

Figure E-2-1 Reservoir Storage Capacity

P-1 Lam Plai Mat

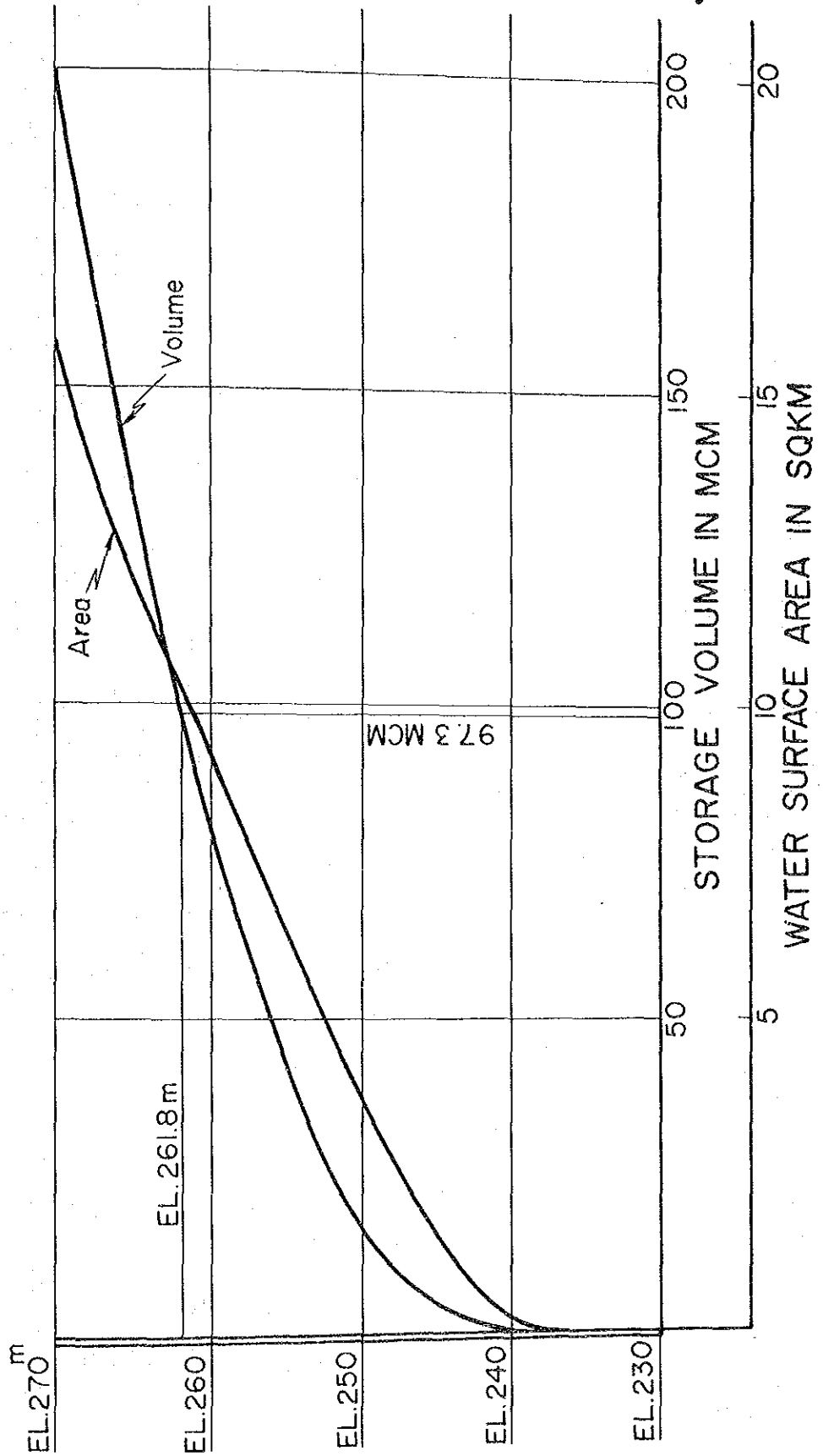


Figure E-2-2 Reservoir Storage Capacity

P-5 Nong Lum Puk

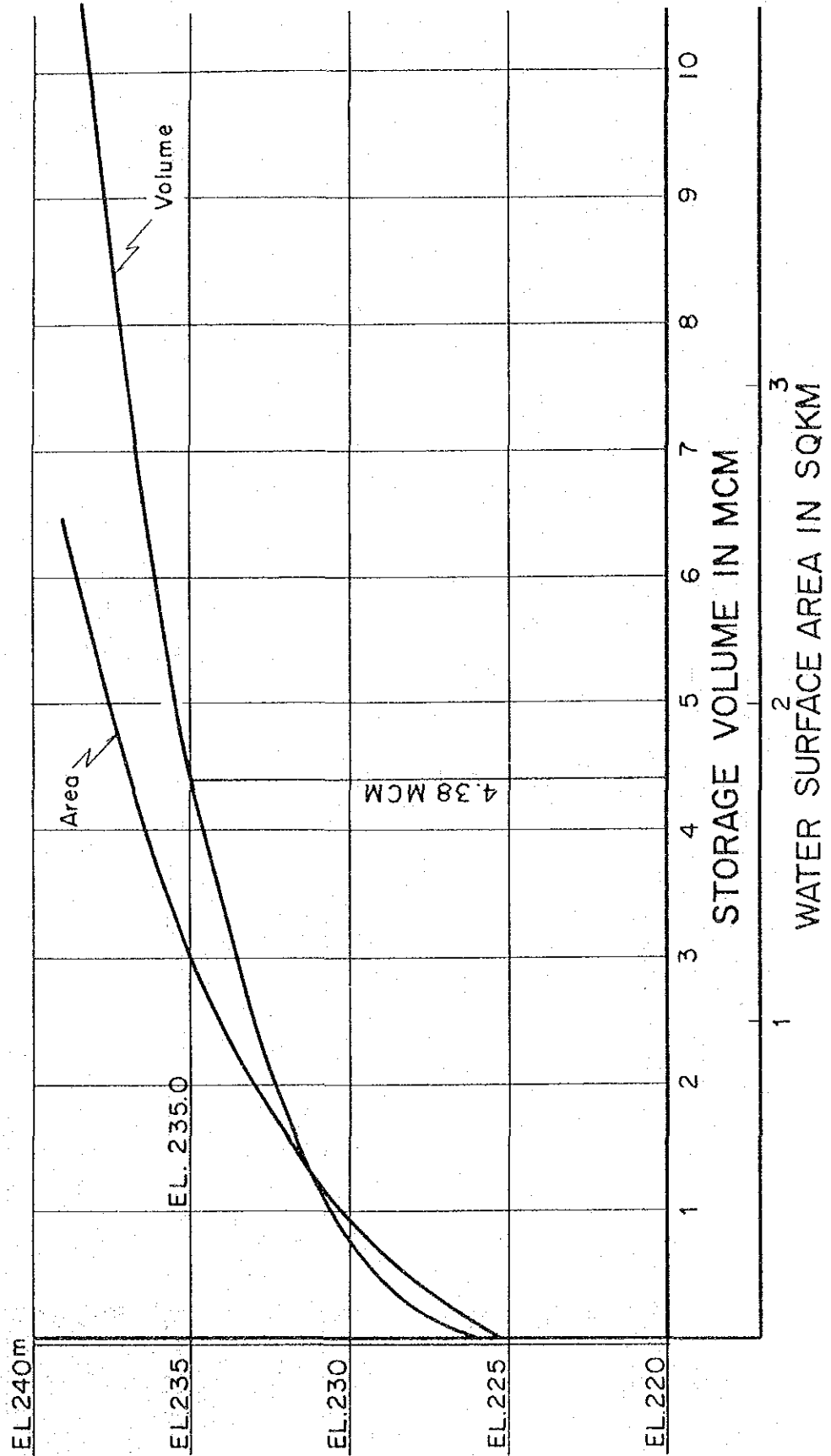
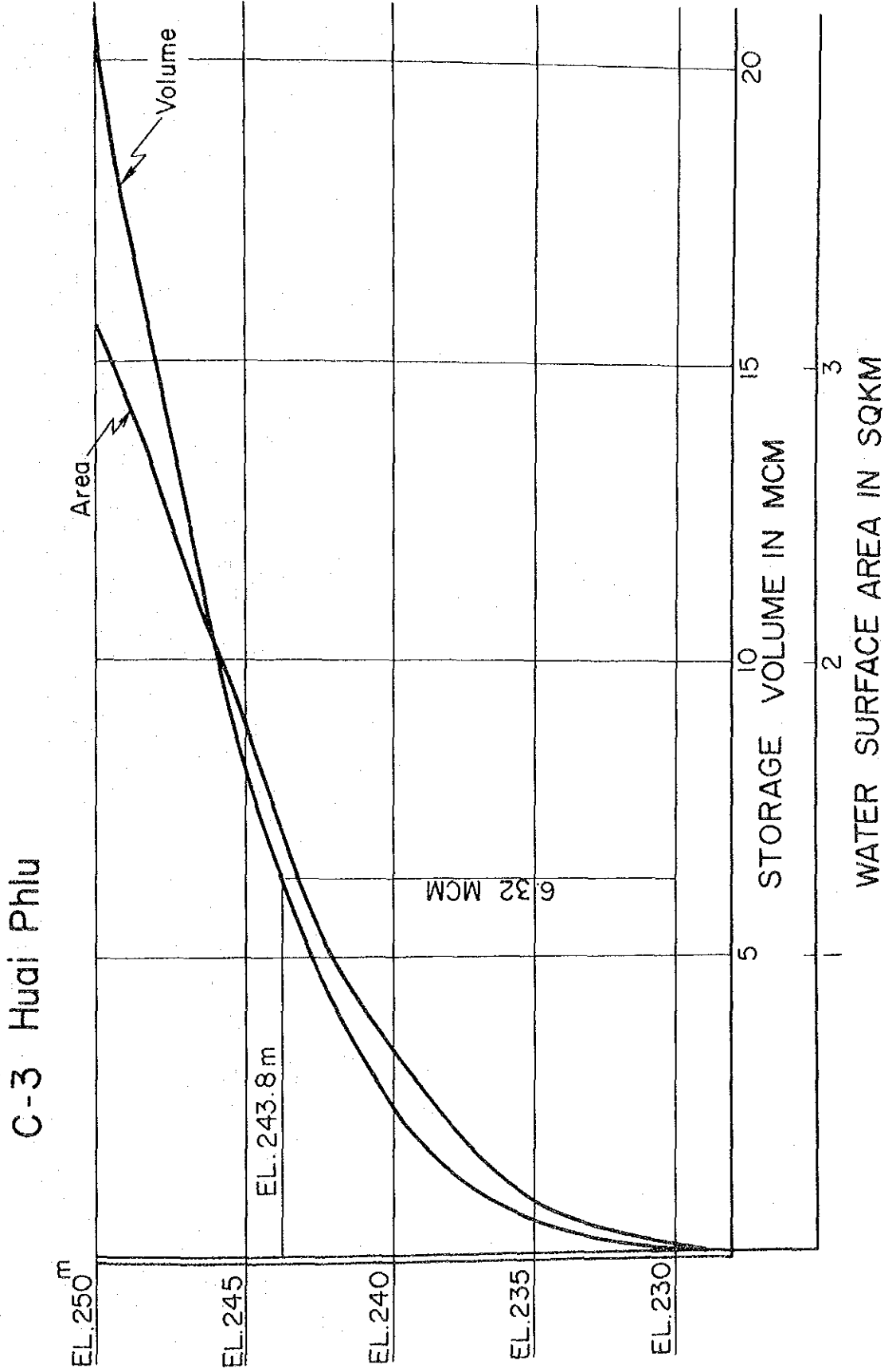


Figure E-23 Reservoir Storage Capacity



ANNEX F STRUCTURES AND FACILITIES

ANNEX F. STRUCTURES AND FACILITIES

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F.1.1. Soil Test

Table F-1-1 (1). SUMMARY OF SOIL TESTS

Sample No.	Unified Soil Classification	Grain-size Analysis					Max. Particle Size (mm)	Specific Gravity of Soil (Gs)	Atterberg Limits				Compaction Test		
		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	0.075 mm (%)			Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (Ip)	Shrinkage Limit (%)	Field Moisture Content (%)	Opt. Water Content (%)	Max. Dry Density (g/cm ³)
LUM PLAI MAT DAM															
TP-1 A	CL	0	33.5	39.5	27.0	4.76	2.60	26.4	16.8	9.6	10.4	14.5	14.1	1.816	ASTM
TP-2 A	ML	0.5	12.0	39.0	49.0	9.52	2.60	41.3	25.9	15.4	12.1	24.0	18.3	1.670	"
TP-1 B	ML	0	29.0	28.0	43.0	4.76	2.58	36.7	25.4	11.3	11.4	23.8	24.3	1.522	"
TP-2 B	ML	0	8.0	43.5	48.5	2.38	2.57	44.2	27.8	16.4	9.6	24.3	21.0	1.603	"
TP-1 C	CL	0	31.0	23.0	46.0	4.76	2.61	30.3	20.8	9.5	10.6	15.6	16.0	1.729	"
TP-2 C	ML	0	1.5	31.5	67.0	2.38	2.59	49.6	33.8	15.8	13.7	23.8	17.6	1.715	"
TP-3 C	CL	1.0	10.5	39.5	49.0	9.52	2.59	38.3	24.6	13.7	9.1	19.8	21.2	1.587	"
TP-4 C	ML	0	10.0	40.0	50.0	4.76	2.62	44.7	29.4	15.3	9.6	18.6	22.9	1.579	"
NONG LUMPHUK															
TP-1 A	GM	65.0	18.0	7.5	9.5	38.1	2.80	52.0	31.6	20.4	18.5	15.6	-	-	-
"	MM	1.5	37.5	36.0	25.0	19.1	2.70	50.0	35.4	14.6	15.8	20.1	-	-	-
TP-1 B	GM	41.0	30.0	12.0	17.0	38.1	2.86	54.7	36.0	18.7	19.8	20.4	-	-	-
TP-1 C	GM	32.0	47.0	8.5	12.5	19.1	2.95	59.7	36.0	23.7	18.4	18.1	-	-	-
HUAI PHLU															
TP-1 A	CL	12.0	37.0	24.0	27.0	38.1	2.62	16.5	13.1	3.4	10.4	11.3	-	-	-
TP-2 B	SM	0	63.0	24.5	12.5	4.76	2.67	38.4	21.7	16.7	14.0	18.2	-	-	-

Table F-1-1 (2). SUMMARY OF SOIL TESTS

Sample No.	Initial Condition of Specimen				Permeability Test			Triaxial Test (U - U)		
	D - value = Max. Yd (%)	Dry Density (g/cm ³)	Wet Density (g/cm ³)	Water Content (%)	Void Ratio (e)	Degree of Saturation (%)	Method	Permeability (τ/m^2)	Cohesion (τ/m^2)	Friction Angle ($^\circ$)
<u>LUM PLAI MAT DAM</u>										
TP-1 A	100	1.816	2.068	13.9	0.432	83.7	Falling Head	4.22×10^{-7}	8.0	26°-00'
"	94.7	1.720	1.932	12.3	0.512	62.5	"	1.32×10^{-6}	3.5	26°-00'
TP-2 B	100	1.601	1.936	20.9	0.605	88.8	Falling Head	6.30×10^{-7}	7.0	10°-30'
"	95	1.522	1.791	17.7	0.689	66.0	"	1.95×10^{-6}	10.0	14°-30'
TP-1 C	100	1.729	2.009	16.2	0.510	82.9	Falling Head	6.47×10^{-7}	4.5	24°-30'
"	95	1.643	1.845	12.3	0.588	54.6	"	1.34×10^{-6}	4.0	24°-36'

กองวิจัยและทดลอง
ที่ ๐๗ 878
วันที่ 24.ค.ศ. 2526

กองวิจัยและทดลอง
กรมชลประทาน

แบบรายงานผลการทดสอบ

เรื่อง รายงานผลการทดสอบ
เลขที่ นจท.

งานทดลอง **คอนกรีตและวัสดุก่อตัววาง** ขอรายงาน
ผลการวิเคราะห์ ทดสอบ ตัวอย่าง **หินเจาะ** เป็นจำนวน
รวมทั้งสิ้น ตัวอย่าง ซึ่งได้จัดส่งมาโดย โครงการ, สำนักงาน-
ชลประทาน **งานสำรวจธรณีวิทยา กองปลัดและธรณีวิทยา**
เป็นตัวอย่างหินจากหลุมเจาะสำรวจ โครงการถนน. ตอนกลาง
จ. นครราชสีมา

สัญญาที่ รายละเอียดผลการวิเคราะห์, ทดสอบ ใต้นแบบมา-
ควยแล้ว ตามรายงาน

Lab. No. (สำคัญงานที่) **M - 10 CA**

Head No.

ค่าทดสอบเป็นเงิน บาท

จึงเสนอมาเพื่อโปรดพิจารณา

15๗๐.๑๗/๖.

Nonrecomtharou

ศาสตราจารย์ ดร. สุนทรธาดา
ม.ค.ศ.

20.ค.ศ. 2526

(ลงชื่อ) *M. S.*

(... นายกำธร... สังขวาดี ...)

ทศว.

13 ค.ศ. 2526

ROYAL IRRIGATION DEPARTMENT
RESEARCH AND LABORATORY DIVISION
CONCRETE AND MATERIALS LABORATORY

Lab.No. H - 10 CA
Project : พจน.หนองจอก อ.อุทัยธานี
Sample : Rock core drills.

Date : October 11, 1983

Tested By :

Checked By:

Table F-1-2 (1). TEST RESULTS OF ROCK CORE DRILLS

Hole No.	Depth m.	Dimension cm.		Specific Gravity	Absorption %	Soundness % loss.	Compressive Strength ksc.
		Diameter	length				
DR 17	3.80-4.30	5.42	10.90	2.39	2.02	6.85	303
DR 18	1.70-2.33	4.12	8.37	2.37	3.03	7.92	430

Date : January 20, 1984
To : SANYU Bangkok Liaison Office
From : Mr. Charnchai Klinhom, RID
Subject : Results of Geological Lab. Test

Would you kindly pass the test results of rock core drills of Nong Lum-Puk Sub-project to Mr. Higushi, Team leader of the Lower N.E. Medium Scale Irrigation Package Project. The test-result is attaching herewith.

Thanking you in advance.

C. Klinhom

Charnchai Klinhom.

ROYAL IRRIGATION DEPARTMENT
RESEARCH AND LABORATORY DIVISION
CONCRETE AND MATERIALS LABORATORY

Lab.No. M - 186CA

Date : January 5, 1984

Project : *Nong Lumbuk, Nakhonratchasima*
พูนทรัพย์ ๗.๓๖๖๖๖๖

Tested By *[Signature]*

Sample : Rock core drills.

Checked By: *Mu*

Table F-1-2 (2). TEST RESULTS OF ROCK CORE DRILLS

Hole No.	Depth m.	Dimension, cm.		Specific-Gravity	Absorption %	Soundness % loss.	Compressive S ksc.
		Diameter	length				
DH.2	7.60-7.83	5.47	8.32	2.72	0.14	1.76	287
DH.2	7.60-7.83	5.47	7.80				308

Figure F-1-1.

LOCATION OF LAM PLAI MAT DAM SITE (P-1)

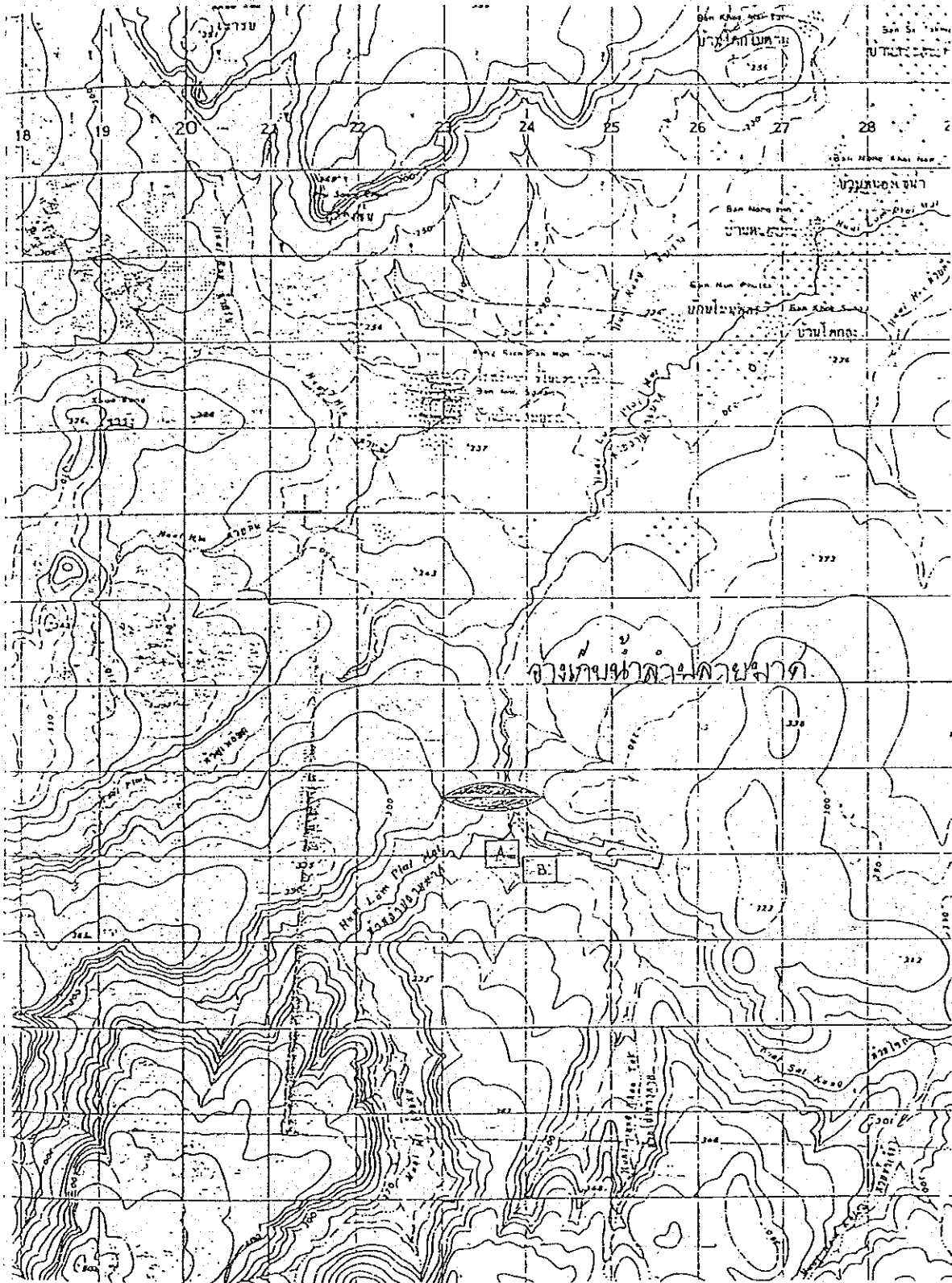


Figure F-1-2

LOCATION OF BORROW PIT OF LAM PLAI MAT DAM (P-1)

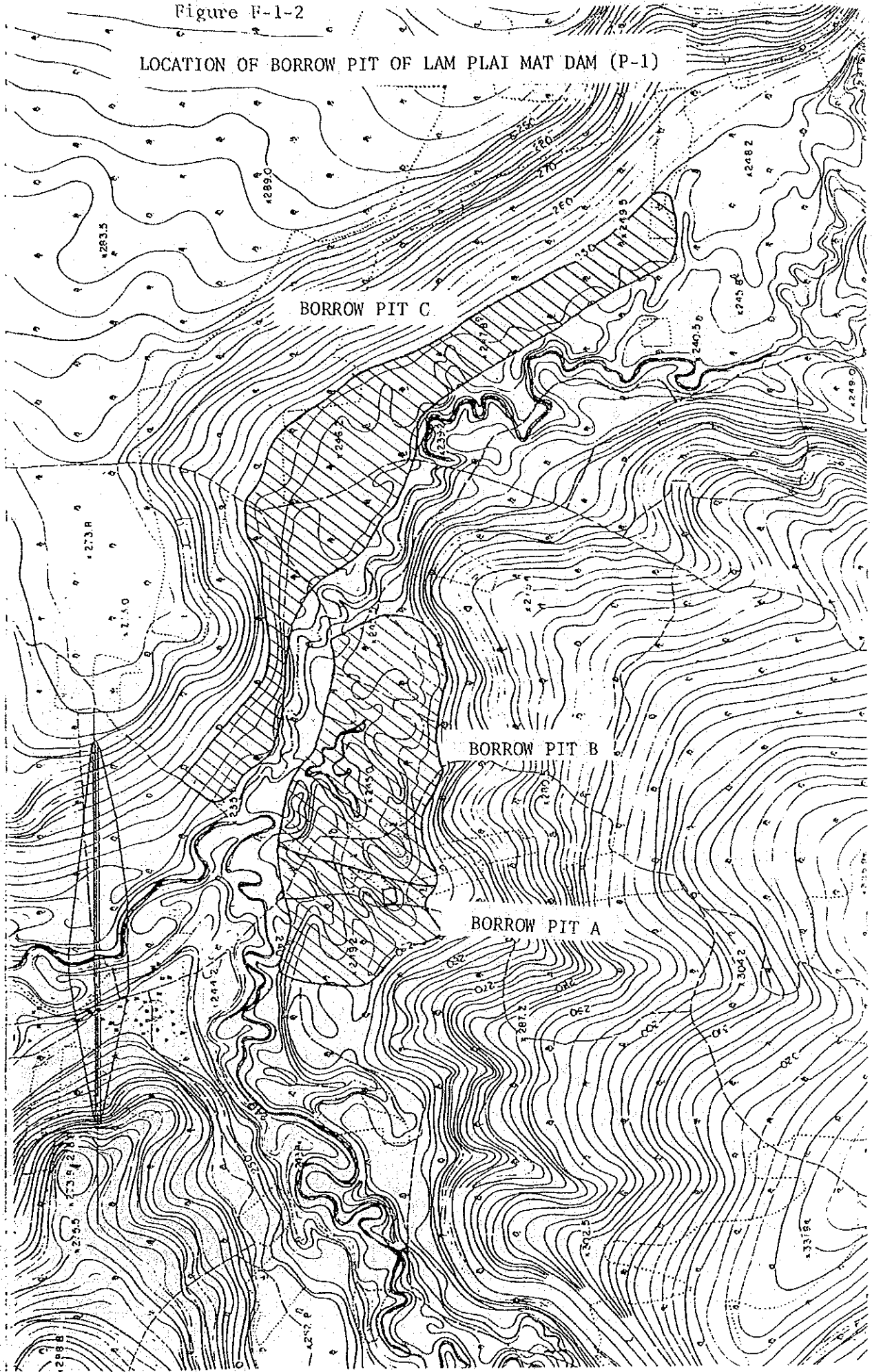


Fig. F-1-3.

LOCATION OF TEST PIT AND AUGER HOLE
LAM PLAI MAT DAM (P-1)

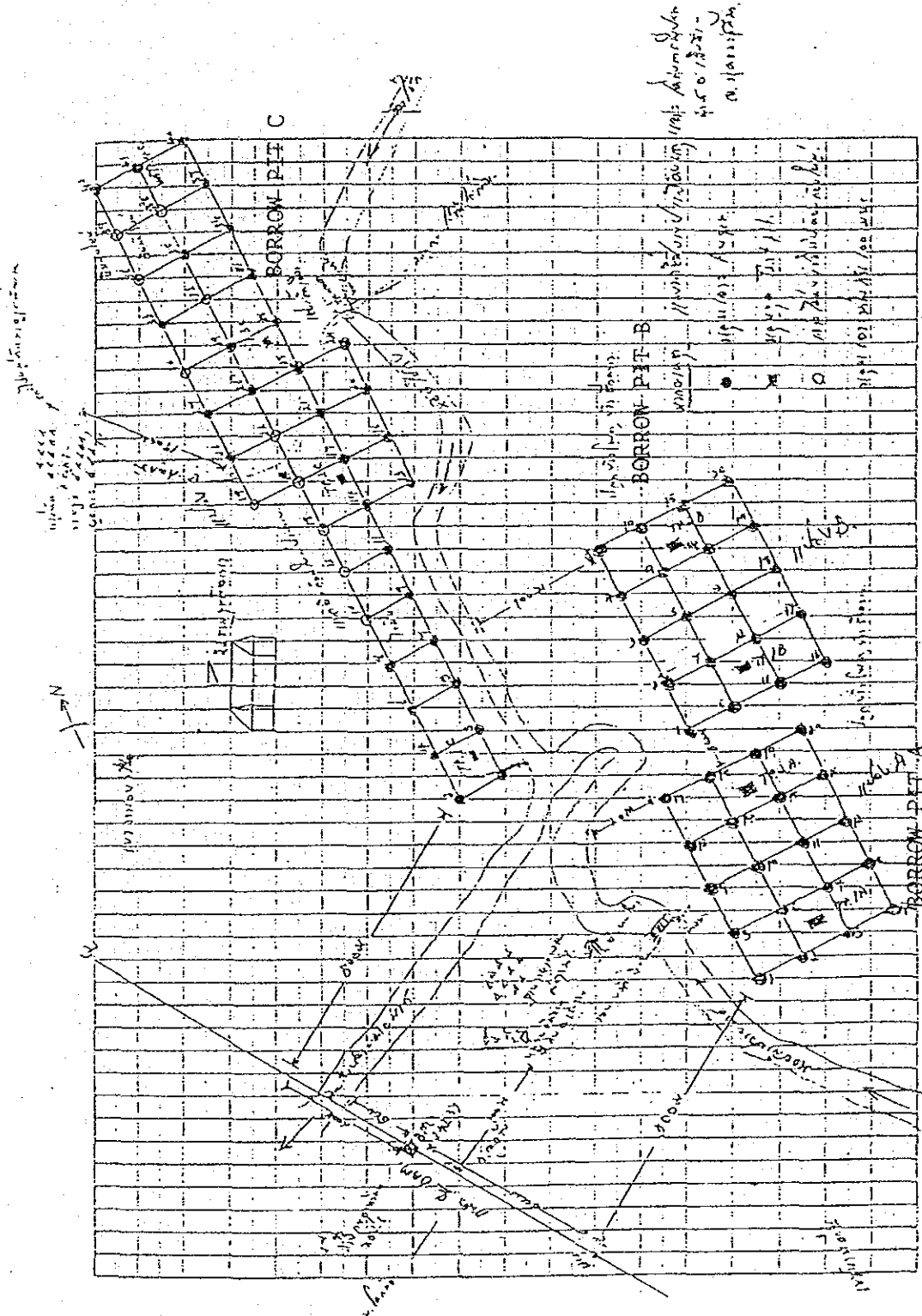


Table F-1-3(1). Unified Soil Classification - Lam Plai Mat

Hole No	Depth (m)		Unified soil Classification	Remarks
	From	To		
A.1	0.00	3.50	ML = Sandy silt.	
A.2	0.00	3.50	ML = Sandy silt.	
A.3	0.00	1.50	SM = Silty sand.	Laterite.
A.4	0.00	1.00	GM = Silty gravel.	
A.5	0.00	3.50	CL = Silty clay.	
A.6	0.00	3.50	CL = Silty clay.	
A.7	0.00	2.50	CL = Silty clay.	
A.8	0.00	1.70	ML = Sandy silt.	Laterite.
A.9	0.00	3.00	ML = Sandy silt.	
A.10	0.00	3.50	ML = Silty clay.	
A.11	0.00	3.00	CL = Silty clay.	
A.12	0.00	3.50	CL = Silty clay.	W.T. 2.50 m.
A.13	0.00	3.00	ML = Sandy silt.	
A.14	0.00	3.00	CL = Silty clay.	
A.15	0.00	3.50	CL = Silty clay.	
A.16	0.00	3.50	CL = Silty clay.	W.T. 2.50 m.
A.17	0.00	1.70	ML = Sandy silt.	W.T. 2.50 m.
A.18	0.00	3.50	CL = Silty clay.	
A.19	0.00	1.70	CL = Silty clay.	Laterite.
A.20	0.00	1.70	CL = Silty clay.	Laterite.
TP.1A	0.00	6.00	ML = Sandy silt.	
TP.2A	0.00	3.50	CL = Silty clay.	W.T. 3.00 m.

Table F-1-3(2). Unified Soil Classification - Lam Plai Mat

รายละเอียดการจำแนกดิน ในสนามของแปลง B
โครงการลำพลายนาผา อ.เสิงสาง จ.นครราชสีมา

Hole No.	Depth (m)		Unified Soil Classification	Remarks.
	From	To		
B.1	0.00	3.50	CL = Silty clay.	
B.2	0.00	3.50	CL = Silty clay.	
B.3	0.00	3.50	CL = Silty clay.	
B.4	0.00	3.50	ML = Sandy silt.	
B.5	0.00	3.50	ML = Sandy silt.	
B.6	0.00	3.50	CL = Silty clay.	
B.7	0.00	2.50	CL = Silty clay.	
B.8	0.00	3.50	CL = Silty clay.	
B.9	0.00	3.50	CL = Silty clay.	
B.10	0.00	3.50	CL = Silty clay.	
B.11	0.00	3.50	CL = Silty clay.	
B.12	0.00	3.50	CL = Silty clay.	
B.13	0.00	3.50	CL = Silty clay.	
B.14	0.00	3.50	CL = Silty clay.	
B.15	0.00	3.50	CL = Silty clay.	
B.16	0.00	0.70	CL = Silty clay.	
B.17	0.00	3.50	CL = Silty clay.	
B.18	0.00	3.50	CL = Silty clay.	
B.19	0.00	3.50	CL = Silty clay.	
B.20	0.00	3.50	CL = Silty clay.	
TP.1B	0.00	6.00	ML = Clayey silt.	WT.2.60 m.
TP.2B	0.00	6.00	CL = Silty clay.	WT.1.70

Table P-1-3 (3). Unified Soil Classification - Lam Plai Mat

รายละเอียดการจำแนกดินในลุ่มของแปลง ๘

โครงการถ้ำลายผา อ.เลิงสา จ.นครราชสีมา

Hole No.	Depth (m.)		Unified Soil Classification	Remarks.	
	From	To			
C.1	0.00	4.00	ML = Sandy silt.	Rock.	
C.2	0.00	1.40	ML = Sandy silt.		
C.3	0.00	4.00	CL = Silty clay.		
C.4	0.00	2.00	ML = Sandy silt.		
C.5	0.00	3.50	CL = Silty clay.		
C.6	0.00	1.50	ML = Sandy silt.		
C.7	0.00	4.00	CL = Silty clay.		
C.8	0.00	1.20	CL = Silty clay.		
C.9	0.00	2.50	ML = Sandy silt.		
C.10	-	-	Rock.		
C.11	0.00	1.50	CL = Silty clay.		
C.12	-	-	Rock.		
C.13	0.00	3.50	ML = Sandy silt.		
C.14	0.00	3.50	CL = Silty clay.		
C.15	-	-	Rock.		
C.16	0.00	3.50	CL = Silty clay.		
C.17	0.00	3.50	CL = Silty clay.		
C.18	-	-	Rock.		
C.19	-	-	Rock.		
C.20	0.00	3.50	CL = Silty clay.		
C.21	0.00	3.50	CL = Silty clay.		
C.22	-	-	Rock.		
C.23	0.00	2.00	ML = Sandy silt.		
C.24	0.00	3.50	CL = Silty clay.		
C.25	0.00	4.00	CL = Silty clay.		
C.26	0.00	3.00	CL = Silty clay.		
C.27	0.00	3.50	CL = Silty clay.		
C.28	0.00	3.50	CL = Silty clay.		
C.29	0.00	1.60	ML = Sandy silt.		WT. 1.0cm.
C.30	-	-	Rock.		
C.31	0.00	3.50	CL = Silty clay.		

Table F-1-3 (4). Unified Soil Classification - Lam Plai Mat

Hole No.	Depth (m.)		Unified Soil Classification	Remarks.
	From	To		
G.32	-	-	Rock.	
G.33	0.00	3.10	ML = Sandy silt.	
G.34	0.00	3.50	ML = Sandy silt.	
G.35	0.00	3.00	ML = Sandy silt.	
G.36	-	-	Rock.	
G.37	0.00	3.50	CL = Silty clay.	
G.38	-	-	Rock.	
G.39	-	-	Rock.	
G.40	0.00	4.00	CL = Silty clay.	
G.41	0.00	4.00	CL = Silty clay.	
G.42	0.00	3.00	ML = Sandy silt.	
TP.10	0.00	4.50	CL = Silty clay.	
TP.20	0.00	6.00	CL = Silty clay.	WT.2.00 m.
TP.30	0.00	6.00	CL = Silty clay.	
TP.40	0.00	6.00	CL = Silty clay.	

Fig. F-1-4. LOCATION OF NONG LUMPHUK DAM SITE (P-5)

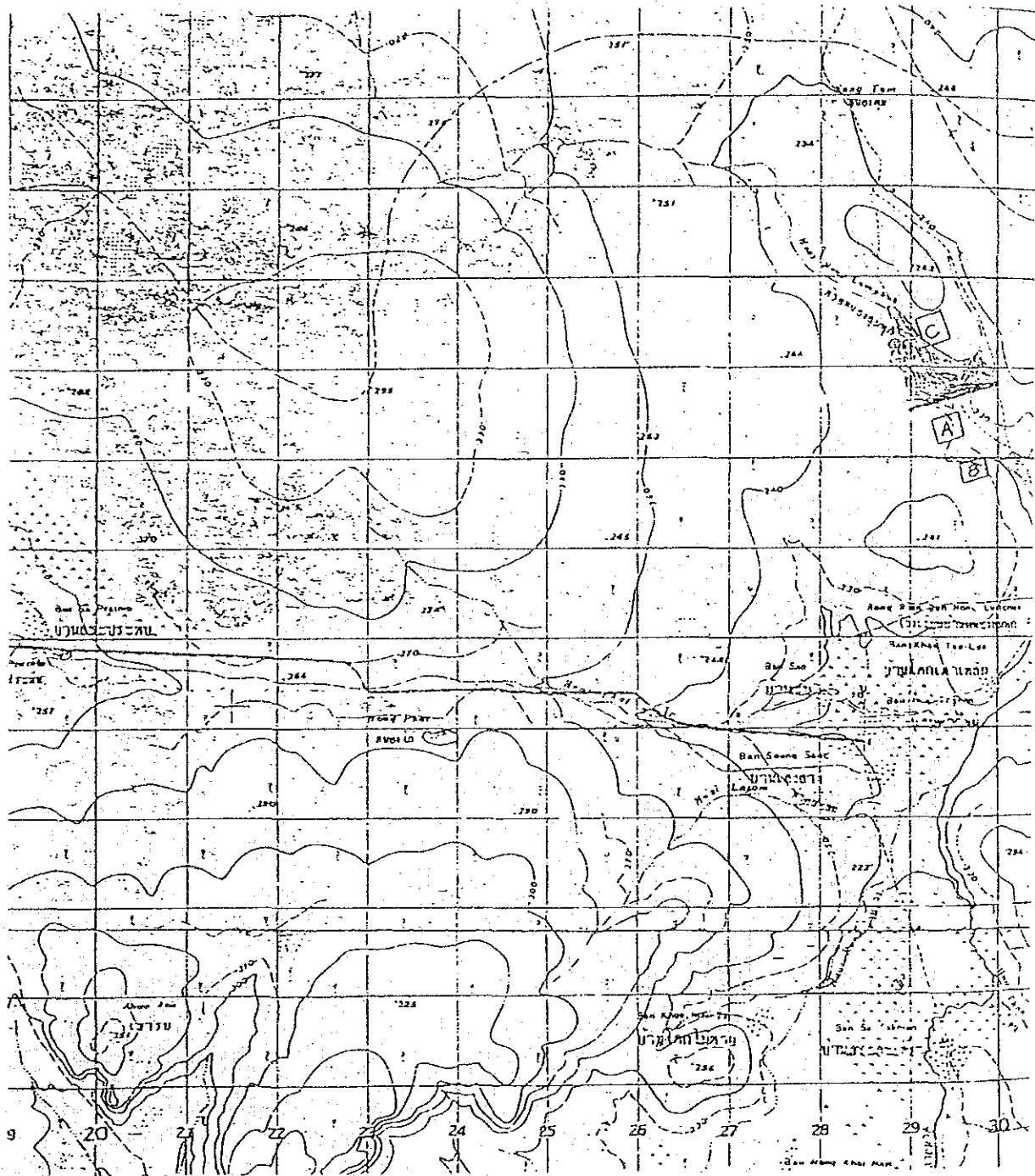


Fig. F-1-5. LOCATION OF BORROW PIT OF NONG LUMPHUK DAM (P-5)

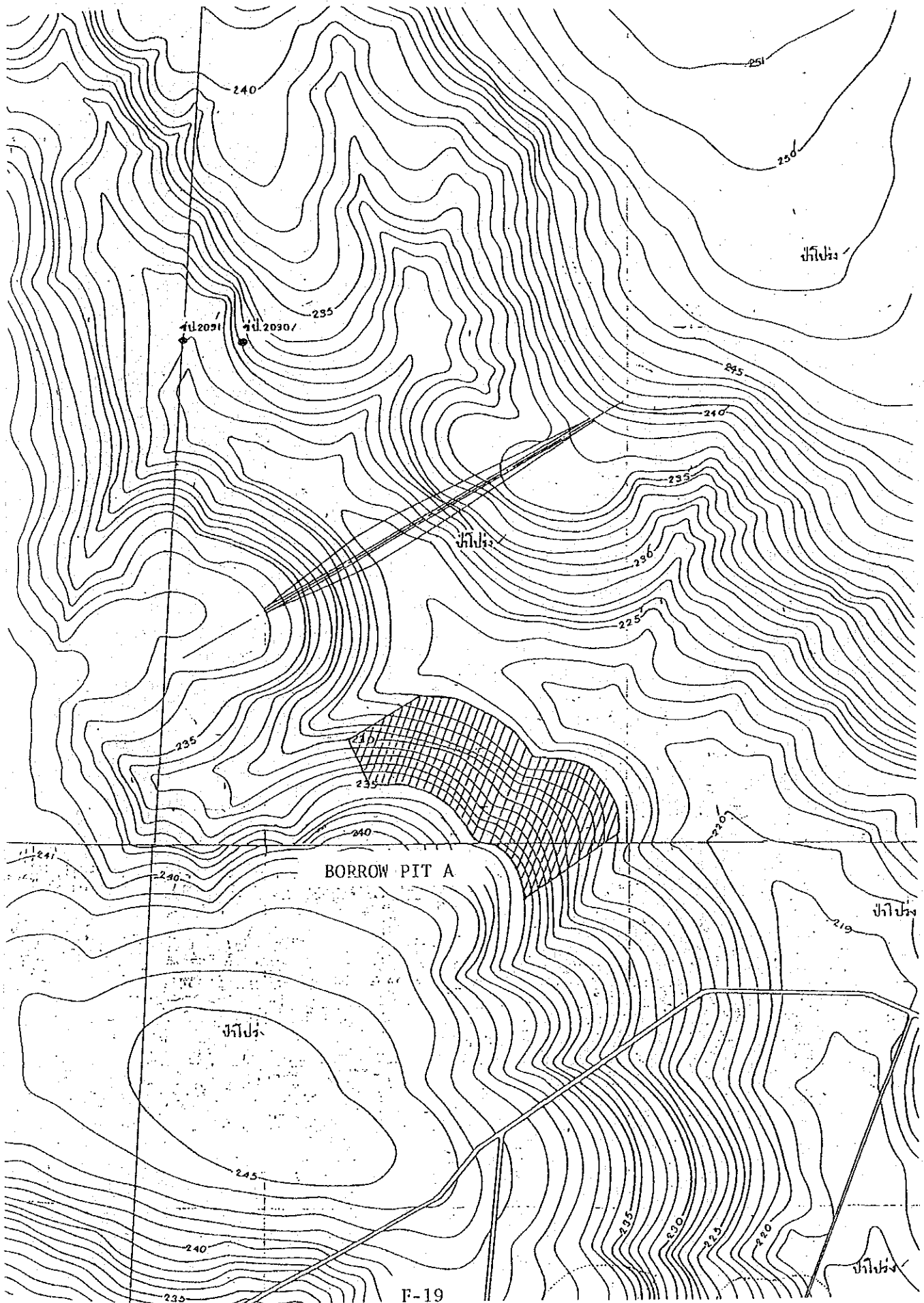


Fig. F-1-6.

LOCATION OF TEST PIT AND AUGER HOLE
NONG LUMPHUK DAM (P-5)

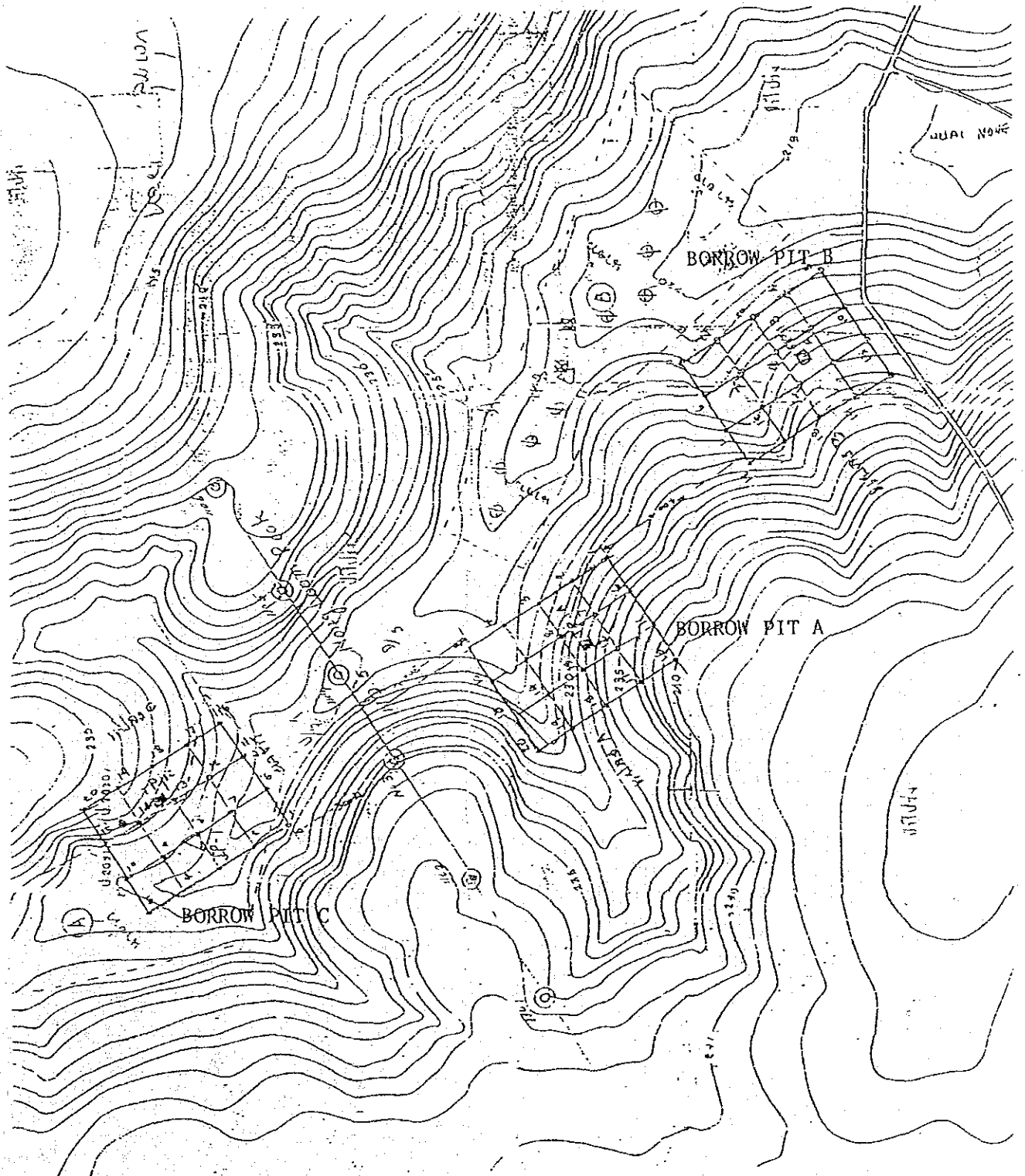


Table F-1-4 (1). Unified Soil Classification - Nong Lum Puk
 กรมชลประทานภาคตะวันออกเฉียงเหนือ
 โครงการหนองสมบูรณ์ 3.1 จังหวัด อ.นครราชสีมา

	Depth (m.)		Unified Soil Classification	Remarks
	From	To		
A.1	0.00	2.70	CL = Gravelly clay.	
A.2	0.00	3.00	CL = Gravelly clay.	
A.3	0.00	3.00	CL = Gravelly clay.	
A.4	0.00	3.00	ML = Sandy silt, laterite.	
A.5	0.00	3.00	CL = Silty clay.	
A.6	0.00	3.00	CL = Silty clay, Laterite.	WT.2.50 m.
A.7	0.00	3.00	CL = Silty clay.	
A.8	0.00	2.00	CL = Gravelly clay.	Laterite.
A.9	0.00	3.00	CL = Gravelly clay.	
A.10	0.00	1.50	CL = Silty clay.	
	1.50	2.00	GM = Silty gravel.	
A.11	0.00	3.50	ML = Sandy silt, Laterite.	WT.3.00 m.
A.12	0.00	3.00	CL = Gravelly clay.	
A.13	0.00	3.00	ML = Sandy silt, Laterite.	Laterite.
A.14	0.00	1.70	CL = Gravelly clay.	Laterite.
A.15	0.00	1.90	CL = Gravelly clay.	
A.16	0.00	3.00	CL = Gravelly clay.	
A.17	0.00	3.00	ML = Sandy silt, Laterite.	
A.18	0.00	1.70	ML = Sandy silt, Laterite.	
A.19	0.00	3.00	ML = Sandy silt, Laterite.	
A.20	0.00	3.00	ML = Sandy silt, laterite.	
TP.1A	0.00	2.00	GM = Clayey gravel.	
	2.00	6.00	CL = Silty clay.	

Table F-1-4 (2). Unified Soil Classification - Nong Lum Puk

รายละเอียดการจำแนกดินในสนาม ของบดลง B

โครงการหนองลุมพุก อ.เวียงสาจ จ.นครราชสีมา

Hole No.	Depth (m.)		Unified Soil Classification	Remarks
	From	To		
B.1	0.00	1.90	CL = Gravelly clay.	
B.2	0.00	2.00	CL = Silty clay.	
B.3	0.00	2.50	CL = Silty clay.	
B.4	0.00	1.80	CL = Gravelly clay.	
B.5	0.00	2.00	CL = Gravelly clay.	
	2.00	3.50	ML = Sandy silt.	
B.6	0.00	1.00	CL = Silty clay.	Laterite.
B.7	0.00	1.50	ML = Sandy silt, Laterite.	Laterite.
B.8	0.00	1.70	ML = Sandy silt, Laterite.	Laterite.
B.9	0.00	3.50	CL = Silty clay, Laterite.	
B.10	0.00	2.00	CL = Gravelly clay.	
B.11	0.00	3.50	CL = Silty clay, Laterite.	
B.12	0.00	2.20	ML = Sandy silt, Laterite.	WT. 1.20 m.
B.13	0.00	2.00	CL = Gravelly clay.	
B.14	0.00	1.70	CL = Gravelly clay.	
B.15	0.00	3.50	CL = Gravelly clay.	
B.16	0.00	2.50	CL = Silty clay, Laterite.	
B.17	0.00	2.00	CL = Gravelly clay.	
B.18	0.00	2.50	CL = Gravelly clay.	WT. 2.10 m.
B.19	0.00	2.00	CL = Gravelly clay.	
B.20	0.00	3.50	ML = Sandy silt, Laterite.	
TP.1B	0.00	2.70	CL = Gravelly clay.	Rock.

Table F-1-4 (3). Unified Soil Classification - Nong Lum Puk
 1. แผนและข้อมูลการจำแนกดิน ในสนามของแปลง C
 โครงการถนนของลุมพุก อ.เวียงจันทน์ จ.มหาราษฏร์

Hole No.	Depth (m.)		Unified Soil Classification	Remarks
	From	To		
C.1	0.00	1.70	CL = Gravelly clay.	WT. 0.80m. Laterite
C.2	0.00	1.50	CL = Gravelly clay.	"
C.3	0.00	2.00	ML = Clayey silt.	
	2.00	2.50	GM = Silty Gravel.	WT. 0.20m. Laterite
C.4	0.00	1.00	CL = Silty clay.	Laterite.
C.5	0.00	1.20	GM = Silty Gravel.	"
C.6	0.00	2.00	CL = Silty clay.	WT. 0.50 m.
C.7	0.00	2.50	CL = Silty clay.	WT. 0.50 m.
C.8	0.00	2.70	CL = Silty clay.	
C.9	0.00	3.50	CL = Silty clay.	WT. 2.50 m.
C.10	0.00	2.50	CL = Silty clay.	
C.11	0.00	1.50	CL = Gravelly clay.	Laterite.
C.12	0.00	1.60	ML = Sandy silt, Laterite.	"
C.13	0.00	1.70	ML = Sandy silt, Laterite.	"
C.14	0.00	1.80	CL = Silty clay.	"
C.15	0.00	1.80	CL = Silty clay.	"
C.16	0.00	1.70	ML = Sandy silt, Laterite.	"
C.17	0.00	1.50	ML = Sandy silt, Laterite.	"
C.18	0.00	1.00	ML = Sandy silt, Laterite.	"
C.19	0.00	1.50	ML = Sandy silt, Laterite.	"
C.20	0.00	1.60	CL = Gravelly clay.	"
TP.1C	0.00	3.00	CL = Gravelly clay.	Rock.

Fig. F-1-7.

LOCATION OF HUAI PHLU DAM SITE (C-3)

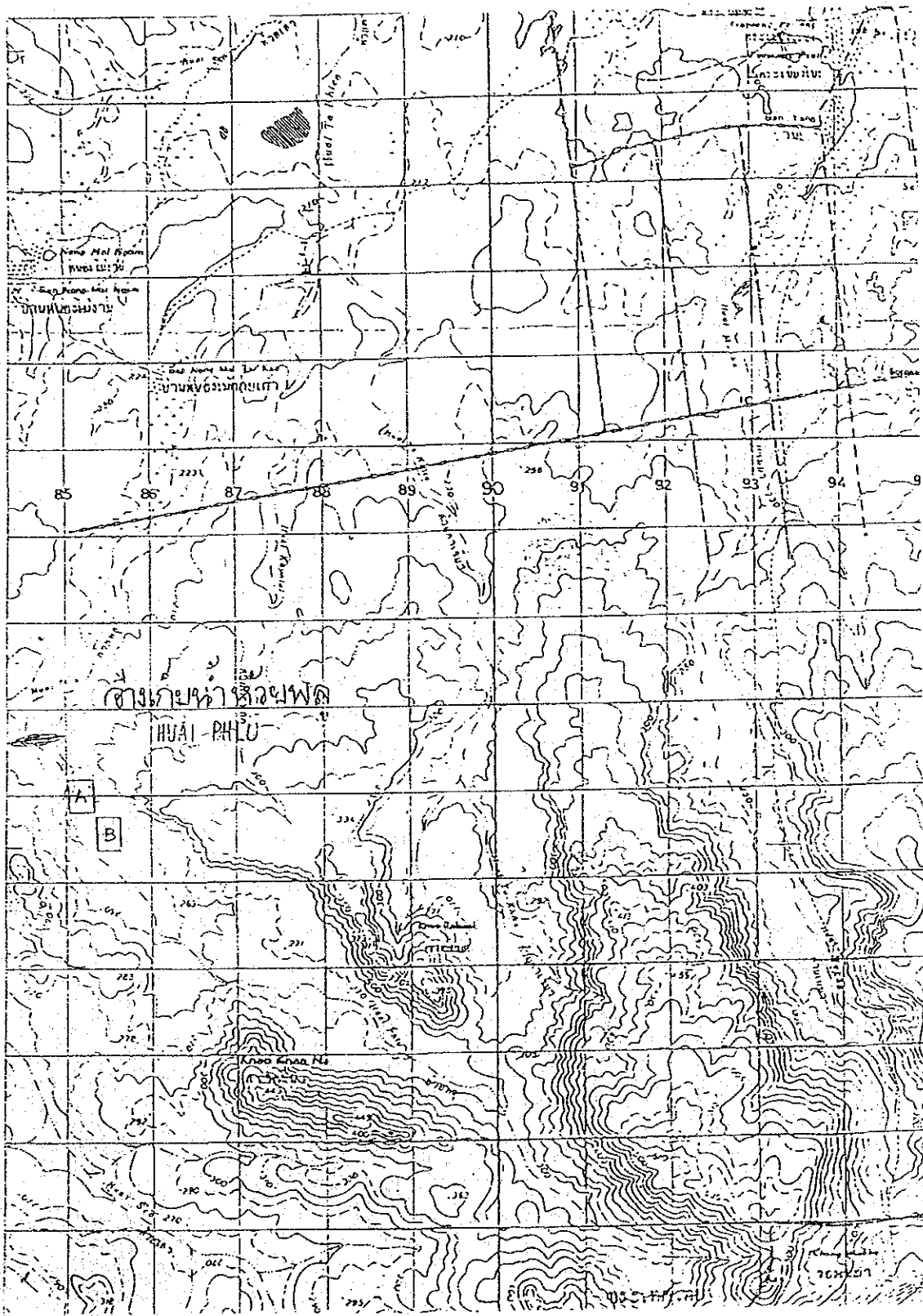


Fig. F-1-8.

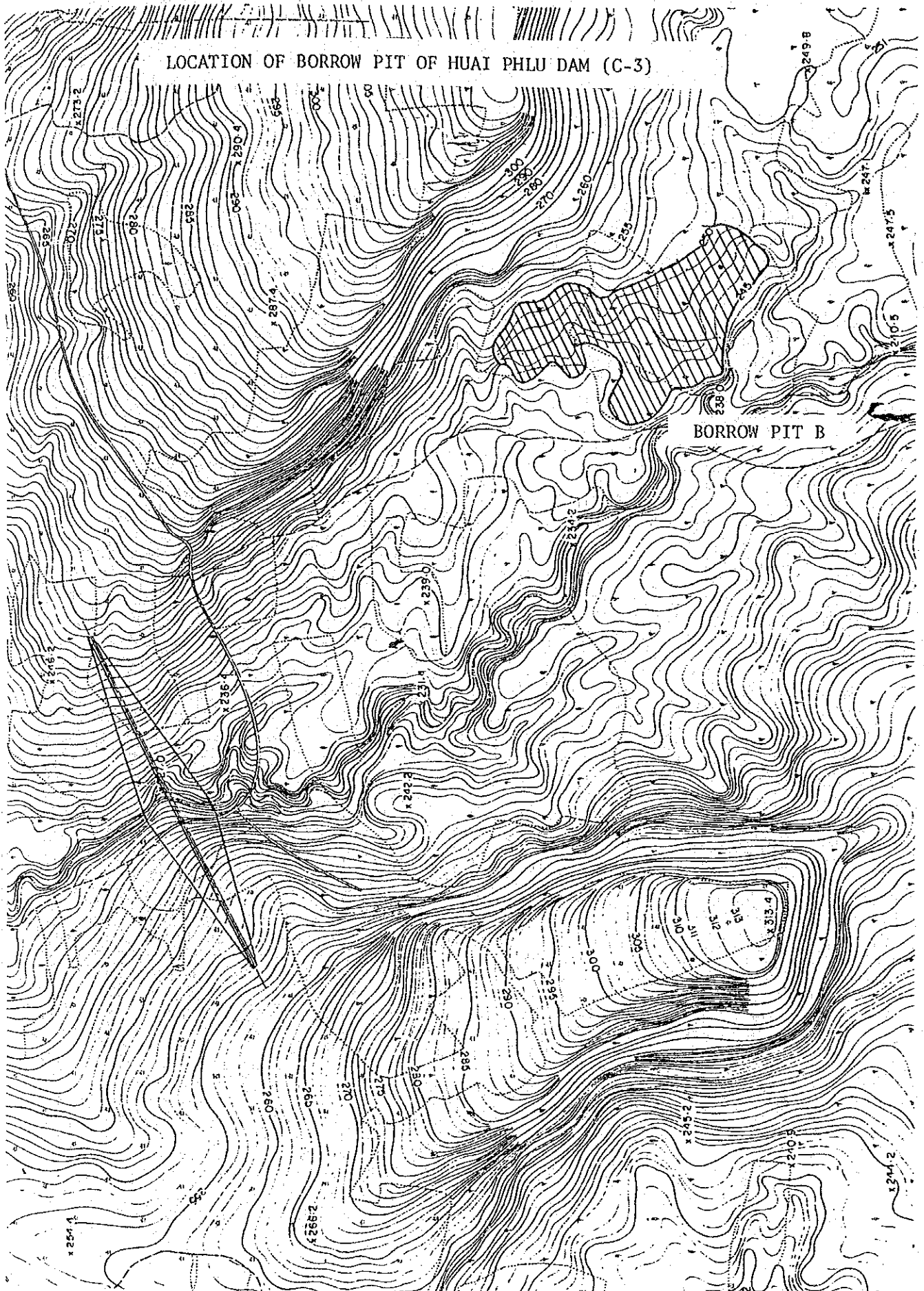


Fig. F-1-9.

LOCATION OF TEST PIT AND AUGER HOLE
HUAI PHLU DAM (C-3)

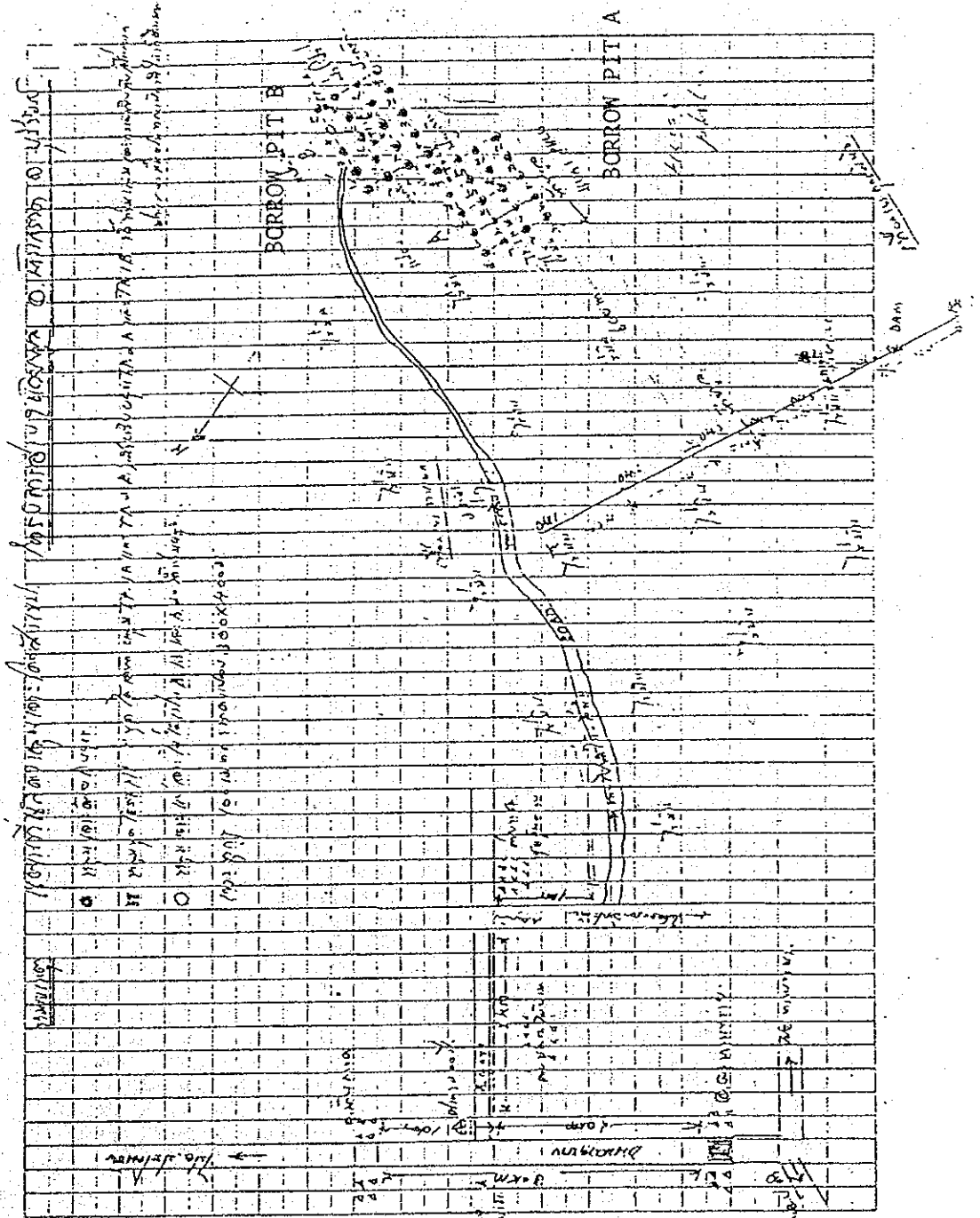


Table F-1-5. (1). Unified Soil Classification - Huai Phlu

รายละเอียดการจำแนกดินในสนาม ของแปลง A

โครงการหน่วยพล อ.บ้านกรวด จ.บุรีรัมย์

Hole No.	Depth (m.)		Unified Soil Classification	Remarks
	From	To		
A.1	0.00	3.30	ML = Sandy silt.	
A.2	0.00	3.00	ML = Sandy silt.	WT. 1.80 m.
A.3	0.00	3.00	ML = Sandy silt.	WT. 1.50 m.
A.4	0.30	2.00	ML = Clayey silt, fine sand.	WT. 0.60 m.
A.5	0.00	3.00	ML = Clayey silt, fine sand.	
A.6	0.00	3.00	ML = Clayey silt, fine sand.	
A.7	0.00	3.50	ML = Clayey silt, fine sand.	
A.8	0.00	3.00	ML = Clayey silt, fine sand.	WT. 1.00 m.
A.9	0.00	3.50	ML = Sandy silt.	
A.10	0.00	3.50	ML = Clayey silt, fine sand.	Rock.
A.11	0.00	1.00	ML = Clayey silt, fine sand.	WT. 1.00 m.
A.12	0.00	3.00	ML = Clayey silt, fine sand.	WT. 0.50 m.
A.13	0.00	3.00	ML = Clayey silt, fine sand.	
A.14	0.00	3.00	ML = Clayey silt, fine sand.	
A.15	0.00	3.00	ML = Clayey silt, fine sand.	
A.16	0.00	1.50	ML = Clayey silt, fine sand.	WT. 0.10 m.
A.17	0.00	2.50	ML = Sandy silt.	WT. 0.50 m. Rock.
A.18	0.00	3.00	ML = Sandy silt.	WT. 1.10 m.
A.19	0.00	3.00	ML = Clayey silt, fine sand.	WT. 1.00 m.
A.20	0.00	2.50	ML = Clayey silt, fine sand.	WT. 1.00 m.
TP. 1A	0.00	6.00	ML = Clayey silt, fine sand.	WT. 3.70 m.

Table F-1-5 (2). Unified Soil Classification - Huai Phly
 เลขที่สำรวจดิน 0.บ้านกรวด จ.บุรีรัมย์

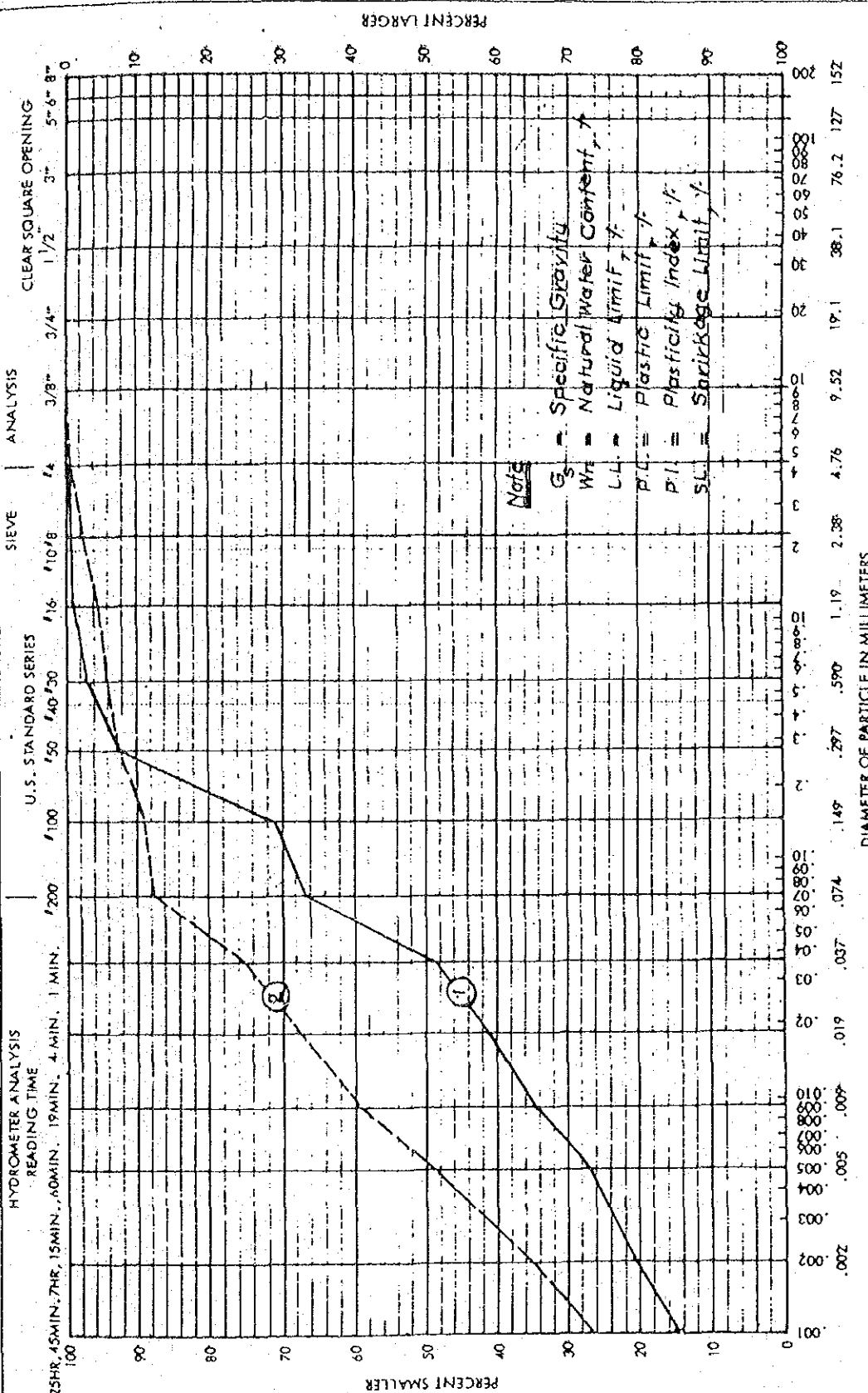
Hole No.	Depth (m.)		Unified Soil Classification	Remarks
	From	To		
B.1	0.00	3.00	ML = Clayey silt, fine sand.	WT. 1.50 m.
B.2	0.00	3.00	ML = Sandy silt.	WT. 0.30 m.
B.3	0.00	2.00	ML = Clayey silt, fine sand.	WT. 0.80 m.
B.4	0.00	1.50	SM = Silty sand, fine sand.	WT. 1.50 m.
B.5	0.00	3.00	ML = Clayey silt, fine sand.	WT. 0.50 m.
B.6	0.00	2.00	ML = Clayey silt, fine sand.	WT. 0.50 m.
B.7	0.00	3.00	ML = Clayey silt, fine sand.	WT. 9.90 m.
B.8	0.00	2.50	ML = Sandy silt, Laterite.	WT. 1.50 m.
B.9	0.00	3.00	ML = Clayey silt, fine sand.	WT. 1.00 m.
B.10	0.00	2.50	ML = Clayey silt, fine sand.	WT. 0.90 m.
B.11	0.00	3.00	ML = Clayey silt, fine sand.	WT. 0.80 m.
B.12	0.00	2.50	ML = Sandy silt, fine sand.	
B.13	-	-	Rock.	
B.14	0.00	3.00	ML = Sandy silt, fine sand.	WT. 100 m.
B.15	0.00	3.00	ML = Clayey silt, fine sand.	WT. 1.00 m.
B.16	0.00	3.00	ML = Sandy silt, fine sand.	WT. 0.90 m.
B.17	0.00	1.50	ML = Clayey silt, fine sand.	WT. 0.50 m.
B.18	0.00	3.00	ML = Sandy silt, fine sand.	WT. 0.70 m.
B.19	0.00	2.50	ML = Clayey silt, fine sand.	WT. 0.30 m.
B.20	-	-	Water	Cannot Drill.
TP.2B	0.00	2.70	ML = Clayey silt, fine sand.	WT. 0.80 m. Rock.



Project Lam Raj Mat Dam

Fig. F-1-10 (1)

GRADATION TEST



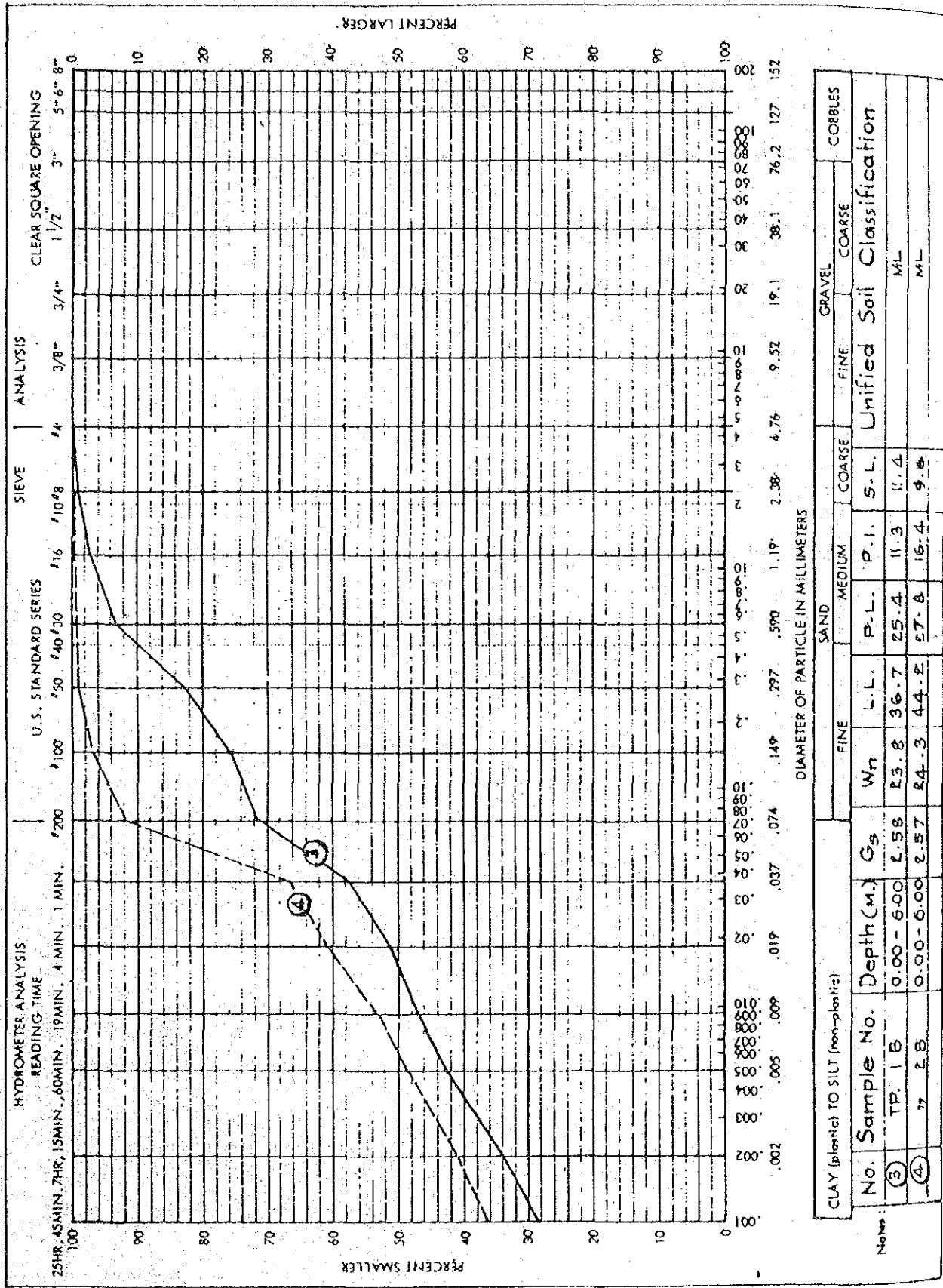
CLAY (plastic) TO SILT (non-plastic)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	
No. Sample No.	Wn	PL	SL	Unified Soil Classification		
TP. 1A	14.5	16.8	10.4	CL		
2A	24.0	15.4	12.1	ML		

Drawn: VV, P.I. Checked: V.S. Date: 26-10-83 Sheet 1 of 41



Memo. 4/2527

Project Larr Plat Mat Dam Fig. F-1-10(2). GRADATION TEST

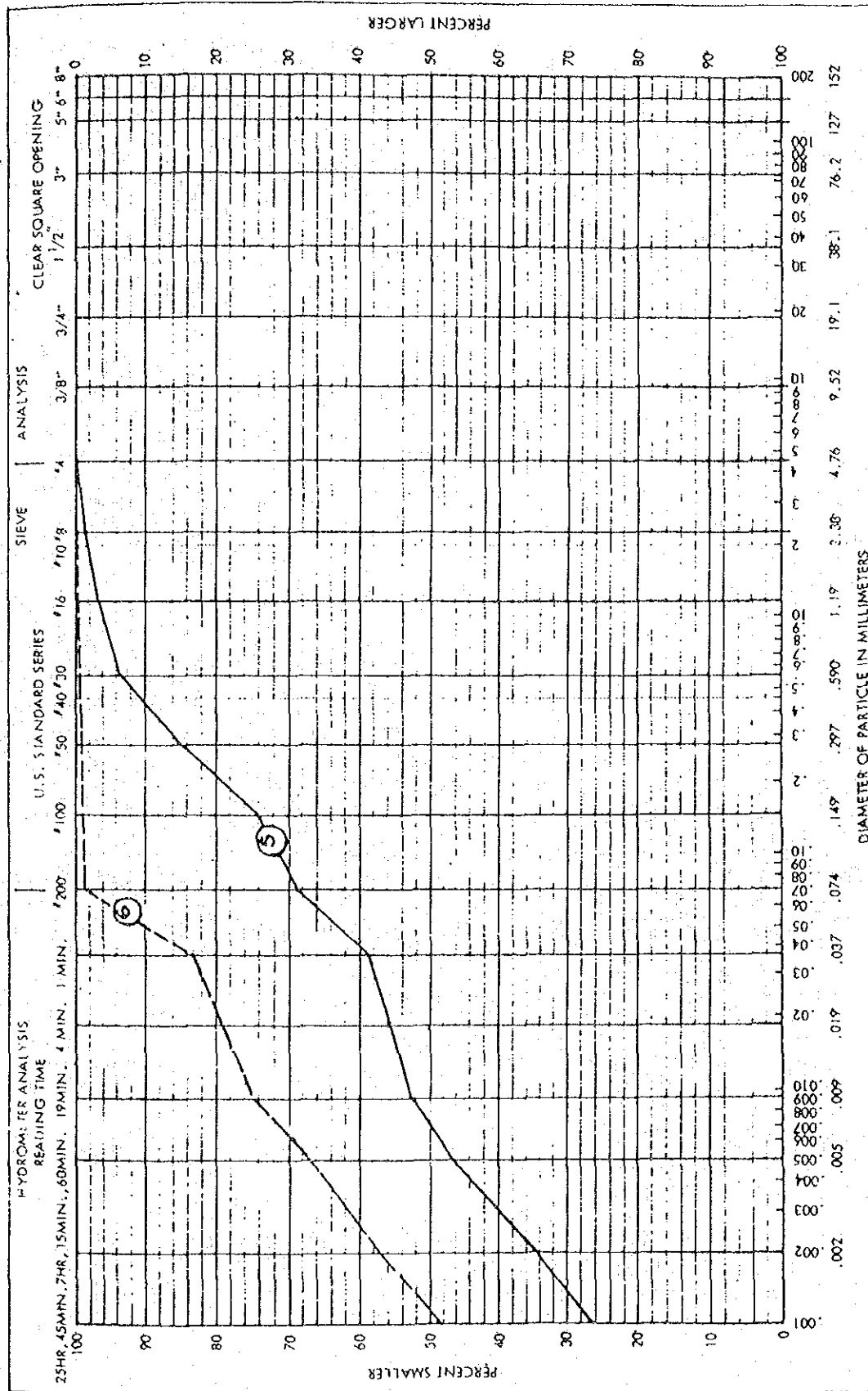


Notes: ③ TP. 1 B. 0.00-6.00 2.58 23.8 36.7 25.4 11.3 11.4
④ 2 B. 0.00-6.00 2.57 24.3 44.2 27.6 15.4 9.6

Fig. F-1-10 (2)

Memo. 4/25/27

Fig. F-1-10 (5). GRADATION TEST

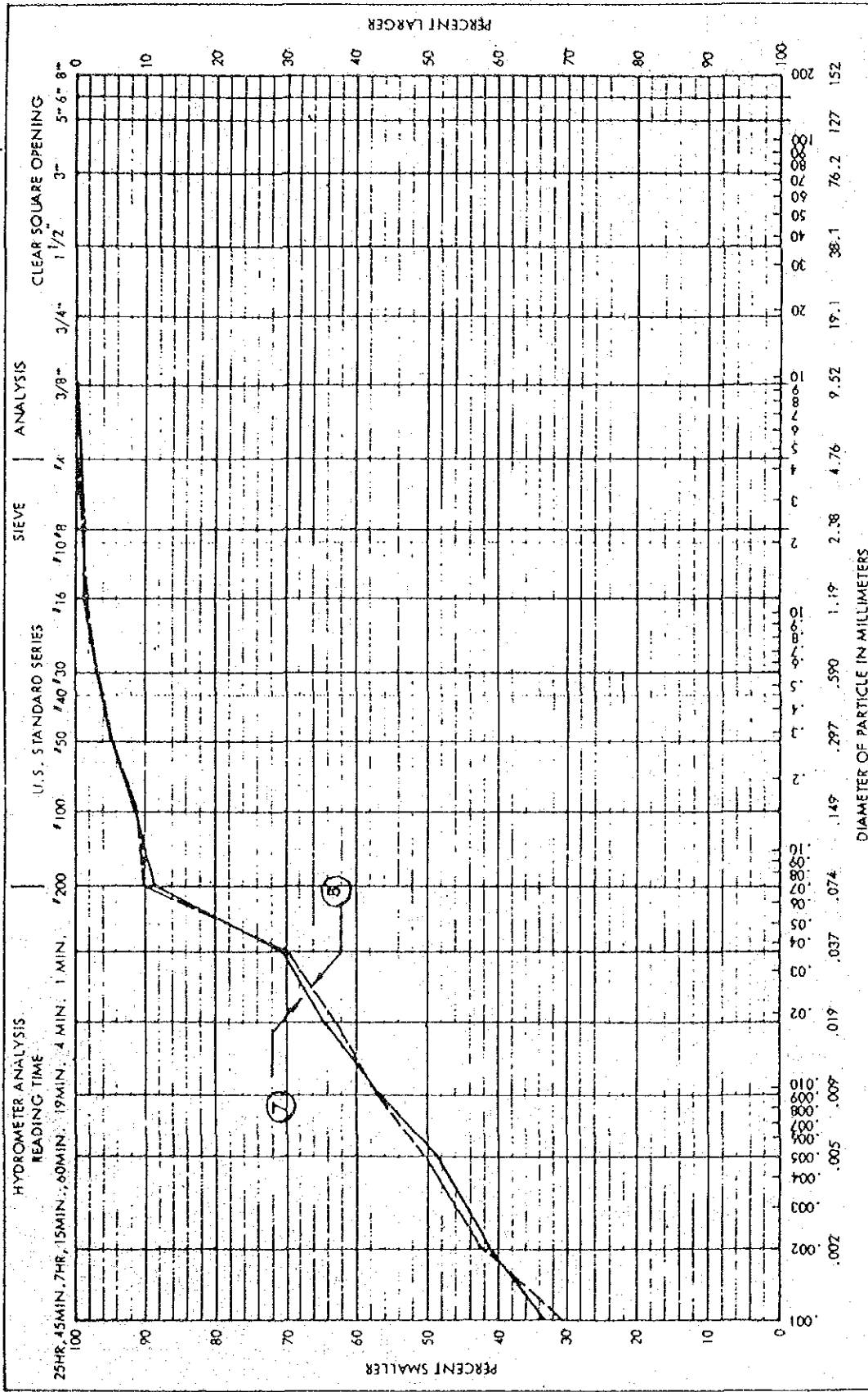


No.	Sample No.	Depth (m)	Gs	Wn	SAND			GRAVEL		COBBLES
					L.L.	P.L.	P.I.	COARSE	FINE	
(5)	TP	IC	0.00-4.50	2.61	30.3	20.8	9.5	10.6	CL	
(6)	"	EC	0.00-6.00	2.59	49.6	33.8	15.8	13.7	ML	



Memo. 4/25/27

Project Lam Plaj. Mat. Dam Fig. F-1-10 (4). GRADATION TEST



No.	Sample No.	Depth (m)	Gs.	Wm.	SAND			GRAVEL		COBBLES
					FINES	MEDIUM	COARSE	FINE	COARSE	
7	TP 3C	0.00-6.00	2.59	19.8	38.3	24.6	13.7	9.1	Unified Soil Classification	
8	4C	0.00-6.00	2.62	18.6	44.7	29.4	15.3	9.6	CL ML	

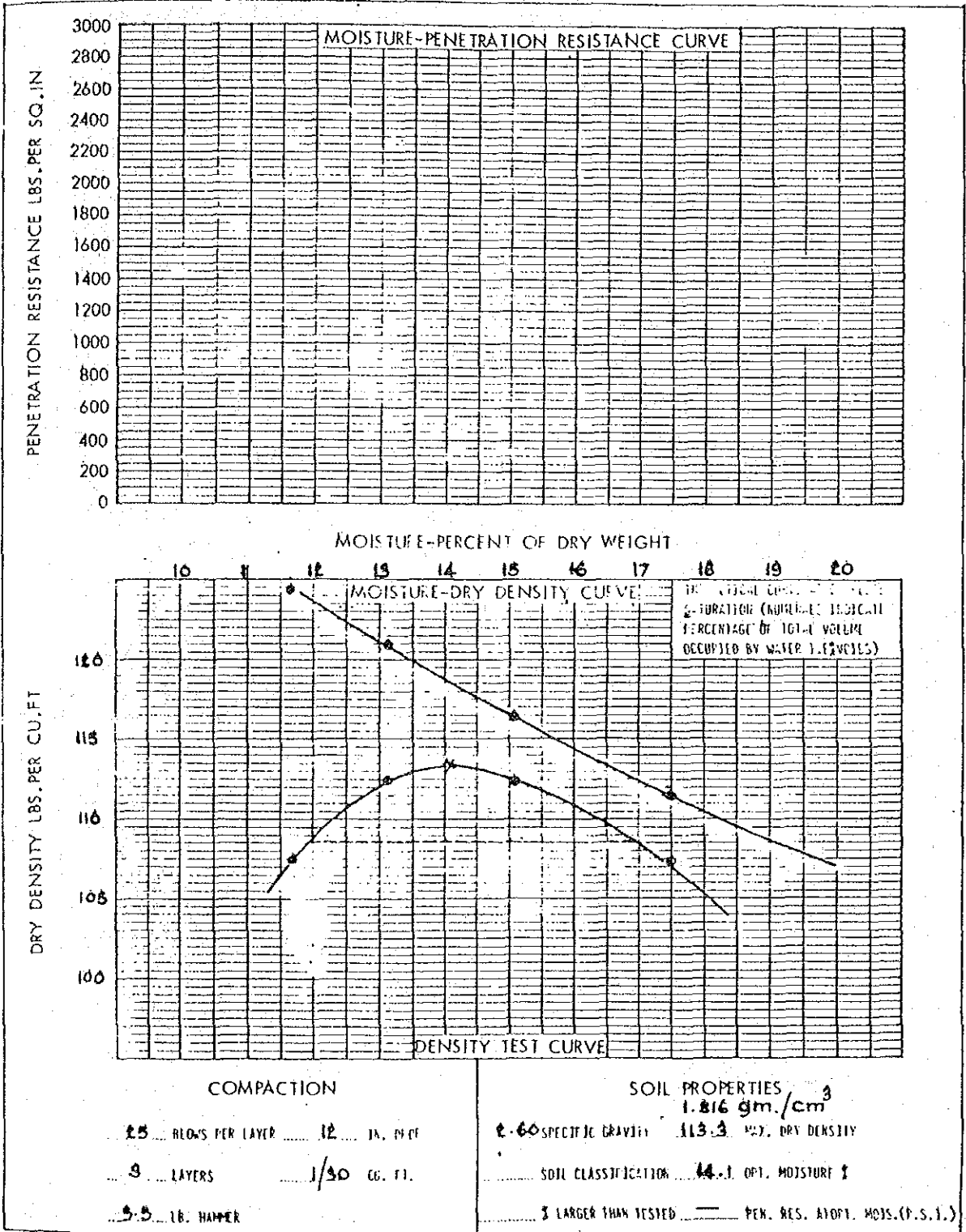


Fig. F-1-11 (1). COMPACTION TEST CURVE

Project Lam Plai Mat Dam

TP. 1A (0.00-6.00)

Memo. 4/2527



Drawn SP. Checked VS. Date 10-10-89 Sheet 5 of 4

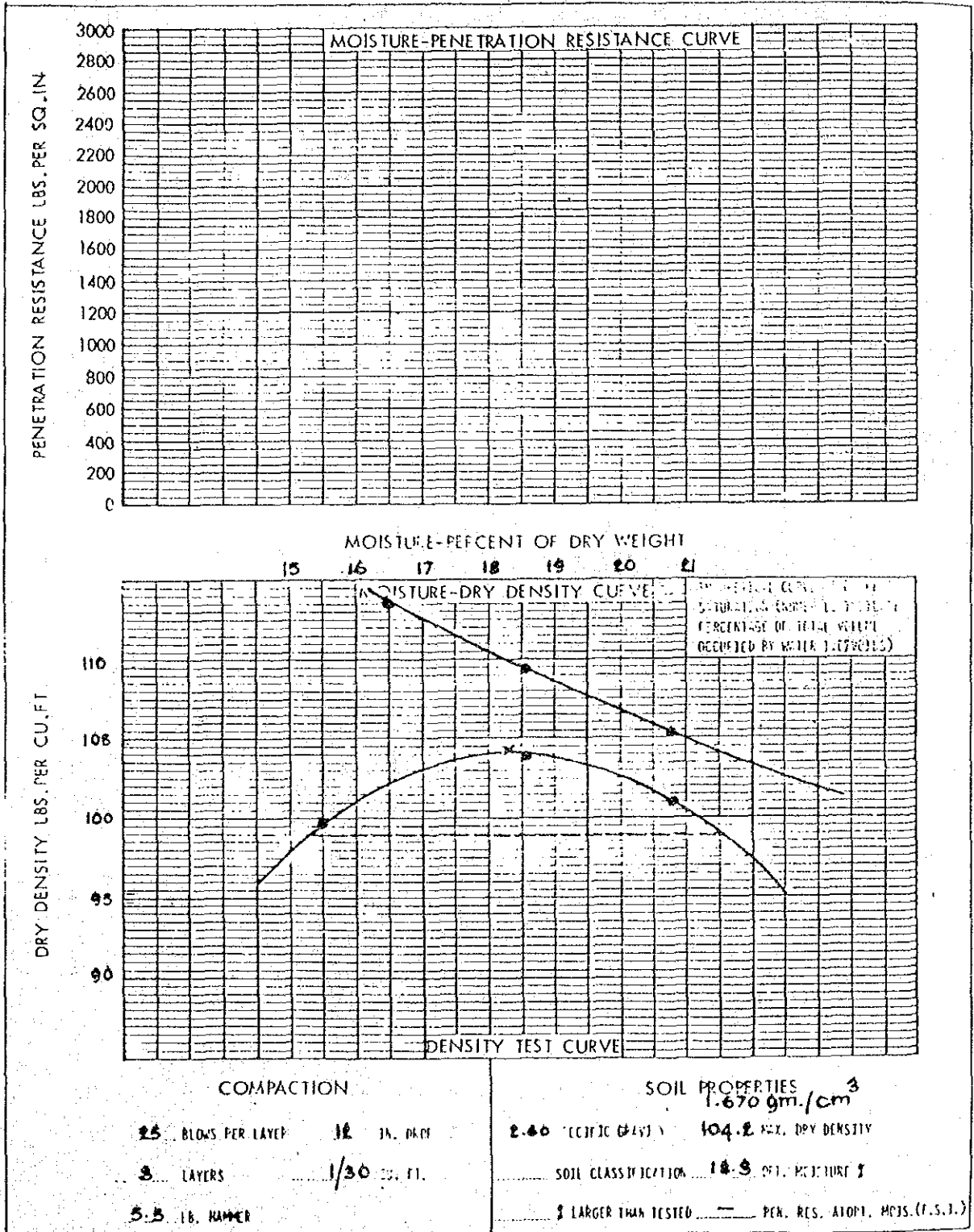


Fig. F-1-11(2). COMPACTION TEST CURVE

Project Lam Ploi Mat Dam

TP. 2A (0.00-3.50)

Memo. 4/1527



Drawn SP Checked YB Date 10-10-33 Sheet 8 of 4

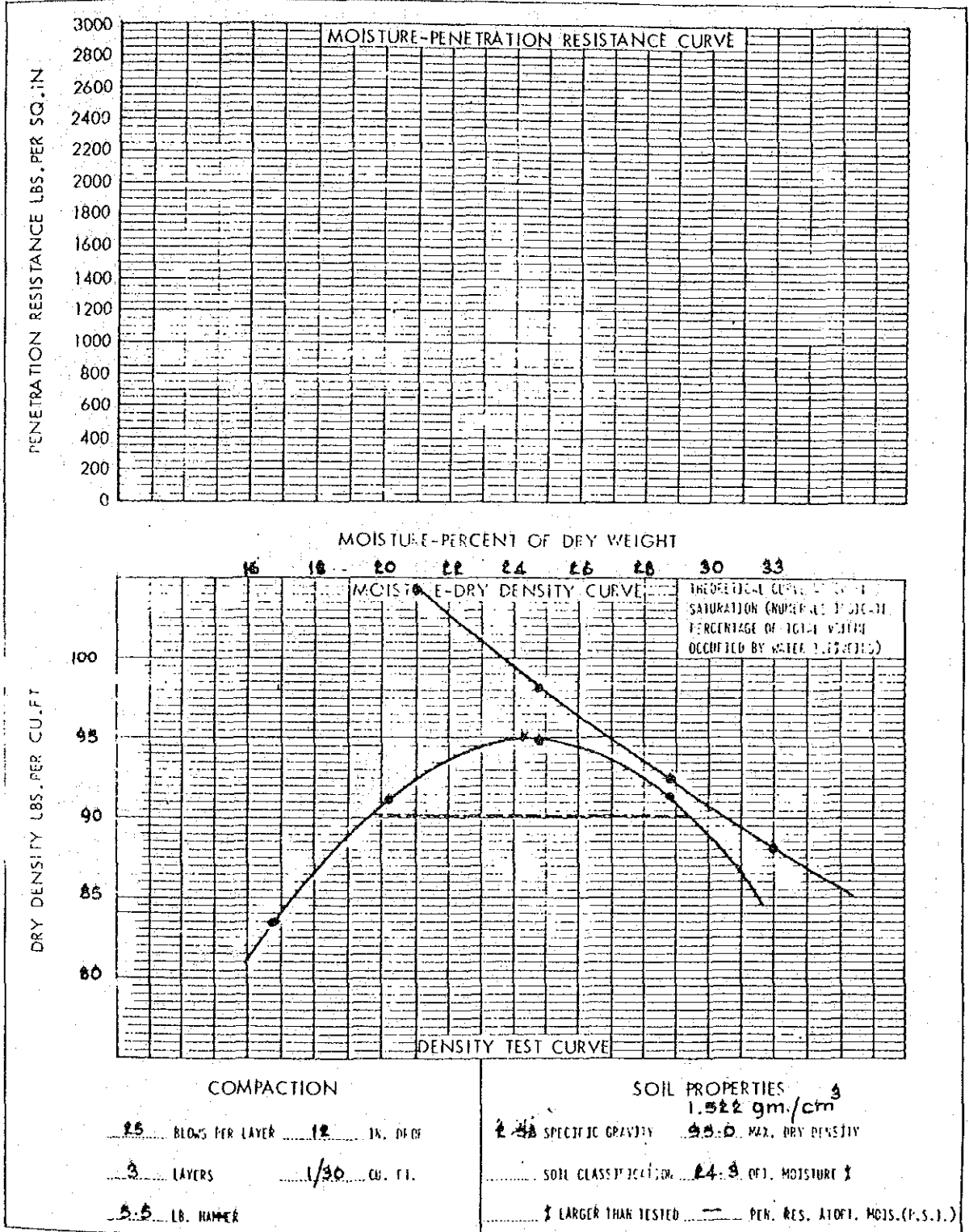


Fig. F-1-11 (3). COMPACTION TEST CURVE

Project Lam Piai Mat Dam

TP. 1B (0.00-6.00)

Memo. 4/2527



Drawn SP. Checked VB. Date 10-10-03 Sheet 3 of 4

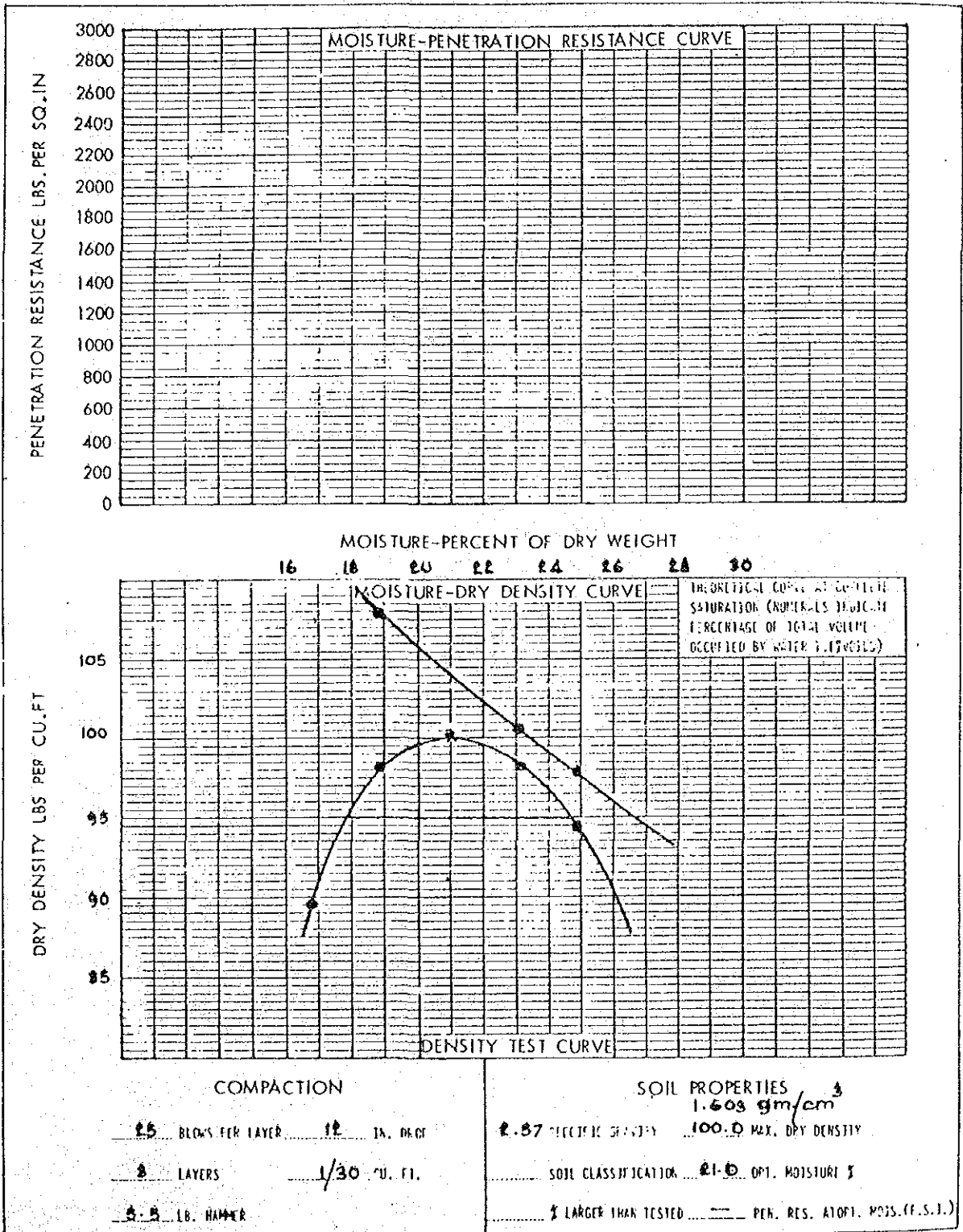


Fig. F-1-11(4). COMPACTION TEST CURVE

Project: Lam Plai Mat Dam

TP. 2B (0.00-6.00)

Memo. A/1527



Drawn SP: Checked VS: Date 10-10-23 Sheet 8 of 4

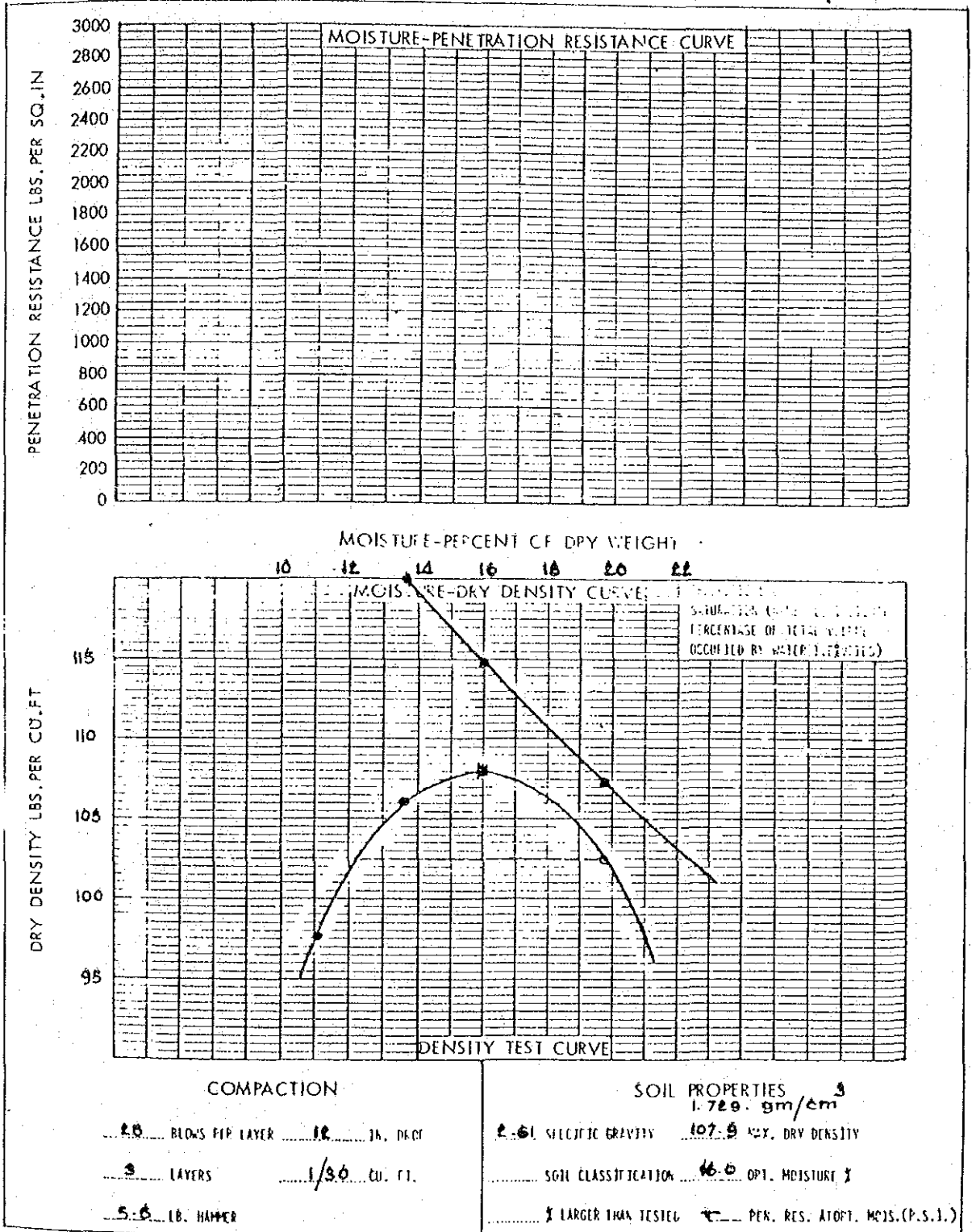


Fig. F-1-11 (5). COMPACTION TEST CURVE

Project Lam Piai Mat Dam

TP. 10 (0.00-4.50)

Memo. 4/2527



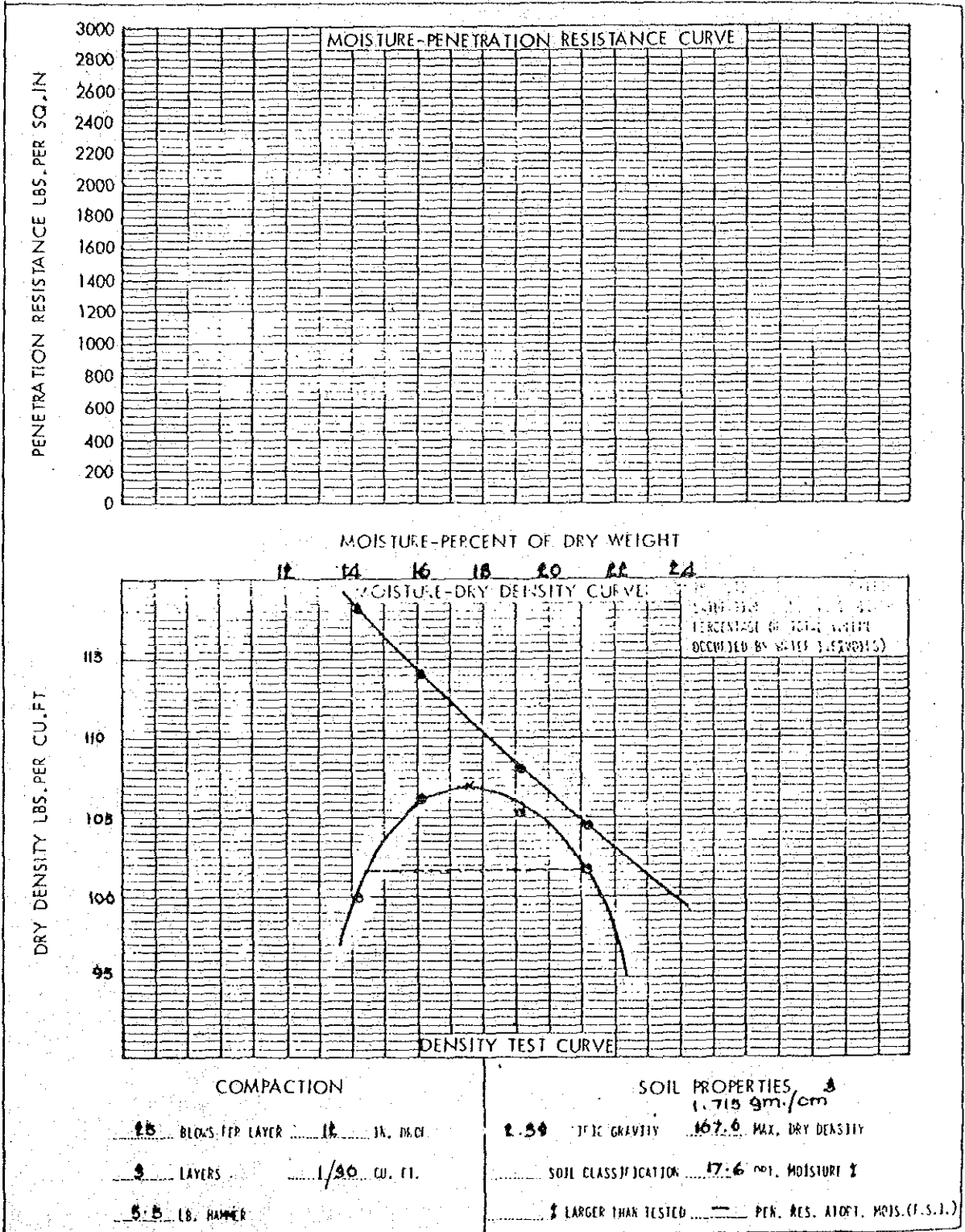
Drawn SP Checked VS Date 10-10-83 Sheet 9 of 4



Fig. F-1-11 (6). COMPACTION TEST CURVE

Project Lam Plai Mat Dam TP. 20 (0.00-6.00)

Memo. A/2527



Drawn SP. Checked VS. Date 10-10-88 Sheet 10 of 4

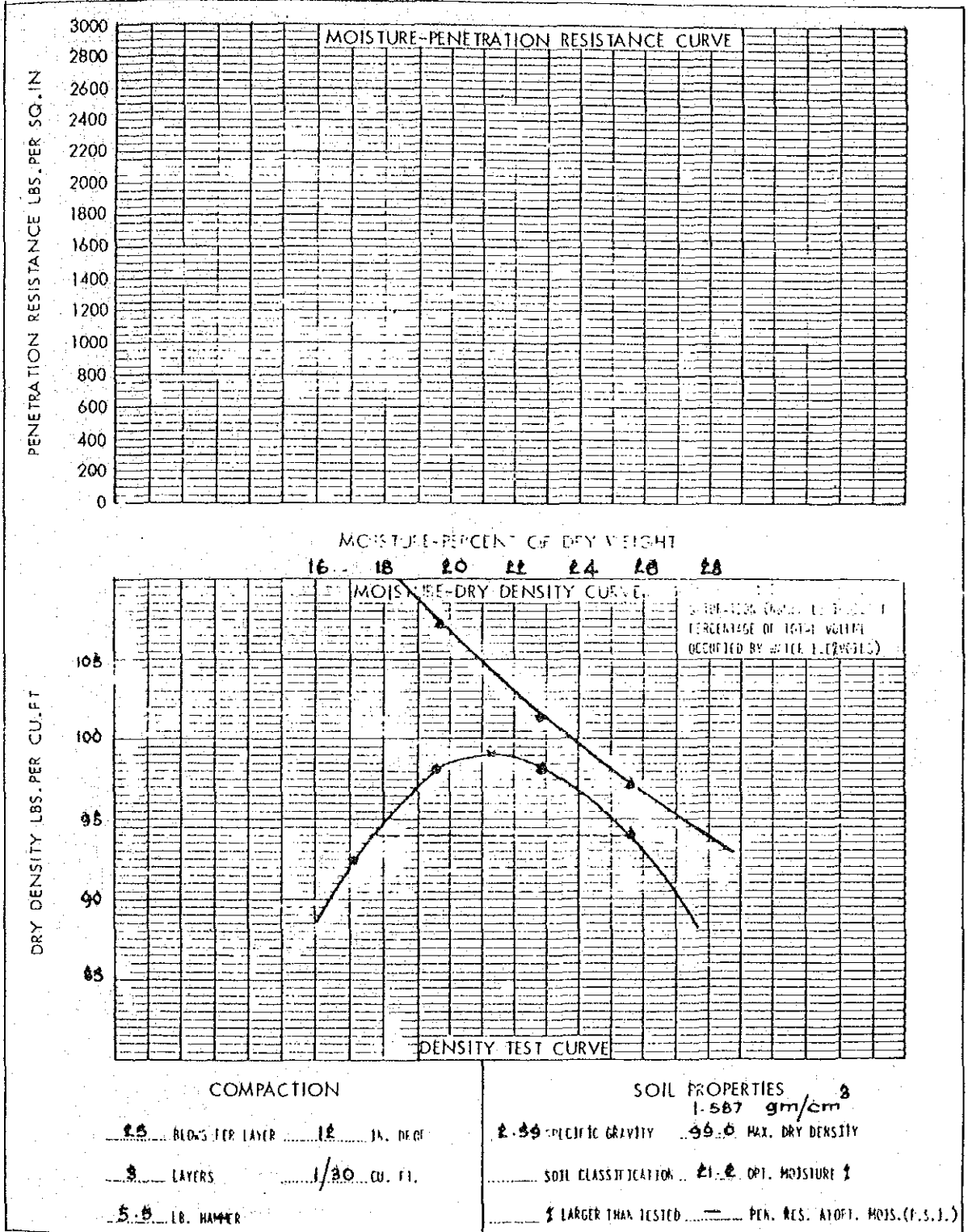


Fig. F-1-11 (7). COMPACTION TEST CURVE

Project Lam Plai Mat Dam

TP. 3C(0.00-6.00)

Memo. 4/2527



Drawn SP. Checked VS. Date 10-10-23 Sheet 11 of 41

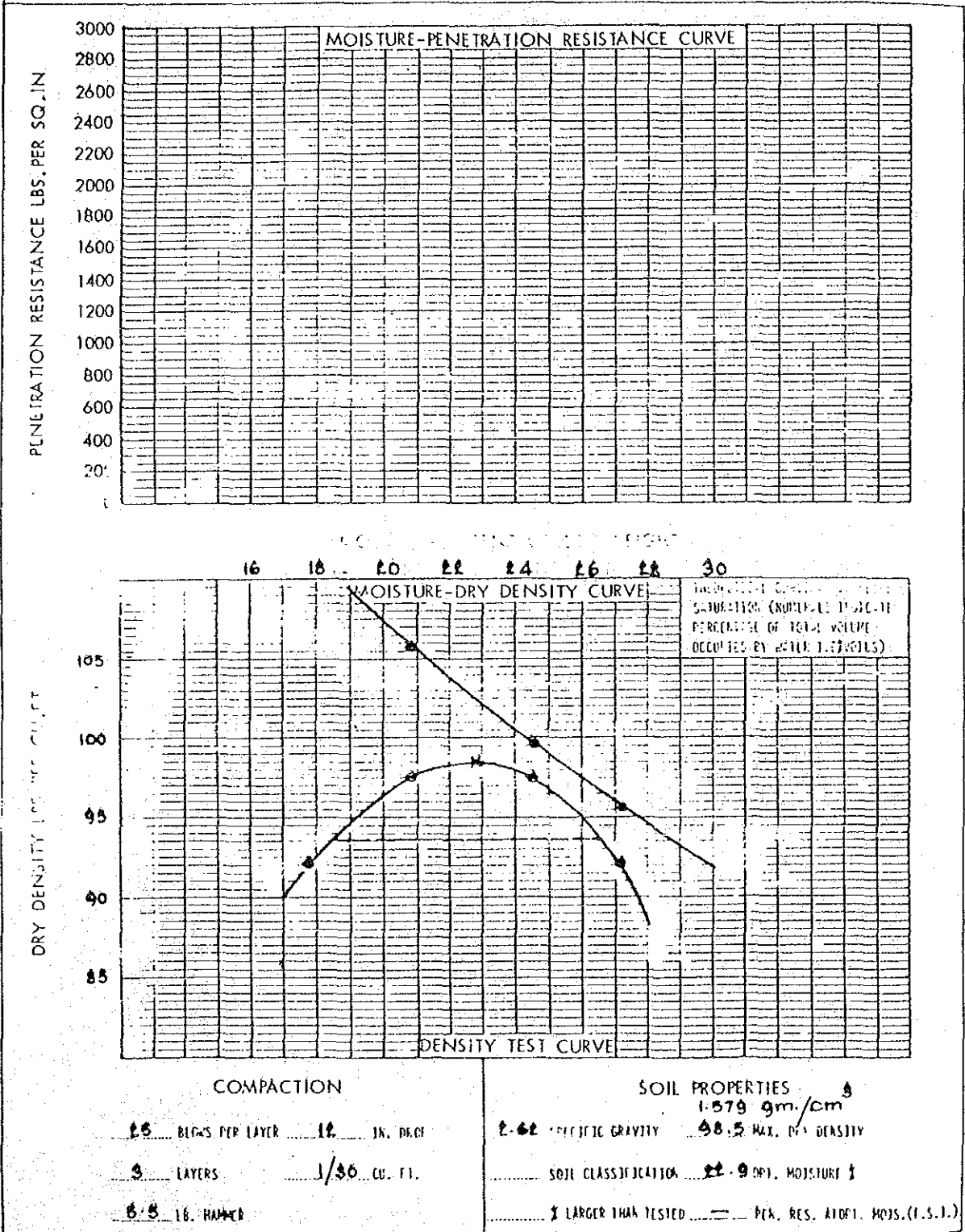


Fig. F-1-11 (8). COMPACTION TEST CURVE

Proje. Lam Plai Mat Dam

TP. 40 (0.00-6.00)

Memo. A/2527



Drawn SP Checked VS. Date 10-10-88 Sheet 12 of 41

Fig. F-1-12 (1). Permeability Test - Lam Plai Mat

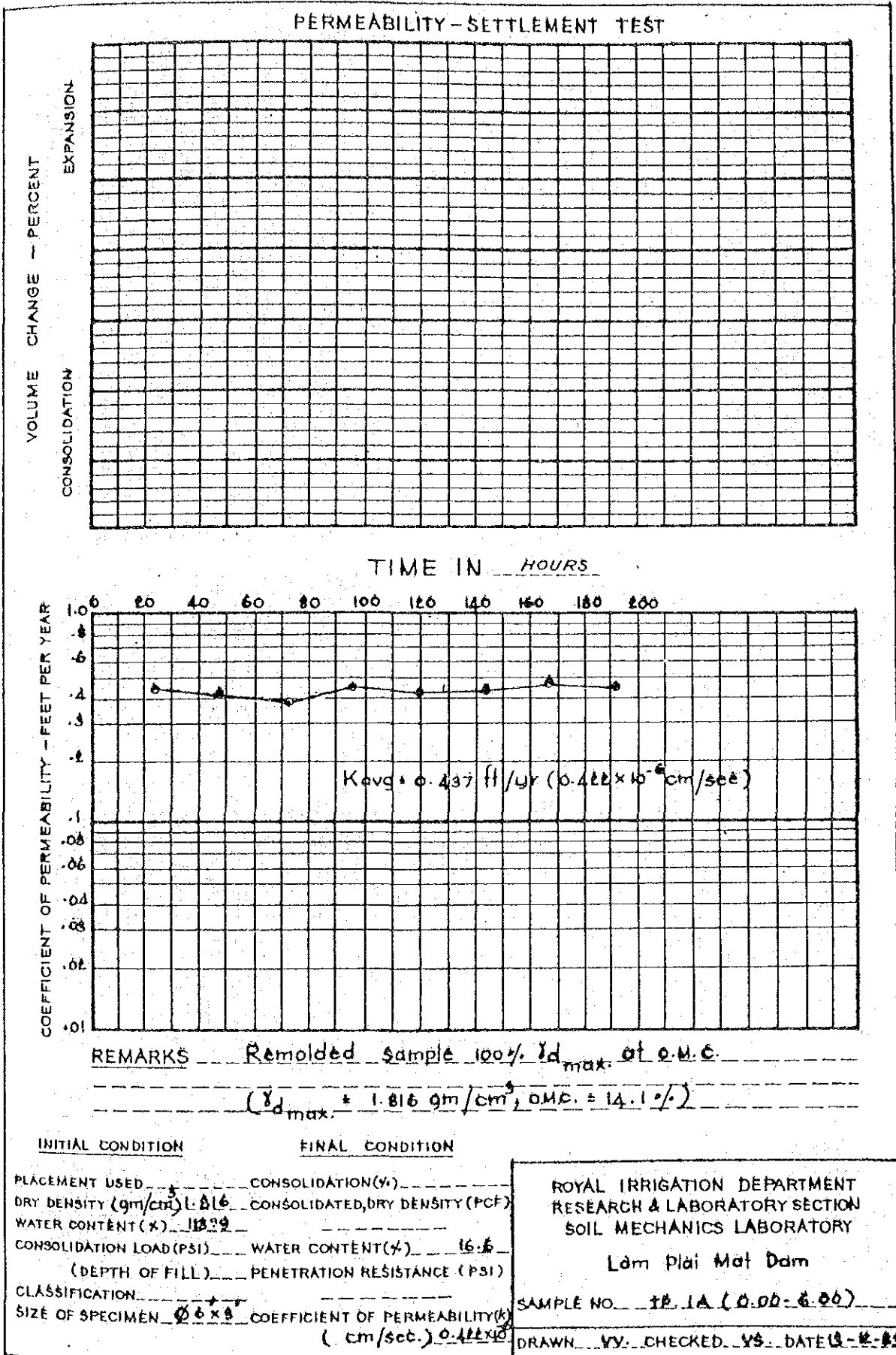


Fig. F-1-12 (2). Permeability Test - Lam Plai Mat

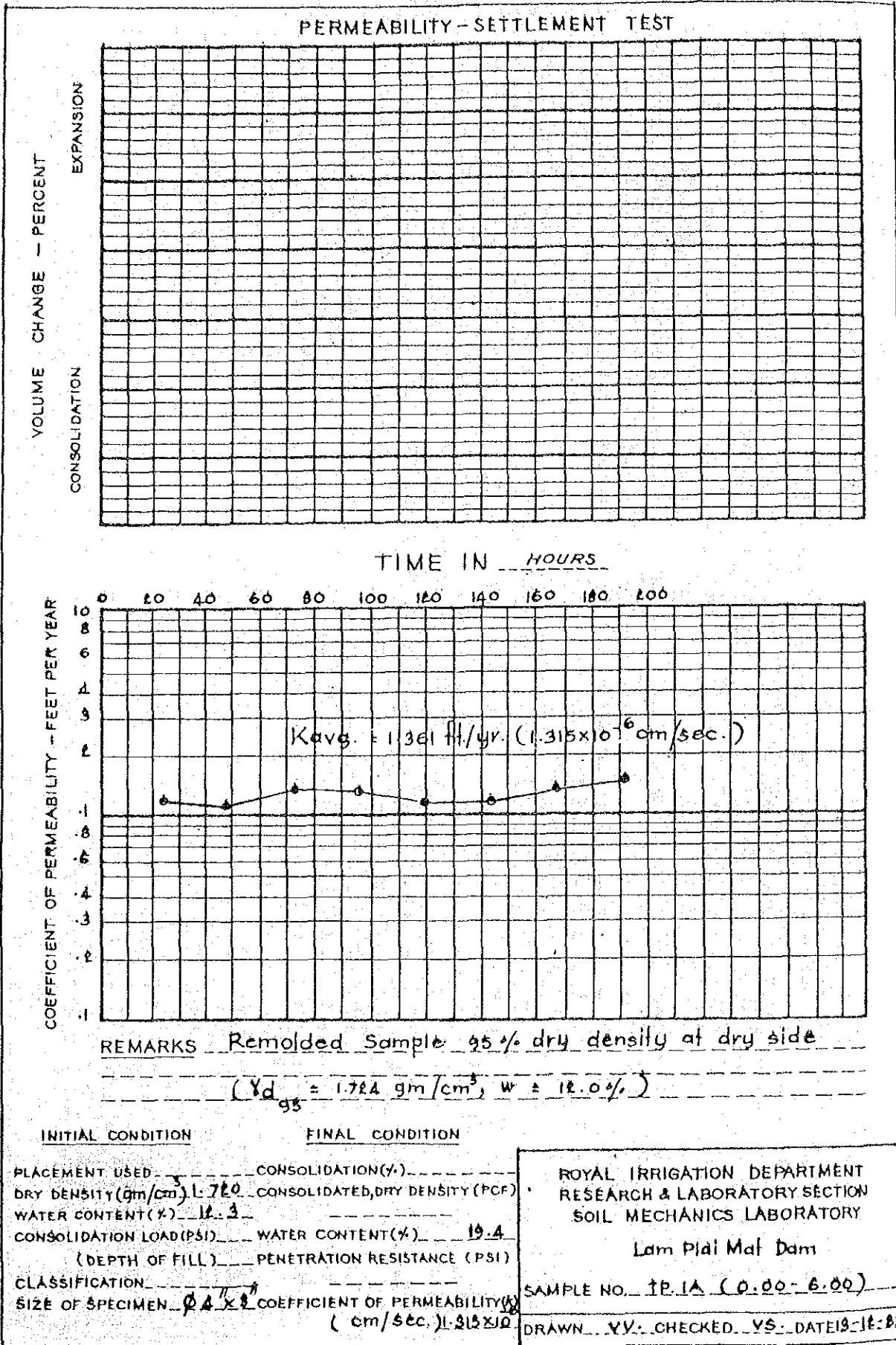


Fig. F-1-12 (3). Permeability Test - Lam Plai Mat

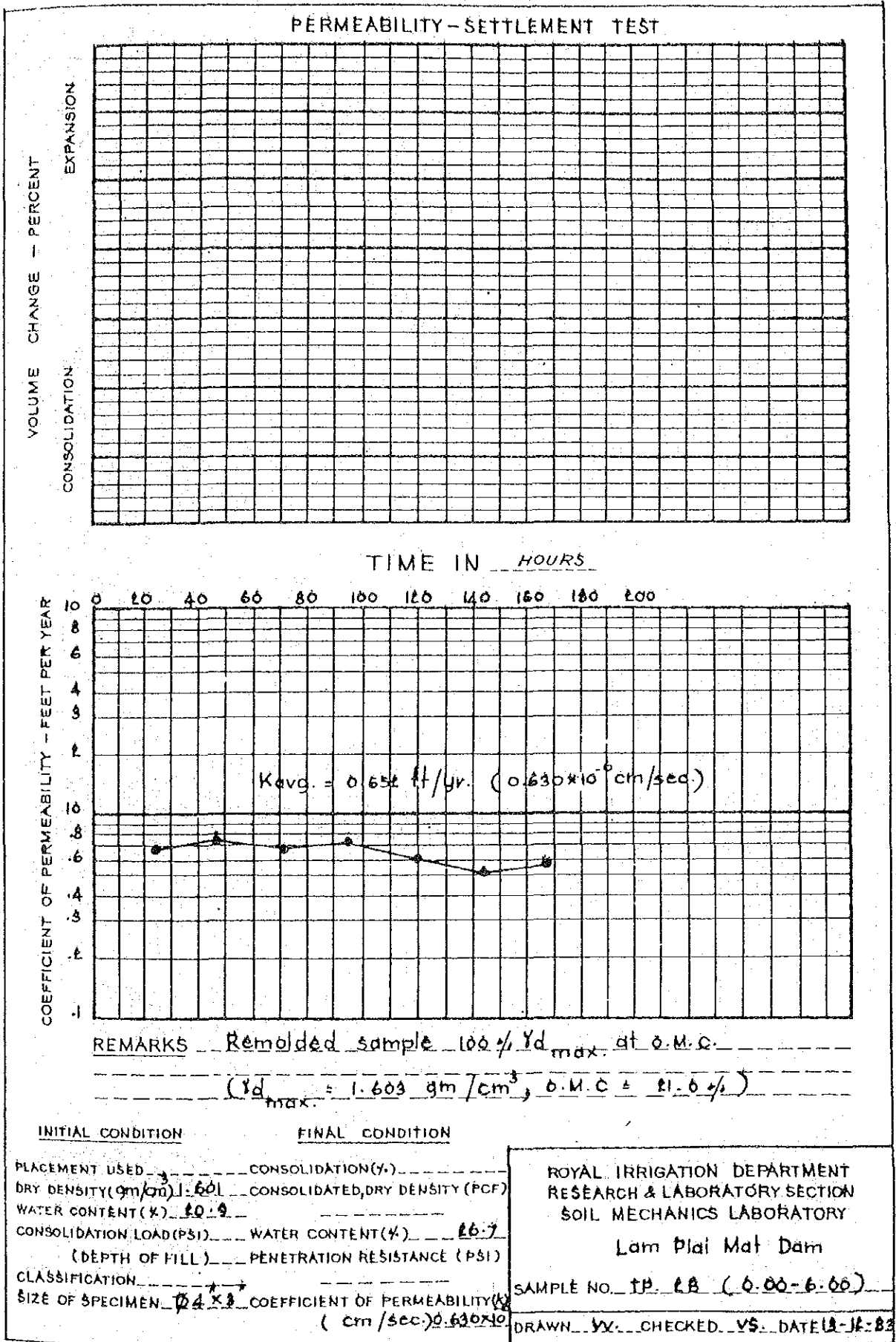


Fig. F-1-12 (4). Permeability Test - Lam Plai Mat

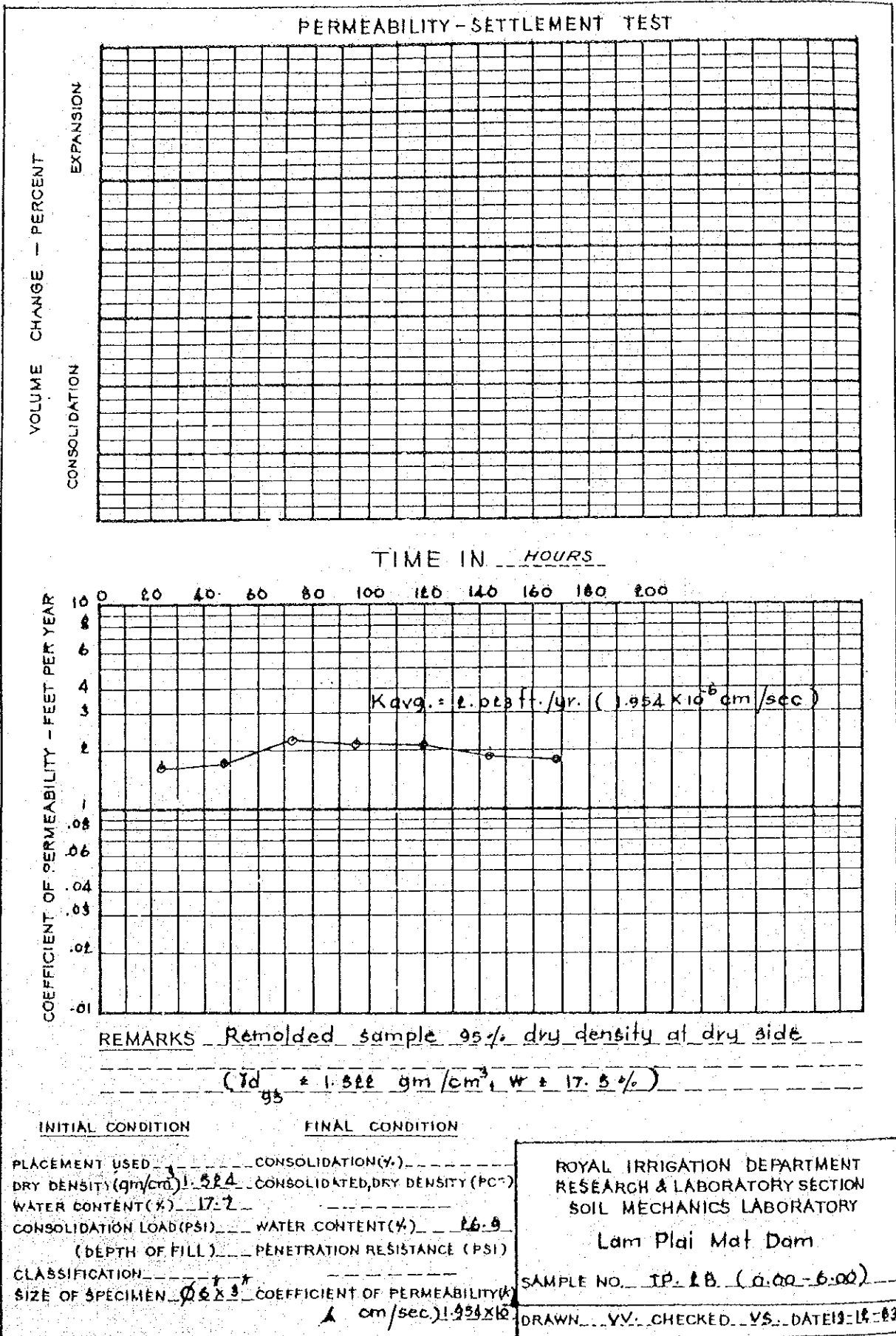


Fig. F-1-12 (5), Permeability Test - Lam Plai Mat

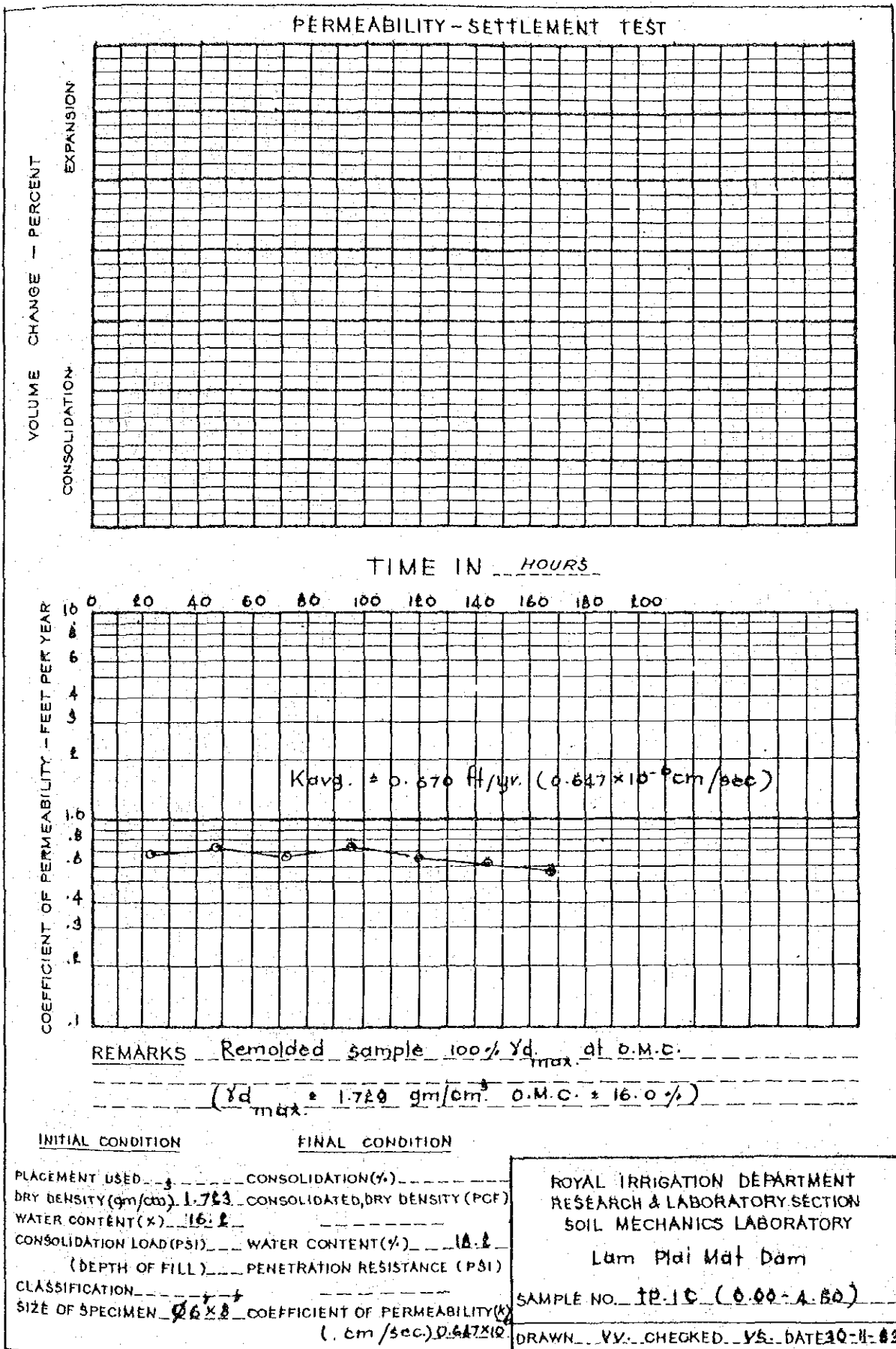


Fig. F-1-12 (6). Permeability Test - Lam Plai Mat

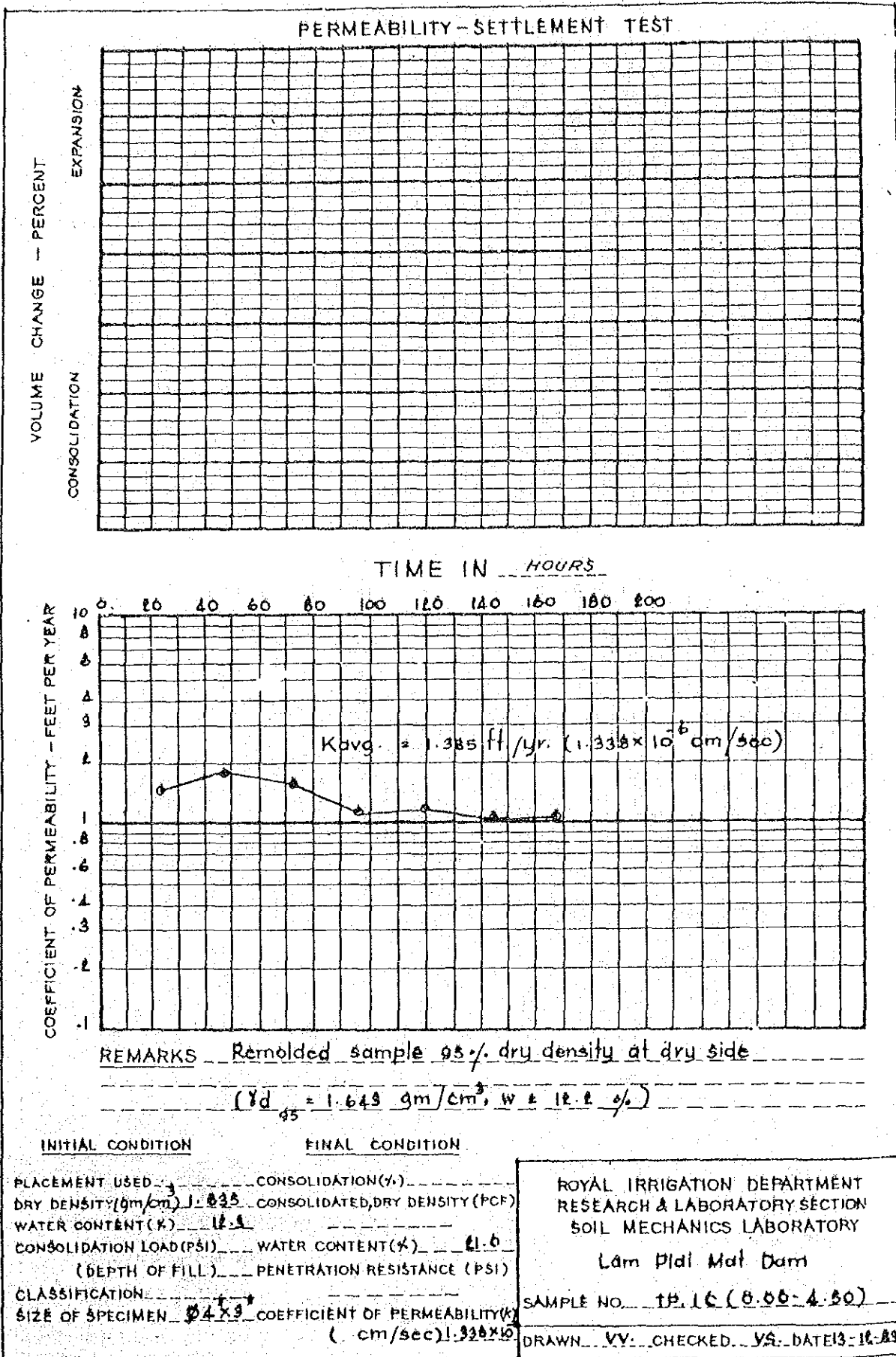
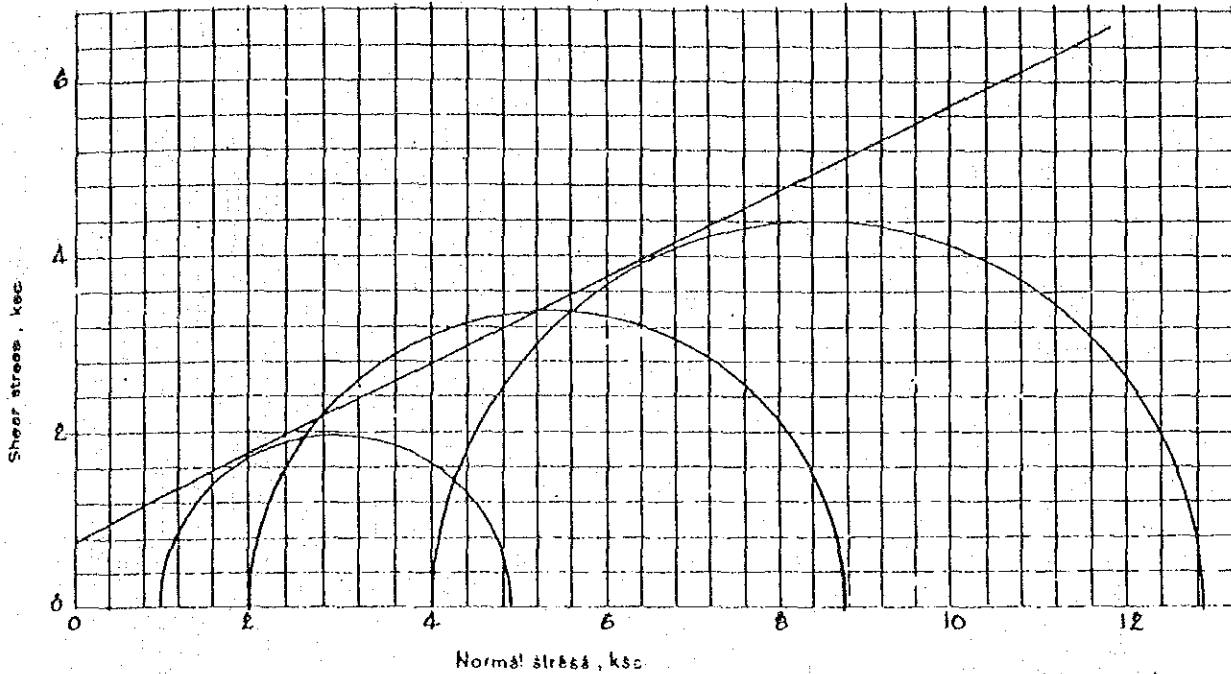


Fig. F-1-13 (1). Triaxial Test - Lam Plai Mat



Test No.	Test values at failure		
	$\sigma_1 - \sigma_3$	σ_3	σ_1
a	3.88	1.00	4.88
b	6.74	2.00	8.74
c	8.86	4.00	12.86

SHEAR VALUES	ϕ	26.0 degree
	TAN ϕ	0.488
	C	0.800 KSC

Test No.		a	b	c	d
Initial	Water content % W_0	14.1	14.1	14.1	
	Void ratio e_0	0.449	0.456	0.446	
	Saturation % S_0	81.6	80.4	82.2	
Before test	Dry density γ_d	1.794	1.786	1.798	
	Water content % W_c				
	Saturation % S_c				
Final	Consolid. press. ksc σ_c				
	Void ratio e_c				
	Water content % W_1	15.1	13.8	13.9	
Chamber press	Void ratio e_1				
	Water content % W_1	15.1	13.8	13.9	
	Void ratio e_1				
Chamber press	ksc	1.00	2.00	4.00	
Max. deviator stress	ksc	3.88	6.74	8.86	
Strain at max.	%	18.37	17.06	19.68	
Initial diameter	cm	3.85	3.86	3.84	
Initial height	cm	7.62	7.60	7.63	

Type UNCONSOLIDATED
of test UNDRAINED

Method of saturation Controlled stress Controlled strain

Type of specimen COMPACTED 100% DRY MAX. DENSITY Rate of strain 0.225 mm/min

Classification

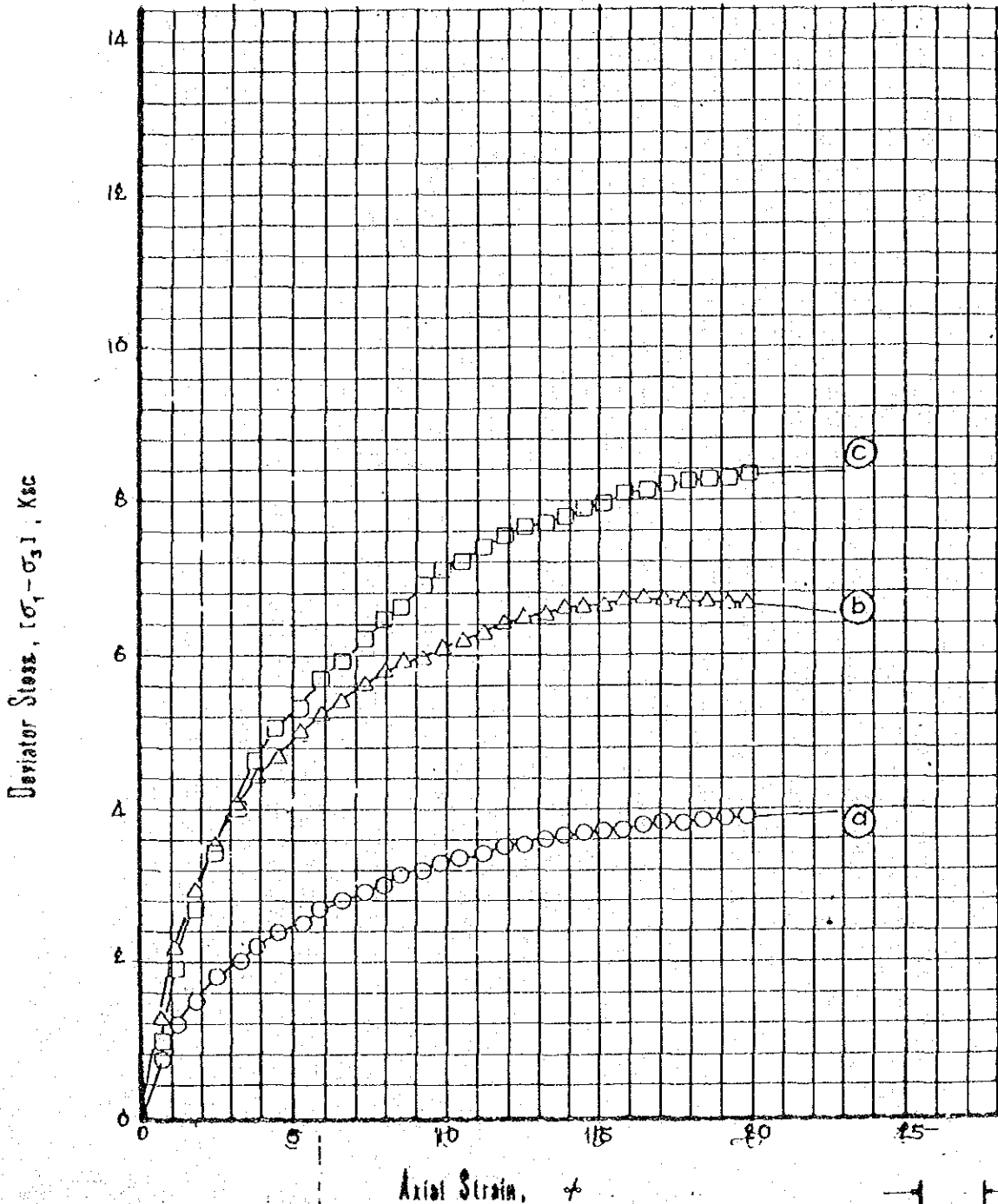
LL PL PI U_s 2.60

Remarks	Project	LAM PLAI MAT DAM	
	Area		
	Boring No.	TP-1A	Sample No.
	Depth	0.00 - 6.00 m	Date

TRIAXIAL COMPRESSION TEST REPORT

Fig. F-1-13 (2). Triaxial Test - Lam Plai Mat

ROYAL IRRIGATION DEPARTMENT
DIVISION OF RESEARCH AND LABORATORY
STRESS - STRAIN CURVE



Project: LAM, PLAI MAT DAM	Location:	
Type of Test: UU - 100%	Spring No.: TP-1A	
Test No.: (a), (b), (c)	Elevation: 0.00 - 6.00 m	
Water Content: 14.1, 14.1, 14.1 %	Sample Description:	
Dry Unit Weight: 1.794, 1.786, 1.796/m ³	Failure Mode	

Fig. F-1-13 (3). Triaxial Test - Lam Plai Mat

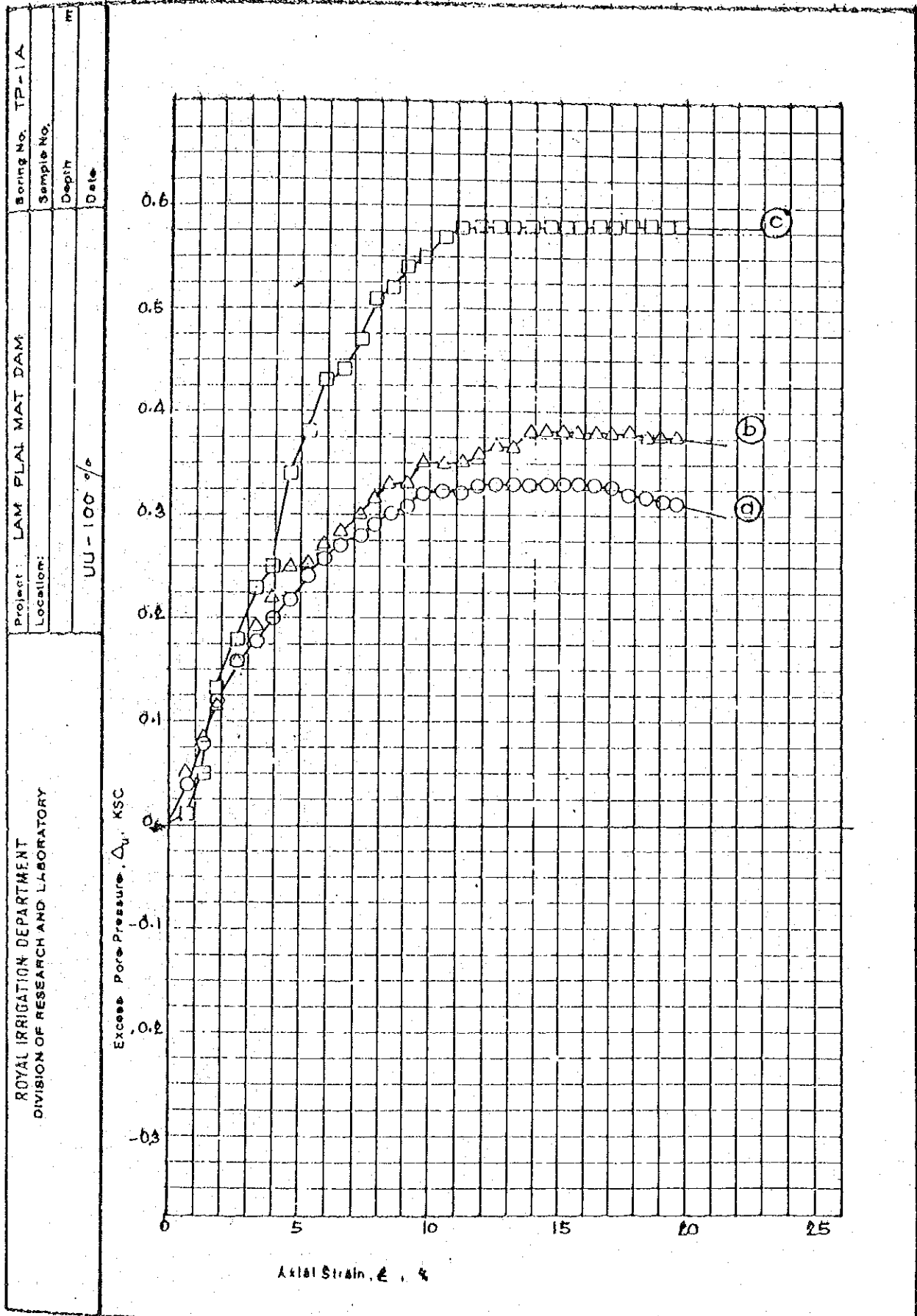
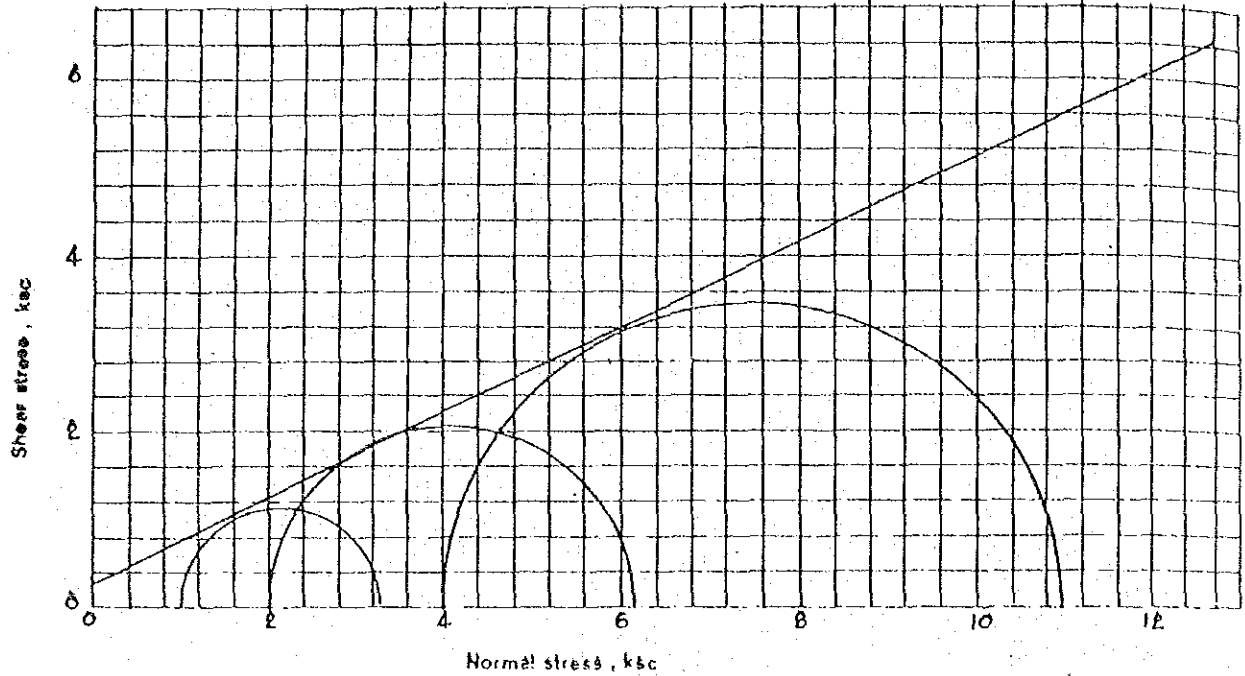


Fig. F-1-13 (4). Triaxial Test + Lam Plai Mat



Test No.	Test values at failure		
	$\sigma_1 - \sigma_3$	σ_3	σ_1
a	3.27	1.00	4.27
b	4.17	2.00	6.17
c	7.01	4.00	11.01

SHEAR VALUES	ϕ	26.0 degree
	TAN ϕ	0.488
	C	0.350 KSC

Type UNCONSOLIDATED

of test UNDRAINED

Test No.		a	b	c	d
Initial	Water content % W_c	12.0	12.0	12.0	
	Void ratio e_0	0.524	0.521	0.518	
	Saturation % S_c	59.8	59.9	60.8	
	Dry density γ_d	1.706	1.709	1.716	
Before test	Water content % W_c				
	Saturation % S_c				
	Consol. press ksc σ_c				
	Void ratio e_c				
Final	Water content % W_f	14.4	14.8	18.9	
	Void ratio e_f				
Chamber press ksc		1.00	2.00	4.00	
Max. deviator stress ksc		3.27	4.17	7.01	
Strain at max. %		16.40	19.02	19.68	
Initial diameter cm		3.83	3.84	3.83	
Initial height cm		7.62	7.62	7.60	

Method of saturation Controlled stress Controlled strain

Type of specimen COMPACTED 95% DRY MAX. DENSITY Rate of strain 0.225 mm/min

Classification

LL PL PI G_s 2.60

Remarks

Project LAM PLAI MAT DAM

Area

Boring No. TP-1A

Sample No.

Depth 0.00-6.00 m

Date

TRIAxIAL COMPRESSION TEST REPORT

Fig. F-1-13 (5). Triaxial Test - Lam Plai Mat

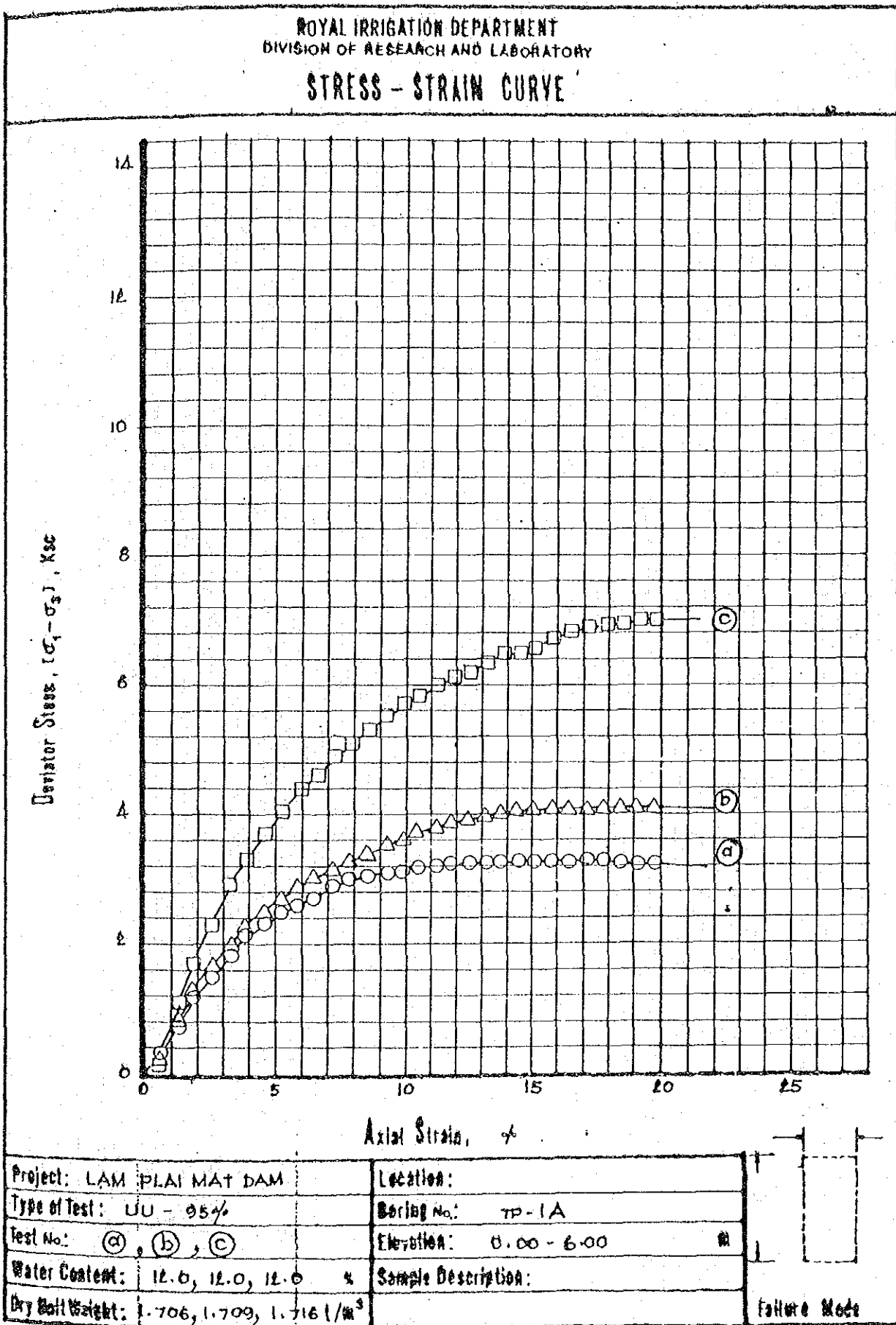


Fig. F-1-13 (6). Triaxial Test - Lam Plai Mat

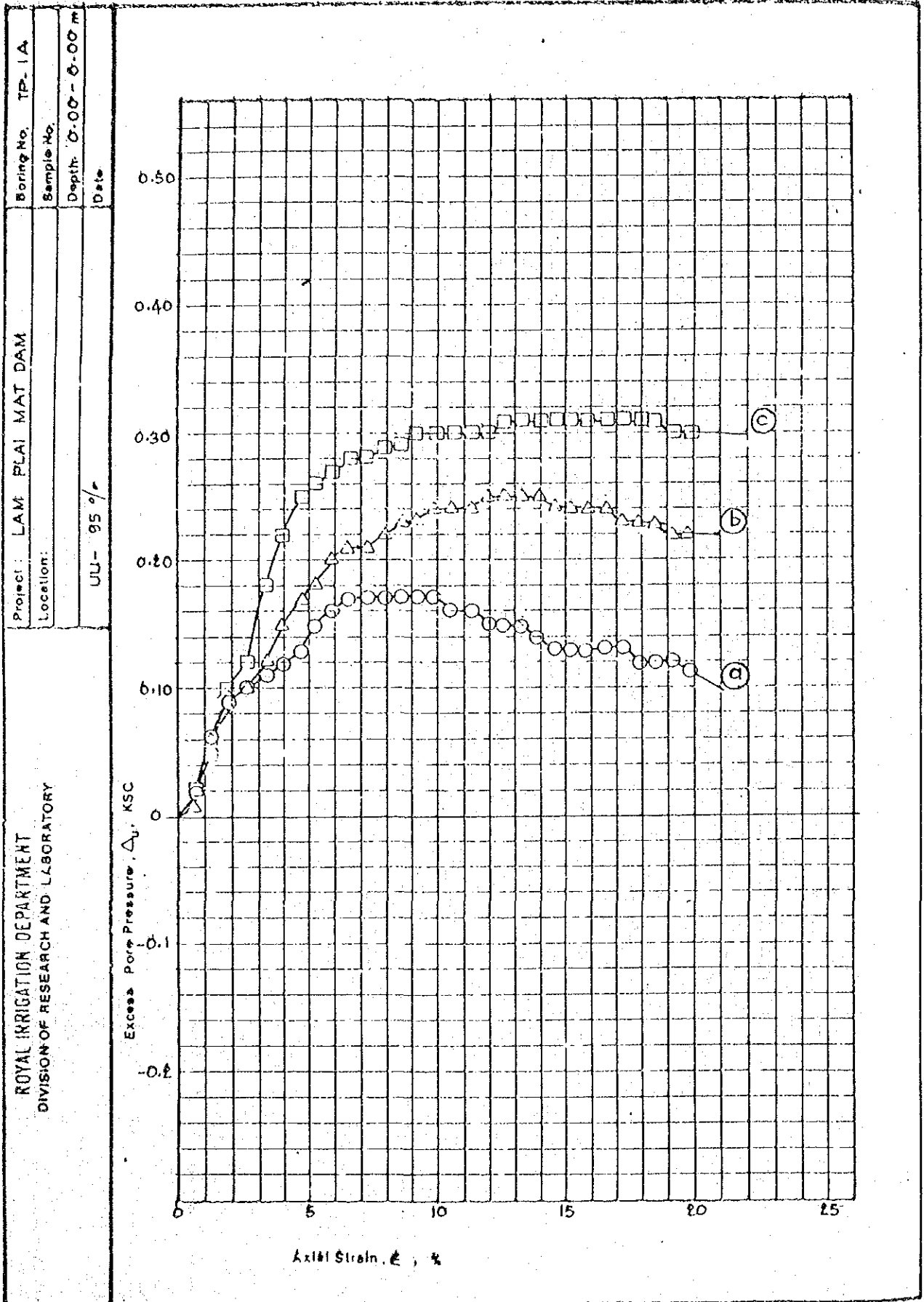
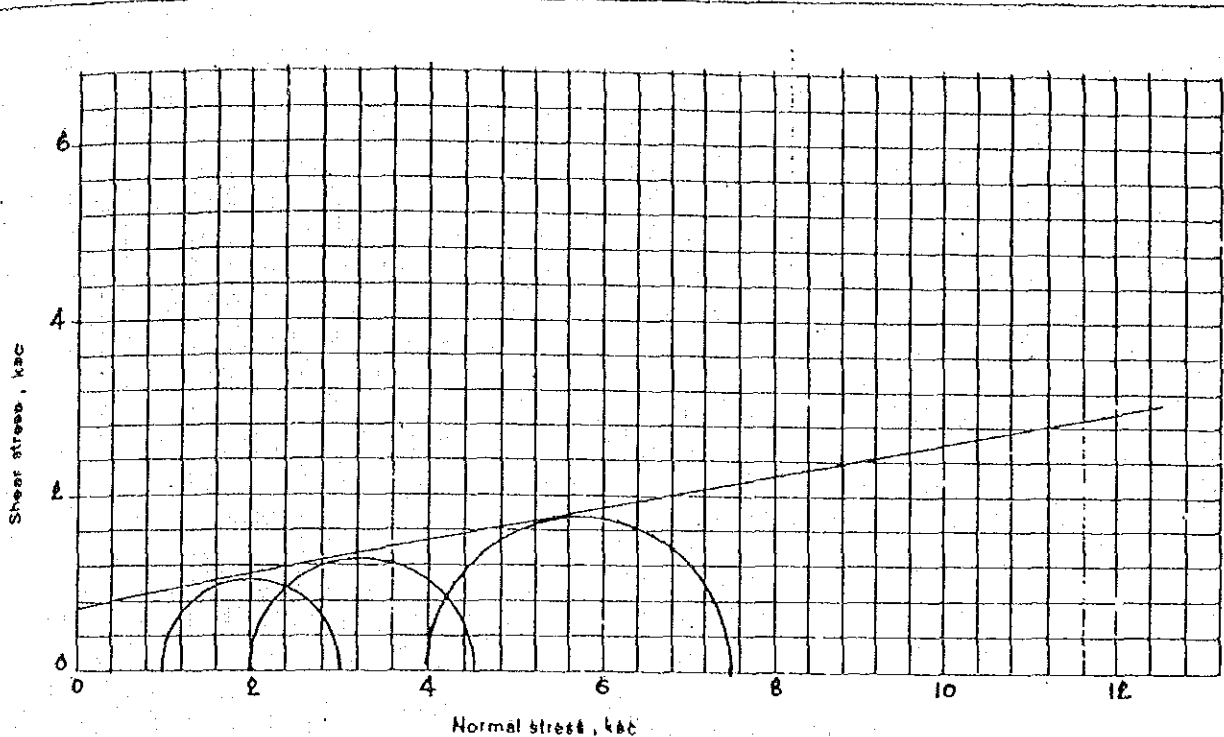


Fig. F-1-13 (7). Triaxial Test - Lam Plai Mat



Test No.	Test values at failure		
	$\sigma_1 - \sigma_3$	σ_3	σ_1
a	2.04	1.00	3.04
b	2.51	2.00	4.51
c	3.53	4.00	7.53

SHEAR VALUES	ϕ	10.5 degrees
	TAN ϕ	0.185
	c	0.700 KSC

Type UNCONSOLIDATED
 of test UNDRAINED

Test No.		a	b	c	d
Initial state before test	Water content % W_0	20.6	20.6	20.6	
	Void ratio e_0	0.697	0.686	0.685	
	Saturation % S_0	83.4	83.6	83.7	
	Dry density $1/cm^3$ γ_d	1.576	1.577	1.578	
	Water content % W_c				
	Saturation % S_c				
	Conso. press ksc σ_c				
	Void ratio e_c				
	Water content % W_1	23.1	22.8	22.8	
	Void ratio e_1				
Chamber press ksc	1.00	2.00	4.00		
Max. deviator stress ksc	2.04	2.51	3.68		
Strain at max. %	12.47	11.15	15.75		
Initial diameter cm	3.88	3.86	3.85		
Initial height cm	7.50	7.56	7.60		

Method of saturation Controlled stress Controlled strain

Type of specimen COMPACTED 100% DRY MAX. DENSITY Rate of strain 0.225 mm/min

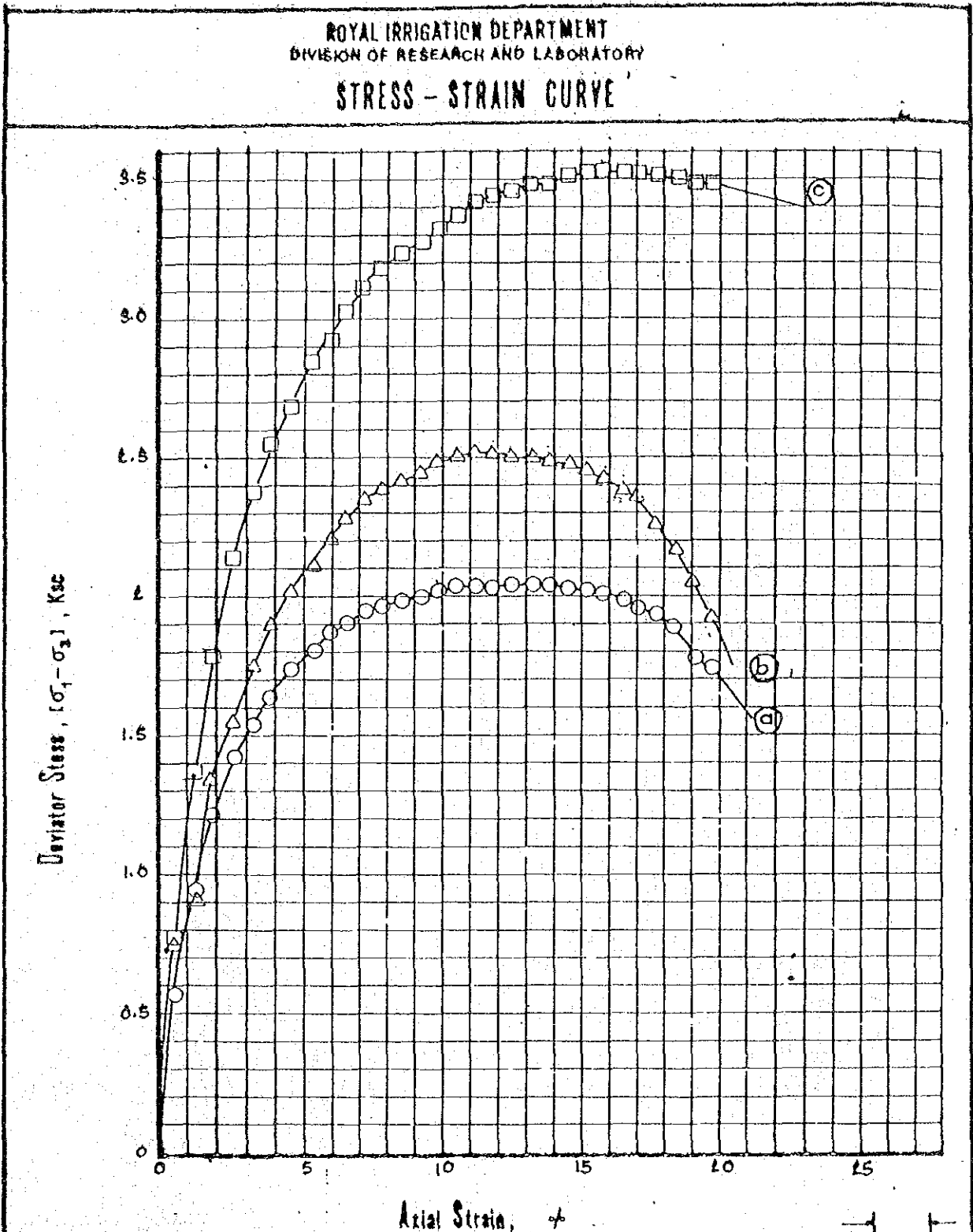
Classification

LL	PL	PI	G _s 2.58
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Remarks	Project <u>LAM PLAI MAT DAM</u>	
	Area	
	Boring No. <u>TP-1B</u>	Sample No.
	Depth <u>0.00-6.00</u> m	Date

TRIAxIAL COMPRESSION TEST REPORT

Fig. F-1-13 (8). Triaxial Test - Lam Plai Mat



Project: LAM PLAI MAT DAM	Location:	
Type of Test: UU - 100 %	Barling No.: TP-1B	
Test No.: (a), (b), (c)	Elevation: 0.00 - 6.00 m	
Water Content: 20.6, 20.6, 20.6 %	Sample Description:	
Dry Ball Weight: 1.576, 1.577, 1.578 / m ³	Failure Mode	

Figure F-1-13 (9) Triaxial Test - Lam Plai Mat

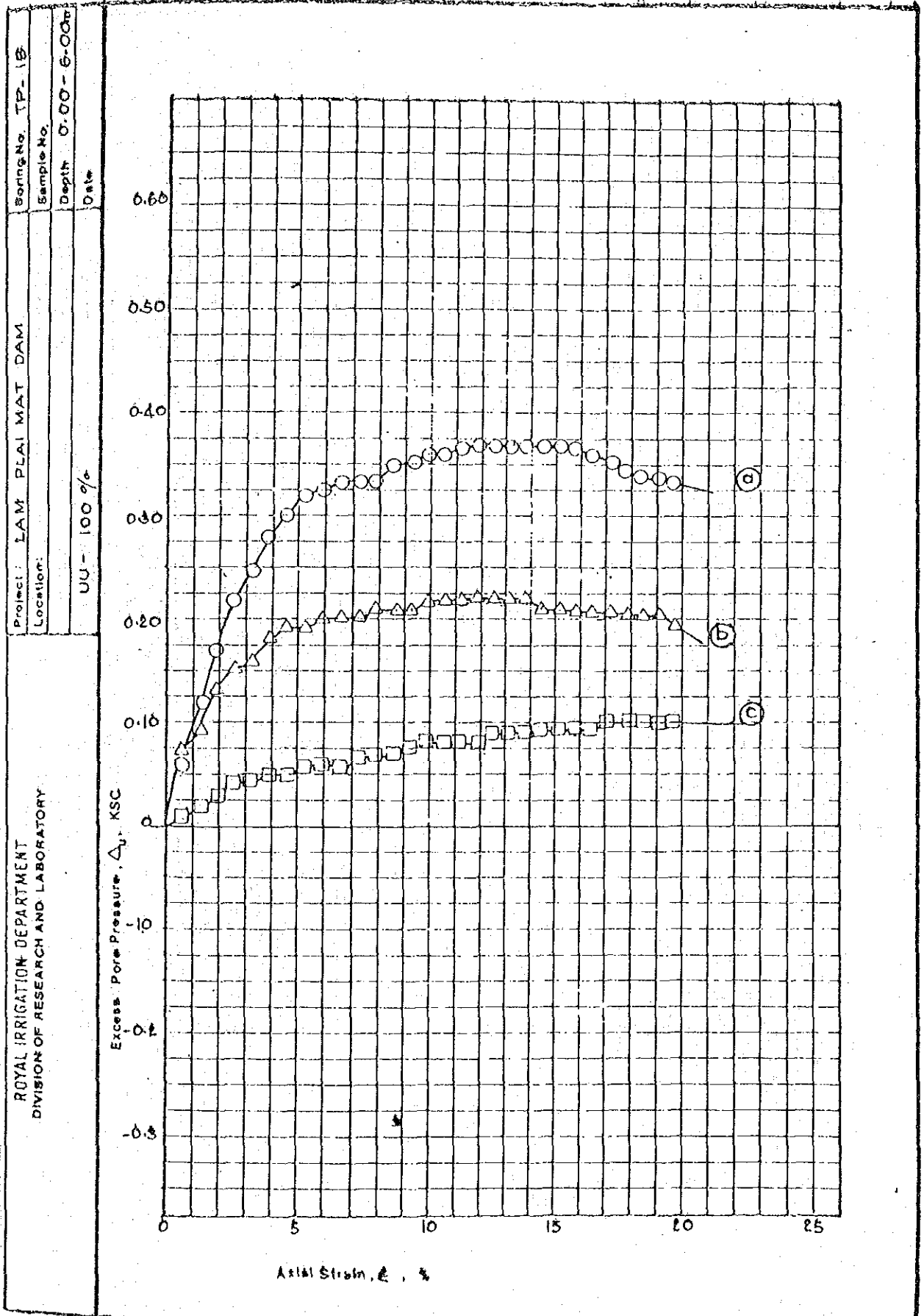


Fig. F-1-13 (10). Triaxial Test - lam Plai Mat

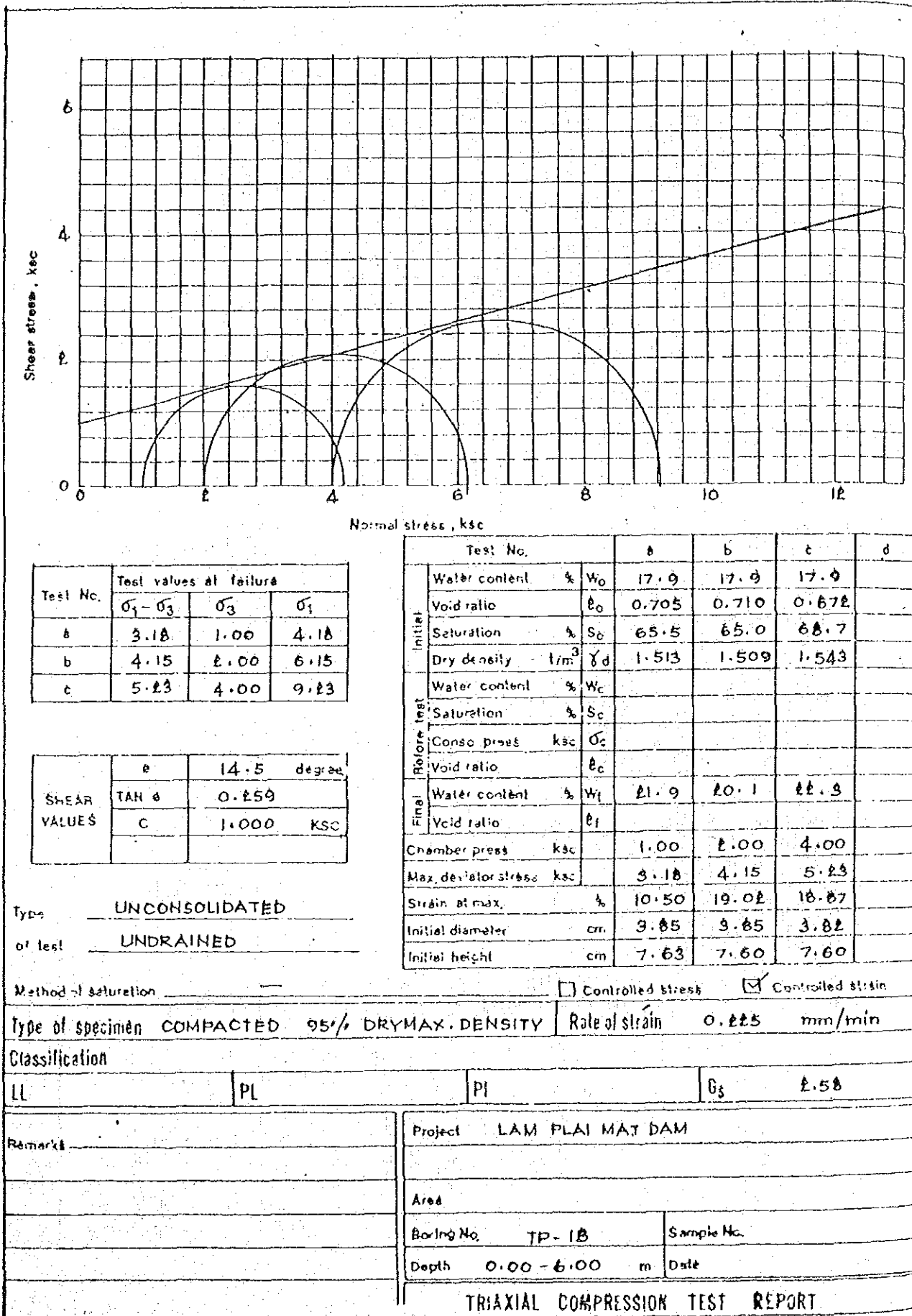


Fig. F-1-13 (11). Triaxial Test - Lam Plai Mat

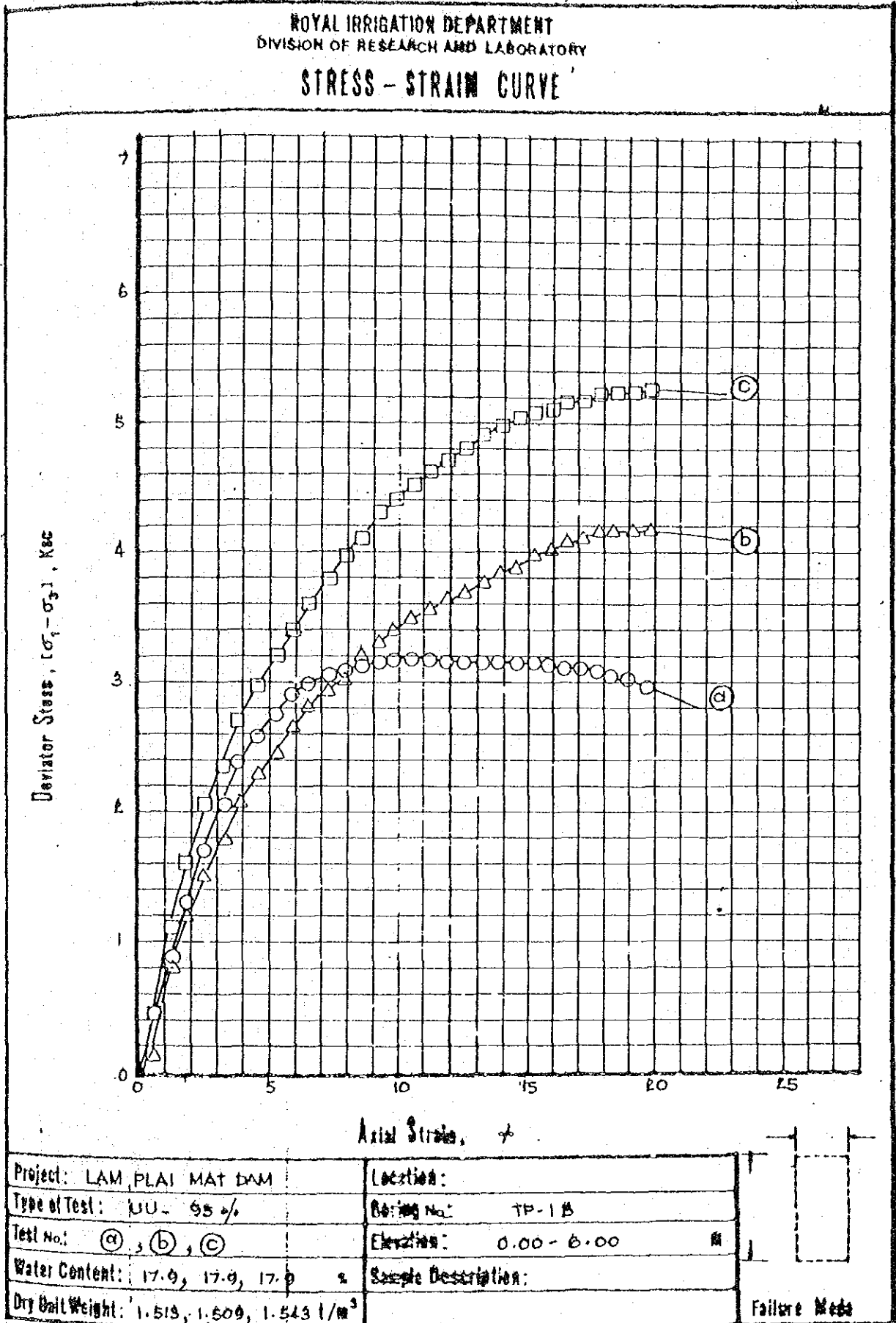


Fig. F-1-13 (12). Triaxial Test - Lam Plai Mat

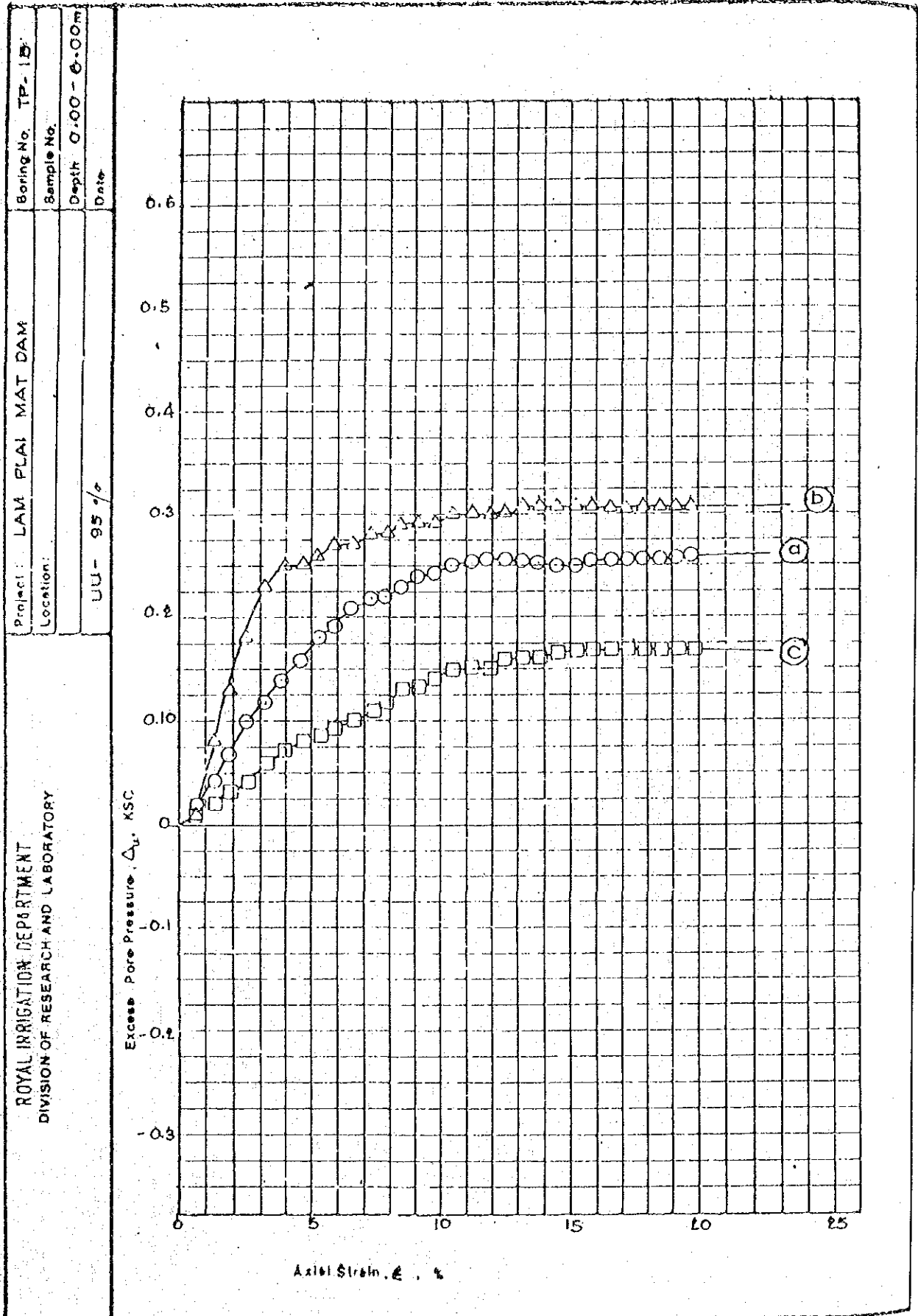
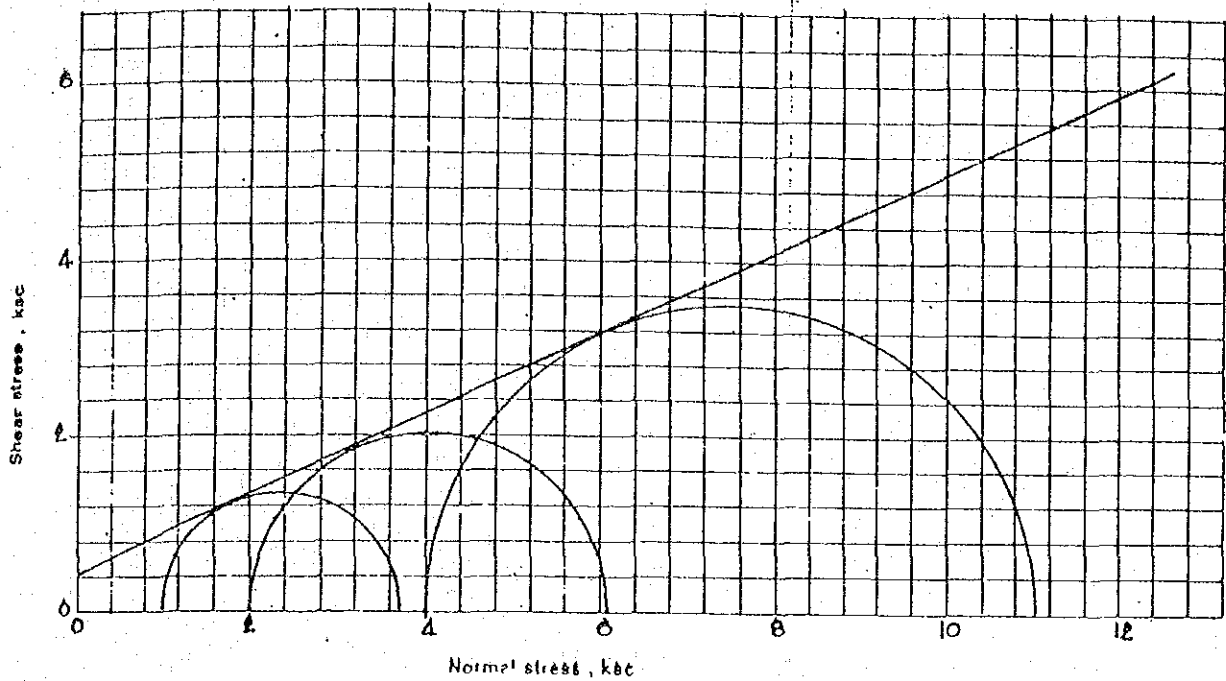


Fig. F-1-13 (13). Triaxial Test - Lam Plai Mat



Test No.	Test values at failure		
	$\sigma_1 - \sigma_3$	σ_3	σ_1
a	2.71	1.00	3.71
b	4.07	2.00	6.07
c	7.04	4.00	11.04

SHEAR VALUES	ϕ	24.5 degree
	TAN ϕ	0.456
	c	0.450 ksc

Type UNCONSOLIDATED
 of test UNDRAINED

Test No.		a	b	c	d
Initial	Water content % W_0	16.4	16.4	16.4	
	Void ratio e_0	0.541	0.535	0.547	
	Saturation % S_0	79.1	80.0	78.2	
	Dry density $1/m^3$ γ_d	1.694	1.700	1.587	
Before test	Water content % W_c				
	Saturation % S_c				
	Consol. press ksc σ_c				
	Void ratio e_c				
Final	Water content % W_f	18.5	16.8	15.5	
	Void ratio e_f				
Chamber press ksc		1.00	2.00	4.00	
Max. deviator stress ksc		2.71	4.07	7.04	
Strain at max. %		19.68	17.06	19.68	
Initial diameter cm		3.85	3.86	3.86	
Initial height cm		7.62	7.58	7.62	

Method of saturation _____ Controlled stress Controlled strain

Type of specimen COMPACTED 100% DRY MAX. DENSITY Rate of strain 0.225 mm/min

Classification

LL _____ PL _____ PI _____ U_s 2.61

Remarks

Project LAM PLAI MAT DAM

Area

Boring No. TP-1C

Sample No.

Depth 0.00 - 4.50 m

Date

TRIAxIAL COMPRESSION TEST REPORT

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Fig. P-1-13 (14). Triaxial Test - Lam Plai Mat

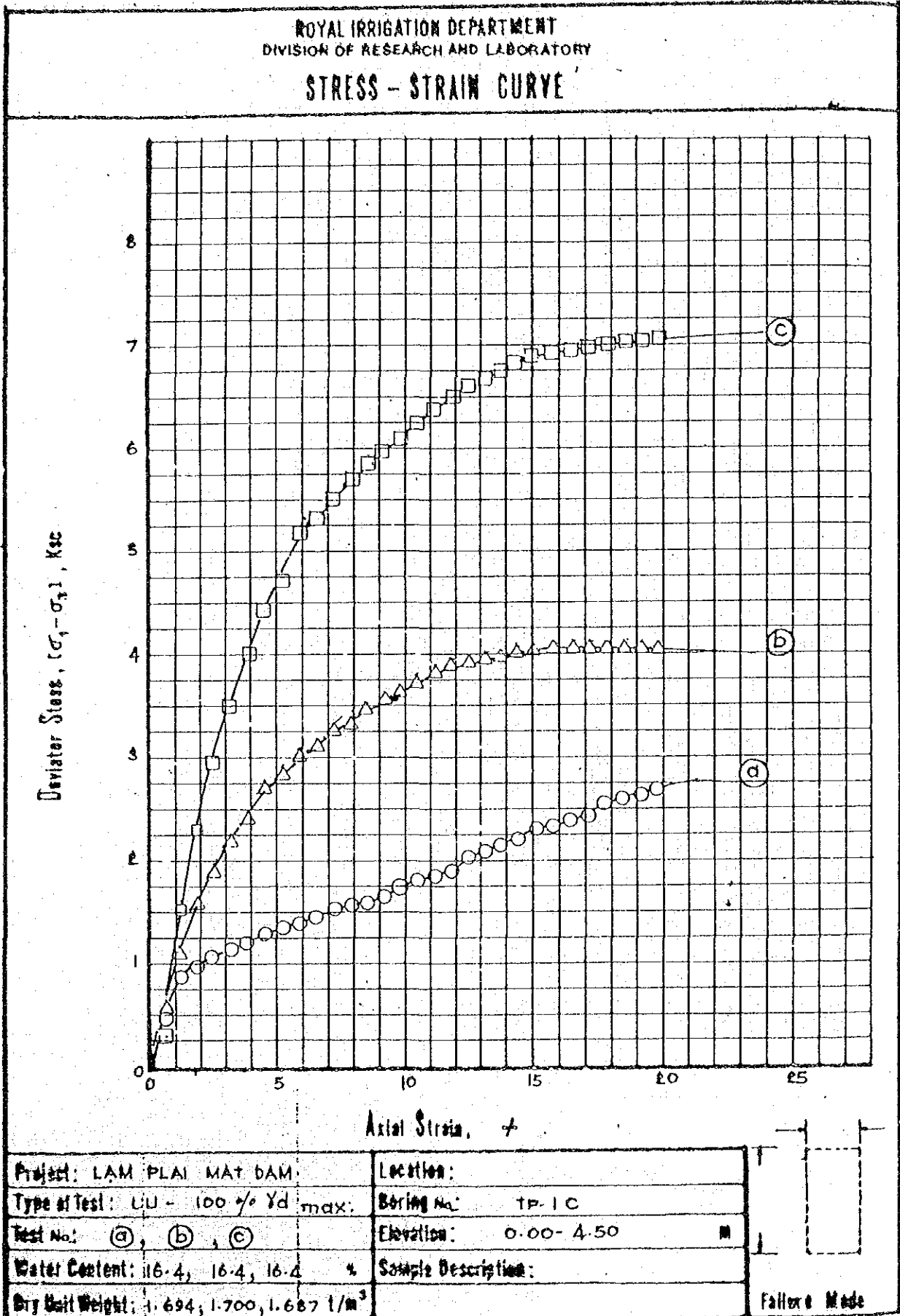


Fig. F-1-13 (15). Triaxial Test - Lam Plai Mat

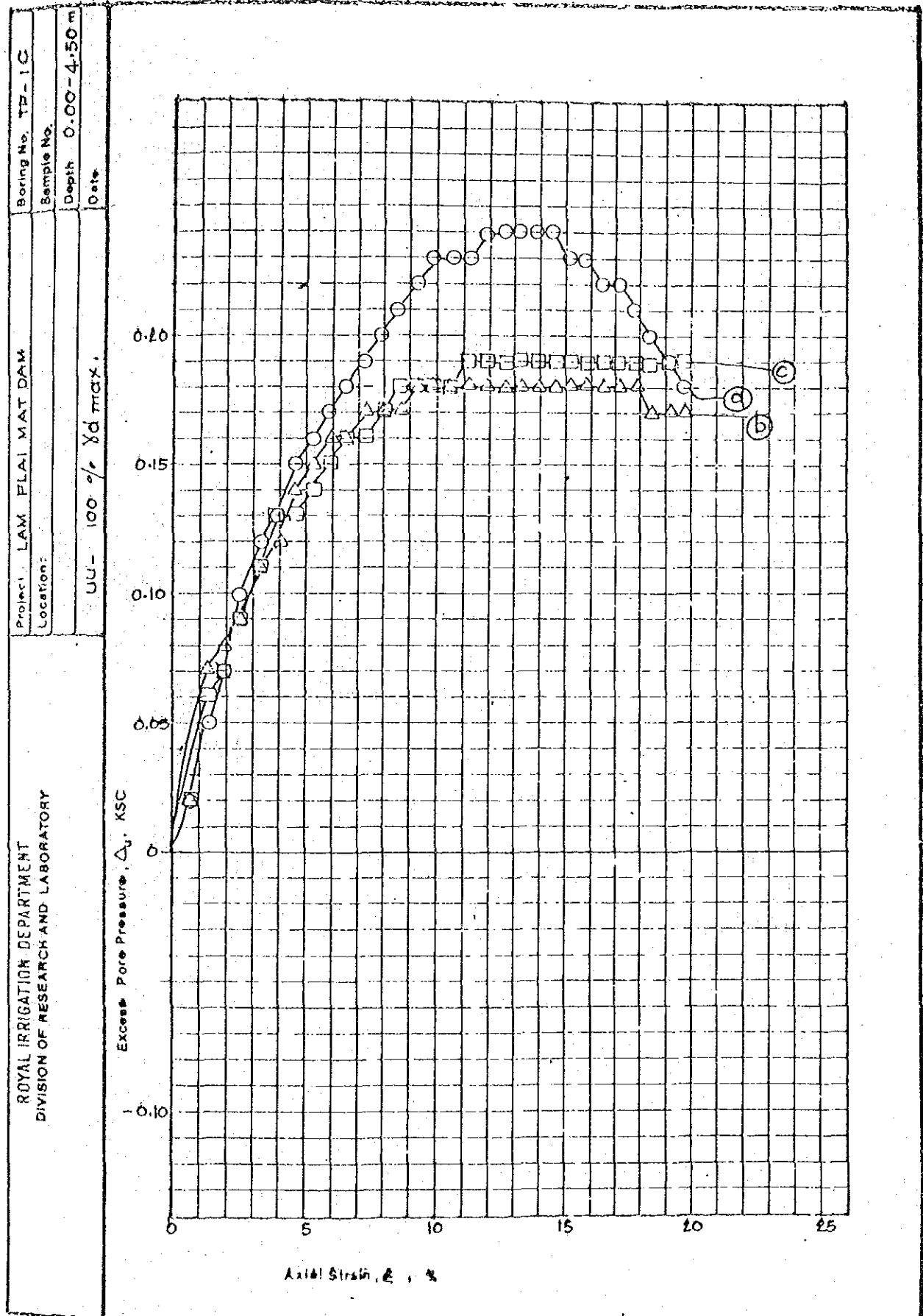
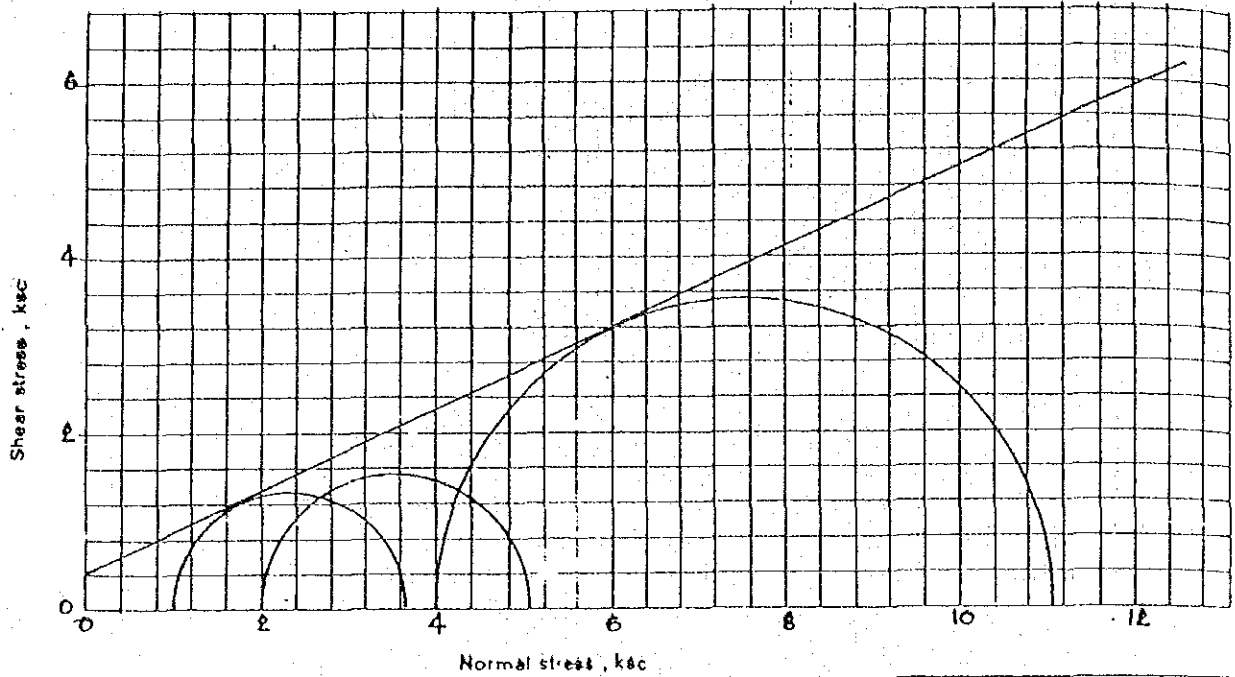


Fig. F-1-13 (16). Triaxial Test - Lam Plai Mat



Test No.	Test values At failure		
	$\sigma_1 - \sigma_3$	σ_3	σ_1
a	2.64	1.00	3.64
b	3.00	2.00	5.00
c	7.08	4.00	11.08

SHEAR VALUES	ϕ	24.6 degree
	TAN ϕ	0.458
	c	0.400 KSC

Test No.		a	b	c	d
Initial	Water content % W_0	11.9	11.9	11.9	
	Void ratio e_0	0.600	0.597	0.600	
	Saturation % S_0	51.8	52.0	51.8	
Before test	Dry density $1/m^3$ γ_d	1.631	1.634	1.631	
	Water content % W_c				
	Saturation % S_c				
Final	Consol. press ksc σ_c				
	Void ratio e_c				
	Water content % W_f	15.9	15.5	14.4	
	Void ratio e_f				
	Chamber press ksc	1.00	2.00	4.00	
	Max deviator stress ksc	2.64	3.00	7.08	
	Strain At max. %	13.12	17.08	19.68	
	Initial diameter cm	3.64	3.83	3.84	
	Initial height cm	7.81	7.83	7.63	

Type UNCONSOLIDATED
of test UNDRAINED

Method of saturation _____ Controlled stress Controlled strain

Type of specimen COMPACTED 95% DRY MAX. DENSITY Rate of strain 0.125 mm/min

Classification

LL _____ PL _____ PI _____ G_s 2.61

Remarks	Project <u>LAM PLAI MAT DAM</u>	
	Area _____	
	Boring No. <u>TP - 1C</u>	Sample No. _____
	Depth <u>0.00 - 4.50</u> m	Date _____
TRIAXIAL COMPRESSION TEST REPORT		

Fig. F-1-13 (17). Triaxial Test - Lam Plai Mat

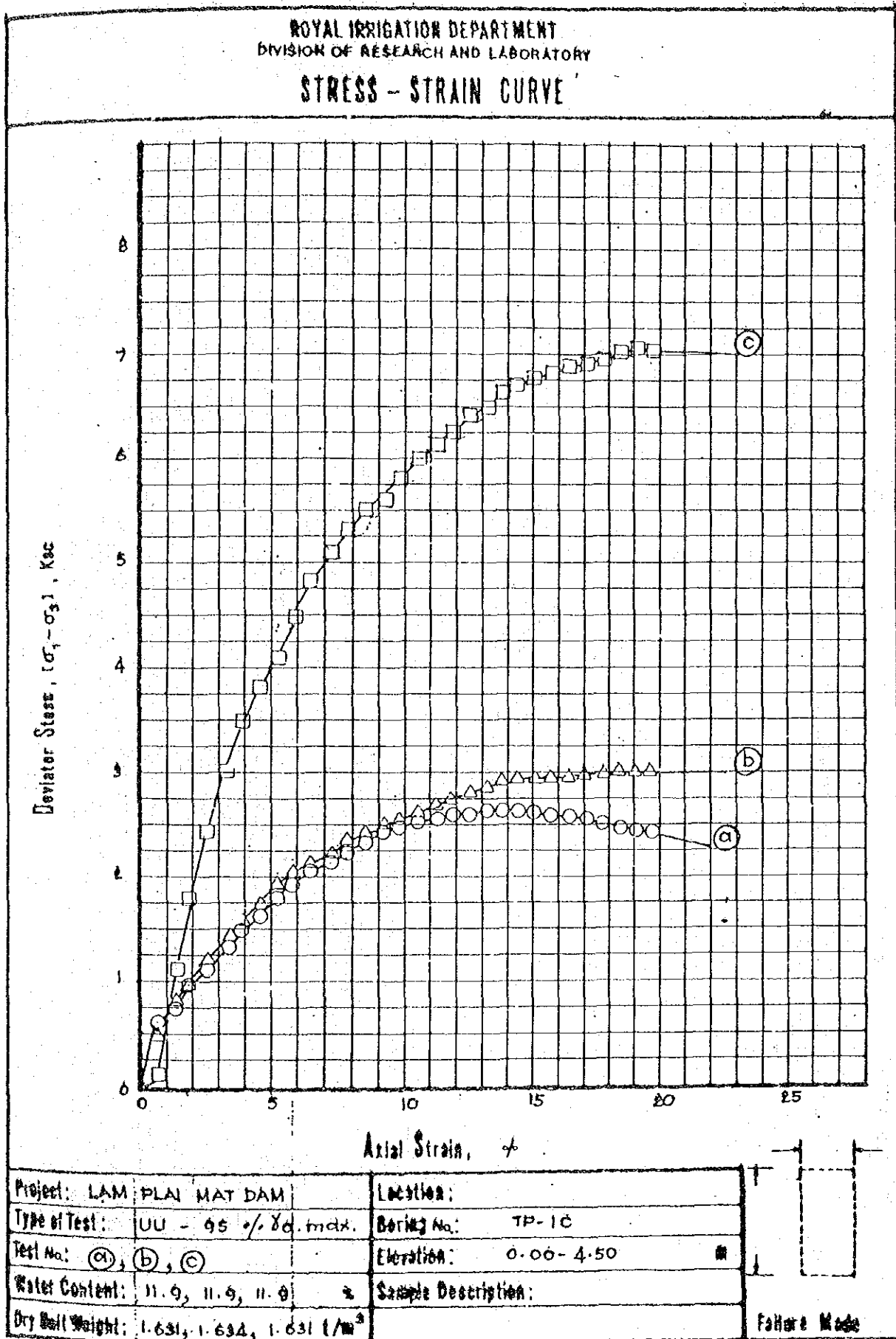
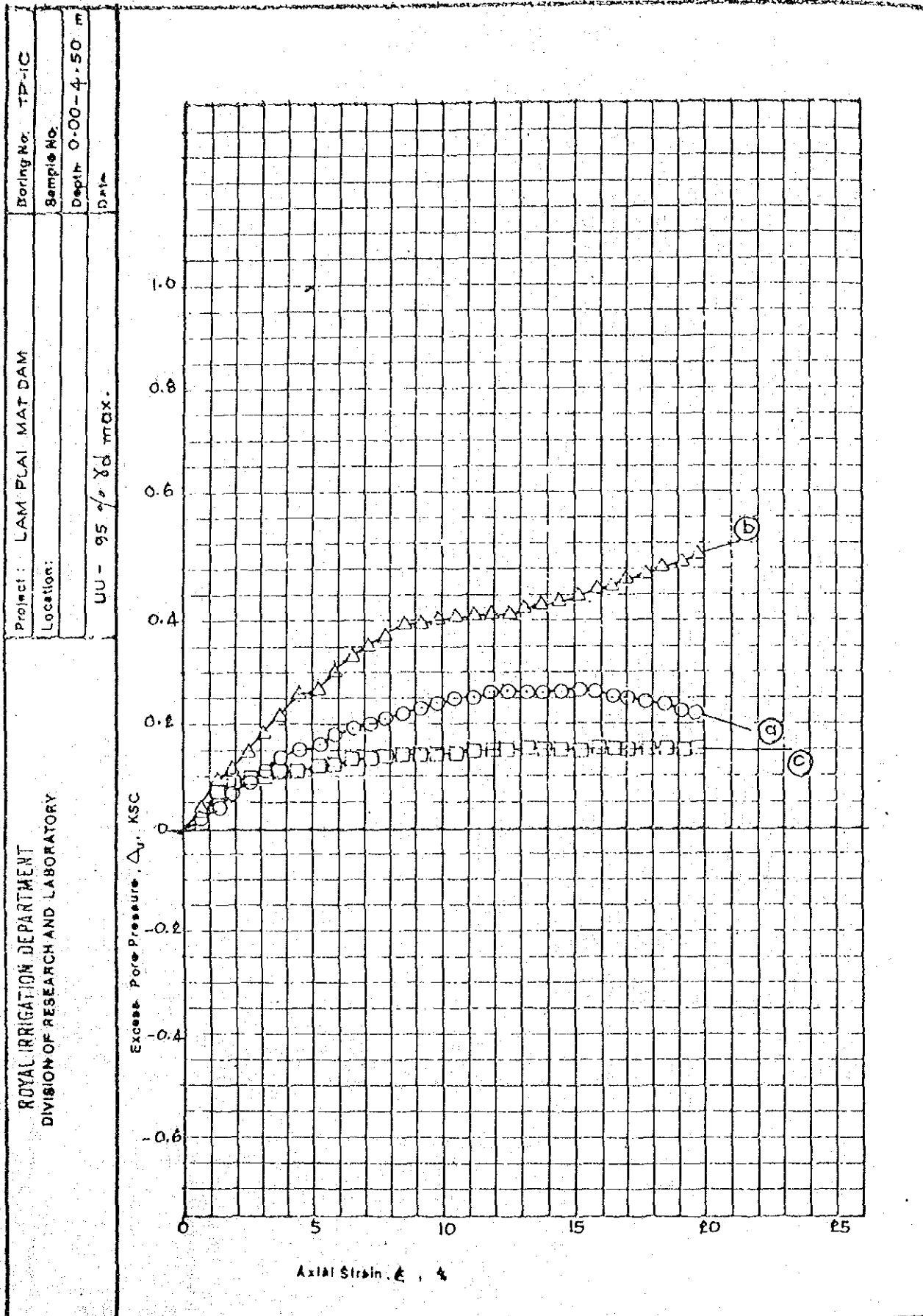


Fig. F-1-13 (18). Triaxial Test - Lam Plai Mat



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(W.R. 2517)

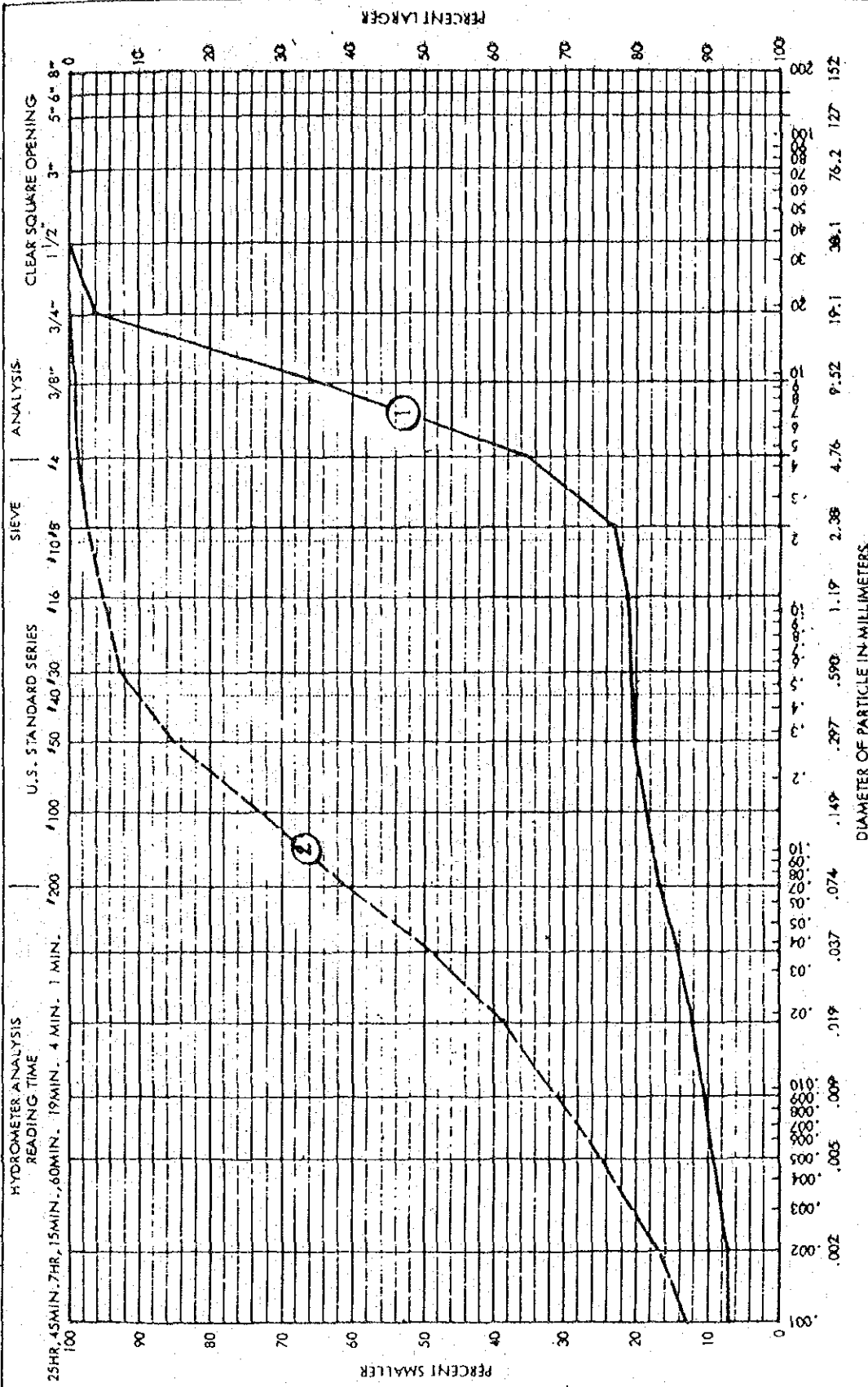
Memo. 4/2527

GRADATION TEST

Fig. F-1-14 (1)

Project: *โครงการชลประทานหนองลำพุก*

Technical Division
Royal Irrigation Department



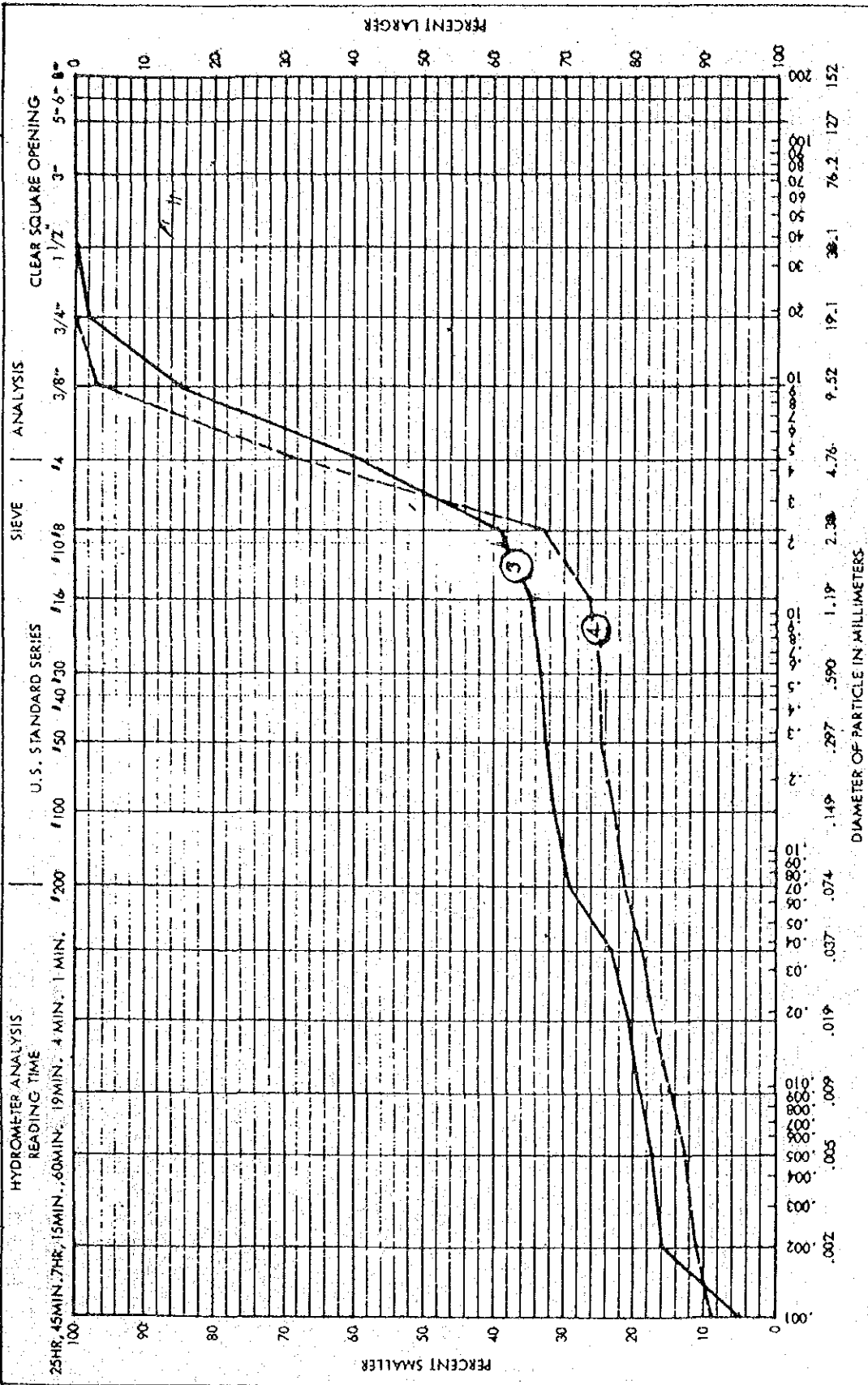
No.	Sample No.	Depth (m)	G _s	SAND			GRAVEL		COBBLES
				W _n	L.L.	P.L.	P.I.	S.L.	
1	TP 1 A	0.00-2.00	2.80	52.0	51.6	20.4	18.5	Unified Soil Classification	
2	TP 1 A	2.00-6.00	2.70	50.0	35.4	14.6	15.8	GM	
								MH	

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Project **WANGMUN** **NONG LUMPHUK** Fig. F-1-14 (2). GRADATION TEST

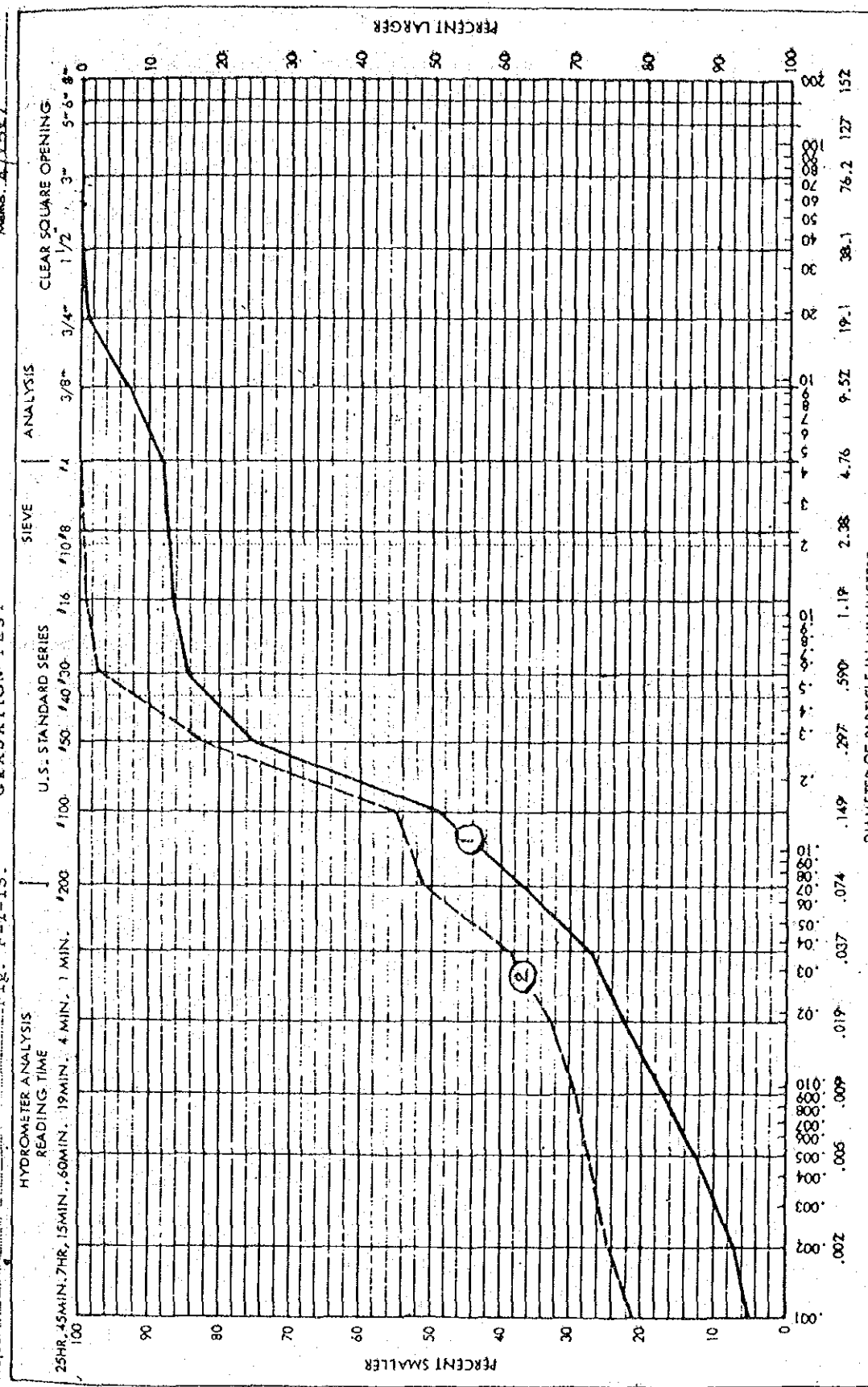
Memo: **4/25/57**



No.	Sample No.	Depth (m)	Gs	SAND			GRAVEL		COBBLES		Unified Soil Classification
				Wn	L.L.	P.L.	F.I.	S.L.	Fine	Coarse	
3	TP. 1 B	0.00-1.70	2.86	54.7	36.0	18.7	19.8				GM
4	TP. 1 C	0.00-3.00	2.95	59.7	36.0	23.7	18.4				GM

Note:

Project #12197
 HUALI PHU
 - Royal Irrigation Department
 Memo. 4/1327



CLAY (plastic) TO SILT (non-plastic)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	
No. Sample No.	Wt	PL	PL	S.L.	Unified Soil Classification	
① TP. 1A	11.3	13.1	3.4	10.4	CL	
② TP. 2B	18.2	33.4	15.7	14.0	SM	

Notes: ① ②

Checked: VS- Date: 8-11-63

Drawn: PI. Sheet of