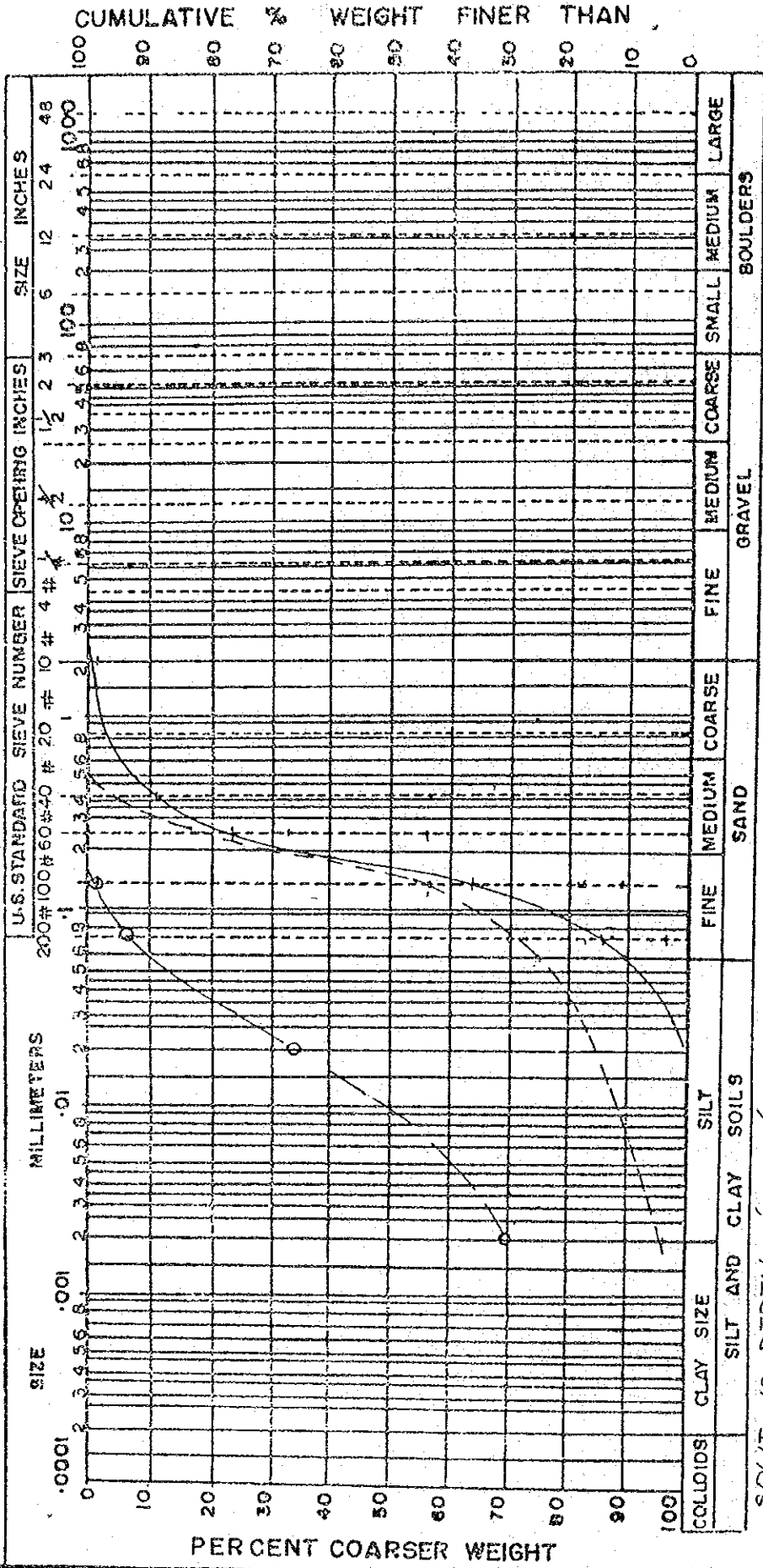


CONSTRUCTION CORPORATION
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 BH. 4



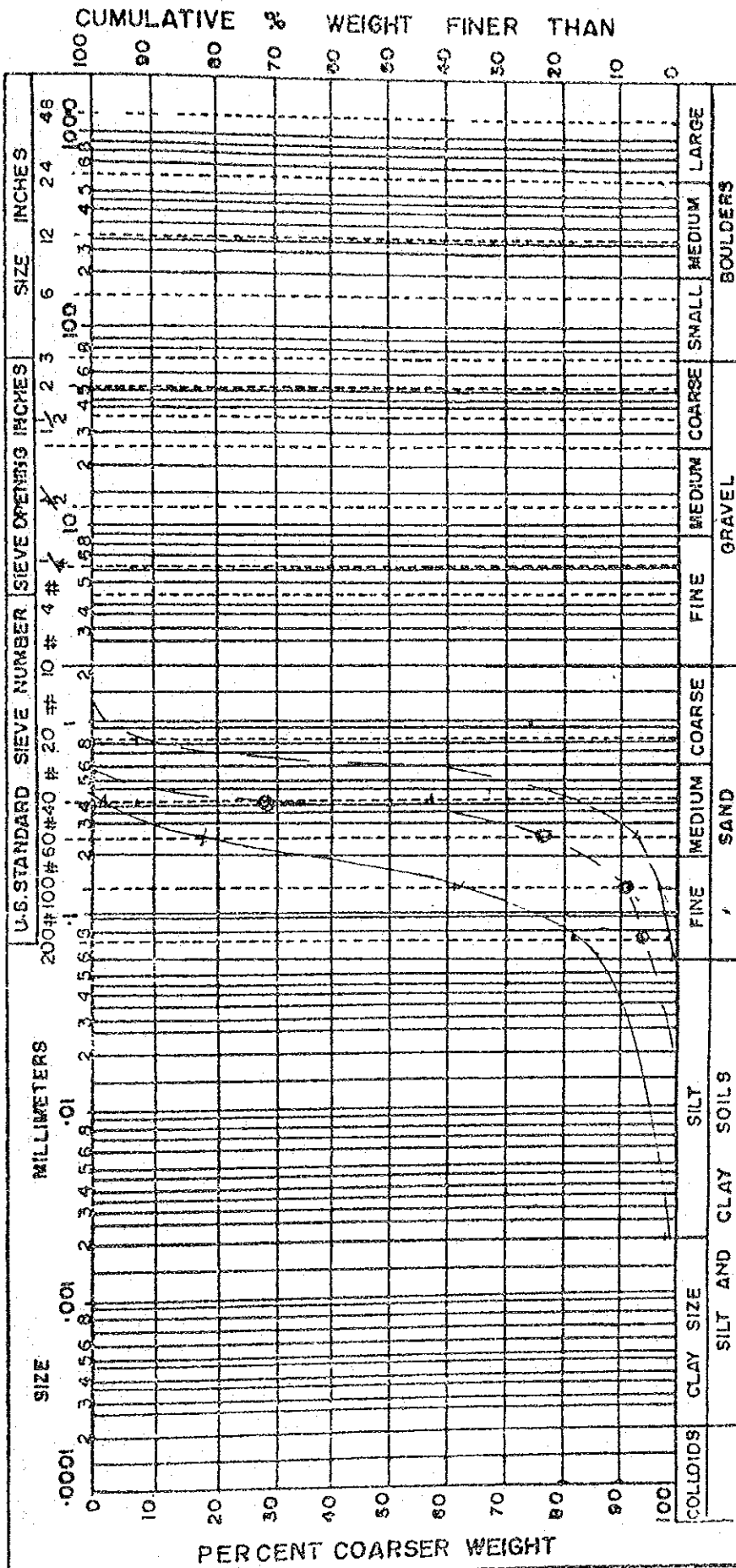
SPLIT 12 DEPTH 55'-60'
 " 15 " 70'-75'
 " 16 " -75'-80'

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PROJECT

BA-4



SPLIT 17, DEPTH. 80'-85'
" 20 " 97'-100"
" 23 " 110'-111"

Appendix Fig. 6.3.30 GRAIN SIZE DISTRIBUTION

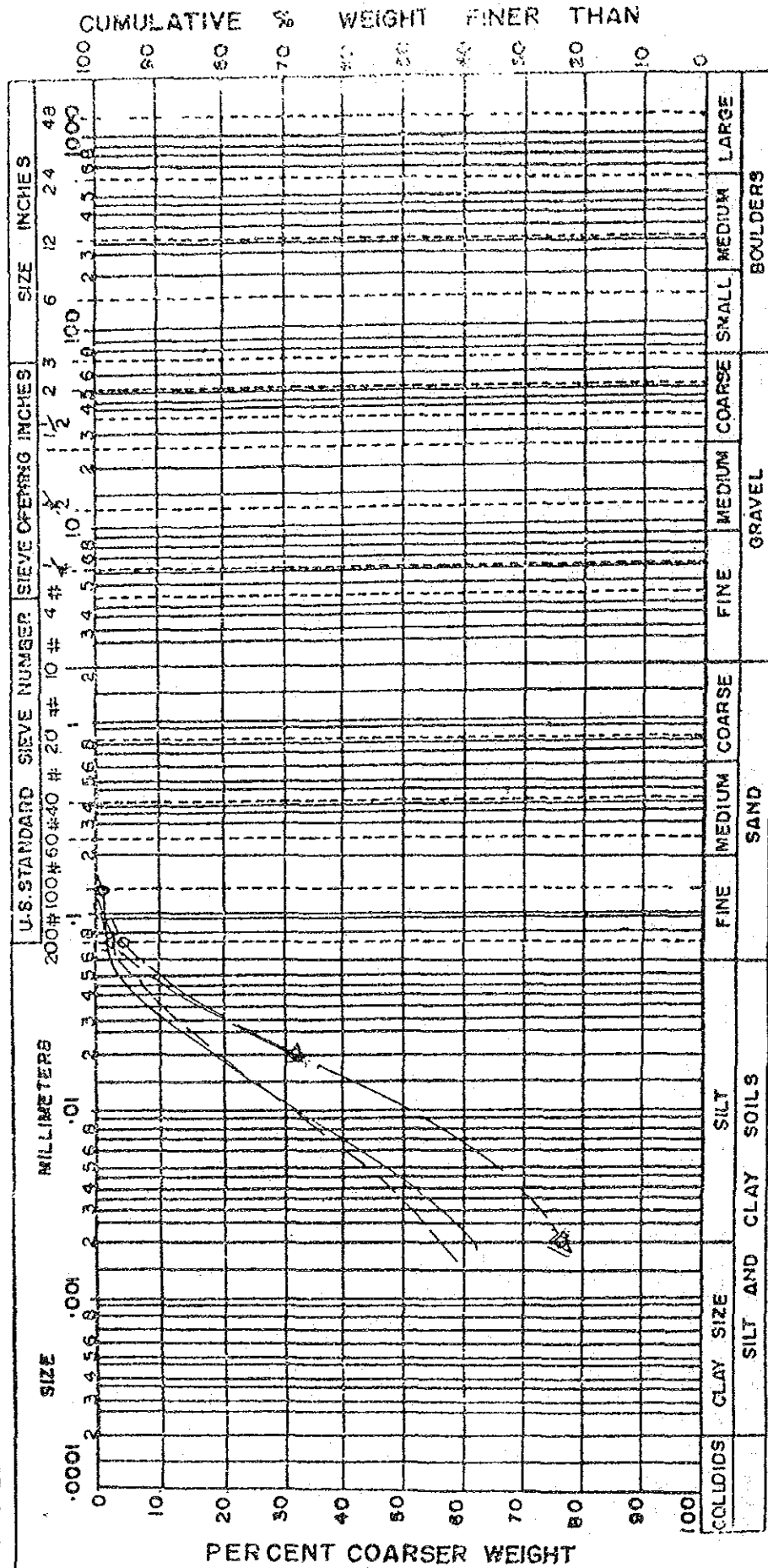
CONSTRUCTION CORPORATION

RESEARCH & TESTING LABORATORY

JOB NO. MYAWADDY BRIDGE PROJECT

PROJECT

BH. S



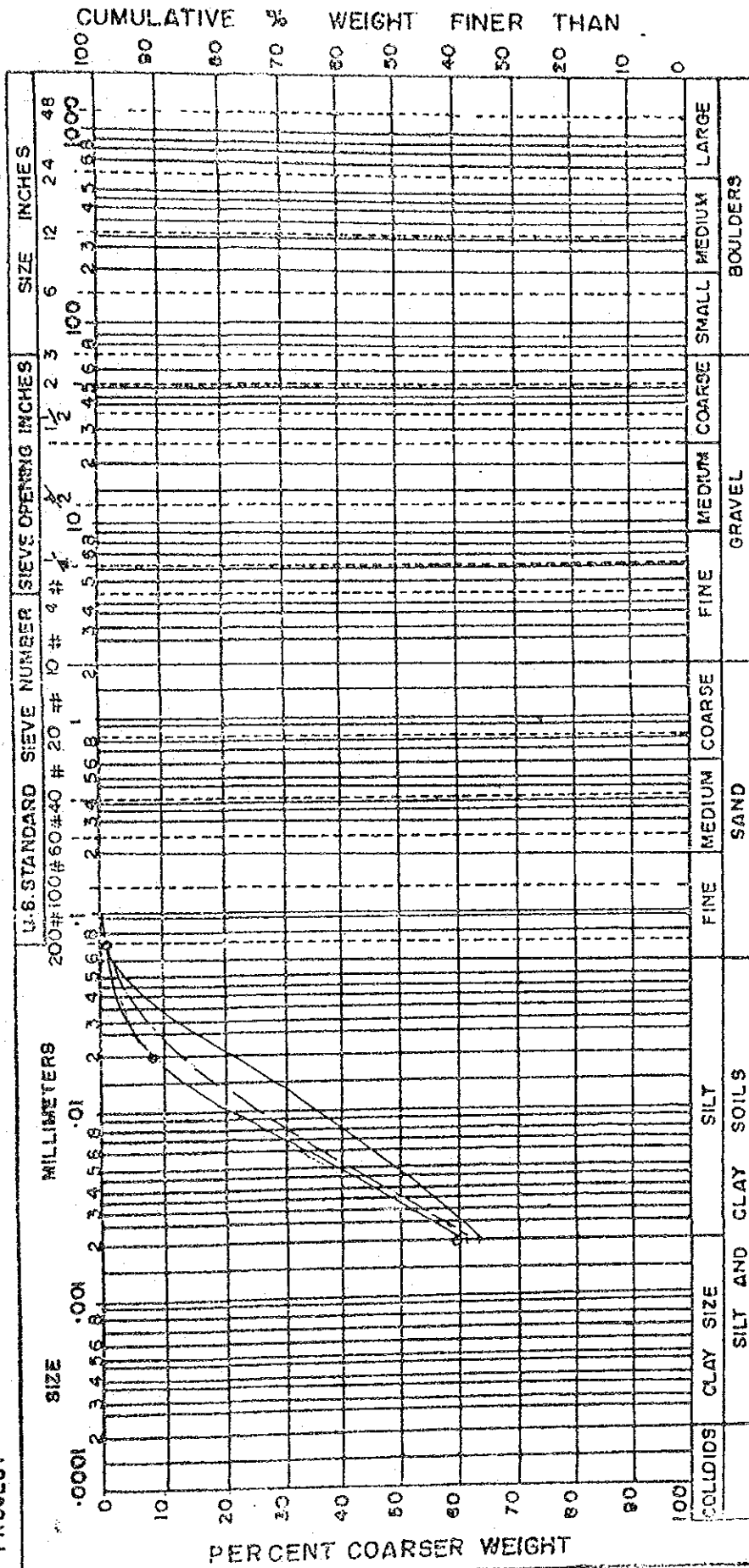
SPLIT S DEPTH: 20' - 21.5'
 " 6 " 25' - 26'
 " 10 " 45' - 45.5'
 " 14 " 50' - 50.5'

Appendix Fig. 6-3-31 GRAIN SIZE DISTRIBUTION

CONSTRUCTION CORPORATION
RESEARCH & TESTING LABORATORY

JOB NO. MYAWADDY BRIDGE PROJECT
PROJECT

84-5



SPLITS (1) DEPTH. 0' - 1.5'
" 2 " 5' - 6.5'
" 3 " 10' - 11.5'

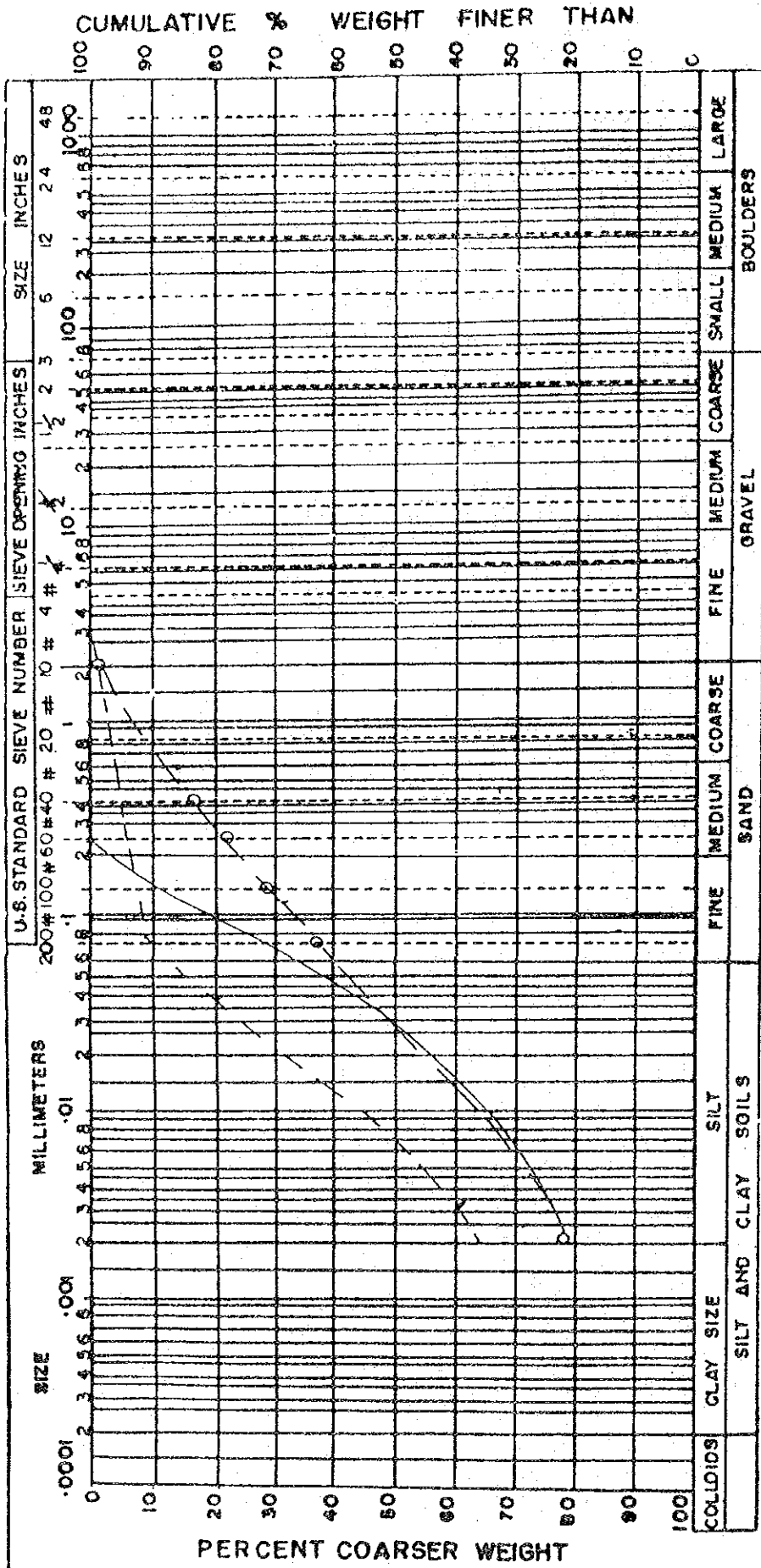
Appendix Fig. 6.3.32 GRAIN SIZE DISTRIBUTION

Appendix Fig. 6.3.33 GRAIN SIZE DISTRIBUTION

JOB NO.

PROJECT MYAWADDY BRIDGE

BH 5.A



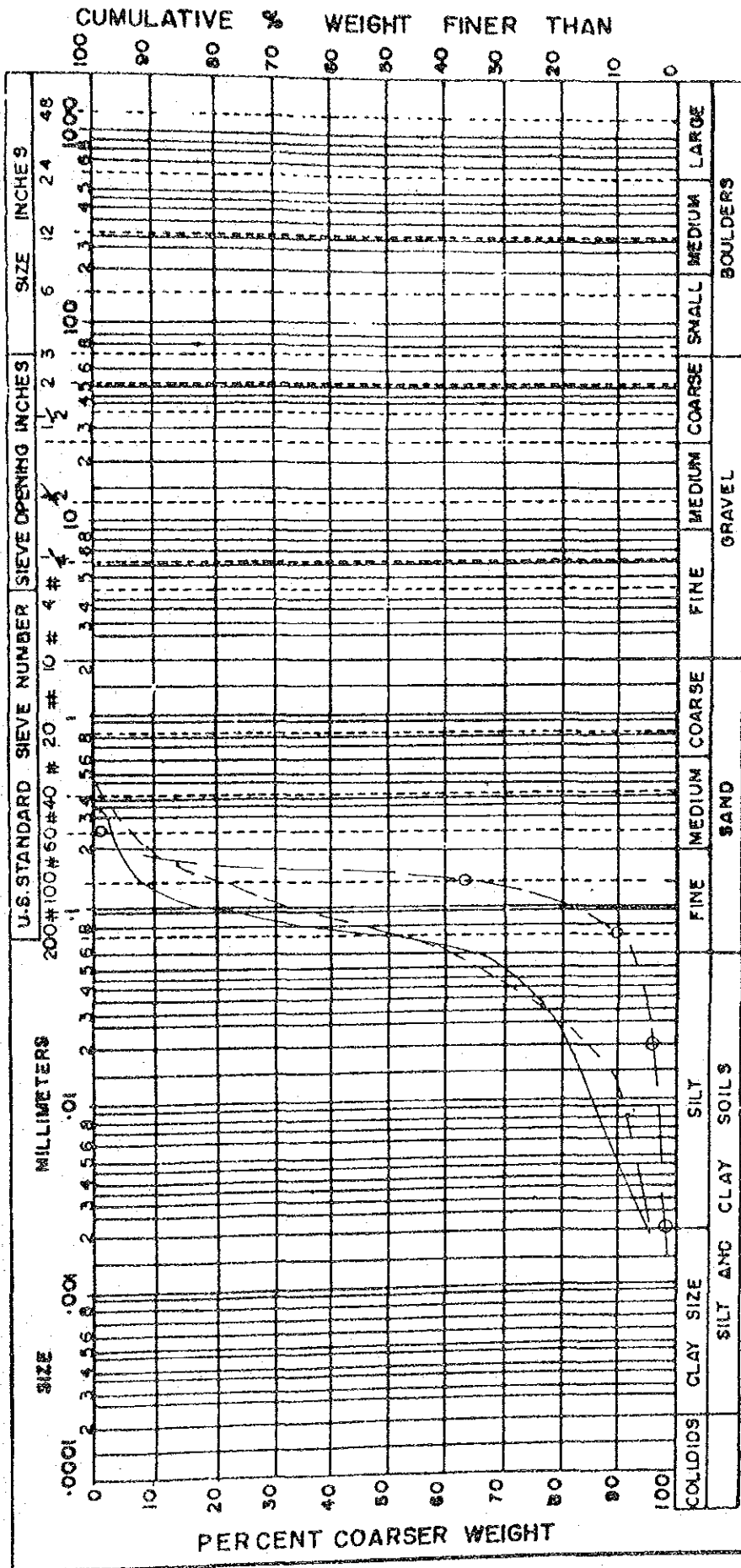
SPLIT NO. 1 DEPTH : 0' - 5'
 . 2 . . . 10' - 15'
 . 5 . . . 25' - 30'

Appendix Fig. 6.3.34 GRAIN SIZE DISTRIBUTION

JOB NO.

PROJECT MYAWADDY BRIDGE

BH.7

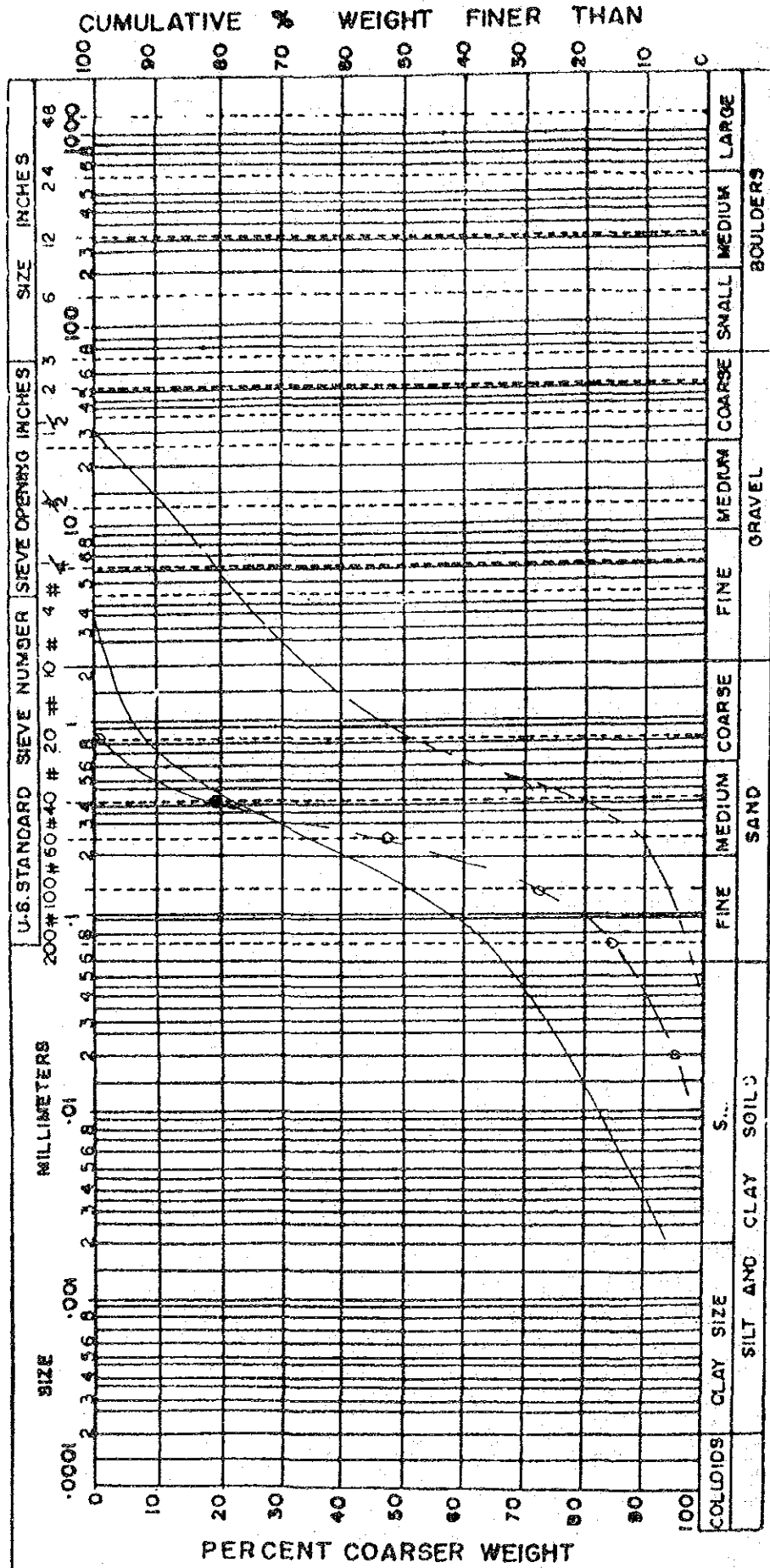


SPLIT NO.1 DEPTH: 0' - 5'
 " 2 " 5' - 10'
 " 5 " 20' - 25'

GRAIN SIZE DISTRIBUTION

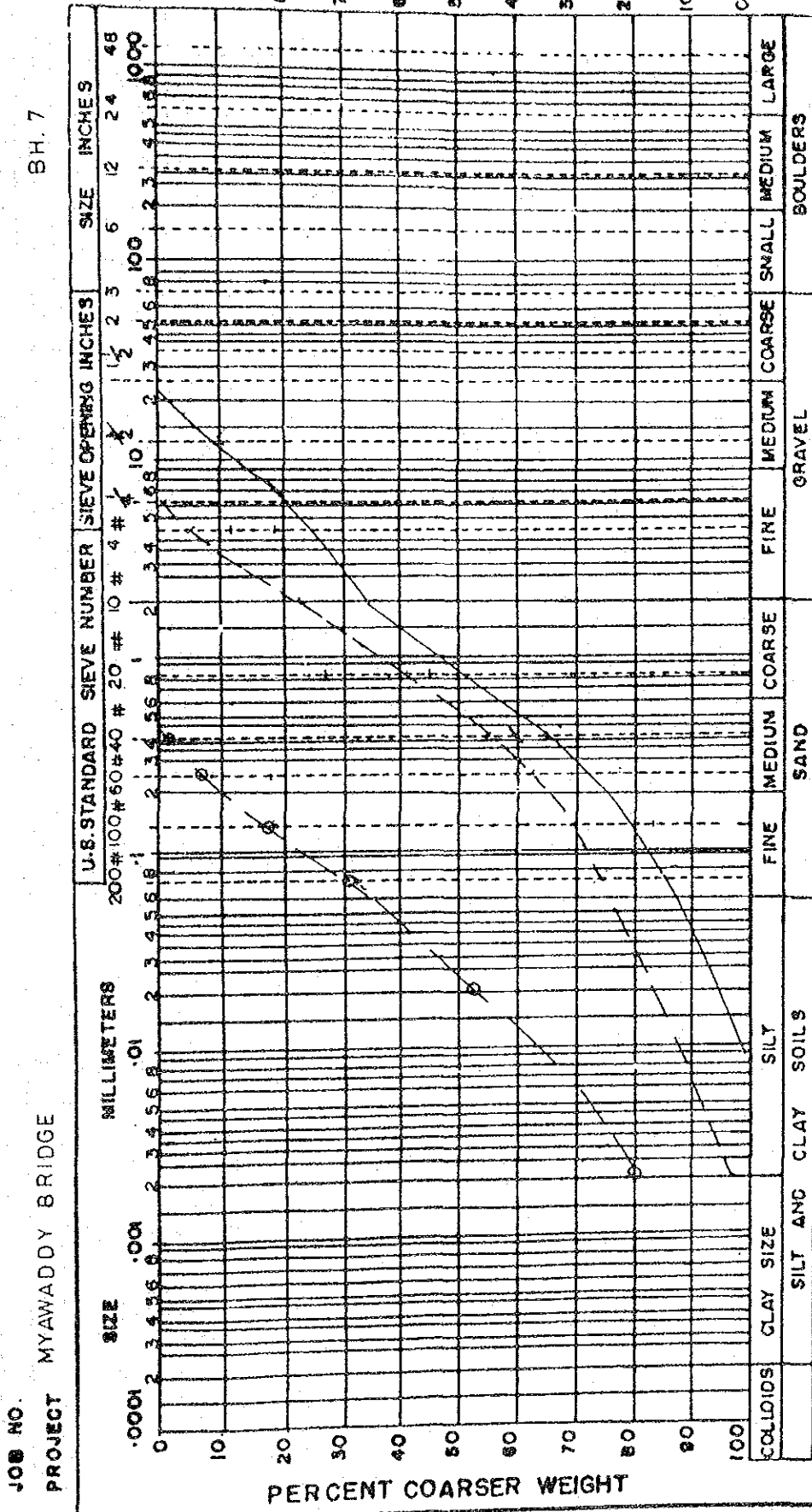
Appendix Fig. 6.3.35

JOB NO. PROJECT MYAWADDY BRIDGE BH. 7



SPLIT NO: 6 DEPTH: 25 - 30
 9 " 40 - 45
 11 " 50 - 55

Appendix Fig. 6.3.36 GRAIN SIZE DISTRIBUTION



SPLIT NO. 12 DEPTH : 55' - 60'
 " 14 " 65' - 70'
 " 17 " 80' - 85'

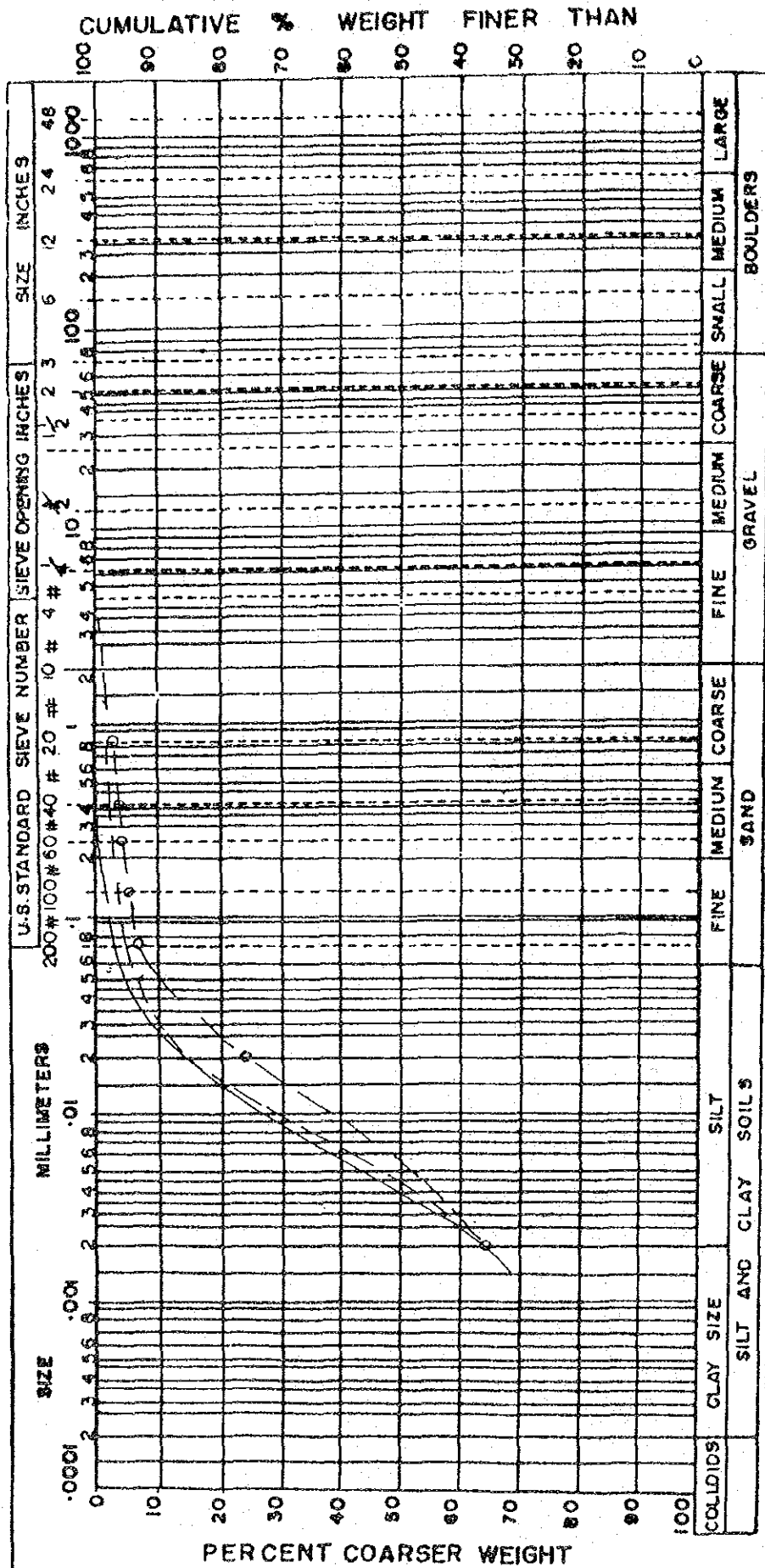
GRAIN SIZE DISTRIBUTION

Appendix Fig. 6.3.37

JOB NO.

PROJECT MYAWADDY BRIDGE

BH. 8 A

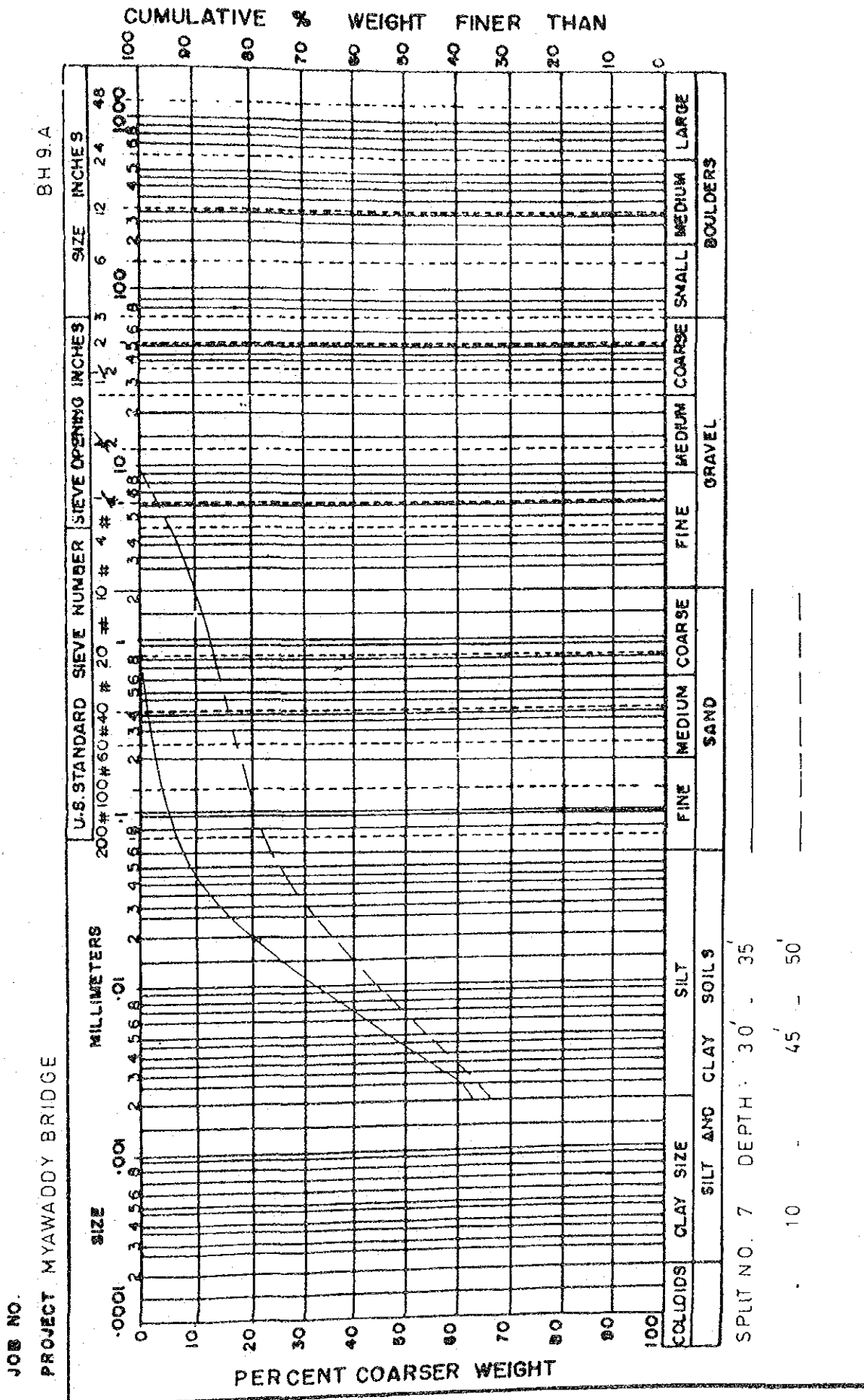


SPLIT NO.1 DEPTH : 0' - 1.6'

 " 3' - 15'

 " 5' - 25'

Appendix Fig. 6.3.38 GRAIN SIZE DISTRIBUTION

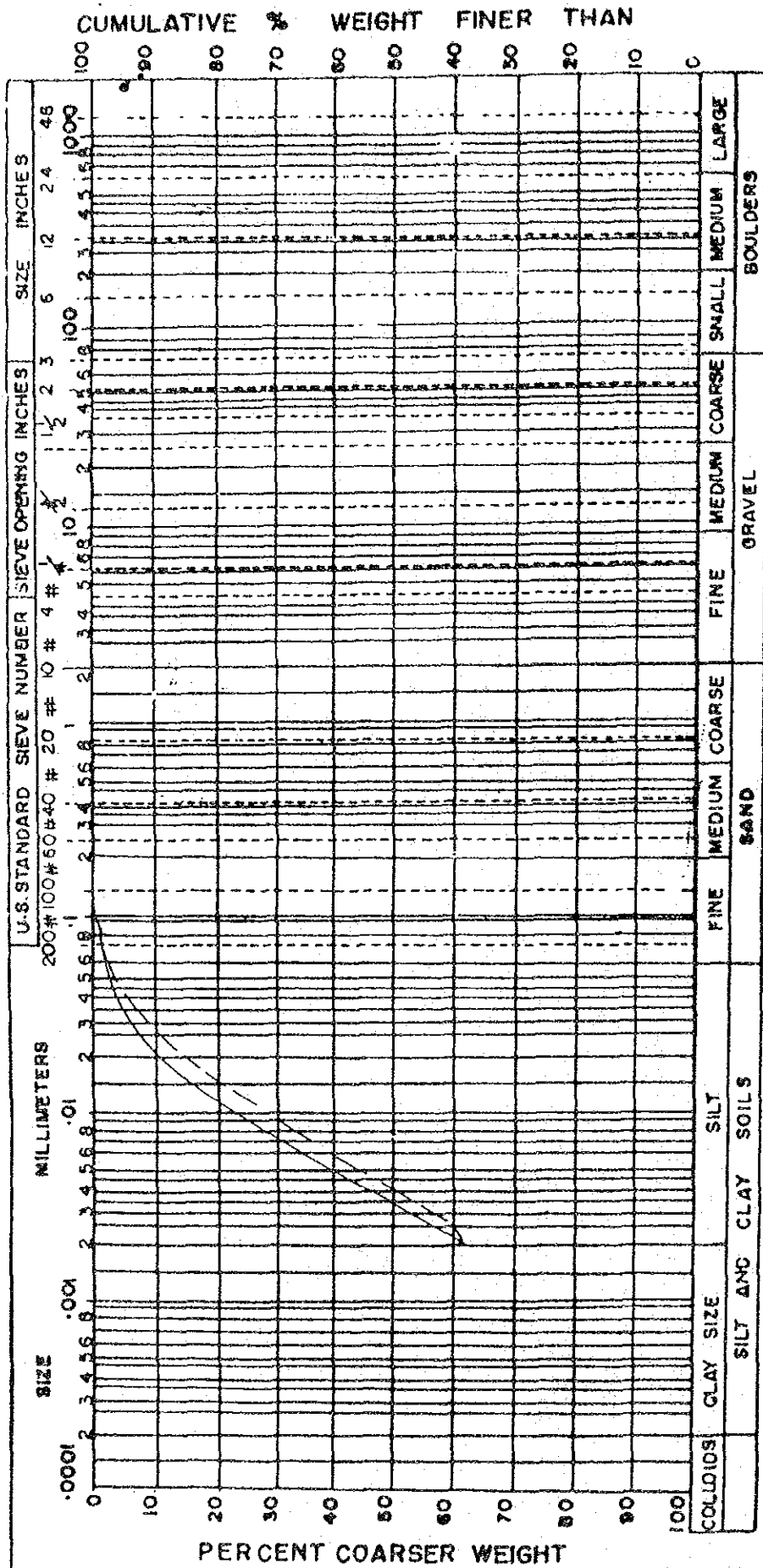


Appendix Fig. 6.3.39 GRAIN SIZE DISTRIBUTION

JOB NO.

PROJECT MYAWADDY BRIDGE

BH 9B



OSTERBERG SAMPLE NO. 1 DEPTH: 15' - 16.6'

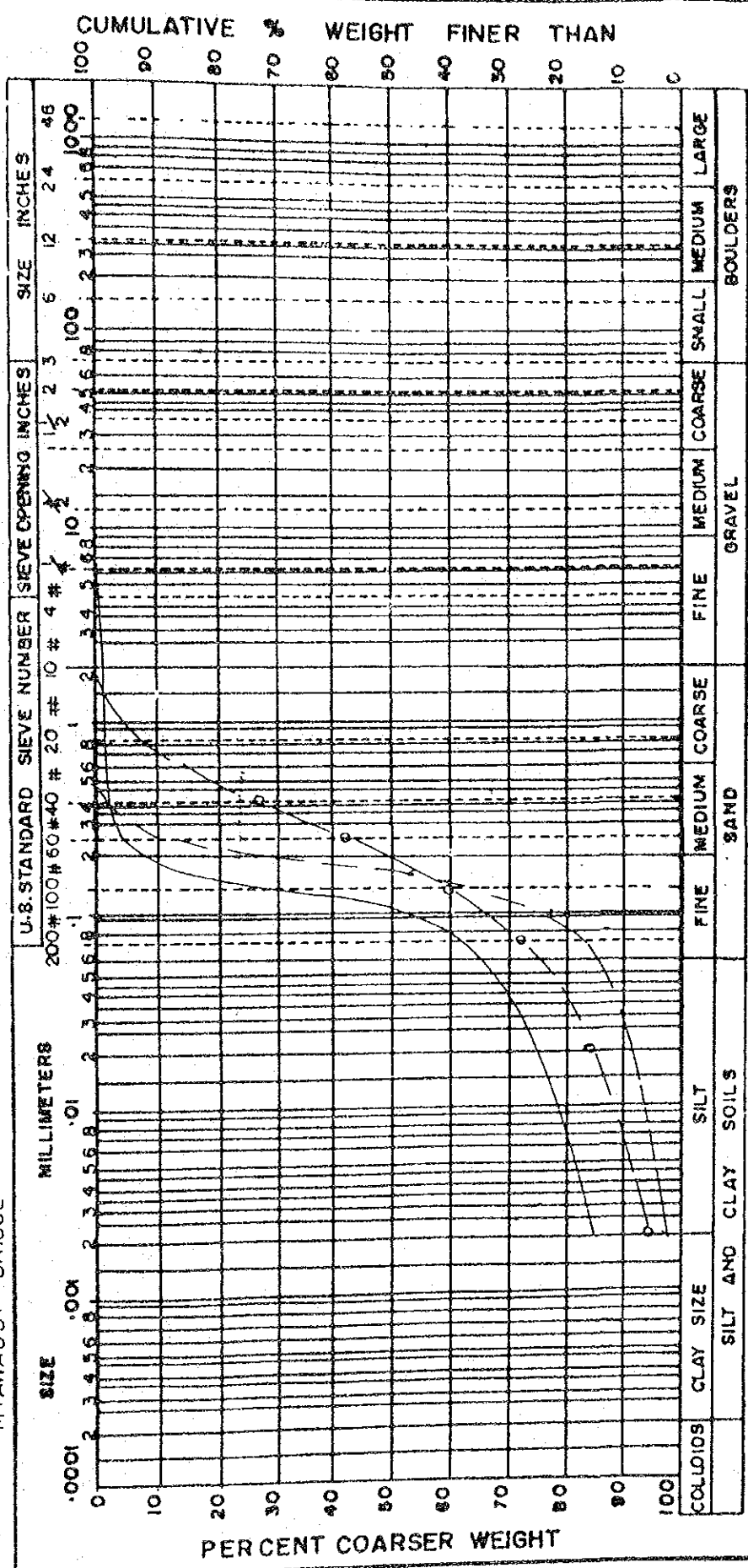
2 30 31.6

Appendix Fig. 6.3.40 GRAIN SIZE DISTRIBUTION

JOB NO.

PROJECT MYAWADDY BRIDGE

BH:11



SPLIT NO. 4 DEPTH: 0' - 5'

2 - 5' - 10'

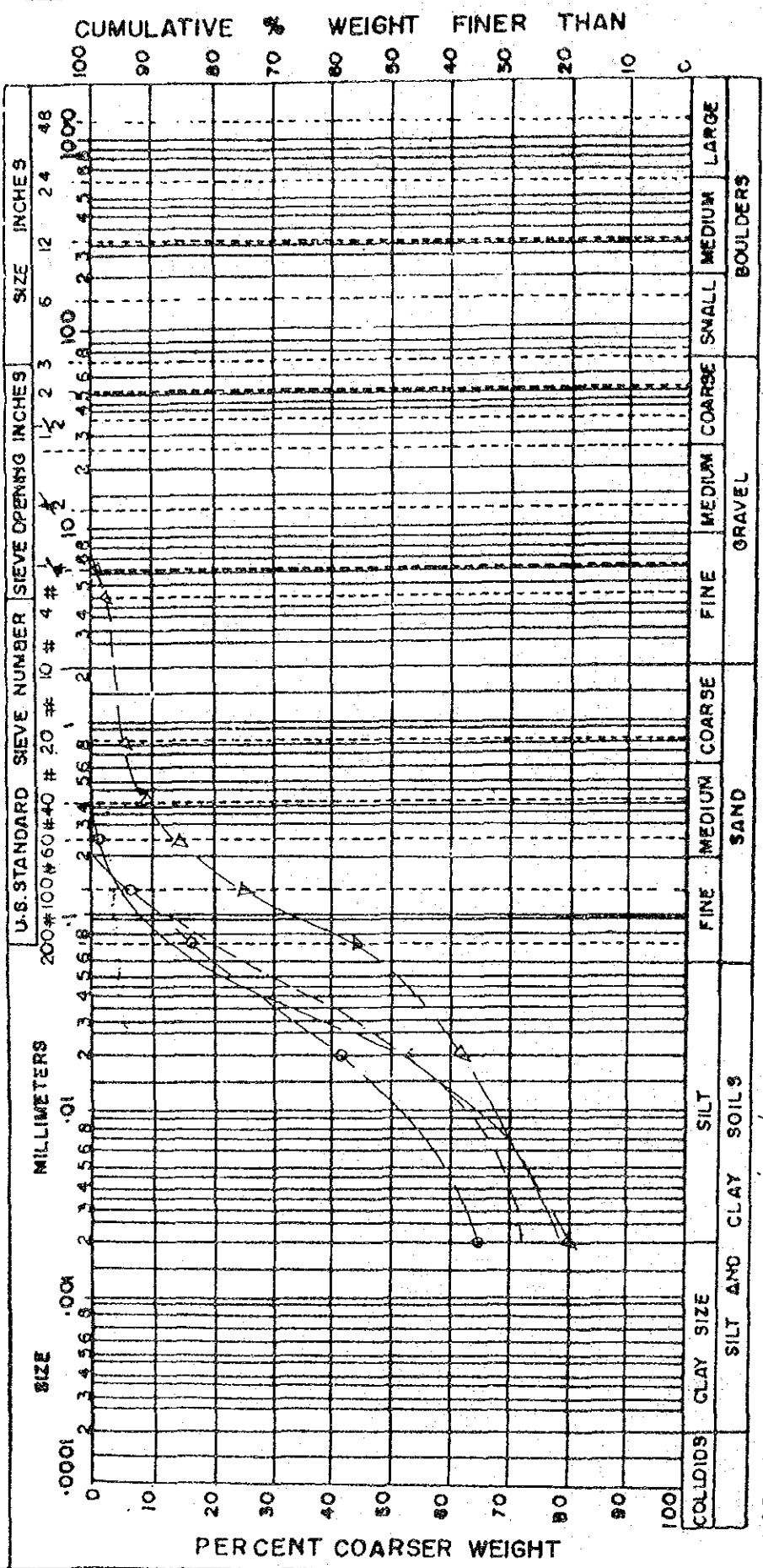
Core Sample. 2 10' 2" - 12' 0

Appendix Fig. 6.3.41 GRAIN SIZE DISTRIBUTION

JOB NO.

PROJECT MYAWADDY BRIDGE

BH. 12



PERCENT COARSER WEIGHT

CUMULATIVE % WEIGHT FINER THAN

SPLIT NO. 1 DEPTH: 0 - 5'
 2 " 5 - 10'
 3 " 15 - 20'
 4 " 25' - 26.6'

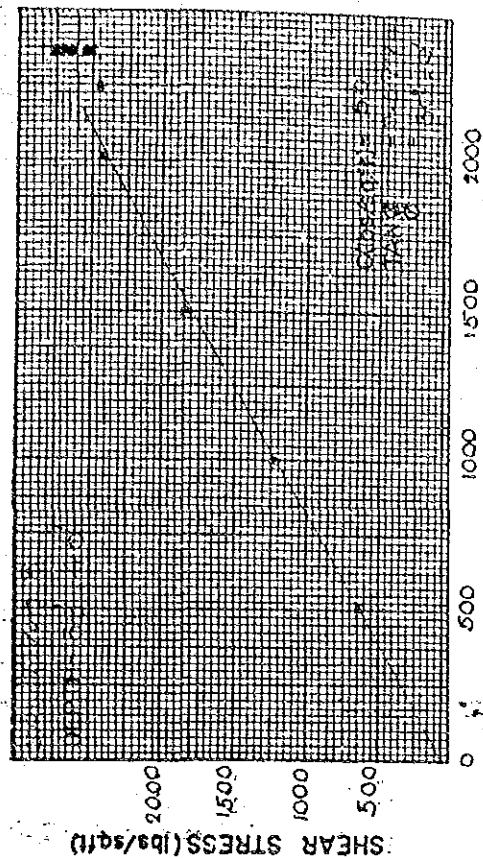
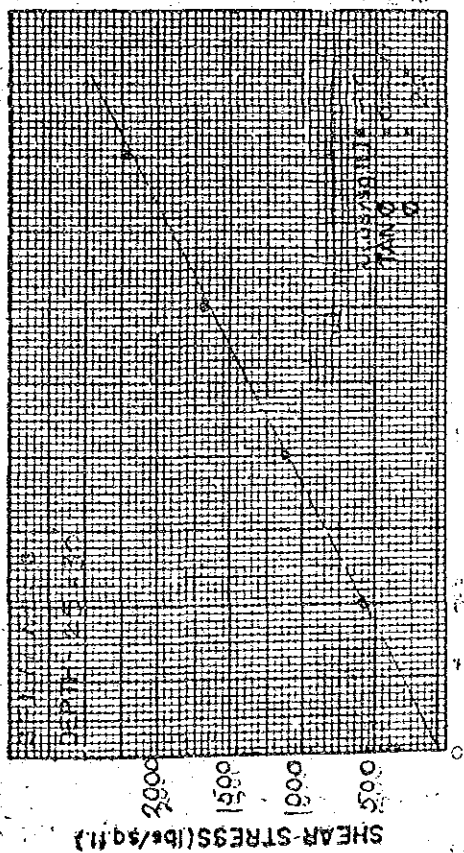
Appendix Fig. 6.3.42 DIRECT SHEAR TEST

LOCATION: MYAWADDY BRIDGE

HOLE NO. 2

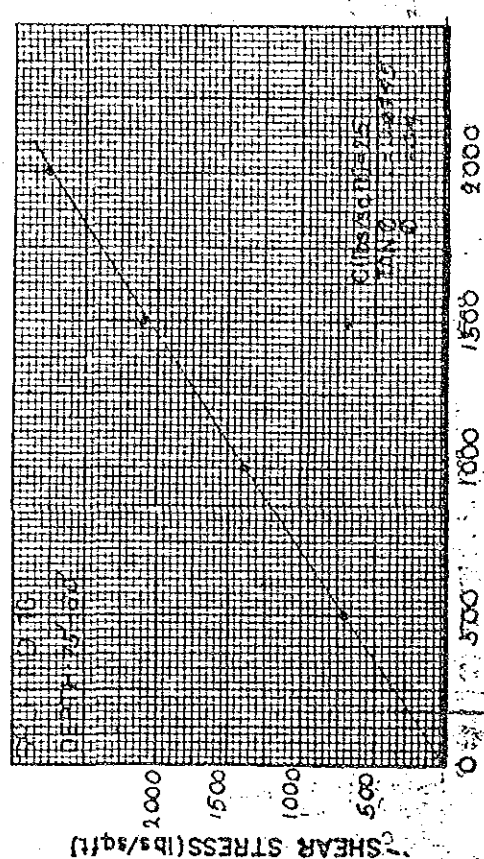
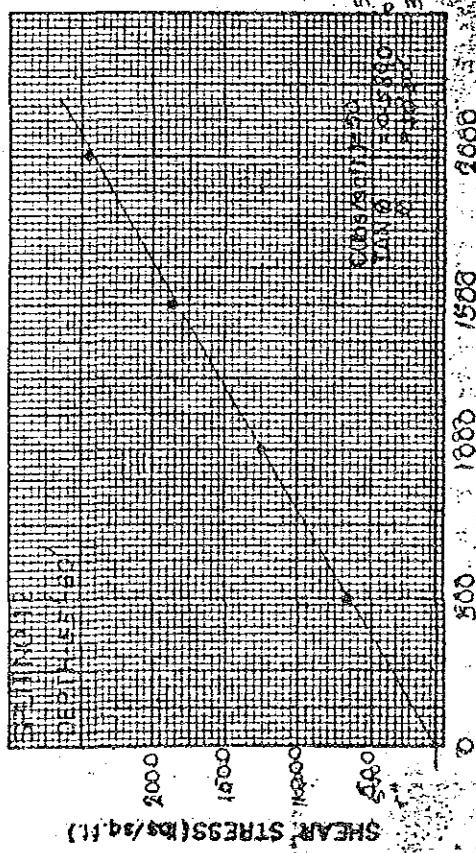
Depth - 25' 4"

55



NORMAL STRESS (lbs/sq ft)

NORMAL STRESS (lbs/sq ft)



NORMAL STRESS (lbs/sq ft)

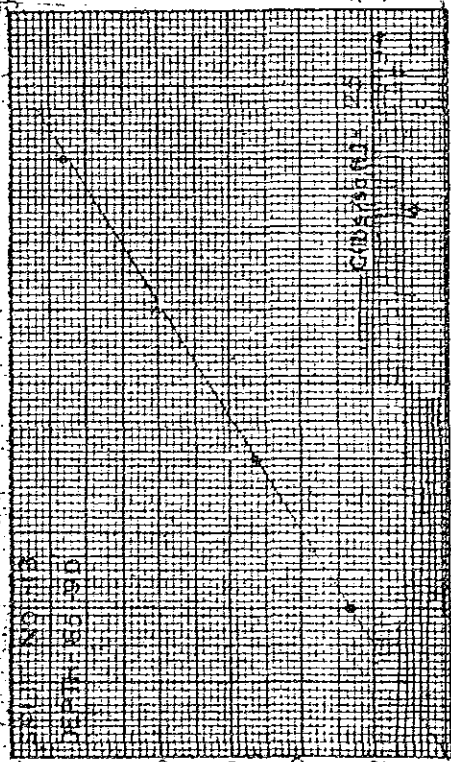
NORMAL STRESS (lbs/sq ft)

Appendix Fig. 6.3.43 DIRECT SHEAR TEST

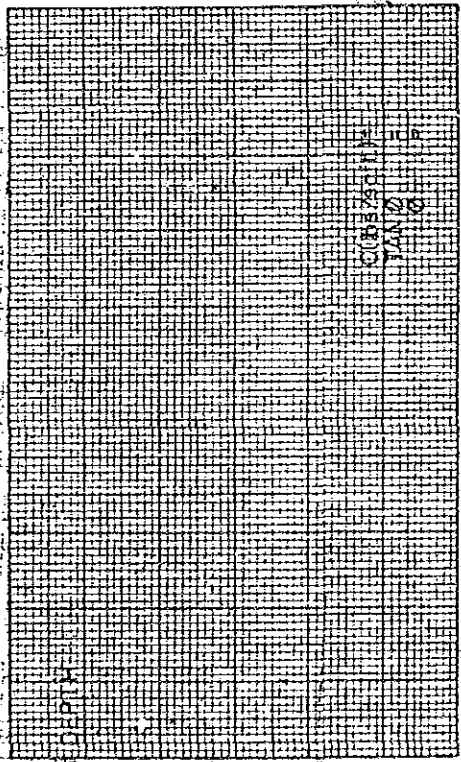
LOCATION: MYAWADDY BRIDGE

HOLE NO. 2

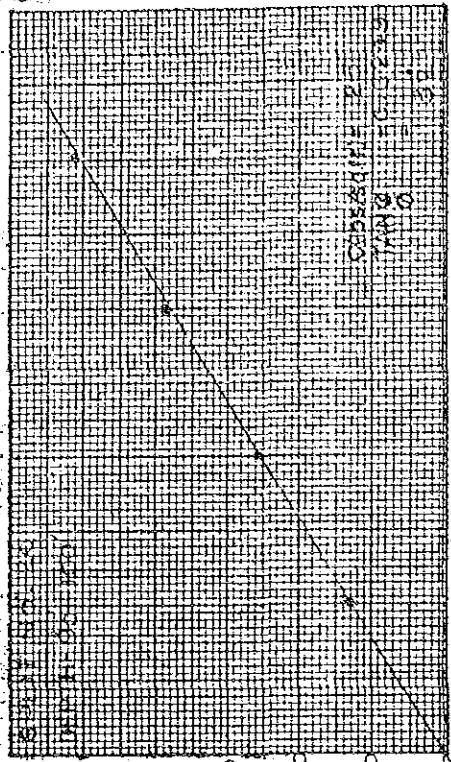
SHEAR STRESS (lbs/sq.ft)



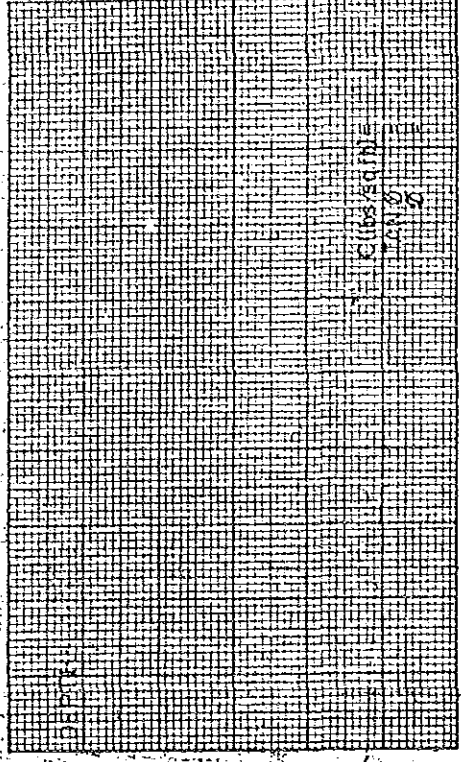
NORMAL STRESS (lbs/sq.ft)



NORMAL STRESS (lbs/sq.ft)



NORMAL STRESS (lbs/sq.ft)



NORMAL STRESS (lbs/sq.ft)

DIRECT SHEAR TEST

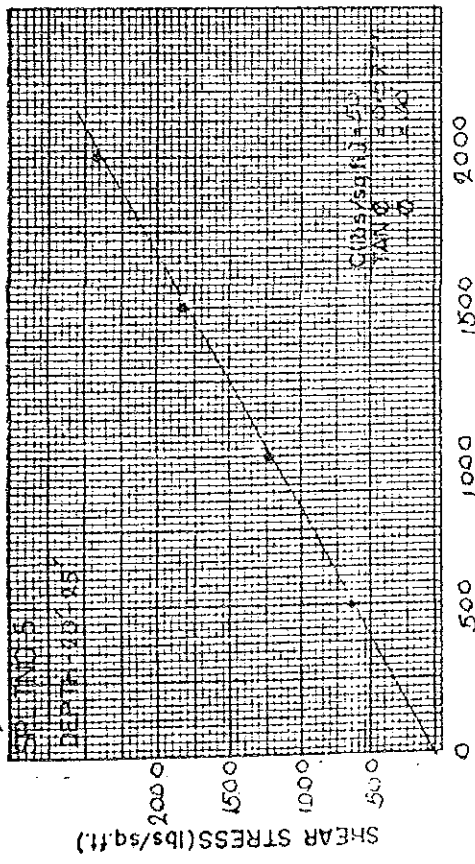
Appendix Fig. 6.3.44

LOCATION: MYAWADDY BRIDGE

HOLE NO. 3

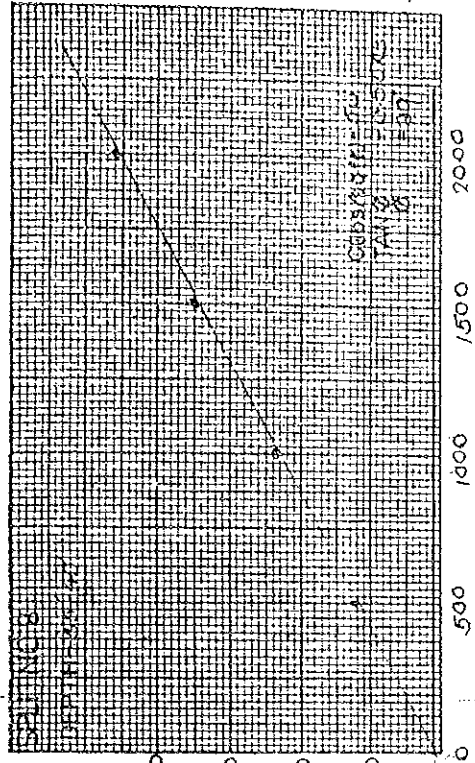
20-25

175-180



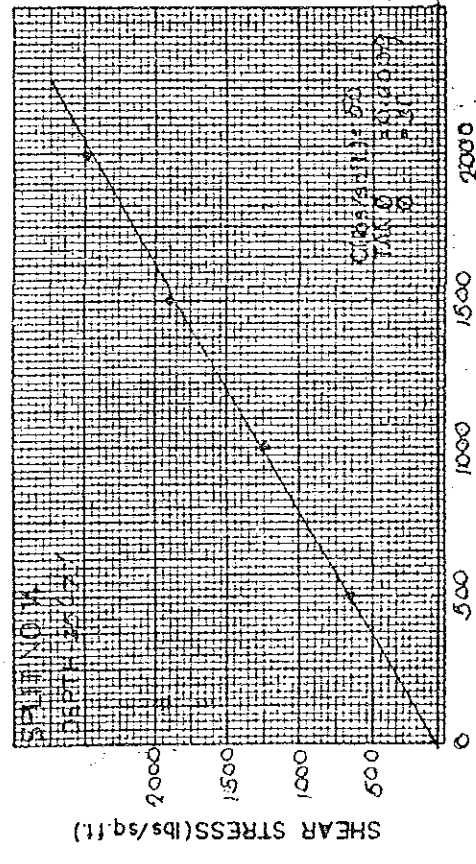
NORMAL STRESS (lbs/sq.ft)

SHEAR STRESS (lbs/sq.ft)



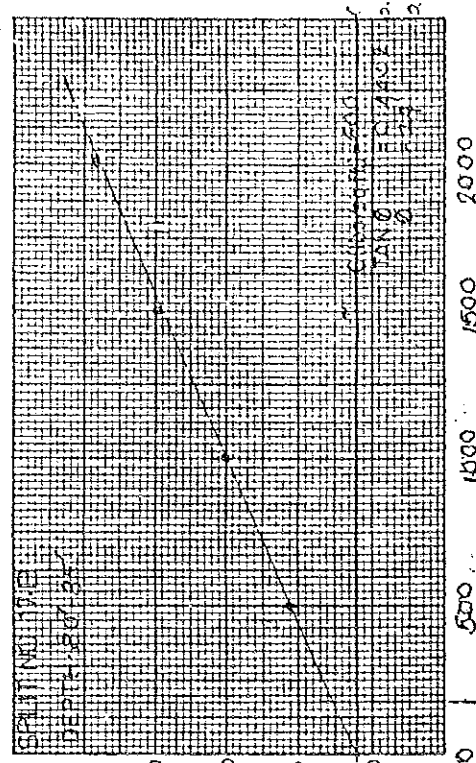
NORMAL STRESS (lbs/sq.ft)

SHEAR STRESS (lbs/sq.ft)



NORMAL STRESS (lbs/sq.ft)

SHEAR STRESS (lbs/sq.ft)



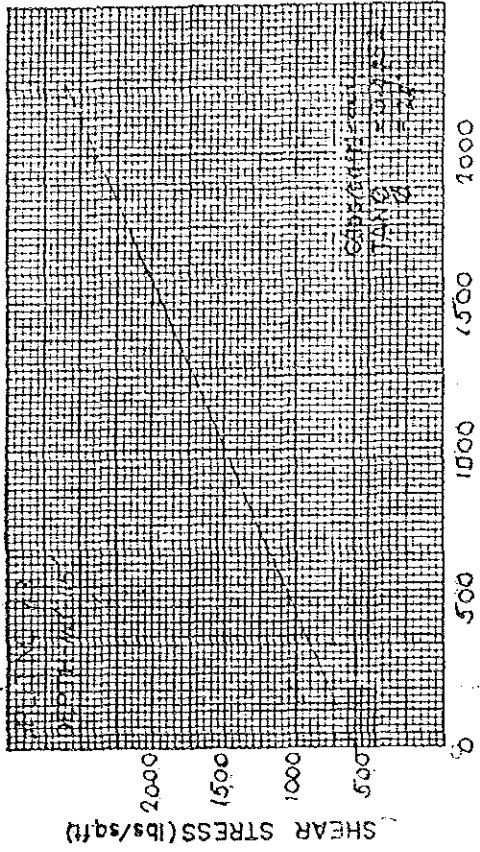
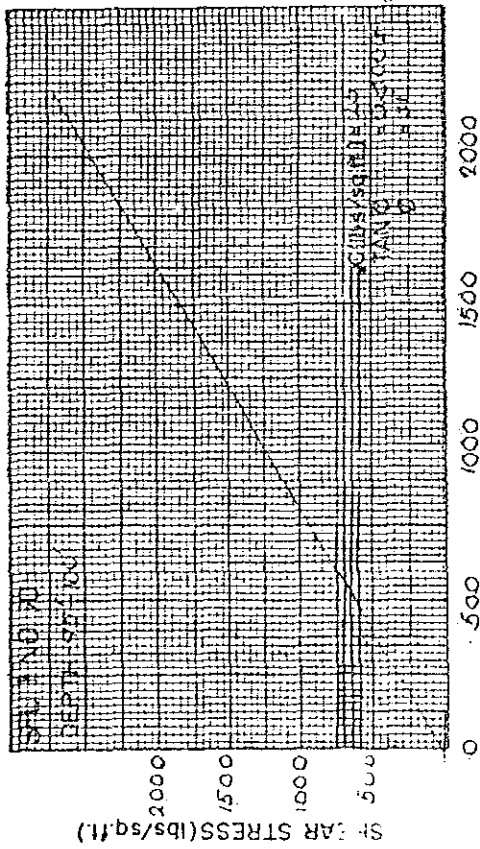
NORMAL STRESS (lbs/sq.ft)

SHEAR STRESS (lbs/sq.ft)

Appendix Fig. 6.3.45 **DIRECT SHEAR TEST**

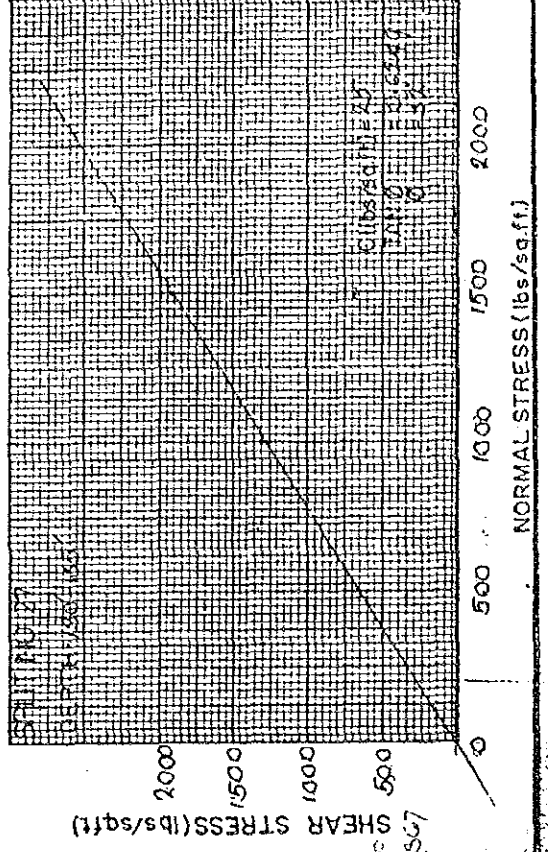
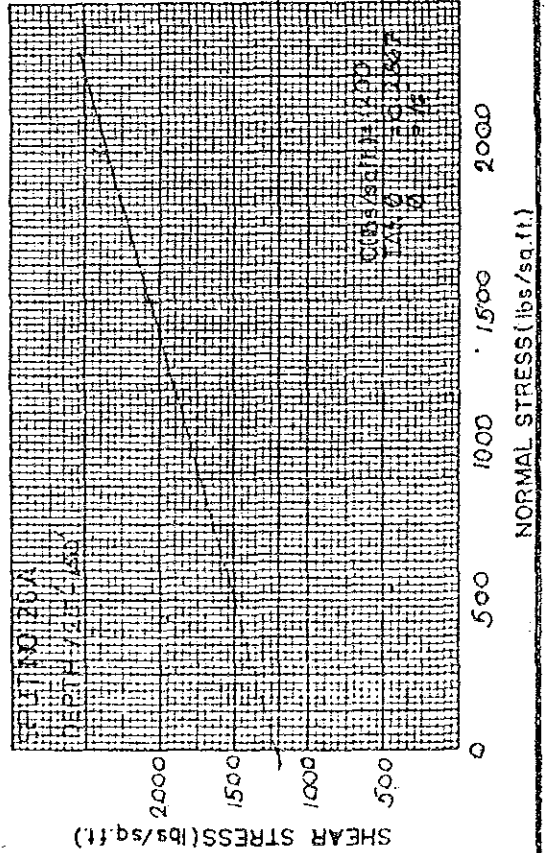
LOCATION: MYAWADDY BRIDGE

HOLE NO: 3



NORMAL STRESS (lbs/sq.ft)

NORMAL STRESS (lbs/sq.ft)



NORMAL STRESS (lbs/sq.ft)

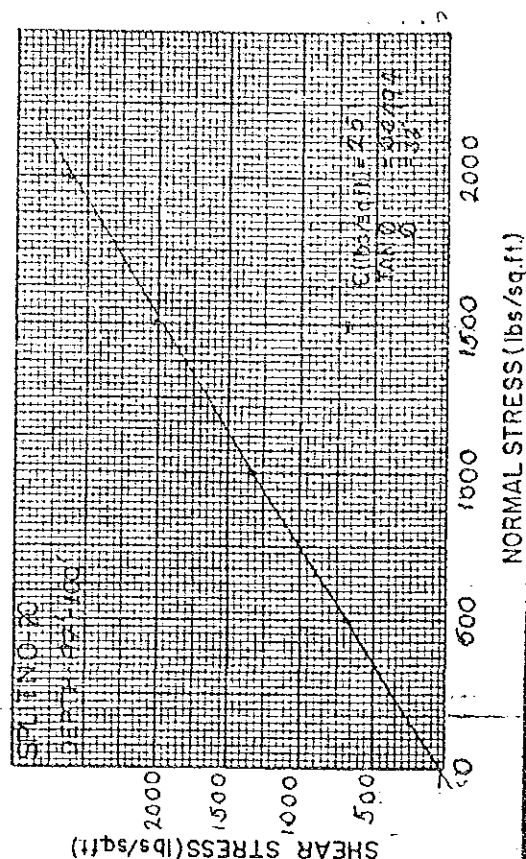
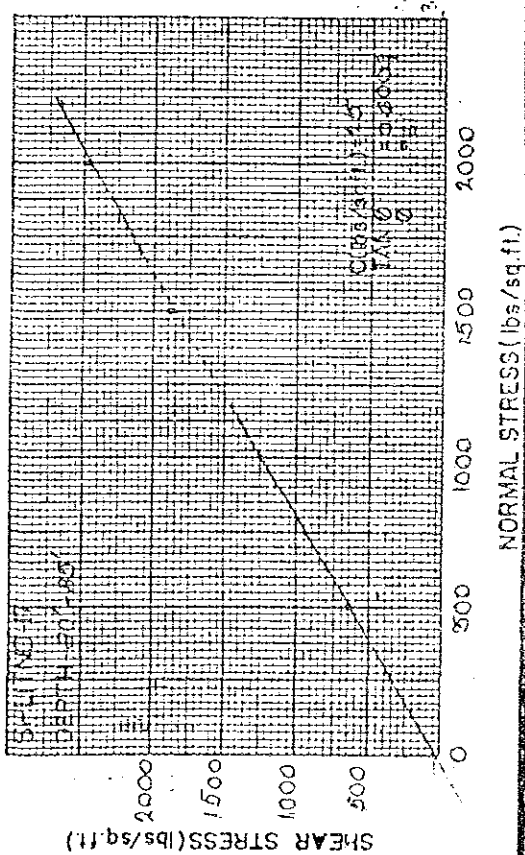
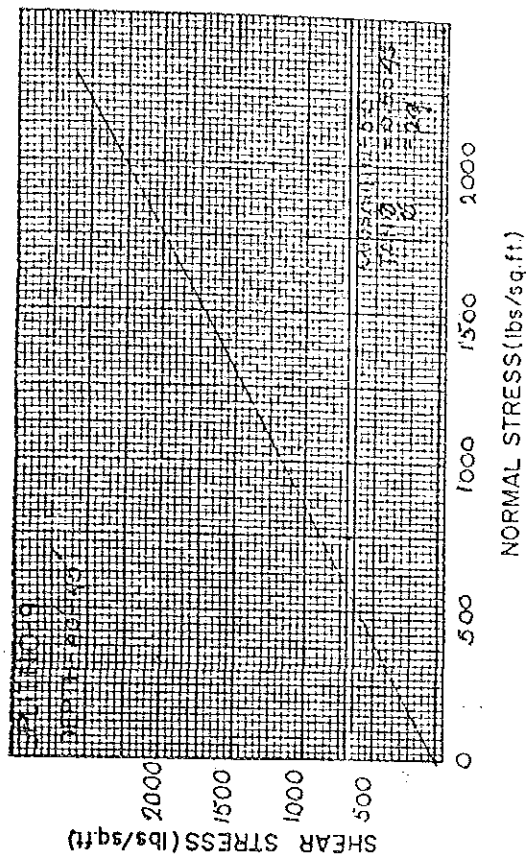
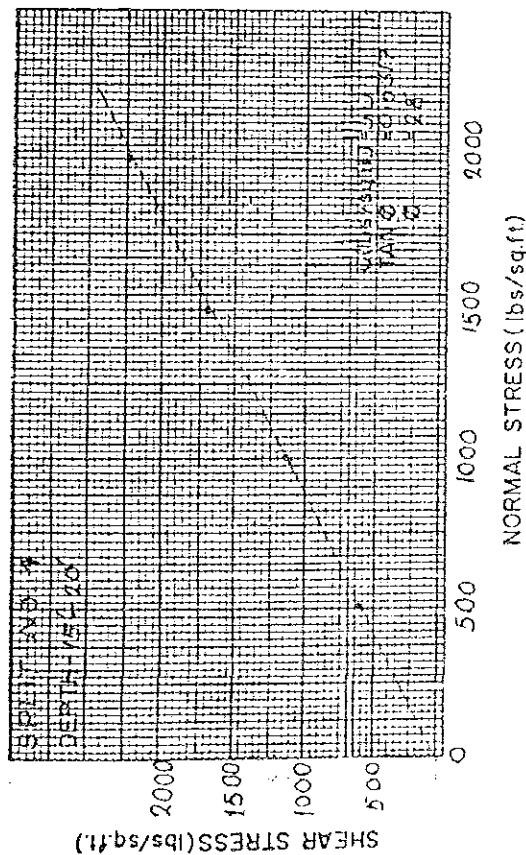
NORMAL STRESS (lbs/sq.ft)

DIRECT SHEAR TEST

Appendix Fig. 6.3.46

LOCATION: MYAWADDY BRIDGE

HOLE NO. 4



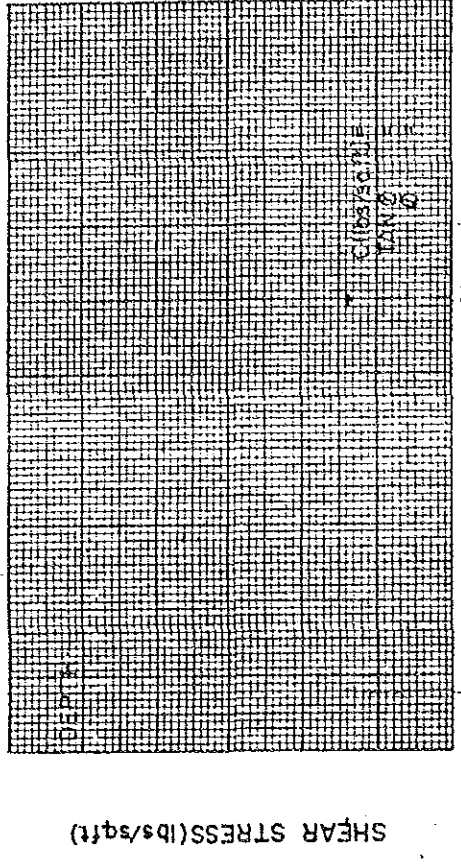
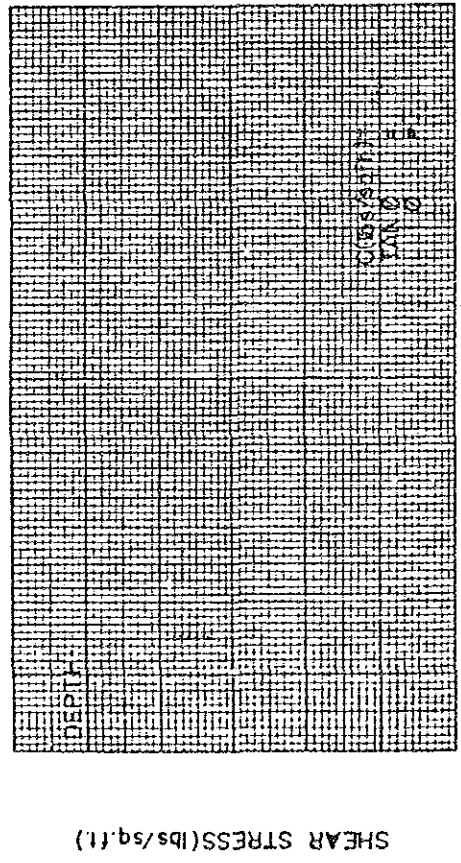
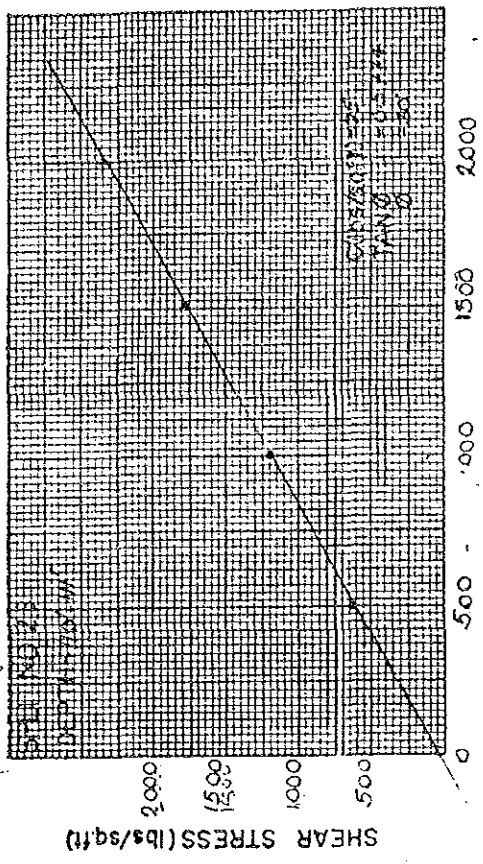
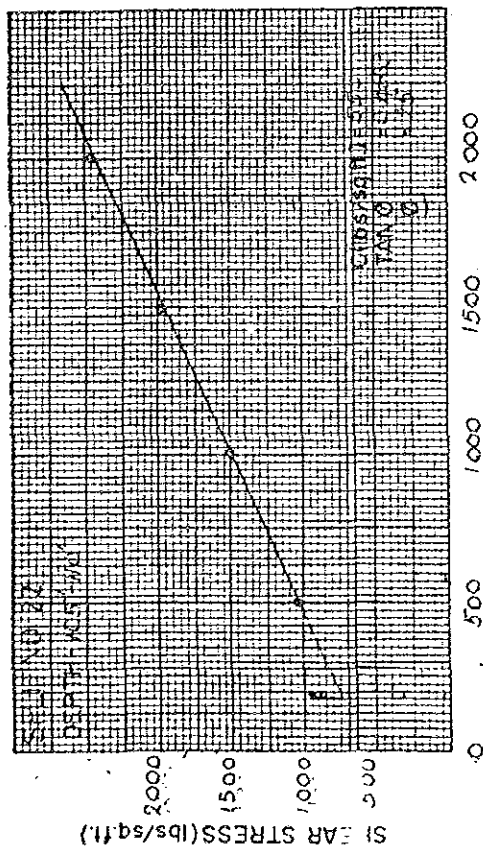
DIRECT SHEAR TEST

Appendix Fig. 6.3.47

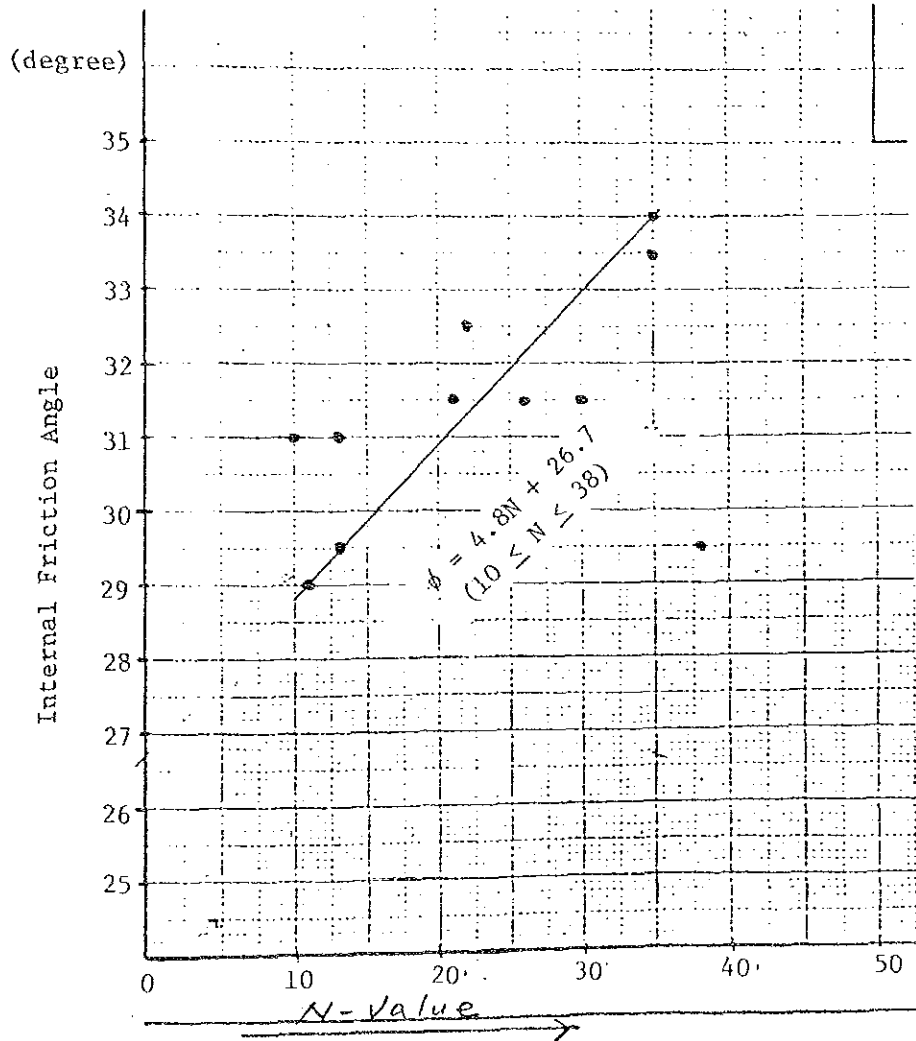
LOCATION: MYAWADDY BRIDGE

HOLE NO. 4

6.23



Appendix Fig. 6.3.48 ϕ vs. N



Appendix Fig. 6.3.49

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

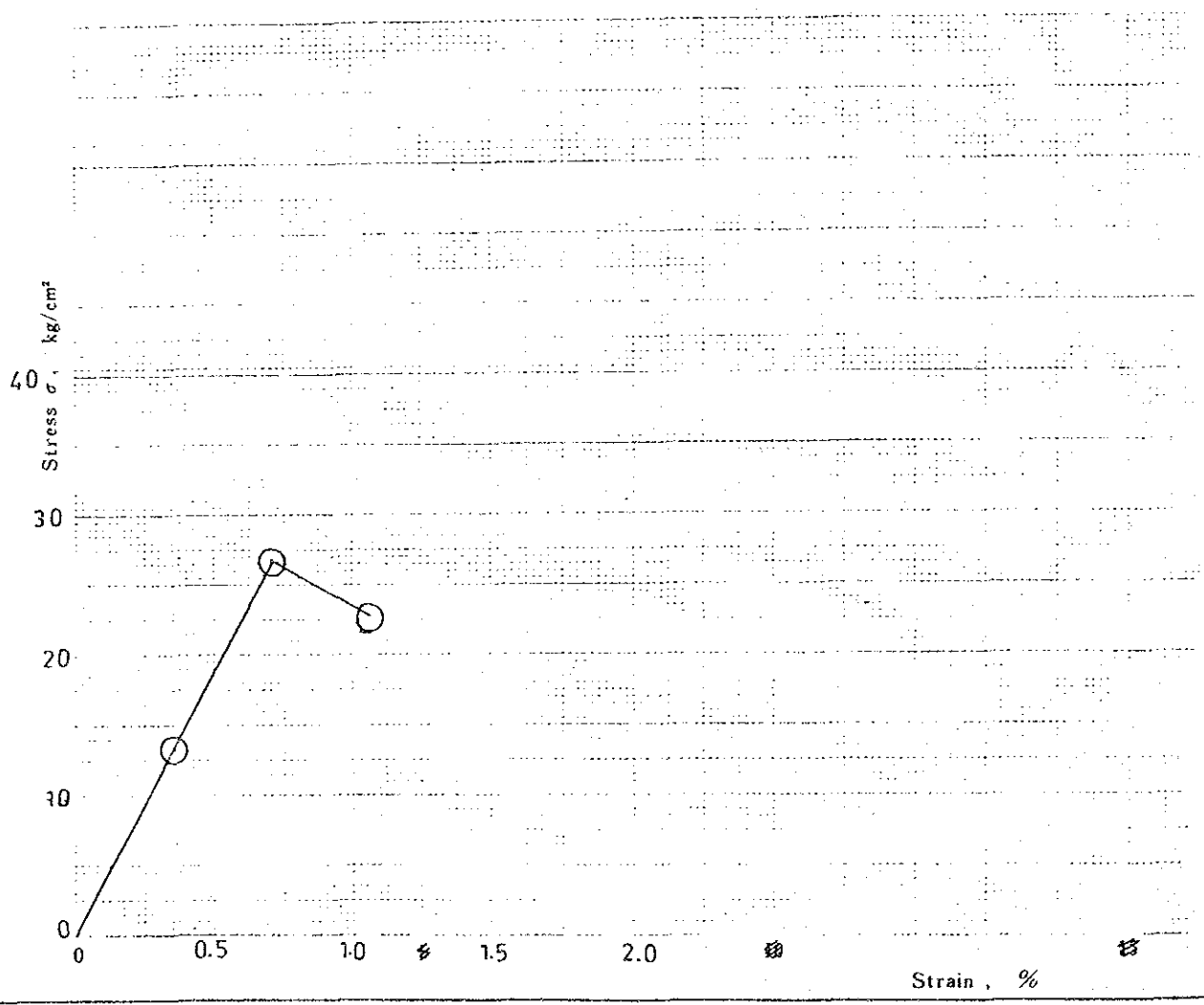
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 5 Sample No. CORE-1

Date of testing 9-12-85 Depth of Sample 50'-5" to 55'-0"

Stress Rate 0.02 mm/sec ~~_____~~

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
1	BLUISH GREY SHALE	7.122	3.566	8.14	2.44	26.83	-	0.7	-



Remarks. Observation of sample at failure

Appendix Fig. 6.3.50

UNCONFINED TRIAXIAL COMPRESSION TEST ! (Stress-Strain Curves)

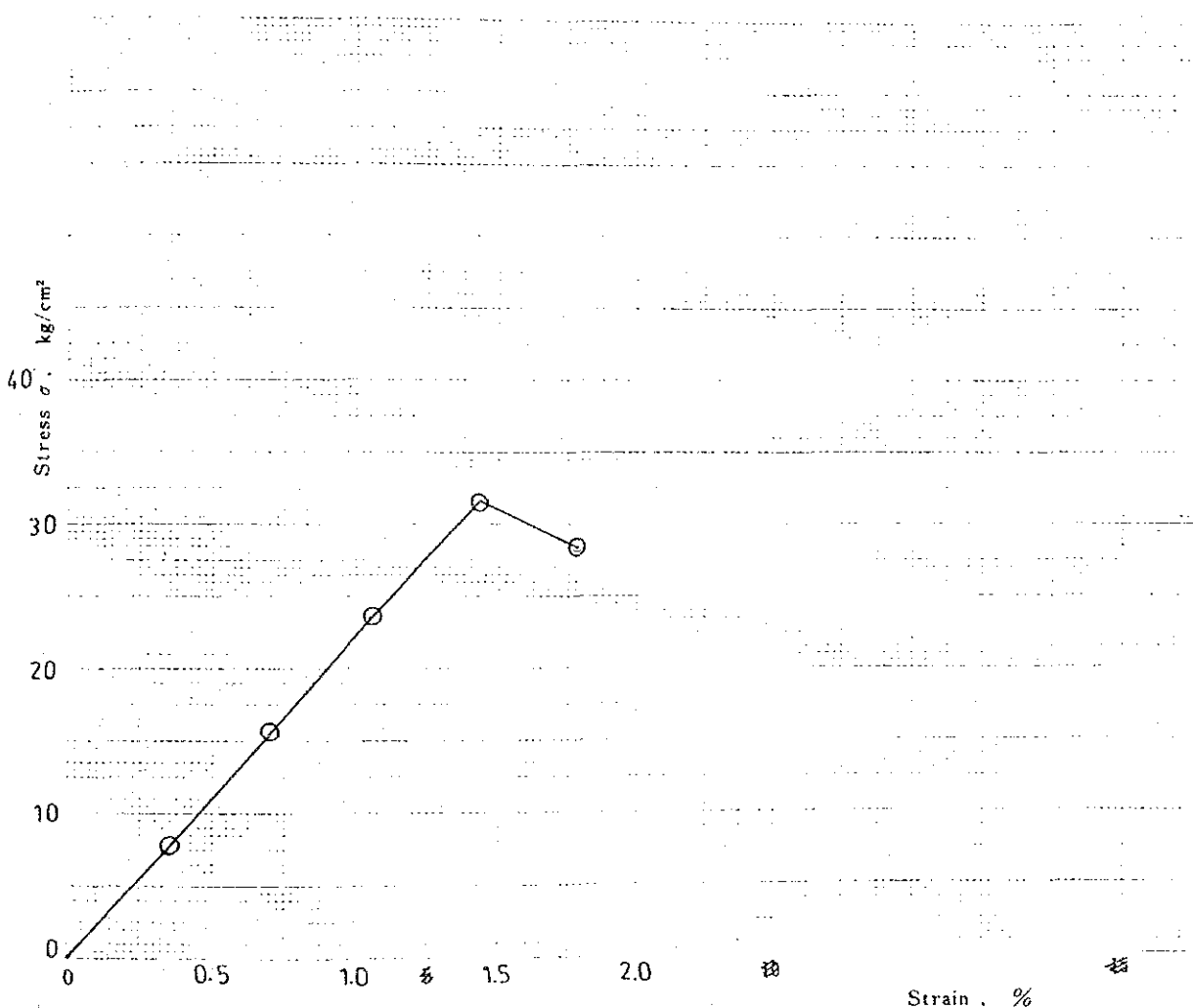
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 5 Sample No. CORE-3

Date of testing 9-12-85 Depth of Sample 60'-0" to 65'-0"

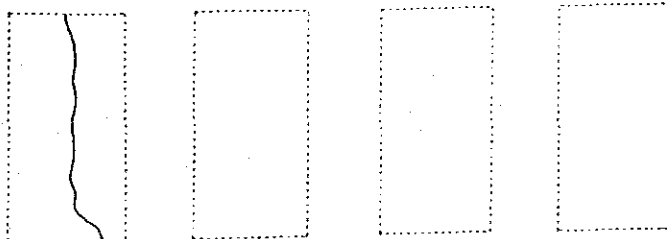
Strain Rate 0.02 mm/sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
3	DARK GREY SHALE	7.112	3.556	6.31	2.40	31.65	-	1.43	-



Remarks.

Observation of sample at failure



Appendix Fig. 6.3.51

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

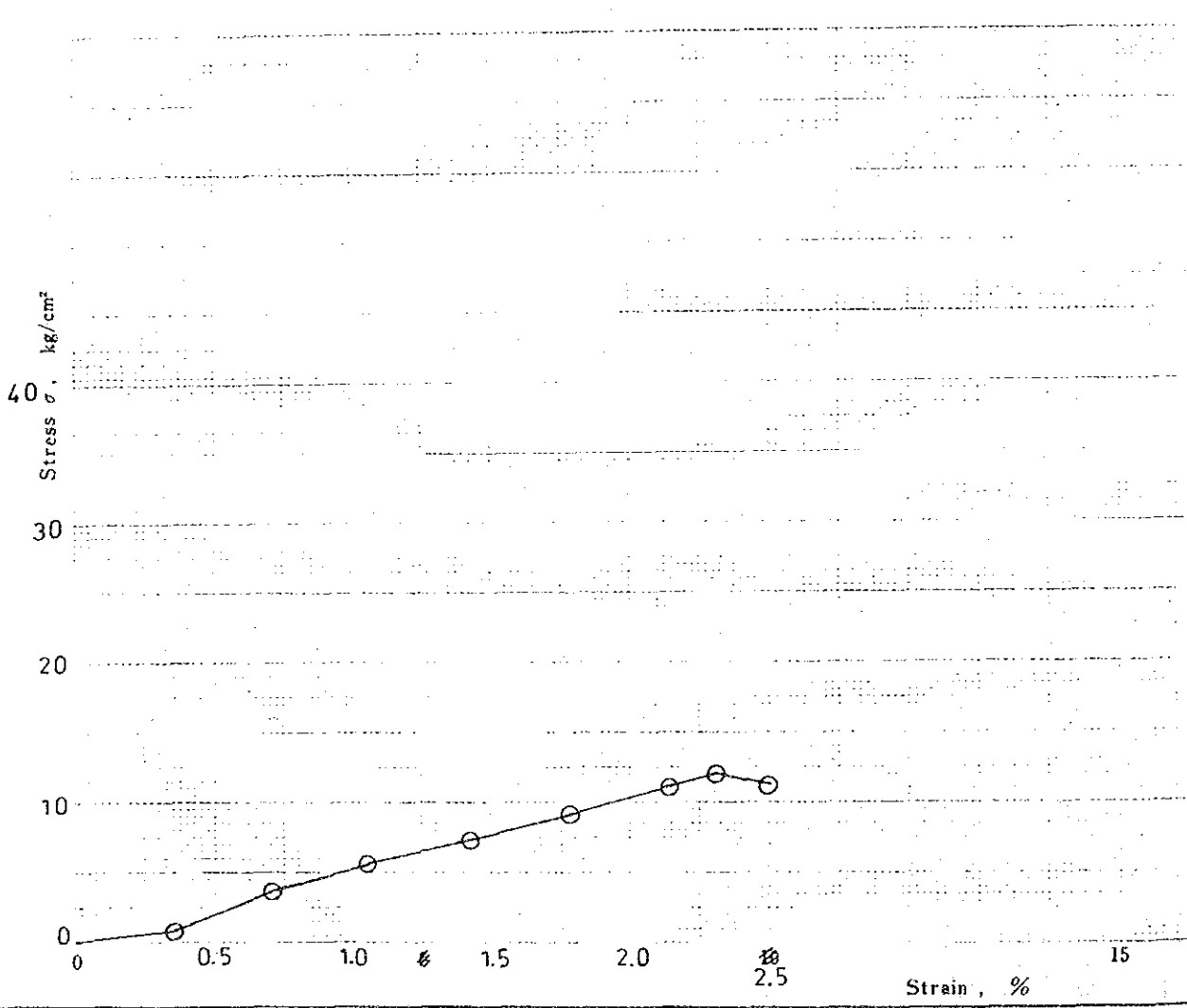
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 5 Sample No. CORE-4

Date of testing 9-12-85 Depth of Sample 65'-0" to 70'-0"

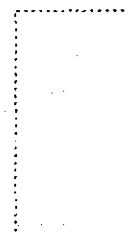
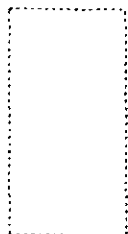
Stress Rate 0.02 mm/Sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
4	DARK GREY SHALE	7.112	3.556	10.56	2.52	12.04	-	2.33	-



Remarks.

Observation of sample at failure




Appendix Fig. 6.3.52

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

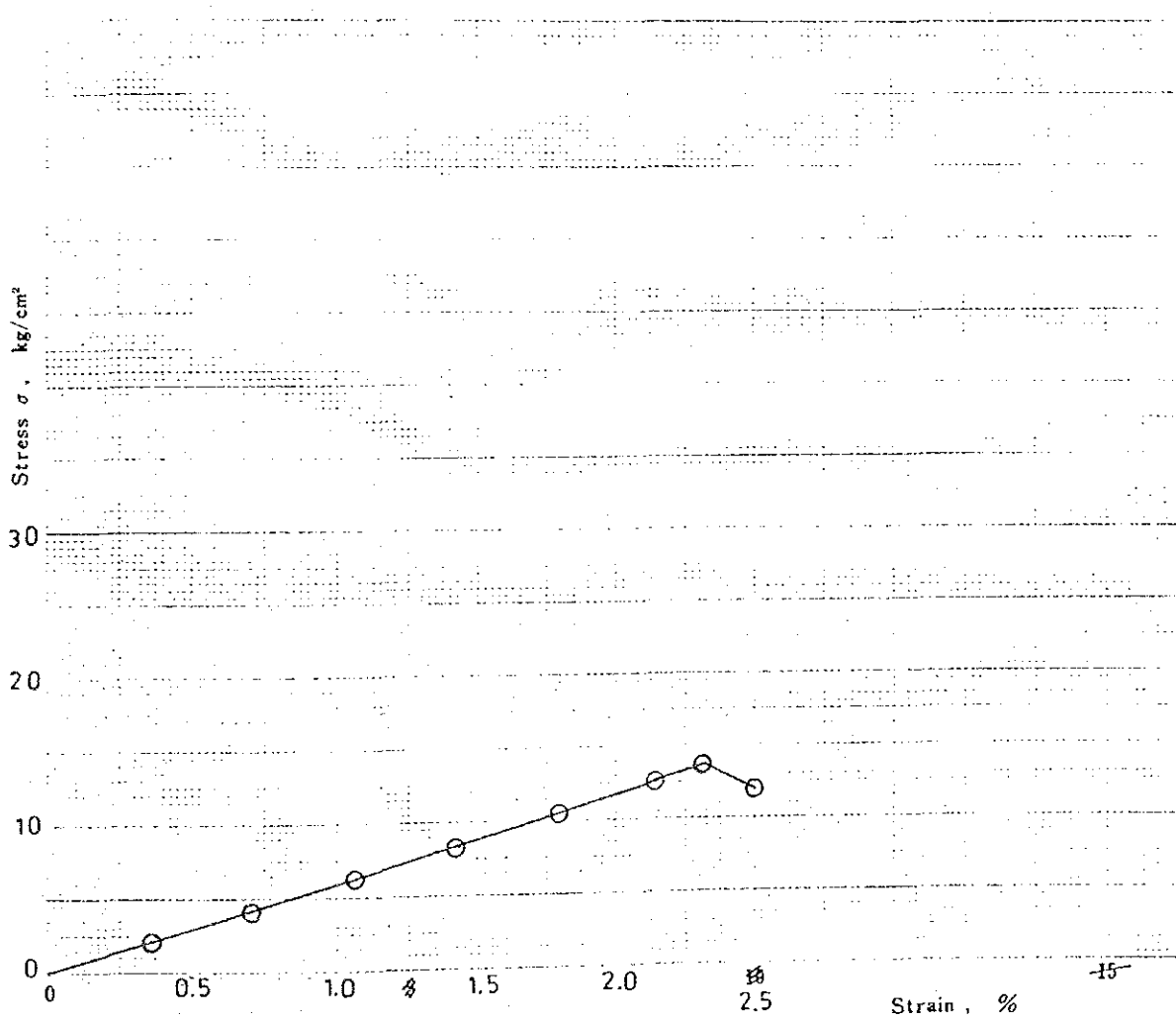
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 5 Sample No. CORE-5

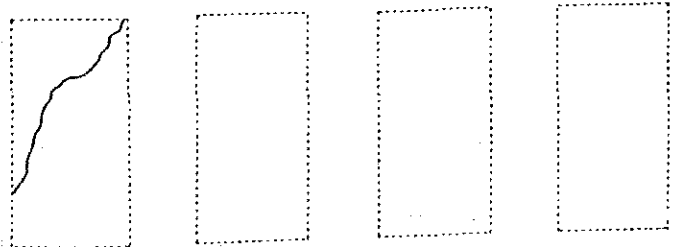
Date of testing 9-12-85 Depth of Sample 70'-0" to 73'-6"

Stress Rate 0.02 mm/sec 

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
6	SHALE & LIMESTONE	7.112	3.556	9.5	2.47	13.69	-	2.33	-



Remarks. Observation of sample at failure

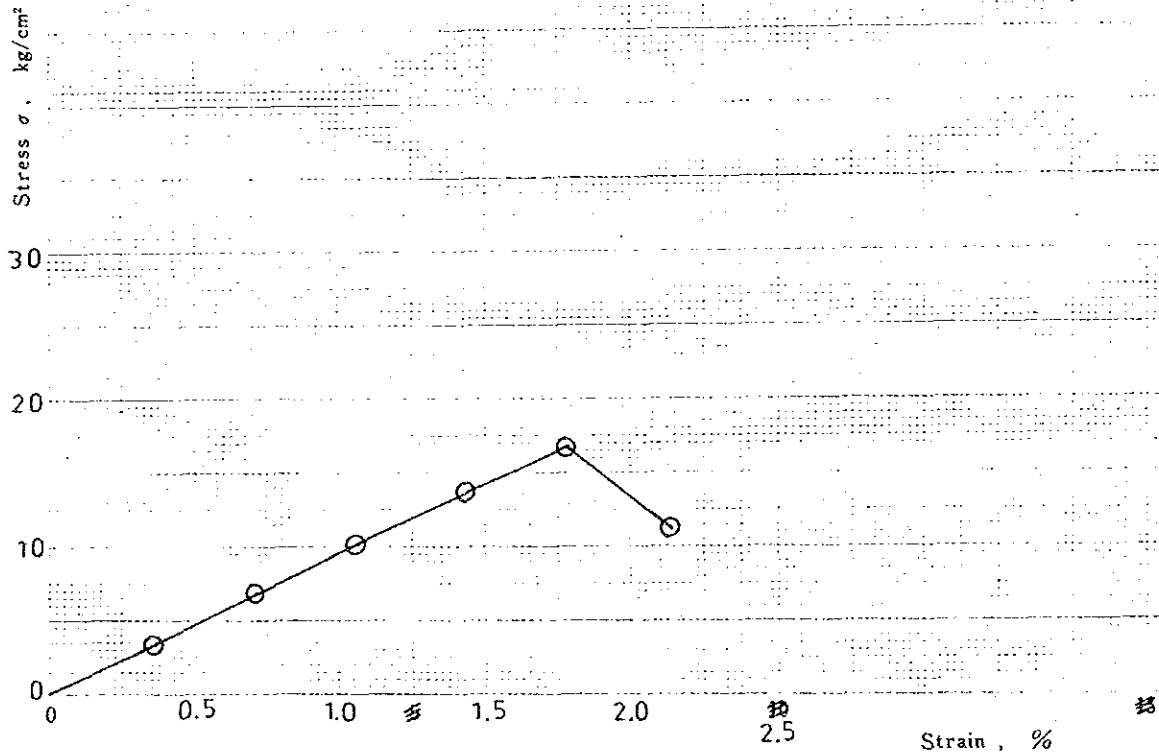


Appendix Fig. 6.3.53

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

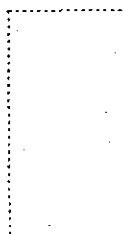
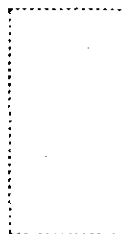
Project IRRAWADDY RIVER BRIDGE Job No. _____
 Location of Project MYAWADDY Boring No. 5 Sample No. CORE-6
 Date of testing 9-12-85 Depth of Sample 73'-6" to 77'-0"
 Strain Rate 0.02 mm/sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
6	BLUISH GREY SHALE	7.112	3.556	8.2	2.61	16.97	-	11.8	-



Remarks.

Observation of sample at failure



Appendix Fig. 6.3.54

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

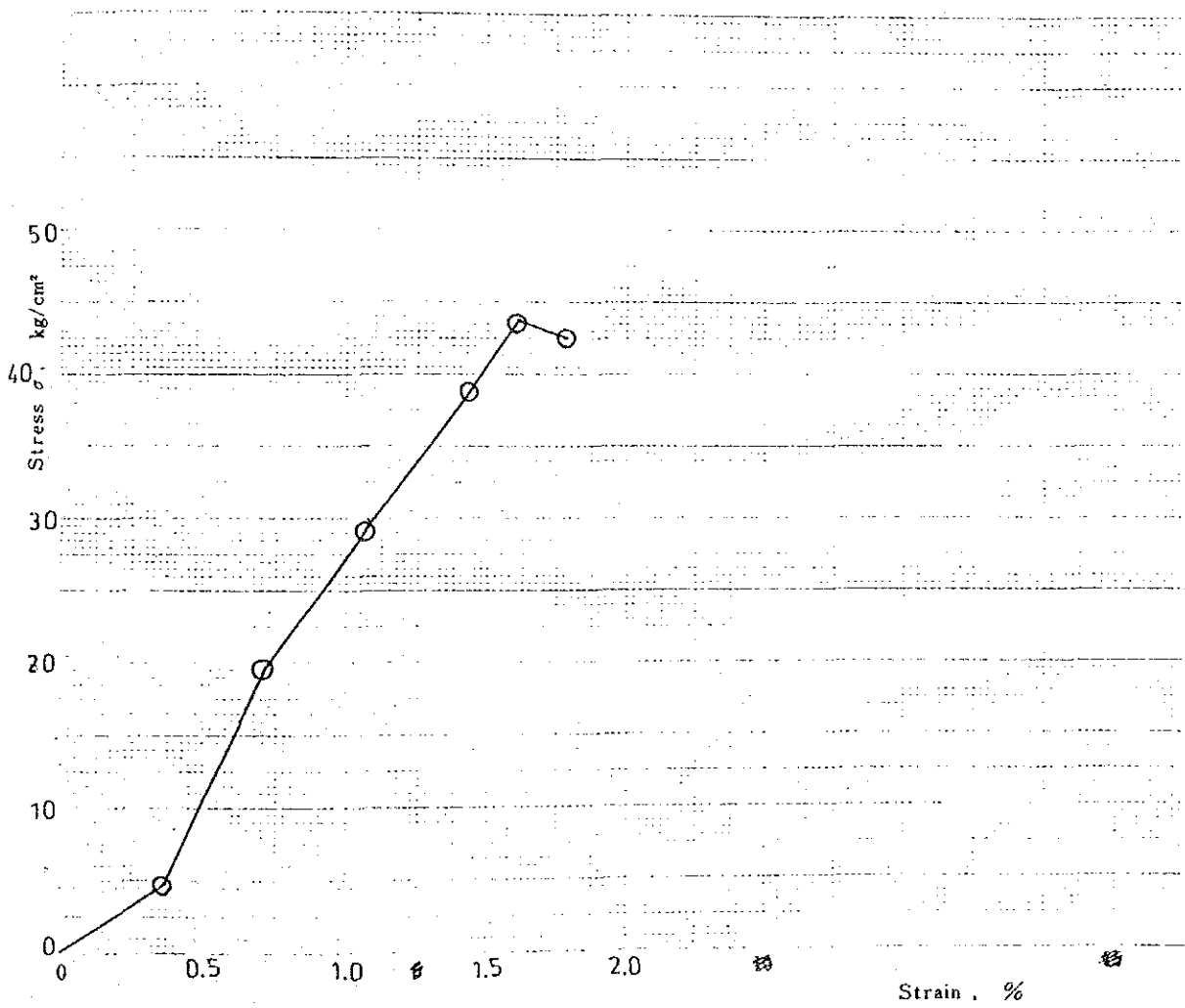
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 5 Sample No. CORE-7

Date of testing 9-12-85 Depth of Sample 77'-0" to 80'-0"

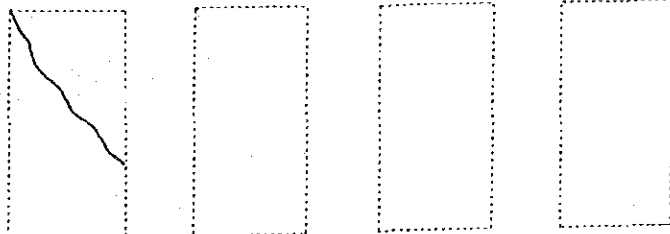
Strain Rate 0.02 mm/sec ~~5 mm/min~~

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
7	BLuish grey SHALE	7.112	3.556	6.8	2.6	43.8	-	1.6	-



Remarks.

Observation of sample at failure



Appendix Fig. 6.3.55

UNCONFINED COMPRESSION TEST I (Stress-Strain Curves)
TRIAXIAL

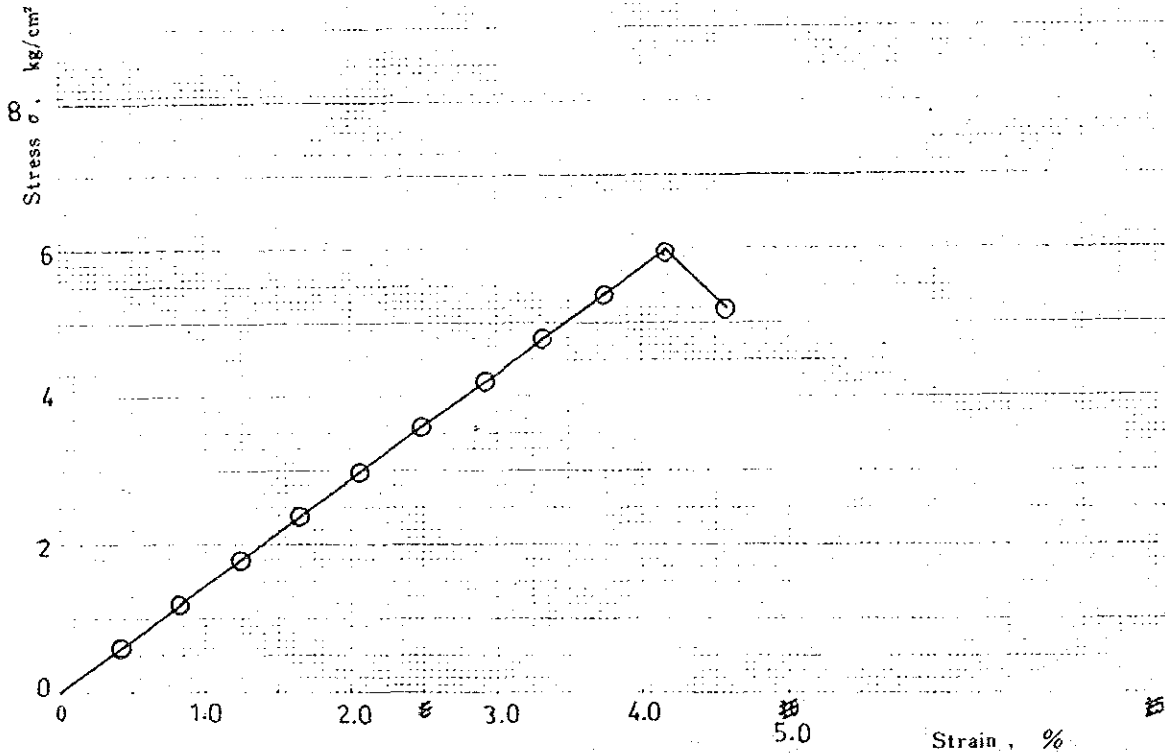
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 4 Sample No. CORE-1

Date of testing 18-2-86 Depth of Sample 115'-6" to 118'-9"

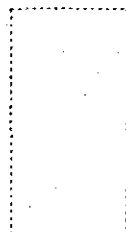
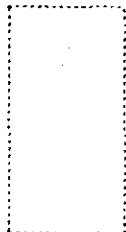
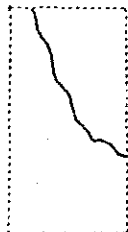
Stress Rate 0.02 mm/sec %/min.

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
1	CLAY & SHALE	6.096	3.048	19.59	2.47	5.97	-	4.15	-



Remarks.

Observation of sample at failure



Appendix Fig. 6.3.56

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

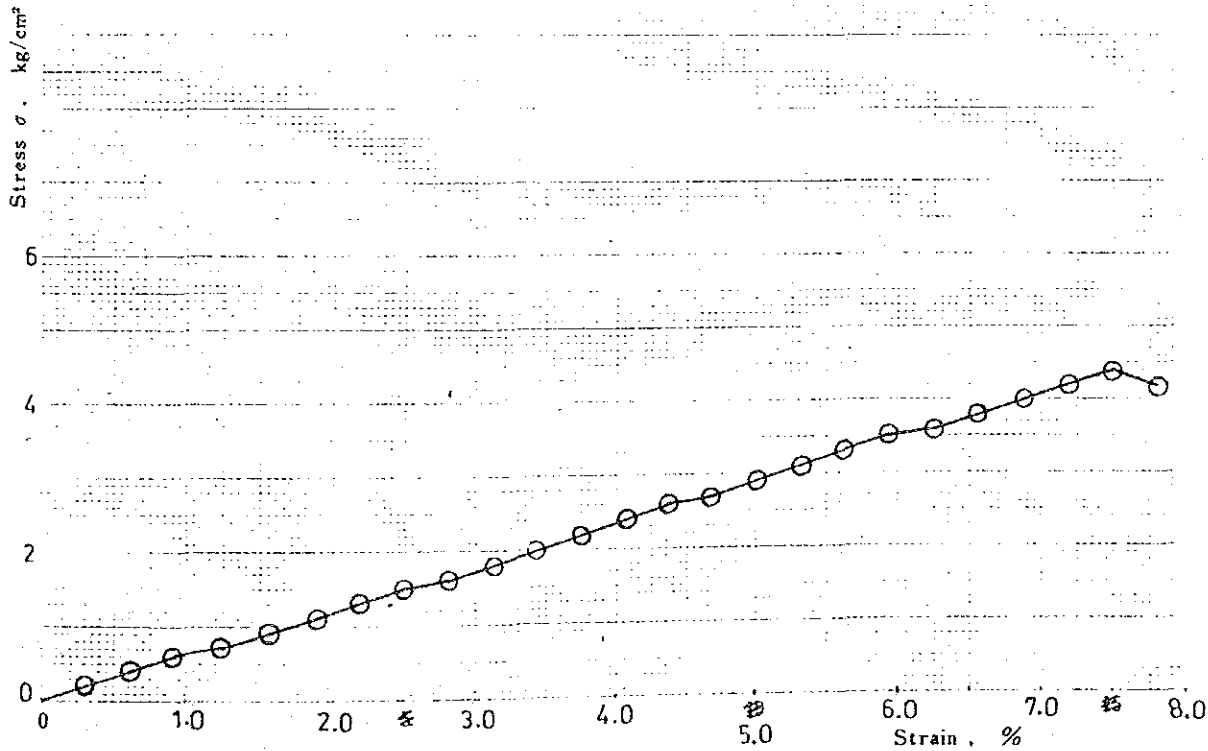
Project: IRRAWADDY RIVR BRIDGE Job No. _____

Location of Project: MYAWADDY Boring No. 4 Sample No. CORE-2

Date of testing: 18-2-86 Depth of Sample: 118'-9" to 122'-0"

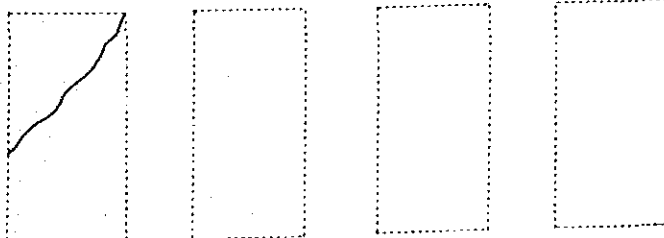
Strain Rate: 0.02 mm/sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
2	GREY SHALE	8.128	4.064	17.12	2.36	4.36	-	7.5	-



Remarks.

Observation of sample at failure



Appendix Fig. 6.3.57

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

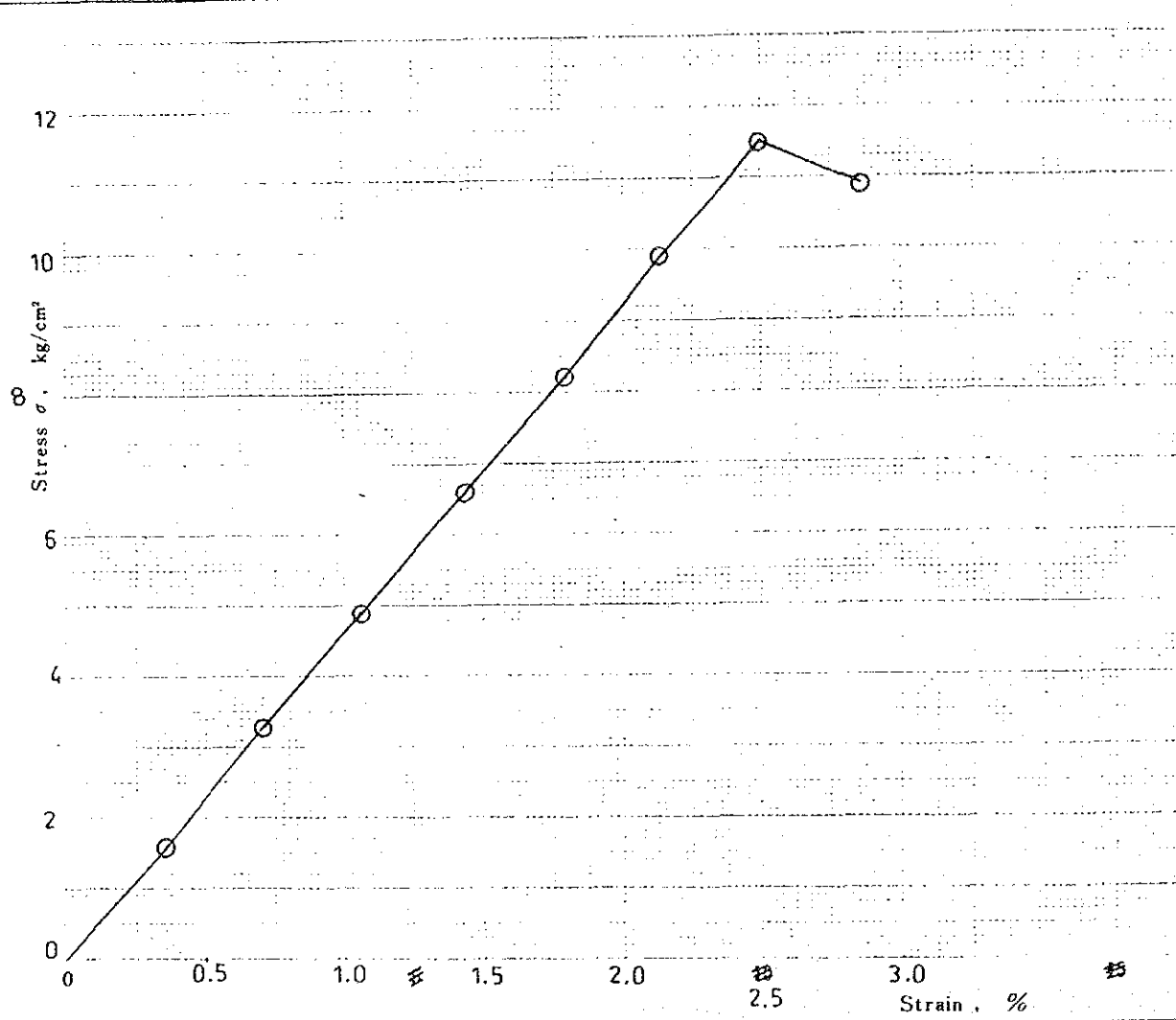
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 4 Sample No. CORE-4

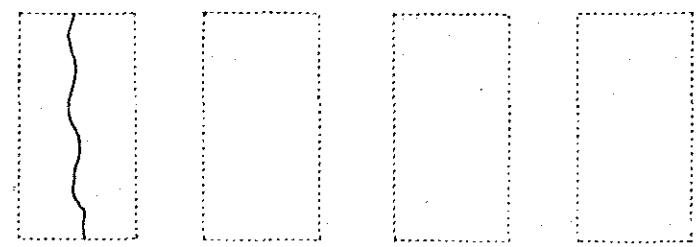
Date of testing 18-2-86 Depth of Sample 125'-3" to 128'-6"

Stress Rate 0.02 mm/sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
4	GREY SHALE	7.112	3.556	13.32	2.34	11.51	-	2.5	-



Remarks. Observation of sample at failure.



Appendix Fig. 6.3.58

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

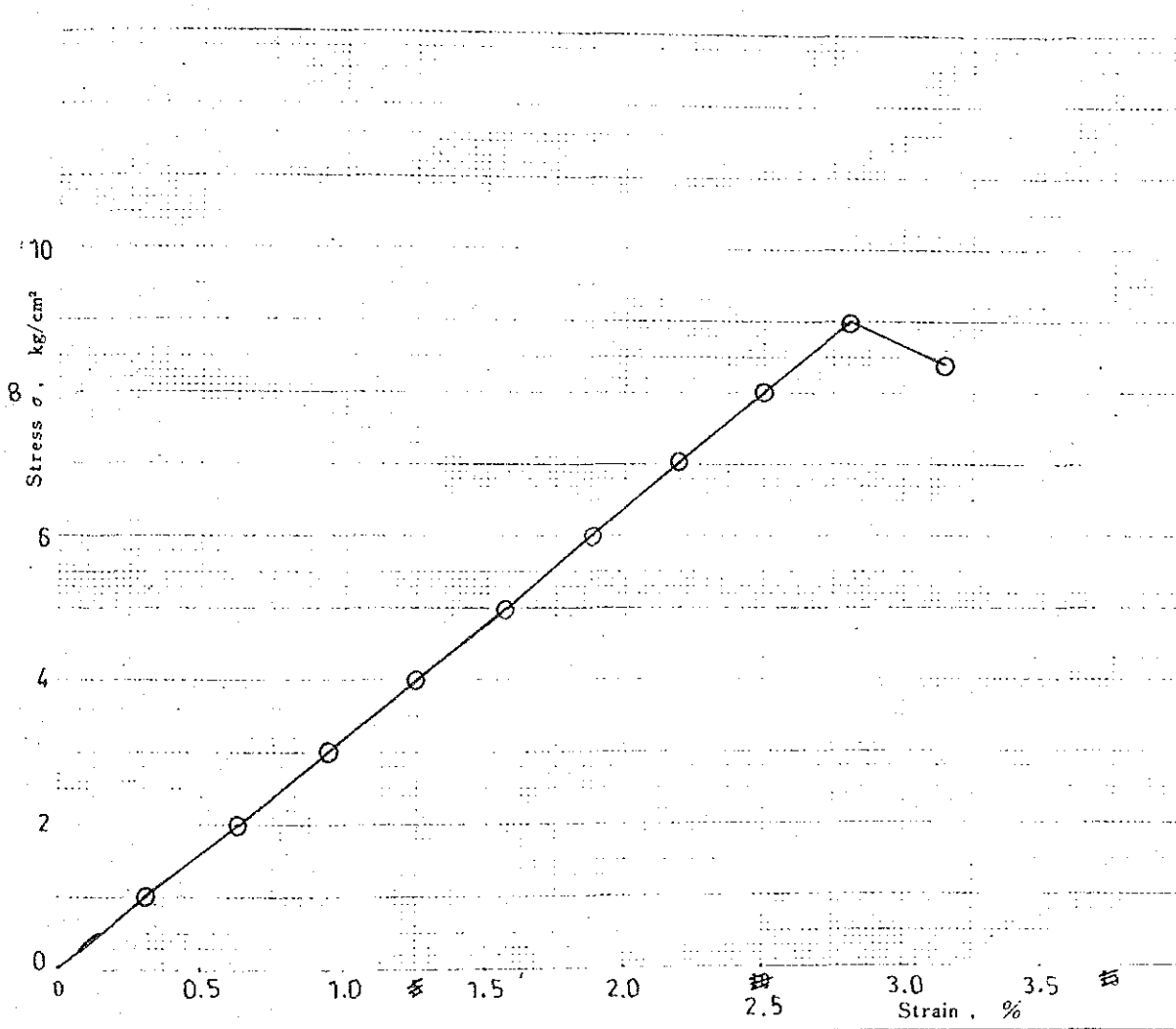
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 4 Sample No. CORE-5

Date of testing 18-2-86 Depth of Sample 128'-6" to 131'-9"

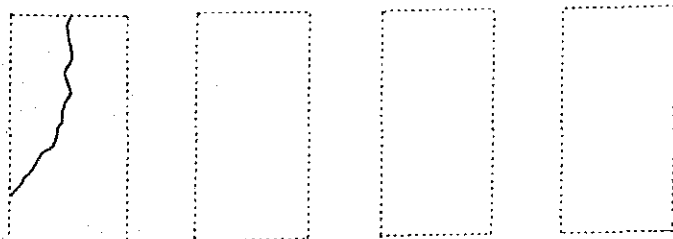
Strain Rate 0.02 mm/sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation		Strain at failure %	Sensitivity ratio
		Height	Diameter				E ₅₀	kg/cm ²		
5	GREY SHALE	8.128	4.064	12.72	21.90	8.98	-	2.8	-	



Remarks.

Observation of sample at failure

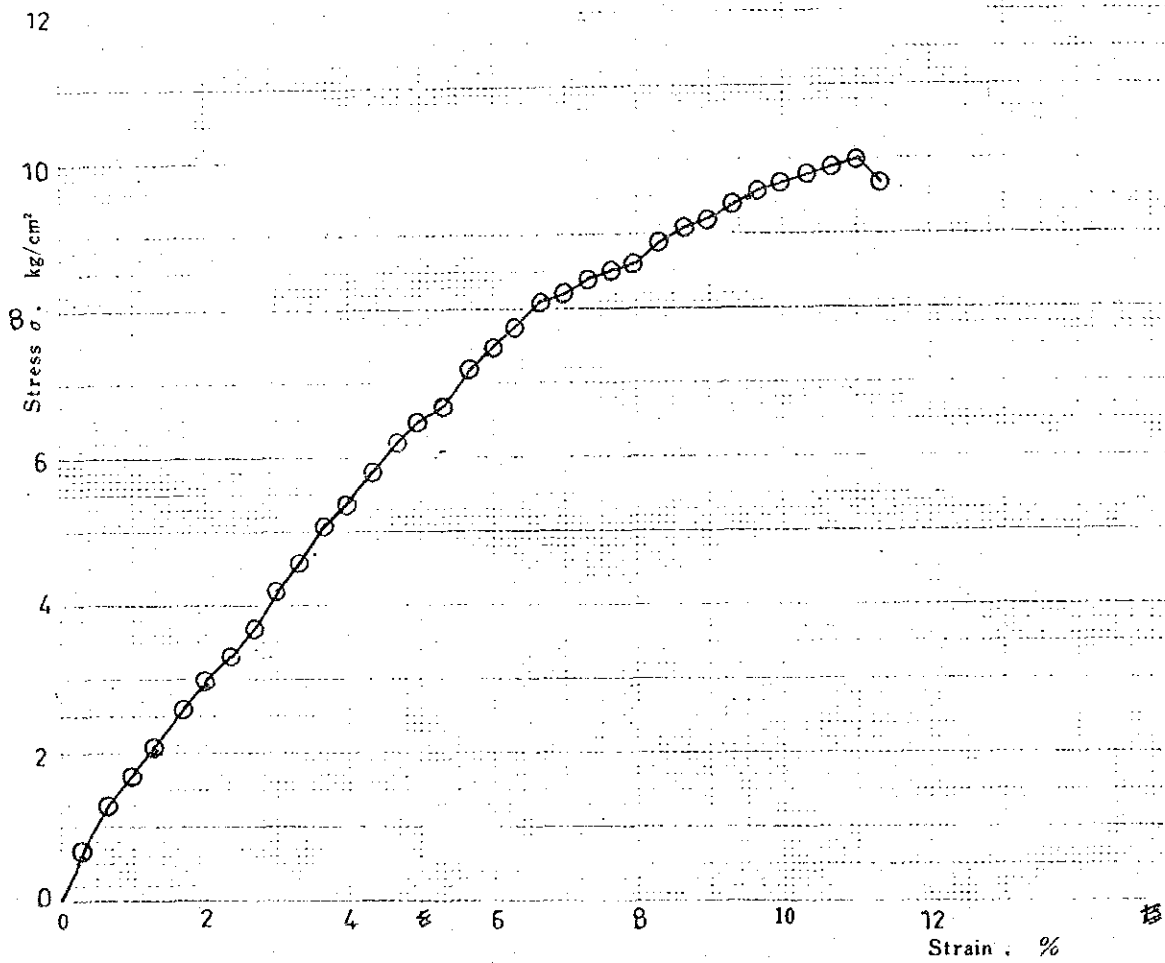


Appendix Fig. 6.3.59

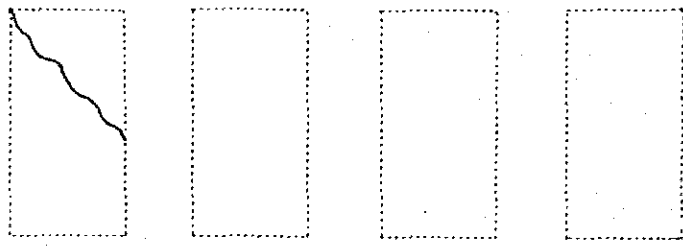
UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

Project: IRRAWADDY RIVER BRIDGE Job No. _____
 Location of Project: MYAWADDY Boring No. 3 Sample No. CORE-2
 Date of testing: 18-3-86 Depth of Sample: 148'-9" to 152'-1"
 Strain Rate: 0.02 mm/sec ~~0.01 mm/sec~~

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
1	GREY SHALE	7.62	3.81	13.83	2.56	9.98	-	11.0	-



Remarks. Observation of sample at failure



Appendix Fig. 6.3.60

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

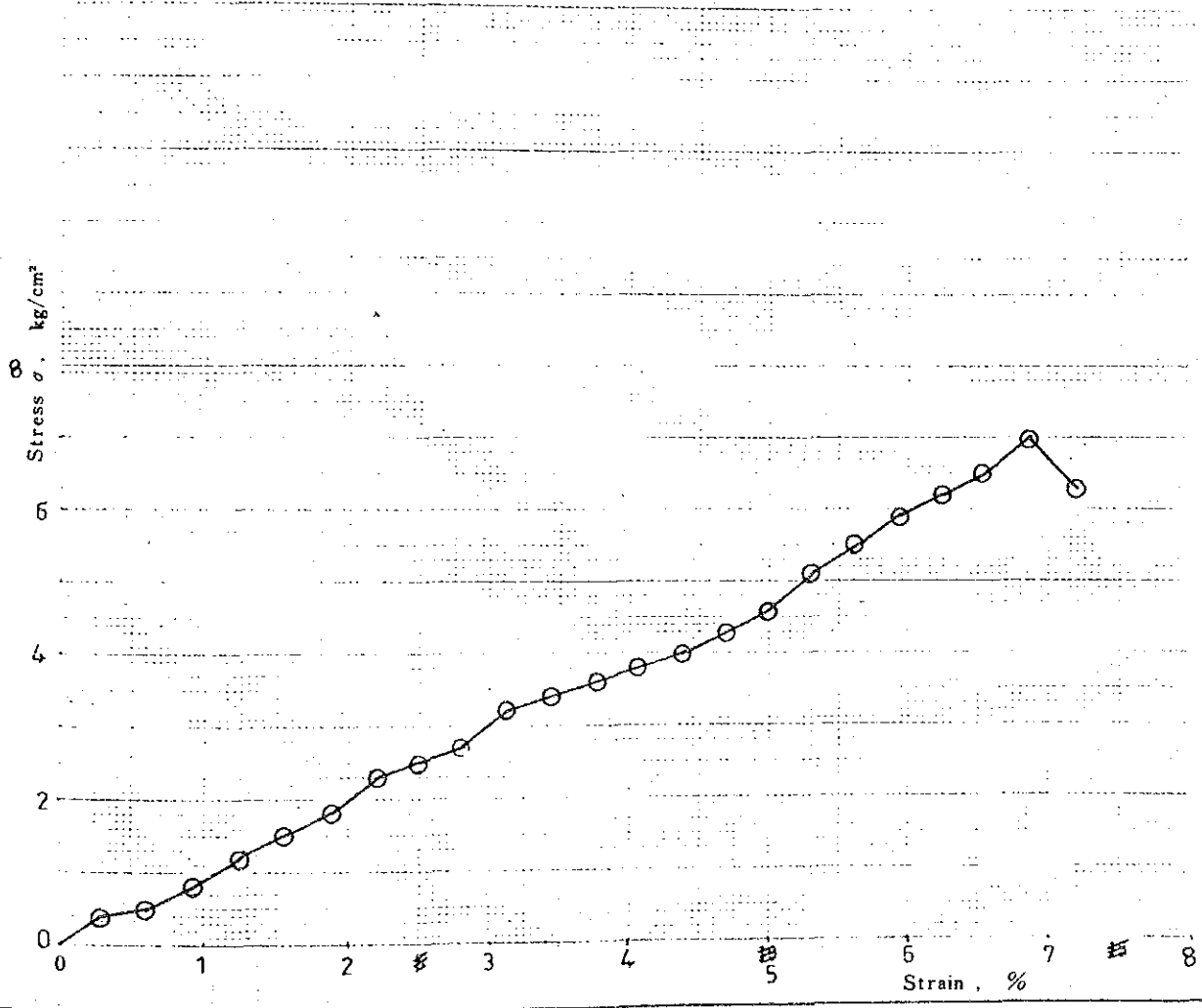
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 3 Sample No. CORE-4

Date of testing 18-3-86 Depth of Sample 155'-3" to 158'-8"

Stress Rate 0.02 mm/sec

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E ₅₀ kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
4	GREY SHALE	8.128	4.064	12.51	2.08	6.96	-	6.85	-



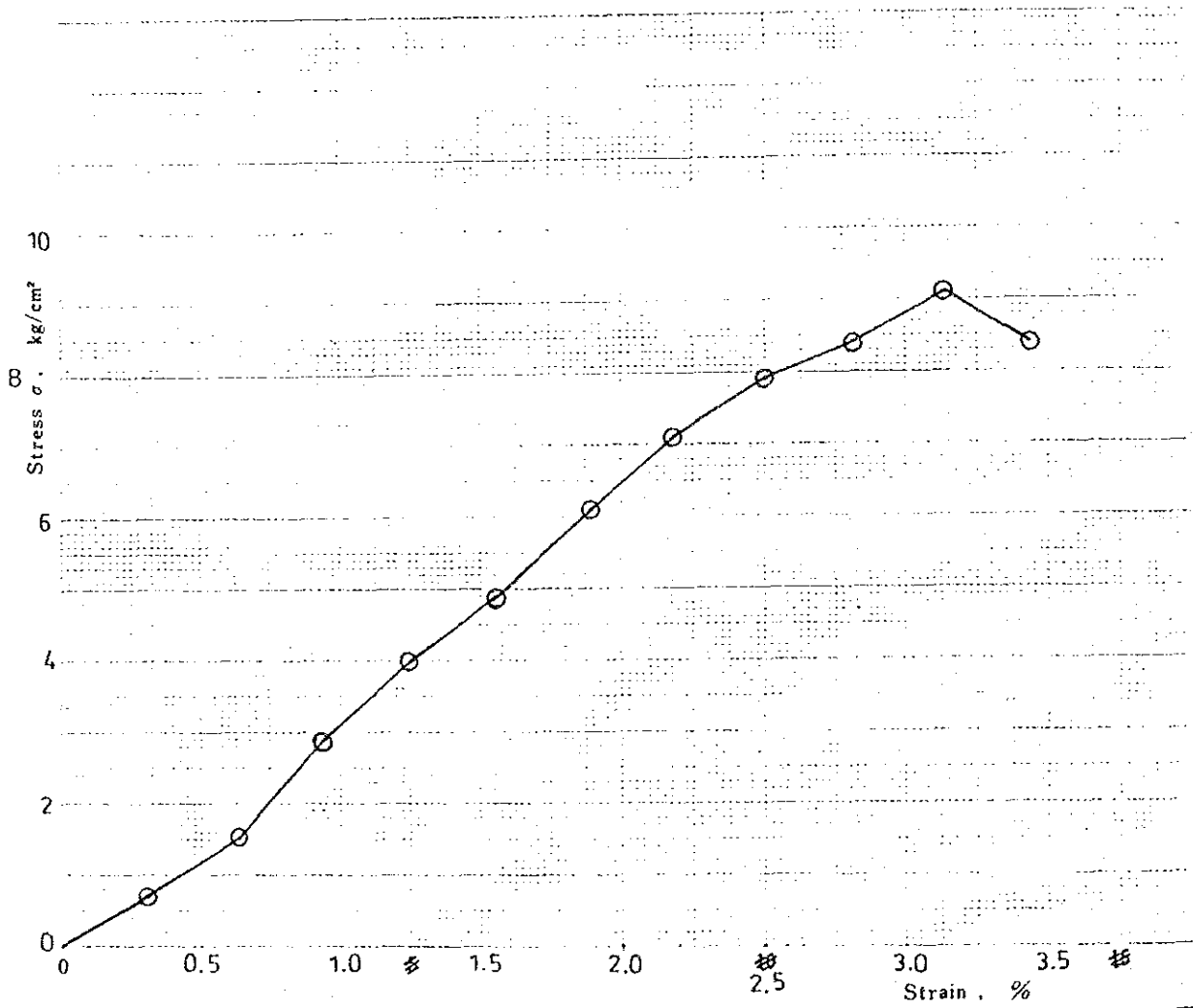
Remarks. Observation of sample at failure

Appendix Fig. 6.3.61

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

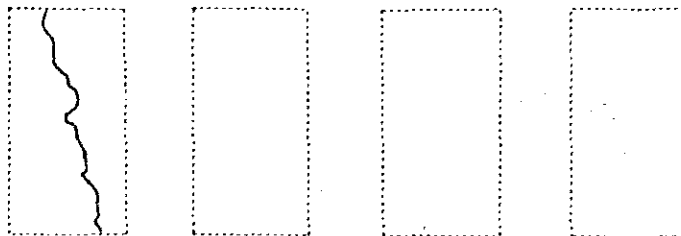
Project IRRAWADDY RIVER BRIDGE Job No. _____
 Location of Project MYAWADDY Boring No. 3 Sample No. CORE-5
 Date of testing 18-3-86 Depth of Sample 158'-8" to 161'-9"
 Strain Rate 0.02 mm/sec ~~0.01 mm/sec~~

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E _{sc} kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
5	GREY SHALE	8.128	4.064	15.51	2.17	9.14	-	3.15	-



Remarks.

Observation of sample at failure



Appendix Fig. 6.3.62

UNCONFINED TRIAXIAL COMPRESSION TEST I (Stress-Strain Curves)

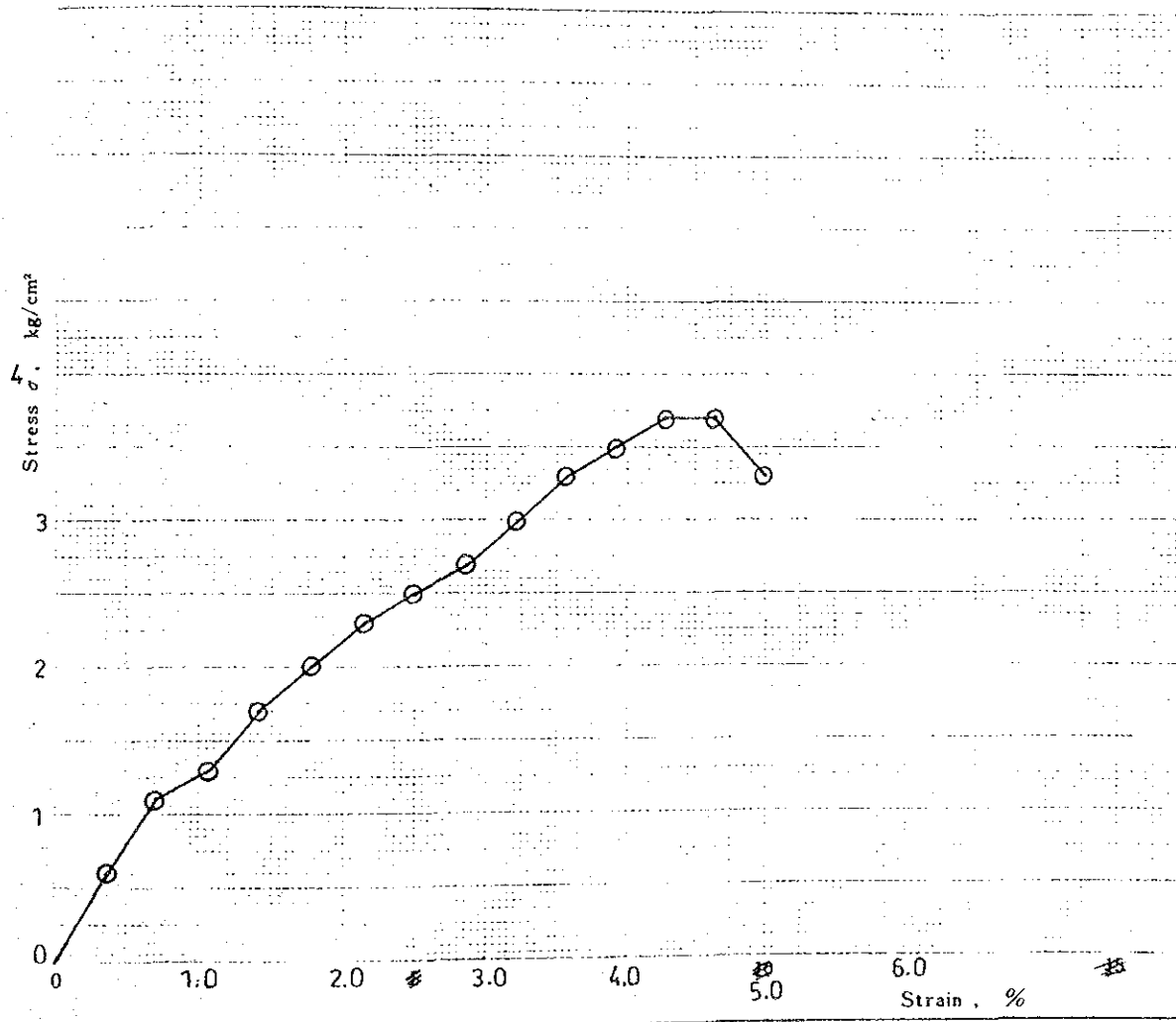
Project IRRAWADDY RIVER BRIDGE Job No. _____

Location of Project MYAWADDY Boring No. 3 Sample No. CORE-6

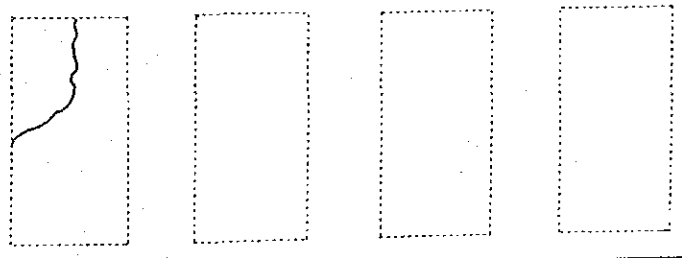
Date of testing 18-3-86 Depth of Sample 161'-11" to 165'-2"

Strain Rate 0.02 mm/sec ~~0.1 mm~~

Specimen No.	Condition of sample	Size of specimen, cm.		Natural water content %	Wet density g/cm ³	Unconfined compressive strength kg/cm ²	Coefficient of deformation E _{SM} kg/cm ²	Strain at failure %	Sensitivity ratio
		Height	Diameter						
6	GREY SHALE	7.112	3.556	15.71	1.87	3.73	-	4.65	-



Remarks. Observation of sample at failure



MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES
FINE-GRAINED SOILS 50% or more passes No. 200 sieve *			
SILTS AND CLAYS Liquid limit greater than 50%	SILTS AND CLAYS Liquid limit 50% or less	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
SILTS AND CLAYS Liquid limit greater than 50%	SILTS AND CLAYS Liquid limit 50% or less	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
SILTS AND CLAYS Liquid limit greater than 50%	SILTS AND CLAYS Liquid limit 50% or less	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit greater than 50%	SILTS AND CLAYS Liquid limit 50% or less	CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity
		PT	Peat, muck and other highly organic soils
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve *			
SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines
		SP	Poorly graded sands and gravelly sands, little or no fines
SANDS WITH FINES	CLEAN SANDS	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
SANDS WITH FINES	GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures

* Based on the material passing the 3-in. (75-mm) sieve.

1983 Annual Book of ASTM Standards, Appendix Table 6.3.2 Soil Classification Chart.

CLASSIFICATION CRITERIA

Classification on basis of percentage of fines
 Less than 5% Pass No. 200 sieve GW, GP, SW, SP
 More than 12% Pass No. 200 sieve GM, GC, SM, SC
 5% to 12% Pass No. 200 sieve Borderline Classification requiring use of dual symbols

$C_u = D_{60}/D_{10}$ Greater than 4
 $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3

Not meeting both criteria for GW

Atterberg limits plot below "A" line or plasticity index less than 4
 Atterberg limits plot above "A" line and plasticity index greater than 7

$C_u = D_{60}/D_{10}$ Greater than 6
 $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3

Not meeting both criteria for SW

Atterberg limits plot below "A" line or plasticity index less than 4
 Atterberg limits plot above "A" line and plasticity index greater than 7

Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols

Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols

PLASTICITY CHART

For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols.

Equation of A-line:
 $PI = 0.73 (LL - 20)$

Visual-Manual Identification. See ASTM Designation D 2488

Appendix Table 6.3.4 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		1									
Sample No.		1-1	1-2	1-3	Core 1-1	Core 1-2	Core 1-3	Core 1-4	Core 1-5	Core 1-6	
Sample depth		0.15 m 0.45 m	0.91 m 1.21 m	1.80 m 1.98 m	1.98 m 3.51 m	3.51 m 5.02 m	5.02 m 6.55 m	6.55 m 8.08 m	8.08 m 9.60 m	9.60 m 11.13 m	
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	
Natural water content, %		15.50	14.05	15.09	6.65	7.89	6.24	5.27	5.20	4.54	
Specific gravity		2.65	2.61	2.70	2.70			2.70			
Wet density, g/cm ³							2.51	2.44	2.40	2.10	
Dry density, g/cm ³											
Natural void ratio											
Degree of saturation, %											
Atterberg limits	Liquid limit, %	46.0	47.0	46.0							
	Plastic limit, %	15.0	15.0	15.0							
	Plasticity index	21.0	22.0	21.0							
Grain size analysis	Gravel, %	0	0	0							
	Sand, %	4	7	4							
	Silt, %	74	70	74							
	Clay & colloid, %	22	23	22							
	Max. diameter, mm	0.10	0.15	0.10							
	Diam. at 60%	0.016	0.016	0.016							
	Diam. at 10%										
Visual soil description		Clayey Siltstone	Clayey Siltstone	Clayey Siltstone	Shale	Shale	Shale	Shale	Shale	Shale	
Unified soil classification		(CL)	(CL)	(CL)							
Unconfined compression test	Undisturbed sample, kg/cm ²										
	Remoulded sample, kg/cm ²										
	Sensitivity ratio										
	Strain at failure, %										
Triaxial compression test	Angle of internal friction										
	Cohesion, kg/cm ²										
	Condition of drainage										
Consolidation test	Preconsolidation pressure, kg/cm ²										
	Compression index										

Remarks: Wet density was obtained from measurement of core sample.

Appendix Table 6.3.5 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		1									
Sample No.		Core 1-7	Core 1-8								
Sample depth		11.13 m 15.60 m	12.60 m 14.17 m	m	m	m	m	m	m	m	m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		4.02	5.96								
Specific gravity			2.70								
Wet density, g/cm ³		1.91	2.33								
Dry density, g/cm ³											
Natural void ratio											
Degree of saturation, %											
Atterberg limits	Liquid limit, %										
	Plastic limit, %										
	Plasticity index										
Grain size analysis	Gravel, %										
	Sand, %										
	Silt, %										
	Clay & colloid, %										
	Max. diameter, mm										
	Diam. at 60%										
	Diam. at 10%										
Visual soil description		Shale	Shale								
Unified soil classification											
Unconfined compression test	Undisturbed sample, kg/cm ²										
	Remoulded sample, kg/cm ²										
	Sensitivity ratio										
	Strain at failure, %										
Triaxial compression test	Angle of internal friction										
	Cohesion, kg/cm ²										
	Condition of drainage										
Consolidation test	Preconsolidation pressure, kg/cm ²										
	Compression index										

Remarks: Wet density was obtained from measurement of core sample.

Appendix Table 6.3.6 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: A S T M

Borehole No.		2								
Sample No.		2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	2-9
Sample depth		0.15 m 0.45 m	1.67 m 1.97 m	3.20 m 3.50 m	4.72 m 5.02 m	6.25 m 6.55 m	7.77 m 8.07 m	9.28 m 9.58 m	10.82 m 11.12 m	12.34 m 12.64 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		25.33	23.83	23.00	22.20	23.63	20.02	17.91	17.83	14.33
Specific gravity		2.61		2.61		2.62		2.63		2.63
Wet density, g/cm ³		2.04	2.04	1.96	1.96	1.90	1.90	1.94	2.12	2.16
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %									
	Plastic limit, %									
	Plasticity index									
Grain size analysis	Gravel, %	0	0			3	26	29		
	Sand, %	99	98			96	72	70		
	Silt, %	1	2			1	2	1		
	Clay & colloid, %	0	0			0	0	0		
	Max. diameter, mm	1.00	0.80			15.0	9.0	12.0		
	Diam. at 60%	0.26	0.35			0.45	0.50	0.60		
	Diam. at 10%	0.12	0.13			0.18	0.15	0.19		
Visual soil description		Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Unified soil classification		SP	SP			SP	SP	SP		
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)						29		31	
	Cohesion (kg/cm ²)						0		0	

Remarks: 1) Wet density was obtained from measurement of SPT sample at site.
 2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.7 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		2								
Sample No.		2-10	2-11	2-12	2-13	2-14	2-15	2-16	2-17	2-18
Sample depth		13.87 m 14.17 m	15.89 m 15.69 m	16.91 m 17.21 m	18.44 m 18.74 m	19.96 m 20.26 m	21.48 m 21.78 m	23.01 m 23.31 m	24.53 m 24.83 m	26.06 m 26.36 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		16.59	14.94	13.13	20.02	6.69	11.55	16.90	15.67	12.84
Specific gravity			2.66	2.64		2.65		2.63	2.62	2.62
Wet density, g/cm ³		1.83	2.18	2.02	2.02	2.13	2.11	2.27	2.17	2.17
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %									
	Plastic limit, %									
	Plasticity index									
Grain size analysis	Gravel, %		39	3		71		13	7	4
	Sand, %		60	96		29		80	88	90
	Silt, %		1	1		0		4	5	6
	Clay & colloid, %		0	0		0		0	0	0
	Max. diameter, mm		12.50	12.00		2.00		12.50	12.50	9.0
	Diam. at 60%		1.75	0.46		4.0		0.34	0.36	0.40
	Diam. at 10%		0.22	0.21		0.84		0.15	0.15	0.10
Visual soil description		Sand	Sand & Gravel	Sand	Sand	Sand & Gravel	Sand	Sand	Sand	Sand
Unified soil classification			SP	SP		GW		SP	SP	(SP-SH)
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)			31.5				34		33.5
	Cohesion (kg/cm ²)			0				0		0

Remarks: 1) Wet density was obtained from measurement of SPT sample at site.
2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.8 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		2								
Sample No.		2-19	2-20	2-21	2-22	2-23	Core 2-1	Core 2-2	Core 2-3	Core 2-4
Sample depth		27.58 m 27.88 m	29.11 m 29.41 m	30.63 m 30.93 m	32.00 m 32.30 m	32.46 m 32.66 m	32.63 m 32.68 m	33.88 m 34.69 m	34.69 m 35.98 m	36.00 m 37.24 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		11.64	11.47	12.68	5.56	15.41	* 17.25	8.99	10.61	10.29
Specific gravity			2.63							2.70
Wet density, g/cm ³		2.12	2.12	2.14			2.41			
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %					55				
	Plastic limit, %					24				
	Plasticity index					31				
Grain size analysis	Gravel, %		19			0				
	Sand, %		76			1				
	Silt, %		5			59				
	Clay & colloid, %		0			40				
	Max. diameter, mm		5.00			0.14				
	Diam. at 60%		0.54			0.005				
	Diam. at 10%		0.08			—				
Visual soil description		Sand & Gravel	Sand	Sand & Gravel	Shale	Shale	Shale	Shale	Shale	Shale
Unified soil classification			SW			MH				
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)		32.5							
	Cohesion (kg/cm ²)		0							

Remarks: 1) Wet density was obtained from measurement of SPT sample (at site) and core sample.
 2) Quick loading method was adopted to the direct shear test.
 3) * waxed core sample. — 6-71 —

Appendix Table 6.3.9 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		3								
Sample No.		3-1	3-2	3-3	3-4	3-5	3-6	3-7A	3-7B	3-8
Sample depth		0.15 m 1.45 m	1.67 m 1.97 m	2.20 m 3.50 m	4.72 m 5.02 m	6.25 m 6.55 m	7.77 m 8.07 m	9.29 m 9.59 m	9.29 m 9.59 m	10.82 m 11.12 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		20.18	11.98	25.99	21.68	17.20	19.73	6.89	21.10	21.78
Specific gravity		2.64		2.61		2.62		2.66	2.57	
Wet density, g/cm ³										
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %								*	
	Plastic limit, %								*	
	Plasticity index								*	
Grain size analysis	Gravel, %	0		0		1		45	0	
	Sand, %	70		78		97		53	7	
	Silt, %	25		20		2		2	68	
	Clay & colloid, %	5		2		0		0	25	
	Max. diameter, mm	0.9		1.1		2.5		6.0	0.17	
	Diam. at 60%	0.26		0.18		0.46		2.5	0.016	
	Diam. at 10%	0.046		0.016		0.15		0.23		
Visual soil description		Sand & Gravel	Sand & Gravel	Silty Sand	Silty Sand	Sand	Sand	Sand	Clayey Silt	Silty Sand
Unified soil classification		(SM)		(SM)		SP		SP	—	
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)					31				29.5
	Cohesion (kg/cm ²)					0				0

Remarks: 1) * Atterberg Limits tests could not be performed due to insufficient soil sample.
 2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.10 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		3								
Sample No.		3-9	3-10	3-11	3-12	3-13	3-14	3-15	3-16	3-17A
Sample depth		12.34 m 12.64 m	13.87 m 14.17 m	15.39 m 15.69 m	17.07 m 17.37 m	18.44 m 18.74 m	19.96 m 20.26 m	21.49 m 21.79 m	23.01 m 23.31 m	24.53 m 24.83 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		20.31	31.61	32.92	17.99	15.15	16.78	15.16	19.52	22.62
Specific gravity		2.62		2.57	2.62		2.62		2.62	2.57
Wet density, g/cm ³										
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %			*						*
	Plastic limit, %			*						*
	Plasticity index			*						*
Grain size analysis	Gravel, %	0		0	0		1		0	0
	Sand, %	95		17	91		94		91	16
	Silt, %	5		62	9		5		9	62
	Clay & colloid, %	0		21	0		0		0	22
	Max. diameter, mm	0.45		0.25	0.55		2.00		1.00	0.6
	Diam. at 60%	0.22		0.027	0.25		0.37		0.25	0.02
	Diam. at 10%	0.063			0.064		0.08		0.064	
Visual soil description		Silty Sand	Clayey Silt	Clayey Silt	Sand	Sand	Sand with Gravel	Sand	Sand	Clayey Sand
Unified soil classification		SP		—	(SP-SM)		SP		(SP-SM)	—
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)						31.5			
	Cohesion (kg/cm ²)						0			

Remarks: 1) * Atterberg Limits tests could not be performed due to insufficient soil sample.
 2) Quick loading test method was adopted to the direct shear test.

Appendix Table 6.3.11 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		3								
Sample No.		3-17B	3-18	3-19	3-20	3-21A	3-21B	3-22	3-23	3-24
Sample depth		24.53 m 24.82 m	26.06 m 26.36 m	27.58 m 27.88 m	29.11 m 29.41 m	30.63 m 30.93 m	30.63 m 30.93 m	32.15 m 32.45 m	33.68 m 33.98 m	35.20 m 35.50 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		16.73	20.04	19.37	17.36	15.47	17.02	18.20	19.52	19.00
Specific gravity			2.63							
Wet density, g/cm ³					2.11	2.04		2.12	2.00	2.07
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %									
	Plastic limit, %									
	Plasticity index									
Grain size analysis	Gravel, %		0							
	Sand, %		93							
	Silt, %		7							
	Clay & colloid, %		0							
	Max. diameter, mm		0.7							
	Diam. at 60%		0.25							
	Diam. at 10%		0.075							
Visual soil description		Clayey Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Unified soil classification			(SP-SM)							
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (Degree)	24			21.5				24.5	
	Cohesion (kg/cm ²)	0.293			0				0.293	

Remarks: 1) Wet density was obtained from measurement of SPT sample at site.
 2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.12 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		3								
Sample No.	3-25	3-26A	3-26B	3-27	3-28	3-29	3-30A	3-30B	Core 3-1	
Sample depth	36.70 m 37.00 m	38.25 m 38.55 m	38.25 m 38.55 m	39.77 m 40.07 m	41.20 m 41.60 m	42.82 m 43.12 m	44.20 m 44.50 m	44.20 m 44.50 m	44.50 m 45.05 m	
Condition of sample	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	
Natural water content, %	17.71	21.52	20.44	15.66	19.71	10.58	8.01	8.00	*10.51	
Specific gravity	2.63				2.64		2.63			
Wet density, g/cm ³	2.09	2.06	2.06	2.10	2.17	1.99				
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %									
	Plastic limit, %									
	Plasticity index									
Grain size analysis	Gravel, %	0	0		5		5			
	Sand, %	99	75		73		54			
	Silt, %	1	25		20		25			
	Clay & colloid, %	0	0		2		6			
	Max. diameter, mm	0.7	0.45		5.8		2.00			
	Diam. at 60%	0.28	0.024		0.4		0.20			
	Diam. at 10%	0.12			0.08		0.004			
Visual soil description	Sand	Sand with Silt and G	Sand with Silt and G	Sand	Sand	Sand & Gravel	Sand & Gravel	Clay	Shale	
Unified soil classification	SP	(SM)			(SM)		(SM)			
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)		16.5		32.5					
	Cohesion (kg/cm ²)		0.566		0					

Remarks: 1) Wet density was obtained from measurement of SPT sample at site.
 2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.13 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		3									
Sample No.		Core 3-2	Core 3-3	Core 3-4	Core 3-5	Core 3-6					
Sample depth		45.35 m 46.36 m	46.36 m 47.37 m	47.37 m 48.34 m	48.34 m 49.35 m	49.35 m 50.50 m	m	m	m	m	m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	
Natural water content, %		* 13.83	* 21.48	* 12.57	* 15.51	* 15.71					
Specific gravity						2.70					
Wet density, g/cm ³		2.56	2.30	2.08	2.17	1.87					
Dry density, g/cm ³											
Natural void ratio											
Degree of saturation, %											
Atterberg limits	Liquid limit, %										
	Plastic limit, %										
	Plasticity index										
Grain size analysis	Gravel, %										
	Sand, %										
	Silt, %										
	Clay & colloid, %										
	Max. diameter, mm										
	Diam. at 60%										
Visual soil description		Shale	Shale	Shale	Shale	Shale					
Unified soil classification											
Unconfined compression test	Undisturbed sample, kg/cm ²	9.98		6.96	9.14	2.73					
	Remoulded sample, kg/cm ²										
	Sensitivity ratio										
	Strain at failure, %	11.0		6.9	2.2	1.7					
Triaxial compression test	Angle of internal friction										
	Cohesion, kg/cm ²										
	Condition of drainage										
Consolidation test	Preconsolidation pressure, kg/cm ²										
	Compression index										

Remarks: 1) Measurement of wet density & the unconfined compression test were carried out on core samples.
 2) * waxed core samples 6-76

Appendix Table 6.3.14 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		4								
Sample No.		4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8	4-9
Sample depth		0.15 m 0.45 m	1.67 m 1.97 m	3.20 m 3.50 m	4.72 m 5.02 m	6.25 m 6.55 m	7.77 m 8.07 m	9.27 m 9.57 m	10.82 m 11.12 m	12.34 m 12.64 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		22.57		14.53	18.93	23.26		15.80	15.94	22.34
Specific gravity		2.63			2.61	2.61			2.66	2.61
Wet density, g/cm ³										
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %									
	Plastic limit, %									
	Plasticity index									
Grain size analysis	Gravel, %	2			0	4			27	0
	Sand, %	66			77	93			72	77
	Silt, %	30			22	3			1	22
	Clay & colloid, %	2			1	0			0	1
	Max. diameter, mm	5.00			0.42	4.5			7.0	0.60
	Diam. at 60%	0.16			0.10	0.5			1.50	0.125
	Diam. at 10%	0.0075			0.075	0.15			0.27	0.028
Visual soil description		Silty Sand	Silty Sand	Silty Sand	Silty Sand	Sand	Sand	Gravelly Sand	Gravelly Sand	Silty Sand
Unified soil classification		(SM)			(SM)	SP			SP	(SM)
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)				39					29.5
	Cohesion (kg/cm ²)				0					0

Remarks: 1) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.15 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		4								
Sample No.		4-10	4-11	4-12	4-13	4-14	4-15	4-16	4-17	4-18
Sample depth		13.87 m 14.17 m	15.37 m 15.67 m	16.81 m 17.21 m	18.44 m 18.74 m	19.86 m 20.26 m	21.49 m 21.79 m	23.01 m 23.31 m	24.84 m 24.64 m	26.77 m 26.17 m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		11.81	21.94	20.98	17.58	17.59	15.70	26.53	17.07	20.81
Specific gravity		2.60	2.56	2.63			2.61	2.57	2.63	2.63
Wet density, g/cm ³										
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %	*	*					*		
	Plastic limit, %	*	*					*		
	Plasticity index	*	*					*		
Grain size analysis	Gravel, %	10	1	1			0	0	0	
	Sand, %	45	8	89			75	9	87	
	Silt, %	45	61	10			21	61	12	
	Clay & colloid, %	20	30	0			4	30	1	
	Max. diameter, mm	5.00	5.00	2.60			0.50	0.165	4.40	
	Diam. at 60%	0.085	0.01	0.19			0.18	0.0165	0.19	
	Diam. at 10%			0.06			0.0067		0.036	
Visual soil description		Clayey silt	Clayey silt	Sand	Sand	Clayey sand	Sand	Clayey silt	Sand	Sand
Unified soil classification		—	—	(SP-SM)			(SM)	—	(SM)	
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									
Direct Shear Test	Internal Friction Angle (degree)								21.5	
	Cohesion (kg/cm ²)								0	

Remarks: 1) * Atterberg Limits Tests could not performed due to insufficient soil sample.
2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.16 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		4									
Sample No.		4-19	4-20	4-21	4-22	4-23	4-24	Core 4-1	Core 4-2	Core 4-3	
Sample depth		26.82 m 27.02 m	29.57 m 29.75 m	30.63 m 30.90 m	32.15 m 32.45 m	33.53 m 33.73 m	34.90 m 35.20 m	35.23 m 36.24 m	36.24 m 37.19 m	37.19 m 38.19 m	
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	
Natural water content, %		7.27	18.96	19.25	17.67	21.76	16.98	19.59	17.12	12.27	
Specific gravity		2.68	2.64			2.68		2.68			
Wet density, g/cm ³								2.47	2.86		
Dry density, g/cm ³											
Natural void ratio											
Degree of saturation, %											
Atterberg limits	Liquid limit, %										
	Plastic limit, %										
	Plasticity index										
Grain size analysis	Gravel, %		0			0					
	Sand, %		99			96					
	Silt, %		1			4					
	Clay & colloid, %		0			0					
	Max. diameter, mm		1.4			2.57					
	Diam. at 60%		0.63			0.40					
	Diam. at 10%		0.20			0.16					
Visual soil description		Sand & Gravel	Sand	Sand	Sand	Sand	Shale	Shale	Shale	Shale	
Unified soil classification			SP			SP					
Unconfined compression test	Undisturbed sample, kg/cm ²							5.97	4.86		
	Remoulded sample, kg/cm ²										
	Sensitivity ratio										
	Strain at failure, %							4.2	7.5		
Triaxial compression test	Angle of internal friction										
	Cohesion, kg/cm ²										
	Condition of drainage										
Consolidation test	Preconsolidation pressure, kg/cm ²										
	Compression index										
Direct Shear Test	Internal Friction Angle (degree)		33		35	30.5					
	Cohesion (kg/cm ²)		0		0.269	0					

Remarks: 1) Measurement of wet density & unconfined compression test were carried out on core sample.
2) Quick loading method was adopted to the direct shear test.

Appendix Table 6.3.17 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		4								
Sample No.		Core 4-4	Core 4-5							
Sample depth		38.19 m 39.20 m	39.20 m 40.16 m	m	m	m	m	m	m	m
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed
Natural water content, %		13.82	12.72							
Specific gravity			2.70							
Wet density, g/cm ³		2.36	1.90							
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %									
	Plastic limit, %									
	Plasticity index									
Grain size analysis	Gravel, %									
	Sand, %									
	Silt, %									
	Clay & colloid, %									
	Max. diameter, mm									
	Diam. at 60%									
	Diam. at 10%									
Visual soil description		shale	shale							
Unified soil classification										
Unconfined compression test	Undisturbed sample, kg/cm ²	11.50	8.98							
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %	3.5	3.8							
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									

Remarks: 1) Measurement of wet density & unconfined compression test were carried out on core sample.

Appendix Table 6.3.18 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.										
Sample No.	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	
Sample depth	0.15 m 0.45 m	1.67 m 1.97 m	2.20 m 2.50 m	4.72 m 5.02 m	6.25 m 6.55 m	7.62 m 7.92 m	9.14 m 9.32 m	10.67 m 10.82 m	12.19 m 12.32 m	
Condition of sample	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	
Natural water content, %	14.75	16.06	16.70	24.06	15.94	15.00	17.27	17.27	15.21	
Specific gravity	2.57	2.59	2.59		2.57	2.58				
Wet density, g/cm ³										
Dry density, g/cm ³										
Natural void ratio										
Degree of saturation, %										
Atterberg limits	Liquid limit, %	52	54	55		54	58			
	Plastic limit, %	23	24	24		24	26			
	Plasticity index	29	30	31		30	32			
Grain size analysis	Gravel, %	0	0	0		0	0			
	Sand, %	2	2	1		2	4			
	Silt, %	61	59	59		59	53			
	Clay & colloid, %	37	39	40		39	43			
	Max. diameter, mm	0.1	0.1	0.1		0.125	0.12			
	Diam. at 60%	0.08	0.085	0.085		0.07	0.06			
	Diam. at 10%	0.0023								
Visual soil description	Silt & clay	Silt & clay	Silty clay	Silty clay	Silty clay	Silt & clay	Silt & clay	Silt & clay	Sandy silt	
Unified soil classification	MH	MH	MH		MH	MH				
Unconfined compression test	Undisturbed sample, kg/cm ²									
	Remoulded sample, kg/cm ²									
	Sensitivity ratio									
	Strain at failure, %									
Triaxial compression test	Angle of internal friction									
	Cohesion, kg/cm ²									
	Condition of drainage									
Consolidation test	Preconsolidation pressure, kg/cm ²									
	Compression index									

Remarks:

Appendix Table 6.3.19 SUMMARY OF SOIL TEST

Project: IRRAWADDY RIVER BRIDGE CONSTRUCTION

Standard: ASTM

Borehole No.		5									
Sample No.		5-10	5-11	Core 5-1	Core 5-2	Core 5-3	Core 5-4	Core 5-5	Core 5-6	Core 5-7	
Sample depth		10.72 m 12.26 m	15.24 m 15.37 m	15.07 m 16.76 m	16.76 m 18.29 m	18.29 m 19.81 m	19.81 m 21.34 m	21.34 m 22.40 m	22.40 m 23.47 m	23.47 m 24.54 m	
Condition of sample		Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	Disturbed Undisturbed	
Natural water content, %		10.06	12.42	8.14	5.31	6.21	10.56	9.50	8.20	6.40	
Specific gravity		2.59	2.59	2.66		2.70		2.66		2.70	
Wet density, g/cm ³				2.44		2.40	2.52	2.47	2.61	2.60	
Dry density, g/cm ³											
Natural void ratio											
Degree of saturation, %											
Atterberg limits	Liquid limit, %	25	26								
	Plastic limit, %	14	15								
	Plasticity index	21	21								
Grain size analysis	Gravel, %	0	0								
	Sand, %	2	5								
	Silt, %	69	72								
	Clay & colloid, %	23	23								
	Max. diameter, mm	0.15	0.10								
	Diam. at 60%	0.016	0.016								
	Diam. at 10%										
Visual soil description		Clayey silt	Clayey siltstone	shale	shale	Shale	Shale	Shale	Shale	Shale	
Unified soil classification		CL	CL								
Unconfined compression test	Undisturbed sample, kg/cm ²			26.8		22.5	12.0	10.7	17.0	43.2	
	Remoulded sample, kg/cm ²										
	Sensitivity ratio										
	Strain at failure, %			0.7		1.2	2.2	2.2	1.2	1.6	
Triaxial compression test	Angle of internal friction										
	Cohesion, kg/cm ²										
	Condition of drainage										
Consolidation test	Preconsolidation pressure, kg/cm ²										
	Compression index										

Remarks: 1) Measurement of wet density & unconfined compression test were carried out on core sample.

Appendix Table 6.3.20

Sample No.	Soil Type	Grain Size Distribution	Passing No. 200 Sieve (%)	Specific Gravity	Liquidity Index (L.I.) (%)	Plasticity Index (P.I.) (%)	Max. D/D (1 _s /1 _s) (%)	O.M.C. (%)	Compaction Test	Sealed CBR (percent)
1	Lateritic Soil	Gravelly SAND some Silt	15.44	2.65	-	-	135.4	6.9	18.0	
2	Cohesive Soil	Sandy and Clayey SILT trace Gravel	75.45	2.47	42.1	24.4	124.0	10.0	3.5	
3	Sand	SAND trace Silt	3.32	2.54	-	-	113.2	11.0	8.0	

Note:

- L.I. = Liquid Limit
- P.I. = Plasticity Index
- Max. D/D = Maximum Dry Density
- O.M.C. = Optimum moisture content

Compaction Method AASHTO modified compaction

Sealed CBR Remoulded at 95 % of Max: D/D and O.M.C. and tested after (4) day soaking. (Used static method to remould the sample)

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GRAIN SIZE DISTRIBUTION
(MYAWADDY BRIDGE)

Appendix Table 6.3.21

Sample No.	Soil Type	Passing Percent				
		No. 10	No. 20	No. 40	No. 60	No. 100
1	Lateritic Soil	75.20	52.68	39.10	27.46	20.80
						15.44
2	Cohesive Soil	97.48	96.50	96.00	95.76	94.65
						76.46
3	Sand	100.00	99.95	95.21	83.55	19.95
						3.32

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Appendix Table 6.4.1 WATER LEVELS AT PROME 1

(YEAR:1979)

**** Water Level at Prome Station ****

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	18.25	17.61	17.23	17.66	17.60	18.20	21.27	25.89	25.87	24.20	21.78	19.30
2	18.24	17.59	17.20	17.63	17.58	18.00	21.69	26.01	25.99	24.21	21.60	19.27
3	18.23	17.57	17.17	17.58	17.58	17.83	21.89	26.24	26.04	24.66	21.49	19.26
4	18.22	17.55	17.15	17.48	17.58	17.74	21.97	26.38	26.12	25.12	21.49	19.25
5	18.21	17.53	17.14	17.40	17.57	17.67	22.02	26.52	26.26	25.33	21.41	19.31
	(18.23)	(17.57)	(17.18)	(17.55)	(17.58)	(17.89)	(21.77)	(26.21)	(26.06)	(24.70)	(21.55)	(19.28)
6	18.20	17.52	17.12	17.43	17.54	17.66	22.77	26.67	26.43	25.34	21.32	19.52
7	18.19	17.50	17.12	17.63	17.52	17.55	23.48	26.98	26.56	25.22	21.17	19.82
8	18.17	17.48	17.10	17.84	17.52	17.44	24.07	27.18	26.62	25.06	21.02	20.12
9	18.14	17.46	17.09	17.91	17.52	17.34	24.48	27.24	26.65	24.94	20.89	20.37
10	18.12	17.44	17.07	17.91	17.56	17.25	24.63	27.19	26.68	25.04	20.75	20.58
	(18.16)	(17.48)	(17.10)	(17.74)	(17.53)	(17.45)	(23.89)	(27.05)	(26.59)	(25.12)	(21.03)	(20.08)
11	18.10	17.43	17.06	17.99	17.68	17.18	24.63	27.04	26.76	25.33	20.63	20.61
12	18.07	17.42	17.04	18.08	17.91	17.12	24.58	26.69	26.94	25.66	20.54	20.49
13	18.03	17.49	17.02	18.12	18.20	17.11	24.41	26.49	27.19	26.07	20.45	20.20
14	17.99	17.55	17.00	18.09	18.33	17.24	24.42	27.05	27.49	26.50	20.36	19.96
15	17.96	17.57	16.99	17.98	18.36	17.26	24.10	26.61	27.82	26.89	20.27	19.75
	(18.03)	(17.49)	(17.02)	(18.05)	(18.10)	(17.18)	(24.43)	(26.78)	(27.24)	(26.09)	(20.45)	(20.20)
16	17.93	17.56	16.97	17.96	18.34	17.43	24.00	25.16	28.11	27.33	20.18	19.61
17	17.90	17.52	16.95	18.02	18.22	17.78	23.83	24.62	28.33	27.73	20.10	19.51
18	17.88	17.48	16.93	18.05	18.03	18.86	23.63	24.06	28.55	28.06	20.04	19.43
19	17.87	17.44	16.91	18.00	17.89	19.87	23.50	23.65	28.60	28.26	19.96	19.33
20	17.84	17.41	16.91	17.89	17.76	20.25	23.49	23.36	28.54	28.30	19.89	19.26
	(17.88)	(17.48)	(16.93)	(17.98)	(18.05)	(18.84)	(23.69)	(24.17)	(28.43)	(27.94)	(20.03)	(19.43)
21	17.82	17.38	16.91	17.75	17.65	20.27	23.63	23.19	28.42	28.16	19.83	19.17
22	17.81	17.37	16.92	17.71	17.59	20.10	23.83	23.07	28.25	27.19	19.76	19.11
23	17.80	17.34	16.99	17.73	17.55	19.96	24.03	23.04	28.03	27.54	19.70	19.07
24	17.78	17.33	17.03	17.82	17.54	20.08	24.28	23.15	27.70	26.99	19.65	19.02
25	17.75	17.31	17.02	17.80	17.60	20.32	24.57	23.61	27.25	26.30	19.59	18.98
	(17.79)	(17.35)	(16.97)	(17.76)	(17.59)	(20.15)	(24.07)	(23.21)	(27.93)	(27.24)	(19.71)	(19.07)
26	17.74	17.29	16.97	17.70	17.89	20.59	24.87	24.15	26.72	25.40	19.54	18.93
27	17.72	17.26	16.93	17.63	18.41	20.67	25.18	24.62	26.20	24.41	19.48	18.86
28	17.70	17.24	16.91	17.68	18.75	20.69	25.45	25.03	25.66	23.52	19.43	18.77
29	17.67	17.21	16.99	17.69	18.77	20.63	25.46	25.43	25.21	22.91	19.39	18.74
30	17.65	17.07	17.07	17.64	18.59	20.76	25.63	25.68	24.58	22.36	19.35	18.69
31	17.63	17.63	17.63	18.36	18.36	25.78	25.78	25.82	22.02	22.02	18.65	18.65
	(17.68)	(17.26)	(17.08)	(17.67)	(18.46)	(20.67)	(25.39)	(25.12)	(25.67)	(23.44)	(19.44)	(18.77)
TOTAL	556.61	488.64	528.54	533.80	554.99	560.85	741.57	787.82	809.57	796.05	611.06	602.94
AVE.	17.96	17.45	17.05	17.79	17.90	18.69	23.92	25.41	26.99	25.68	20.37	19.45
YEAR; 1979	28.60	24.10	19.25	17.63	16.99	16.91	20.75	7572.44				

Source: MHD

Appendix Table 6.4.1 WATER LEVELS AT PROME 2

(YEAR;1980)

**** Water Level at Prome Station ****

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	18.61	17.73	17.49	17.52	18.53	18.54	24.80	26.67	27.62	25.17	24.33	19.48
2	18.55	17.70	17.53	17.52	18.66	18.73	24.56	26.46	27.44	25.71	24.82	19.36
3	18.54	17.67	17.53	17.62	19.22	18.73	24.36	26.27	27.25	26.07	23.94	19.23
4	18.51	17.65	17.46	17.75	19.73	18.76	24.22	26.10	27.10	26.14	23.50	18.26
5	18.50	17.64	17.43	18.08	19.94	18.76	24.12	25.96	26.91	26.73	23.01	19.21
(	18.54)	(17.68)	(17.49)	(17.70)	(19.22)	(18.70)	(24.41)	(26.29)	(27.26)	(25.96)	(23.92)	(19.31)
6	18.48	17.64	17.46	18.52	19.73	18.74	24.09	25.90	26.74	26.95	22.53	19.16
7	18.45	17.64	17.60	18.79	19.63	20.19	24.13	26.01	26.59	27.14	22.15	19.11
8	18.42	17.64	17.76	18.78	19.54	20.07	24.10	26.18	26.30	27.37	21.85	19.05
9	18.39	17.68	17.71	18.62	19.45	19.82	23.98	26.37	26.21	27.59	21.61	19.01
10	18.38	17.71	17.64	18.57	19.35	19.73	23.81	26.56	26.13	27.77	21.38	18.96
(	18.42)	(17.66)	(17.63)	(18.66)	(19.54)	(19.71)	(24.02)	(26.20)	(26.39)	(27.36)	(21.90)	(19.06)
11	18.38	17.70	17.67	18.55	19.19	19.65	23.78	26.70	25.80	28.04	21.22	18.92
12	18.38	17.67	17.91	18.50	19.06	19.60	23.95	26.82	25.45	28.25	21.07	18.87
13	18.37	17.63	18.34	18.39	18.95	20.17	24.21	26.94	25.18	28.40	20.93	18.84
14	18.33	17.58	18.45	18.26	18.90	21.32	24.42	27.08	24.90	28.46	20.79	18.79
15	18.29	17.55	18.41	18.19	18.97	22.22	24.50	27.19	24.60	28.42	20.68	18.77
(	18.35)	(17.63)	(18.16)	(18.38)	(19.01)	(20.59)	(24.17)	(26.95)	(25.19)	(28.31)	(20.94)	(18.84)
16	18.24	17.59	18.36	18.19	19.23	22.60	24.51	27.28	24.31	28.35	20.56	18.73
17	18.20	17.70	18.35	18.16	19.48	22.81	24.61	27.34	24.04	28.12	20.48	18.70
18	18.16	17.80	18.34	18.03	19.71	23.14	24.80	27.40	23.84	27.82	20.37	18.66
19	18.11	17.79	18.27	17.95	19.90	23.53	25.08	27.45	23.93	27.40	20.28	18.63
20	18.08	17.73	18.18	17.98	19.98	23.88	25.39	27.50	24.13	26.73	20.19	18.61
(	18.16)	(17.72)	(18.30)	(18.06)	(19.66)	(23.21)	(24.88)	(27.39)	(24.05)	(27.68)	(20.38)	(18.67)
21	18.04	17.65	18.11	18.16	20.03	24.00	25.71	27.57	24.26	26.01	20.11	18.59
22	18.02	17.56	17.99	18.30	19.91	24.11	25.96	27.62	24.29	25.29	20.03	18.56
23	17.97	17.50	17.90	18.43	19.74	24.31	26.15	27.71	24.27	24.64	19.96	18.53
24	17.96	17.47	17.83	18.59	19.56	24.64	26.41	27.83	24.20	24.08	19.58	18.51
25	17.93	17.45	17.76	18.72	19.38	24.96	26.56	27.96	24.21	23.64	19.81	18.48
(	17.98)	(17.53)	(17.92)	(18.44)	(19.72)	(24.40)	(26.16)	(27.74)	(24.25)	(24.73)	(19.90)	(18.53)
26	17.90	17.42	17.70	18.75	19.34	25.18	26.73	28.10	24.20	23.25	19.74	18.46
27	17.89	17.42	17.65	18.76	19.36	25.38	26.94	28.25	24.26	23.07	19.67	18.43
28	17.85	17.42	17.60	18.77	19.44	25.41	27.12	28.30	24.41	23.27	19.61	18.39
29	17.82	17.44	17.58	18.74	19.33	25.26	27.23	28.18	24.58	23.71	19.55	18.36
30	17.81		17.55	18.73	19.19	25.05	27.17	27.97	24.77	24.04	19.50	18.34
31	17.79		17.53		19.02	26.93	27.76	27.97	24.24	24.24	19.50	18.31
(	17.84)	(17.43)	(17.60)	(18.75)	(19.28)	(25.26)	(27.02)	(28.09)	(24.44)	(23.60)	(19.61)	(18.38)
TOTAL	564.35	510.77	553.09	549.93	601.45	659.39	780.33	841.43	757.92	811.87	633.25	582.31
AVE.	18.20	17.61	17.84	18.33	19.40	21.98	25.17	27.14	25.26	26.19	21.11	18.78

YEAR; 1980 28.46 24.58 19.58 18.36 17.52 17.42 21.44 7846.09

Source: MHD

Appendix Table 6.4.1 WATER LEVELS AT RROME 3

**** Water Level at Promé Station ****

(YEAR:1981)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	18.19	17.53	17.24	17.78	18.64	19.18	23.01	26.26	25.95	23.48	19.91	19.42
2	18.16	17.52	17.22	17.78	18.49	19.24	23.65	26.12	26.15	23.08	19.81	19.30
3	18.13	17.50	17.20	17.79	18.40	19.46	24.14	26.06	26.34	22.71	19.72	19.07
4	18.10	17.50	17.16	17.77	18.32	19.92	24.60	26.08	26.52	22.42	19.67	18.92
5	18.07	17.48	17.15	17.71	18.27	20.68	24.98	26.21	26.70	22.30	19.68	18.82
6	(18.13)	(17.51)	(17.19)	(17.77)	(18.42)	(19.70)	(24.08)	(26.15)	(26.33)	(22.80)	(19.76)	(19.11)
7	18.04	17.47	17.15	17.63	18.23	21.39	25.31	26.46	26.85	22.33	19.70	18.74
8	17.98	17.45	17.12	17.60	18.15	21.94	25.59	26.63	26.96	22.42	19.64	18.66
9	17.95	17.44	17.10	17.60	17.98	22.47	25.92	26.90	27.03	22.56	19.59	18.59
10	17.92	17.44	17.13	17.58	17.86	22.90	26.15	27.16	27.05	22.71	19.53	18.51
11	(17.98)	(17.45)	(17.13)	(17.60)	(18.03)	(22.28)	(25.88)	(26.88)	(26.98)	(22.52)	(19.60)	(18.59)
12	17.89	17.46	17.39	17.59	17.82	22.87	26.67	27.27	26.94	22.66	19.50	18.42
13	17.86	17.51	17.85	17.80	17.79	22.87	26.90	27.24	26.86	22.47	19.46	18.38
14	17.83	17.56	18.07	18.04	17.79	22.80	27.11	27.22	26.77	22.22	19.46	18.34
15	17.80	17.60	18.08	18.45	17.82	22.77	27.26	27.03	26.72	21.95	19.55	18.29
16	(17.83)	(17.55)	(17.87)	(18.14)	(17.81)	(22.78)	(27.10)	(27.13)	(26.79)	(22.21)	(19.51)	(18.34)
17	17.71	17.57	17.81	18.89	17.83	22.42	27.35	26.73	26.68	21.59	19.53	18.21
18	17.71	17.52	17.71	18.84	17.83	22.27	27.26	26.60	26.66	21.52	19.41	18.18
19	17.69	17.48	17.68	18.72	17.84	22.21	27.10	26.53	26.65	21.43	19.28	18.14
20	17.77	17.44	17.81	18.65	17.88	22.34	26.78	26.18	26.64	21.57	19.19	18.10
21	17.82	17.48	18.01	18.58	17.92	22.28	26.44	25.91	26.63	21.39	19.12	18.07
22	(17.74)	(17.50)	(17.80)	(18.74)	(17.86)	(22.30)	(26.99)	(26.39)	(26.65)	(21.50)	(19.31)	(18.14)
23	17.80	17.50	18.10	18.58	17.98	22.19	26.28	25.63	26.56	21.23	19.32	18.06
24	17.77	17.54	18.10	18.53	18.13	22.20	26.29	25.40	26.45	21.06	20.85	18.07
25	17.74	17.56	18.07	18.44	18.30	21.96	26.43	25.26	26.27	20.99	20.46	18.16
26	17.71	17.58	18.03	18.34	18.28	21.89	26.60	25.20	26.08	20.95	19.96	18.19
27	17.68	17.54	18.01	18.27	18.26	21.86	26.74	25.25	25.86	20.84	19.86	18.15
28	(17.74)	(17.54)	(18.06)	(18.43)	(18.19)	(22.02)	(26.47)	(25.35)	(26.24)	(21.01)	(20.09)	(18.13)
29	17.65	17.47	18.00	18.26	18.27	21.82	26.84	25.40	25.63	20.69	19.97	18.12
30	17.62	17.42	17.99	18.31	18.34	21.87	26.92	25.53	25.31	20.63	20.00	18.09
31	17.61	17.33	18.00	18.43	18.61	21.98	26.95	25.58	24.84	20.53	19.91	18.04
TOTAL	552.68	489.97	548.02	545.69	563.48	655.43	813.18	813.08	789.02	672.49	590.57	569.56
AVE.	17.83	17.50	17.68	18.19	18.18	21.85	26.23	26.23	26.30	21.69	19.69	18.37
YEAR: 1981			27.54	22.90	19.12	17.92	17.33	17.10	20.83	7603.17		

Source: MHD

Appendix Table 6.4.1 WATER LEVELS AT PROME 4

(YEAR;1982)

**** Water Level at Prome Station ****

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	17.85	17.11	17.04	16.98	18.00	17.65	25.53	26.10	26.17	26.32	20.60	18.89
2	17.81	17.10	17.13	17.00	18.01	17.58	25.75	26.38	26.07	26.07	20.56	18.83
3	17.77	17.08	17.23	16.96	17.93	17.57	25.92	26.79	26.02	25.87	20.48	18.79
4	17.74	17.06	17.32	16.91	17.86	17.63	26.09	27.18	25.91	25.89	20.36	18.74
5	(17.73	17.04	17.30	16.89	17.83	17.72	26.23	27.52	25.87	25.86	20.20	18.72
	(17.78)	(17.08)	(17.20)	(16.95)	(17.93)	(17.63)	(25.90)	(26.79)	(26.01)	(26.00)	(20.44)	(18.79)
6	17.70	17.02	17.15	16.92	17.80	17.78	26.36	27.77	25.86	25.78	20.08	18.68
7	17.68	17.00	17.07	16.98	17.86	17.85	26.38	27.98	25.78	25.73	20.00	18.64
8	17.66	16.98	17.03	17.07	18.04	17.95	26.38	28.16	25.72	25.64	19.90	18.60
9	17.64	16.96	16.99	17.12	18.26	18.13	26.38	28.21	25.65	25.57	19.81	18.55
10	17.62	16.94	16.95	17.13	18.46	18.32	26.18	28.15	25.75	25.45	19.74	18.51
	(17.66)	(16.98)	(17.04)	(17.04)	(18.08)	(18.01)	(26.34)	(28.05)	(25.75)	(25.63)	(19.91)	(18.60)
11	17.59	16.91	16.89	17.44	18.53	18.57	26.06	27.91	25.54	25.30	19.71	18.46
12	17.55	16.89	16.85	17.96	18.48	18.73	25.93	27.71	25.08	25.12	19.68	18.42
13	17.52	16.89	16.82	18.30	18.39	18.89	25.81	27.44	24.77	24.99	19.63	18.40
14	17.50	16.91	16.82	18.30	18.37	19.17	25.65	27.17	24.57	24.68	19.53	18.36
15	(17.49	16.94	16.91	18.13	18.35	19.91	25.51	26.84	24.42	24.39	19.45	18.33
	(17.53)	(16.91)	(16.86)	(18.03)	(18.42)	(19.05)	(25.79)	(27.41)	(24.88)	(24.90)	(19.60)	(18.39)
16	17.47	16.97	16.97	19.09	18.28	20.91	25.42	26.67	24.23	24.00	19.41	18.23
17	17.45	17.00	16.99	18.17	18.22	21.91	25.47	26.53	24.01	23.55	19.39	18.25
18	17.42	17.03	16.96	18.28	18.19	22.93	25.60	26.36	23.84	23.10	19.47	18.22
19	17.41	17.06	16.92	18.39	18.20	23.74	25.71	26.19	23.85	22.68	19.63	18.19
20	17.38	17.08	16.98	18.38	18.38	24.19	25.82	26.01	24.16	22.35	19.85	18.16
	(17.43)	(17.03)	(16.96)	(18.46)	(18.25)	(22.74)	(25.60)	(26.35)	(24.02)	(23.14)	(19.55)	(18.21)
21	17.36	17.08	17.00	18.20	18.63	24.33	25.90	25.80	24.61	22.02	19.94	18.13
22	17.34	17.07	16.98	18.08	18.74	24.52	25.90	25.59	25.06	21.75	19.95	18.11
23	17.32	17.04	16.95	17.95	18.72	24.78	25.78	25.42	25.55	21.50	19.83	18.09
24	17.29	17.00	16.90	17.88	18.56	25.04	25.60	25.68	25.93	21.30	19.56	18.07
25	17.26	16.97	16.87	17.83	18.31	25.21	25.41	26.00	26.28	21.05	19.38	18.05
	(17.31)	(17.03)	(16.94)	(17.99)	(18.59)	(24.78)	(25.72)	(25.70)	(25.49)	(21.52)	(19.73)	(18.09)
26	17.23	16.97	16.86	17.78	18.30	25.27	25.25	25.92	26.58	20.99	19.25	18.04
27	17.21	16.97	16.82	17.72	18.30	25.30	25.17	25.84	26.77	20.82	19.19	18.03
28	17.19	16.99	16.79	17.70	18.20	25.25	25.20	25.85	26.86	20.65	19.07	18.03
29	17.17	16.99	16.77	17.73	18.03	25.20	25.35	25.99	26.80	20.63	19.02	18.01
30	17.15	16.99	16.81	17.88	17.85	25.29	25.53	26.15	26.75	20.63	18.94	17.98
31	17.13	16.99	16.91	17.73	17.73	25.22	25.77	26.22	20.59	20.59	17.95	17.95
	(17.18)	(16.98)	(16.83)	(17.76)	(18.07)	(25.26)	(25.38)	(26.00)	(26.75)	(20.72)	(19.09)	(18.01)
TOTAL	541.63	476.06	525.98	531.15	564.81	637.32	799.04	827.53	764.45	730.27	591.61	568.46
AVE.	17.47	17.00	16.97	17.70	18.22	21.24	25.78	26.69	25.48	23.56	19.72	18.34
YEAR; 1982			28.21	25.21	18.57	17.57	16.89	16.77	20.71	7558.31		

Source: MHD

Appendix Table 6.4.1 WATER LEVELS AT PROME 5

**** Water Level at Prome Station ****
(YEAR;1983)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	17.92	17.44	17.11	19.60	19.33	19.19	22.34	25.99	25.62	27.58	23.13	20.20	
2	17.90	17.43	17.19	19.47	19.14	19.10	22.43	26.13	25.88	27.31	22.79	20.08	
3	17.89	17.42	17.29	19.23	19.07	19.01	22.50	26.24	26.21	27.09	22.49	20.00	
4	17.93	17.41	17.35	18.98	19.02	19.03	22.62	26.45	26.64	26.83	22.23	19.91	
5	17.97	17.40	17.38	18.73	19.00	18.90	22.69	26.78	26.98	26.59	21.94	19.82	
6	(17.92)	(17.42)	(17.26)	(19.20)	(19.11)	(19.05)	(22.52)	(26.32)	(26.27)	(27.08)	(22.52)	(20.00)	
7	17.91	17.38	17.40	18.51	18.98	18.87	22.87	27.09	27.26	26.38	21.68	19.75	
8	17.86	17.37	17.42	18.52	19.01	18.78	22.99	27.42	27.41	25.88	21.48	19.70	
9	17.83	17.35	17.44	18.52	19.45	18.76	23.24	27.59	27.44	25.26	21.32	19.65	
10	17.83	17.36	17.48	18.53	19.95	18.75	23.50	28.06	27.33	24.94	21.33	19.56	
11	17.82	17.46	17.56	18.50	20.22	18.92	23.95	28.39	27.16	24.82	21.54	19.48	
12	(17.88)	(17.38)	(17.46)	(18.52)	(19.52)	(18.82)	(23.31)	(27.71)	(27.32)	(25.46)	(21.47)	(19.63)	
13	17.80	17.55	17.63	18.37	20.48	19.24	24.31	28.56	26.93	25.03	21.57	19.42	
14	17.78	17.60	17.64	18.28	20.71	19.67	24.58	28.58	26.73	25.34	21.81	19.37	
15	17.76	17.57	17.61	18.25	20.83	20.35	24.79	28.47	26.48	25.47	21.91	19.31	
16	17.72	17.53	17.60	18.53	20.79	20.97	24.93	28.27	26.23	25.54	22.53	19.26	
17	17.71	17.50	17.65	18.84	20.61	21.53	25.00	27.94	26.18	25.53	23.22	19.22	
18	(17.75)	(17.55)	(17.63)	(18.45)	(20.68)	(20.35)	(24.72)	(28.36)	(26.51)	(25.38)	(22.21)	(19.32)	
19	17.68	17.44	17.75	19.09	20.42	21.71	25.01	27.39	26.13	25.45	23.54	19.18	
20	17.66	17.39	17.89	19.31	20.19	21.63	24.97	27.12	26.25	25.27	23.64	19.13	
21	17.63	17.33	17.83	19.58	19.99	21.46	24.85	26.67	26.41	24.96	23.62	19.08	
22	17.61	17.30	17.74	19.82	19.79	21.11	24.03	26.21	26.63	24.67	23.51	19.04	
23	17.60	17.27	17.64	20.02	19.42	20.86	24.37	26.00	26.30	24.54	23.26	19.00	
24	(17.64)	(17.35)	(17.77)	(19.56)	(19.96)	(21.35)	(24.65)	(26.68)	(26.34)	(24.98)	(23.51)	(19.09)	
25	17.60	17.23	17.57	20.20	19.47	20.78	24.11	25.68	26.39	24.50	22.85	18.96	
26	17.61	17.19	17.65	20.32	19.39	21.00	23.91	25.41	26.97	24.36	22.40	18.92	
27	17.62	17.17	17.95	20.42	19.32	21.37	23.77	25.20	27.07	24.43	21.96	18.89	
28	17.59	17.16	18.25	20.57	19.26	21.80	23.70	24.98	27.24	24.63	21.57	18.85	
29	17.55	17.13	18.38	20.63	19.22	22.15	23.70	24.74	27.31	24.82	21.24	18.82	
30	(17.59)	(17.18)	(17.96)	(20.43)	(19.33)	(21.42)	(23.84)	(25.20)	(27.00)	(24.55)	(22.00)	(18.89)	
31	17.52	17.12	18.44	20.54	19.18	22.37	23.77	24.55	27.38	24.85	20.97	18.78	
27	17.50	17.11	18.51	20.34	19.14	22.47	24.50	24.50	27.44	24.73	20.76	18.76	
28	17.47	17.09	18.65	20.00	19.14	22.50	24.59	24.55	27.44	24.47	20.60	18.75	
29	17.45	17.09	18.89	19.80	19.24	22.47	25.16	24.80	27.46	24.18	20.46	18.73	
30	17.43	17.03	19.30	19.54	19.28	22.38	25.55	25.08	27.59	23.82	20.33	18.72	
31	17.42	17.03	19.58	19.24	19.24	25.18	25.35	23.48	23.48	23.48	18.70	18.70	
(17.47)	(17.11)	(18.89)	(20.04)	(19.20)	(22.44)	(24.79)	(24.81)	(27.46)	(24.25)	(20.62)	(18.74)		
TOTAL	548.71	485.70	553.77	581.04	608.28	617.13	743.91	820.19	804.49	782.75	661.68	597.04	7804.69
AVE.	17.70	17.35	17.86	19.37	19.62	20.57	24.00	26.46	26.82	25.25	22.06	19.26	21.38

YEAR; 1983 28.58 24.54 20.20 18.51 17.27 17.09 21.38 7804.69

Source: MHD

Appendix Table 6.4.2 YEARLY EXTREME WATER LEVELS PROME STATION, 1868- , MHD

NO	(R)	1/T	NO	(R)	1/T
1 1948	103.1	.010	51 1951	93.0	.526
2 1974	99.2	.021	52 1961	92.8	.536
3 1877	98.7	.031	53 1978	92.7	.546
4 1880	98.6	.041	54 1962	92.6	.557
5 1966	97.2	.052	55 1982	92.6	.567
6 1952	97.2	.062	56 1937	92.5	.577
7 1947	97.2	.072	57 1933	92.3	.588
8 1976	97.0	.082	58 1892	92.2	.598
9 1939	97.0	.093	59 1888	92.1	.608
10 1971	96.9	.103	60 1969	92.0	.619
11 1890	96.9	.113	61 1903	92.0	.629
12 1973	96.8	.124	62 1932	91.9	.639
13 1875	96.6	.134	63 1975	91.8	.649
14 1955	96.4	.144	64 1934	91.8	.660
15 1886	96.0	.155	65 1972	91.6	.670
16 1968	95.8	.165	66 1900	91.6	.680
17 1953	95.6	.175	67 1884	91.5	.691
18 1970	95.5	.186	68 1922	91.5	.701
19 1958	95.4	.196	69 1925	91.3	.711
20 1905	95.3	.206	70 1921	91.3	.722
21 1954	95.0	.216	71 1914	91.1	.732
22 1883	94.6	.227	72 1964	91.0	.742
23 1928	94.6	.237	73 1917	91.0	.753
24 1956	94.5	.247	74 1912	90.9	.763
25 1936	94.5	.258	75 1960	90.8	.773
26 1926	94.5	.268	76 1946	90.8	.784
27 1893	94.4	.278	77 1904	90.4	.794
28 1911	94.3	.289	78 1902	90.4	.804
29 1935	94.3	.299	79 1897	90.4	.814
30 1959	94.2	.309	80 1885	90.4	.825
31 1957	94.2	.320	81 1895	90.3	.835
32 1927	94.1	.330	82 1882	90.1	.845
33 1915	94.1	.340	83 1913	90.1	.856
34 1899	94.1	.351	84 1930	90.0	.866
35 1931	94.0	.361	85 1981	89.7	.876
36 1979	93.8	.371	86 1896	89.3	.887
37 1963	93.7	.381	87 1916	89.1	.897
38 1906	93.7	.392	88 1919	89.0	.907
39 1889	93.6	.402	89 1967	88.9	.918
40 1983	93.5	.412	90 1929	88.9	.928
41 1938	93.5	.423	91 1901	88.8	.938
42 1923	93.5	.433	92 1887	88.7	.948
43 1910	93.5	.443	93 1891	88.1	.959
44 1909	93.5	.454	94 1907	88.0	.969
45 1894	93.4	.464	95 1920	87.5	.979
46 1980	93.4	.474	96 1908	85.8	.990
47 1868	93.3	.485			
48 1918	93.2	.495			
49 1924	93.1	.505			
50 1965	93.0	.515			

$$\text{LOG}(X) = .014U + 1.968$$

$$= .990$$

$$\text{LOG}(X+B) = 1.572 + .047*U$$

$$B = -55.56$$

T	U	A*U	LOG(X)	X	T	U	1/A*U	L(X+B)	X+B	X
200	2.580	.036	2.004	101.	200	1.820	.086	1.658	45.5	101.
100	2.330	.032	2.001	100.	100	1.650	.078	1.650	44.7	100.
80	2.240	.031	1.999	100.	80	1.580	.075	1.647	44.4	100.
70	2.200	.030	1.999	100.	70	1.550	.073	1.645	44.2	100.
50	2.050	.028	1.997	99.	50	1.450	.069	1.641	43.7	99.
40	1.960	.027	1.996	99.	40	1.390	.066	1.638	43.4	99.
30	1.830	.025	1.994	99.	30	1.300	.061	1.634	43.0	99.
20	1.640	.023	1.991	98.	20	1.160	.055	1.627	42.4	98.
10	1.280	.018	1.986	97.	10	.910	.043	1.616	41.2	97.
5	.840	.012	1.980	96.	5	.600	.028	1.601	39.9	95.
2	.000	.000	1.968	93.	2	.000	.000	1.572	37.3	93.

Appendix Table 6.4.3 STAGE-AREA RELATION

(A-R March/86)			
(H)	(A)	(R)	(B)
6.000	.000	.000	.000
7.000	96.667	.835	126.333
8.000	277.917	1.447	236.167
9.000	529.750	2.169	267.500
10.000	807.250	3.063	287.500
11.000	1111.400	3.925	320.800
12.000	1445.850	4.756	348.100
13.000	1817.600	5.536	395.400
14.000	2248.900	6.218	467.200
15.000	2752.000	6.804	539.000
16.000	3321.063	7.405	599.125
17.000	3944.250	8.021	647.250
18.000	4623.313	8.637	710.875
19.000	5437.000	9.087	916.500
20.000	6358.500	9.547	926.500
21.000	7288.383	10.158	933.267
22.000	8229.783	10.852	949.533
23.000	9181.367	11.602	953.633
24.000	10137.050	12.399	957.733
25.000	11096.830	13.228	961.833
26.000	12060.490	14.081	965.475
27.000	13027.780	14.952	969.117
28.000	13998.720	15.837	972.758
29.000	14973.300	16.733	976.400
30.000	15953.830	17.634	984.667
31.000	16951.630	18.523	1010.933
32.000	17963.950	19.407	1013.700
33.000	18982.780	20.297	1023.967
34.000	20018.260	21.176	1046.983
35.000	21076.750	22.038	1070.000

H: Stage
A: Area
R: Nydraulic Radius
B: River Width

(A-R September/86)			
(H)	(A)	(R)	(B)
5.000	.000	.000	.000
6.000	119.750	.879	146.500
7.000	288.000	1.724	190.000
8.000	526.250	2.397	286.500
9.000	824.750	3.135	310.500
10.000	1147.500	3.947	335.000
11.000	1506.250	4.731	382.500
12.000	1918.500	5.448	442.000
13.000	2396.250	6.100	513.500
14.000	2934.000	6.741	562.000
15.000	3523.750	7.388	617.500
16.000	4161.063	8.058	657.125
17.000	4835.000	8.755	690.750
18.000	5536.313	9.485	711.875
19.000	6286.250	10.187	788.000
20.000	7137.250	10.780	914.000
21.000	8059.633	11.370	930.767
22.000	8997.783	12.038	945.533
23.000	9945.450	12.767	949.800
24.000	10897.380	13.543	954.067
25.000	11853.580	14.352	958.333
26.000	12814.550	15.187	963.600
27.000	13780.780	16.040	968.867
28.000	14752.280	16.905	974.133
29.000	15729.050	17.781	979.400
30.000	16711.080	18.665	984.667
31.000	17708.880	19.541	1010.933
32.000	18721.200	20.414	1013.700
33.000	19740.030	21.292	1023.967
34.000	20775.510	22.161	1046.983
35.000	21834.000	23.012	1070.000

