APPENDIX 3. Reference Data of Construction Site

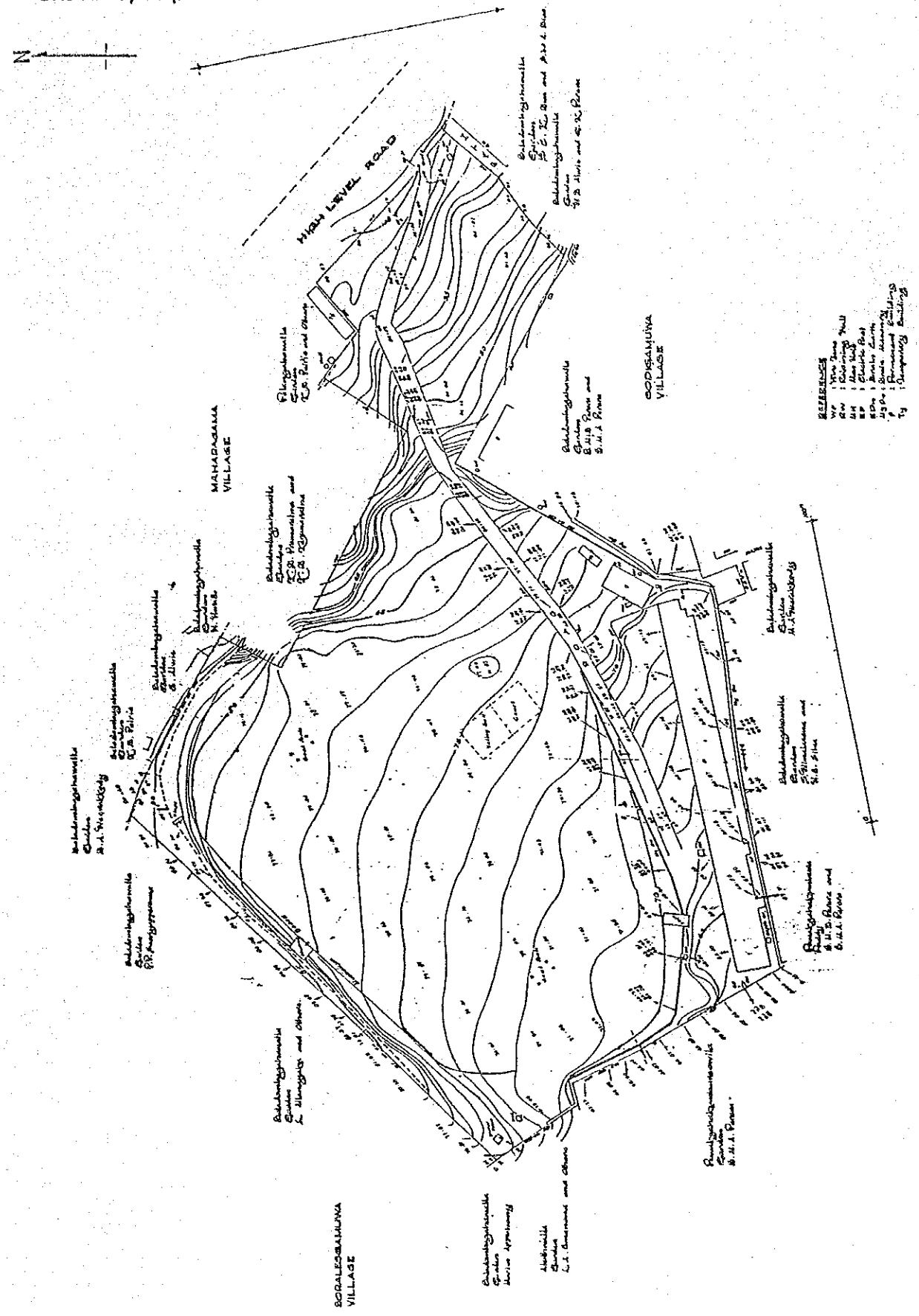
Site survey map

Development plan for Maharagama town prepared by U.D.A

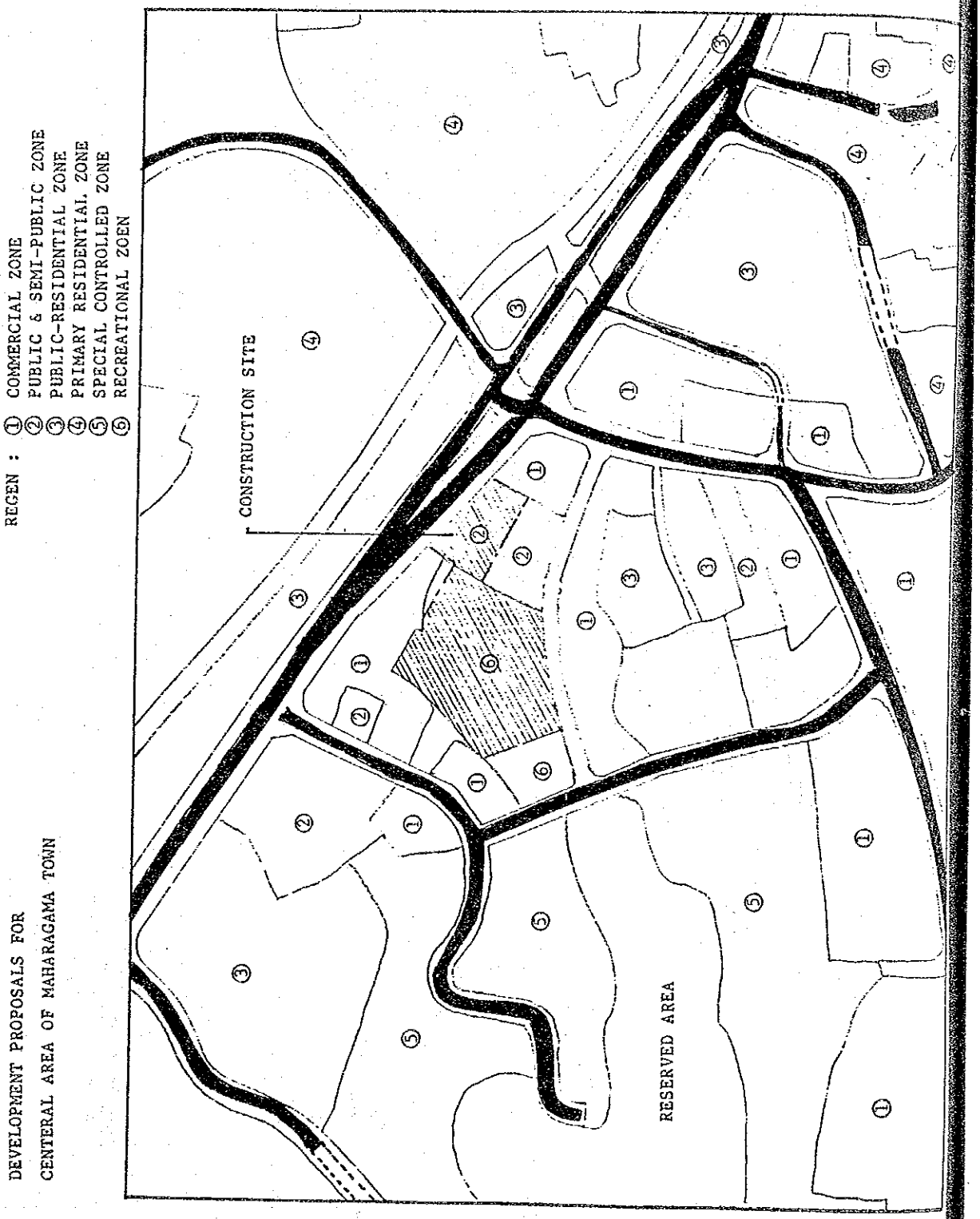
Photographs of the project site

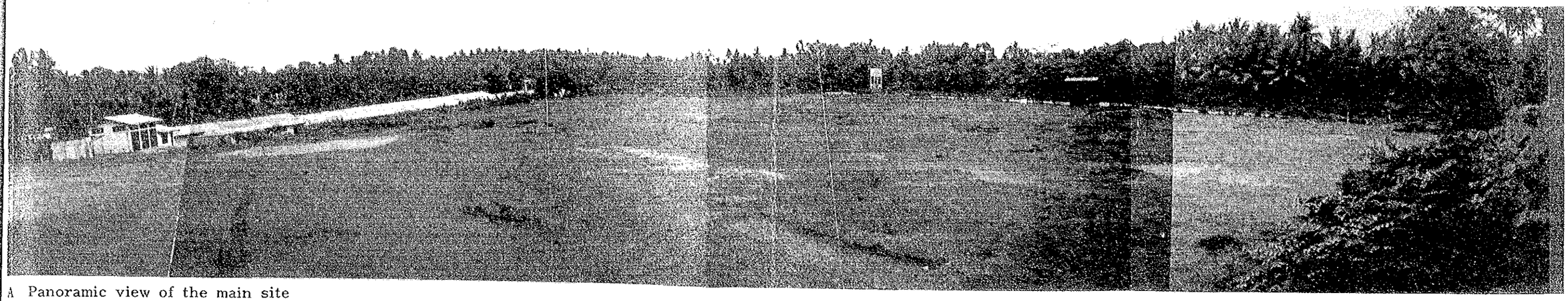
Boring records

Site survey map



Development plan for Maharagama town prepared by U.D.A

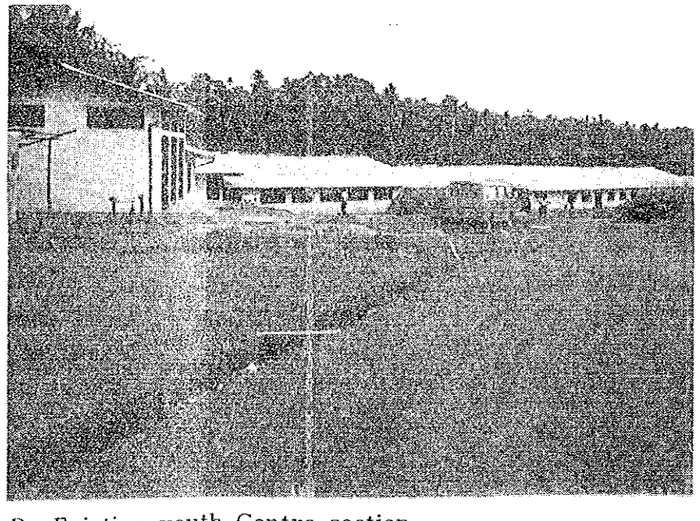




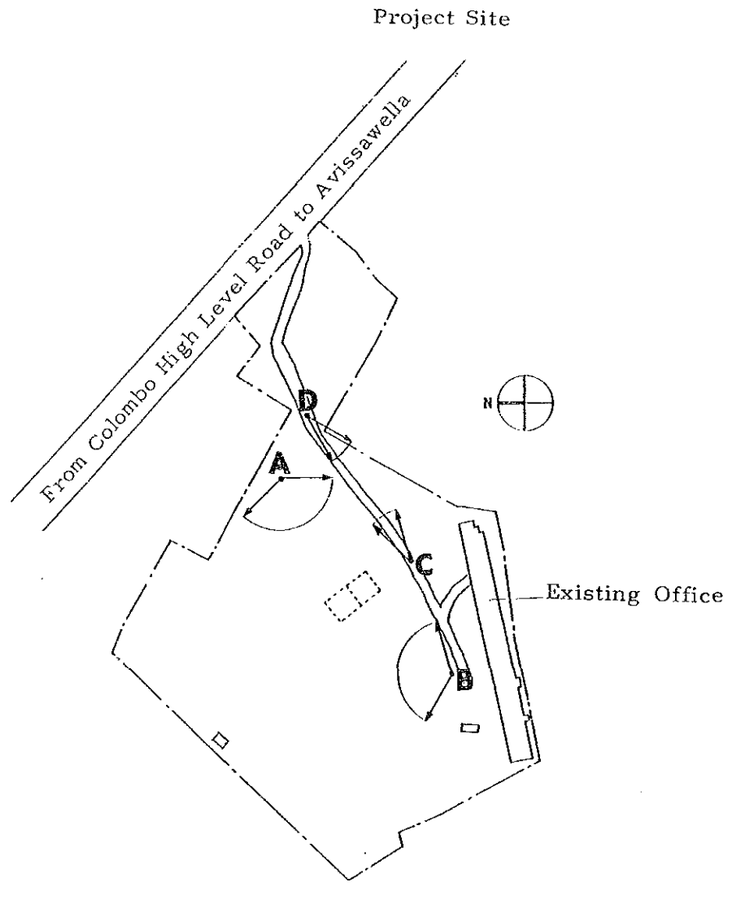
A Panoramic view of the main site

B Opposite direction view

C Narrow area near the entry



D Existing youth Centre section



Photographs of the project site

S O I L S I N V E S T I G A T I O N

FOR THE PROPOSED

NATIONAL YOUTH SERVICES COUNCIL

AT

MAHARAGAMA

FOR

NATIONAL YOUTH SERVICES COUNCIL

GEOTECH LIMITED

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SOIL INVESTIGATION PROGRAMME
FOR THE PROPOSED
NATIONAL YOUTH SERVICES COUNCIL
AT MAHARAGAMA
FOR
NATIONAL YOUTH SERVICES COUNCIL

INTRODUCTION

The National Youth Services Council by their letter of 8th July, 1985 under reference ET/CH/34/85/Vol.1 requested Geotech to undertake a programme of soil investigation at their Maharagama Site.

It is understood that the investigation is for the purpose of deciding on a foundation for a seven storey building to be built on the above site.

This report presents the results of the field work done on the site and the laboratory and provides a discussion of ground conditions in relation to foundation constructions.

REQUIREMENTS

It was required to drill six bore holes at the site and each bore hole was to be taken down to approximately 10 m depth below ground level. Standard penetration testing were to be done at 1.5 m. intervals and a ground water level observed. There was no requirements to instal peizometric stand pipes.

METHOD OF INVESTIGATION

The subsurface exploration was performed using the following methods :

75mm Casing rotary wash borings which accommodated a 52mm outside diameter thin walled tube sampler.

Diamond core drilling was to be done with the double tude NWG core barrel.

THE BORINGS

The bore hole locations are marked on the site of ground plans attached to this report. The bore hole locations were given by M/s Geotech Limited and set out by personnel of Group Engineering Laboratories.

FIELD WORK

A total of 6 boreholes were carried out and designated as boreholes 1 to 6. These were put down using 75mm Casings by rotary wash boring method. The position of the bore holes are as shown in the site plan attached.

Undisturbed open drive tube samples 52mm in diameter were recovered from cohesive materials together with representative bulk samples. Standard penetration tests (SPTs) were carried out in the made ground alluvial sand and clay.

The site work was carried out in August 1985.

THE BOREHOLE LOGS

The borehole locations mainly consist of the following information:

1) Number, location and elevation of hole.
2) Date
3) Number of blows for SPT 30cm penetration.
4) Depth of hole and depths at which soil/rock types changed.
5) Soil description.
6) Method of drilling.
7) Casing size and depth.
8) Ground water observations.
9) Sample type.
10) Results of field tests.

STANDARD PENETRATION TEST

In the normal standard penetration test, the 150mm seating drive is followed by a 300mm test drive and the N-value recorded on the borehole logs is the number of blows for the 300mm test drive. However, when attempting standard penetration tests in very dense materials or weathered bedrock, it may be necessary to terminate the test before completion to prevent damage to the equipment. In these circumstances, the results of the tests are presented on the borehole logs in the following manner:

a) Where the 150mm seating drive and part of the 300mm test drive is carried out, the number of blows for the partial test drive only is recorded on the borehole log thus $\frac{S}{(30)}$. An N-value may be obtained by linear extrapolation of the number of blows recorded for the partial test drive.

b) If the total penetration is equal to or less than the 150mm required for the seating drive, the number of blows for the actual depth penetrated is recorded on the borehole logs thus $\frac{5}{(50)}$. 'Initial penetration only'.

GROUND WATER

Static water level is indicated in each of the bore hole logs. No requirements were made to install peizometric stand pipes. Hence, the water level indicated are those obtained approximately 24 hours after the drilling operations are completed. There was no significant difference between the ground water level at first meeting in drilling and 24 hours after the completion of drilling.

LABORATORY TESTING

Laboratory testing were undertaken at the laboratories of Group Engineering Laboratories. The results of the testing presented eleswhere are summarized in the following paragraphs.

Particle Size Distribution

Ten samples from the 6 boreholes were analysied for particle size distribution and the distribution curves are attached.

Grading curves are typical to those encountered with the lateritic soils. These curves are very flat with variations in sand content silt content and clay content depending on the amount of weathering that has taken place. In certain samples the clay content is as much as 30%.

Index P-operties

Index Properties were determined on 10 samples. As expected most of the samples indicated a medium to high liquid limit but low plasticity. The highest plasticity index was in the region of 24%.

Triaxial Compression Tests

One sample was tested for triaxial Compression to determine their undrained shear strength parameters.

These samples represented soil in bore holes 1 at the depth of 8.5m. The N-value record at this depth was 7. The triaxial compression tests indicated that this soil had an undrained cohesion of 37 kN/m^2. The very soft layer in borehole 1 has an undrained cohesion of around 25 kN/m^2.

DISCUSSION ON GROUND CONDITIONS IN RELATION TO FOUNDATION DESIGN

An examination of the borehole logs and the laboratory tests results show that the soil at the site is a lateritic soil.

Ground water was encountered at a depth of around 2.5m below ground level.

The strata showed variation in the boreholes drilled from one side of the site to the other.

A survey of the N-values obtained in the boreholes are as given below.

	SOFT CLAYS			SANDY CLAYS		
	(1)	(2)	(3)	(4)	(5)	(6)
1.5	4	4	8	9	7	14
3	4	4	15	7	16	5
4.5	11	10	34	29	29	30
6	1	4	Rock	22	33	30
7.5	7	11		22	Rock	33
9	16	11		30		
10	23	10		26		

Borehole 1 + 2 passes through soft clays while bore holes 3 to 6 passes through harder clays with a considerable amount of sand and gravelly particles.

In bore hole 1 + 2 there is also an area of very soft clays at a depth of 6m below ground level having a thickness of approximately 1.5m

A sample of clay just below this layer having an N-value of 7 was tested in Triaxial compression and gave an undrained cohesion of 38 kN/m^2. The soft layer gave a value of undrained cohesion of 25.5 kN/m^2.

Using a safety factor of 3 the soils encountered in these two boreholes cannot be estimated to have a bearing capacity of any value more than 50 kN/m^2 or ($0.5T/_o'$).

It is understood that site at Maharagama is to be developed by constructing a seven storey block. It is also understood that the estimated column load is approximately 3000kN (300T).

For loading of this order of magnetude the use of shallow foundations of the pad type will not arise as the allowable bearing capacity in the region of borehole 1 + 2 will have to be reduced to 50 kN/m^2 ($0.5T/_o'$) and even in the area of boreholes 2,3,4,5,6 a bearing pressure of less than 130 kN/m^2 ($1.3T/_o'$) will have to be used.

Pad footings will become too big and uneconomical at these bearing pressures.

Differential settlement will also result.

The choice is then between a raft foundation and piles.

Raft foundation

If a Raft Foundation is used complications will arise as there would be unequal settlement in the two areas (i.e. Area of borehole 1 + 2 and Area of boreholes 3,4,5,6).

For a bearing pressure of 100 kN/m^2 the estimated settlement in the area of borehole 1 + 2 would be around 180m.

Using Mr = 0.40 $m^2/_{MN}$ and a zone of influ of the load of 6m.

In the area of boreholes 3,4,5,6 this settlement would be less.

The raft foundation will have to be eliminiated due to excessive settlement and possible differential settlement.

Pile Foundation

A pile foundation could be the ideal solution to a seven storied building at this site specially because of the varing soil conditions at the site. It is seen that rock exists at 6m and 7.5m on the site.and some parts of the site consists of soft clay deposits. Going down in excess of 10m.Under these conditions a raft foundation is bound to give rise to differential settlement.

The piles could be designed as end bearing piles or friction piles. If they are to be end bearing piles the piles will have to be driven to a pre-determined set.

In this case however end bearing piles driven to rock could be used as the rock levels vary from 6m upwards.

Assuming that the rock is competent the allowable load on a bored pile of different diameter would be as given below.

Diameter mm	Allowable Load Tonnes
750	200
825	240
900	280

It would be advisable to establish the nature of the tock by rotary core drilling prior to finalising the pile design.

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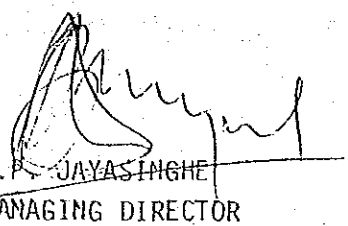


A.P. JAYASINGHE
MANAGING DIRECTOR

-/mpp.
11th September, 1985.

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 1
SHEET 1 OF 3

EQUIPMENT & METHODS: Water Flush Rotary Drill
75 mm casing

LOCATION NO: National Youth Services Council
Project – Kaharagama

CARRIED OUT FOR: M/s Geotech Ltd

GROUND LEVEL: 21.737 m.
REF. BASEMENT OF SECURITY HUT

COORDINATES

DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS: SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Gravelly sandy clay of lateritic origin. Yellowish brown in colour.				B	1	–	
				WS	2	–	
	20.737		1				
				D	3	S N = 4	1 1 3
			(3.30)				
	19.737		2				
				WS	4	–	Ground water
				D	5	S N = 4	3 2 2
	18.737		3				
Soft highly organic sandy, silty clay blackish grey in colour.			(0.70)	WS	6	–	
	17.737		4				
Clayey, sandy silt. Brown mottled with yellow and white.				D	7	S N = 11	5 5 6
			(2.00)				
	16.737		5				
				WS	8		

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

UNITS : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed SAmple
Piston (P) Tube (U) or core sample length co scale
S Standard Penetration Test

W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY

SCALE

FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 1
SHEET 2 OF 3

EQUIPMENT & METHODS

LOCATION NO:

CARRIED OUT FOR:

GROUND LEVEL | COORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS: SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Same as above							
	15·737		6	6.00 – 6.45 D	9	S	1-45 cm
Very soft clay with a small percentage of coarse to fine sand. Yellowish mottled white and brown.			(1.50)				
				WS	10	–	
	14·737		7				
				7.50 – 7.95 D	11	S N= 7	3 3 4
Moderately stiff clay with a small percentage of sand. Yellow mottled with white, pink and brown.	13·737		8				
				8.25 – 8.75 U	12	–	
			(4.00)				
	12·737		9	9.00 – 9.45 D	13	S N=16	5 6 10
	11·737		10	D	14	S N=23	7 11 12

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

DEPTHS : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed SAmple
Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test

W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY

SCALE

FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 1
SHEET 3 OF 3

EQUIPMENT & METHODS

LOCATION NO:

CARRIED OUT FOR:

GROUND LEVEL | COORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS: SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Same as above	10·737		11	11.00 –11.45 D	15	S N =12	4 4 8
Stiff silty clay with a small percentage of gravel particles. Brown in colour.	9·737		(1.00) 12	12.00 –12.45 D	16	S N =40	12' 16 24
Soft gravelly clay. Greenish brown mottled with reddish brown and white.	8·737		13	13.00 –13.45 D	17	S N =14	6 6 8
	7·737		14	14.00 –14.45 D	18	S N =11	8 5 6
Borehole terminated at 14.45 m depth.	7·287		15				

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

DEPTHS : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

Water level observations during

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed SAmple
Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test

W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY

SCALE

FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 2
SHEET 1 OF 2

EQUIPMENT & METHODS: Water Flush Rotary Drill
75 mm casing

LOCATION NO: National Youth Services Council
Project - Makaragama

CARRIED OUT FOR: M/s Geotech Ltd

GROUND LEVEL: 21·850 m.
REF. BASEMENT OF SECURITY HUT

COORDINATES

DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS	SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Gravelly, sandy clay of lateritic origin. Brown in colour.					B	1	-	
					WS	2	-	
	20·852		1					
			(3.50)	1.50 - 1.95	D	3	S N=4	2 2 2
								Ground water
	19·850		2					
					WS	4	-	
	18·850		3	3.00 - 3.45	D	5	S Bad	3 2 2
Silty, coarse to fine sand with a trace of clay. Grey mottled with brown.					WS	6	-	
	17·850		4					
			(3.00)	4.50 - 4.95	D	7	S No:0	3 5 5
	16·850		5					
					WS	8	-	

SPT : where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

DEPTHS : all depths and reduced levels in metres. Thicknesses given in brackets in depth column.

WATER : water level observations during boring are given as water level.

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
U S Undisturbed Sample
Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test
V Vane Test

W Water Sample
C Core Recovery (%)
R Rock Quality Designation (RQD %)

LOGGED BY

SCALE

FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 2
SHEET 2 OF 2

EQUIPMENT & METHODS

LOCATION NO:

CARRIED OUT FOR:

GROUND LEVEL | COORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS				FIELD RECORDS
					SAMPLE TYPE	SAMPLE NO	TEST	
Same as above	15·850		6	6.00–6.45	D	9	S N= 4	2 2 2
Same as above, with a considerable percentage of fine gravel.	14·850		7		WS	10	-	
			(2.00)	7.50 – 7.95	D	11	N=11	5 5 6
	13·850		8		WS	12	-	
Clayey silty coarse to fine sand with occassional fine gravel. Yellow mottled with white.	12·850		9	9.00 – 9.45	D	13	S N=11	4 5 6
			(1.95)					
	11·850		10	10.00 –10.45	D	14	S N=16	5 7 9
	11·400							
Borehole terminated at 10.45 m depth								

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

NOTES : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

W : Water level observations during [illegible]

SAMPLE/TEST KEY

D Disturbed Sample
B Bulk Sample
W S Washed Sample
Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test
V [illegible] Test
W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY

SCALE

FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 3
SHEET 1 OF 2

EQUIPMENT & METHODS: Water Flush Rotary Drill
75 mm casing

LOCATION NO: National Youth Services Council
Project - Kaharagama

CARRIED OUT FOR: M/s Geotech Ltd

GROUND LEVEL: 22·808 m
REF. BASEMENT OF SECURITY HUT.

COORDINATES

DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS: SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Gravelly sandy silty clay of lateritic origin. Reddish brown in colour. Reddish brown mottled with yellowish grey when go deeper.	22·808			B	1	–	
				WS	2	–	
	21·808		1				
				D	3	S N=8	4 6 2
			(4.00)				
	20·808		2				
				WS	4	–	Ground water
				D	5	S N=15	10 7 8
	19·808		3				
				WS	6	–	
Hard silty clay with a considerable percentage of sand and gravel. Reddish brown mottled with yellowish brown.	18·808		4				
			(1.75)	D	7	S N=34	12 16 18
	17·808		5				
				WS	8	–	

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given ('N'-value).

NOTES : [illegible] and reduced levels in metres. Thicknesses given in brackets in depth column. [illegible] encountered during [illegible]

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed Sample
P Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test
W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY
SCALE
FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 3
SHEET 2 OF 2

EQUIPMENT & METHODS

LOCATION NO:

CARRIED OUT FOR:

GROUND LEVEL | COORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS	SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Same as above								
Borehole terminated at 6.35 m depth.	16.808		6 (0.60)	6.00 - 6.35	D	9	S	25 50 - 10cm
	15.458							

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

DEPTHS : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

[illegible] observations during

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed SAmple
Piston (P) Tube (U) or core sample length to scale
Standard Penetration Test

W Water Sample
C Core Recovery (%)
r Rock Quality Designation (SUM %)

LOGGED BY

SCALE

FIG:

GROUP ENGINEERING LABOROTORIES LTD.

BOREHOLE NO. 4
SHEET 1 OF 3

EQUIPMENT & METHODS Water Flush Rotary Drill

LOCATION No. National Youth Services Council
Project - Maharagama

CARRIED OUT FOR :

GROUND LEVEL 24·720 m
REF BASEMENT OF SECURITY HUT

CO-ORDINATES

DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS				FIELD RECORDS
					SAMPLE TYPE	SAMPLE NO	TEST	
Gravelly silty clay. Reddish brown mottled with yellow.					B	1	-	
					WS	2	-	
	23·720		1					
			(2.50)	1.50 - 1.95	D	3	S N=9	7 4 5
	22·720		2					
					WS	4	-	
Silty clay with a small percentage of sand. Reddish brown mottled with yellowish brown.				3.00 - 3.45	D	5	S N=7	6 4 3
	21·720		3					Ground water
			(1.50)					
					WS	6	-	
	20·720		4					
Very stiff clay with a small percentage of sand particles. Yellow mottled with white.				4.50 - 4.95	D	7	S N=29	12 13 16
	19·720		5					
					WS	8	-	

Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).
All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W Water Sample
Piston (P) Tube (T) and sample Length in cms
S Standard Penetration Test
Core Size

C Core recovery (%)
R Rock Quality Designation (RQD-%)

LOGGED BY
SCALE
FIG.

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO. 4
SHEET 2 OF 3

EQUIPMENT & METHODS

LOCATION NO.

CARRIED OUT FOR :

GROUND LEVEL | CO-ORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS: SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Same as above	18.720		6	6.00 – 6.45 D	9	S N=22	6 11 11
				WS	10	–	
			(4.50)				
	17.720		7				
				7.50 – 7.95 D	11	S N=30	13 14 16
	16.720		8				
				WS	12	–	
Stiff silty clay with a small percentage of sand particles. Mica present. Yellowish brown mottled with white and greenish brown.	15.720		9	9.00 – 9.45 D	13	S N=26	8 11 15
			(3.00)	WS	14	–	
	14.720		10				
				10.50 – 10.95 D	15	S N=34	

Where full 0.3m penetration was not been achieved, the number of blows for the quoted penetration is given (not N-value).
All depths and reduced levels in metres. Thicknesses given in brackets in depth column.
[illegible] observations by [illegible]

SAMPLE/TEST KEY
C Disturbed Sample
B Bulk Sample
W Water Sample
Piston (P) Tubeliner core sample Length to scale
S Standard Penetration Test
V Vane Test

C Core recovery (%)
R Rock Quality Designation (RQD-%)

LOGGED BY

SCALE

FIG

GROUP ENGINEERING LABOROTORIES LTD.

BOREHOLE NO. 4
SHEET 3 OF 3

EQUIPMENT & METHODS

LOCATION NO

CARRIED OUT FOR :

GROUND LEVEL CO-ORDINATES DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS			FIELD RECORDS
				SAMPLE TYPE	SAMPLE NO	TEST	
Same as above	13·720		11	WS	16	–	
Clayey silty fine sand. Brownish grey in colour.	12·720		12	D	17	S N=25	10 11 14
	12·270						
Borehole terminated at 12.45 m depth			13				

Where full 3.3m penetration has not been achieved, the number of blows for the quoted penetration is given (eg 9/225mm).
All depths and reduced levels in metres. Thicknesses given in brackets to depth colum[illegible]

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W Water Sample
Piston (P) Tube(U)or core sample Length to scale
S Standard Penetration Test
[illegible] Test

C Core recovery (%)
r Rock Quality Designation (RQD-%)

LOGGED BY

SCALE

FIG.

GROUP ENGINEERING LABOROTORIES LTD.

BOREHOLE NO. 5
SHEET 1 OF 2

EQUIPMENT & METHODS Water Flush Rotary Drill
75 mm casing

LOCATION NO. National Youth Services Council
Project - Maharagama

CARRIED OUT FOR : M/s Geotech Ltd

GROUND LEVEL 23·866 m.
CO-ORDINATES
DATE
REF. BASEMENT OF SECURITY HUT

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS	SAMPLE TYPE	SAMPLE NO.	TEST	FIELD RECORDS
Gravelly, sandy, soft clay of lateritic origin. Reddish brown mottled with yellow.					B	1	-	
					WS	2	-	
	22·866		1					
			(2.50)	1.50 - 1.95	D	3	S N=7	3 3 4
	21·866		2					
					WS	4	-	▽ Ground water
Soft silty clay with medium to fine sand. Yellowish brown mottled yellow.	20·866		3	3.00 - 3.45	D	5	S N=16	5 5 11
			(2.25)					
					WS	6	-	
	19·866		4					
				4.50 - 4.95	D	7	S N=29	17 13 16
Sandy, soft clay with a small percentage of fine gravel particles of lateritic origin.	18·866		5		WS	8	-	

Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).
All depths and reduced levels in metres. Thicknesses given in brackets in depth column.
Water level observations [illegible]

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W Water Sample
P Piston (P) Tube(U) or core sample length to scale
S Standard Penetration Test
V Vane Test

C Core recovery (%)
r Rock Quality Designation (RQD-%)

LOGGED BY
SCALE
FIG.

GROUP ENGINEERING LABOROTORIES LTD.

BOREHOLE NO. 5
SHEET 2 OF 2

EQUIPMENT & METHODS

LOCATION NO.

CARRIED OUT FOR :

GROUND LEVEL | CO-ORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS	SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Same as above	17·866		-6 (2.00)	6.00 – 6.45	D	9	S N=33	4 10 23
					WS	10	-	
Silty, clayey coarse to fine sand with a considerable percentage of gravel size particles. Mica present. Dark brown mottled with yellowish brown and greenish brown. Completely weathered rock fabricks present.	16·866		-7					
				7.50 – 7.85	D	11	S	35 50 – 20cm.
	16·015							
Borehole terminated at 7.85 m depth.			-8					

Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).
All depths and reduced levels in metres. Thicknesses given in brackets in depth column.
Water level observations during boring

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W Water Sample
Piston (P) Tube/Undisturbed core sample Length to scale
S Standard Penetration Test
V Vane Test

C Core recovery (%)
r Rock Quality Designation (RQD-%)

LOGGED BY
SCALE
FIG.

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 6
SHEET 1 OF 2

EQUIPMENT & METHODS: Water Flush Rotary Drill
75 mm casing

LOCATION NO: National Youth Services Council
Project – Maharagama

CARRIED OUT FOR: M/s Geotech Ltd

GROUND LEVEL: 24.106 m
REF: BASEMENT OF SECURITY HUT

COORDINATES:

DATE:

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS: SAMPLE TYPE	SAMPLE NO	TEST	FIELD RECORDS
Gravelly, sandy clay of lateritic origin.			0	B	1	–	
			1	WS	2	–	
	23·106		1				
			(3.00)	D	3	S N=14	5 9 5
	22·106		2				
				WS	4	–	V Ground water
	21·105		3	D	5	S N=5	3 2 3
Clayey, silty, coarse to fine sand. Mica present. Dark Brown mottled with yellowish brown.				WS	6	–	
	20·106		4				
			(4.5)				
				D	7	S N=30	10 10 20
	19·106		5				
				WS	8	–	

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).
DEPTHS : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.
WATER : Water level observations during boring are given as water level.

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed SAmple
Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test
V Vane Test
W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY
SCALE
FIG:

GROUP ENGINEERING LABORATORIES LTD.

BOREHOLE NO: 6
SHEET 2 OF 2

EQUIPMENT & METHODS

LOCATION NO:

CARRIED OUT FOR:

GROUND LEVEL | COORDINATES | DATE

DESCRIPTION	REDUCED LEVEL	LEGEND	DEPTH & THICKNESS	SAMPLES/TESTS				FIELD RECORDS
					SAMPLE TYPE	SAMPLE NO	TEST	
Same as above	18·106		6	6.00 – 6.45	D	9	N=30	8 12 18
					WS	10	–	
	17·106		7					
							S	18
				7.50 – 7.95	D	11	N=33	15 18
Coarse to fine silty sand with fine gravel size particles. Dark brown in colour. Kica present. Completely weathered rock. Parent rock fabricks present.	16·106		8					
	15·406				WS	12	–	
Borehole terminated at 8.70 m depth			9					

SPT : Where full 0.3m penetration has not been achieved, the number of blows for the quoted penetration is given (not N-value).

DEPTHS : All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

WATER : Water level observations during boring are given as water level.

SAMPLE/TEST KEY
D Disturbed Sample
B Bulk Sample
W S Washed Sample
Piston (P) Tube (U) or core sample length to scale
S Standard Penetration Test
V Vane Test

W Water Sample
C Core Recovery (%)
r Rock Quality Designation (RQD %)

LOGGED BY

SCALE

FILE

Results of U.U. Triaxial Test

B.H. No: 1

Depth: 8.25m

Soil description : Soft sandy clay, yellow mottled with white.

Cell pressure (lbs/in^2):	10;	20;	40;
Deviator stress at failure (lbs/in^2)	12;	18;	25;
Failure strain %:	8;	19;	13;

C_u (lbs/in^2) = 5.5 (37 kN/m^2)

ϕ = 10^o

Av. Wet Density (lbs/ft^3) = 101

Dry Density (lbs/ft^3) = 66

Av.M.C. % = 53

RESULTS OF LABORATORY TESTS DONE FOR NATIONAL YOUTH SERVICES COUNCIL AT MAHARAGAMA

Results of the Tests for Index Properties

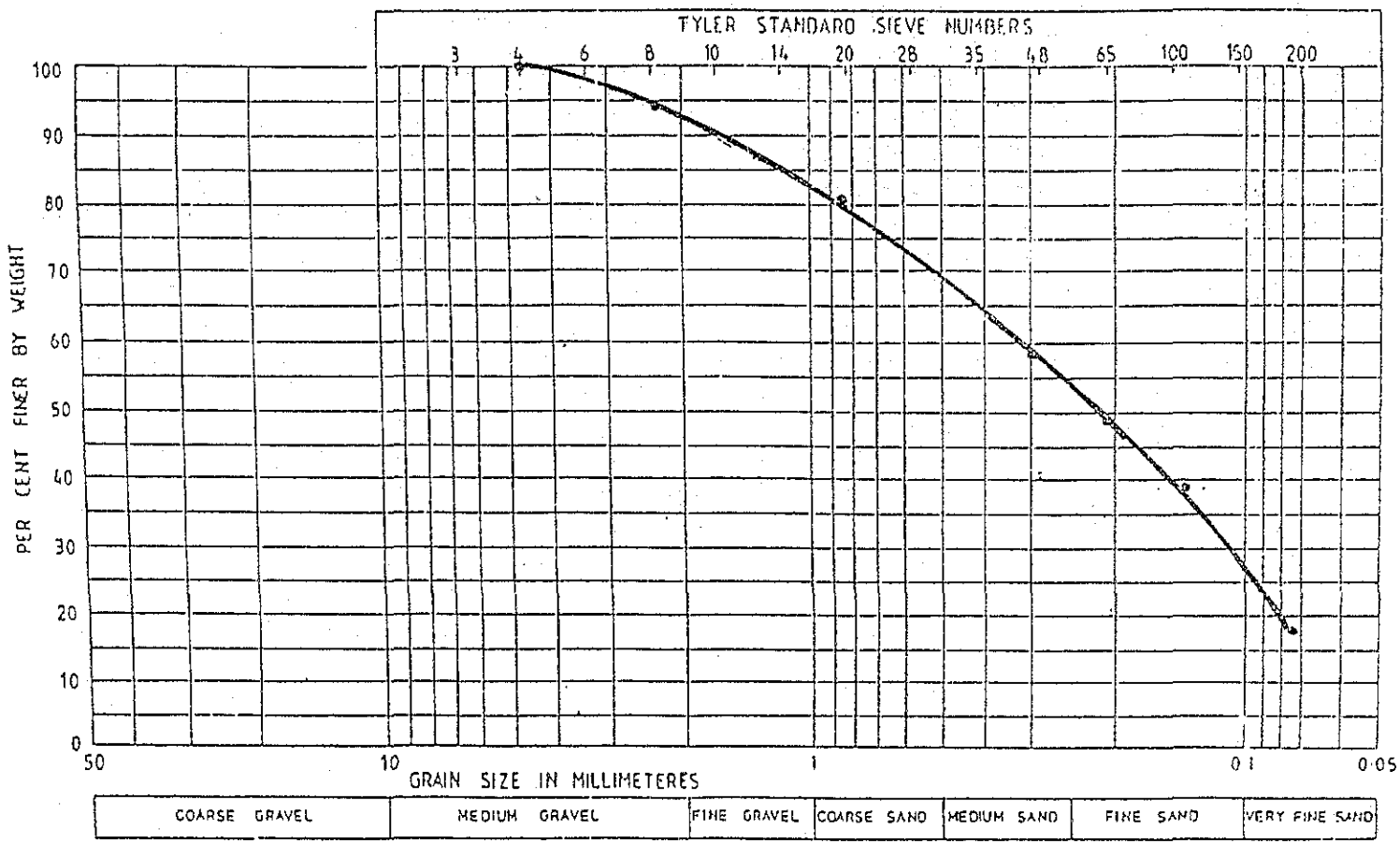
B.H. No.	Depth (m)	L.L. %	P.L. %	P.I. %
(1)	6.00	43	29	14
(1)	9.00	47	31	16
(3)	3.00	32	18	14
(3)	4.50	25	24	01
(4)	1.50	36	22	14
(4)	4.50	73	58	15
(4)	9.00	48	24	24
(4)	10.50	37	30	07
(5)	1.50	29	28	01
(6)	1.50	36	21	15

Results of Specific Gravity Tests

B.H. No.	Depth (m)	Specific Gravity
(1)	13.00	2.677
(1)	14.00	2.634
(2)	7.50	2.528
(2)	10.00	2.513
(3)	6.00	2.584
(4)	12.00	2.539
(5)	7.50	2.602
(5)	7.80	2.689
(6)	6.00	2.579
(6)	7.50	2.538

Results of Sieve Analysis

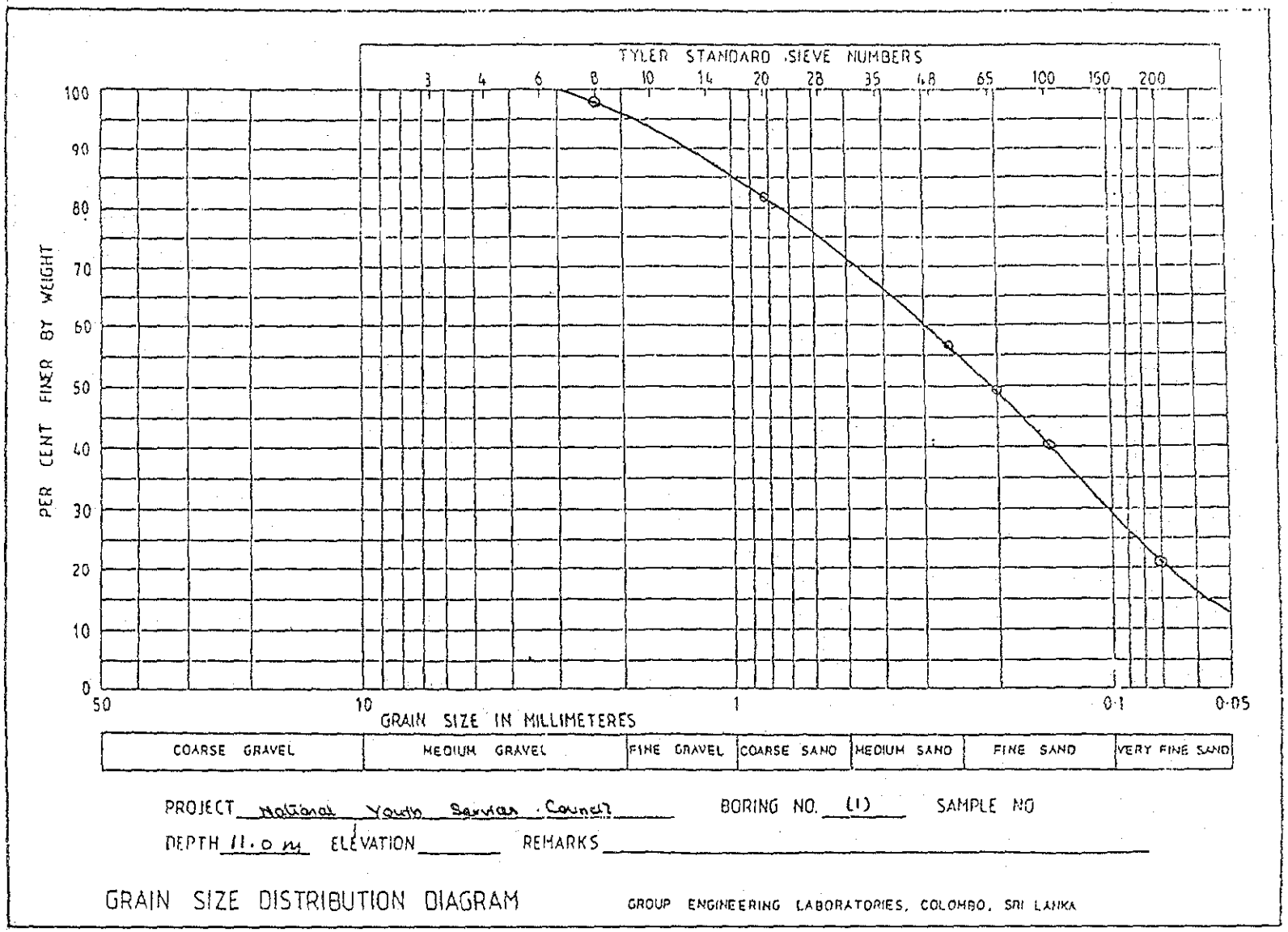
B.H. No.	Depth (m)	Remarks
(1)	4.50	Curve attached
(1)	11.00	Curve attached
(2)	4.50	Curve attached
(2)	7.50	Curve attached
(4)	1.50	Curve attached
(4)	3.00	Curve attached
(4)	12.00	Curve attached
(5)	7.50	Curve attached
(6)	4.50	Curve attached
(6)	6.00	Curve attached



PROJECT National Youth Services Council BORING NO. (1) SAMPLE NO. _____

DEPTH 4.50 m ELEVATION _____ REMARKS _____

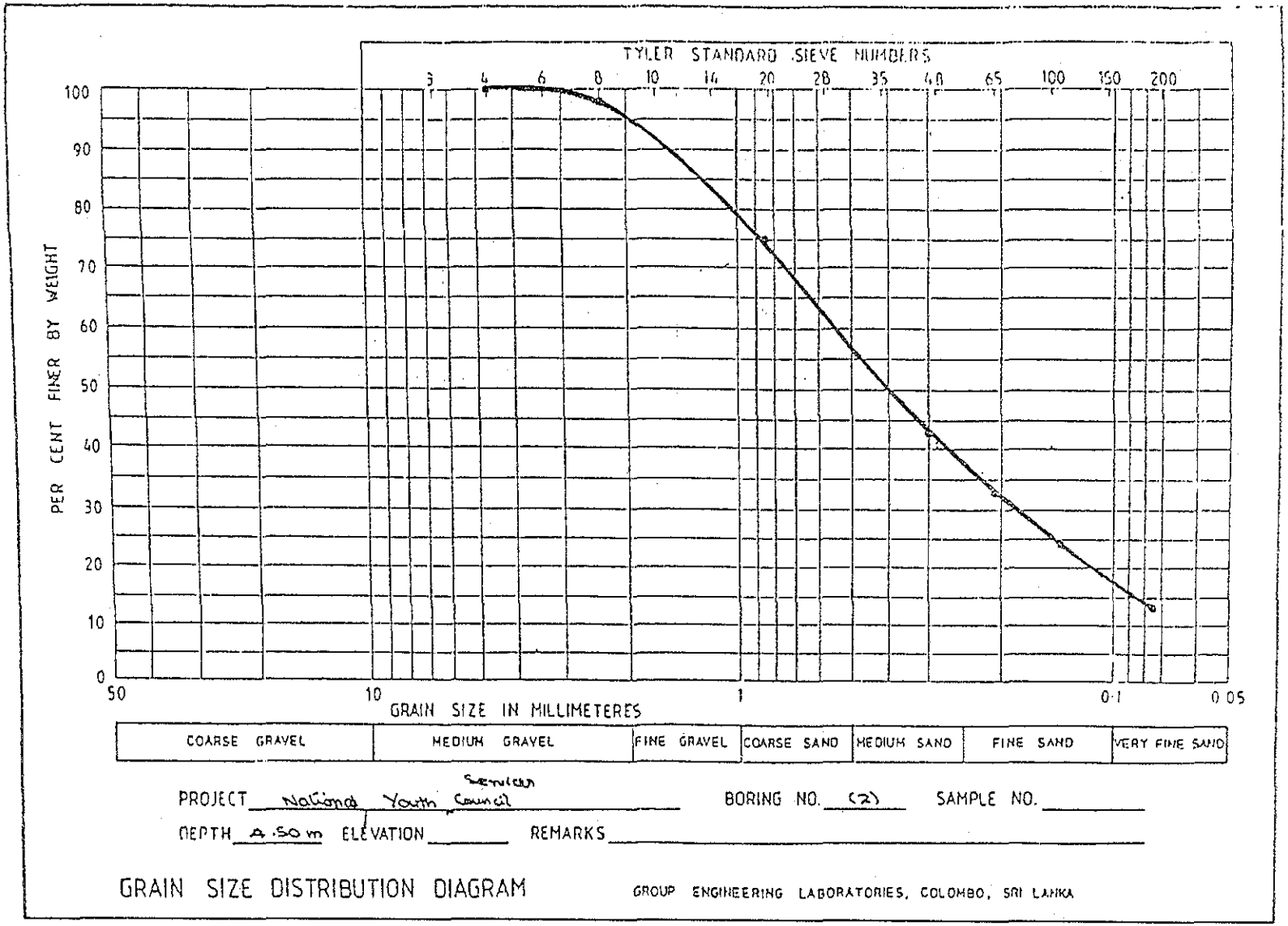
GRAIN SIZE DISTRIBUTION DIAGRAM GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA



PROJECT National Youth Services Council BORING NO. (1) SAMPLE NO

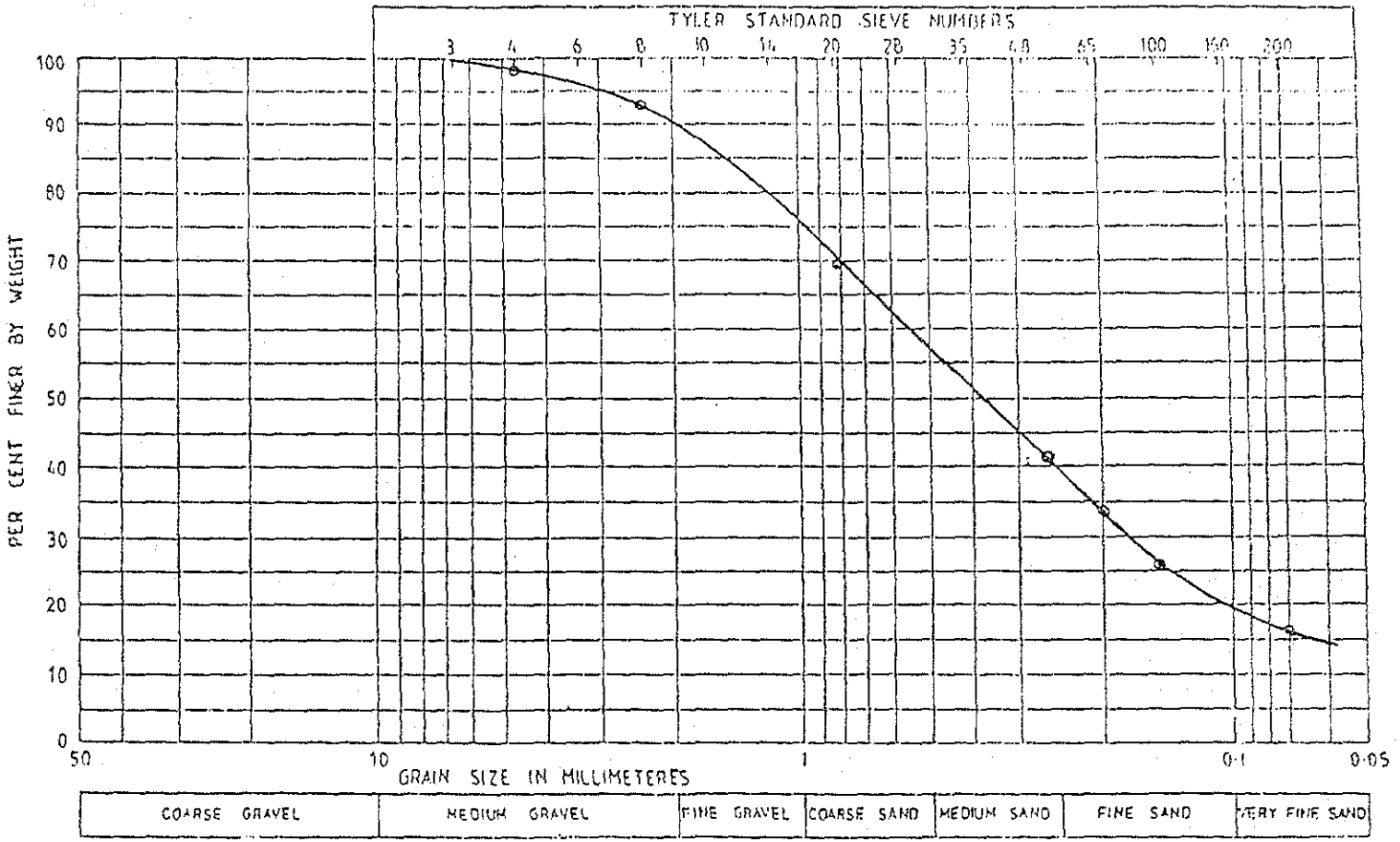
DEPTH 11.0 m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA



GRAIN SIZE DISTRIBUTION DIAGRAM

GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA

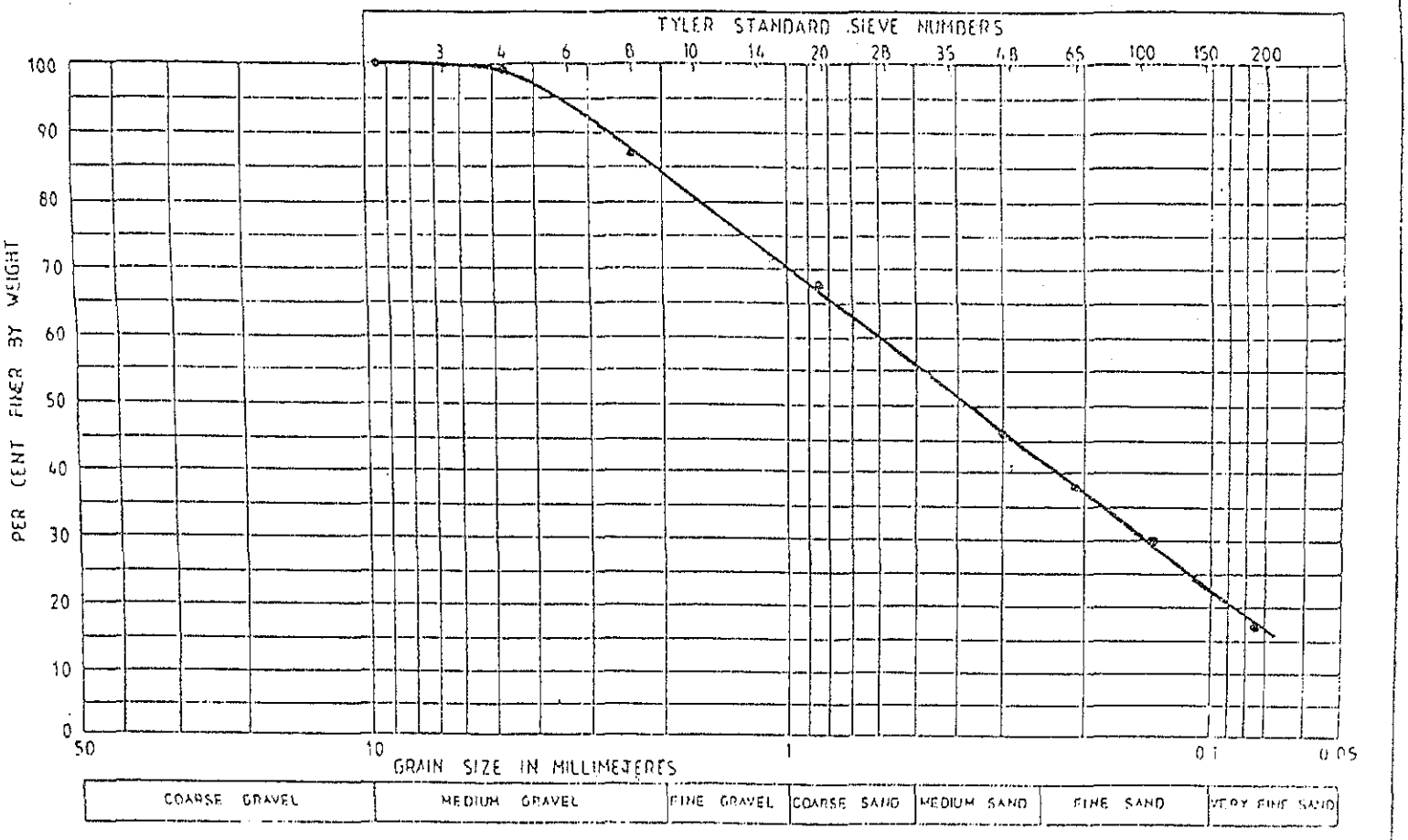


PROJECT National Youth Services Council BORING NO. (2) SAMPLE NO. ...

DEPTH 7·5 m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM

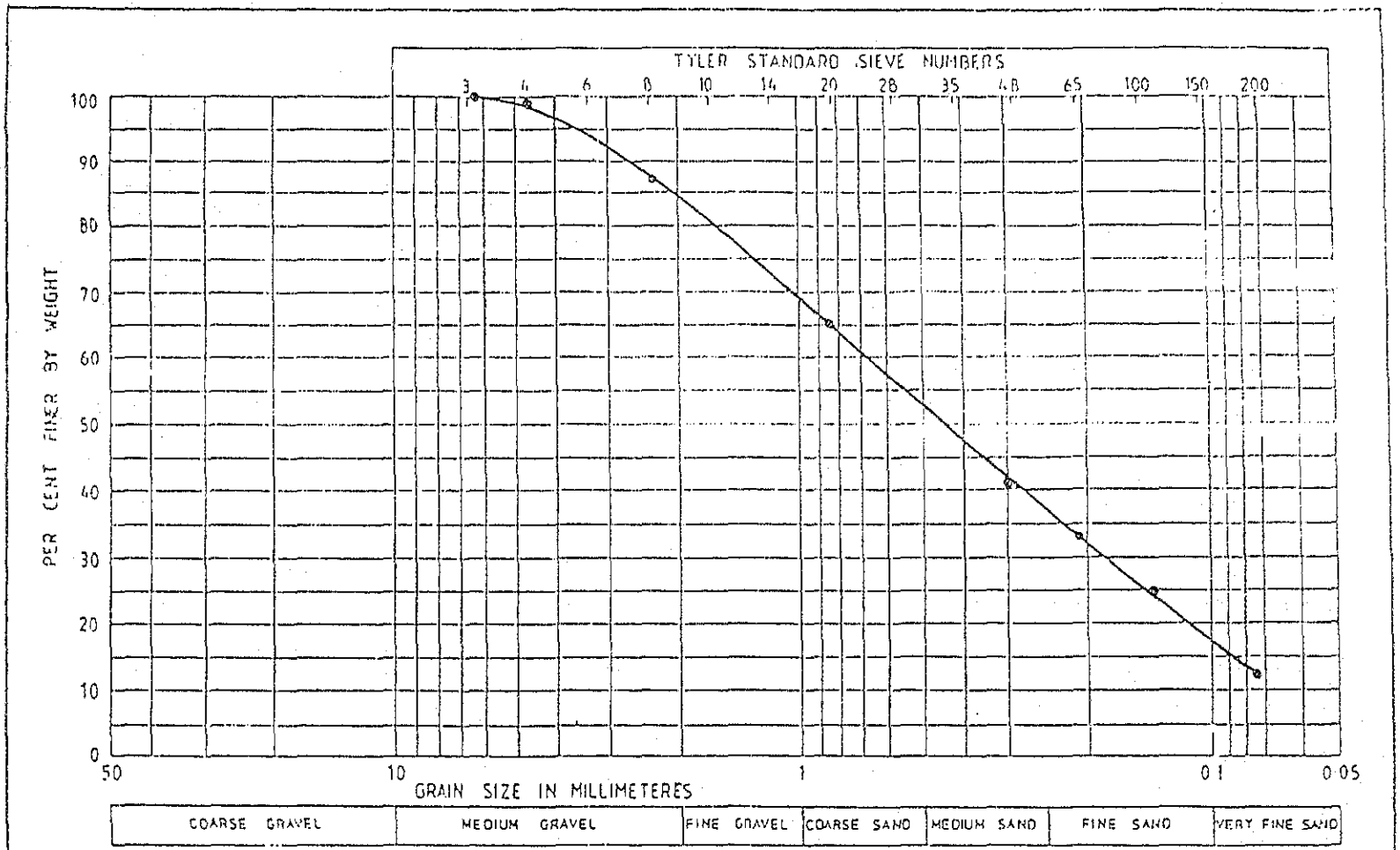
GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA



PROJECT Matara Youth Service Council BORING NO (A) SAMPLE NO. [illegible]

DEPTH 1.50 m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA

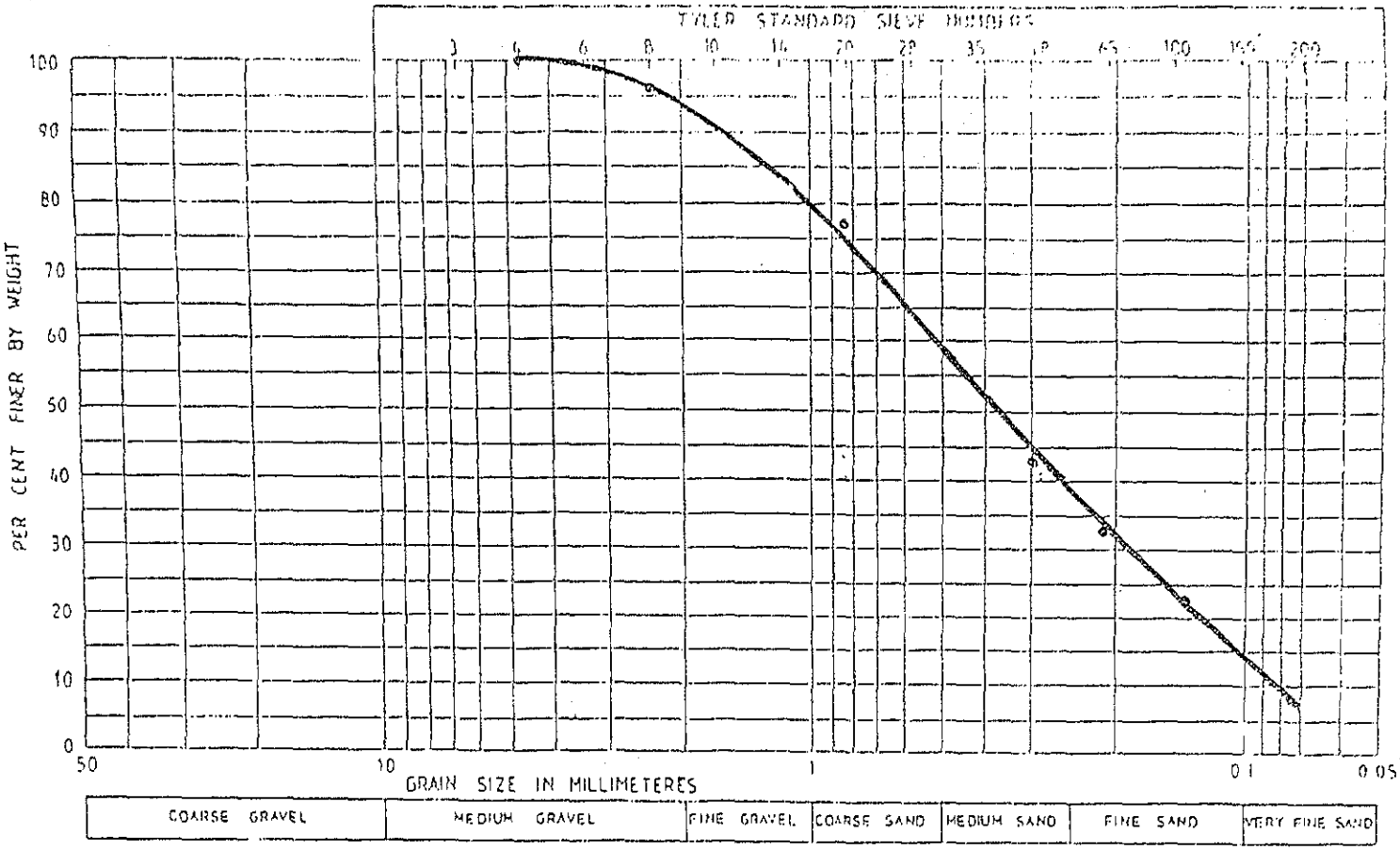


PROJECT National Youth BORING NO. (A) SAMPLE NO. _____

DEPTH 3.00m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM

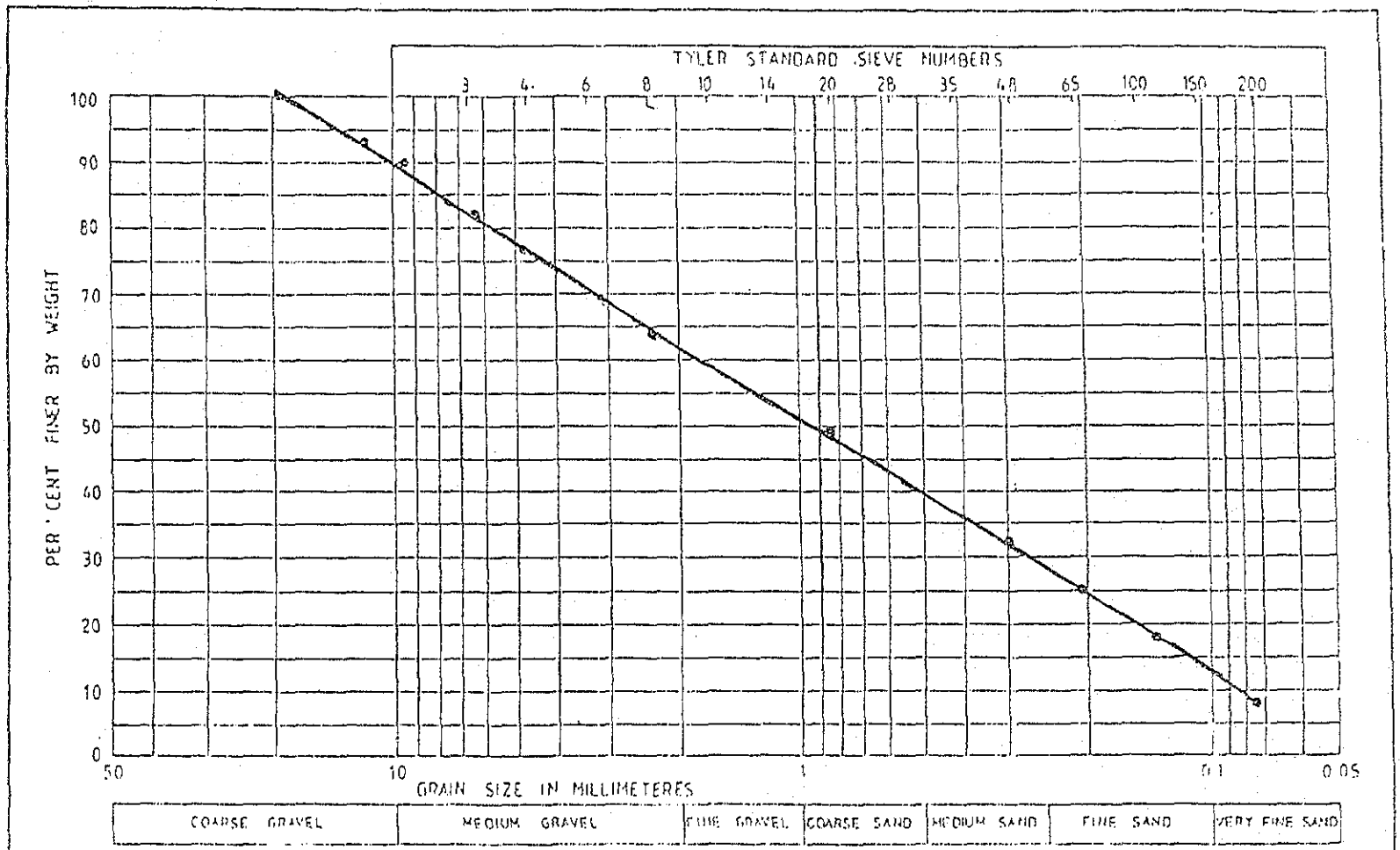
GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA



PROJECT National Youth Services Council BORING NO. (4) SAMPLE NO. _____

DEPTH 12.00 m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA

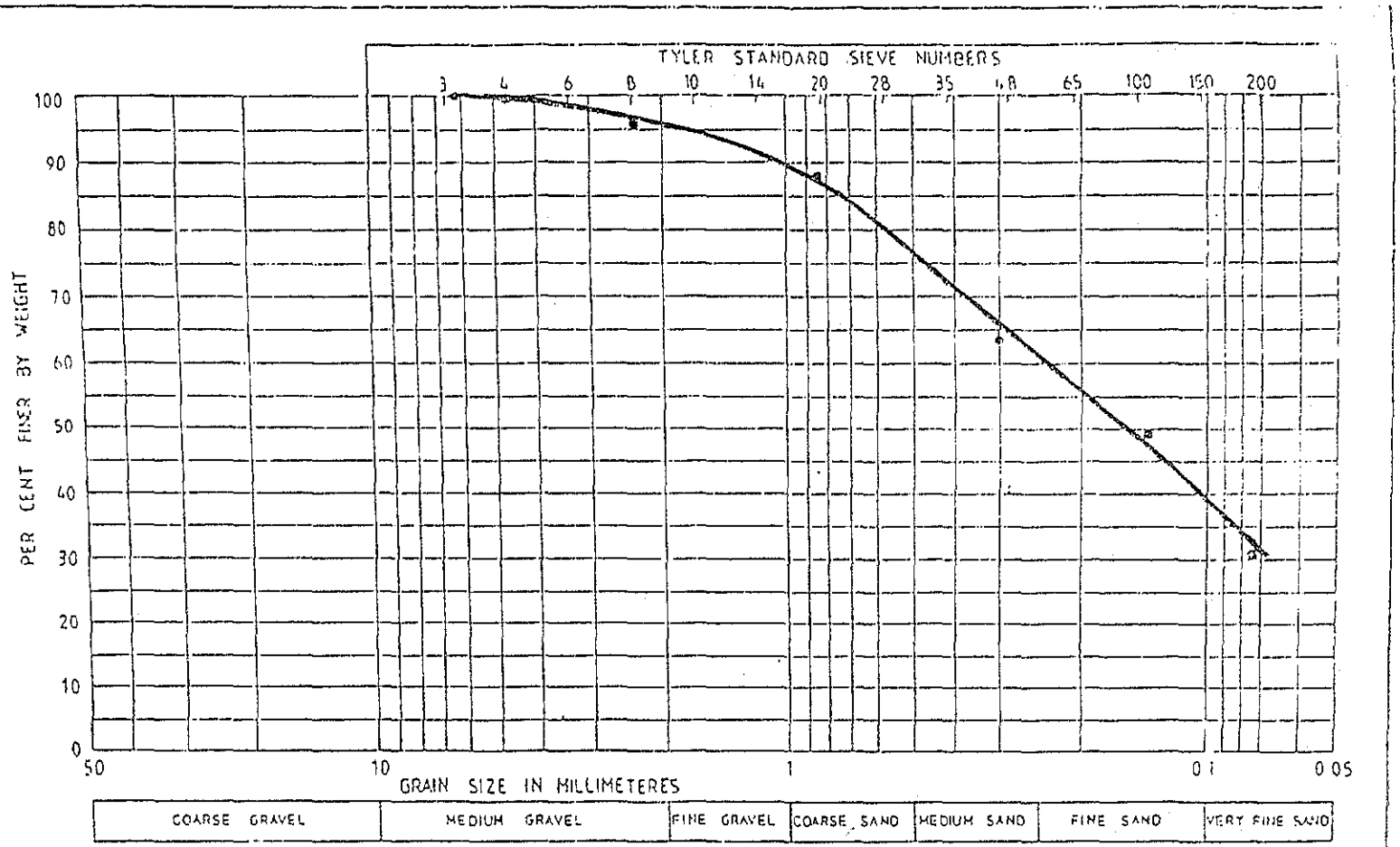


PROJECT National Youth Services Council BORING NO (5) SAMPLE NO

DEPTH 7.50 m ELEVATION REMARKS

GRAIN SIZE DISTRIBUTION DIAGRAM

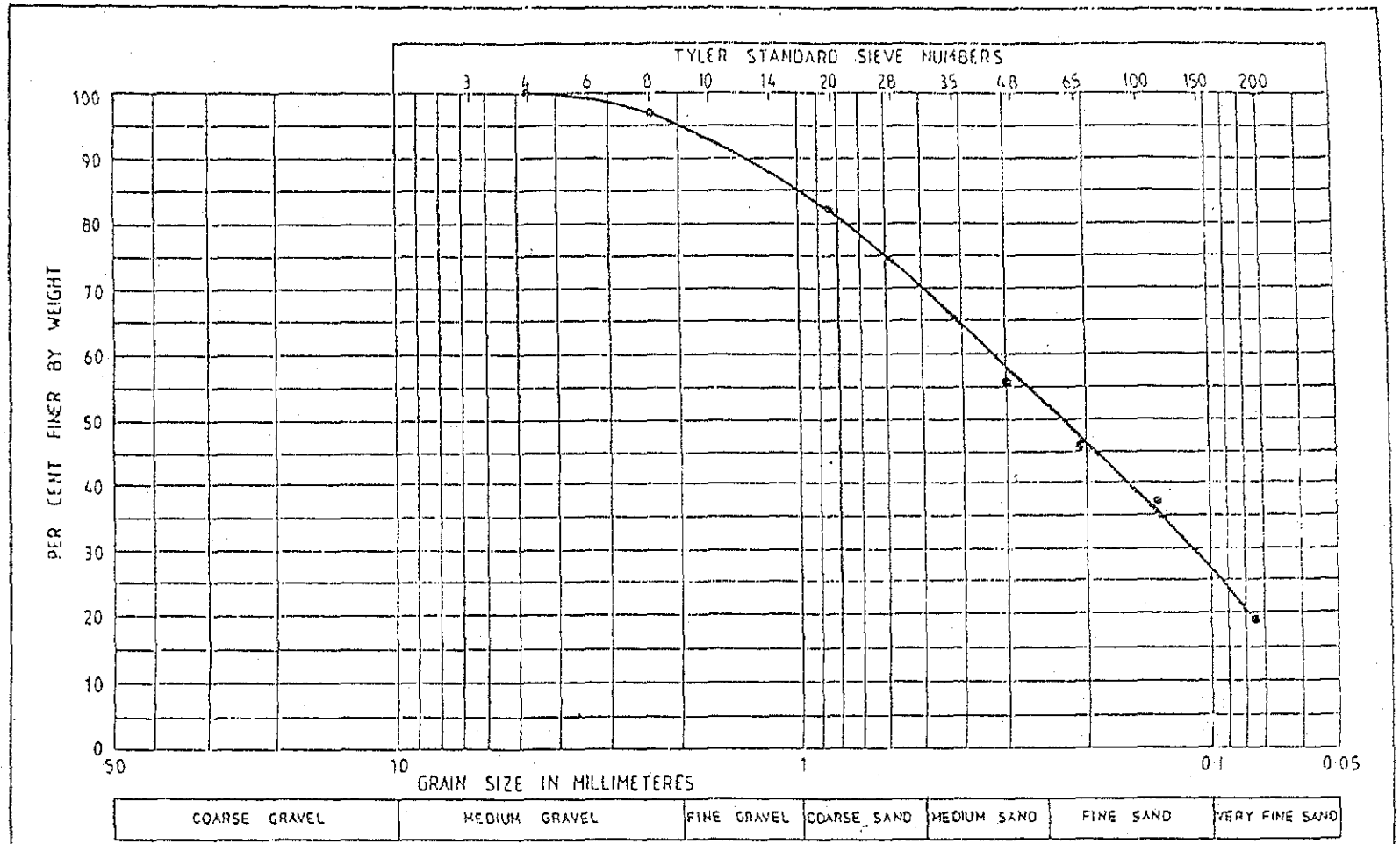
GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA



PROJECT National Youth Services Council BORING NO. (6) SAMPLE NO. _____

DEPTH 4.50m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA

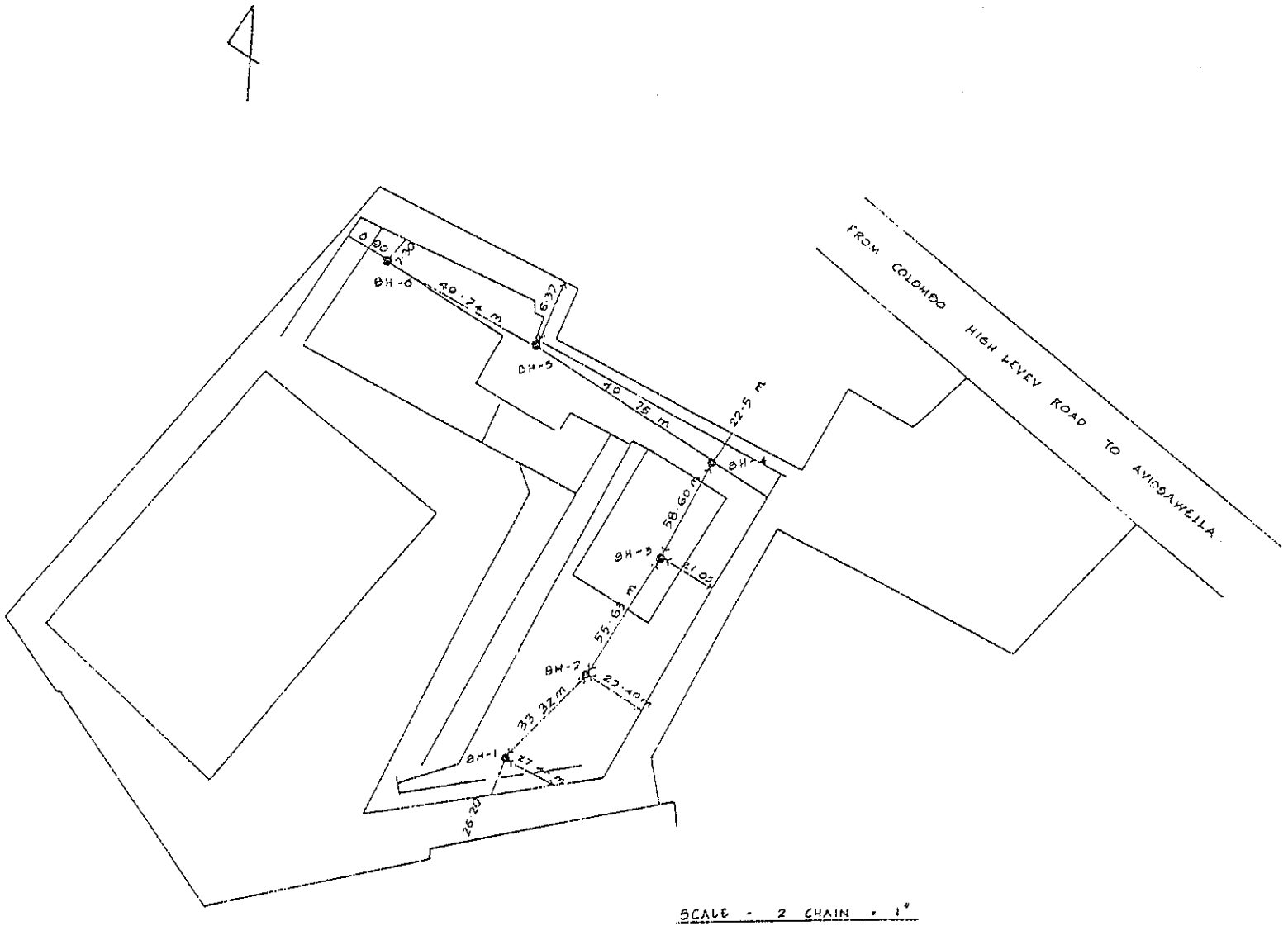


PROJECT National Youth Services Council BORING NO. (6) SAMPLE NO. _____

DEPTH 6·00m ELEVATION _____ REMARKS _____

GRAIN SIZE DISTRIBUTION DIAGRAM

GROUP ENGINEERING LABORATORIES, COLOMBO, SRI LANKA


FROM COLOMBO HIGH LEVEV ROAD TO AVISSAWELLA
BH-6
40.74 m
6.32
BH-5
40.75 m
22.5 m
BH-4
58.60 m
BH-3
2.03
55.63 m
BH-2
23.40
33.32 m
BH-1
26.20
SCALE - 2 CHAIN = 1"

APPENDIX 4. Data for Maintenance and Management Cost

Fuel and light expenses of the facility

Estimation of electricity cost

(1) Calculation condition

1. Facility service hour:
   Eight hours per day and 25 days per month (stage service hour: twice per week, totaling four hours)

(2) Calculation of load capacity

a. Electric load (Lighting and Receptacles)

Administration building	2,086 m^2 x @30 VA/m^2 ≒	63 kVA
Seminar building	3,237 m^2 x @30 VA/m^2 ≒	97 kVA
Hostels	3,575 m^2 x @15 VA/m^2 ≒	54 kVA
Multi-purpose hall	5,450 m^2 x @20 VA/m^2 ≒	109 kVA
Outdoor lighting		7 kVA

b. Electric load (Air conditioner)

1,000 m^2 x @90 VA/m^2 = 90 kVA

c. Electric load (General power unit) 180 kVA

d. Electric load (Stage lighting) 200 kVA

800 kVA

(3) Estimated maximum electric power
800 kVA x 0.65 = 520 kW

(4) Calculation of electric charge

a. Basic charge (demanded charge)
   520 kW x 115 RS/kW = 59,800 RS/month

b. Accumulated charge (unit charge)
   1 600 kVA x 0.65 x 8 hours x 25 days x 0.4 x 1.5 RS/kWH
   = 46,800 RS/month (under regular load)
   2 200 KVA x 0.65 x 4 hours x 8 days x 0.4 x 1.5 RS/kWH
   ≒ 2,500 RS/month

c. Fixed charge

200 RS/month

Therefore, electric charge per month is calculated as follows

a + b + c = 59,800 RS/month + 46,800 RS/month +
2,500 RS/month + 200 RS/month
= 109,300 RS/month

Yearly electric charge

109,300 RS/month x 12 months = 1,311,600 RS/month

APPENDIX 5. List of Training Equipment

EQUIPMENT LIST FOR THE NATIONAL YOUTH CENTRE

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
A	ELECTRONICS (include. Radio and Acoustic Engineering)		
1	Pulse Circuit Trainer	1	
2	SCR Circuit Trainer	1	
3	Automatic Voltage Regulator	1	
4	Silicone Rectifier	1	
5	Pattern Generator	2	
6	Sweep Generator	2	
7	RC Oscillator	5	
8	Signal Generator	2	
9	FM Stereo Signal Generator	1	
10	Test Oscillator	5	
11	DC Power Supply	5	
12	Oscilloscope (Standard type)	2	
13	Oscilloscope (2 idential channels type)	2	
14	Standard Self Inductors	3	
15	Variable Attenuator	3	
16	Audio Amplifier	2	
17	Universal Bridge	1	
18	Wheatstone Bridge	2	
19	L.C.R. Meter	2	
20	Double Bridge	2	
21	Transistor Tester	2	
22	Curve Tracer	1	
23	Q Meter	1	
24	Capacitance Meter	1 set	
25	Transceiver	1	
26	Radio Receiver (1 Band) (2 Band) (3 Band)	4 3 3	
27	TV Set (20" Color) (14" Color) (17" Monocrome) (14" Monocrome)	2 1 2 1	
28	Speaker	1	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
29	Stereo Set (Amplifier, Tuner, Cassette Deck, Turn table, Speakers)	1 set	
30	Portable Cassette Recorder	2	
31	Electronic Calculator	2	
32	Portable High-Frequency Milliammeters & Voltmeters	5	
33	Portable Standard DC Voltmeters	5	
34	Portable Standard DC Ammeters	5	
35	Portable Standard AC Voltmeters	5	
36	Portable Standard AC Amlmeters	5	
37	Circuit Tester	10	
38	Electronic Galvanometer	2	
39	Insulation Testers	3	
40	Portable Frequency Meters	2	
41	Standard Resistors	3	
42	Sound Level Meter	2	
B	ELECTRONIC APPLIANCES ASSEMBLY, REPAIRING, SERVICING AND MAINTAINING		
1	Electronics Circuit Trainer	1	
2	Sequential Control System Trainer	1	
3	Transister Experiment Applatus	1	
4	Logical Circuit System Trainer	1	
5	Color TV Trainer	1	
6	RF Signal Generator	1	
7	Pattern Generator	2	
8	Sweep Generator & Alignment Scope	2	
9	Osiloscope (Standard type)	2	
10	Osiloscope (2 identical channels)	2	
11	Portable Wheatstone Bridge	3	
12	Portable Double Bridge	3	
13	Rice Cooker	2	
14	Toaster	2	
15	Electric Fan	2	
16	Washer	2	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
17	Refrigerator	2	
18	Water Pump	2	
19	Experimental Device for Servo-Motor	1	
20	Coil Winder Automatic Universal Coil Winder	1 1	
21	Dryer	1	
22	Voltmeter	1	
23	Ammeter	1	
24	Wattmeter	1	
25	Frequency Meter	1	
26	Power Factor Meter	1	
27	Circuit Tester	5	
28	Portable DC Potentiometer	1	
29	Portable Standard AC Voltmeters	5	
30	Portable Standard AC Ammeters	5	
31	Portable Standard DC Voltmeters	5	
32	Insulation Testers	5	
33	Portable Power Factor Meters	5	
34	Portable Frequency Meters	2	
35	Pocket Thermometers	3	
36	Degital Hygrometer	2	
37	Earth Tester	1	
38	Pocket Tachometers	5	
39	Stop Watch	3	
40	Universal Tester	2	
C	ELECTRONICS WORKSHOP		
1	Precision Lath	1	
2	Foot Shearing Machine	1	
3	Hand Lever Shear	1	
4	Bench Drilling Machine	1	
5	Electric Bench Grinder w/Dust Collector	1	
6	Electric Drill	3	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
7	Tools & Miscellaneous	L.S	
D	REFRIGERATION AND AIR-CONDITIONING		
1	Air Conditioning Laboratory Unit	1	
2	Refrigeration Test Bench	1	
3	Air-cooled Packaged Water Chiller	1	
4	Fan Coil Unit	3	
5	Air-Cooled Packaged Type Air Conditioner	2	
6	Split System Room Air Cohnditioner	2	
7	Window Type Room Air Conditioner	2	
8	Self-Contained Display Case	1	
9	Centrifugal Fan	1	
10	Parts Washing Stand	1	
11	AC Arc Welder	1	
12	Hotjet	1	
13	Drying Oven for Electrodes	1	
14	Foot Shearing Machine	1	
15	Folding Machine	1	
16	Treading Machine	1	
17	Sawing Machine	1	
18	Bench Type Drilling Machine	2	
19	Electric Bench Grinder	1	
20	Portable Electric Grinder	3	
21	Electric Drill	3	
22	Impact Drill	2	
23	High-speed Cut Off Machine	1	
24	Air Compressor	1	
25	Portable Crane	1	
26	Miscellaneous Tools		
E	COMPUTER ENGINEERING AND PROGRAMING		
1	Personal Computer	26	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
2	Personal Computer	26	
3	Personal Computer Color Monitor	26	
4	Pinwriter	26	
5	Printer	26	
6	Computer Basic Experimental Equipment	2	
F	VEDIO PRODUCTION		
	【 Studio Equipment 】		
1	DXC-M3APK 3-Tube Color Video Camera	3	
2	DXF-50CE Electronic View Finder for DXC-M3P	3	
3	L0-26 Flexible Cable	3	
4	VSF-2000SD Tripod w/Dolly by Heiwa Fluid Head & Two Pan-Rods	3	
5	COQ-25AM Camera Cable for CCU-M3/CCU-M3P	3	
6	PVM-2010QM Color Video Monitor	1	
7	SU-530 Monitor Stand for PVM-1910/2010QM	1	
8	SS-P520 Compact Monitor Speaker	2	
9	C-48 Condenser Microphone for Pro Use	2	
10	C-74 Condenser Microphone	1	
11	ECM-55S Electret Condenser Mic	3	
12	F-760 Dynamic Mic	3	
13	Special Mic Cable	9	
14	UM-5(U) Battery	100	
15	A-12 Table Microphone Stand	3	
16	B-303B Microphone Boom Stand	3	
17	CRS-3P Cradle Suspension	4	
18	SAD-26 Microphone Stand Pole	3	
19	Special Audio/Video Cord for PVM-2010QM/SS-P520	1	
20	Special Studio Connecting Panel for Video & Audio	1	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
	[Productioon Control Unit]		
21	CCU-M3P Camera Control Unit for DXC-M3P	3	
22	CMA-8CE Camera Adaptor	3	
23	RMM-1800 Rack Mount Metal for CCU-1800/DXF-40CMA-7	2	
24	CCQ-25AM Camera Cable for CCU-M3/CCU-M3P	3	
25	PVM-910E Monochrome Video Monitor	3	
26	MB-500B Mounting Bracket for PVM-8010/9010ME	2	
27	528A OP.3 Waveform Monitor	1	
28	1421 Vector Scope PAL System	1	
29	016-0115-02 Rack Mountkit for 1421/1420 and 528A	1	
30	Special Monitor Selector	1	
31	PVM-9010ME 9" Video Color Monitor for W/F & V/S	1	
32	SEG-2000AP Special Effect Generator	1	
33	CRK-2000P Universal Chromakeyer for SEG-2000P (PAL)	1	
34	WEX-2000P Wipe Pattern Extender for SEG-2000AP (PAL)	1	
35	CCDD-2. 5 Connecting Cable	8	
36	CCF-1 Extender Board Set	1	
37	PVM-1371QM 13" Video Color Monitor for PST 7 PGM of SEG-2000	2	
38	Special Console Rack for SEG	1	
39	PVM-1220E Monocrome Video Monitor	4	
40	Special Video Cable	1	
41	DR-100 Inter Communication Head-Set SEG-2000AP & CCU	1	
42	Special Signal Selector	1	
43	1411R Kit PAL Signal Generator Kit By Tektronix	1	
44	TSG11 Color Bars Generator Kit	2	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
	[Acoustic Control Console]		
45	MX-P21 Professional 8-Channel Audio Mixer	1	
46	Special Power Amlplifier	2	
47	SS-P520 Compact Monitor Speaker	2	
48	Special Audio Console	1	
49	Special Audio Cable	1	
50	Special Cassette Tape Recorder	2	
51	MDR-CD5 Stereo Headphone	3	
	[Editing System]		
52	VO-5850P U-Matic Video Cassette Recorder/Editing PAL	2	
53	RM-440 Automatic Editing Control Unit	1	
54	RCC-5F Remote Control Cable	2	
55	VDC-5 Dubbing Connector Cable	1	
56	RK-74A Connecting Cord	2	
57	VMC-3P Monitor Connecting Cable	1	
58	BVT-800PS (P) Digital TBC for U-Matic PAL	1	
59	OVN0137QM Color Video Monitor	2	
60	Special Video Editing Console Rack	1	
61	Special Video/Audio Cable	1	
	[ELECTRONICS NEWS GATHERING SYSTEM]		
62	DXC-M3APK 3-Tube Color Video Camera	1	
63	CCQ -10AR Camera Extension Cable	1	
64	Portable Power Factor MetersVO-6800PS Portable Video Cassette Recorder PAL/SECAM	1	
65	16BV-SET Tripod for Outdoor Use Standard/Short Legs	1	
66	16BV-BAG-1/2 Carrying Case for 16BV-SET	1	
67	PVM-6030ME Color Video Monitor	1	
68	NP-1 Rechargeable Battery Pack for PVM-6030ME 7 DXC-M3AP	8	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
69	BC-1WA Battery Charger for NP-1 up to Four NP-1S	3	
70	F-115 Dynamic Mic	1	
	[Duplicating System]		
71	PVM-1371QM Color Video Monitor	2	
72	U-Matic Video Cassette Recorder/Editing PAL	2	
73	Special Console Rack and A/V Cables	1	
74	RM-440 Automatic Editing Control Unit	1	
75	RCC-5F Remote Control Cable	2	
76	VDC-5 Dubbing Connector Cable	1	
77	RK-74A Connecting	1	
	[Presentation Unit]		
78	VPH-1020PM 100" Universal Video Projector	1	
79	VMC-10P Monitor Connecting Cable	1	
80	VO-5630 U-Matic Video Cassette Recorder	1	
81	VPS-100F1 100" Flat Screen for Video Projector	1	
82	VLC-722 Carrying Case for VPH-722QM/1020QM	1	
	[Studio Lighting]		
83	Special Studio Lighting System	1	
	[Spare Parts]		
84	KCA-60K U-Matic Video Cassette Tape	25	
85	KCA-30K U-Matic Video Cassette Tape	100	
86	HF-60 Low Noise Audio Cassette Tape	150	
G	HOME SCIENCE		
1	Sawing Machine (Pedestal Type)	10	
2	Sawing Machine (Motor Driving Type)	3	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
3	Sawing Machine (Zigzag Type)	2	
4	Button Hole Mending Tool	3	
5	Dress Making Tool Set for Teacher	3	
6	Dress Making Tool Set for Student	10	
7	Steam Iron (700W)	5	
8	Iron Stand	5	
9	Cutting Scissor	15	
10	Pinking Scissor	3	
11	Dress Hanger	10	
12	Mirror	3	
13	Model Stand	3	
14	Cooking Table, Gas Range, Sink	4	
15	Electric Cooking Oven	4	
16	Electric Rice Cooker	4	
17	Refrigirator (446 L.)	1	
18	Juicer/Mixer	2	
19	Sort of Pans	4sets	
20	Cooking Instruments	4sets	
21	Cooking Knife and Board	4sets	
22	Dining Plates	4sets	
23	Tea Set	4sets	
24	Cook-measuring Instruments	4sets	
25	Kitchen Scale	4sets	
H	LANGAUGE LABORATORY		
1	Control Console for 32 Students Booths	1	
2	Console Desk	1	
3	Side Panel	2	
4	Compact Cassette Deck for LLC-1000	2	
5	Open-Reel Master Deck	1	
6	Remote Control Unit for TC-707	1	
7	Console Desk for TC-707SD	1	

Item No.	Articles, Descriptions and Specifications	Q'ty	Remarks
8	Booth Amplifier for LL	32	
9	Headeset for LL	32	
10	Speaker for LL	2	
11	Power Supply for ER-1000	2	
12	Booth Assembly	16	
13	Cable for Remote Control for LL System	4	
14	Installation Meterials for LL System	1	
18	Low Noise Audio Cassette Tape	200	
19	Installation Materials & Tools for LL System Only	1	
I	SEMINAR RM EQUIPMENT		
1	16mm Projector	1	
2	Slide Projector	1	
3	Overhead Projector	1	
4	Screen (MotorDrive Type)	1	
5	Screen (Tripod Type)	1	
6	Tape Slicer w/Tape	1	
7	Film Rewinder	1