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MINISTRY OF DEVELOPMENT AND NEW COMMUNITIES

ARAB REPUBLIC OF EGYPT

# REHABILITATION AND MODERNIZATION OF EXISTING PORT AT PORT SAID

## final report

## technical report - volume III
## book 2 - appendicies

OCTOBER 1978

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**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

# TEST BORING METHODS

## TEST BORING EQUIPMENT:

The following test boring equipment is utilised by Raymond International in Egypt.

Acker Teredo Mark 11 Boring rig; mfg. Acker Drill Co.; Scranton, Pa; USA

Acker MP3-100 Boring Rig; mfg. Acker Drill Co. Scranton, Pa; USA

Acker Ace test boring rig--Mfg. Acker Drill Co. Scranton, Pa; USA

Boyles BBS Drilling Rig--mfg. Boyle- Dresser UK Ltd. ; England

Pumps---Acker Moyno 2LS type; mfg. Acker Drill Co. Scranton, Pa; USA

Casing: HW; NW and AW mfg. Acker Drill Co. Scranton, Pa. USA

Drill Rods: BW and AW mfg. Acker Drill Co.

Tools and core barrels: Acker Drill Co.

## DRILLING METHODS:

Pipe casing ranging from 2 1/2 " to 4" inside diameter is driven into the ground to support the sides of the borehole through loose and unconsolidated surface materials, such as fill, for example. The continued use of casing is optional in soil formations which do not cave i.e. clay soil material.

With the exception of marine borings, the first sample is usually taken without using casing. The borehole is advanced by the use of a chopping bit or roller bit attached to the end of a string of drill rods coupled together to make the required length. Water is pumped through the drill rod so that the cuttings can be carried to the surface with the return circulation.

As the drill rod is either churned up and down by the driller or rotated and advanced by the hydraulic drilling righ, the driller is able to feel the consistancy of the material in which he is working. Whenever a change in the soil formation is detected, drilling is stopped; however circulation of the water is continued for a time to clear the hole and to minimise the amount of settled solids at the bottom of the borehole. Then the drill rod and bit are removed from the boring, a sample spoon is inserted and a soil sample taken.

The standard sample spoon has an outside diameter of 2 inches and inside diameter of 1 3/8 inches. The barrel section of the spoon is constructed to separate into two halves. The sample spoon is attached to the drill rod

and lowered to the bottom of the boring. A drive head is fastened to the drilling rod and a standard 140 lb. drive weight is used to drive the sample thr ugh the next eighteen inches with a drop of thirty inches. The blows for penetration of each six inch increment is noted and the sum of the last two six inch increments is the N value or the STANDARD PENETRATION TEST resistance which is noted on the boring logs. The standard penetration test is perfored in accordance with ASTM 1586 procedure.

A representative sample is removed from the barrel and placed into a plastic wide mouth jar and labelled for further identification.

Undisturbed samples are taken in cohesive soils.

In clays --Shelby tube samples of 2 or 3 inch diameter are taken at every change of material or five foot intervals whichever is sooner. This method may be varied by interspersing SPT testing in place of undisturbed sampling every ten feet i.e. ten foot interval for each sample.

Exception in sampling in clays with shelby tubes will occur when the stiffness of the clay approximates an SPT value of 8, it may be necessary to tap lightly with the SPT test hammer the drill rods in order to obtain a sample in the stiffer clays. In clays with an equivalent SPT value of 14 or more, it is virtually impossible to obtain an undisturbed sample with thin wall shelby tube samplers; therefore sampling is accomplished with the split spoon sampler.

The ground water level in the boreholes is recorded usually the following day after completion of the boring i.e. from twelve to twenty four hours after the completion of the boring.

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Elevations utilised in Port Said Study:

Ground elevations are related to MHWS (Mean High Water Spring) datum which is 0.7 meters above the LAT (Lowest Astonomical Tide).

The bathymetric survey has LAT as the datum.

0.7 M

MHWS Mean High Water Spring ; Datum

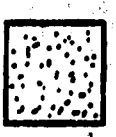
LAT Lowest Astronomical Tide ; Datum

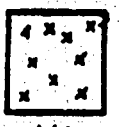
# DEFINITION OF SYMBOLS & TERMS

## SOIL TYPES

(shown in strata column)

gravel


sand


silt

clay

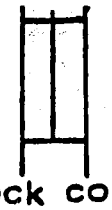
calcareous matter

## SAMPLER TYPES

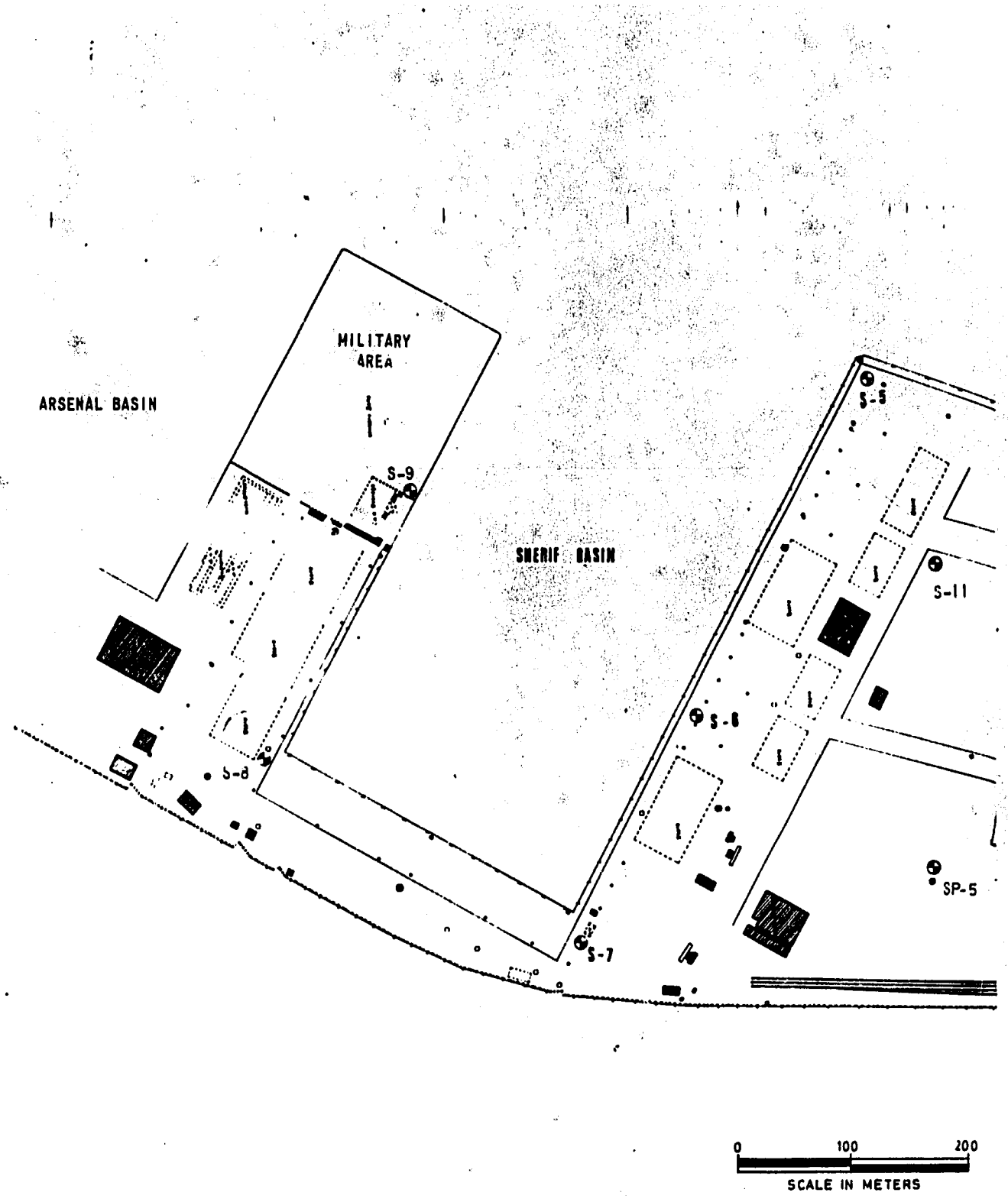
(shown in sample column)

shelby tube

split spoon

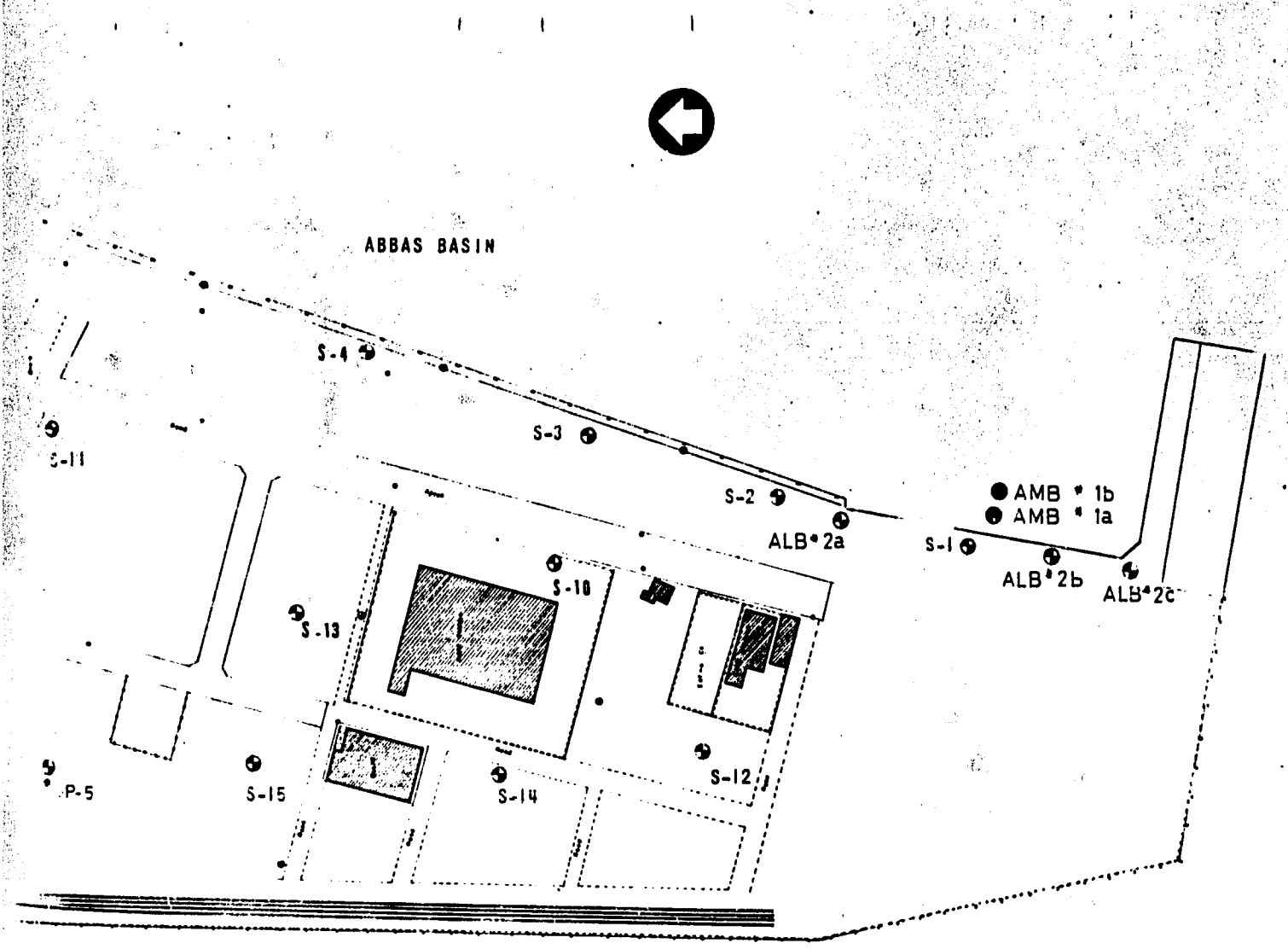

rock core barrel

no recovery


MILITARY AREA
ARSENAL BASIN
SHERIF BASIN
S-9
S-5
S-11
S-6
S-8
SP-5
S-7
0
100
200
SCALE IN METERS

HARRIS

6




LEGEND

- 2-1/2 INCH DIA. BORING (LAND)
- 2-1/2 INCH DIA. BORING (MARINE)

200

BORING LOCATION PLAN

1

BORING LOGS

# RAYMOND INTERNATIONAL OF DELAWARE Inc.
## CAIRO

Job: CA 27 — Location: PORT SAID HARBOUR

Borehole No. S 1 — Ground Elevation 2.0m — Datum: MSS

Date: 24 - 7 - 1977 - 24 - 7 — Diameter Casing: 114mm — Depth Cased: 18.0m

Boring Method: Rotery — Percussion — Foreman: M. MAHMOOD

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BLOWS/FT | Strata Legend | Elev. 2.0m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | X | 26 | | | ( FILL ) | |
| 4 | | | | | | | | |
| 6 | 2 | 2 | X | 25 | | | Brown medium to fine SAND, shells | Water |
| 8 | | | | | | | | |
| 10 | 3 | 3 | X | 33 | | -1.1m | | |
| 12 | | | | | | | | |
| 14 | 4 | | | | | | | |
| 16 | 5 | 4 | X | 42 | | | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | | Brown medium to fine SAND shells | |
| 22 | | 5 | X | 44 | | | | |
| 24 | 7 | | | | | -5.2m | | |
| 26 | 8 | 6 | X | 45 | | | | |
| 28 | | | | | | | Brown medium to fine SAND, little | |
| 30 | 9 | | | | | | silt | |
| 32 | | 7 | X | 47 | | | | |
| 34 | 10 | | | | | -8.7m | | |
| 36 | 11 | 8 | X | 22 | | | | |
| 38 | | | | | | | | |
| 40 | 12 | 9 | X | 22 | | | | |
| 42 | | | | | | | Dark brown SILT, low plasticity, | |
| 44 | 13 | | | | | | some fine sand | |
| 46 | 14 | 10 | X | 20 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | 11 | X | 23 | | | | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | -14.8m | | |
| 56 | 17 | 12 | X | 9 | | | | |
| 58 | | | | | | | Black silty CLAY, medium plasticity, | |
| 60 | 18 | | | | | | | |
| 62 | | 1 | U | | | | trace fine sand | R.100% |
| 64 | 19 | | | | | | | |
| 66 | 20 | 13 | X | 6 | | -18.3m | | |
| 68 | | | | | FOB 20.3m | | | |
| 70 | 21 | | | | | | | |
| 76 | 23 | | | | | | | |
| 78 | | | | | | | | |
| 80 | 24 | | | | | | | |
| 82 | 25 | | | | | | | |
| 84 | | | | | | | | |
| 86 | 26 | | | | | | | |
| 88 | | | | | | | | |
| 90 | 28 | | | | | | | |
| 92 | 27 | | | | | | | |
| 94 | | | | | | | | |
| 96 | 29 | | | | | | | |
| 98 | | | | | | | | |
| 100 | 30 | | | | | | | |

D - Disturbed Sample  U - Undisturbed Sample  C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

9

M. MOSLY.

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 88

Borehole No. S 2

Date : 27 - 7 - 1977 - 29 - 7

Boring Method : Rotery — Percussion

Location : PORT SAID HARBOUR

Ground Elevation : 2.0m Datum : MSS

Diameter Casing : 114mm Depth Cased : 30.2m

Foreman : M. MAHMOOD.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S.P.T. BLOWS/FT | Legend | Elev. 2.0m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 9 | | | ( FILL ) | |
| 4 | | | | | | | Brown medium to fine GRAVEL and | |
| 6 | 2 | 2 | | 19 | | | course to fine sand, trace : silt | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | 1.1m | | |
| 12 | | 3 | | 30 | | | Grey course-medium to fine SAND, | |
| 14 | 4 | | | | | | trace fine gravel, trace silt. | |
| 16 | 5 | 4 | | 30 | | 2.6m | | |
| 18 | | | | | | | Brown medium to fine SAND, shells | |
| 20 | 6 | 5 | | 29 | | | | |
| 22 | | | | | | | | |
| 24 | 7 | | | | | | | |
| 26 | 8 | 6 | | 24 | | 5.6m | | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | Grey medium to fine SAND, some silt. | |
| 32 | | 7 | | 27 | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | 8 | | 18 | | 8.7m | | |
| 38 | | | | | | | Black course, medium fine SAND. | |
| 40 | 12 | | | | | 10.2m | and silt | |
| 42 | | 9 | | 7 | | | | |
| 44 | 13 | | | | | | | |
| 46 | 14 | 10 | | 6 | | | Black SILT low plasticity, trace | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | fine-sand. | |
| 52 | | 11 | | 6 | | | | |
| 54 | 16 | | | | | 14.0m | | |
| 56 | 17 | 12 | | 6 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 13 | | 6 | | | | |
| 64 | 19 | | | | | | Black SILT trace fine sand | |
| 66 | 20 | 1 | D | | | | | R.100 % |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |
| 72 | | 14 | | 6 | | 16.0m | | |
| 74 | 22 | | | | | | | |
| 76 | 23 | | | | | | | |
| 78 | | 2 | | | | | | R.100 % |
| 80 | 24 | | | | | | | |
| 82 | | 15 | | 5 | | | Black clayey SILT, trace fine | |
| 84 | 25 | | | | | | sand | |
| 86 | 26 | | | | | | | |
| 88 | | 3 | | | | | | R.100 % |
| 90 | 28 | 16 | | 6 | | | | |
| 92 | | | | | | | | |
| 94 | 27 | | | | | | | |
| 96 | 29 | | | | | | | |
| 98 | | 4 | | | | | | R.100 % |
| 100 | 30 | 17 | | 6 | | 28.7m | | |

FOB 30.67m

D - Disturbed Sample U - Undisturbed Sample C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

10

M. MOSLY.

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA - 27

Borehole No. S 3

Date : 15.16/9/1977 - 19 - 9

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.

Ground Elevation : 2.0m Datum : MHWS

Diameter Casing : 114mm Depth Cased : 59.5m

Foreman : M. MAHMOUD.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWSIFT | Strata 2.0m Legend | Strata Elev. 2.0m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 20 | | | | |
| 4 | | | | | | | | |
| 6 | 2 | 2 | | 12 | | | | |
| 8 | | | | | | | Brown course medium to fine SAND, little fine gravel, shells | |
| 10 | 3 | | | | | | | |
| 12 | | 3 | | 4 | | | | |
| 14 | 4 | | | | | | | |
| 16 | 5 | 4 | | 23 | | | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | -4.1m | | |
| 22 | | 5 | | 31 | | | | |
| 24 | 7 | | | | | | | |
| 26 | 8 | 6 | | 31 | | | Grey course medium to fine SAND, little silt, trace fine gravel | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | | |
| 32 | | 7 | | 28 | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | 8 | | 4 | | - 8.7m | | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | | | |
| 42 | | 1 | | 100% | | | Grey fine SAND, little silt | |
| 44 | 13 | | | | | -11.0m | | |
| 46 | 14 | 9 | | 4 | | | | |
| 48 | | | | | | | Grey fine SAND, and - silt | |
| 50 | 15 | | | | | -13.0m | | |
| 52 | | 2 | | 100% | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 10 | | 2 | | | | |
| 58 | | | | | | | Black clayey SILT, trace fine sand | |
| 60 | 18 | | | | | | | |
| 62 | | 3 | | 100% | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | 11 | | 2 | | | | |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample U - Undisturbed Sample C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA - 27
Borehole No. S.3
Date : 15/7/1977 - 19 - 9 - 1977
Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.
Ground Elevation : 2.0m Datum : MHWS
Diameter Casing : 114mm Depth Cased : 59.5m
Foreman : M. MAHMOUD.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 4 | | 100% | | | | |
| 4 | | | | | | | | |
| 6 | 2 | 12 | | 4 | | | | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | | | |
| 12 | | 5 | | 100% | | | Black clayey SILT, trace fine sand | |
| 14 | 4 | | | | | | | |
| 16 | 5 | 13 | | 4 | | | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | | | |
| 22 | | | | | | -25.5m | | |
| 24 | 7 | 6 | | 100% | | | | |
| 26 | 8 | 14 | | 4 | | | | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | | |
| 32 | 10 | | | | | | | |
| 34 | | 7 | | 100% | | | | |
| 36 | 11 | | | | | | Black silty CLAY, trace fine sand | |
| 38 | | | | | | | | |
| 40 | 12 | 15 | | 3 | | | | |
| 42 | 13 | | | | | | | |
| 44 | | 8 | | 100% | | | | |
| 46 | 14 | | | | | | | |
| 48 | | | | | | | | |
| 50 | 15 | 16 | | 10 | | | | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 9 | | 100% | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 17 | | 15 | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | | |
| 68 | | 10 | | 100% | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample U - Undisturbed Sample C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

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# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA - 27

Borehole No. S 3

Date : ~~15/9/1977 - 19 - 9 - 1977~~

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.

Ground Elevation : 2.0m Datum : MHWS

Diameter Casing : 114mm Depth Cased : 59.5m

Foreman : ~~M. MAHMOUD.~~

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BLOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 18 | | 9 | | | | |
| 4 | | | | | | | | |
| 6 | 2 | | | | | | | |
| 8 | | 11 | | 100% | | | | |
| 10 | 3 | | | | | | | |
| 12 | | | | | | | | |
| 14 | 4 | 19 | | 9 | | | | |
| 16 | 5 | | | | | | | |
| 18 | | | | | | | | |
| 20 | 6 | 12 | | 100% | | | | |
| 22 | | | | | | | | |
| 24 | 7 | 20 | | 10 | | | | |
| 26 | 8 | | | | | | | |
| 28 | | | | | | | | |
| 30 | 9 | 13 | | 100% | | | Black silty CLAY, trace fine sand. | |
| 32 | | | | | | | | |
| 34 | 10 | | | | | | | |
| 36 | | 21 | | 10 | | | | |
| 38 | 11 | | | | | | | |
| 40 | 12 | | | | | | | |
| 42 | | 14 | | 100% | | | | |
| 44 | 13 | | | | | | | |
| 46 | | 22 | | 14 | | | | |
| 48 | 14 | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | | 15 | | 100% | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | | | | | | | |
| 58 | | 23 | | 15 | | | | |
| 60 | 18 | 24 | | 15 | | - 59.0m | | |
| 62 | | | | | EOB 60.98 m | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | | |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

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# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 27
Borehole No. S 4
Date: 11 - 8 - 1972 - 13 - 8
Boring Method: Rotary — Percussion

Location: PORT SAID HARBOUR
Ground Elevation: 1.2m Datum: MHS
Diameter Casing: 114mm Depth Cased: 19.8 m
Foreman: MOSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S.P.T. BLOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 54 | | 1.2m | | |
| 4 | | | | | | | Brown course medium to fine SAND | |
| 6 | 2 | 2 | | 44 | | 0.4 m | Grey course to fine SAND, trace silt, little fine gravel | Water |
| 8 | | | | | | | | |
| 10 | 3 | | | | | -1.2 m | | |
| 12 | | 3 | | 25 | | | | |
| 14 | 4 | | | | | | Course to fine GRAVEL, and course to medium sand, | |
| 16 | 5 | 4 | | 39 | | -2.7 m | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | | Brown course medium to fine SAND, little fine gravel, shells | |
| 22 | | 5 | | 53 | | | | |
| 24 | 7 | | | | | -5.7 m | | |
| 26 | 8 | 6 | | 50 | | | | |
| 28 | | | | | | | Grey medium to fine SAND | |
| 30 | 9 | | | | | -7.3 m | | |
| 32 | | 7 | | 35 | | | Brown medium to fine SAND | |
| 34 | 10 | | | | | -8.8m | | |
| 36 | 11 | 8 | | 33 | | | Grey medium to fine SAND, trace silt | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | -10.3m | | |
| 42 | | 9 | | 10 | | | | |
| 44 | 13 | | | | | | Dark brown clayey SILT, little fine sand | |
| 46 | 14 | 1 | | | | | | R.100 % |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | | 10 | | 7 | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 2 | | | | | | R.100 % |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 11 | | | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | 3 | | | | -18.2m | | R.100 % |
| 68 | | | | | FOB 20.12m | | | |
| 70 | 21 | | | | | | | |
| 76 | 23 | | | | | | | |
| 78 | | | | | | | | |
| 80 | 24 | | | | | | | |
| 82 | 25 | | | | | | | |
| 84 | | | | | | | | |
| 86 | 26 | | | | | | | |
| 88 | | | | | | | | |
| 90 | 28 | | | | | | | |
| 92 | 27 | | | | | | | |
| 94 | | | | | | | | |
| 96 | 29 | | | | | | | |
| 98 | | | | | | | | |
| 100 | 30 | | | | | | | |

D - Disturbed Sample  U - Undisturbed Sample  C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows / ft. penetration

M.MOSLY.

14

# RAYMOND INTERNATIONAL OF DELAWARE Inc.
## CAIRO

Job: CA 27

Borehole No. S 5

Date : 4/9/1977 - 4 - 9 - 77.

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.

Ground Elevation : 1.9m Datum : MHWS

Diameter Casing : 114mm Depth Cased : 18.3m

Foreman : MOHAMED KAMAL.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWSIFT | Strata Legend | Strata Elev. 1.9m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 10 | | | | |
| 4 | | | | | | | | |
| 6 | 2 | 2 | | 12 | | | Brown medium to fine SAND, truce silt. | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | | | |
| 12 | 4 | 3 | | 26 | | | | |
| 14 | | | | | | | | |
| 16 | 5 | | | | | 3.1m | | |
| 18 | | 4 | | 27 | | | | |
| 20 | 6 | | | | | | | |
| 22 | 7 | 5 | | 28 | | | Dark brown medium to fine SAND, truce silt, truce shells. | |
| 24 | | | | | | | | |
| 26 | 8 | | | | | | | |
| 28 | | 6 | | 28 | | | | |
| 30 | 9 | | | | | | | |
| 32 | 10 | | | | | 8.2m | | |
| 34 | | 7 | | 2 | | | | |
| 36 | 11 | | | | | | Black SILT, truce fine sand. | |
| 38 | | | | | | | | |
| 40 | 12 | 8 | | 3 | | | | |
| 42 | | | | | | | | |
| 44 | 13 | | | | | 11.5m | | |
| 46 | | 9 | | 10 | | | | |
| 48 | 14 | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | | 10 | | 10 | | | | |
| 54 | 16 | | | | | | Black silty CLAY, truce fine sand | |
| 56 | 17 | | | | | | | |
| 58 | | 1 | | 100% | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 11 | | 10 | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | | |
| 68 | | 2 | | 100% | | 19.0m | | |
| 70 | 21 | | | | FOB | | | |
| | | | | | | 20.91m | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows / ft. penetration

14A

# RAYMOND INTERNATIONAL OF DELAWARE INC.
CAIRO



Job: CA 27 — Location: PORT-SAID HARBOUR

Borehole No. SP 5 — Ground Elevation 1.8m — Datum: MHWS

Date: 24/9/1977 - 26 - 9 - 1977 — Diameter Casing: 114mm — Depth Cased: 39.7m

Boring Method: Rotery — Percussion — Foreman: M. KAMAL

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. 1.8m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | X | 14 | | | Tan medium to fine GRAVEL, little course to fine sand. | |
| 4 | | | | | | 0.1m | | |
| 6 | 2 | 2 | X | 11 | | | Brown course medium to fine SAND. | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | - 1.6m | | |
| 12 | | 3 | X | 15 | | | | |
| 14 | 4 | | | | | | Brown medium to fine SAND and SILT, shells. | |
| 16 | 5 | | | | | - 3.2m | | |
| 18 | | 4 | X | 23 | | | Brown course to fine SAND, trace silt. | |
| 20 | 6 | | | | | | | |
| 22 | | | | | | - 4.9m | | |
| 24 | 7 | 5 | X | 26 | | | Brown course to fine SAND, trace silt, shells. | |
| 26 | 8 | | | | | | | |
| 28 | | | | | | - 6.7m | | |
| 30 | 9 | 6 | X | 30 | | | Black course medium to fine SAND, trace silt | |
| 32 | | | | | | - 8.3m | | |
| 34 | 10 | 7 | X | 34 | | | Brown course medium to fine + SAND trace fine gravel, trace silt | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | | | |
| 40 | 12 | 8 | X | 33 | | - 10.0m | Brown SILT, slight plasticity, some fine sand. | |
| 42 | | | | | | | | |
| 44 | 13 | | | | | | | |
| 46 | | 9 | X | 31 | | | | |
| 48 | 14 | | | | | | | |
| 50 | 15 | | | | | -13.3m | | |
| 52 | | 10 | X | 13 | | | | |
| 54 | 16 | | | | | | Grey SILT, low plasticity, some fine sand. | |
| 56 | 17 | 11 | X | 7 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | -16.6m | | |
| 62 | | 12 | X | 4 | | | | |
| 64 | 19 | | | | | | Black silty CLAY, little fine sand | |
| 66 | 20 | | | | | | | |
| 68 | | | | | | | | |
| 70 | 21 | 1 | ■ | 100% | | | | |

D - Disturbed Sample — U - Undisturbed Sample — C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

15

# RAYMOND INTERNATIONAL OF DELAWARE INC.



CAIRO

Job: CA 27

Location : PORT-SAID HARBOUR

Borehole No. SP 5

Ground Elevation : 1.8m Datum : MWS

Date : 25/9/1977 - 26 - 9 - 1977

Diameter Casing : 114mm Depth Cased : 39.7m

Boring Method : Rotery — Percussion

Foreman :

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. | Description | Remarl |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | | | | | | | |
| 4 | | | | | | | | |
| 6 | 2 | 13 | | 4 | | | | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | | | |
| 12 | | 2 | | 100% | | | | |
| 14 | 4 | | | | | | | |
| 16 | 5 | | | | | | | |
| 18 | | | | | | | | |
| 20 | 6 | 14 | | 6 | | | | |
| 22 | | | | | | | | |
| 24 | 7 | | | | | | | |
| 26 | | 3 | | 100% | | | | |
| 28 | 8 | | | | | | | |
| 30 | 9 | 15 | | 6 | | | Black silty CLAY, trace fine sand. | |
| 32 | | | | | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | 4 | | 100% | | | | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | | | |
| 42 | | | | | | | | |
| 44 | 13 | 16 | | | | | | |
| 46 | 14 | | | | | | | |
| 48 | | 5 | | 100% | | | | |
| 50 | 15 | | | | | | | |
| 52 | | | | | | | | |
| 54 | 16 | 17 | | 8 | | | | |
| 56 | 17 | | | | | | | |
| 58 | | | | | | | | |
| 60 | 18 | 6 | | 100% | | | | |
| 62 | | | | | | | | |
| 64 | 19 | 18 | | 6 | | | | |
| 66 | | | | | | -39.9m | | |
| 68 | 20 | | | | | | | |
| 70 | 21 | | | | | EOB 41.46m | | |

FOB

16

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 27 Location : PORT SAID HARBOUR

Borehole No. S 6 Ground Elevation : 1.7m Datum : MSWS

Date : 1 - 8 - 1977 - 3 - 8 - 1977 Diameter Casing : 114mm Depth Cased : 30.2 m

Boring Method : Rotery — Percussion Foreman : M.MAHMOOD.

| Depth ft. | Depth m. | Sample No. | Sample Type | S.P.T. BLOWS/FT | Strata Legend | Strata Elev. m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 18 | | | Brown medium to fine SAND | |
| 4 | | | | | | | | Water |
| 6 | 2 | 2 | | 8 | | 0.2m | Mottled grey and black course-medium to fine SAND, trace silt | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | -1.4m | | |
| 12 | | 3 | | 50 | | | Grey medium to fine SAND, trace silt, shells. | |
| 14 | 4 | | | | | -2.9m | | |
| 16 | 5 | 4 | | 30 | | | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | | | |
| 22 | | 5 | | 45 | | | | |
| 24 | 7 | | | | | | | |
| 26 | 8 | 6 | | 53 | | | | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | Grey course medium to fine SAND, trace silt | |
| 32 | | 7 | | 27 | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | 8 | | 32 | | | | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | -10.5m | | |
| 42 | | 9 | | 17 | | | | |
| 44 | 13 | | | | | | Silt, some fine sand. | |
| 46 | 14 | 10 | | 12 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | -13.6m | | |
| 52 | | 11 | | 9 | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 1 | | | | | | R.100 % |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 12 | | 7 | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | 2 | | | | | | R.100 % |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | Black silty CLAY, medium to high | |
| 72 | | 13 | | 6 | | | plasticity, trace fine sand. | |
| 74 | 22 | | | | | | | |
| 76 | 23 | 3 | | | | | | R.100 % |
| 78 | | | | | | | | |
| 80 | 24 | | | | | | | |
| 82 | | 14 | | 5 | | | | |
| 84 | 25 | | | | | | | |
| 86 | 26 | 4 | | | | | | R.100 % |
| 88 | | | | | | | | |
| 90 | 28 | | | | | | | |
| 92 | | 15 | | 5 | | | | |
| 94 | 27 | | | | | | | |
| 96 | 29 | 5 | | | | | | R.100% |
| 98 | | | | | | | | |
| 100 | 30 | 16 | | 5 | | -28.0m | | |

D - Disturbed Sample FOB 30.49m U - Undisturbed Sample C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

17

M.MOSLY.

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 22 — Location: PORT SAID HARBOUR

Borehole No. S 7 — Ground Elevation 1.9m — Datum: MSL

Date: 6 - 8 - 1977 - 6 - 8 — Diameter Casing: 114mm — Depth Cased: 19.8 m

Boring Method: Rotary — Percussion — Foreman: MOSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BLOWS/FT | Strata Legend | Elev. 1.9m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | ☒ | 22 | | | Brownish black medium to fine | |
| 4 | | | | | | | SAND, shells | |
| 6 | 2 | 2 | ☒ | 6 | | 0.4m | | Water |
| 8 | | | | | | | Light brown course - medium to | |
| 10 | 3 | | | | | -1.2m | fine SAND | |
| 12 | | 3 | ☒ | 7 | | | Grey course to fine SAND, trace | |
| 14 | 4 | | | | | -2.7m | medium gravel, traces silt. | |
| 16 | 5 | 4 | ☒ | 7 | | | | |
| 18 | | | | | | | Grey course to fine SAND, traces | |
| 20 | 6 | | | | | -4.2m | clayey silt. | |
| 22 | | 5 | ☒ | 45 | | | | |
| 24 | 7 | | | | | | | |
| 26 | 8 | 6 | ☒ | 43 | | | | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | | |
| 32 | | 7 | ☒ | 12 | | | Dark grey medium to fine SAND, | |
| 34 | 10 | | | | | | shells | |
| 36 | 11 | 8 | ☒ | 11 | | | | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | -10.3m | | |
| 42 | | 9 | ☒ | 8 | | | | |
| 44 | 13 | | | | | | | |
| 46 | 14 | 10 | ☒ | 4 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | | 1 | | | | | Black silty CLAY, trace fine sand. | R.100% |
| 54 | 16 | | | | | | | |
| 56 | 17 | 11 | ☒ | 4 | | | shells | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 2 | | | | | | R.100% |
| 64 | 19 | | | | | | | |
| 66 | 20 | 12 | ☒ | 4 | | -18.2m | | |
| 68 | | | | | FOB 20.12m | | | |
| 70 | 21 | | | | | | | |
| 76 | 23 | | | | | | | |
| 78 | | | | | | | | |
| 80 | 24 | | | | | | | |
| 82 | 25 | | | | | | | |
| 84 | | | | | | | | |
| 86 | 26 | | | | | | | |
| 88 | | | | | | | | |
| 90 | 28 | | | | | | | |
| 92 | 27 | | | | | | | |
| 94 | | | | | | | | |
| 96 | 29 | | | | | | | |
| 98 | | | | | | | | |
| 100 | 30 | | | | | | | |

D - Disturbed Sample — U - Undisturbed Sample — C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

M.MOSLY.

18

# RAYMOND INTERNATIONAL OF DELAWARE INC.

## CAIRO

Job: CA 22

Borehole No. S B

Date : 8 - 8 - 1977 - 10 - 8

Boring Method : Rotery — Percussion

Location : PORT SAID HARBOUR

Ground Elevation 1.7m . Datum : MWS

Diameter Casing : 114mm Depth Cased : 29.0 m

Foreman : M.MAHMOOD.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BLOWS/FT | Strata Legend | Strata Elev. 1.7m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 14 | | | Brown course to fine SAND | |
| 4 | | | | | | 0.2m | | Water |
| 6 | 2 | 2 | | 16 | | | | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | | | |
| 12 | | 3 | | 6 | | | Brown course to medium to fine SAND | |
| 14 | 4 | | | | | | | |
| 16 | 5 | 4 | | 14 | | -3.3m | | |
| 18 | | | | | | | Brown medium to fine SAND | |
| 20 | 6 | | | | | -4.4m | | |
| 22 | | 5 | | 34 | | | | |
| 24 | 7 | | | | | | Dark gray Fine SAND, trace fine gravel, | |
| 26 | 8 | 6 | | 38 | | | little silt, shells | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | -7.5m | | |
| 32 | | 7 | | 28 | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | 8 | | 29 | | | Dark brown coarse, medium to fine SAND, trace silt | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | -10.5m | | |
| 42 | 13 | 9 | | 6 | | | Black clayey SILT, trace fine sand. | |
| 44 | | | | | | | | |
| 46 | 14 | 1 | | | | -12.3m | | R.100 % |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | | | | | | | | |
| 54 | 16 | 2 | | | | | | R.100 % |
| 56 | 17 | | | | | | | |
| 58 | | | | | | | | |
| 60 | 18 | 10 | | 6 | | | | |
| 62 | | | | | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | 3 | | | | | | R.100 % |
| 68 | | | | | | | Black silty CLAY, trace fine sand. | |
| 70 | 21 | | | | | | | |
| 72 | 22 | 11 | | 6 | | | | |
| 74 | | | | | | | | |
| 76 | 23 | | | | | | | R.100 % |
| 78 | | 4 | | | | | | |
| 80 | 24 | | | | | | | |
| 82 | 25 | 12 | | 6 | | | | |
| 84 | | | | | | | | |
| 86 | 26 | | | | | | | |
| 88 | | | | | | | | R.100 % |
| 90 | 28 | 5 | | | | | | |
| 92 | | | | | | | | |
| 94 | 27 | 13 | | 6 | | | | |
| 96 | 29 | | | | | | | |
| 98 | | | | FOB | | | | |
| 100 | 30 | 6 | | 30.67 | | -29.0m | | R.100 % |

D - Disturbed Sample FOB 30.67m U - Undisturbed Sample C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

M.MOSLY.

19

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA - 27
Borehole No. S9
Date : 9/9/1977 - 10 - 9
Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.
Ground Elevation : 1.7m Datum : MHWS
Diameter Casing : 114mm Depth Cased : 30.5m
Foreman : MOHAMED KAMAL.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWSIFT | Strata Legend | Strata Elev. 1.7m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | ☒ | 11 | | | Brown course medium to fine GRAVEL little course to fine sand. | |
| 4 | | | | | | -0.0m | | |
| 6 | 2 | 2 | ☒ | 19 | | | Black course to fine SAND, trace silt, shells | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | -1.7m | | |
| 12 | | 3 | ☒ | 13 | | | | |
| 14 | 4 | | | | | | Brown medium to fine SAND trace silt. | |
| 16 | 5 | | | | | -3.3m | | |
| 18 | | 4 | ☒ | 46 | | | | |
| 20 | 6 | | | | | | Brown medium to fine SAND, shells | |
| 22 | | | | | | | | |
| 24 | 7 | 5 | ☒ | 35 | | | | |
| 26 | 8 | | | | | -6.7m | | |
| 28 | | 6 | ☒ | 10 | | | | |
| 30 | 9 | | | | | | | |
| 32 | | | | | | | | |
| 34 | 10 | 7 | ☒ | 13 | | | Brown medium to fine SAND, little silt and clay. | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | | | |
| 40 | 12 | 8 | ☒ | 12 | | | | |
| 42 | | | | | | | | |
| 44 | 13 | | | | | -11.7m | | |
| 46 | 14 | 9 | ☒ | 15 | | | | |
| 48 | | | | | | | Brown clayey SILT, trace fine sand. | |
| 50 | 15 | 10 | ☒ | 15 | | | | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | -15.1m | | |
| 56 | 17 | 11 | ☒ | 5 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 12 | ☒ | 4 | | | Black silty CLAY, trace fine sand. | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | | |
| 68 | | 13 | ☒ | 5 | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample
U - Undisturbed Sample
C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

20

# RAYMOND INTERNATIONAL OF DELAWARE INC.

CAIRO

Job: C4 - 27

Borehole No. S9

Date : 9/9/1977 - 10 - 9

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.

Ground Elevation : 1.7m Datum : MHWS

Diameter Casing : 114mm Depth Cased : 30.5m

Foreman : M. KAMAL.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 100% | | | | |
| 4 | | | | | | | | |
| 6 | 2 | | | | | | | |
| 8 | | | | | | | | |
| 10 | 3 | 14 | | 6 | | | Black silty CLAY, trace fine sand. | |
| 12 | 4 | | | | | | | |
| 14 | | | | | | | | |
| 16 | 5 | 2 | | 100% | | | | |
| 18 | | | | | | | | |
| 20 | 6 | 15 | | 6 | | | | |
| 22 | 7 | | | | | | | |
| 24 | | | | | | | | |
| 26 | 8 | 3 | | 100% | | | | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | | |
| 32 | | 16 | | 6 | | ±29.4m | | |
| 34 | 10 | | | | EOB 31.00 m | | | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | | | |
| 42 | 13 | | | | | | | |
| 44 | | | | | | | | |
| 46 | 14 | | | | | | | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | 16 | | | | | | | |
| 54 | | | | | | | | |
| 56 | 17 | | | | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | | | | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | | |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 27
Borehole No. S 10
Date : 18 - 8 - 1977 - 24 - 8
Boring Method : Rotery — Percussion

Location : PORT SAID HARBOUR
Ground Elevation : 2.1m Datum : MHWS
Diameter Casing : Depth Cased : 39.6m
Foreman : MUSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. 2.1m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 25 | | | Brown course to fine SAND, trace | |
| 4 | | | | | | 0.4m | fine gravel. | |
| 6 | 2 | 2 | | 10 | | | Brown course to medium to fine SAND, | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | - 1.3m | trace silt, shells | |
| 12 | 4 | 3 | | 33 | | | | |
| 14 | | | | | | | Grey CLAY, high plasticity, trace | |
| 16 | 5 | | | | | | | |
| 18 | | 4 | | 47 | | | fine sand, little silt. | |
| 20 | 6 | | | | | | | |
| 22 | | | | | | -4.6m | | |
| 24 | 7 | 5 | | 35 | | | | |
| 26 | 8 | | | | | | Grey medium to fine SAND, | |
| 28 | | 6 | | 38 | | | trace silt | |
| 30 | 9 | | | | | | | |
| 32 | 10 | | | | | | | |
| 34 | | 7 | | 27 | | | | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | -9.6m | | |
| 40 | 12 | 8 | | 17 | | | | |
| 42 | 13 | | | | | | | |
| 44 | | 9 | | 19 | | | | |
| 46 | 14 | | | | | | | |
| 48 | | | | | | | | |
| 50 | 15 | 10 | | 17 | | | Black SILT, trace fine sand | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 11 | | 19 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | -16.4m | | |
| 62 | | 12 | | 7 | | | Black silty CLAY, high plasticity, | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | trace fine sand | |
| 68 | | 1 | | RECY100% | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample
U - Undisturbed Sample
C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

22

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: ~~CA - 27~~

Borehole No. S11

Date : ~~6/9/1977 - 8 - 9 - 1977~~

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.

Ground Elevation 2.2m Datum : MHWS

Diameter Casing : 114mm Depth Cased : 39.7m

Foreman : MOUSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | ~~2.2m~~ | | |
| 2 | 1 | 1 | | 22 | | | | |
| 4 | | | | | | | Tan course, course to fine SAND, | |
| 6 | 2 | | | | | | trace fine gravel | |
| 8 | | 2 | | 24 | | | | |
| 10 | 3 | | | | | | | |
| 12 | | 3 | | 10 | | - 1.8m | | |
| 14 | 4 | | | | | | Brown medium to fine SAND, little | |
| 16 | 5 | | | | | | clayey silt | |
| 18 | | 4 | | 42 | | -3.4m | | |
| 20 | 6 | | | | | | Brown medium to fine SAND. | |
| 22 | | | | | | -4.5m | | |
| 24 | 7 | 5 | | 38 | | | Dark greyish brown compact fine | |
| 26 | 8 | | | | | | SAND and shells. | |
| 28 | | | | | | - 6.2m | | |
| 30 | 9 | 6 | | 36 | | | Blackish grey fine SAND. | |
| 32 | | | | | | | | |
| 34 | 10 | 7 | | 14 | | - 7.9m | | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | | | |
| 40 | 12 | 8 | | 15 | | | Brown medium to fine SAND, | |
| 42 | | | | | | | trace silt, shells | |
| 44 | 13 | | | | | -11.2m | | |
| 46 | 14 | 9 | | 8 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | Black course to fine SAND | |
| 52 | | 10 | | 7 | | | little silt | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 11 | | 6 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | -16.3m | | |
| 62 | | 12 | | 5 | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | Black silty CLAY, trace fine sand. | |
| 68 | | 1 | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

23

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA - 27 | Location : PORT-SAID HARBOUR.

Borehole No. S 11 | Ground Elevation 2.2m | Datum : MHWS

Date : ~~7/9/1977 - 8 - 9 - 1977~~ | Diameter Casing : 114mm | Depth Cased : 39.7m

Boring Method : Rotery — Percussion | Foreman : MOUSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BlOWS/FT | Strata Legend | Strata Elev. 2.2m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 13 | | 4 | | | | |
| 4 | | | | | | | | |
| 6 | 2 | | | | | | | |
| 8 | | | | | | | | |
| 10 | 3 | 2 | | | | | | |
| 12 | | | | | | | | |
| 14 | 4 | 14 | | 4 | | | | |
| 16 | 5 | | | | | | | |
| 18 | | | | | | | | |
| 20 | 6 | 3 | | | | | | |
| 22 | | | | | | | | |
| 24 | 7 | | | | | | | |
| 26 | 8 | 15 | | 6 | | | Black silty CLAY, trace fine sand. | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | | |
| 32 | | 4 | | | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | | | | | | | |
| 38 | | 16 | | 7 | | | | |
| 40 | 12 | | | | | | | |
| 42 | | | | | | | | |
| 44 | 13 | 5 | | | | | | |
| 46 | 14 | | | | | | | |
| 48 | | | | | | | | |
| 50 | 15 | 17 | | 8 | | | | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 6 | | | | | | |
| 58 | | | | | | | | |
| 60 | 18 | 18 | | 8 | | -37.6m | | |
| 62 | | | | | | | | |
| 64 | 19 | | | | EOB 39.82m | | | |
| 66 | 20 | | | | | | | |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample | U - Undisturbed Sample | C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows / ft. penetration

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 27

Borehole No. S 12

Date : 21 - 7 - 1977 - 23 - 7

Boring Method : Rotary — Percussion

Location : PORT SAID HARBOUR

Ground Elevation : 1.9m Datum : MWS

Diameter Casing : 114mm Depth Cased : 18.9m

Foreman : M.MAHMOOD.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BLOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 16 | | 1.9m | Grey medium to fine SAND, shells. | |
| 4 | | | | | | 0.4m | | Water |
| 6 | 2 | 2 | | 12 | | | | |
| 8 | | | | | | | Grey clayey SILT, trace fine sand, shells. | |
| 10 | 3 | | | | | -1.2m | | |
| 12 | | 3 | | 35 | | | | |
| 14 | 4 | | | | | | | |
| 16 | 5 | 4 | | 48 | | | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | | | |
| 22 | | 5 | | 49 | | | | |
| 24 | 7 | | | | | | Brown medium to fine SAND, shells. | |
| 26 | 8 | 6 | | 49 | | | | |
| 28 | | | | | | | | |
| 30 | 9 | | | | | | | |
| 32 | | 7 | | 49 | | | | |
| 34 | 10 | | | | | | | |
| 36 | 11 | 8 | | 13 | | -9.5m | | |
| 38 | | | | | | | | |
| 40 | 12 | | | | | | | |
| 42 | | 9 | | 14 | | | | |
| 44 | 13 | | | | | | | |
| 46 | 14 | 10 | | 24 | | | Black SILT, little fine sand, shells | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | -13.4m | | |
| 52 | | 11 | | 5 | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 1 | | | | | | R.100 % |
| 58 | | | | | | | Black silty CLAY, trace fine sand. | |
| 60 | 18 | | | | | | | |
| 62 | | 12 | | 5 | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | 2 | | | | -18.5m | | R.100 % |
| 68 | | | | | FOB 20.43m | | | |
| 70 | 21 | | | | | | | |
| 74 | | | | | | | | |
| 76 | 23 | | | | | | | |
| 78 | | | | | | | | |
| 80 | 24 | | | | | | | |
| 82 | 25 | | | | | | | |
| 84 | | | | | | | | |
| 86 | 26 | | | | | | | |
| 88 | | | | | | | | |
| 90 | 28 | | | | | | | |
| 92 | 27 | | | | | | | |
| 94 | | | | | | | | |
| 96 | 29 | | | | | | | |
| 98 | | | | | | | | |
| 100 | 30 | | | | | | | |

D - Disturbed Sample U - Undisturbed Sample C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

M. MOSLY.

25

# RAYMOND INTERNATIONAL OF DELAWARE INC.
## CAIRO

Job: CA 27 — Location: PORT SAID HARBOUR

Borehole No. S 13 — Ground Elevation: 1.8m — Datum: MHWS

Date: 31 - 8 - 1977 - 1 - 9 — Diameter Casing: 114mm — Depth Cased: 39.7m

Boring Method: Rotery — Percussion — Foreman: MOUSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BLOWS/FT | Strata Legend | Strata Elev. 1.8m | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | | 12 | | | Yellow brown medium to fine GRAVEL little, trace silt, course to fine sand. | |
| 4 | | | | | | 0.1m | | |
| 6 | 2 | 2 | | 20 | | | | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | | | |
| 12 | 4 | 3 | | 19 | | | | |
| 14 | | | | | | | Grey course medium to fine SAND, trace silt. | |
| 16 | 5 | | | | | | | |
| 18 | | 4 | | 30 | | | | |
| 20 | 6 | | | | | | | |
| 22 | | | | | | | | |
| 24 | 7 | 5 | | 15 | | | | |
| 26 | 8 | | | | | | | |
| 28 | | | | | | - 6.6m | | |
| 30 | 9 | 6 | | 33 | | | Brown medium to fine SAND, shells. | |
| 32 | 10 | | | | | - 8.3m | | |
| 34 | | 7 | | | | | | |
| 36 | 11 | | | | | | Black fine SAND, little silt. | |
| 38 | | | | | | - 9.9m | | |
| 40 | 12 | 8 | | 12 | | | | |
| 42 | 13 | | | | | | | |
| 44 | | | | | | | | |
| 46 | 14 | 9 | | 11 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | 10 | | 10 | | | | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | | Black silty CLAY, trace fine sand | |
| 56 | 17 | 11 | | | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | 12 | | 4 | | | | |
| 64 | 19 | | | | | | | |
| 66 | | | | | | | | |
| 68 | 20 | 1 | [redacted] | RECY 100% | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample — U - Undisturbed Sample — C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows / ft. penetration

# RAYMOND INTERNATIONAL OF DELAWARE INC.

## CAIRO

Job: CA 27

Borehole No. S 14

Date : 25/9/1977. - 26 - 9

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR

Ground Elevation : 1.8m Datum : MHWS

Diameter Casing : 114mm Depth Cased : 39.7m

Foreman : M. KAMAL.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1.8m | | |
| 2 | | 1 | ☒ | 15 | | | Brown coarse medium to fine SAND, | |
| 4 | 1 | | | | | | and medium to fine gravel. | |
| | | | | | | 0.1m | | |
| 6 | 2 | 2 | ☒ | | | | Light brown medium to fine SAND. | |
| 8 | | | | | | | | |
| 10 | 3 | | | | | - 1.6m | | |
| 12 | | 3 | ☒ | 6 | | | | |
| 14 | 4 | | | | | | | |
| 16 | 5 | | | | | | | |
| 18 | | 4 | ☒ | 5 | | | Dark brown medium to fine SAND, | |
| 20 | 6 | | | | | | little silt. | |
| 22 | | | | | | | | |
| 24 | 7 | 5 | ☒ | 6 | | | | |
| 26 | 8 | | | | | - 6.4m | | |
| 28 | | 6 | ☒ | 33 | | | | |
| 30 | 9 | | | | | | | |
| 32 | 10 | | | | | | Brown fine SAND, trace silt, shells. | |
| 34 | | 7 | ☒ | 35 | | | | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | - 9.9m | | |
| 40 | 12 | 8 | ☒ | 15 | | | | |
| 42 | 13 | | | | | | Dark brown fine SAND, little silt. | |
| 44 | | 9 | ☒ | 9 | | | | |
| 46 | 14 | | | | | | | |
| 48 | | | | | | -13.3m | | |
| 50 | 15 | 10 | ☒ | 5 | | | | |
| 52 | | | | | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 11 | ☒ | 4 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | Black silty CLAY, trace fine sand. | |
| 62 | | 1 | ■ | 100% | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | 12 | ☒ | 4 | | | | |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

27

# RAYMOND INTERNATIONAL OF DELAWARE INC.
CAIRO

Job: CA 27

Location : PORT-SAID HARBOUR

Borehole No. 14

Ground Elevation : 1.0m Datum : MHWS

Date : 25/9/1977 - 26 - 9

Diameter Casing : 114mm Depth Cased : 39.7m

Boring Method : Rotery — Percussion

Foreman : M. KAMAL.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWSIFT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 2 | | 100% | | | | |
| 4 | | | | | | | | |
| 6 | 2 | | | | | | | |
| 8 | | | | | | | | |
| 10 | 3 | 13 | | 8 | | | | |
| 12 | | | | | | | | |
| 14 | 4 | | | | | | | |
| 16 | 5 | 3 | | 100% | | | | |
| 18 | | | | | | | | |
| 20 | 6 | | | | | | | |
| 22 | | | | | | | | |
| 24 | 7 | 14 | | 4 | | | | |
| 26 | 8 | | | | | | | |
| 28 | | 4 | | 100% | | | | |
| 30 | 9 | | | | | | | |
| 32 | | | | | | | | |
| 34 | 10 | 15 | | 4 | | | Black silty CLAY, trace fine sand. | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | | | |
| 40 | 12 | 5 | | 100% | | | | |
| 42 | | | | | | | | |
| 44 | 13 | | | | | | | |
| 46 | 14 | 16 | | 6 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | | | |
| 52 | | 6 | | 100% | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | 17 | | 6 | | | | |
| 58 | | | | | | | | |
| 60 | 18 | | | | | | | |
| 62 | | | | | | | | |
| 64 | 19 | 7 | | 100% | | -38.9m | | |
| 66 | 20 | | | | FOB 40.23m | | | |
| 68 | | | | | | | | |
| 70 | 21 | | | | | | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test (SPT)
140 Lb. weight dropping 30"
Record number blows / ft. penetration

# RAYMOND INTERNATIONAL OF DELAWARE INC.



CAIRO

Job: CA - 27

Borehole No. 15

Date : 4/9/1977. - 4 - 9 - 1977.

Boring Method : Rotery — Percussion

Location : PORT-SAID HARBOUR.

Ground Elevation 1.9m Datum : MWS

Diameter Casing : 114mm Depth Cased : 19.8m

Foreman : MOUSTAFA.

| Depth ft. | Depth ms. | Sample No. | Sample Type | S. P. T. BIOWS/FT | Strata Legend | Strata Elev. | Description | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1.9m | | |
| 2 | 1 | 1 | ☒ | 18 | | | Light brown medium to fine SAND, truce gravel. | |
| 4 | | | | | | | | |
| 6 | 2 | | | | | 0.2m | | |
| 8 | | 2 | ☒ | 14 | | | Brown CLAY and SILT, little fine sand. | |
| 10 | 3 | | | | | | | |
| 12 | | 3 | ☒ | 19 | | - 1.5m | | |
| 14 | 4 | | | | | | Brown medium to fine SAND, little medium to fine gravel. | |
| 16 | 5 | | | | | | | |
| 18 | | 4 | ☒ | 16 | | - 3.1m | | |
| 20 | 6 | | | | | | Grey course medium to fine SAND, shells. | |
| 22 | | | | | | 4.8m | | |
| 24 | 7 | 5 | ☒ | 21 | | | Grey medium to fine SAND. | |
| 26 | 8 | | | | | - 6.5m | | |
| 28 | | 6 | ☒ | 41 | | | | |
| 30 | 9 | | | | | | | |
| 32 | 10 | 7 | ☒ | 35 | | | Grey medium to fine SAND, truce silt, shells. | |
| 34 | | | | | | | | |
| 36 | 11 | | | | | | | |
| 38 | | | | | | - 9.8m | | |
| 40 | 12 | 8 | ☒ | 17 | | | | |
| 42 | 13 | | | | | | | |
| 44 | | | | | | | Dark grey SILT, little fine sand. | |
| 46 | 14 | 9 | ☒ | 19 | | | | |
| 48 | | | | | | | | |
| 50 | 15 | | | | | -13.2m | | |
| 52 | | 10 | ☒ | 4 | | | | |
| 54 | 16 | | | | | | | |
| 56 | 17 | | | | | | | |
| 58 | | 1 | ■ | 100% | | | | |
| 60 | 18 | | | | | | Black silty CLAY, truce fine sand. | |
| 62 | | 11 | ☒ | 4 | | | | |
| 64 | 19 | | | | | | | |
| 66 | 20 | | | | | | | |
| 68 | | 12 | ☒ | 6 | | -18.8m | | |
| 70 | 21 | | | | FOB 20.73m | | | |

D - Disturbed Sample

U - Undisturbed Sample

C. Core Sample

Standard Penetration Test ( SPT )
140 Lb. weight dropping 30"
Record number blows/ ft. penetration

# SUMMARY
# OF
# LABORATORY TESTS DATA

RAYMOND INTERNATIONAL INC.

# Soil Mechanics Laboratory Summary

Project : T.R.A. Por Sqid Date Oct 1977 Sheet 1 pf 7

| Borehole | Sample | Depth (ft) | PHYSICAL PROPERTY TESTS: Nat. Water Content % | Liquid Limit % | Plastic Limit % | Wet Density gm/cc | Grain Size Dist. | Grain Size + Hydrometer | Specific Gravity | Special Test | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9D | 41 | 38.2 | 27.1 | N.C | | | | | | |
| | 1U | | 60.2 | | | | | | | | |
| 2 | 1U | 65 | 67.7 | 28.4 | 23.3 | | | | | | |
| | 2U | 76 | 37.4 | 31.1 | 24.3 | | | | | | |
| | 3U | 86 | 36.1 | 35.7 | 24.7 | | | | | | |
| | 4U | 95 | 49.7 | 37.8 | 26.8 | | | | | | |
| | 5D | 20 | | | | | | | 2.68 | | |
| | 10D | 45 | 54,3 | 25.0 | NC | | | | | | |
| 3 | 1U | 41 | 52.3 | 28.6 | NC | | | | | | |
| | 2U | 51 | 32.1 | 72.5 | 41.2 | | | | | | |
| | 3U | 61 | 59.1 | 37.0 | 26.2 | | | | | | |
| | 4U | 71 | 40.2 | 48.3 | 31.0 | | | | 2.71 | | |
| | 6U | 90 | 51.5 | 60.4 | 37.1 | | | | | | |
| | 7U | 103 | 38.5 | | | | | | | | |
| | 8U | 113 | 48.0 | 75.9 | 44.9 | | | | | | |
| | 9U | 123 | 51.0 | 45.2 | 25.2 | | | | | | |
| | 11U | 143 | 92.7 | 55.9 | 27.2 | | | | 2.69 | | |
| | 12U | 157 | 84.7 | 71.8 | 48.5 | | | | 2.67 | | |
| | 13U | 169 | 77.6 | 78.1 | 44.6 | | | | | | |
| | 14U | 179 | 57.0 | 61.5 | 39.3 | | | | | | |
| | 15U | 189 | 64.1 | 51.5 | 42.4 | | | | | | |

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RAYMOND INTERNATIONAL INC.

# Soil Mechanics Laboratory Summary

Project : T.R.H. - Boat Said . Date Oct 1977 Sheet 2 of 7

| Borehole | Sample | Depth (ft) | PHYSICAL PROPERTY TESTS | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Nat. Water Content % | Liquid Limit % | Plastic Limit % | Wet Density gm/cc | Grain Size Dist. | Grain Size + Hydrometer | Specific Gravity | Special Test | |
| 3 | D2 | 7 | | | | | | | 2.65 | | |
| | D6 | 26 | | | | | | | 2.63 | | |
| | D8 | 36 | 22.0 | 19.3 | NC | | | | | | |
| | D9 | 46 | 36.7 | 25.8 | NC | | | | | | |
| | D10 | 56 | 47.2 | 20.4 | 20.0 | | | | | | |
| | D11 | 66 | 50.9 | | | | | | | | |
| | D12 | 75 | 46.4 | | | | | | | | |
| | D13 | 87 | | 19.1 | NC | | | | | | |
| | D14 | 95 | 66.8 | 72.3 | 45.6 | | | | | | |
| | D15 | 108 | 56.9 | | | | | | | | |
| | D16 | 118 | 56.5 | 65.1 | 29.9 | | | | | | |
| | D17 | 128 | 54.9 | | | | | | | | |
| | D18 | 138 | 57.1 | | | | | | | | |
| | D19 | 151 | 49.2 | | | | | | | | |
| | D20 | 162 | 49.6 | | | | | | | | |
| | D21 | 172 | 66.1 | | | | | | | | |
| | D22 | 183 | 57.0 | | | | | | | | |
| | D23 | 193 | 58.4 | | | | | | | | |
| | D24 | 196 | 65.2 | | | | | | | | |
| 4 | D2 | 5 | 9.6 | | | | | | 2.66 | | |
| | D5 | 20 | 15.1 | | | | | | | | |
| | D8 | 35 | 23.8 | | | | | | | | |
| | D9 | 40 | 23.8 | | | | | | | | |

RAYMOND INTERNATIONAL INC

# Soil Mechanics Laboratory Summary

Project : T.R.H. - Port Said. Date Oct 1977 Sheet 3 of 7

| Borehole | Sample | Depth (ft) | PHYSICAL PROPERTY TESTS | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Nat. Water Content % | Liquid Limit % | Plastic Limit % | Wet Density gm/cc | Grain Size Dist. | Grain Size + Hydrometer | Specific Gravity | Special Test | |
| 4 | U1 | 45 | 38.2 | 31.9 | NC | | | | | | |
| | U2 | 55 | 37.2 | 30.2 | NC | | | | 2.67 | | |
| | U3 | 65 | 39.5 | 31.7 | NC | | | | | | |
| SP5 | 1U | 68 | 57.1 | 63.6 | 37.2 | | | | | | |
| | 2U | 80 | 55.1 | 46.6 | 28.0 | | | | | | |
| | 4U | 105 | 63.0 | 46.0 | 28.0 | | | | | | |
| | 12D | 61 | 35.9 | 58.0 | 24.4 | | | | | | |
| | 13D | 75 | 47.3 | 52.1 | 32.9 | | | | | | |
| | 14D | 89 | 53.0 | 55.6 | 40.0 | | | | | | |
| | 15D | 100 | 50.2 | — | — | | | | | | |
| | 16D | 112 | 49.5 | 42.3 | 25.3 | | | | | | |
| | 17D | 123 | 58.9 | — | — | | | | | | |
| | 18D | 135 | 55.6 | 57.8 | 34.1 | | | | | | |
| 6 | D4 | 15 | 17.4 | | | | | | | | |
| | D8 | 35 | 23.2 | | | | | | | | |
| | D9 | 40 | 23.2 | | | | | | | | |
| | D10 | 45 | 37.6 | 28.1 | NC | | | | | | |
| | D11 | 50 | 35.9 | | | | | | | | |
| | D12 | 60 | 38.1 | | | | | | | | |
| | D13 | 70 | 40.1 | 44.5 | 28.2 | | | | | | |
| | D14 | 80 | 52.9 | 42.1 | 21.0 | | | | | | |
| | D15 | 90 | 25.2 | 28.4 | 30.4 | | | | | | |
| | U1 | 55 | 44.7 | 38.0 | 24.6 | | | | | | |
| | U2 | 65 | 52.8 | 35.4 | 20.8 | | | | | | |

RAYMOND INTERNATIONAL INC.

# Soil Mechanics Laboratory Summary

Project : TB R . H. Dort Said Date Oct 1977 Sheet 4 of 7

| Borehole | Sample | Depth (ft) | PHYSICAL PROPERTY TESTS | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Nat. Water Content % | Liquid Limit % | Plastic Limit % | Wet Density gm/cc | Grain Size Dist. | Grain Size + Hydrometer | Specific Gravity | Special Test | |
| 7 | 1U | 50 | 46.4 | 34.2 | 20.4 | | | | | | |
| | 2U | 60 | 41.2 | 37.5 | 19.2 | | | | 2.70 | | |
| | D2 | 5 | 7.6 | | | | | | | | |
| | D5 | 20 | 17.8 | | | | | | 2.71 | | |
| | D8 | 35 | 25.8 | | | | | | | | |
| | D9 | 40 | 46.5 | | | | | | | | |
| | D10 | 45 | 47.3 | | | | | | | | |
| 8 | U1 | 45 | 41.2 | 28.9 | NC | | | | | | |
| | U2 | 52 | 47.4 | 29.3 | 21.2 | | | | | | |
| | U3 | 64 | 68.7 | | | | | | | | |
| | U4 | 75 | 45.5 | | | | | | 2.69 | | |
| | U5 | 87 | 56.3 | 59.3 | 29.3 | | | | | | |
| | D3 | 10 | 13.9 | | | | | | | | |
| | D7 | 30 | 23.9 | | | | | | | | |
| | D9 | 40 | 44.6 | 41.5 | 25.7 | | | | | | |
| | D10 | 60 | 49.9 | | | | | | | | |
| 9 | D13 | 66 | 59.6 | | | | | | | | |
| | D14 | 78 | 61.6 | | | | | | | | |
| | D15 | 89 | 37.3 | | | | | | | | |
| | D16 | 101 | 62.9 | | | | | | | | |
| 11 | D11 | 55 | 34.6 | 33.4 | 27.5 | | | | | | |
| | D12 | 60 | 56.1 | 37.0 | 19.5 | | | | | | |
| | D13 | 72 | 57.8 | 61.9 | 33.9 | | | | | | |
| | D14 | 82 | 56.7 | | | | | | | | |
| | D15 | 93 | 58.0 | | | | | | | | |

RAYMOND INTERNATIONAL INC

# Soil Mechanics Laboratory Summary

Project : T.R.H. - Port Said. Date Oct 1977 Sheet 5 of 7

| Borehole | Sample | Depth (ft) | PHYSICAL PROPERTY TESTS: Nat. Water Content % | Liquid Limit % | Plastic Limit % | Wet Density gm/cc | Grain Size Dist. | Grain Size + Hydrometer | Specific Gravity | Special Test | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | D16 | | 60.1 | | | | | | | | |
| | D17 | | 50.2 | | | | | | | | |
| | D18 | 130 | 39.3 | 53.3 | 33.3 | | | | | | |
| 12 | U1 | 55 | 51.7 | 34.9 | 20.8 | | | | | | |
| | D9 | 40 | 27.6 | 24.6 | NC | | | | | | |
| 14 | U1 | 60 | 47.7 | 34.6 | 30.0 | | | | | | |
| | U2 | 71 | 46.4 | 44.9 | 27.7 | | | | | | |
| | U6 | 110 | 55.5 | 81.2 | 47.6 | | | | | | |
| | U7 | 131 | 45.5 | 64.8 | 36.1 | | | | | | |
| | D11 | 55 | 60.3 | | | | | | | | |
| | D12 | 66 | 53.8 | 54.6 | 28.2 | | | | | | |
| | D13 | 77 | | | | | | | | | |
| | D14 | 92 | 40.5 | 47.8 | 31.2 | | | | | | |
| | D15 | 103 | 54.8 | 85.9 | 37.0 | | | | | | |
| | D16 | 114 | 63.0 | | | | | | | | |
| | D17 | 126 | 51.5 | 69.5 | 48.8 | | | | | | |
| 3 | 5U | | | | | | | | | | |
| | 19D | | | | | | | | | | |
| 3 | 6D | | | | | | | | 25 | | |
| | 8D | | | | | | | | 10 | feeect of | |
| | 10D | | | | | | | | 10 | HYDROCHLORIC acid | |
| | U8 | | | | | | | | 20 | solution on | |
| | U10 | | | | | | | | 10 | soils | |
| | U15 | | | | | | | | 10 | No Cinnic | |

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RAYMOND INTERNATIONAL INC

# Soil Mechanics Laboratory Summary

Project : T.R.H. Port Said. Date Oct 1977 Sheet 6 of 7

| Borehole | Sample | Depth (ft) | PERFORMANCE PROPERTIES TESTS: Consolidation Test (diam: 63.5mm) | Direct Shear (diam: 63.5mm) | Unconfined Compression (kg/cm²) | Laboratory Vane Shear (kg/cm²) | Triaxial Shear | Special Test | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1+2 | 5 | | | $\phi$ = 30° | | | | | |
| | | | | C = 0kg/cm² | | | | | |
| 1 | 1U | 61 | | | 1.20 | 1.44 | | | |
| 2 | 1U | 65 | | | * | 0.19 | | | |
| | 2U | 76 | | | | 0.31 | | | |
| | 3U | 86 | | | 0.81 | 0.72 | | | |
| | 4U | 95 | | | 0.50 | 0.26 | | | |
| 3 | 1U | 41 | | | | 1.52 | | | |
| | 2U | 51 | | | | 1.48 | | | |
| | 3U | 61 | | | 1.50 | 1.12 | | | |
| | 4U | 71 | Cc = 0.56 | | 0.90 | 1.98 | | | |
| | | | Pc = 1.60kg/cm² | | | | | | |
| | 6U | 90 | Cc= 0.60 | | 0.80 | 0.90 | | | |
| | | | Pc= 1.10kg/cm² | | | | | | |
| | 7U | 103 | | | —— | 0.46 | | | |
| | 8U | 113 | | | —— | 0.53 | | | |
| | 9U | 123 | | | 0.72 | 1.38 | | | |
| | 11U | 143 | Pc= 0.79kg/cm² | | | | | | |
| | | | Cc= 0.62 | | | | | | |
| | 12U | 157 | Pc= 0.80kg/cm² | | | | | | |
| | | | Cc= 0.64 | | | | | | |
| | 13U | 169 | | | 0.30 | 0.26 | | | |

RAYMOND INTERNATIONAL INC.

# Soil Mechanics Laboratory Summary

PROJECT: F.R.H - Port Sand DATE: Oct 1977 SHEET: 7 OF 7

| Borehole | Sample | Depth (ft.) | PERFORMANCE PROPERTIES TESTS | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Consolidation Test (diam: 63 mm) | Direct Shear (diam: 63.5mm) | Unconfined Compression (kg/cm²) | Laboratory Vane Shear (kg/cm²) | Triaxial Shear | Special Test | | |
| 3 | 14.0 | 179 | | | – | 1.40 X | | | | |
| | 15.0 | 189 | | | 1.50 | [illegible] X | | | | |
| 4 | 1.0 | 45 | | | | [illegible] X | | | | |
| | 2.0 | 55 | | | | [illegible] X | | | | |
| | 4.0 | 65 | | | | [illegible] | | | | |
| 6+7 | 5 | | | φ = 32.3° c = [illegible] | | | | | | |
| 6 | 1-2 | 25 | | | 0.15 | [illegible] | | | | |
| 7 | 0-1 | 55 | | | | [illegible] | | | | |
| | 0-2 | 60 | | | | [illegible] | | | | |
| 8 | 0-4 | 75 | | | | [illegible] | | | | |
| | 0-5 | 85 | | | | [illegible] | | | | |
| 12 | 0-1 | | | | [illegible] (P.P.) | [illegible] | | | | |
| 9 | U-3 | 96' | $C_c = 0.52$ $P_c = 0.9$ | | | | | | | |

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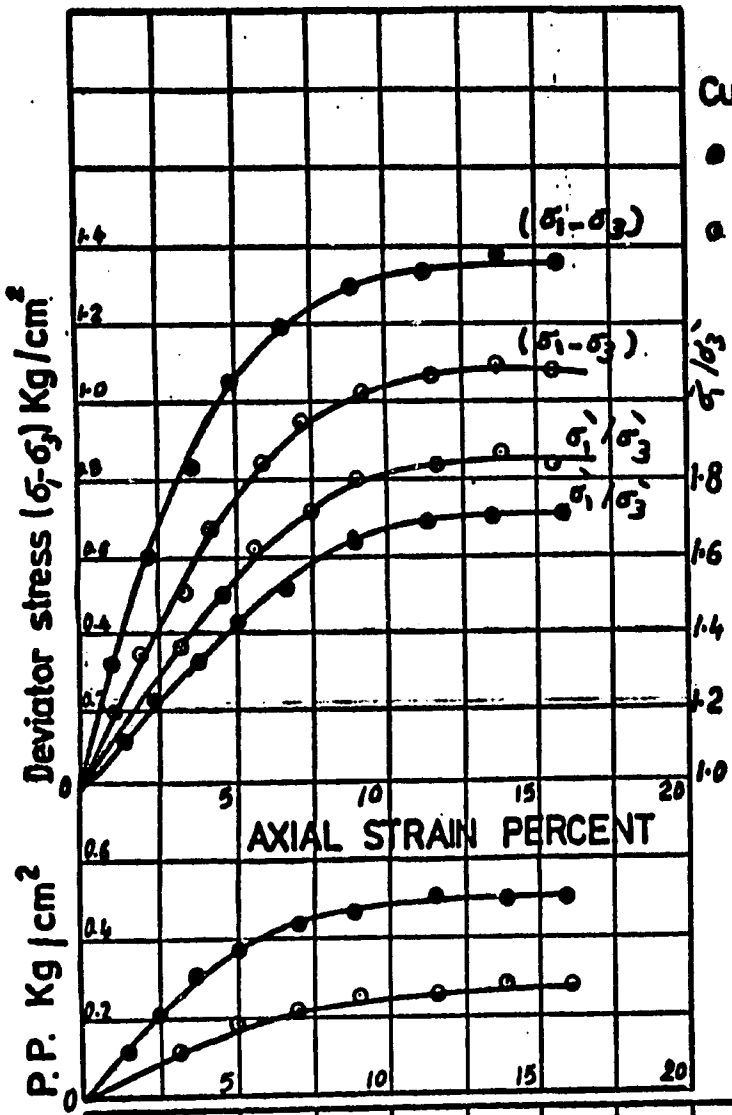
# LABORATORY TESTS DATA

SHEAR TESTS DATA

- CU TRIAXIAL TESTS
- UU TRIAXIAL TESTS
- LABORATORY VANE SHEAR TESTS
- FIELD VANE SHEAR TESTS

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| ● 1 | 2.5 | 31.8 | 1.95 | |
| ○ 2 | 1.5 | 31.8 | 1.05 | |
| 3 | | | | |

TYPE C.U. Tests

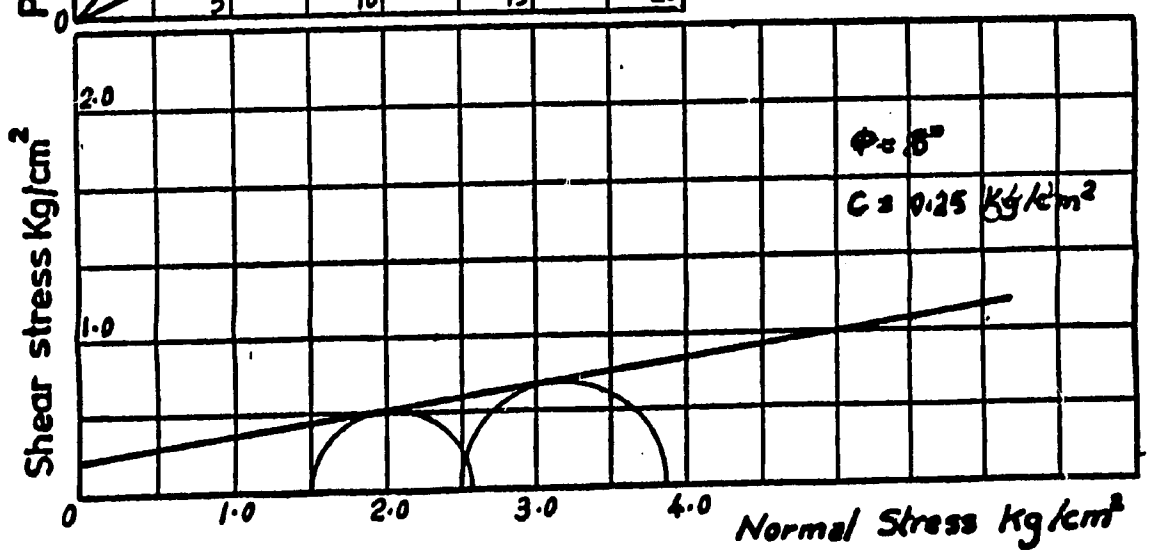
$(\Delta V/V)$ during consolidation = 4.36% 2.95%

SOIL CLASSIFICATION

Med dark grey clayey silt to silty clay interlayered with fine silty sand with broken shells

BORING No S-4 U-2

DEPTH 55 - 57




Location : Port Said Harbour

For : Raymond International - Cairo

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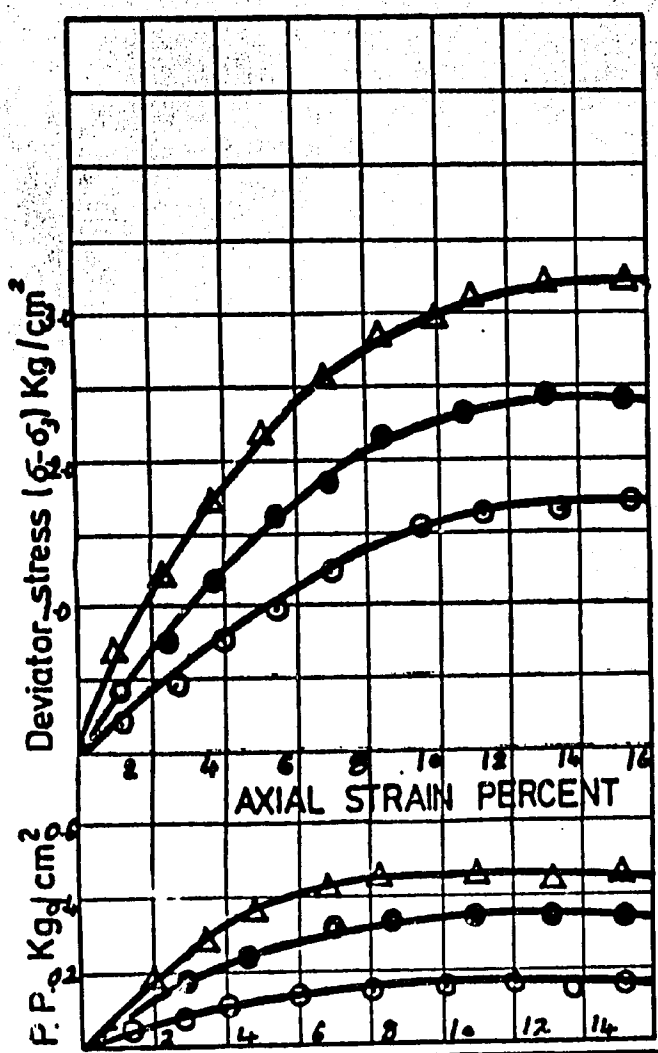
# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma$. |
|---|---|---|---|---|---|
| ① 1 | 1.5 | 52.7 | 1.75 | 1 | 1.64 |
| ● 2 | 2.5 | 53.9 | 2.4 | | 1.63 |
| △ 3 | 3.5 | | 3.2 | | |

TYPE C.U. Tests

SOIL CLASSIFICATION

Dark grey med silty clay

BORING No SP5-U-5

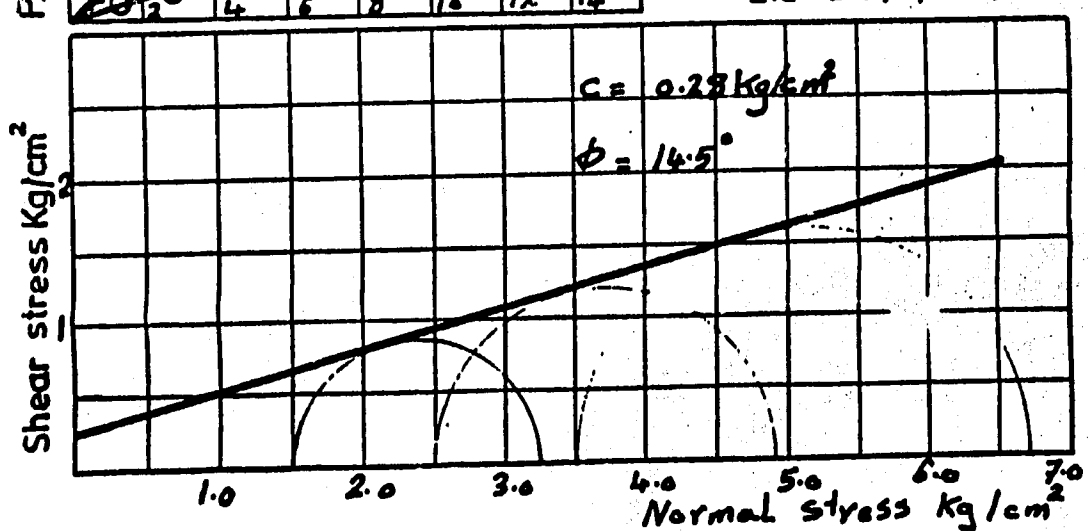
DEPTH 117-119'

Strain rate = :012 in/min

Sample size: D = 3.8 cm

H = 7.6 cm

L.L = 71.4 P.L = 29.9




Location: Port Said Harbour

For: Raymond International - Cairo

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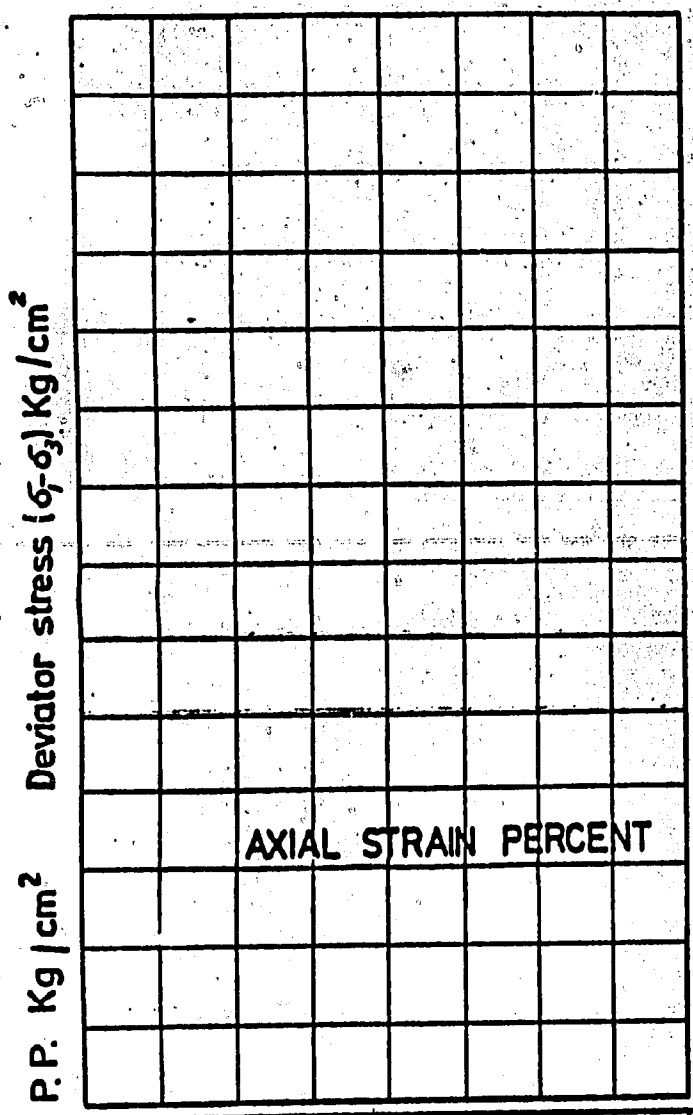
# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

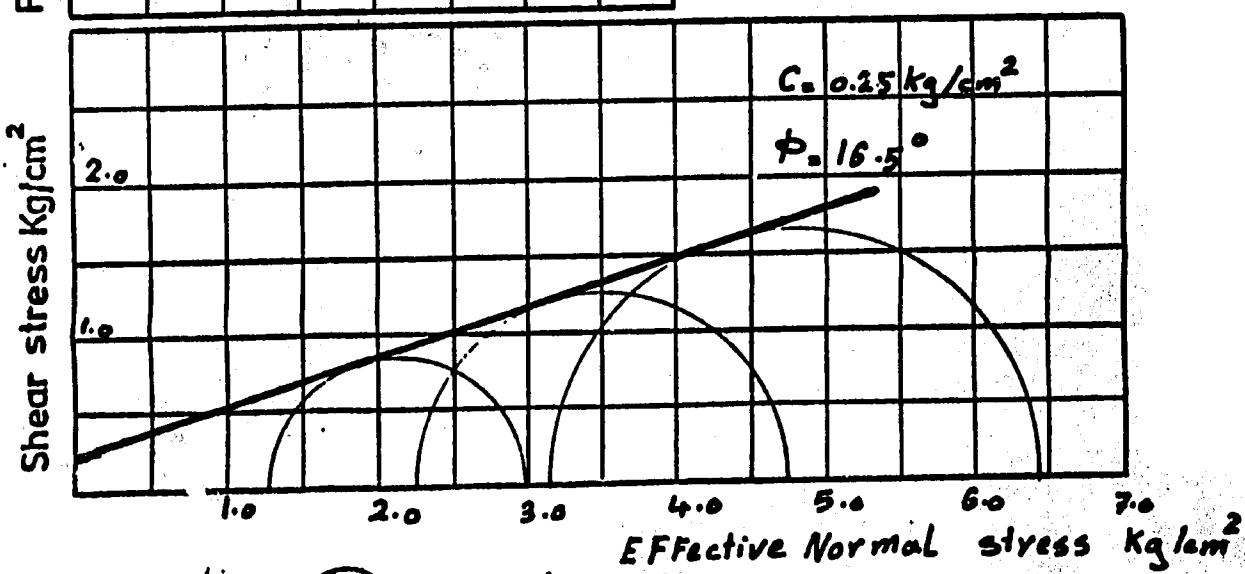
TYPE C.U Test

SOIL CLASSIFICATION

Dark grey med. silty clay

BORING No SP5-U-5

DEPTH 117-119




Location : Port Said Harbour

For : Raymond International - Cairo

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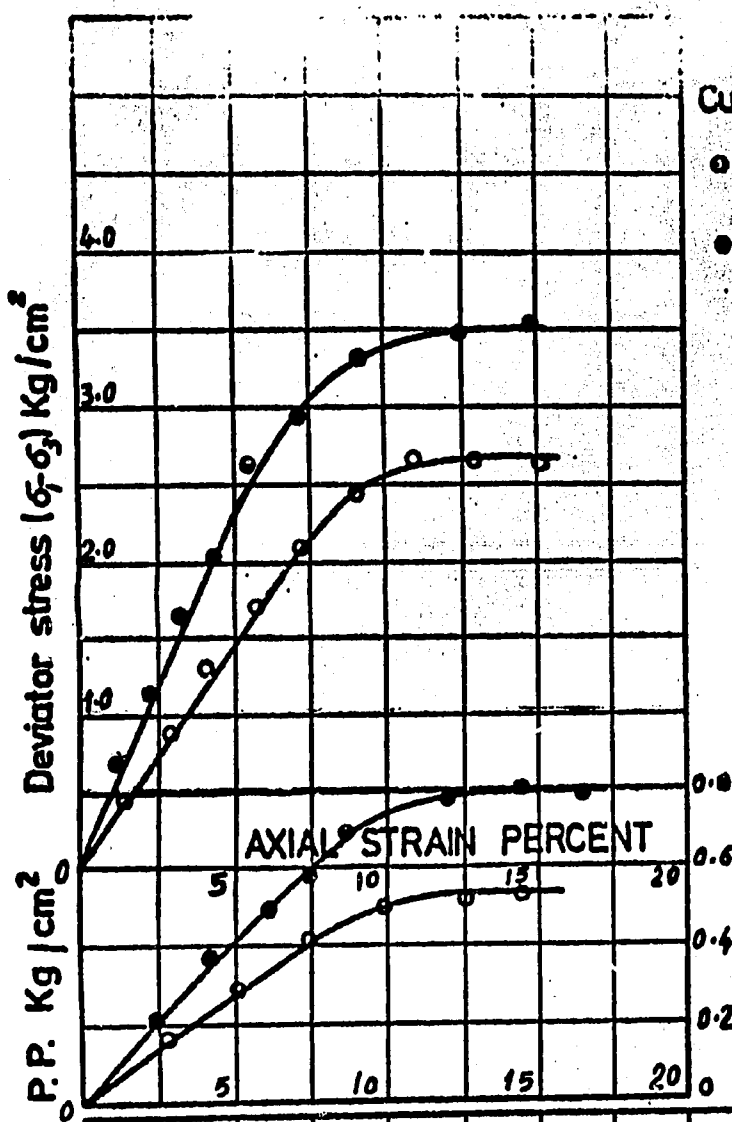
# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| ○ 1 | 1.5 | 38.1 | 2.65 | |
| ● 2 | 2.5 | 38.1 | 3.5 | |
| 3 | | | | |

TYPE *C.U. Tests*

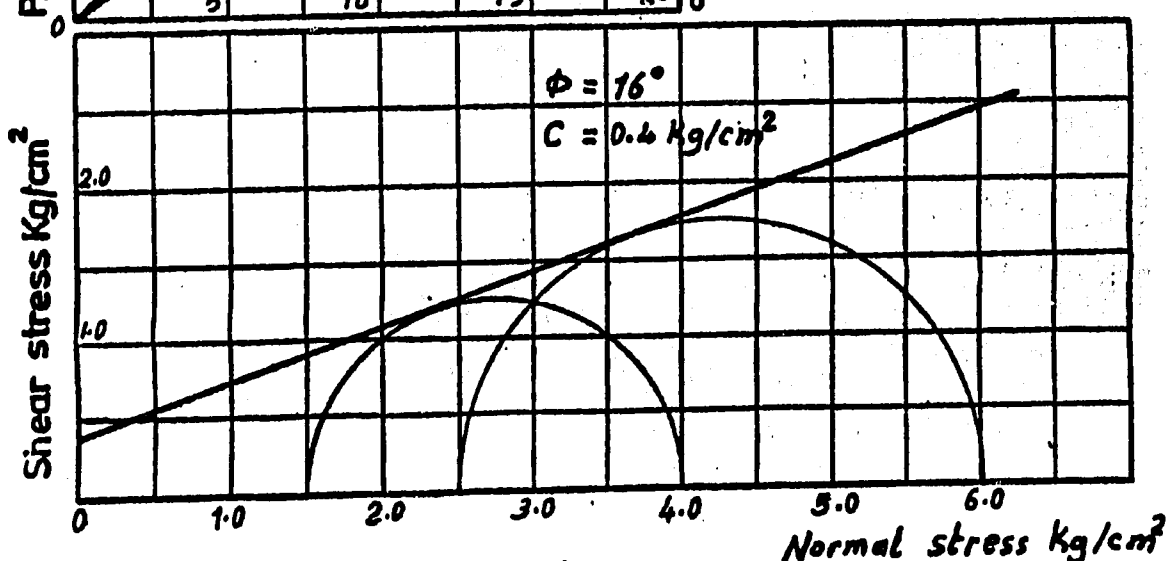
*$(\Delta V/V)$ during consolidation = 6.65, 8.1%*

SOIL CLASSIFICATION

*Dark grey fine to med. silty sand interlayed with clayey silt with broken shells*

BORING No *S.6 U-1*

DEPTH *55' - 57'*




*Location: Port Said Harbour*

*For : Raymond International-Cairo*

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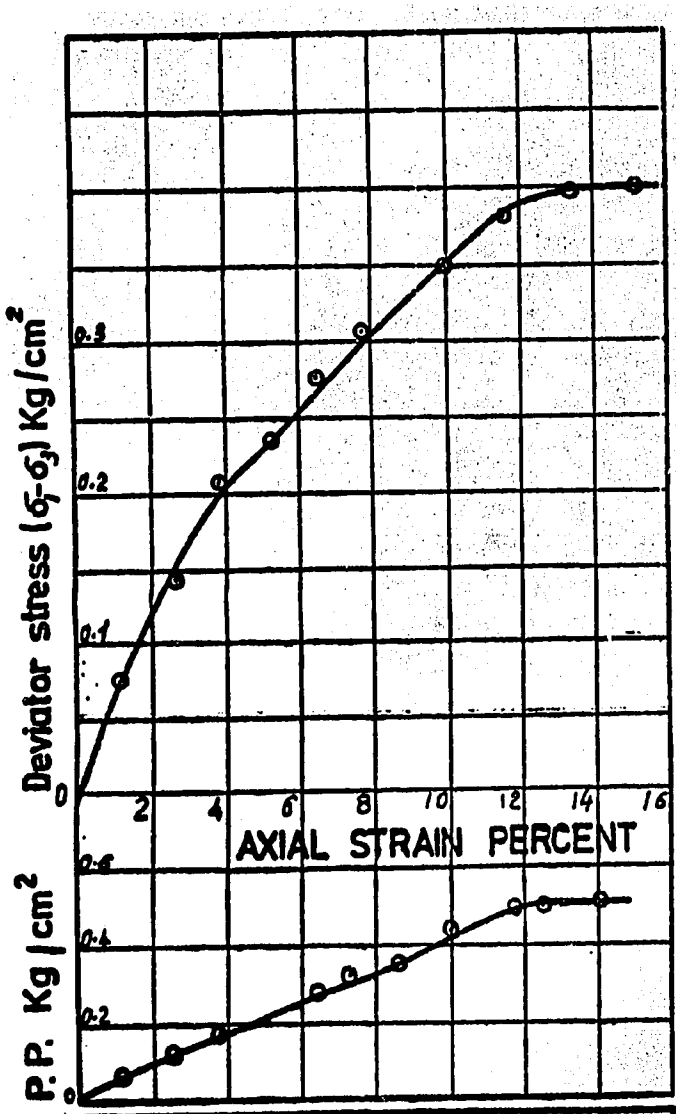
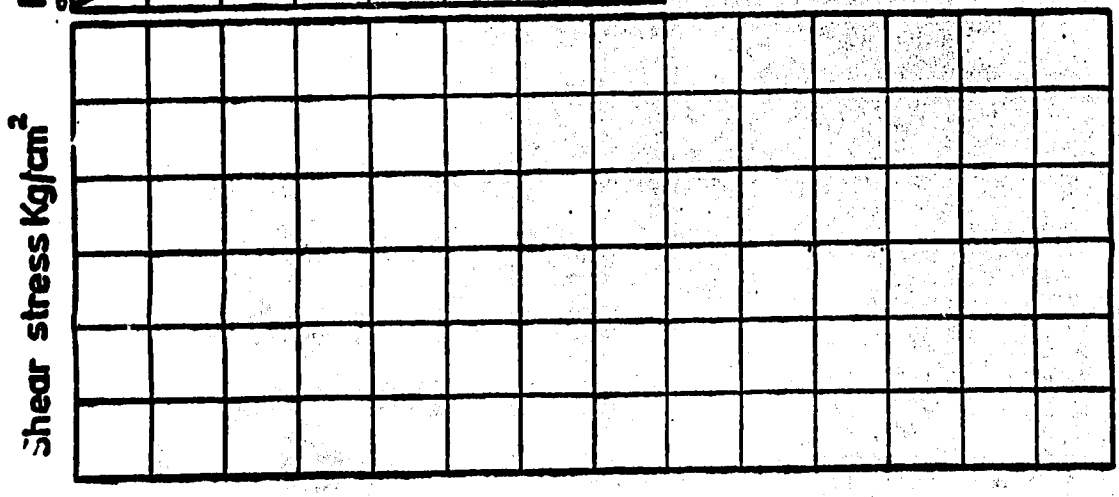
# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% | $\gamma T/_1$ |
|---|---|---|---|---|---|
| 1 | 1.5 | 71% | 0.40 | | 1.55 |
| 2 | | | | | |
| 3 | | | | | |

TYPE: C.U. Test

SOIL CLASSIFICATION
Very soft dark grey silty silty clay interlayed with silty sand with broken shells and traces of micr.

BORING No S-8 U-3

DEPTH 64'-66'

Location: Port Said Harbour
For : Raymond International-Cairo

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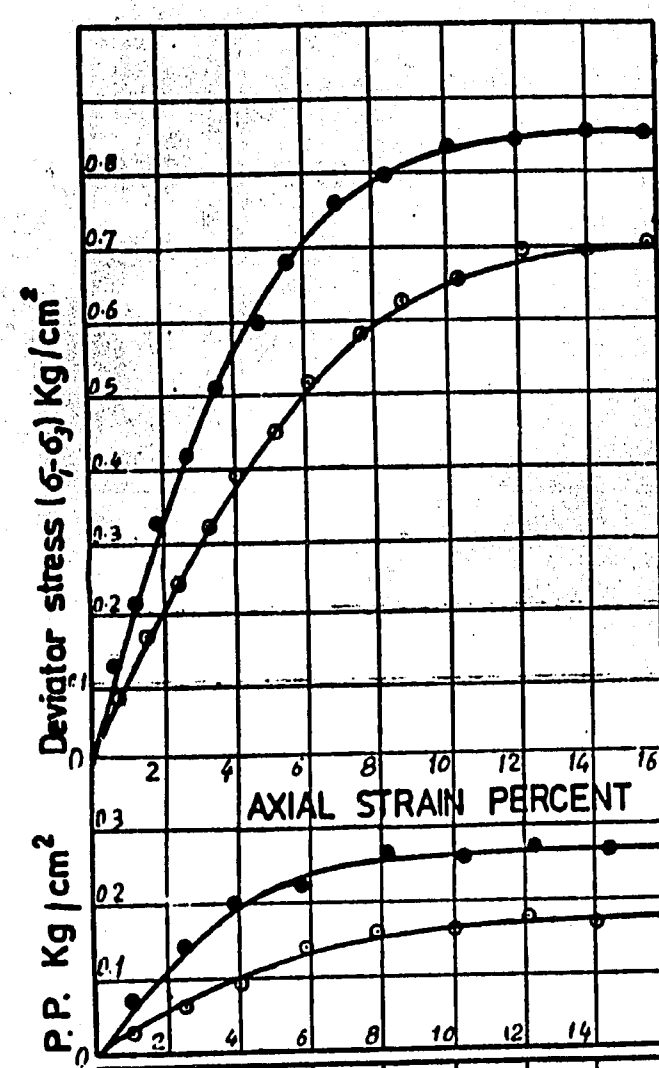
# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% | $\gamma_{wet}$ |
|---|---|---|---|---|---|
| ○ 1 | 0.5 | 60.8 | 0.7 | 58. | 1.61 |
| ● 2 | 1.0 | 59.5 | 0.84 | 53.7 | |
| 3 | | | | | |

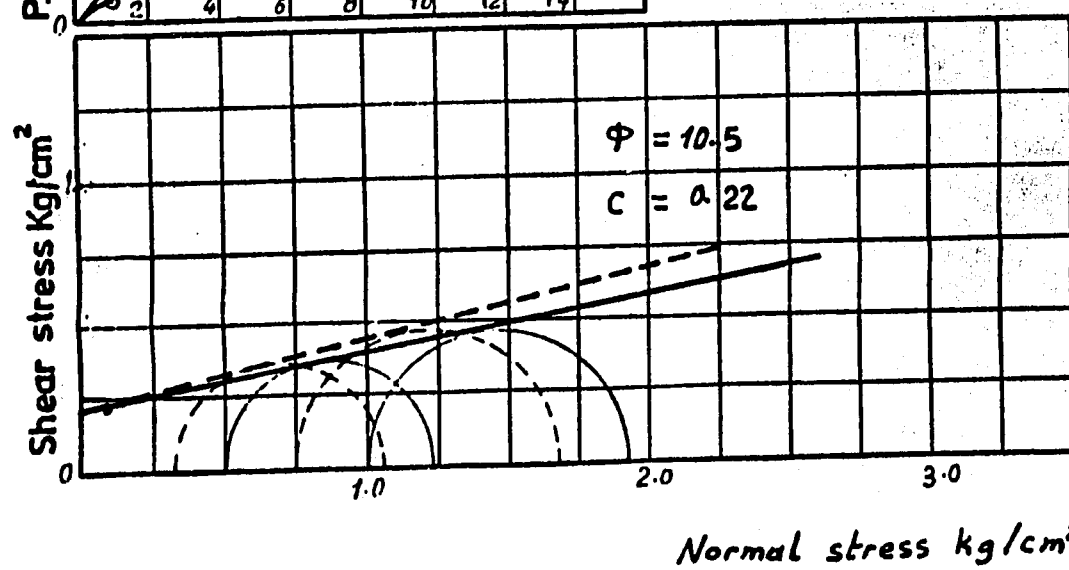
TYPE C.U. Tests

SOIL CLASSIFICATION
Med. dark grey silty clay with pockets of clayey silt

BORING Nº 10-3

DEPTH 89'

L.L. = 80% P.L = 23%

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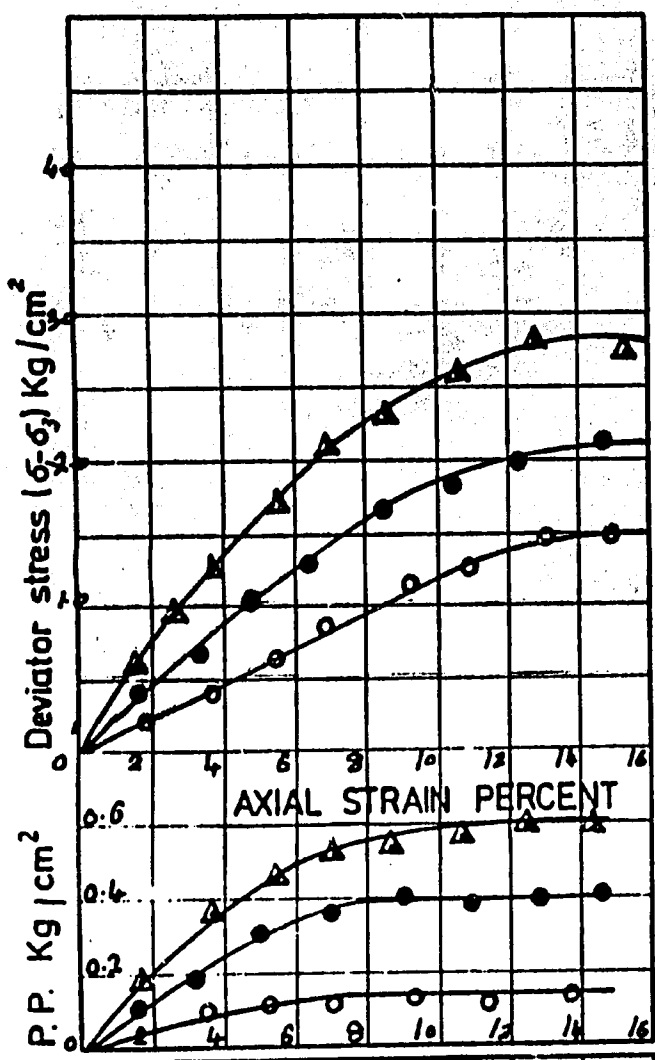
# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma_{dry}$ |
|---|---|---|---|---|---|
| ○ 1 | 1.5 | 57.1 | 1.5 | 56 | 1.72 |
| ● 2 | 2.5 | 58.5 | 2.1 | 56.4 | 1.73 |
| ▲ 3 | 3.5 | 57.5 | 2.75 | 54 | 1.72 |

TYPE C.U. Tests

SOIL CLASSIFICATION
Dark grey med. silty clay

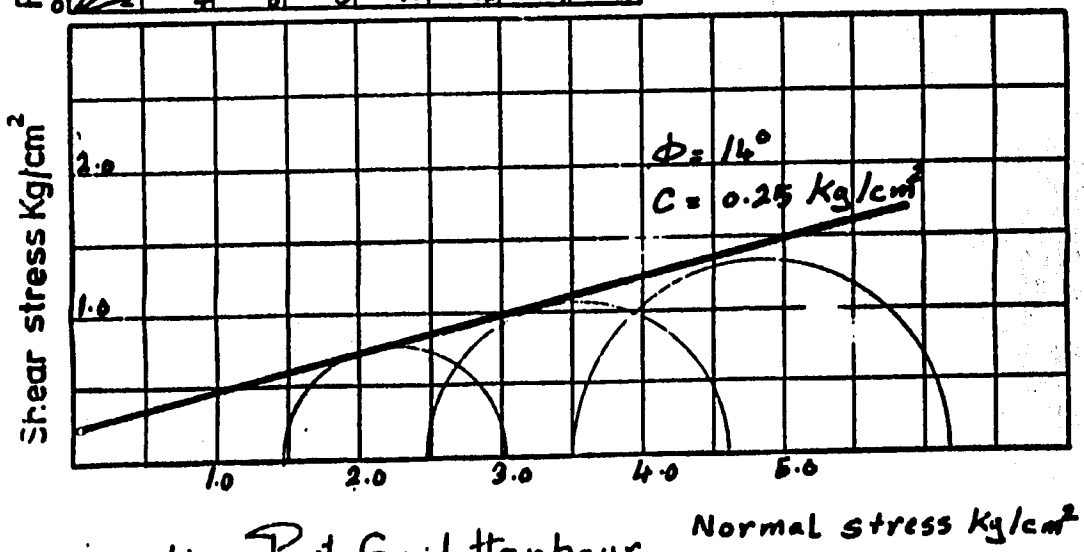
BORING Nº S-14 U-1

DEPTH 60'-62'

L.L = 73.5% P.L = 25.9%

Strain rate = .012 in/min

Sample size D = 3.8 cm
H = 7.6 cm




Location: Port Said Harbour
For : Raymond International - Cairo

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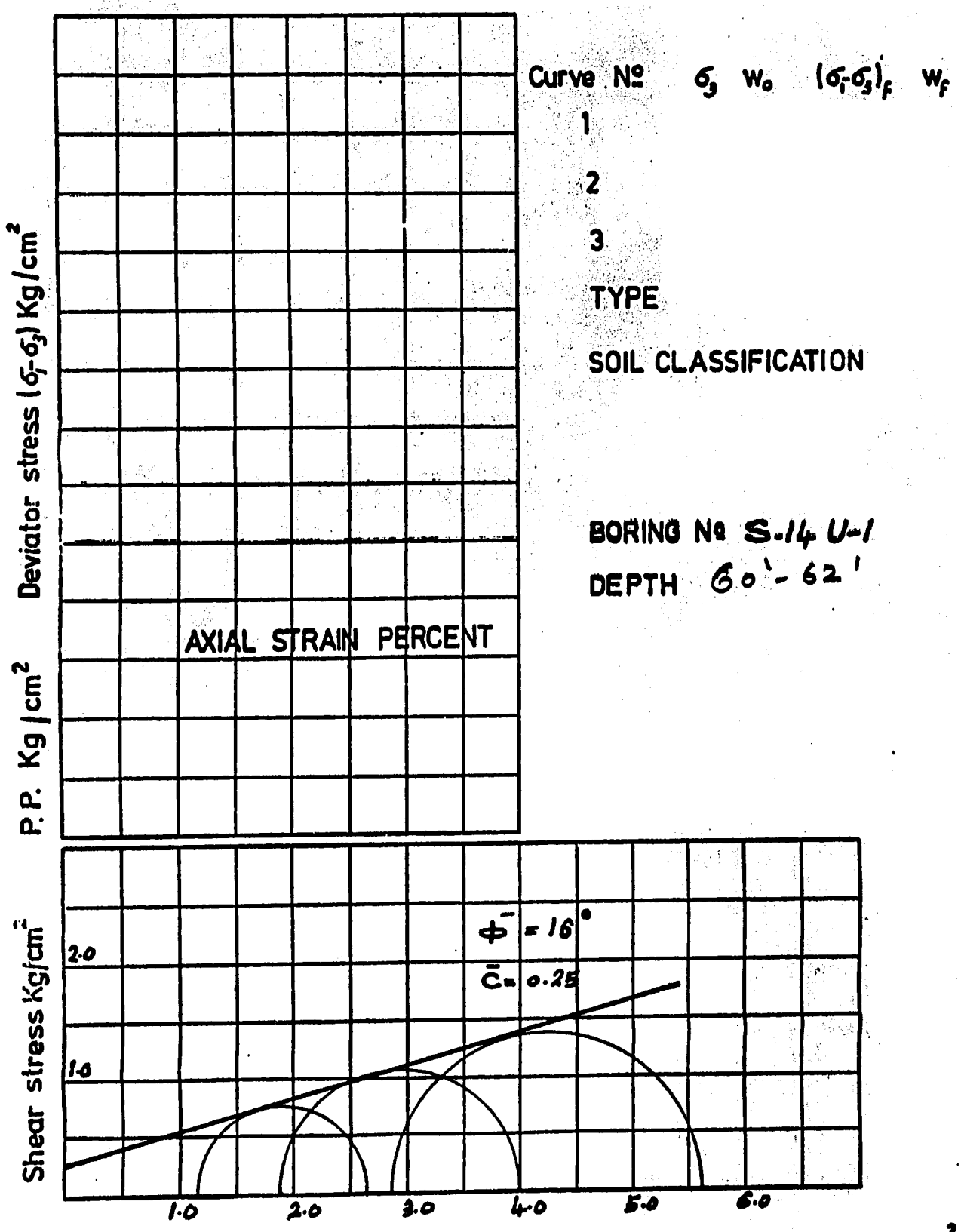
4/0

# TRIAXIAL SHEAR TESTS




Location: Port Said Harbour

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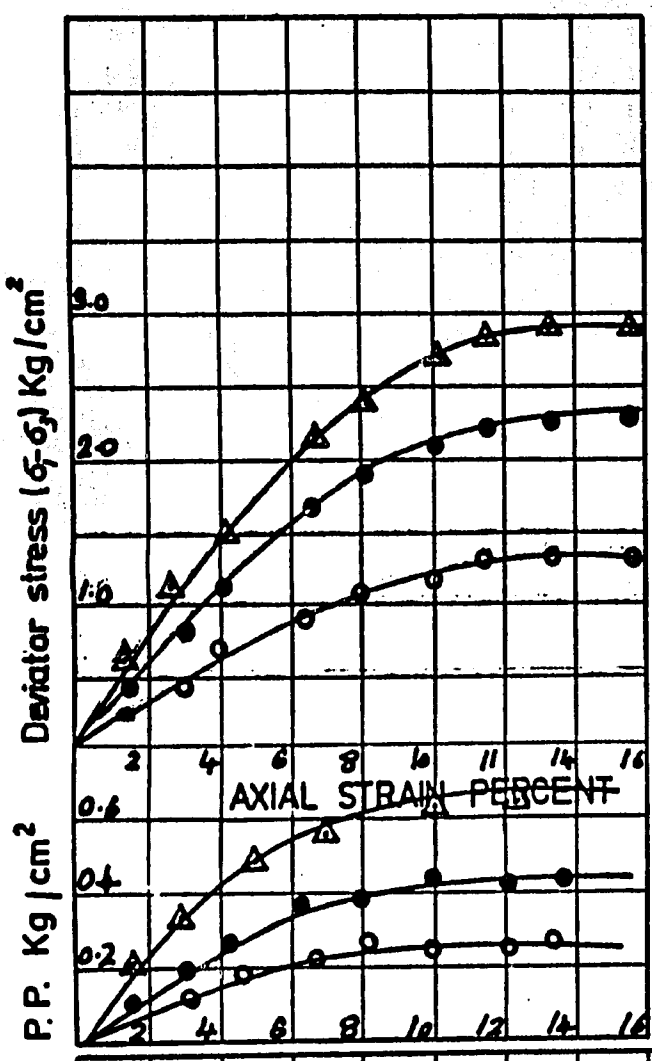
# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma_{wet}$ |
|---|---|---|---|---|---|
| ○ 1 | 1.5 | 57 | 1.35 | 56.0 | 1.74 |
| ● 2 | 2.5 | 57.8 | 2.35 | 55.0 | |
| △ 3 | 3.5 | 56.7 | 2.9 | | |

TYPE CU. Tests.

SOIL CLASSIFICATION

Dark grey med. silty clay with pockets of Fine sandy silt

BORING No S.14 U=2

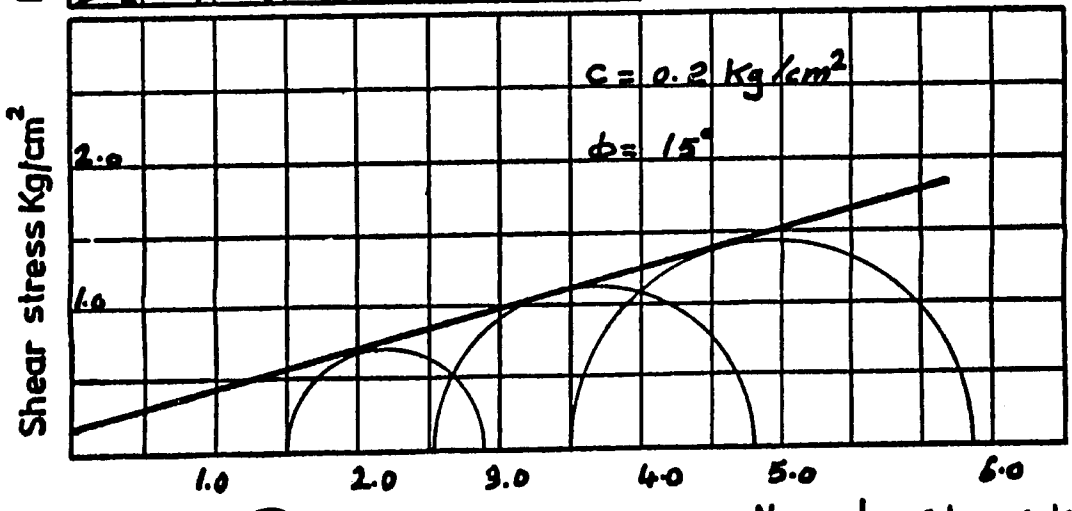
DEPTH 72'-74'

Strain rate: .012 in/min

Sample size D= 3.8cm

H = 7.6cm

L.L = 72 P.L =




Location: Port Said Harbour

For: Raymond International - Cairo

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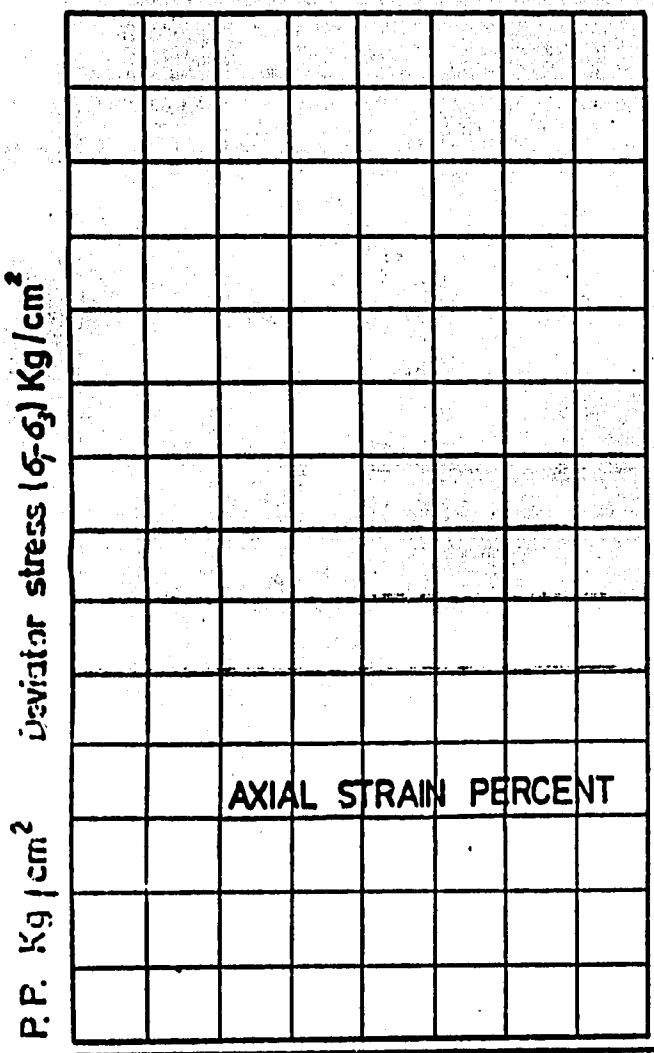
# TRIAXIAL SHEAR TESTS



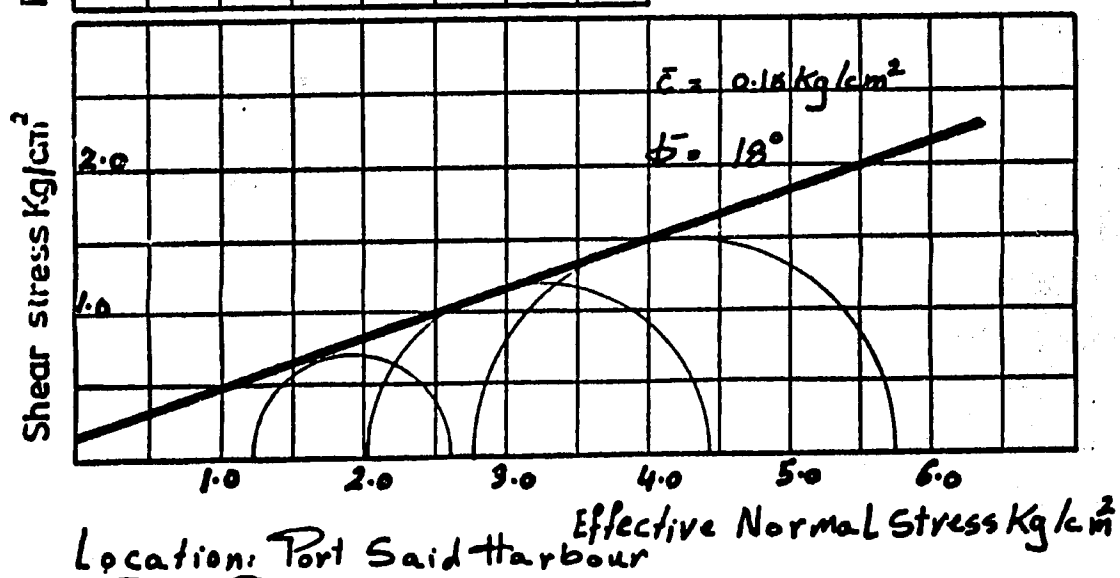

| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

TYPE

SOIL CLASSIFICATION Dark grey med. silty clay

BORING No S-14 U-2

DEPTH




Location: Port Said Harbour

For: Raymond International - Cairo

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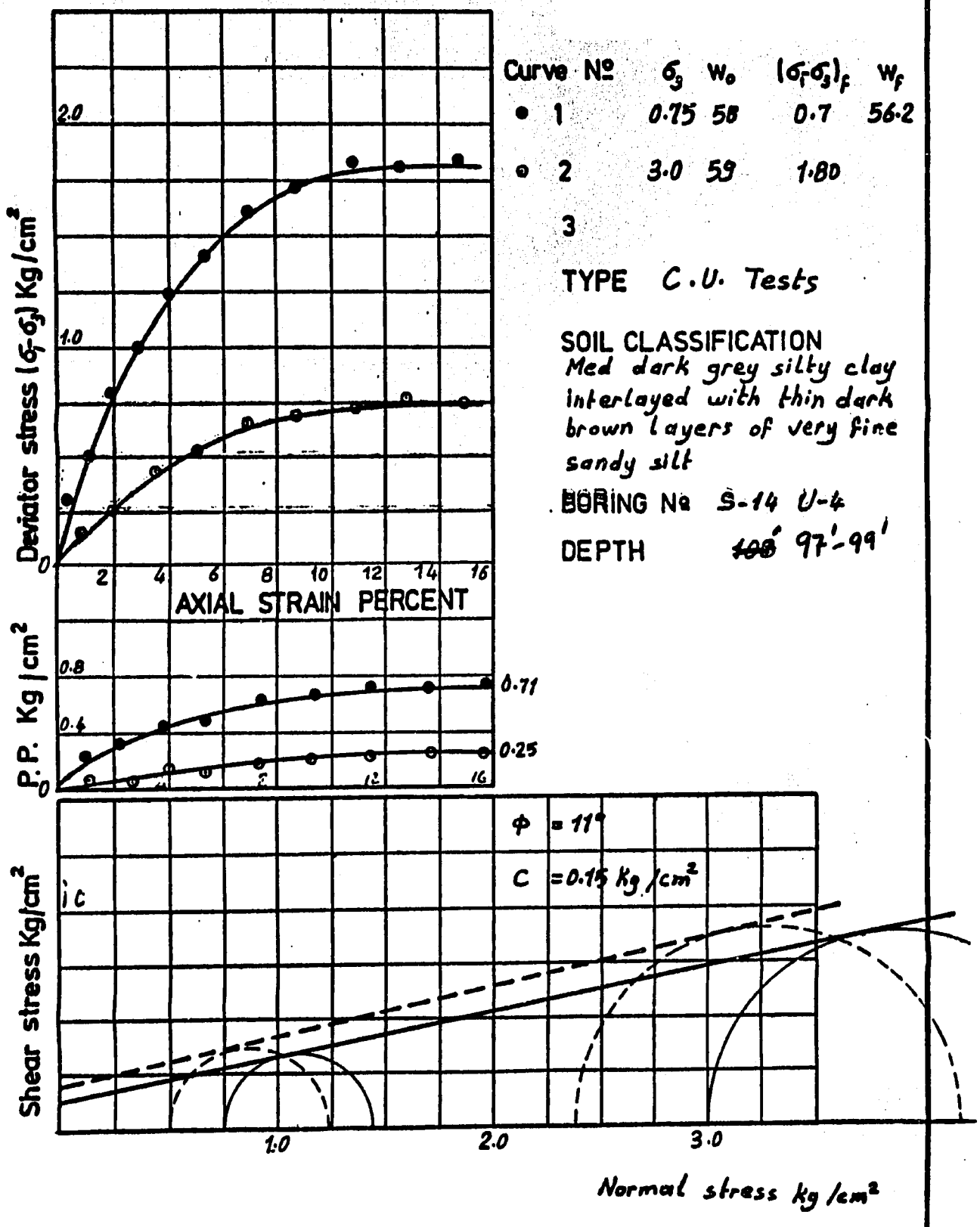
# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ |
|---|---|---|---|---|
| ● 1 | 0.75 | 58 | 0.7 | 56.2 |
| ○ 2 | 3.0 | 59 | 1.80 | |
| 3 | | | | |

TYPE C.U. Tests

SOIL CLASSIFICATION
Med dark grey silty clay interlayed with thin dark brown layers of very fine sandy silt

BORING No S-14 U-4

DEPTH ~~108'~~ 97'-99'

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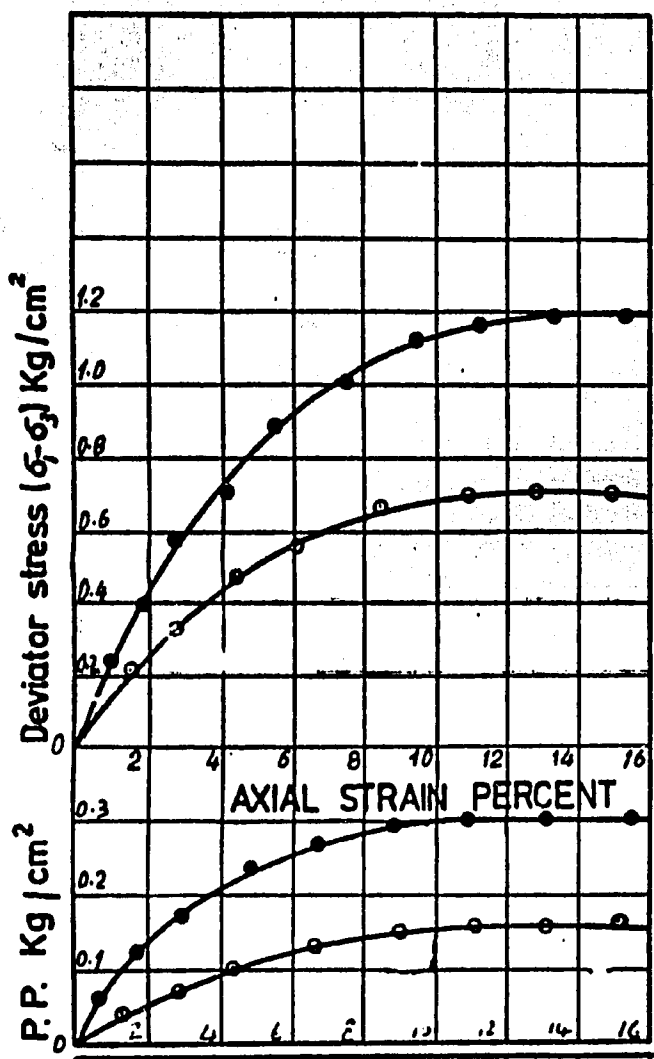
# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ |
|---|---|---|---|---|
| ● 1 | 0.7 | 60.8 | 0.7 | |
| ● 2 | 2.5 | 55.6 | 1.2 | 50.3 |
| 3 | | | | |

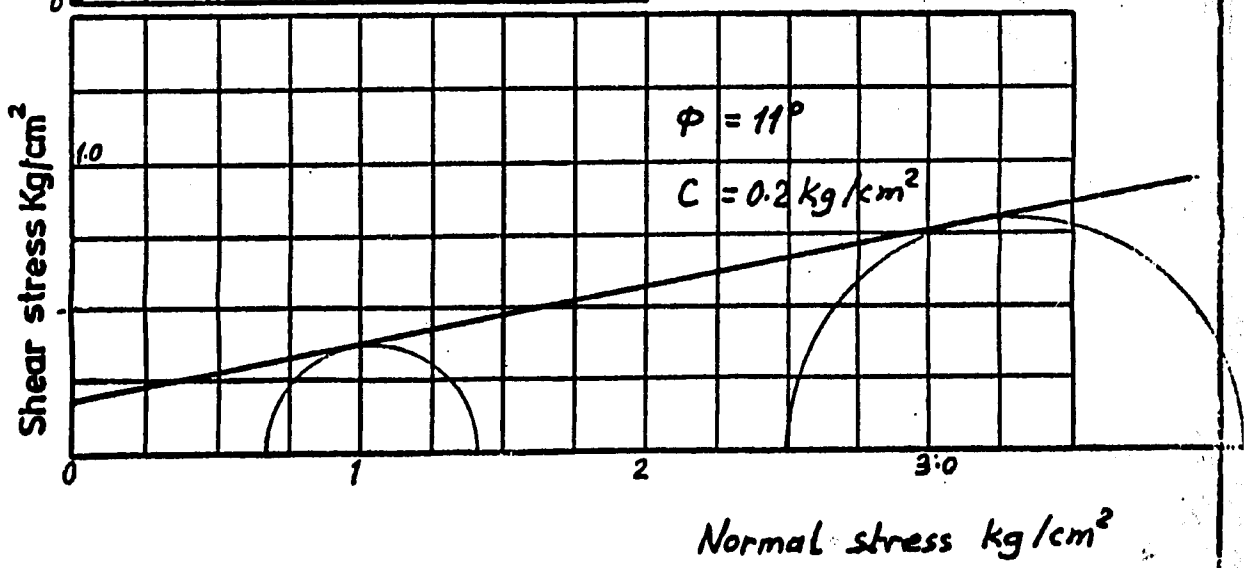
TYPE C.U. Tests

SOIL CLASSIFICATION
Soft dark grey silty clay

BORING Nº S14-U-5

DEPTH 110′

L.L = 76 % P.L = 26 %

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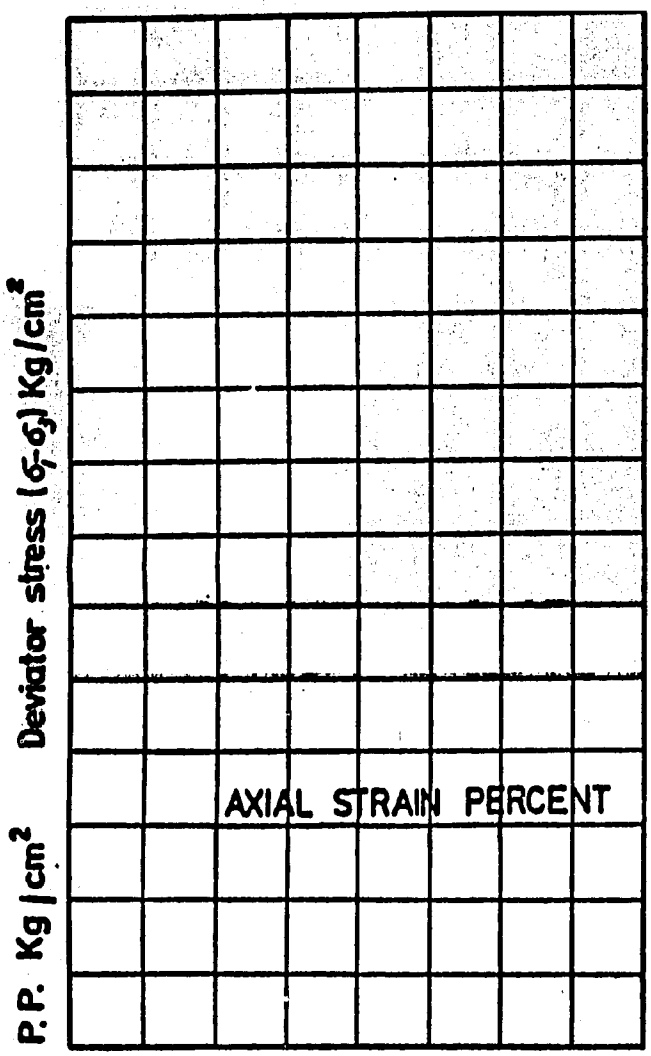
# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

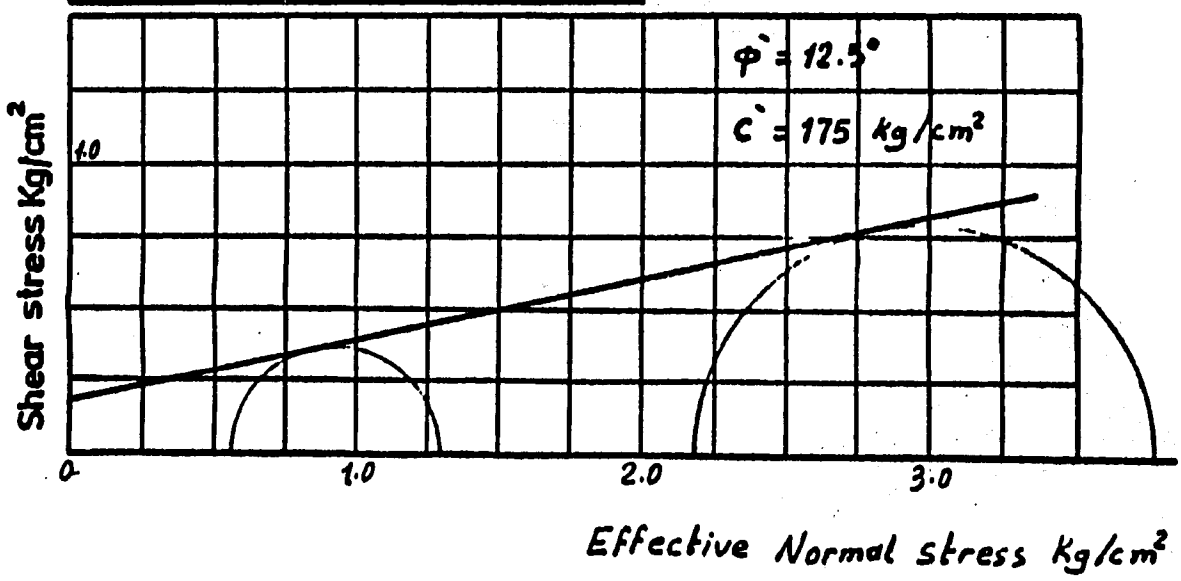
TYPE

SOIL CLASSIFICATION

*soft dark grey silty clay.*

BORING Nº *S-14 U-5*

DEPTH *110'*

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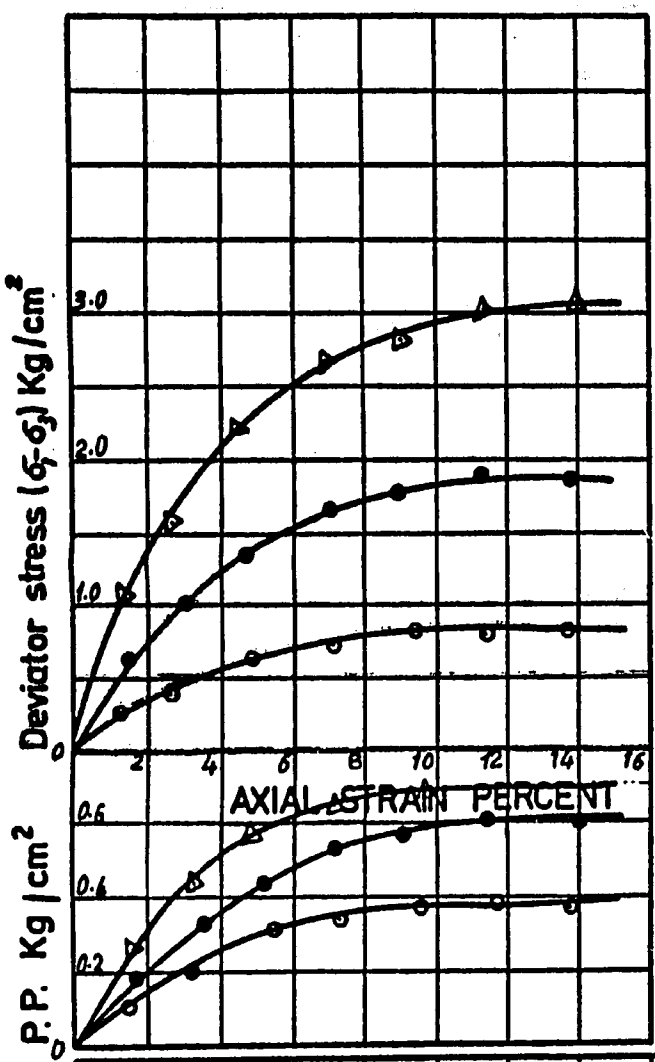
# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma$ |
|---|---|---|---|---|---|
| ● 1 | 1.0 | 61.3 | 0.85 | 58% | 1.56 |
| ● 2 | 2.5 | 60 | 1.9 | 55 | |
| ▲ 3 | 4.0 | 59.1 | 3.10 | 50.5 | |

TYPE *C.U. Tests*

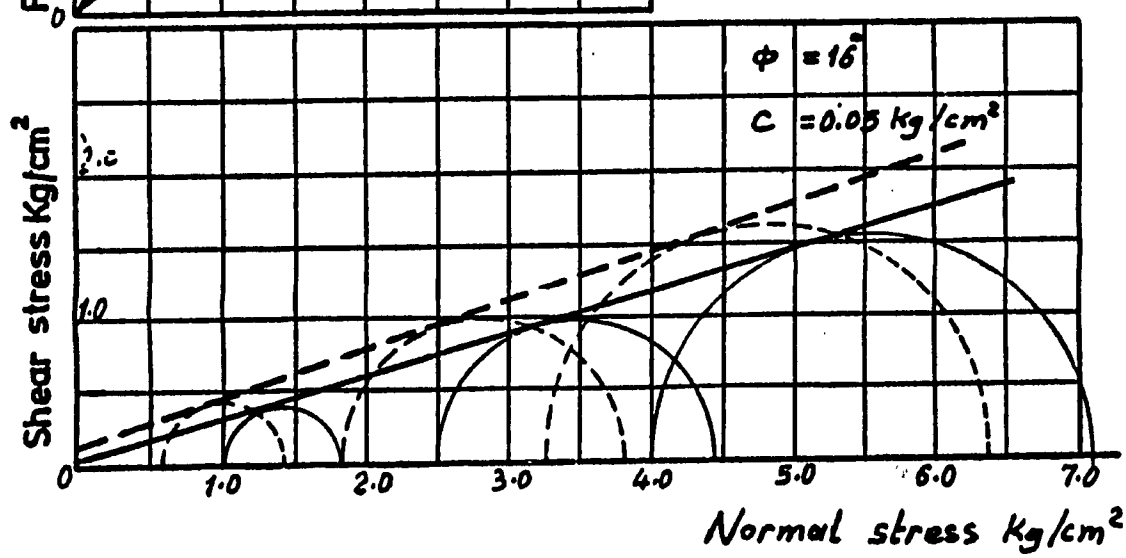
SOIL CLASSIFICATION

*Med. to soft dark grey silty clay with pockets of clayey silt*

BORING Nº *S-15 U-6*

DEPTH *120'-122'*

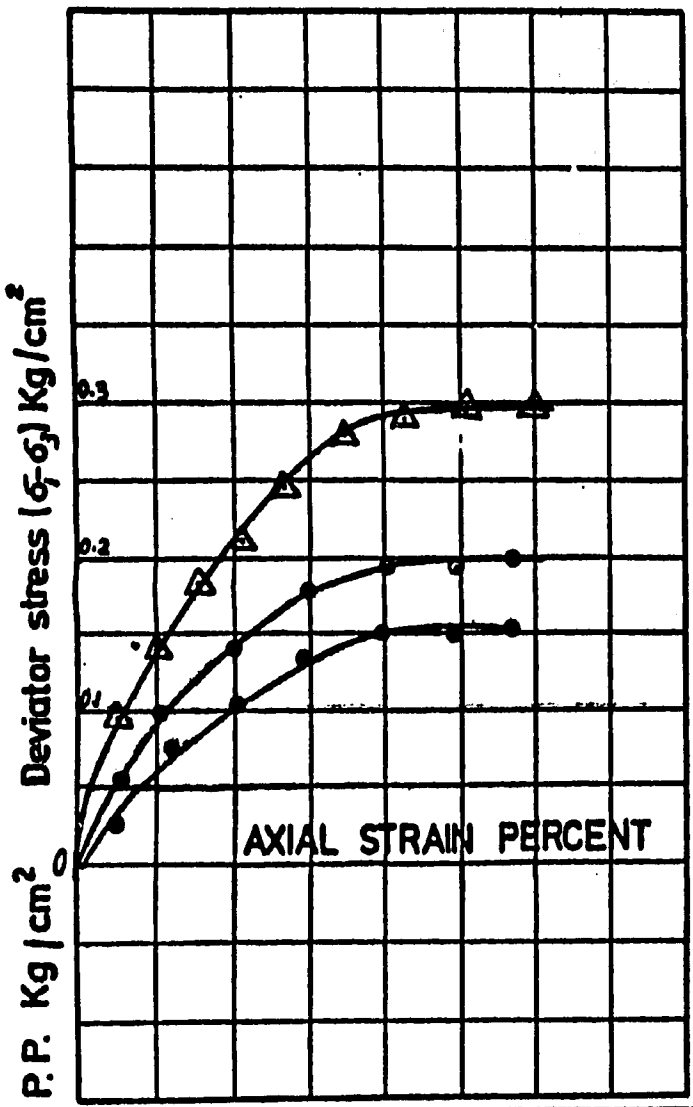
L.L.= 73 % P.L.=24 %




كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| ● 1 | 1.5 | 37 | 0.176 | |
| ● 2 | 2.5 | 37 | 0.2 | |
| △ 3 | 4 | 37 | 0.29 | |

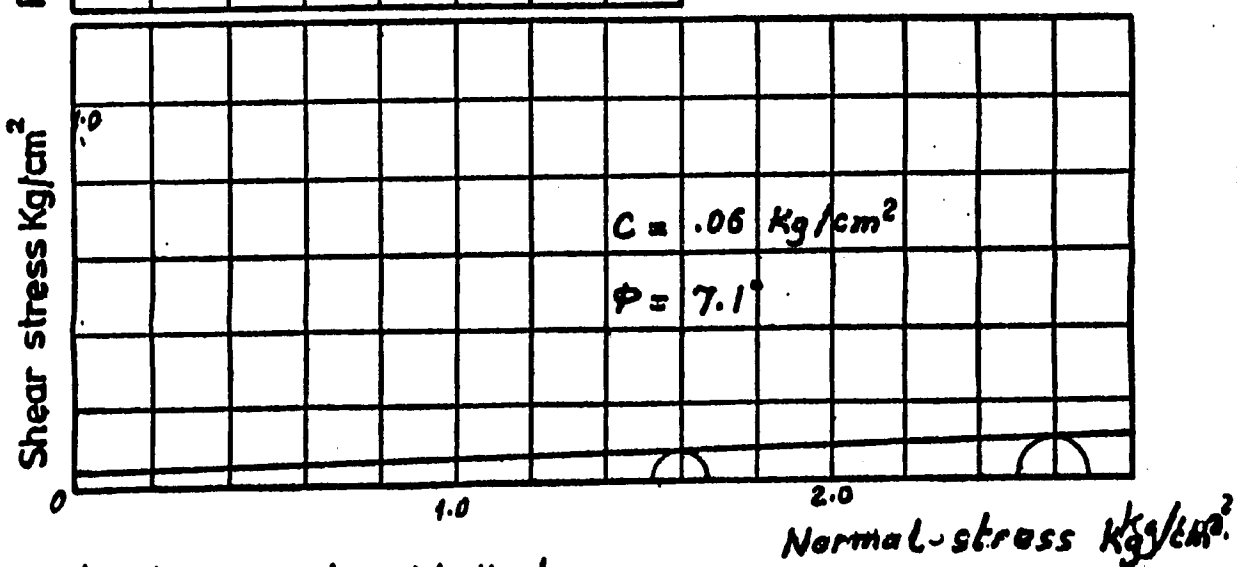
TYPE U.U. Tests

SOIL CLASSIFICATION

Calc. soft dark grey clayey silt with broken shells and pockets of fine sand.

BORING No S-2 U-2

DEPTH 75' - 77'



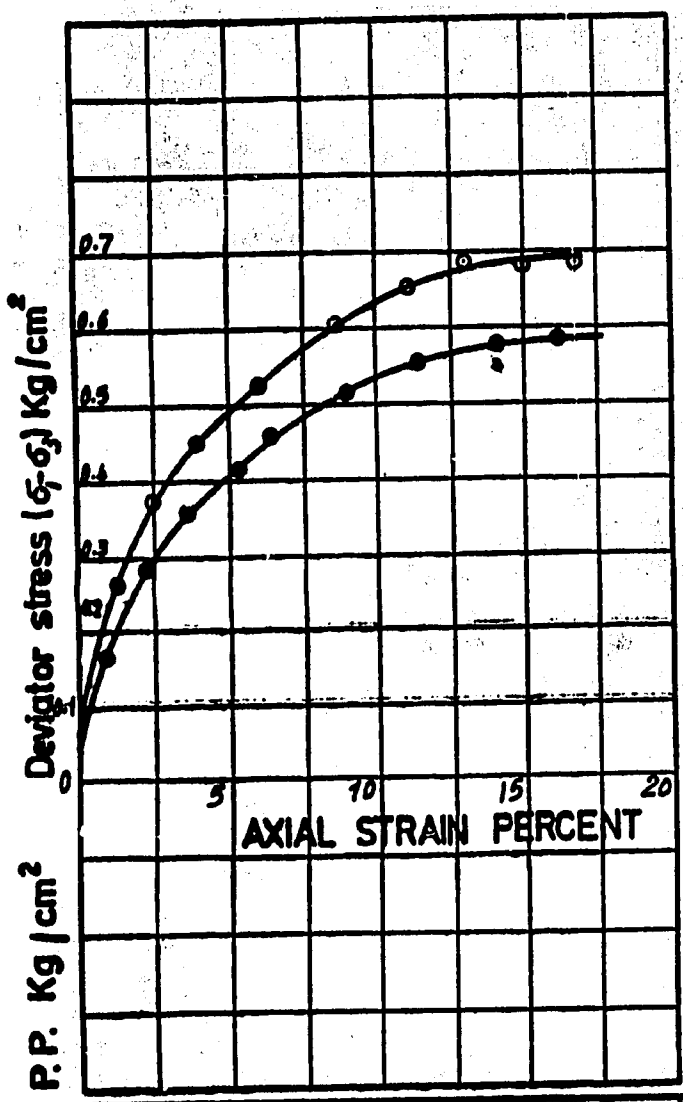

Location: Port Said Harbour

For : Raymond International-Cairo

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| ● 1 | 1 | 40.9 | .58 | |
| ⊙ 2 | 2 | 40.9 | .69 | |
| 3 | | | | |

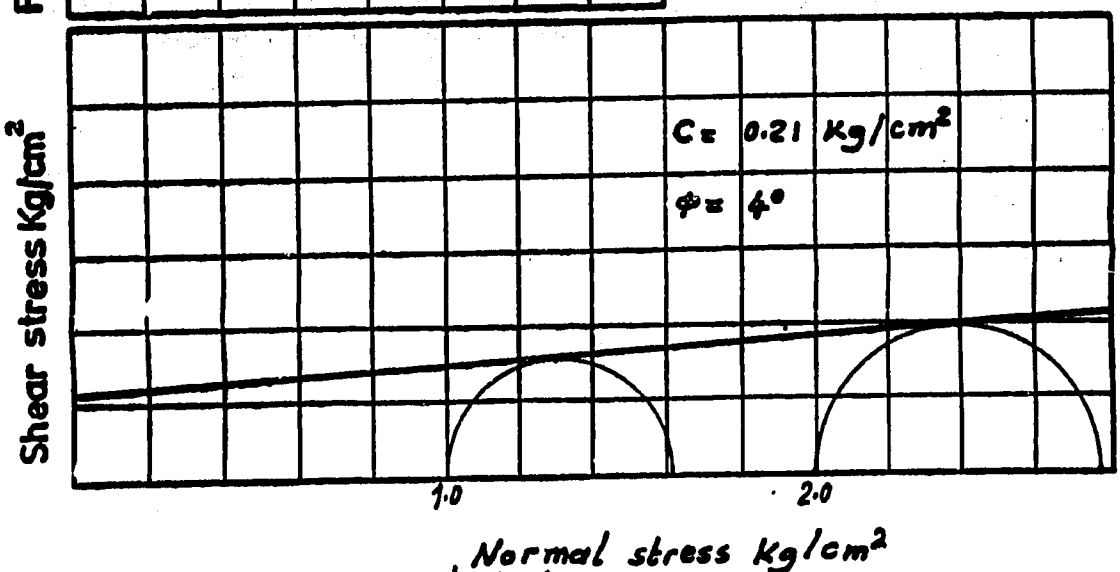
TYPE *U.U. Tests*

SOIL CLASSIFICATION
*Med. dark grey silty clay with thin layers of fine sand*

BORING No *S-3 U-3*

DEPTH *18.5 - 19.1 m*

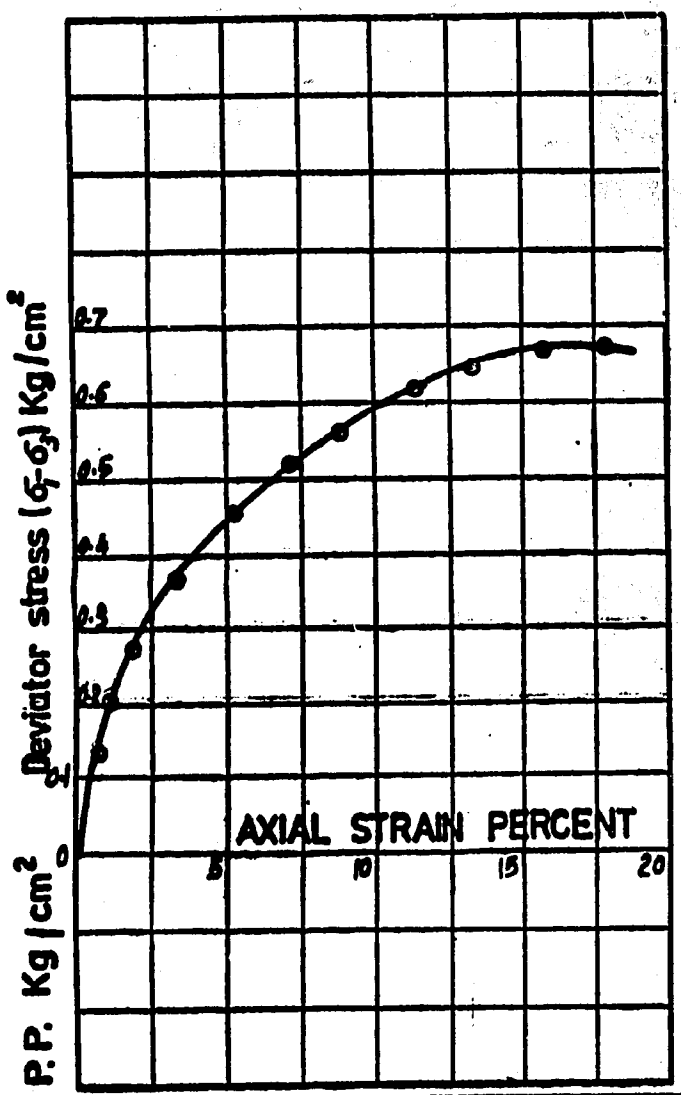
P.P. Kg/cm²




Location: *Port Said Horbour*
For : *Raymond International-Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| 1 | 4 | 57 | 0.67 | |
| 2 | | | | |
| 3 | | | | |

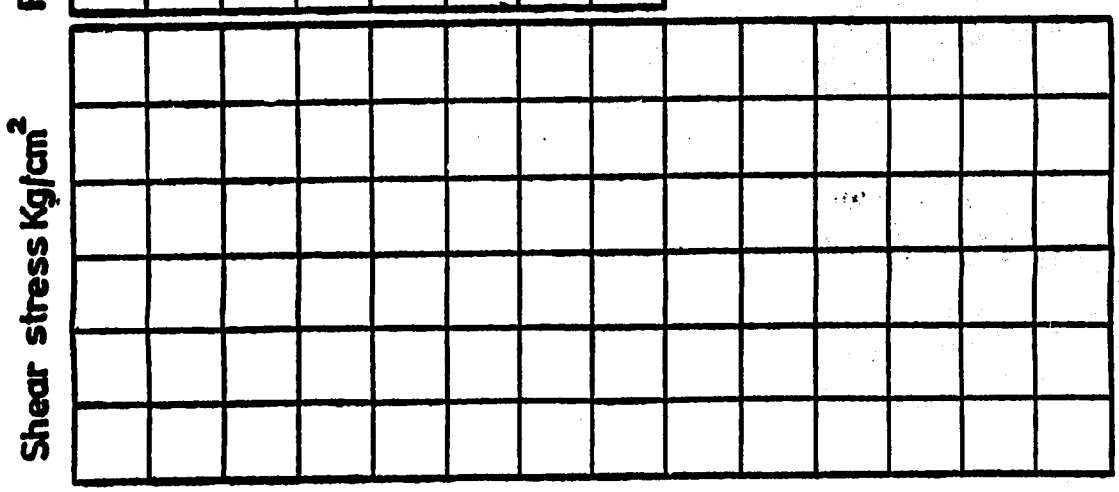
TYPE U.U. Test.

SOIL CLASSIFICATION
Med dark grey silty clay with thin layers of fine sand.

BORING No S-3 U=4

DEPTH 21.5 - 22.1 m

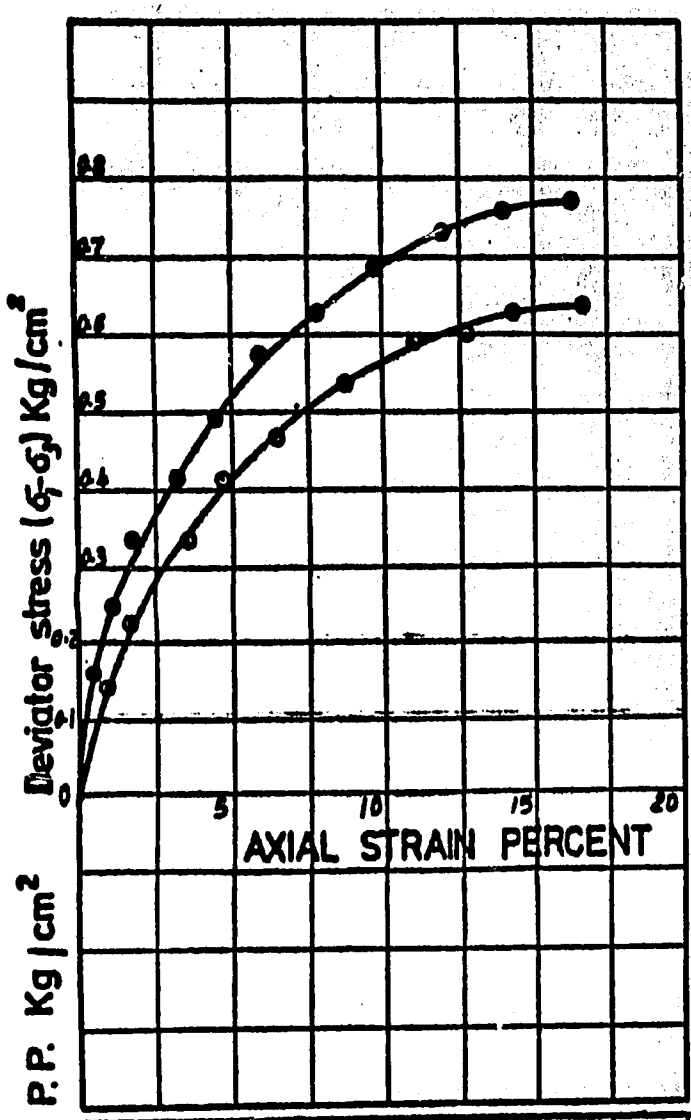
P.P. Kg/cm²




Location: Port Said Harbour
For : Raymond International-Cairo

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No. | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| ● 1 | 1.5 | 58.9 | 0.63 | |
| ● 2 | 4 | 58.9 | 0.778 | |
| 3 | | | | |

TYPE *U.U. Tests*

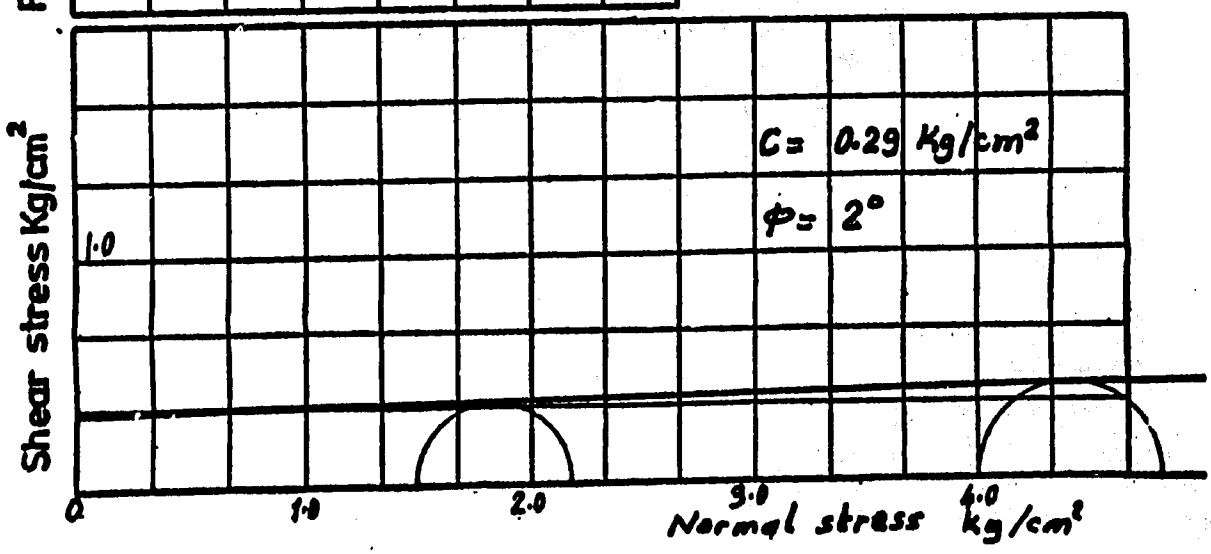
SOIL CLASSIFICATION

*Med. dark grey silty clay with thin layers of fine sand.*

BORING No. *S-3 U-6*

DEPTH *27.5 - 28.1 m*

P.P. Kg/cm²



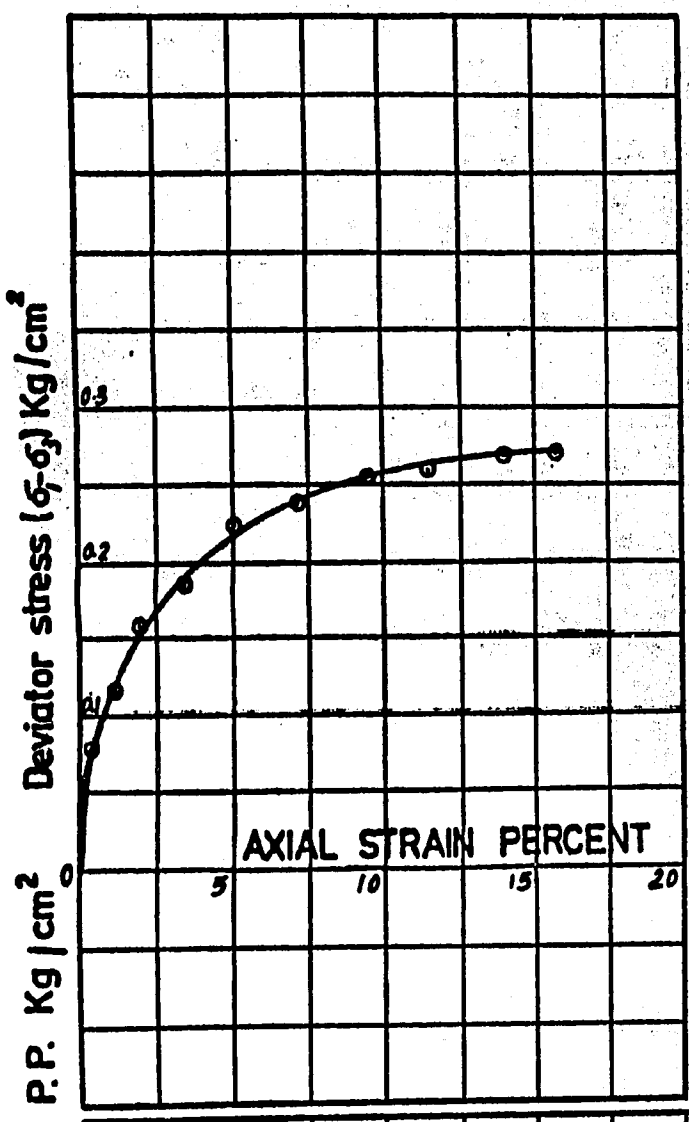

*Location: Port Said Harbour*

*For : Raymond International-Cairo*

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| 1 | 2 | 63.6 | .283 | |
| 2 | | | | |
| 3 | | | | |

TYPE U. U. Tests

SOIL CLASSIFICATION

soft dark grey silty clay

BORING Nº S-3 U-13

DEPTH 51- 51.6 m

P.P. Kg/cm²

Shear stress Kg/cm²

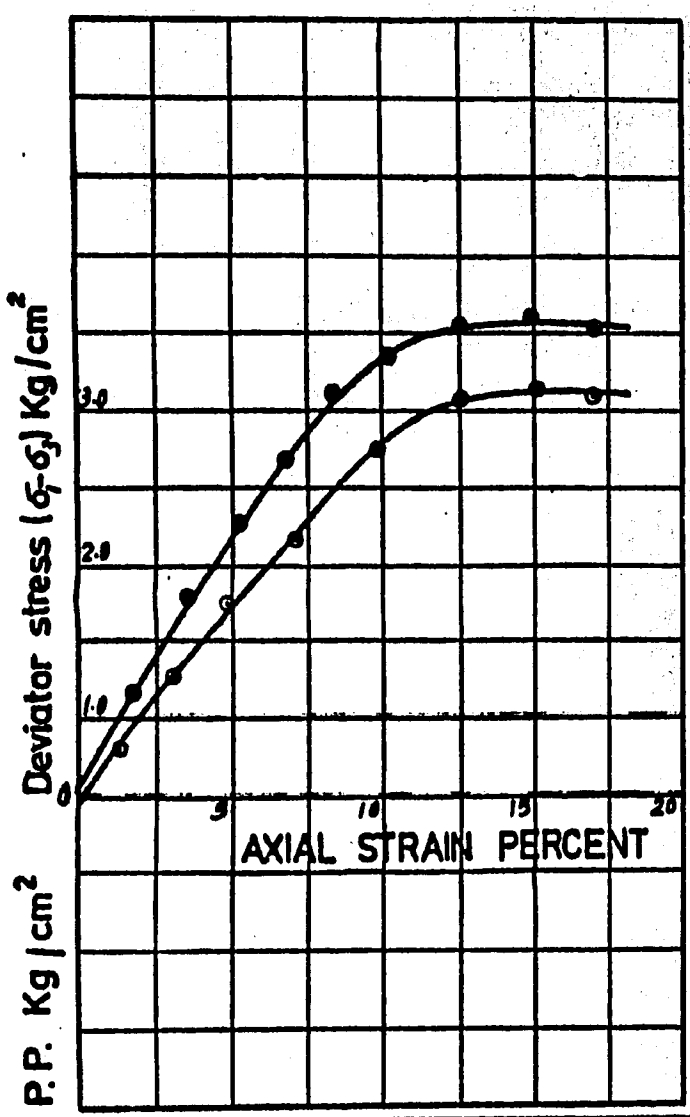
Location: Port said Harbour

For : Raymond International-Cairo

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS



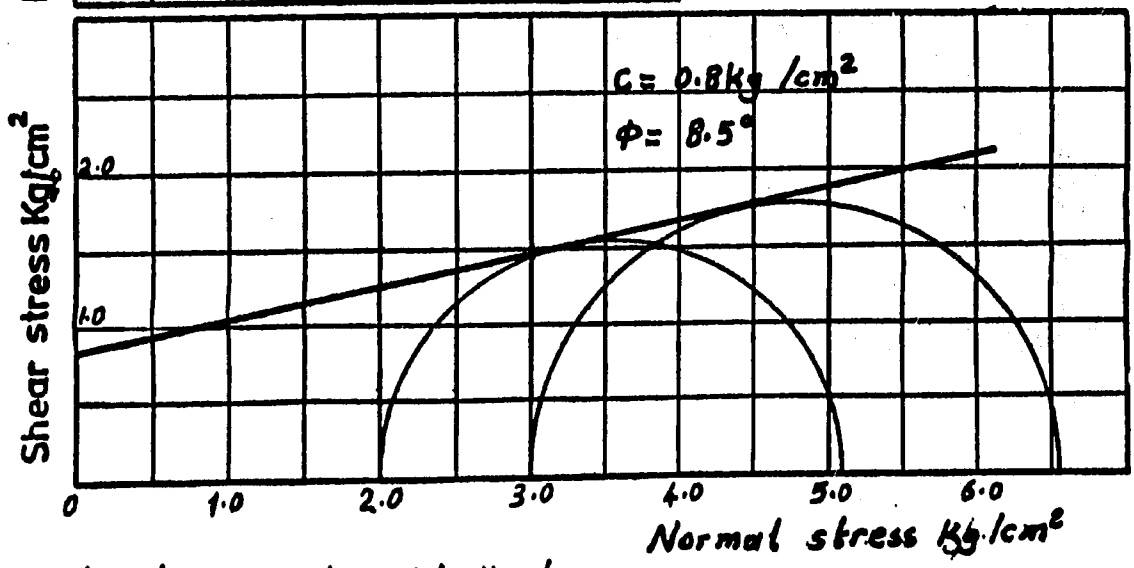

| Curve No. | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| ○ 1 | 2 | 35.2 | 3.1 | |
| ● 2 | 3 | 35.2 | 3.6 | |
| 3 | | | | |

TYPE *U. U. Tests*

SOIL CLASSIFICATION
*Dark grey fine silty sand*

| | | |
|---|---|---|
| BORING No | S-4 | U-1 |
| DEPTH | 45' | 47' |

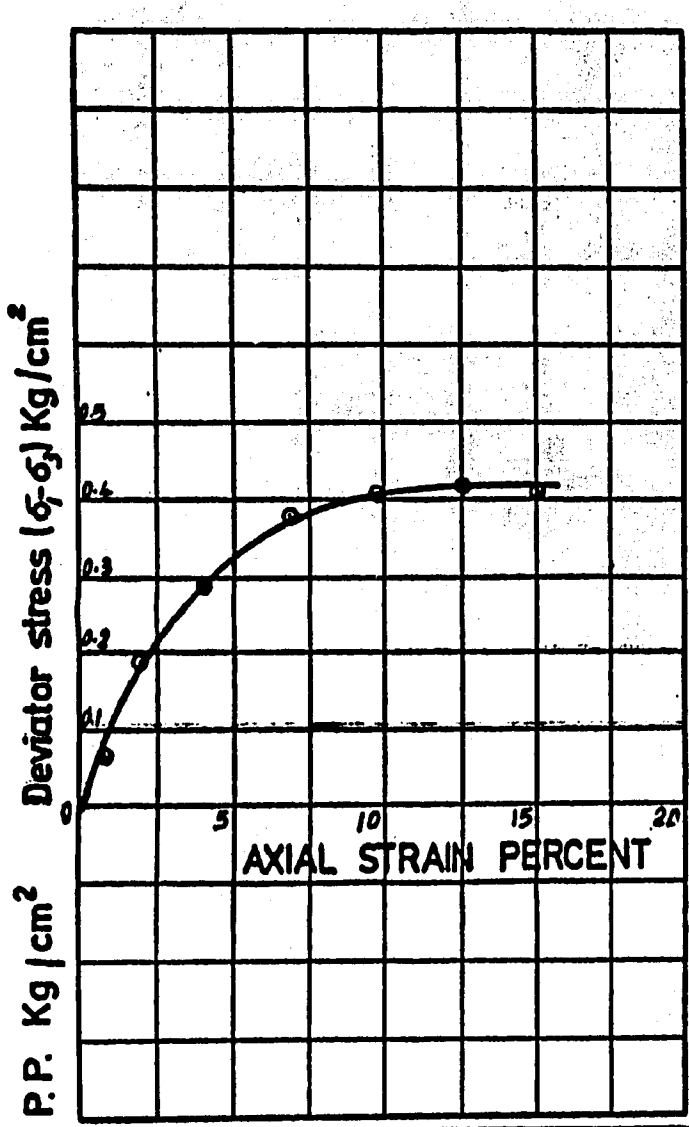
P.P. Kg/cm²




*Location: Port Said Harbour*
*For : Raymond International-Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| 1 | 4 | 53 | 0.42 | |
| 2 | | | | |
| 3 | | | | |

TYPE *U. U. Tests*

SOIL CLASSIFICATION
*Med. dark grey silty clay to clayey silt interlayered with fine silty sand.*

BORING No *S-4 U-2*

DEPTH *55'- 57'*

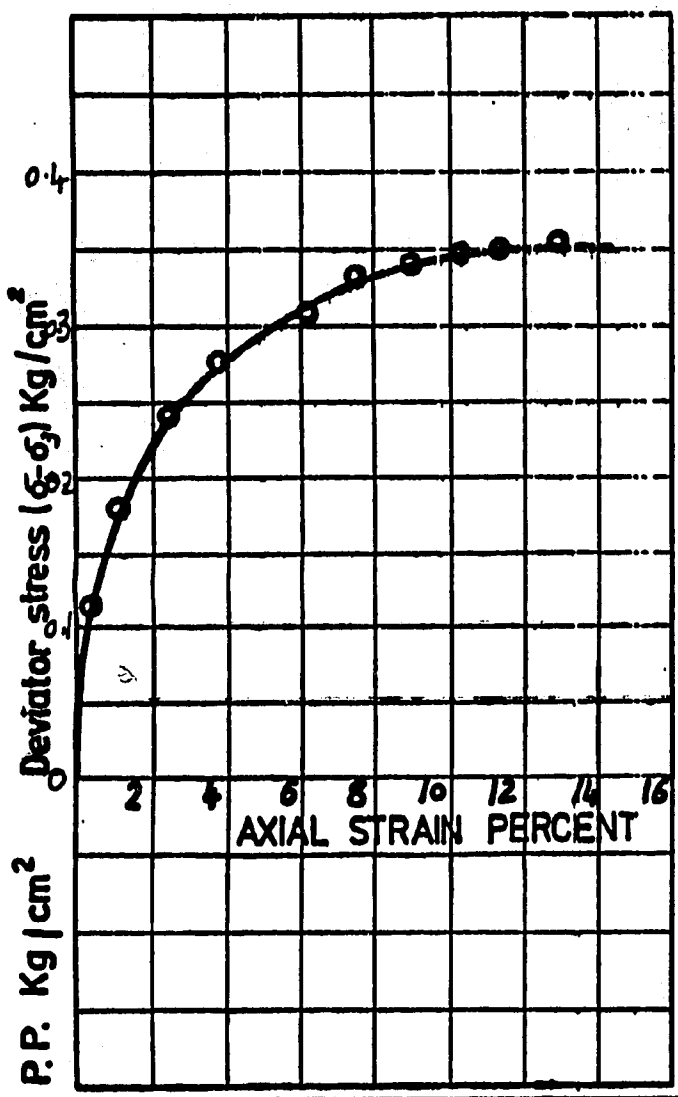
P.P. Kg/cm²

Shear stress Kg/cm²

*Location : Port Said Harbour*
*For : Raymond International - Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No. | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma_o$ |
|---|---|---|---|---|---|
| 1 | 3 | 70.0 | 0.35 | | 1.59 |
| 2 | | | | | |
| 3 | | | | | |

TYPE U.U. Tests

SOIL CLASSIFICATION

Dark gray soft silty clay

BORING No SPB - U-1

DEPTH

P.P. Kg/cm²

Shear stress Kg/cm²

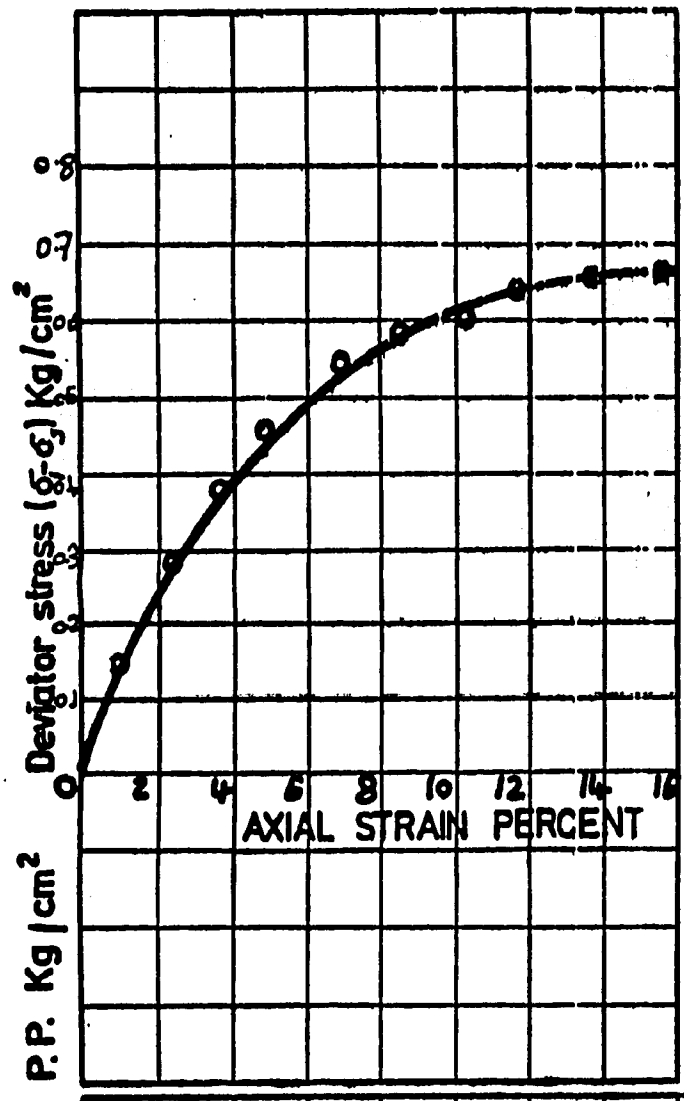
Location: Port Said Harbour

For : Raymond International - Cairo

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma_o$ |
|---|---|---|---|---|---|
| 1 | 1.5 | 62.7 | 0.67 | | 1.64 |
| 2 | | | | | |
| 3 | | | | | |

TYPE

SOIL CLASSIFICATION

Dark gray med. silty clay

BORING No SP5. U-1

DEPTH

P.P. Kg/cm²

Shear stress Kg/cm²

Location: Port Said Harbour

For : Raymond International-Cairo

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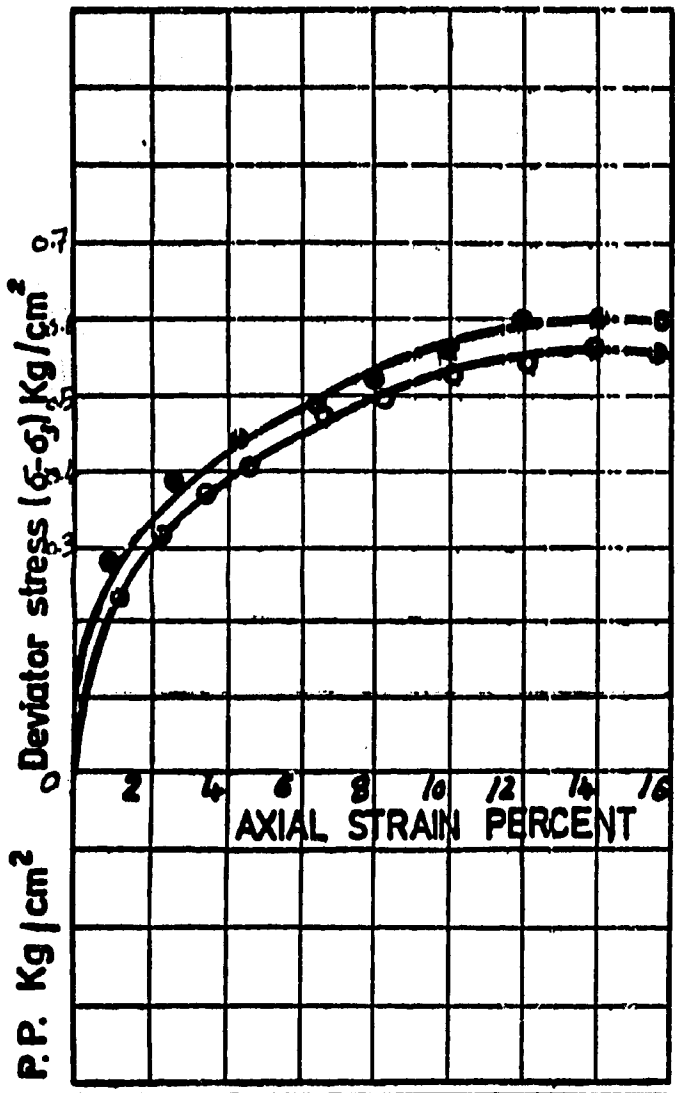
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma_o$ |
|---|---|---|---|---|---|
| ● 1 | 3 | 678 | 0.6 | | 1.62 |
| ○ 2 | 1.5 | | 0.56 | | |
| 3 | | | | | |

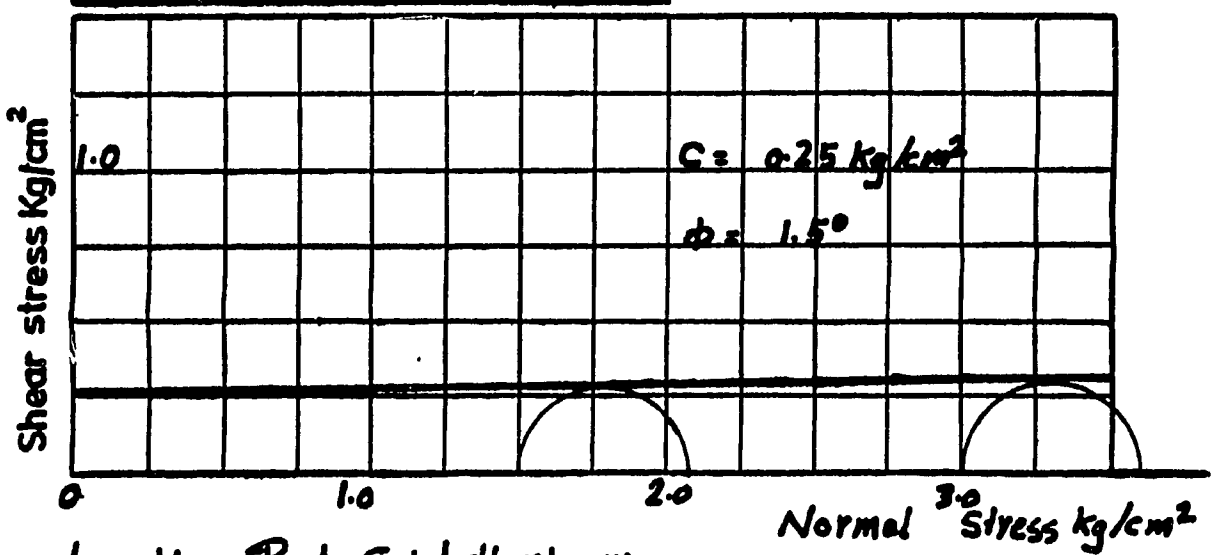
TYPE

SOIL CLASSIFICATION

Dark grey med. clayey silt to silty clay

BORING No SPS - U.2

DEPTH




Location: Port Said Harbour

For : Raymond International - Cairo

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

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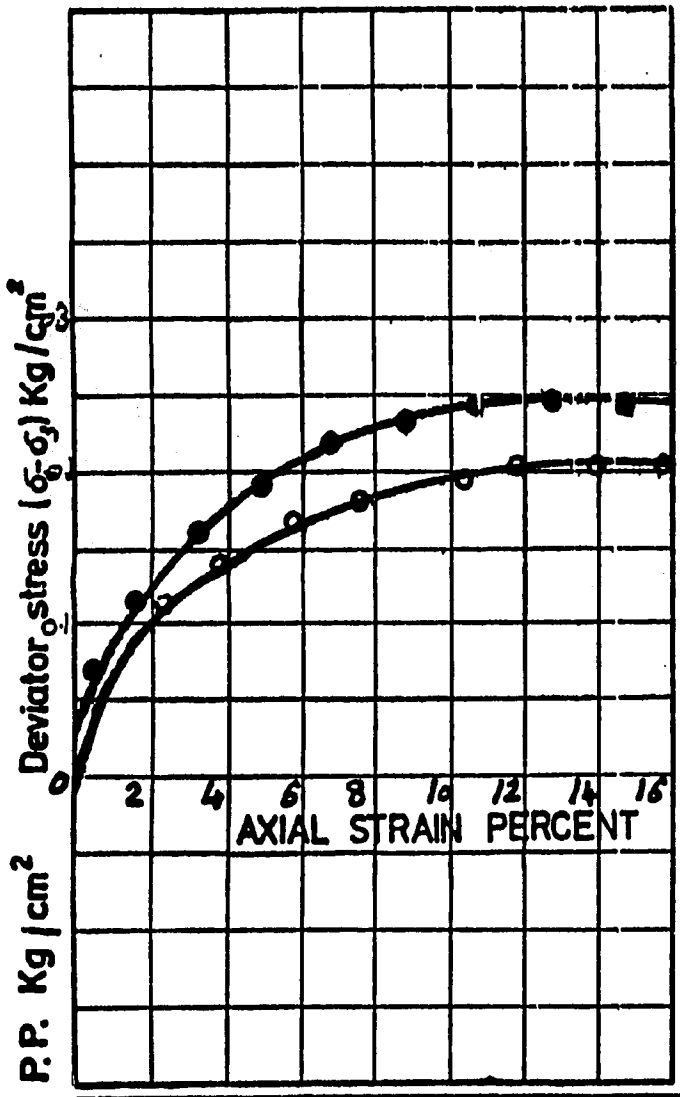
# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $W_o$ | $(\sigma_1-\sigma_3)_f$ | $W_f$ | $\gamma_o$ |
|---|---|---|---|---|---|
| ○ 1 | 1.5 | 56 | 0.22 | | 1.65 |
| ● 2 | 3 | | | | |
| 3 | | | | | |

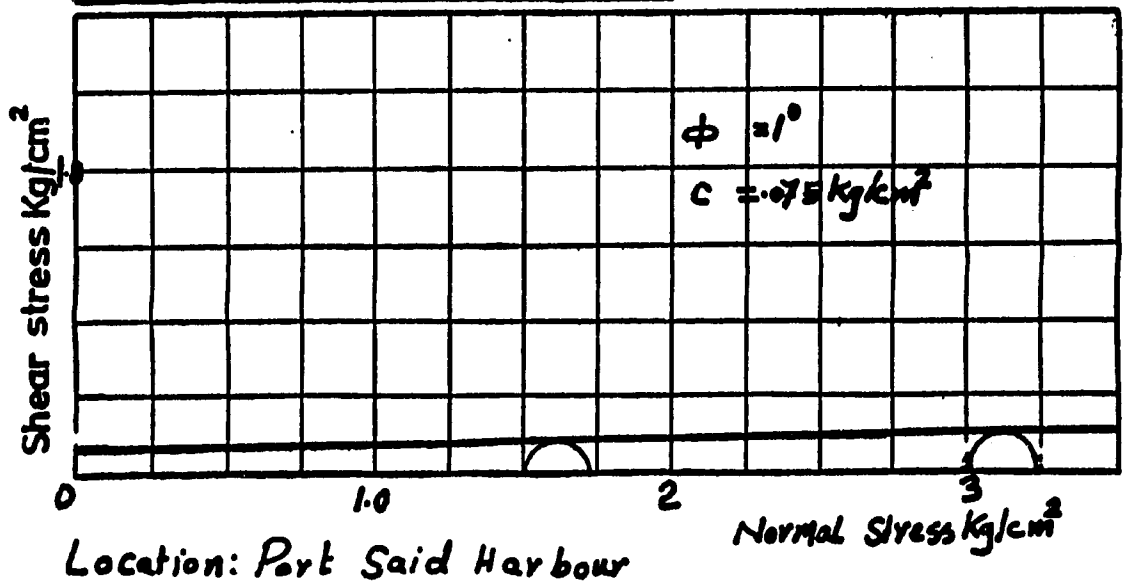
TYPE: U.U. Tests.

SOIL CLASSIFICATION
Dark grey soft silty clay

BORING Nº SP5- U4

DEPTH

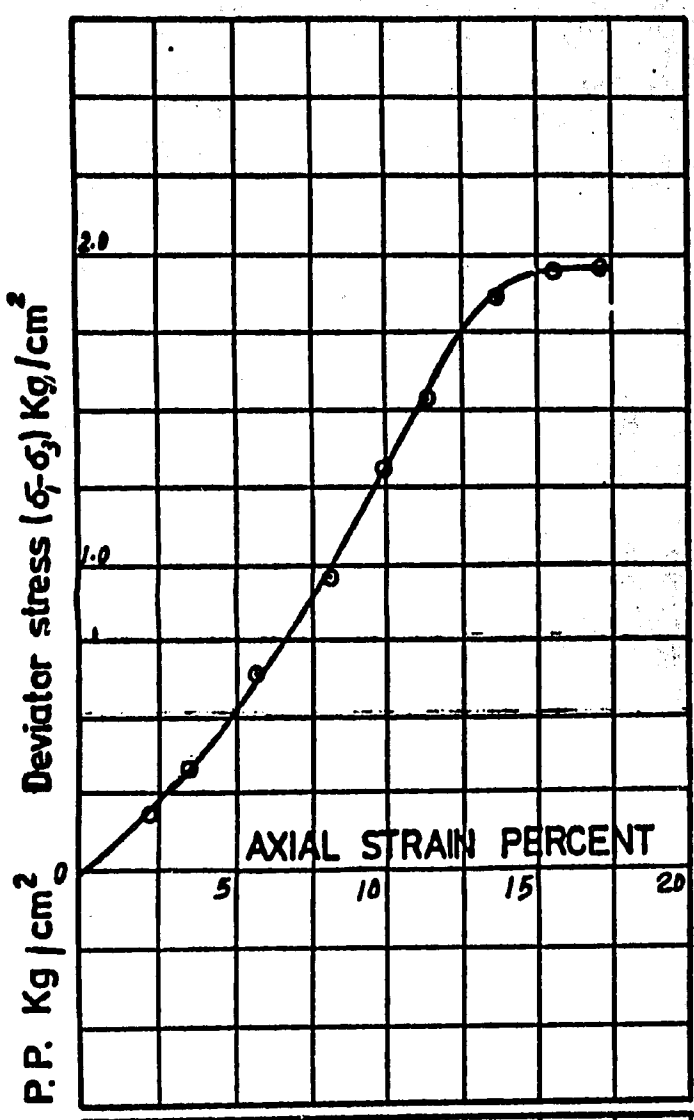
P.P. Kg/cm²




Location: Port Said Harbour
For : Raymond International-Cairo

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| 1 | 1.5 | 38.6 | 1.9 | |
| 2 | | | | |
| 3 | | | | |

TYPE *U.U. Tests*

SOIL CLASSIFICATION
*Calc. dark grey silty sand with broken shells with top layer of clayey silt*

BORING Nº *S-6 U-3*

DEPTH *75' - 77'*

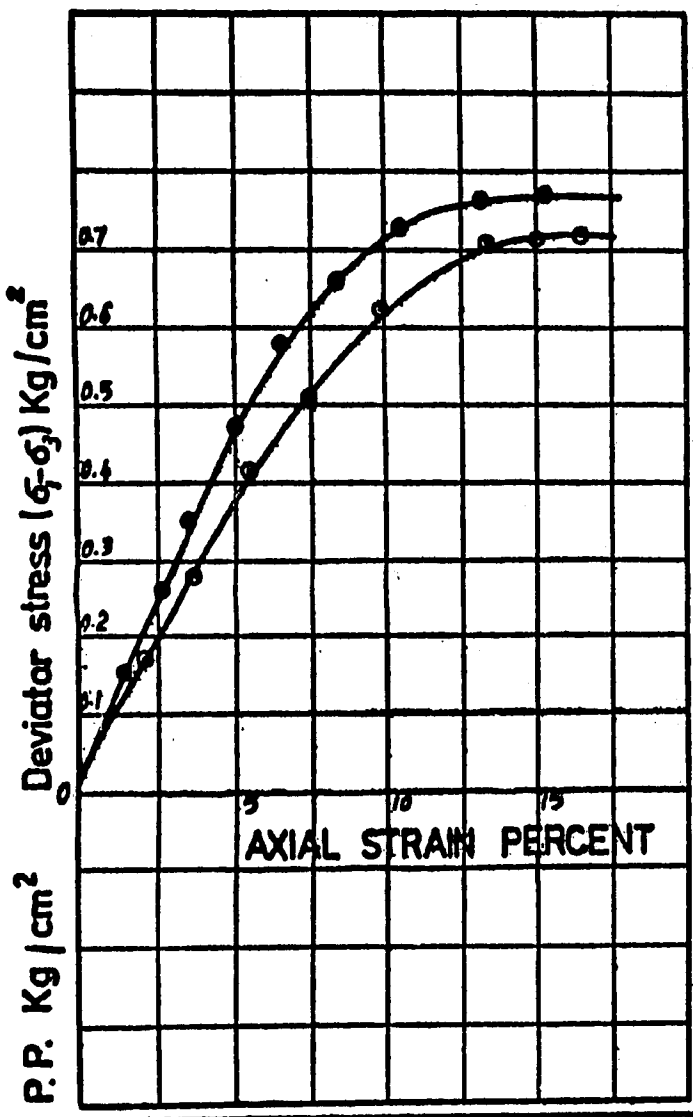
P.P. Kg/cm²

Shear stress Kg/cm²

*Location: Port Said Harbour*
*For : Raymond International - Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| • 1 | 3 | 38.6 | 0.710 | |
| • 2 | 4 | 38.6 | 0.75 | |
| 3 | | | | |

TYPE *U.U. Tests*

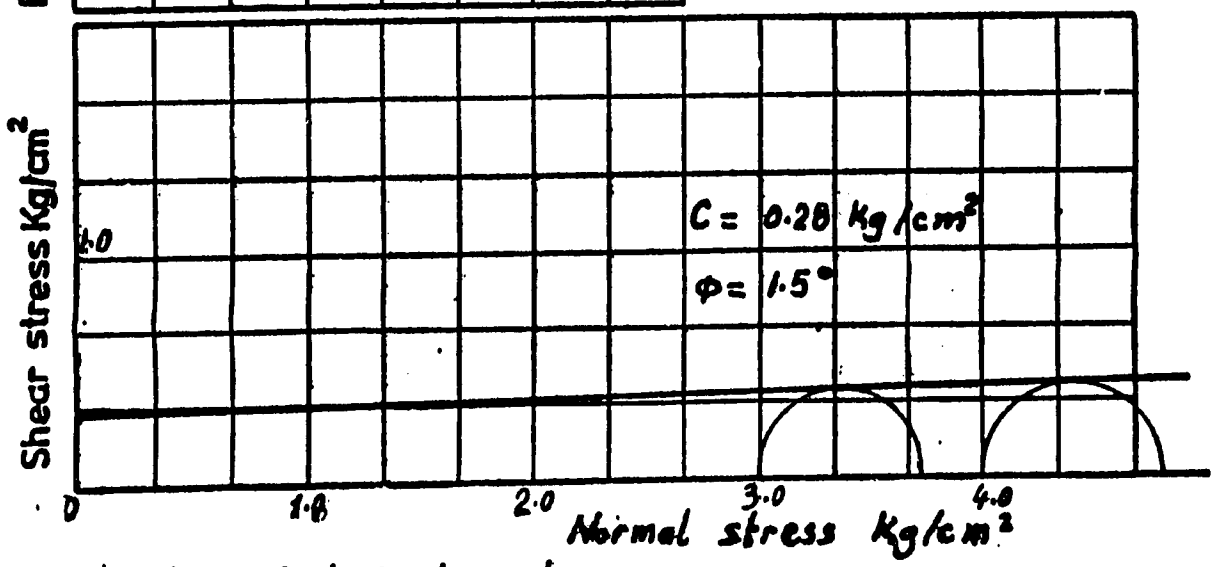
SOIL CLASSIFICATION

*Med dark grey clayey silt*

BORING No *S-6 U-3*

DEPTH *75' - 77'*

P.P. Kg/cm²



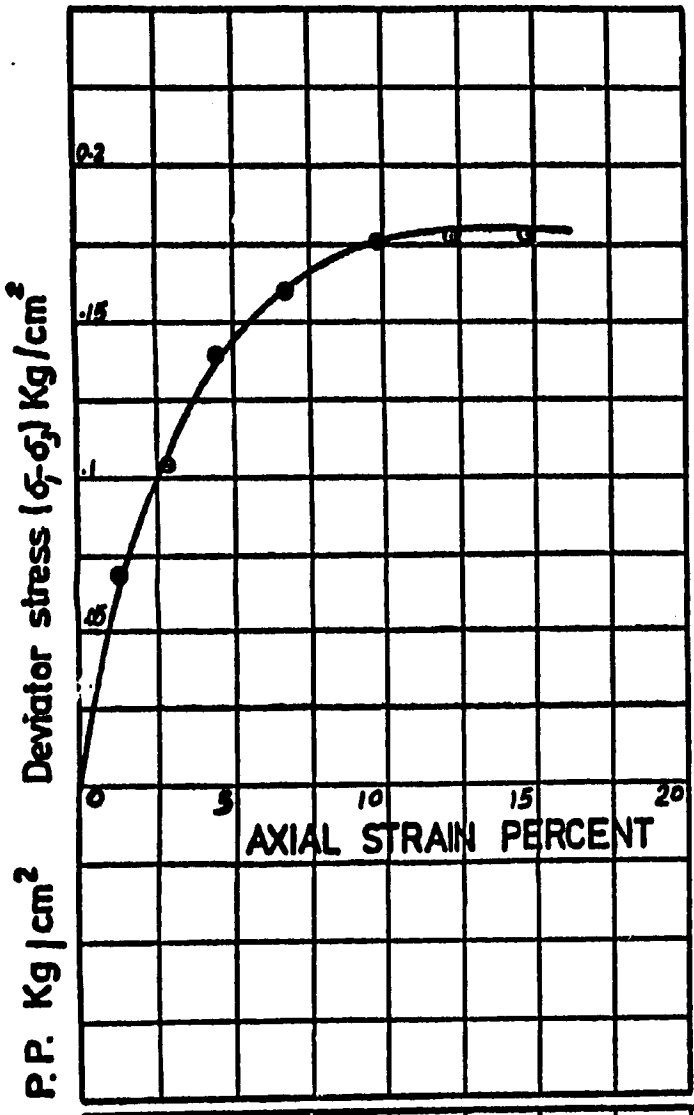

Location : *Port Said Harbour*

For : *Raymond International-Cairo*

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve No | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| 1 | 2.5 | 35.7 | .216 | |
| 2 | | | | |
| 3 | | | | |

TYPE *U.U. Tests*

SOIL CLASSIFICATION
*Soft dark grey clayey silt with thin layers of fine sand.*

BORING No *S-7 U-2*

DEPTH *60' - 62'*

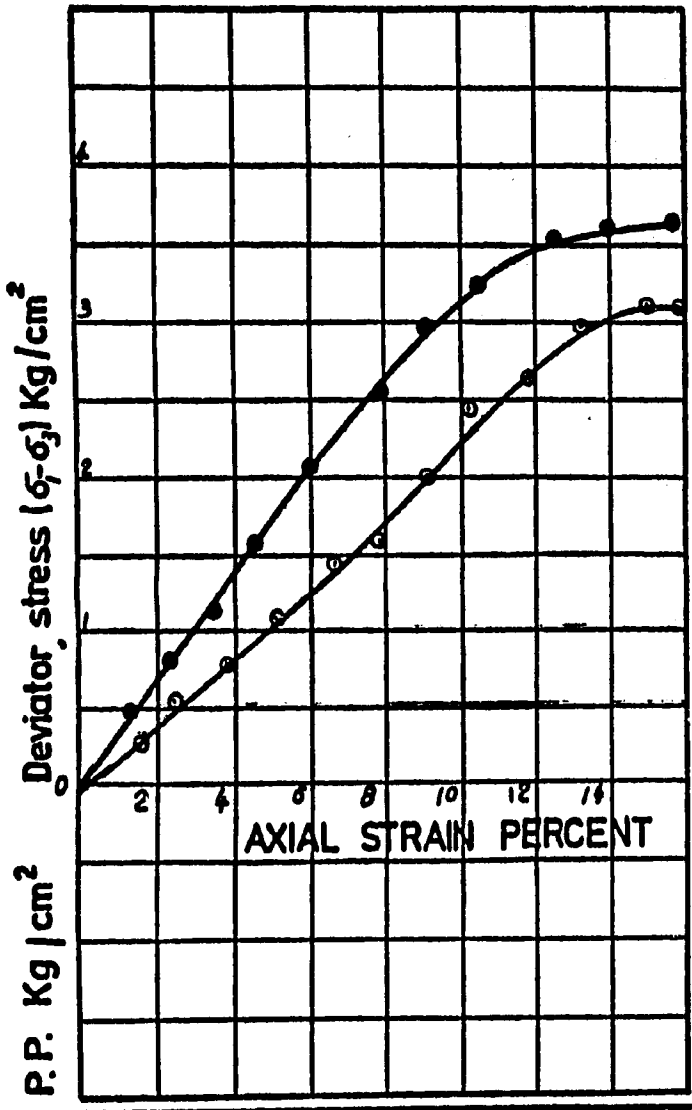
P.P. Kg/cm²

Shear stress Kg/cm²

*Location: Port Said Harbour*
*For : Raymond International - Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS



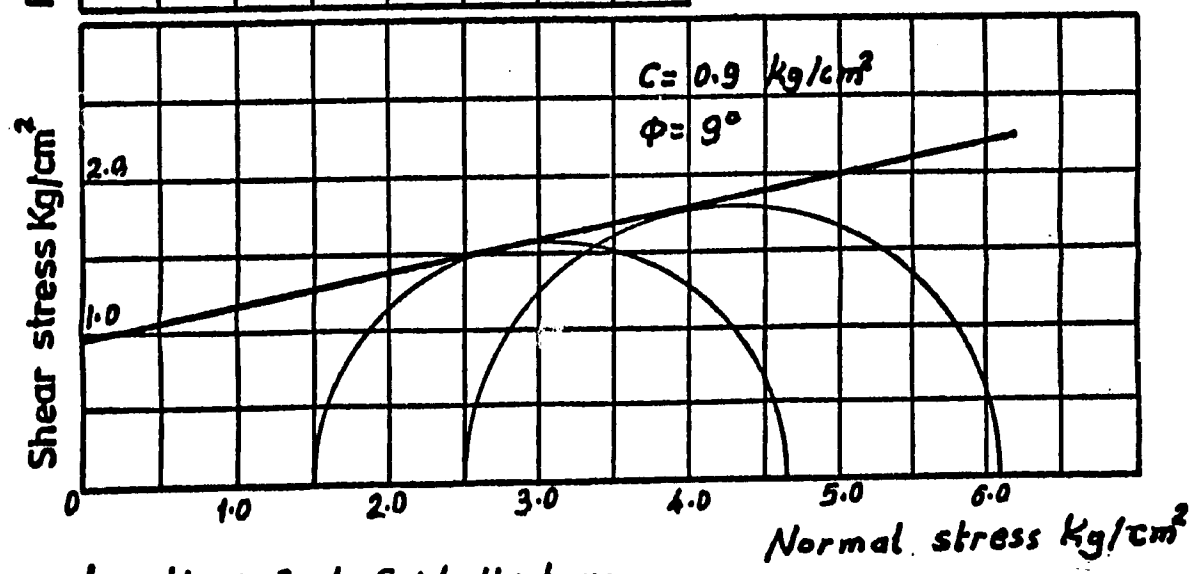

| Curve Nº | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| ○ 1 | 1.5 | 33 | 3.2 | |
| ● 2 | 2.5 | 33 | 3.65 | |
| 3 | | | | |

TYPE U.U. Tests

SOIL CLASSIFICATION
Dark grey fine silty sand with broken shells

BORING Nº S-8 U-1

DEPTH 45"-47"




Location: Port Said Harbour
For : Raymond International - Cairo

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

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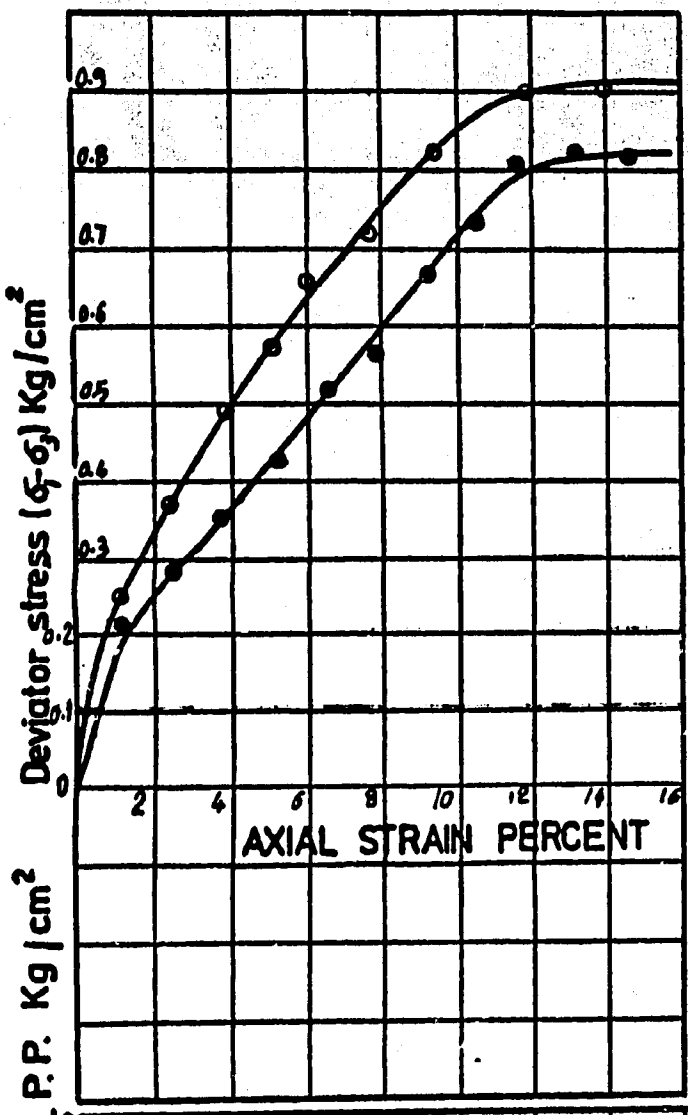
# TRIAXIAL SHEAR TESTS



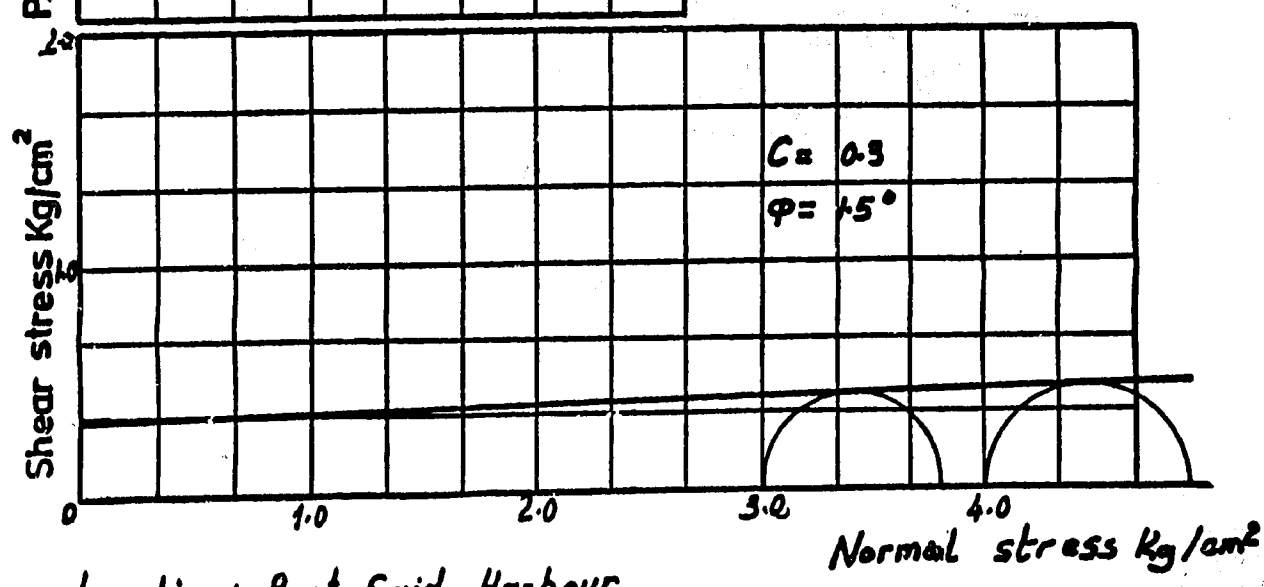

| Curve Nº | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| ● 1 | 3 | 64 | 0.82 | |
| ● 2 | 4 | 64 | 0.91 | |
| 3 | | | | |

TYPE U.U. Tests.

SOIL CLASSIFICATION
Dark grey med clayey silt with pockets of fine sand and with broken shells

BORING Nº S-8 U-2

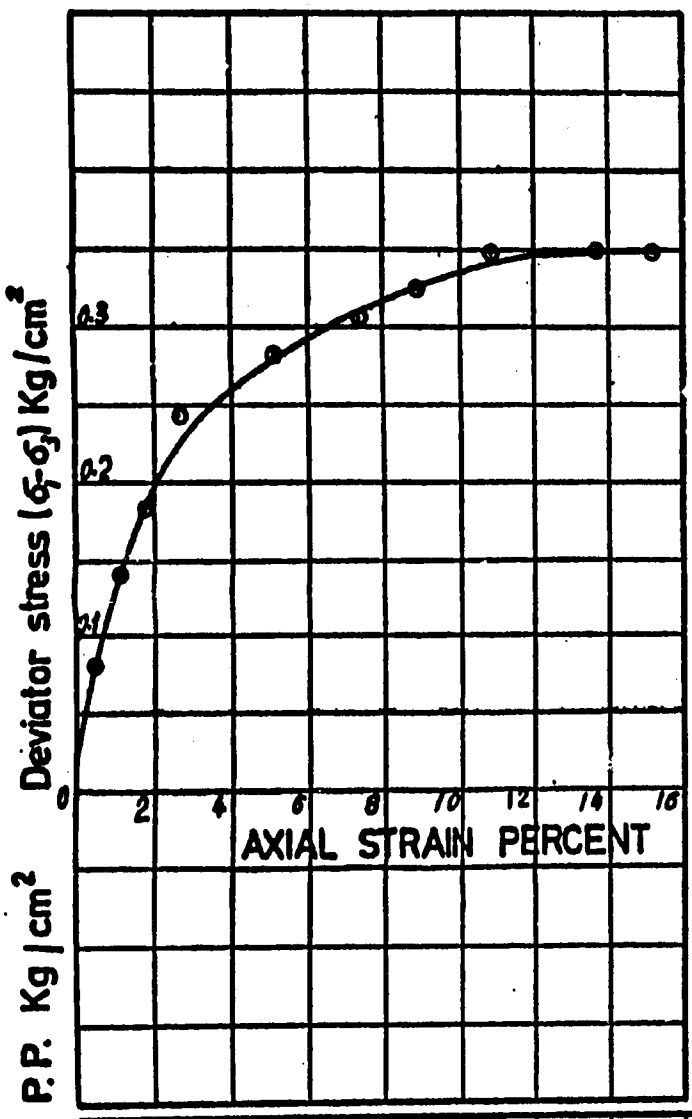
DEPTH 52`-54`




Location: Port Said Harbour
For : Raymond International - Cairo

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $W_o$% | $(\sigma_1-\sigma_3)_f$ | $W_f$% |
|---|---|---|---|---|
| 1 | 2.5 | 61.4 | 0.35 | |
| 2 | | | | |
| 3 | | | | |

TYPE *U.U. Tests.*

SOIL CLASSIFICATION
*Soft to medium dark grey silty clay*

BORING Nº *S-8 U-4*

DEPTH *75½' - 77½'*

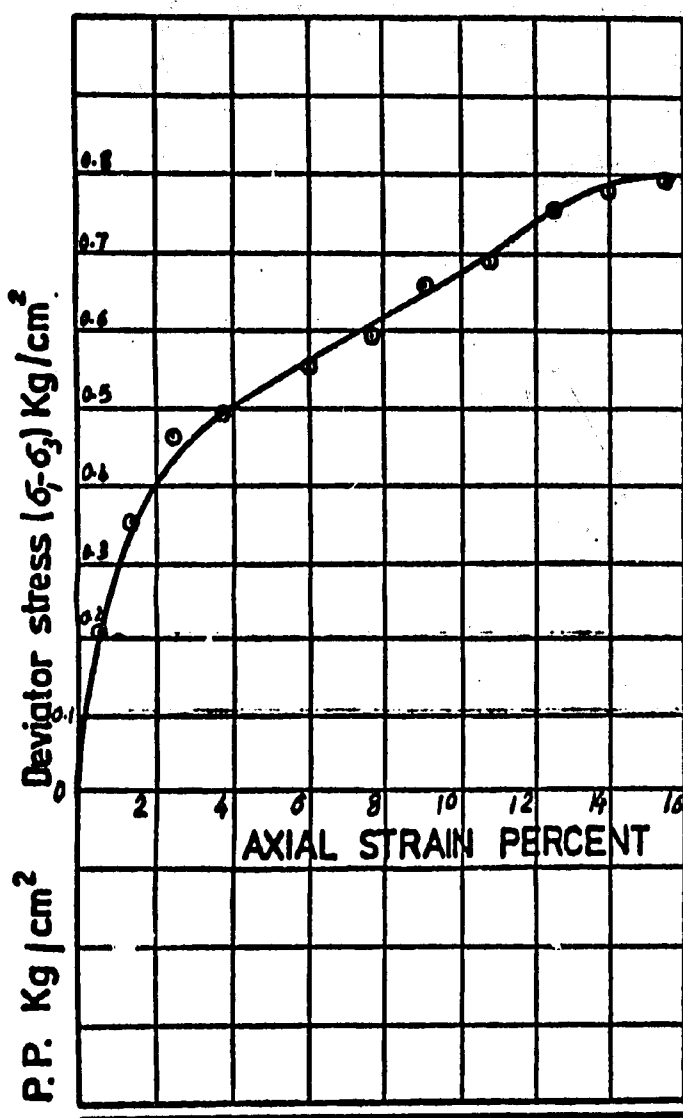
P.P. Kg/cm²

Shear stress Kg/cm²

*Location: Port Said Harbour*
*For : Raymond International - Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$% | $(\sigma_1-\sigma_3)_f$ | $w_f$% |
|---|---|---|---|---|
| 1 | 4.0 | 42 | | |
| 2 | | | | |
| 3 | | | | |

TYPE *U.U. Tests*

SOIL CLASSIFICATION
*Dark grey clayey silt to silty clay interlayered with fine silty sand*

BORING Nº *S-8 U-5*

DEPTH *87" - 89"*

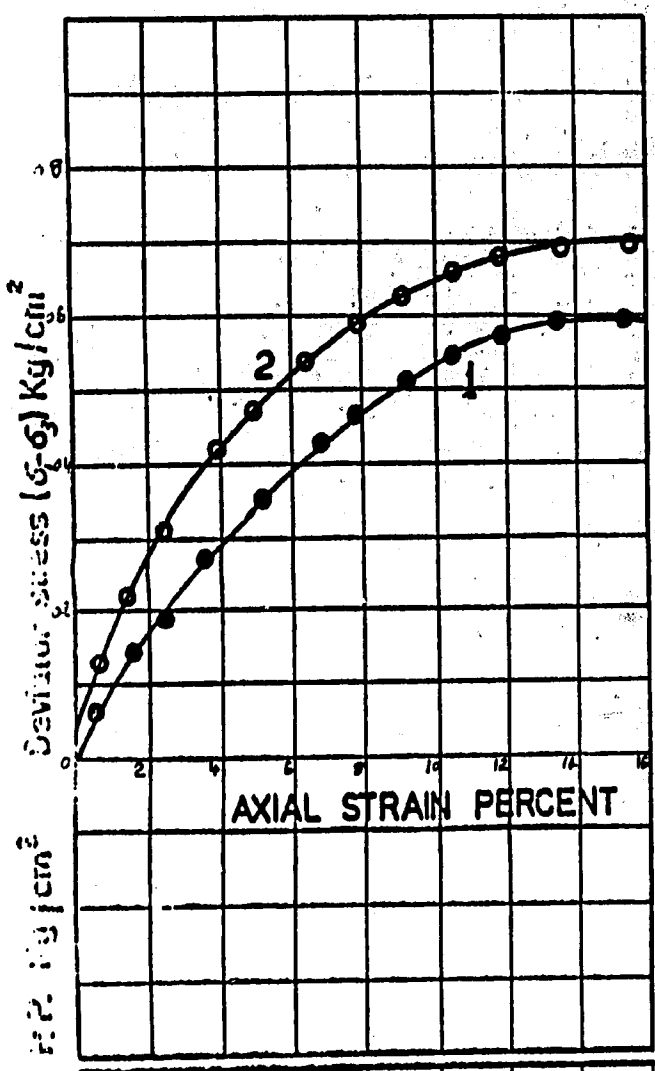
P.P. Kg/cm²

Shear stress Kg/cm²

*Location : Port Said Harbour*
*For : Raymond International - Cairo*

كلية الهندسة - جامعة القاهرة
معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $W_o$ | $(\sigma_1-\sigma_3)_f$ | $W_f$ |
|---|---|---|---|---|
| ● 1 | 2 | | 0.6 | |
| ○ 2 | 3 | | 0.7 | |
| 3 | | | | |

TYPE U.U Tests

SOIL CLASSIFICATION

Dark grey soft to med. clay

BORING Nº S-11 U-2

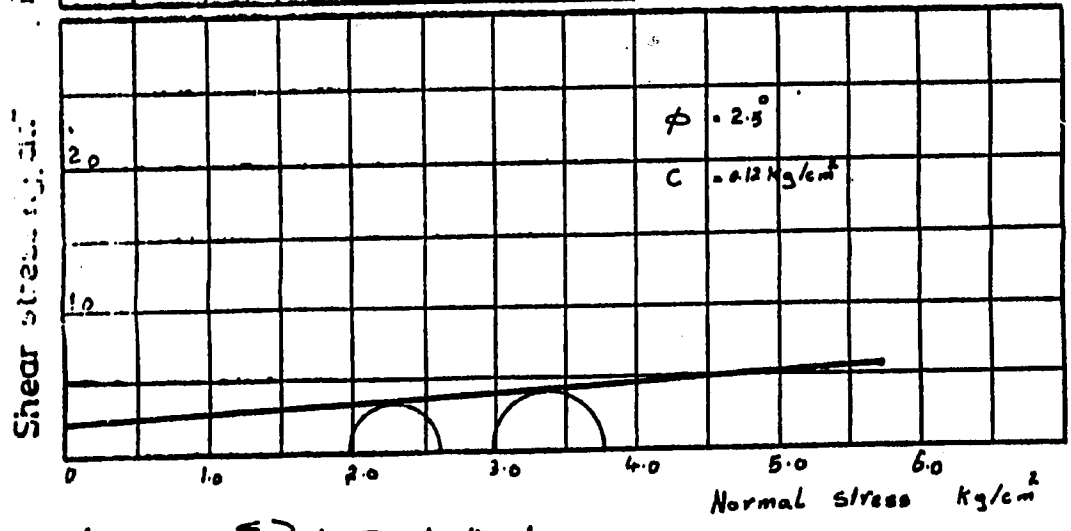
DEPTH 77 - 79

L.L = 73.2 P.L = 26.6

Strain rate = .012 in/min

Sample size H = 7.6 cm

D = 3.8 "



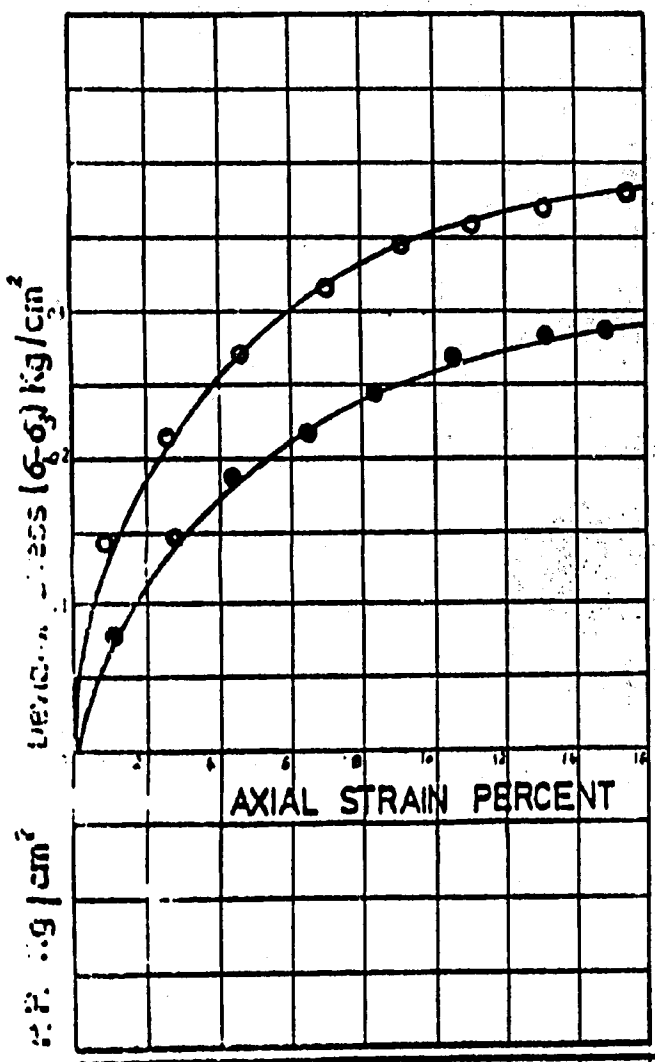

Location : Port Said Harbour

For : Raymond International - Cairo

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve Nº | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ |
|---|---|---|---|---|
| ● 1 | 2 | 57.14 | 0.28 | |
| ○ 2 | 3 | 58.3 | | |
| 3 | | | | |

TYPE U.U Tests

SOIL CLASSIFICATION

Dark grey med. silty clay

BORING Nº S-11 - U-3

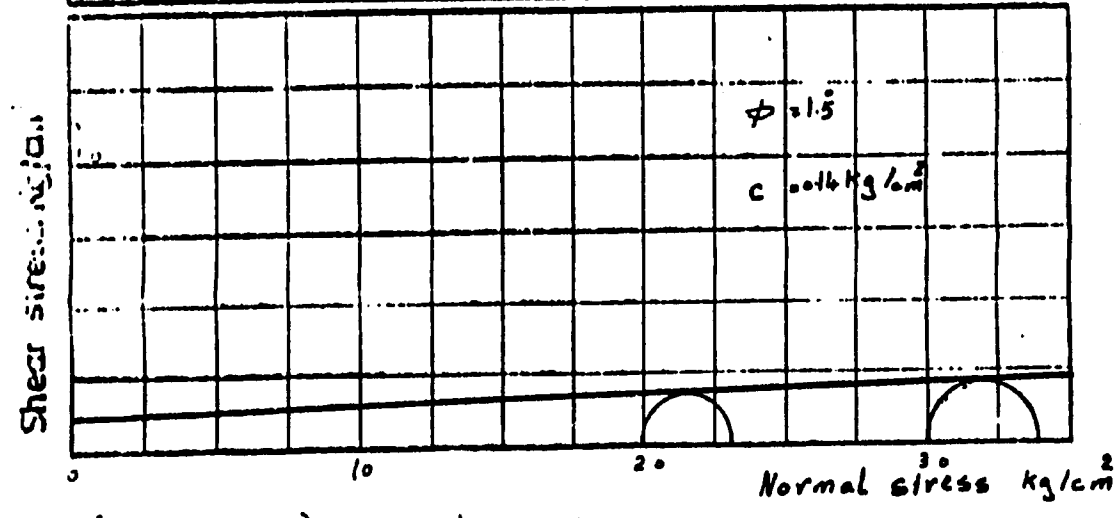
DEPTH 83.6 - 87.6

Strain rate = .012 in/min

Sample size H = 7.6 cm

D = 3.8 "

L.L = 68 %  P.L = 24.6 %



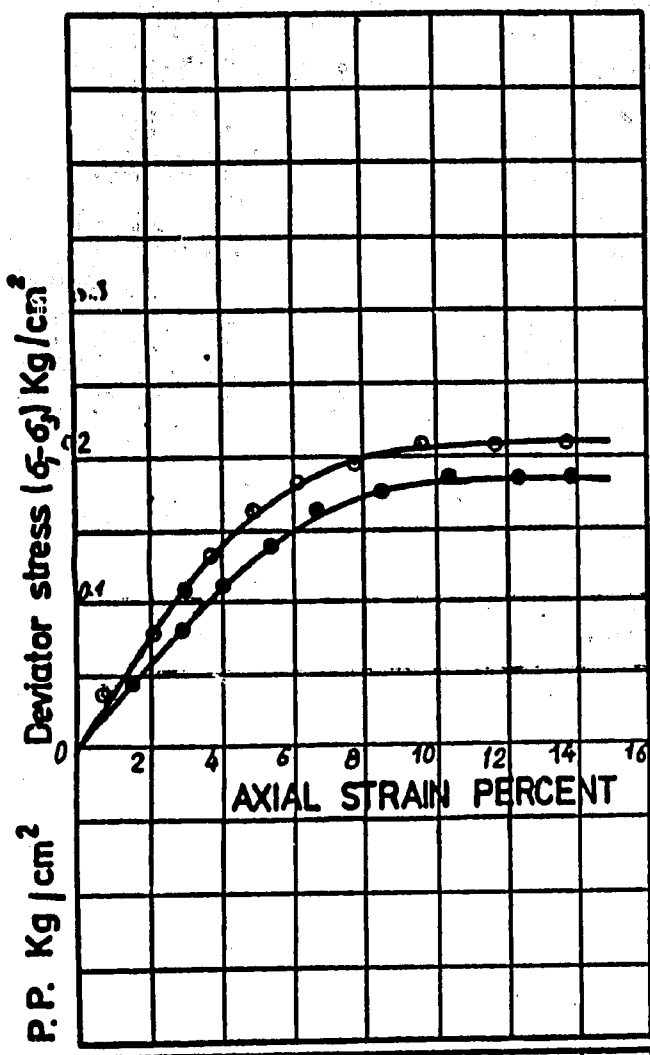

Location : Port Said Harbour

For : Raymond International - Cairo

كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve № | $\sigma_3$ | $w_o$ % | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma$ |
|---|---|---|---|---|---|
| ○ 1 | 2.5 | 55.9 | 0.25 | | 1.6 |
| ● 2 | 1.5 | 56.2 | 0.19 | | |
| 3 | | | | | |

TYPE U.U. Tests

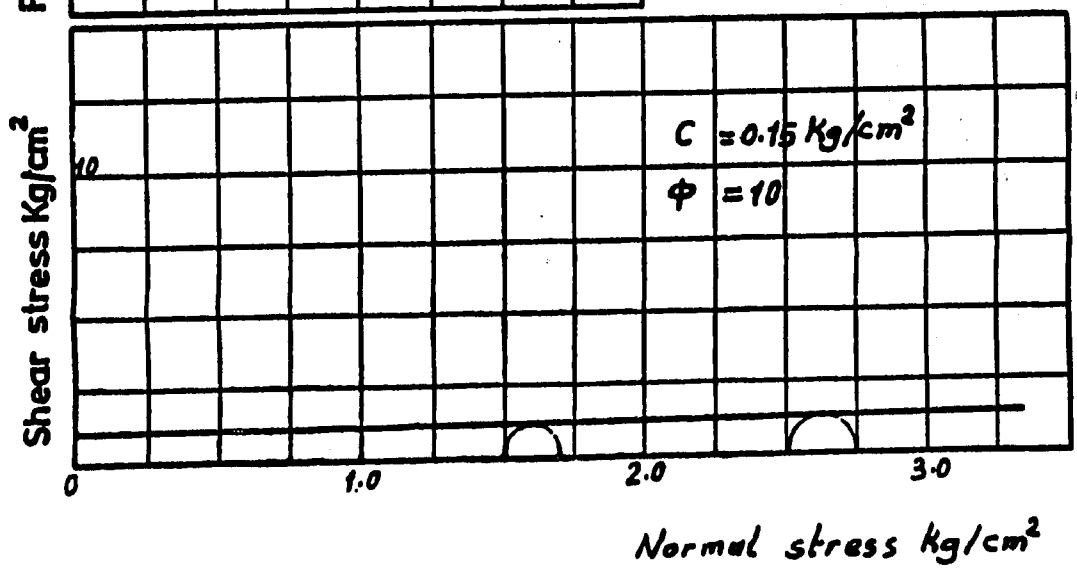
SOIL CLASSIFICATION

Very soft dark grey silty clay

BORING № S-11 U-4

DEPTH 16.1'

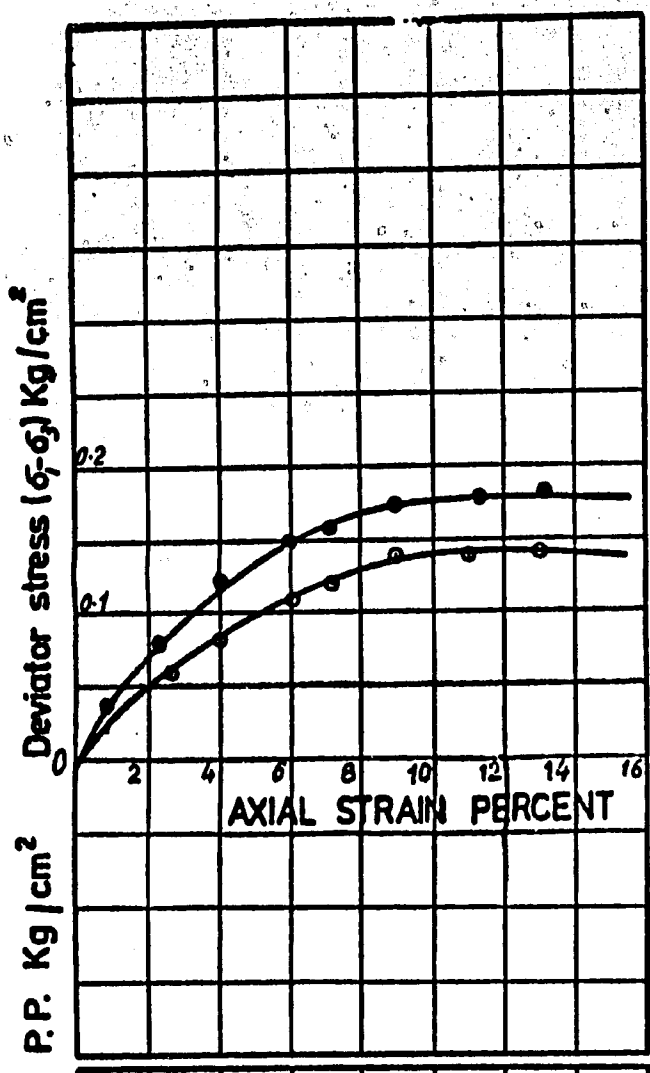
L.L. = 81 % P.L. = 22 %




كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

# TRIAXIAL SHEAR TESTS




| Curve № | $\sigma_3$ | $w_o$ | $(\sigma_1-\sigma_3)_f$ | $w_f$ | $\gamma_o$ |
|---|---|---|---|---|---|
| ○ 1 | 1 | 61 | 0.14 | | 1.61 |
| ● 2 | 3 | 64 | 0.18 | | 1.6 |
| 3 | | | | | |

TYPE *U.U. Tests*

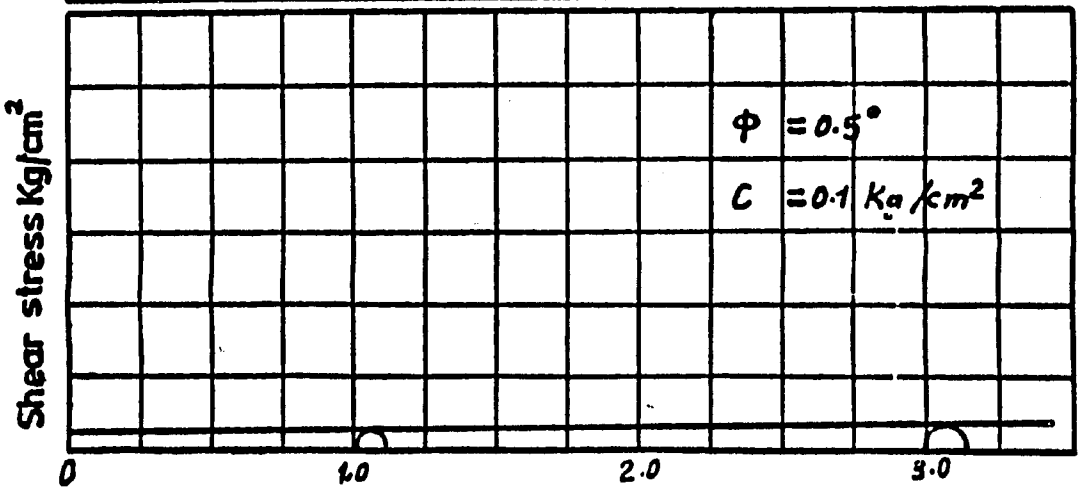
SOIL CLASSIFICATION

*Very soft dark silty clay*

BORING № *S-11 U-6*

DEPTH *12.4'*

P.P. Kg/cm²




كلية الهندسة - جامعة القاهرة

معمل أبحاث الأساسات

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

Cairo
16 October 1977
Laboratory No. 4

# Laboratory Vane Shear Test of Cohesive Soils

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | Vane Shear Stress $Kgs/cm^2$ |
|---|---|---|---|
| 1 | SP 5 | U D S 1 | 1.52 |
| 2 | SP 5 | U D S 2 | 1.09 |
| 3 | SP 5 | U D S 4 | 0.46 |

For Laboratory
Chemist:
M.M.El-Saiedi

DIRECT SHEAR OF COHESIONLESS SOIL

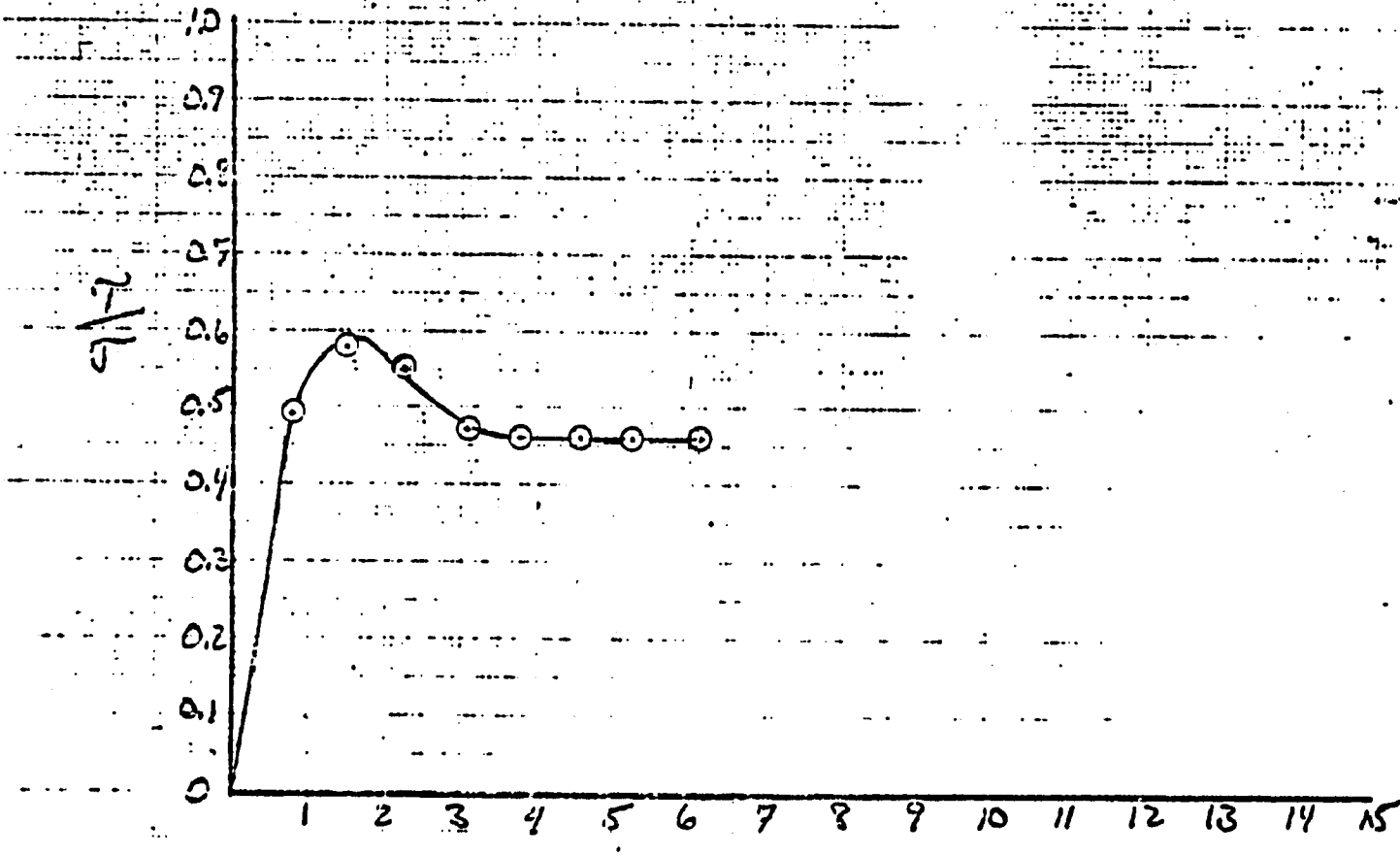
Soil Sample: FINE SAND WITH SHELL FRAGMENTS

Location: HARRIS - EXISTING POOL  Borehole: BH 1 + BH 2  Depth: D-5

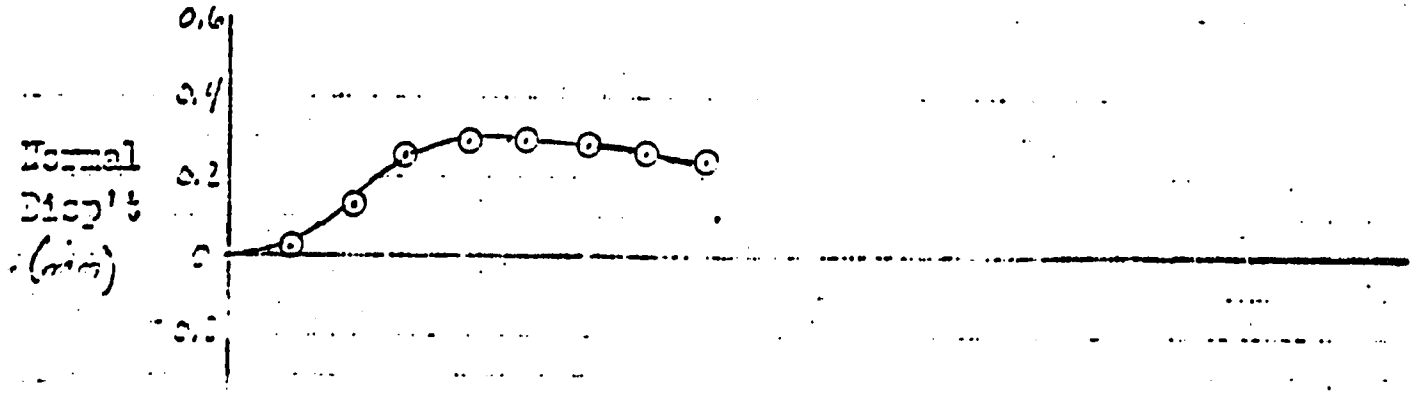
Date: 18/AUG  Sample: Saturated

Initial Density: ≈ 65% $D_r$  Normal Load: 1 KS/cm²

STRAIN RATE: 1.5095 mm/min  $\tau_{ULT}$: 0.58 KS/cm²




Shear Displacement (mm)




Best Available Document

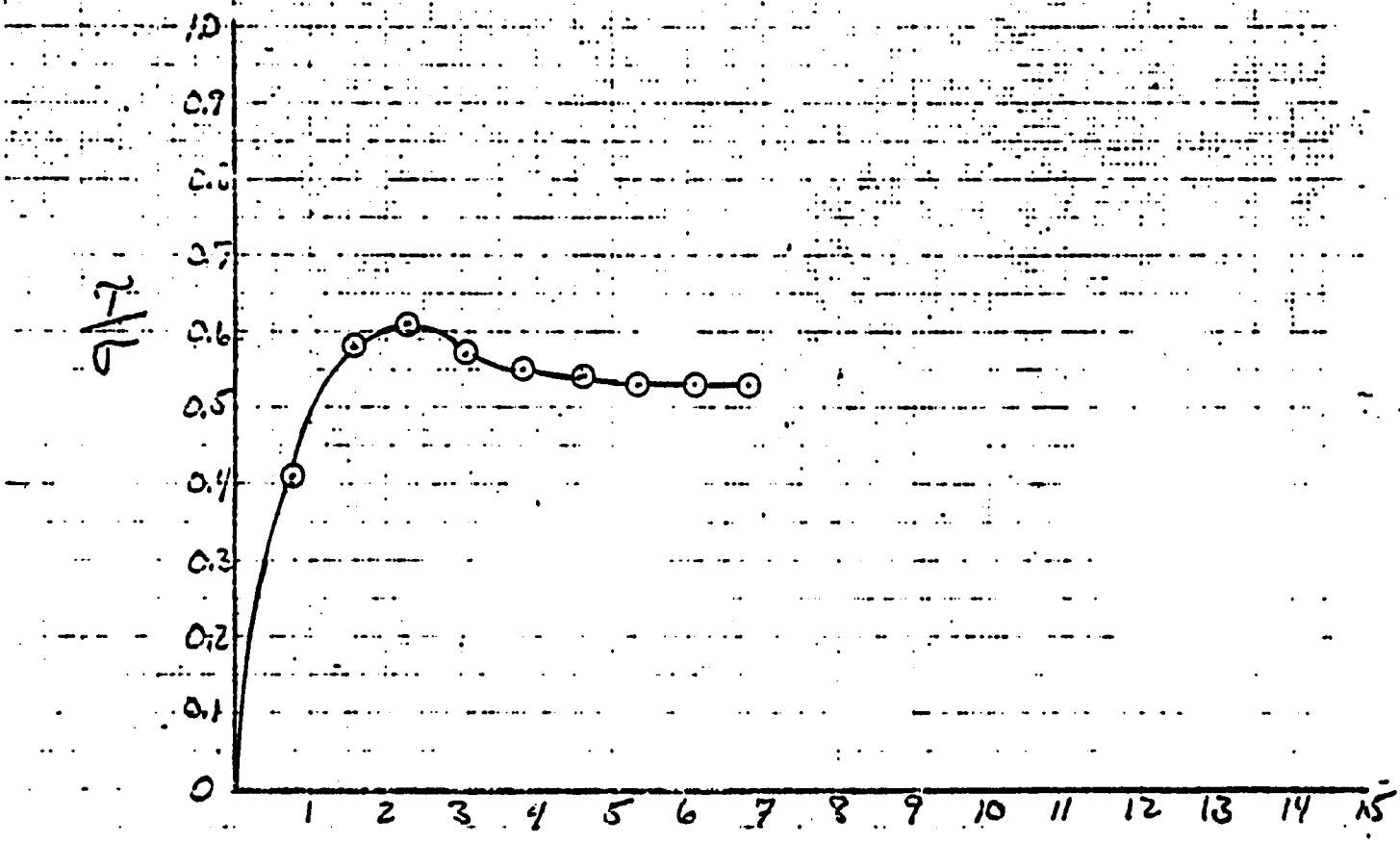
Soil Sample: Fine SAND with Small Fragments

Location: Hanford - Existing Pit  Borehole: BH 1 & H 2  Depth: 5'5"

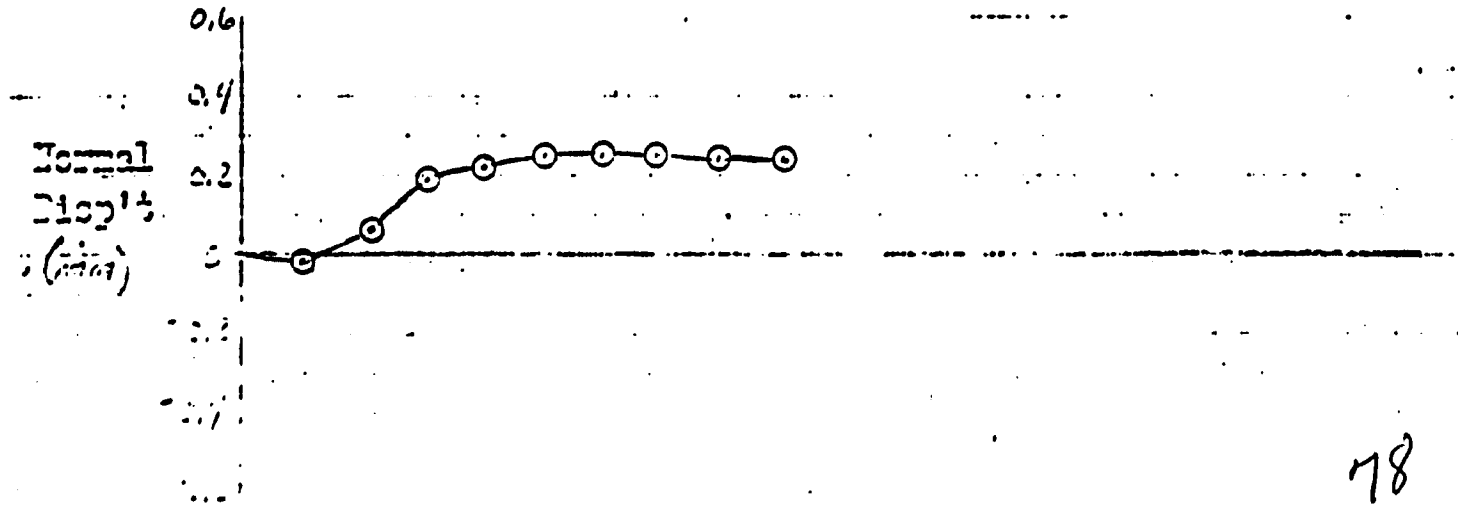
Date: 18 Aug 1977  Sample: Undisturbed

Initial Density: ≈ 65% Dr  Normal Load: 2 KS/cm²

Strain Rate: 1.5095 mm/min  $\tau_{ult}$: 1.21 KS/cm²




Shear Displacement (mm)



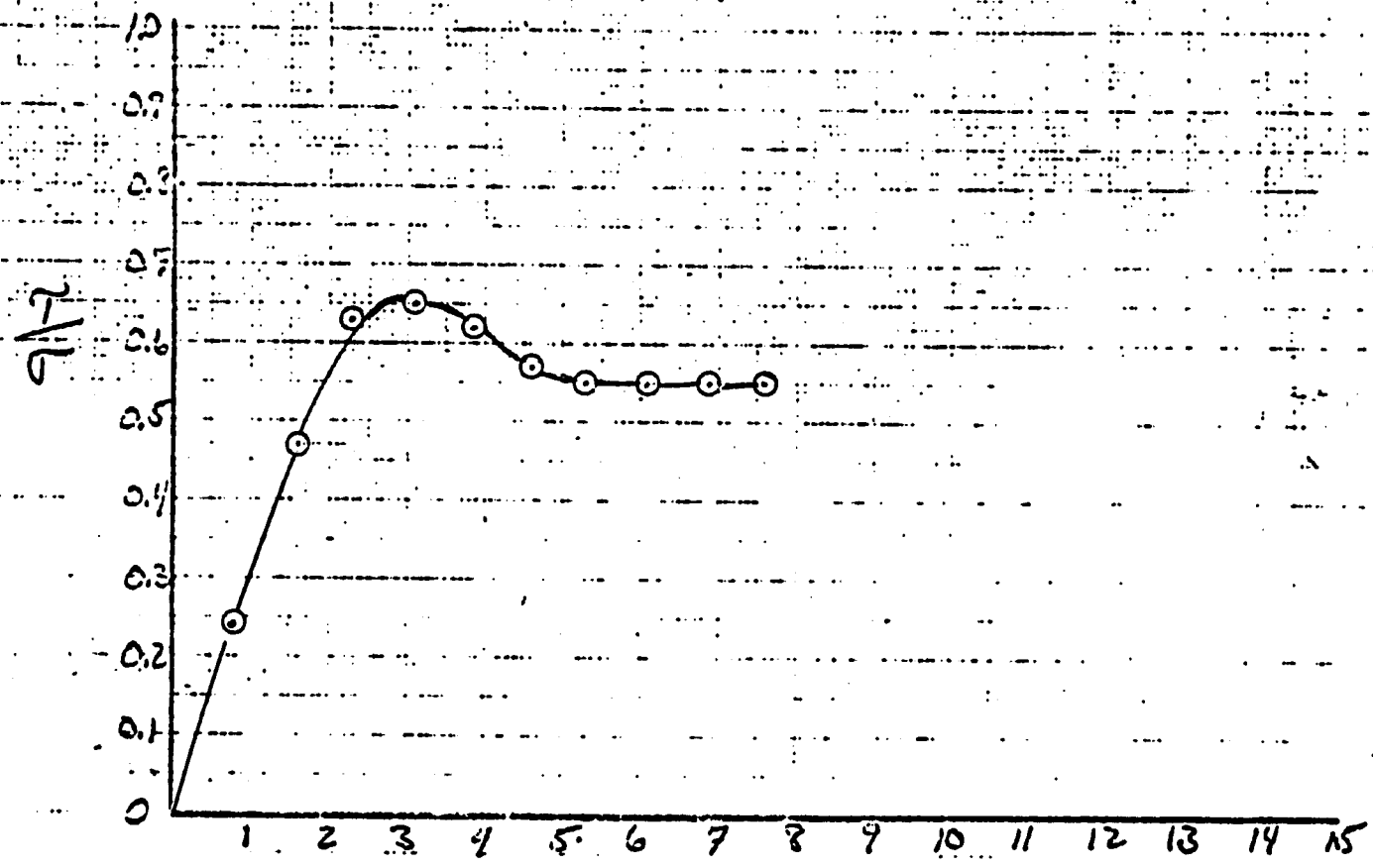
Soil Sample: fine SAND with SHELL FRAGMENTS

Location: Harris Eastern Pier  Borehole: 1+2 SA5  Depth:

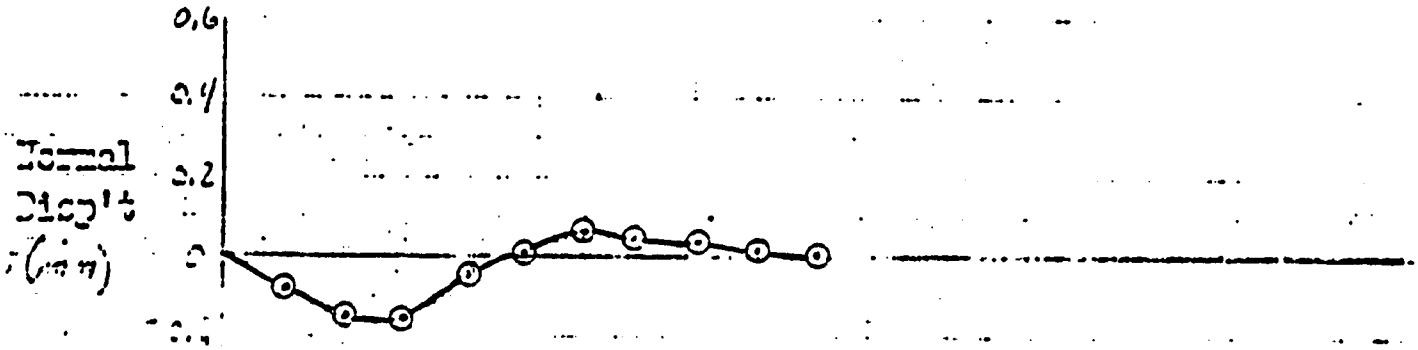
Date: 18 AUG 1977  Sample: Undisturbed

Initial Density: ≈ 65% Dr  Normal Load: 4 kg/cm²

$\dot{\epsilon}_1$ = 1.5085 mm/min  $\tau_{ult}$ = 2.59 kg/cm²




Shear Displacement (mm)



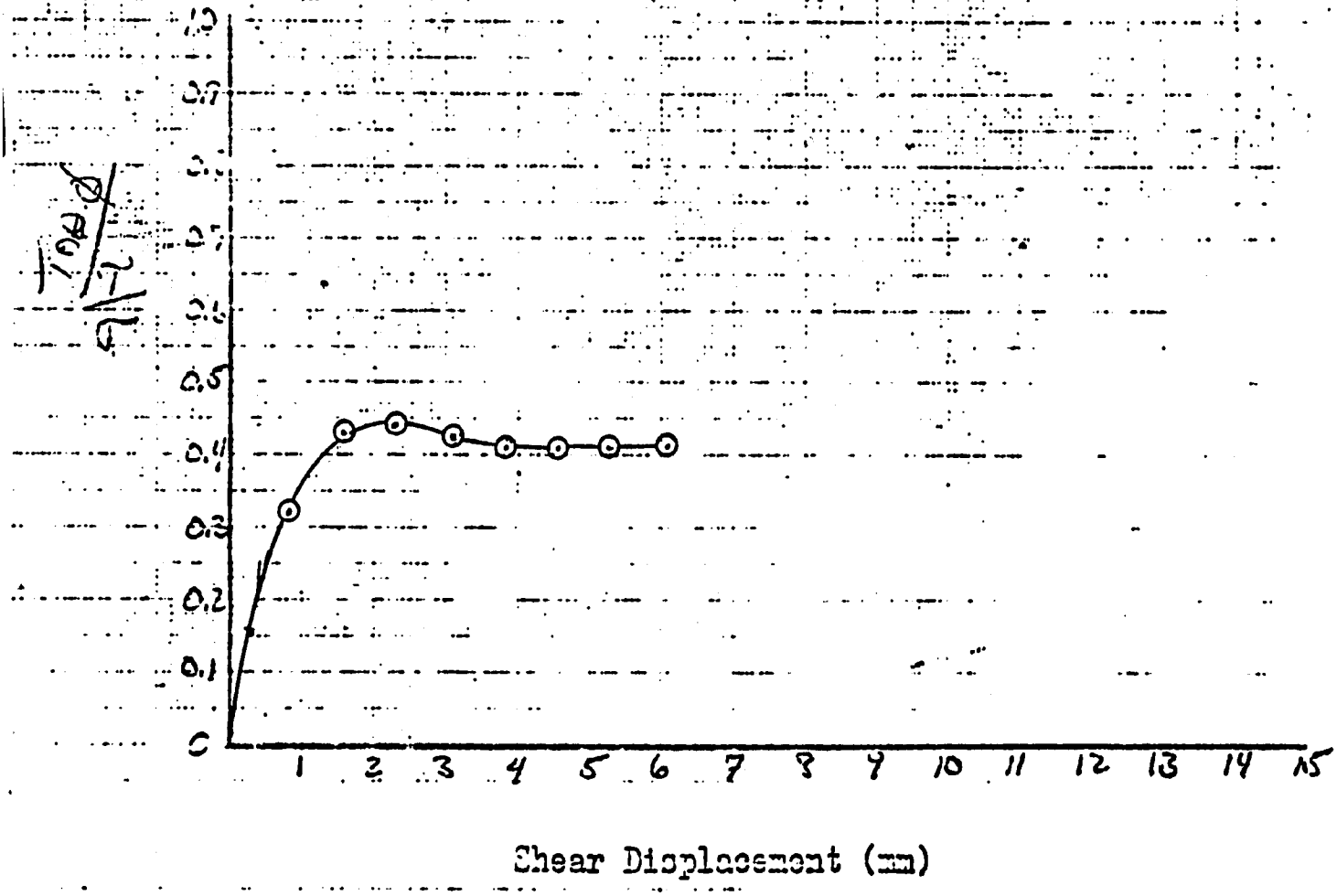
Soil Description: fine SAND with Shells

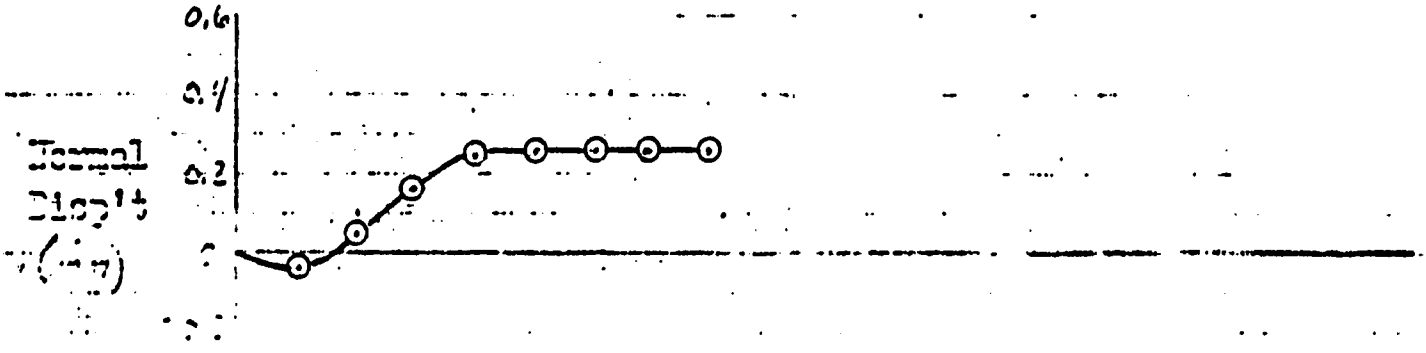
Location: Harris - Existing Port  Borehole: 617 D-5  Depth: _____

Date: 21 Dec 1977  Sample: ~~Dry~~/Saturated

Initial Density: 1.58 gm/cc  Normal Load: 1.5 kg/cm²

Strain Rate: 1.5095 mm/min  $\tau_{ult}$: 0.66 kg/cm²




**Best Available Document**

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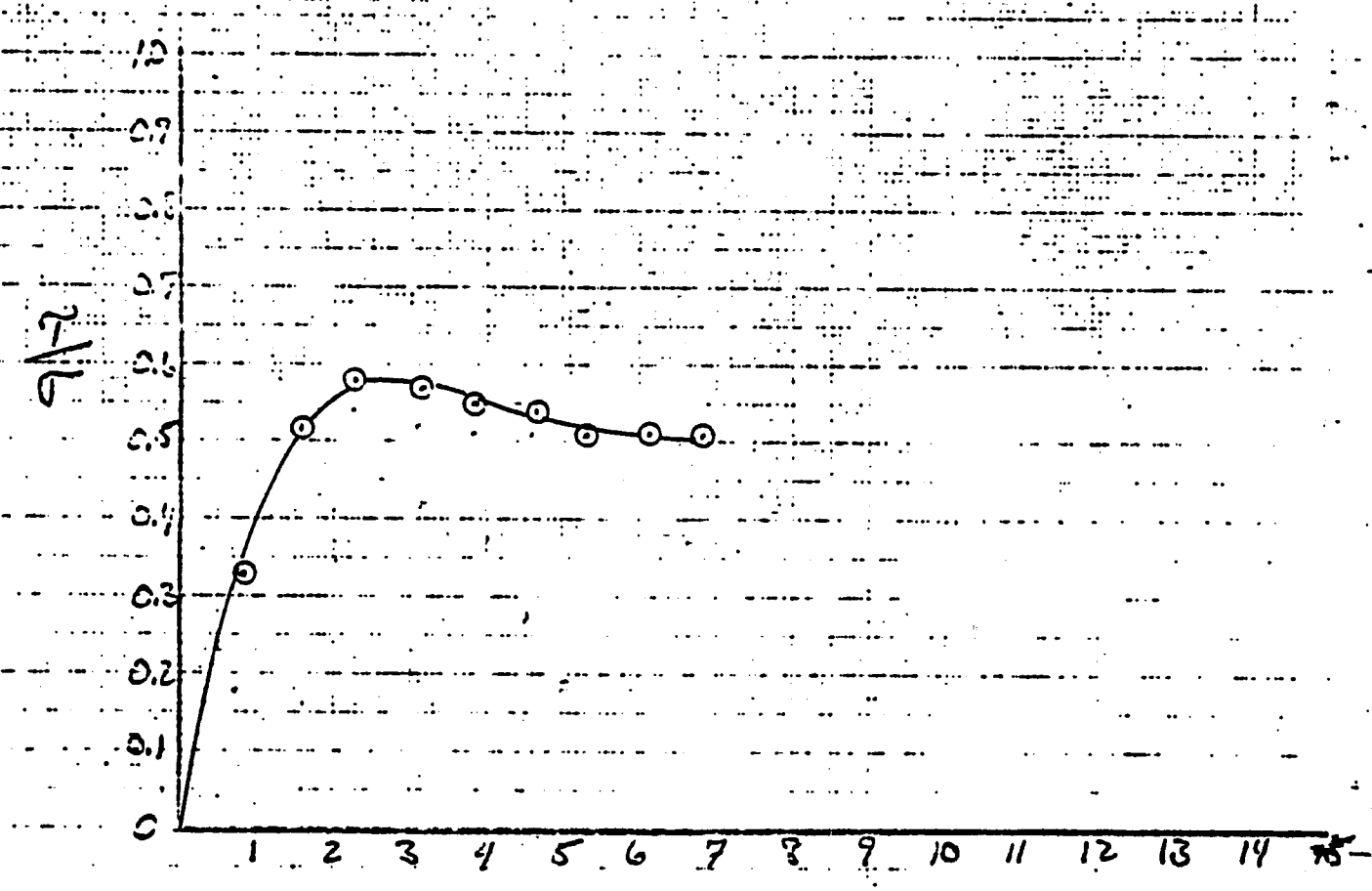
Soil Sample: FINE SAND WITH SHELLS

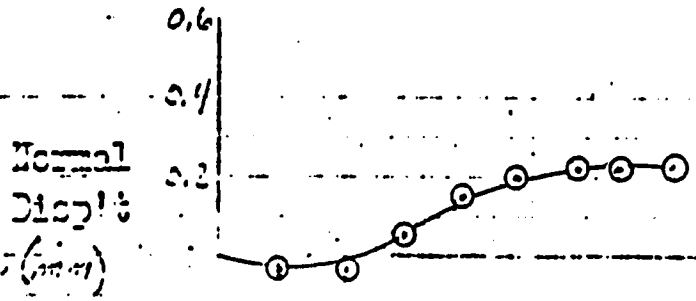
Location: HARRIS - EXISTING PAD  Borehole: 6+7 D5  Depth:

Date: 21 AUG 1977  Sample: Dry/Saturated

Initial Density: 2.58 gm/cc  Normal Load: 2.5 kg/cm²

STRAIN RATE: 1.5095 mm/min  $\tau_{ULT}$: 1.44 kg/cm²



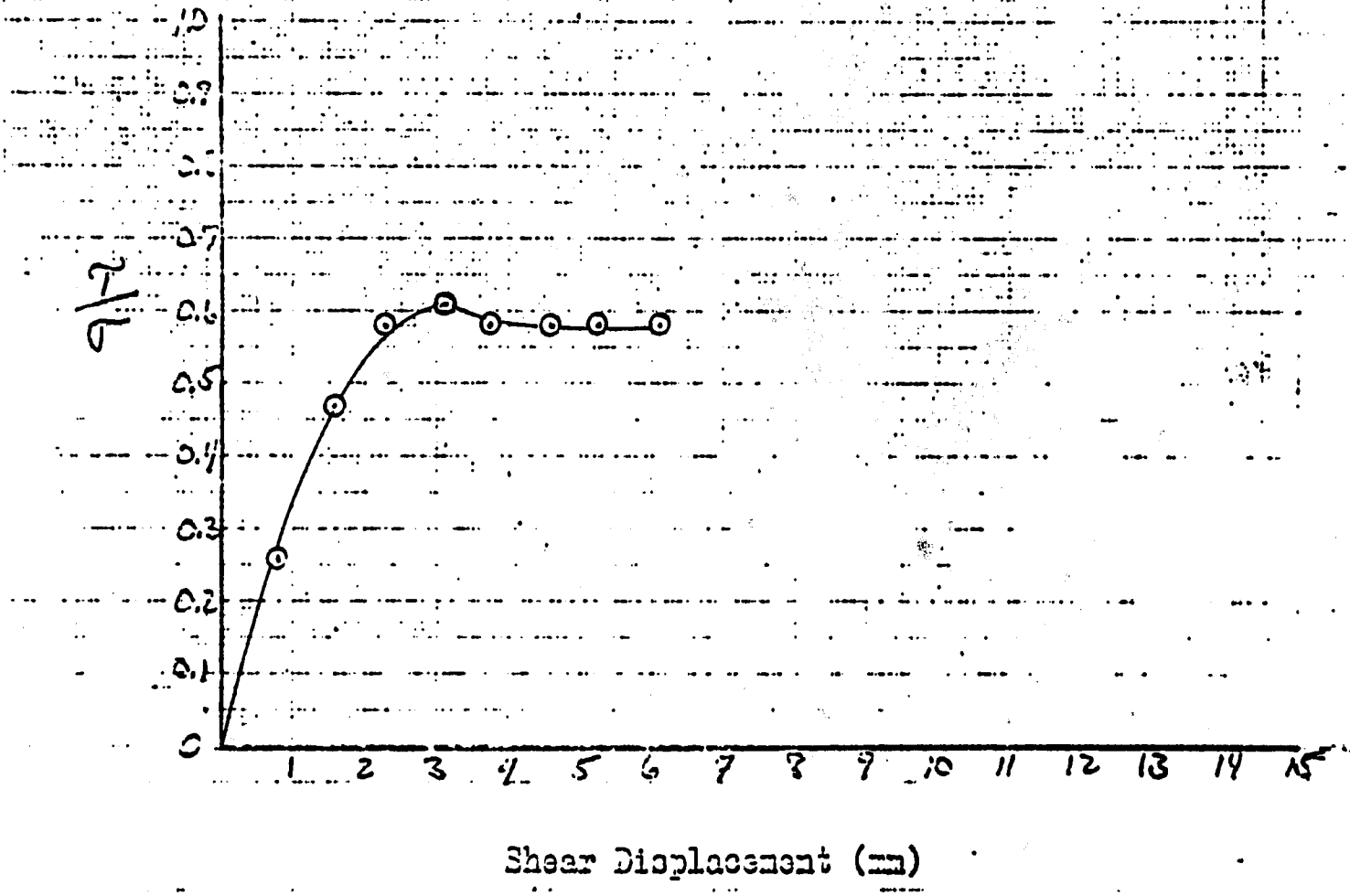
Soil Sample: Pine SAND with Shells

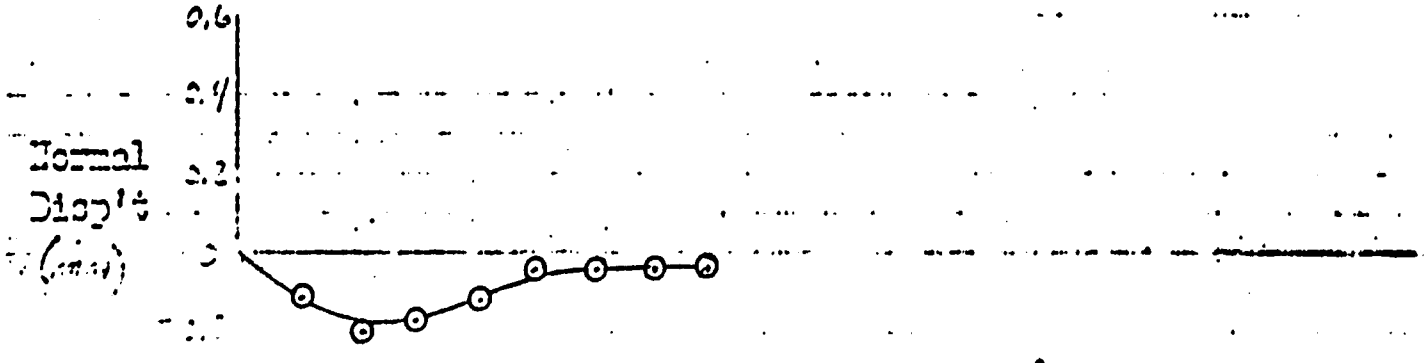
Location: Harris - New Port  Borehole: 67 D5  Depth:

Date: 21 Aug 1977  Sample: Undisturbed

Initial Density: 1.58 gm/cc  Normal Load: 4 Kg/cm²

Strain Rate: 1.5095 mm/min  $\tau_{ult}$: 2.45 Kg/cm²




Best Available Document

RAYMOND INTERNATIONAL OF DELAWARE INC.

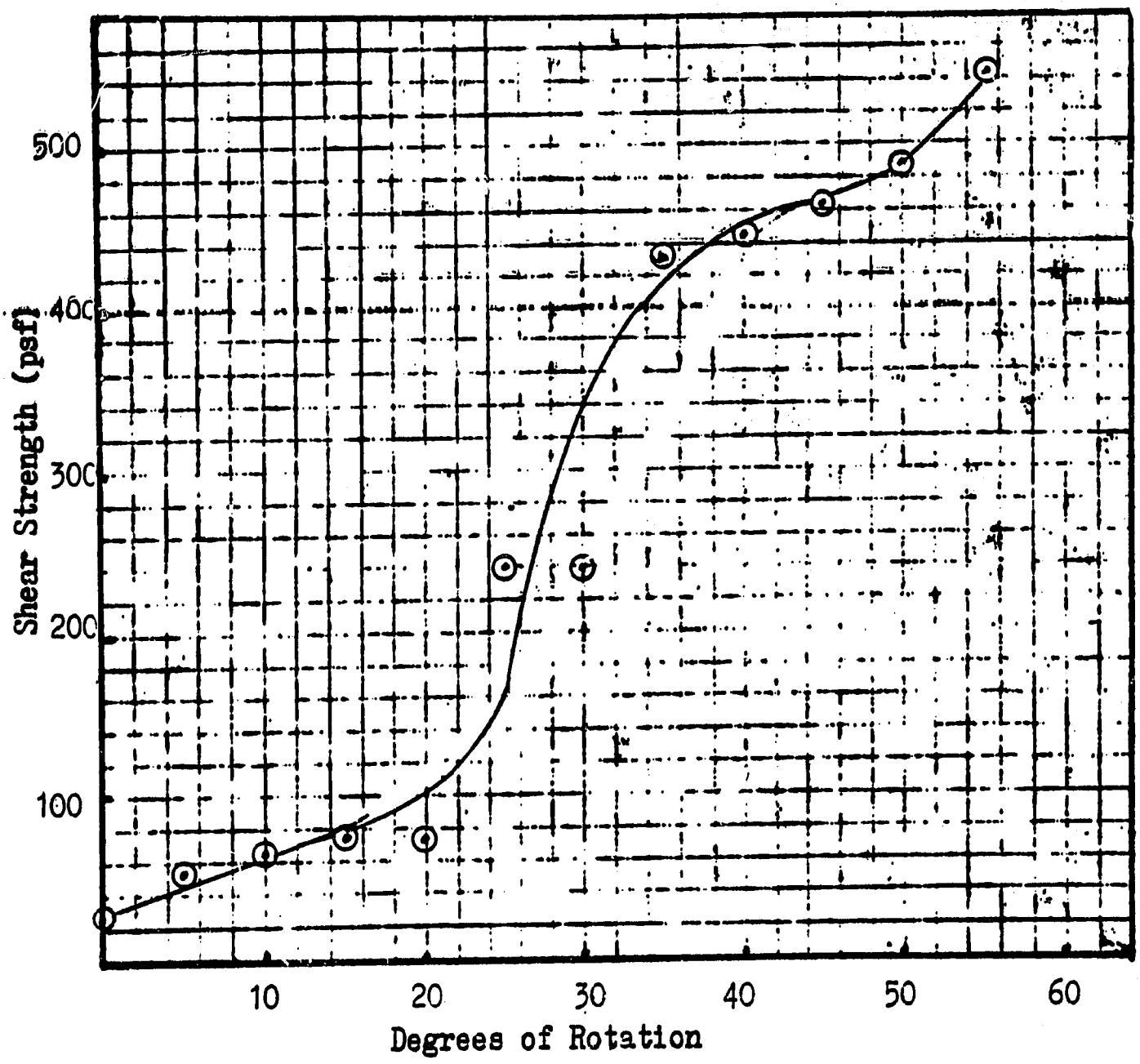
Project: PORT -SAID EXISTING PORT Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP -5 Depth: 63.0' - 64.5'

Torque Arm Length: 6.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

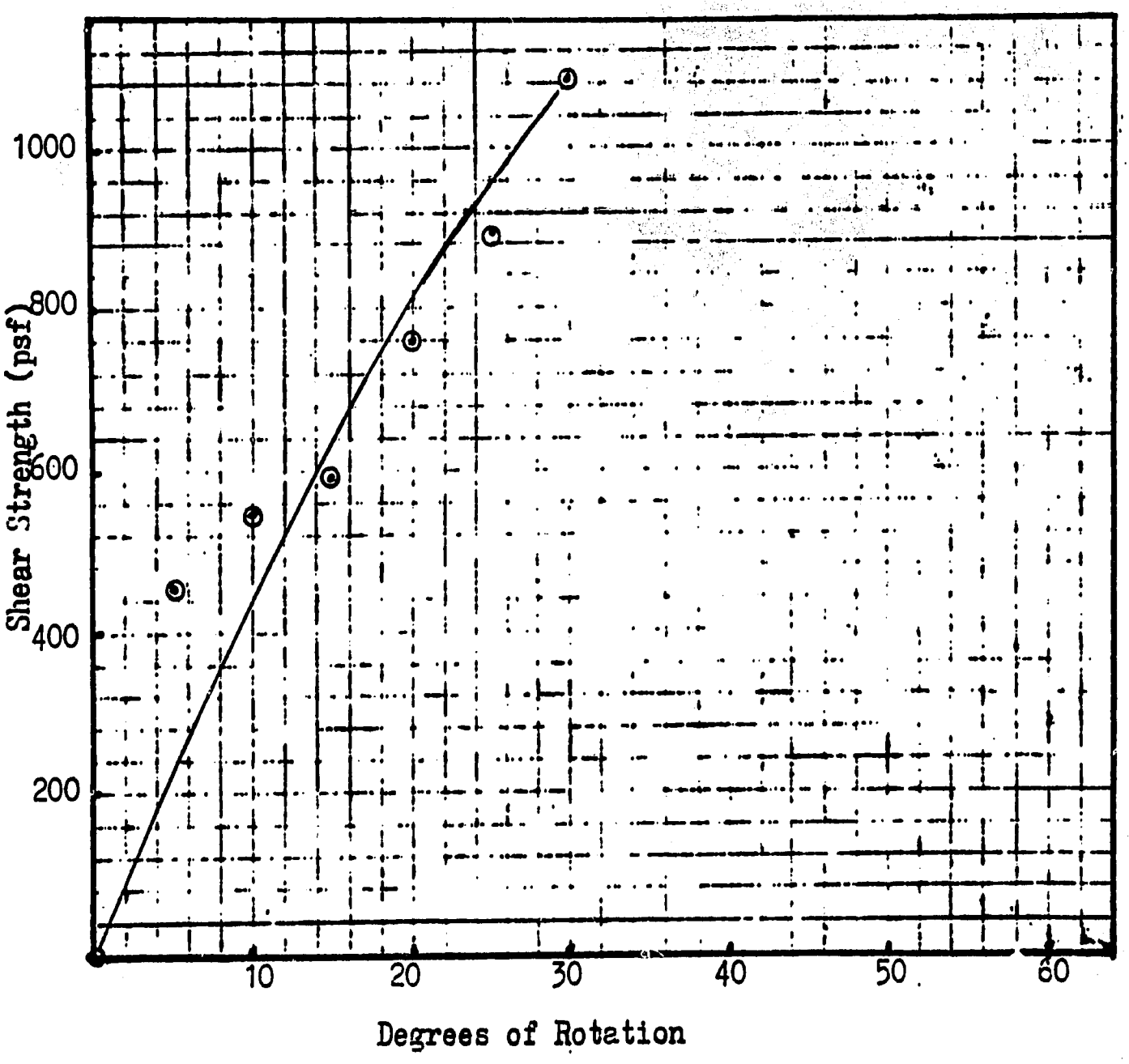
Project: PORT SAID EXISTING PORT. Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 63.0' - 64'5"

Torque Arm Length: 12.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

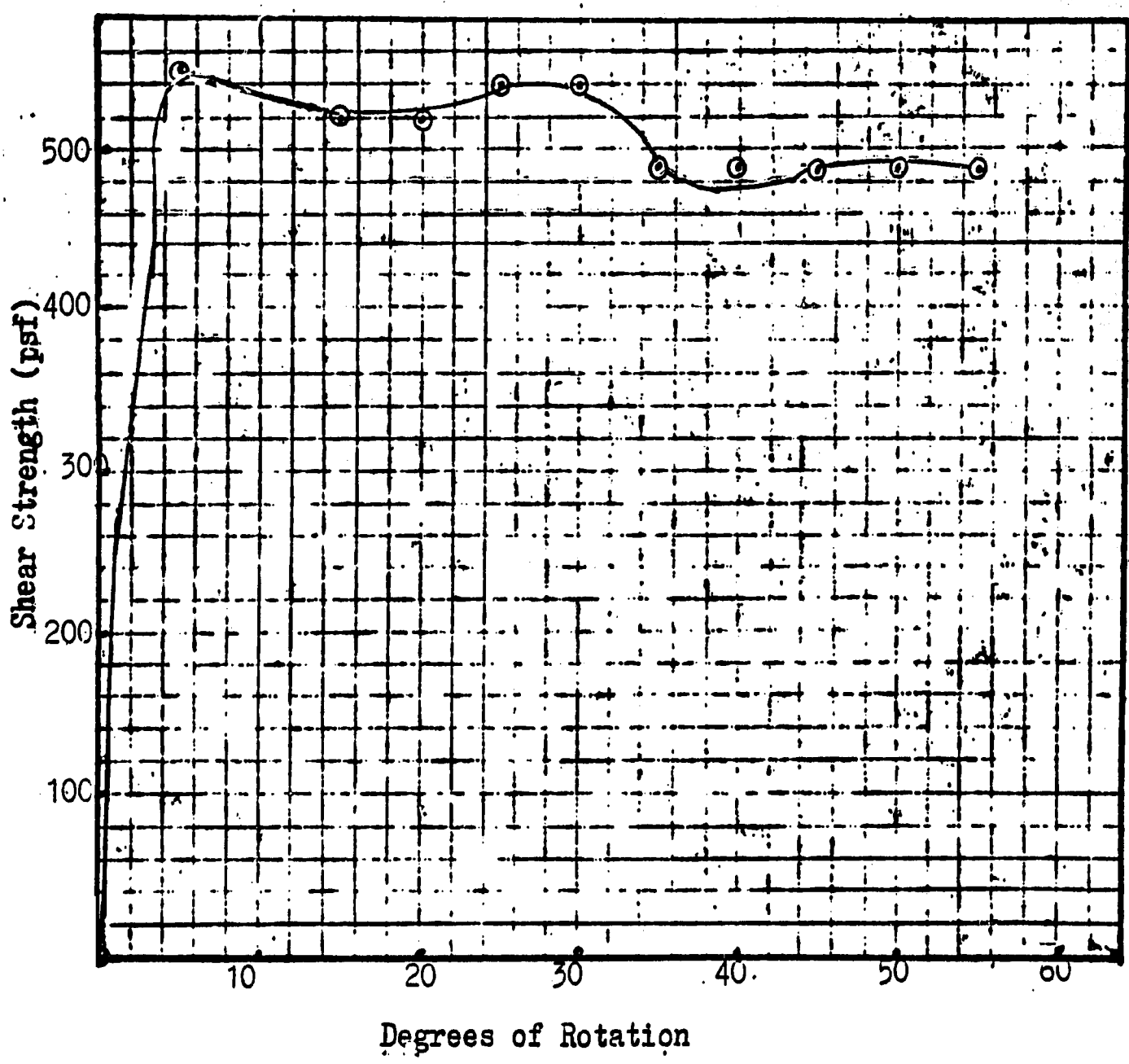
Project: PORT SAID EXISTING PORT. Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 63.0' - 64',5"

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

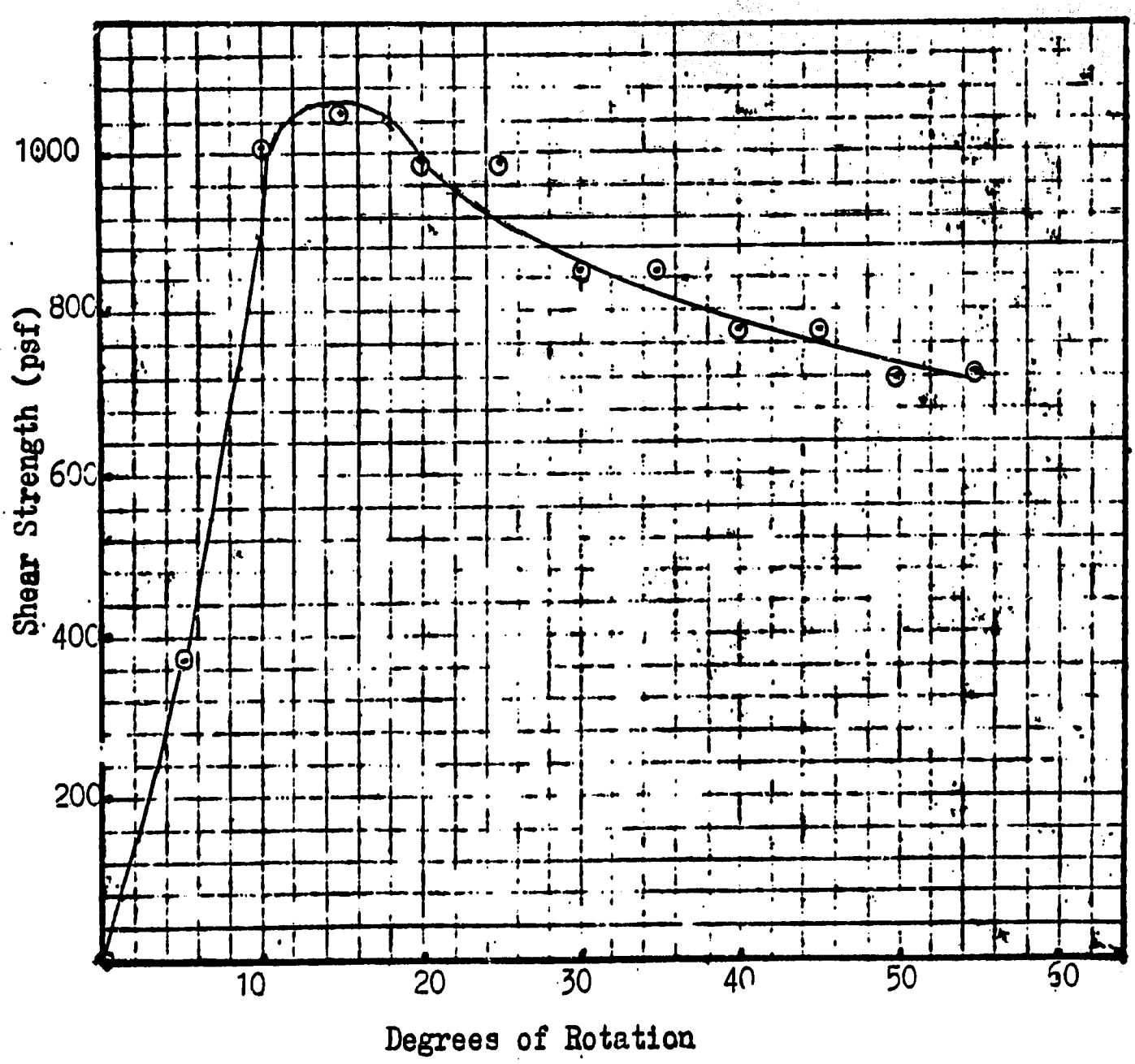
Project: PORT SAID EXISTING PORT. Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 63.0' - 64',5"

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

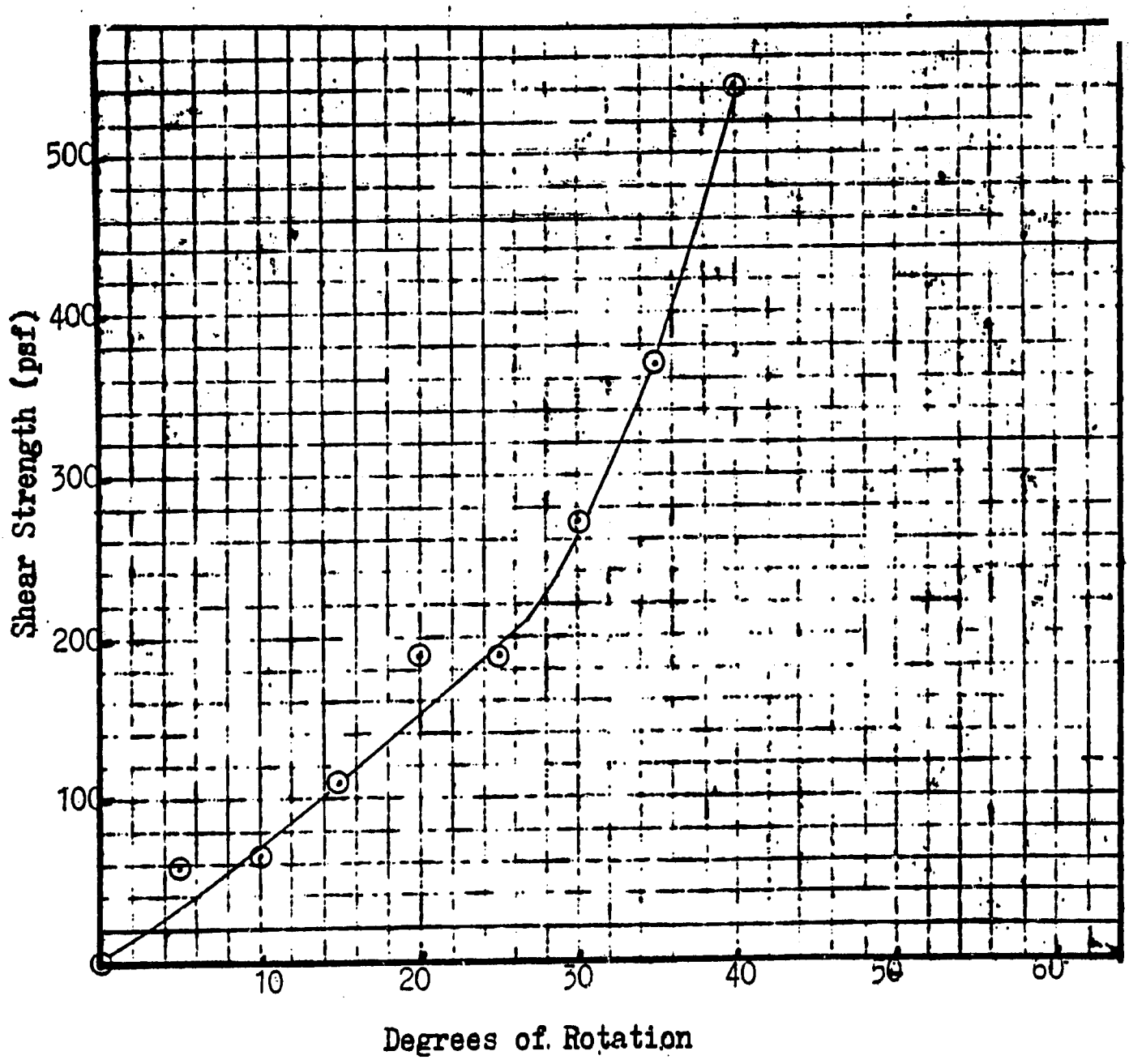
Project: PORT SAID, EXISTING PORT Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 83.0' - 84.5"

Torque Arm Length: 6.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

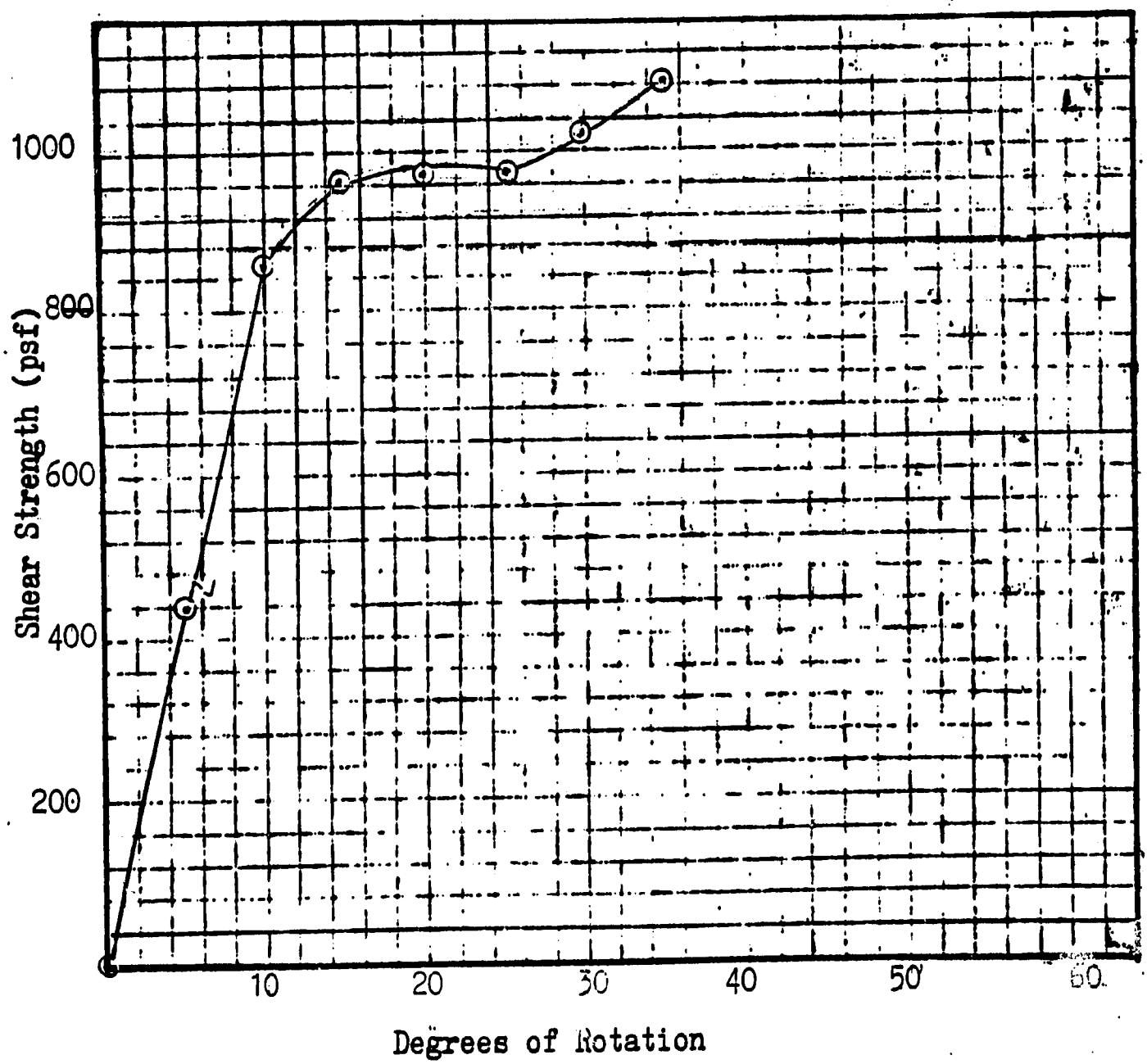
Project: PORT SAID EXISTING PORT. Date: 26/9/1977.

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 83.0' - 84',5"

Torque Arm Length: 12.0" Vane Diameter: 3 5/8"

Undisturbed / Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

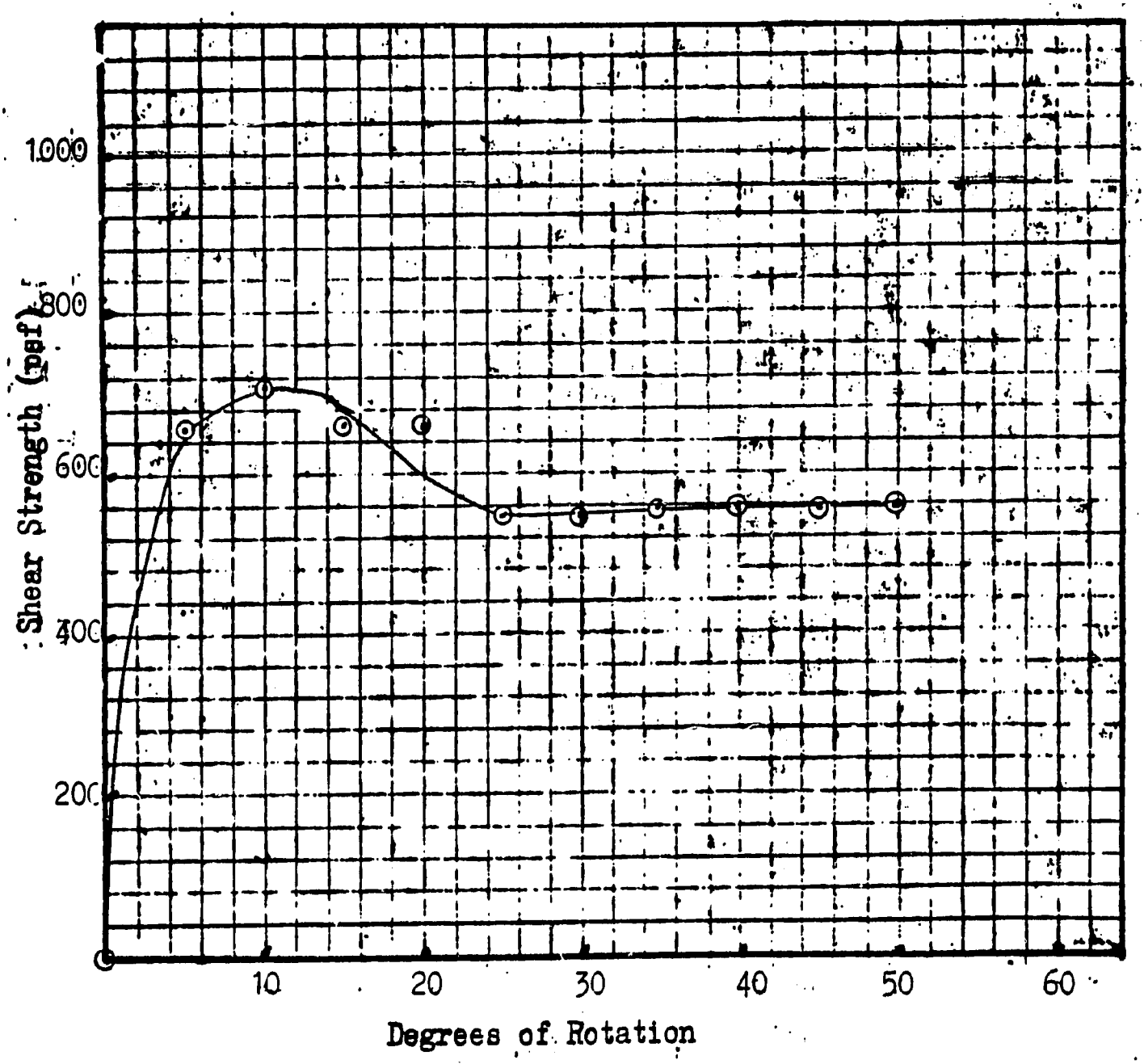
Project: PORT SAID EXISTING PORT Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 83.0' - 84'.5"

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed / Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

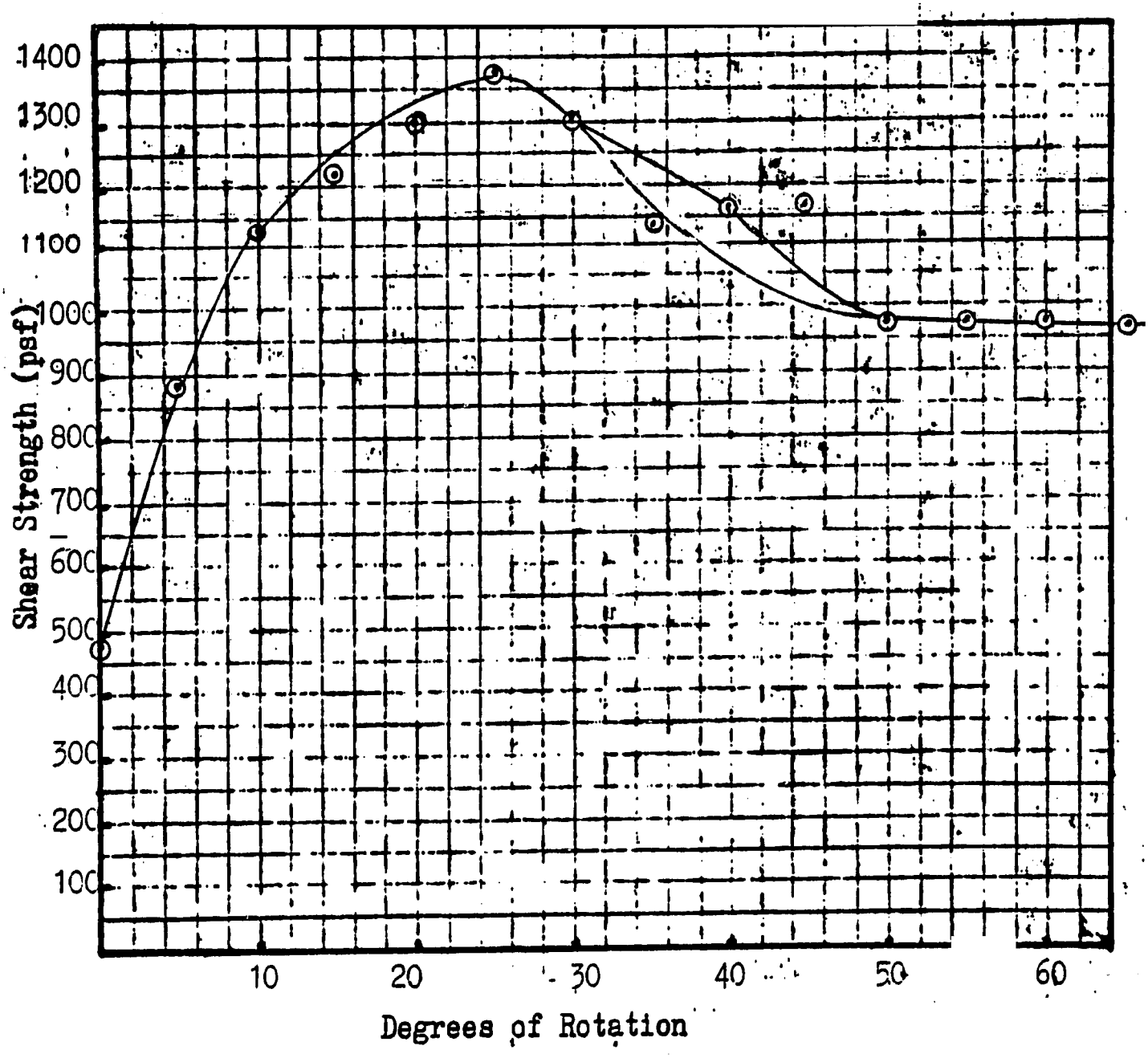
Project: PORT SAID EXISTING PORT Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: SP - 5 Depth: 83.0' - 84'.5"

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905



RAYMOND INTERNATIONAL OF DELAWARE INC.

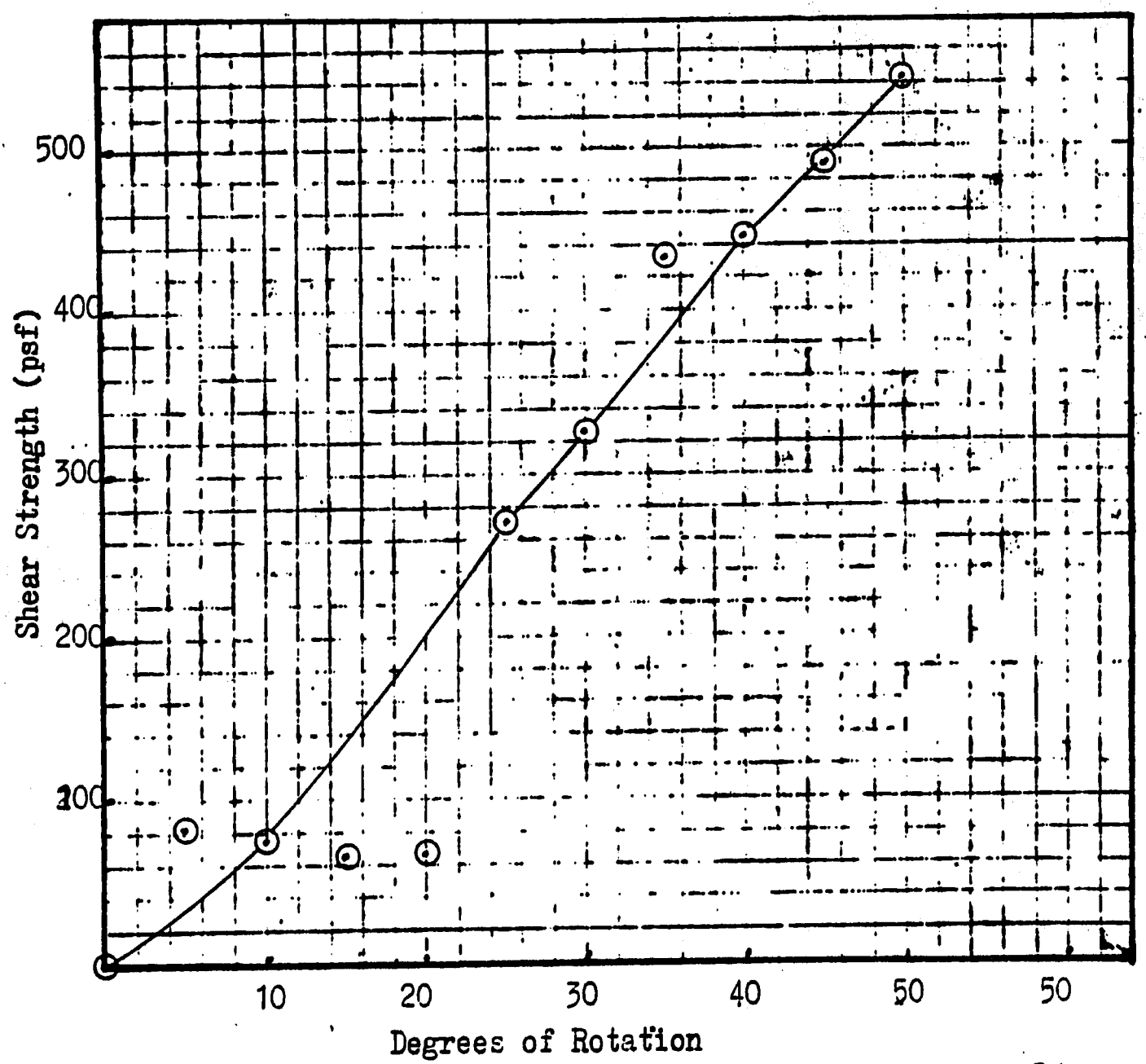
Project: PORT- SAID HARRIS. Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: s - 14 Depth: 58.0'

Torque Arm Length: 6.0" Vane Diameter: 35/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

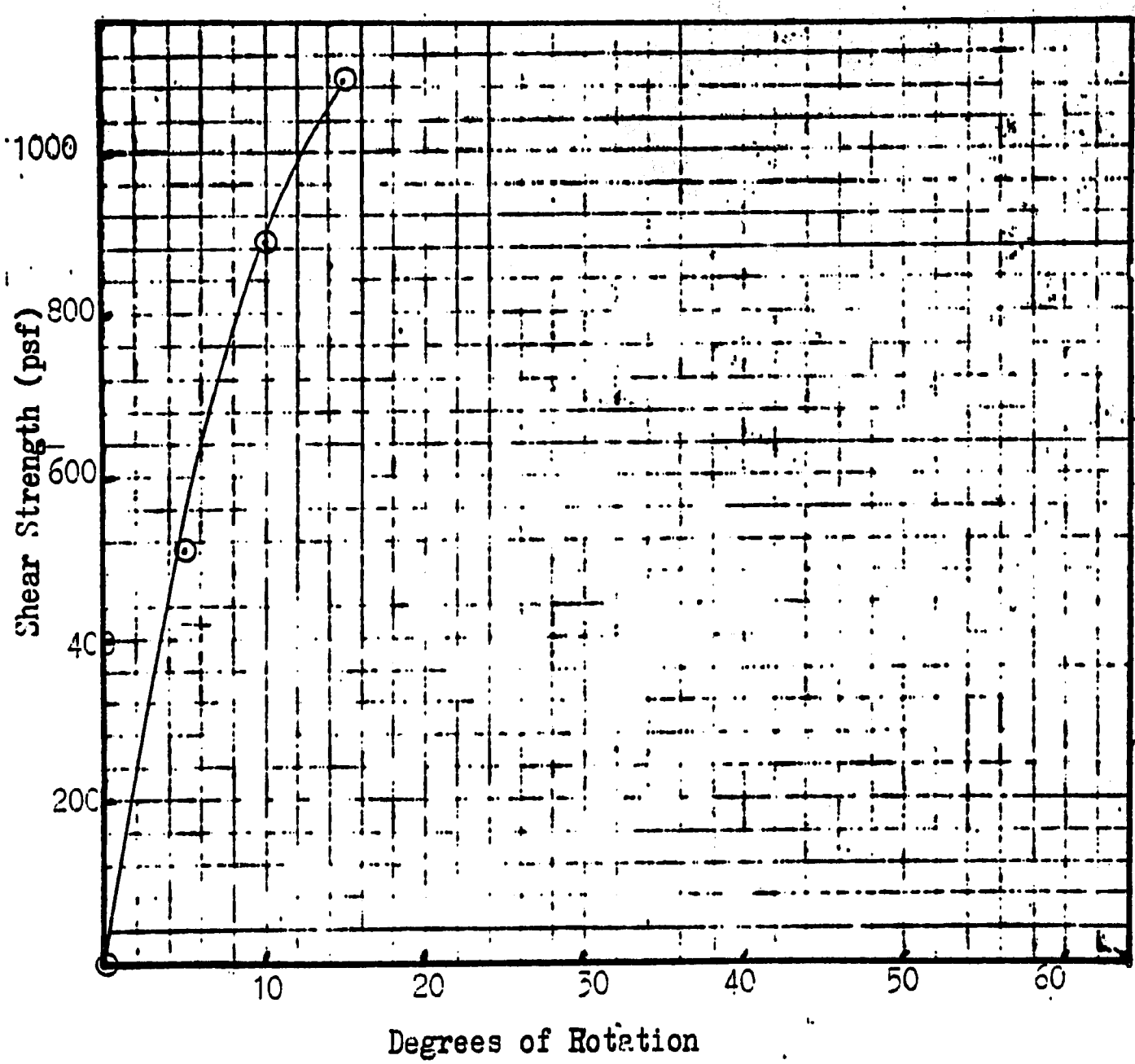
Project: PORT SAID HARRIS Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 58',5"

Torque Arm Length: 12" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.305

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RAYMOND INTERNATIONAL OF DELAWARE INC.

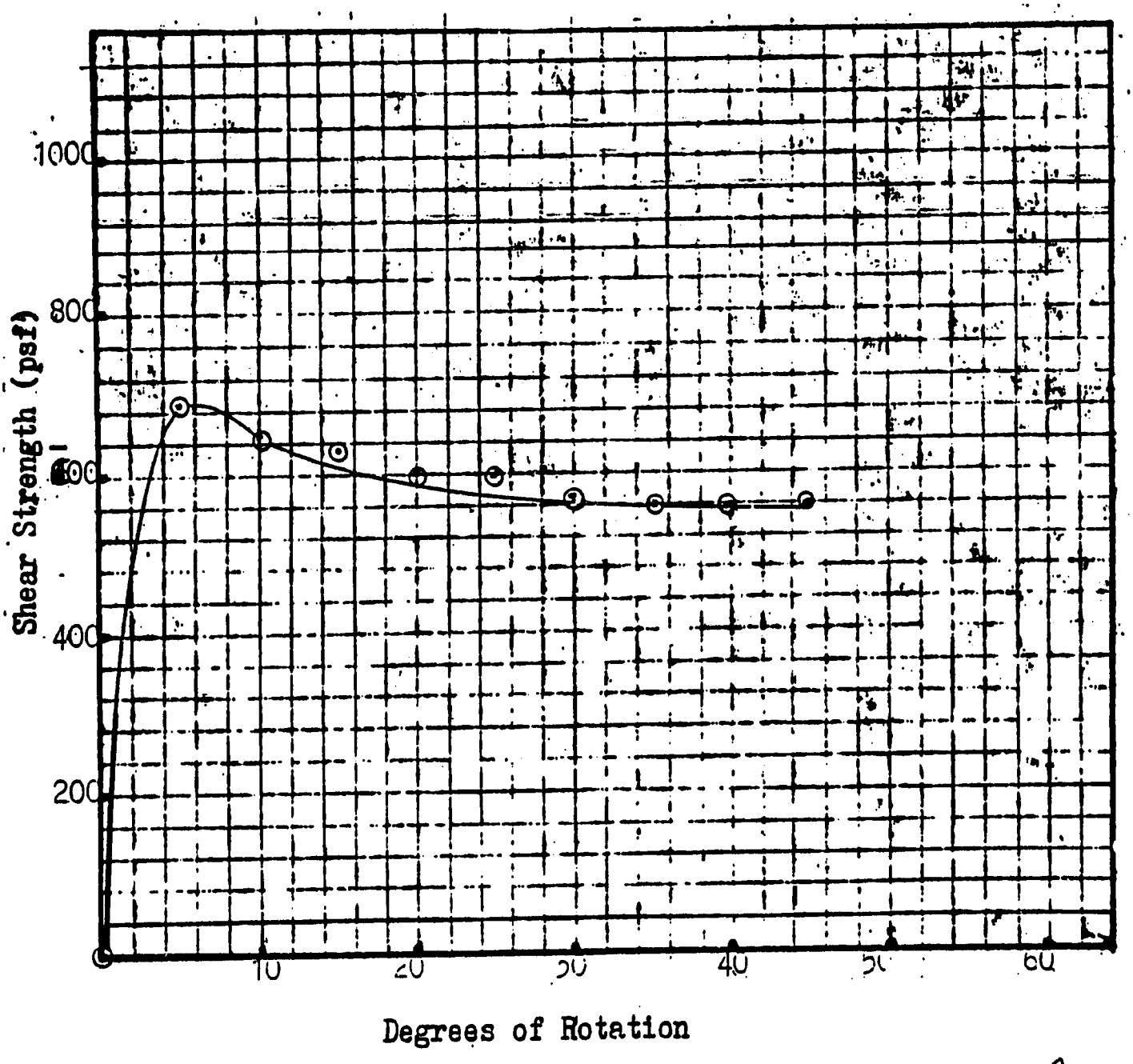
Project: PORT SAID HARRIS Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: 3 - 14 Depth: 59.0'

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed (Remolded) Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

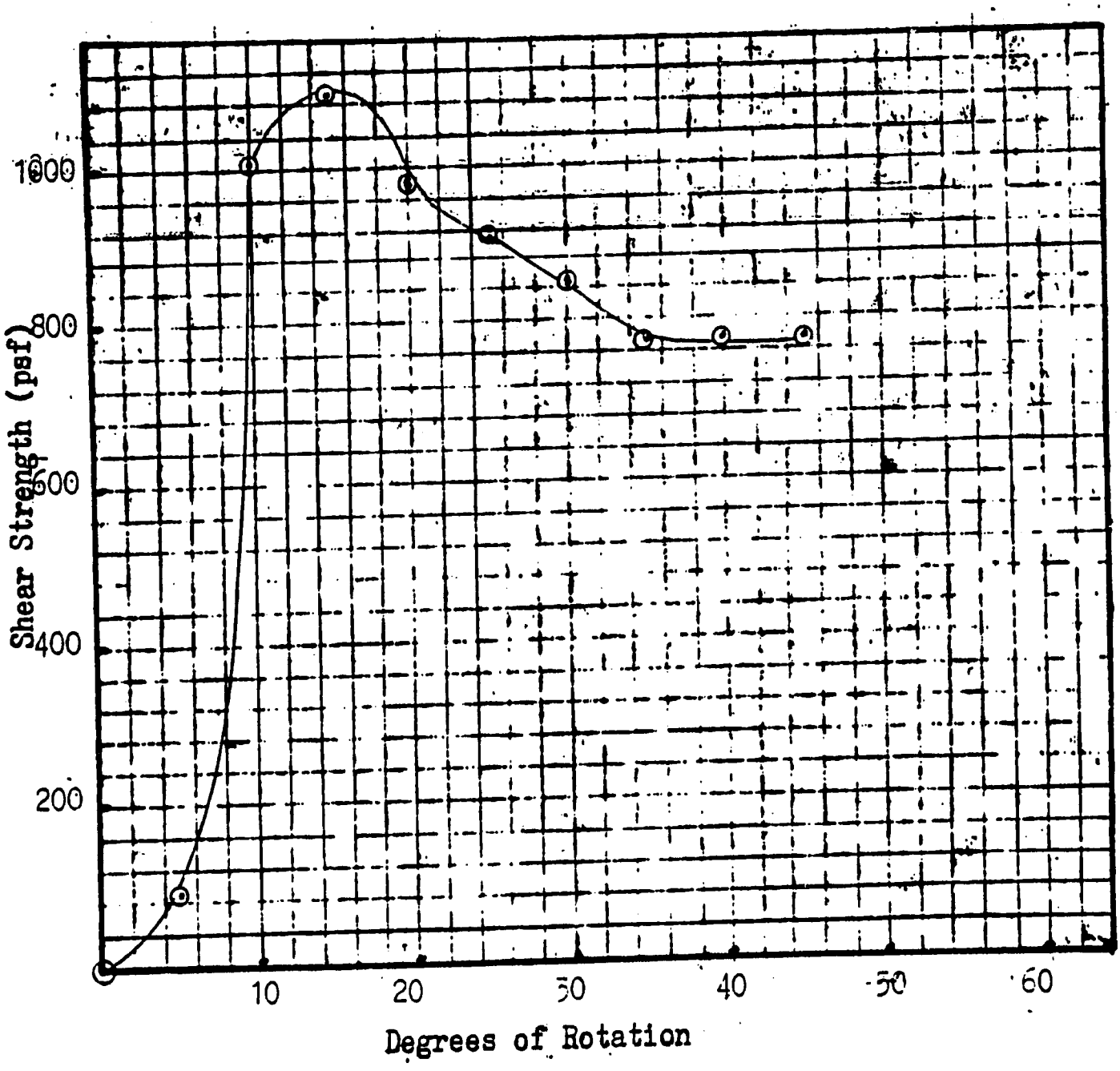
Project: PORT SAID EXISTING PORT. Date: 26/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 59.44

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed / Remolded Vane Constant: 0.905



RAYMOND INTERNATIONAL OF DELAWARE INC.

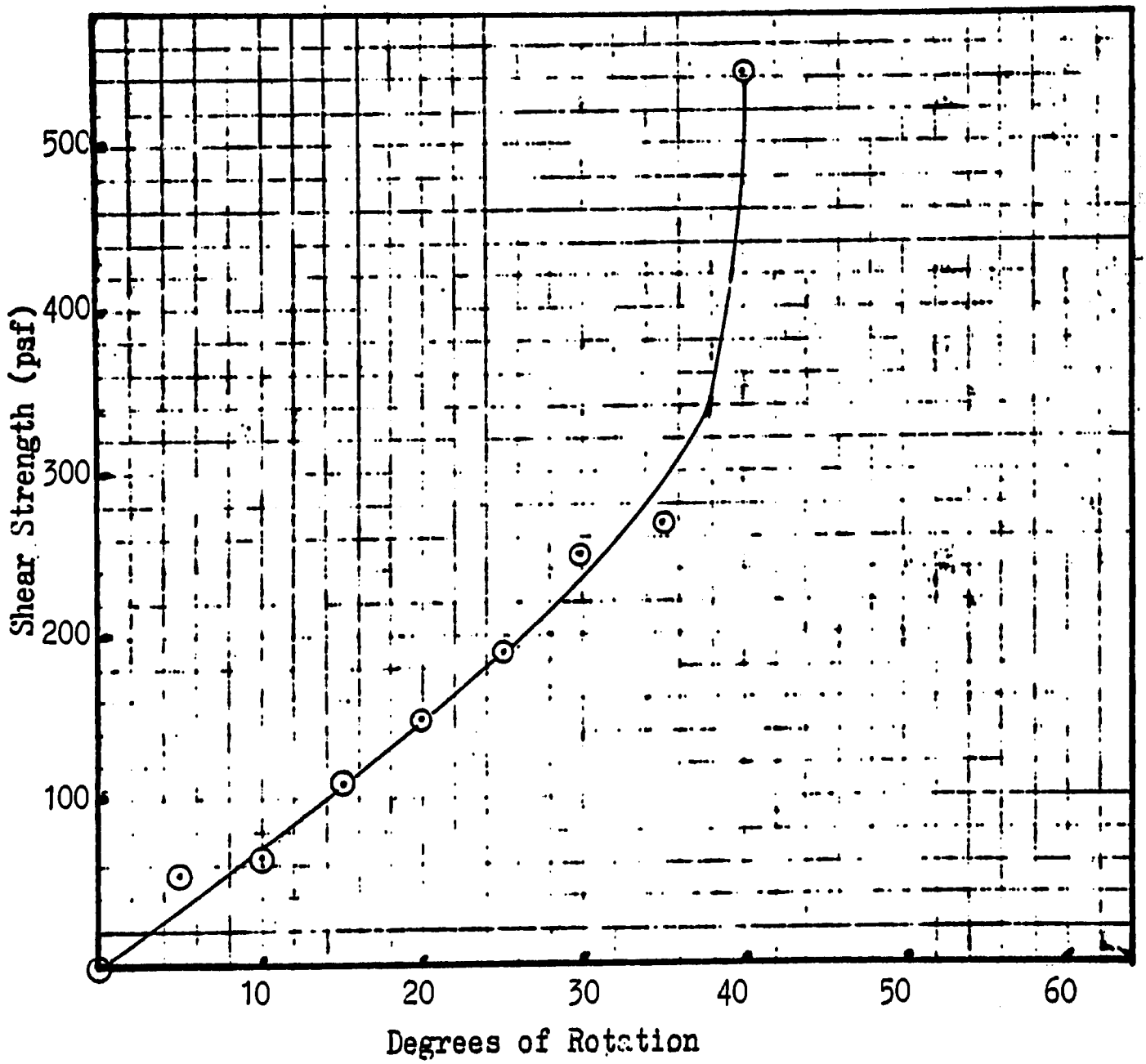
Project: PORT SAID Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 80.0'

Torque Arm Length: 6.0" Vane Diameter: 3 5/8"

Undisturbed / Remolded Vane Constant: 0.905



RAYMOND INTERNATIONAL OF DELAWARE INC.

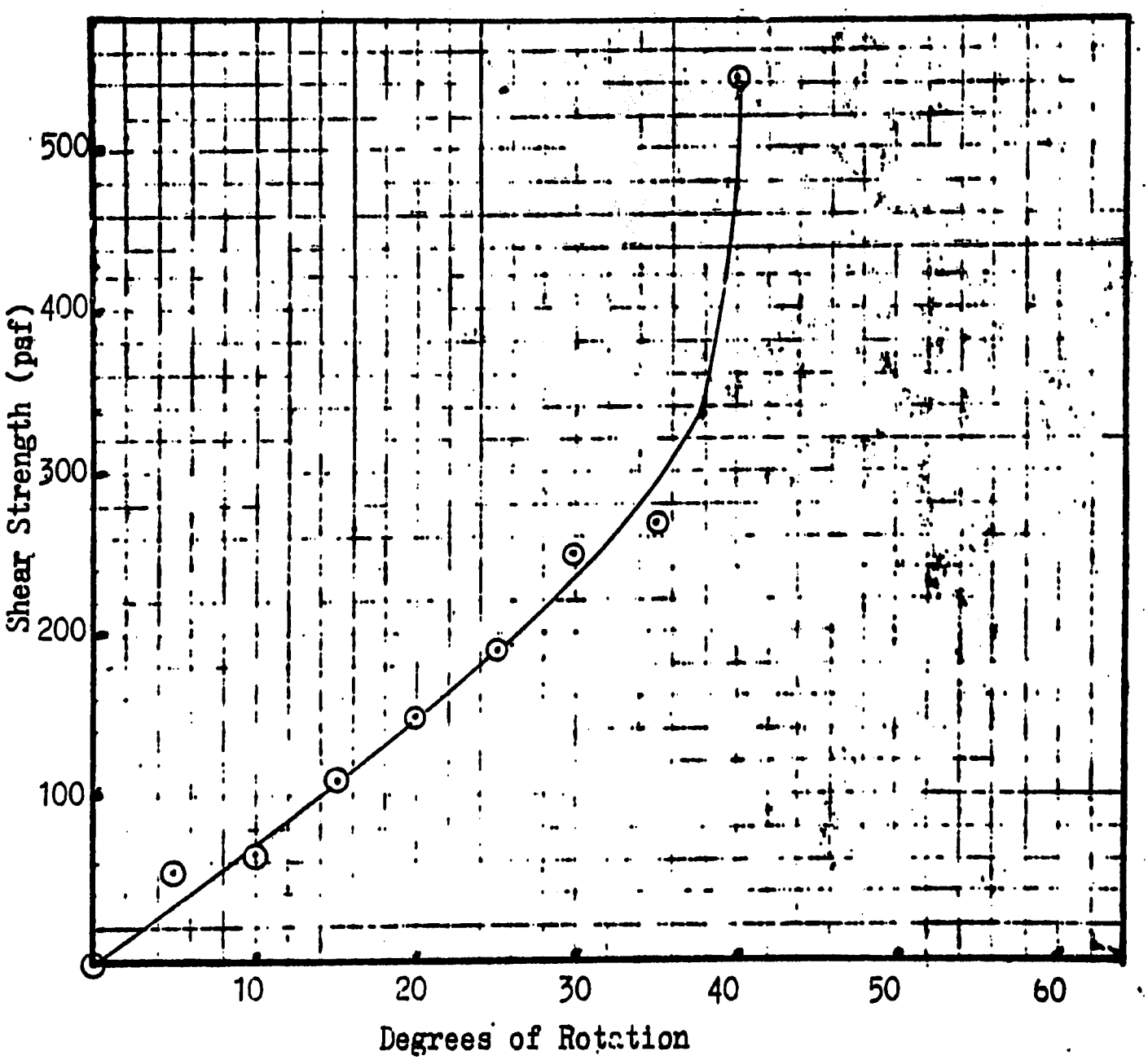
Project: PORT SAID Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 80.0'

Torque Arm Length: 6.0" Vane Diameter: 3 5/8"

Undisturbed / Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

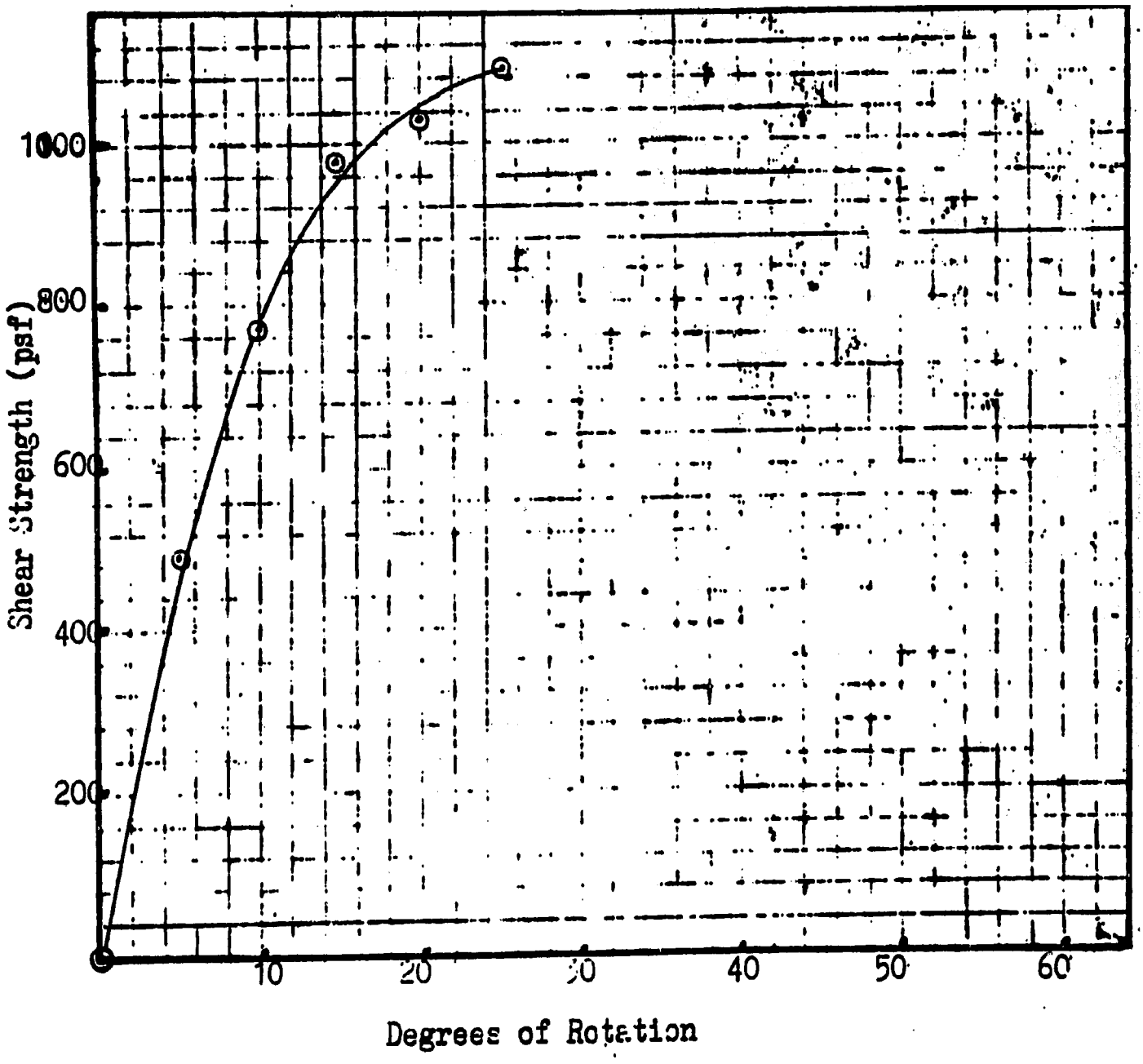
Project: HARRIS-PORTSAID. Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 80'.5"

Torque Arm Length: 12.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

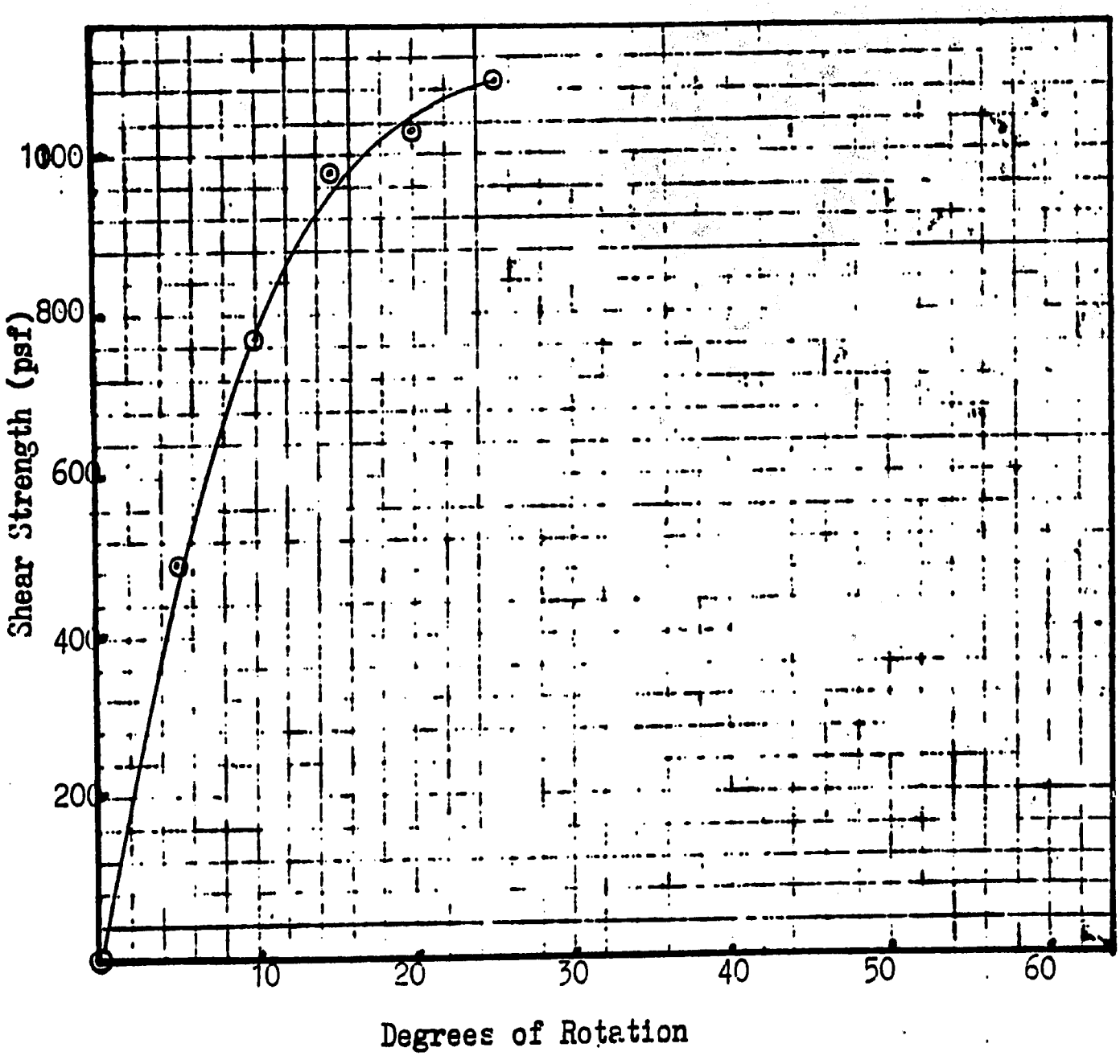
Project: HARRIS-PORTSAID. Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 80'.5"

Torque Arm Length: 12.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

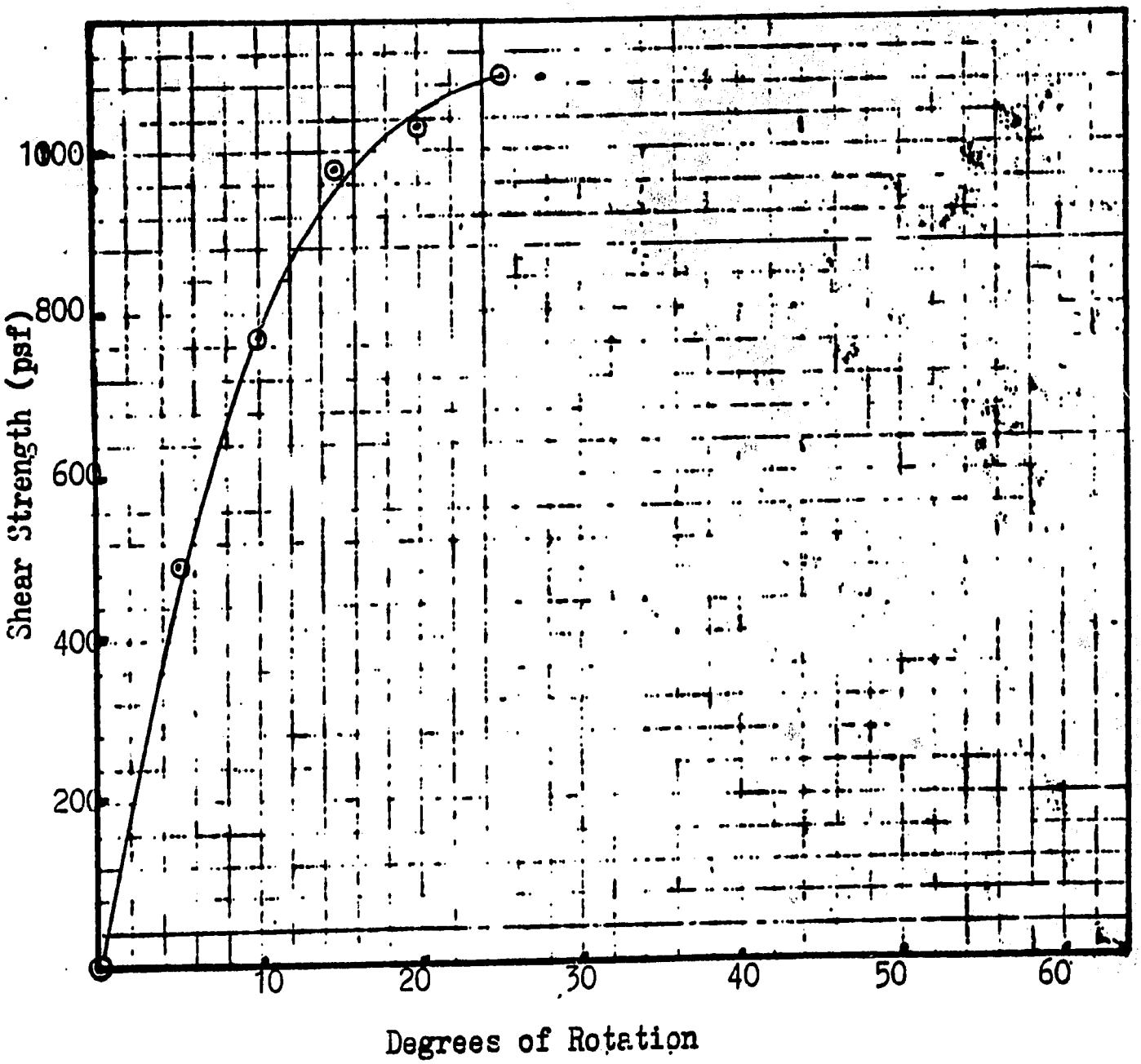
Project: HARRIS-PORTSAID. Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 80'.5"

Torque Arm Length: 12.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905



RAYMOND INTERNATIONAL OF DELAWARE INC.

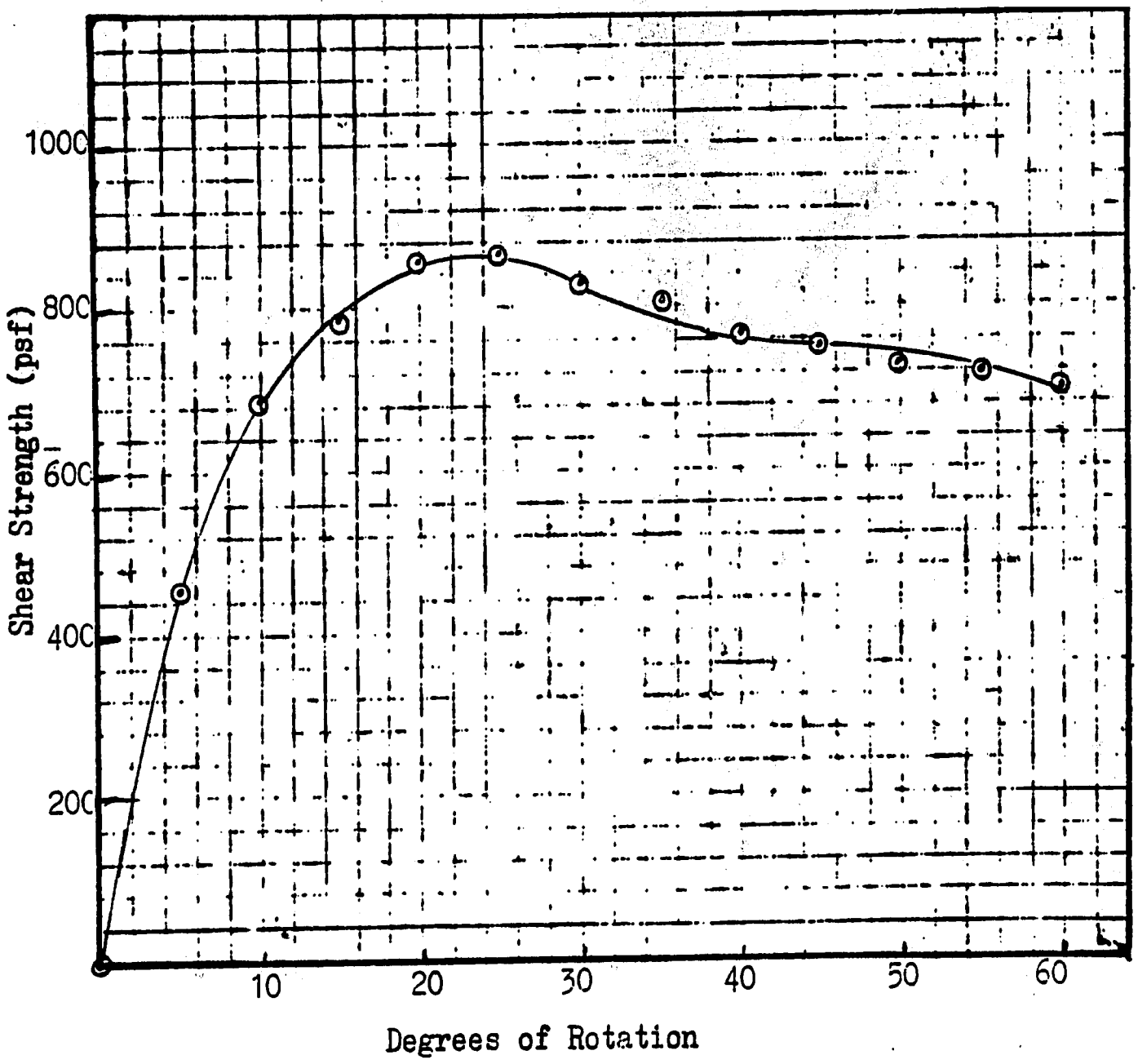
Project: PORT SAID HARRIS Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 81.0'

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905

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RAYMOND INTERNATIONAL OF DELAWARE INC.

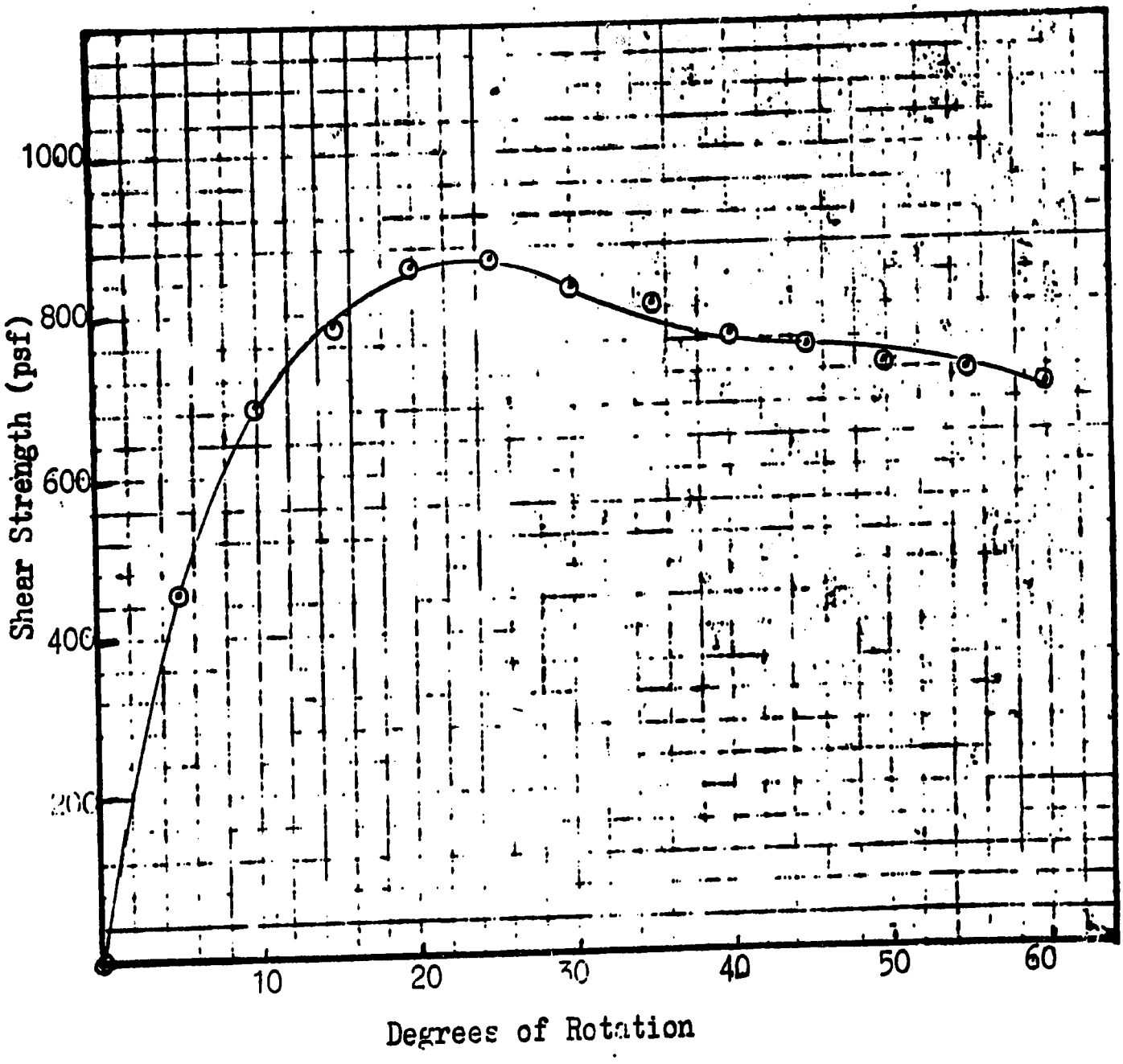
Project: PORT SAID HARRIS Date: 25/5/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S - 14 Depth: 81.0'

Torque Arm Length: 18.0" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905




101

RAYMOND INTERNATIONAL OF DELAWARE INC.

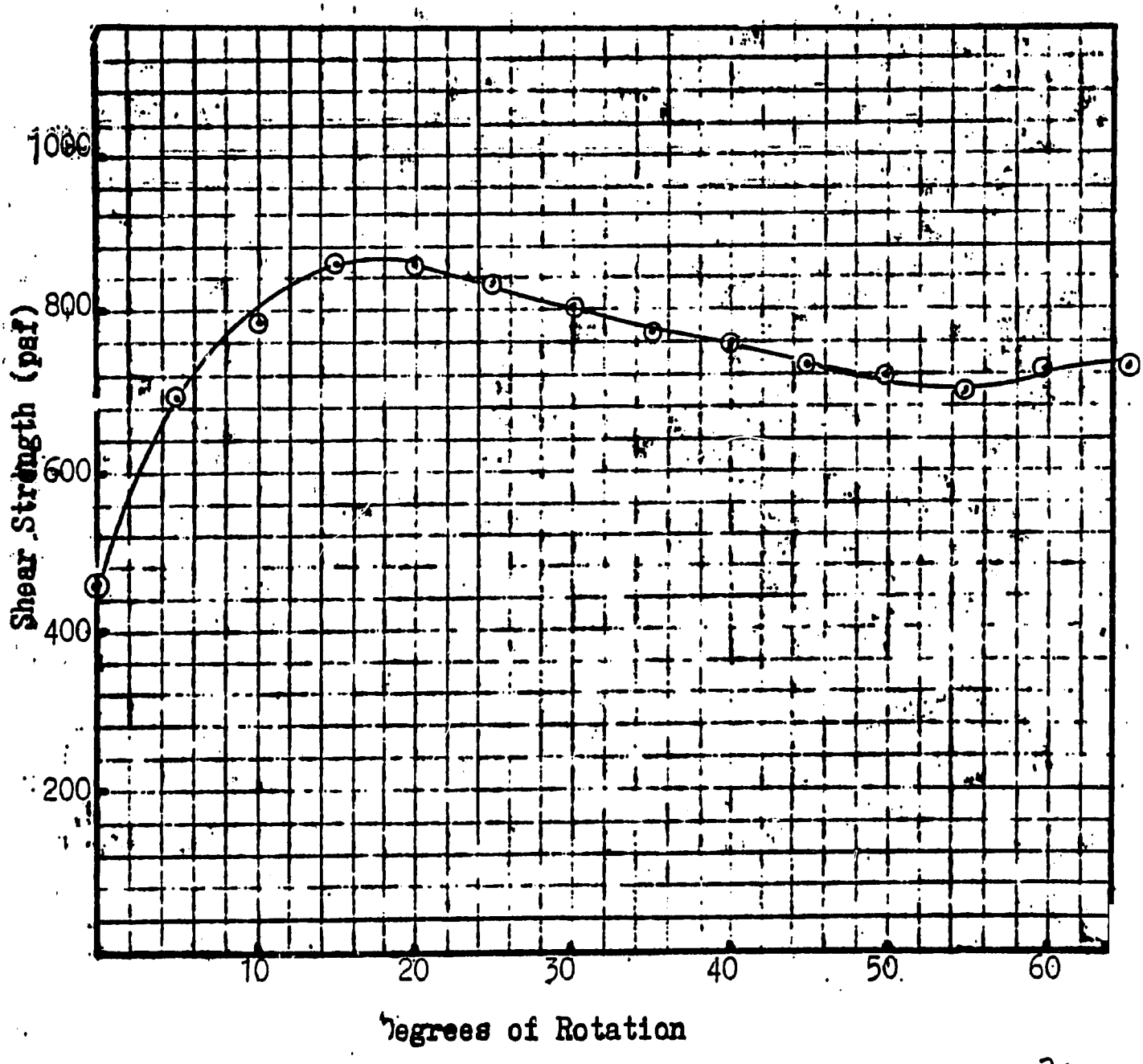
Project: PORT SAID-HARRIS Date: 25/9/1977

FIELD VANE SHEAR TEST REPORT

Borehole: S. - 14 Depth: 81'0"

Torque Arm Length: 18" Vane Diameter: 3 5/8"

Undisturbed/Remolded Vane Constant: 0.905




102

# CONSOLIDATION TESTS DATA

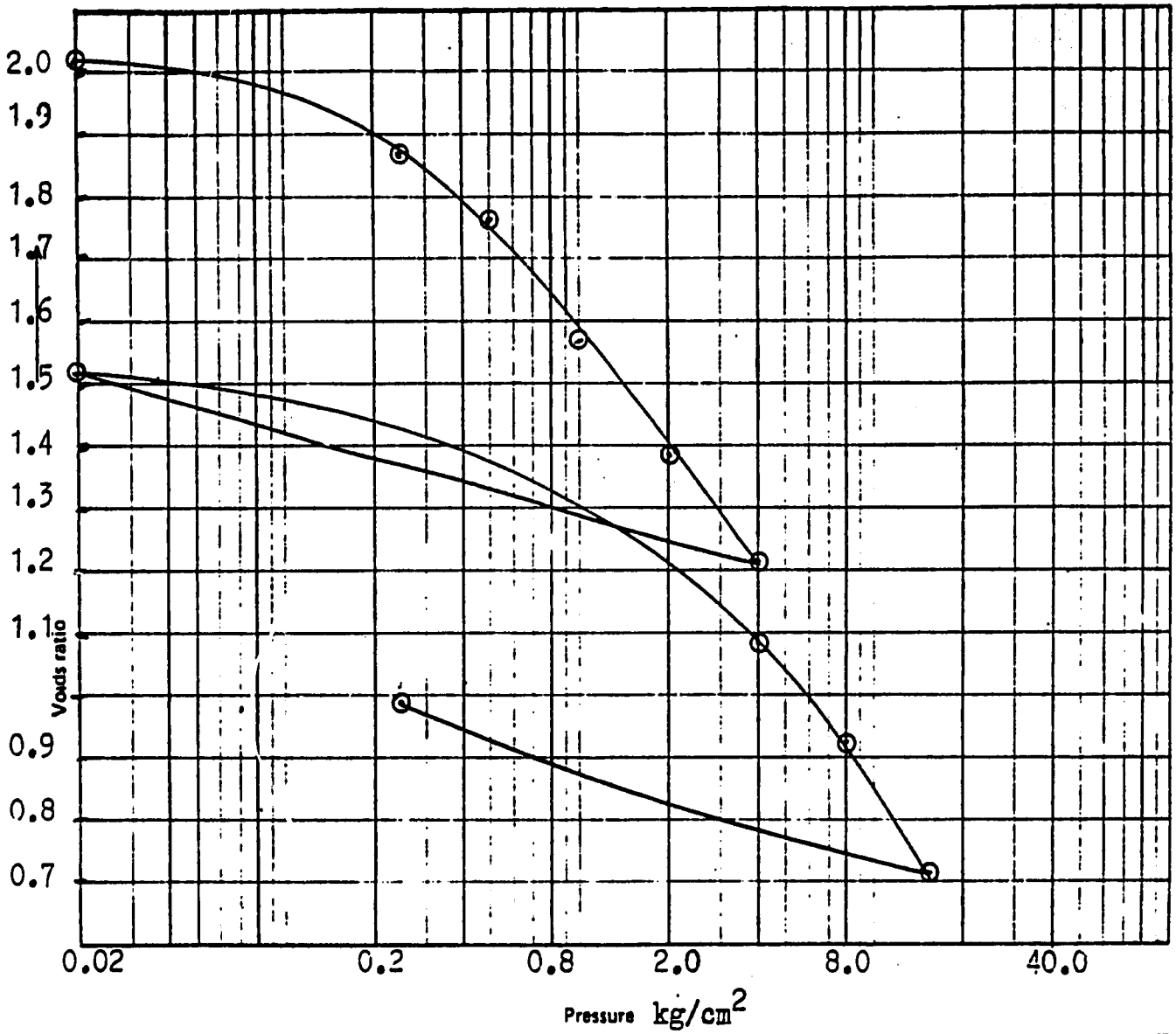
RAYMOND INTERNATIONAL INC.

# CONSOLIDATION TEST

e = Log P Curve

Borehole No. S3 Description of Sample

Sample No. U.D.S.11 Port Said Harbor




Depth 143 ft.

Initial void ratio 2.03

Specific gravity

Natural moisture content 79.6 % dry wt.

Dry density 0.89 gm/cm³

Compression Index ($C_c$)...0.62..

Preconsolidation Pressure 0.79 kg/cm²

NOTES

| Pressure kg/cm² | Consolidation coefficient $10^{-4}$ cm²/sec | $C_\alpha$ |
|---|---|---|
| 0.25 | 90 | |
| | 42 | |
| 1.0 | 69 | |
| 2.0 | 98 | |
| 4.0 | 102 | |
| 8.0 | 78 | |
| 16.0 | 90 | 0.17 |

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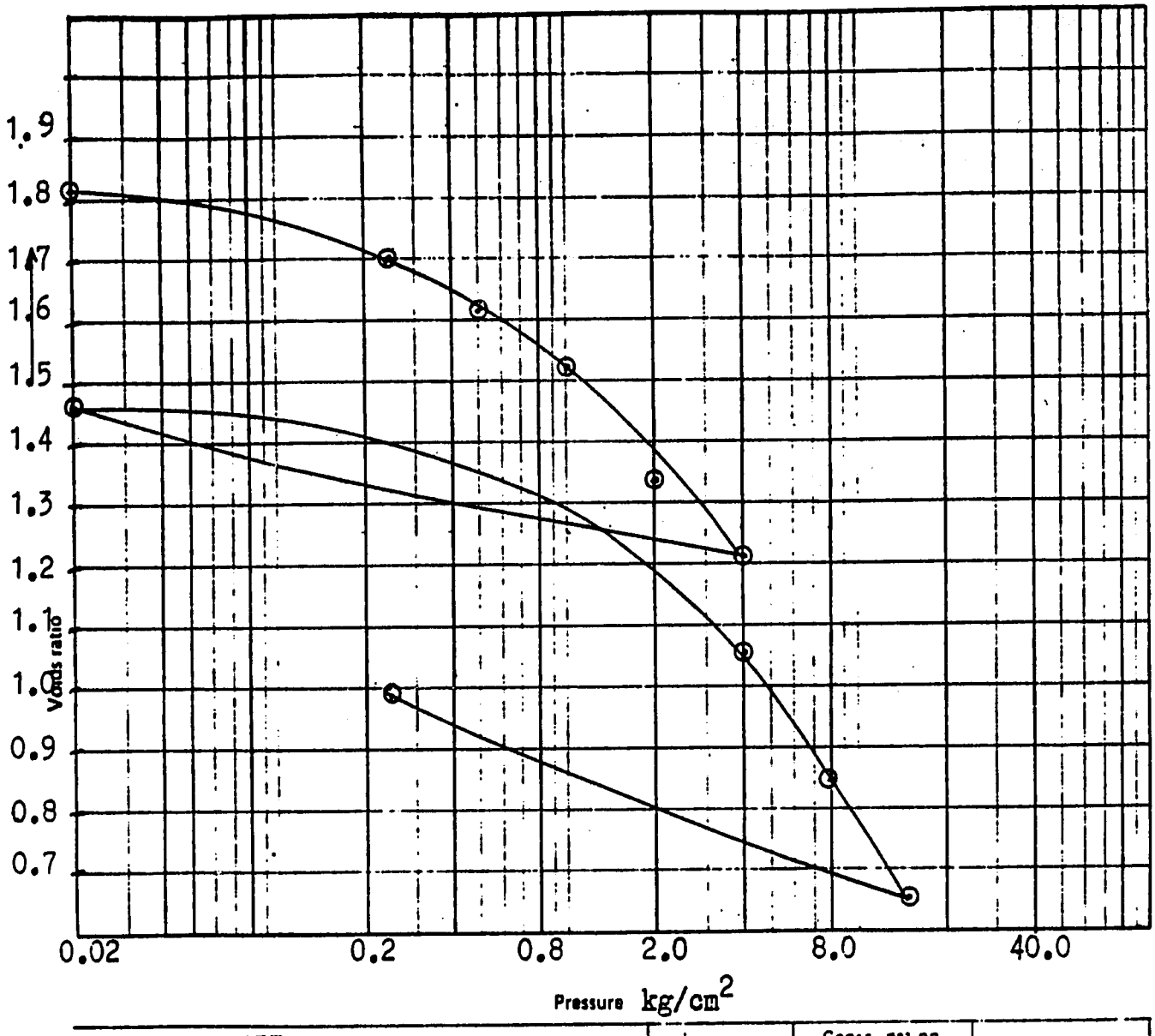
RAYMOND INTERNATIONAL INC.

# CONSOLIDATION TEST

e - Log P Curve

Borehole No. S3 Description of Sample

Sample No. U D S 12 Port Said Harbor




Depth 157 ft.

Initial void ratio 1.81

Specific gravity

Natural moisture content 72.9 % dry wt.

Dry density 0.96 gm/cm3

Compression Index ($C_c$) 0.64

Preconsolidation Pressure 0.80 kg/cm2

NOTES

| Pressure kg/cm2 | Consolidation coefficients $10^{-4}$ cm2/sec | $C_\alpha$ |
|---|---|---|
| 0.25 | 130 | |
| .50 | 102 | |
| 1.0 | 78 | |
| 2.0 | 102 | |
| 4.0 | 98 | |
| 8.0 | 63 | |
| 16.0 | 102 | 0.20 |

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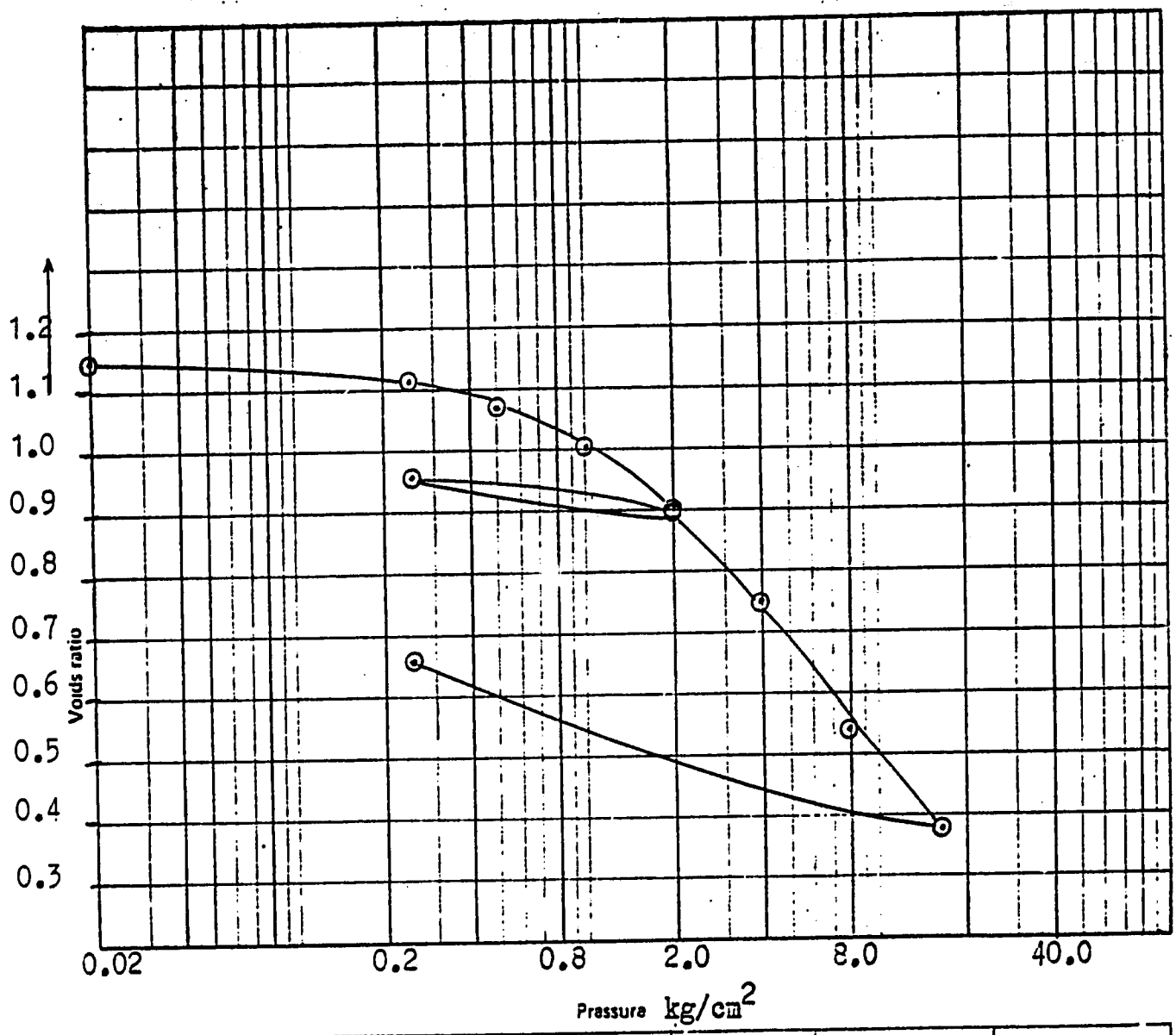
RAYMOND INTERNATIONAL INC.

# CONSOLIDATION TEST

Borehole No. S3 Description of Sample CL

Sample No. U D S 4 Port Said Harbor




Depth 70' - 72' ft.

Initial void ratio 1.15

Specific gravity

Natural moisture content 40.2 % dry wt.

Dry density 1.27 gm/cm$^3$

Compression Index ($C_c$) 0.56

Preconsolidation Pressure 1.60 kg/cm$^2$

NOTES

| Pressure kg/cm$^2$ | Consolidation coefficient $10^{-4}$ cm$^2$/sec | $C_\alpha$ |
|---|---|---|
| 0.25 | 357.0 | |
| 0.50 | 126.5 | |
| 1.0 | 98.9 | |
| 2.0 | 84.3 | 0.0065 |
| 4.0 | 14.0 | 0.0146 |
| 8.0 | 3.6 | |
| 16.0 | 35.2 | |

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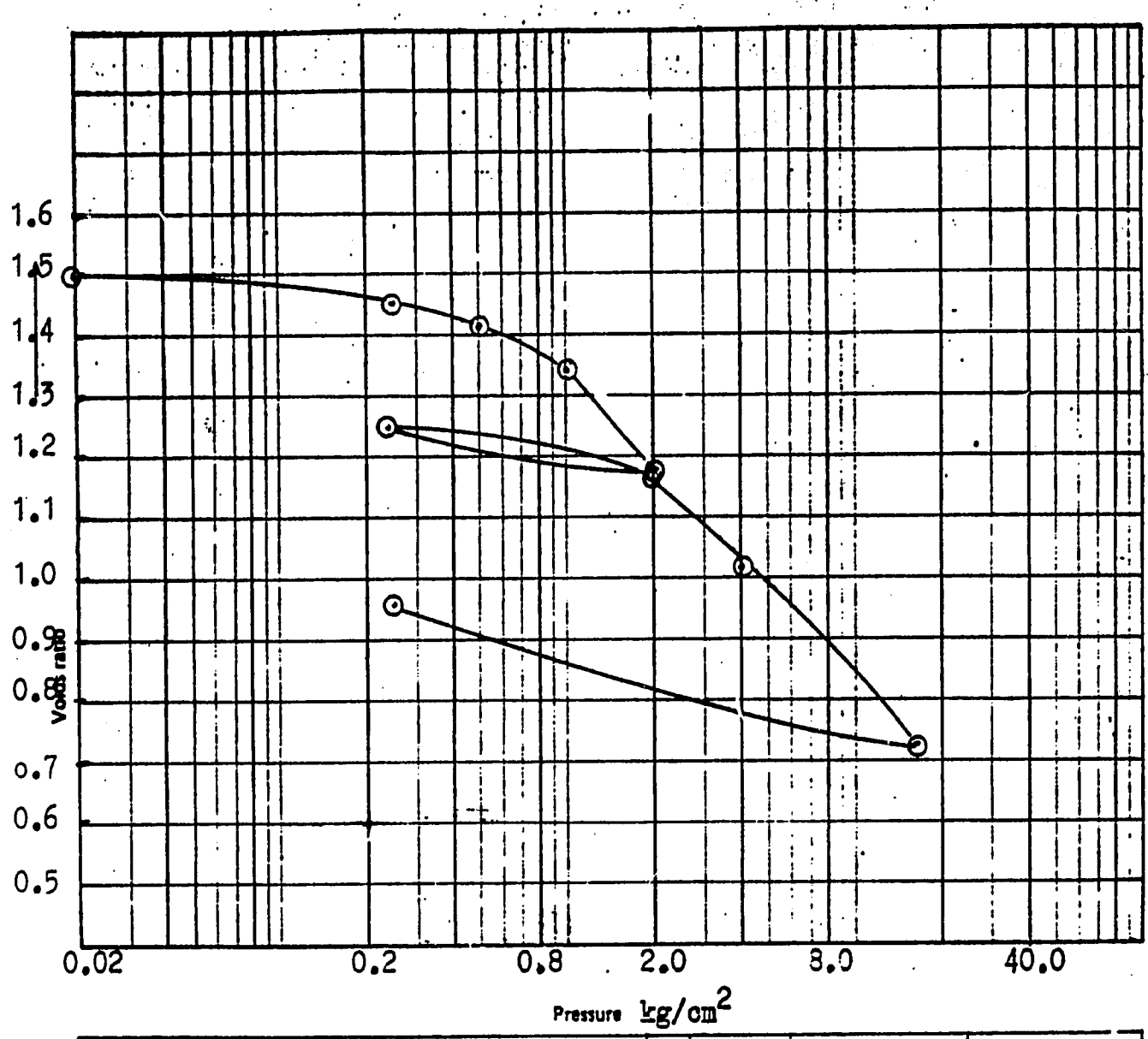
RAYMOND INTERNATIONAL INC.

# CONSOLIDATION TEST

Borehole No. S3 Description of Sample MH

Sample No. U-D-S-6 Port Said Harbor




Depth 91'6" - 93'6" ft.

Initial void ratio 1.5

Specific gravity

Natural moisture content 51.5 % dry wt.

Dry density 1.08

Compression Index ($C_c$) 0.60

Preconsolidation Pressure 1.10 kg/cm$^2$

NOTES

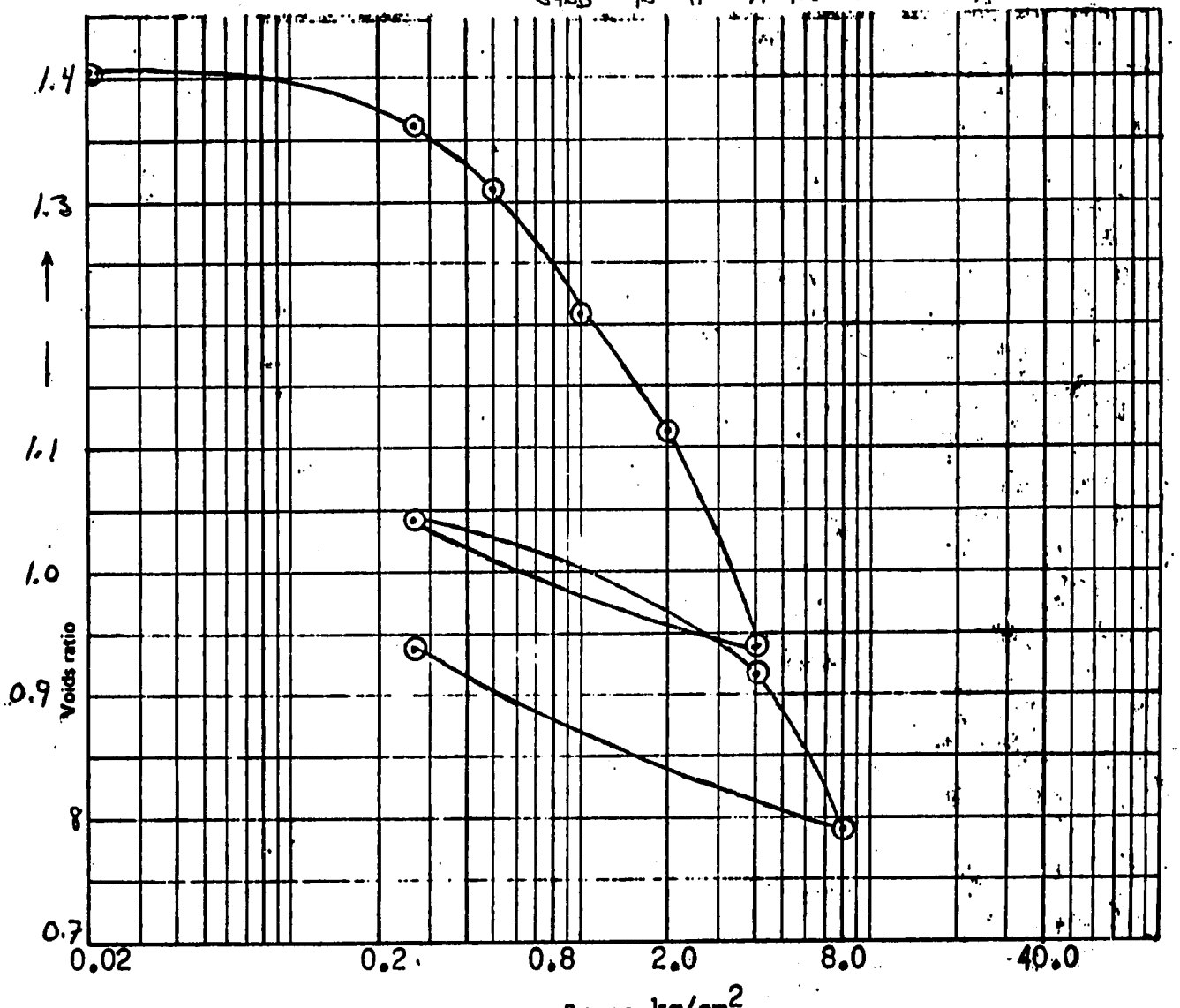
| Pressure kg/cm$^2$ | Consolidation coefficient $10^{-4}$ cm$^2$/sec | $C_\alpha$ |
|---|---|---|
| 0.25 | 336 | |
| 0.5 | 421 | |
| 1.0 | 60 | |
| 2.0 | 81 | 0.0066 |
| 4.0 | 21 | 0.0059 |
| 8.0 | 6 | |
| 16.0 | 8 | |

RAYMOND INTERNATIONAL INC.

# CONSOLIDATION TEST

Borehole No. 9 Description of Sample Black Silty Clay

Sample No. UDS 3 Note: Sample Contains Lenses of Fine Sand in a Horizontal Direction




Depth 96 ft.

Initial void ratio 1.41

Specific gravity 2.68

Natural moisture content 55.1 % dry wt.

Dry density 1.12 gm/c.c.

Compression Index ($C_c$) 0.52

Preconsolidation Pressure 0.90 kg/cm²

NOTES

| Pressure kg/cm² | Consolidation coefficient $10^{-4}$ cm²/sec | $C_\alpha$ |
|---|---|---|
| 0.25 | 0.56 | |
| 0.50 | 0.70 | |
| 1.0 | 0.31 | |
| 2.0 | 0.39 | |
| 4.0 | 0.49 | |
| 8.0 | 0.58 | |
| | | |

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# CHEMICAL TESTS DATA

**Raymond International of Delaware, Inc.**
3 A AL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
13 August 1977
Lab.No. 4

## Soil Chemical analysis

Location: Port Said Harbor ( Borehole No.S3 )

| Item | Chemical compound | result wt % of | |
|---|---|---|---|
| | | U D S 3 | D 19 |
| 1 | Silicon dioxide $SiO_2$ | 92.14 | 83.69 |
| 2 | Ferric and Alliminum oxides $R_2O_3$ | 4.05 | 5.39 |
| 3 | Calicium oxide CaO | 0.0 | 4.49 |
| 4 | Magnesium oxide MgO | 0.0 | 0.0 |
| 5 | Sodium Chloride NaCl | 2.53 | 1.36 |
| 6 | Sulpher trioxide $SO_3$ | .81 | 0.78 |
| 7 | Loss due to Ignition | 0.0 | 3.52 |
| 8 | PH Value (electro-Chemical ) | 7.63 | 7.88 |

For Lab.
Chemist:
M.M.El-Saiedi

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**Raymond International of Delaware, Inc.**
9 A AL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
14 Aygust 1977
Lab. No. 4

## Effect of 10 % Conc HCl on Soil

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | result |
|---|---|---|---|
| 1 | S 3 | 6 | 25 % |
| 2 | | 8 | 10 % |
| 3 | | 10 | 10 % |
| 4 | | U D S 8 | 20 % |
| 5 | | U D S 10 | 10 % |
| 6 | | U D S 15 | 10 % |

Notes: 1) The procedures of the test were given and and requested by Dr.Banad N.Jagannath (F.R.Harris Inc.)
2) 100 % means all the sample is affected by HCl i.e.All Calicium Carbonate.

For Lab.
Chemist: M.M.El-Saiedi

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# PHYSICAL PROPERTIES TESTS DATA

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**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
19 October 1977
Laboratory No.4

## Specific Gravity of Soil

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | Specific Gravity |
|---|---|---|---|
| 1 | S 4 | 2 | 2.66 |
| 2 | S 4 | U D S 2 | 2.67 |
| 3 | S 6 | U D S 2 | 2.69 |
| 4 | S 7 | 5 | 2.71 |
| 5 | S 7 | U D S 2 | 2.70 |
| 6 | S 8 | U D S 3 | 2.69 |

For Laboratory

Chemist: M.M.El-Saiedi

Raymond International of Delaware, Inc.
3 A AL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo

13 August 1977

Lab. No. 4

## Specific Gravity of Soil

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | Specific Gravity |
|---|---|---|---|
| 1 | S 2 | 5 | 2.68 |
| 2 | S 3 | 2 | 2.65 |
| 3 | ,, | 6 | 2.63 |
| 4 | ,, | U D S 4 | 2.71 |
| 5 | ,, | U D S 6 | 2.70 |
| 6 | ,, | U D S 11 | 2.69 |
| 7 | ,, | U D S 12 | 2.67 |

For Lab.

Chemist: M.M.El-Saiedi

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
14 August 1977
Laboratory No.4

## Water Content of Soil

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | Water Content Wt % |
|---|---|---|---|
| 1 | S 1 | 9 | 38.2 |
| 2 | S 1 | U D S 1 | 60.2 |
| 3 | S 2 | 10 | 54.3 |
| 4 | S 2 | U D S 1 | 67.7 |
| 5 | S 2 | U D S 3 | 36.1 |
| 6 | S 2 | U D S 4 | 49.7 |
| 7 | S 3 | 8 | 22.0 |
| 8 | ,, | U D S 1 | 52.3 |
| 9 | ,, | 9 | 36.7 |
| 10 | ,, | U D S 2 | 32.1 |
| 11 | ,, | 10 | 47.2 |
| 12 | ,, | U D S 3 | 59.1 |
| 13 | ,, | 11 | 50.9 |
| 14 | ,, | U D S 4 | 40.2 |
| 15 | ,, | 12 | 46.4 |
| 16 | ,, | U D S 6 | 51.5 |
| 17 | ,, | 14 | 66.8 |
| 18 | ,, | U D S 7 | 58.5 |
| 19 | ,, | 15 | 56.9 |

Continue page 2 Water

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## Page 2 Water

| Item | Borehole No. | Sample No. | Water Content wt% |
|---|---|---|---|
| 20 | S 3 | U D S 8 | 48.0 |
| 21 | ,, | 16 | 56.5 |
| 22 | ,, | U D S 9 | 51.0 |
| 23 | ,, | 17 | 54.9 |
| 24 | ,, | 18 | 57.1 |
| 25 | ,, | U D S 11 | |
| 26 | ,, | 19 | 49.2 |
| 27 | ,, | U D S 12 | |
| 28 | ,, | 20 | 49.6 |
| 29 | ,, | U D S 13 | 77.6 |
| 30 | ,, | 21 | 66.1 |
| 31 | ,, | U D S 14 | 57.0 |
| 32 | ,, | 22 | 58.3 |
| 33 | ,, | U D S 15 | 64.1 |
| 34 | ,, | 23 | 58.4 |
| 35 | ,, | 24 | 65.2 |
| 36 | S 12 | 9 | 27.6 |
| 37 | S 12 | U D S 1 | 51.7 |

For Lab
Chemist:
M.M.El-Saiedi

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Raymond International of Delaware, Inc.
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
16 October 1977
Laboratory No.4

## Water Content of Soil

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | % Water Content |
|---|---|---|---|
| 1 | S P 5 | U D S 1 | 57.1 |
| 2 | ,,, | U D S 2 | 55.1 |
| 3 | ,,, | U D S 4 | 63.0 |
| 4 | ,,, | 15 | 50.2 |
| 5 | ,,, | 17 | 58.9 |
| 6 | 9 | 13 | 59.6 |
| 7 | 9 | 14 | 61.6 |
| 8 | 9 | 15 | 37.3 |
| 9 | 9 | 16 | 62.9 |
| 10 | 11 | 11 | 34.6 |
| 11 | 11 | 12 | 56.1 |
| 12 | 11 | 13 | 57.8 |
| 13 | 11 | 14 | 56.7 |
| 14 | 11 | 15 | 58.0 |
| 15 | 11 | 16 | 60.1 |
| 16 | 11 | 17 | 50.2 |

Continue Page 2

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Page 2 water Content

| Item | Borehole No. | Sample No. | % water Content |
|---|---|---|---|
| 17 | 11 | 18 | 39.3 |
| 18 | 14 | 11 | 60.3 |
| 19 | 14 | 12 | 53.8 |
| 20 | 14 | 14 | 40.5 |
| 21 | 14 | 15 | 59.8 |
| 22 | 14 | 16 | 63.6 |
| 23 | 14 | 17 | 51.5 |

For Laboratory
Chemist: M.d.
M.M.El-Saiedi

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
18 October 1977
Laboratory No. 4

## Water Content of Soil

Location: Port Said Harbor

| Item | Borehole No. | Sample No. | % water Content |
|---|---|---|---|
| 1 | S 2 | U D S 2 | 37.4 |
| 2 | S 3 | U D S 11 | 92.7 |
| 3 | S 3 | U D S 12 | 84.7 |
| 4 | S 4 | 2 | 9.6 |
| 5 | S 4 | 5 | 15.1 |
| 6 | S 4 | 8 | 23.8 |
| 7 | S 4 | U D S 1 | 38.2 |
| 8 | S 4 | 9 | 23.8 |
| 9 | S 4 | U D S 2 | 37.2 |
| 10 | S 4 | U D S 3 | 39.5 |
| 11 | S 5 | U D S 2 | 23.5 |
| 12 | S 5 | U D S 3 | 27.9 |
| 13 | S 6 | 4 | 17.4 |
| 14 | S 6 | 8 | 23.2 |
| 15 | S 6 | U D S 1 | 44.7 |
| 16 | S 6 | U D S 2 | 52.8 |
| 17 | S 6 | 9 | 23.2 |
| 18 | S 6 | 10 | 37.6 |
| 19 | S 6 | 11 | 35.9 |
| 20 | S 6 | 12 | 38.1 |
| 21 | S 6 | 13 | 40.1 |

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Continue page 2

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Page 2 water content

| Item | Borehole No. | Sample No. | % Water Content |
|---|---|---|---|
| 22 | S 6 | 14 | 52.9 |
| 23 | S 6 | 15 | 52.2 |
| 24 | S 7 | 2 | 7.6 |
| 25 | S 7 | 5 | 17.8 |
| 26 | S 7 | 8 | 25.8 |
| 27 | S 7 | U D S 1 | 46.4 |
| 28 | S 7 | U D S 2 | 41.2 |
| 29 | S 7 | 9 | 46.5 |
| 30 | S 7 | 10 | 47.3 |
| 31 | S 8 | 3 | 13.9 |
| 32 | S 8 | 7 | 23.7 |
| 33 | S 8 | U D S 1 | 41.2 |
| 34 | S 8 | 9 | 44.6 |
| 35 | S 8 | U D S 2 | 47.4 |
| 36 | S 8 | 10 | 49.9 |
| 37 | S 8 | U D S 3 | 68.7 |
| 38 | S 8 | U D S 4 | 45.5 |
| 39 | S 8 | U D S 5 | 56.3 |
| 40 | S P 5 | 12 | 35.9 |
| 41 | S P 5 | 13 | 47.3 |
| 42 | S P 5 | 14 | 53.0 |
| 43 | S P 5 | 16 | 49.5 |
| 44 | S P 5 | 18 | 55.6 |



Continue page 3

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Page 3 Water Content

| Item | Borehole No. | Sample No. | % water content |
|---|---|---|---|
| 45 | 14 | U D S 1 | 47.7 |
| 46 | 14 | U D S 2 | 46.4 |
| 47 | 14 | U D S 6 | 55.5 |
| 48 | 14 | U D S 7 | 45.5 |

For Laboratory
Chemist: M.d.
M.M.El-Saiedi

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

Cairo
10 November 1977
Laboratory No.4

## Water Content of Soil

Location: Port Said Harbor

| Borehole No. | Sample No. | % Water Content |
|---|---|---|
| S9 | U D S 3 | 55.1 % |

For Laboratory

Chemist: M.d.

M.M.El-Saiedi

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**Delaware, Inc. International of Raymond**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

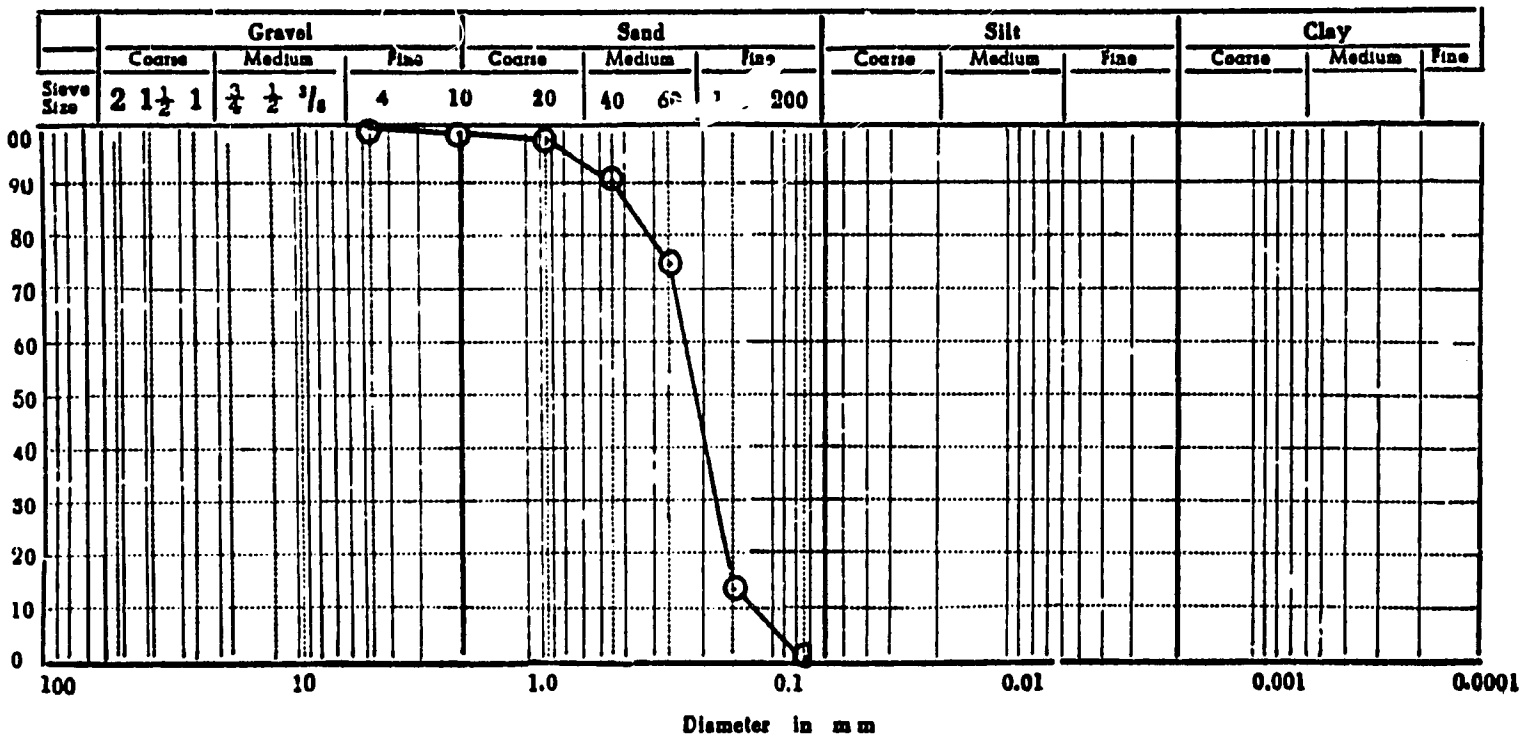
**Borehole no.** S 1

**Location** Port Said Harbor

**Sample no.** 5

**Description** SP

**Depth** 20'-21'6"




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By**

**Remarks :-**

1 – Uniformity Coefficient = 1.7

2 – The Sample was brought to the laboratory by the client at

**Checked By** Chemist: M.M.El-Saiedi

**Date** 1/10/1977

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Figure no.

Project: Port Said Harbor

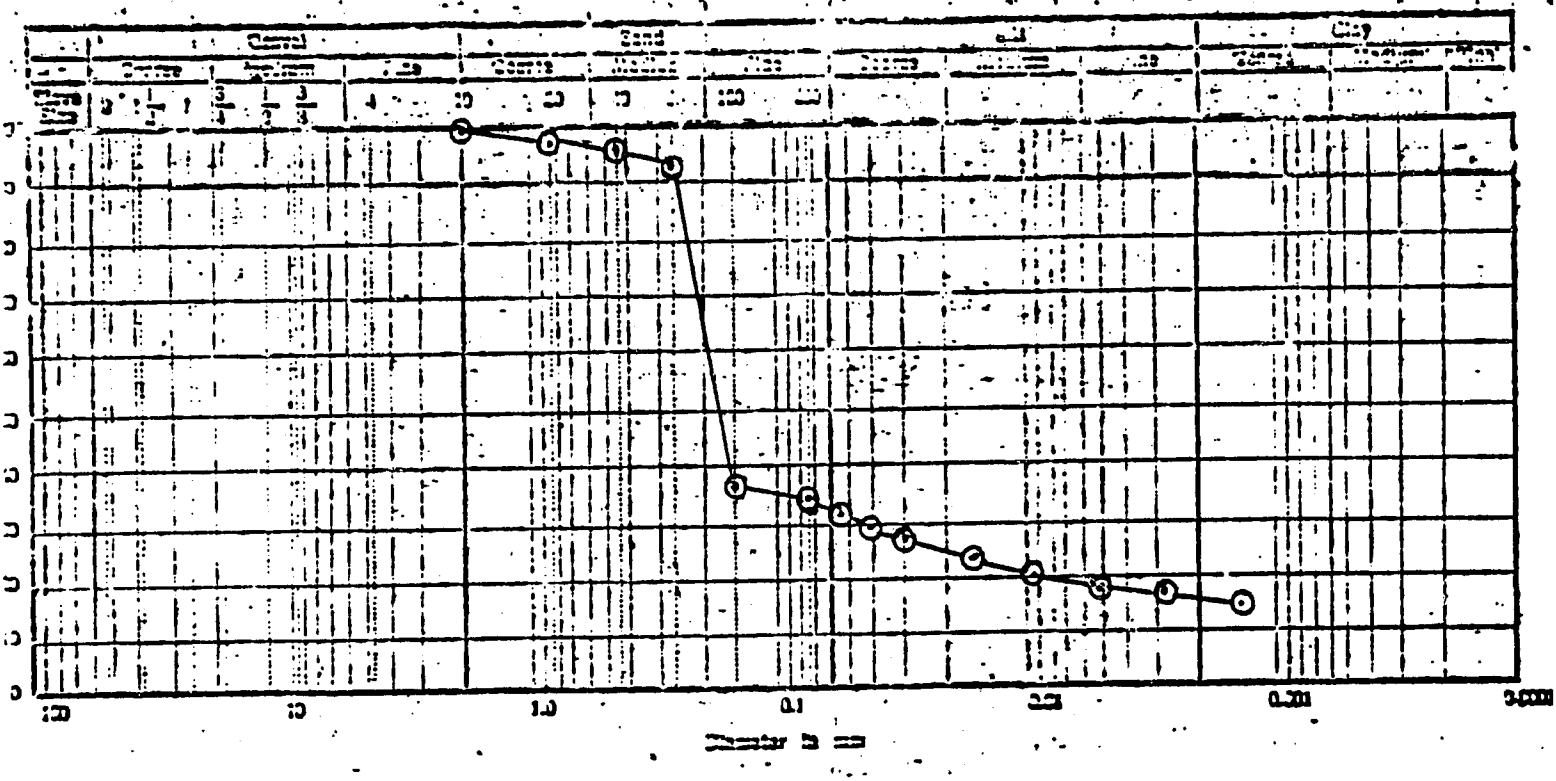
Client:

Job no.

Borehole no. S1 Sample no. 6

Description: SM

Depth 25'-26'6" Pre-treatment loss %




Method Used : 1) Mechnical sieve analysis

2) Sedimentation by Hydrometer

Remarks :-

Test Made By : Chemist:

Checked By : M.M.El-Saiedi

Date : 14/8/1977

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LABORATORY

Figure no.

Location Port Said Harbor

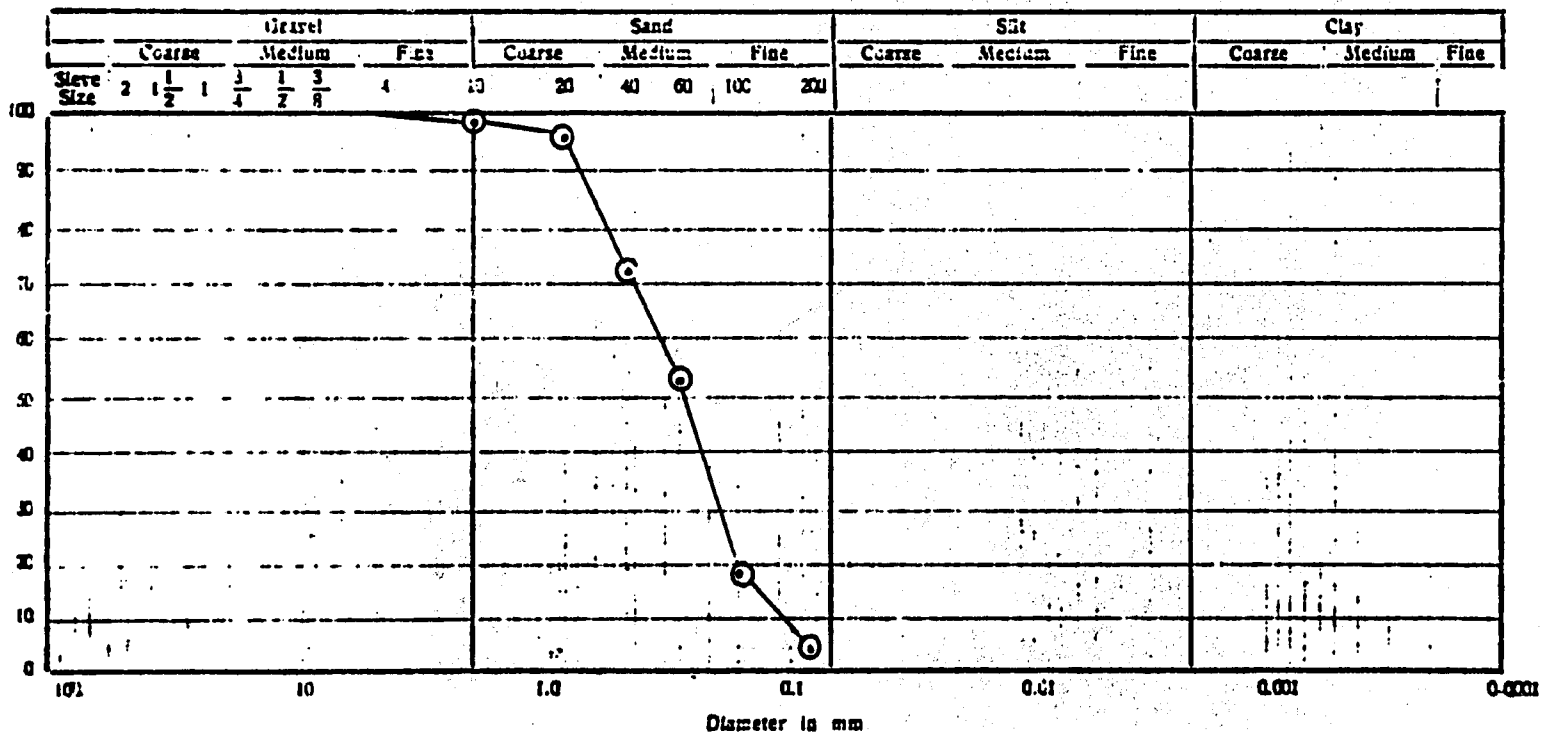
# Particle Size Distribution

Client

Borehole no. S2 Sample no. 5

Description SP

Depth 20'-21'6" Pre-treatment loss %




Method Used :

Remarks

Test Made By :

Checked By : Chemist: M.M.El-Saiedi

Date : 8/8/1977

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Figure no.

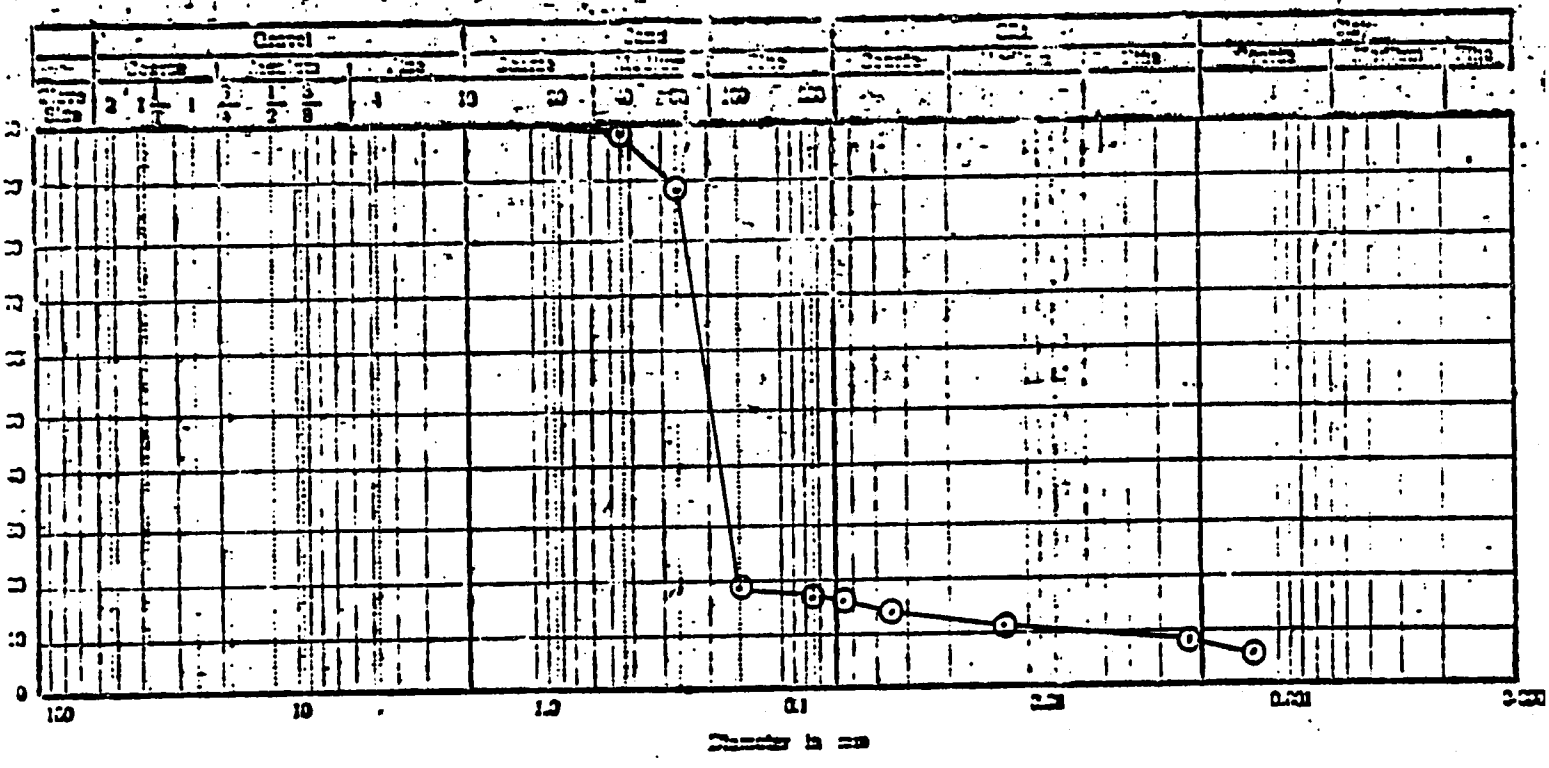
Location: Port Said Harbor

Client: Job no.

Borehole no. 52 Sample no. 7

Description: S.A

Depth 30'-30'6" Pre-treatment loss %




Method Used : 1)Mechnical sieve analysis

2)Sedimentation by Hydrometer

Remarks :-

Test Made By :

Chemist: M.C.

Checked By : M.M.El-Saiedi

Date 14/8/1977

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Figure no.

Location : Port Said Harbor

Client

Job no.

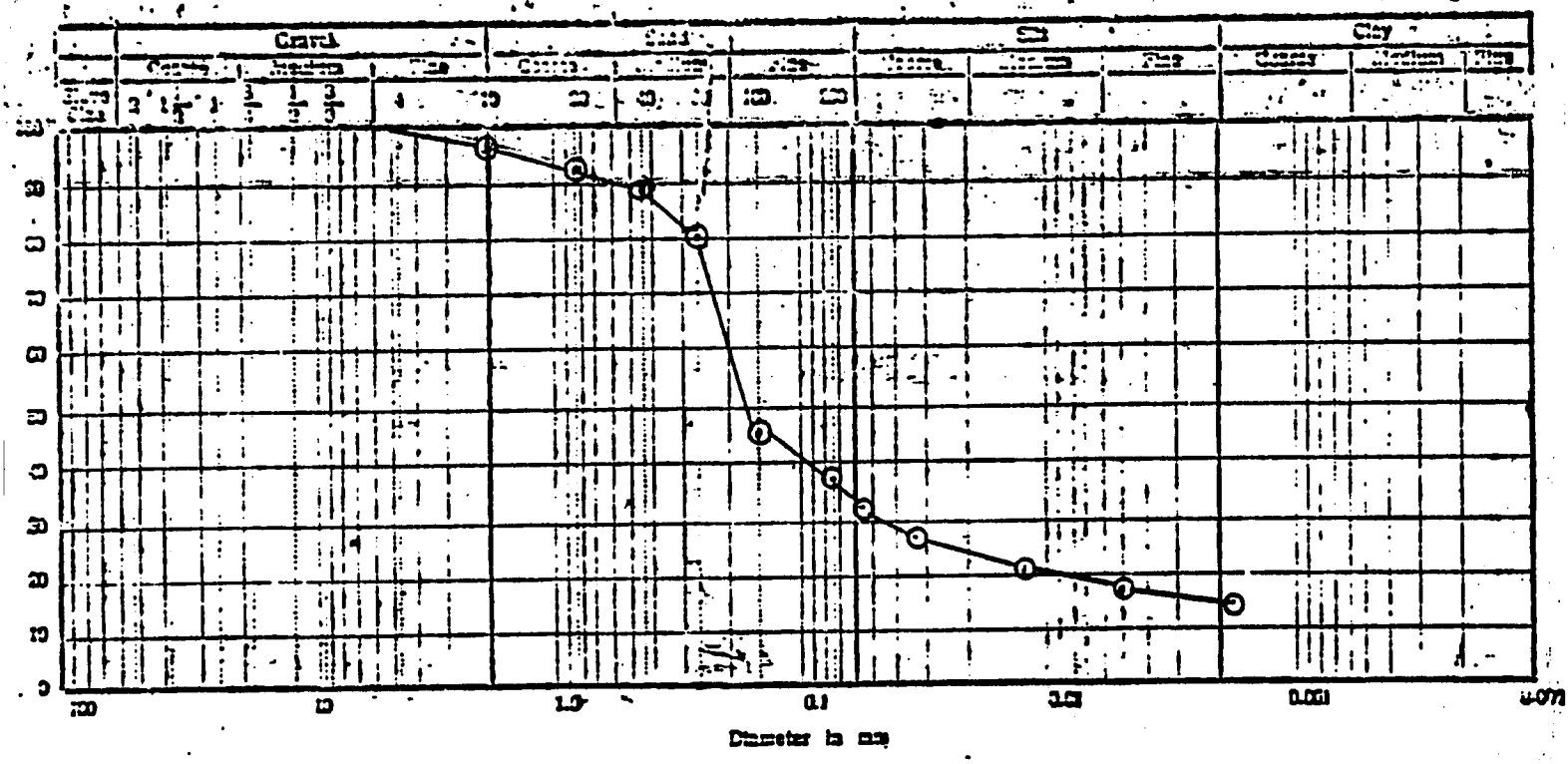
Borehole no. S2. Sample no. 8

Description

Depth

Pre-treatment loss %

SM




Method Used : 1)Mechnical sieve analysis

2) Sedimentation by hydrometer

Remarks :-

Test Made By : Chemist:

Checked By : M.M.El-Saiedi

Date : 14/8/1977

M.S.

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Best Available Document

**LABORATORY**

Figure no.

Location Port Said Harbor

# Particle Size Distribution

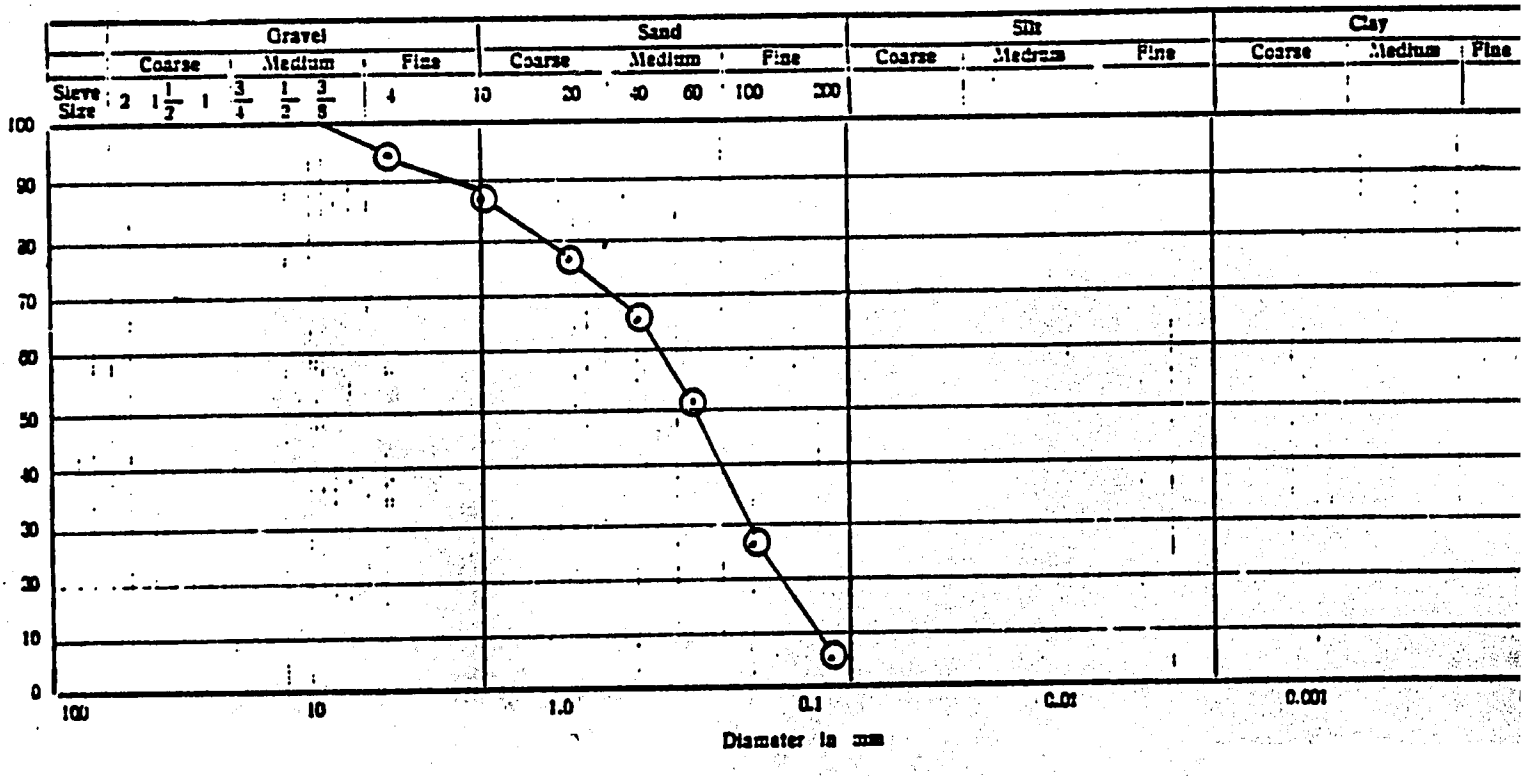
Client

Borehole no. S3 Sample no. 2

Description

Depth 5'-6'6" Pre-treatment loss

SP-SM




Method Used :

Remarks :-

Test Made By : Chemist: Mc

Checked By : M.M.El-Saiedi

Date : 9/8/1977

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**LABORATORY**

Figure no.

Location Port Said Harbor

# Particle Size Distribution

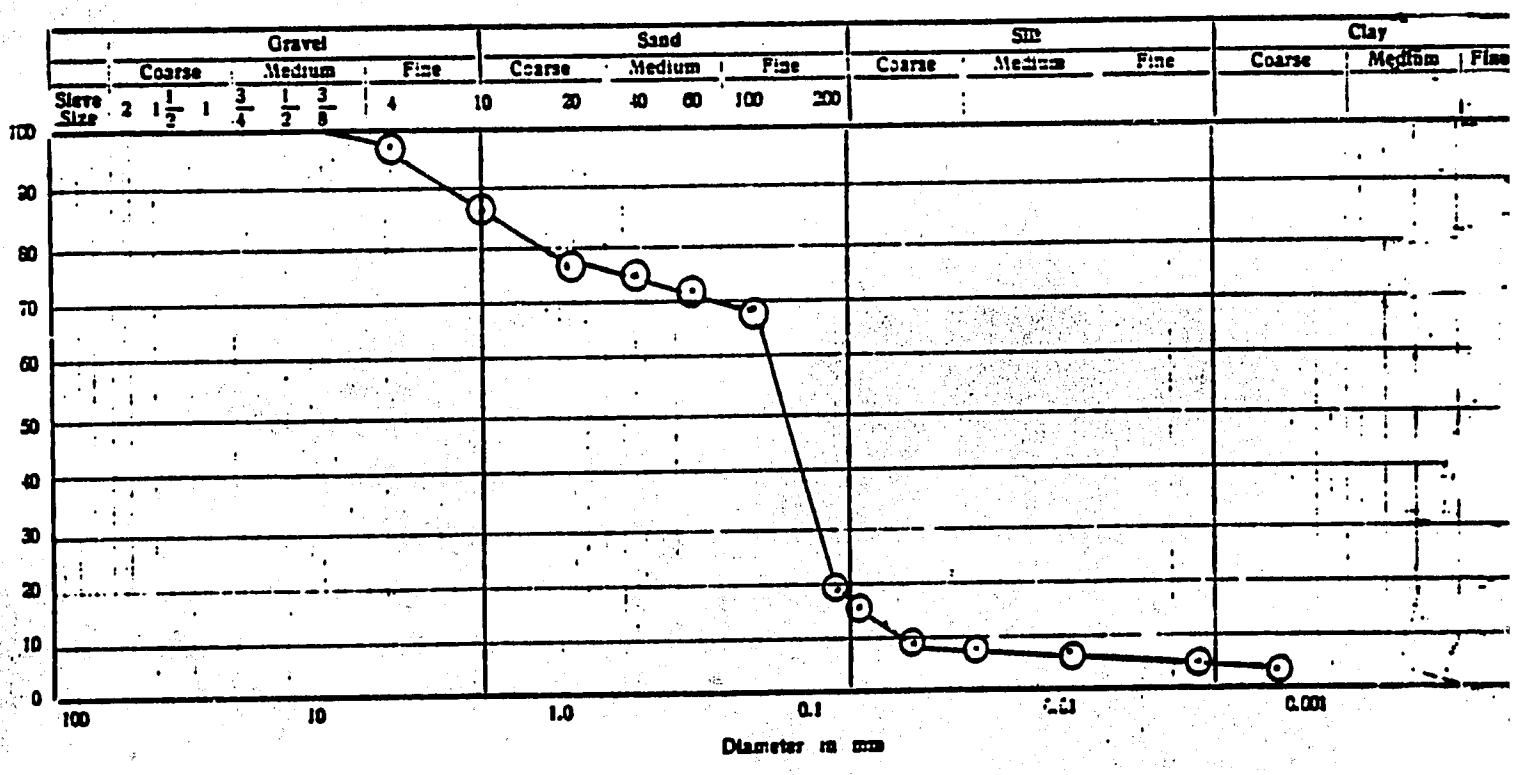
Client

Borehole no. S3_ Sample no. 6

Depth 25'-26'6" Pre-treatment loss %

Description

SM




Method Used :

Remarks :-

Test Made By :

Chemist: Mc

Checked By : M.M.El-Saiedi

Date : 11/8/1977

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**LABORATORY**

Figure no.

Location Port Said Harbor

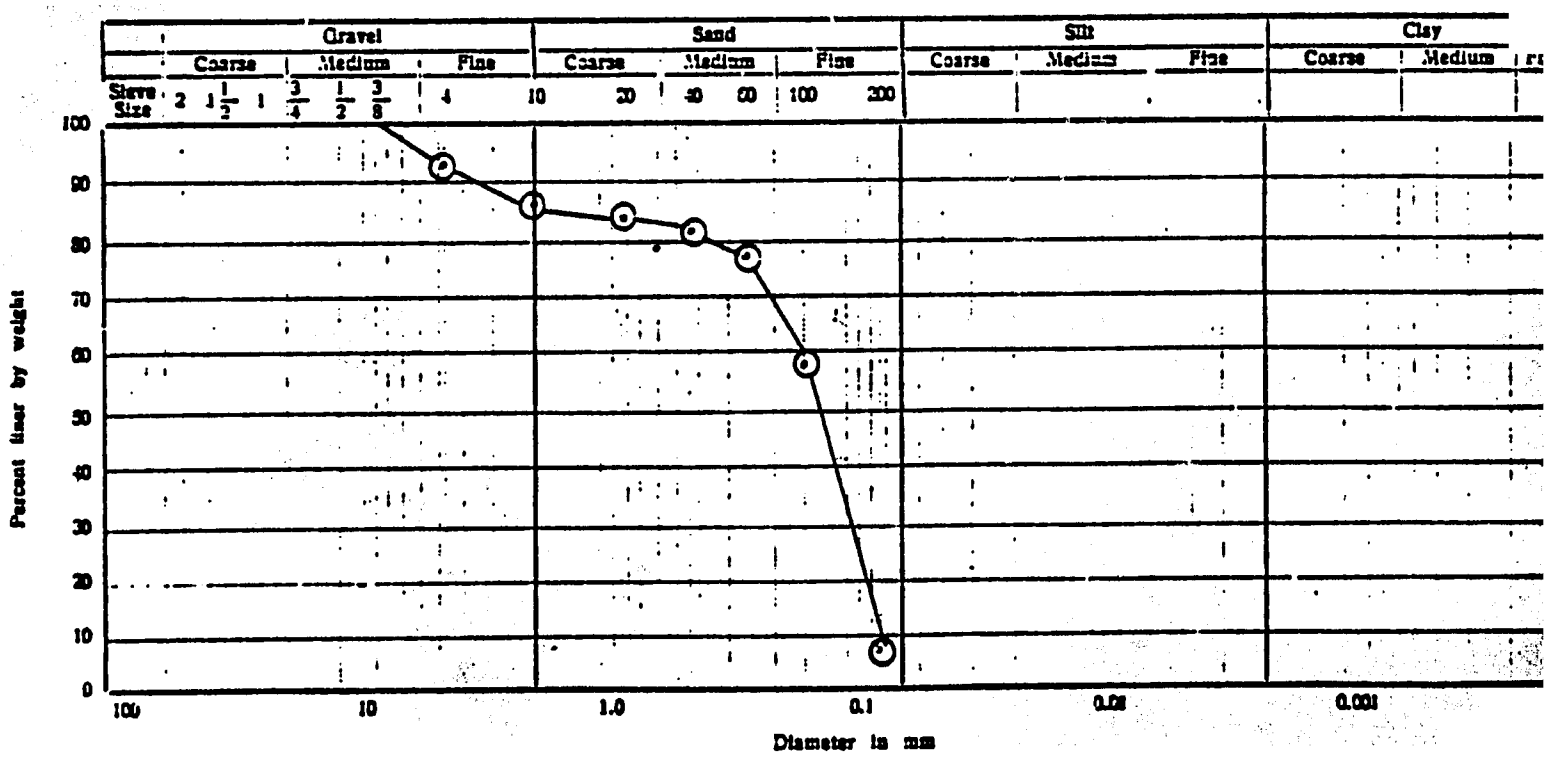
# Particle Size Distribution

Client

Borehole no. S3 Sample no. 7

Description SP-SM

Depth 30'-31'6" Pre-treatment loss %




Method Used :

Remarks :-

Test Made By :

Chemist: M.M.El-Saiedi

Checked By :

Date : 7/8/1977

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**LABORATORY**

Figure no.

Location Port Said Harbor

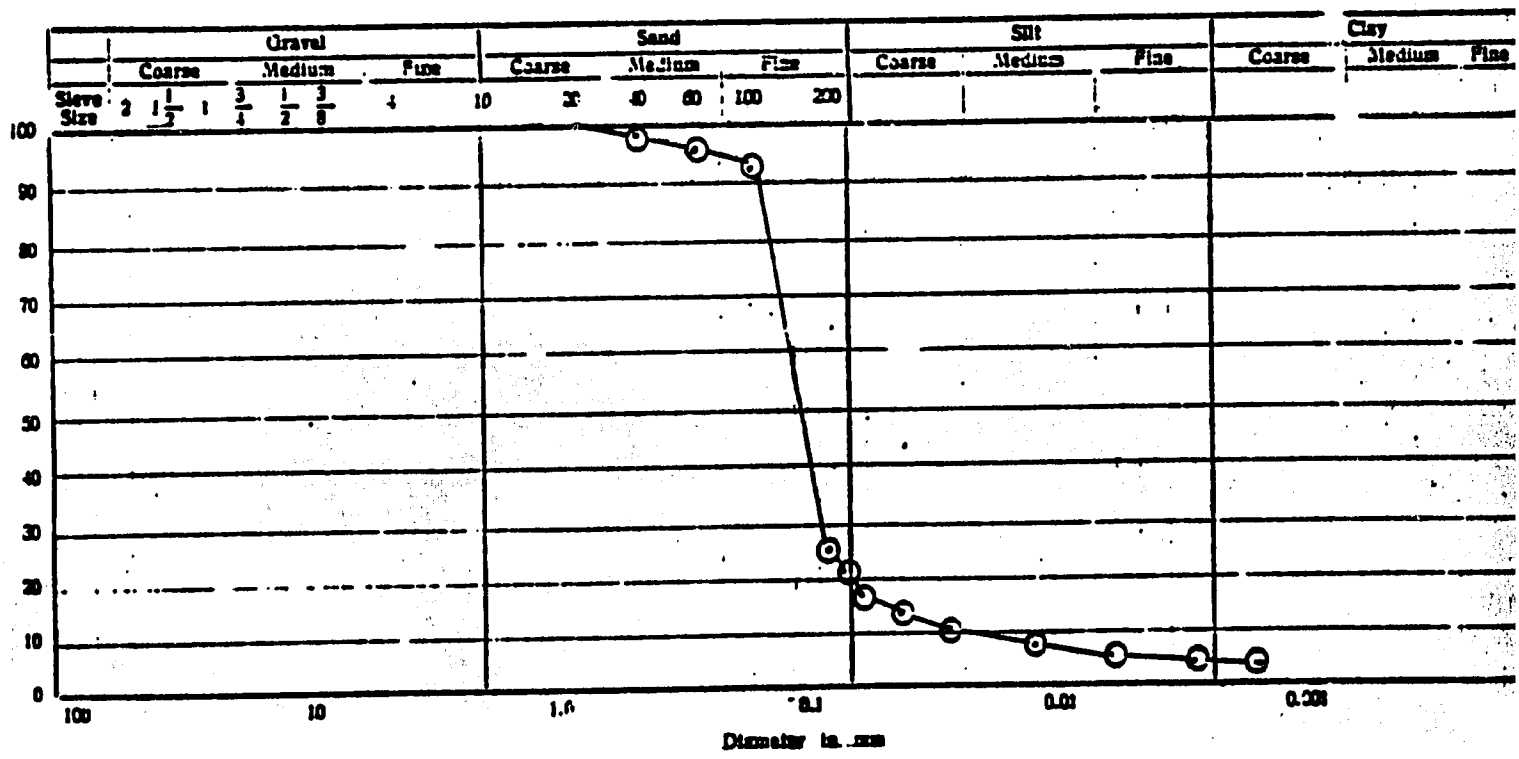
## Particle Size Distribution

Client

Borehole no. S3 Sample no. 8

Description SP-3M

Depth 35'-36'6" Pre-treatment loss %




Method Used :

Remarks :-

Test Made By : Chemist: M.

Checked By : M.M.El-Saiedi

Date : 10/8/1977

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**LABORATORY**

Figure no.

Location Port Said Harbor

**Particle Size Distribution**

Client

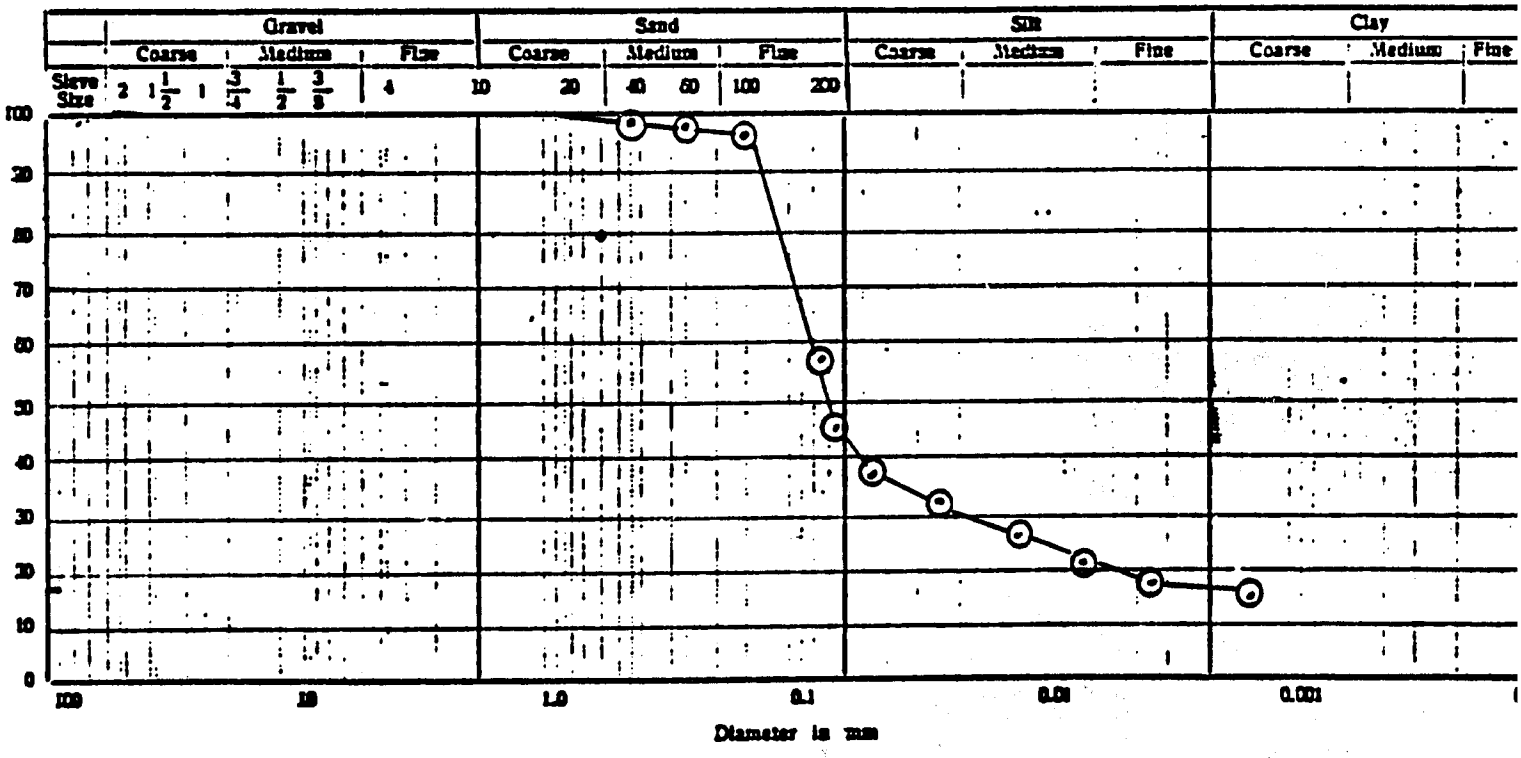
Borehole no. S3

Sample no. 9

Description SM

Depth 45'-46'6"

Pre-treatment loss %




Method Used :

Remarks :-

Test Made By : Chemist: M.S.

Checked By : M.M.El-Saiedi

Date : 10/8/1977

132

Laboratory

- Figure no -

Location Port Said Harbor

Particle Size Distribution

Client

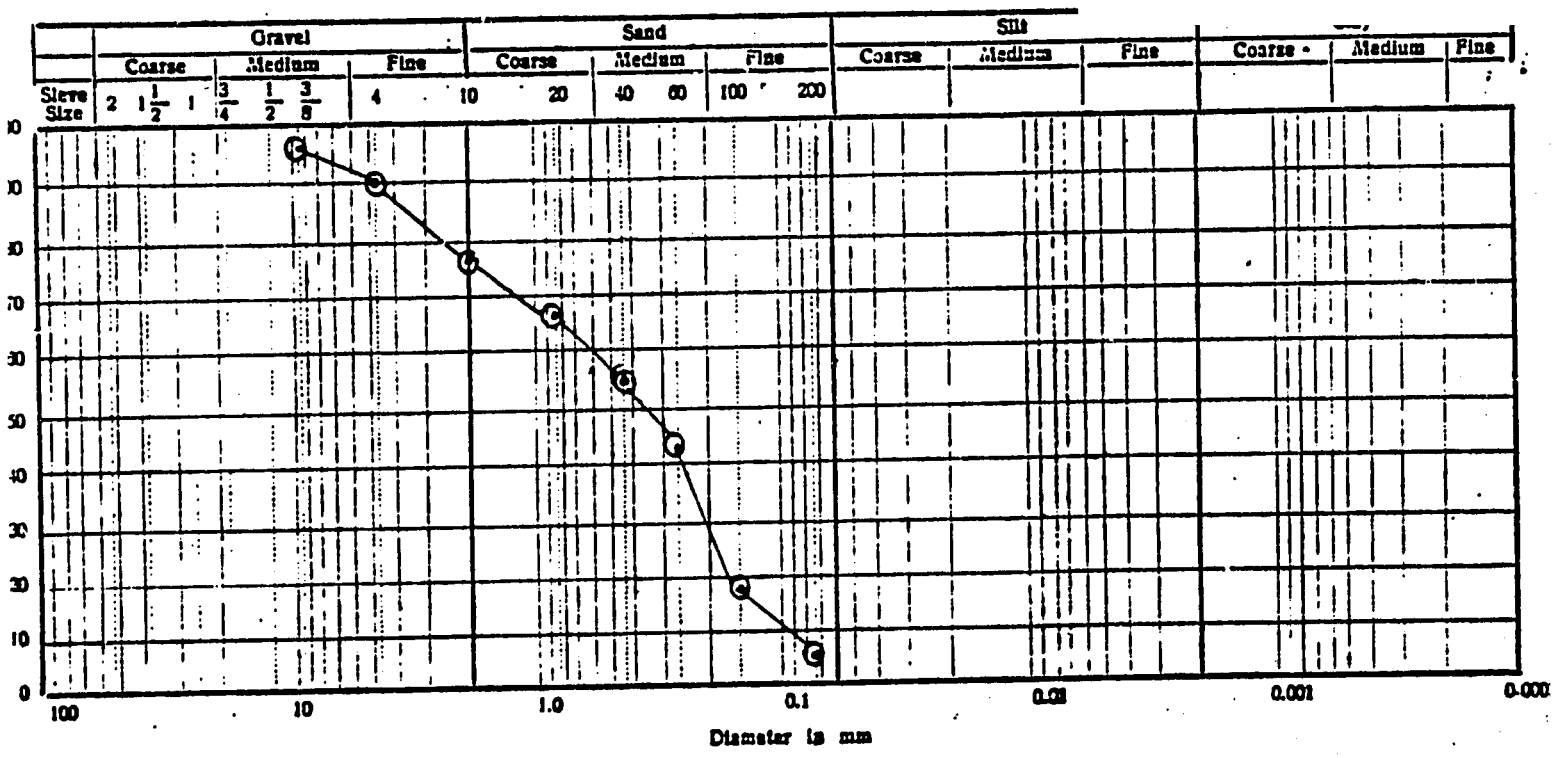
Borehole no. S 4

Sample no. 2

Description S W-S M

Depth

Pre-treatment loss %




Method Used : 1)Mechnical Sieve analysis

Remarks :-

Test Made By :Abed. EL-khailk

Chemist:

Checked By :

M.M.EL-Saiedi

Date : 24/8/1977

133

LABORATORY

Figure no.

Location Port Said Harbor

## Particle Size Distribution

Client

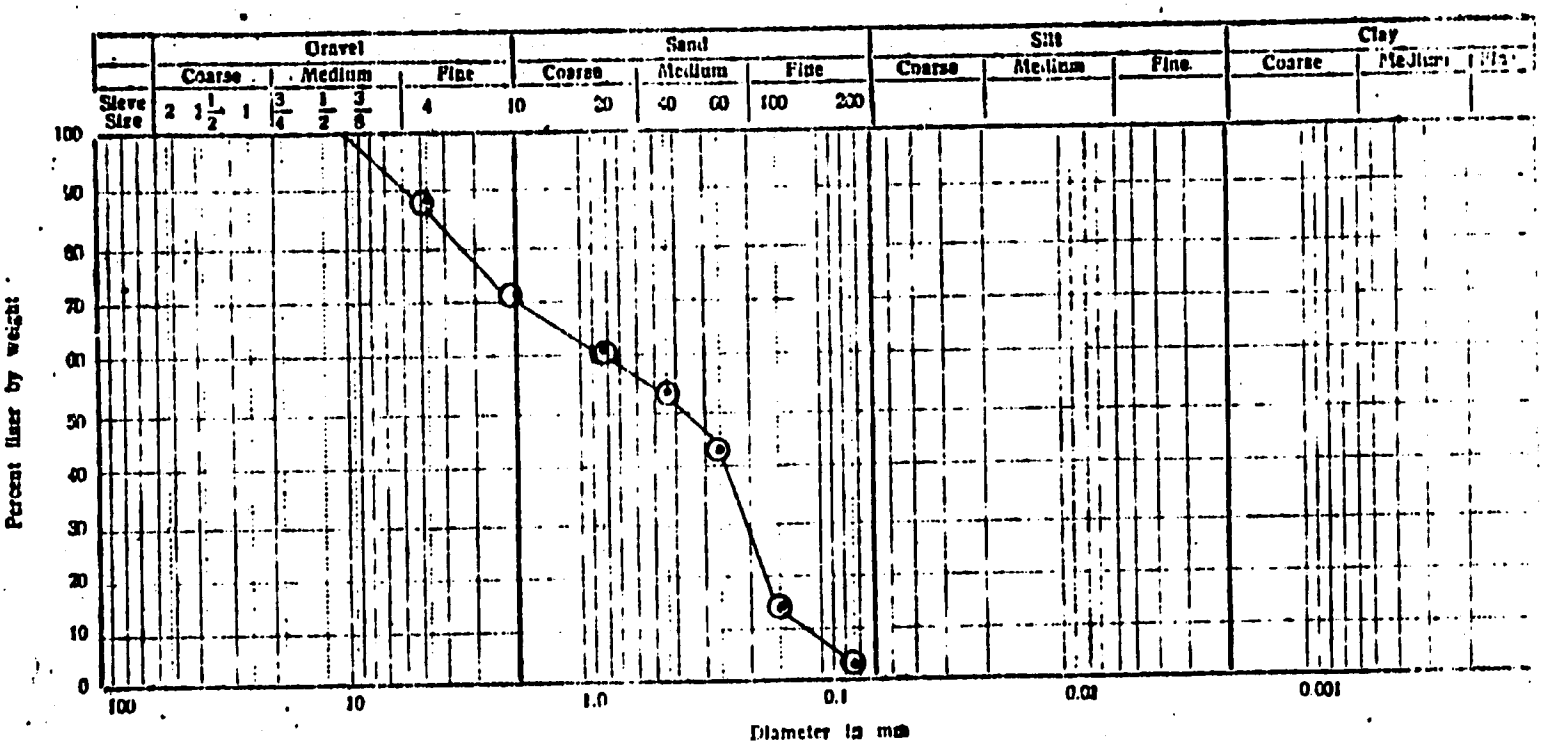
Borehole no. S4

Sample no. 5

Description S W

Depth

Pre-treatment loss %




Method Used :1)Mechnical Sieve Analysis

Remarks :-

Test Made By :Abed EL-Khailk
Chemist:

Checked By : M.M.EL-Saiedi

Date : 24/8/1977

134

LABORATORY

Figure no.

Location Port Said Harbor

# Particle Size Distribution

Client

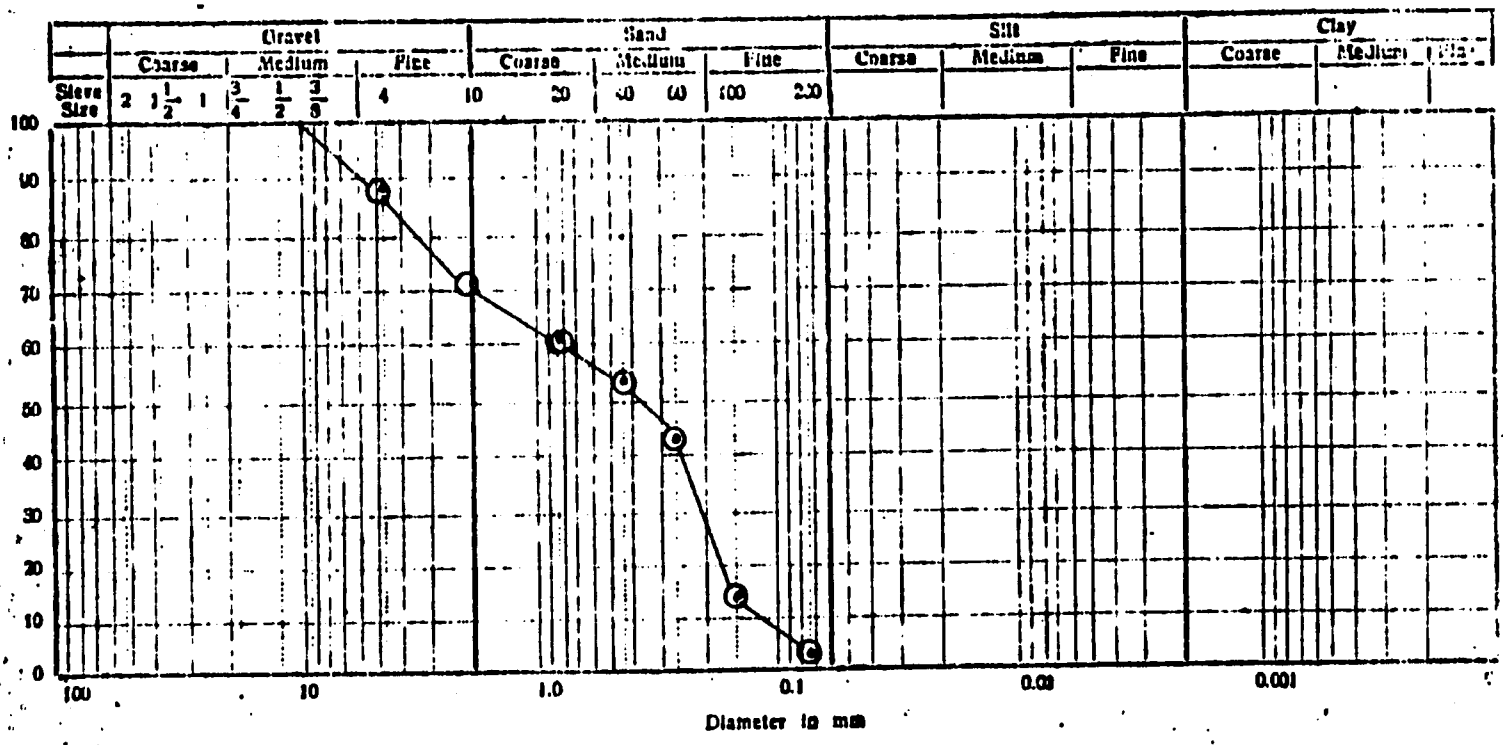
Borehole no. S4

Sample no. 5

Description S W

Depth

Pre-treatment los:
%




Method Used :1)Mechnical Sieve Analysis

Remarks :-

Test Made By :Abed EL-Khailk
Chemist:

Checked By :
M.M.EL-Saiedi

Date : 24/8/1977

135

LABORATORY

Figure no.

Location : Port Said Harbor

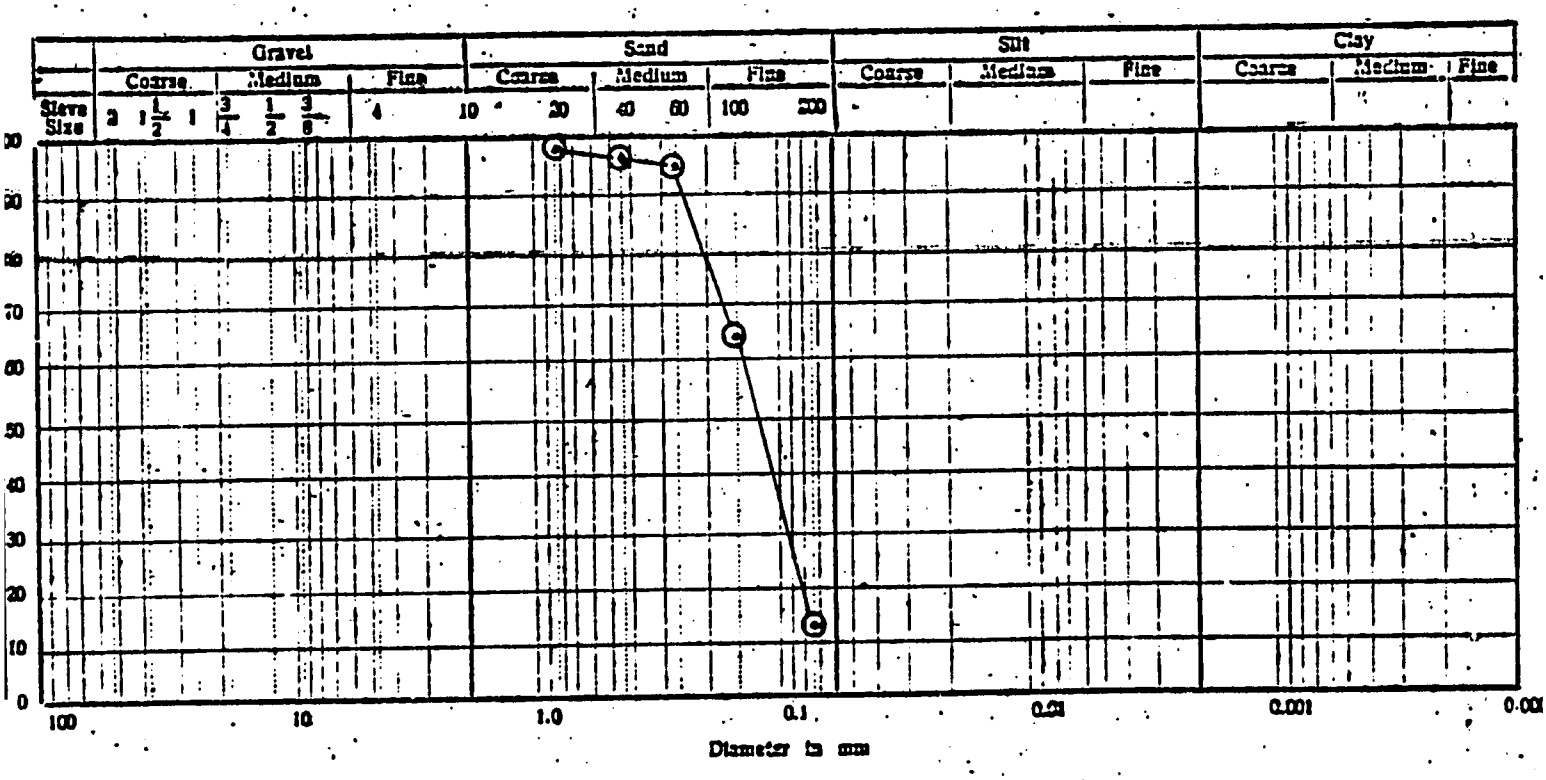
Particle Size Distribution

Client

Borehole no. S4 Sample no. 8

Description S M-S P

Depth Pre-treatment loss %




Method Used : 1)Mechnical Sieve Analysis

Remarks :

Test Made By : Abed EL-Khailk
Chemist :

Checked By : M.M.EL-Saiedi

Date : 24/8/1977

136

Location : Port Said Harbor

# Particle Size Distribution

Client

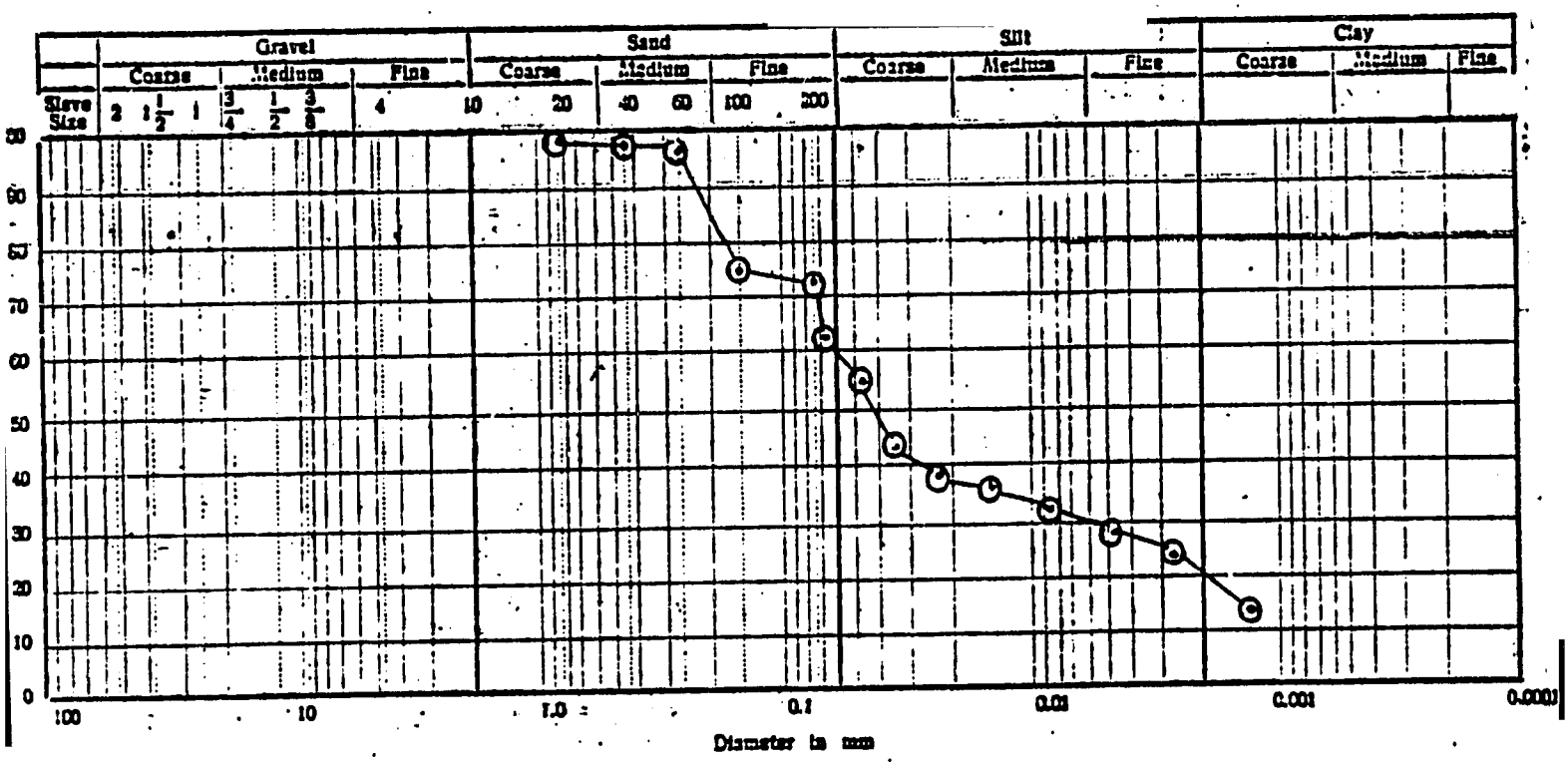
Borehole no. S 4

Sample no. U.D.S1

Description : M L

Depth

Pre-treatment loss %




Method Used : 1)Mechnical Sieve Analysis

Remarks :-

Test Made By : Abed EL-Khailk
Chemist:

Checked By :
M.M.EL-Saiedi

Date : 24/8/1977

137

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

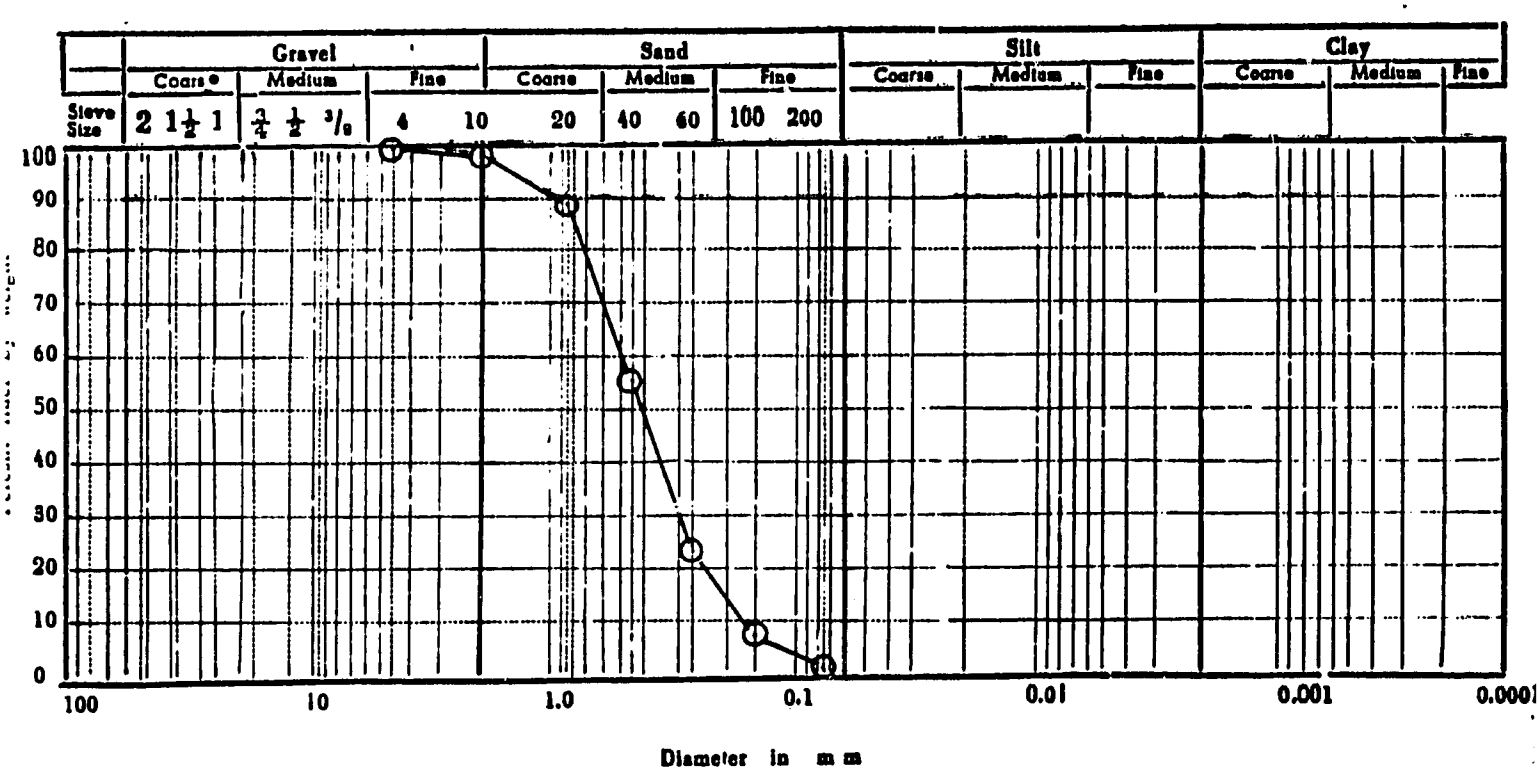
**Borehole no.** SP. 5

**Location** Por Said Harbor

**Sample no.** 2

**Description** SP

**Depth** 5' - 6'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abd EL-Khalik

**Remarks :-**

1 – Uniformity Cofficient = 2.8

2 – The Sample was brought to the laboratory the client at

**Checked By** Chemist. M.I..EL-Saiedi

**Date** 16/10/1977

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**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

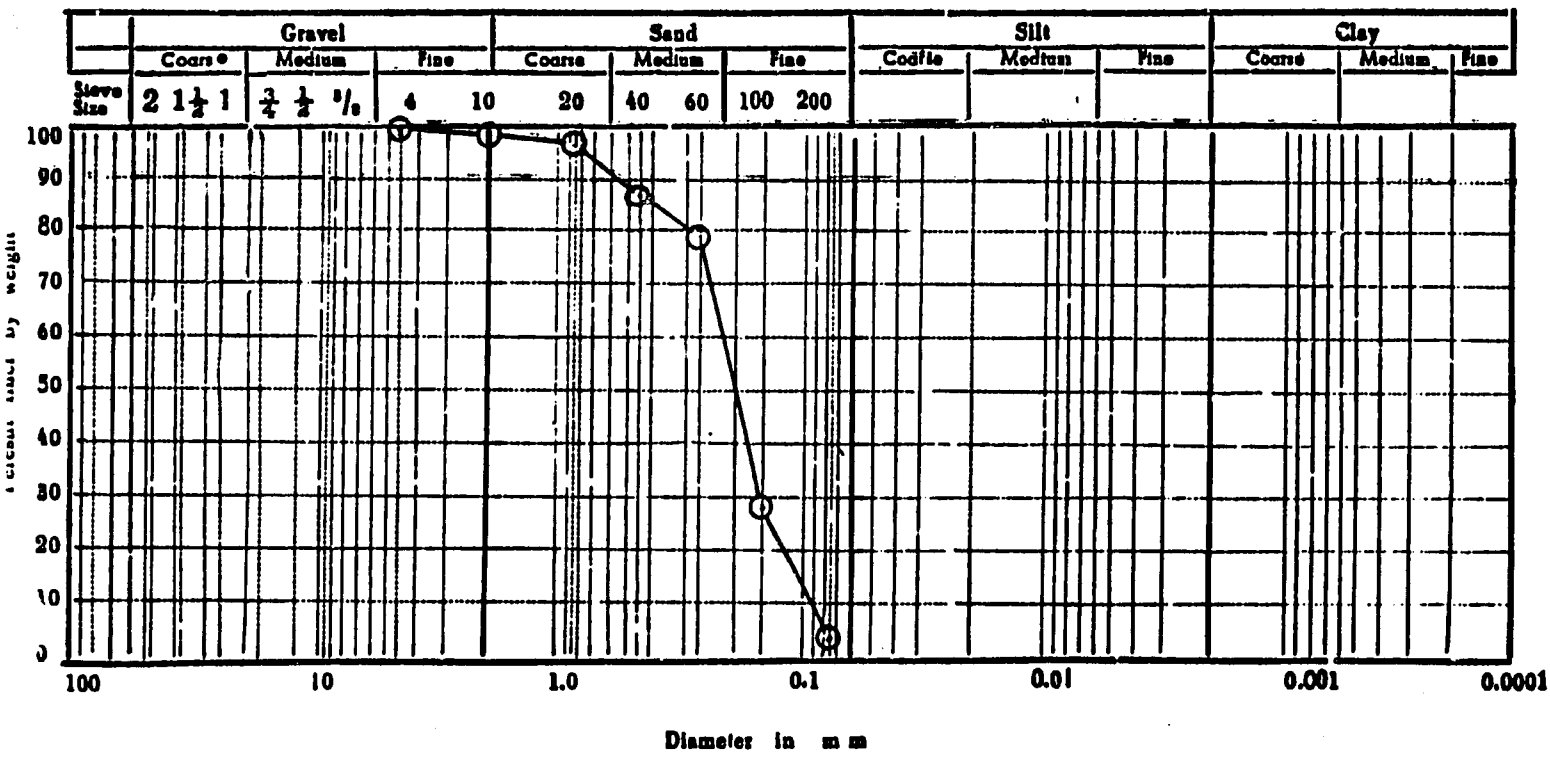
**Borehole no** SP. 5

**Location** Por Said Harbor .

**Sample no.** 4

**Description** SP

**Depth** 16' - 18'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abd EL- Khalik

**Remarks :-**

1 – Uniformity Cofficient = 2.8

2 – The Sample was brought to the laboratory the client at

**Checked By** Chemist. M.K.EL-Saiedi

**Date** 16/10/1977

139

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

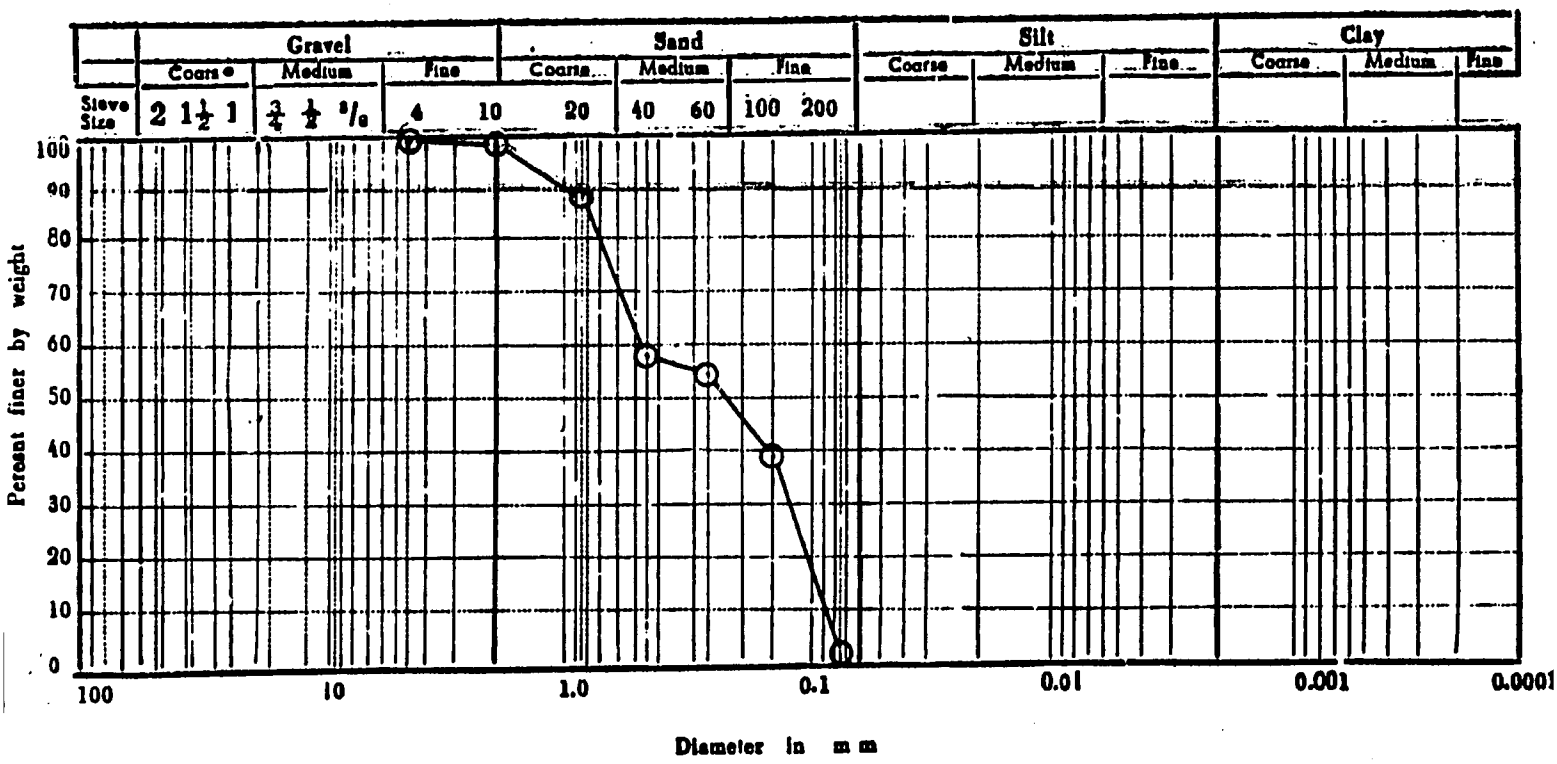
**Borehole no.** SP. 5

**Location** Por Said Harbor.

**Sample no.** 6

**Description** SW

**Depth** 27' - 29'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abd EL-Khalik

**Remarks :-**

1 – Uniformity Cofficient = 7.2

2 – The Sample was brought to the laboratory the client at

**Checked By** Chemist. M.M.EL-Saiedi

**Date** 16/10/1977

140

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

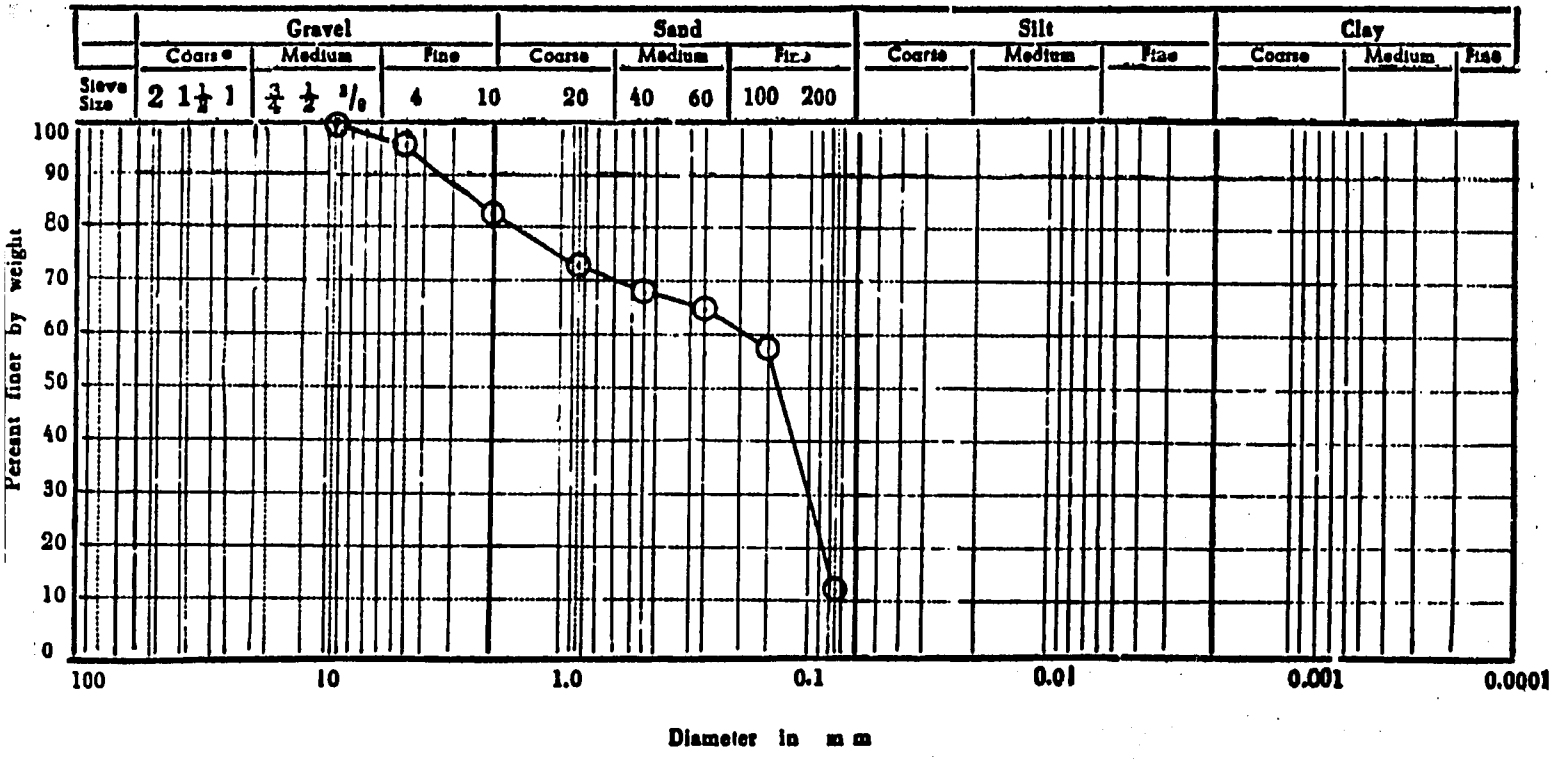
**Borehole no.** SP. 5

**Location** Por Said Harbor.

**Sample no.** 8

**Description** SP-S17

**Depth** 38' - 40'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abd EL-Khalik

**Remarks :-**

1 – Uniformity Cofficient =

2 – The Sample was brought to the laboratory the client at

**Checked By** Chemist. M.M.EL-Saiedi

**Date** 16/10/1977

141

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

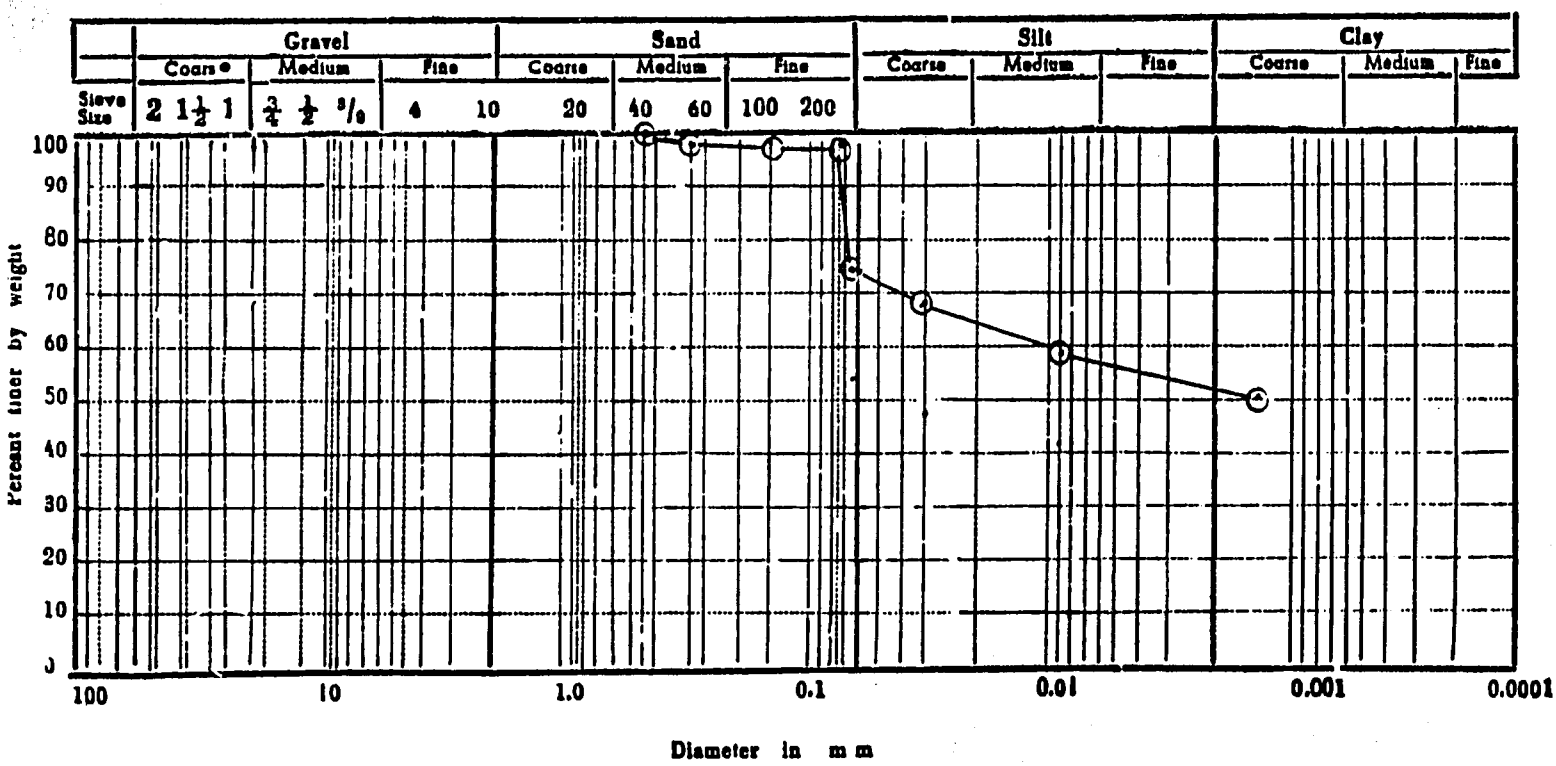
**Borehole no.** SP. 5

**Location** Por Sai d. Hrabor.

**Sample no.** U.D.S. 1

**Description** CH

**Depth** 68',6" – 70',6"




**Method Used :**

1 – Mechnical sieve analysis

2 – Sedimentation By Hydrometr

**Remarks :-**

1 – Uniformity Cofficient =

2 – The Sample was brought to the laboratory the client at

**Test Made By** Tec. Assist.
M.HAGIB

**Checked By** Chemist.
M.M.EL-Saiedi

**Date** 16/10/1977

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**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

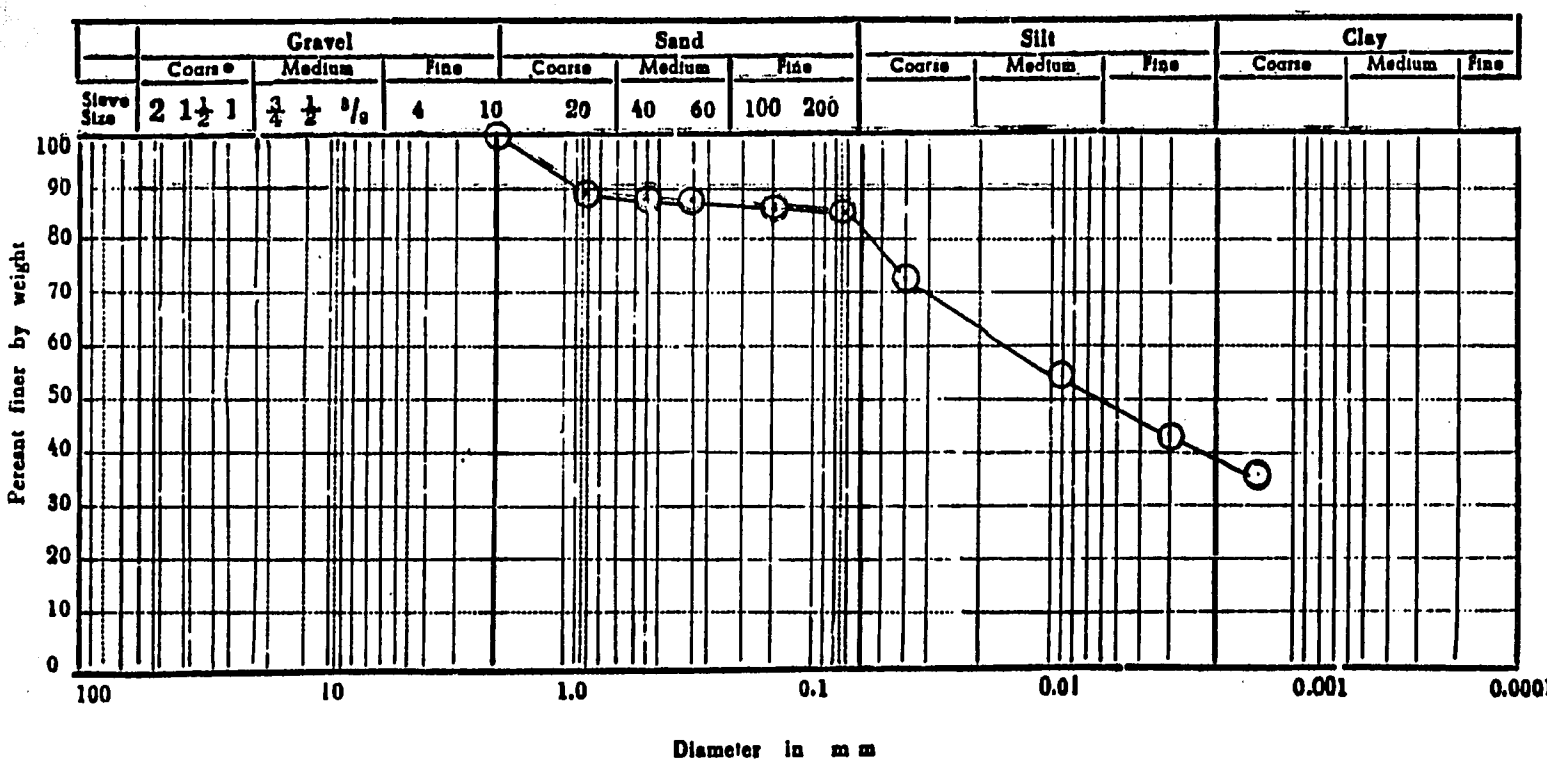
**Borehole no.** SP. 5

**Location** Por Said Hrbor

**Sample no.** U.D.S. 2

**Description** CL

**Depth** 80' – 82'




**Method Used :**

1 – Mechnical sieve analysis

2– Sedimentation By Hydrometer.

**Remarks :-**

1 – Uniformity Cofficient =

2 – The Sample was brought to the laboratory the client at

**Test Made By** Tec. Assist. M.NAGIB

**Checked By** Chemist. M.M.EL-Saiedi

**Date** 16/10/1977

143

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4 4

**Client**

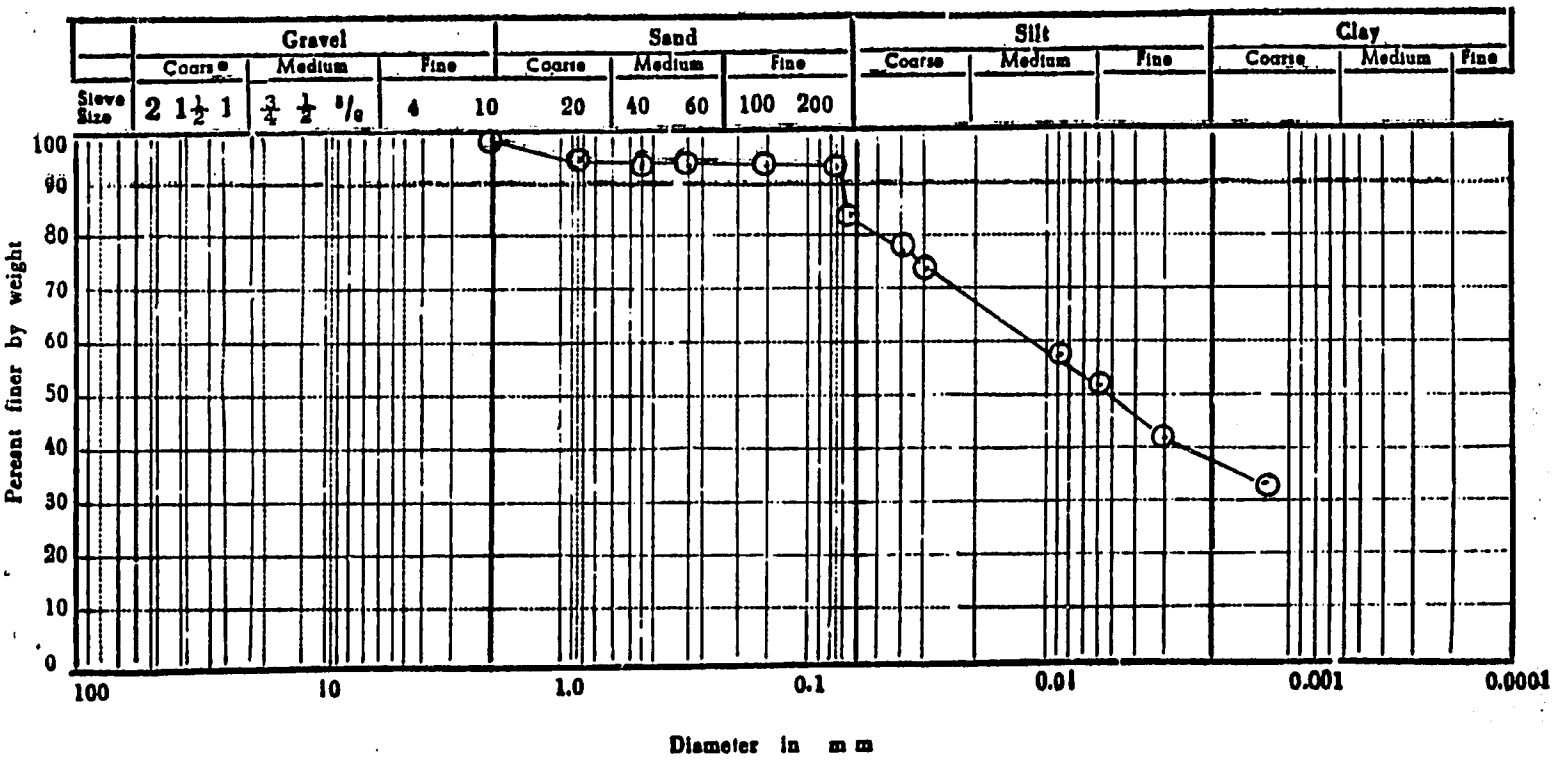
**Borehole no.** SP. 5

**Location** Por Said Harbor

**Sample no.** U P S 4

**Description** CL

**Depth** 105',6" - 107',6"




**Method Used :**

1 – Mechnical sieve analysis

2– Sedimentation By Hydrometer.

**Remarks :-**

1 – Uniformity Cofficient =

2 – The Sample was brought to the laboratory the client at

**Test Made By** Tec.Assist.
M.HAGIB

**Checked By** Chemist.
M.M.EL-Saiedi

**Date** 16/10/1977

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LABORATORY

Figure no

Location : Port Said Harbor

# Particle Size Distribution

Client

Borehole no. S 6

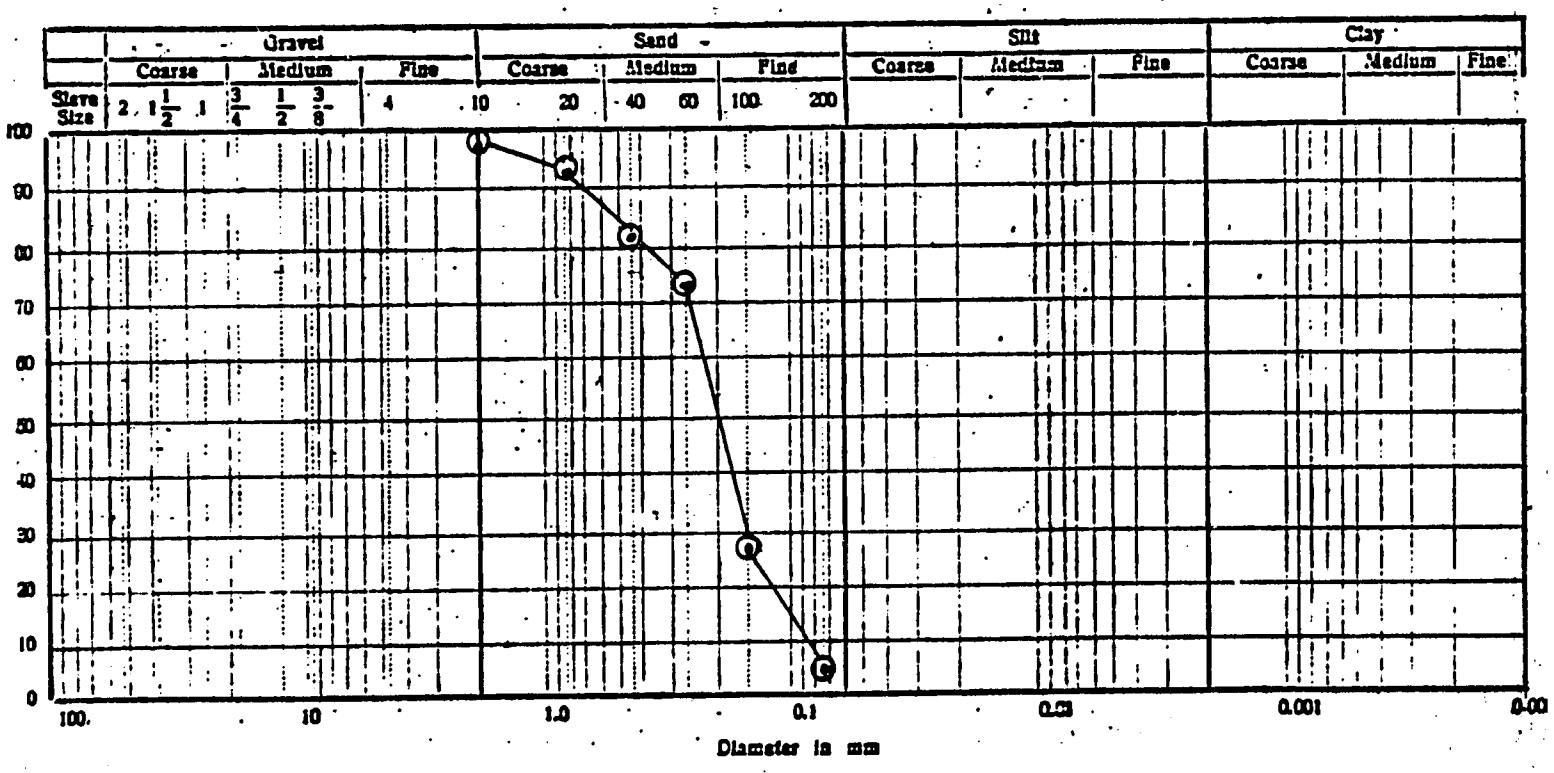
Sample no. 4

Description

Depth

Pre-treatment loss %

S P




Method Used : 1)Mechnical Sieve Analysis

Remarks

Test Made By aAbed EL-Khailk

Chemist:

Checked By M.M.EL-Saiedi

Date : 24/8/1977

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LABORATORY

~~Figure no.~~

Location Port Said Harbor

# Particle Size Distribution

Client

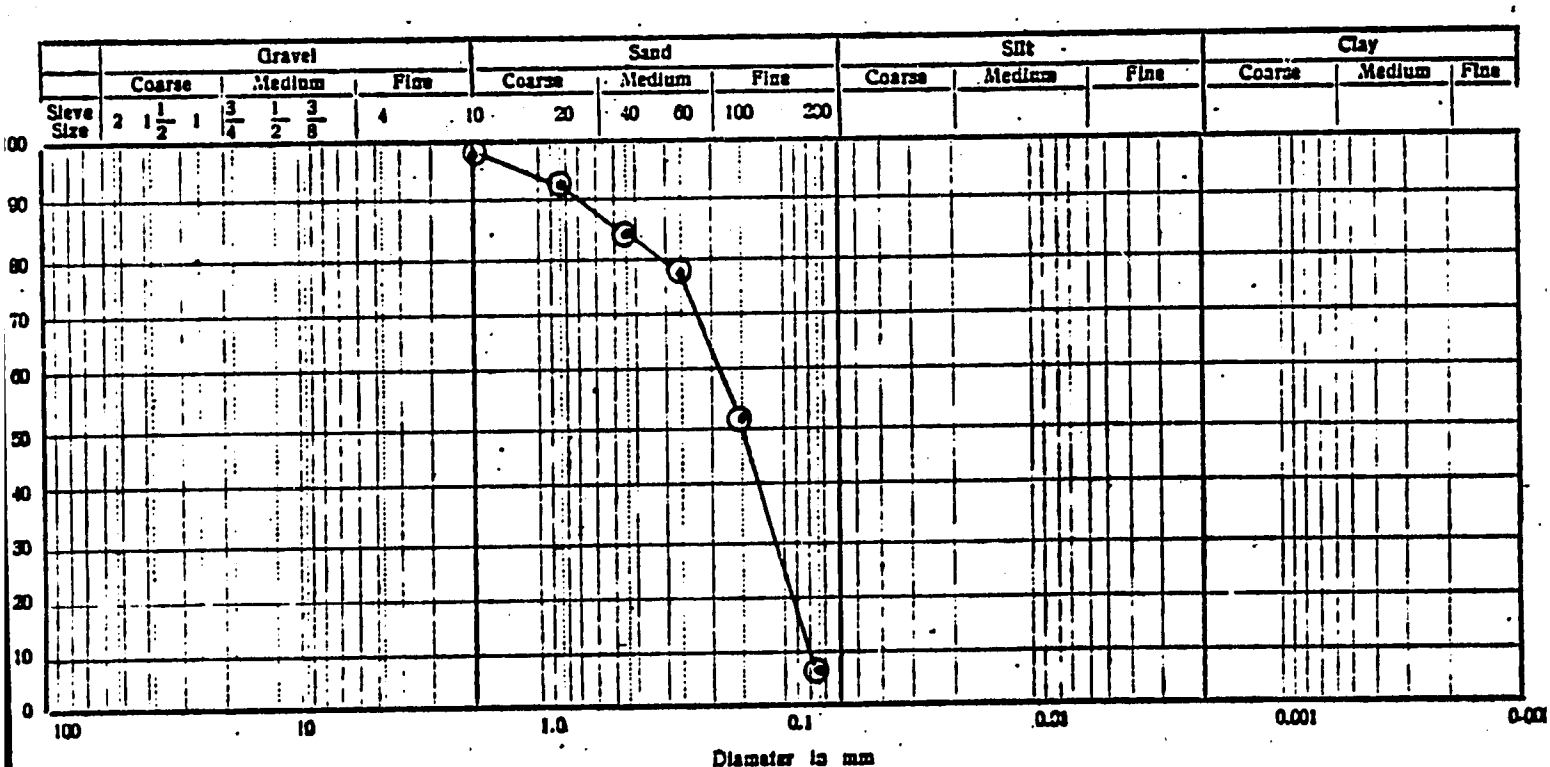
Borehole no. S. 6 Sample no. 8

Description F

SP- S17

Depth

Pre-treatment loss %




Method Used : 1) Mechnical Sieve Analysis

Remarks :

Test Made By : Abed EL-Khailk

Chemist:

Checked By : M.M.EL-Saiedi

Date : 24/8/1977

146

LABORATORY

Location: Port Said Harbor

Client

Description

SP

Figure no.

# Particle Size Distribution

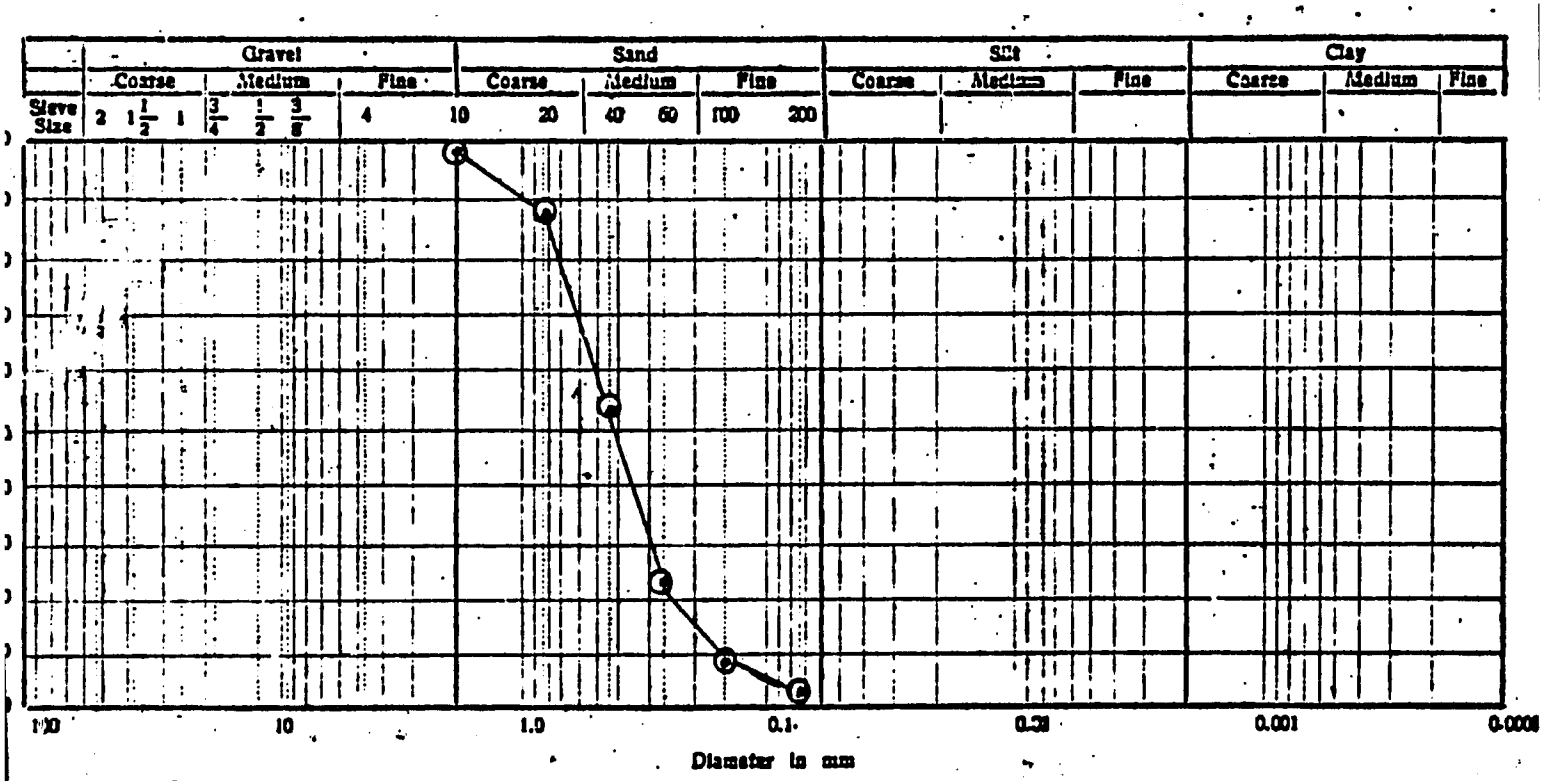
Borehole no. S7

Sample no. 2

Depth 5'-7'

Pre-treatment loss

%




Method Used : 1)Mechnical Sieve Analysis

Remarks.

Test Made By : Abed EL-Khalik

Chemist:

Checked By: M.M.EL-Saiedf.

Date : 24/8/1977

147

LABORATORY

figure no.

Location : Port-Said Harbor

# Particle Size Distribution

Client

Borehole no. S7

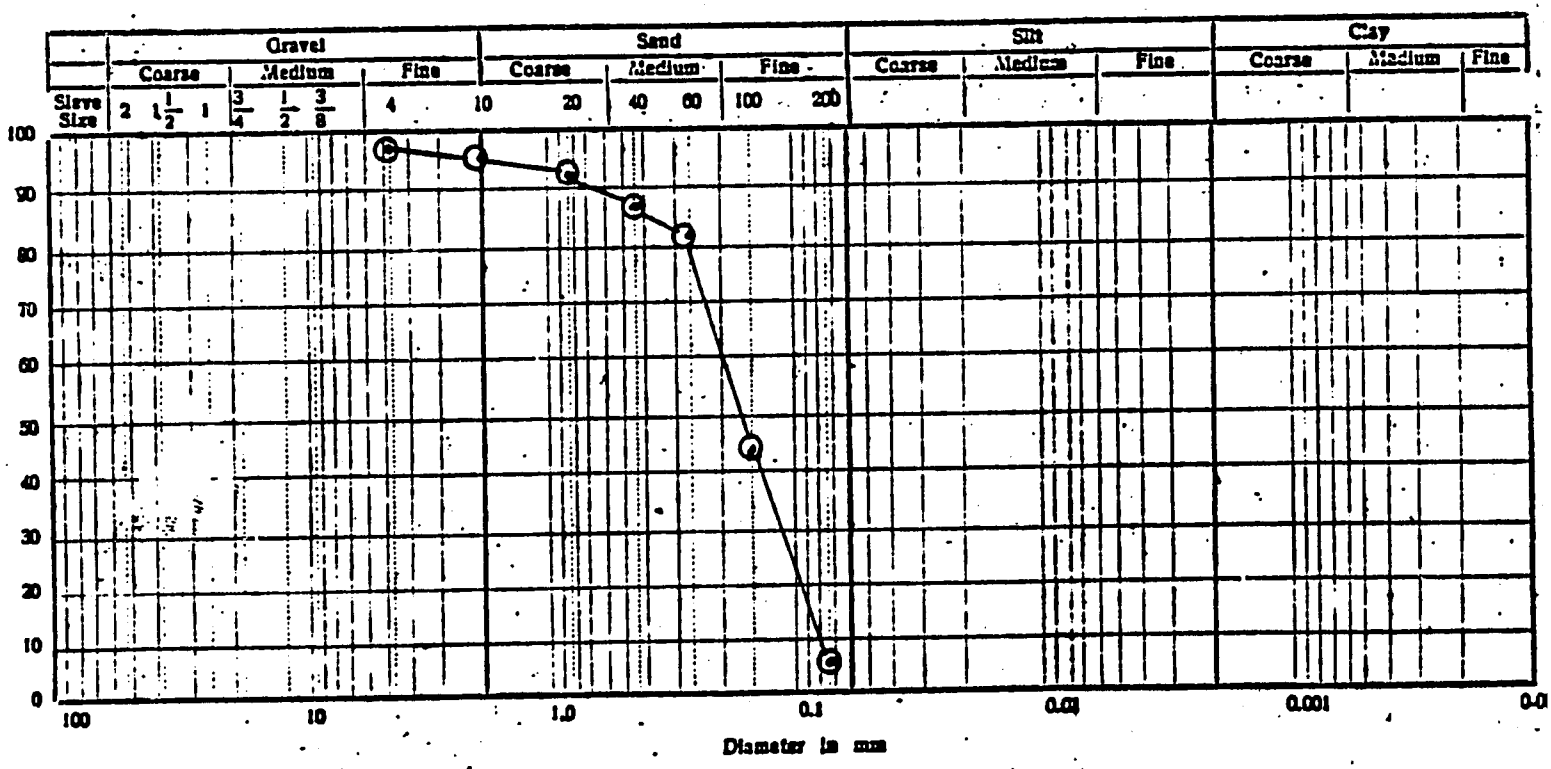
Sample no. 5

Description

Depth

Pre-treatment loss %

S P




Method Used : 1)Mechnical Sieve Analysis

Remarks :-

Test Made By : Abed EL-Khalik
Chemist:

Checked By : M.M.EL-Saiedi

Date : 24/8/1977

148

LABORATORY

Figure no.

Location POrt Said Harbor

# Particle Size Distribution

Client

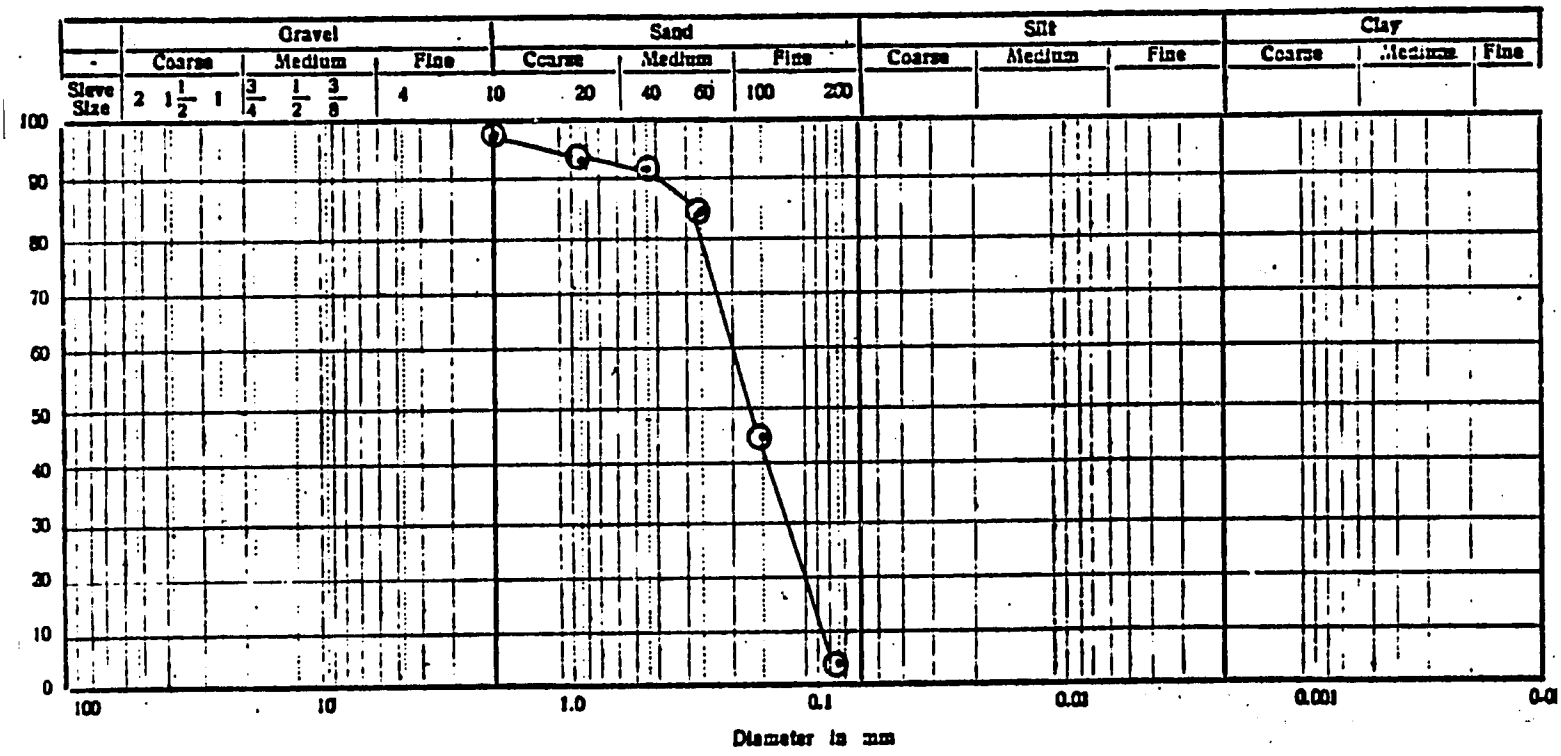
Borehole no. S 7 Sample no. 8

Description

Depth

Pre-treatment loss %

SP




Method Used : 1)Mechnical Sieve Analysis

Remarks :-

Test Made By Abed EL-Khailk

Chemist:

Checked By :

M.M.EL-Saiedi

Date : 24/5/1977

149

LABORATORY

Figure no.

Location Port Said Harbor

# Particle Size Distribution

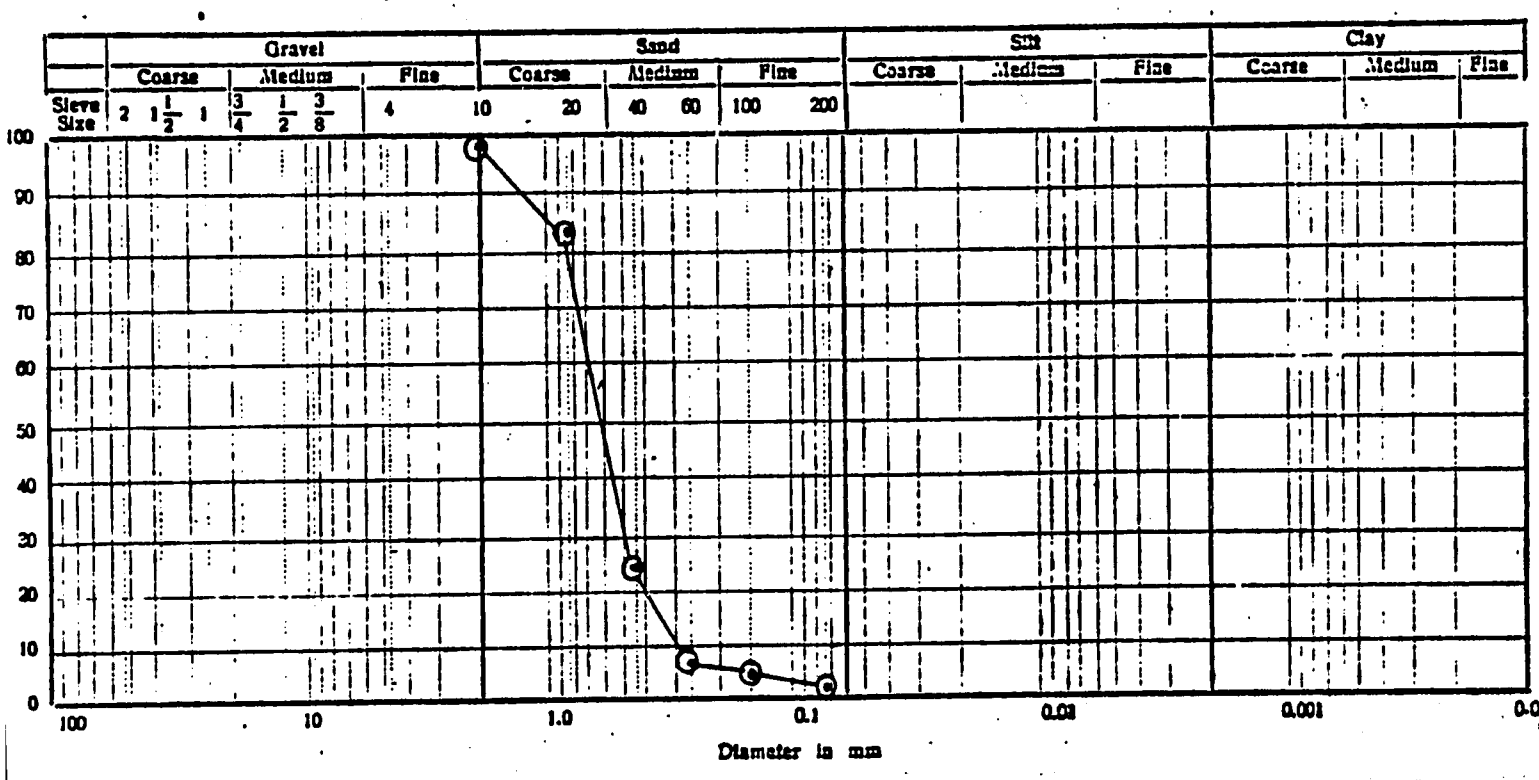
Client

Borehole no. S.8 Sample no. 3

Description

Depth Pre-treatment loss %

SP




Method Used : 1)Mechnical Sieve Analysis

Remarks :-

Test Made By :Abed EL-Khalik
Chemist:

Checked By : M.M.El-Saiedi

Date : 24/8/1977

150

LABORATORY

Figure no.

Location Port Said Harbor

# Particle Size Distribution

Client

Borehole no. S-8

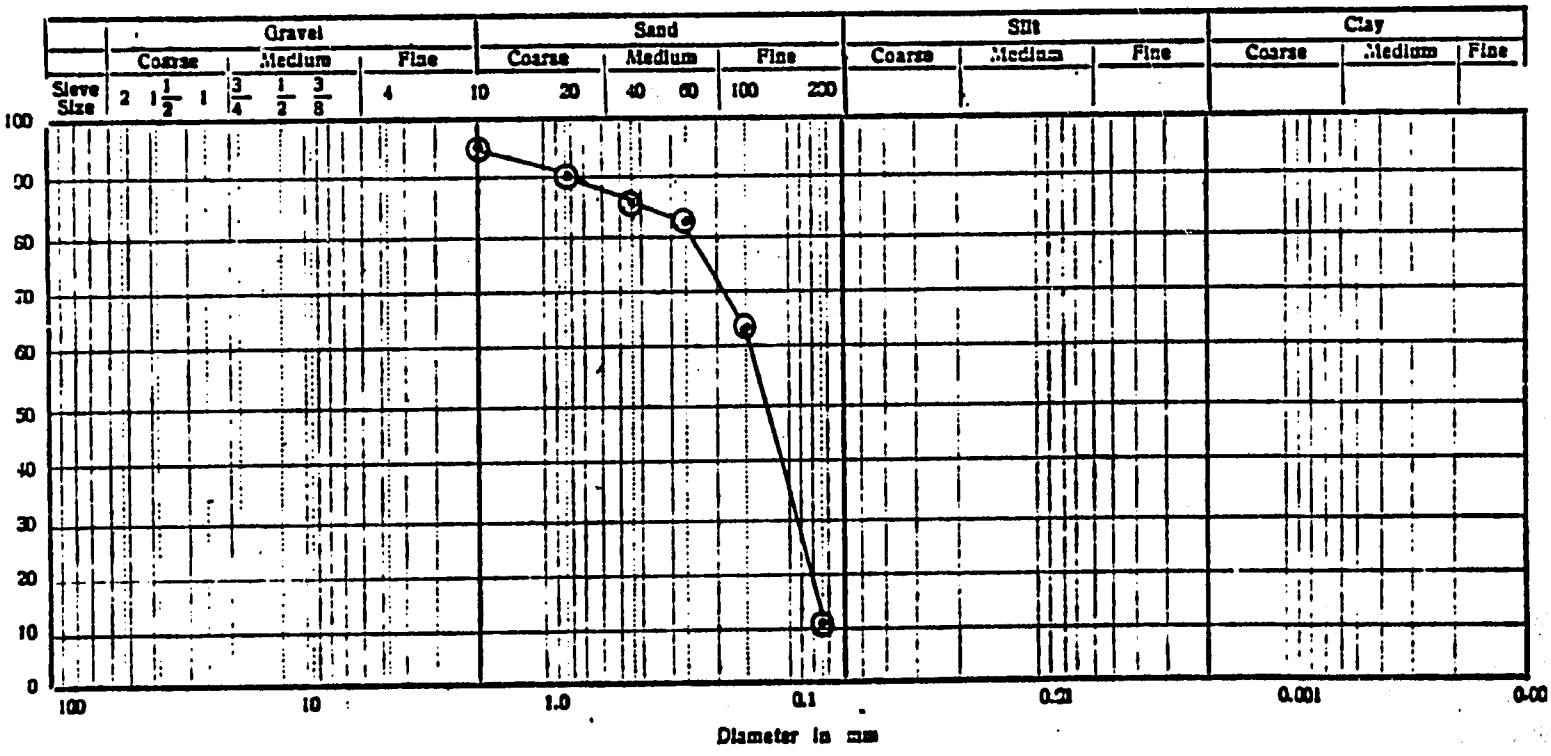
Sample no. 7

Description

Depth

Pre-treatment loss %

SM - SP




Method Used : 1)Mechnical Sieve Analysis

Remarks :-

Test Made By : Abed el-Khaik
Chemist;

Checked By : M.M.EL-Saiedi

Date : 24/8/1977

151

LABORATORY

Figure no.

Location Port Said Harbor

# Particle Size Distribution

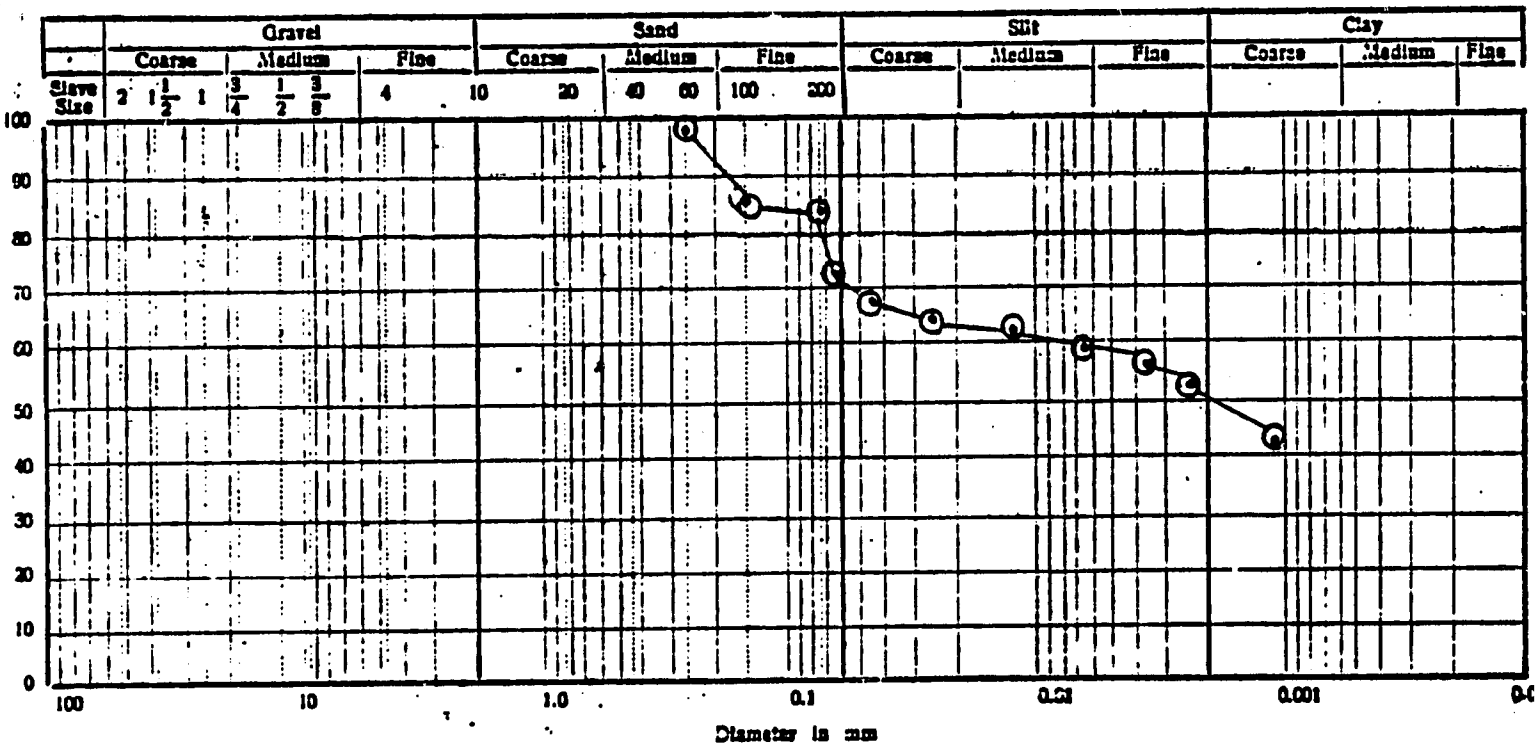
Client

Borehole no. S8 Sample no. 9

Description

Depth

Pre-treatment loss %




Method Used : 1)Mechnical Sieve Analysis

Remarks :-

Test Made By Abed EL-Khailk
Chemist.

Checked By :M.M.EL-Saiedi M

Date :24/8/1977

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**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

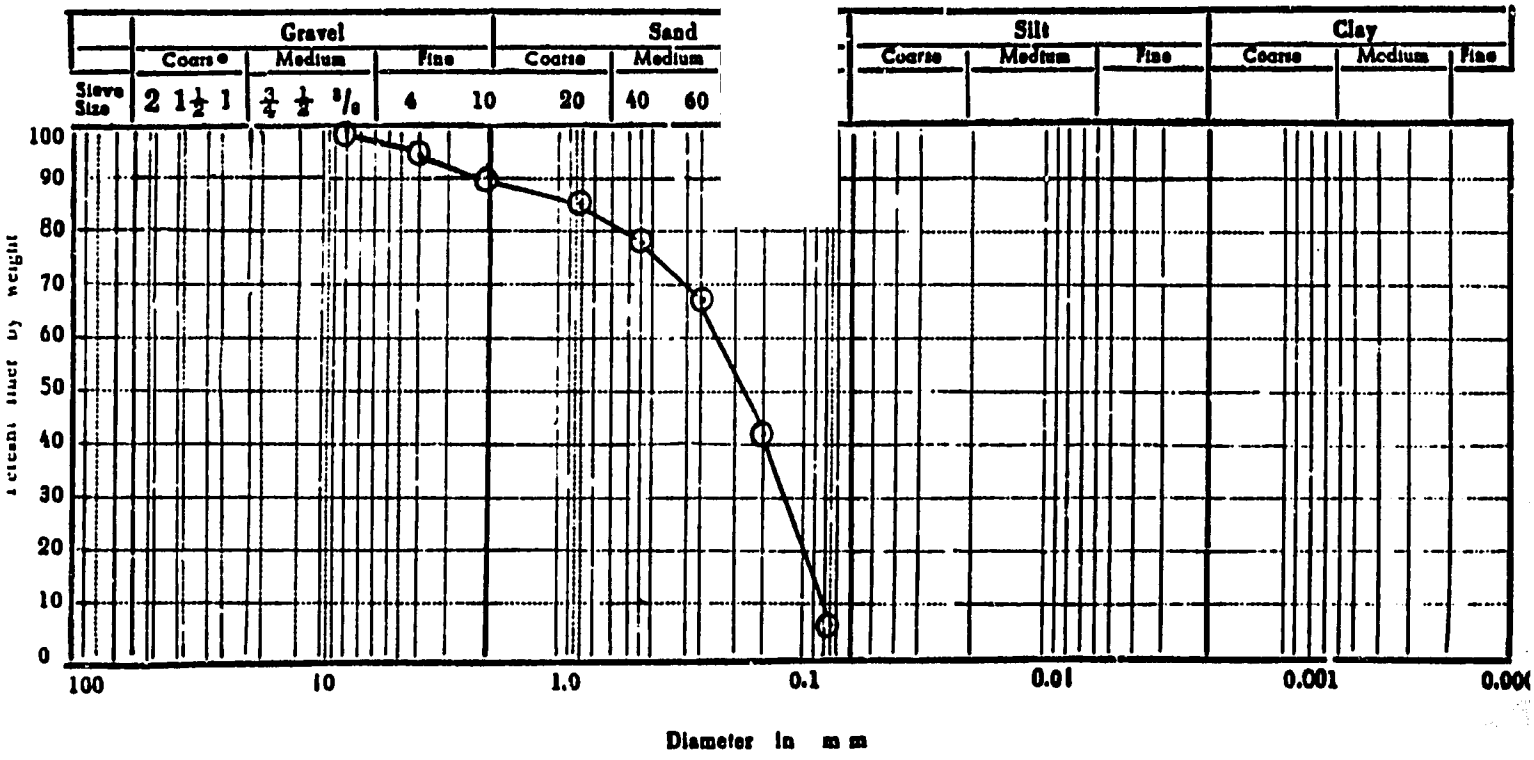
## Grain Size Distribution

**Laboratory No.** 4

**Client** hole no. 11

**Location** Port Said Harbor ple no. 2

**Description** SP - SM h 5'-7'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abed EL-Khalik

**Remarks :-**

1 – Uniformity Cofficient = 2.9

2 – The Sample was brought to the laboratory the client at

Chemist:

**Checked By** M.M.EL-Saiedi

**Date** 19/10/1977

153

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

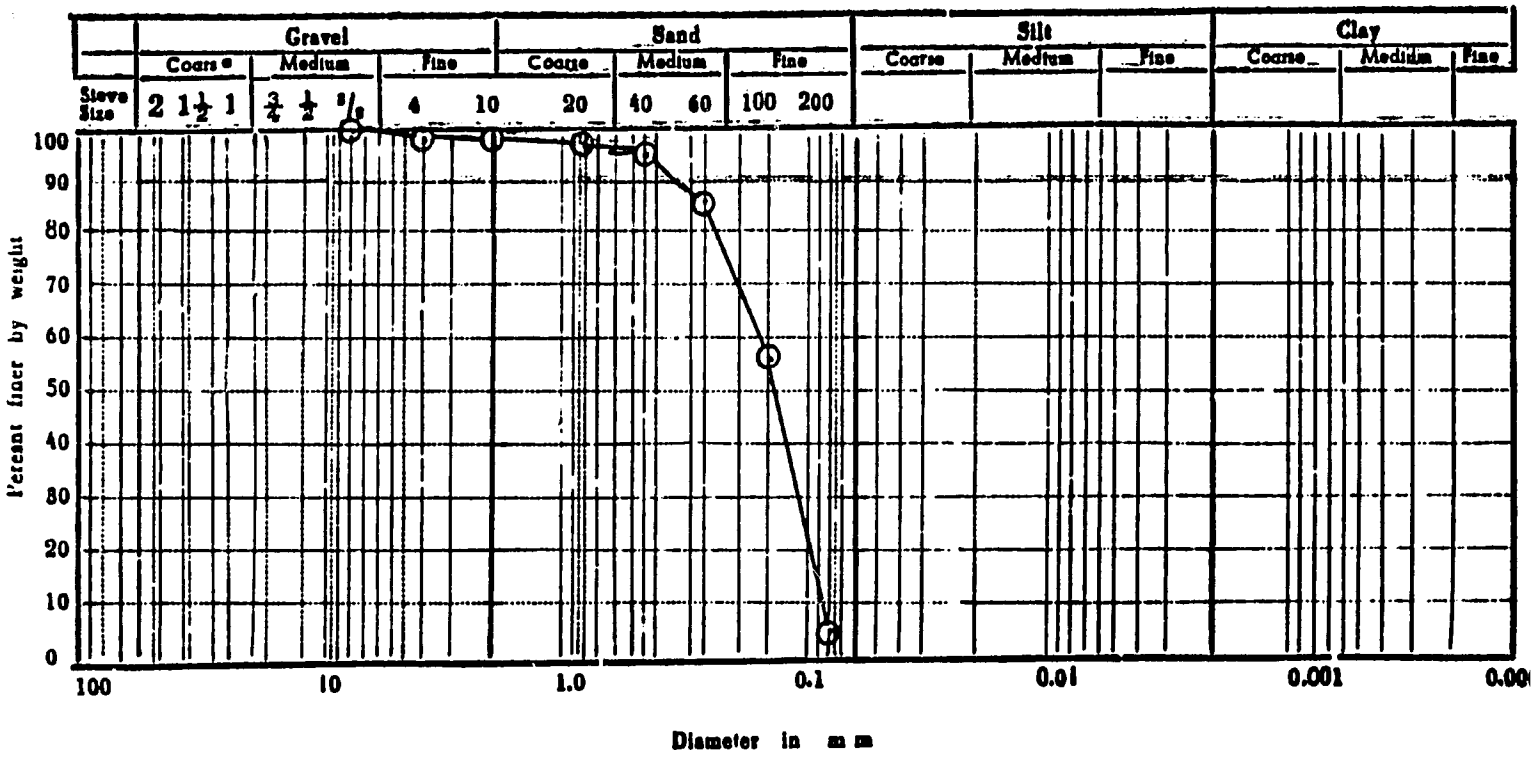
**Borehole no.** 11

**Location** Port Said Harbor

**Sample no.** 4

**Description** SP - SM

**Depth** 15'-18'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abed El-Khalik

**Remarks :-**

1 – Uniformity Cofficient = 1.9

2 – The Sample was brought to the laboratory the client at

Chemist:

**Checked By** M.M.EL-Saiedi

**Date** 19/10/1977

154

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## Grain Size Distribution

Laboratory No.

Client

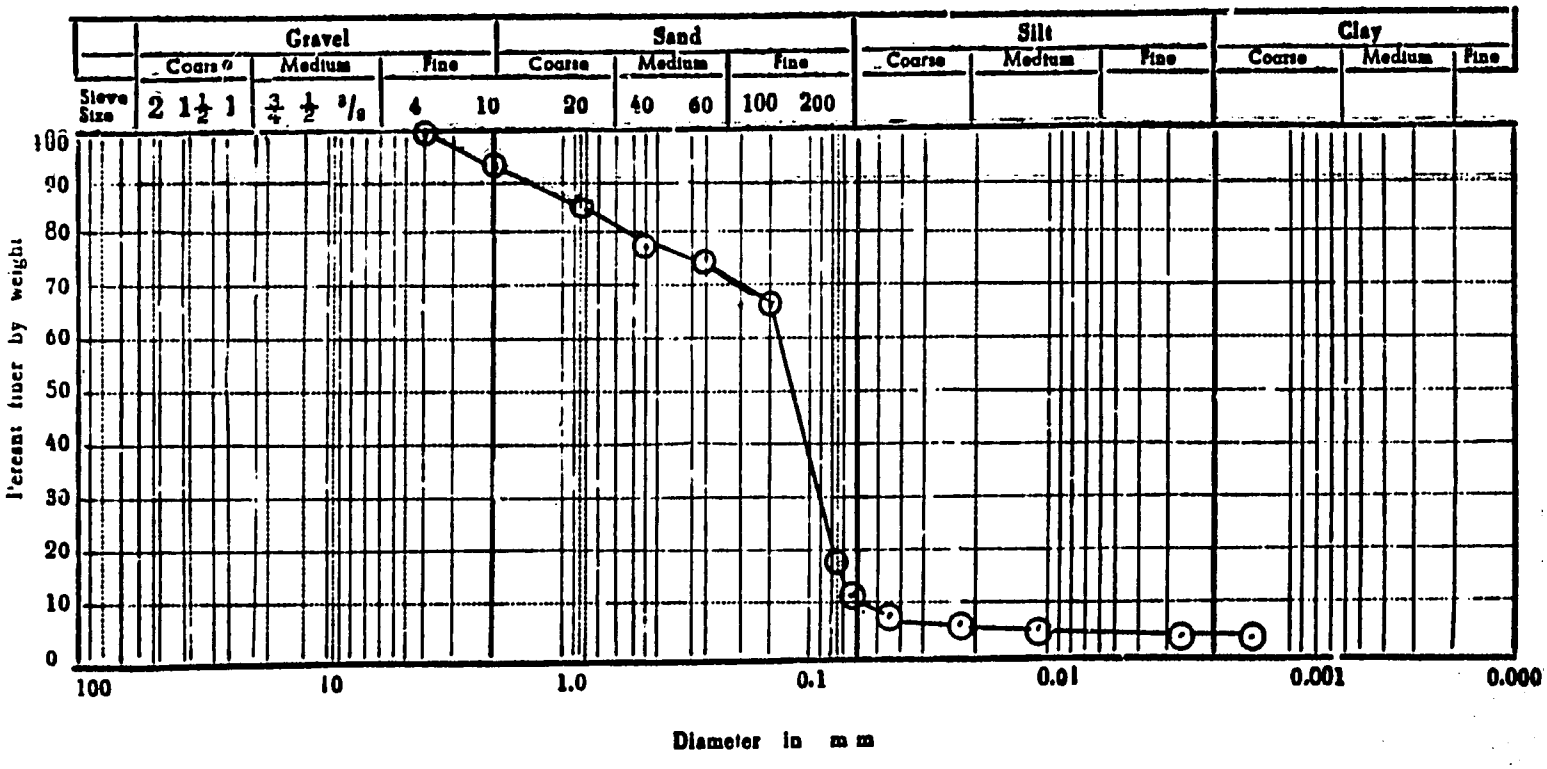
Borehole no. 1

Location Port Said Harbor

Sample no. 7

Description SP-SM

Depth 33'-34'




Method Used :

1 – Mechnical sieve analysis

Test Made By Abed EL-Khalik

Chemist:

Checked By M.M.EL-Saiedi

Date 19/10/1977

Remarks :-

1 – Uniformity Cofficient = 2.4

2 – The Sample was brought to the laboratory the client at

155

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## Grain Size Distribution

**Laboratory No.** 4

**Client**

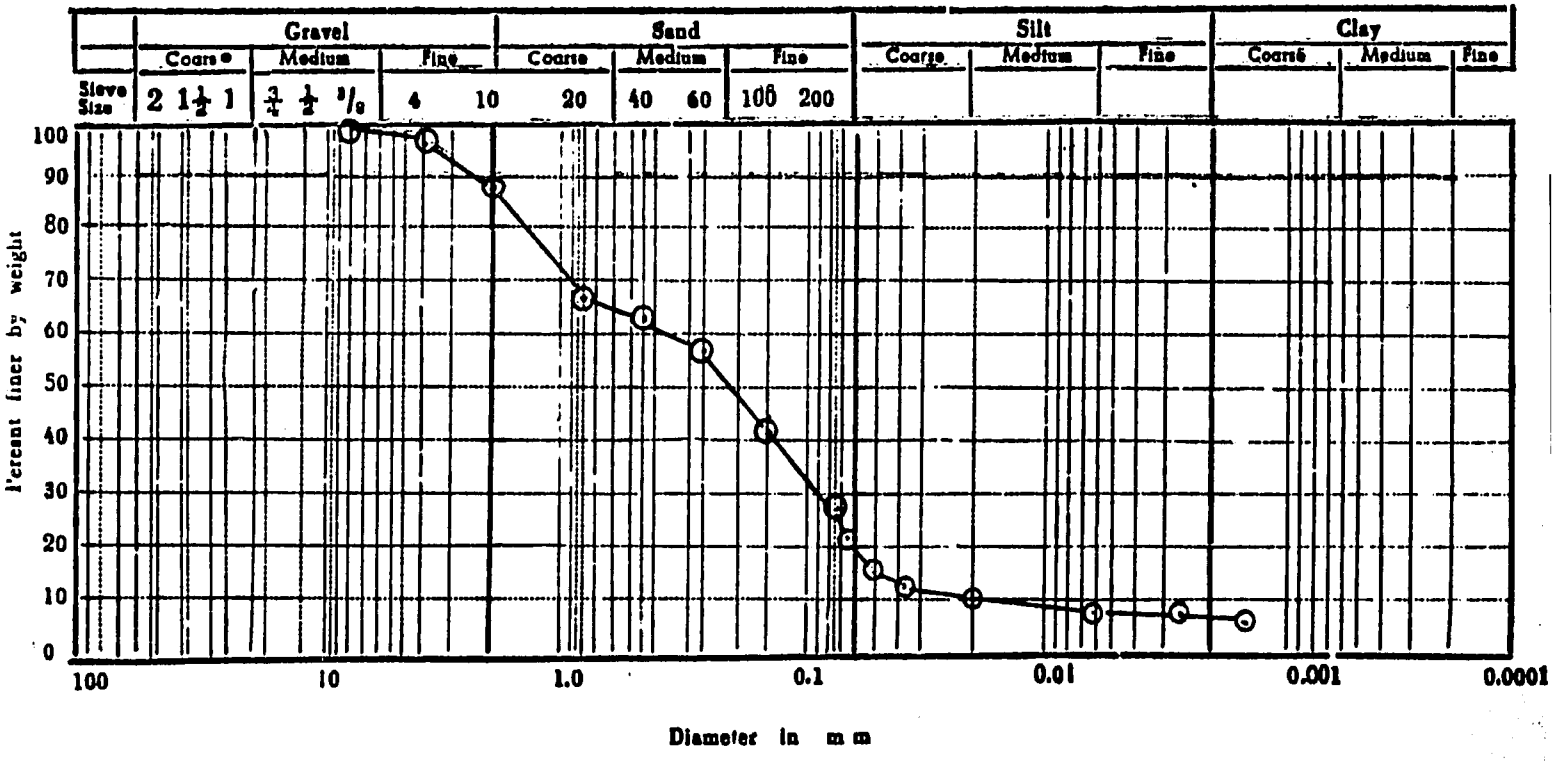
**Borehole no.** 11

**Location** Port Said Harbor

**Sample no.** 10

**Description** SC

**Depth** 49'-51'




**Method Used :**

1 – Mechnical sieve analysis

**Test Made By** Abed EL-Khalik

**Remarks :-**

1 – Uniformity Cofficient = 20.0

2 – The Sample was brought to the laboratory the client at

**Checked By** Chemist: M.M.EL-Saiedi

**Date** 19/10/1977

156

**LABORATORY**

Figure no.

Location Port Said harbor

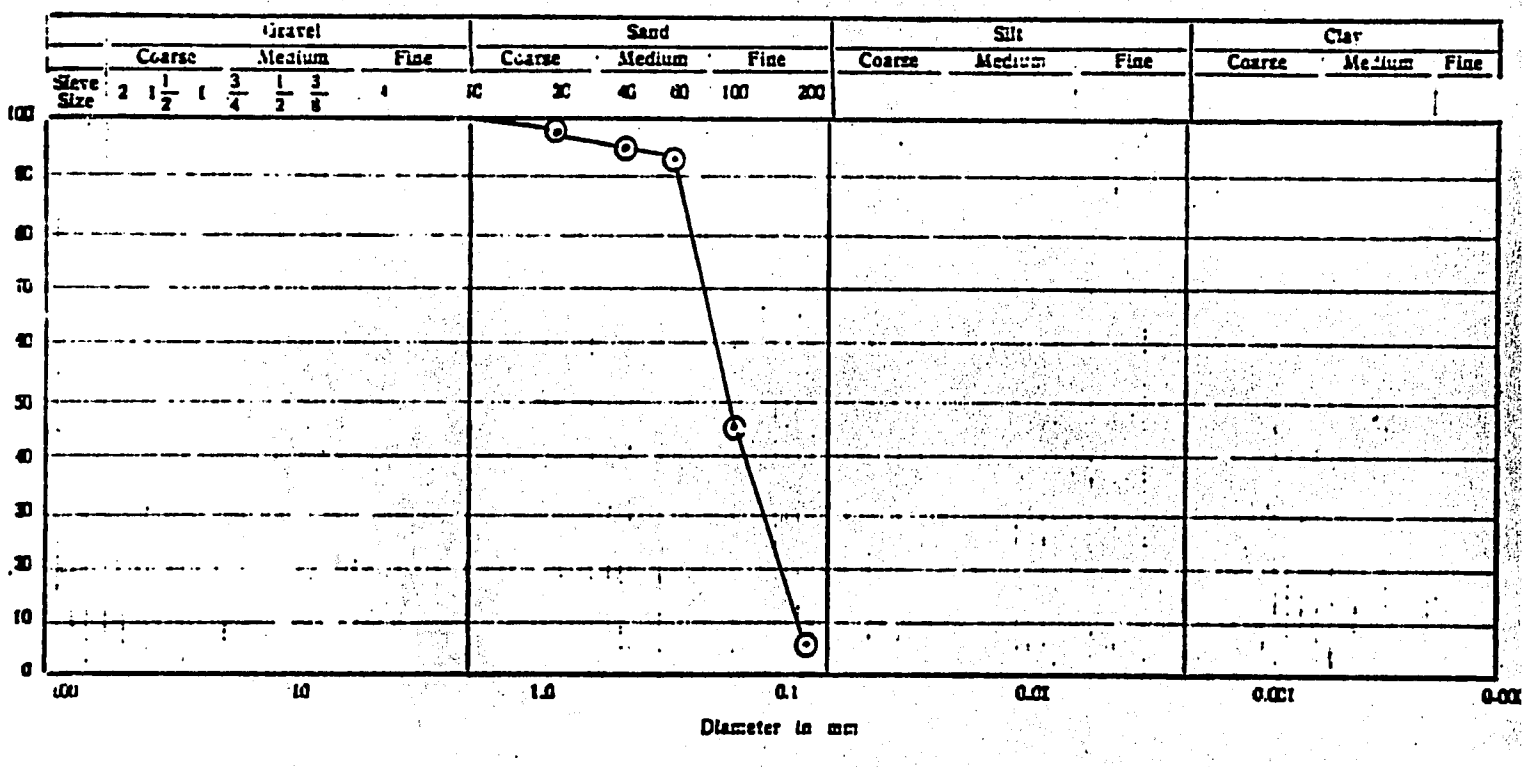
**Particle Size Distribution**

Client

Borehole no. S12 Sample no. 4

Description SP

Depth 15'-16'6" Pre-treatment loss




Method Used :

Remarks :-

Test Made By :

Chemist:

Checked By : M.M.El-Saiedi

Date : 10/8/1977

157

**Raymond International of Delaware, Inc.**
3 A EL BALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S1

Location Port Said Harbor

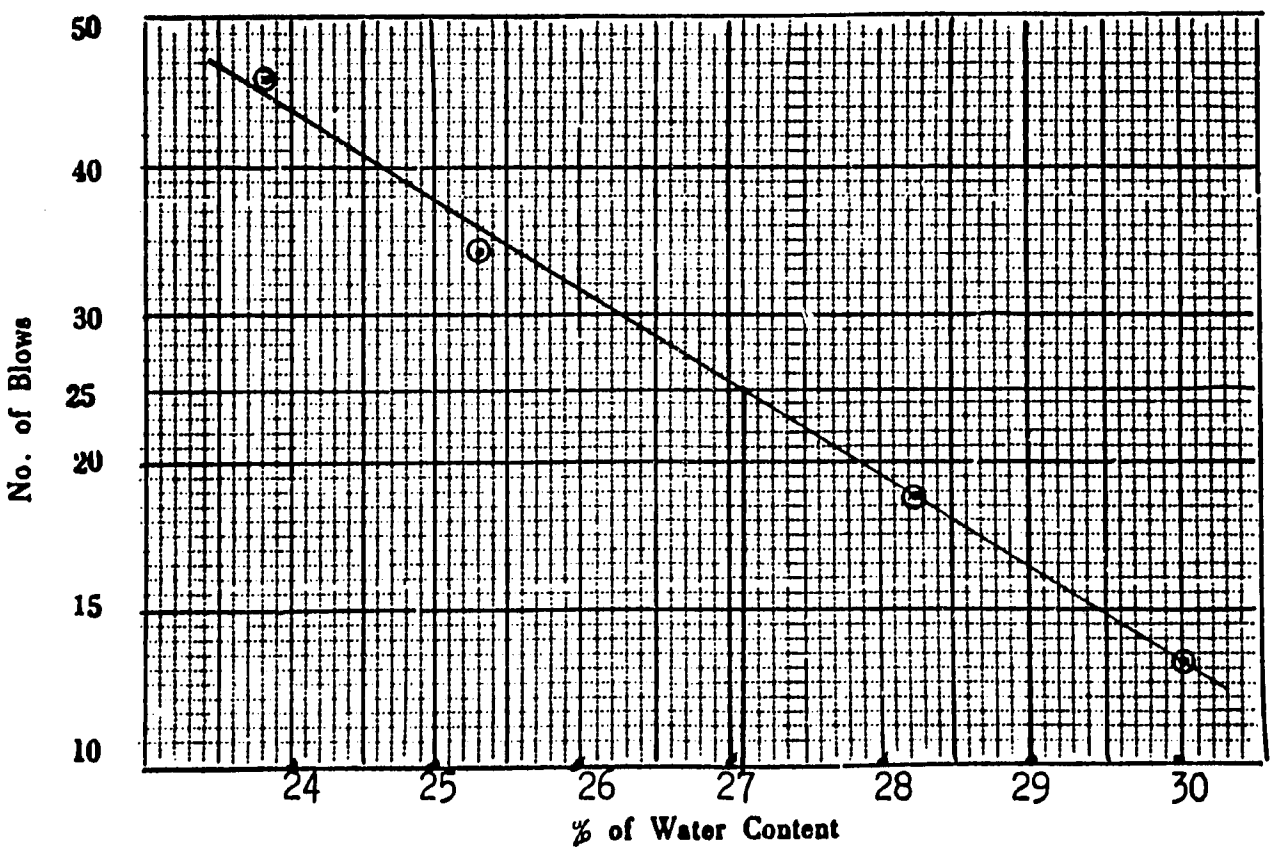
Sample no. 9

Description SM

I h 40'-41'6"

| Item | Test | Result | m | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 27.10 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

**FLOW CURVE**




Tested by

checked by Chemist: date 11/8/1977

M.M.El-Saiedi

Mc. 158

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description CL

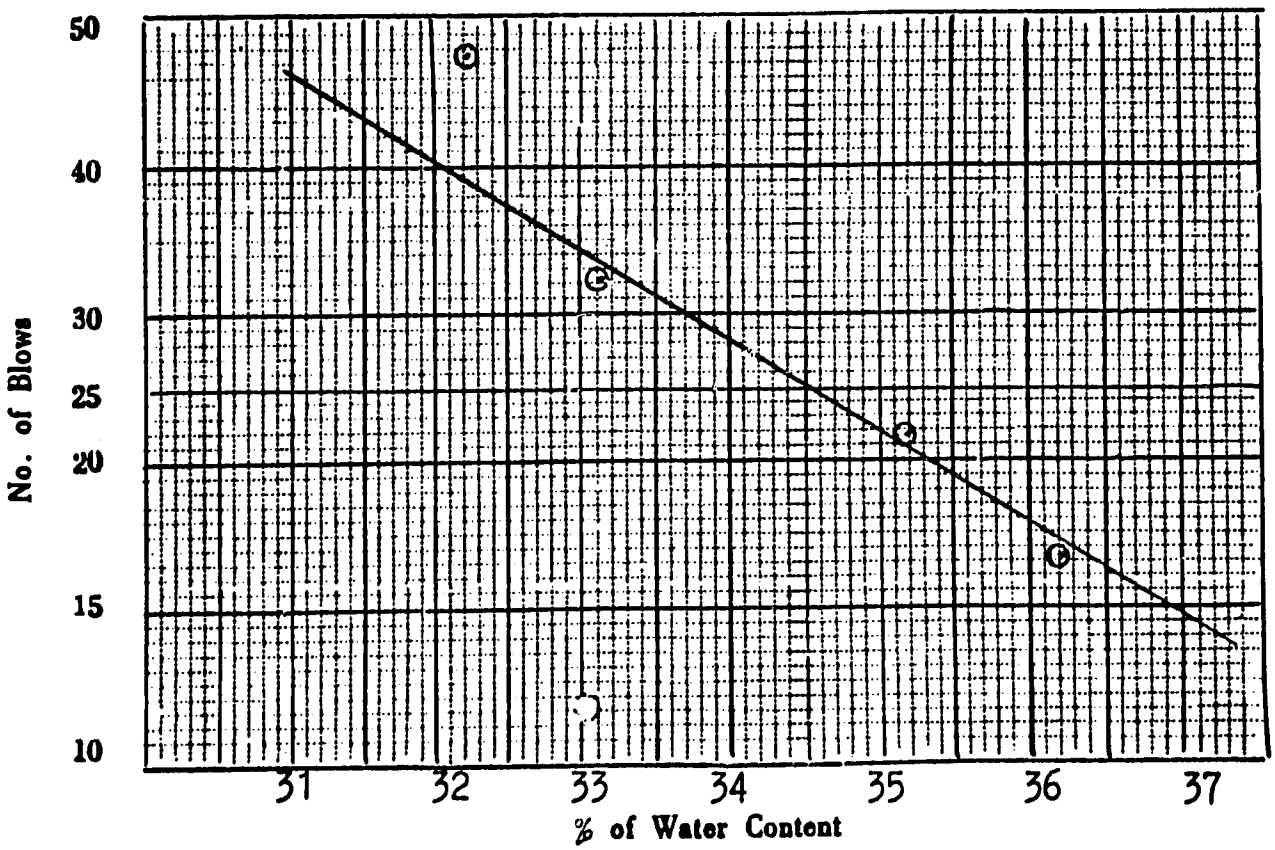
Borehole no. S1

Sample no. U D S 1

Depth 60'-62'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 34.55 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 20.00 | 4 | Plasticity index % | 14.55 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 11/8/1977

M.S.159

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Location Port Said harbor

Description SM

Borehole no. S2

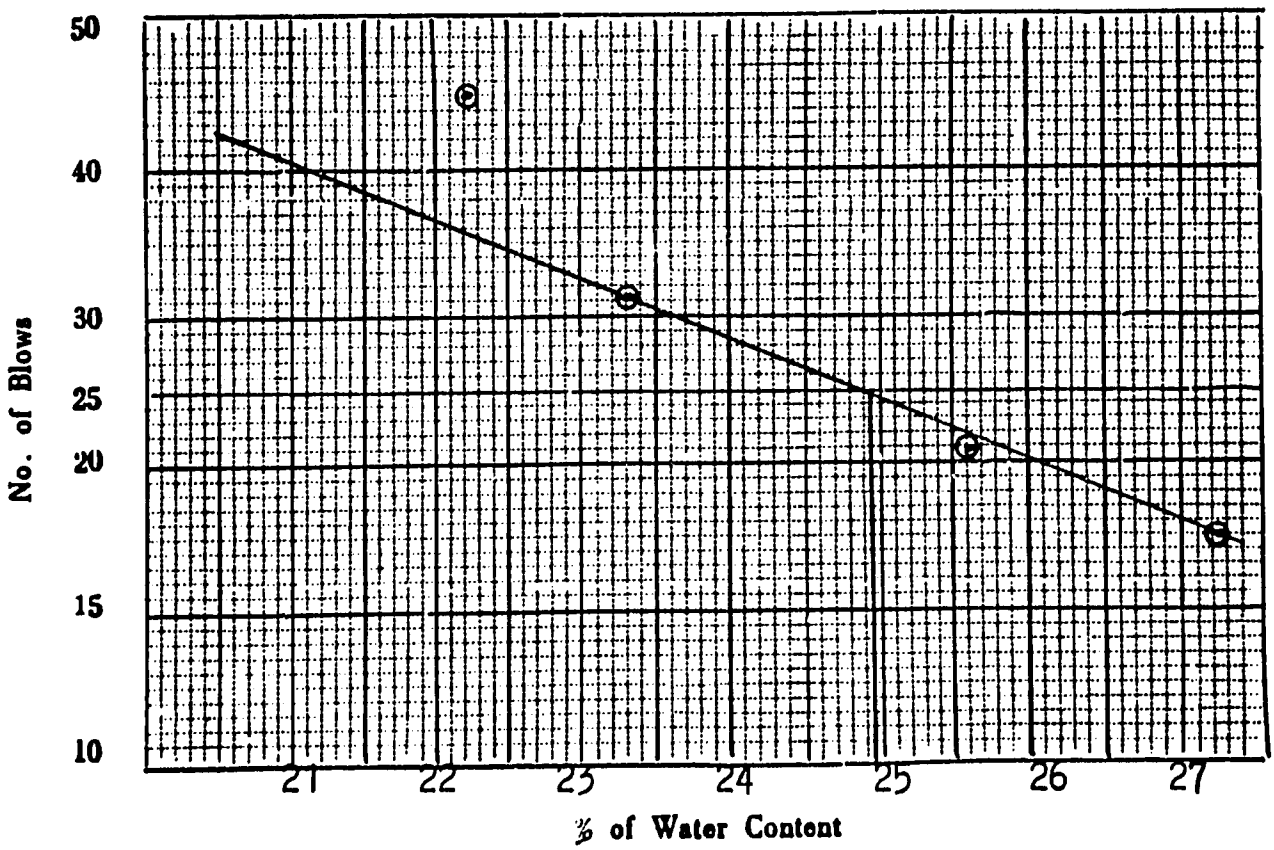
Sample no. 10

Depth 45'-46'6"

1000 7 77 T

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 24.99 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

### FLOW CURVE




Tested by

checked by Chemist: M.M.El-Saiedi

date 9/8/1977

M 760

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description ML

Borehole no. S2

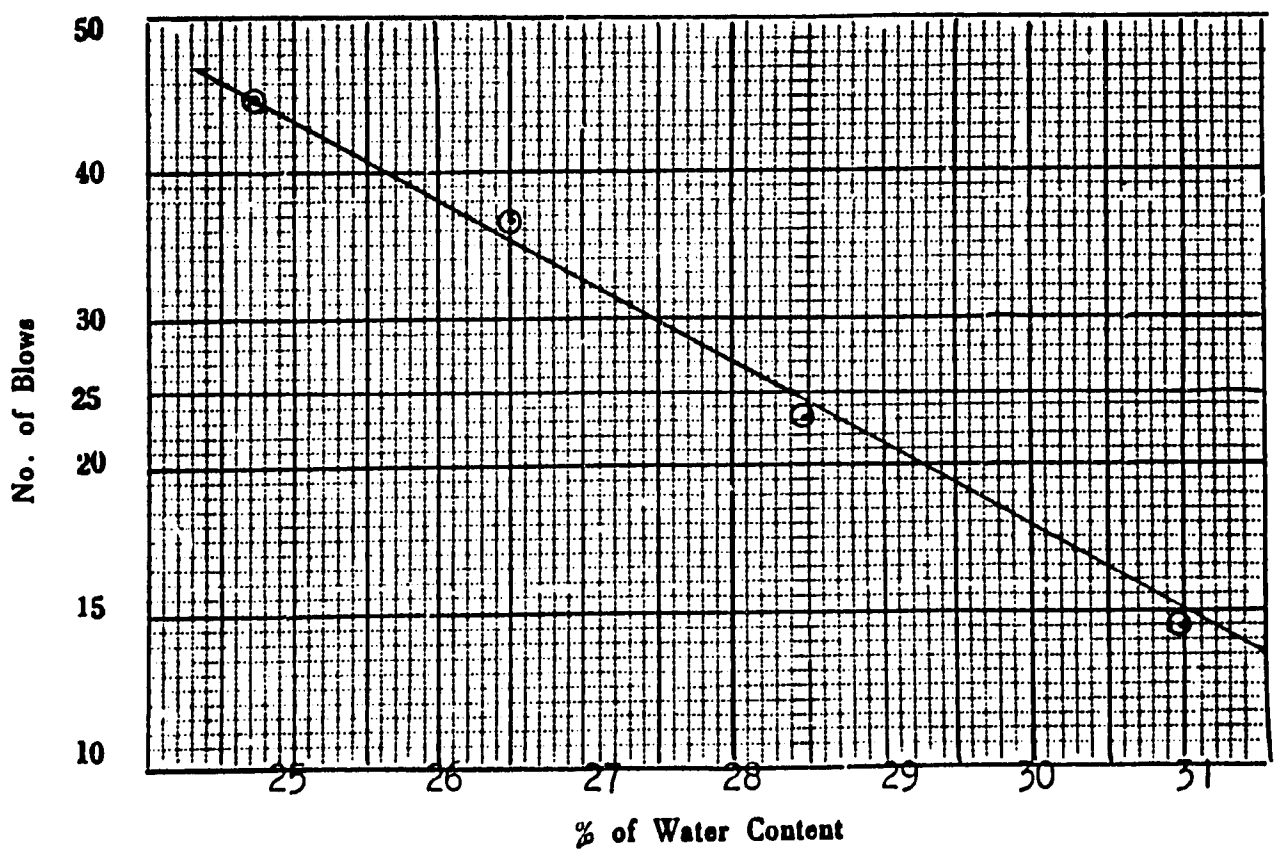
Sample no. U D S 1

Depth 65'-67'

1000 7 77 Y

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 28.40 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 23.28 | 4 | Plasticity index | % | 5.12 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saied

date 8/8/1977

M.E.
161

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S 2

**Location** Por Said Harbor.

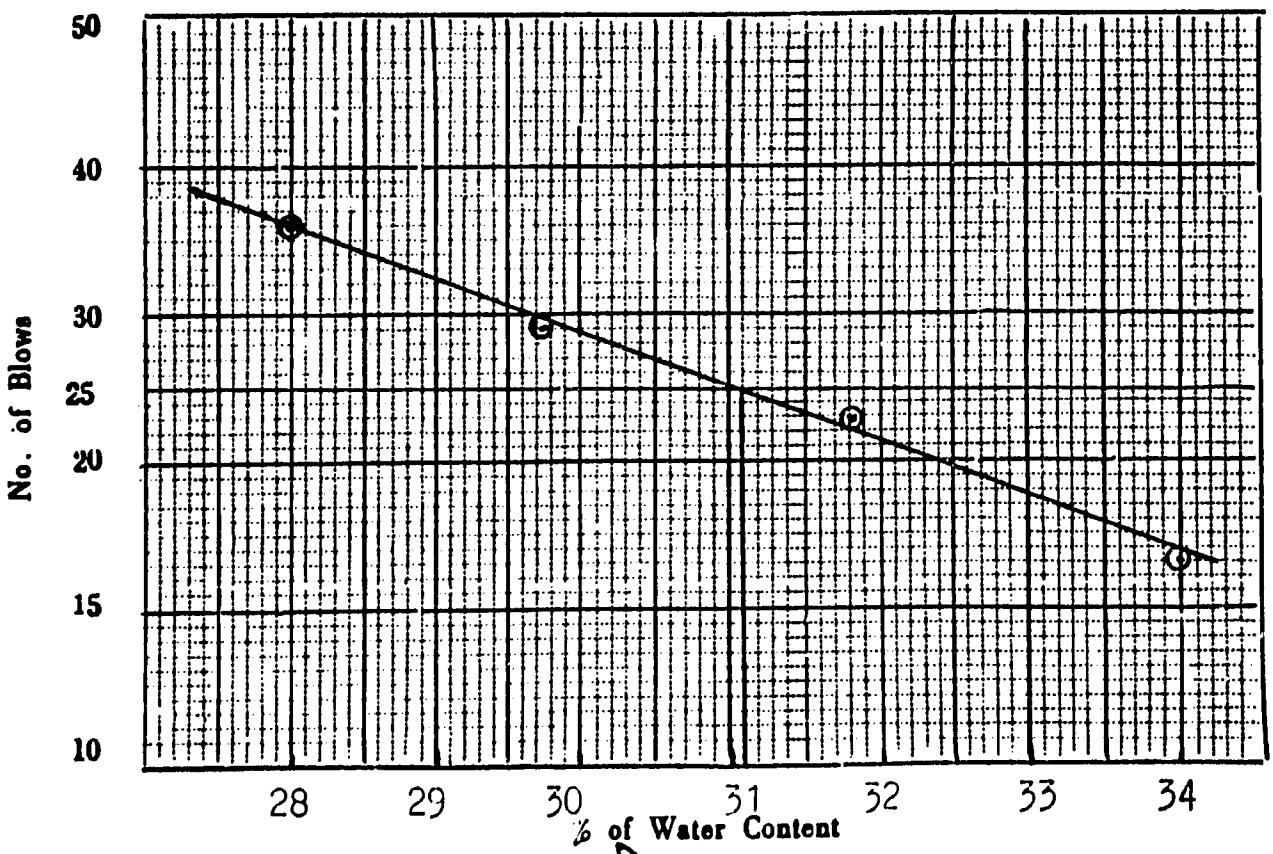
**Sample no.** U.D.S. 2

**Description** ML

**Depth** 75' - 77'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 31.10 | 3 | Shrinkage Limit % | |
| 2 | Plastic Limit % | 24.30 | 4 | Plasticity index % | 6.80 |

**FLOW CURVE**




**Tested by** Tec.Assist. **checked by** Chemist. **date** 11/10/1977

M.NAGIB

M.NAGIB

M.M.EL-Saiedi

M S/162

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S2

**Location** Port Said Harbor

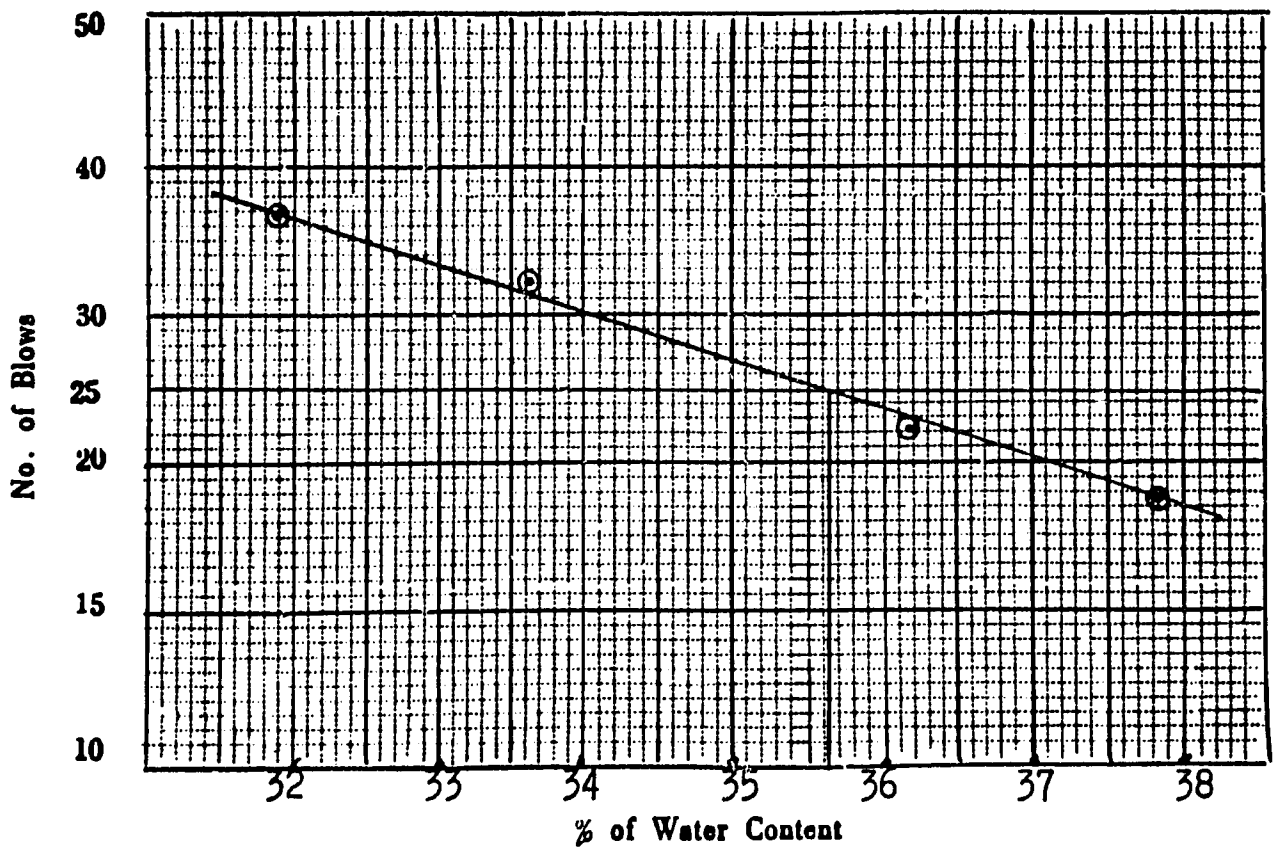
**Sample no.** U D S 3

**Description** ML

**Depth** 85'-87'

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 35.65 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 24.69 | 4 | Plasticity index | % | 10.96 |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: **date** 11/8/1977

M.M.El-Saiedi

No. 163

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Port Said Harbor

**Description** ML

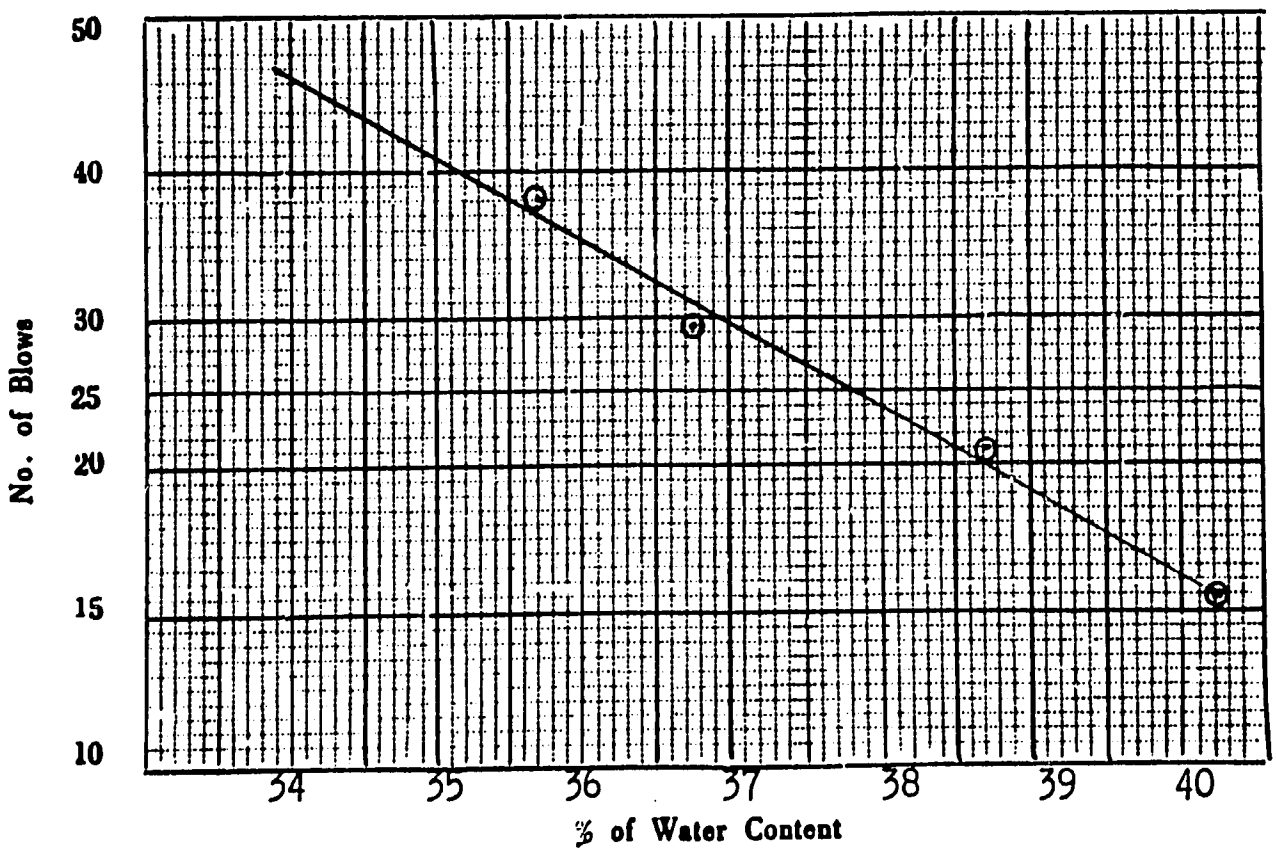
**Borehole no.** S2

**Sample no.** U D S 4

**Depth** 9.5'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 37.50 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 26.80 | 4 | Plasticity index % | 11.00 |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: **date** 10/8/1977

M.M.El-Saiedi

Mc. 164

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4 $

Client

Location Port Said Harbor

Description SM

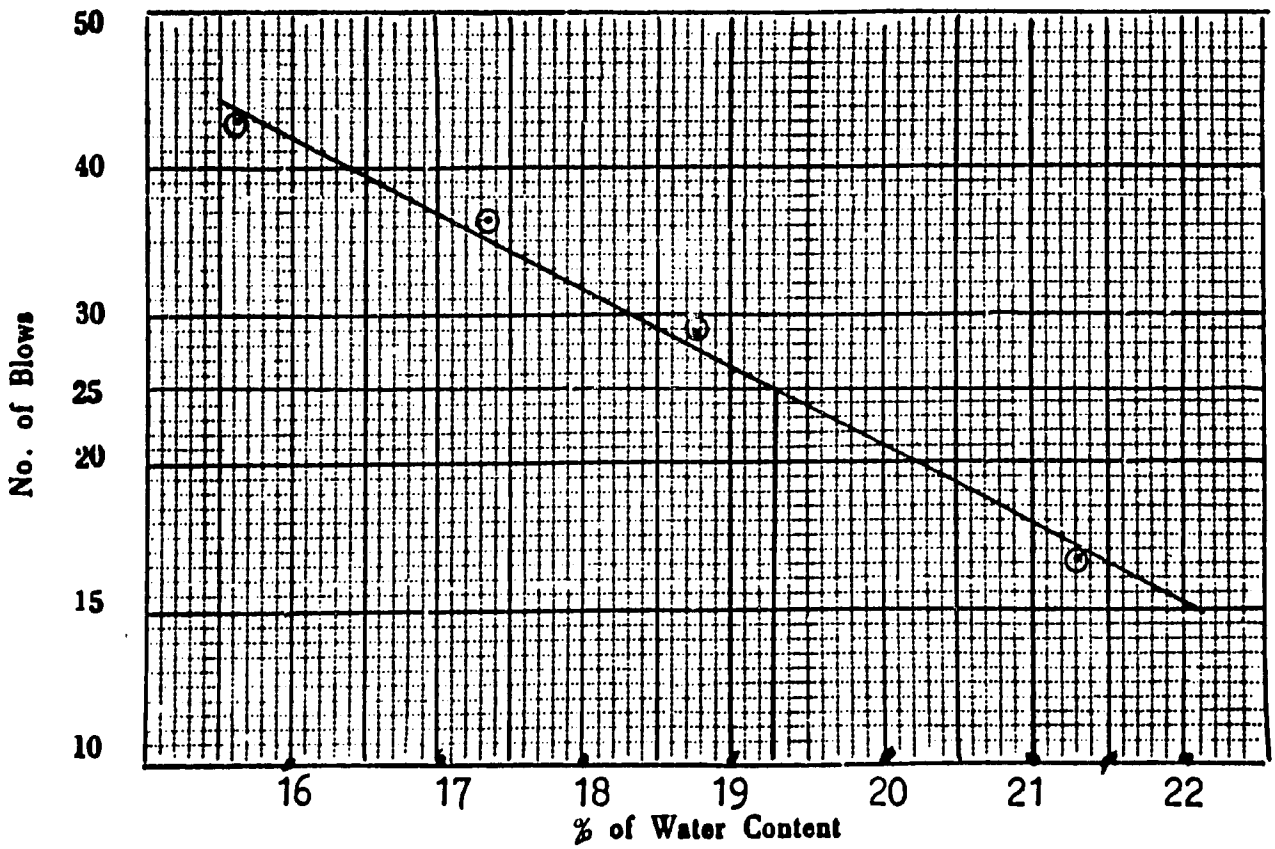
Borehole no. S3

Sample no. 8

Depth 35'-36'6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 19.30 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 8/8/1977

M.S. 165

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description SM

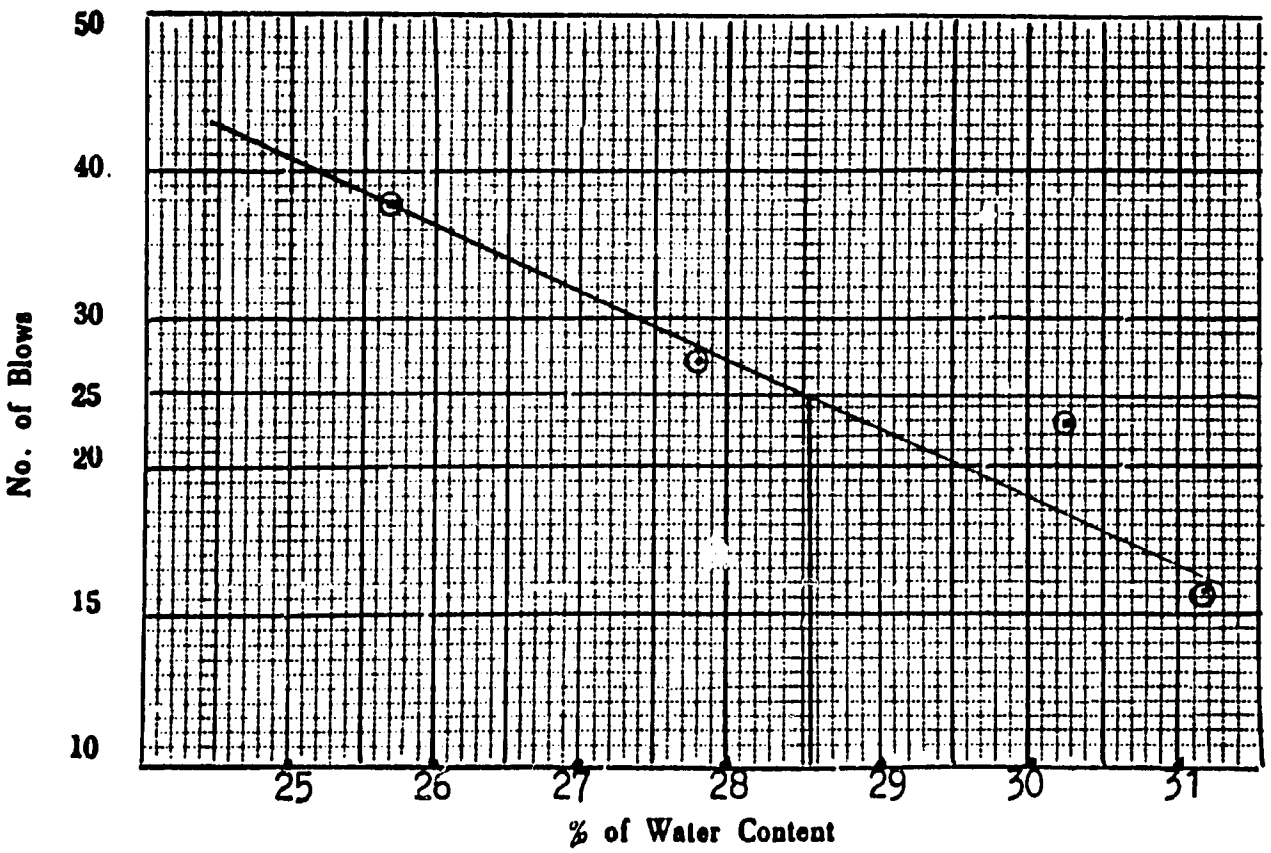
Borehole no. S3

Sample no. U D S 1

Depth 40'-42'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 28.55 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

**FLOW CURVE**




Tested by

checked by Chemist: date 9/8/1977

Chemist: M.M.El-Saiedi 166

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** 52

**Location** Port Said Harbor

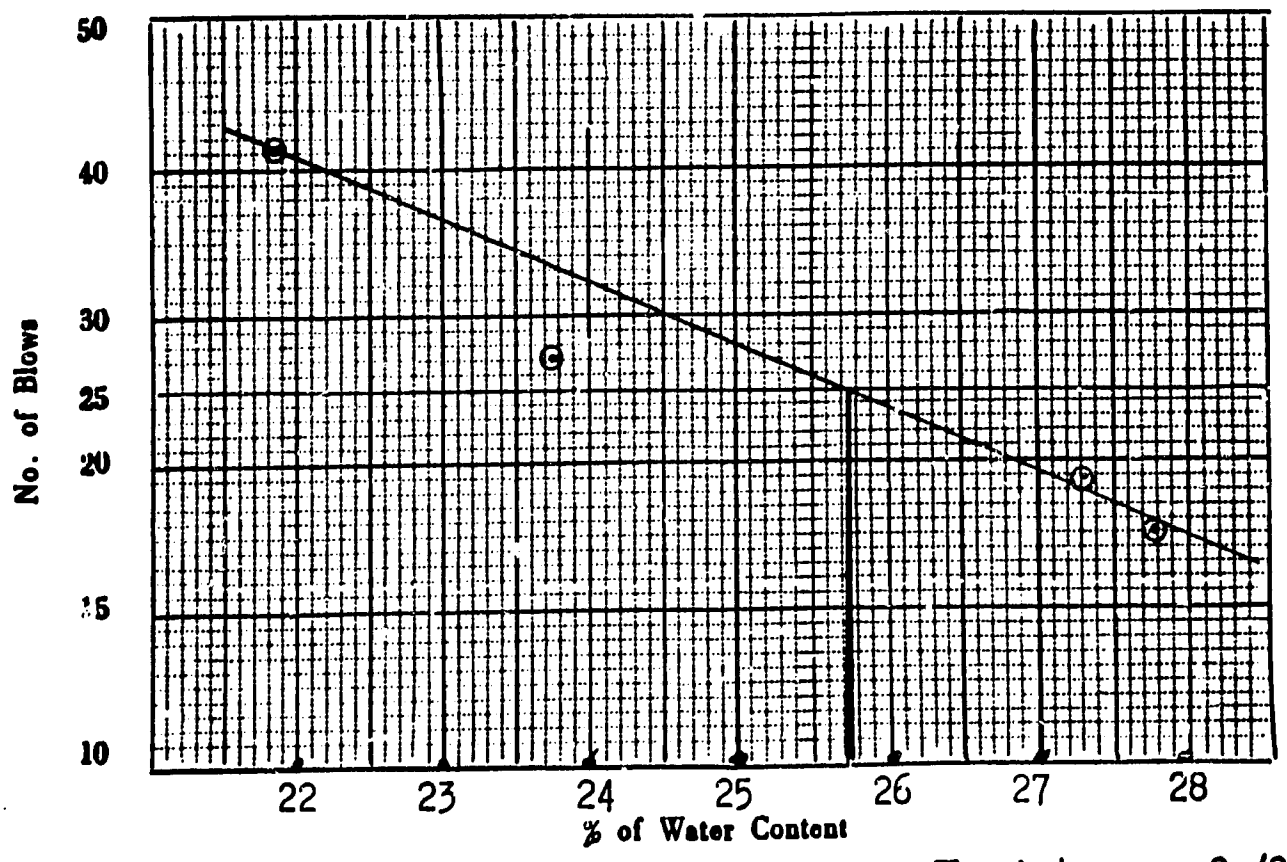
**Sample no.** 9

**Description** SM

**Depth** 45'-45'6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 25.75 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: M.M.El-Saiedi

**date** 8 /8/1977

167

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849028

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S 3

**Location** Por Said Harbor.

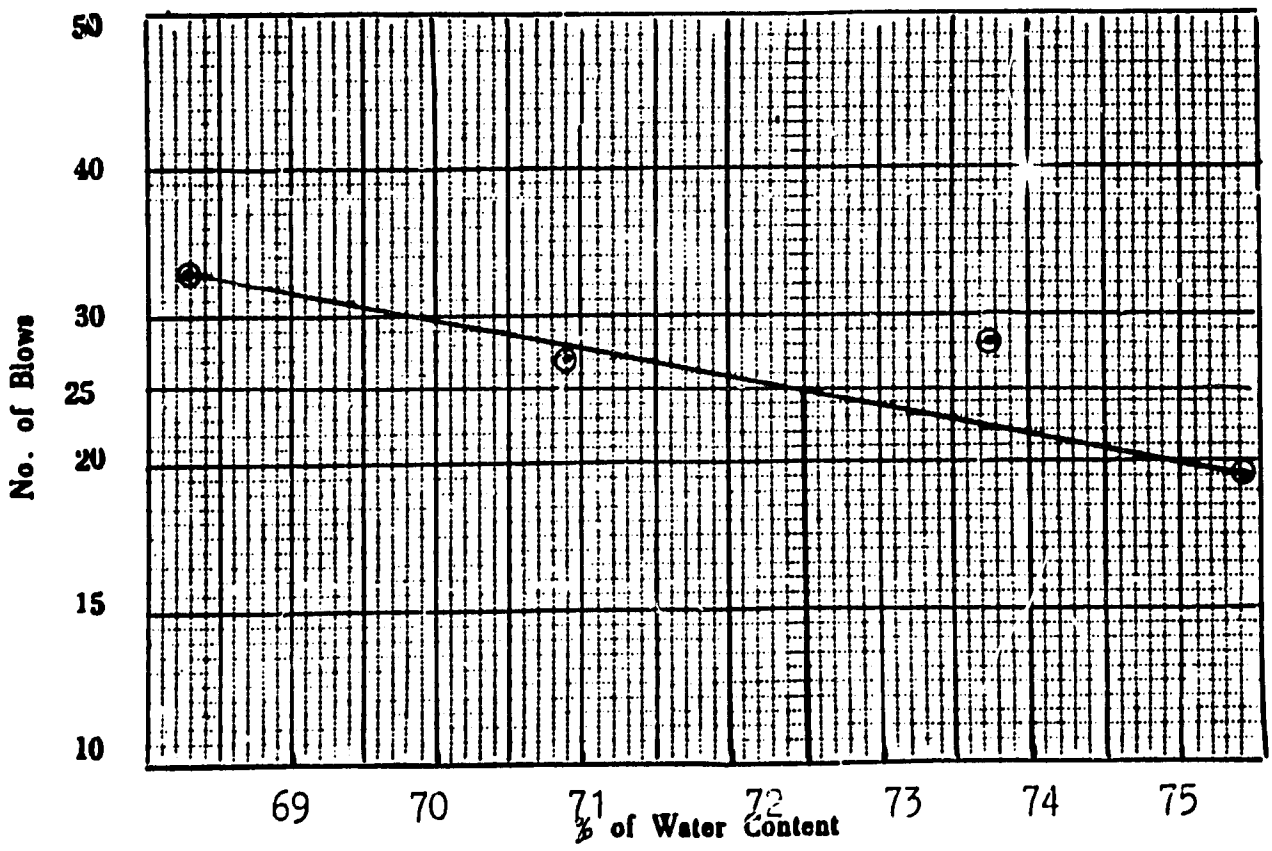
**Sample no.** U.D.S. 2

**Description** MH

**Depth** 50' - 52'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 72.50 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 41.20 | 4 | Plasticity index % | 31.30 |

**FLOW CURVE**




**Tested by** Tec. Assist. **checked by** Chemist. **date** 11/10/1977

M.NAGIB

M.M.EL-Saiedi

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. Sõ

Location Port Said Harbor

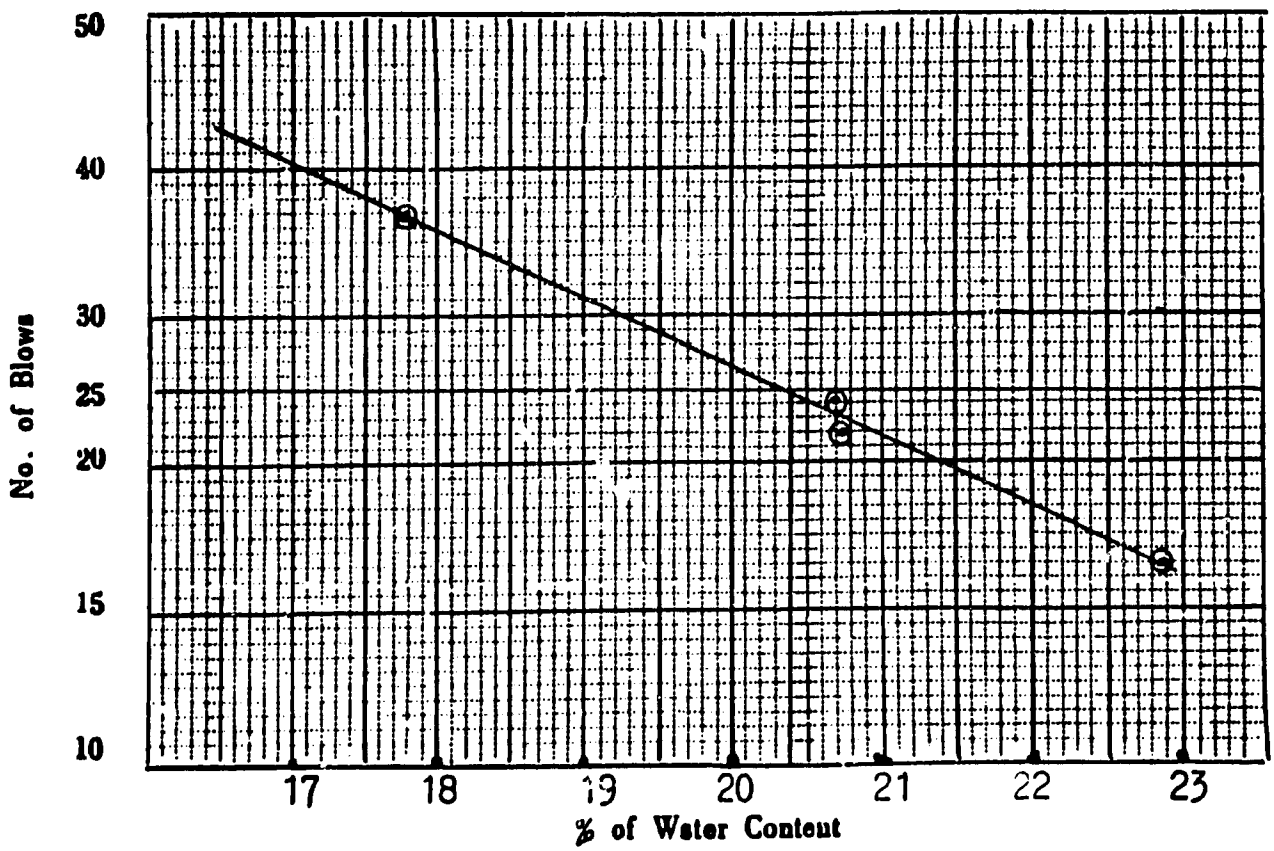
Sample no. 10

Description SM

Depth 55'-56'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 20.40 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 20.04 | 4 | Plasticity index % | 0.36 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 8/8/1977

M.S. 169

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S3

Location Port Said Harbor

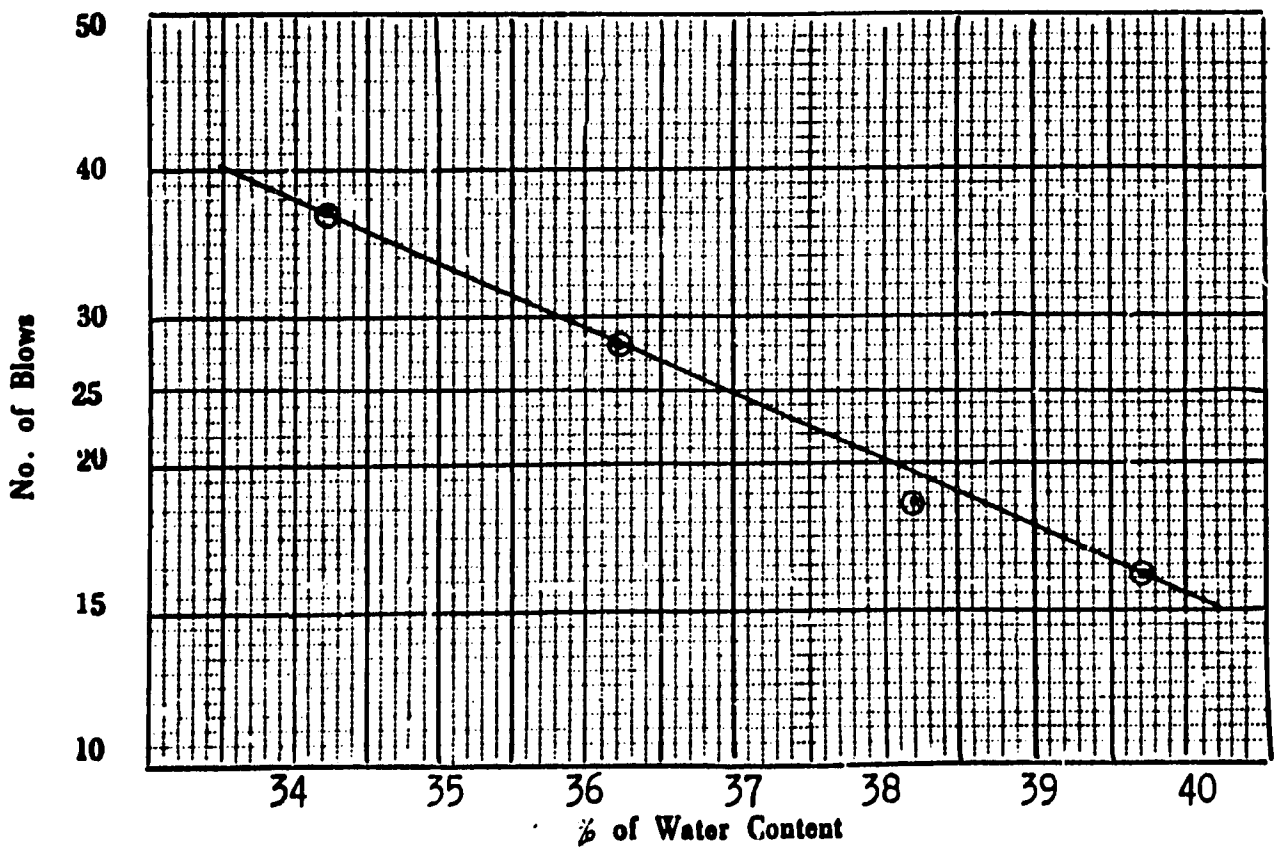
Sample no. U D S 3

Description ML

Depth 60'-62'

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 37.00 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 26.22 | 4 | Plasticity index | % | 10.77 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 10/8/1977

M.S. 170

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** 3

**Location** Por Said Harbor .

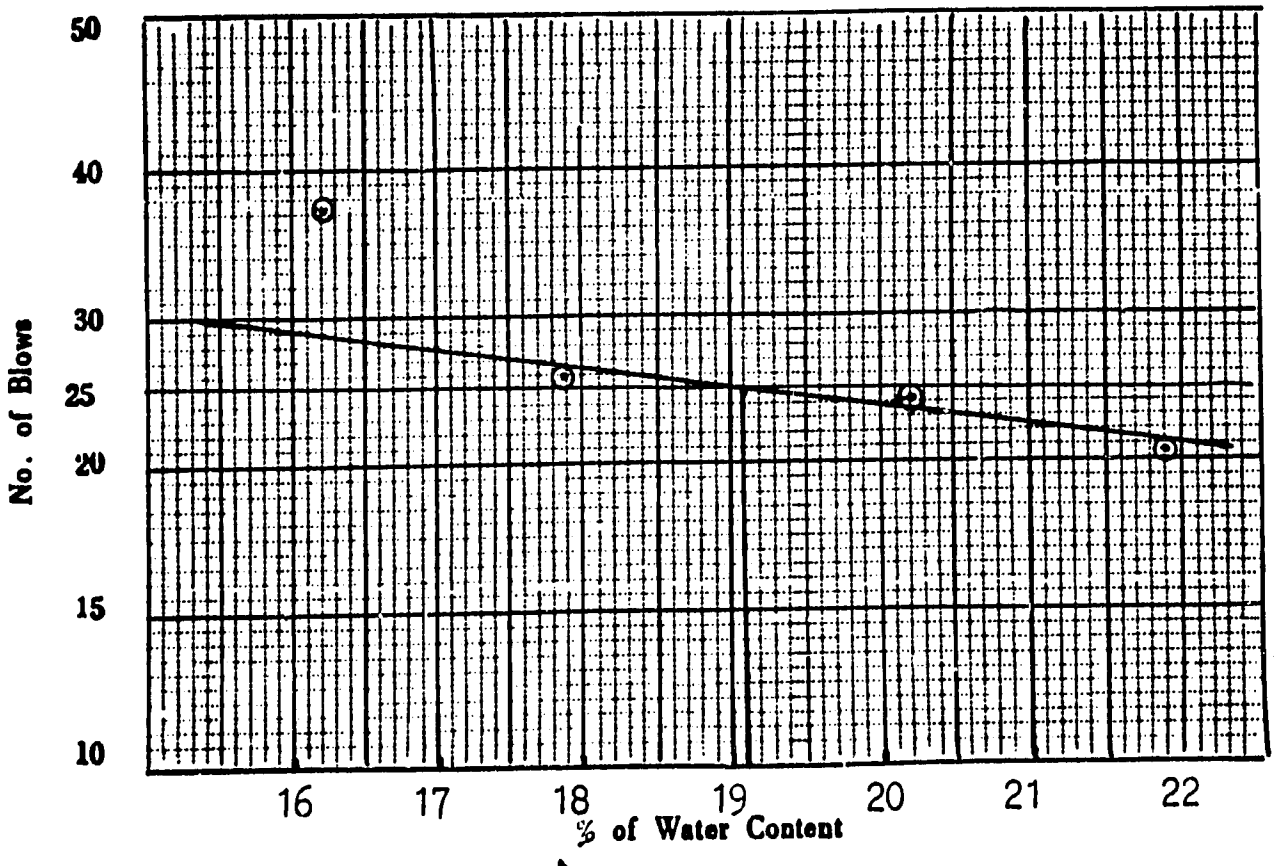
**Sample no.** 13

**Description** ML

**Depth** 86' - 87&,6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 19.1 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

**FLOW CURVE**




**Tested by** Tec.Assist. **checked by** Chemist. **date** 12/10/1977

M.NAGIB

M.M.EL-Saiedi

171

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S3

Location Port Said Harbor

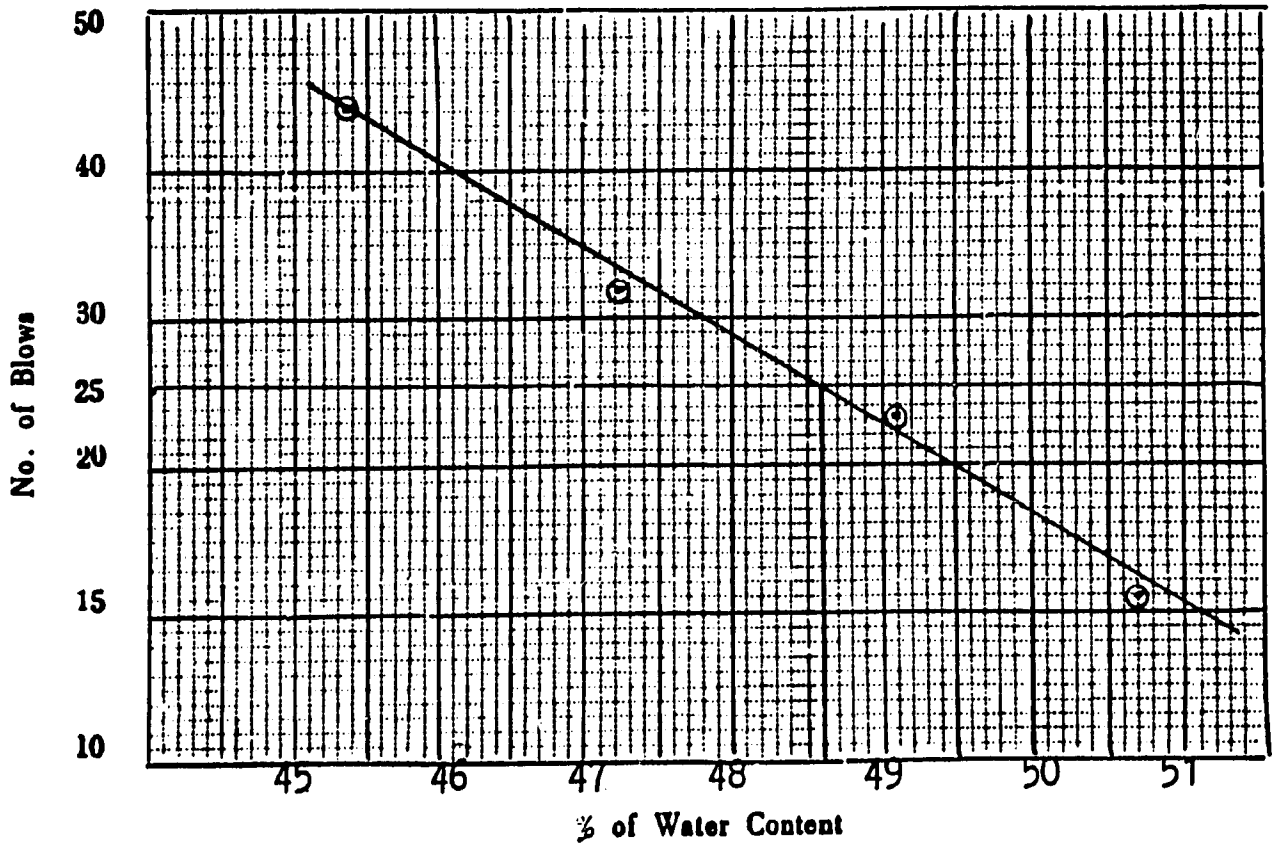
Sample no. U D S 4

Description CL

Depth

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 48.60 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 31.01 | 4 | Plasticity index | % | 17.59 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 14/8/1977

M.S. 172

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description OH

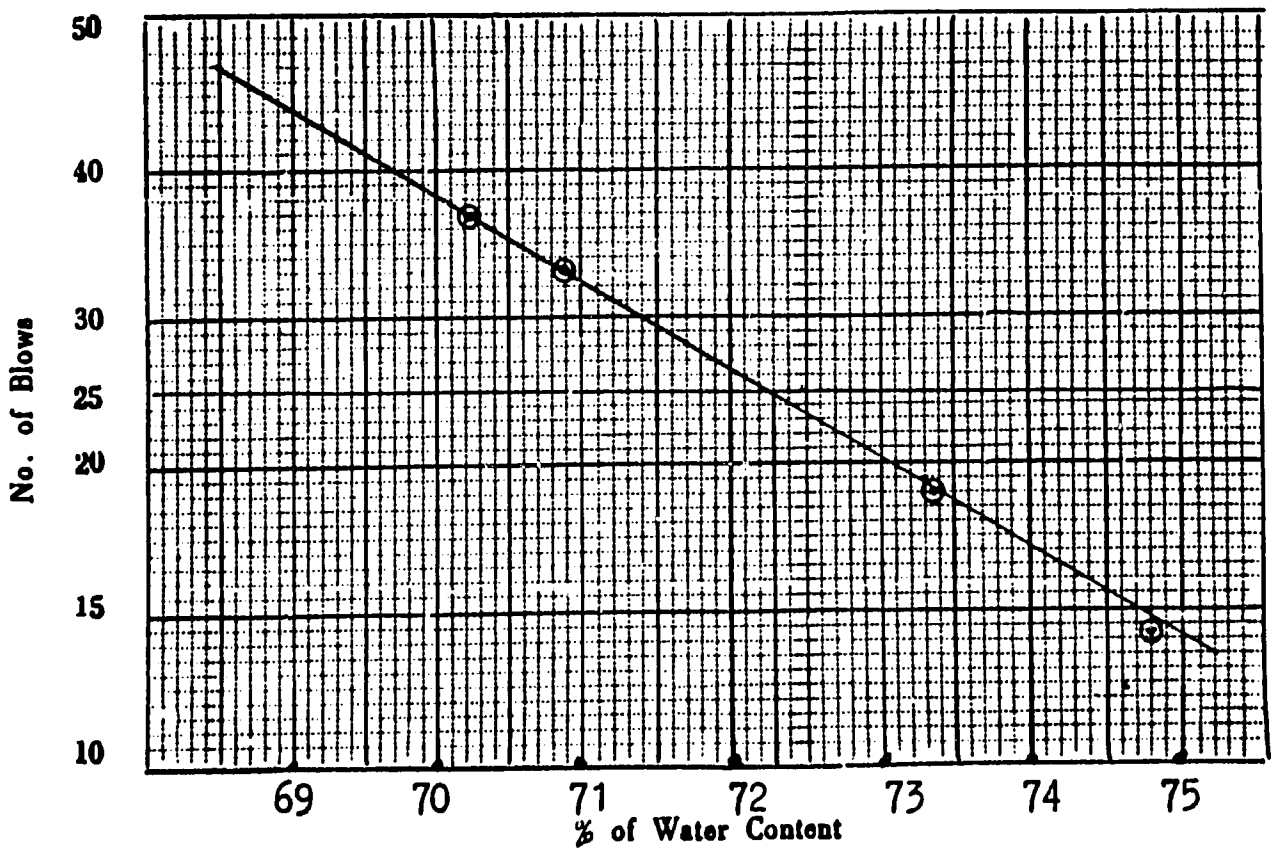
Borehole no. S3

Sample no. 14

Depth 97'6" -98'6"

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 72.30 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 45.55 | 4 | Plasticity index | % | 26.75 |

**FLOW CURVE**




Tested by

checked by Chemist: date 8/8/1977

M.M.El-Saiedi

M.S. 173

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Location** Port Said Harbor

**Description** MH

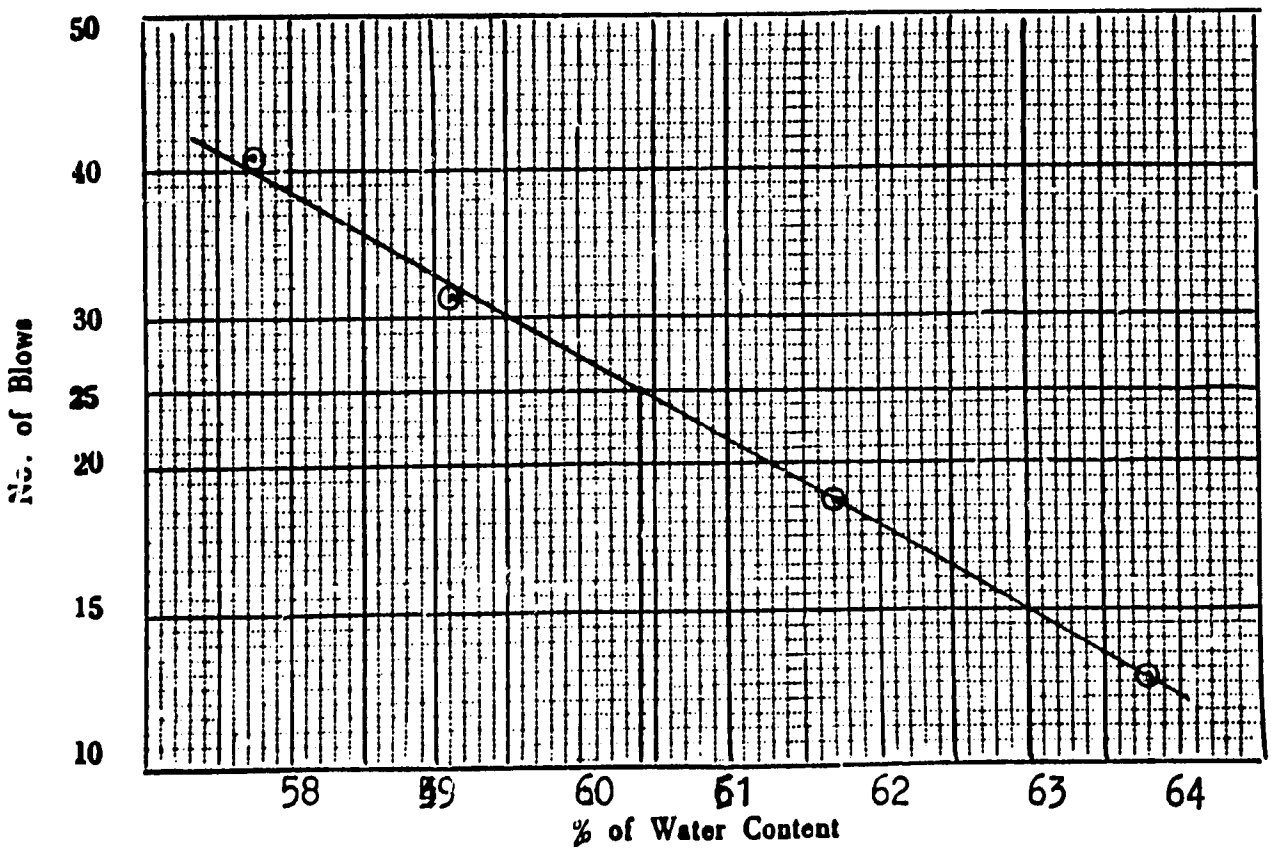
**Borehole no.** S3

**Sample no.** U D S 6

**Depth**

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 60/40 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 37.10 | 4 | Plasticity index % | 23.30 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 14/8/1977

M 174

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S3

Location Port Said Harbor

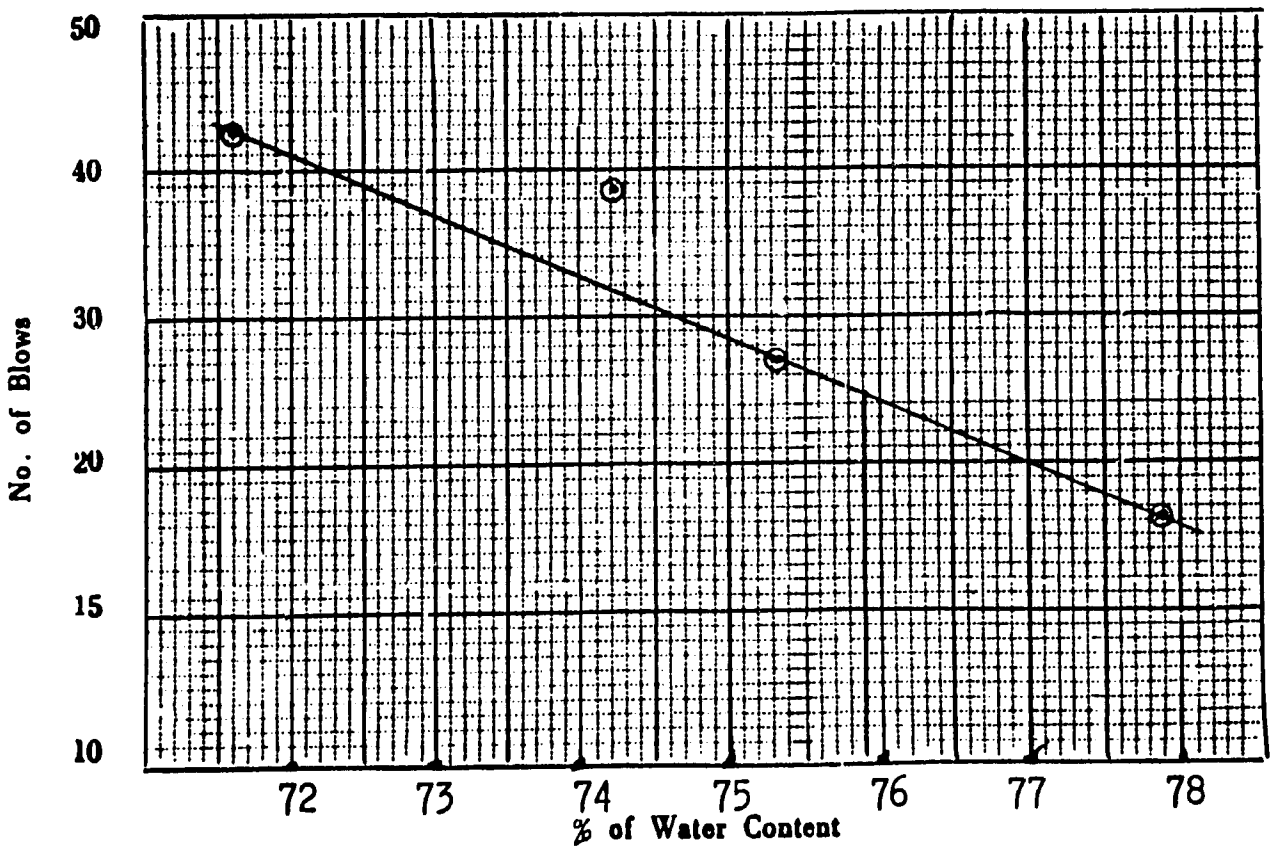
Sample no. U D S 8

Description OH

Depth 113'6" - 115'6"

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 75.90 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 44.93 | 4 | Plasticity index | % | 30.97 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 9/8/1977

175

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S3

**Location** Port Said Harbor

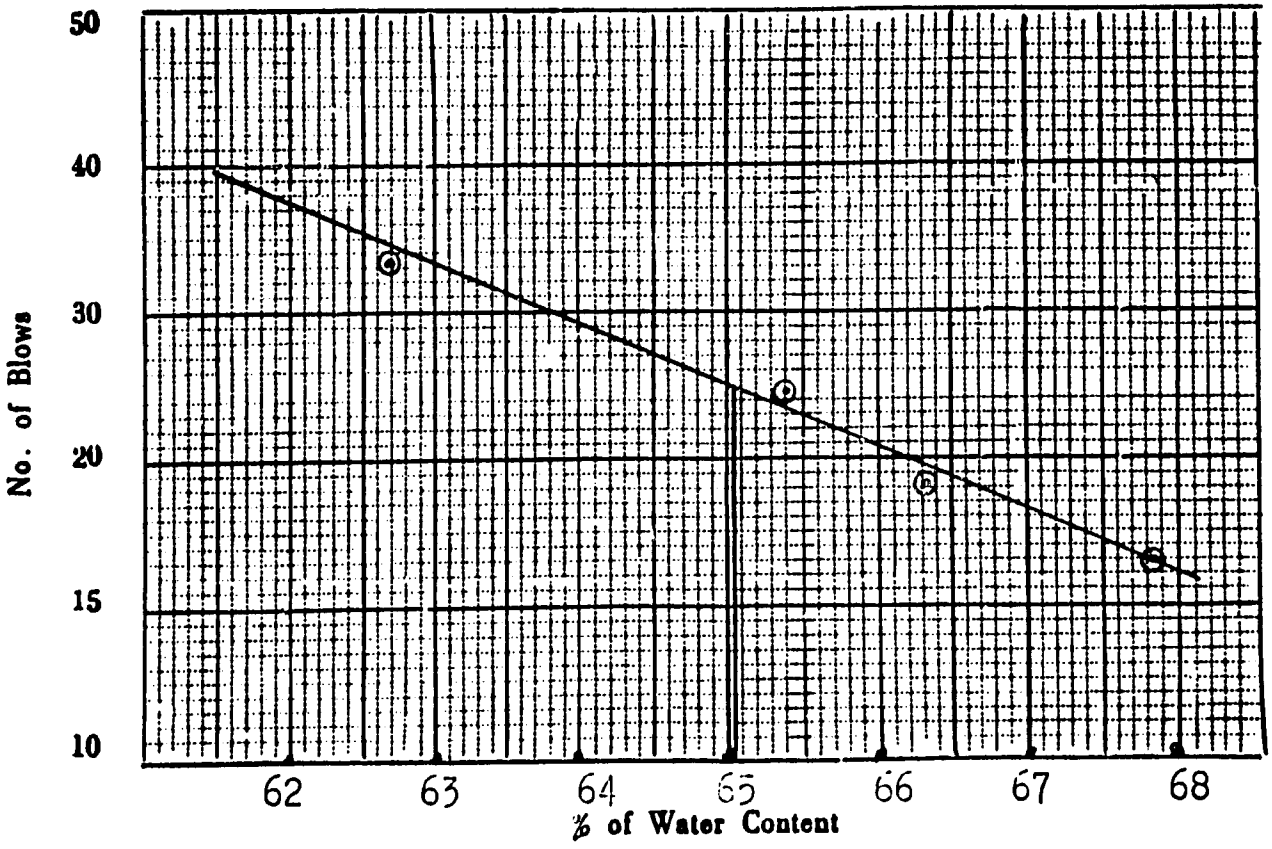
**Sample no.** 16

**Description** CH (CH)

**Depth** 119'6" -120'6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 65.05 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 29.90 | 4 | Plasticity index % | 35.15 |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: M.M.El-Saiedi

**date** 7/8/1977

M 176

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description CL &ML

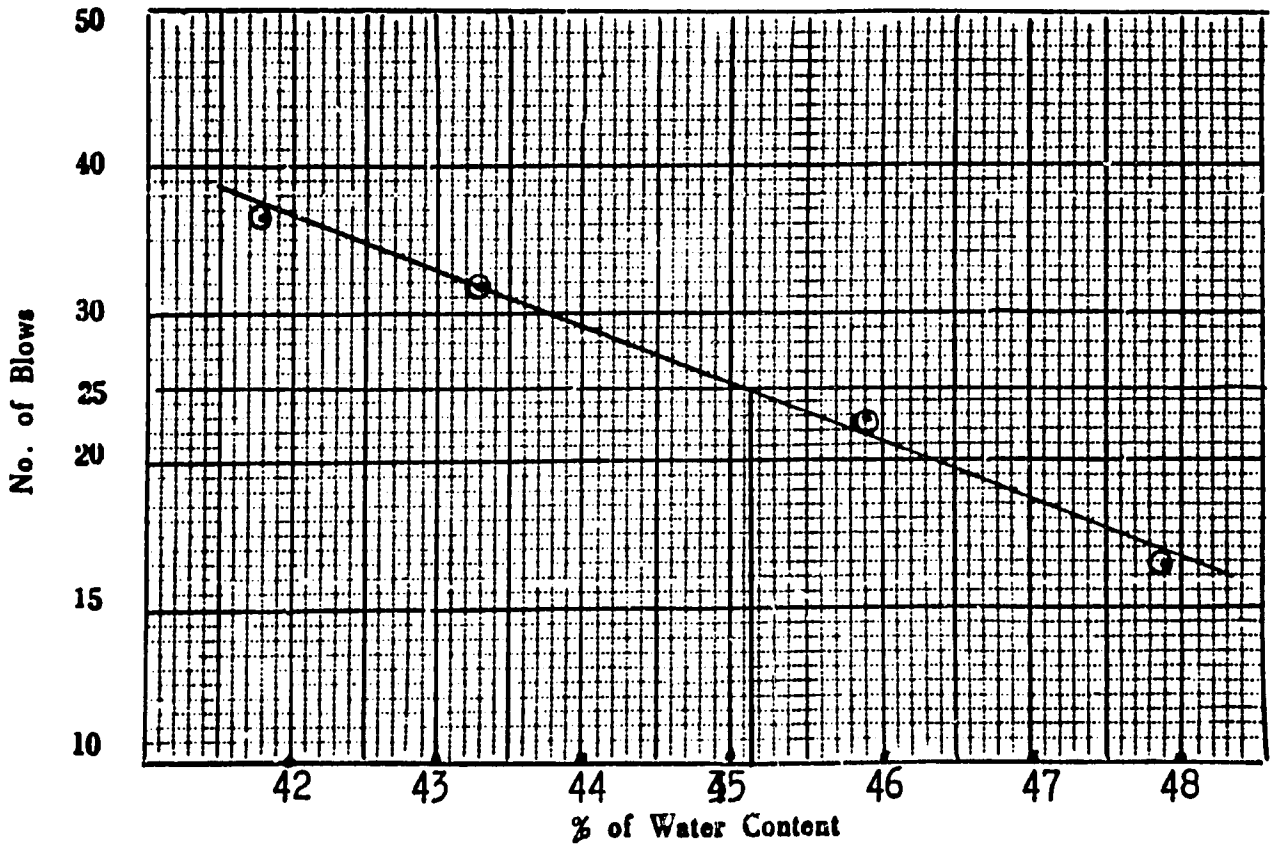
Borehole no. S3

Sample no. U D S 9

Depth 123'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 45.15 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 25.18 | 4 | Plasticity index % | 19.97 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 8/8/1977

177

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S 3

**Location** Por Said Harbor .

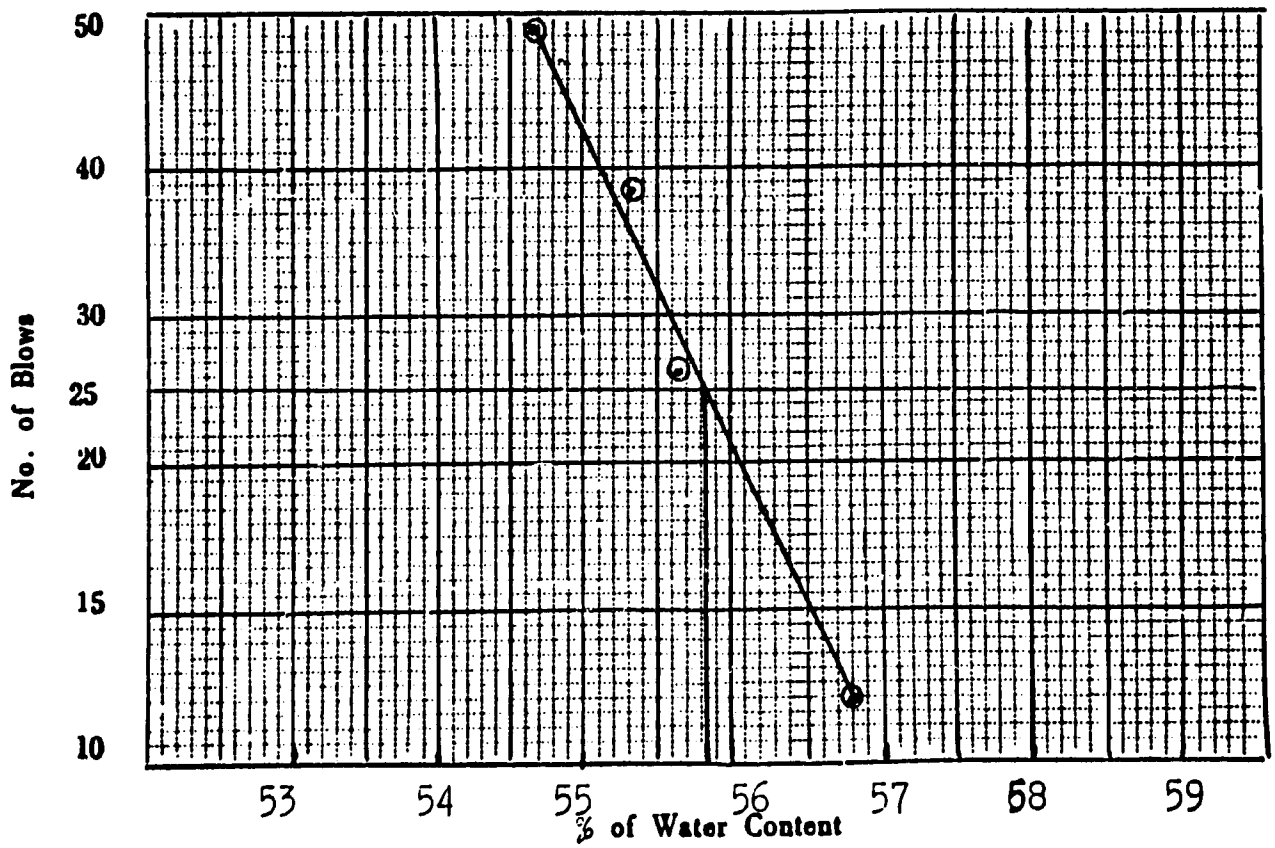
**Sample no.** U.D.S. 11

**Description** ii H

**Depth** 146',6" - 148',6"

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 55.85 | 3 | Shrinkage Limit | % | ——— |
| 2 | Plastic Limit | % | 27.20 | 4 | Plasticity index | % | 28.65 |

### FLOW CURVE




**Tested by** Tec.Assist. M.NAGIB **checked by** Chemist. M.M.EL-Saiedi **date** 11/10/1977

M.S.-178

**Raymond International of Delaware, Inc.**
3 A EL BALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S 3

**Location** Por Said Harbor .

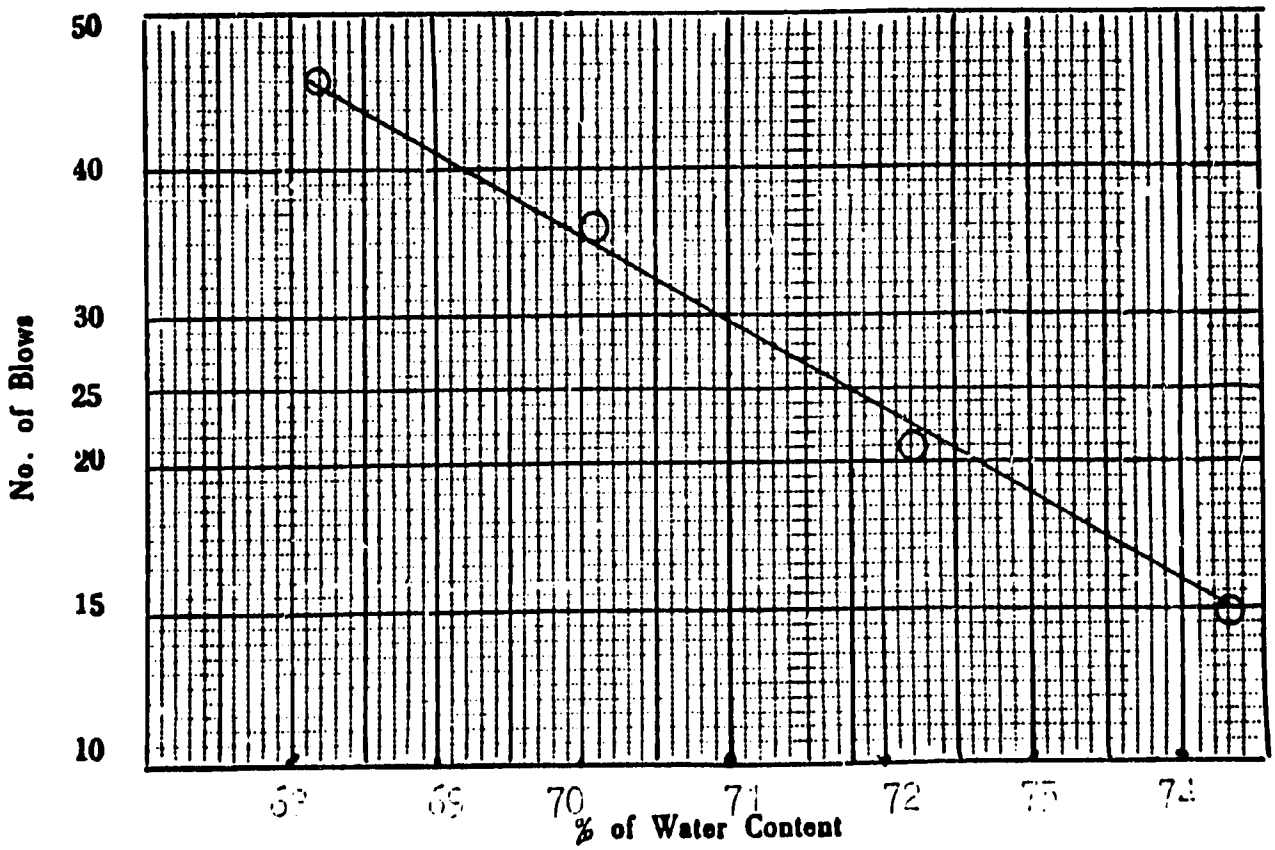
**Sample no.** U.D.S, 12

**Description** OH

**Depth** 157'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 71.80 | 3 | Shrinkage Limit % | —— |
| 2 | Plastic Limit % | 48.52 | 4 | Plasticity index % | 32.28 |

### FLOW CURVE




**Tested by** Tec.assist. **checked by** Chemist . **date** 19/1[illegible]/1977

I.MAGID I. M.EL-Saiedi

179

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description OH

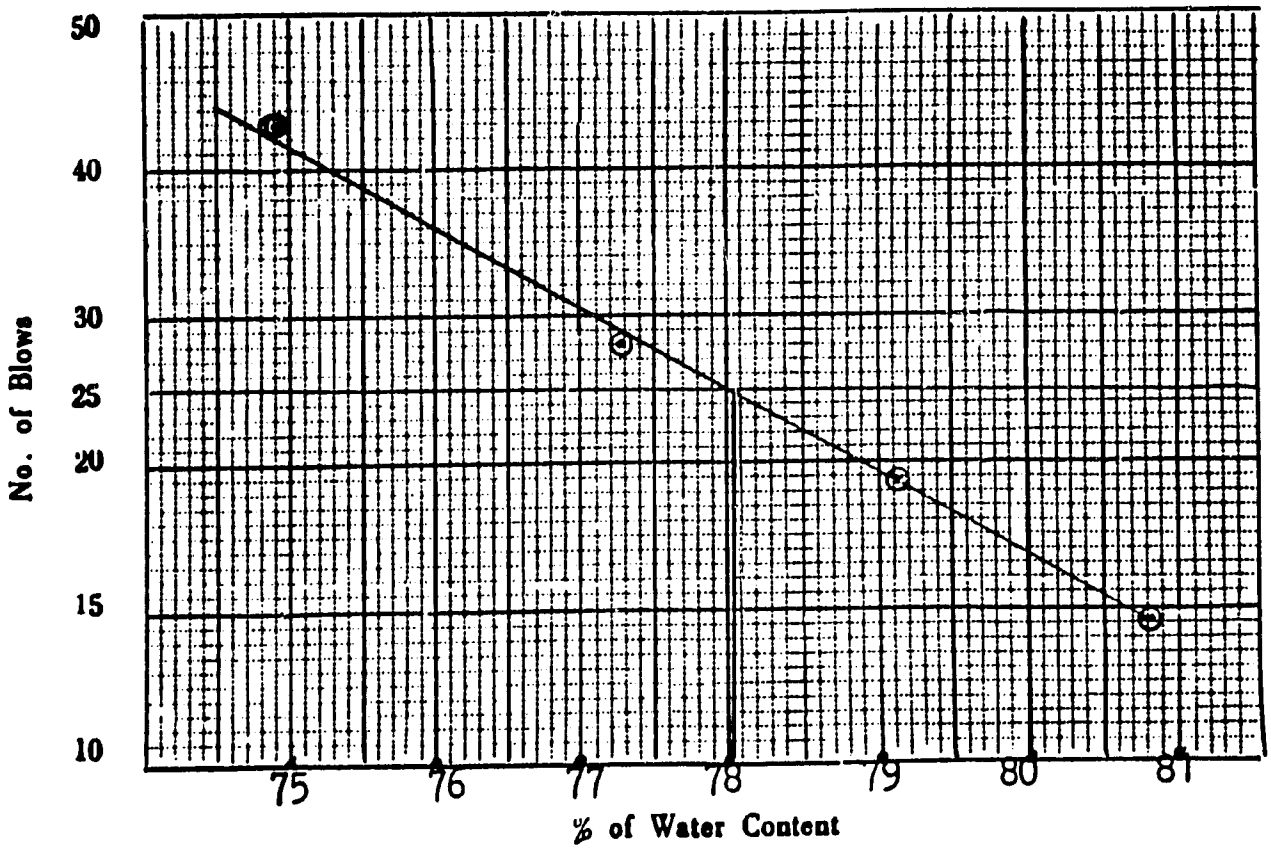
Borehole no. S3

Sample no. U D S 13

Depth 168'6" - 170'6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 78.05 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 44.61 | 4 | Plasticity index % | 33.44 |

**FLOW CURVE**




Tested by

checked by Chemist: date 9/18/1977

M.M.El-Saiedi

180

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849629

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S3

**Location** Port Said Harbor

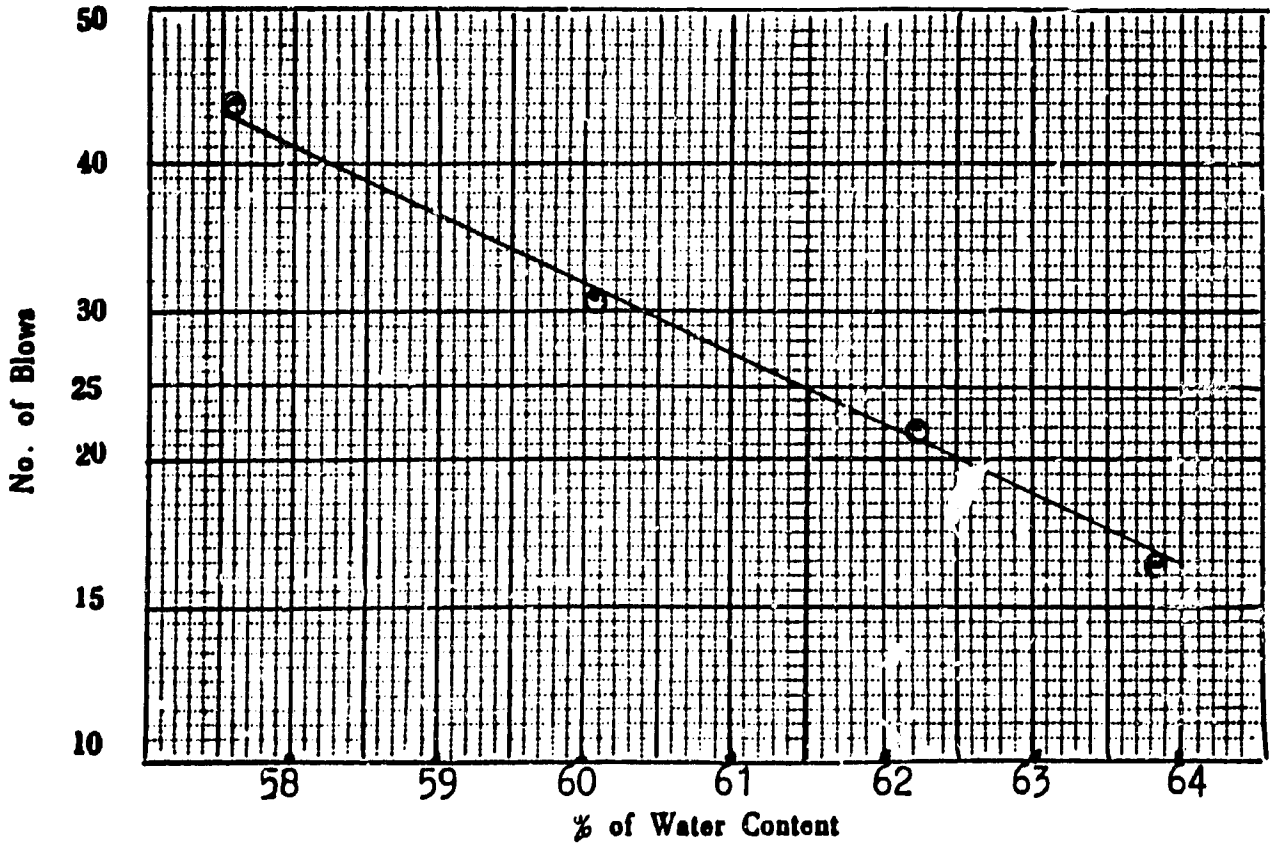
**Sample no.** U D S 14

**Description** MH

**Depth** 179'6" - 181'6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 61.50 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 39.29 | 4 | Plasticity index % | 22.21 |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: **date** 9/8/1977

M.M.El-Saiedi

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S3

Location Port Said Harbor

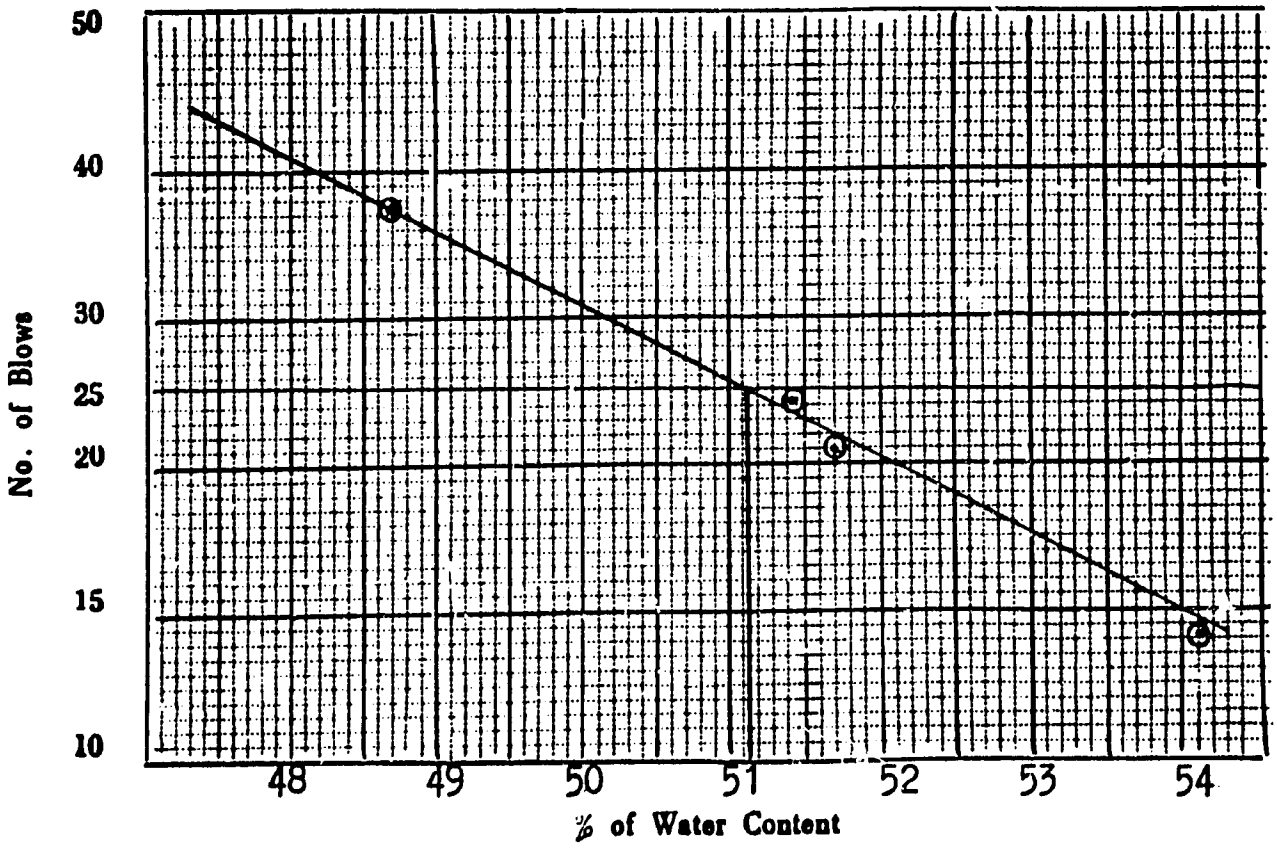
Sample no. U D S 15

Description OL

Depth 190'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 51.15 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 42.43 | 4 | Plasticity index % | 8.72 |

**FLOW CURVE**




Tested by

checked by Chemist: date 14/8/1977

Chemist:
M.M.El-Saiedi

182

**Raymond International of Delaware, In**
8 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S4

Location Port Said Harbor

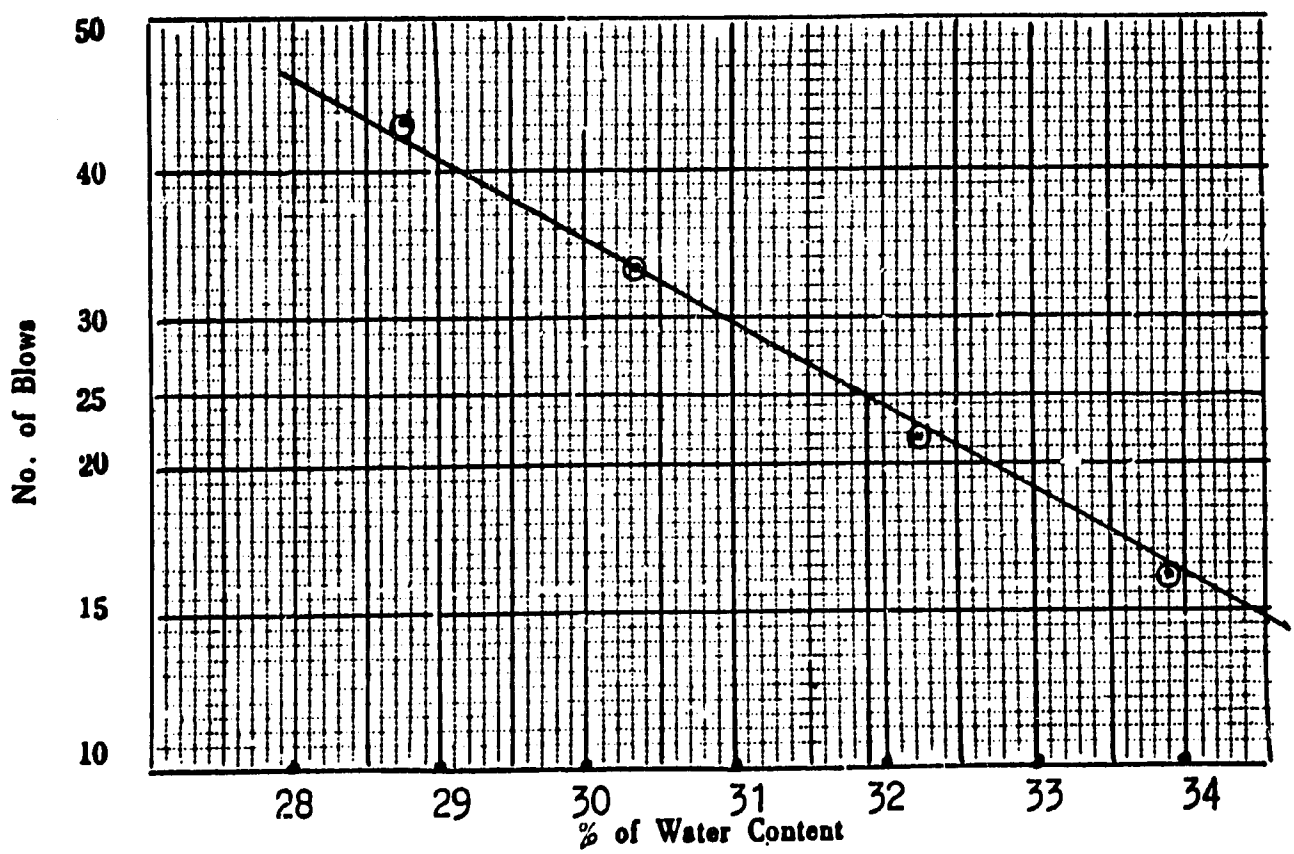
Sample no. U.D.S 1

Description M L

Depth 45'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 31.90 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | N C | 4 | Plasticity index % | N C |

**FLOW CURVE**




Tested by

checked by
Chemist:

M.M.EL-Saidi

date 23/8/1977

183

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Borehole no. S4

Location Port Said Harbor

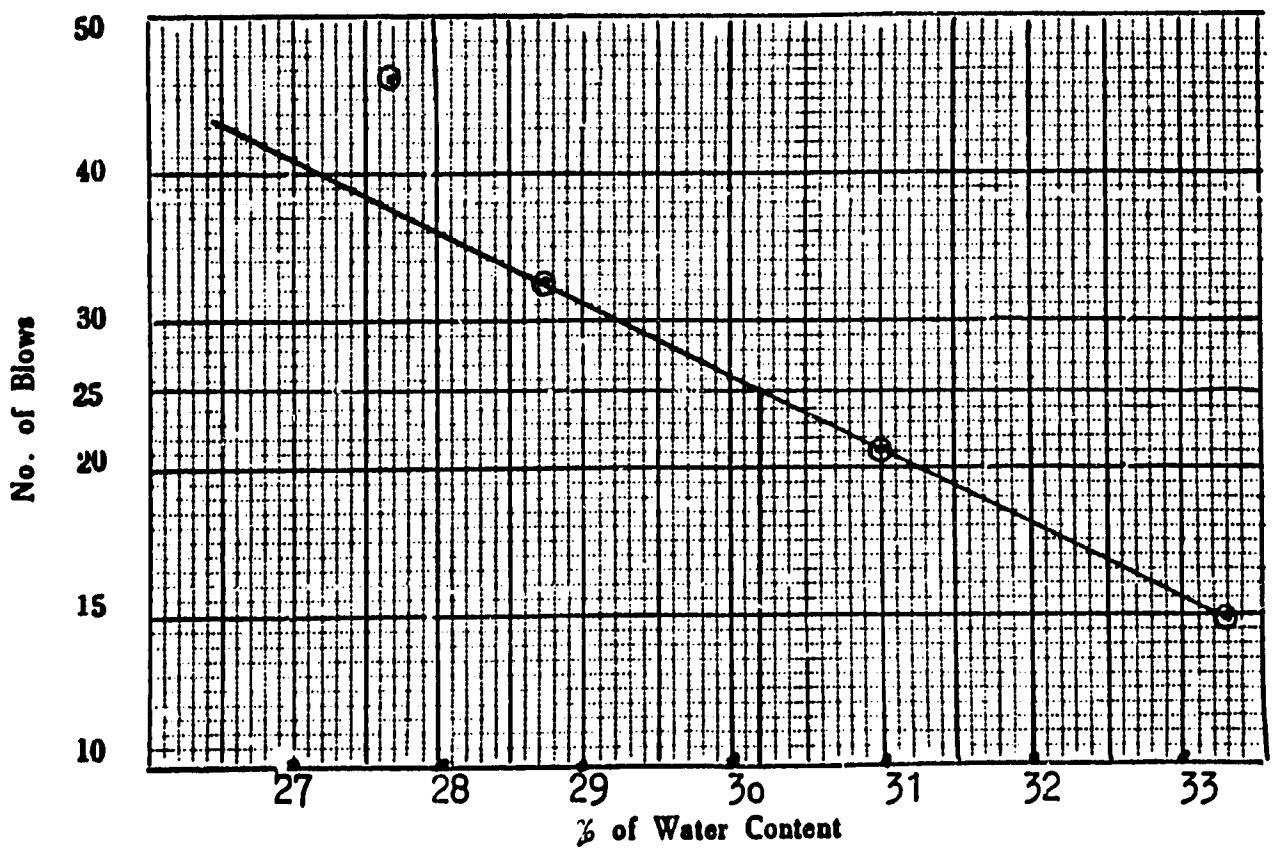
Sample no. UD S 2

Description ML

Depth 55'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 30.20 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

### FLOW CURVE




Tested by

checked by Chemist date 23 /8/1977

M.M. El* Saiedi

MS 184

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Borehole no. S4

Location Port Said Harbor

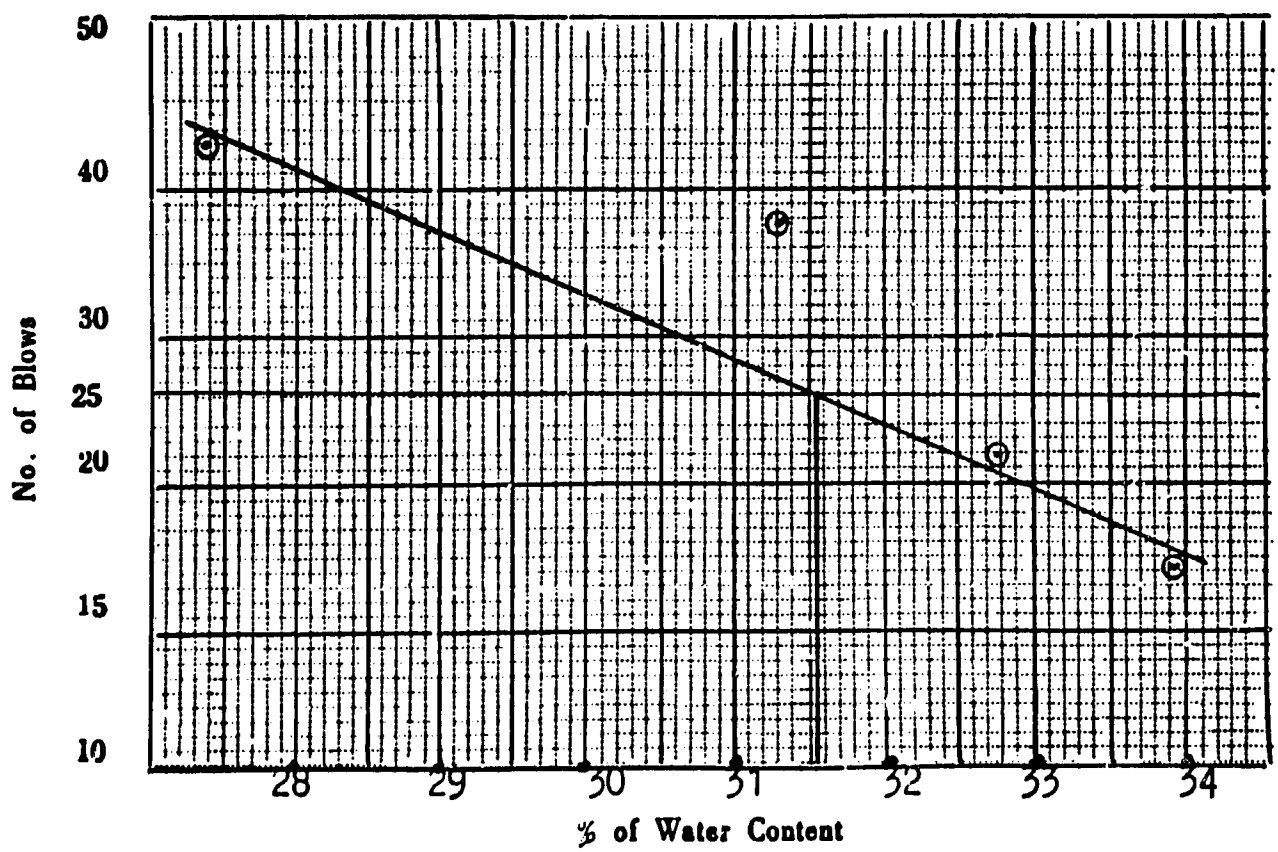
Sample no. U.D.S3

Description ML

Depth 65'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 31 .65 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

### FLOW CURVE




Tested by

checked by Chemist M.M.El-Saiedi

date 23/8/1977

Md. 185

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S.P. 5

**Location** Por Said Harbor

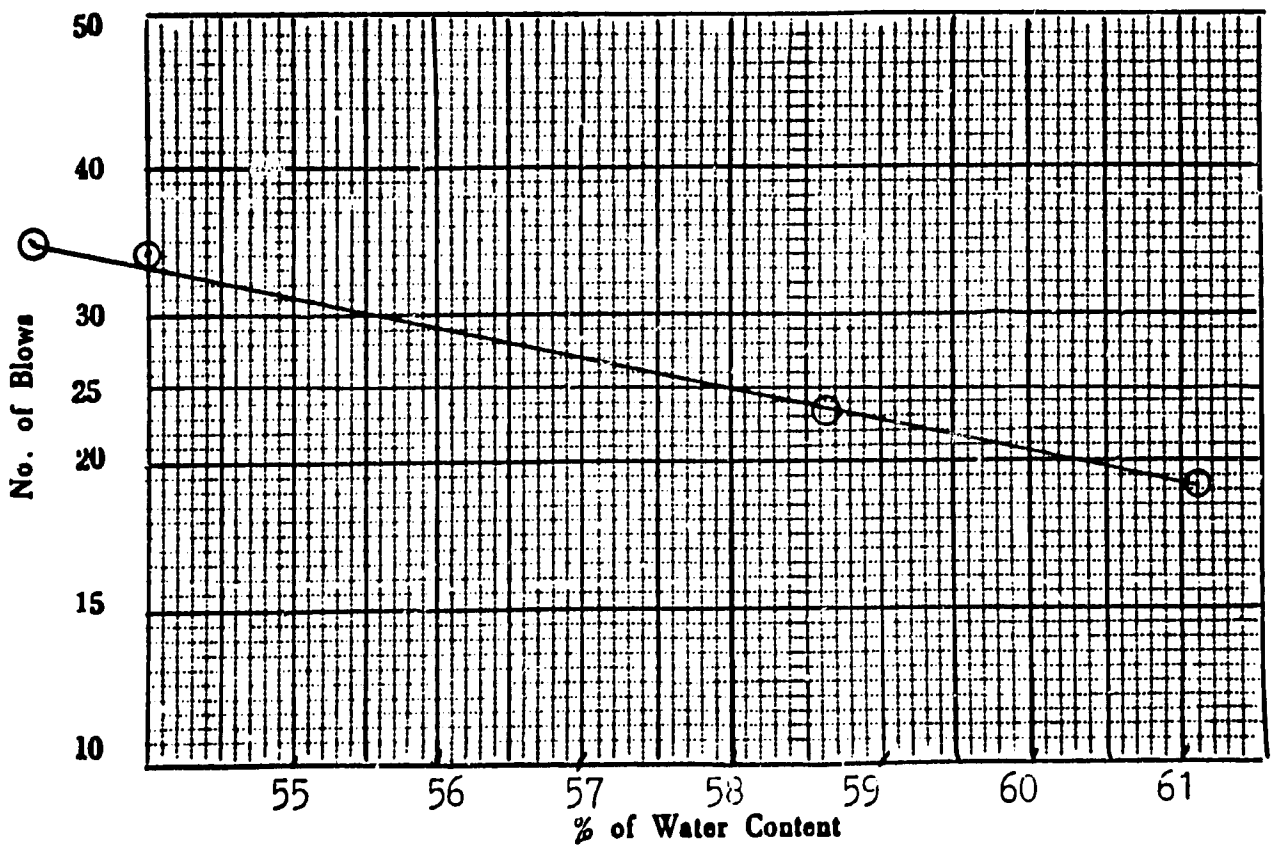
**Sample no.** 12

**Description** CH

**Depth** 60',6" - 62'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 58.00 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 24.4 | 4 | Plasticity index % | 33.6 |

### FLOW CURVE




**Tested by** Tec.Assist. **checked by** Chemist. **date** 19/10/1977

M.MAGIB M.I.EL-Saiedi

186

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** SP5

**Location** Por Said Harbor.

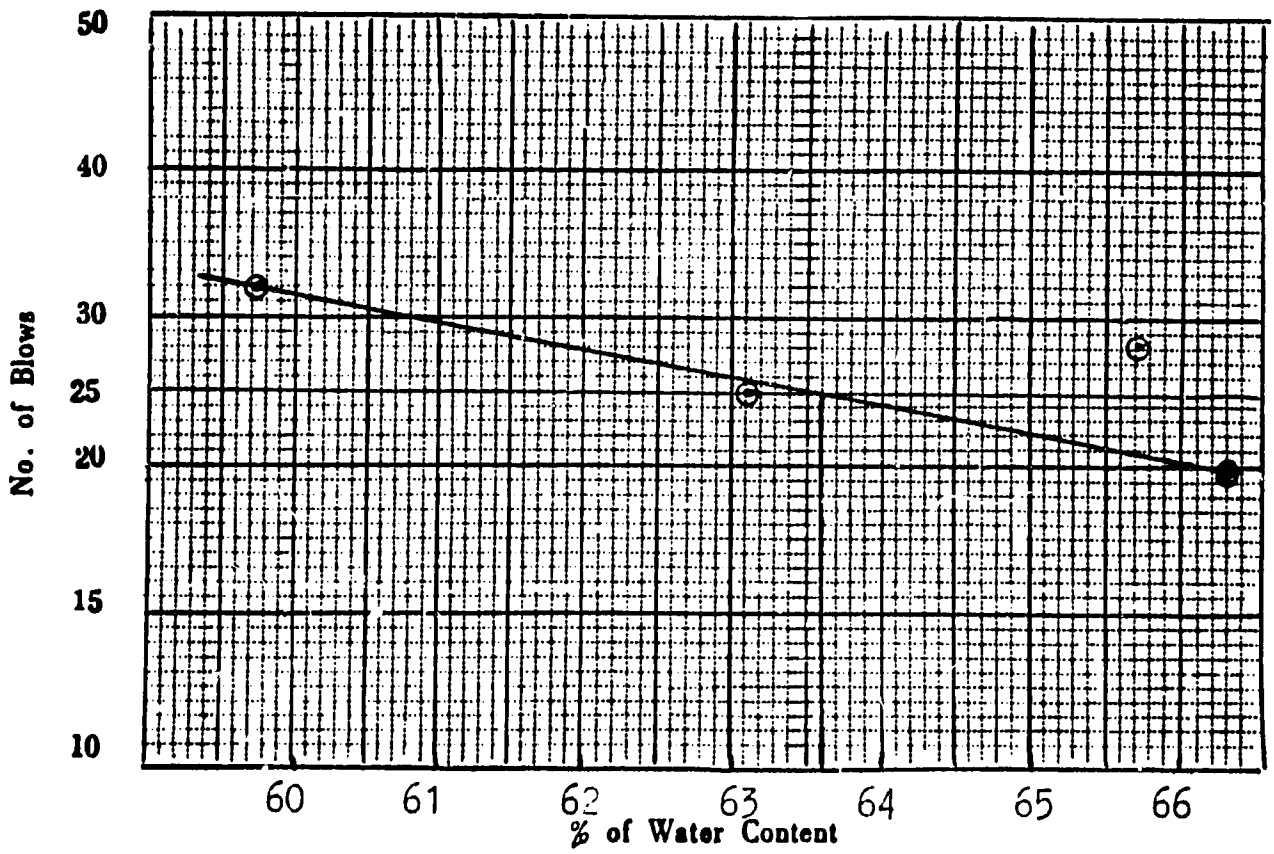
**Sample no.** U.D.S. 1

**Description** CH

**Depth** 68' 6"-70' 6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 63.6 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 37.2 | 4 | Plasticity index % | 26.4 |

### FLOW CURVE




Tested by Tec. Assist. checked by Chemist. date 11/10/1977

M.NAGIB

M.NAGIB ... EL-Saidi

M.S. 187

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S.P. 5

**Location** Por Said Härbor .

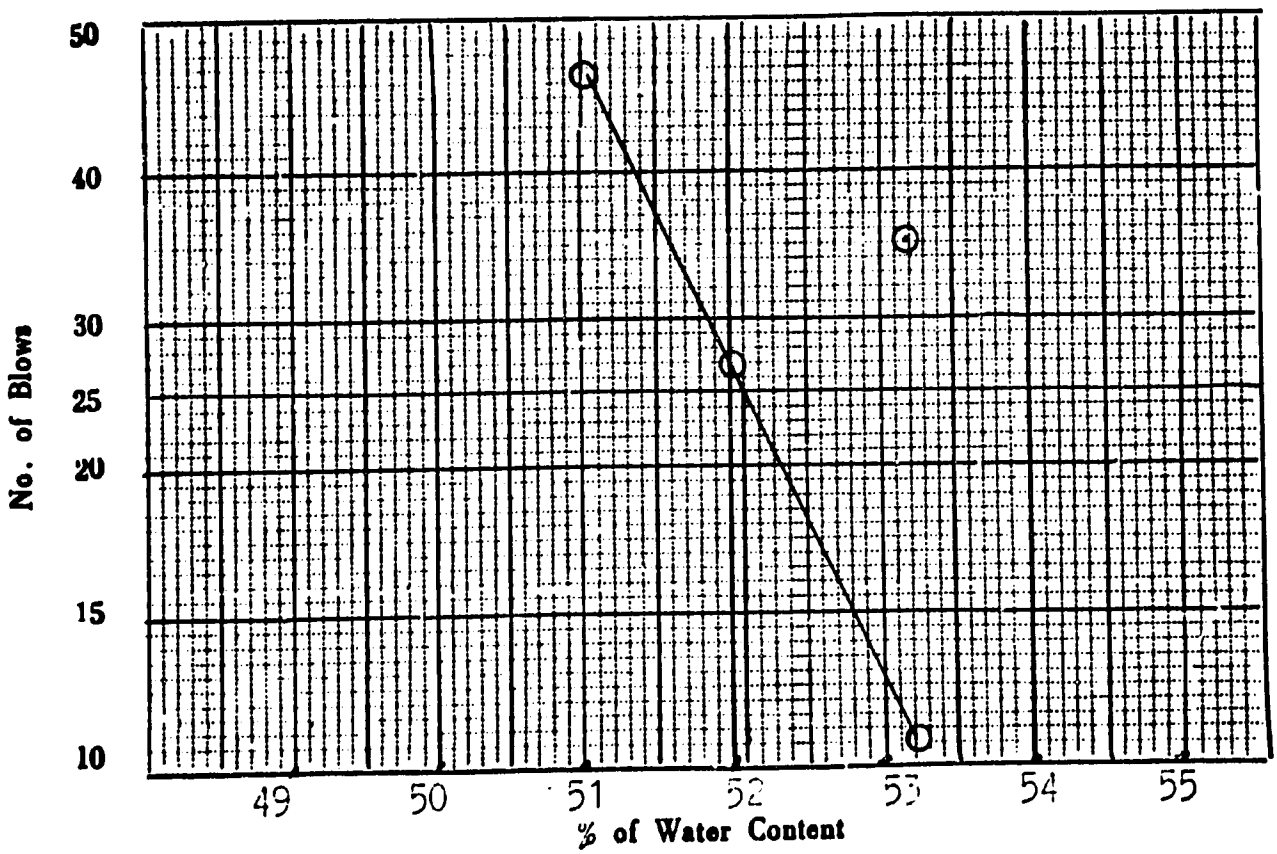
**Sample no.** 13

**Description** MH

**Depth** 74',6" - 76'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 52.1 | 3 | Shrinkage Limit % | —— |
| 2 | Plastic Limit % | 32.9 | 4 | Plasticity index % | 19.2 |

### FLOW CURVE




**Tested by** Said.M. **checked by** Chemist . **date** 19/10/1977

M. .EL-Saiedi.

188

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S P 5

**Location** Por Said Harbor .

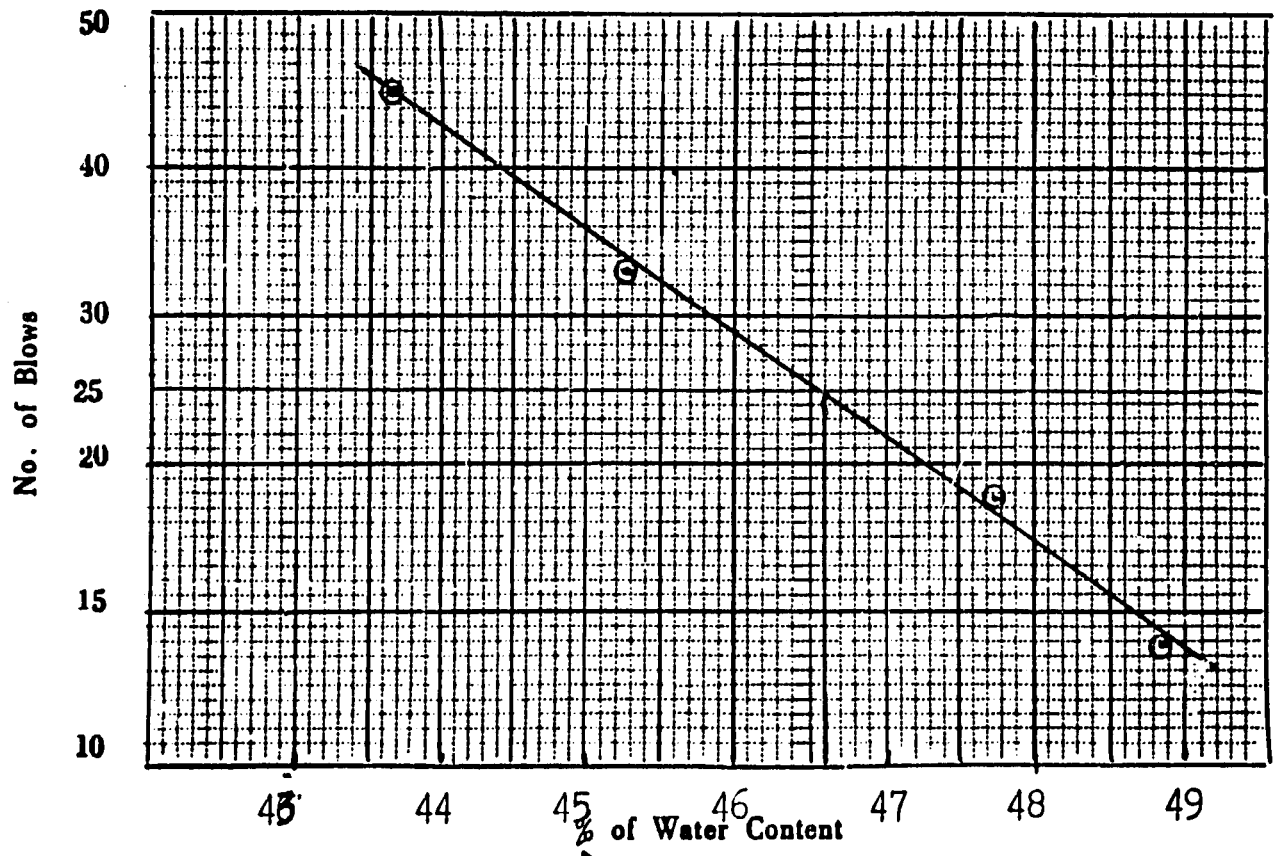
**Sample no.** U.D.S. 2

**Description** CL

**Depth** 80' - 82'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 46.60 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 28.00 | 4 | Plasticity index % | 18.60 |

**FLOW CURVE**




**Tested by** Tec. Assist. M.NAGIB **checked by** Chemist. M.M.EL-Sadi. **date** 11/10/1977

189

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S.P. 5

**Location** Por Said Harbor .

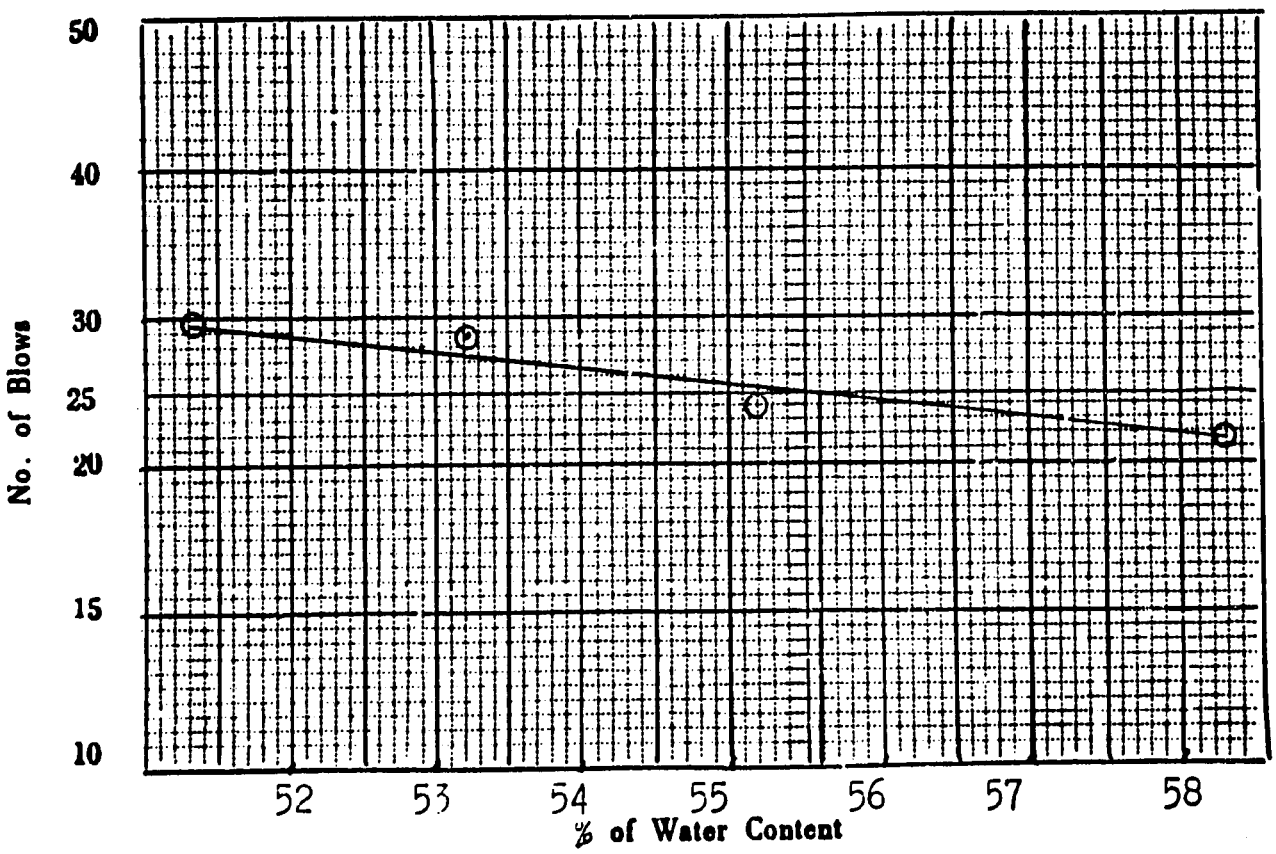
**Sample no.** 14

**Description** MH

**Depth** 88',6" - 90'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 55.6 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 40.0 | 4 | Plasticity index % | 15.6 |

### FLOW CURVE




**Tested by** Tec.Assist. **checked by** Chemist. **date** 19/10/1977

M.NAGIB M.H.EL-Saiedi.

190

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** SP 5

**Location** Por Said Harbor.

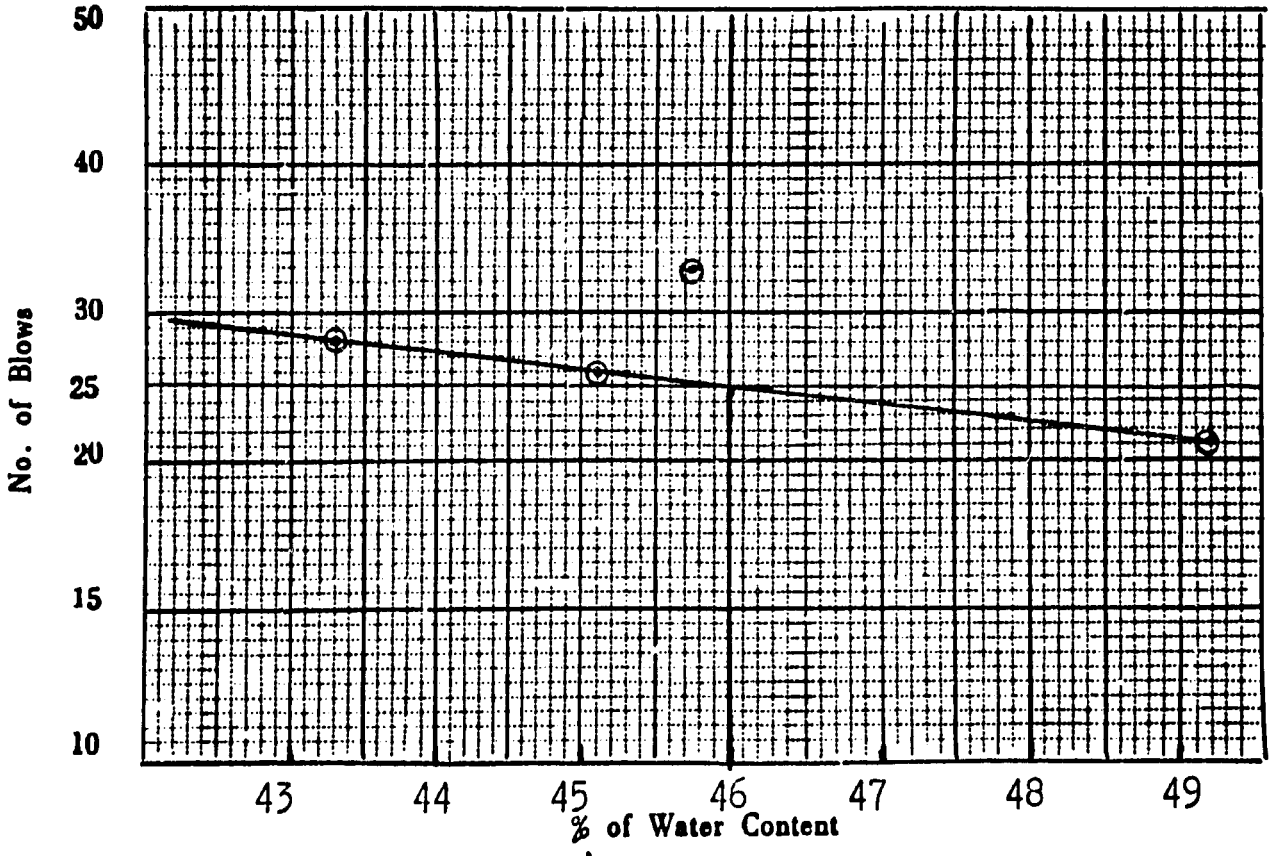
**Sample no.** U.D.S. 4

**Description** CL

**Depth** 105' 6" - 107' 6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 46.00 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 28.00 | 4 | Plasticity index % | 18.00 |

**FLOW CURVE**




**Tested by** Tec. Assist. M. NAGIB **checked by** Chemist. H.M. EL-Saiedi **date** 11/10/1977

M.S.

191

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S.P. 5

**Location** Por Said Harbor .

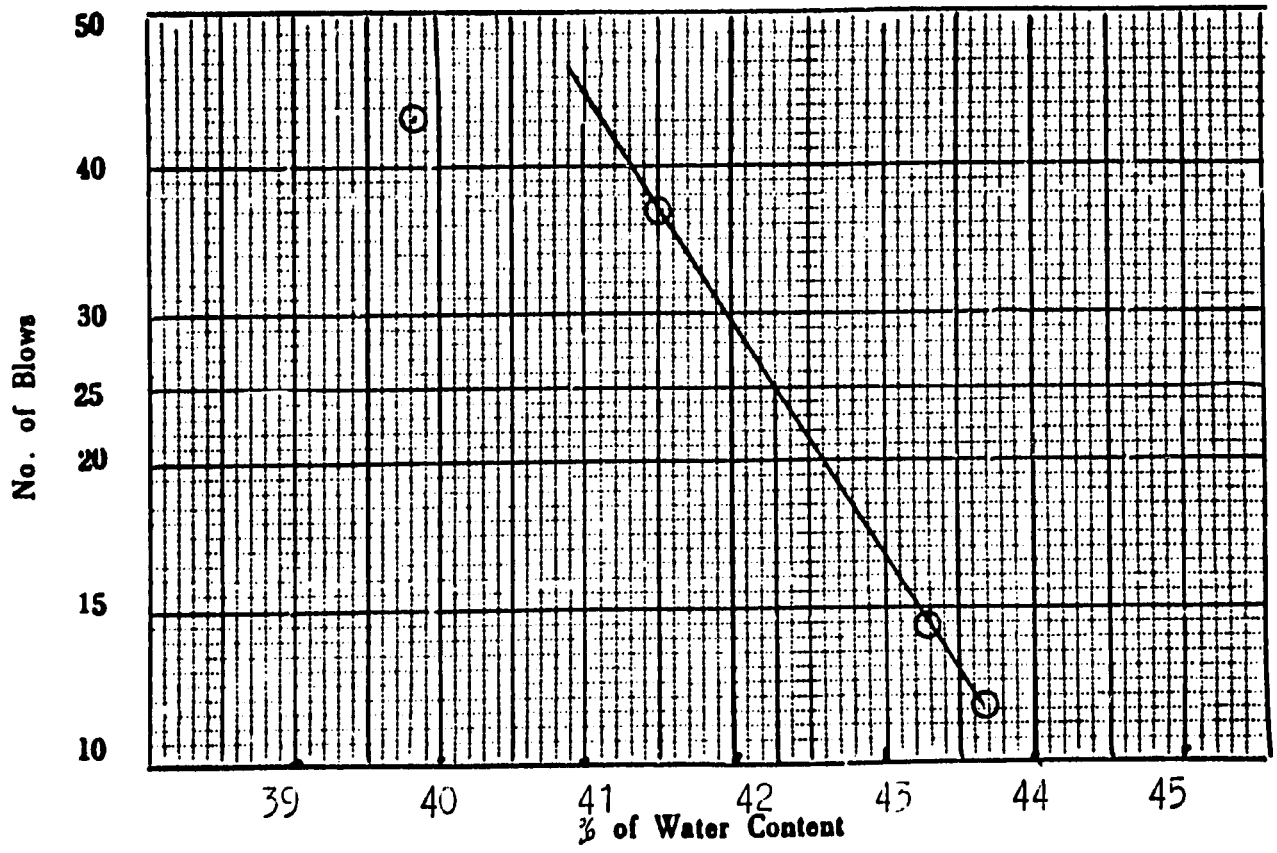
**Sample no.** 16

**Description** MH

**Depth** 111',6" - 113'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 42.3 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 25.3 | 4 | Plasticity index % | 17.00 |

**FLOW CURVE**




**Tested by** Said.M. **checked by** Chemist **date** 19/10/1977

M.M.EL-Saiedi

192

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S.P. 5

**Location** Por Said Harbor .

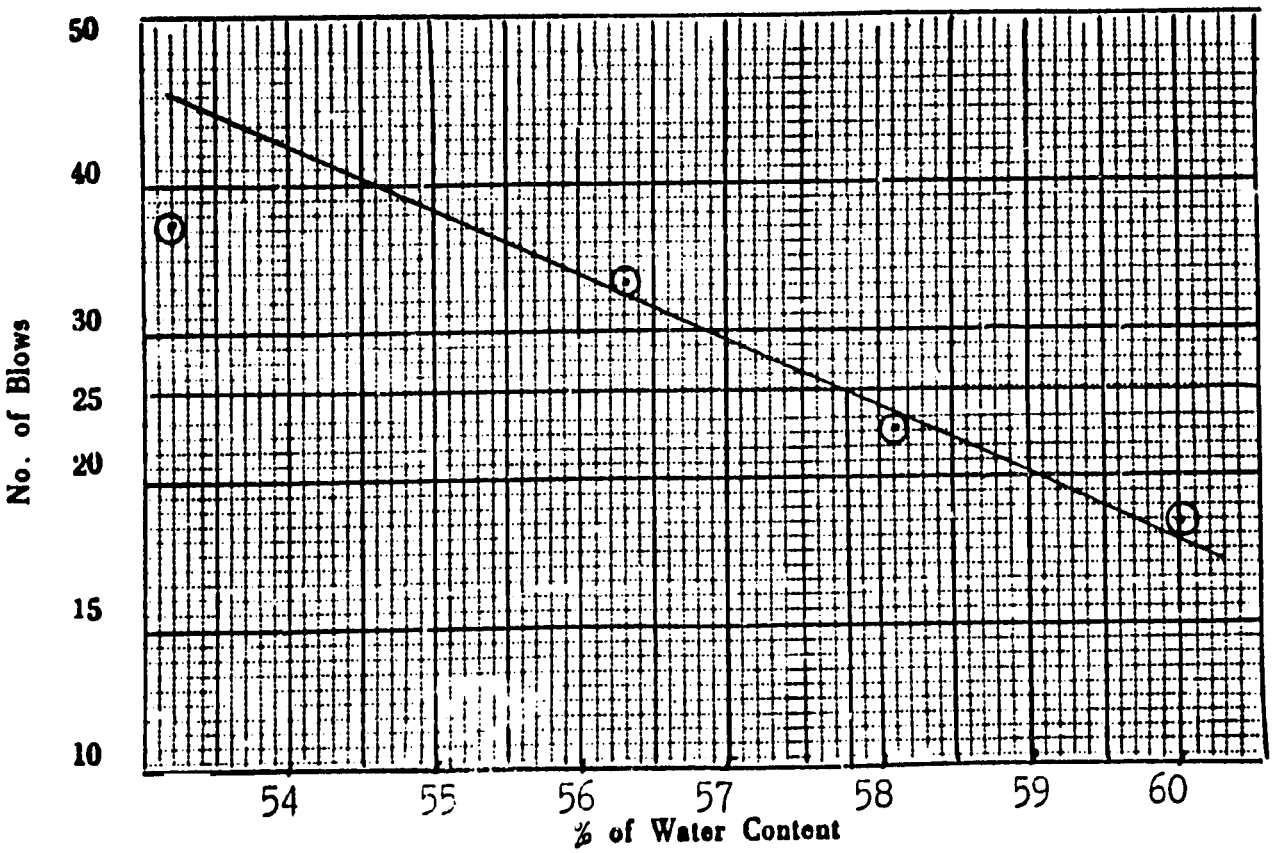
**Sample no.** 18

**Description** MH

**Depth** 134',6" - 136'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 57.8 | 3 | Shrinkage Limit % | — |
| 2 | Plastic Limit % | 34.1 | 4 | Plasticity index % | 23.7 |

**FLOW CURVE**




**Tested by** SaidM. **checked by** Chemist. **date** 19/10/1977

M.M. L-Saiedi

M S. 193

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Borehole no. S6

Location POrt Said Harbor

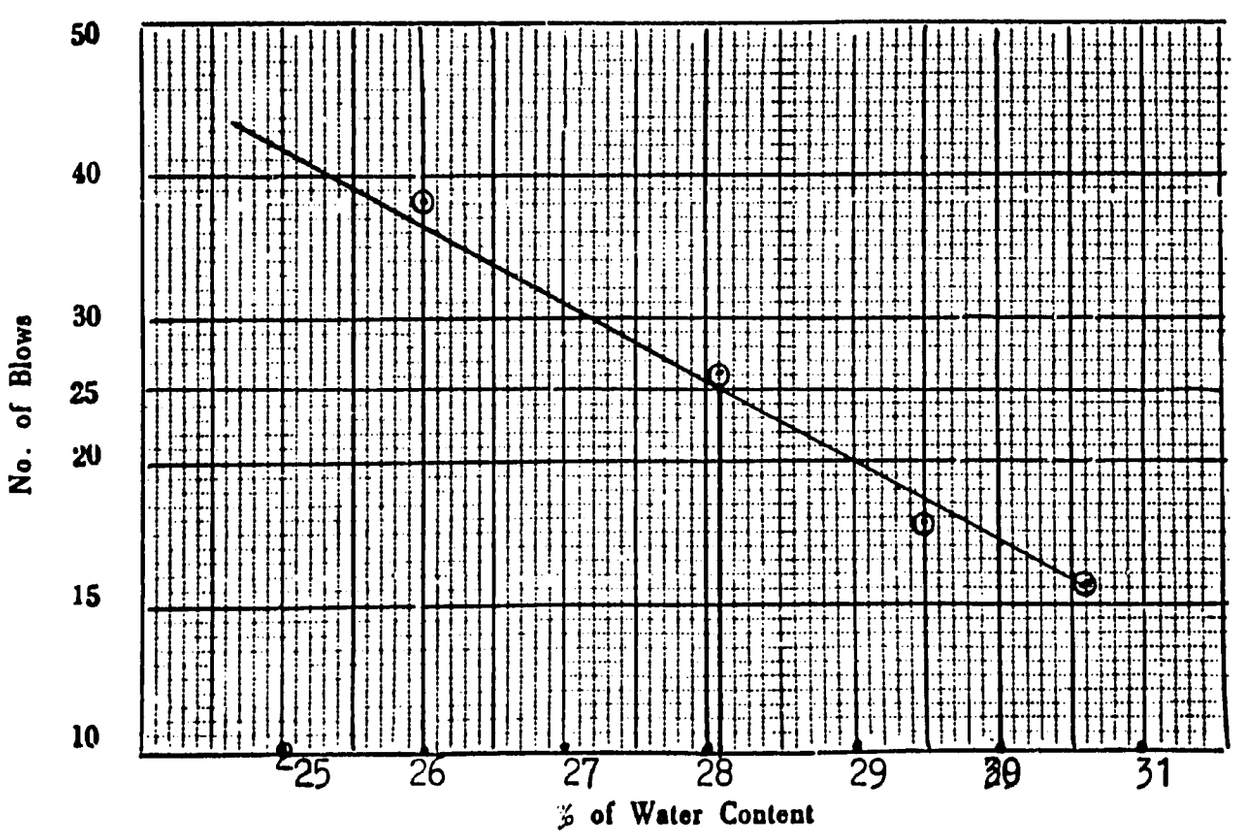
Sample no. 10

Description M.L

Depth 45'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 28.10 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

### FLOW CURVE




Tested by

checked by Chemist M.M.El-Saiedi

date 23/8/1977

M.S. 194

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S 6

Location Port Said Harbor

Sample no. U.D.S £ 1

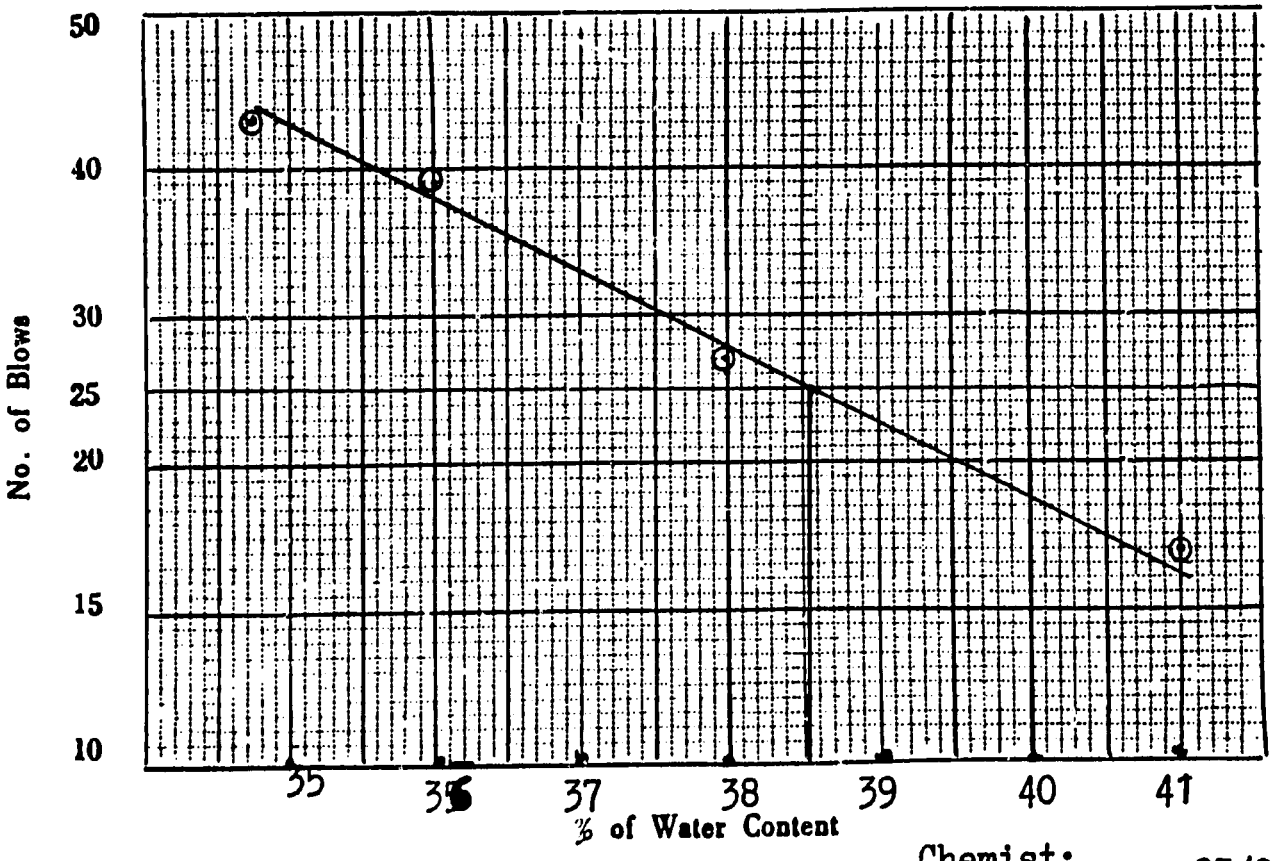
Description C L

Depth 55

1000 7 77 T

| Item | Test | | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 38.55 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 24.60 | 4 | Plasticity index % | 13.95 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.EL-Saiedi

date 23/8/1977

M.S.

195

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S6

**Location** Port Said Harbor

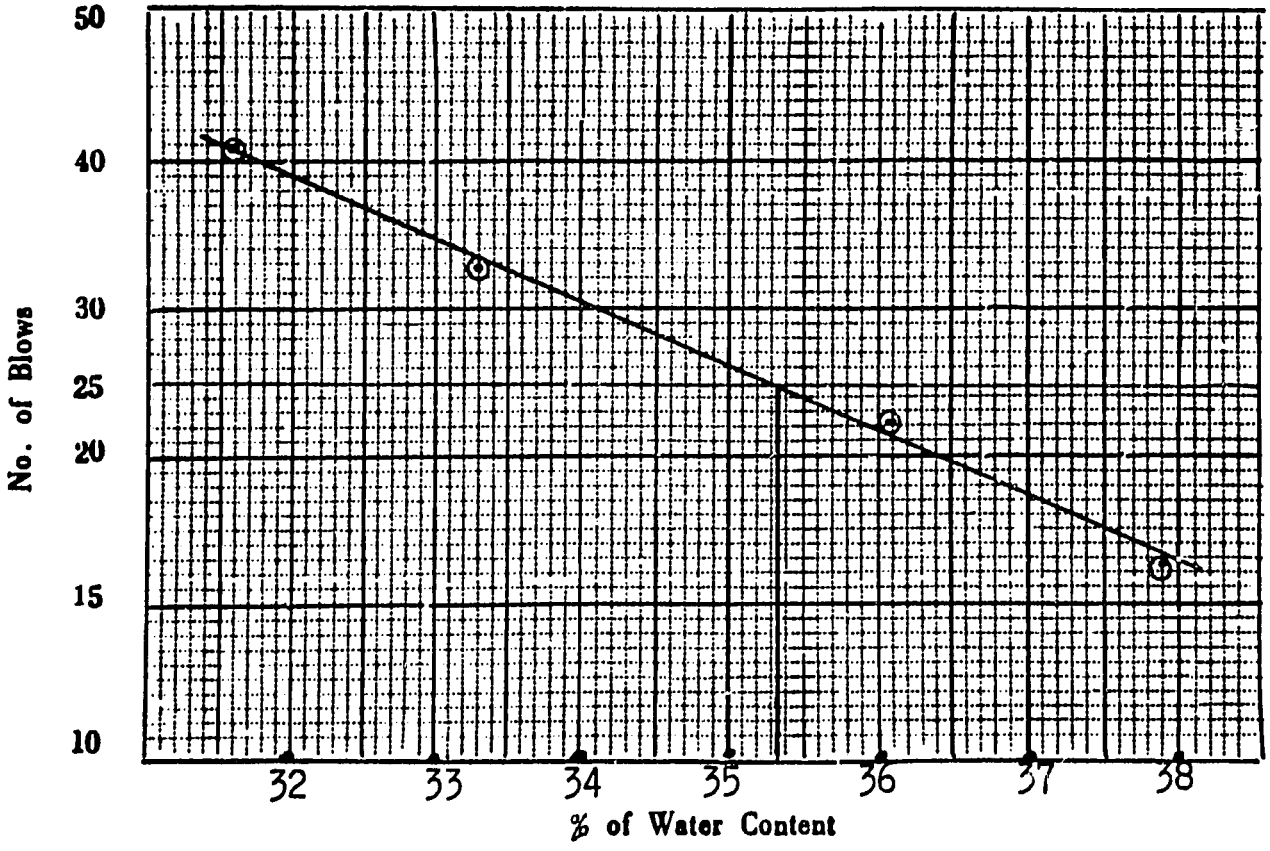
**Sample no.** U D S 2

**Description** CL

**Depth** 6.5'

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 35.35 | 3 | Shrinkage Limit | % | not required |
| 2 | Plastic Limit | % | 20.80 | 4 | Plasticity index | % | 14.55 |

**FLOW CURVE**




Tested by

checked by Chemist: M.M.El-Saiedi

date 23/8/1977

M.S. 196

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Borehole no. S 6

Location Port Said Harbor

Sample no. 13

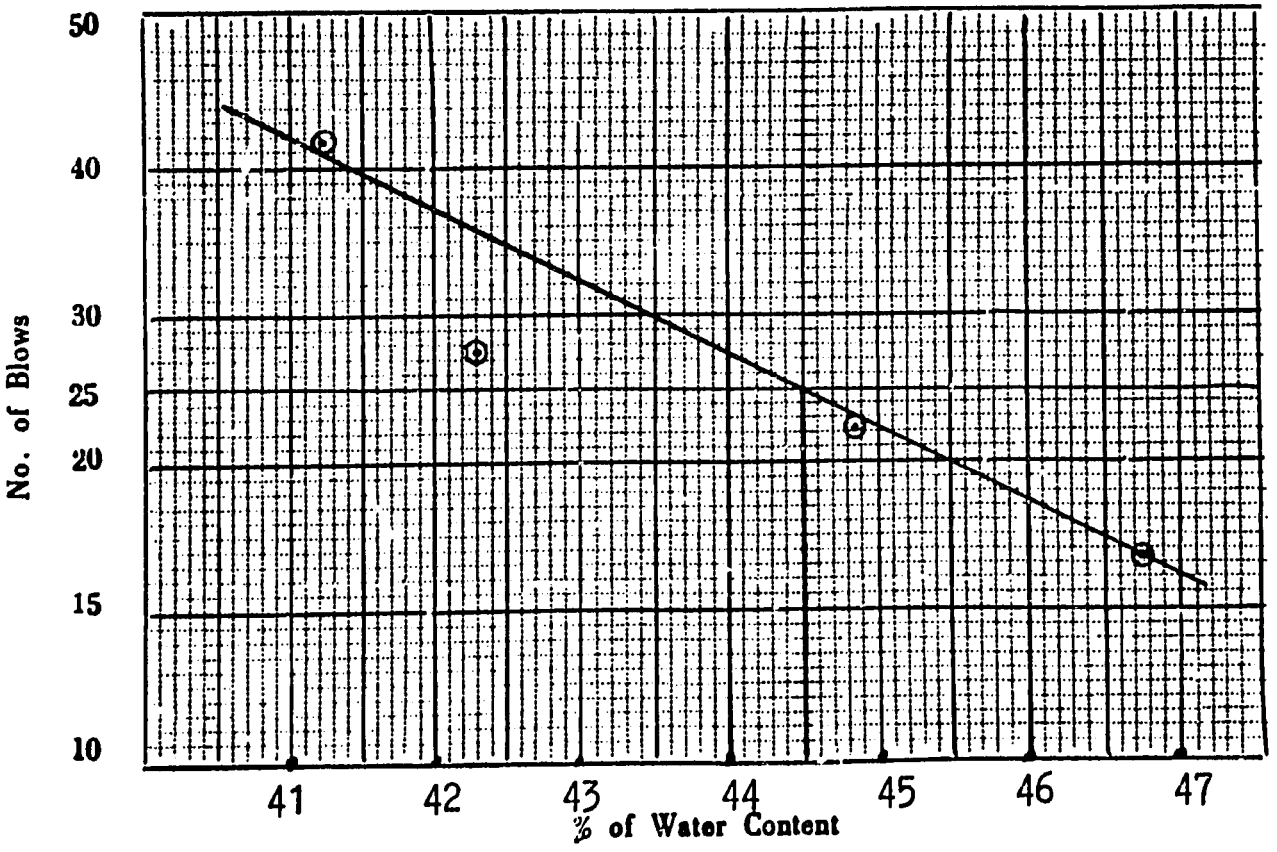
Description C L

Depth 77

1000 7 77 T

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 44.50 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 28.80 | 4 | Plasticity index % | 15.70 |

### FLOW CURVE




Tested by

checked by Chemist: M.M.EL-Saiedi

date 23/8/1977

197

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Location Port Said Harbor

Description C L

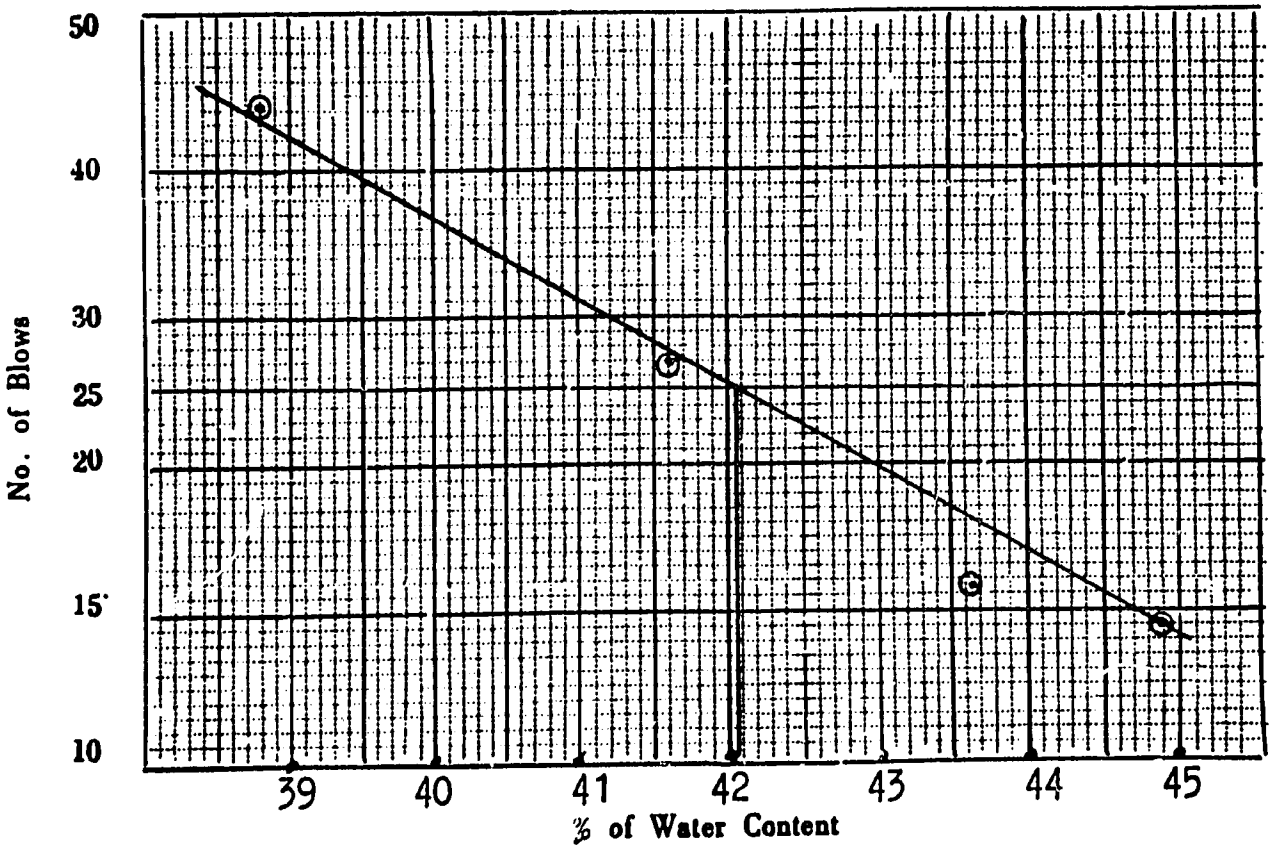
Borehole no. 56

Sample no. 14

Depth 8.0

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 42.07 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 21.02 | 4 | Plasticity index % | 21.05 |

### FLOW CURVE




Tested by

checked by
Chemist:
M.M.EL-Saiedi

date 23/8/1977

198

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Location Port Said Harbor

Description ML

Borehole no. S 6

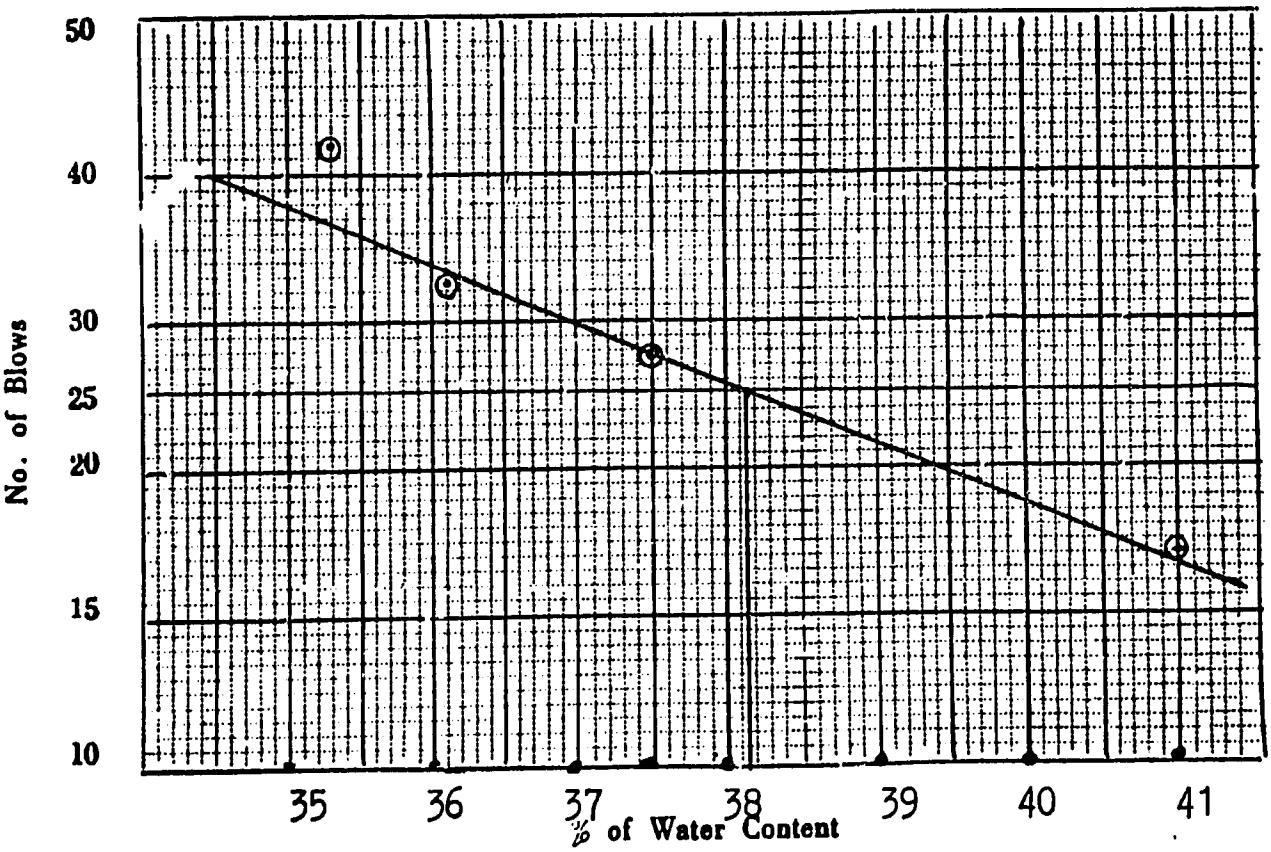
Sample no. 15

Depth 9D

1000 7 77 Y

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 38.15 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 30.40 | 4 | Plasticity index % | 7.75 |

**FLOW CURVE**




Tested by

checked by Chemist

date 23/8/1977

M.M.El-Saiedi

M.S. 199

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT — TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Borehole no. S7

Location Port Said Haibor

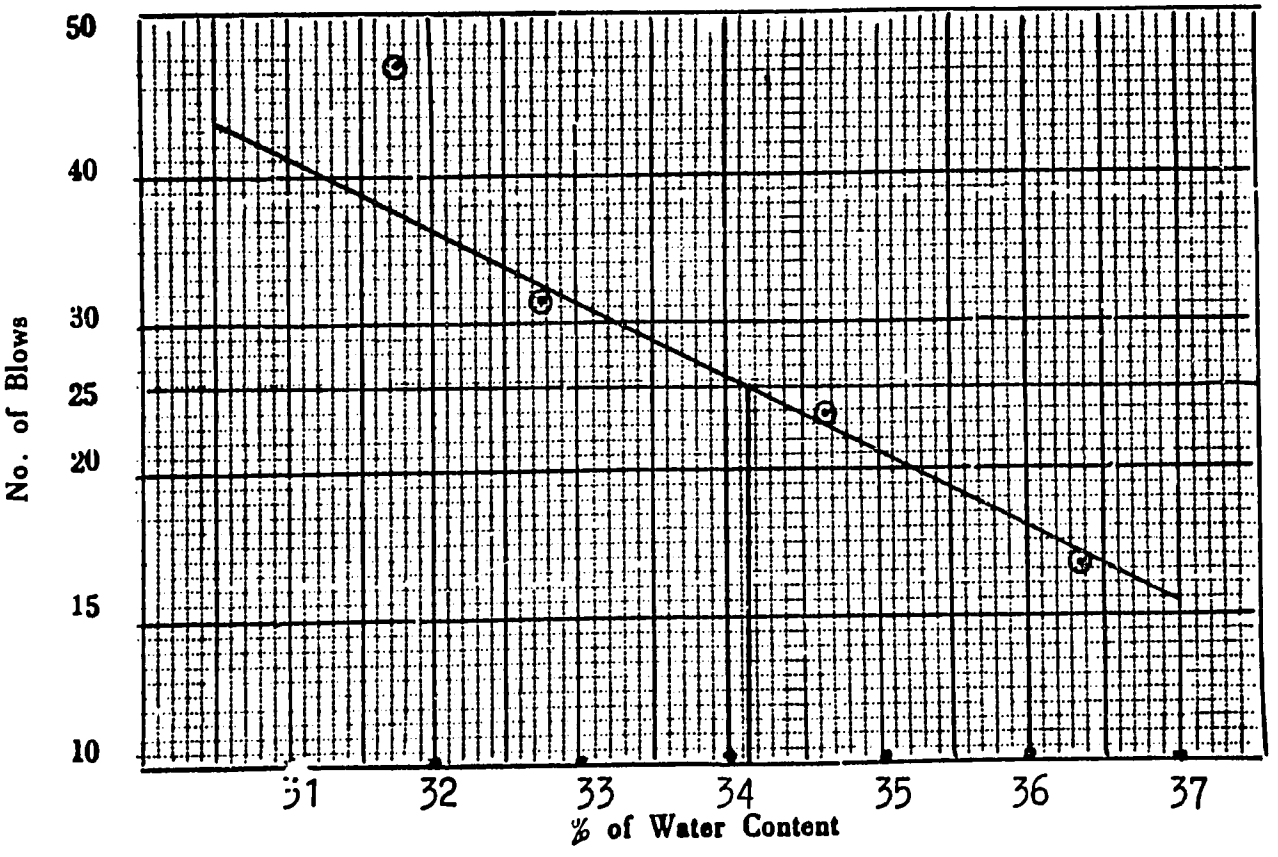
Sample no. U.D.S1

Description CL

Depth 50'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 34.15 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 20.40 | 4 | Plasticity index % | 13.75 |

### FLOW CURVE




Tested by

checked by chemist M,M.El-Saiedi

date 23 /8/1977

M.S.

200

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S 7

Location Port Said Harbor

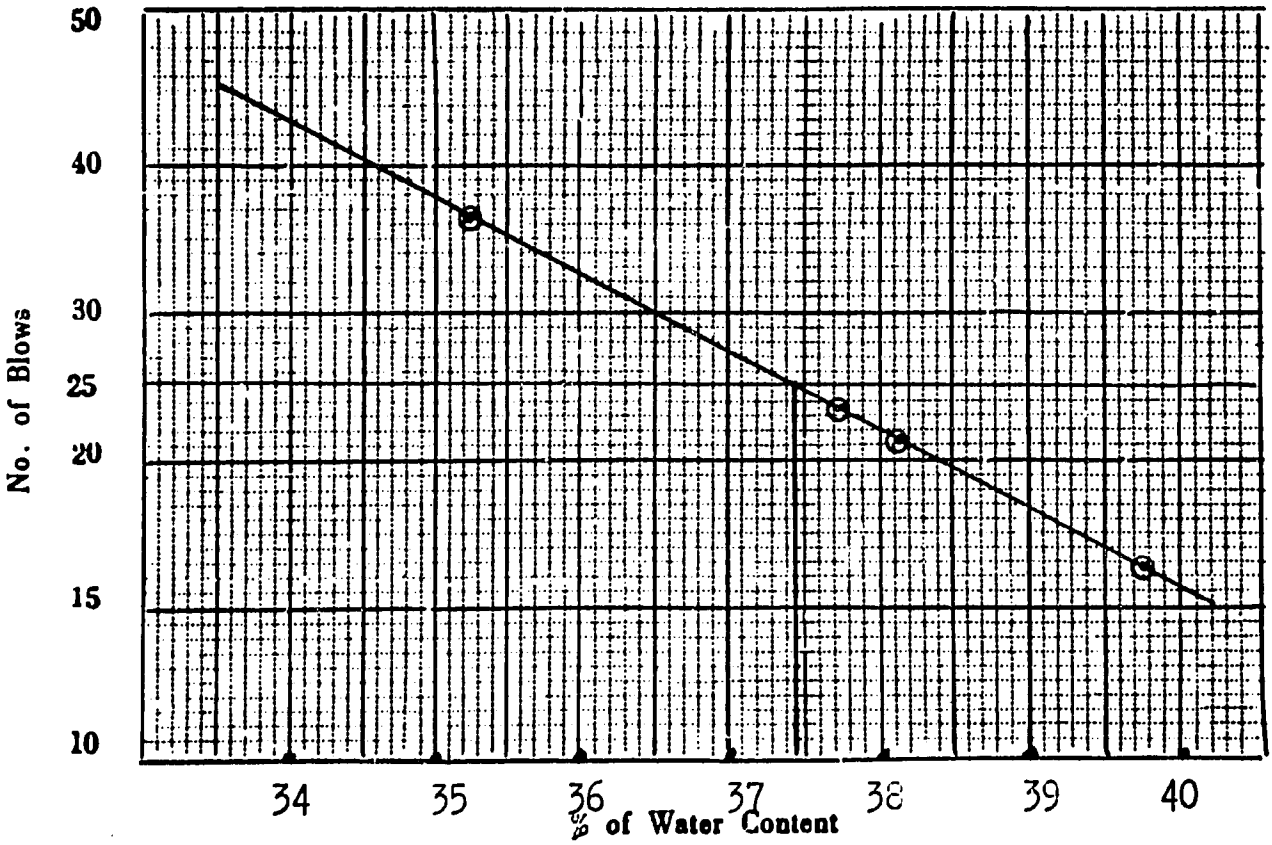
Sample no. U.D.S 2

Description CL

Depth 60'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 37.45 | 3 | Shrinkage Limit % | not rebuired |
| 2 | Plastic Limit % | 19.20 | 4 | Plasticity index % | 18.25 |

**FLOW CURVE**




Tested by

checked by Chemist

date 23/8/1977

M.M.El-Saiedi

Md. 201

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

Laboratory No. 4

Client

Borehole no. S8

Location Port Said Harbor

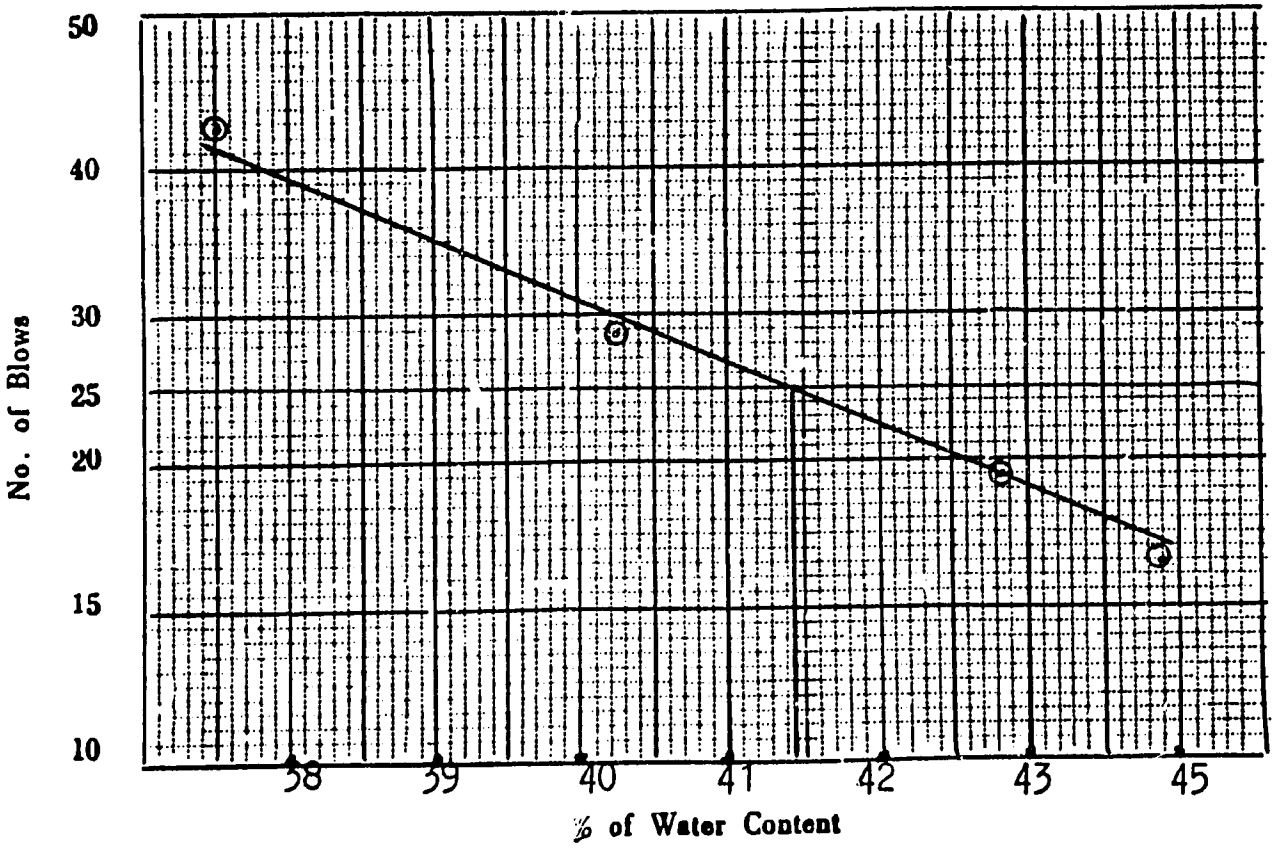
Sample no. 9

Description CL

Depth 40

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 41.45 | 3 | Shrinkage Limit % | not requird |
| 2 | Plastic Limit % | 25.70 | 4 | Plasticity index % | 15.75 |

**FLOW CURVE**




Tested by M.M.EL/Saiedi

checked by chemist

date 23/8/1977

Md. 202

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849625

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S8

**Location** Por Said Harbor .

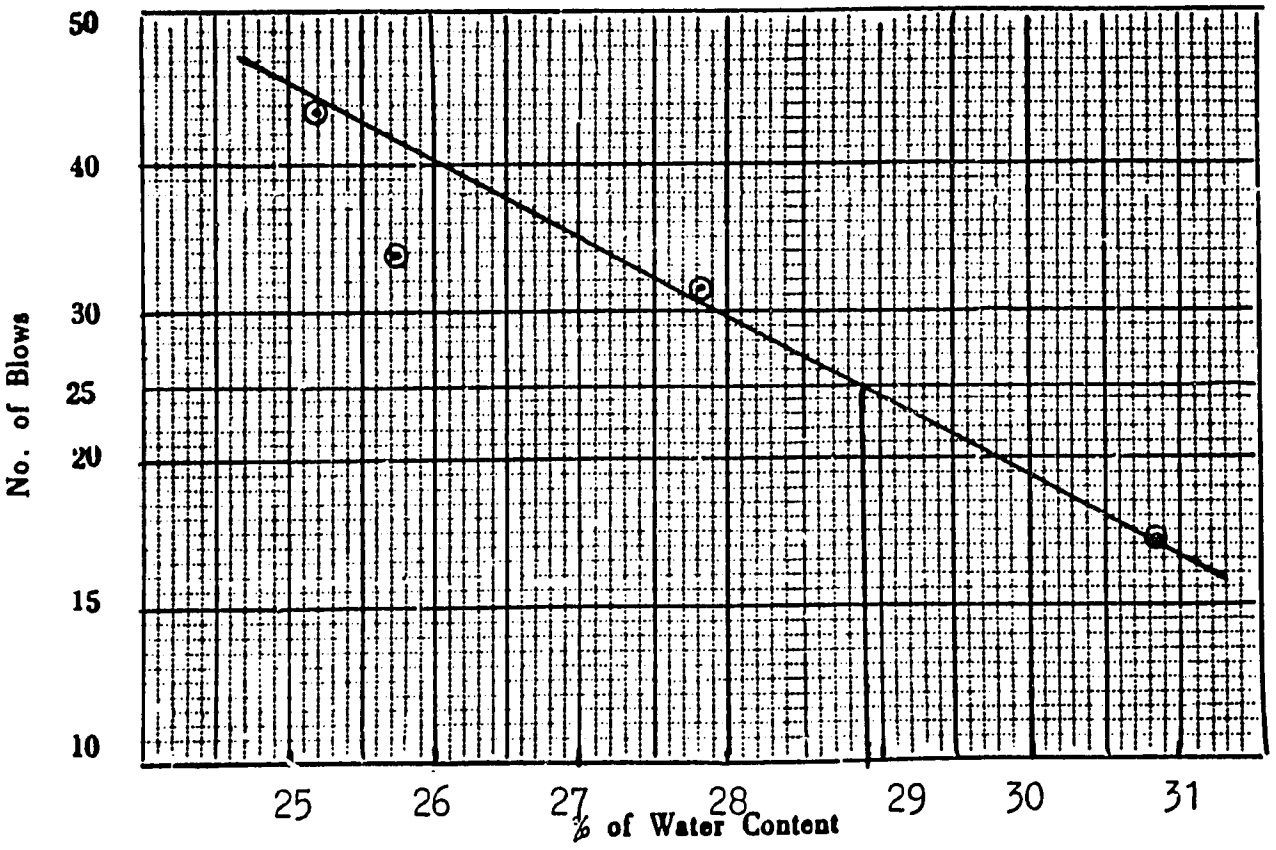
**Sample no.** U.D.S. 1

**Description** ML

**Depth** 45' - 47'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 28.90 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

### FLOW CURVE




Tested by Tec. Assist. checked by Chemist. date 12/10/1977

M.NAGIB

M.NAGIB H.M.EL-Saiedi

M.S. 203

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Por Said Harbor .

**Description** Ml & CL

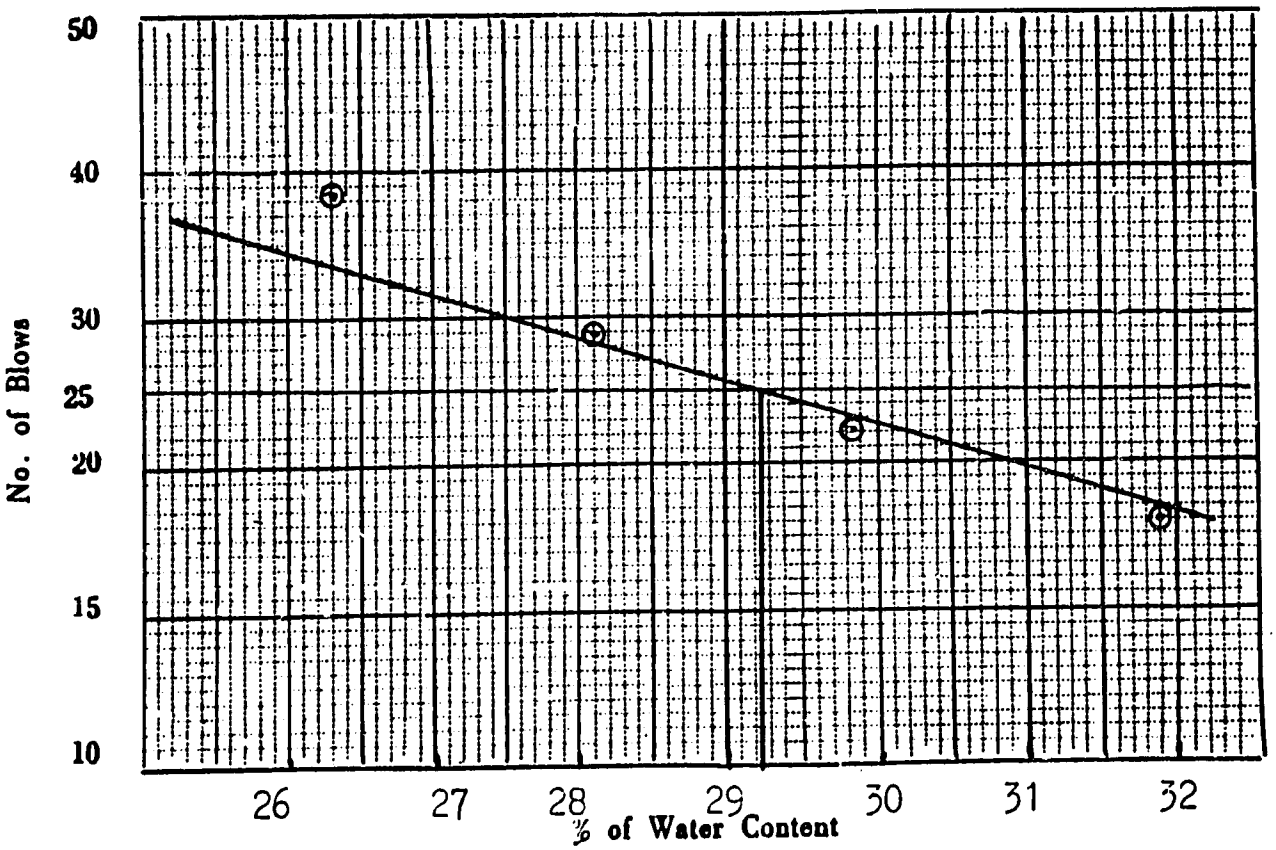
**Borehole no.** S 8

**Sample no.** U.D.S. 2

**Depth** 52' - 54',6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 29.25 | 3 | Shrinkage Limit % | —— |
| 2 | Plastic Limit % | 21.19 | 4 | Plasticity index % | 8.06 |

**FLOW CURVE**




Tested by Tec. Assist. M.NAGIB checked by Chemist. date 12/10/1977

M.M.EL-Saiedi

204

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S 8

**Location** Por Said Harbor .

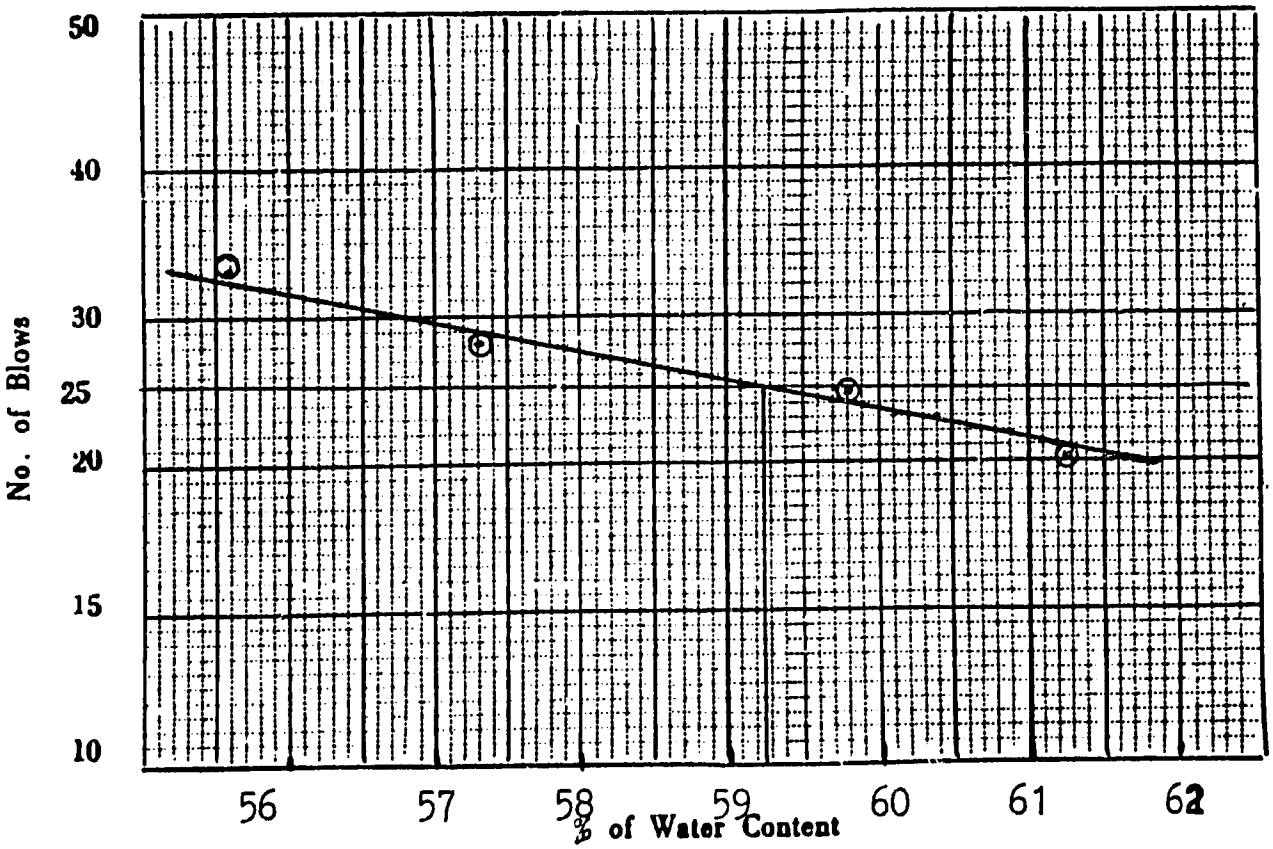
**Sample no.** U.D.S. 5

**Description** CH

**Depth** 87' - 89'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 59.25 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 29.30 | 4 | Plasticity index % | 29.95 |

**FLOW CURVE**




Tested by Tec.Assist. M.NAGIB checked by Chemist. date 12/10/1977

M.NAGIB H.M.EL-Saiedi

205

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** 9

**Location** Port Said Harbor

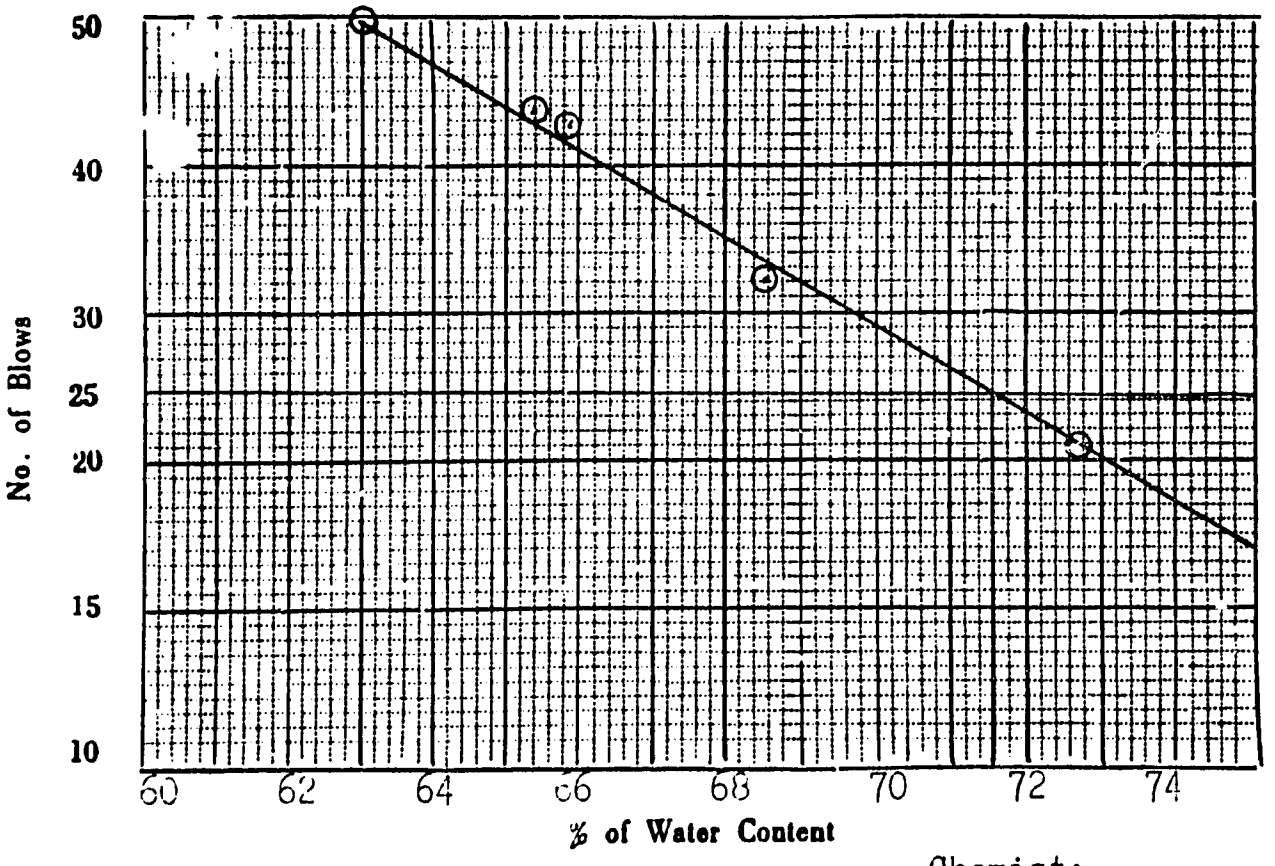
**Sample no.** U D S 3

**Description** CH

**Depth** 94' - 96'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 71.6 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 32.6 | 4 | Plasticity index % | 39.0 |

**FLOW CURVE**




**Tested by** Abe. El-Khalik

**checked by** Chemist: M.M. El-Saiedi

**date** 10/11/1977

M.S.

206

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S 11

**Location** Por Said Harbor.

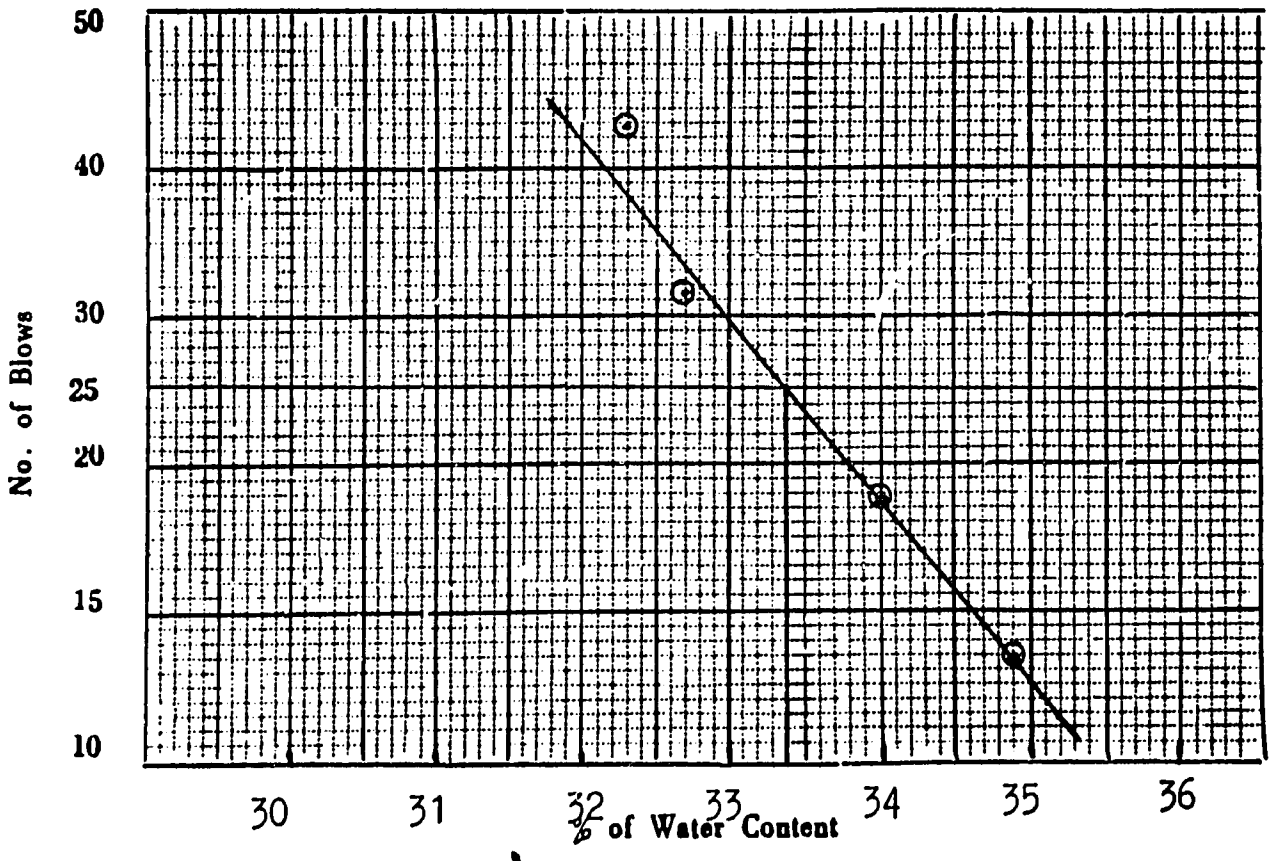
**Sample no.** 11

**Description** ML

**Depth** 55' - 56'.6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 33.4 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 27.5 | 4 | Plasticity index % | 5.9 |

**FLOW CURVE**




Tested by Tec. Assist. checked by Chemist. date 11/10/1977

M.NAGIB

M.M.EL-Saiedi

207

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Por Saied Harbor .

**Description** CL

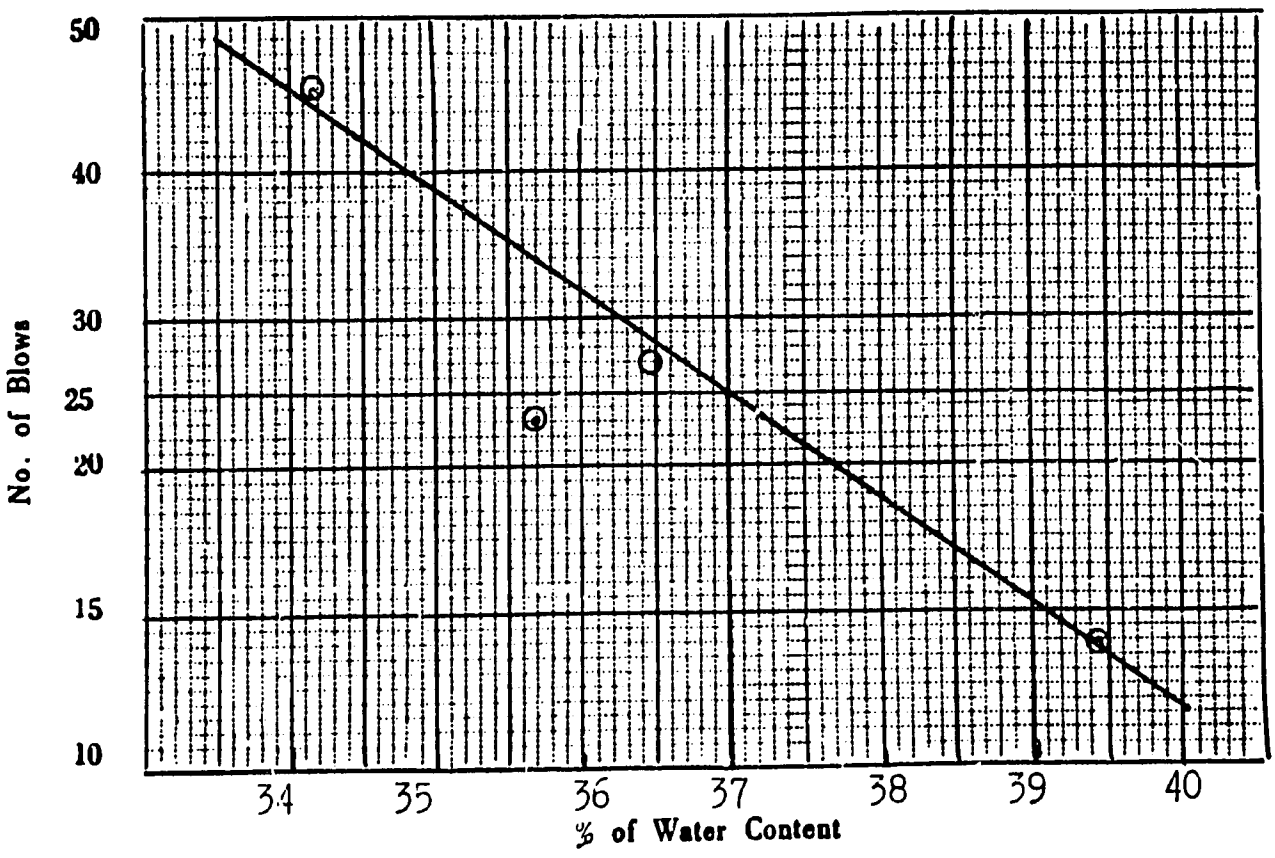
**Borehole no.** S 11

**Sample no.** 12

**Depth** 60',6" – 62'

| Item | Test | | Result | Item | Test | | Result |
|---|---|---|---|---|---|---|---|
| 1 | Liquid Limit | % | 37.00 | 3 | Shrinkage Limit | % | ——— |
| 2 | Plastic Limit | % | 19.50 | 4 | Plasticity index | % | 17.5 |

**FLOW CURVE**




**Tested by** Tec. Assist. M. NAGIB M.NAGIB **checked by** Chemist: M.M.EL-Saiedi **date** 12/10/1977

M. S.

208

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S 11

**Location** Por Said Harbor.

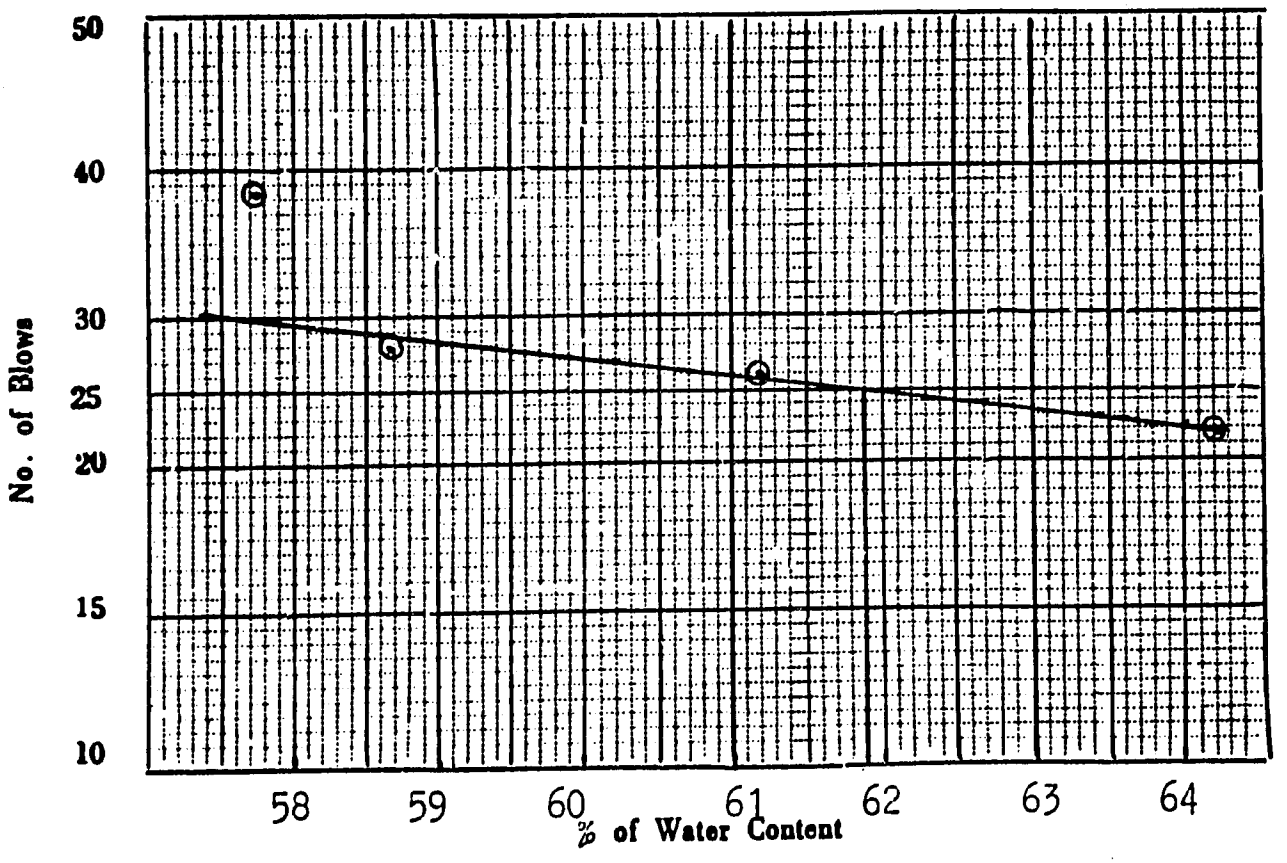
**Sample no.** 13

**Description** MH

**Depth** 72' - 73',6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 61.90 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 33.9 | 4 | Plasticity index % | 28.00 |

### FLOW CURVE




**Tested by** Tec. Assist. M. NAGIB M.NAGIB **checked by** Chemist: M.M.EL-Saiedi. **date** 11/10/1977

209

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** S 11

**Location** Por Said Harbor.

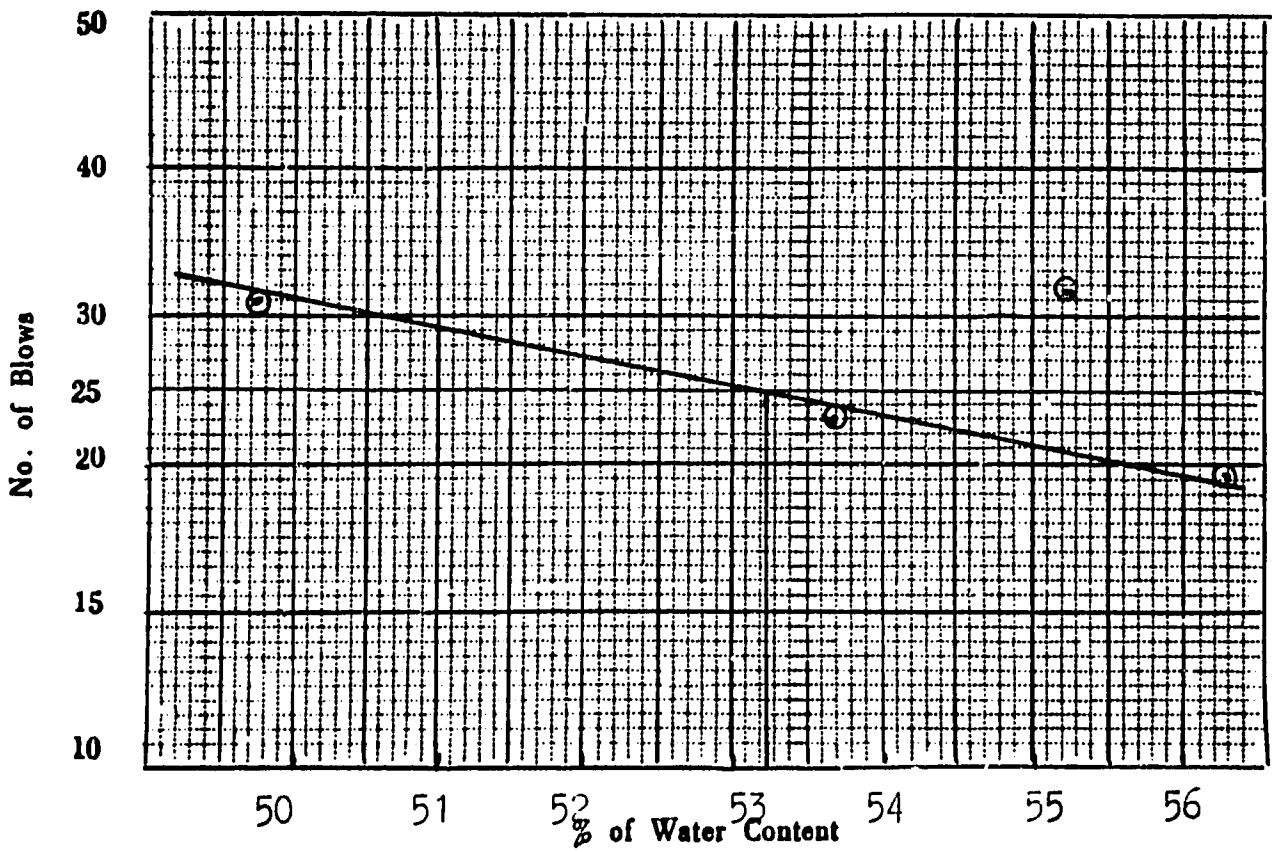
**Sample no.** 18

**Description** MH , CL

**Depth** 129' - 130'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 53.25 | 3 | Shrinkage Limit % | —— |
| 2 | Plastic Limit % | 33.30 | 4 | Plasticity index % | 19.95 |

### FLOW CURVE




Tested by Tec. Assist. M. NAGIB H.NAGIB checked by Chemist. M.M.EL-Saiedi date 11/10/1977

210

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Borehole no.** S12

**Location** Port Said Harbor

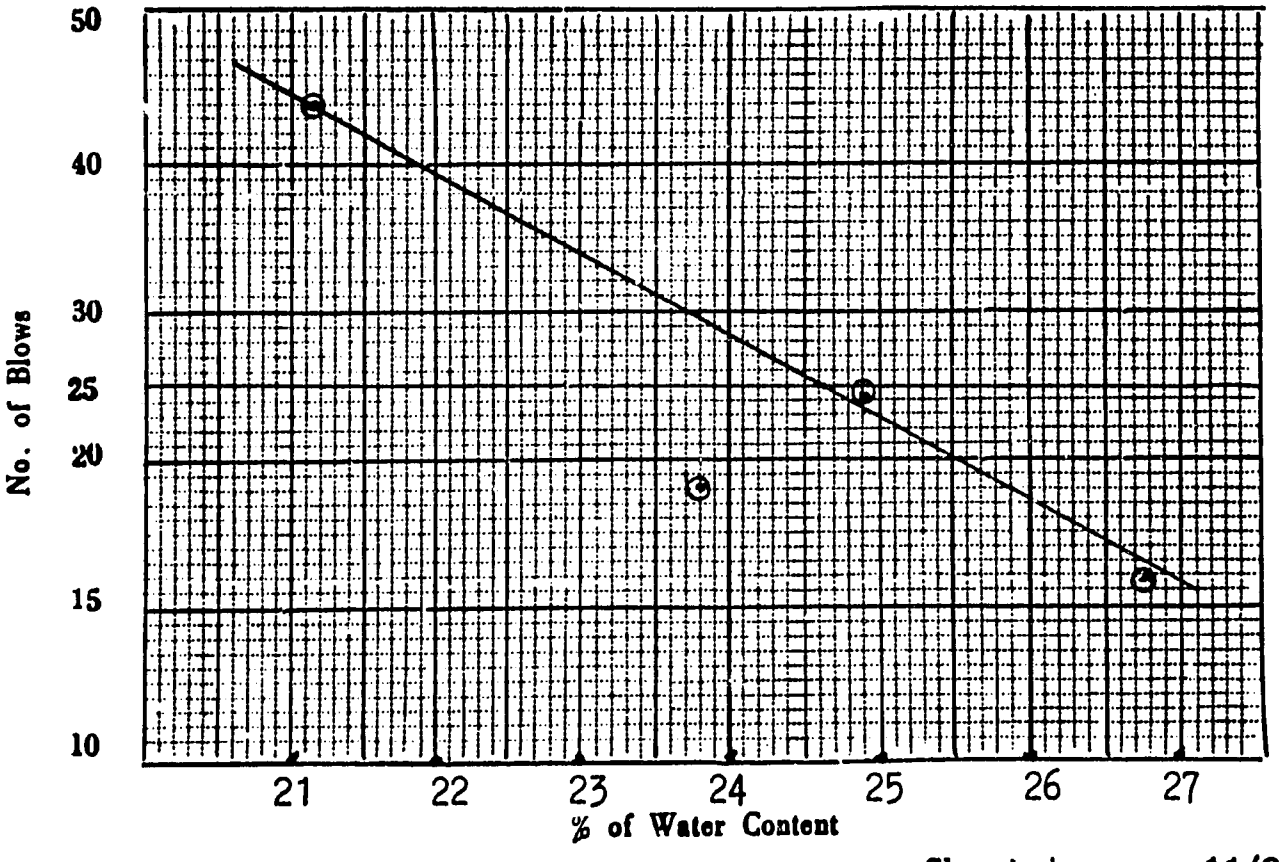
**Sample no.** 9

**Description** SM

**Depth** c/c'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 24.62 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | NC | 4 | Plasticity index % | NC |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: M.M.El-Saieed

**date** 11/8/1977

M.S. 211

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Port Said Harbor

**Description** CL

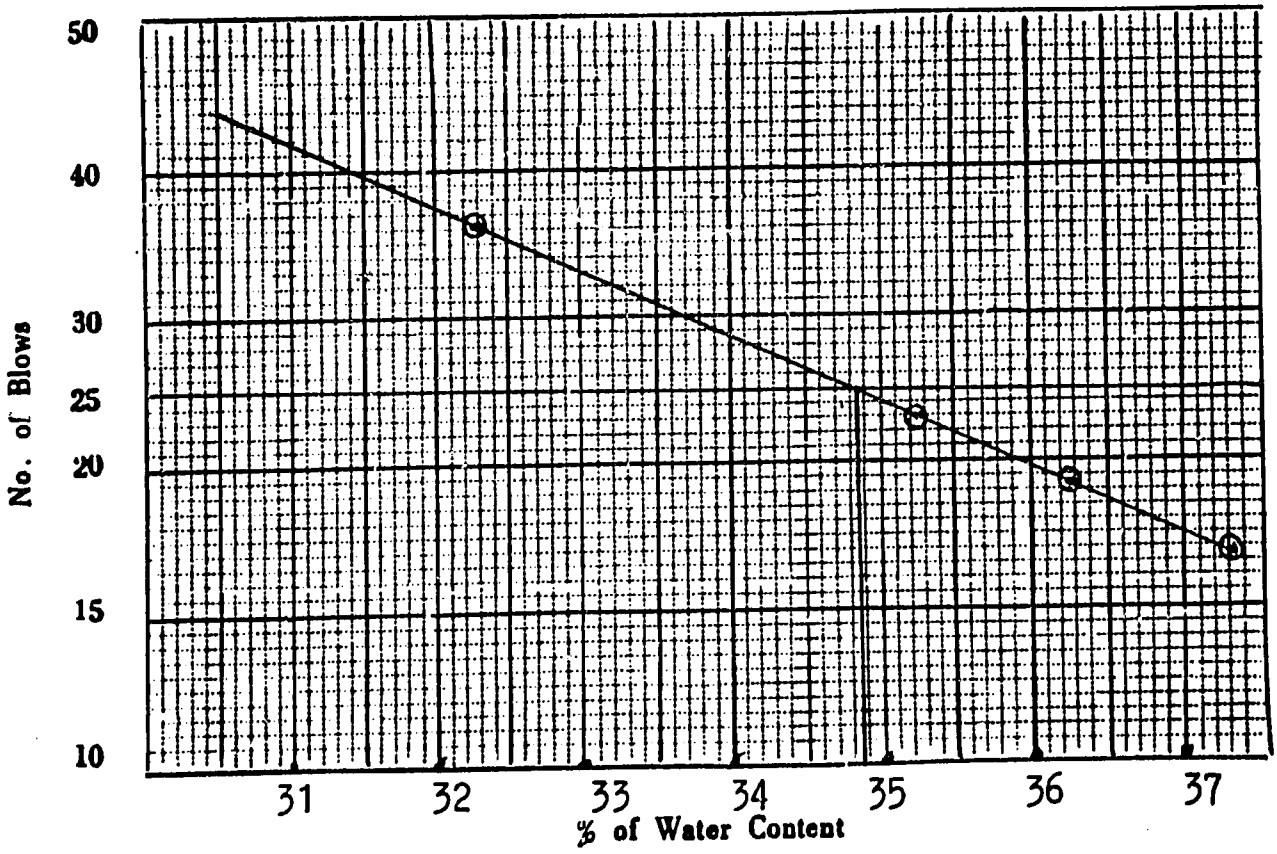
**Borehole no.** S 12

**Sample no.** U D S 1

**Depth** 60'-62'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 34.85 | 3 | Shrinkage Limit % | not required |
| 2 | Plastic Limit % | 20.80 | 4 | Plasticity index % | 13.95 |

**FLOW CURVE**




**Tested by**

**checked by** Chemist: M.M.El-Saiedi

**date** 11/8/1977

M 212

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** 14

**Location** Por Said Harbor .

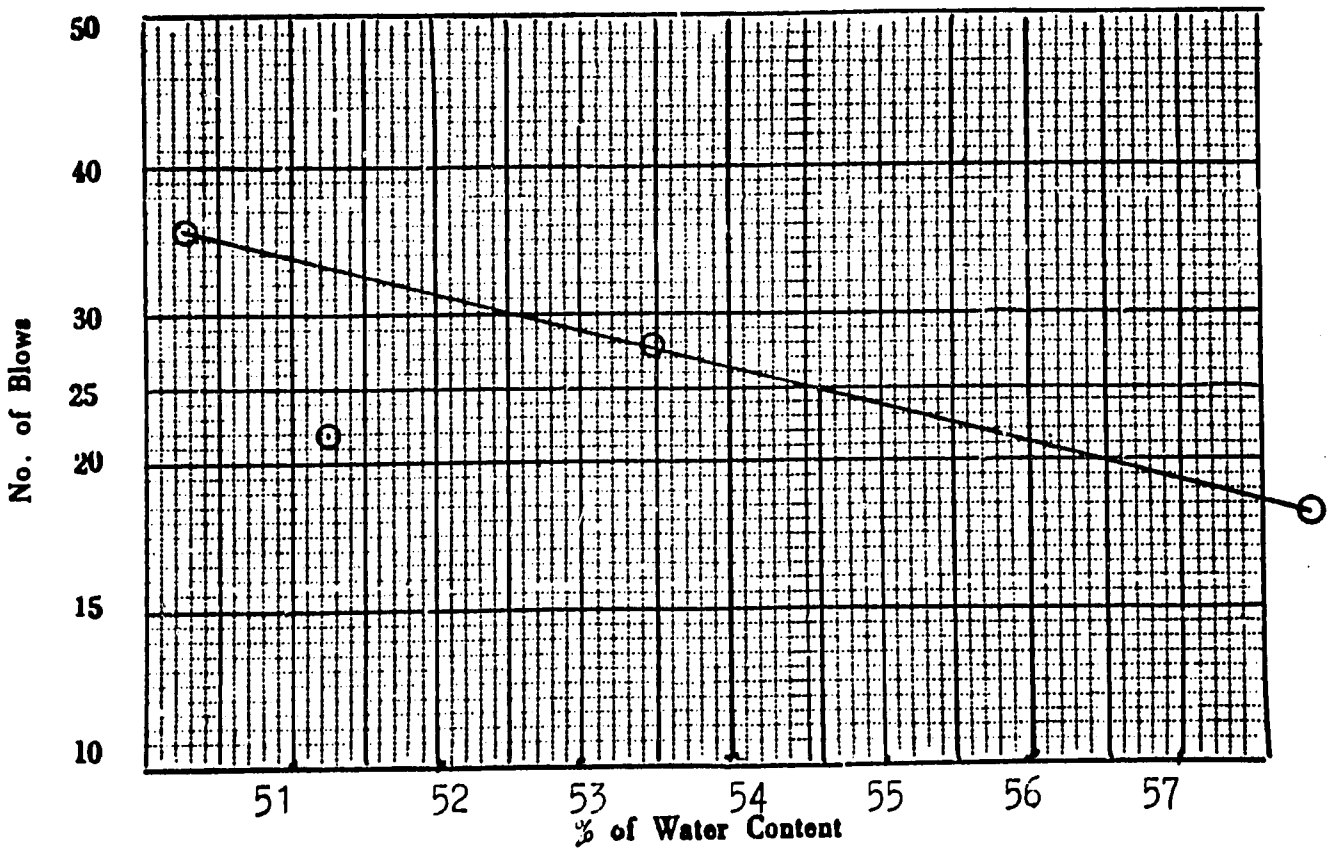
**Sample no.** U.D.S. 1

**Description** MH

**Depth** 60' - 62'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 54.6 | 3 | Shrinkage Limit % | —— |
| 2 | Plastic Limit % | 30.00 | 4 | Plasticity index % | 24.6 |

### FLOW CURVE




**Tested by** Tec.Assist **checked by** Chemist . **date** 19/10/1977

H.HAGIB M.A.EL-Saiedi

213

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Por Said Hrabor

**Description** CH & CL

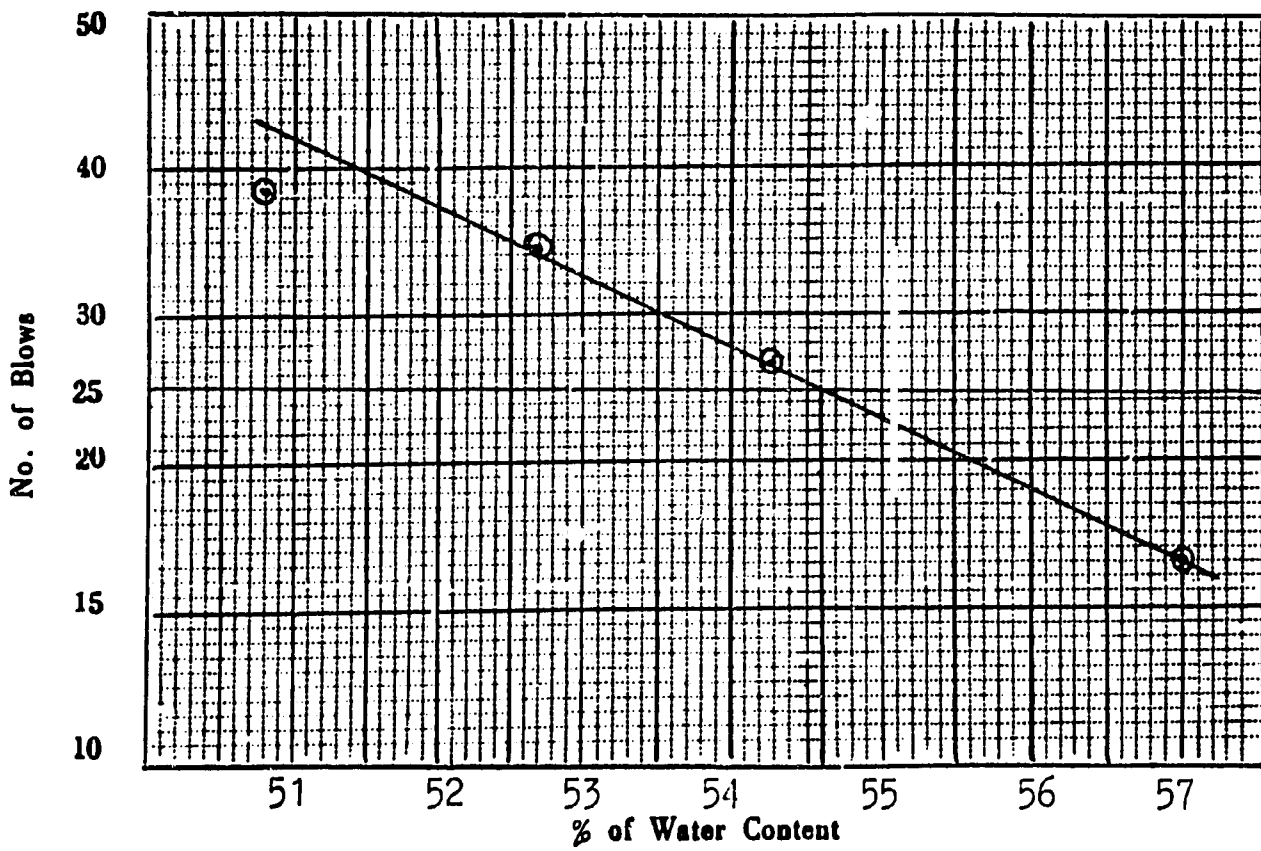
**Borehole no.** 14

**Sample no.** 12

**Depth** 66' - 67',6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 54.60 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 28.2 | 4 | Plasticity index % | 26.4 |

### FLOW CURVE




**Tested by** Said.M. **checked by** Chemist. **date** 16/10/1977

M.M.EL-Saiedi

214

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Por Said Harbor .

**Description** MH

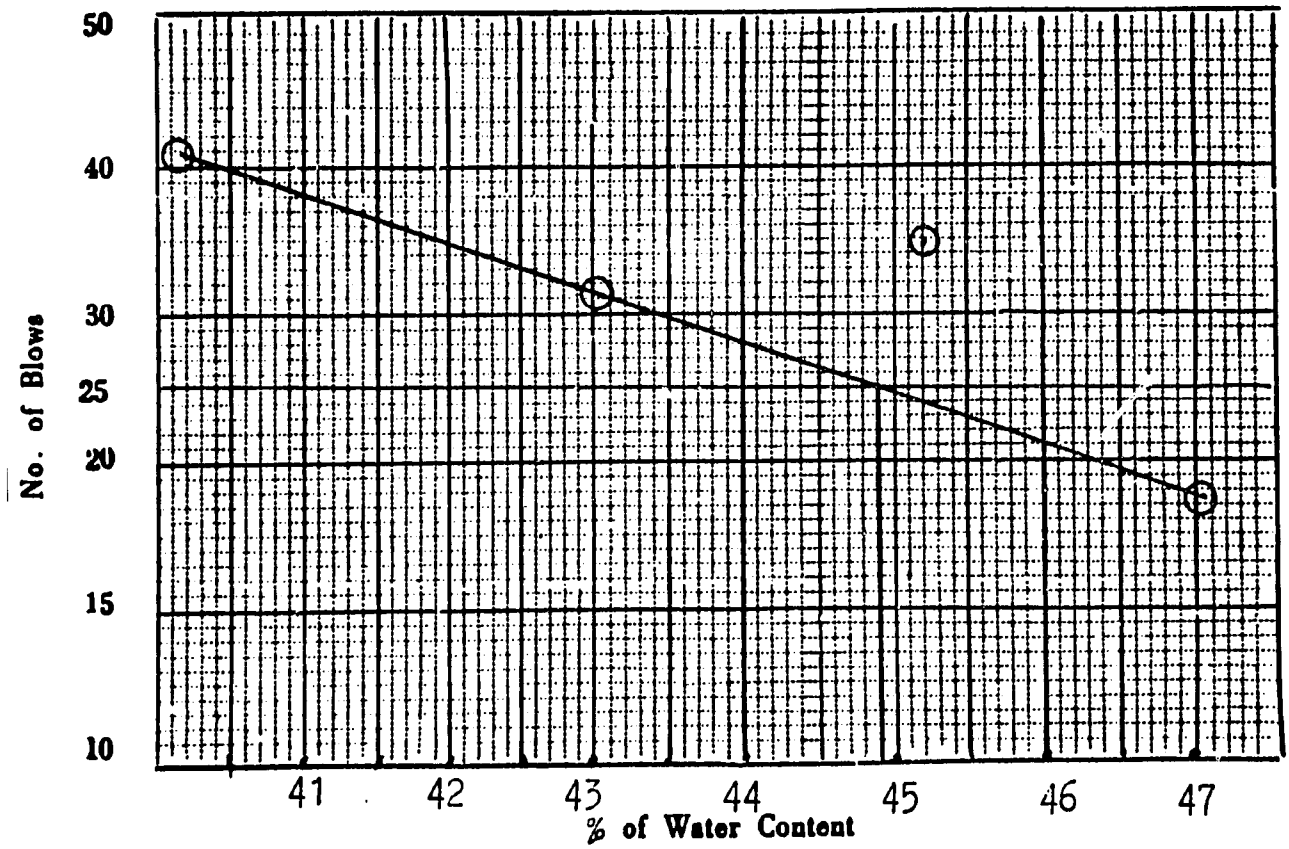
**Borehole no.** 14

**Sample no.** U.D.S. 2

**Depth** 71',6" - 73'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 44.9 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 27.7 | 4 | Plasticity index % | 17.2 |

### FLOW CURVE




**Tested by** Said .M. **checked by** Chemist. **date** 19/10/1977

M.M.EL-Saiedi Md.

215

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT – TEL. 849628

**ATTERBERG LIMITS :**

**Laboratory No.** 4

**Client**

**Location** Por Said Hrbor

**Description** MH

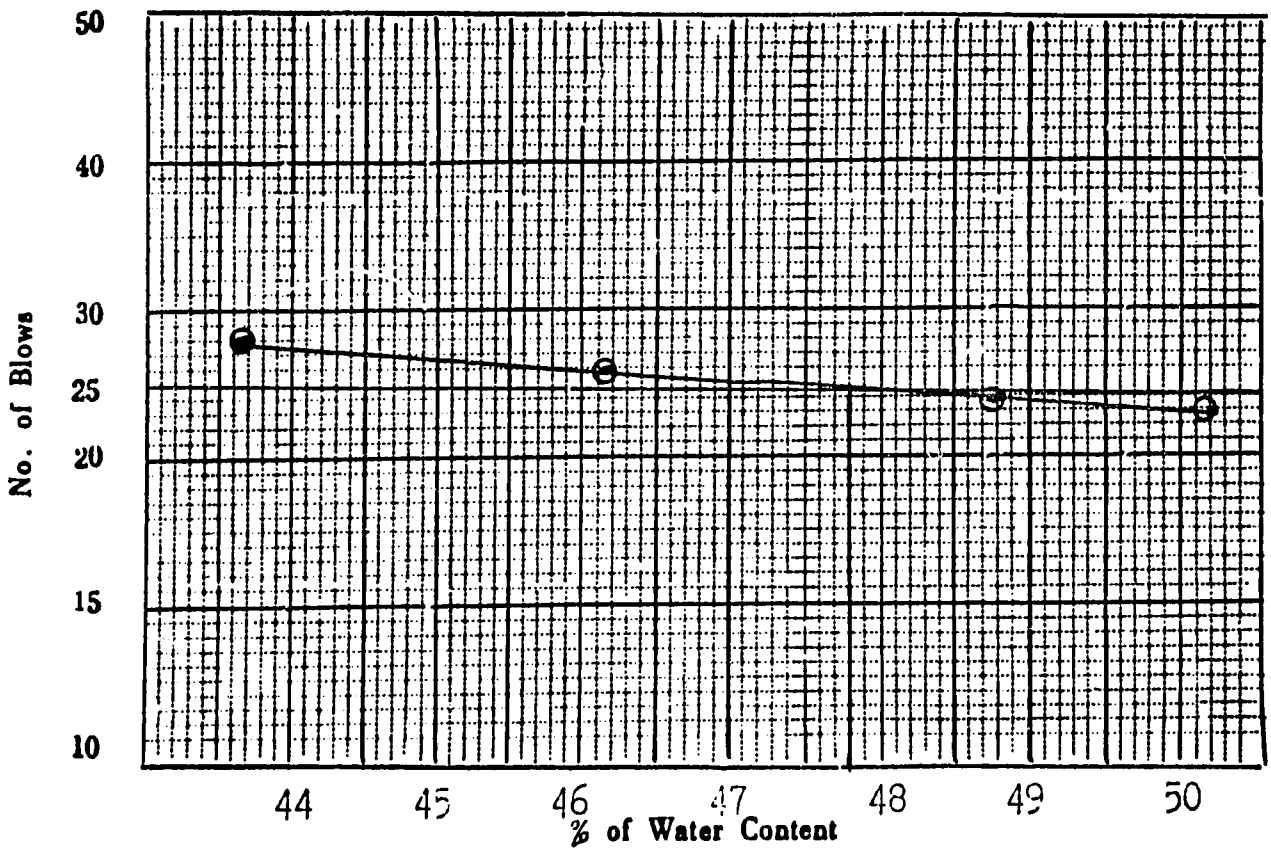
**Borehole no.** 14

**Sample no.** 14

**Depth** 91',6" - 93'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 47.8 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 31.2 | 4 | Plasticity index % | 16.6 |

**FLOW CURVE**




**Tested by** Said... **checked by** Chemist. **date** 16.11/1.77

Md.

214

**Best Available Document**

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Location** Por Said Harbor .

**Description** CH

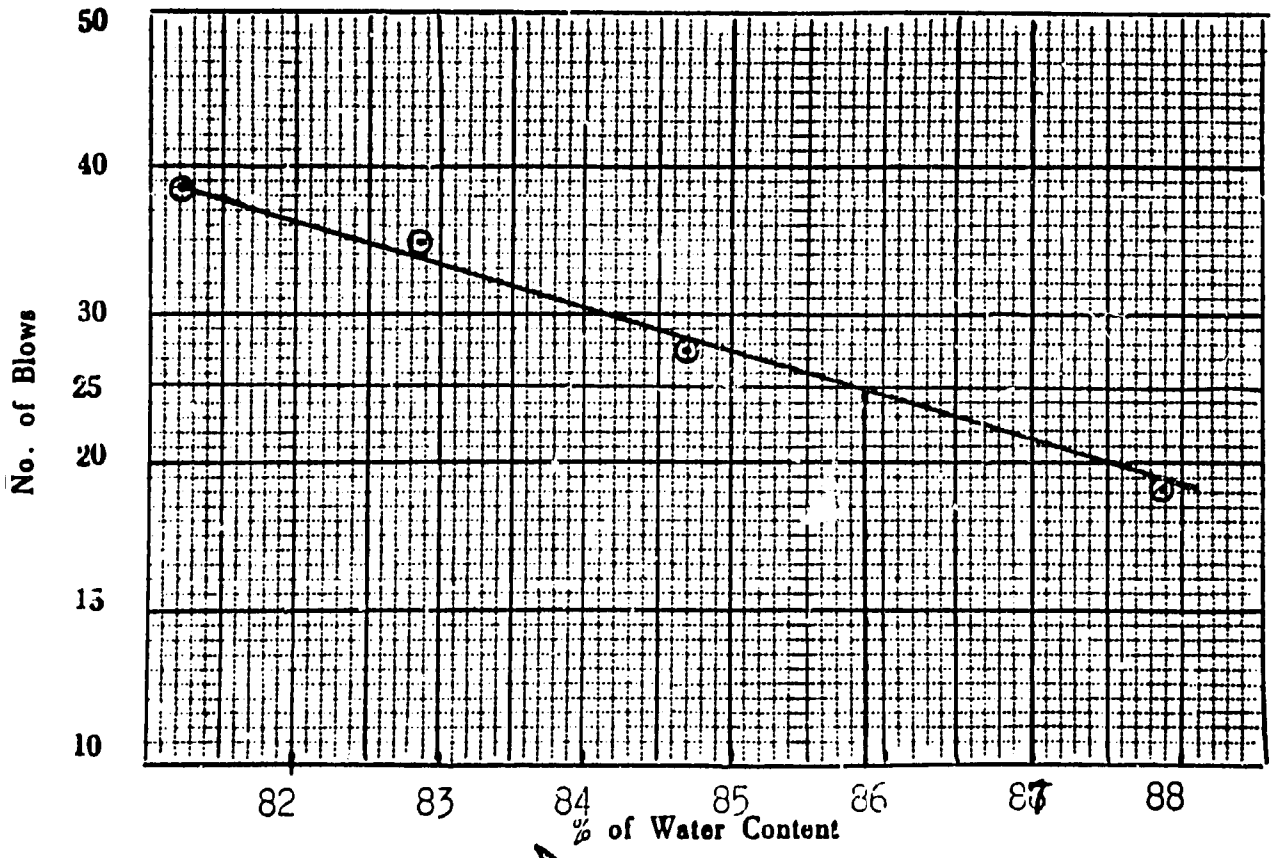
**Borehole no.** S 14

**Sample no.** 15

**Depth** 103' - 104',6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 85.90 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 37.00 | 4 | Plasticity index % | 48.90 |

### FLOW CURVE




**Tested by** Tec. Assist. M.NAGIB M.NAGIB **checked by** Chemist. M.M.EL-Saiedi **date** 11/10/1977

M.S.

217

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849623

## ATTERBERG LIMITS :

**Laboratory No.** 4

**Client**

**Borehole no.** 14

**Location** Por Said Harbor .

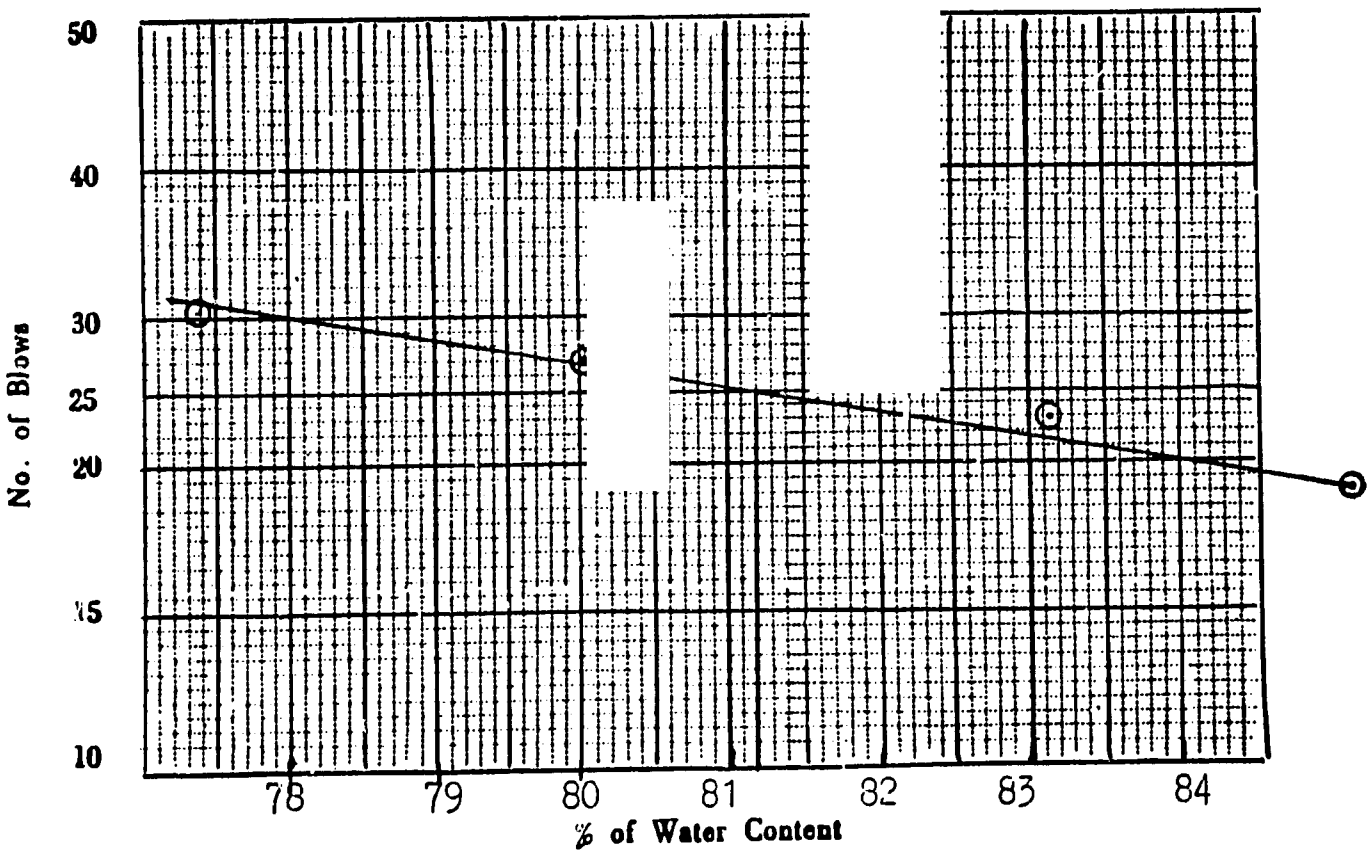
**Sample no.** U.D.S. 6

**Description** MH

**Depth** 120',6" - 122'

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 81.2 | 3 | Limit % | ——— |
| 2 | Plastic Limit % | 47.6 | 4 | index % | 33.6 |

**FLOW CURV**




**Tested by** Tec.Assist. **checked by** Chemist. **date** 19/10/1977

H.HAGIB H.M.EL-Saiedi

218

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849328

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Location Por Said Arbor.

Description II

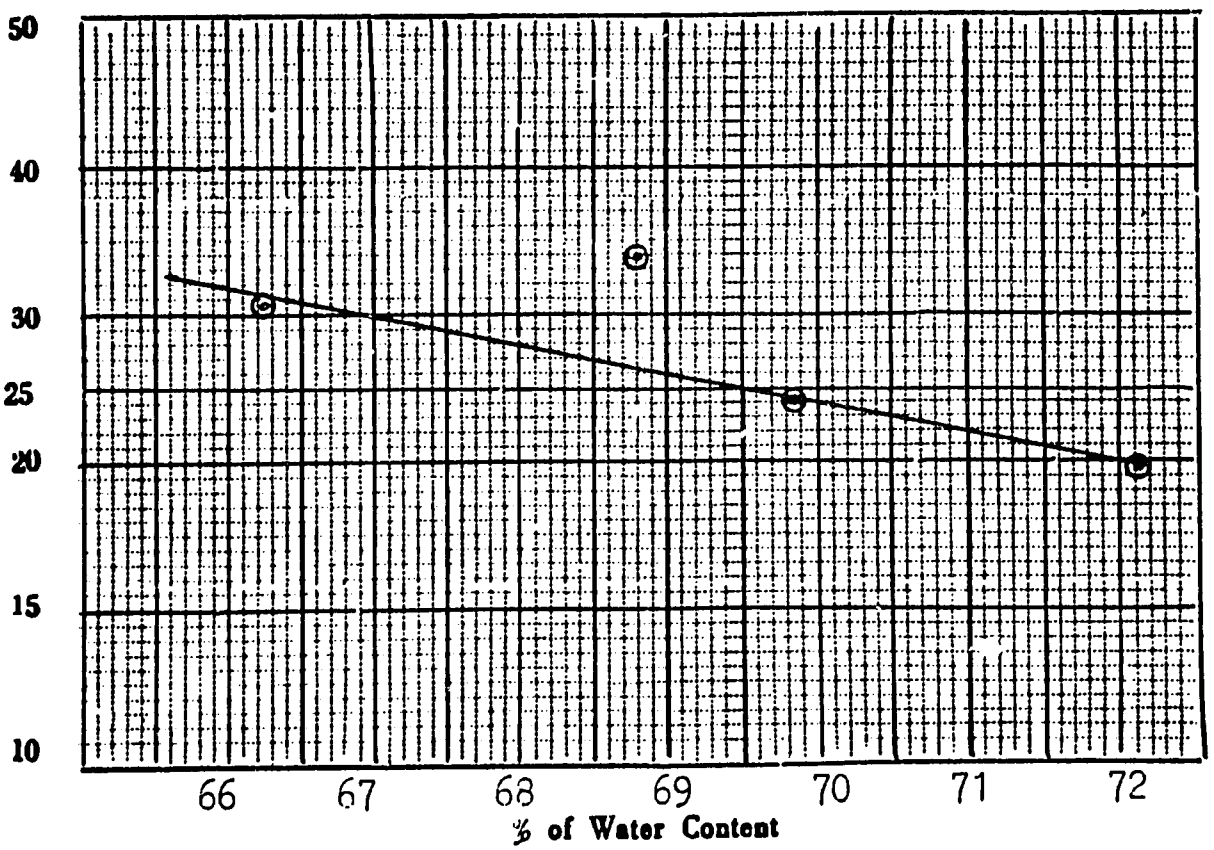
Borehole no. 14

Sample no. 17

Depth 126' - 127',6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 69.5 | 3 | Shrinkage Limit % | —— |
| 2 | Plastic Limit % | 48.8 | 4 | Plasticity index % | 20.7 |

### FLOW CURVE




Tested by Said.H. checked by Chemist. date 15/10/1977

L.M.EL-Saiedi

219

**Raymond International of Delaware, Inc.**
3 A EL SALULI STR. EL DOKI - GIZA
EGYPT - TEL. 849628

## ATTERBERG LIMITS :

Laboratory No. 4

Client

Borehole no. 14

Location Por Said Harbor

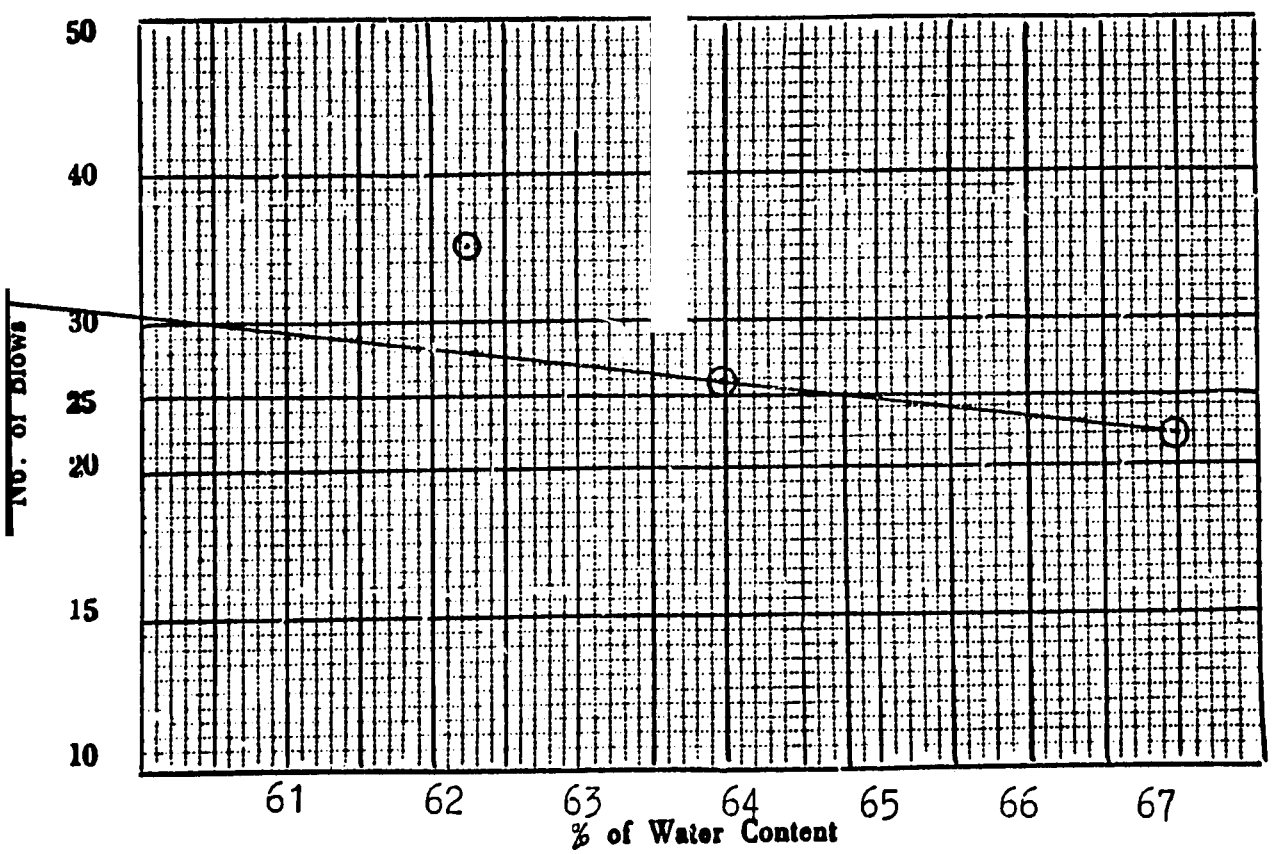
Sample no. U.D.S. 7

Description MH

Depth 131',6" - 133',6"

| Item | Test | Result | Item | Test | Result |
|---|---|---|---|---|---|
| 1 | Liquid Limit % | 64.8 | 3 | Shrinkage Limit % | ——— |
| 2 | Plastic Limit % | 36.1 | 4 | Plasticity index % | 23.7 |

### FLO' CURVE




Tested by Said checked by Chemist. date 19/10/1977

M.F..EL-Saiedi

220