25	6.7	17.1	31	8.9
3.3	29	6.6	10.2	25	6.7	17.2	30	8.7
3.4	32	7.2	10.3	24	6.5	17.3	31	8.9
3.5	42	9.3	10.4	24	6.5	17.4	30	8.7
3.6	47	10.3	10.5	25	6.7	17.5	30	8.7
3.7	50	11.0	10.6	25	6.7	17.6	27	8.1
3.8	51	11.2	10.7	25	6.7	17.7	25	7.7
3.9	46	10.1	10.8	26	6.9	17.8	29	8.5
4.0	48	10.7	10.9	27	7.1	17.9	27	8.1
4.1	48	10.7	11.0	26	7.1	18.0	29	8.4
4.2	45	10.0	11.1	27	7.3	18.1	31	9.1
4.3	41	9.2	11.2	25	6.9	18.2	29	8.7
4.4	42	9.4	11.3	24	6.6	18.3	31	9.1
4.5	38	8.6	11.4	25	6.9	18.4	31	9.1
4.6	39	8.8	11.5	25	6.9	18.5	31	9.1
4.7	39	8.9	11.6	26	7.1	18.6	30	8.9
4.8	38	8.6	11.7	27	7.3	18.7	32	9.3
4.9	38	8.6	11.8	25	6.9	18.8	33	9.5
5.0	40	9.1	11.9	24	6.6	18.9	32	9.3
5.1	37	8.5	12.0	25	7.0	19.0	32	9.4
5.2	40	9.1	12.1	27	7.4	19.1	32	9.4
5.3	37	8.5	12.2	25	7.0	19.2	31	9.2
5.4	37	8.5	12.3	23	6.6	19.3	37	10.5
5.5	45	10.2	12.4	25	7.0	19.4	32	9.4
5.6	40	9.1	12.5	25	7.0	19.5	33	9.6
5.7	40	9.1	12.6	27	7.4	19.6	33	9.6
5.8	40	9.1	12.7	26	7.2	19.7	37	10.5
5.9	37	8.5	12.8	25	7.0	19.8	34	9.8
6.0	38	8.9	12.9	25	7.0	19.9	34	9.8
6.1	37	8.7	13.0	24	6.9	20.0	35	10.2
6.2	40	9.3	13.1	27	7.5	20.1	34	10.0
6.3	42	9.7	13.2	27	7.5	20.2	34	10.0
6.4	43	9.9	13.3	27	7.5	20.3	37	10.6
6.5	43	9.9	13.4	29	8.0	20.4	37	10.6
6.6	39	9.1	13.5	27	7.5	20.5	38	10.9
6.7	41	9.5	13.6	27	7.5	20.6	40	11.2
6.8	41	9.5	13.7	28	7.8	20.7	42	11.6
6.9	43	9.9	13.8	28	7.8	20.8	45	12.3
			13.9	34	9.0	20.9	50	13.3

21.0	45	12.4
21.1	40	11.4
21.2	42	11.8
21.3	42	11.8
21.4	43	12.0
21.5	39	11.1
21.6	40	11.4
21.7	47	12.8
21.8	53	14.1
21.9	55	14.5
22.0	60	15.7
22.1	65	16.7
22.2	69	17.5
22.3	85	20.9
22.4	89	21.7
22.5	85	20.9
22.6	109	25.8
22.7	120	28.1
22.8	125	29.2
22.9	123	28.9
23.0	125	29.3
23.1	140	32.4
23.2	135	31.4
23.3	140	32.4
23.4	137	31.8
23.5	150	34.5
23.6	150	34.5
23.7	151	34.7
23.8	175	39.7
23.9	170	38.7
24.0	179	40.7
24.1	205	46.1

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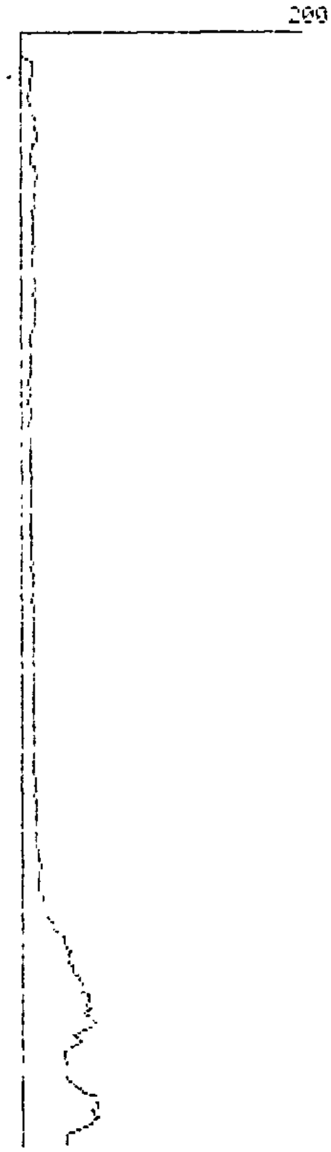
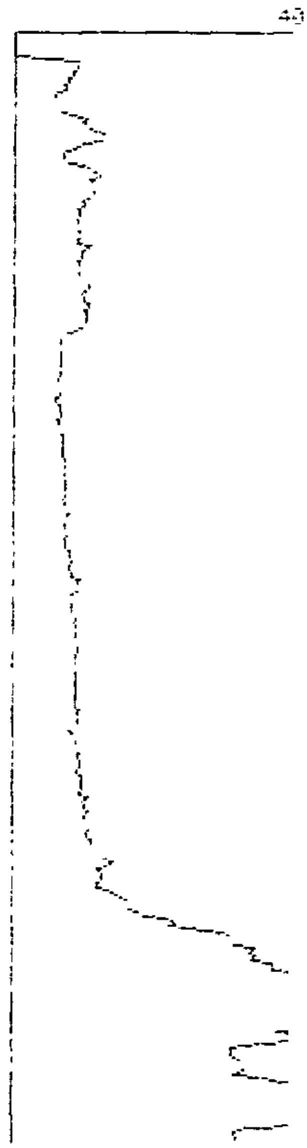
24.2	50	46.1
24.3	49	45.2
24.4	47	43.5
24.5	51	47.0
24.6	46	42.7
24.7	50	46.1
24.8	53	48.7
24.9	54	49.5
25.0	51	47.1
25.1	46	42.8
25.2	37	35.1
25.3	40	37.7
25.4	44	41.1
25.5	39	36.9
25.6	32	30.9
25.7	30	29.2
25.8	30	29.2
25.9	30	29.2
26.0	31	30.2
26.1	32	31.0
26.2	30	29.3
26.3	35	33.6
26.4	38	36.1
26.5	42	39.6
26.6	44	41.3
26.7	54	49.8
26.8	57	52.3
26.9	55	50.6
27.0	55	50.8
27.1	50	46.5
27.2	52	48.2
27.3	55	50.8
27.4	51	47.4
27.5	50	46.5
27.6	40	38.0
27.7	32	31.2
27.8	30	29.5
27.9	30	29.5
28.0	30	29.6





D-13 4919
4919

D-14

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	39	8.2
0.5	42	8.9
0.6	47	9.9
0.7	36	7.6
0.8	30	6.4
0.9	33	7.0
1.0	31	6.7
1.1	27	5.9
1.2	22	4.9
1.3	22	4.9
1.4	25	5.5
1.5	27	5.9
1.6	25	5.5
1.7	20	4.4
1.8	19	4.2
1.9	22	4.9
2.0	20	4.6
2.1	21	4.3
2.2	23	5.2
2.3	21	4.8
2.4	20	4.6
2.5	19	4.4
2.6	19	4.4
2.7	23	5.2
2.8	21	4.8
2.9	25	5.6
3.0	28	6.4
3.1	30	6.8
3.2	27	6.2
3.3	24	5.5
3.4	25	5.8
3.5	27	6.2
3.6	30	6.8
3.7	20	4.7
3.8	18	4.3
3.9	17	4.1
4.0	16	4.0
4.1	17	4.2
4.2	17	4.2
4.3	17	4.2
4.4	19	4.6
4.5	22	5.3
4.6	39	8.8
4.7	48	10.7
4.8	46	10.3
4.9	43	9.6
5.0	46	10.4
5.1	50	11.2
5.2	47	10.6
5.3	47	10.5
5.4	43	9.8
5.5	40	9.1
5.6	35	8.1
5.7	32	7.5
5.8	30	7.1
5.9	26	6.2
6.0	25	6.2
6.1	27	6.6
6.2	24	6.0
6.3	21	5.3
6.4	22	5.5
6.5	20	5.1
6.6	20	5.1
6.7	19	4.9
6.8	19	4.9
6.9	18	4.7
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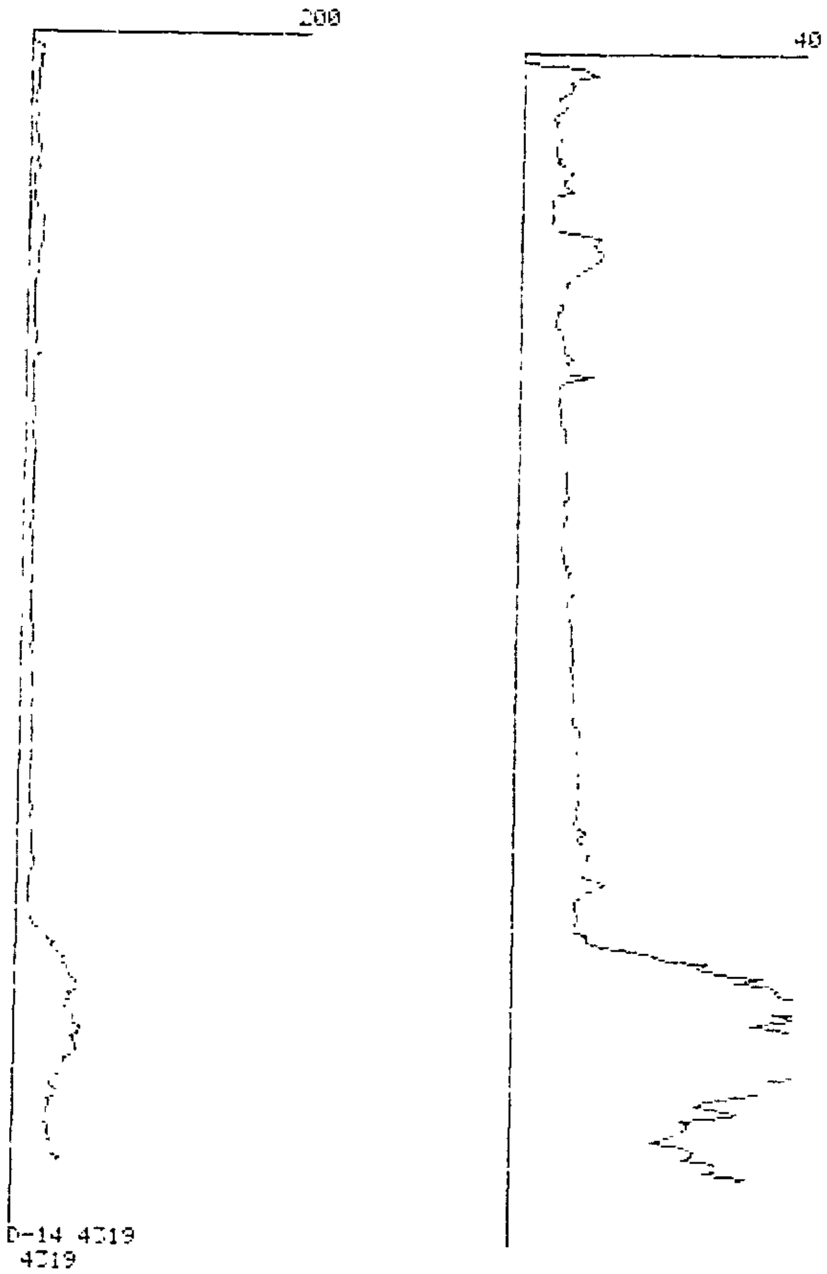
7.3	[illegible]	[illegible]
7.4	[illegible]	[illegible]
7.5	[illegible]	[illegible]
7.6	24	[illegible]
7.7	26	[illegible]
7.8	29	[illegible]
7.9	25	[illegible]
8.0	29	[illegible]
8.1	41	[illegible]
8.2	[illegible]	[illegible]
8.3	[illegible]	[illegible]
8.4	[illegible]	[illegible]
8.5	[illegible]	[illegible]
8.6	[illegible]	[illegible]
8.7	[illegible]	[illegible]
8.8	[illegible]	[illegible]
8.9	[illegible]	[illegible]
9.0	[illegible]	[illegible]
9.1	[illegible]	[illegible]
9.2	21	[illegible]
9.3	21	[illegible]
9.4	21	[illegible]
9.5	[illegible]	[illegible]
9.6	24	6.4
9.7	24	6.4
9.8	24	[illegible]
9.9	24	[illegible]
10.0	[illegible]	5.1
10.1	[illegible]	5.1
10.2	[illegible]	5.1
10.3	[illegible]	[illegible]
10.4	[illegible]	[illegible]
10.5	24	[illegible]
10.6	24	[illegible]
10.7	[illegible]	[illegible]
10.8	24	[illegible]
10.9	24	[illegible]
11.0	24	[illegible]
11.1	24	[illegible]
11.2	[illegible]	[illegible]
11.3	[illegible]	[illegible]
11.4	[illegible]	[illegible]
11.5	24	[illegible]
11.6	[illegible]	[illegible]
11.7	[illegible]	[illegible]
11.8	24	[illegible]
11.9	[illegible]	[illegible]
12.0	[illegible]	[illegible]
12.1	[illegible]	[illegible]
12.2	[illegible]	6.4
12.3	21	[illegible]
12.4	20	[illegible]
12.5	20	[illegible]
12.6	[illegible]	[illegible]
12.7	22	[illegible]
12.8	21	[illegible]
12.9	[illegible]	[illegible]
13.0	[illegible]	[illegible]
13.1	25	[illegible]
13.2	24	[illegible]
13.3	[illegible]	[illegible]
13.4	25	[illegible]
13.5	25	[illegible]
13.6	25	7.1
13.7	29	8.0
13.8	26	[illegible]
13.9	24	6.9
14.0	[illegible]	[illegible]
14.1	[illegible]	[illegible]
14.2	[illegible]	[illegible]
14.3	[illegible]	[illegible]
14.4	[illegible]	[illegible]
14.5	[illegible]	[illegible]
14.6	[illegible]	[illegible]
14.7	[illegible]	[illegible]
14.8	[illegible]	[illegible]
14.9	[illegible]	[illegible]
15.0	[illegible]	[illegible]
15.1	[illegible]	[illegible]
15.2	[illegible]	[illegible]
15.3	[illegible]	[illegible]
15.4	[illegible]	[illegible]
15.5	[illegible]	[illegible]
15.6	[illegible]	[illegible]
15.7	[illegible]	[illegible]
15.8	[illegible]	[illegible]
15.9	[illegible]	[illegible]
16.0	[illegible]	[illegible]
16.1	[illegible]	[illegible]
16.2	[illegible]	[illegible]
16.3	[illegible]	[illegible]
16.4	[illegible]	[illegible]
16.5	[illegible]	[illegible]
16.6	[illegible]	[illegible]
16.7	[illegible]	[illegible]
16.8	[illegible]	8.0
16.9	[illegible]	[illegible]
17.0	[illegible]	[illegible]
17.1	[illegible]	[illegible]
17.2	[illegible]	[illegible]
17.3	[illegible]	[illegible]
17.4	[illegible]	[illegible]
17.5	[illegible]	[illegible]
17.6	[illegible]	[illegible]
17.7	[illegible]	[illegible]
17.8	[illegible]	[illegible]
17.9	[illegible]	[illegible]
18.0	[illegible]	[illegible]
18.1	[illegible]	[illegible]
18.2	[illegible]	[illegible]
18.3	[illegible]	[illegible]
18.4	[illegible]	[illegible]
18.5	[illegible]	[illegible]
18.6	[illegible]	[illegible]
18.7	[illegible]	[illegible]
18.8	[illegible]	[illegible]
18.9	[illegible]	[illegible]
19.0	[illegible]	[illegible]
19.1	[illegible]	[illegible]
19.2	[illegible]	[illegible]
19.3	[illegible]	[illegible]
19.4	[illegible]	[illegible]
19.5	[illegible]	[illegible]
19.6	[illegible]	[illegible]
19.7	[illegible]	[illegible]
19.8	[illegible]	[illegible]
19.9	[illegible]	[illegible]
20.0	[illegible]	[illegible]
20.1	[illegible]	[illegible]
20.2	[illegible]	[illegible]
20.3	[illegible]	[illegible]
20.4	[illegible]	[illegible]
20.5	[illegible]	[illegible]
20.6	[illegible]	12.4
20.7	[illegible]	[illegible]
20.8	[illegible]	11.[illegible]
20.9	[illegible]	12.0

21.0	40	11.4
21.1	33	9.9
21.2	30	9.3
21.3	27	8.7
21.4	26	8.4
21.5	26	8.4
21.6	26	8.4
21.7	28	8.9
21.8	28	9.9
21.9	28	8.9
22.0	26	9.6
22.1	33	10.3
22.2	33	10.0
22.3	33	10.9
22.4	41	11.7
22.5	54	14.4
22.6	65	17.5
22.7	75	18.6
22.8	85	20.9
22.9	109	25.8
23.0	102	24.5
23.1	107	25.6
23.2	125	29.3
23.3	143	33.1
23.4	125	29.3
23.5	144	33.7
23.6	151	34.9
23.7	150	34.5
23.8	155	35.6
23.9	174	39.9
24.0	173	40.7
24.1	143	34.2
24.2	161	36.9
24.3	151	34.6
24.4	135	31.5
24.5	151	34.9
24.6	163	37.4
24.7	170	38.8
24.8	169	38.5
24.9	165	37.8
25.0	190	43.1
25.1	193	44.1
25.2	185	42.1
25.3	162	37.1
25.4	175	40.3
25.5	180	41.0
25.6	180	41.2
25.7	179	40.8
25.8	165	37.8
25.9	145	33.7
26.0	139	32.6
26.1	137	31.7
26.2	115	26.6
26.3	105	25.6
26.4	98	24.1
26.5	110	25.6
26.6	125	29.7
26.7	120	28.7
26.8	90	22.4
26.9	95	23.5
27.0	97	23.3
27.1	90	22.6
27.2	95	21.5
27.3	81	20.9
27.4	71	16.6
27.5	85	21.5
27.6	95	23.6
27.7	97	24.0
27.8	96	23.8
27.9	90	22.5
28.0	110	26.9
28.1	103	25.4
28.2	130	31.0


200
40
D-14 4319
4319

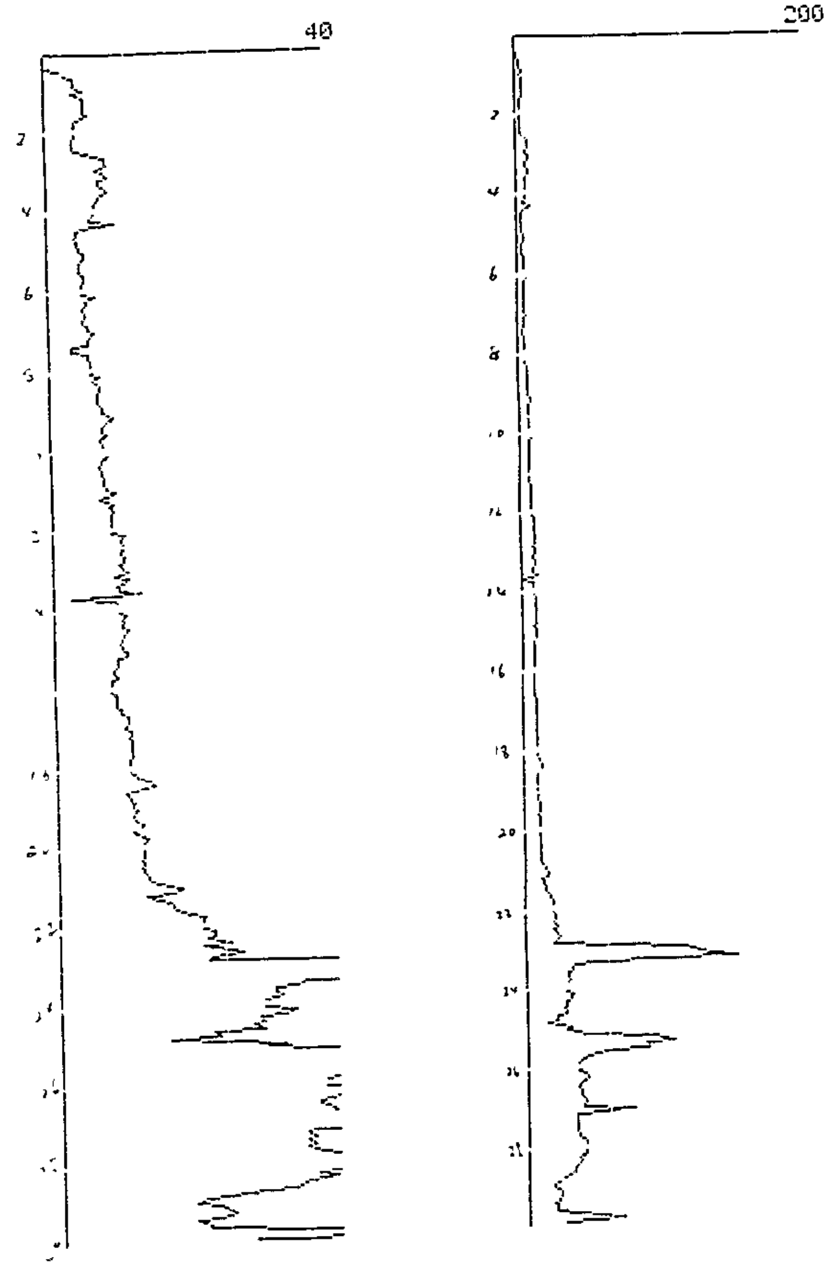
D-15

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	10	2.2
0.6	14	3.1
0.7	20	4.3
0.8	20	4.3
0.9	20	4.3
1.0	25	5.5
1.1	17	3.8
1.2	25	5.5
1.3	24	5.3
1.4	25	5.5
1.5	25	5.5
1.6	25	5.5
1.7	27	5.9
1.8	20	4.4
1.9	18	4.0
2.0	18	4.2
2.1	18	4.2
2.2	17	4.0
2.3	17	4.0
2.4	16	3.7
2.5	20	4.6
2.6	30	6.7
2.7	37	8.1
2.8	37	8.1
2.9	39	8.5
3.0	31	7.0
3.1	35	7.8
3.2	38	8.5
3.3	32	7.2
3.4	32	7.2
3.5	35	7.8
3.6	38	8.5
3.7	33	7.4
3.8	32	7.2
3.9	30	6.8
4.0	28	6.5
4.1	27	6.3
4.2	25	5.9
4.3	42	9.4
4.4	19	4.6
4.5	17	4.2
4.6	16	4.0
4.7	15	3.8
4.8	16	4.0
4.9	17	4.2
5.0	17	4.4
5.1	21	5.2
5.2	20	5.0
5.3	19	4.8
5.4	17	4.4
5.5	17	4.4
5.6	17	4.4
5.7	20	5.0
5.8	20	5.0
5.9	20	5.0
6.0	18	4.7
6.1	27	6.6
6.2	20	5.1
6.3	21	5.3
6.4	19	4.9
6.5	18	4.7
6.6	20	5.1
6.7	20	5.1
6.8	19	4.9
6.9	21	5.3
7.0	20	5.3
7.1	25	6.3
7.2	22	5.7
7.3	20	5.3
7.4	20	5.3
7.5	10	3.2
7.6	10	3.2
7.7	21	5.5
7.8	21	5.5
7.9	22	5.7
8.0	22	5.8
8.1	27	6.9
8.2	23	6.0
8.3	26	6.7
8.4	27	6.9
8.5	27	6.9
8.6	26	6.7
8.7	26	6.7
8.8	26	6.7
8.9	27	6.9
9.0	28	7.2
9.1	28	7.2
9.2	35	8.7
9.3	32	8.0
9.4	30	7.6
9.5	28	7.2
9.6	28	7.2
9.7	31	7.8
9.8	27	7.0
9.9	27	7.0
10.0	28	7.3
10.1	30	7.8
10.2	26	6.9
10.3	26	6.9
10.4	25	6.7
10.5	26	6.9
10.6	26	6.9
10.7	28	7.3
10.8	27	7.1
10.9	28	7.3
11.0	28	7.5
11.1	34	8.7
11.2	28	7.5
11.3	24	6.6
11.4	32	8.3
11.5	30	7.9
11.6	32	8.3
11.7	31	8.1
11.8	31	8.1
11.9	31	8.1
12.0	31	8.2
12.1	40	10.1
12.2	37	9.5
12.3	37	9.5
12.4	39	9.9
12.5	37	9.5
12.6	37	9.5
12.7	40	10.1
12.8	38	9.7
12.9	35	9.1
13.0	38	9.8
13.1	40	10.3
13.2	32	8.6
13.3	40	10.3
13.4	38	9.8
13.5	33	8.8
13.6	34	9.0
13.7	47	11.7
13.8	4	2.8
13.9	31	8.4
14.0	34	9.1
14.1	38	10.0
14.2	35	9.3
14.3	37	9.8
14.4	35	9.3
14.5	40	10.4
14.6	37	9.8
14.7	37	9.8
14.8	35	9.3
14.9	34	9.1
15.0	34	9.3
15.1	37	9.9
15.2	37	9.9
15.3	31	8.7
15.4	31	8.7
15.5	31	8.7
15.6	28	8.0
15.7	28	8.0
15.8	31	8.7
15.9	27	7.8
16.0	27	8.0
16.1	30	8.6
16.2	29	8.4
16.3	29	8.4
16.4	30	8.6
16.5	33	9.2
16.6	33	9.2
16.7	37	10.0
16.8	37	10.0
16.9	37	10.0
17.0	33	9.3
17.1	37	10.2
17.2	37	10.2
17.3	36	10.0
17.4	38	10.4
17.5	38	10.4
17.6	37	10.2
17.7	37	10.2
17.8	38	10.4
17.9	36	10.0
18.0	36	10.1
18.1	38	10.5
18.2	40	10.9
18.3	48	12.6
18.4	50	13.0
18.5	43	11.6
18.6	32	9.3
18.7	34	9.7
18.8	35	9.9
18.9	39	10.7
19.0	37	10.5
19.1	39	10.9
19.2	37	10.5
19.3	37	10.5
19.4	39	10.9
19.5	42	11.5
19.6	39	10.9
19.7	36	10.2
19.8	40	11.1
19.9	45	12.1
20.0	41	11.4
20.1	42	11.6
20.2	41	11.4
20.3	40	11.2
20.4	42	11.6
20.5	40	11.2
20.6	41	11.4
20.7	43	11.8
20.8	44	12.0
20.9	46	12.5

21.0	56	14.7
21.1	65	16.6
21.2	60	15.5
21.3	42	11.8
21.4	50	13.4
21.5	57	14.9
21.6	59	15.3
21.7	60	15.5
21.8	69	17.4
21.9	80	19.7
22.0	77	19.2
22.1	85	20.9
22.2	85	20.9
22.3	80	19.8
22.4	95	22.9
22.5	77	19.2
22.6	95	22.9
22.7	103	24.6
22.8	81	20.0
22.9	80	19.8

2 t Pins

23.0	120	105.7
23.1	125	109.9
23.2	140	122.7
23.3	158	138.1
23.4	50	46.0
23.5	35	33.2
23.6	33	31.5
23.7	30	28.9
23.8	30	28.9
23.9	31	29.8
24.0	28	27.3
24.1	33	31.6
24.2	31	29.9
24.3	27	26.5
24.4	28	27.3
24.5	26	25.6
24.6	28	27.3
24.7	20	20.5
24.8	21	21.4
24.9	13	14.5
25.0	31	30.0
25.1	28	27.5
25.2	43	40.3
25.3	96	85.5
25.4	111	98.3
25.5	88	79.7
25.6	90	80.4
25.7	58	53.1
25.8	45	42.9
25.9	40	37.7
26.0	37	35.3
26.1	41	38.7
26.2	43	40.4
26.3	39	37.0
26.4	36	34.4
26.5	36	34.4
26.6	38	36.1
26.7	38	36.1
26.8	41	38.7
26.9	42	39.6
27.0	40	38.0
27.1	80	72.1
27.2	35	33.7
27.3	34	32.9
27.4	35	33.7
27.5	34	32.9
27.6	35	33.7
27.7	34	32.9
27.8	36	34.6
27.9	39	37.1
28.0	42	39.8
28.1	42	39.8
28.2	35	33.9
28.3	38	36.4
28.4	34	33.0
28.5	33	32.2
28.6	32	31.3
28.7	27	27.0
28.8	21	21.9
28.9	18	19.4
29.0	16	17.8
29.1	20	21.2
29.2	21	22.1
29.3	22	22.9
29.4	20	21.2
29.5	16	17.8
29.6	18	19.5
29.7	18	19.5
29.8	52	48.5
29.9	70	63.9
30.0	25	25.6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200
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8
16
18
20

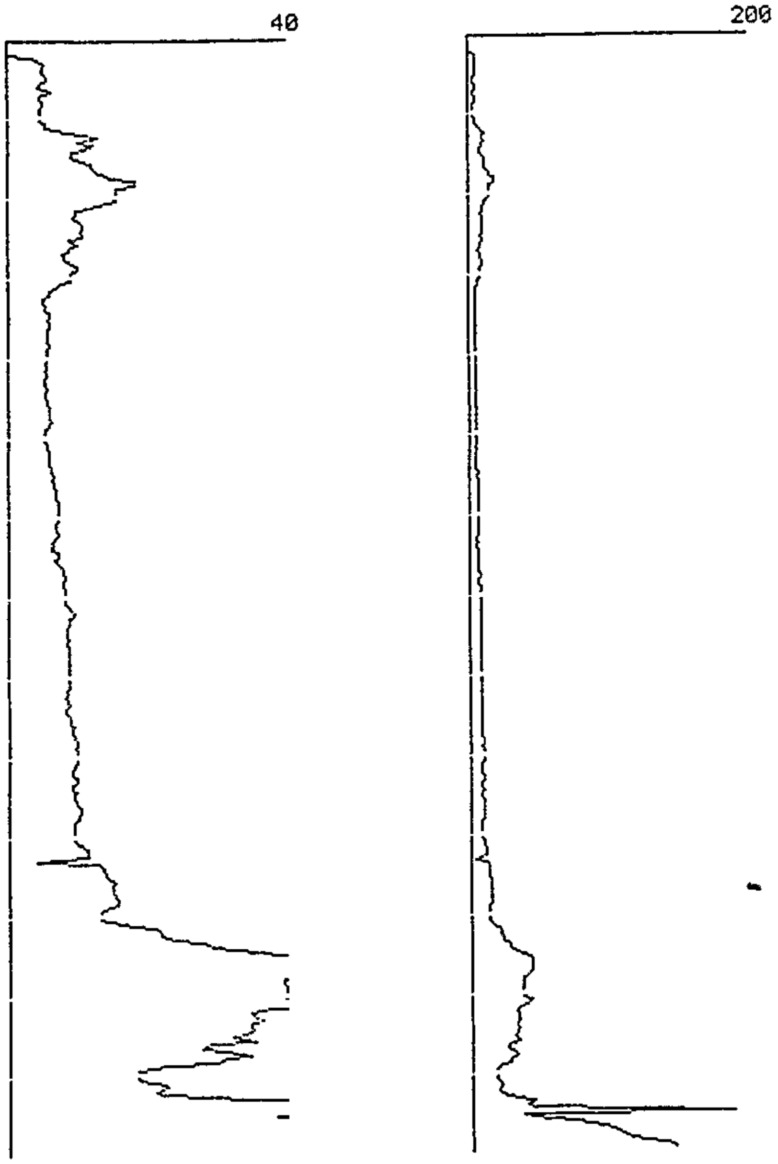
D-16

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	15	3.3
0.6	22	4.7
0.7	24	5.1
0.8	23	4.9
0.9	23	4.9
1.0	25	5.5
1.1	24	5.3
1.2	20	4.4
1.3	18	4.0
1.4	27	5.9
1.5	22	4.9
1.6	20	4.4
1.7	21	4.6
1.8	22	4.9
1.9	20	4.4
2.0	19	4.4
2.1	22	5.0
2.2	22	5.0
2.3	30	6.7
2.4	48	10.4
2.5	56	12.1
2.6	45	9.8
2.7	53	11.4
2.8	49	10.6
2.9	40	8.7
3.0	40	8.9
3.1	43	9.5
3.2	52	11.4
3.3	51	11.2
3.4	55	12.0
3.5	57	12.4
3.6	64	13.9
3.7	80	17.2
3.8	79	17.0
3.9	68	14.7
4.0	67	14.6
4.1	61	13.4
4.2	50	11.1
4.3	42	9.4
4.4	42	9.4
4.5	41	9.2
4.6	45	10.0
4.7	46	10.3
4.8	46	10.3
4.9	45	10.0
5.0	45	10.2
5.1	37	8.5
5.2	43	9.8
5.3	38	8.7
5.4	36	8.3
5.5	32	7.5
5.6	34	7.9
5.7	37	8.5
5.8	42	9.6
5.9	42	9.6
6.0	37	8.7
6.1	30	7.2
6.2	27	6.6
6.3	23	5.8
6.4	22	5.5
6.5	19	4.9
6.6	19	4.9
6.7	20	5.1
6.8	20	5.1
6.9	22	5.5
7.0	22	5.7
7.1	21	5.5
7.2	22	5.7
7.3	22	5.7
7.4	20	5.3
7.5	20	5.3
7.6	20	5.3
7.7	20	5.3
7.8	22	5.7
7.9	21	5.5
8.0	20	5.4
8.1	18	5.0
8.2	20	5.4
8.3	18	5.0
8.4	20	5.4
8.5	18	5.0
8.6	18	5.0
8.7	18	5.0
8.8	20	5.4
8.9	18	5.0
9.0	18	5.1
9.1	19	5.3
9.2	19	5.3
9.3	20	5.5
9.4	20	5.5
9.5	20	5.5
9.6	20	5.5
9.7	22	6.0
9.8	20	5.5
9.9	18	5.1
10.0	17	5.1
10.1	18	5.3
10.2	19	5.5
10.3	20	5.7
10.4	20	5.7
10.5	20	5.7
10.6	20	5.7
10.7	20	5.7
10.8	21	5.9
10.9	22	6.1
11.0	23	6.4
11.1	21	6.0
11.2	23	6.4
11.3	23	6.4
11.4	24	6.6
11.5	24	6.6
11.6	24	6.6
11.7	25	6.9
11.8	26	7.1
11.9	25	6.9
12.0	24	6.8
12.1	23	6.6
12.2	23	6.6
12.3	23	6.6
12.4	25	7.0
12.5	23	6.6
12.6	20	6.0
12.7	21	6.2
12.8	20	6.0
12.9	25	7.0
13.0	24	6.9
13.1	21	6.3
13.2	24	6.9
13.3	25	7.1
13.4	27	7.5
13.5	27	7.5
13.6	28	7.8
13.7	27	7.5
13.8	27	7.5
13.9	28	7.8
14.0	28	7.9
14.1	28	7.9
14.2	30	8.3
14.3	32	8.7
14.4	33	8.9
14.5	31	8.5
14.6	31	8.5
14.7	30	8.3
14.8	29	8.1
14.9	29	8.1
15.0	28	8.0
15.1	30	8.4
15.2	29	8.2
15.3	30	8.4
15.4	30	8.4
15.5	30	8.4
15.6	30	8.4
15.7	30	8.4
15.8	30	8.4
15.9	30	8.4
16.0	30	8.6
16.1	30	8.6
16.2	29	8.4
16.3	28	8.2
16.4	28	8.2
16.5	27	8.0
16.6	28	8.2
16.7	30	8.6
16.8	26	7.8
16.9	26	7.8
17.0	28	8.3
17.1	29	8.5
17.2	28	8.3
17.3	32	9.1
17.4	30	8.7
17.5	30	8.7
17.6	31	8.9
17.7	33	9.3
17.8	33	9.3
17.9	32	9.1
18.0	32	9.3
18.1	32	9.3
18.2	31	9.1
18.3	30	8.9
18.4	30	8.9
18.5	32	9.3
18.6	32	9.3
18.7	30	8.9
18.8	30	8.9
18.9	32	9.3
19.0	31	9.2
19.1	31	9.2
19.2	32	9.4
19.3	33	9.6
19.4	35	10.0
19.5	35	10.0
19.6	34	9.8
19.7	32	9.4
19.8	30	9.0
19.9	31	9.2
20.0	30	9.1
20.1	31	9.3
20.2	35	10.2
20.3	38	10.8
20.4	39	11.0
20.5	39	11.0
20.6	4	3.7
20.7	45	12.3
20.8	47	12.7
20.9	48	12.9

21.0	48	13.0
21.1	50	13.4
21.2	54	14.3
21.3	53	14.1
21.4	53	14.1
21.5	52	13.9
21.6	54	14.3
21.7	55	14.5
21.8	55	14.5
21.9	50	13.4
22.0	45	12.5
22.1	50	13.6
22.2	66	16.9
22.3	80	19.8
22.4	83	20.4
22.5	83	20.4
22.6	92	22.3
22.7	110	26.1
22.8	115	27.1
22.9	130	30.2
23.0	160	36.6
23.1	180	40.8
23.2	190	42.8
23.3	190	42.8
23.4	186	42.0
23.5	190	42.8
23.6	175	39.7
23.7	160	36.6
23.8	160	36.6
23.9	161	36.8
24.0	160	36.7
24.1	190	43.0
24.2	170	38.8
24.3	150	34.6
24.4	138	32.2
24.5	140	32.6
24.6	146	33.8
24.7	140	32.6
24.8	138	32.2
24.9	140	32.6
25.0	135	31.7
25.1	125	29.6
25.2	140	32.7
25.3	111	26.7
25.4	106	25.6
25.5	121	28.8
25.6	137	32.1
25.7	121	28.8
25.8	115	27.5
25.9	85	21.3
26.0	65	17.2
26.1	67	17.7
26.2	84	21.2
26.3	85	21.4
26.4	78	19.9
26.5	84	21.2
26.6	135	31.8
26.7	195	44.3
26.8	170	39.1
26.9	195	44.3

2 t Ring

27.0	200	174.5
27.1	37	35.4
27.2	60	55.0
27.3	80	72.1
27.4	100	89.2
27.5	109	96.8
27.6	115	102.0
27.7	117	103.7
27.8	130	114.8
27.9	150	131.8
28.0	155	136.2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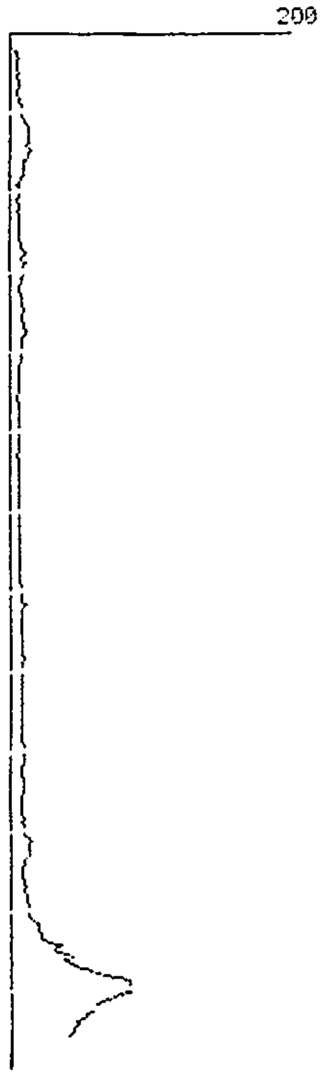
200

D-17

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	26	5.5
0.6	25	5.3
0.7	30	6.4
0.8	27	5.8
0.9	27	5.8
1.0	27	5.9
1.1	30	6.5
1.2	26	5.7
1.3	30	6.5
1.4	29	6.3
1.5	29	6.3
1.6	28	6.1
1.7	27	5.9
1.8	29	6.3
1.9	33	7.1
2.0	37	8.1
2.1	40	8.7
2.2	45	9.8
2.3	53	11.4
2.4	60	12.9
2.5	63	13.5
2.6	60	12.9
2.7	60	12.9
2.8	63	13.5
2.9	57	12.3
3.0	65	14.1
3.1	58	12.6
3.2	57	12.4
3.3	48	10.5
3.4	45	9.9
3.5	46	10.1
3.6	46	10.1
3.7	45	9.9
3.8	37	8.2
3.9	32	7.2
4.0	30	6.9
4.1	30	6.9
4.2	25	5.9
4.3	28	6.5
4.4	28	6.5
4.5	26	6.1
4.6	27	6.3
4.7	31	7.1
4.8	30	6.9
4.9	28	6.5
5.0	29	6.9
5.1	32	7.5
5.2	32	7.5
5.3	33	7.7
5.4	39	8.9
5.5	40	9.1
5.6	50	11.2
5.7	42	9.6
5.8	40	9.1
5.9	48	10.8
6.0	47	10.7
6.1	34	8.0
6.2	34	8.0
6.3	30	7.2
6.4	30	7.2
6.5	32	7.6
6.6	37	8.7
6.7	35	8.2
6.8	37	8.7
6.9	39	9.1
7.0	41	9.6
7.1	38	9.0
7.2	37	8.8
7.3	39	9.2
7.4	43	10.0
7.5	44	10.3
7.6	52	11.9
7.7	45	10.5
7.8	37	8.8
7.9	32	7.8
8.0	32	7.9
8.1	34	8.3
8.2	33	8.1
8.3	30	7.5
8.4	26	6.7
8.5	29	7.3
8.6	25	6.4
8.7	25	6.4
8.8	27	6.9
8.9	24	6.2
9.0	23	6.2
9.1	24	6.4
9.2	22	6.0
9.3	22	6.0
9.4	25	6.6
9.5	25	6.6
9.6	26	6.8
9.7	26	6.8
9.8	25	6.6
9.9	24	6.4
10.0	25	6.7
10.1	24	6.5
10.2	23	6.3
10.3	23	6.3
10.4	23	6.3
10.5	24	6.5
10.6	22	6.1
10.7	23	6.3
10.8	24	6.5
10.9	23	6.3
11.0	23	6.4
11.1	22	6.2
11.2	23	6.4
11.3	24	6.6
11.4	25	6.9
11.5	27	7.3
11.6	25	6.9
11.7	25	6.9
11.8	26	7.1
11.9	27	7.3
12.0	26	7.2
12.1	25	7.0
12.2	25	7.0
12.3	25	7.0
12.4	25	7.0
12.5	26	7.2
12.6	25	7.0
12.7	25	7.0
12.8	25	7.0
12.9	25	7.0
13.0	25	7.1
13.1	25	7.1
13.2	25	7.1
13.3	26	7.3
13.4	25	7.1
13.5	27	7.5
13.6	27	7.5
13.7	27	7.5
13.8	25	7.1
13.9	26	7.3
14.0	30	8.3
14.1	31	8.5
14.2	33	8.9
14.3	45	11.4
14.4	30	8.3
14.5	31	8.5
14.6	32	8.7
14.7	31	8.5
14.8	29	8.1
14.9	29	8.1
15.0	28	8.0
15.1	29	8.2
15.2	29	8.2
15.3	29	8.2
15.4	29	8.2
15.5	30	8.4
15.6	31	8.7
15.7	33	9.1
15.8	35	9.5
15.9	32	8.9
16.0	30	8.6
16.1	30	8.6
16.2	31	8.8
16.3	33	9.2
16.4	33	9.2
16.5	33	9.2
16.6	33	9.2
16.7	31	8.8
16.8	32	9.0
16.9	33	9.2
17.0	32	9.1
17.1	29	8.5
17.2	30	8.7
17.3	32	9.1
17.4	29	8.5
17.5	30	8.7
17.6	30	8.7
17.7	28	8.3
17.8	30	8.7
17.9	31	8.9
18.0	32	9.3
18.1	32	9.3
18.2	33	9.5
18.3	32	9.3
18.4	31	9.1
18.5	31	9.1
18.6	31	9.1
18.7	33	9.5
18.8	33	9.5
18.9	33	9.5
19.0	34	9.8
19.1	32	9.4
19.2	31	9.2
19.3	29	8.8
19.4	30	9.0
19.5	29	8.8
19.6	29	8.8
19.7	29	8.8
19.8	33	9.6
19.9	29	8.8
20.0	31	9.3
20.1	40	11.2
20.2	60	15.4
20.3	47	12.7
20.4	46	12.5
20.5	46	12.5
20.6	47	12.7
20.7	43	11.8
20.8	37	10.6
20.9	31	9.3

21.0	28	8.9
21.1	28	8.9
21.2	28	8.9
21.3	33	9.9
21.4	33	9.9
21.5	40	11.4
21.6	30	9.3
21.7	38	10.9
21.8	39	11.1
21.9	41	11.6
22.0	45	12.5
22.1	49	13.4
22.2	60	15.7
22.3	75	18.8
22.4	75	18.8
22.5	78	19.4
22.6	86	21.1
22.7	85	20.9
22.8	109	25.8
22.9	150	34.4
23.0	127	29.7
23.1	145	33.5
23.2	185	41.8
23.3	155	35.6
23.4	185	41.8
23.5	195	43.9
23.6	250	55.3
	2 t Ring	
23.7	62	56.2
23.8	78	69.8
23.9	87	77.5
24.0	87	77.7
24.1	78	70.0
24.2	70	63.2
24.3	65	58.9
24.4	60	54.6
24.5	62	56.3
24.6	55	50.4
24.7	55	50.4
24.8	48	44.4
24.9	50	46.1
25.0	45	42.0
25.1	45	42.0
25.2	42	39.4



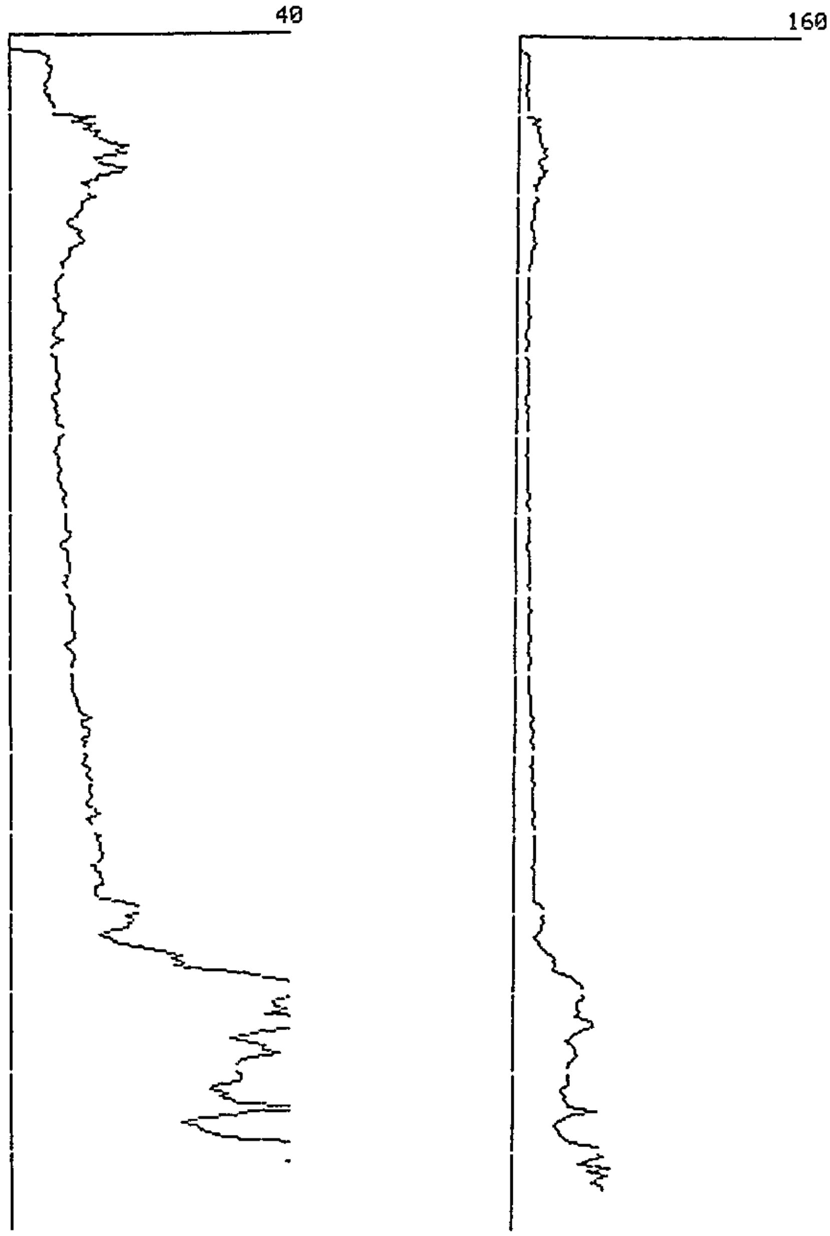
D-18

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	18	3.9
0.6	25	5.3
0.7	25	5.3
0.8	24	5.1
0.9	26	5.5
1.0	26	5.7
1.1	25	5.5
1.2	25	5.5
1.3	23	5.1
1.4	22	4.9
1.5	23	5.1
1.6	21	4.6
1.7	24	5.3
1.8	25	5.5
1.9	26	5.7
2.0	27	6.0
2.1	52	11.2
2.2	39	8.5
2.3	52	11.2
2.4	46	10.0
2.5	55	11.9
2.6	52	11.2
2.7	57	12.3
2.8	61	13.1
2.9	73	15.6
3.0	65	14.1
3.1	70	15.1
3.2	51	11.2
3.3	53	11.6
3.4	57	12.4
3.5	70	15.1
3.6	67	14.5
3.7	54	11.8
3.8	53	11.6
3.9	44	9.7
4.0	47	10.5
4.1	50	11.1
4.2	44	9.8
4.3	44	9.8
4.4	43	9.6
4.5	42	9.4
4.6	41	9.2
4.7	36	8.2
4.8	34	7.8
4.9	37	8.4
5.0	43	9.8
5.1	40	9.1
5.2	42	9.6
5.3	44	10.0
5.4	40	9.1
5.5	35	8.1
5.6	35	8.1
5.7	35	8.1
5.8	32	7.5
5.9	30	7.1
6.0	30	7.2
6.1	29	7.0
6.2	25	6.2
6.3	25	6.2
6.4	25	6.2
6.5	25	6.2
6.6	27	6.6
6.7	24	6.0
6.8	27	6.6
6.9	27	6.6
7.0	26	6.5
7.1	31	7.6
7.2	30	7.3
7.3	29	7.1
7.4	27	6.7
7.5	24	6.1
7.6	24	6.1
7.7	23	5.9
7.8	29	7.1
7.9	25	6.3
8.0	22	5.8
8.1	24	6.2
8.2	24	6.2
8.3	25	6.4
8.4	25	6.4
8.5	24	6.2
8.6	26	6.7
8.7	26	6.7
8.8	25	6.4
8.9	25	6.4
9.0	25	6.6
9.1	22	6.0
9.2	21	5.7
9.3	22	6.0
9.4	23	6.2
9.5	22	6.0
9.6	24	6.4
9.7	25	6.6
9.8	24	6.4
9.9	24	6.4
10.0	27	7.1
10.1	25	6.7
10.2	24	6.5
10.3	24	6.5
10.4	23	6.3
10.5	22	6.1
10.6	25	6.7
10.7	25	6.7
10.8	25	6.7
10.9	24	6.5
11.0	25	6.9
11.1	24	6.6
11.2	24	6.6
11.3	24	6.6
11.4	26	7.1
11.5	26	7.1
11.6	29	7.7
11.7	28	7.5
11.8	27	7.3
11.9	27	7.3
12.0	27	7.4
12.1	27	7.4
12.2	27	7.4
12.3	27	7.4
12.4	27	7.4
12.5	30	8.0
12.6	30	8.0
12.7	29	7.8
12.8	25	7.0
12.9	25	7.0
13.0	28	7.8
13.1	28	7.8
13.2	28	7.8
13.3	28	7.8
13.4	30	8.2
13.5	30	8.2
13.6	30	8.2
13.7	27	7.5
13.8	28	7.8
13.9	26	7.3
14.0	28	7.9
14.1	29	8.1
14.2	29	8.1
14.3	30	8.3
14.4	32	8.7
14.5	30	8.3
14.6	30	8.3
14.7	30	8.3
14.8	30	8.3
14.9	30	8.3
15.0	30	8.4
15.1	32	8.9
15.2	31	8.7
15.3	30	8.4
15.4	26	7.6
15.5	27	7.8
15.6	30	8.4
15.7	32	8.9
15.8	31	8.7
15.9	30	8.4
16.0	30	8.6
16.1	30	8.6
16.2	29	8.4
16.3	29	8.4
16.4	30	8.6
16.5	30	8.6
16.6	31	8.8
16.7	32	9.0
16.8	33	9.2
16.9	33	9.2
17.0	33	9.3
17.1	35	9.8
17.2	40	10.8
17.3	35	9.8
17.4	35	9.8
17.5	37	10.2
17.6	39	10.6
17.7	39	10.6
17.8	35	9.8
17.9	37	10.2
18.0	36	10.1
18.1	37	10.3
18.2	35	9.9
18.3	34	9.7
18.4	38	10.5
18.5	38	10.5
18.6	37	10.3
18.7	39	10.7
18.8	41	11.2
18.9	38	10.5
19.0	38	10.7
19.1	38	10.7
19.2	39	10.9
19.3	38	10.7
19.4	37	10.5
19.5	39	10.9
19.6	40	11.1
19.7	43	11.7
19.8	37	10.5
19.9	38	10.7
20.0	40	11.2
20.1	43	11.8
20.2	42	11.6
20.3	43	11.8
20.4	43	11.8
20.5	43	11.8
20.6	44	12.0
20.7	44	12.0
20.8	42	11.6
20.9	39	11.0

21.0	40	11.4
21.1	43	12.0
21.2	43	12.0
21.3	44	12.2
21.4	44	12.2
21.5	40	11.4
21.6	39	11.1
21.7	39	11.1
21.8	43	12.0
21.9	55	14.5
22.0	65	16.7
22.1	58	15.2
22.2	62	16.1
22.3	59	15.4
22.4	60	15.7
22.5	51	13.8
22.6	41	11.7
22.7	48	13.2
22.8	51	13.8
22.9	56	14.8
23.0	72	18.3
23.1	81	20.2
23.2	93	22.7
23.3	87	21.4
23.4	95	23.1
23.5	88	21.6
23.6	110	26.2
23.7	133	31.0
23.8	147	33.9
23.9	158	36.2
24.0	166	38.0
24.1	168	38.4
24.2	155	35.7
24.3	150	34.6
24.4	152	35.1
24.5	158	36.3
24.6	145	33.6
24.7	173	39.4
24.8	191	43.2
24.9	192	43.4
25.0	157	36.2
25.1	145	33.7
25.2	131	30.8
25.3	123	29.2
25.4	137	32.1
25.5	145	33.7
25.6	143	33.3
25.7	153	35.4
25.8	137	32.1
25.9	130	30.6
26.0	126	29.9
26.1	130	30.8
26.2	130	30.8
26.3	127	30.1
26.4	110	26.6
26.5	109	26.4
26.6	120	28.7
26.7	115	27.6
26.8	125	29.7
26.9	127	30.1
27.0	200	45.5

2 t Ring

27.1	33	32.0
27.2	30	29.5
27.3	25	25.2
27.4	22	22.6
27.5	24	24.3
27.6	25	25.2
27.7	26	26.0
27.8	29	28.6
27.9	33	32.0
28.0	50	46.7
28.1	53	49.2
28.2	41	39.0
28.3	38	36.4
28.4	56	51.8
28.5	43	40.7
28.6	55	50.9
28.7	50	46.7
28.8	47	44.1
28.9	51	47.5
29.0	52	48.5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D-19

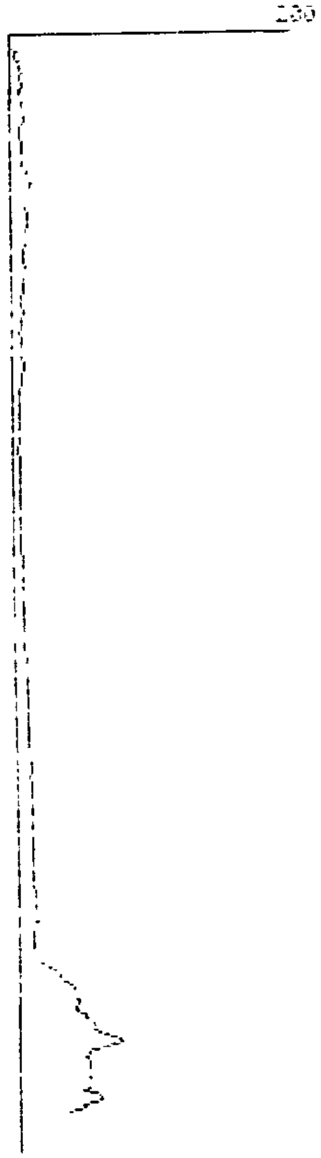
D-19

Depth	Dial 500kg Ring	Qc
0.1	0	0.1
0.2	0	0.1
0.3	0	0.1
0.4	0	0.1
0.5	27	4.9
0.6	18	3.9
0.7	15	3.5
0.8	40	8.5
0.9	29	[illegible]
1.0	32	6.9
1.1	37	8.0
1.2	29	[illegible]
1.3	[illegible]	7.1
1.4	[illegible]	8.0
1.5	39	8.4
1.6	30	6.5
1.7	30	6.5
1.8	45	9.6
1.9	36	[illegible]
2.0	41	8.9
2.1	45	9.8
2.2	43	9.4
2.3	[illegible]	[illegible]
2.4	[illegible]	7.1
2.5	31	6.9
2.6	29	6.4
2.7	[illegible]	[illegible]
2.8	[illegible]	8.1
2.9	[illegible]	8.1
3.0	35	[illegible]
3.1	[illegible]	[illegible]
3.2	[illegible]	[illegible]
3.3	[illegible]	[illegible]
3.4	39	[illegible]
3.5	49	10.7
3.6	50	11.0
3.7	44	9.7
3.8	55	12.0
3.9	65	14.1
4.0	56	12.3
4.1	60	13.2
4.2	45	10.0
4.3	35	9.9
4.4	42	9.4
4.5	54	11.9
4.6	54	11.9
4.7	50	11.1
4.8	51	11.3
4.9	50	11.1
5.0	45	10.2
5.1	40	9.1
5.2	45	10.2
5.3	48	10.8
5.4	45	10.2
5.5	37	8.5
5.6	37	8.5
5.7	36	8.3
5.8	35	8.1
5.9	35	8.1
6.0	40	9.2
6.1	35	8.1
6.2	33	7.8
6.3	33	7.8
6.4	33	7.8
6.5	34	8.0
6.6	30	7.2
6.7	27	6.6
6.8	30	7.2
6.9	32	7.6
7.0	33	8.0
7.1	32	[illegible]
7.2	28	[illegible]
7.3	26	[illegible]
7.4	25	[illegible]
7.5	25	[illegible]
7.6	24	6.1
7.7	25	[illegible]
7.8	25	[illegible]
7.9	29	[illegible]
8.0	[illegible]	[illegible]
8.1	[illegible]	[illegible]
8.2	[illegible]	[illegible]
8.3	[illegible]	[illegible]
8.4	[illegible]	[illegible]
8.5	30	[illegible]
8.6	26	[illegible]
8.7	28	7.1
8.8	[illegible]	[illegible]
8.9	[illegible]	[illegible]
9.0	21	[illegible]
9.1	20	[illegible]
9.2	20	[illegible]
9.3	19	[illegible]
9.4	19	[illegible]
9.5	[illegible]	6.0
9.6	21	[illegible]
9.7	20	5.5
9.8	20	[illegible]
9.9	19	[illegible]
10.0	19	5.5
10.1	15	4.6
10.2	16	4.9
10.3	14	4.4
10.4	14	4.4
10.5	14	4.4
10.6	15	4.6
10.7	16	4.9
10.8	17	5.1
10.9	19	[illegible]
11.0	20	[illegible]
11.1	19	[illegible]
11.2	20	[illegible]
11.3	21	[illegible]
11.4	20	[illegible]
11.5	21	6.0
11.6	19	5.6
11.7	18	[illegible]
11.8	18	5.4
11.9	16	[illegible]
12.0	16	5.1
12.1	17	[illegible]
12.2	18	5.5
12.3	18	5.5
12.4	18	5.5
12.5	18	5.5
12.6	17	[illegible]
12.7	17	[illegible]
12.8	19	[illegible]
12.9	20	6.0
13.0	19	[illegible]
13.1	22	[illegible]
13.2	22	[illegible]
13.3	22	[illegible]
13.4	23	[illegible]
13.5	21	[illegible]
13.6	21	[illegible]
13.7	21	[illegible]
13.8	21	[illegible]
13.9	21	[illegible]
14.0	21	6.4
14.1	[illegible]	[illegible]
14.2	[illegible]	[illegible]
14.3	[illegible]	[illegible]
14.4	21	6.4
14.5	21	[illegible]
14.6	[illegible]	[illegible]
14.7	[illegible]	[illegible]
14.8	[illegible]	[illegible]
14.9	[illegible]	[illegible]
15.0	[illegible]	[illegible]
15.1	[illegible]	[illegible]
15.2	[illegible]	[illegible]
15.3	[illegible]	[illegible]
15.4	[illegible]	[illegible]
15.5	[illegible]	[illegible]
15.6	[illegible]	[illegible]
15.7	[illegible]	[illegible]
15.8	[illegible]	[illegible]
15.9	[illegible]	[illegible]
16.0	[illegible]	[illegible]
16.1	[illegible]	[illegible]
16.2	[illegible]	[illegible]
16.3	[illegible]	[illegible]
16.4	[illegible]	[illegible]
16.5	[illegible]	[illegible]
16.6	[illegible]	[illegible]
16.7	[illegible]	[illegible]
16.8	[illegible]	[illegible]
16.9	[illegible]	[illegible]
17.0	[illegible]	[illegible]
17.1	[illegible]	[illegible]
17.2	[illegible]	[illegible]
17.3	[illegible]	[illegible]
17.4	[illegible]	[illegible]
17.5	[illegible]	[illegible]
17.6	30	[illegible]
17.7	30	[illegible]
17.8	[illegible]	[illegible]
17.9	31	[illegible]
18.0	30	[illegible]
18.1	31	[illegible]
18.2	[illegible]	[illegible]
18.3	[illegible]	[illegible]
18.4	34	[illegible]
18.5	34	[illegible]
18.6	31	9.1
18.7	[illegible]	[illegible]
18.8	34	[illegible]
18.9	34	[illegible]
19.0	[illegible]	[illegible]
19.1	[illegible]	10.5
19.2	34	[illegible]
19.3	[illegible]	9.4
19.4	[illegible]	9.4
19.5	[illegible]	9.4
19.6	35	10.0
19.7	35	10.0
19.8	[illegible]	[illegible]
19.9	35	[illegible]
20.0	36	10.4
20.1	[illegible]	10.6
20.2	35	[illegible]
20.3	36	10.4
20.4	36	10.4
20.5	[illegible]	9.6
20.6	31	[illegible]
20.7	[illegible]	[illegible]
20.8	31	[illegible]
20.9	30	9.1

21.0	32	9.7
21.1	37	10.7
21.2	35	10.3
21.3	43	12.0
21.4	37	10.7
21.5	42	11.8
21.6	41	11.6
21.7	40	11.4
21.8	37	10.7
21.9	38	10.9
22.0	37	10.9
22.1	36	10.7
22.2	56	14.8
22.3	47	12.9
22.4	36	10.7
22.5	34	10.2
22.6	34	10.2
22.7	32	9.8
22.8	33	10.0
22.9	35	10.5
23.0	45	12.7
23.1	41	11.8
23.2	46	12.9
23.3	61	16.0
23.4	77	19.7
23.5	100	24.1
23.6	113	26.8
23.7	116	27.4
23.8	130	30.4
23.9	153	35.1
24.0	160	36.7
24.1	170	38.8
24.2	175	39.3
24.3	161	36.9
24.4	164	37.6
24.5	192	43.4
24.6	195	44.0
24.7	215	48.2

I t Ring

24.8	55	50.4
24.9	53	48.7
25.0	59	57.9
25.1	64	58.2
25.2	74	66.7
25.3	76	69.4
25.4	63	57.7
25.5	53	48.3
25.6	51	47.1
25.7	48	44.5
25.8	50	46.2
25.9	50	46.2
26.0	50	46.4
26.1	50	46.4
26.2	54	49.9
26.3	53	48.9
26.4	46	47.0
26.5	56	51.5
26.6	59	54.1
26.7	59	54.1
26.8	45	42.1
26.9	47	43.8
27.0	35	33.7



D-19 4513
4518

D-20

Depth	Dial	Qc
	500kg Ring	
0.1	0	0.1
0.2	0	0.1
0.3	31	6.6
0.4	31	6.6
0.5	21	4.5
0.6	30	6.4
0.7	60	12.6
0.8	50	10.5
0.9	50	10.5
1.0	40	8.6
1.1	40	8.6
1.2	40	8.6
1.3	34	7.3
1.4	39	8.4
1.5	33	7.1
1.6	31	6.7
1.7	37	8.0
1.8	33	7.1
1.9	41	8.8
2.0	49	10.6
2.1	51	11.0
2.2	52	11.2
2.3	39	8.5
2.4	37	8.1
2.5	38	8.3
2.6	36	7.9
2.7	32	7.1
2.8	35	7.7
2.9	33	7.3
3.0	36	8.0
3.1	28	6.0
3.2	30	6.8
3.3	31	7.0
3.4	30	6.9
3.5	30	6.8
3.6	35	7.8
3.7	41	9.1
3.8	50	11.0
3.9	60	13.0
4.0	55	12.1
4.1	50	11.1
4.2	50	11.1
4.3	61	13.4
4.4	60	13.2
4.5	55	12.1
4.6	55	12.1
4.7	55	12.1
4.8	68	14.8
4.9	69	15.0
5.0	70	15.4
5.1	64	14.1
5.2	63	13.9
5.3	64	14.1
5.4	55	12.3
5.5	45	10.2
5.6	45	10.2
5.7	43	9.8
5.8	54	12.1
5.9	34	7.9
6.0	27	6.6
6.1	25	6.2
6.2	20	5.1
6.3	17	4.5
6.4	17	4.5
6.5	15	4.1
6.6	16	4.3
6.7	15	4.1
6.8	17	4.5
6.9	17	4.5
7.0	16	4.4
7.1	25	6.3
7.2	16	4.8
7.3	17	4.6
7.4	17	4.6
7.5	17	4.6
7.6	15	4.2
7.7	15	4.2
7.8	18	4.8
7.9	19	5.1
8.0	19	5.2
8.1	19	5.2
8.2	17	4.8
8.3	17	4.8
8.4	17	4.9
8.5	18	5.0
8.6	17	4.8
8.7	19	5.2
8.8	19	5.2
8.9	19	5.2
9.0	18	5.1
9.1	21	5.7
9.2	22	6.0
9.3	19	5.3
9.4	19	5.3
9.5	17	4.9
9.6	16	4.7
9.7	17	4.9
9.8	15	4.5
9.9	17	4.9
10.0	17	5.1
10.1	17	5.1
10.2	17	5.1
10.3	18	5.3
10.4	19	5.5
10.5	20	5.7
10.6	20	5.7
10.7	20	5.7
10.8	19	5.5
10.9	18	5.3
11.0	18	5.4
11.1	18	5.4
11.2	20	5.9
11.3	22	6.2
11.4	22	6.2
11.5	21	6.0
11.6	22	6.2
11.7	23	6.4
11.8	24	6.6
11.9	24	6.6
12.0	24	6.6
12.1	20	6.0
12.2	20	6.0
12.3	21	6.2
12.4	22	6.4
12.5	22	6.4
12.6	22	6.4
12.7	22	6.4
12.8	22	6.4
12.9	22	6.4
13.0	23	6.7
13.1	25	7.1
13.2	23	6.7
13.3	25	7.1
13.4	25	7.1
13.5	29	8.0
13.6	26	7.3
13.7	22	6.5
13.8	24	6.9
13.9	25	7.1
14.0	25	7.1
14.1	25	7.3
14.2	26	7.5
14.3	[illegible]	[illegible]
14.4	27	7.7
14.5	26	7.5
14.6	26	7.5
14.7	26	7.5
14.8	25	7.3
14.9	27	7.7
15.0	28	8.0
15.1	27	7.8
15.2	26	7.6
15.3	28	8.0
15.4	28	8.1
15.5	27	7.9
15.6	27	7.9
15.7	28	8.2
15.8	29	8.3
15.9	30	8.4
16.0	29	8.4
16.1	25	7.5
16.2	24	7.2
16.3	25	7.5
16.4	27	8.0
16.5	28	8.2
16.6	28	8.2
16.7	28	8.2
16.8	26	7.8
16.9	29	8.4
17.0	[illegible]	[illegible]
17.1	[illegible]	9.1
17.2	25	[illegible]
17.3	[illegible]	8.1
17.4	26	7.9
17.5	[illegible]	9.1
17.6	27	8.1
17.7	26	7.9
17.8	26	7.9
17.9	26	7.9
18.0	[illegible]	8.4
18.1	[illegible]	8.4
18.2	25	7.6
18.3	[illegible]	9.3
18.4	26	8.0
18.5	28	8.0
18.6	28	8.4
18.7	31	9.1
18.8	29	8.7
18.9	31	9.1
19.0	30	9.0
19.1	29	[illegible]
19.2	[illegible]	8.4
19.3	29	8.8
19.4	29	8.8
19.5	27	8.4
19.6	28	8.6
19.7	29	[illegible]
19.8	30	9.0
19.9	29	[illegible]
20.0	[illegible]	[illegible]
20.1	29	8.9
20.2	30	9.1
20.3	30	9.1
20.4	30	9.1
20.5	30	9.1
20.6	33	9.8
20.7	33	9.8
20.8	29	8.9
20.9	26	8.3

21.0	30	9.3
21.1	37	10.7
21.2	30	9.3
21.3	29	9.1
21.4	32	9.7
21.5	29	9.1
21.6	30	9.3
21.7	30	9.3
21.8	25	8.2
21.9	22	7.6
22.0	25	8.4
22.1	29	9.2
22.2	32	9.8
22.3	33	10.0
22.4	30	9.4
22.5	26	8.6
22.6	25	8.4
22.7	28	9.0
22.8	40	11.5
22.9	40	11.5
23.0	37	11.0
23.1	36	10.8
23.2	33	10.2
23.3	36	10.8
23.4	37	11.0
23.5	31	9.8
23.6	33	10.2
23.7	32	10.0
23.8	37	11.0
23.9	50	13.7
24.0	82	20.5
24.1	60	15.9
24.2	65	17.0
24.3	86	21.3
24.4	88	21.9
24.5	89	22.0
24.6	96	23.4
24.7	110	26.3
24.8	117	27.8
24.9	115	27.4
25.0	125	29.6
25.1	130	30.6
25.2	137	32.1
25.3	175	40.0
25.4	200	51.4

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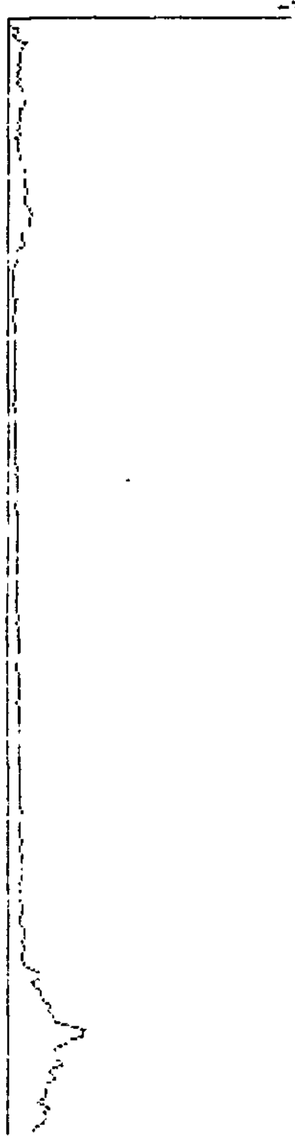
25.5	54	49.7
25.6	54	49.7
25.7	45	42.0
25.8	42	39.4
25.9	35	33.4
26.0	32	31.0
26.1	37	35.7
26.2	38	36.1
26.3	31	30.2
26.4	29	28.5
26.5	31	30.2
26.6	32	31.0
26.7	28	27.6
26.8	24	24.2
26.9	25	25.1
27.0	25	25.2
27.1	25	25.2
27.2	20	20.9
27.3	23	23.5
27.4	29	28.6
27.5	23	23.5
27.6	27	26.9
27.7	25	25.2
27.8	23	23.5
27.9	18	19.2
28.0	16	17.7



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